Attachment I

Geologic Processes Reports

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

GEOTECHNICAL REPORT

Newlove Park C.U.P.

Solomon Hills
Portion of Assessor's Parcel Number
101-020-087
Santa Barbara County, California

Exclusively Prepared For:

Solstra Communities California, LLC
1130 East Clark Avenue, Suite 150 #286
Orcutt, CA 93455

July 26, 2025
Job No.: 25-2195s-1

TABLE OF CONTENTS

1.0 PROJECT DESCRIPTION SUMMARY 1
2.0 SCOPE OF WORK 2
3.0 PROPERTY DESCRIPTION 3
4.0 PROPOSED GRADING 3
5.0 GEOLOGIC MAPPING AND REFERENCE SOURCES 4
6.0 GEOLOGIC SETTING 4
7.0 GEOLOGIC UNITS 5
7.1 Careaga Sandstone Formation – Cebada Member (Tcac) 5
7.2 Careaga Sandstone Formation – Graciosa Member (Tcag) 5
7.3 Paso Robles Formation (QTp) 6
7.4 Landslides (Qls) 6
7.5 Slopewash (Qsw) 6
7.6 Artificial Fill (af) 6
8.0 GROUNDWATER 7
9.0 POTENTIAL GEOLOGIC AND GEOTECHNICAL HAZARDS/CONSTRAINTS 7
9.1 Seismic Considerations 7
9.1.1 Introduction 7
9.1.2 Ground Rupture 8
9.1.3 Ground Motion 10
9.1.4 Ground Failure 12
9.2 Slope Stability 13
9.2.1 Proposed Cut-Slopes 13
9.2.2 Proposed Fill Slopes 13
9.2.3 Natural Slopes 13
9.2.4 Debris Flow Hazards 13
9.3 Soil Compressibility and Hydro-consolidation 14
9.3.1 Hydro-Compression (Collapse) 14
9.3.2 Compressibility of Landslide Material 14
9.4 Landslides 15
9.5 Expansion Potential 15
9.6 Potential Corrosivity of Soils 16
9.7 Soil Creep 16
9.8 Subsidence 17
9.9 Oil Wells 17
9.10 Building Setbacks 17
10.0 GENERAL CONSTRUCTION CONSIDERATIONS 18
10.1 Earthwork and Grading Recommendations 18

TABLE OF CONTENTS

10.1.1 Removals and Benching 18
10.1.2 Fill Materials 18
10.1.3 Fill Compaction 18
10.1.4 Construction of Fill Slopes 18
10.1.5 Bulking/Shrinkage Behavior of Site Soil/Rock Deposits 19
10.1.6 Compaction Characteristics 19
10.2 Drainage Recommendations 19
10.3 Sewage Disposal 20
11.0 FEASIBILITY OF DEVELOPMENT 20
12.0 CONCLUSIONS AND RECOMMENDATIONS 20
13.0 FUTURE GEOTECHNICAL STUDIES 22
14.0 LIMITATIONS 23

The following attachments and appendices complete this report.

Location Map following page 2
References

APPENDIX A – Subsurface Logs
- Geologic Test Pits GT-14, GT-15, GT-16, and GT-27
- Bucket-Auger Borings BA-3 and BA-6

APPENDIX B – Construction Diagrams
- Fill Over Natural Slope 5:1 or Steeper
- Rock Disposal
- Fill Slope Over Natural Slope 5:1 or Steeper
- Fill Slope Toeing Out on Flat Alluviated Canyon
- Stability/Buttress Fill and Backdrains

APPENDIX C – Maps
- **Regional Geologic Map** (1'=2,000') **Plate I**
- **Preliminary Geotechnical Maps** **Plates II - V**
- **Geologic Map** (1'=400') **Plate VI**

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

July 26, 2025 Job No.: 25-2195s-1

Solstra Communities California, LLC
1130 East Clark Avenue, Suite 150 #286
Orcutt, CA 93455

Attention: Mr. Peter Kiesecker

Subject: **GEOTECHNICAL REPORT**
Newlove Park C.U.P.

Property: Solomon Hills Development
Portions of Assessor's Parcel Number 101-020-087
Santa Barbara County, California

Dear Mr. Kiesecker:

This report presents the results of a preliminary geotechnical and seismic hazard assessment for proposed improvements to the existing Newlove Park as part of the overall Solomon Hill project area. The objective of this assessment is to characterize the geologic setting of the site, identify geologic units, and evaluate potential geologic and seismic hazards, including landslides, faulting, liquefaction, and slope instability. The report is intended to support environmental review and the Conditional Use Permit (CUP) process by providing a baseline understanding of site conditions. The assessment is based on published geologic maps, available seismic hazard data, and in-house geologic mapping and subsurface exploration conducted by this office.

1.0 PROJECT DESCRIPTION SUMMARY

The Newlove Park improvements are proposed as part of the broader Solomon Hills Development, a master-planned community in northern Santa Barbara County. Within this context, the 31-acre Newlove Park site lies within the Orcutt Community Plan boundary, and serves as a transitional zone between existing development and future land uses in the Solomon Hills Specific Plan.

Newlove Park is an existing park north of the Solomon Hills Specific Plan boundary that is proposed to be upgraded and expanded to provide a range of active and passive recreational amenities for the community and general public. Planned improvements include two youth soccer fields, four pickleball courts, a little league baseball field, playgrounds, trails connecting

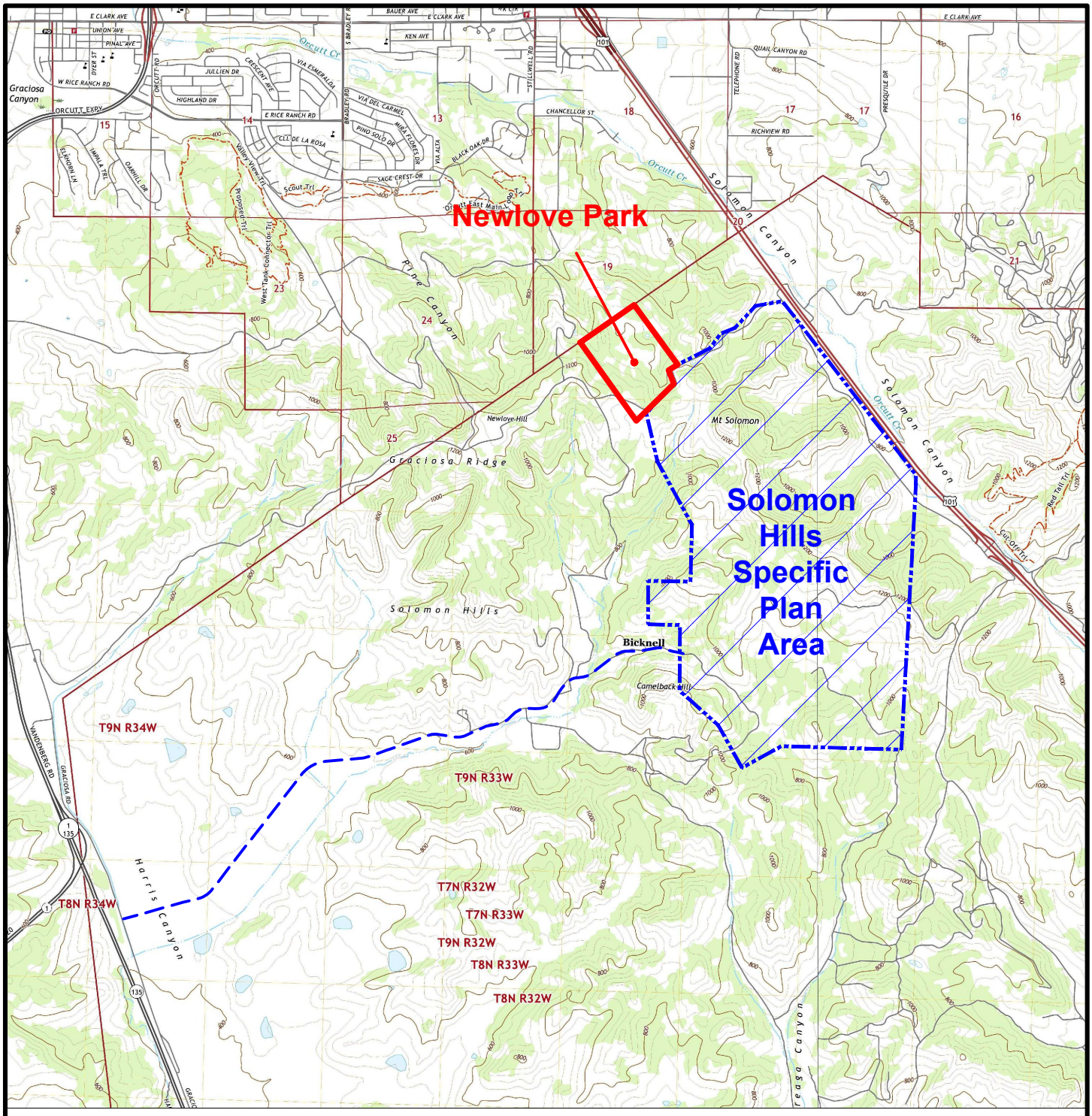
to the Orcutt and Solomon Hills trail networks, activity nodes, a public overlook, and associated site infrastructure such as a bathroom building and parking lot. The earthwork area of disturbance is 18.1 acres to accommodate the new features.

The improvements are intended to enhance community access to open space, recreation, and restored natural features while maintaining an open space buffer between Orcutt and the new urban development boundary proposed as part of the Specific Plan.

2.0 SCOPE OF WORK

The scope of work for this assessment included the following tasks:

- Review of published Geologic Map of the Camalia and Orcutt Quadrangles (Dibblee, 1989) and the USGS 30′×60′ Geologic Map of the Santa Maria and Point Conception Quadrangles (Sweetkind et al., 2021).
- Preparation of a Regional Geologic Map (Plate I).
- Review of the Newlove Park Conditional-Use Permit (C.U.P.) plans prepared by RRM Design Group, dated 7/23/25. The 80- and 40-scale Primary Access Road Plan and Profile, Preliminary Grading and Drainage, and Secondary Access Road (sheets C4 throughC7) was used as the base map for the Preliminary Geotechnical Map (**Plates II, III, IV, and V**). We make no representations regarding the accuracy of these base maps.
- Review of the General Plan Amendments and Specific Plan Geotechnical Report (AES, 2023) and associated exploratory trench and boring logs in the Newlove Park and in the vicinity.
- Interpretation of geologic mapping previously performed by this office in the Newlove Park area.
- Evaluation of geologic units, slope conditions, landslides, expansion potential, corrosivity, and groundwater conditions based on available data.
- Preparation of a 400-scale Geologic Map (**Plate VI**) showing mapped geologic units, landslides, and structural features based on existing data and prior surface mapping and subsurface investigations by this office.
- Preparation of this geotechnical assessment report for use in Conditional-Use Permit (CUP) processing and early-stage project planning.



Source: U.S. Geological Survey Orcutt and Sisquoc Quadrangles, Dated 2021

Approximate Scale: 1"=4,000'

NOTE: THIS IS NOT A SURVEY OF THE PROPERTY

1 0,5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 40 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

N

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

LOCATION MAP

Job No.: 25-2195s-1	*Date:* 7/26/25

3.0 PROPERTY DESCRIPTION

The property is located in northern Santa Barbara County, south of the town of Orcutt in the Solomon Hills (see Location Map following page 2). The Solomon Hills are separated from the Casmalia Hills to the west by Graciosa Canyon, which flow to the north and is bisected by Highway 135. Solomon Canyon, which is bisected by Highway 101, drains north toward Orcutt Creek and forms the eastern boundary of the property.

The proposed improvements encompass the Newlove Park, an existing 31-acre public park located just outside the Solomon Hills Specific Plan boundary but within the larger Solomon Hills project area. The existing park is characterized by gentle sloping terrain. The terrain outside of the proposed improvements transitions into steeper hillslopes and canyon margins farther north and east. Existing slope gradients adjacent to the proposed improvements range from approximately 5:1 to 2:1 (h:v), with most proposed improvements located in areas with slopes between 10:1 and 3:1 gradient. Steeper slopes occur along the northern and eastern park boundaries, where natural terrain begins to descend more sharply into adjacent drainages.

Topography ranges from gently sloping ridge crests to more complex terrain at the margins of the park footprint, with elevations varying from approximately 980 to 1,090 feet above sea level. Vegetation consists primarily of grasses, scattered oaks, and patches of chaparral, with visible remnants of past ranch use and informal trail access.

4.0 PROPOSED GRADING

The Primary Access Road Plan and Profile (sheet C4) and the Preliminary Grading and Drainage plans (sheet C5 and C6) illustrates proposed grading improvements within the Newlove Park area, including pad areas, slopes, bioretention basins, detention basins, and access features. A retaining wall up to 8.5 ft in exposed height is proposed at the toe of a 2:1 cut slope located along the west side of the primary access road. A secondary access road extends from the park west to private Orcutt Hills Road.

The maximum proposed cut is 16 ft in the Soccer Fields and the maximum fill thickness is 17 ft at the Primary Access Road and parking lot. Proposed cut slopes are shown at 2:1 (h:v) gradients. The maximum proposed cut slope is 25 ft in height, which is along the primary access road to the park. The maximum proposed fill slope is 16 ft in height at ~3:1 (h:v) gradient at the primary access road and the parking lot. The Little League Baseball / Softball field has up to 11 ft of fill. In general, the proposed grades for the parking lot area are within a few feet of existing grades. The lawn recreation area to the east of the parking lot has fill up to 5 ft in thickness. Based on current design, the volume of cut is 57,930 cubic yards (c.y.)

and fill is 48,158 cy. Based on an assumed shrinkage of 20% for the placed compacted fill, the proposed park site improvements are anticipated to have balanced net zero (0) earthwork.

5.0 GEOLOGIC MAPPING AND REFERENCE SOURCES

Geologic conditions at the Newlove Park site were evaluated using multiple sources. Regional geologic context was reviewed using the Geologic Map of the Casmalia and Orcutt Quadrangles (Dibblee, 1989), which provides 1:24,000-scale mapping of the local area. These maps were supplemented by the U.S. Geological Survey's Geologic and Geophysical Maps of the Santa Maria and Point Conception 30'×60' Quadrangles, California (Sweetkind et al., 2022), which offer updated interpretations of regional stratigraphy and structural features. In addition, site-specific surface geologic mapping was previously performed by this office in support of the Solomon Hills General Plan Amendments and Specific Plan geotechnical investigation, using the project topographic base map and aerial photo interpretation. This combination of published and site-specific mapping forms the basis for the geologic assessment presented in this report.

6.0 GEOLOGIC SETTING

The proposed park is located within the southern portion of the Coast Ranges Geomorphic Province, along the southern margin of the Santa Maria Valley in the Solomon Hills. This region is characterized by northwest-trending structural and stratigraphic features resulting from long-term compressional tectonic forces associated with the western Transverse Ranges. Uplift of basement and overlying sedimentary rocks has produced a series of asymmetric folds and reverse faults, followed by erosion and incision that have shaped the current landscape.

Within the Newlove Park improvement area, the underlying geology is dominated by the Careaga Sandstone Formation, which includes the Cebada Member (Tcac) and the Graciosa Member (Tcag). These marine sandstones are underlain by the older Sisquoc Formation (Tsq), a fine-grained diatomaceous mudstone. The Sisquoc Formation is not exposed on the park site. The Careaga Formation is in turn overlain by the Paso Robles Formation (QTp).

The most prominent structural feature in the area is the Casmalia fault zone, a south-dipping reverse fault with an inferred trace at the base of the Solomon Hills. The fault trace is not exposed at the surface. The subsurface fault believed to underlie this structure has not been observed at the surface and is not designated as active under the Alquist-Priolo Earthquake Fault Zoning Act. Fault activity has resulted in the formation of the Solomon Hills Anticline, a broad east-west–trending fold that defines the elevated terrain of the Solomon Hills. This anticline has uplifted and tilted underlying sedimentary strata, exposing older geologic units at

the surface and contributing to localized slope instability in some areas. The Newlove Park is encompassed by a large landslide.

Moving westward across the broader Solomon Hills region, bedrock dips vary from steeply dipping (30°–45°) near Highway 101, to near-horizontal bedding near the crest of the Mt. Solomon Anticline, and then to gently dipping (5°–15°) southwest-oriented beds west of the fold axis. Cross bedding and localized variations in dip are present within the Careaga Sandstone Formation. The Careaga Sandstone Formation bedding adjacent to the park has shallow dips (6° or less), which gradually increase with distance to the northeast up to 43° (See Geologic Map, Plate VI).

7.0 GEOLOGIC UNITS

The proposed improvement to the Newlove Park is underlain by sedimentary bedrock of the Pliocene-age Careaga Sandstone Formation, which includes both the Graciosa Member (Tcag) and Cebada Member (Tcac). However, the Careaga Sandstone Formation at the Newlove Park has been affected by landsliding. The southwestern portion of the secondary access road where it connects to the private Orcutt Hills Road is underlain by the sedimentary bedrock of the Pleistocene-age nonmarine Paso Robles Formation. The following descriptions summarize the characteristics and engineering significance of the geologic units present within the project area.

7.1 Careaga Sandstone Formation – Cebada Member (Tcac)

The Cebada Member is the dominant bedrock unit underlying the Newlove Park site. It is composed of fine-grained, poorly to moderately cemented sandstone and sandy siltstone. It tends to form more subdued topography and may exhibit lower shear strength and higher compressibility, especially when weathered or saturated. However, as previously stated the Cebada member is landslide affected beneath the limits of the proposed park improvements.

7.2 Careaga Sandstone Formation – Graciosa Member (Tcag)

The Graciosa Member is present primarily in the southern and southeastern portions of the park site. It consists of moderately cemented, fossiliferous marine sandstone and conglomerate, with local cross-bedding and coarse-grained intervals. The unit is generally massive and well-drained, with fair to good strength properties. In outcrop, it often forms shallow ridgelines and moderately sloping terrain. Excavation is typically manageable but may be more difficult where localized cementation or conglomeratic zones occur. The Graciosa Member is generally suitable as a foundation material, though localized variability in cementation and clast content may affect grading and fill performance. The primary access road is anticipated to be underlain by the Graciosa member.

7.3 Paso Robles Formation (QTp)

The Paso Robles Formation is nonmarine unit consists of poorly sorted conglomerates, cross-bedded sandstones, claystones, and siltstones. Subsurface exposures from previous trenching show typical sequences of interbedded granular and cohesive materials, with local expansive clays. Engineering properties can be variable depending on the degree of cementation and moisture content.

7.4 Landslides (Qls)

Landslide deposits (Qls) are beneath the limit of the proposed park improvements, except for the southern portion of the primary access road (see **Geologic Map**, Plate VI). The landslide material consists of disturbed and sheared soil and bedrock derived from the Careaga Sandstone Formation. These deposits are associated with a deep-seated landslide feature previously mapped and confirmed through subsurface explorations including Boring BA-3 and Trenches GT-14 and GT-15. The materials encountered within the landslide zone include fractured and rotated blocks, sheared fine- to coarse-grained sandstone, and zones of elevated moisture content. The geometry and composition of the deposit suggest translational or rotational movement along a buried slip surface, with moderate to steep scarps and hummocky surface morphology. This landslide is estimated to encompass about 132-acres. While no recent movement has been documented, the landslide is considered a potential geologic hazard.

7.5 Slopewash (Qsw)

Slopewash, or colluvium, is a heterogeneous deposit formed on slopes as a result of weathering, sheet wash, creep and shallow debris flows on sloping ground. This unit is generally thickest in swales and side canyons, and at the toe of existing natural slopes, where it commonly interfingers with the canyon alluvial deposits. The slopewash generally consists of poorly sorted, pebbly silty sand, but varies depending on the composition of the underlying source material. The maximum thickness of slopewash encountered in our exploratory excavations is about 2 to 3 feet. Slopewash is noted on the geologic logs but is not shown on the Preliminary Geotechnical Maps (**Plates II thru V**).

7.6 Artificial Fill (af)

Undocumented fills (af) are likely present in limited areas of the park site, particularly in association with previous park improvements such as access roads, parking areas, and utility trenches. These fills are typically composed of reworked native soils and bedrock fragments, placed during past grading or landscaping activities. The composition, depth, and compaction of these fills are not documented. Where encountered, these materials may

exhibit variable density and moisture content and should not be assumed to possess uniform engineering properties.

8.0 GROUNDWATER

The proposed park site lies within the Santa Maria River Valley Groundwater Basin, a regionally significant aquifer system underlying much of the Santa Maria–Orcutt area. Although perched water may occur locally along drainage pathways, available regional data indicate that groundwater levels are generally deep throughout the basin. Per the Orcutt Community Plan, the regional groundwater table is considered to be very deep.

No groundwater monitoring wells or published groundwater data are available in the immediate vicinity of the proposed park. However, groundwater was encountered at a depth of approximately 44 feet below ground surface in Boring BA-3, which was advanced within the mapped landslide deposit at the eastern edge of the proposed improvements. In contrast, no groundwater was observed in nearby trenches GT-14 and GT-15 to their maximum explored depths of approximately 8 feet. These observations suggest that shallow groundwater is not widespread across the park site, though localized saturation may occur seasonally in topographic lows or near drainage channels. Perched water may also be present above low-permeability bedrock horizons.

9.0 POTENTIAL GEOLOGIC AND GEOTECHNICAL HAZARDS/CONSTRAINTS

9.1 Seismic Considerations

9.1.1 Introduction

The park site is within the Coast Ranges Geomorphic Province of California. The Coast Ranges consist of northwest-trending mountain ranges and valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. The Solomon and Casmalia Hills form the southern edge of Santa Maria Valley. The Solomon Hills were formed by compressional forces uplifting the basement rocks, ultimately causing west-northwest trending folds and thrust faults. The Casmalia fault, also referred to as the Orcutt Frontal fault, is inferred to extend along the northeast flank of the Solomon Hills. Other faults near the park are the Los Alamos, San Luis Range, Lion's Head, and West Huasna strike-slip and reverse/thrust faults.

The California region is traversed by the San Andreas Fault, which is a transform boundary between the Pacific Plate and the North American Plate. The San Andreas Fault is part of the San Andreas system of northwest-striking, right-lateral faults. The faults of this system are generally historically active, as evidenced by the June 28, 1992 Landers (M7.6).

The California region is seismically active and commonly experiences strong ground shaking resulting from earthquakes along active faults. Earthquakes along these faults are part of a continuous, naturally occurring process, which has contributed to the characteristic landscape of the region. Common geologic hazards associated with earthquakes are discussed below and include **Ground Rupture**, **Ground Motion**, and **Ground Failure**.

9.1.2 Ground Rupture

Earthquake faults in California that are defined as active may present a hazard of fault rupture. The California Department of Conservation, California Geologic Survey (CGS), Special Publication 42 defines an active fault as one which has had surface displacement within Holocene time (about the last 11,700 years). Review of the Earthquake Fault Zone Maps provided in the California Department of Conservation, Division of Mines and Geology, Special Publication 42 indicates that there are not any known active faults within the Property, per the criteria specified in the Alquist-Priolo Earthquake Fault Zoning Act.

The potential for ground rupture was further evaluated utilizing published maps in conjunction with field mapping and subsurface exploration programs. The California Geological Survey ("CGS") Fault Activity Map of California show the inferred trace of the Casmalia fault zone, which includes a trace just north of the park. In addition, Orcutt Oil Field faults west of the park. The CGS indicates late Quaternary fault displacement (during the past 130,000 years) for the Casmalia and Orcutt Oil Field faults.

9.1.2.1 Casmalia Fault (Orcutt Frontal)

The Casmalia fault (Orcutt Frontal) was originally identified in the subsurface from oil field data in the Solomon Hills, and inferred to extend along the northeast flank of the Casmalia Range and Solomon Hills. Based upon oil well data, this fault is interpreted to be a blind thrust fault concealed below the ground surface. This fault is believed to be responsible for the uplift of the Casmalia Range and Solomon Hills. The Orcutt and Mt. Solomon anticlines are part of a series of en-echelon northwest trending anticlines that define the Casmalia-Orcutt anticlinal trend. These anticlinal folds are typically asymmetrical in cross section, wherein the southern limbs are long and gently dipping and the northern limbs are moderately to steeply dipping, consistent with folding typically found in the upper plate of a blind thrust fault.

The Casmalia fault (Orcutt Frontal) is believed to be Late Quaternary in age by some authors and other authors believe that it is seismically active, with some attributing recent seismic events (i.e., the 1980 Point Sal M5.1Earthquake) to this fault system.

The fault is located north of the Mount Solomon anticlinal fold axes. Larger scale maps (1:24,000 scale map) indicate the concealed surface trace of the Casmalia Fault is located north of the park (Dibblee, 1989 and Sweetkind, et al., 2021). The Fault Activity Map of California (Jennings and Bryant, 2010) show the Casmalia Fault (Orcutt Frontal) extending further to the east and bending to the southeast in Solomon. Other maps (Jennings, 1987; Woodring, 1950 and Sweetkind, et al., 2021) show a fault near the same location in Solomon Canyon but do not show it connecting to the Casmalia Fault (Orcutt Frontal) system. The Dibblee geologic maps (1989 and 1994) do not show a fault in Solomon Canyon.

There is a strong aerial photographic lineament east of Mount Solomon that is on trend with the eastern end of a Casmalia fault as mapped by Dibblee. Two backhoe trenches (GT-9 and GT-10) were excavated on either side of this strong aerial photographic lineament, east of Mt. Solomon to investigate the potential for faulting. The geologic structure encountered in the trenches was consistent across the lineament, suggesting that the lineament is likely due to lithologic conditions rather than faulting.

The potential for ground rupture hazard from the Casmalia faults on the park is considered to be low.

9.1.2.2 Orcutt Oil Field Faults

Review of published geologic maps (Dibblee, 1989) indicate that the "Orcutt Oil Field faults" are south and west of the park, except for a north-south trending fault that is west portion of the park (see Preliminary Geotechnical Maps, Plate II thru V). The Orcutt Oil Field faults consist of a group of small east-west and north-south trending faults each generally less than 1 mile in length. The "Orcutt Oil Field fault" are vertical to near-vertical in orientation and are believed to be Quaternary to Late Quaternary in age (i.e., not Holocene).

On the adjacent property to the west of the Solomon Hills Specific Plan area a 275 ft long trench was excavated and geologically logged across this eastern most published map trace of a north-south trending Orcutt Oil Field faults. We did not observe any evidence of faulting in this trench. Sandy and clayey bedrock units of the Paso Robles Formation (QTp) were observed in the trench. Published geologic maps (Dibblee, 1989) of this area show the Paso Robles Formation in fault contact with the Careaga Formation to the east, implying that the fault cuts across the younger Paso Robles Formation. Based on the findings in this trench, the Paso Robles Formation continues further to the east across the mapped trace of the fault. This indicates that the fault is unlikely to reach the surface at this location and that the Paso Robles Formation is younger than the last

episode of movement on this fault. Based upon this relationship, the fault is not considered to be active or to be a source of primary ground rupture hazard.

The potential for ground rupture hazard from the Orcutt Oil Field faults on the park is considered to be low.

9.1.3 Ground Motion

9.1.3.1 General

The park is located in California, which is in a geologically and seismically active region where large-magnitude, potentially destructive earthquakes are common. Therefore, it is reasonable to assume that moderate or large magnitude earthquakes along any of the numerous faults in the region are expected to produce strong ground shaking at the park in the future.

The Casmalia fault, which has an inferred surface trace located just north of the park, is the closest known potentially seismically active fault. The active San Andreas fault is located about 44 mi northeast of the park. Large earthquakes along these, or along any of the other numerous faults in the region, are expected to produce strong ground shaking at the Property in the future.

The current standards for construction provided in the California Building Code are designed to safeguard against major failures and loss of life, but are not intended to limit damage, maintain functions or provide for easy repair. Per Structural Engineers Association of California (SEAOC), conformance to these recommendations does not constitute any kind of guarantee or assurance that significant structural damage will not occur in the event of a maximum level of earthquake ground motion. However, it is reasonable to expect that a well-planned and constructed structure will not collapse in a major earthquake and that protection of life is reasonably provided, but not with complete assurance.

Although research on earthquakes during the last fifty years has greatly enhanced the level of understanding of earthquake faulting in California, the record is much too short to constrain behavior of all faults in Southern California and the attenuation characteristics of all areas relative to each future potential earthquake. Predicted accelerations should, therefore, be considered rough estimates rather than precise facts and ground motions from future earthquakes may exceed the predicted accelerations. Neither the Time, Location, nor Magnitude of an earthquake can be accurately predicted at this time.

9.1.3.2 Earthquake Magnitude

Earthquake magnitude is a quantitative measure of the strength of an earthquake or the strain energy released by it, as determined by seismographic or geologic observations. It does not vary with distance or the underlying earth material. This differs from intensity, which is a qualitative measure of the effects a given earthquake has on people, structures, loose objects, and the ground at a specific location. Intensity generally increases with increasing magnitude and in areas underlain by unconsolidated materials and decreases with distance from the epicenter.

The table below presents the distances to nearby significant faults located within about 25 miles radius of the park. The site-to-source distances were obtained from the USGS fault parameters online database (based on 2008 National Seismic Hazard Maps). The maximum earthquake magnitudes (M) were calculated using the Ellsworth-B magnitude-area scaling relationship presented in Appendix E of the Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3).

Summary of Major Known Faults Within 25 Miles

Distance (Miles)	Fault Name	Dip Degrees	Dip Direction	Slip Sense	Magnitude
0.03	Casmalia (Orcutt Frontal)	75	SW	reverse	6.7
6.63	San Luis Range (So Margin)	45	N	thrust	7.2
6.95	Los Alamos-West Baseline	30	S	thrust	7.0
7.05	Lions Head	75	NE	Reverse	6.8
19.79	Los Osos	45	SW	thrust	7.0
20.17	Hosgri	80	E	strike slip	7.3
23.10	Santa Ynez (West)	70	S	strike slip	7.0
22.10	Santa Ynez Connected	70		strike slip	7.4

9.1.3.3 Evaluation of Peak Ground Acceleration

Peak ground acceleration (PGA) is equal to the maximum ground acceleration that occurs during earthquake shaking at a location. PGA is equal to the amplitude of the largest absolute acceleration recorded on an accelerogram at a site during a particular earthquake. PGA is an important parameter (also known as an intensity measure) for earthquake engineering.

The peak ground acceleration (PGA_M) consistent with maximum considered earthquake (MCER) ground motions was evaluated at the park for bedrock (Site Class C, very dense soil and soft rock) conditions in accordance with ASCE 7-16. The mapped PGA_M adjusted for Site Class effects was determined using the OSHPD Seismic Design Maps

web tool by the Structural Engineers Association of California (SEAOC) for a 2% probability of exceedance in 50 years (i.e., 2,475-year return period). Based on our evaluation, a probabilistic PGA_M of 0.48g (Site Class C) would be produced by the maximum considered earthquake.

Standard ASCE 7-16 is an integral part of building codes in the United States and is adopted by reference into California Building Code, 2022. ASCE/SEI 7-16 includes contour maps of maximum considered earthquake geometric mean (MCEG) Peak Ground Acceleration, PGA, Figs. 22-9 through 22-13, for use in geotechnical investigations. Based upon these figures, PGAs in California typically range from 0.3g to 1.2g, depending upon site location and other factors.

9.1.4 Ground Failure

Ground Failure is a general term describing seismically induced secondary permanent ground deformation caused by strong ground motion. This includes liquefaction, lateral spreading, seismic settlement of poorly consolidated materials (dynamic densification), differential materials response, slope failures, sympathetic movement on weak bedding planes or non-causative faults, shattered ridge effects and ground lurching.

Potential secondary seismic hazards to potential development areas at the Property are described below. The potential for adverse impacts to the proposed development from liquefaction and other secondary seismic effects is considered manageable for practical design purposes, provided that our recommendations are incorporated into future designs and implemented during construction.

9.1.4.1 Potential for Liquefaction.

Liquefaction occurs when saturated, cohesionless soils lose strength during strong ground shaking, leading to temporary fluid-like behavior. It typically affects young, loose sands or silts with a shallow groundwater table (generally <50 feet), particularly in low-lying areas such as alluvial plains and coastal basins.

The site is underlain by bedrock and landslide affected bedrock. Therefore, the potential for liquefaction is non-existent.

9.1.4.2 Potential for Other Modes of Ground Failure

Earthquake-induced slope failures include activation and reactivation of landslides, rock falls, debris flows and surficial failures. The potential for earthquake-induced slope failures of the natural slope is considered low due to the moderate steepness of the slope adjacent to the park. However, there is a potential for reactivation of the existing landslide.

As part of the Grading Plan permitting process further geotechnical subsurface exploration and analysis would be needed to determine the landslide geometry and analysis to evaluate the stability during a seismic event prior to issuance of the grading permit.

9.2 Slope Stability

9.2.1 Proposed Cut-Slopes

The maximum proposed 2:1 (h:v) gradient cut slope is 25 ft in height, which is along the west side of the primary access road to the park. The southern approximately two-thirds of this cut-slope is anticipated to exposed the Graciosa member of the Careaga Sandstone Formation. The geologic bedding dips are anticipated to be neutral to the slope face. Due to the shallow bedding dips (6° or less) adverse bedding dips are opined not to significant consideration for gross stability. Due to the limited height, gradient, and geologic conditions this portion of the slope is considered geologically gross stable.

The north portion of the primary access road to the park (approximately at the north end of the retaining wall) may expose landslide affected bedrock. The cut-slope height is approximately 10 ft in this area. This cut-slope can be stabilized, if warranted, with a geotechnical design feature, such as a standard Stability Fill with a 15-foot-wide keyway.

9.2.2 Proposed Fill Slopes

Review of the Grading Plan indicates that fill slopes are proposed at a 3:1 (h:v) gradient or flatter. The maximum proposed fill slope height is 16 feet. Based on the analysis of fill slopes for the Solomon Holl Specific Plan this slope will satisfy the standard of care factor of safety requirements for slope stability for global-overall static, static surficial stability and pseudo-static loading conditions.

9.2.3 Natural Slopes

Existing natural slope gradients adjacent to the proposed park improvements range from approximately 5:1 to 2:1 (h:v) gradient to a maximum vertical height of 40. Based on the analysis of natural slopes for the Solomon Hill Specific Plan static stability of natural slopes at locations with advantageous bedding dip is adequate for bedrock slopes with an inclination of 2:1 (h:v), or flatter, for slope heights up to about 100 feet.

9.2.4 Debris Flow Hazards

Debris flows typically require a combination of loose colluvial soil, steep slopes and be exposed to period(s) of intense rainfall and/or may be triggered by an earthquake. Destructive debris flows originate on slopes with gradients between 26 to 56 degrees (Campbell 1975). Debris flows on slopes of 27 degrees or less do not tend to accelerate

and are not generally considered a geo-hazard. The potential debris flow hazard to the park site is considered low.

9.3 Soil Compressibility and Hydro-consolidation

9.3.1 Hydro-Compression (Collapse)

Hydro-compression is volume reduction that occurs when unsaturated soil materials are inundated with water. Soil materials most prone to hydro-compression are sandy and silty soils with dry density less than about 108 pcf and moisture content less than about 8 percent. The landslide material may be susceptible to hydro-compression.

As part of the Grading Plan permitting process further geotechnical subsurface exploration and analysis would be needed to determine if hydro-compression potential exists and remedial measures, such as removal and recompaction, for the restroom building and improvements sensitive to settlement (e.g., asphalt concrete pavements) is warranted prior to issuance of the grading permit.

9.3.2 Compressibility of Landslide Material

Settlement of landslide affect bedrock could result from pressure applied to the soils by raising of grade and/or foundation loads. Primary settlement of landslide material is expected to take place rapidly after grade is raised. However, settlement monitoring may be warranted after the park is raised to the design grade in order to decide when the rate of secondary settlement has reduced to a tolerable level for the proposed use intended. The settlement process depends on the variety of factors, including but not limited to, soil's permeability, water drainage paths, the thickness of fill placed, amount of vertical surcharge imposed, fluctuation in groundwater and pre-consolidation pressure, which is the maximum effective vertical overburden stress that a particular soil has sustained in the past. Further, cohesionless soils have higher permeability than cohesive soils that have small voids blocking the water movement. Therefore, settlement is more rapid in cohesionless soils versus cohesive soils.

The Little League Baseball / Softball field raises grade in general between 7 to 11 ft. This additional pressure may result in settlement. The change in grade for the restroom facility is on the order of +1 ft and the foundation loads are anticipated to decrease significantly with increase depth. Geotechnical design feature, such as a standard removal and recompaction to a depth where the restroom facility foundation increase in pressure is minimal (e.g., 4 ft below an 18-inch-wide continuous footing) may be implemented.

As part of the Grading Plan permitting process further geotechnical subsurface exploration and analysis would be needed to determine if compression potential exists and remedial

measures, such as removal and recompaction, for the restroom building and improvements sensitive to settlement (e.g., asphalt concrete pavements) prior to issuance of the grading permit.

9.4 Landslides

A large Quaternary landslide deposit (Qls) is mapped (~134-acres) beneath the Newlove Park site and is documented in the General Plan Amendments and Specific Plan Geotechnical Report (AES, 2023). The landslide is delineated based on geomorphic features, including hummocky topography, arcuate scarps, and disrupted drainage patterns. Subsurface exploration within the mapped landslide includes Boring BA-3 and Trenches GT-14 and GT-15, all of which encountered features consistent with landslide deposits, such as disturbed bedding, sheared material, and variable moisture conditions. Although no recent movement has been documented, the landslide is considered deep-seated, and it is considered a potential geologic hazard to the park.

As part of the Grading Plan permitting process further geotechnical subsurface exploration and analysis would be needed to determine the landslide geometry and evaluate the stability of this deep-seated landslide. If the landslide is determined to be unstable, design features to address the issue by the geotechnical consultant, include but are not limited to, complete or partial removal of soil and/or replacement with engineered fill, adding shear keyways, or buttressing.

9.5 Expansion Potential

Expansion testing conducted as part of the broader Solomon Hills investigation included samples from geologic units present within the Newlove Park site. An Expansion Index (EI) of 46 (classified as low expansion potential per CBC criteria) was measured on a clay sample derived from the Graciosa Member of the Careaga Formation (Tcag). Although no expansion testing was performed on samples from the Cebada Member (Tcac) or the Paso Robles Formation (QTp), prior studies indicate that clay-rich horizons in these units, if present, may exhibit moderate to high expansion potential. However, the granular and sandy character of subsurface exploration within the park and adjacent areas park suggests that the potential of expansive soils is likely limited.

If clayey soils from deeper layers or adjacent geologic units are used during grading, they may require routine mitigation measures such as moisture conditioning, proper compaction, and placement at depth or blending with granular materials. Based on currently available data, the presence of expansive soils is not expected to significantly impact the feasibility of park development.

9.6 Potential Corrosivity of Soils

Soil is considered potentially corrosive to concrete and/or steel if it meets any of the following criteria: electrical resistivity less than 1,000 ohm-cm, soluble sulfate content equal to or exceeding 2,000 ppm (0.20%), pH of 5.5 or less, or chloride content equal to or exceeding 500 ppm. To evaluate potential corrosivity at the site, laboratory testing was conducted on representative samples from various geologic units, including those that underlie the Newlove Park area. The testing included measurements of resistivity, pH, chloride, and sulfate content, and results are summarized in Table B2 of the General Plan Amendments and Specific Plan Geotechnical Report (AES, 2023).

Careaga Sandstone Formation – Cebada Member (Tcac):

- Resistivity: 1,329 to 2,159 ohm-cm (moderately corrosive to ferrous metals)
- pH: 5.2 to 7.2
- Chloride: 0.9 to 3.6 ppm (well below corrosive threshold)
- Sulfate: 0.019% (not considered corrosive to concrete)

Careaga Sandstone Formation – Graciosa Member (Tcag):

- Resistivity: 3,919 to 5,713 ohm-cm (moderately corrosive to ferrous metals)
- pH: 6.4
- Chloride: 2.7 to 5.4 ppm (negligible corrosive impact)
- Sulfate: Not detected or very low

Additional corrosivity testing of soils from the subgrades of footings and floor slabs should be performed following the park grading. This firm does not practice in areas of corrosion engineering, as it is not under the purview of geotechnical engineering services. A corrosion specialist may provide final recommendations for management of the potential corrosion of metals and concrete.

9.7 Soil Creep

Slope creep is an imperceptibly slow, progressive downward and outward movement of slope soils that can affect both the near-surface (surficial) soils and deep-seated (gross) soils. Slope softening is the result of increased moisture content as a result of rainfall and irrigation. As the soils approach saturation, an increase in the wet density and associated reduction in shear strength leads to slope deformation. For slope creep, cyclic wetting and drying of the soils also causes a reduction in shear strength that yields permanent deformation of surficial soils under their own weight. The progressive outward and downward movement due to slope softening.

The Careaga Sandstone Formation (Tcag and Tcac) on the site are generally not associated with significant creep behavior. Based on the slope gradients the potential for slope creep is opined to be low.

9.8 Subsidence

Per the County of Santa Barbara's Seismic Safety and Safety Element (amended July 2023): "*Despite inquiries to responsible agencies, no evidence of significant subsidence or problems related to subsidence in Santa Barbara County were uncovered. However, to our knowledge, no precise level lines or surveys have been measured in oil, gas or water producing areas in Santa Barbara County. Subsidence could be occurring in these areas, but if so, it is not significant since no problems have been reported. Establishment of a grid base and precise level surveys would be needed to determine subsidence.*"

9.9 Oil Wells

Review of the California Department of Convservation, Geologic Energy Management Division (CalGEM) well finder web page https://maps.conservation.ca.gov/doggr/wellfinder/#) indicates that one oil well has been drilled in the vicinity of the park. The Newlove Park CUP plan shows the location of the one abandoned oil well, which is outside the proposed grading limit.

Where development is planned on or adjacent to existing oil wells, the wells should be evaluated and abandoned or re-abandoned following the recommendations from CalGEM, and all other applicable regulations. The development plans will likely need to be submitted to CalGEM for review relative to the proposed development and the wells. CalGEM reviews the well records relative to the proposed development and provides recommendations, which may include abandonment or re-abandonment to the latest CalGEM requirements. Typically, CalGEM policy is that structures not to be constructed above an oil well so that future access to the well may not be compromised in case of future leaks.

The permitting jurisdictional agency (e.g., Santa Barbara County) should also be consulted regarding policies relative to the park in the vicinity of an oil well.

9.10 Building Setbacks

The standard building setbacks from ascending and descending man-made slope should be followed in accordance with the California Building Code, unless superseded by site-specific geologic and/or soils engineering evaluation.

10.0 GENERAL CONSTRUCTION CONSIDERATIONS

10.1 Earthwork and Grading Recommendations

10.1.1 Removals and Benching

In order to provide a uniform firm bottom prior to placing fill soil, unconsolidated landslide materials, artificial fill, slopewash, weathered bedrock, and should be removed from areas to receive fill. The excavated soils may be used as fill material, under observation and testing by the geotechnical engineer of the record.

In areas to receive compacted fill where the surface gradient is steeper than 5:1 (h:v) the soil mantle, colluvium and unsuitable material should be removed and such areas benched horizontally into the competent material prior to or in conjunction with fill placement (See **Appendix B, Fill Over Natural Slope**).

10.1.2 Fill Materials

Soils that are free of debris, over-size rocks, topsoil and organic matter may be used as sources for compacted fills. Rock or similar irreducible material with a maximum dimension greater than eight (8) inches may not be placed in the fill. Rocks or hard fragments larger than four (4) inches shall not compose more than 25 percent of the fill and/or lift. Any large rock fragments over eight (8) inches in size, may be incorporated into the fill as rockfill in windrows after being reduced to the specific maximum rock fill size (see **Appendix B, Rock Disposal**). Where fill depths are too shallow to allow large rock disposal, special handling or removal may be required.

10.1.3 Fill Compaction

All fill material should be placed in uniform lifts not exceeding six (6) inches in its loose state, water conditioned to at least optimum moisture content, thoroughly mixed to obtain a near uniform moisture condition and uniform blend of materials, and compacted to a relative compaction to at least 90 percent of Maximum Dry Density (MDD), per ASTM D1557.

10.1.4 Construction of Fill Slopes

Fill slope inclination should not be steeper than 2:1 (h:v). The fill material within approximately one equipment width (typically 12 feet) of the slope face should be constructed with cohesive material obtained from the Property's soils.

Where fill slopes are constructed above natural ground with a gradient of 5:1 (H:V) or steeper, all topsoil, colluvium, and unsuitable material shall be removed and a keyway should be constructed at the toe of the fill slope with a minimum width of 15 feet, and a minimum depth of 3 feet into firm undisturbed earth (see **Fill Slope Over Natural Slope**

detail in **Appendix B**). It is recommended that a minimum 15-foot width, measured horizontally from the slope face to the bench and/or backcut, be maintained.

Where fill slopes toe out on relatively level natural ground, the removals should be performed to a minimum 1:1 (H:V) projection from the toe of slope to the recommended removal depth, (see **Fill Slope Toeing Out on Flat Alluviated Canyon** detail in **Appendix B**).

10.1.5 Bulking/Shrinkage Behavior of Site Soil/Rock Deposits

Slopewash, landslide debris, weathered bedrock, and bedrock are expected to reduce in volume (i.e., shrink) when excavated and subsequently compacted to at least 90% of Maximum Dry Density. The calculated shrinkage estimates are based on a comparison of in-situ densities and compaction test data. In practice however, mixture of fine-grained and coarse-grained materials tends to produce fills with higher densities and shrinkage. Consequently, it would be prudent to assume that actual shrinkage could be on the order of ten percent higher than the calculated shrinkage estimates provided in the preceding tables. For purposes of preparing preliminary earthwork volume estimates, we recommend that the shrinkage factors provided in the right-hand column be used. Assumptions regarding design grades and/or earthwork quantities should be made accordingly. Calculated shrinkage values listed in the following table are based upon our limited laboratory testing.

Geologic Unit	Shrinkage (%)	
	Calculated	For Volume Estimation
Slopewash	N/A	15 – 20
Weathered Bedrock	N/A	10
Careaga Sandstone (Tcag/Tcac)	6	16

10.1.6 Compaction Characteristics

Ordinary earthwork methods may be used to place and compact fills composed of bedrock derived from the Careaga Sandstone (Tcag/Tcac) formations.

10.2 Drainage Recommendations

Ground water and soil moisture conditions can vary seasonally or for other reasons. It must be recognized that we do not and cannot have complete knowledge of the subsurface conditions at the Property. It is possible that seepage could be encountered while stripping and excavating during preparation at some areas (e.g., in drainages). Whenever seepage is observed, the condition must be evaluated by the Engineering Geologist and Geotechnical Engineer prior to covering with fill material.

Fill slopes, Buttress Fill and Stability Fills, as applicable, shall be provided with subsurface drainage as necessary for stability. A typical backdrain detail is included in **Appendix B**.

10.3 Sewage Disposal

We understand that sewage disposal will be by public sanitary sewers.

11.0 FEASIBILITY OF DEVELOPMENT

The improvements to the Newlove Park and the proposed grading on the Preliminary Grading and Drainage plans, dated January 31, 2025 is feasible for development from a geologic and geotechnical standpoint provided our recommendations are followed and implemented throughout design and construction.

12.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations summarize the primary geologic and geotechnical issues that may impact the proposed development:

1. Potential for primary ground rupture on a fault at the Property is reasonably considered to be **low**.
2. The horizontal Peak Ground Acceleration (PGA) for an earthquake with a 2% probability of exceedance in 50 years (i.e., 2,475-year return period) is expected to be 0.48g. As discussed earlier, PGA's in California typically range from 0.3g to 1.2g, depending upon site location and other factors.
3. The potential for liquefaction is non-existent at the park site.
4. The potential for earthquake-induced slope failures of the natural slopes is considered low due to the moderate steepness and height of the slopes adjacent to the park. However, there is a moderate potential for reactivation of the existing landslide. As part of the Grading Plan permitting process further geotechnical subsurface exploration and analysis would be needed to determine the geometry landslide and analysis to evaluate the stability during a seismic event prior to issuance of the grading permit.
5. The potential for seismic settlement (dynamic densification) during future seismic events can be practically ruled out in the bedrock portions for the park, but should be evaluated for in the landslide areas of the park, as the Grading Plan is developed further.
6. A large (~134-acre) Quaternary landslide deposit (Qls) is mapped beneath the Newlove Park site. Although no recent movement has been documented, the landslide is considered deep-seated, and it is considered a potential geologic hazard to the park. It should be noted that no occupied structures are proposed for the park site improvements.

As part of the Grading Plan permitting process further geotechnical subsurface exploration and analysis would be needed to determine the landslide geometry and evaluate if this deep-seated landslide will satisfy the standard of care factor of safety requirements for slope stability for global-overall static and pseudo-static loading conditions. If the landslide is determined to be unstable, design features to address the issue by the geotechnical consultant, include but are not limited to, complete or partial removal of soil and/or replacement with engineered fill, adding shear keyways, buttressing, or avoidance.

7. Proposed cut slopes anticipated to expose landslide material should be evaluated by a geotechnical consultant during the grading plan stage. These cut slopes may be stabilized with design features such as Buttress Fills and/or Shear Keys designed by a geotechnical engineer.

8. The proposed cut-slopes exposing bedrock and fill slope are anticipated to be grossly and surficially stable. The proposed cut slopes should be further evaluated for gross and surficial slope stability as the Grading Plan develops. Proposed cut slopes will require subsurface investigation to evaluate site-specific geologic conditions. Cut slopes with daylighted bedding conditions should be evaluated by the geotechnical consultant. Slopes that do not meet adequate factors of safety, and/or expose landslide materials, need design features, including but not limited to, design at a shallower slope gradient, or constructing buttresses, stability fills with compacted fill.

9. Existing natural slope, considering the heights and gradients, adjacent to the proposed park improvements are consider to be geologically grossly stable.

10. Based on the heights and gradients of the ascending natural slopes adjacent to the park site improvements the potential for debris flow hazard is considered low.

11. The bedrock is not susceptible to hydro-compression. However, the landslide material may be susceptible to hydro-compression. During the grading plan stages, a study should be conducted by a geotechnical consultant to evaluate the hydro-compression potential of the landslide debris below the proposed restroom facility and improvements sensitive to settlement (e.g., asphalt concrete pavements).

12. Settlement of landslide affect bedrock could result from pressure applied to the soils by raising of grade and/or foundation loads. The Little League Baseball / Softball field raises grade in general between 7 to 11 ft. This additional pressure may result in settlement.

    The change in grade for the restroom facility is on the order of +1 ft and the foundation loads are anticipated to decrease significantly with increase depth. Geotechnical design feature, such as a standard removal and recompaction to a depth where the restroom

facility foundation increase in pressure is minimal (e.g., 4 ft below an 18-inch-wide continuous footing) may be implemented.

13. Expansive soils may be present at the in the grading footprint of the park, but are not anticipated to be a significant design constraint. If these potentially expansive units are encountered in the final pad or street grades during construction, they should be evaluated by Expansion Index (EI) tests by the geotechnical consultant relative to risk reductions from special foundation designs and reinforcement. Alternatively, the expansive material can be removed to a specified depth determined by the geotechnical consultant and replaced with soil with very low to non-expansive characteristics. Alternatively, the expansive soil may be treated with additives to lower the expansion potential.

14. Soils on site may be corrosive to concrete and ferrous metals. Soil moisture, chemistry, and other physical characteristics all have important effects on corrosivity. Testing during development will indicate what special measures, such as cement type in concrete and corrosion protection for metallic pipes will be required for construction.

13.0 FUTURE GEOTECHNICAL STUDIES

As part of the Newlove Park Grading Plan permitting process further study should be performed by a geotechnical consultant to evaluate the geologic and geotechnical conditions and provide standard design level recommendations for submitted to Santa Barbara County as required for review and approval prior to issuance of the grading permit.

14.0 LIMITATIONS

This report has been prepared by Allan E. Seward Engineering Geology, Inc. for the exclusive use of Solstra Communities California LLC and their contracted design consultants for the specific property and development discussed herein. This report should not be considered transferable. Prior to use by others, this firm must be notified, as additional work may be required to update this report.

Additional investigation will be required to prepare recommendations for subsequent phases of development. In the event that any modifications in the design or location of the proposed development are planned, a written review by this firm will be required.

The proposed development is located in California, a geologically and tectonically active region, where large magnitude, potentially destructive earthquakes are common. Therefore, ground motions from moderate or large magnitude earthquakes could affect the Property during the design life of the proposed structure(s).

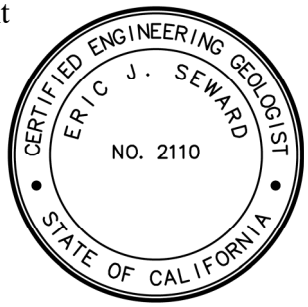
In performing these professional services, this firm has used the degree of care and skill ordinarily exercised under similar circumstances by reputable geologists and geotechnical engineers practicing in this or similar localities. The data presented in this report are based on results of preliminary field testing. It should be recognized that subsurface conditions can vary in time, and laterally, and with depth at a given property and that the conclusions and recommendations presented in this report are based on our observations and testing. Therefore, our **conclusions** and **recommendations** are **professional opinions** and are **not meant** to be a control of nature. We make no **warranty** of any kind, either **expressed** or **implied**.

This page intentionally left blank.

This opportunity of be of service is appreciated. If you have any questions regarding this report, please contact us.

Respectfully submitted,

Eric J. Seward, CEG 2110
Principal Engineering Geologist
Vice President



Farbod Bouya, MS, PE C94592
Professional Engineer



The following attachments and appendices complete this report.

Location Map following page 2
References

APPENDIX A – Subsurface Logs
- Geologic Test Pits GT-14, GT-15, GT-16, and GT-27
- Bucket-Auger Borings BA-3 and BA-6

APPENDIX B – Construction Diagrams
- Fill Over Natural Slope 5:1 or Steeper
- Rock Disposal
- Fill Slope Over Natural Slope 5:1 or Steeper
- Fill Slope Toeing Out on Flat Alluviated Canyon
- Stability/Buttress Fill and Backdrains

APPENDIX C – Maps
- **Regional Geologic Map** (1'=2,000') **Plate I**
- **Preliminary Geotechnical Maps** **Plates II - V**
- **Geologic Map** (1'=400') **Plate VI**

REFERENCES

Allan E. Seward Engineering Geology, Inc., 2023, *Geotechnical Report, Solomon Hills General Plan Amendments and Specific Plan, Portions of Assessor's Parcel Numbers 101-020-085, -086 & -087, Santa Barbara County, California*, prepared for Solstra Communities California, LLC, Job No. 23-2195s-1, dated October 20, 2023

Published

American Society of Civil Engineers, 2016, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-16), provisions and commentary.

American Society of Civil Engineers, 2021, Supplement No. 2 to the ASCE/SEI 7-16, October 14.

American Society of Civil Engineers, 2021, Supplement No. 3 to the ASCE/SEI 7-16, November 5.

ASTM International, Annual Book of ASTM Standards, 2023, Section 4 Construction, Volumes 04.08 and 04.09.

California Building Standards Commission, 2022, California Building Code (CBC): California Code of Regulations, Title 24, Part 2, Volumes 1 and 2

California Department of Conservation, California Geological Survey (CGS), 2018, Earthquake Fault Zones, A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California, Special Publication 42, 83 p.

California Department of Conservation, California Geological Survey, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A.

California Department of Conservation, California Geological Survey, 2018, Earthquake Zones of Required Investigation web application, https://maps.conservation.ca.gov/cgs/EQZApp/

California Department of Conservation, California Geological Survey, 2015, Fault Activity Map of California web application, https://maps.conservation.ca.gov/cgs/fam/.

CDCDMG, 1997, Guidelines for evaluating and mitigating seismic hazards in California: California Department of Conservation Division of Mines and Geology Special Publication 117.

Dibblee, T.W., Jr., 1994, Geologic Map of the Sisquoc Quadrangle, Santa Barbara County, California: Dibblee Geological Foundation Map DF-53, scale 1:24,000.

Dibblee, T.W., Jr., 1989, Geologic Map of the Casmalia and Orcutt Quadrangle, Santa Barbara County, California: Dibblee Geological Foundation Map DF-24, scale 1:24,000.

Hart, E.W., 1999, Fault-rupture hazard zones in California: California Division of Mines and Geology Special Publication 42, 24 p.

Jennings, C.W., and Bryant, W.A., 2010, Fault activity map of California: California Geological Survey, Geologic Data Map No. 6, map scale 1:750,000.

Jennings, C.W., Gutierrez, C., Bryant, W., Saucedo, G., and Wills, C., 2010, Geologic Map California: California Geological Survey, Geologic Data Map GDM-2.2010, 1 sheet, scale 1:750,000.

McGregor, I.S., and Onderdonk, N.W., 2021. Late Pleistocene rates of rock uplift and faulting at the boundary between the southern Coast Ranges and the western Transverse Ranges in California from reconstruction and luminescence dating of the Orcutt Formation. Geosphere, v. 17, no. 3, p. 932–956.

Seismic Safety & Safety Element, 2023, Santa Barbara County Comprehensive Plan.

Sweetkind, D.S., Langenheim, V.E., McDougall-Reid, K., Sorlien, C.C., Demas, S.C., Tennyson, M.E., and Johnson, S.Y., 2021, Geologic and geophysical maps of the Santa Maria and part of the Point Conception 30'×60' quadrangles, California: U.S. Geological Survey Scientific Investigation map 3472, 1 sheet, scale 1:100,000, 58-p pamphlet.

Sylvester, A.G., and Darrow, A.C., 1978, Structure and Neotectonics of the Western Santa Ynez fault system in southern California: Tectonophysics 52 (1979) 389-405.

REFERENCES

University of Southern California (USC), Southern California Earthquake Center (SCEC), Workshop on "Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California", USC, Los Angeles, California, June 17, 1999.

U.S. Geological Survey, United States Seismic Design Maps web application, http://earthquake.usgs.gov/designmaps/us/application.php

U.S. Geological Survey, Quaternary Faults and Folds in the U.S., Google Earth .kmz file, https://www.usgs.gov/natural-hazards/earthquake-hazards/google-earth-kml-files

U.S. Geological Survey, 2008 National Seismic Hazards Map – Source Parameters, https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/query_main.cfm

U.S. Geological Survey, Groundwater for USA: Water Levels, https://nwis.waterdata.usgs.gov/nwis/gwlevels

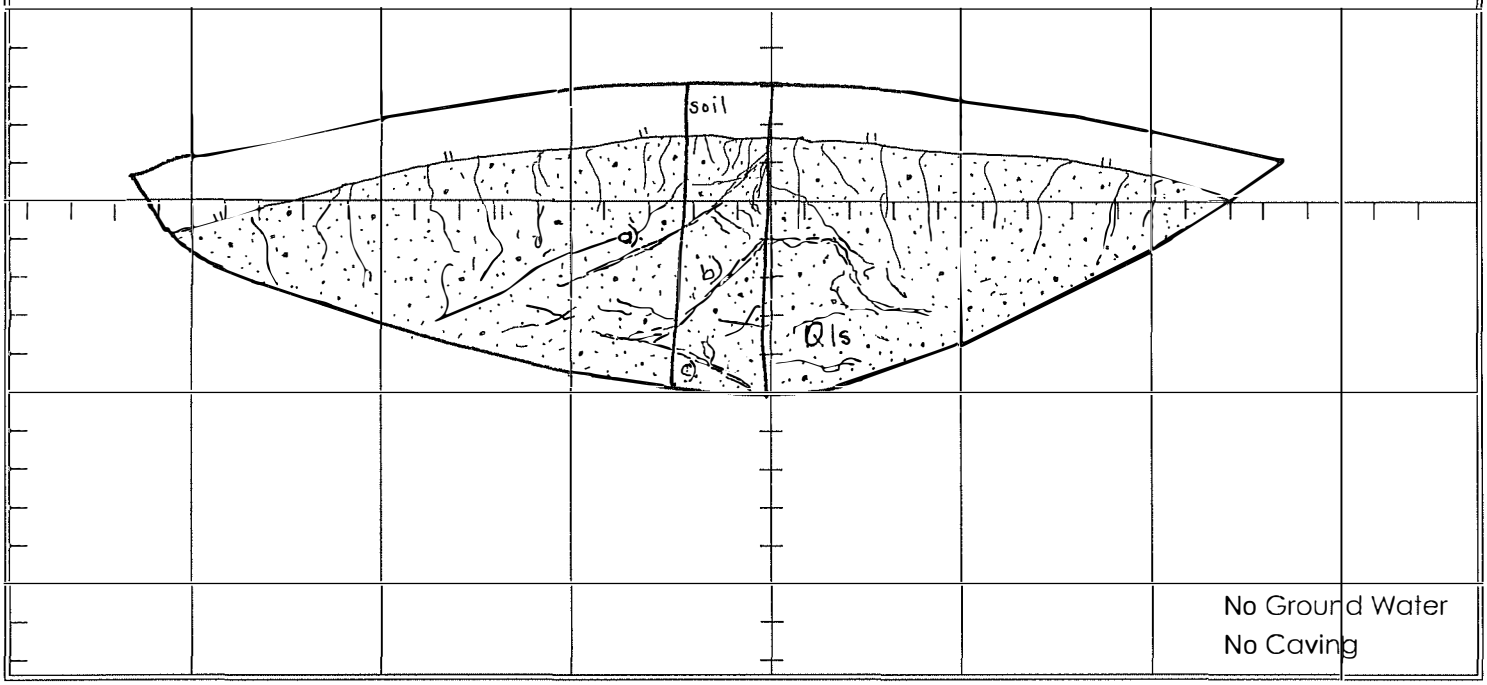
Woodring, W.P., and Bramlette, M.N., 1950, Geology and Paleontology of the Santa Maria District California: Geological Survey Professional Paper 222, 6 sheets scale 1:24,000, 185-p.

Appendix A

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-14**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: / 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/9/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	Other Tests
0					**SOIL; s (0 - 1.5')** @ 0' Dark-brown, clayey sand; loose; damp to moist **LANDSLIDE DEBRIS; Qls (1.5 - 8')** @ 1.5' Mottled orangish-tan, light-gray, grayish-tan and light-brown, very fine-grained, sandstone to silty sandstone; moderately hard; dry to damp; massive	a) MF/Sh: N5W, 42SW b) MF/Sh: N65E, 47SE c) B?: N35E, 38NW			
5									
10					COMMENTS: Highly weathered to 3.5' Appears tight and intact, and tectonically disrupted; however, based on BA-3 it is interpreted as Qls				
15									
20									

TOTAL DEPTH: 8 feet ←N67E→ SCALE: 1 inch = 5 feet

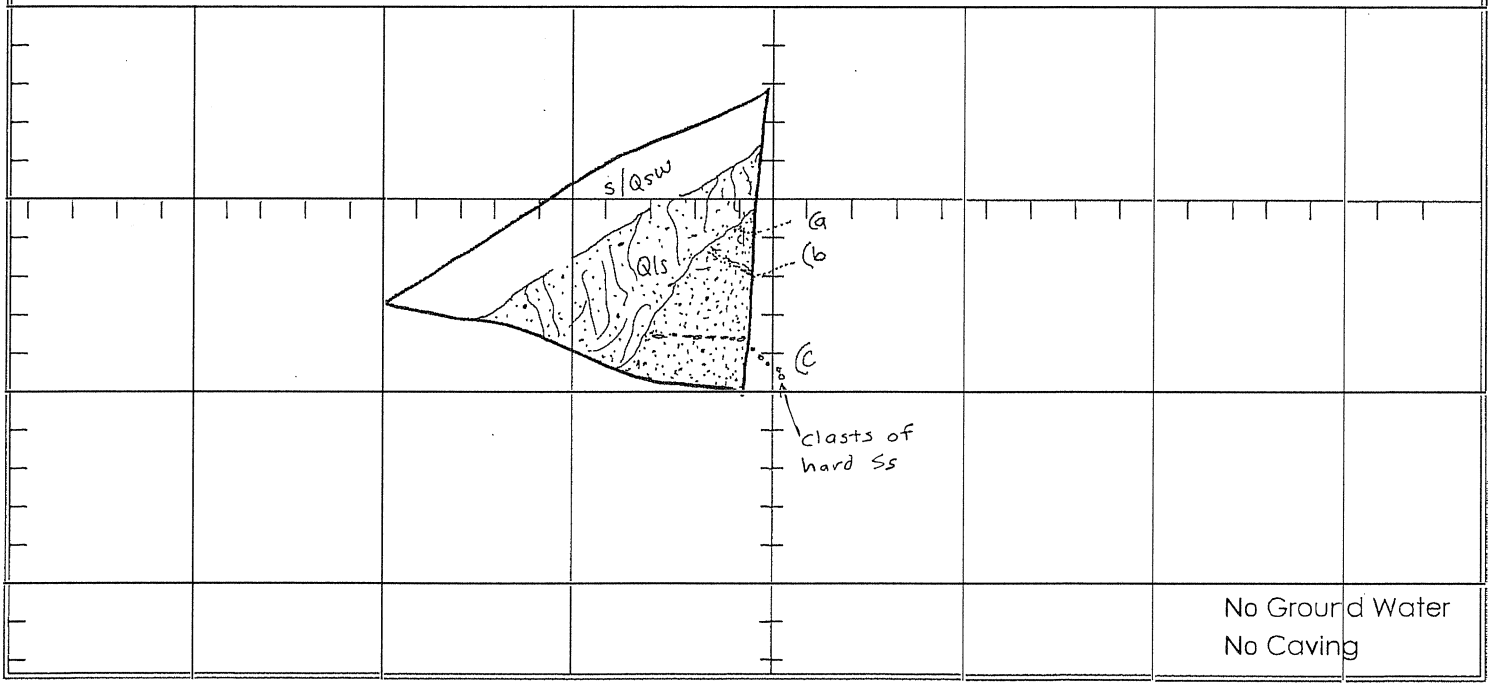


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-15**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/9/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Dark-brown, silty, clayey sand; loose; damp to moist **LANDSLIDE DEBRIS; Qls (1.5 - 8')** @ 1.5' Light-gray, light olive-brown, light greenish- to yellowish-tan, and light-brown, very fine-grained sandstone and silty sandstone (discontinuous blocks); soft to moderately hard; dry to damp	a) B: N20W, 15SW b) B: N6W, 26SW c) B: N37W, 33NE			
5									
10					COMMENTS: Highly weathered to 8' Qls is tight Light gray unit has the red and brown "specks" of weathered Tcac				
15									
20									

TOTAL DEPTH: 8 feet ←N54E SCALE: 1 inch = 5 feet

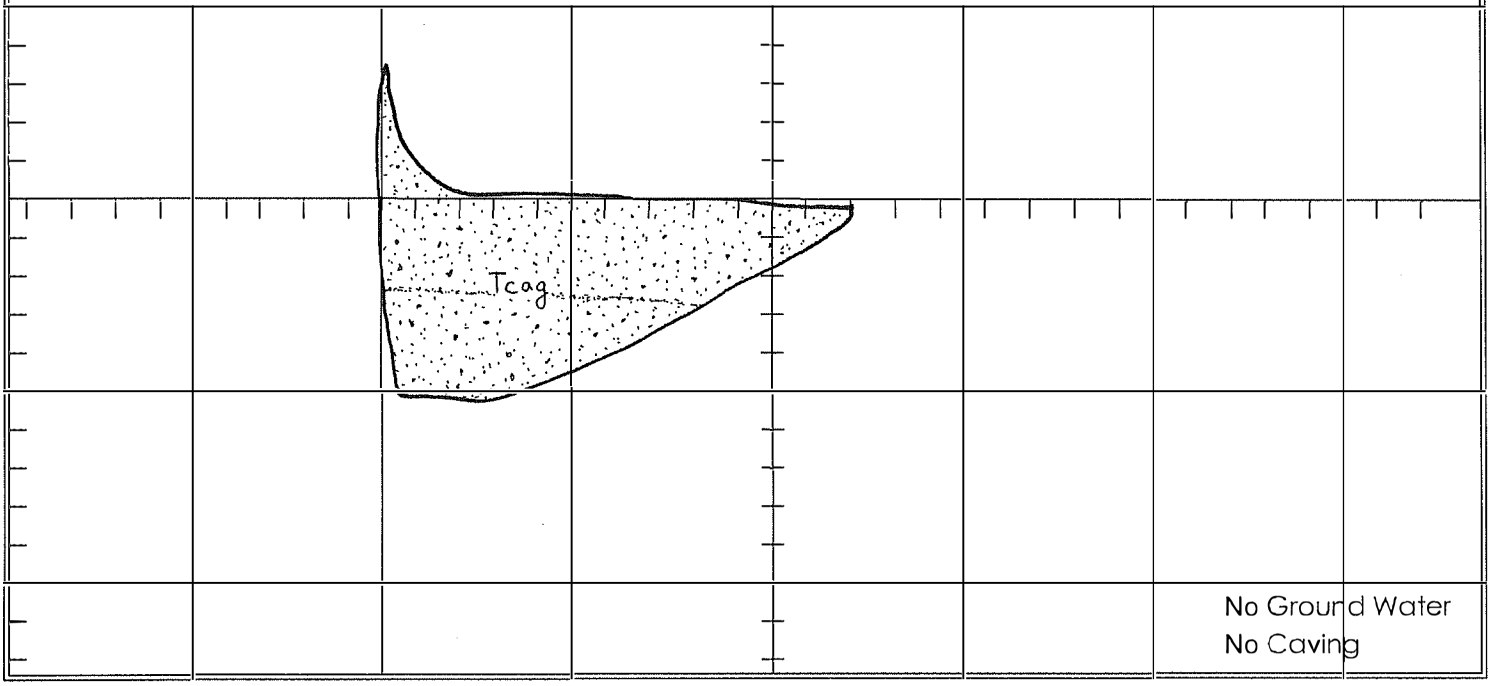


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-16**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/9/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; Tcag (0 - 9')** @ 0' Light-brown to light yellowish-brown and medium-brown, coarse- to medium-grained sandstone with scattered pebbles; damp to moist; massive and moderately friable				
5									
10					COMMENTS: Excavated in abandoned oil pad backcut. Shallow, southerly dips exposed in backcut.				
15									
20									

TOTAL DEPTH: 9 feet ←N65E SCALE: 1 inch = 5 feet

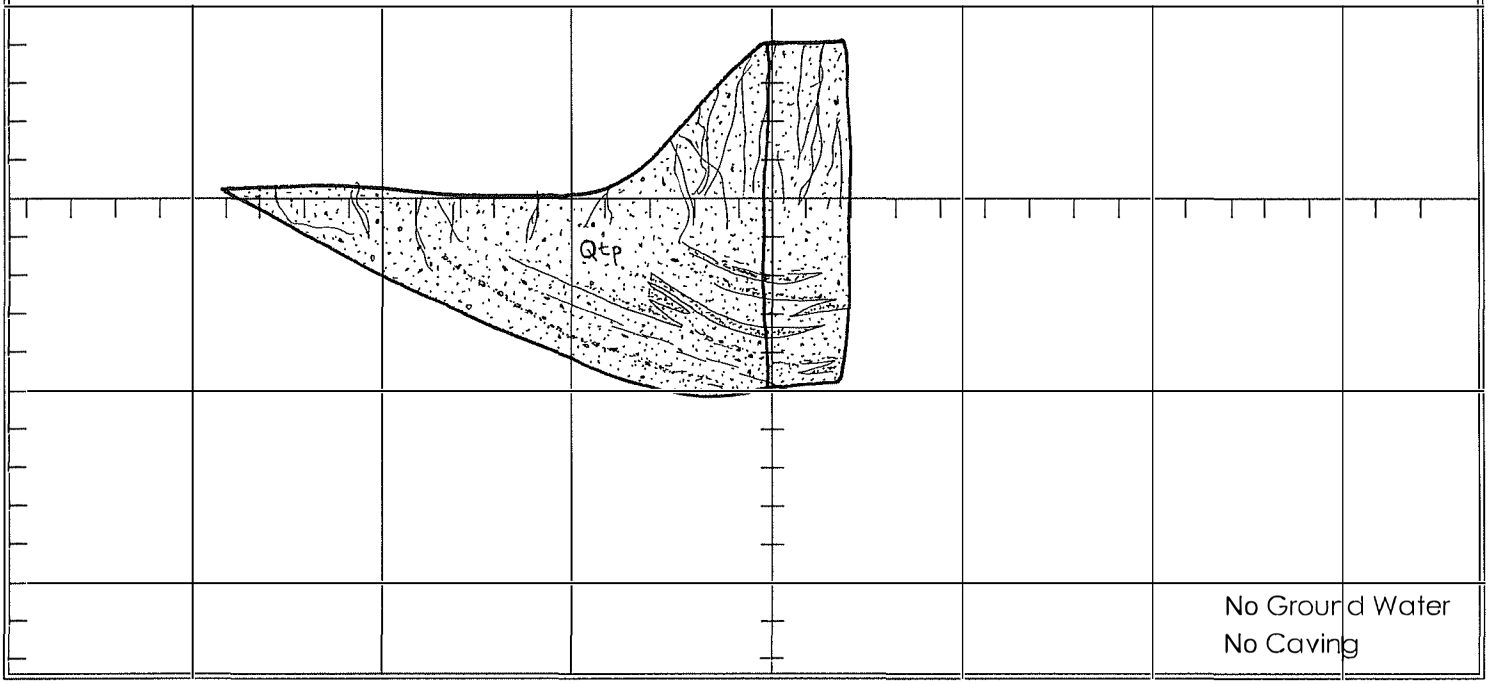


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-27**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/13/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; QTp (0 - 9')** @ 0' Light grayish-tan and light yellowish-brown, interfingering sandstone, silty sandstone, and pebbly sandstone to conglomerate; moderately hard (moderately friable); dry to damp				
5					@ 5-9' Bulk sample	B: N42W, 30NE			
10					COMMENTS: Highly weathered to 4' Excavated in old road "Textbook" sharp interfingering lenses				
15									
20									

TOTAL DEPTH: 9 feet N65E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Tri-Valley Drilling	DRILLED: 2/13/06		
DRILLING METHOD: Bucket-Auger (116' Rig)	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-3	
DRIVING WEIGHTS: 0-30' 5952lbs,30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lbs	ELEVATION: 970'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						SOIL; s (0 - 3') @ 0' Dark brown silty sand to sandy silt; soft; moist	@ 0 - 3.5' Casing
						QUATERNARY LANDSLIDE; Qls (3 - 24') @ 3.5' Yellowish-brown silty sand; soft to moderately hard; damp to moist; some wispy oxidized zones and laminae; jumbled appearance	
5						@ 5' Scattered pebbles	
						@ 7' friable	
10	■	4 5				@ 10' Grayish-brown fine-to medium-grained sand	@ 10 - 20' Bulk Sample
						@ 12' Moist	
15						@14' Very small seep	
						@ 18.5' Pebbly; soft	
20	■	4 5					
25				Apx B: horizontal		**BEDROCK/QUATERNARY LANDSLIDE? Tcac/Qls? (24 - 44')** @ 24' Pale yellowish-brown sandy siltstone; moderately hard; damp; friable; sharp, non-planar contact with overlying Qls; roughly horizontal laminations; laminations offset 1/4" to 4" by subvertical minor faults; minor faults only expressed by offset laminations	
						@ 26' 1-foot-diameter soft zone	
30	■	7 10			CL	@ 28.5' Grayish-brown sandy mudstone; massive; contact with overlying unit is sharp and slightly channelized; some iron-oxide staining @ 30' Minor faults not observed; may be due to the massive nature of the mudstone	LL= 43 PI= 20 Shear Test
				Apx B: horizontal		@ 32' Coarses down to yellowish-brown sandy siltstone to silty fine-grained sandstone; moist; massive	
35						@ 33' Grayish-brown clayey mudstone; moist; abundant oxidation staining	

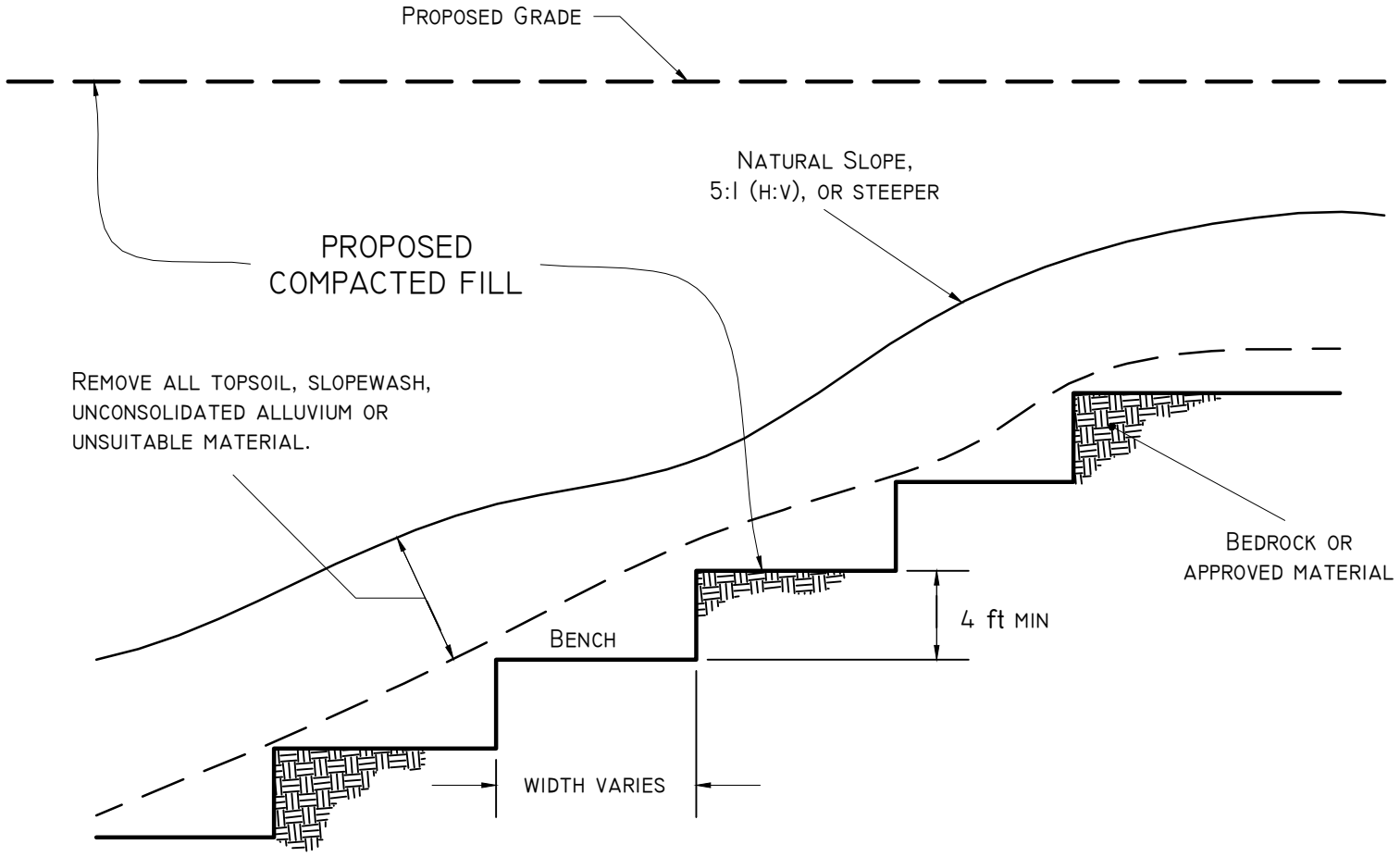
CLIENT: Solstra Communities California LLC	JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: MBW	
DRILLING COMPANY: Tri-Valley Drilling	DRILLED: 2/13/06	
DRILLING METHOD: Bucket-Auger (116' Rig)	HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-3
DRIVING WEIGHTS: 0-30' 5952lbs,30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lbs	ELEVATION: 970'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
40		4 6	Tca.c./ Qls?			@ 42' Moist to wet @ 43' Caving; "belling" up to 18" @ 44' Ground Water	@ 44' Ground water presumed to be associated with cattle pond located just south of boring
45							Backfill tamped every 5'
50						TOTAL DEPTH 47' (Elev. 923') Minor seep @ 14' Ground Water @ 44' Caving @ 43'	
55							
60							
65							
70							
75							

CLIENT: Solstra Communities California LLC	JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Tri-Valley Drilling	DRILLED: 2/14/06		
DRILLING METHOD: Bucket-Auger (116' Rig)	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-6	
DRIVING WEIGHTS: 30' 5952 lbs, 30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lb	ELEVATION: 1115'		

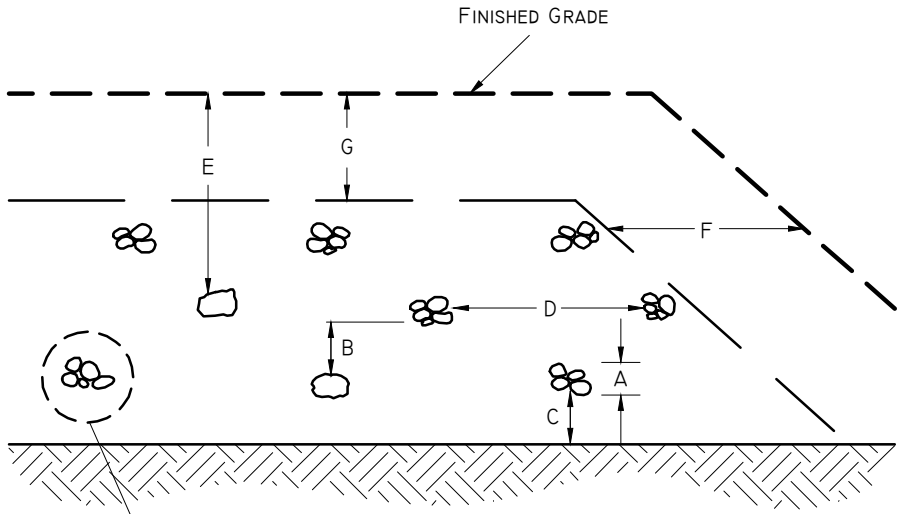
DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						BEDROCK; Tcag (0 - 15')	Surface logged only
						@ 0' Dark grayish-brown pebbly sandstone with silt; moist	
						@ 3' Grayish-brown pebbly, clayey sandstone; moist; some iron-oxide staining	
5							
		7 8				@ 5' Grayish-brown sandy mudstone; moist; yellowish-brown silty fine-grained sandstone in the bottom of the sampler	@ 5 - 15' Bulk Sample
						@ 6' yellowish-brown silty fine-grained sandstone; damp to moist	
						@ 8' Yellowish-brown sandstone with pebbles	
10							
		8 10/3"				@ 10' Yellowish-brown sandy siltstone/silty sandstone; damp to moist	Shear Test
15							
		6 12				@ 15' Yellowish-brown to strong brown fine- to medium-grained sandstone; damp	Shear Test Backfill tamped every 5'
						TOTAL DEPTH 15' (Elev. 1100') No Ground Water No Caving	
20							
25							
30							
35							

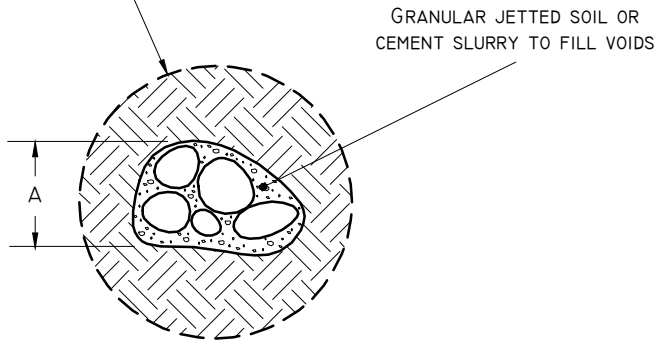
Appendix B



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□s□□□s

FILL OVER NATURAL SLOPE
5:1 OR STEEPER





EXPLANATION

A) ± 4 FT, HEIGHT AND WIDTH MAY VARY DEPENDING ON ROCK SIZE

B) MINIMUM OF 4 FT FROM STAGGER WINDROW

C) MINIMUM OF 5 FT FROM FIRST SET OF WINDROW TO COMPETENT MATERIAL OR BEDROCK

D) MINIMUM OF 15 FT BETWEEN WINDROWS

E) MINIMUM OF 23 FT FROM OVERSIZED ROCKS (LARGEST DIMENSION ≥ 4 FT) TO FINISHED SUBGRADE. ALL OVERSIZED ROCKS MUST BE INDIVIDUALLY PLACED.

F) MINIMUM OF 25 FT FROM PROJECTED WINDROW AREA TO FINISHED SLOPE SURFACE.

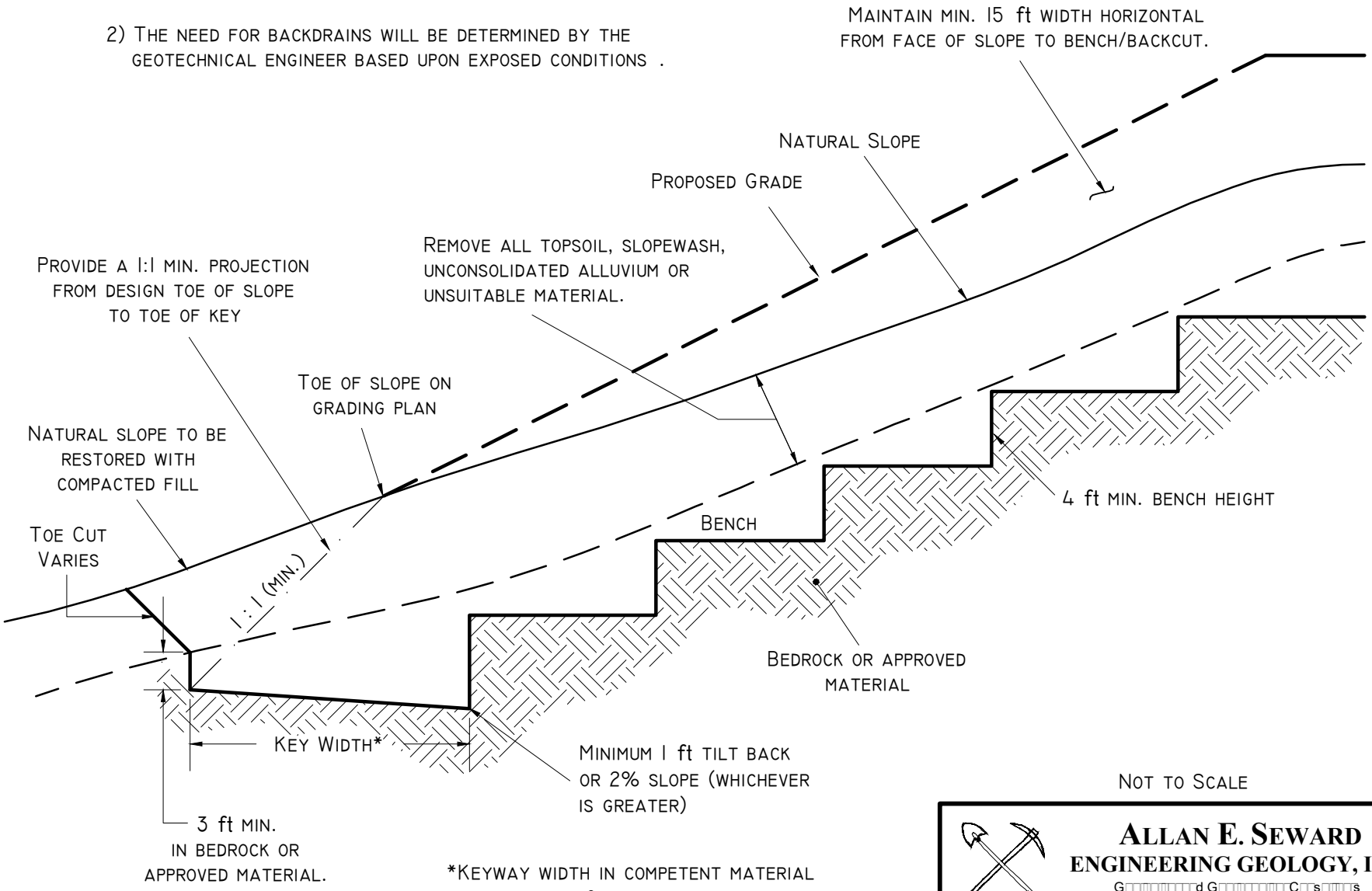
G) MINIMUM OF 15 FT BENEATH FINISHED GRADE TO PROVIDE CLEARANCE FOR FOUNDATIONS AND POOLS, OR 5 FT BELOW THE DEEPEST ADJACENT UTILITY TRENCH, WHICHEVER IS DEEPEST.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□□s□□□□s

ROCK DISPOSAL (WINDROWS)

NOTE: 1) WHERE THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN SLOPE RATIO, SPECIAL RECOMMENDATIONS WILL BE PROVIDED BY THE GEOTECHNICAL ENGINEER.

2) THE NEED FOR BACKDRAINS WILL BE DETERMINED BY THE GEOTECHNICAL ENGINEER BASED UPON EXPOSED CONDITIONS .

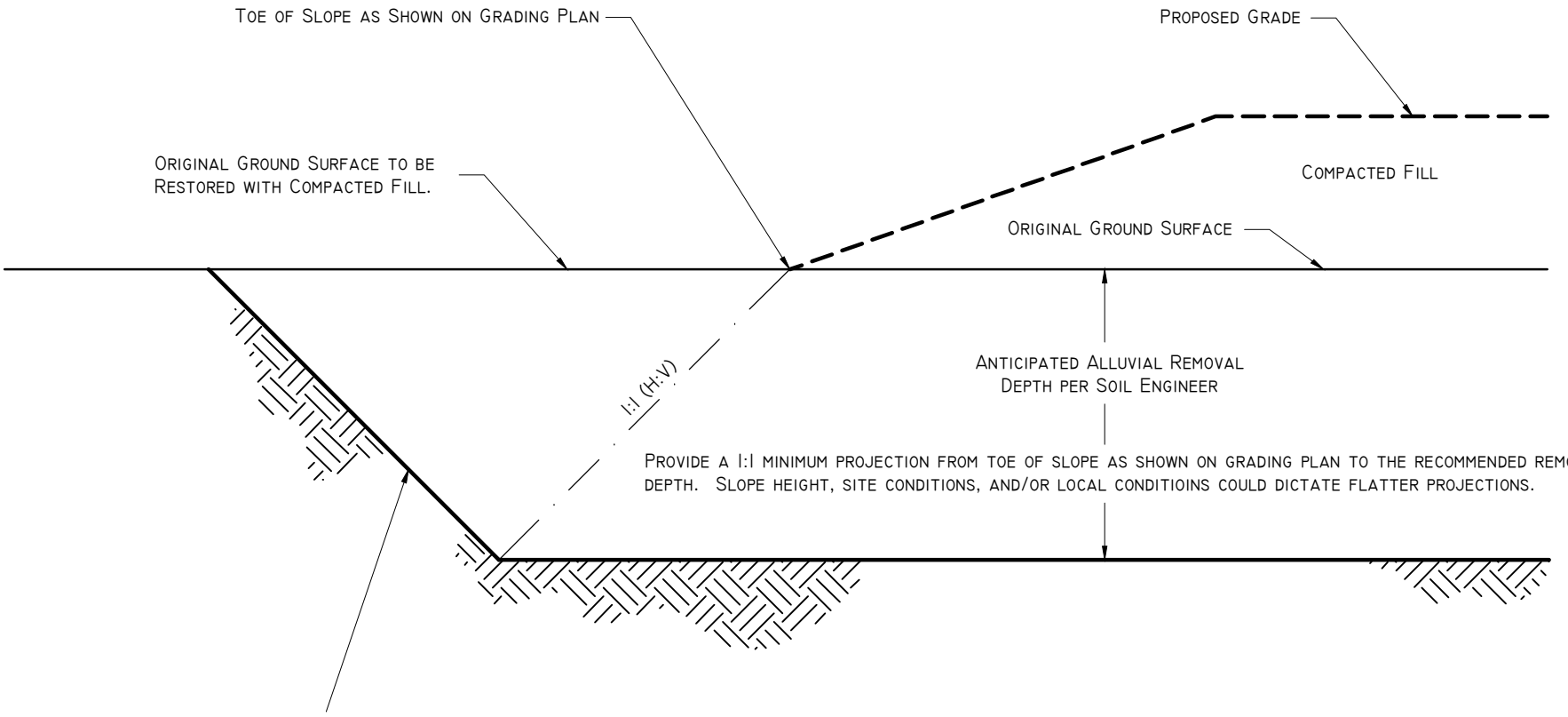


*KEYWAY WIDTH IN COMPETENT MATERIAL MINIMUM OF 15 ft OR AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

NOT TO SCALE

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□s□□□s

FILL SLOPE OVER NATURAL SLOPE
5:1 OR STEEPER



BACKCUT VARIES. BACKCUT SHOULD BE EXCAVATED AS APPROPRIATE TO PROVIDE SAFE CONDITIONS PER CAL OSHA. ALTERNATIVELY, THE SLOT-CUT METHOD CAN BE USED (SEE TEXT), OR TEMPORARY SHORING CAN BE UTILIZED.

NOT TO SCALE

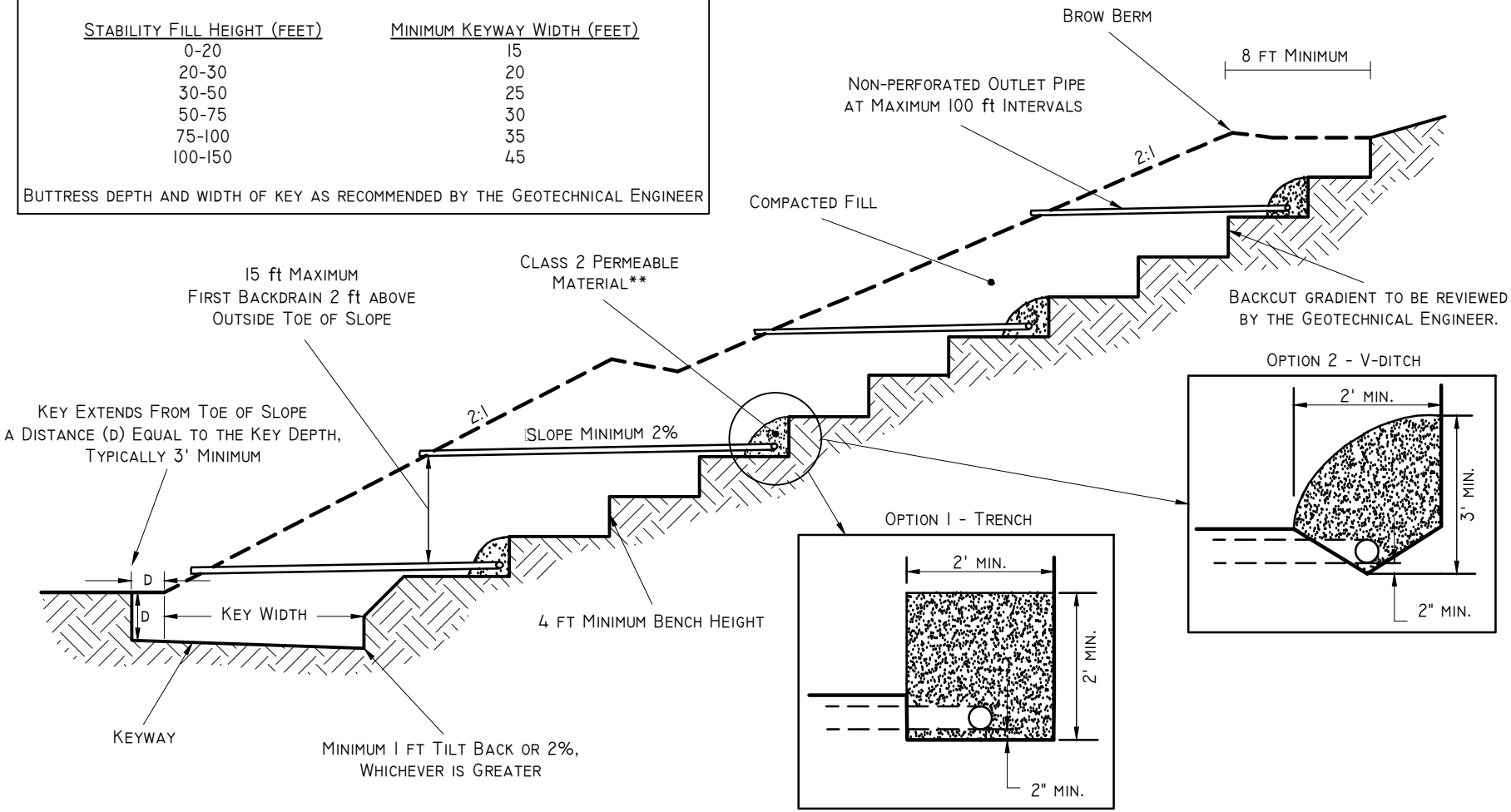
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□□s□□□□s

FILL SLOPE TOEING OUT ON FLAT ALLUVIATED CANYON

Standard Keyway Width vs. Slope Height for Stability Fill

Stability Fill Height (feet)	Minimum Keyway Width (feet)
0-20	15
20-30	20
30-50	25
50-75	30
75-100	35
100-150	45

Buttress depth and width of key as recommended by the Geotechnical Engineer



**Specifications for CalTrans Class 2 Permeable Material

U.S. Standard Sieve Size	% Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

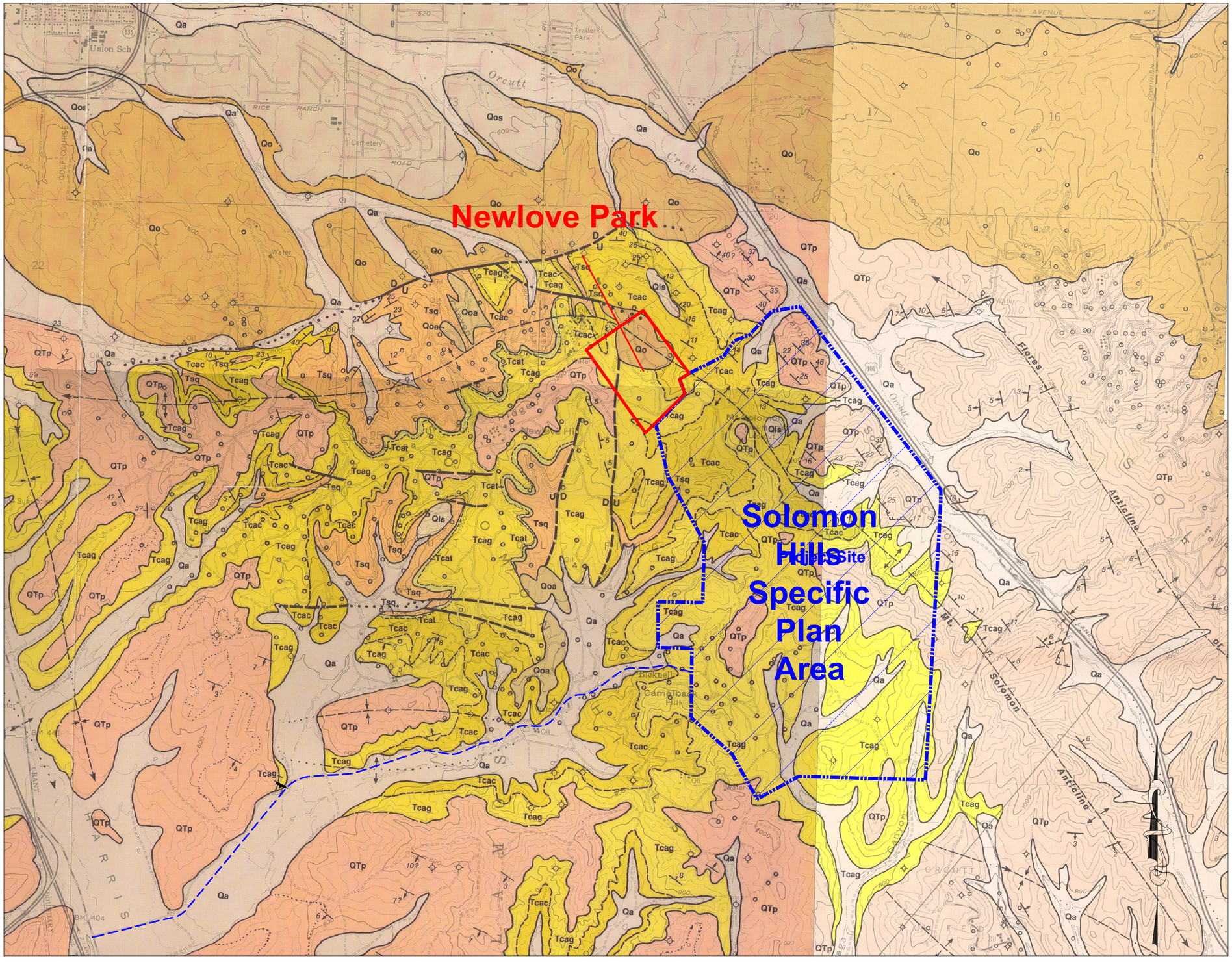
Sand Equivalent >75

All backdrains and outlet pipes to be 4" diameter PVC pipe (SDR 35 or Schedule 40); Backdrain Perforations positioned down; Upper ends of backdrains to be sealed with an approved cap.

Allan E. Seward
Engineering Geology, Inc.
Geotechnical and Geological Consultants

Stability/Buttress Fill and Backdrains

Appendix C



0 2,000' 4,000'

Approximate Scale

Source: Geologic Map of the Casmalia and Orcutt Quadrangles, Santa Barbara County, California, by Thomas W. Dibblee, JR. 1989, Dibblee Foundation Map DF-24 and Geologic Map of the Sisquoc Quadrangle, Santa Barbara County, California, by Thomas W. Dibblee, JR. 1994, Dibblee Foundation Map DF-53.

LEGEND

QUATERNARY

Holocene

Qa / Qds / Qg / Qls

SURFICIAL SEDIMENTS

Qs *beach sand deposits*
Qds *dune sand deposits*
Qa *valley and floodplain alluvial deposits*
Qls *landslide debris*

Pleistocene

Qos / Qoa / Qo

OLDER DISSECTED SURFICIAL SEDIMENTS

Qos *dune sand deposits, in places weakly consolidated*
Qoa *remnants of weakly consolidated stream terrace and alluvial fan deposits of silt, sand and gravel*
Qo *Orcutt Sand: tan to rusty brown, poorly consolidated to locally indurated, wind-deposited sand; pebble gravel at base locally*

UNCONFORMITY

QTp

PASO ROBLES FORMATION

nonmarine; latest Pliocene to early Pleistocene age

QTp *weakly consolidated, light greenish-gray to reddish alluvial sediments; conglomerate composed largely of Monterey Shale pebbles*

Pliocene

Tca / Tcag / Tcac

CAREAGA SAND

shallow marine regressive; late Pliocene age

Tca *undivided; weakly indurated, massive, grayish-yellow, locally pebbly sand*
Tcag *Graciosa Member: thick bedded, grayish-yellow, locally pebbly, weakly indurated sand; fossiliferous calcareous reef at base*
Tcac *Cebada Member: massive tan-yellow, weakly indurated, fine-grained sand; locally includes* **Tcat**, *basal tar-soaked sand*

Tf

FOXEN MUDSTONE

marine; middle to late Pliocene age

Tf *light gray massive claystone and siltstone*

Tsqd / Tsqo / Tsq

SISQUOC FORMATION

marine; late Miocene age

Tsqd *white to cream-white, punky, diatomaceous claystone and clayey diatomite*
Tsqo *same as Tsqd, but oil-saturated and partly burned locally to frothy stone*
Tsq *(Tudos Santos Claystone Member of Woodring and Bramlette, 1950): light gray claystone and slightly diatomaceous or siliceous clay shale*

SYMBOLS

not all symbols present on each map

FORMATION CONTACT *dashed where inferred or indefinite* — **MEMBER CONTACT**

CONTACT BETWEEN SURFICIAL SEDIMENTS *located approximately in places*

U / D — 70 — **FAULT**

dashed where indefinite or inferred, dotted where concealed, queried where existence doubtful. Parallel arrows indicate inferred relative lateral movement. Relative vertical movement shown by U/D (U = upthrown side D = downthrown side). Short arrow indicates dip of fault plane.

ANTICLINE — **SYNCLINE**

arrow on axis indicates direction of plunge, dotted where concealed

horizontal · 25 inclined · 20 inclined (approximate) · vertical · 25 overturned · 25 inclined metamorphic foliation

STRIKE AND DIP OF BEDDED ROCKS

DIRECTION OF LANDSLIDE MOVEMENT · **SANDSTONE BED** · **CONGLOMERATE BED**

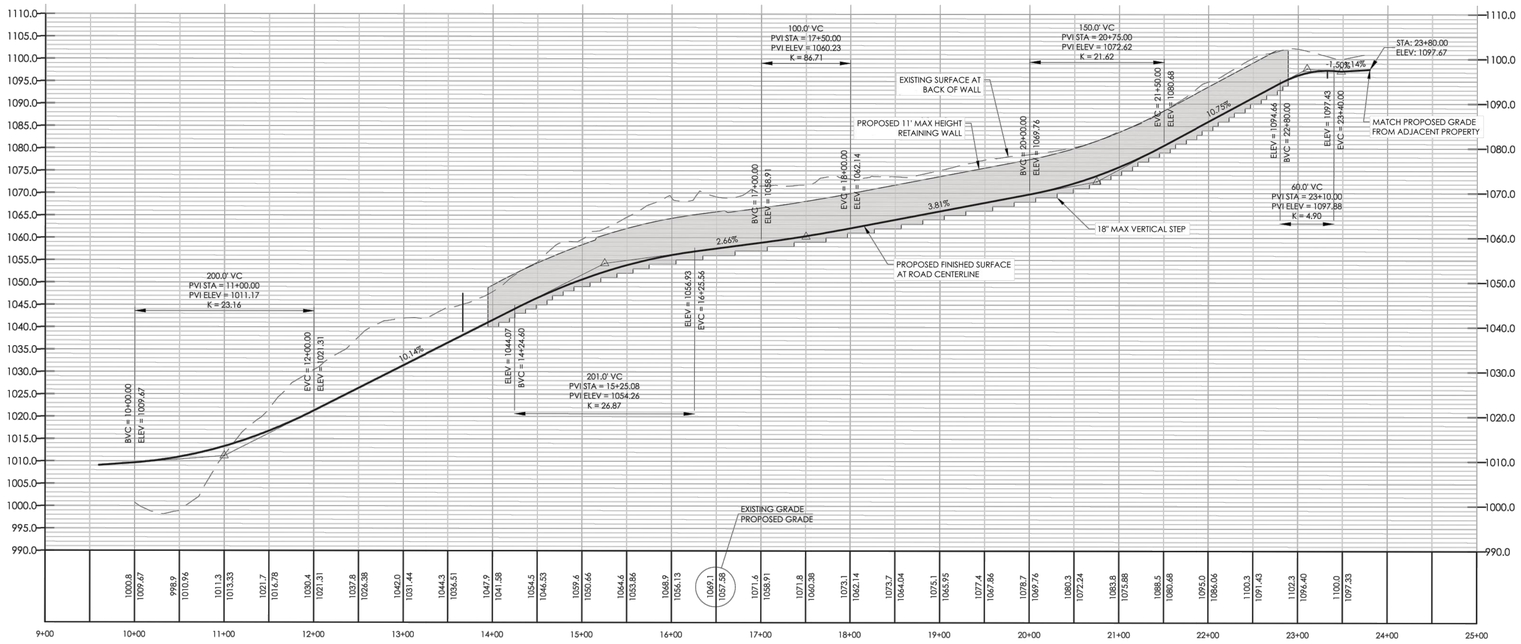
ABANDONED EXPLORATORY OIL WELL

OIL WELL LOCATIONS INDICATED ON TOPOGRAPHIC BASE MAP.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

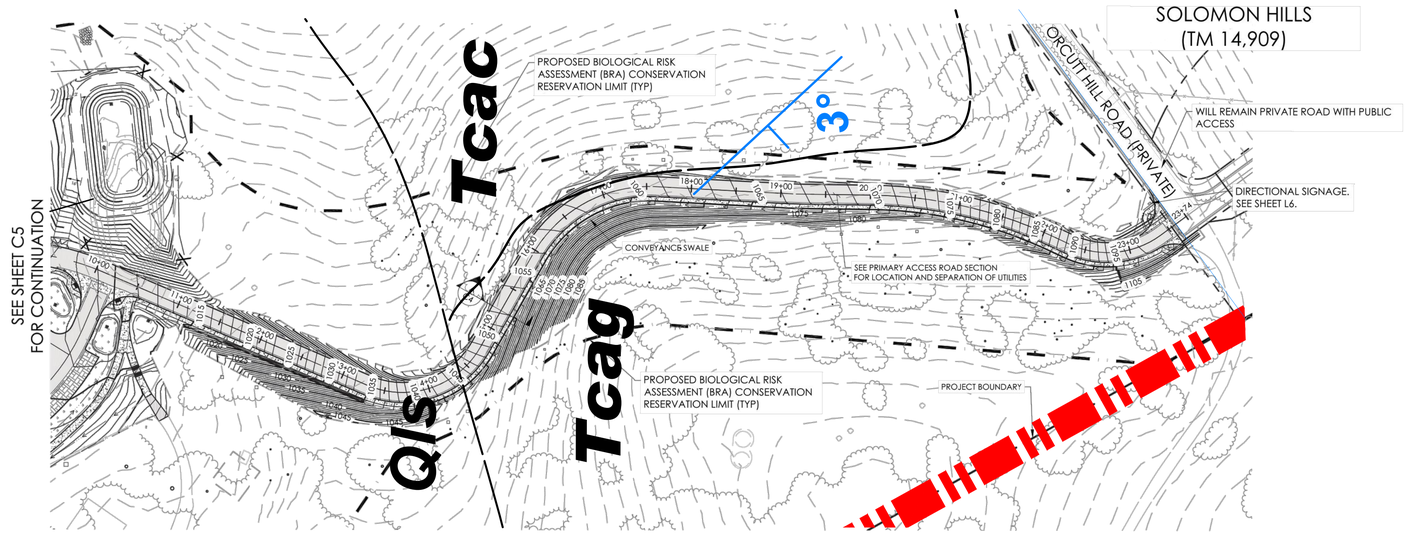
REGIONAL GEOLOGIC MAP

Date: 7/26/25	*Job No.:* 25-2195s-1
Scale: As Shown	*CAD File:* Regional Geologic Map Dibblee
Plate I	*Geology by:* Staff
	Drawn by: CHS
	Revised:



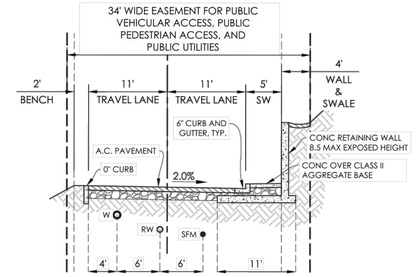
PRIMARY ACCESS ROAD PROFILE [10+00 - 23+74]

1" = 16' VERTICAL SCALE
1" = 80' HORIZONTAL SCALE



PRIMARY ACCESS ROAD [10+00 - 23+74]

1" = 80' SCALE



A PRIMARY ACCESS ROAD SECTION
SCALE: NTS

LEGEND

Qls	Quaternary Landslide
QTp	Paso Robles Formation
Tcag	Careaga Sand Formation - Graciosa member
Tcac	Careaga Sand Formation - Cebada member
GT-101	Geologic test pit
BA-6	Bucket-auger boring
30°	Strike and dip of bedding (per Woodring map)
48°	Strike and dip of bedding
15° (D)	Strike and dip of bedding (per Dibblee map)
19°	Approximate strike and dip of bedding
78°	Fault Attitude
	Horizontal Bedding
	Fault trace (per Dibblee map)
	Geologic contact; dotted where concealed

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Preliminary Geotechnical Map

DATE: 7/26/25	JOB NO.: 25-2195S-1	
SCALE: 1" = 80'	FILE: AES 25.07.25 GEOTECHNICAL MAP NEWLOVE PARK - DEBRIS BASIN	
PLATE II	GEOLOGY BY: CHS	REVISED:
	DRAWN BY: EV	

0 80 160 240 feet
1"=80'

rrm

JULY 23, 2025

NEWLOVE PARK C.U.P.
PRIMARY ACCESS ROAD PLAN AND PROFILE

C4

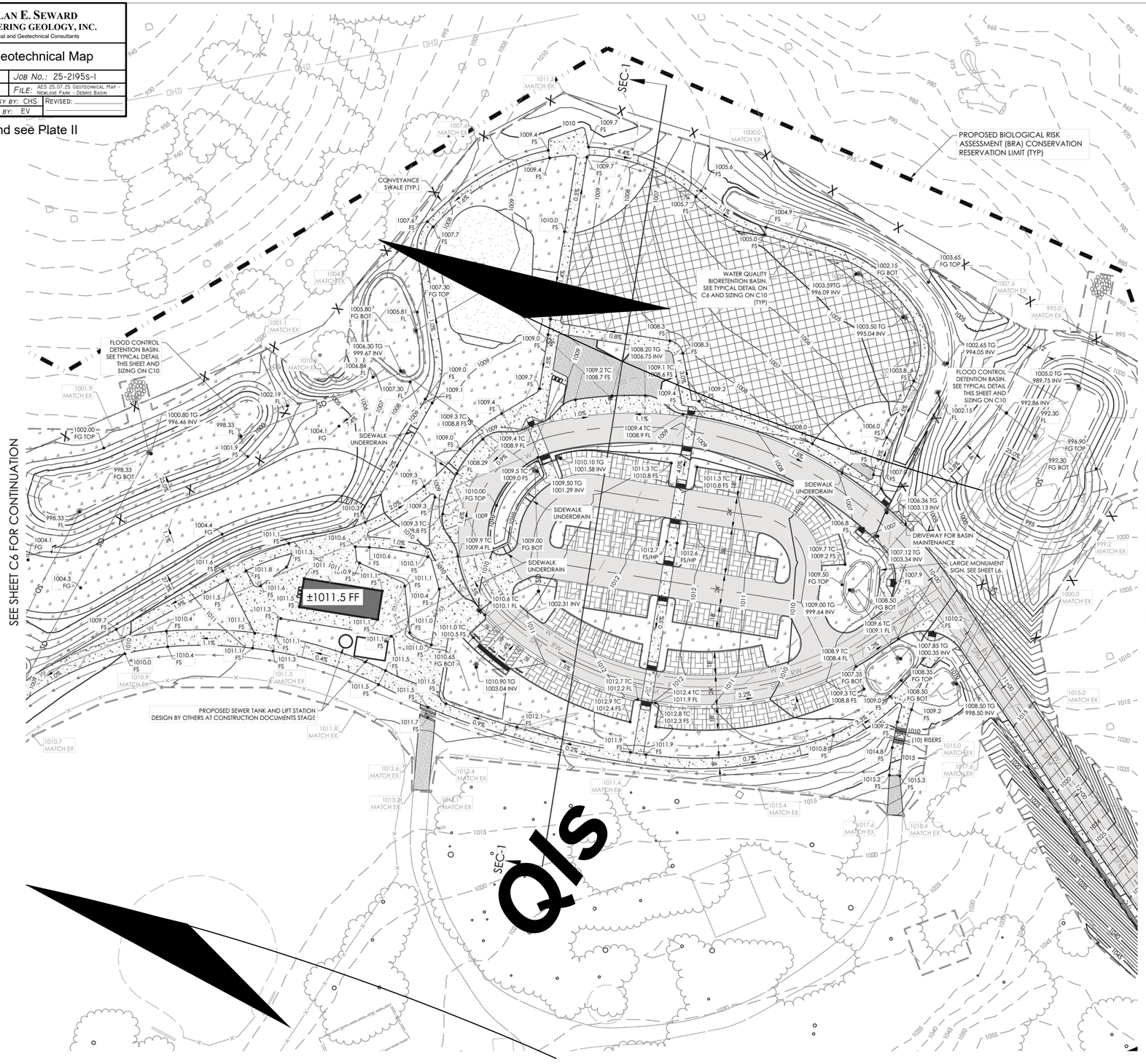
N:\2200\2298-03-CU23 Solomon Hills Specific Plan\Engineering\1TM\Sheet Files\C4F_New Love Park\C4_Preliminary Grading and Drainage.dwg, C4, Jul 23, 2025 2:21pm, apolemo

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Preliminary Geotechnical Map

DATE: 7/26/25	JOB NO.: 25-2195s-1
SCALE: 1" = 40'	FILE: AES 25.07.25 GEOTECHNICAL MAP - NEWLOVE PARK - DEBRIS BASIN
PLATE III	GEOLOGY BY: CHS / DRAWN BY: EV / REVISED:

Legend see Plate II

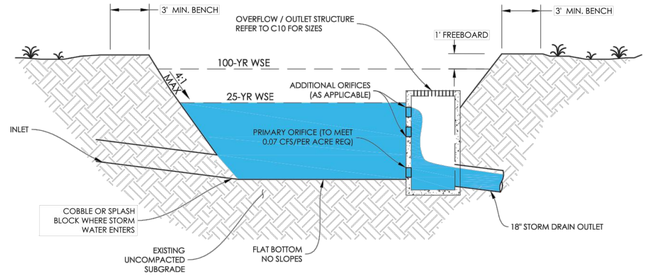


GRADING NOTES

1. EXISTING UNDERGROUND UTILITIES NOT SHOWN. EXISTING UNDERGROUND UTILITIES ONSITE TO BE CAPPED AND ABANDONED, REMOVED OR RELOCATED ACCORDINGLY. ALL ATTACHED SURFACE UTILITY FEATURES WITHIN THE GRADING LIMITS TO BE REMOVED OR RELOCATED ACCORDINGLY.
2. EXISTING TREE NUMBER SHOWN FOR REFERENCE ONLY. SEE LANDSCAPE PLAN SHEETS L1 AND L2 FOR EXISTING TREE INFORMATION, DISPOSITION AND PROPOSED TREE PLANTING. ALSO, REFER TO TREE REPORT PREPARED BY DUDEK.
3. NOT ALL OVERHEAD UTILITIES SHOWN. MORE FACILITIES IN AND THROUGHOUT AREA. LINES WILL BE REMOVED AND/OR RELOCATED IN CONSTRUCTION DOCUMENT STAGE.
4. PRIVATE PARK WITH PUBLIC PEDESTRIAN ACCESS.
5. RUNOFF FROM OFFSITE DRAINAGE WILL BE MANAGED AND CONVEYED IN AN NON-EROSIVE MANNER.
6. THE MAXIMUM MASS GRADING SLOPES SHALL BE 3:1 FOR FILL CONDITION AND 2:1 FOR CUT CONDITION.

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED DRAINAGE SWALE
- EXISTING BOUNDARY LINE
- GRADING LIMIT
- PROPOSED FENCING. REFER TO LANDSCAPE SHEET L3.
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN CATCH BASIN
- PROPOSED OUTLET RIPRAP
- ABANDONED OIL WELL. A 40'x60' ACCESS EASEMENT REQUIRED. FUTURE DEVELOPMENT MAY RELOCATE THE EASEMENT, BUT IT MUST MAINTAIN THE SAME 40'x60' DIMENSIONS. A TEMPORARY ACCESS EASEMENT PROPOSED TO THE NEAREST POINT OF ACCESS. A PERMANENT 20' RADIUS NO-BUILD ZONE IS PROPOSED FOR EVERY OIL WELL LOCATION. SEE DETAIL C ON SHEET C8.



TYPICAL DETENTION BASIN DETAIL

NTS

0 40 80 120 feet

1"=40'

NEWLOVE PARK C.U.P.

PRELIMINARY GRADING AND DRAINAGE

C5

JULY 23, 2025

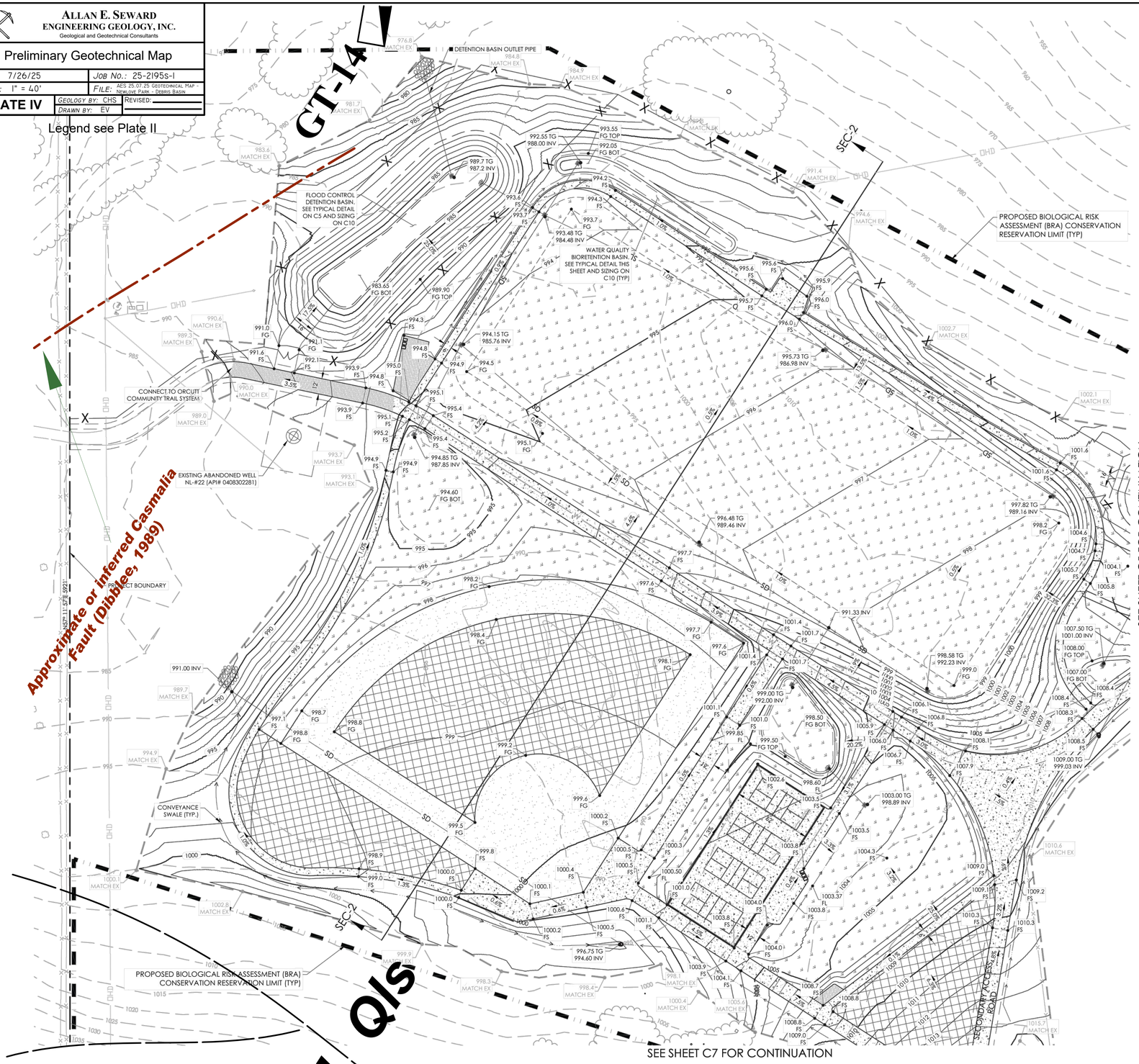
N:\2200\2298.03-C\25-Solomon-Hills-Specific-Plan\Engineering\TM\Sheet-Files\CUP_New Love Park\C4_Preliminary Grading and Drainage.dwg, C5, Jul 23, 2025 2:23pm, cpolemo

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Preliminary Geotechnical Map

DATE: 7/26/25	JOB NO.: 25-2195s-I
SCALE: 1" = 40'	FILE: AES 25.07.25 GEOTECHNICAL MAP - NEWLOVE PARK - DEBRIS BASIN
PLATE IV	GEOLOGY BY: CHS / DRAWN BY: EV / REVISED:

Legend see Plate II

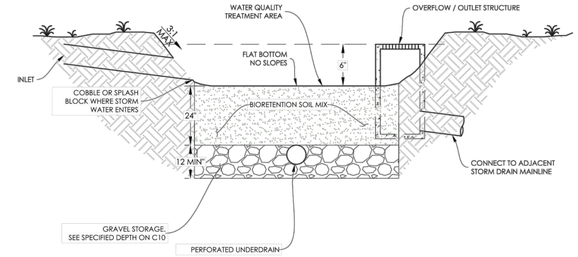


GRADING NOTES

1. EXISTING UNDERGROUND UTILITIES NOT SHOWN. EXISTING UNDERGROUND UTILITIES ONSITE TO BE CAPPED AND ABANDONED, REMOVED OR RELOCATED ACCORDINGLY. ALL ATTACHED SURFACE UTILITY FEATURES WITHIN THE GRADING LIMITS TO BE REMOVED OR RELOCATED ACCORDINGLY.
2. EXISTING TREE NUMBER SHOWN FOR REFERENCE ONLY. SEE LANDSCAPE PLAN SHEETS L1 AND L2 FOR EXISTING TREE INFORMATION, DISPOSITION AND PROPOSED TREE PLANTING. ALSO, REFER TO TREE REPORT PREPARED BY DUDEK.
3. NOT ALL OVERHEAD UTILITIES SHOWN. MORE FACILITIES IN AND THROUGHOUT AREA. LINES WILL BE REMOVED AND/OR RELOCATED IN CONSTRUCTION DOCUMENT STAGE.
4. PRIVATE PARK WITH PUBLIC PEDESTRIAN ACCESS.
5. RUNOFF FROM OFFSITE DRAINAGE WILL BE MANAGED AND CONVEYED IN AN NON-EROSIVE MANNER.
6. THE MAXIMUM MASS GRADING SLOPES SHALL BE 3:1 FOR FILL CONDITION AND 2:1 FOR CUT CONDITION.

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED DRAINAGE SWALE
- EXISTING BOUNDARY LINE
- GRADING LIMIT
- PROPOSED FENCING. REFER TO LANDSCAPE SHEET L3.
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN CATCH BASIN
- PROPOSED OUTLET RIPRAP
- ABANDONED OIL WELL. A 40'x60' ACCESS EASEMENT REQUIRED. FUTURE DEVELOPMENT MAY RELOCATE THE EASEMENT, BUT IT MUST MAINTAIN THE SAME 40'x60' DIMENSIONS. A TEMPORARY ACCESS EASEMENT PROPOSED TO THE NEAREST POINT OF ACCESS. A PERMANENT 20' RADIUS NO-BUILD ZONE IS PROPOSED FOR EVERY OIL WELL LOCATION. SEE DETAIL C ON SHEET C8.



TYPICAL BIORETENTION DETAIL

NTS

0 40 80 120 feet

1"=40'

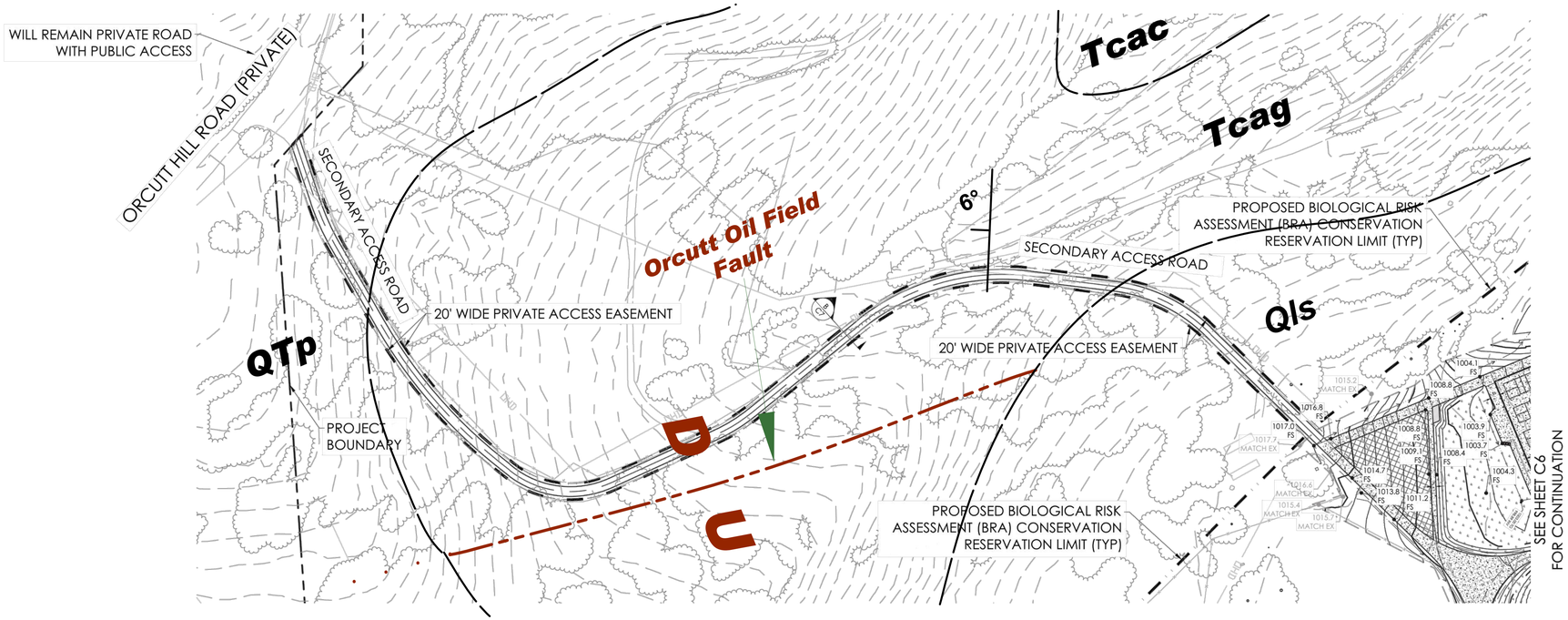
rrm

JULY 23, 2025

NEWLOVE PARK C.U.P.
PRELIMINARY GRADING AND DRAINAGE

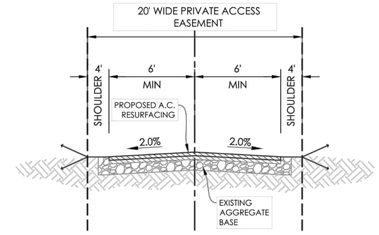
C6

N:\2201\2298.03-CU23-Solomon-Hills-Specific_Plan\Engineering\TM\Sheet Files\CUP_New Love Park\C4_Preliminary Grading and Drainage.dwg, C4, Jul 23, 2025, 2:29pm, opdemo



SECONDARY ACCESS ROAD

1" = 80' SCALE



B SECONDARY ACCESS ROAD SECTION
SCALE: NTS

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Preliminary Geotechnical Map

DATE: 7/26/25	JOB NO.: 25-2195s-1
SCALE: 1" = 80'	FILE: AES 25.07.25 GEOTECHNICAL MAP - NEWLOVE PARK – DEBRIS BASIN
PLATE V	GEOLOGY BY: CHS / DRAWN BY: EV
	REVISED:

Legend see Plate II

0 80 160 240 feet
1"=80'

N:\2500\2298-00-C123-Solomon-Hills-Specific-Plan\Engineering \TM\Sheet Files\CUP_New Love Park\C4_Preliminary Grading and Drainage.dwg, C7, Jul 23, 2025, 2:25pm, dpalermo

NEWLOVE PARK C.U.P.
SECONDARY ACCESS ROAD

C7

Approximate or inferred Casmalia Fault (Dibblee, 1989)

Approximate or inferred Casmalia Fault (Dibblee, 1989)

Orcutt Oil Field Fault

Existing Boundary Line

Newlove Park Grading Limit

Solomon Hills Specific Plan Area Boundary

Qls

Tcag

Tcac

QTp

40° (D)

25° (D)

25° (D)

13° (D)

(D) 40°

30°

20° (D)

15° (D)

11° (D)

14°

4°

2°

3°

5° (D)

2°

5° (D)

10°

14°

14°

GT-14

GT-15

GT-27

GT-16

GT-102

GT-31

GT-101

GT-99

GT-32

GT-104

BA-3

BA-6

HS-24

D / U

750 775 800 825 850 700 725 750 775 800 825 850 875 900 925 950 975 1000 1025 1050 1075 1100 1125 1150 1175 1200

Legend see Plate II

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Geologic Map

DATE: 07/26/25	JOB NO.: 25-2195S-1
SCALE: 1" = 400'	PLATE VI

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

GEOTECHNICAL REPORT

Solomon Hills

Proposed Offsite Wet Weather Storage Basin C.U.P.

Portion of Assessor's Parcel Number

101-020-087

Santa Barbara County, California

Exclusively Prepared For:

Solstra Communities California, LLC

1130 East Clark Avenue, Suite 150 #286

Orcutt, CA 93455

July 25, 2025

Job No.: 25-2195s-1

TABLE OF CONTENTS

1.0 PROJECT DESCRIPTION SUMMARY 1
2.0 SCOPE OF WORK 2
3.0 SITE DESCRIPTION 3
4.0 PROPOSED GRADING 3
5.0 GEOLOGIC SETTING 4
6.0 GEOLOGIC AND GEOTECHNICAL CONDITIONS 4
6.1 Geologic Units 4
6.1.1 Paso Robles Formation (QTp) 4
6.1.2 Alluvium (Qa) 5
6.1.3 Slopewash (Qsw) 5
6.2 Groundwater 5
7.0 SEISMIC CONSIDERATIONS 6
7.1 Introduction 6
7.2 Ground Rupture 6
7.2.1 Casmalia Fault (Orcutt Frontal) 7
7.3 Ground Motion 8
7.3.1 General 8
7.3.2 Earthquake Magnitude 8
7.4 Ground Failure 9
7.4.1 Potential for Liquefaction and Associated Ground Failure 9
7.4.2 Potential for Other Modes of Ground Failure 10
8.0 POTENTIAL GEOLOGIC AND GEOTECHNCIAL HAZARDS 10
8.1 Proposed Cut-Slopes 10
8.2 Proposed Fill Slopes 10
8.3 Natural Slopes 10
8.4 Soil Compressibility and Hydro-consolidation 10
8.4.1 Hydro-Compression (Collapse) 10
8.4.2 Compressibility of Alluvium 11
8.5 Rippability 12
8.6 Oversize Material 12
8.7 Expansion Potential 12
8.8 Potential Corrosivity of Soils 13
8.9 Soil Creep 13
9.0 PROJECT FEASIBILITY 15
10.0 CONCLUSIONS AND RECOMMENDATIONS 15
11.0 FUTURE GEOTECHNICAL STUDIES 16
12.0 LIMITATIONS 16

The following attachments and appendices complete this report.

Location Map following page 4
References

TABLE OF CONTENTS

APPENDIX A – Subsurface Logs

- Geologic Test Pits GT-25 & GT-26
- Geotechnical Test Pit ST-24
- Hollow Stem Auger Boring HS-5 & Key to Symbols

APPENDIX B

Regional Geologic Map **Plate I**
Preliminary Geotechnical Map **Plate II**

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

July 25, 2025 Job No.: 25-2195s-1

Solstra Communities California, LLC
1130 East Clark Avenue, Suite 150 #286
Orcutt, CA 93455

Attention: Mr. Peter Kiesecker

Subject: **GEOTECHNICAL REPORT**
Solomon Hills Offsite Wet Weather Storage Basin CUP

Property: Solomon Hills Development
Portion of Assessor's Parcel Numbers 101-020-087
Santa Barbara County, California

Dear Mr. Kiesecker:

This report presents the results of a geologic assessment for a proposed offsite wet weather storage basin as part of an overall Solomon Hill project area. The purpose of this assessment is to characterize geologic conditions at the basin site, including the identification of surficial and bedrock units, potential landslides, fault-related deformation, and other geologic hazards relevant to long-term stability and feasibility of the planned improvements. This investigation is intended to support environmental review and project planning at the Conditional-Use Permit (C.U.P.) stage and does not include quantitative geotechnical design recommendations.

1.0 PROJECT DESCRIPTION SUMMARY

The Solomon Hills Project proposes to create Santa Barbara County's first new community that will result in a sustainable, resilient and healthy environment for its residents. The Project establishes a holistic framework for Smart Growth with a redevelopment of private lands historically used for grazing and oil and gas production. It's proposed Specific Plan includes the design and implementation of a central village closely surrounded by several neighborhoods, office and commercial space, a TK-8 school, fire/sheriff station, parks, open space and public trails to allow walking and biking as an easy alternative to vehicle transport.

The Project's proposed Specific Plan allows for a balance of land uses primarily serving working families allowing 4,000 single and multi-family residential units, 650,000 square feet of commercial retail and office use and space, 25.5-acres of public and institutional uses and space, and 1,023 acres of recreational and open space uses. Critical infrastructure includes

water supply and a water reclamation facility, interchange improvements along Hwy 101, additional secondary access along Hwy 101 and Hwy 135 and several active and passive parks and public trails. Public benefits include developer sponsored Affordable housing near commercial and transportation access points, utility and access improvements that minimize traffic impacts to neighboring properties, new public trail access into the Orcutt Hills, recreational improvements and public access to the Newlove Picnic Grounds, the preservation of open space ridgelines and valleys for habitat protection and the abandonment and remediation of all oilfield features and operations. The Project is designed to be built in four buildout phases over a fourteen-year period for the orderly delivery of the Project. Phased grading, access, utility, horizontal and public improvements are scheduled ahead of and to align with the same buildout phases.

2.0 SCOPE OF WORK

The scope of work for this assessment included the following tasks:

1. Review of published Geologic Map of the Camalia and Orcutt Quadrangles (Dibblee, 1989) and the USGS 30′×60′ Geologic Map of the Santa Maria and Point Conception Quadrangles (Sweetkind et al., 2021).
2. Preparation of a Regional Geologic Map (**Plate I**).
3. Review of the Wet Weather Storage Basin C.U.P. plan by RRM Design Group, dated January 31, 2025. The 80-scale Overall Site Plan, Sheet C3, was used as the base for our Preliminary Geotechnical Map (**Plate II**). We make no representation regarding the accuracy of this base map.
4. Review of the General Plan Amendments and Specific Plan Geotechnical Report (AES, 2023) and associated exploratory trench and boring logs in the vicinity.
5. Interpretation of slope conditions and geologic structure based on topography and bedding attitudes.
6. Analysis of grading plans, topographic base maps, and aerial imagery to assess potential geologic hazards.
7. Compilation of a geologic hazards overview focused on slope stability and seismic considerations for CUP-level review.
8. Preparation of this geologic assessment report for use in Conditional-Use Permit (CUP) processing and early-stage project planning.

3.0 SITE DESCRIPTION

The proposed Wet Weather Storage Basin No. 3 (storage basin) and 3 irrigation blocks is located in northern Santa Barbara County, southeast of the community of Orcutt and along the western side of the Highway 101 (see **Location Map** following page 4). The storage basin is in the accessors Parcel Number 101-020-087 and is located north of the Solomon Hills Specific Plan area. The proposed storage basin will have an overall footprint of approximately 7.5 acres and is located on the alluvial flats between the south bound Highway 101 and a gently sloping hillside with slope gradients ranging from 2.9:1 to 4.3:1 (h:v). The project footprint ranging from approximately 630 to 930 feet above sea level. Vegetation within the site consists primarily of non-native grasslands interspersed with patches of low shrub cover. Access to the site is currently provided by unimproved service routes that trace the legacy infrastructure of former oil exploration.

4.0 PROPOSED GRADING

The proposed storage basin will serve as a recycled water storage reservoir to support the broader infrastructure and sustainability goals of the Solomon Hills development. Specifically, the basin is designed to accommodate up to 39.5 acre-feet of recycled water when irrigation needs are minimal (i.e., winter months). To ensure environmental protection and water quality containment, the basin will be lined with a geosynthetic liner, allowing for safe long-term storage of reclaimed water intended for future reuse in landscape irrigation and other non-potable applications.

The grading plan proposes a cutting below exiting grade to create the storage basin with 2:1 (h:v) gradient interior cut slopes at a maximum height of 12 feet and three associated irrigation block improvements. The storage basin bottom invert is at an elevation of 630 ft, with a maximum cut of approximately 20 feet below existing grade. A maximum of 11.6 feet of fill is proposed for the fill slope berm for the northern portion of the storage basin. The three irrigations blocks (east, middle, and west) are approximately 24.6 acres in area located on the ascending natural slopes. The western edge of the basin a 2:1 gradient (h:v) cut-slope up to 45 ft in height ascends from the 18 ft wide access road at the top of the basin side slopes. The proposed grading for the wet weather storage basin is shown on the attached Preliminary Geotechnical Map (see **Plate II**).

Based on current design, the site is expected to generate a net excess of approximately 144,000 cubic yards of excavated material, which will require export or management elsewhere within the overall Solomon Hills project area. Final earthwork grading volumes will be refined during subsequent project design phases.

5.0 GEOLOGIC SETTING

The proposed debris basin site is located within the southern portion of the Coast Ranges Geomorphic Province, along the southeastern edge of the Santa Maria Valley in the Solomon Hills. This region is characterized by northwest-trending folds and reverse faults resulting from compressional tectonic forces associated with the western Transverse Ranges. Uplift of both basement and overlying sedimentary rocks has produced a complex structural landscape marked by asymmetric folding and blind thrusting, followed by erosion and dissection of the uplifted terrain.

The proposed storage basin will primarily be underlain by alluvium with the portion of the proposed cut slopes along the western side exposing the Paso Robles Formation (QTp). The Paso Robles Formation is a Pleistocene nonmarine unit consisting of conglomerate, sandstone, siltstone, and claystone, often interbedded with expansive clay-rich horizons. The Paso Robles Formation forms the dominant geologic bedrock unit underlying the basin area and surrounding ridges. The bedding attitudes within the QTp, generally strike northwest ranging from N43W to N62W and dip moderately to the northeast at angles between 30° and 43°. The Alluvium consists of loose to medium-dense sandy silts, silty sands, and locally clayey layers, derived from reworked Paso Robles sediments.

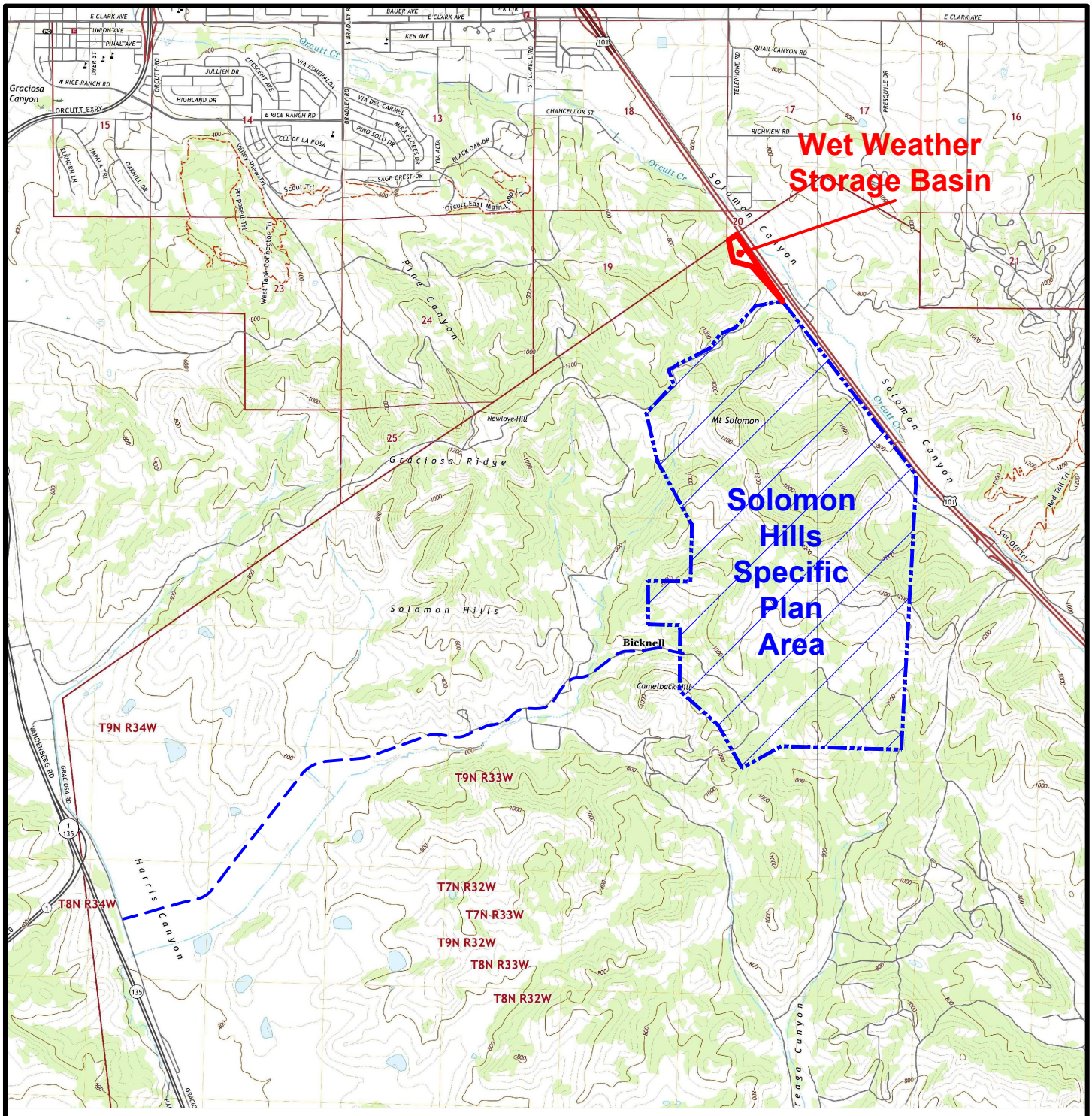
6.0 GEOLOGIC AND GEOTECHNICAL CONDITIONS

6.1 Geologic Units

The proposed debris basin site is underlain primarily by surficial alluvial deposits (Qa). The naturals slopes ascending on the south and west sides of the proposed storage basin are mapped as the Paso Robles Formation (QTp) with approximately 2 to 3 feet of slopewash on the exterior portion of the slope face. The following unit descriptions summarize the geologic conditions observed or inferred within the area of proposed improvements.

6.1.1 Paso Robles Formation (QTp)

The Paso Robles Formation is the predominant geologic unit underlying the proposed debris basin and surrounding slopes. This nonmarine unit consists of poorly sorted conglomerates, cross-bedded sandstones, claystones, and siltstones. Subsurface exposures from previous trenching (e.g., GT-25 and GT-26) show typical sequences of interbedded granular and cohesive materials, with local expansive clays. Bedding attitudes derived from surficial mapping indicate moderately dipping strata (30° to 43° NE) striking north-northwest. Engineering properties can be variable depending on the degree of cementation and moisture content. While generally suitable as a cut slope or foundation material, localized lenses of expansive clay or weak siltstone may present



Source: U.S. Geological Survey Orcutt and Sisquoc Quadrangles, Dated 2021

Approximate Scale: 1"=4,000'

NOTE: THIS IS NOT A SURVEY OF THE PROPERTY

1 0,5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 40 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

N

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

LOCATION MAP

Job No.: 25-2195s-1	*Date:* 7/25/25

challenges during excavation or long-term performance of slopes. Shallow creep or surficial instability may occur under prolonged wet conditions or where slopes are over steepened.

6.1.2 Alluvium (Qa)

Quaternary alluvial deposits are mapped within the main drainage swale and toe of slope areas near the basin footprint. These Holocene age deposits typically consist of loose to medium-dense sandy silts, silty sands, and locally clayey layers, derived from reworked Paso Robles sediments. Engineering behavior of the alluvium is variable, with moderate compressibility and low shear strength under saturated conditions.

6.1.3 Slopewash (Qsw)

Slopewash, or colluvium, is a heterogeneous deposit formed on slopes as a result of weathering, sheet wash, creep and shallow debris flows on sloping ground. This unit is generally thickest in swales and side canyons, and at the toe of existing natural slopes, where it commonly interfingers with the canyon alluvial deposits. The slopewash generally consists of poorly sorted, pebbly silty sand, but varies depending on the composition of the underlying source material. The maximum thickness of slopewash encountered in our exploratory excavations is about 2 to 3 feet. Slopewash is noted on the geologic logs but is not shown on the Preliminary Geotechnical Map (**Plate II**).

6.2 Groundwater

The proposed storage basin lies within the Santa Maria River Valley Groundwater Basin, a regionally significant aquifer system underlying much of the Santa Maria–Orcutt area. Although perched water may occur locally in alluvial drainage pathways, available regional data indicate that groundwater levels are generally deep throughout the basin. Per the Orcutt Community Plan, the regional groundwater table is considered to be very deep. The closest known active well is located approximately 0.43-mile northwest of the storage basin. The well record indicates that the last reading that measured a water level was conducted on 7/19/1967 with a measured groundwater depth of 521.80 feet (elev. 83.2') and the highest measured groundwater depth of 483 feet (elev. 122') was recorded on 5/29/1958. Hollow-stem-auger Boring HS-5 (Elev. 738') located 1,300 feet south of the debris basin was drilled to a depth of 70 feet (Elev. 668') and no groundwater was observed in the boring.

7.0 SEISMIC CONSIDERATIONS

7.1 Introduction

The proposed storage basin is within the Coast Ranges Geomorphic Province of California. The Coast Ranges consist of northwest-trending mountain ranges and valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. The Solomon and Casmalia Hills form the southern edge of Santa Maria Valley. The Solomon Hills were formed by compressional forces uplifting the basement rocks, ultimately causing west-northwest trending folds and thrust faults. The Casmalia fault, also referred to as the Orcutt Frontal fault, is inferred to extend along the northeast flank of the Solomon Hills. Other faults near the basin are the Los Alamos, San Luis Range, Lion's Head, and West Huasna strike-slip and reverse/thrust faults.

The California region is traversed by the San Andreas Fault, which is a transform boundary between the Pacific Plate and the North American Plate. The San Andreas Fault is part of the San Andreas system of northwest-striking, right-lateral faults. The faults of this system are generally historically active, as evidenced by the June 28, 1992 Landers (M7.6).

The California region is seismically active and commonly experiences strong ground shaking resulting from earthquakes along active faults. Earthquakes along these faults are part of a continuous, naturally occurring process, which has contributed to the characteristic landscape of the region. Common geologic hazards associated with earthquakes are discussed below and include **Ground Rupture**, **Ground Motion**, and **Ground Failure**.

7.2 Ground Rupture

Earthquake faults in California that are defined as active may present a hazard of fault rupture. The California Department of Conservation, California Geologic Survey (CGS), Special Publication 42 defines an active fault as one which has had surface displacement within Holocene time (about the last 11,700 years). Review of the Earthquake Fault Zone Maps provided in the California Department of Conservation, Division of Mines and Geology, Special Publication 42 indicates that there are not any known active faults crossing the basin, per the criteria specified in the Alquist-Priolo Earthquake Fault Zoning Act.

The potential for ground rupture was further evaluated utilizing published maps. The California Geological Survey ("CGS") Fault Activity Map of California show the inferred trace of the Casmalia fault zone, which includes a trace northwest of the storage basin. The CGS indicates late Quaternary fault displacement (during the past 130,000 years) for the Casmalia.

7.2.1 Casmalia Fault (Orcutt Frontal)

The Casmalia fault (Orcutt Frontal) was originally identified in the subsurface from oil field data in the Solomon Hills, and inferred to extend along the northeast flank of the Casmalia Range and Solomon Hills. Based upon oil well data, this fault is interpreted to be a blind thrust fault concealed below the ground surface. This fault is believed to be responsible for the uplift of the Casmalia Range and Solomon Hills. The Orcutt and Mt. Solomon anticlines are part of a series of en-echelon northwest trending anticlines that define the Casmalia-Orcutt anticlinal trend. These anticlinal folds are typically asymmetrical in cross section, wherein the southern limbs are long and gently dipping and the northern limbs are moderately to steeply dipping, consistent with folding typically found in the upper plate of a blind thrust fault.

The Casmalia fault (Orcutt Frontal) is believed to be Late Quaternary in age by some authors and other authors believe that it is seismically active, with some attributing recent seismic events (i.e., the 1980 Point Sal M5.1Earthquake) to this fault system.

The fault is located north of the Mount Solomon anticlinal fold axes. Larger scale maps (1:24,000 scale map) indicate the concealed surface trace of the Casmalia fault is located north of the basin (Dibblee, 1989 and Sweetkind, et al., 2021). The Fault Activity Map of California (Jennings and Bryant, 2010) show the Casmalia Fault (Orcutt Frontal) extending further to the east and bending to the southeast in Solomon Canyon along the eastern property line of the Solomon Hills Project. Other maps (Jennings, 1987; Woodring, 1950 and Sweetkind, et al., 2021) show a fault near the same location in Solomon Canyon but do not show it connecting to the Casmalia fault (Orcutt Frontal) system. The Dibblee geologic maps (1989 and 1994) do not show a fault in Solomon Canyon.

There is a strong aerial photographic lineament east of Mount Solomon that is on trend with the eastern end of a Casmalia fault as mapped by Dibblee. Two backhoe trenches (GT-9 and GT-10) were excavated on either side of this strong aerial photographic lineament, east of Mt. Solomon to investigate the potential for faulting. The geologic structure encountered in the trenches was consistent across the lineament, suggesting that the lineament is likely due to lithologic conditions rather than faulting.

The inferred fault mapped in the vicinity of Solomon Canyon is believed to be a blind thrust. Therefore, ground rupture hazard on the fault is considered to be low to practically non-existent. This fault is not illustrated on the Preliminary Geologic Map because of its speculative and uncertain location.

7.3 Ground Motion

7.3.1 General

The proposed storage basin is located in California, which is in a geologically and seismically active region where large-magnitude, potentially destructive earthquakes are common. Therefore, it is reasonable to assume that moderate or large magnitude earthquakes along any of the numerous faults in the region are expected to produce strong ground shaking in the future.

The Casmalia fault, which has an inferred surface trace located about 0.3 mi northwest of the basin, is the closest known potentially seismically active fault. The active San Andreas fault is located about 43 mi northeast of the basin. Large earthquakes along these, or along any of the other numerous faults in the region, are expected to produce strong ground shaking in the future.

Although research on earthquakes during the last fifty years has greatly enhanced the level of understanding of earthquake faulting in California, the record is much too short to constrain behavior of all faults in Southern California and the attenuation characteristics of all areas relative to each future potential earthquake. Predicted accelerations should, therefore, be considered rough estimates rather than precise facts and ground motions from future earthquakes may exceed the predicted accelerations. Neither the Time, Location, nor Magnitude of an earthquake can be accurately predicted at this time.

7.3.2 Earthquake Magnitude

Earthquake magnitude is a quantitative measure of the strength of an earthquake or the strain energy released by it, as determined by seismographic or geologic observations. It does not vary with distance or the underlying earth material. This differs from intensity, which is a qualitative measure of the effects a given earthquake has on people, structures, loose objects, and the ground at a specific location. Intensity generally increases with increasing magnitude and in areas underlain by unconsolidated materials and decreases with distance from the epicenter.

The table below presents the distances to nearby significant faults located within about 25 miles radius of the basin. The site-to-source distances were obtained from the USGS fault parameters online database (based on 2008 National Seismic Hazard Maps). The maximum earthquake magnitudes (M) were calculated using the Ellsworth-B magnitude-area scaling relationship presented in Appendix E of the Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3).

Summary of Major Known Faults Within 25 Miles

Distance (Miles)	Fault Name	Dip Degrees	Dip Direction	Slip Sense	Magnitude
0.83	Casmalia (Orcutt Frontal)	75	SW	reverse	6.7
5.83	San Luis Range (So Margin)	45	N	thrust	7.2
7.03	Los Alamos-West Baseline	30	S	thrust	6.9
7.85	Lions Head	75	NE	reverse	6.8
19.42	Los Osos	45	SW	thrust	7.0
20.77	Hosgri	80	E	strike slip	7.3
23.48	Santa Ynez (West)	70	S	strike slip	7.0
23.48	Santa Ynez Connected	70		strike slip	7.4

7.4 Ground Failure

Ground Failure is a general term describing seismically induced secondary permanent ground deformation caused by strong ground motion. This includes liquefaction, lateral spreading, seismic settlement of poorly consolidated materials (dynamic densification), differential materials response, slope failures, sympathetic movement on weak bedding planes or non-causative faults, shattered ridge effects and ground lurching.

Potential secondary seismic hazards are described below. The potential for adverse impacts to the proposed basin from liquefaction and other secondary seismic effects is considered manageable for practical design purposes.

7.4.1 Potential for Liquefaction and Associated Ground Failure

Liquefaction occurs when saturated, cohesionless soils lose strength during strong ground shaking, leading to temporary fluid-like behavior. It typically affects young, loose sands or silts with a shallow groundwater table (generally <50 feet), particularly in low-lying areas such as alluvial plains and coastal basins. The storage basin is underlain primarily by alluvium (Qa), which are unconsolidated, granular units with low natural density. These geologic materials, in isolation, could be considered moderately susceptible to liquefaction. However, the likelihood of liquefaction is strongly reduced in this case by the depth to groundwater.

After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and storage basin improvement plans are prepared further study should be performed by a geotechnical consultant to evaluate seismically induced dry sand settlements and liquefaction potential beneath proposed storage basin.

7.4.2 Potential for Other Modes of Ground Failure

Earthquake-induced slope failures include activation and reactivation of landslides, rock falls, debris flows and surficial failures. The potential for earthquake-induced slope failures is considered low on the gentle canyon slopes. Most of the hillside areas directly adjacent to the storage basin are at slope gradients between 2.9:1 to 4.3:1 (h:v) and the proposed cut slopes are being designed as 2:1 (h:v) gradients and a maximum height of 45 feet. The potential for earthquake-induced slope failures to adversely impact the proposed development is considered low.

After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and the wet weather storage basin construction documents are prepared are prepared further study should be performed by a geotechnical consultant to evaluate slope stability.

8.0 POTENTIAL GEOLOGIC AND GEOTECHNCIAL HAZARDS

8.1 Proposed Cut-Slopes

The proposed cut-slopes shown on the attached Preliminary Geotechnical Map (**Plate II**) are designed at a gradient of 2:1 or shallower, (approx. 26.5º). The highest proposed cut-slope is approximately 45 feet tall. The cut-slopes are anticipated to expose the Paso Robles Formation dipping steeper than the slope face. These slopes are generally considered geologically grossly stable.

8.2 Proposed Fill Slopes

The proposed storage basin indicates that fill slopes are proposed at a 2:1 (h:v) gradient with a maximum proposed fill slope height of approximately 11.6 feet. The gross and surficial slope stability of fill slopes was performed for the Solomon Hills Specific Plan (AES, 2023). Generally, fill materials (i.e., derived from a reasonable combination of Qa, QTp), are anticipated to be grossly and surficially stable at a slope gradient of 2:1 (h:v).

8.3 Natural Slopes

Stability of natural slopes at the location of the storage basin are considered geologically grossly stable. Based on the observed advantageous bedding dip and slope gradients ranging from 2.9:1 to 4.3:1 (H:V).

8.4 Soil Compressibility and Hydro-consolidation

8.4.1 Hydro-Compression (Collapse)

Hydro-compression is volume reduction that occurs when unsaturated soil materials are inundated with water. Soil materials most prone to hydro-compression are sandy and silty

soils with dry density less than about 108 pcf and moisture content less than about 8 percent. Some alluvial samples with dry density and moisture content values in this range were observed in the alluvial canyons found within the Solomon Hills specific plan area. Hydro-compression (collapse) tests were performed on in-situ samples of alluvial deposits from these alluvial canyons. In general, compression of these specimens following inundation in water (at vertical pressures approximating the in-situ vertical pressure) was negligible and potential for additional settlement due to hydro-compression of these soils can be regarded to be low at this time. Given the lack of subsurface data with the proposed storage basin, after the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and storage basin improvement plans are prepared further studies should be performed by a geotechnical consultant to evaluate hydro-compressibility beneath proposed storage basin.

8.4.2 Compressibility of Alluvium

Settlement of alluvial soils could result from pressure applied to the soils by raising of grade and/or foundation loads. The settlement process depends on the variety of factors, including but not limited to, soil's permeability, water drainage paths, the thickness of fill placed, amount of vertical surcharge imposed, fluctuation in groundwater and pre-consolidation pressure, which is the maximum effective vertical overburden stress that a particular soil has sustained in the past. Further, cohesionless soils have higher permeability than cohesive soils that have small voids blocking the water movement. Therefore, settlement is more rapid in cohesionless soils versus cohesive soils.

The proposed storage basin is not anticipated to increase pressures on the underlying alluvial soil. However, the 11.6 ft tall fill berm at the north portion will increase pressures on the underlying alluvial soils. Primary settlement of alluvium that will be left in place is expected to take place rapidly after grade is raised. The settlement process depends on the variety of factors, including but not limited to, soil's permeability, water drainage paths, the thickness of fill placed, amount of vertical surcharge imposed, fluctuation in groundwater and pre-consolidation pressure, which is the maximum effective vertical overburden stress that a particular soil has sustained in the past. Further, cohesionless soils have higher permeability than cohesive soils that have small voids blocking the water movement. Therefore, settlement is more rapid in cohesionless soils versus cohesive soils.

After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and storage basin improvement plans are prepared. Further studies should be performed by a geotechnical consultant to evaluate compressibility beneath proposed storage basin fill berm.

8.5 Rippability

The bedrock competency is variable in the Paso Robles Formation (QTp). For preliminary planning purposes, grading operations are expected to be performed with the conventional equipment. Heavy single shank ripping will probably be required if massive conglomerate units are encountered. Excavation in the alluvium (Qa) is typically straightforward but may be more difficult in locally cemented or indurated intervals, where partial rippability may be required.

8.6 Oversize Material

Cobbles and small boulders could be present within the alluvium and the Paso Robles Formation in the grading footprint of the basin. This oversize material may present difficulties during cutting operations with some types of equipment. In addition, oversize material will require special handling during fill construction.

8.7 Expansion Potential

Although no expansion index testing was conducted within the debris basin footprint as part of this investigation, prior testing results were performed on the geologic units within the Solomon Hills Specific Plan area property suggest that expansive behavior may be present in some materials.

The Paso Robles Formation (QTp) is known to include clay-rich interbeds with potentially high expansion potential. These clays may exhibit significant swell and shrink behavior in response to moisture fluctuations, particularly when excavated and recompacted as fill. While granular portions of the formation are generally expected to have low expansion potential.

Alluvial deposits (Qa), which underlies the proposed storage basin may also include interbedded silts and clays as it is likely derived from reworked Paso Robles sediments. Expansion index testing performed on similar deposits elsewhere in the Solomon Hills area yielded very low values, suggesting that the fine-grained alluvium in this region is typically not expansive. However, variability in composition means that some localized zones could still contribute to differential movement under certain conditions.

Where expansive materials are present and incorporated into engineered fill or support for structures, typical construction practices should be employed to mitigate swell-related issues. These include increased slab thickness and reinforcement, moisture conditioning of fills, and proper drainage design to reduce seasonal moisture fluctuations. Depending on the final grading configuration and material usage, further testing may be warranted to evaluate the expansion potential of specific soils encountered during construction.

8.8 Potential Corrosivity of Soils

Soil is considered to be corrosive to concrete and/or steel if the measured resistivity is 1,000 ohm-cm or less, and/or if the sulfate concentration is 2,000 ppm (0.20%) or greater, and/or if the pH is 5.5 or less. Also, a soil with a chloride concentration greater than or equal to 500 ppm is considered deleterious to ferrous metals.

Soil resistivity, chloride content, soluble sulfate content, and pH were measured on alluvial soils and bedrock for the Solomon Hills Specific Plan. Results of this testing was used to assess the potential corrosive effects on concrete and metals. The results of this testing are summarized as follows:

- The measured resistivity values ranged from 1,329 to 13,751 ohm-cm (which classifies as mildly to corrosive to ferrous metals).
- Chloride content values ranged from 1 to 120 parts per million (ppm). Soils in this chloride content range have a negligible effect on concrete or ferrous metals.
- Sulfate content values ranged from 0.019 to non-detected. Soils in this sulfate content range have a negligible effect on concrete per ACI 318 (Table 4.3.1).
- Based on the pH value measured in the soil samples (6.4 to 8.15, with one sample at 5.2), measured acidity of the soils is low and not anticipated to increase soil corrosivity.

While these results indicate generally low corrosivity across much of the Solomon Hills project area, no laboratory corrosivity testing was performed on samples specifically collected from the Paso Robles Formation (QTp). As such, the corrosion potential of the in-situ soils at this location remains uncertain and should not be assumed to match results from adjacent formations.

After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and storage basin improvement plans are prepared further study should be performed by a geotechnical consultant to evaluate project-specific corrosivity testing to confirm corrosive potential for buried infrastructure and inform appropriate material selection and protective measures.

8.9 Soil Creep

Slope creep is an imperceptibly slow, progressive downward and outward movement of slope soils that can affect both the near-surface (surficial) soils and deep-seated (gross) soils. Slope softening is the result of increased moisture content as a result of rainfall and irrigation. As the soils approach saturation, an increase in the wet density and associated reduction in shear strength leads to slope deformation. For slope creep, cyclic wetting and

drying of the soils also causes a reduction in shear strength that yields permanent deformation of surficial soils under their own weight. The progressive outward and downward movement due to slope softening.

The Paso Robles Formation, observed on the ascending slopes adjacent to the proposed storage basin, is noted in the Seismic Safety Plan as a formation having potential soil creep susceptibility. Based on the slope gradients that range from 2.9:1 to 4.3:1 (H:V), the potential for slope creep is opined to be low.

9.0 PROJECT FEASIBILITY

The proposed Offsite Wet Weather Storage Basin is feasible from the geologic and geotechnical standpoint, and will be safe from geologic and geotechnical hazards provided that the geologic or geotechnical constraints outlined in this report along with appropriate building and grading codes are taken into account during the planning, design and construction phases of the project.

10.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations summarize the primary geologic and geotechnical issues that may impact the proposed wet weather storage basin.

1. The potential for primary ground rupture to occur on a fault on the site is considered to be **very low to non-existent**.
2. The alluvium is designated as a low problem rating relative to liquefaction with a no variation from the assigned rating within the Santa Barbara County Seismic Safety & Safety Element. Based on depth to groundwater the potential for liquefaction is considered to be **low**.
3. The potential for seismic settlement (dynamic densification) during future seismic events for the alluvium should be evaluated. If seismic settlements are determined to exceed acceptable tolerance for the fill berm removal and recompaction of the alluvial soils are standard project design features, which can minimize the total and differential settlements.
4. The ascending natural slopes are anticipated to be geologically grossly stable. The potential for earthquake-induced slope failures is considered to be **low** on the moderate gradient ascending natural slopes. As the improvement plans develops further, slopes should be evaluated at the design-level and during the grading by the geotechnical consultant, in order to design and implement suitable design features to further address potential risks associated with (possible) earthquake-induced slope failures.
5. The 2:1 (h:v) gradient cut-slopes and fill slope are anticipated to be surficially and grossly stable. These slopes should be evaluated at the design-level and during the grading by a geotechnical consultant.
6. The potential for the hydro-consolidation of the alluvial soils is considered **low**. Soil compressibility of the alluvial soil due to the increase pressure from the fill berm and the potential of hydro-consolidation should be evaluated at the design-level by a geotechnical

consultant. Standard design features like removal and recompaction of alluvial soils or placement of temporary fill stockpile surcharge may be implemented, if warranted.

7. Expansive soils may be present at the in the grading footprint of the Wet weather Storage Basin, but are not anticipated to be a design constraint. However, at the design level or construction stage standard design feature can be implemented for structures (e.g., pump station, etc.) to reduce the impact of expansive soils.

8. Soils on site may be corrosive to concrete and ferrous metals. Soil moisture, chemistry, and other physical characteristics all have important effects on corrosivity. Testing during development will indicate what special measures, such as cement type in concrete and corrosion protection for metallic pipes will be required for construction.

11.0 FUTURE GEOTECHNICAL STUDIES

After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and Offsite Wet Weather Storage Basin construction documents are prepared further study should be performed by a geotechnical consultant to evaluate the geologic and geotechnical conditions and provide standard design level recommendations for submitted to Santa Barbara County as required for review and approval.

12.0 LIMITATIONS

This report has been prepared by Allan E. Seward Engineering Geology, Inc. for the exclusive use of Solstra Communities California LLC and their contracted design consultants for the specific development discussed herein. This report should not be considered transferable. Prior to use by others, this firm must be notified, as additional work may be required to update this report.

Additional investigation will be required to prepare recommendations for subsequent phases of development. In the event that any modifications in the design or location of the proposed development are planned, a written review by this firm will be required.

The proposed development is located in California, a geologically and tectonically active region, where large magnitude, potentially destructive earthquakes are common. Therefore, ground motions from moderate or large magnitude earthquakes could affect the basin during the design life of the proposed structure(s).

In performing these professional services, this firm has used the degree of care and skill ordinarily exercised under similar circumstances by reputable geologists and geotechnical engineers practicing in this or similar localities. The data presented in this report are based on results of preliminary field testing. It should be recognized that subsurface conditions can vary

in time, and laterally, and with depth and that the conclusions and recommendations presented in this report are based on our observations and testing. Therefore, our **conclusions** and **recommendations** are **professional opinions** and are **not meant** to be a control of nature. We make no **warranty** of any kind, either **expressed** or **implied**.

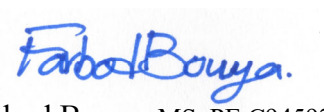
This page intentionally left blank.

This opportunity of be of service is appreciated. If you have any questions regarding this report, please contact us.

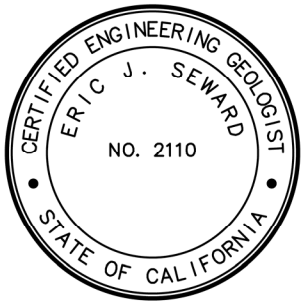
Respectfully submitted,



Eric J. Seward, CEG 2110
Principal Engineering Geologist
Vice President



Farbod Bouya, MS, PE C94592
Professional Engineer





The following attachments and appendices complete this report.

Location Map following page 4
References

APPENDIX A – Subsurface Logs

- Geologic Test Pits GT-25 & GT-26
- Geotechnical Test Pit ST-24
- Hollow Stem Auger Boring HS-5 & Key to Symbols

APPENDIX B

Regional Geologic Map **Plate I**
Preliminary Geotechnical Map **Plate II**

REFERENCES

Allan E. Seward Engineering Geology, Inc., 2023, *Geotechnical Report, Solomon Hills General Plan Amendments and Specific Plan, Portions of Assessor's Parcel Numbers 101-020-085, -086 & -087, Santa Barbara County, California*, prepared for Solstra Communities California, LLC, Job No. 23-2195s-1, dated October 20, 2023

Published

American Society of Civil Engineers, 2016, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-16), provisions and commentary.

American Society of Civil Engineers, 2021, Supplement No. 2 to the ASCE/SEI 7-16, October 14.

American Society of Civil Engineers, 2021, Supplement No. 3 to the ASCE/SEI 7-16, November 5.

ASTM International, Annual Book of ASTM Standards, 2023, Section 4 Construction, Volumes 04.08 and 04.09.

California Building Standards Commission, 2022, California Building Code (CBC): California Code of Regulations, Title 24, Part 2, Volumes 1 and 2

California Department of Conservation, California Geological Survey (CGS), 2018, Earthquake Fault Zones, A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California, Special Publication 42, 83 p.

California Department of Conservation, California Geological Survey, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A.

California Department of Conservation, California Geological Survey, 2018, Earthquake Zones of Required Investigation web application, https://maps.conservation.ca.gov/cgs/EQZApp/

California Department of Conservation, California Geological Survey, 2015, Fault Activity Map of California web application, https://maps.conservation.ca.gov/cgs/fam/.

CDCDMG, 1997, Guidelines for evaluating and mitigating seismic hazards in California: California Department of Conservation Division of Mines and Geology Special Publication 117.

Dibblee, T.W., Jr., 1994, Geologic Map of the Sisquoc Quadrangle, Santa Barbara County, California: Dibblee Geological Foundation Map DF-53, scale 1:24,000.

Dibblee, T.W., Jr., 1989, Geologic Map of the Casmalia and Orcutt Quadrangle, Santa Barbara County, California: Dibblee Geological Foundation Map DF-24, scale 1:24,000.

Hart, E.W., 1999, Fault-rupture hazard zones in California: California Division of Mines and Geology Special Publication 42, 24 p.

Jennings, C.W., and Bryant, W.A., 2010, Fault activity map of California: California Geological Survey, Geologic Data Map No. 6, map scale 1:750,000.

Jennings, C.W., Gutierrez, C., Bryant, W., Saucedo, G., and Wills, C., 2010, Geologic Map California: California Geological Survey, Geologic Data Map GDM-2.2010, 1 sheet, scale 1:750,000.

McGregor, I.S., and Onderdonk, N.W., 2021. Late Pleistocene rates of rock uplift and faulting at the boundary between the southern Coast Ranges and the western Transverse Ranges in California from reconstruction and luminescence dating of the Orcutt Formation. Geosphere, v. 17, no. 3, p. 932–956.

Seismic Safety & Safety Element, 2023, Santa Barbara County Comprehensive Plan.

Sweetkind, D.S., Langenheim, V.E., McDougall-Reid, K., Sorlien, C.C., Demas, S.C., Tennyson, M.E., and Johnson, S.Y., 2021, Geologic and geophysical maps of the Santa Maria and part of the Point Conception 30'×60' quadrangles, California: U.S. Geological Survey Scientific Investigation map 3472, 1 sheet, scale 1:100,000, 58-p pamphlet.

REFERENCES

Sylvester, A.G., and Darrow, A.C., 1978, Structure and Neotectonics of the Western Santa Ynez fault system in southern California: Tectonophysics 52 (1979) 389-405.

University of Southern California (USC), Southern California Earthquake Center (SCEC), Workshop on "Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California", USC, Los Angeles, California, June 17, 1999.

U.S. Geological Survey, United States Seismic Design Maps web application, http://earthquake.usgs.gov/designmaps/us/application.php

U.S. Geological Survey, Quaternary Faults and Folds in the U.S., Google Earth .kmz file, https://www.usgs.gov/natural-hazards/earthquake-hazards/google-earth-kml-files

U.S. Geological Survey, 2008 National Seismic Hazards Map – Source Parameters, https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/query_main.cfm

U.S. Geological Survey, Groundwater for USA: Water Levels, https://nwis.waterdata.usgs.gov/nwis/gwlevels

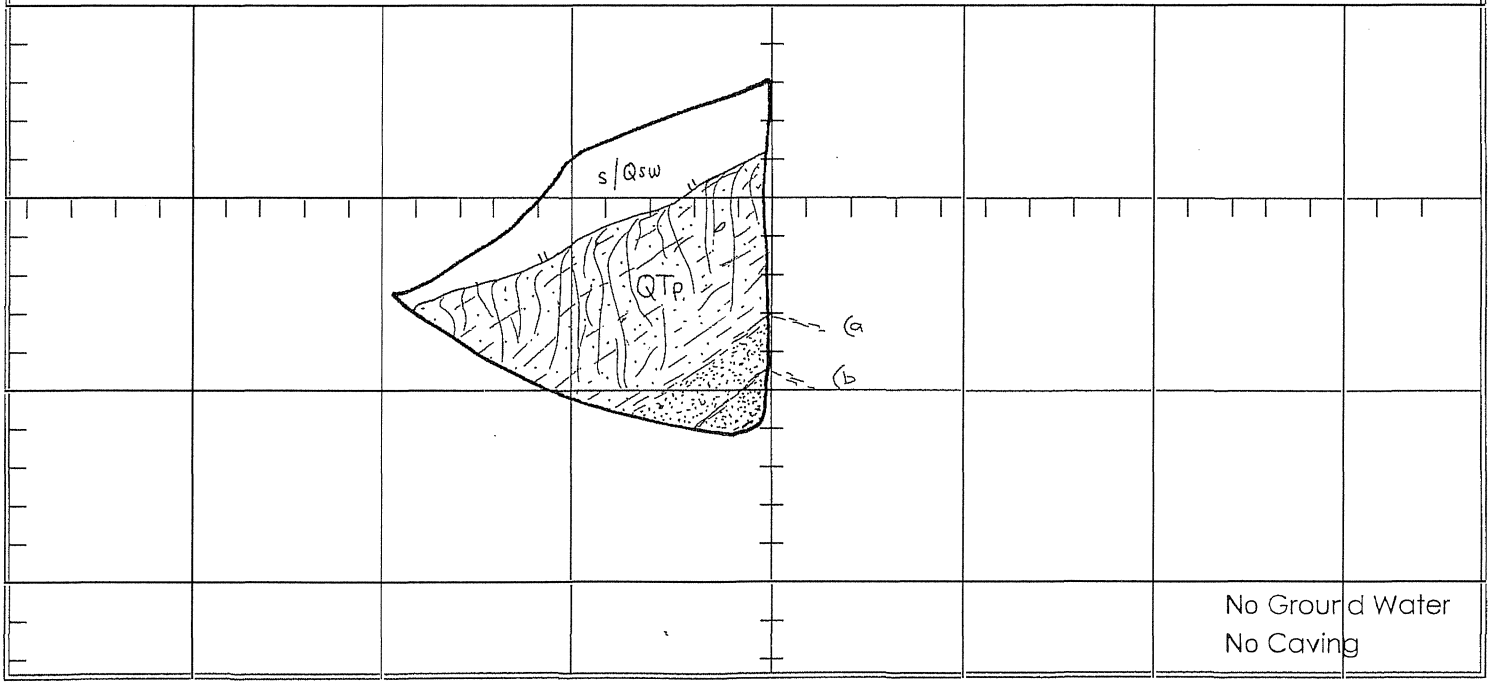
Woodring, W.P., and Bramlette, M.N., 1950, Geology and Paleontology of the Santa Maria District California: Geological Survey Professional Paper 222, 6 sheets scale 1:24,000, 185

Appendix A

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-25**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/13/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Dark-brown to black, sandy, silty clay; soft; damp to moist **BEDROCK; QTp (2 - 9')** @ 2' Light grayish-brown, sandy siltstone and silty sandstone with clayey siltstone interbeds (1-3"); moderately hard; dry to damp	a) B?: N43W, 36NE b) B: N51W, 38NE			
5									
10					COMMENTS: Highly weathered to 6' Excavated in old roadside cut From 2-6' caliche bends parallel to bedding and creep effected Queried bedding attitude may be slide plane at base of creep-affected zone				
15									
20									

TOTAL DEPTH: 9 feet ←N52E SCALE: 1 inch = 5 feet

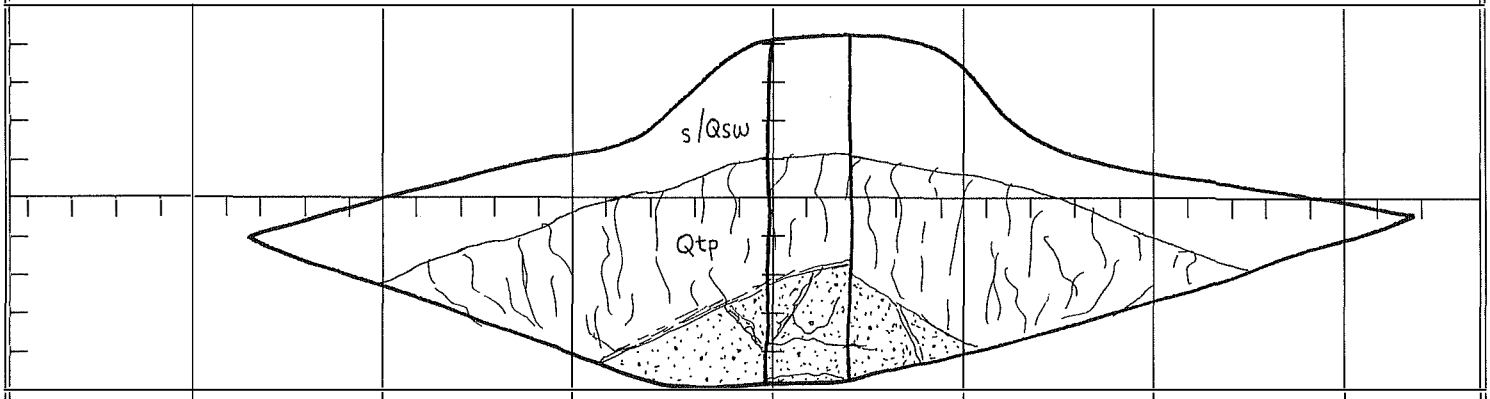


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-26**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/13/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Dark grayish-brown, sandy clay; soft; damp to moist				
5					**BEDROCK?; QTp (3 - 9')** @ 3' Light yellowish-brown and light grayish-tan, silty sandstone and clayey siltstone; moderately hard; dry to damp	a) MF: N70E, 78SE b) B: N62W, 43NE			
10					COMMENTS: Highly weathered to 6' Possible slide-affected QTp F: 1/4-1/2" reddish-brown to olive-gray gouge; offset not determined				
15									
20									

TOTAL DEPTH: 9 feet ←N60E→ SCALE: 1 inch = 5 feet



No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. ST-24**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: KPC	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: Rubber tire backhoe w/24" bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0				SM	**ALLUVIUM; Qa (0 - 14.5')** @ 0' Silty SAND; loose; damp; grayish to medium brown; roots; voids @ 0-7' Bulk sample @ 1' -medium dense to dense; no voids; rootlets				
				SP-SM	@ 3.5' 3"-thick interbed of poorly graded SAND with silt and gravel; medium dense; moist; grayish brown				
5				SM	@ 4' Silty SAND; medium dense; moist; dark grayish brown				
					@ 7.5' -yellowish brown				
10									
15					@ 14.5' Bulk sample COMMENTS: Surface logged below 7'				
20									

TOTAL DEPTH: 14.5 feet

SCALE: 1 inch = 5 feet

No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/7/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-5	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 738'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; Qa (0 - 5')**				
5	■	9		SC	**ALLUVIUM; Qa (5 - 70')** @ 5' Clayey SAND; loose; damp; medium to dark brown; voids	14.7	105		
10	◪	6			@ 10' -yellowish brown				
15	■	18		CL-ML	@ 15' Sandy, silty CLAY; stiff; damp; yellowish to orangish brown	14.2	104	63	
20	◪	4		SM	@ 20' Silty SAND; loose; damp; yellowish brown				
25	■	19			@ 25' -medium dense	6.5	104		
30	◪	7		SC-SM	@ 30' Silty, clayey SAND; loose; damp; yellowish brown			48	
35	■	22		SM	@ 35' Silty SAND; medium dense; damp; pale yellowish brown	7.8	98		Swell/Consol

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/7/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-5	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 738'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40		8			@ 40' -loose; 3" thick, medium brown, sandy lean clay interbed; firm; damp				
45		15		ML	@ 45' Sandy SILT; firm to stiff; damp; pale yellowish brown	8.2	97	53	
50		9		CL	@ 50' -light grayish brown @ 50.5' Lean CLAY; stiff; damp; pale yellowish to orangish brown				
55		39		SC-SM	@ 55' Silty, clayey SAND; medium dense; damp; pale yellowish to orangish brown	13.5	99		Swell/Consol
60		22		SM	@ 60' Silty SAND; medium dense; damp; pale yellowish brown				
65		28		CL	@ 65' Sandy lean CLAY; very stiff; damp; orangish to pale yellowish brown	16.3	102		
70		13			@ 70' -stiff				
					TOTAL DEPTH 70' No Ground Water				
75									

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS: GRAPH	SYMBOLS: LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS: MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS: MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE SIZE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	Well-graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	Silty gravels, gravel-sand-silt mixtures
				GC	Clayey gravels, gravel-sand-clay mixtures
	SAND AND SANDY SOILS: MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE SIZE	CLEAN SANDS (LITTLE OR NO FINES)		SW	Well-graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
FINE GRAINED SOILS: MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	Inorganic silts and very fine sands, clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
				OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	Inorganic silts, micaceous or diatomaceous fine, sandy or silty soils, elastic silts
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS				PT	Peat and other highly organic soils

Notes:
(1) Dual USCS symbols, such as SP-SM, denote 5 to 12% of minor constituent.
(2) Dual USCS symbols, such as SM/ML, denote borderline soil classifications.
(3) Subsurface information from boring and test pit logs depict conditions only at the specific locations. and dates indicated. Soil conditions and water levels at other locations may differ from conditions at these locations. Also, the conditions at these locations may change with time.
(4) Blow counts on logs are the number of blows to drive the sampler with the weight and drop height indicated on each log.
(5) Split-barrel sampler driving record applies only to hollow-stem-auger and rotary-wash borings.
(6) These logs are subject to the limitations, conclusions, and recommendations in this report.

HS: Hollow-stem-auger boring
RW: Rotary-wash boring
B: Bucket-auger boring

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586 Test Method
- CALIFORNIA DRIVE — Split-barrel sampler in accordance with ASTM D-3550 Test Method
- DISTURBED CALIFORNIA DRIVE
- SHELBY TUBE — Thin-walled sampler in accordance with ASTM D-1587 Test Method
- BULK SAMPLE
- NO RECOVERY

GROUND WATER DATA

- GROUND WATER WHILE DRILLING
- GROUND WATER AFTER DRILLING

DENSITY OF GRANULAR SOILS	
DESCRIPTION	SPT BLOWS PER FOOT
Very Loose	< 4
Loose	4 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

STRENGTH OF COHESIVE SOILS	
CONSISTENCY	SPT BLOWS PER FOOT
Very Soft	< 2
Soft	2 - 4
Firm	5 - 8
Stiff	9 - 15
Very Stiff	16 - 30
Hard	> 30

SPLIT-BARREL SAMPLER DRIVING RECORD	
BLOW COUNT	DESCRIPTION
25	25 blows drove the sampler 12 inches, after initial 6 inches of seating
50/7"	50 blows drove the sampler 7 inches, after initial 6 inches of seating
Ref/3"	50 blows drove the sampler 3 inches during initial 6-inch seating interval

LABORATORY TESTING ABBREVIATIONS

Plasticity Index	PI	Compaction Curve	Curve=A
Liquid Limit	LL	Consolidation / Collapse	Consol
Hydrometer	%-5 micron	Direct Shear / Reshear / Remold	Shear Test
Expansion Index	EI		
Corrosivity Analysis	Cor		

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

USCS Soil Classification and Key to Boring Log Symbols

Appendix B

Wet Weather Storage Basin

Solomon Hills Specific Plan Area

0 2,000' 4,000'

Approximate Scale

Source: Geologic Map of the Casmalia and Orcutt Quadrangles, Santa Barbara County, California, by Thomas W. Dibblee, JR. 1989, Dibblee Foundation Map DF-24 and Geologic Map of the Sisquoc Quadrangle, Santa Barbara County, California, by Thomas W. Dibblee, JR. 1994, Dibblee Foundation Map DF-53.

LEGEND

QUATERNARY

Holocene

Qa / Qds / Qg / Qa — Qls

SURFICIAL SEDIMENTS
- **Qs** *beach sand deposits*
- **Qds** *dune sand deposits*
- **Qa** *valley and floodplain alluvial deposits*
- **Qls** *landslide debris*

Pleistocene

Qos / Qoa / Qo

OLDER DISSECTED SURFICIAL SEDIMENTS
- **Qos** *dune sand deposits, in places weakly consolidated*
- **Qoa** *remnants of weakly consolidated stream terrace and alluvial fan deposits of silt, sand and gravel*
- **Qo** *Orcutt Sand: tan to rusty brown, poorly consolidated to locally indurated, wind-deposited sand; pebble gravel at base locally*

UNCONFORMITY

Pliocene

QTp

PASO ROBLES FORMATION
nonmarine; latest Pliocene to early Pleistocene age
- **QTp** *weakly consolidated, light greenish-gray to reddish alluvial sediments; conglomerate composed largely of Monterey Shale pebbles*

Tca / Tcag / Tcac

CAREAGA SAND
shallow marine regressive; late Pliocene age
- **Tca** *undivided; weakly indurated, massive, grayish-yellow, locally pebbly sand*
- **Tcag** *Graciosa Member: thick bedded, grayish-yellow, locally pebbly, weakly indurated sand; fossiliferous calcareous reef at base*
- **Tcac** *Cebada Member: massive tan-yellow, weakly indurated, fine-grained sand; locally includes* **Tcat**, *basal tar-soaked sand*

Tf

FOXEN MUDSTONE
marine; middle to late Pliocene age
- **Tf** *light gray massive claystone and siltstone*

Tsqd / Tsqo / Tsq

SISQUOC FORMATION
marine; late Miocene age
- **Tsqd** *white to cream-white, punky, diatomaceous claystone and clayey diatomite*
- **Tsqo** *same as Tsqd, but oil-saturated and partly burned locally to frothy stone*
- **Tsq** *(Tudos Santos Claystone Member of Woodring and Bramlette, 1950): light gray claystone and slightly diatomaceous or siliceous clay shale*

SYMBOLS

not all symbols present on each map

FORMATION CONTACT — *dashed where inferred or indefinite*

MEMBER CONTACT

CONTACT BETWEEN SURFICIAL SEDIMENTS — *located approximately in places*

U / D — 70 — FAULT

dashed where indefinite or inferred, dotted where concealed, queried where existence doubtful. Parallel arrows indicate inferred relative lateral movement. Relative vertical movement shown by U/D (U = upthrown side D = downthrown side). Short arrow indicates dip of fault plane.

ANTICLINE — *arrow on axis indicates direction of plunge, dotted where concealed*

SYNCLINE

horizontal; 25 inclined; 20 inclined (approximate); vertical; 25 overturned; 25 inclined metamorphic foliation

STRIKE AND DIP OF BEDDED ROCKS

DIRECTION OF LANDSLIDE MOVEMENT

SANDSTONE BED

CONGLOMERATE BED

ABANDONED EXPLORATORY OIL WELL

OIL WELL LOCATIONS INDICATED ON TOPOGRAPHIC BASE MAP.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

REGIONAL GEOLOGIC MAP

Date: 7/25/25	*Job No.:* 25-2195s-1
Scale: As Shown	*CAD File:* Regional Geologic Map Dibblee
Plate I	*Geology by:* Staff; *Drawn by:* CHS; *Revised:*

LEGEND

Qa	Quaternary Alluvium
QTp	Paso Robles Formation
Tcag	Careaga Sand Formation - Graciosa member
HS-5	Hollow-stem-auger boring
ST-24	Geotechnical test pit
GT-26	Geologic test pit
48°	Strike and dip of bedding
15° (D)	Strike and dip of bedding (per Dibblee map)
78°	Fault Attitude
	Geologic contact; dotted where concealed

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Preliminary Geotechnical Map

DATE: 7/25/25	JOB No.: 25-2195s-I
SCALE: 1" = 80'	FILE: AES 25.07.25 GEOTECHNICAL MAP - NEWLOVE PARK - DEBRIS BASIN
PLATE II	GEOLOGY BY: CHS
	DRAWN BY: EV
	REVISED:

Tcag

QTp

(QTp)

QTp

QTp

Qa

Qa

40° (D)

30° (D)

38°

GT-25

35° (D)

ST-24

HS-5

78°

43°

GT-26

37° (D)

SHEET C2

MIDDLE IRRIGATION BLOCK (9.8 AC)

WEST IRRIGATION BLOCK (9.5 AC)

6" BURIED IRRIGATION MAIN

6" BURIED IRRIGATION MAIN

EAST IRRIGATION BLOCK (5.3 AC)

SHEET C5

EXISTING PROPERTY LINE

PUBLIC ACCESS EASEMENT IN FAVOR OF LAGUNA COUNTY SANITATION DISTRICT

SHEET C4

RECYCLED WATER PUMP STATION

EFFLUENT STORAGE BASIN No. 3
(42.2 AC-FT)

SPRAY FIELD PUMP STATION: 8' DIA 20' DEPTH

EXISTING PROPERTY LINE

EXISTING PROPERTY LINE

PUBLIC ACCESS EASEMENT IN FAVOR OF LAGUNA COUNTY SANITATION DISTRICT

US HWY 101 N

US HWY 101 S

NOTE:
SEE BASIN DESCRIPTION AND "POTENTIAL SPRAY FIELD IRRIGATION LAYOUT" BY WALLACE GROUP FOR EFFLUENT STORAGE DETAIL.

0 80 160 240 feet
1"= 80'

N:\2200\2298-03-C\23-Solomon-Hills-Specific-Plan\Engineering\TM\Sheet-Files\CUP_Basin\C3_Site Plan.dwg, C3, Jan 29, 2025 3:25pm, kmatsumoto

rrm

solomon hills

JANUARY 31, 2025

WET WEATHER STORAGE BASIN C.U.P.
OVERALL SITE PLAN

C3

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

GEOTECHNICAL REPORT

Solomon Hills Development Water Supply Pipeline
Santa Barbara County, California

Exclusively Prepared For:

Solstra Communities California, LLC
1130 East Clark Avenue, Suite 150 #286
Orcutt, CA 93455

July 24, 2025
Job No.: 25-2195s-7

TABLE OF CONTENTS

1.0 SCOPE OF WORK 1
2.0 PROJECT DESCRIPTION 2
3.0 GEOLOGIC SETTING 2
4.0 GEOLOGIC AND GEOTECHNICAL CONDITIONS 3
4.1 Geologic Units 3
4.2 Bedrock 3
4.2.1 Sisquoc Formation (Tsq) 3
4.2.2 Careaga Sand Formation (Tcac and Tcag) 4
4.2.3 Paso Robles Formation (QTp) 5
4.3 Surficial Deposits 5
4.3.1 Orcutt Sand (Qo) 5
4.3.2 Old Dune Sands (Qos) 6
4.3.3 Alluvium (Qa) 7
4.4 Geologic Overview of the Waterline Alignment 7
4.5 Groundwater 9
5.0 SEISMIC CONSIDERATIONS 10
5.1 Introduction 10
5.2 Ground Rupture 10
5.2.1 Casmalia Fault (Orcutt Frontal) 11
5.3 Ground Motion 12
5.3.1 General 12
5.3.2 Earthquake Magnitude 12
5.4 Ground Failure 13
5.4.1 Potential for Liquefaction and Associated Ground Failure 13
5.4.2 Potential for Other Modes of Ground Failure 14
6.0 POTENTIAL GEOLOGIC AND GEOTECHNICAL HAZARDS 14
6.1 Natural Slopes 14
6.2 Soil Compressibility and Hydro-consolidation 14
6.2.1 Hydro-Compression (Collapse) 14
6.2.2 Compressibility of Alluvium 15
6.3 Landslides 15
6.4 Expansion Potential 17
6.5 Potential Corrosivity of Soils 18
6.6 Soil Creep 18
6.7 Subsidence 19
7.0 CONCLUSIONS AND RECOMMENDATIONS 20
8.0 LIMITATIONS 21

TABLE OF CONTENTS

The following attachments complete this report.

Location Map following page 2
References
Geologic Overview Map **Plate I**

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

July 24, 2025 Job No.: 25-2195s-7

Solstra Communities California, LLC
1130 East Clark Avenue, Suite 150 #286
Orcutt, CA 93455

Attention: Mr. Peter Kiesecker

Subject: **GEOTECHNICAL REPORT**
Solomon Hills Development Water Supply Pipeline
Santa Barbara County, California

Dear Mr. Kiesecker:

This report has been prepared to present our professional opinions regarding the existing geologic and geotechnical conditions along the proposed ~10.2-mile-long Water Supply Pipeline alignment from Santa Maria to the Solomon Hills Development. The objective of this assessment is to characterize the geologic setting along the alignment, including the identification of surficial and bedrock units, major structural features, and potential geologic and seismic hazards such as liquefaction, faulting, and slope instability. The information provided is intended to support environmental review and future project planning by offering a baseline understanding of geologic conditions along the proposed water supply pipeline alignment.

1.0 SCOPE OF WORK

The scope of work for this investigation included the following tasks:

1. Review of the Solomon Hills Development Water Supply Pipeline plan consisting of 23 sheets prepared by Wallace Group, dated 7/3/25.
2. Review of published geologic maps and reports relevant to the Solomon Hills Development Water Supply Pipeline alignment.
3. Review of General Plan documents for the City of Orcutt.
4. Reviewed the Santa Barbara County Seismic and Safety Element for regional hazard context.
5. Preparation of a Location Map.

6. Preparation of a Geologic Overview Map (**Plate I**) illustrating the alignment of the proposed Water Supply Pipeline. This map is based on the Dibblee geologic maps for the Santa Maria and Twitchell Dam quadrangle, and Camalia and Orcutt quadrangle.
7. Preparation of this geologic assessment report to document geologic conditions and potential hazards along the alignment.

This report is based on published geologic mapping, available well and seismic hazard data, and desktop review of the project area. No field reconnaissance, subsurface exploration, or laboratory testing was conducted in support of this assessment, except where the alignment is within the Solomon Hills Specific Plan area.

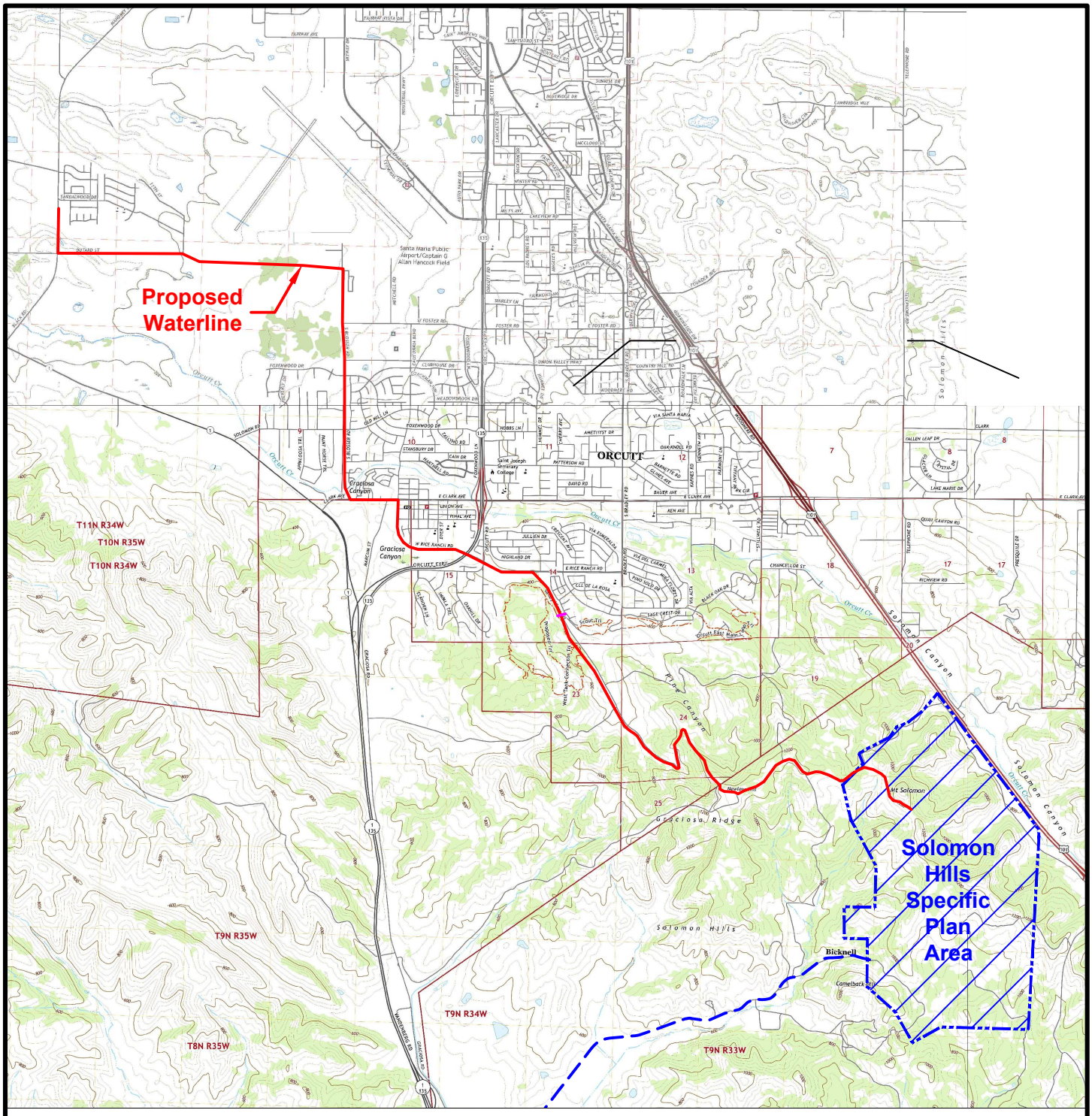
2.0 PROJECT DESCRIPTION

The proposed 10.2-mile Solomon Hills Water Supply Pipeline is a 16-inch diameter ductile iron pipe with two Booster Pump Stations. The proposed alignment begins at Black Road in the Santa Maria Valley and extends east and south to the Solomon Hills, terminating at a proposed tank site within the Solomon Hills Development (see **Location Map** following page 2). The alignment generally follows existing roadways, including Black Road, Dutard Street, S. Blosser Road, W. Clark Avenue, S. Broadway Street, Rice Ranch Road, and Orcutt Hill Road with an extension southeast from the PCEC facility to the Solomon Hills Development proposed water tank site. At the southern portion of the alignment Blosser Road north of the intersection with Clark Avenue horizontal directional drilling is proposed for construction of the waterline beneath a stormwater drainage culvert.

The waterline alignment transitions from relatively flat, low-lying terrain in the northwest to moderately steep, structurally uplifted hills in the southeast. Elevations range from approximately 200 feet above sea level near Black Road to 1,200 feet at proposed Water Tank site. Vegetation is sparse in developed areas and denser in the eastern hills, where land use includes rangeland, oil field infrastructure, and open space. The alignment traverses both unincorporated Santa Barbara County and portions of the Orcutt community.

3.0 GEOLOGIC SETTING

The proposed waterline alignment is located along the structurally complex southwestern margin of the Santa Maria Basin, where late Cenozoic marine and nonmarine sedimentary units have been deformed by compressional tectonics associated with the western Transverse Ranges (Dibblee, 1989; Sweetkind et al., 2021). Regional geologic structures reflect long-term crustal shortening and uplift, particularly along the southern boundary of the basin in the vicinity of the Solomon and Casmalia Hills.



LEGEND

Base Map Source: U.S. Geological Survey Orcutt and Sisquoc Quadrangles, Dated 2021

Approximate Scale: 1"=5500'

NOTE: THIS IS NOT A SURVEY OF THE PROPERTY

1 0,5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 40 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

N

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

LOCATION MAP

Job No.: 25-2195s-7 | *Date:* 7/24/25

The alignment crosses a diverse assemblage of sedimentary rocks and surficial deposits ranging in age from late Miocene to Holocene. These include marine mudstones of the Sisquoc Formation, fossiliferous sandstones and conglomerates of the Careaga Sand Formation, nonmarine fluvial and alluvial sediments of the Paso Robles Formation, and widespread dune sand and alluvium of Quaternary age (see **Geologic Overview Map**, Plate I). These units are exposed in a west-to-east progression along the alignment, reflecting increasing consolidation, stratification, and structural complexity toward the eastern Solomon Hills.

The most prominent structural feature in the area is the Casmalia fault zone, a south-dipping reverse fault with an inferred trace at the base of the Casmalia Hills. The fault trace is not exposed at the surface and lies beneath recent surficial deposits. This fault forms a major tectonic boundary between the uplifted southern margin of the basin and the downwarped Santa Maria Valley. Fault activity has resulted in the formation of the Solomon Hills Anticline, a broad east-west–trending fold that defines the elevated terrain of the Solomon Hills. This anticline has uplifted and tilted underlying sedimentary strata, exposing older geologic units at the surface and contributing to localized slope instability in some areas.

4.0 GEOLOGIC AND GEOTECHNICAL CONDITIONS

4.1 Geologic Units

Based on published geologic mapping (Dibblee, 1989 & 1994; Sweetkind et al., 2021; and McGregor and Onderdonk, 2021) the proposed waterline alignment crosses a sequence of sedimentary units ranging in age from Holocene to late Miocene. These include unconsolidated dune sands and alluvium in the western Santa Maria Valley, as well as increasingly consolidated fluvial and marine units exposed in the eastern Solomon Hills. The following descriptions summarize the physical characteristics and general engineering considerations of each unit encountered along the alignment.

4.2 Bedrock

Bedrock units shown on the Geologic Map (**Plate I**) are discussed from oldest to youngest below.

4.2.1 Sisquoc Formation (Tsq)

The Sisquoc Formation is a fine-grained marine unit of late Miocene age, composed predominantly of diatomaceous mudstone, siliceous shale, and subordinate claystone. It was deposited in deep-water environments and typically exhibits low dry density, high porosity, and a fragile fabric due to its high diatomite content. In its weathered state, the formation becomes highly plastic, with low shear strength, poor compaction characteristics, and a strong tendency to swell or break down when exposed to moisture.

Structurally, the unit is often intensely fractured or sheared, especially near fault zones or fold limbs, and has been widely associated with both shallow and deep-seated landslides in the Solomon Hills and surrounding areas. Bedding planes within the Sisquoc Formation are commonly inclined, and where these planes dip in the direction of slope, they may act as failure surfaces. The material's behavior is especially problematic for excavation and slope stability, as excavated spoils are difficult to compact and highly moisture-sensitive. The unit is generally unsuitable for reuse as fill without significant modification and should be treated with caution during any grading or slope work.

4.2.2 Careaga Sand Formation (Tcac and Tcag)

The Careaga Sand is a Pliocene age marine sandstone formation that is exposed extensively along the southeastern portion of the alignment. The unit is subdivided into the Graciosa Member (Tcag) and the underlying Cebada Member (Tcac), with the basal portion of the Cebada locally mapped as Tcat, a tar-impregnated subunit. These members reflect a transition from shallow marine depositional environments to deeper, more restricted conditions and exhibit contrasting physical properties and geotechnical behavior.

The Graciosa Member (Tcag) is composed of moderately to well-cemented, fossiliferous marine sandstone and conglomerate, typically light brown to gray in color. It is cross-bedded in places and often exhibits good drainage and slope stability. Excavation is generally manageable, but localized cementation, fossil-rich lenses, and minor induration may cause variability in hardness and rippability. The Graciosa Member is generally considered a competent foundation material and may be suitable for structural backfill where properly processed.

The Cebada Member (Tcac) is a finer-grained sandstone to sandy siltstone that tends to be more recessive, moisture-sensitive, and variable in cementation. It weathers more readily than the overlying Graciosa Member and is typically less suitable for reuse without conditioning. The unit can exhibit plasticity when wet and may have moderate shrink-swell behavior, particularly where clay content increases in transitional facies.

At the base of the Cebada Member, the Tcat subunit consists of sandstones and conglomerates that are impregnated with tar or asphaltic hydrocarbons, giving the unit a darker appearance and strong odor. These materials are often sticky, poorly compactable, and reduced in shear strength, with variable cohesion and high oil content. Tcat is generally unsuitable for reuse as engineered fill and may present environmental handling concerns during excavation or disposal. Its presence may also interfere with trenching equipment or cause adherence to excavation tools.

4.2.3 Paso Robles Formation (QTp)

The Paso Robles Formation is a Pleistocene-age nonmarine unit composed of interbedded conglomerate, sandstone, siltstone, and claystone, deposited in fluvial and alluvial environments. Along the waterline alignment, the formation is exposed primarily in the eastern Solomon Hills, where it overlies older marine units and transitions into more competent structural terrain.

The formation is lithologically heterogeneous, with abrupt lateral and vertical changes in grain size, sorting, and cementation. Coarser zones contain moderately well-consolidated sandy gravels and conglomerates that are relatively competent and drainable. However, these are interspersed with weaker layers of fine-grained siltstone and expansive clay, particularly near the base of the unit. One such regionally persistent clay horizon is known to act as a slip plane for landslides throughout northern Santa Barbara County and may serve as a zone of reduced shear strength under both static and seismic conditions.

In general, the engineering behavior of the Paso Robles Formation is highly variable. Coarser-grained facies can perform well in cut or fill applications, but finer facies are moisture-sensitive, compressible, and subject to volumetric change. These materials may require over-excavation or stabilization if encountered near finished subgrades or in trench backfill.

The formation has been implicated in multiple landslides within the Solomon Hills and other nearby uplands, particularly on slopes where bedding planes dip parallel to the surface or where fine-grained units are saturated. Weathered materials tend to be friable and may ravel easily from unshored trench walls. Accordingly, slope stability and excavation behavior within QTp must be assessed with respect to local bedding orientation, stratigraphic variability, and groundwater conditions.

4.3 Surficial Deposits

4.3.1 Orcutt Sand (Qo)

The Orcutt Sand (Qo) is a Pleistocene-aged marine deposit composed primarily of fine- to medium-grained, moderately consolidated sand, often exhibiting subtle bedding and occasional gravel lenses. It is exposed in isolated areas along the central portion of the waterline alignment, particularly near Rice Ranch Road, where it occurs beneath or adjacent to younger dune sands (Qos) and alluvium (Qa).

The Orcutt Sand is typically better consolidated and more competent than younger surficial units and generally drains well due to its granular texture. The degree of cementation is variable, with some exposures showing weak to moderate induration,

particularly in fossil-rich zones. Excavation is typically straightforward but may be more difficult in locally cemented or indurated intervals, where partial rippability may be required.

From an engineering perspective, the Orcutt Sand exhibits improved stability compared to younger dune sands (Qos) or alluvium (Qa) and may serve as a more reliable foundation material in areas where it is exposed or lies near the surface. However, zones of weak cohesion, loose texture, or moisture retention may still be present and should be evaluated on a case-specific basis. The unit generally shows low plasticity and is not associated with expansive behavior.

Subsurface investigations at the adjacent Rice Ranch development describe the Orcutt Sand as consisting of silty sands with approximately 20–35% non-plastic fines. The material was observed to be loose to medium dense near the surface and generally became dense to very dense with depth. Indurated layers within the unit were also associated with erosional features such as steep-sided gullies. These field observations align with regional expectations for the Orcutt Sand along the waterline alignment.

Overall, the Orcutt Sand provides a transitional material between unconsolidated surficial deposits and the more lithified sedimentary formations to the south. Its competent yet granular nature makes it a favorable unit in terms of trenching and backfill compatibility, provided localized variability in cementation and grain size is accounted for.

4.3.2 Old Dune Sands (Qos)

The old dune sands unit consists of well-sorted, fine- to medium-grained eolian sand deposited during the late Pleistocene to Holocene across coastal and near-coastal regions of Santa Barbara County. These dune sand deposits dominate the western portion of the waterline alignment, extending from Black Road through S. Blosser Road and portions of Rice Ranch Road.

Old dune sands materials are typically loose, dry, noncohesive, and low in natural density, exhibiting very poor shear strength and a tendency to ravel or collapse when disturbed. Vertical trench walls in these deposits are generally unstable without support, and excavation commonly requires shoring, sloping, or benching to maintain safe working conditions. The sands are generally non-plastic and free-draining, though localized perched water conditions may occur where the dune sand overlies finer-grained or cemented layers.

From a construction standpoint, old dune sands are easily excavated but presents challenges related to blowout, raveling, and over-excavation. The material is also highly

erodible, particularly under wind or runoff exposure, and may require dust control or surface stabilization during site work. If reused as backfill, dune sands typically require moisture conditioning and mechanical compaction to meet density requirements.

While old dune sands do not typically contain expansive clays or cemented horizons, its loose and cohesionless character can contribute to settlement under load and should be considered in any future assessment of subgrade or pipeline bedding performance

4.3.3 Alluvium (Qa)

The Holocene aged alluvium consists of unconsolidated to loosely consolidated silts, sands, gravels, and minor clay, typically deposited in modern drainages, floodplains, and low-lying swales. Along the waterline alignment, alluvium is encountered intermittently in shallow valleys and topographic depressions, particularly near W. Clark Avenue, Orcutt Hills Road, and localized drainage crossings.

These materials are generally poorly sorted and variable, both laterally and vertically. Sand and gravel zones may exhibit moderate drainage and be easily excavated, while silty or clayey layers are more compressible and prone to saturation. In near-surface conditions, alluvium often appears as soft, loose, and moisture-sensitive, and may exhibit poor bearing capacity and elevated settlement potential under imposed loads.

Alluvium deposits are also susceptible to seasonal groundwater fluctuation, especially near active or historically active drainages. Where saturated, they may pose a risk of trench instability, pipe flotation, or subgrade softening, and may require temporary dewatering during construction.

4.4 Geologic Overview of the Waterline Alignment

The proposed waterline alignment generally follows existing roadways as it extends south and eastward from Black Road in the Santa Maria Valley into the Solomon Hills region, terminating at a proposed tank site within the Solomon Hills Development. Over this distance, the alignment crosses a progression of geologic units ranging from unconsolidated dune sands to increasingly consolidated Pleistocene and Pliocene aged bedrock formations.

The alignment begins at Station 10+00.00 (Black Road) to approximately Station 290+00, covering Black Road, Dutard Street, S. Blosser Road, Clark Avenue, S Broadway Street, Rice Ranch Road. This portion of the waterline alignment lies entirely within the old dune sands (Qos) unit, consisting of late Pleistocene to Holocene dune sand deposits. These well-sorted, fine- to medium-grained sands are loose, dry, and noncohesive, resulting in low natural density and poor shear strength. The materials are easily excavated but highly susceptible to raveling and trench wall collapse without support. Along the southern portion

of Blosser Road and W. Clark Avenue, minor alluvial deposits (Qa) appear intermittently with the dune sands. These Holocene sediments are typically silty to sandy and may be moist or saturated near drainages, contributing to potential settlement or trench instability.

Beginning at Rice Ranch Road (Station ~290+00), the alignment starts to intersect more variable geologic units. From this point, the underlying materials include alluvium (Qa), and exposures of the Orcutt Sand (Qo). The Orcutt Sand is a moderately competent Pleistocene marine sand that is typically more consolidated than older dune sands (Qos), though localized weak or cemented zones may be present.

East of Station ~400+00, along Orcutt Hill Road, the alignment enters increasingly consolidated and structurally complex terrain. From Station ~400+00 to 440+00, the alignment intersects the Sisquoc Formation (Tsq), a soft, siliceous marine mudstone with low strength and poor compaction behavior. The Sisquoc Formation bedding dips moderately (mid-20 degrees) to the north just south of the inferred trace of the Casmalia fault with dips shallowing towards the Solomon Hills anticline. From Station ~440+00 to Sation 538+68.70, the corridor crosses the Careaga Sand Formation (Tcag/Tcac), the tar-impregnated basal unit (Tcat), and Paso Robles Formation (QTp). The Paso Robles Formation includes poorly sorted conglomerates, sandstones, and expansive clay-rich intervals. The overlying Careaga Sand is generally better sorted and more stable but include localized variability in cementation. The Tcat subunit, where present, may contain visible tar saturation, which can affect excavation and handling properties. These formation in this area in general have shallow bedding dips (12 degrees or less). Isolated alluvial deposits (Qa) may also be present in valley-bottom areas or shallow drainages. Table 1 summarizes the overview of the geological units along the proposed waterline alignment.

Table 1

ROAD	START STA.	END STA.	GEOLOGIC UNIT
Black Road	0+00.00′	24+07.37′	Old dune sand (Qos)
Dutard Street	24+07.37′	72+53.40′	Old dune sand (Qos)
n/a	72+53.40′	134+73.13′	Old dune sand (Qos)
S Blosser Road	134+73.13′	222+61.74′	Old dune sand (Qos), alluvium (Qa)
W Clark Ave	222+61.74′	240+79.57′	Old dune sand (Qos), alluvium (Qa)
S Broadway Street	240+79.57′	250+00.00′	Old dune sand (Qos)
Rice Ranch Road	250+00.00′	309+24.34′	Orcutt Sand (Qo), old dune sand (Qos), alluvium (Qa)
Orcutt Hill Road	309+24.34′	453+88.28′	Alluvium (Qa), Paso Robles (QTp), Careaga Sand (Tcag/Tcat), Sisquoc (Tsq)
PCEC to Tanks	453+88.28′	538+68.70′	Paso Robles (QTp), Careaga Sand (Tcag/Tcac)

4.5 Groundwater

The proposed waterline alignment lies within the Santa Maria River Valley Groundwater Basin, a regionally important aquifer system. Review of available groundwater monitoring wells along and near the alignment indicates that the regional groundwater table is generally deep, consistent with statements in the Orcutt Community Plan and published USGS records.

Most nearby monitoring wells did not have publicly available groundwater data. However, depth-to-groundwater records from wells adjacent to the project corridor range from approximately 91 feet to 229 feet below ground surface, with the shallowest values occurring in west-draining alluvial valleys. Well, 348680N1204560W001, located near Blosser Road and Clark Avenue, shows groundwater depths between 171.4 and 228.54 feet over the past 15 years (USGS NWIS, Well ID 348680N1204560W001).

Although regional groundwater is deep, perched groundwater may occur locally in alluvium or dune sand, especially above bedrock or finer-grained layers. In the nearby tract report (AES, 2023) area south of the alignment, perched water was observed in test pits and borings at depths as shallow as 9 to 15 feet in alluvial drainages. These shallow zones were interpreted as isolated perched conditions, not representative of the regional water table.

Groundwater conditions encountered in the nearby Rice Ranch development provide supporting regional context. Investigations there recorded groundwater depths ranging from approximately 18 to 35 feet below ground surface, with the potential for perched conditions near drainages and seasonal fluctuations up to one foot above observed depths (AES, 2014). These findings reinforce the presence of localized shallow groundwater in near-surface old dune sands (Qos) and alluvium (Qa) deposits while supporting the conclusion that regional groundwater remains deep, consistent with measurements at the USGS monitoring well near Blosser Road.

For this alignment, shallow groundwater is unlikely to be encountered during trenching, except possibly in low-lying alluvial areas after periods of extended rainfall. Where encountered, such saturation would likely represent perched or transient moisture, not a continuous saturated zone. After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and improvement plans are prepared further study would be needed to confirm seasonal high groundwater conditions in specific segments, particularly where alluvium overlies bedrock.

5.0 SEISMIC CONSIDERATIONS

5.1 Introduction

The subject Water Supply Line is within the Coast Ranges Geomorphic Province of California. The Coast Ranges consist of northwest-trending mountain ranges and valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. The Solomon and Casmalia Hills form the southern edge of Santa Maria Valley. The Solomon Hills were formed by compressional forces uplifting the basement rocks, ultimately causing west-northwest trending folds and thrust faults. The Casmalia fault, also referred to as the Orcutt Frontal fault, is inferred to extend along the northeast flank of the Solomon Hills. Other faults nearby are the Los Alamos, San Luis Range, Lion's Head, and West Huasna strike-slip and reverse/thrust faults.

The California region is traversed by the San Andreas Fault, which is a transform boundary between the Pacific Plate and the North American Plate. The San Andreas Fault is part of the San Andreas system of northwest-striking, right-lateral faults. The faults of this system are generally historically active, as evidenced by the June 28, 1992 Landers (M7.6).

The California region is seismically active and commonly experiences strong ground shaking resulting from earthquakes along active faults. Earthquakes along these faults are part of a continuous, naturally occurring process, which has contributed to the characteristic landscape of the region. Common geologic hazards associated with earthquakes are discussed below and include **Ground Rupture**, **Ground Motion**, and **Ground Failure**.

5.2 Ground Rupture

Earthquake faults in California that are defined as active may present a hazard of fault rupture. The California Department of Conservation, California Geologic Survey (CGS), Special Publication 42 defines an active fault as one which has had surface displacement within Holocene time (about the last 11,700 years). Review of the Earthquake Fault Zone Maps provided in the California Department of Conservation, Division of Mines and Geology, Special Publication 42 indicates that there are not any known active faults crossing the waterline alignment, per the criteria specified in the Alquist-Priolo Earthquake Fault Zoning Act.

The potential for ground rupture was further evaluated utilizing published. The California Geological Survey ("CGS") Fault Activity Map of California show the inferred trace of the Casmalia fault zone, which is crossed by the waterline alignment. The CGS indicates late Quaternary fault displacement (during the past 130,000 years) for the Casmalia fault.

5.2.1 Casmalia Fault (Orcutt Frontal)

The most significant structural feature in the project area is the Casmalia fault system, also referred to in subsurface oil field literature as the Orcutt Frontal fault. It is interpreted to be a south-dipping blind thrust fault, originally identified from oil well and geophysical data in the Solomon Hills and inferred to extend along the northeastern flank of the Casmalia Range. The fault is widely believed to be responsible for the uplift of the Casmalia Range and adjacent structural features, including the Solomon Hills Anticline and the Orcutt and Mt. Solomon Anticlines, which exhibit asymmetrical folding consistent with deformation above a blind thrust fault.

The proposed waterline alignment crosses the inferred trace of the Casmalia fault near Station 372+70. While Dibblee (1989) and other geologic sources show the fault as buried beneath younger surficial units, other sources (e.g., Jennings and Bryant, 2010; Sweetkind et al., 2021) suggest variations in its inferred trace, and some mapping depicts an eastward extension or potential connection with the Pezzoni-Casmalia fault in Solomon Canyon. No direct surface expression or rupture zone has been confirmed in this area, and prior trenching east of Mt. Solomon across prominent aerial lineaments did not reveal structural offset, suggesting those features are lithologic rather than tectonic.

Despite the lack of visible surface rupture, multiple authors consider the Casmalia fault to be Late Quaternary or potentially active, with some attributing recent seismic events (i.e., the 1980 Point Sal M5.1Earthquake) to this fault system. Geologic evidence indicates slip rates of approximately 5.6 to 6.7 mm/year over the past 119,000 years (McGregor and Onderdonk; 2021). Modern GPS data across the Santa Maria Basin record comparable ground movement (~6 ±2 mm/year), indicating that the fault is still accommodating crustal shortening.

The Casmalia fault is not located within an Alquist-Priolo Earthquake Fault Zone, and because it is likely blind, the risk of surface rupture is considered low. However, the potential for strong ground shaking remains significant due to the fault's proximity, geometry, and ongoing tectonic deformation. Regional shaking may also be influenced by other nearby structures, including the Santa Ynez fault, San Andreas fault, and offshore faults of the western Transverse Ranges. Ground motion effects may be locally amplified in unconsolidated surficial deposits such as old dune sands (Qos) and alluvium (Qa), which extend across much of the western alignment.

5.3 Ground Motion

5.3.1 General

The waterline is located in California, which is in a geologically and seismically active region where large-magnitude, potentially destructive earthquakes are common. Therefore, it is reasonable to assume that moderate or large magnitude earthquakes along any of the numerous faults in the region are expected to produce strong ground shaking in the future.

The Casmalia fault is inferred surface trace located at Station 372+70. The active San Andreas fault is located about 44 mi northeast. Large earthquakes along these, or along any of the other numerous faults in the region, are expected to produce strong ground shaking in the future.

Although research on earthquakes during the last fifty years has greatly enhanced the level of understanding of earthquake faulting in California, the record is much too short to constrain behavior of all faults in California and the attenuation characteristics of all areas relative to each future potential earthquake. Predicted accelerations should, therefore, be considered rough estimates rather than precise facts and ground motions from future earthquakes may exceed the predicted accelerations. Neither the Time, Location, nor Magnitude of an earthquake can be accurately predicted at this time.

5.3.2 Earthquake Magnitude

Earthquake magnitude is a quantitative measure of the strength of an earthquake or the strain energy released by it, as determined by seismographic or geologic observations. It does not vary with distance or the underlying earth material. This differs from intensity, which is a qualitative measure of the effects a given earthquake has on people, structures, loose objects, and the ground at a specific location. Intensity generally increases with increasing magnitude and in areas underlain by unconsolidated materials and decreases with distance from the epicenter.

The Table 2 below presents the distances to nearby significant faults located within about 25 miles radius of the waterline. The site-to-source distances were obtained from the USGS fault parameters online database (based on 2008 National Seismic Hazard Maps). The maximum earthquake magnitudes (M) were calculated using the Ellsworth-B magnitude-area scaling relationship presented in Appendix E of the Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3).

Table 2 - Summary of Major Known Faults Within 25 Miles

Distance (Miles)	Fault Name	Dip Degrees	Dip Direction	Slip Sense	Magnitude
0	Casmalia (Orcutt Frontal)	75	SW	reverse	6.7
5.67	Los Alamos-West Baseline	30	S	thrust	7.0
7.39	San Luis Range (So Margin)	45	N	thrust	7.2
10.02	Lions Head	75	NE	Reverse	6.8
17.13	Los Osos	45	SW	thrust	7.0
18.02	Hosgri	80	E	strike slip	7.3
25.27	Santa Ynez (West)	70	S	strike slip	7.0
25.27	Santa Ynez Connected	70		strike slip	7.4

5.4 Ground Failure

Ground Failure is a general term describing seismically induced secondary permanent ground deformation caused by strong ground motion. This includes liquefaction, lateral spreading, seismic settlement of poorly consolidated materials (dynamic densification), differential materials response, slope failures, sympathetic movement on weak bedding planes or non-causative faults, shattered ridge effects and ground lurching.

Potential secondary seismic hazards are described below. The potential for adverse impacts to the proposed waterline from liquefaction and other secondary seismic effects is considered manageable for practical design purposes.

5.4.1 Potential for Liquefaction and Associated Ground Failure

Liquefaction occurs when saturated, cohesionless soils lose strength during strong ground shaking, leading to temporary fluid-like behavior. It typically affects young, loose sands or silts with a shallow groundwater table (generally <50 feet), particularly in low-lying areas such as alluvial plains and coastal basins.

The western and central portions of the waterline alignment are underlain primarily by dune sands (Qos) and alluvium (Qa), both of which are unconsolidated, granular units with low natural density. These geologic materials, in isolation, could be considered moderately susceptible to liquefaction. However, the likelihood of liquefaction is strongly reduced in this case by the depth to groundwater.

Well data from the Orcutt area (e.g., near the intersection of Blosser Road and Clark Avenue) show that depth to groundwater ranges from approximately 171 to 229 feet below ground surface. This is far deeper than the upper 50 feet typically considered critical for liquefaction hazard. Even in areas of known surficial sands and silts, the absence of shallow groundwater makes liquefaction unlikely under present conditions.

The *Santa Barbara County Seismic Safety Element* identifies portions of the Santa Maria Valley, including the northern potions of the waterline alignment, as having moderate liquefaction susceptibility, but this designation is based on generalized geologic criteria and does not account for localized groundwater conditions. However, no historical cases of liquefaction have been documented within the immediate project area, and no liquefaction hazard zones are mapped along the alignment.

Based on current geological and hydrogeological data, the potential for liquefaction along the proposed waterline alignment is considered low.

5.4.2 Potential for Other Modes of Ground Failure

Earthquake-induced slope failures include activation and reactivation of landslides, rock falls, debris flows and surficial failures. The potential for earthquake-induced slope failures to adversely impact the proposed waterline is considered manageable.

After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and improvement plans are prepared further study would be needed to evaluate slope stability in specific segments, particularly where bedrock bedding is adverse.

6.0 POTENTIAL GEOLOGIC AND GEOTECHNICAL HAZARDS

6.1 Natural Slopes

Due to the complexity and variability of geometry, geology and geotechnical stability of the steeper natural slopes could have an impact on the proposed waterline alignment in the vicinity of ascending natural slopes. Static stability of natural slopes at locations with advantageous bedding dip is adequate for bedrock slopes with an inclination of 2:1 (H:V), or flatter, for slope heights up to about 100 feet.

Based on the published geologic structure of the bedding (shallow dips) and the proposed waterline alignment within existing roads, it is opined that ascending natural slopes will more than likely not be a significant constraint to the proposed waterline alignment.

6.2 Soil Compressibility and Hydro-consolidation

6.2.1 Hydro-Compression (Collapse)

Hydro-compression is volume reduction that occurs when unsaturated soil materials are inundated with water. Soil materials most prone to hydro-compression are sandy and silty soils with dry density less than about 108 pcf and moisture content less than about 8 percent. Hydro-compression (collapse) is typically only a potential in poorly consolidated soil deposited by debris flows. The alluvial (Qa) deposits at the toe of ascending slopes may have hydro-compression potential. The potential for hydro-compression of the older

dune sands (Qos) and Orcutt Sand (Qo) is considered low and non-existent for the bedrock formations.

Hydro-compression (collapse) tests were performed on in-situ samples of alluvial deposits from these alluvial canyons in the Solomon Hills Development. In general, compression of these specimens following inundation in water (at vertical pressures approximating the in-situ vertical pressure) was negligible. It can be inferred that the alluvial (Qa) deposits along the waterline alignment will also have a low potential for hydro-compression.

After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and waterline improvement plans are prepared further study should be performed by a geotechnical consultant to evaluate hydro-compression potential beneath proposed structures for the water supply waterline (e.g., booster pump stations).

6.2.2 Compressibility of Alluvium

Settlement of alluvial soils could result from pressure applied to the soils by raising of grade and/or foundation loads. The settlement process depends on the variety of factors, including but not limited to, soil's permeability, water drainage paths, the thickness of fill placed, amount of vertical surcharge imposed, fluctuation in groundwater and pre-consolidation pressure, which is the maximum effective vertical overburden stress that a particular soil has sustained in the past. Further, cohesionless soils have higher permeability than cohesive soils that have small voids blocking the water movement. Therefore, settlement is more rapid in cohesionless soils versus cohesive soils.

The proposed waterline is not anticipated to increase pressures on the underlying alluvial soil. Therefore, settlement of alluvial soil is considered very low. After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and waterline improvement plans are prepared further study should be performed by a geotechnical consultant to evaluate the compressibility of the alluvial soil beneath proposed structures for the water supply waterline (e.g., booster pump stations).

6.3 Landslides

Landslides in Santa Barbara County are typically associated with moderate to steep slopes, weak or layered sedimentary rocks, and areas of active or historic tectonic deformation. Formations such as the Paso Robles Formation, Careaga Sand Formation, and especially the Sisquoc Formation are known to be susceptible to slope instability, particularly where they are exposed on hillsides, cut slopes, or over-steepen natural grades. Landsliding in these materials may occur under static conditions due to rainfall and saturation or be triggered by strong seismic shaking.

In the western and central portions of the waterline alignment, the terrain is generally flat to gently sloping and underlain by older dune sands (Qos) and alluvium (Qa). These deposits are not prone to landsliding, and no mapped landslide features or slope hazards are present in these areas. Accordingly, the potential for either static or seismically induced landslides is considered low along these segments.

As the alignment enters the Solomon Hills to the east—particularly along Orcutt Hill Road and into the structurally uplifted zone of the Solomon Hills Anticline the terrain becomes steeper and the underlying geology transitions to more consolidated and stratified units. These include the Paso Robles (QTp), Careaga Sand (Tcag and Tcac), and Sisquoc (Tsq) Formations. Each of these formations presents elevated landslide risk under certain conditions:

- The Paso Robles Formation includes interbedded sands, gravels, silts, and a prominent clay-rich basal unit that is expansive and has been associated with regional landsliding, particularly where slopes parallel bedding planes.
- The Careaga Sand Formation is generally stable but can exhibit localized instability, especially where slopes intersect unconformities or are capped by saturated surficial soils.
- The Sisquoc Formation is especially landslide-prone due to its composition of diatomaceous mudstone and shale deposited in deep marine settings. This formation is typically soft, highly absorbent, and weak, with low shear strength and a tendency to fracture and swell when saturated. These characteristics make it prone to both shallow and deep-seated landslides, particularly in areas of slope excavation or prolonged rainfall.

Although no active or historical landslides have been mapped directly along the alignment, the eastern portion of the corridor lies within generalized zones of seismically induced landslide susceptibility, due to the combination of susceptible geologic units, active tectonic structures, and moderate to steep slopes. This risk is further elevated by proximity to the Casmalia fault, which introduces potential for strong shaking and pre-existing structural deformation within slope materials.

Deep-seated and intermediate landslides are known to occur elsewhere in the Solomon Hills, including in the vicinity of Mount Solomon. While no such features have been confirmed along the alignment at this time, slope cuts or trenching in these areas should be approached cautiously. The existence, extent, and depth of potential slope instability must be evaluated on a case-by-case basis where grading or excavation is proposed in hillside terrain.

After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and waterline improvement plans are prepared further study should be performed by a geotechnical consultant to evaluate slope stability in specific segments, particularly where bedrock bedding is adverse. If future studies determine that landslides could impact the alignment, appropriate investigation, such as subsurface exploration and slope stability modeling, would be required to assess geometry, material behavior, and the mitigation options (e.g., avoidance or stabilization).

6.4 Expansion Potential

Certain geologic formations encountered along the alignment, particularly the Paso Robles Formation (QTp) and the Cebada Member (Tcac) of the Careaga Sand Formation, are known to contain clay-rich intervals with a potential for expansive behavior. These materials may exhibit volumetric change in response to seasonal moisture fluctuations, leading to shrink-swell cycles that can affect the stability of trench backfill, pipe bedding, and appurtenant infrastructure.

While no expansion index testing was conducted as part of this assessment, expansion potential in the Paso Robles Formation (QTp) and the Cebada Member (Tcac) of the Careaga Sand Formation may range from moderate to very high depending on local clay content and soil structure. In contrast, the Graciosa Member (Tcag) of the Careaga Sand Formation and alluvial units (Qa) generally exhibit low to very low expansion potential.

Expansion Index (EI) testing performed in the Solomon Hills region indicates that most near-surface soils exhibit low to very low expansion potential. In the AES (2023) investigation, a sample from the Graciosa Member of the Careaga Formation (Tcag) returned an EI of 46, classifying it as low expansion under CBC criteria. Other samples from alluvial deposits and mixtures of alluvium with Graciosa Member (Tcag) of the Careaga Sand Formation yielded EI values as low as 1, indicating very low expansion. However, the report notes that expansive behavior may be significant in clay-rich zones of the Paso Robles Formation (QTp) and the Cebada Member of the Careaga (Tcac). As such, moisture-sensitive materials encountered during excavation may require selective handling or mitigation depending on depth and project-specific conditions.

Where excavation intersects expansive clay-rich strata, particularly near slope transitions or shallow bedrock exposures, site-specific evaluation may be warranted during the design phase to assess the need for moisture conditioning, replacement, or blending with non-expansive materials.

6.5 Potential Corrosivity of Soils

This assessment did not include chemical analysis of soils for corrosivity parameters such as resistivity, sulfate, chloride, or pH. However, soils derived from marine sedimentary units and alluvial deposits, such as those encountered in the alignment can occasionally exhibit characteristics that may be mildly to moderately corrosive to buried concrete or ferrous metal components.

Soil is considered to be corrosive to concrete and/or steel if the measured resistivity is 1,000 ohm-cm or less, and/or if the sulfate concentration is 2,000 ppm (0.20%) or greater, and/or if the pH is 5.5 or less. Also, a soil with a chloride concentration greater than or equal to 500 ppm is considered deleterious to ferrous metals.

Soil corrosivity was evaluated based on available geotechnical data from previous studies in the Solomon Hills region. The AES (2023) geotechnical report for the nearby Solomon Hills Specific Plan included laboratory testing of soils from both alluvial deposits and shallow bedrock. Measured soil resistivity values ranged from 1,329 to 13,751 ohm-cm, classifying the soils as mildly to moderately corrosive to ferrous metals. Chloride concentrations ranged from 1 to 120 ppm, and soluble sulfate concentrations ranged from 0.019% to non-detect, both of which are considered negligible with respect to corrosion potential. The pH of tested soils ranged from 6.4 to 8.15, with one sample recorded at 5.2, suggesting generally non-aggressive to mildly acidic conditions. These results indicate that soil corrosivity along the alignment is expected to be low to moderate, although variability in material type and depth may influence localized conditions. After the General Plan Amendment and Specific Plan is approved for the Solomon Hills project and waterline improvement plans are prepared further study should be performed by a geotechnical consultant to evaluate project-specific corrosivity testing to confirm corrosion potential for buried infrastructure and inform appropriate material selection and protective measures.

To inform material selection and corrosion mitigation measures, it is recommended that representative subgrade soils be tested during final design or construction in areas where metallic or reinforced concrete components will be installed. If elevated corrosivity is confirmed, additional evaluation by a corrosion specialist may be warranted.

6.6 Soil Creep

Slope creep is an imperceptibly slow, progressive downward and outward movement of slope soils that can affect both the near-surface (surficial) soils and deep-seated (gross) soils. Slope softening is the result of increased moisture content as a result of rainfall and irrigation. As the soils approach saturation, an increase in the wet density and associated reduction in shear strength leads to slope deformation. For slope creep, cyclic wetting and

drying of the soils also causes a reduction in shear strength that yields permanent deformation of surficial soils under their own weight. The progressive outward and downward movement due to slope softening or creep may cause distress to improvements near the top of slopes.

The Paso Robles Formation, observed onsite, is noted in the Seismic Safety Plan as a formation having potential soil creep susceptibility. Possible design features to address potential soil creep include, but are not limited to, avoidance, guniting of the slopes, structural design features (e.g., stiffening foundation system with additional reinforcement), and/or adequate planting of trees and other plants, designed and implemented by a qualified licensed landscape architect and/or an agricultural engineer. The more vegetation a surface has on it, the more the roots reinforce the soil, helping to keep the soil in place and minimizing, but not eliminating its movement. Not only does stabilizing the soil with root systems slow down soil creep, but it also it helps protect against erosion.

6.7 Subsidence

Per the County of Santa Barbara's Seismic Safety and Safety Element (amended July 2023): *"Despite inquiries to responsible agencies, no evidence of significant subsidence or problems related to subsidence in Santa Barbara County were uncovered. However, to our knowledge, no precise level lines or surveys have been measured in oil, gas or water producing areas in Santa Barbara County. Subsidence could be occurring in these areas, but if so, it is not significant since no problems have been reported. Establishment of a grid base and precise level surveys would be needed to determine subsidence.*"

7.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations summarize the primary geologic and geotechnical issues that may impact the proposed development:

1. The proposed Solomon Hills Water Supply Pipeline alignment extends from Black Road in the Santa Maria Valley to a tank site in the eastern Solomon Hills Development, traversing approximately 53,830 linear feet (10.2 miles). The alignment crosses a west-to-east progression of geologic units, ranging from unconsolidated older dune sands (Qos) and alluvium (Qa) in the western valley to lithified fluvial and marine units in the eastern hills, including the Paso Robles Formation (QTp), Careaga Sand Formation (Tcag and Tcac), and the Sisquoc Formation (Tsq).
2. The alignment crosses the Casmalia fault system (also known as the Orcutt Frontal fault) near Station 372+70. This blind thrust fault is considered structurally active and associated with uplift and folding of the Solomon Hills. While surface rupture is unlikely, the fault presents a potential seismic shaking hazard.
3. The western alignment, underlain by older dune sands (Qos) and alluvium (Qa), consists of loose, granular materials that are easily excavated but may be prone to raveling, trench instability, and settlement. However, due to deep groundwater levels, the liquefaction potential is considered low.
4. Groundwater depth along the alignment is generally greater than 170 feet, based on available well data, with no evidence of shallow, continuous saturation. Localized perched water may exist in dune sands or drainages but is not expected to significantly affect trenching operations.
5. The eastern alignment, particularly south and east of Station 400+00, traverses more consolidated and structurally complex terrain, where formations such as Paso Robles (QTp), Careaga Sand (Tcac), and Sisquoc (Tsq) Formations may present elevated risk of landslides, slope creep, or instability, especially where slopes are steep or bedding is unfavorably oriented.
6. Portions of the Paso Robles Formation (QTp) and Cebada Member (Tcac) of the Careaga Sand are known to contain expansive clay horizons, which may exhibit shrink-swell behavior when disturbed or re-compacted as fill.
7. No laboratory testing for soil corrosivity was conducted as part of this assessment. However, soils derived from marine or alluvial sources may exhibit corrosive properties and should be tested during final design where metallic or reinforced concrete components will be installed.

8. After the General Plan Amendment and Specific Plan is approved for the Solomon Hills Development further study should be performed by a geotechnical consultant during the design phase of waters supply pipeline construction documents to evaluate project-specific trench support requirements, bedding conditions, and long-term stability.

8.0 LIMITATIONS

This report has been prepared by Allan E. Seward Engineering Geology, Inc. for the exclusive use of Solstra Communities California, LLC and their contracted design consultants for the specific development discussed herein. This report should not be considered transferable. Prior to use by others, this firm must be notified, as additional work may be required to update this report.

Additional investigation will be required to prepare recommendations for subsequent phases of development. In the event that any modifications in the design or location of the proposed development are planned, a written review by this firm will be required.

The proposed development is located in California, a geologically and tectonically active region, where large magnitude, potentially destructive earthquakes are common. Therefore, ground motions from moderate or large magnitude earthquakes could affect the project during the design life of the proposed structure(s).

In performing these professional services, this firm has used the degree of care and skill ordinarily exercised under similar circumstances by reputable geologists and geotechnical engineers practicing in this or similar localities. Therefore, our **conclusions** and **recommendations** are **professional opinions** and are **not meant** to be a control of nature. We make no **warranty** of any kind, either **expressed** or **implied**.

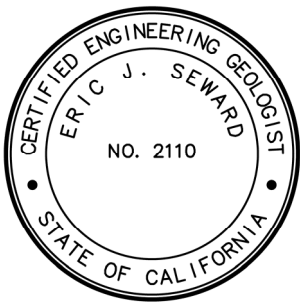
This page intentionally left blank.

This opportunity of be of service is appreciated. If you have any questions regarding this report, please contact us.

Respectfully submitted,

Eric J. Seward, CEG 2110
Principal Engineering Geologist
Vice President

Farbod Bouya, MS, PE C94592
Professional Engineer





The following attachments complete this report.

Location Map following page 2
References
Geologic Overview Map **Plate I**

REFERENCES

Allan E. Seward Engineering Geology, Inc., 2014. *Geologic and Geotechnical Report – Review of Vesting Tentative Tract Map, dated February 2014; Rice Ranch, Orcutt, County of Santa Barbara, California.* prepared for Rice Ranch Community, LLC. Job No. 14-1882S-4, dated February 27, 2014.

Allan E. Seward Engineering Geology, Inc., 2023, *Geotechnical Report, Solomon Hills General Plan Amendments and Specific Plan, Portions of Assessor's Parcel Numbers 101-020-085, -086 & -087, Santa Barbara County, California*, prepared for Solstra Communities California, LLC, Job No. 23-2195s-1, dated October 20, 2023

Published

California Department of Conservation, California Geological Survey (CGS), 2018, Earthquake Fault Zones, A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California, Special Publication 42, 83 p.

California Department of Conservation, California Geological Survey, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A.

California Department of Conservation, California Geological Survey, 2018, Earthquake Zones of Required Investigation web application, https://maps.conservation.ca.gov/cgs/EQZApp/

California Department of Conservation, California Geological Survey, 2015, Fault Activity Map of California web application, https://maps.conservation.ca.gov/cgs/fam/.

CDCDMG, 1997, Guidelines for evaluating and mitigating seismic hazards in California: California Department of Conservation Division of Mines and Geology Special Publication 117.

Dibblee, T.W., Jr., 1989, Geologic Map of the Casmalia and Orcutt Quadrangles, Santa Barbara County, California: Dibblee Geological Foundation Map DF-24, scale 1:24,000.

Dibblee, T.W., Jr., 1994, Geologic Map of the Santa Maria and Twitchell Dam Quadrangles, Santa Barbara County, California: Dibblee Geological Foundation Map DF-51, scale 1:24,000.

Dibblee, T.W., Jr., 1994, Geologic Map of the Sisquoc Quadrangle, Santa Barbara County, California: Dibblee Geological Foundation Map DF-53, scale 1:24,000.

Hart, E.W., 1999, Fault-rupture hazard zones in California: California Division of Mines and Geology Special Publication 42, 24 p.

Jennings, C.W., and Bryant, W.A., 2010, Fault activity map of California: California Geological Survey, Geologic Data Map No. 6, map scale 1:750,000.

Jennings, C.W., Gutierrez, C., Bryant, W., Saucedo, G., and Wills, C., 2010, Geologic Map California: California Geological Survey, Geologic Data Map GDM-2.2010, 1 sheet, scale 1:750,000.

McGregor, I.S., and Onderdonk, N.W., 2021. Late Pleistocene rates of rock uplift and faulting at the boundary between the southern Coast Ranges and the western Transverse Ranges in California from reconstruction and luminescence dating of the Orcutt Formation. Geosphere, v. 17, no. 3, p. 932–956.

Seismic Safety & Safety Element, 2023, Santa Barbara County Comprehensive Plan.

Sweetkind, D.S., Langenheim, V.E., McDougall-Reid, K., Sorlien, C.C., Demas, S.C., Tennyson, M.E., and Johnson, S.Y., 2021, Geologic and Geophysical Maps of the Santa Maria and part of the Point Conception 30' × 60' Quadrangles, California: U.S. Geological Survey Scientific Investigation map 3472, 1 sheet, scale 1:100,000, 58-p pamphlet.

Sylvester, A.G., and Darrow, A.C., 1978, Structure and Neotectonics of the Western Santa Ynez fault system in southern California: Tectonophysics 52 (1979) 389-405.

REFERENCES

University of Southern California (USC), Southern California Earthquake Center (SCEC), Workshop on "Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California", USC, Los Angeles, California, June 17, 1999.

U.S. Geological Survey, Groundwater for USA: Water Levels, https://nwis.waterdata.usgs.gov/nwis/gwlevels

Woodring, W.P., and Bramlette, M.N., 1950, Geology and Paleontology of the Santa Maria District California: Geological Survey Professional Paper 222, 6 sheets scale 1:24,000, 185-p.

Black Rd.

Dutard Rd.

Blosser Rd.

PROPOSED WATERLINE

HORIZONTAL DIRECTIONAL DRILLING

Clark Ave

BOOSTER PUMP STATION 1

S. Broadway

Rice Ranch Rd.

Orcutt Hill Rd.

Casmalia Fault (Orcutt Frontal Fault)

BOOSTER PUMP STATION 2

PROPOSED TANK SITE

GRAPHIC SCALE

1,200 0 600 1,200 2,400 4,800

(IN FEET)
1 inch = 1,200 ft.

Legend

- Qa - valley and floodplain alluvial deposits
- Qo - Orcutt Sand, aelian sand deposits
- Qos - dune sand deposits
- QTp - Paso Robles Formation, nonmarine alluvial sediments
- Tcag - Careaga Sand Graciosa Member, fossiliferous sand
- Tcac - Careaga Sand Cebada Member, fine-grained sand
- Tsq - Sisquoc Formation

- Proposed Waterline Alignment
- Fault (Sweetkind et al., 2021)
- Reverse Fault (Sweetkind et al., 2021)
- Solomon Hills Specific Plan Area

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Geologic Overview Map

DATE: 7/24/25	JOB NO.: 25-2195s-7
SCALE: 1" = 1,200'	FILE: AES GEOLOGY IN PROGRESS
PLATE I	GEOLOGY BY: MDS / DRAWN BY: MDS / REVISED:

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

GEOTECHNICAL REPORT

Solomon Hills
General Plan Amendments and Specific Plan

Portions of Assessor's Parcel Number
101-020-085, -086 & -087
Santa Barbara County, California

Exclusively Prepared For:

Solstra Communities California, LLC
1130 East Clark Avenue, Suite 150 #286
Orcutt, CA 93455

October 20, 2023
Job No.: 23-2195s-1

TABLE OF CONTENTS

1.0 PROJECT DESCRIPTION SUMMARY 1
2.0 SCOPE OF WORK 2
3.0 PROPERTY DESCRIPTION 5
4.0 PROPOSED GRADING 6
5.0 FIELD EXPLORATION, SAMPLING, AND LABORATORY TESTING 6
5.1 Surface Mapping 6
5.2 Subsurface Explorations 6
5.3 Sampling Procedures 7
5.4 Laboratory Program 8
6.0 GEOLOGIC SETTING 8
7.0 GEOLOGIC AND GEOTECHNICAL CONDITIONS 9
7.1 Geologic Units 9
7.2 Bedrock 9
7.2.1 Sisquoc Formation (Tsq) 9
7.2.2 Careaga Sandstone Formation (Tcac and Tcag) 10
7.2.3 Paso Robles Formation (QTp) 11
7.3 Surficial Deposits 11
7.3.1 Older Alluvium (Qoa) 11
7.3.2 Alluvium (Qa) 11
7.3.3 Slopewash (Qsw) 13
7.3.4 Soil 13
7.4 Mass Movement Deposits 13
7.4.1 Landslides (Qls) 13
7.4.2 Surficial Failures (Qsf) 14
7.5 Artificial Fill (af) 14
7.6 Groundwater 14
7.7 Soils Shear Strength 16
8.0 POTENTIAL GEOLOGIC AND GEOTECHNICAL HAZARDS/CONSTRAINTS AND POTENTIAL AVOIDANCE MEASURES AND DESIGN FEATURES 17
8.1 Seismic Considerations 17
8.1.1 Introduction 17
8.1.2 Ground Rupture 17
8.1.3 Building Setbacks due to Fault-Rupture Hazard 20
8.1.4 Ground Motion 20
8.1.5 Ground Failure 23
8.2 Slope Stability 24
8.2.1 Proposed Cut-Slopes 24

TABLE OF CONTENTS

8.2.2 Proposed Fill Slopes 25
8.2.3 Natural Slopes 26
8.2.4 Debris Flow Hazards 26
8.3 Deep Fill Areas 27
8.4 Soil Compressibility and Hydro-consolidation 27
8.4.1 Hydro-Compression (Collapse) 27
8.4.2 Compressibility of Alluvium 28
8.5 Landslides 29
8.6 Expansion Potential 29
8.7 Potential Corrosivity of Soils 30
8.8 Soil Creep 31
8.9 Subsidence 31
8.10 Oil Wells 32
8.11 Building Setbacks 32
8.12 Infiltration for Basins 32
9.0 GENERAL CONSTRUCTION CONSIDERATIONS 33
9.1 Earthwork and Grading Recommendations 33
9.1.1 Removals and Benching 33
9.1.2 Cut-Fill Transitions (Over-Excavation) 33
9.1.3 Fill Materials 34
9.1.4 Fill Compaction 34
9.1.5 Construction of Fill Slopes 34
9.1.6 Bulking/Shrinkage Behavior of Site Soil/Rock Deposits 35
9.1.7 Compaction Characteristics 35
9.2 Drainage Recommendations 35
9.2.1 Subsurface Water Control 36
9.2.2 Surface Drainage and Erosion Control 36
9.3 Sewage Disposal 37
10.0 FEASIBILITY OF DEVELOPMENT 38
11.0 CONCLUSIONS AND RECOMMENDATIONS 38
12.0 LIMITATIONS 41

The following attachments and appendices complete this report.

Location Map following Page 6
References
Summary of Cut-Slopes **Table 1**

TABLE OF CONTENTS

Preliminary Summary of Estimated Static Settlements at Selected Exploration Location **Table 2**

APPENDIX A – Subsurface Logs

- **Geologic Test Pits**
  - GT-1 to GT-29, GT-33 to GT-81, GT-100, and GT-103 to GT-124
  - GT-125 **Plate I**
  - GT-159 to GT-161, GT-166 to GT-174, and GT-197 to GT-244
- **Geotechnical Test Pits**
  - ST-17 through ST-24
- **Hollow Stem Auger Borings**
  - HS-5 to HS-17, and HS-38 to HS-49
  - Key to Symbols
- **Bucket-Auger Borings**
  - BA-1 to BA-6, BA-8 to BA-13, and BA-19 to BA-21
- **Cone Penetration Test Sounding Data**
  - CPT-1 to CPT-23

APPENDIX B – Laboratory Test Results

APPENDIX C – Seismicity

- Ground Motion and Response Spectra References
- Quaternary Fault Location Map Figure C1
- Modified Mercalli Scale, 1956 Version
- Earthquake Epicenter Location Map Figure C2
- Magnitude-Distance Contributions to Hazard Figure C3
- USGS Deaggregation Parameters and Output Table C1

APPENDIX D – Liquefaction Potential Assessment and Evaluation of Earthquake-Induced Settlements

APPENDIX E – Slope Stability Analyses

APPENDIX F – Construction Diagrams

- Fill Over Natural Slope 5:1 or Steeper
- Rock Disposal
- Fill Slope Over Natural Slope 5:1 or Steeper
- Fill Slope Toeing Out on Flat Alluviated Canyon
- Over-excavation for Transitional Cut and Cut-Fill Lots
- Stability/Buttress Fill and Backdrains
- Canyon Subdrain

TABLE OF CONTENTS

APPENDIX G – Map and Cross Sections

- Solomon Hills Area Designations Map
- Solomon Hills Neighborhood Plan Land Uses, dated 8/28/2023
- Groundwater Well Location Map
- Groundwater Data **Table G1**
- Regional Geologic Map **Plate II**
- Cross Sections (1-1' thru 15-15')
- **Preliminary Geologic Map** **Plate III**
- **Preliminary Geologic Map** (Bicknell and Graciosa Rd Site Access) **Plate IV**

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

October 20, 2023 Job No.: 23-2195s-1

Solstra Communities California, LLC
1130 East Clark Avenue, Suite 150 #286
Orcutt, CA 93455

Attention: Mr. Peter Kiesecker

Subject: **GEOTECHNICAL REPORT**
Solomon Hills, General Plan Amendments and Specific Plan

Property: Portions of Assessor's Parcel Numbers 101-020-085, -086 & -087
Santa Barbara County, California

Dear Mr. Kiesecker:

This report has been prepared to present our professional opinions regarding the existing geologic and geotechnical conditions on the subject property ("Property") to support preparation of an Environmental Impact Report ("EIR") for the currently proposed development of the Solomon Hills ("Project"). The primary objective of this investigation was to provide generalized conceptual-level development guidelines based on our preliminary evaluation of the geologic and geotechnical conditions and provide geotechnical recommendations relative to the proposed grading concept.

1.0 PROJECT DESCRIPTION SUMMARY

The Solomon Hills Project proposes redevelopment of 1,903 acres of private land held by Solstra Communities California, LLC., currently used for oil production and grazing into a new innovative town in North Santa Barbara County. Additional Off-Site Area includes approximately 40-acres for access and utility improvements.

On 1,616 acres within the Project Area, the Project proposes to amend the current Agriculture Commercial (AC) land use designation and zoning of AG-II-100 to the proposed Solomon Hills Specific Plan (SH). The proposed Specific Plan will serve as an integrated planning tool for this new town, providing guidelines and standards for the various land uses (residential, commercial/retail, and public) and detailing phasing of key infrastructure and sustainability elements. A mix of residential units are proposed to support a variety of residents for the community on approximately 468 acres. Approximately 650,000 square feet of commercial uses (125,000 sf retail and 525,000 sf office) are proposed on approximately 41 acres to support

a vibrant community and jobs/housing balance. Critical public and institutional uses are proposed, including a school, fire/sheriff station, and water reclamation facility on approximately 25 acres.

The remaining 287 acres of the Project Area, referred to as the Newlove Area, is within the Orcutt Community Plan and the County's rural boundary and will retain its existing land use and zoning designations (AC and AG-II-100). The area contains Newlove Park and provides an open space buffer between Orcutt and the new urban boundary proposed with the Project. Uses and exiting zoning will continue here, with added amenities and enhancements for active and passive recreation, water retention, habitat restoration, conservation, and public trails.

The Project will also provide the necessary road connections including two interchange improvements along Highway 101, one interchange improvement along Highway 135, and various on-site and regional transit improvements. In total, the Project proposes 1,219 acres of open space (963 acres within the Specific Plan Area and 256 acres in the Newlove Area) and 72 acres of parks, recreation facilities, and trails (41 acres in the Specific Plan Area and 31 acres in Newlove Area), including 9 miles of public trails connecting Orcutt to Los Flores.

2.0 SCOPE OF WORK

The scope of work for this investigation included the following tasks:

- Review of readily available published geologic references pertinent to the Property.
- Review of the Solomon Hills Specific Plan Area Designations Map.
- Review of the Neighborhood Plan Land Uses prepared by RRM Design Group, dated 8/29/23.
- Review of the 1-inch equals 300-ft Overall Grading & Drainage Plan prepared by RRM Design Group, dated 10/15/23 (herein referred to as Grading Plan). This plan was used as the base for the Preliminary Geologic Map (**Plate III**). We make no representations regarding the accuracy of the base map.
- Review of the 1-inch equals 200-ft Bicknell Road and Graciosa Road Site Access (Attachment 3, Page 2/3) prepared by Wallace Group, dated 1/4/23. This plan was used as the base for the Preliminary Geologic Map (**Plate IV**). We make no representations regarding the accuracy of the base map.

- Review of the following aerial photographs:

Date	Flight	Frame	Scale	Agency
1/22/38	C-4950	A:50, A:51, A:93 – A:95, A:105 – A:107, D:50, D:51	1" = 2,000'±	Fairchild
10/23/43	BTM-1943	2B-25 – 2B-28; 2B-108, 2B-109, 3B-94 – 3B-96, 6B-47 – 6B-51	1" = 1,667'±	USDA
6/16/61	BTM-1961	1BB-12, 1BB-49 – 1BB-54, 1BB-73 – 1BB-76, 5BB-90 – 5BB-92	1" = 1,667'±	USDA
5/14/67	BTM-1967	2HH-180, 2HH-186, 2HH-215 – 2HH-220	1" = 1,667'±	USDA
6/18/70	HB-RF	8-10, 40-46, 69-75, 92-94, 109-114, 158-160	1" = 1,000'±	Mark Hurd Aerial Surveys
11/30/81	332014	497-55 – 497-57	1" = 5,225'±	HAP
9/3/94	NAAP-2C	6921-68 – 6921-70	1" = 3,333'±	USGS
1994 – 2023	- Various Images	-	-	Google Earth Web Application

- Limited geologic reconnaissance and field mapping of the Property.
- Excavation, cleaning, sampling, and logging of geologic/geotechnical conditions in one hundred and sixty-nine test pits excavated to depths varying between about 3 ft and 16 ft below the existing ground surface.
- Excavation, cleaning, sampling, and logging of geologic conditions exposed in the sidewalls of a 410-ft long, 6-ft deep trench.
- Drilling, logging, and sampling of twenty-five 8-inch diameter hollow-stem-auger borings to depths varying between about 21 ft and 70 ft, below the existing ground surface.
- Drilling, logging, and sampling of fifteen 24-inch diameter bucket-auger borings to depths varying between about 15 ft and 90 ft, below the existing ground surface.
- Completion of twenty-three Cone Penetration Test (CPTs) soundings to depths varying from about 10 to 90.4 ft below the existing ground surface at the explored locations.
- Laboratory testing of selected samples obtained from the test pits and borings to help evaluate the geotechnical engineering characteristics of the soils and bedrock underlying the Property.
- Review of subsurface cone penetrometer tests (CPTs), drill holes, test pits and associated laboratory test data and analyses relative to the shear strength parameters of the Property's materials and preliminary alluvial removal depths.

- Preparation of subsurface exploration logs.
- Summarize the strength, compressibility, compaction characteristics, and expansion potential of the Property's soil and rock deposits.
- Preliminary evaluation of groundwater conditions and historical high groundwater levels based on water well data and published maps.
- Performed general earthquake ground motion characterization utilizing the latest seismic ground-motion provisions of the applicable codes and guidelines such as 2022 California Building Code (CBC), ASCE 7-16, and Special Publication 117A, all of which are industry-standard technical references. Our evaluation included the calculation of the potential ground accelerations that could be generated at the Property during future potential earthquakes on nearby faults.
- Preliminary evaluation of geotechnical hazards, including landslides, settlement, hydro-consolidations potential, stability of fill slopes, stability of cut-slopes, stability of natural slopes, compaction of Property's soils, fault-related ground surface rupture, and potential liquefaction and its associated consequences (e.g., vertical settlement and lateral spread).
- Geotechnical assessment of liquefaction potential of Property's alluvial soils and calculation of associated seismic settlements and lateral spread displacements based on subsurface data, existing and historic groundwater levels, laboratory test results, and estimated earthquake ground motions.
- In part for the purposes of a settlement monitoring program, preliminary limited estimation of potential static settlements, given the proposed additional fill placement and under future building loads based on SPT blow count data, CPT tip resistance, and applicable soil engineering laboratory testing (e.g., consolidation and hydro collapse testing).
    - Consolidation test is used to determine the rate and magnitude of soil consolidation when the soil is restrained laterally and loaded axially.
    - Hydro collapse test is used for the magnitude of one-dimensional collapse that occurs when unsaturated soils are inundated with water given a vertical (axial) stress. It provides an index for rating the potential for collapse.
- Preparation of a Preliminary Geologic Map (**Plate III**) illustrating the location of our subsurface explorations, distribution of geologic units, cross sections relative to the currently proposed land use areas.

- Preparation of a Preliminary Geologic Map (**Plate IV**) illustrating distribution of geologic units to the anticipated secondary access to State Highway 135.
- Review of selective geologic cross sections and gross slope stability of a few selected natural slopes and cut-slopes adjacent to the proposed development areas.
- Provide preliminary building/road setback from the landslide just east of Mount Solomon.
- Preparation of figures and illustrations, including Location Map, Groundwater Well Location Map, Regional Geologic Map, Quaternary Fault Location Map, drill hole logs, test pits logs, CPT logs, laboratory test reports, seismicity figures, preliminary liquefaction results and calculations, and pertinent limited construction details for inclusion in this report.
- Preparation of this report, describing our completed scope of work, which presents generalized conceptual-level development guidelines based on our current evaluation of the geologic and geotechnical conditions on the above noted Property, along with the results of our analyses with appropriate conclusions and recommendations for the conceptual design and construction of the proposed improvements.

3.0 PROPERTY DESCRIPTION

The Property is located in northern Santa Barbara County south of the town of Orcutt in the Solomon Hills (see **Location Map** following page 6). The Solomon Hills are separated from the Casmalia Hills to the west by Graciosa Canyon and Harris Canyon, which flow to the north and south, respectively, and are bisected by Highway 135. Solomon Canyon, which is bisected by Highway 101, drains north toward Orcutt Creek and forms the eastern boundary of the Property. In general, all of the other canyons on the Property drain south towards the Los Alamos Valley.

Topography on the Property ranges from relatively broad and flat alluvial valleys with gentle side slopes (10 to 30%) to narrow canyons with steep side slopes (45 to 100%) and fairly rugged terrain. The current Property's topography is illustrated on the attached Overall Grading & Drainage Plan utilized as the base map for our Preliminary Geologic Map (**Plate III**). Chaparral and grasses cover most of the Property and scattered groves of oak trees occur locally. Numerous roads and pads associated with (previous) oil explorations and productions exist on the Property. The majority of these features are located on the western portion of the Property and a smaller number is present on the eastern portion of the Property. Cattle grazing also currently occurs throughout the Property.

4.0 PROPOSED GRADING

The Property is shown on the attached Solomon Hills Area Designations Map and Neighborhood Plan Land Uses, which consists of thirty areas. The Overall Grading & Drainage Plan illustrates the proposed super-pads and slopes for the Neighborhood Plan Land Uses areas. The main access to the Solomon Hills Project will be from U.S. Highway 101. Typical cut and fill grading techniques are anticipated to construct the slopes, pads, and roads. The estimated preliminary earthwork quantities are 22,174,258 cubic yards of cut and 25,587,073 cubic yards of fill. The earthwork cut and fill volumes will usually be balanced on-site by the project supervising civil engineer (i.e., via raising or lowering the grades) at the improvement plan stages.

In general, the Overall Grading & Drainage Plan illustrates the proposed slope gradient at a 2.5:1 (H:V), or flatter. The maximum proposed cut-slope (CS-5) is approximately 235 feet, which has a slope gradient of 3.8:1 (H:V). The maximum proposed 2.5:1 (H:V) gradient cut slope height is 110 feet (CS-1). The maximum proposed fill slope is 145 feet adjacent to Area 15 pad, which has a slope gradient of 3.1:1 (H:V). The second highest proposed fill slope is 125 feet adjacent to Area 15 pad, which has a slope gradient of 3:1 (H:V). The maximum proposed 2.5:1 (H:V) gradient fill slope height is 105 feet adjacent to Area 8 pad. The maximum depth of cut will be about 115 feet at the toe of Cut-slope CS-4 on Area 2. The maximum height of the proposed fill will be about 100 feet in the vicinity of Area 8.

The Bicknell Road and Graciosa Road Site Access plan illustrates the proposed road grades for an anticipated secondary access to State Highway 135. This plan also illustrates proposed cut and fill slopes adjacent to the anticipated secondary access to State Highway 135 to the west of the Solomon Hills western Property boundary.

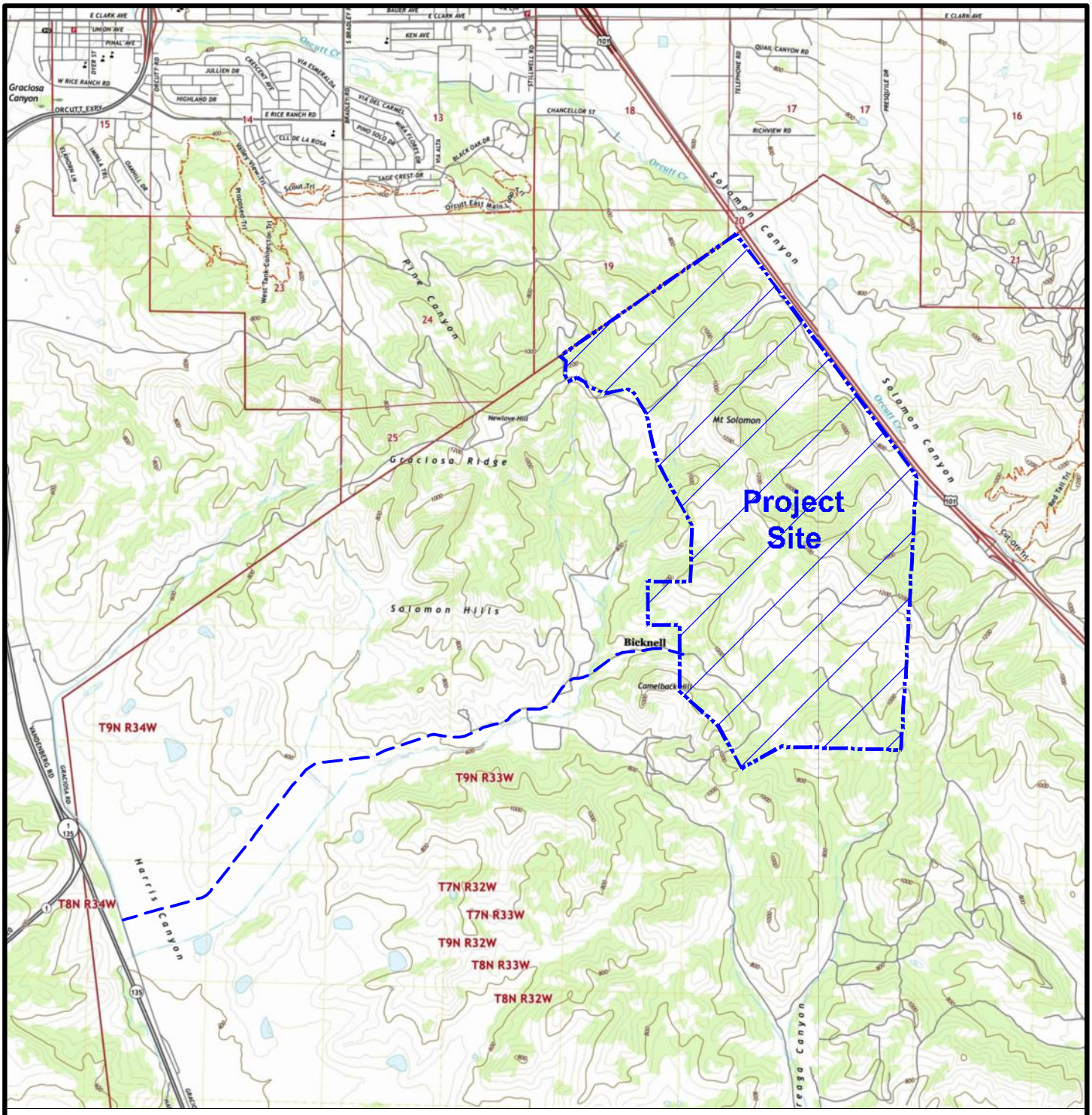
5.0 FIELD EXPLORATION, SAMPLING, AND LABORATORY TESTING

5.1 Surface Mapping

Surface geologic mapping in conjunction with aerial photo interpretations was undertaken by personnel from Allan E. Seward Engineering Geology Inc. (“AESEGI”) using the Property topographic map as the base map.

5.2 Subsurface Explorations

Logging and sampling operations were performed by AESEGI staff of trench and test pits, and exploration borings between January 30, 2006 and September 27, 2006 at the Property. Additionally, Cone Penetration Test (CPT) soundings were performed in September 2006 under the observation of AESEGI staff. Locations of the subsurface explorations are shown on the Preliminary Geologic Map (**Plate III**) and include the following:



Source: U.S. Geological Survey Orcutt and Sisquoc Quadrangles, Dated 2021

Approximate Scale: 1"=4,000'

NOTE: THIS IS NOT A SURVEY OF THE PROPERTY

KILOMETERS 0 0.5 1 2
METERS 1000 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 40 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

N

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□A□d G□□□□□□□□□C□s□□□s

LOCATION MAP

Job No.: 23-2195s-1	*Date:* 10/20/23

- 114 Geologic test pits (GT-1 to GT-29, GT-33 to GT-81, GT-100, GT-103 to GT-125, GT-159 to GT-161, and GT-166 to GT-174)
- 8 Geotechnical test pits (ST-17 to ST-24)
- 15 Bucket-auger drill holes (BA-1 to BA-6, BA-8 to BA-13, and BA-19 to BA-21)
- 9 Hollow-stem-auger drill holes (HS-5 through HS-17)
- 23 CPT soundings (CPT-1 through CPT-23)

The test pits and trenches were excavated by a rubber tire and tracked backhoes provided and operated by "Engel and Gray" and "John Watson Loader and Backhoe Services". The 24-inch diameter bucket auger drill rig and operators were provided by "Tri-Valley Drilling" and "All Ways Drilling". The hollow-stem-auger (8-inch diameter) drill rig and operators were provided by "Valley Well Drilling". The Cone Penetration Test rig and operators were provided by "Holguin, Fahan & Associates, Inc.".

In 2023, additional subsurface explorations were performed, which included 48 geologic test pits (GT-197 through GT-244) and 12 hollow-stem-auger drill holes (HS-38 through HS-49). The test pits were excavated by a Caterpillar 306 mini-excavator provided and operated by "Barkley General Engineering". The hollow-stem-auger (8-inch diameter) drill rig and operators were provided by "Gregg Drilling, LLC".

The drill holes, trenches, and test pits were logged and sampled by AESEGI personnel. The drill hole logs, trench logs, and CPT soundings are presented in **Appendix A**. The locations of the drill holes, test pits, trenches and CPTs are shown on the Preliminary Geologic Map **(Plate III)**.

The drill hole logs included in **Appendix A** represent our interpretation of field data prepared for each boring by our geologic/engineering staff at the time of drilling, along with refinements based on observations and laboratory test results. Unit boundaries shown in the graphic log column of our hollow-stem-auger drill hole logs are approximate and may represent gradual transitions at the explored locations. The distribution and engineering characteristics of materials in adjacent areas may vary from those observed in the explorations.

5.3 Sampling Procedures

California-Drive (relatively undisturbed ring samples) and Standard Penetration Test (SPT) samples were obtained in the exploratory drill holes at various depths (see logs in **Appendix A**). Recovered soil samples were sealed in plastic containers (in an attempt to maintain its

in-situ moisture conditions) and brought to our laboratory for further classification and testing.

Bulk (disturbed) samples of the near surface soils and bedrock were obtained from cuttings developed during excavation of the exploratory drill holes and trenches. The bulk samples were collected for classification and testing purposes and represent a mixture of soils within the noted depths.

5.4 Laboratory Program

Soil and bedrock samples were visually classified in the field using visual-manual procedures in accordance with applicable portions of the Unified Soil Classification System (ASTM D2488). Thereafter, the samples were brought to our geotechnical laboratory, the visual soil classifications were checked, and the drill hole and trench logs were reviewed in order to select soil samples for testing.

The laboratory testing program performed on the on-site soils and bedrock was to evaluate geotechnical engineering characteristics, which included the following tests: in-situ moisture content (ASTM D2216) and dry density (ASTM D7263), Amount of Material in Soil Finer than No. 200 Sieve (ASTM D1140), particle-size distribution of soils using sieve analysis (ASTM D6913), modified Proctor compaction (ASTM D1557), direct shear (ASTM D3080), consolidation (ASTM D2435), hydro-collapse (ASTM D2435), expansion index (ASTM D4829) and corrosivity (CT Methods).

The results of the field investigation and the laboratory tests were used as the basis for our analyses and recommendations presented in this report. Results of the laboratory testing are provided in **Appendix B** of this report, presented on the subsurface logs, or within the following sections of this report.

6.0 GEOLOGIC SETTING

The Property is located in the southern portion of the Coast Ranges Geomorphic Province on the southern edge of the Santa Maria Valley in the Solomon Hills. These hills were formed by compressional tectonic forces which uplifted the basement rocks and overlying sedimentary rocks. These hills have been subsequently eroded and incised. Most of the Property is underlain by the Careaga Sandstone Formation (Tcac/Tcag) which stratigraphically is underlain by the Sisquoc Formation (Tsq). The Paso Robles Formation (QTp) overlies the Careaga Formation. The anticlinal warp, which these formations have been subjected to, has brought the older Sisquoc Formation to the surface in limited areas on the Property and resulted in the erosion of the Paso Robles Formation. Moving from east to west across the Property, the generalized geologic structure consists of relatively steeply dipping (30-45º) northwest

striking bedrock in the foothills adjacent to Highway 101. The bedrock dips gently toward the west near the Mt. Solomon anticline where dips flatten to near horizontal. West of the anticline, the bedrock dips gently (5º-15º) to the southwest and strikes northwesterly with local variations due to cross bedding. This asymmetric anticlinal warp is attributed to a blind thrust fault located deep below the surface. The lateral extent and overall geometry of this fault or fault system is not well constrained because it has not been observed to extend to the ground surface. This fault is not designated as active per the criteria specified in the Alquist-Priolo Earthquake Fault Zoning Act. Faulting in the vicinity of the Property is discussed in more detail in Section 8.1.

7.0 GEOLOGIC AND GEOTECHNICAL CONDITIONS

7.1 Geologic Units

The Property consists of (undocumented) artificial fill and alluvial deposits that are underlain by (weathered to competent) bedrock. A general description of these geologic units is presented below and presented on our subsurface logs (**Appendix A**). Distribution of these units is shown on the Preliminary Geologic Maps (Plates III and IV).

7.2 Bedrock

Bedrock units which outcrop on the Property were previously mapped by others (Woodring and Bramlette 1950; Dibblee, 1989). We have transferred their locations to the enclosed 1-inch = 300-ft scale Preliminary Geologic Map. Minor modifications have been made to previously mapped geologic contacts, where warranted, by observations in our subsurface explorations or field mapping. Bedrock units shown on the Preliminary Geologic Map (**Plate III**) are discussed from oldest to youngest below.

7.2.1 Sisquoc Formation (Tsq)

The Sisquoc Formation underlies the entire Property at depth but has very limited outcrops within the western portion of the Property. These late Miocene to middle Pliocene age marine deposits generally consist of diatomaceous mudstone and less diatomaceous clayey mudstone. The concentration of diatoms varies, but can comprise on the order of 50-65% of the rock by volume. Owing to the relatively high percentage of diatoms, the dry densities in this formation typically are low (75-90 pcf).

In outcrop, the weathered rock appears virtually white in color. This massive rock is highly fractured and jointed, and bedding within the diatomaceous strata is rare. Typically, this formation forms relatively steep slopes, but is prone to landsliding where the fracture and joint patterns are adversely oriented.

Cut slopes in this formation and fills derived from this formation are not anticipated. If encountered, compaction of fill composed of this formation is considered to be problematic owing to the high percentage of diatoms, and would require somewhat tedious, time-consuming moisture conditioning and blending. Also, compacted fill derived from the Sisquoc Formation is prone to have unusually high compressibility and unusually low shear strength. The Sisquoc Formation do not crop out in the area planned for development and therefore will not impact the proposed grading concept.

7.2.2 Careaga Sandstone Formation (Tcac and Tcag)

The Careaga Sandstone Formation (Tcac and Tcag) conformably overlies the Sisquoc Formation (Tsq) and is conformably overlain by the Paso Robles Formation (QTp). The Careaga Sandstone Formation is Pliocene in age and consists of two members, the lower fine-grained Cebada Member (Tcac), and the upper coarse-grained Graciosa Member (Tcag), both of which are marine deposits. At some locations the basal portion of the Careaga Formation is soaked with tar where it has migrated upward through the Sisquoc Formation. This was not observed on the Property. Where these areas have been observed in outcrop (by others), they are shown on the Regional Geologic Map (**Plate II**) as Tcat.

7.2.2.1 Cebada Member (Tcac)

The Cebada Member of the formation conformably overlies the Sisquoc Formation and outcrops locally across the Property. This member is locally absent and the Graciosa Member directly overlies the Sisquoc Formation. The Cebada Member consists predominately of light gray and light yellowish brown to tan, fine to very fine grained, massive sands that are weakly cemented and friable. Our subsurface explorations typically encountered fine-grained sandstone to sandy mudstone.

Since this member of the Careaga Sandstone Formation has low cohesion due to poor cementation and its high percentage of fine-grained sand, it tends to form gentle rolling hills which are susceptible to deep erosion where concentrated water flow occurs.

7.2.2.2 Graciosa Member (Tcag)

The Graciosa Member overlies the Cebada Member at the Property. The Graciosa Member is composed of two parts: a lower part that consists of coarse-grained gray and brown sandstone and conglomerate (sand and gravel) with local medium-grained sandstone and an upper part that consists of coarse-grained gray sandstone (Woodring and Bramlette, 1950). Cross bedding is common, especially in the upper part. The pebble and cobble clasts are almost entirely composed of white procelaneous shale in the lower part. In the upper part, reddish and gray quartzite and rhyolite porphyry are the chief pebble and cobble constituents. Hard, resistant sandstone lenses which form

ledges also occur in the upper part. Fossiliferous strata occur in the lower part, and are concentrated in "reefs" of hard sandstone.

7.2.3 Paso Robles Formation (QTp)

The majority of the Paso Robles Formation on the Property outcrops along the eastern Property boundary. This non-marine formation conformably overlies the Careaga Sandstone Formation, and consists of moderately to poorly consolidated conglomerate and sandstone interbedded with siltstone, clayey mudstone, and minor lacustrine limestone.

The sandstone and conglomerate units are typically gray to grayish-brown and light yellowish-brown to tan in color, poorly sorted, and cross bedded. The siltstone and clayey mudstone beds are typically olive brown to light brown in color and 1 inch to a few feet thick. The limestone beds are typically gray in color and discontinuous. Per the published references, a zone of 50 to 100 ft thick clay deposits occurs near the base of the Paso Robles Formation over most of the Santa Maria area, and is used as a marker bed to differentiate it from the Careaga Sandstone Formation. A thick clay bed was not specifically observed in Trench Log GT-125 that exposed the Paso Robles Formation overlying the Graciosa Member of the Careaga Sandstone Formation. Therefore, this clay marker bed may not likely be continuously present at the Property. Nevertheless, an approximately 20 ft thick clay bed was encountered below a landslide deposit in Boring BA-2, which may represent the basal clay of the Paso Robles Formation, or may be an intermediate clay bed located above the referenced 50 to 100 ft thick clay bed.

7.3 Surficial Deposits

7.3.1 Older Alluvium (Qoa)

Published maps have older alluvium that mantles some of the lower slopes that flank the canyons (Dibblee, 1989). These deposits are a remnant stream terrace deposit. The older alluvium is estimated to be Pleistocene in age (i.e., older than 11,700 years). This geologic unit is mapped west of the Property and is illustrated on the Regional Geologic Map (Plate II) and the within the Preliminary Geologic Map (Plate IV) based on Bicknell Road and Graciosa Road Site Access plan.

7.3.2 Alluvium (Qa)

Alluvium (Qa) occurs in the canyon bottoms. A residual soil has developed at the surface of the alluvium and is typically 2 to 5 ft thick. For ease of discussion the alluvial canyons areas are discussed by the following neighborhood plan land uses:

Alluvium in Solomon Canyon (Areas 19 and 20), alluvial canyons that drain east towards Solomon Canyon (Areas 17, 18 and 31; Areas 21 and 22; Areas 23 through 29; and Area

30), alluvial canyons that drain west towards Harris Canyon (Area 15 and WWTP), and alluvial canyons that drain south towards Careaga Canyon (Areas 1 through 14).

7.3.2.1 Alluvium (Solomon Canyon)

The alluvium along the western edge of Solomon Canyon (Areas 19 and 20) is primarily derived from the erosion of adjacent hillsides that consist of the Paso Robles Formation bedrock (QTp). Our exploration in this canyon included CPT-12 through CPT-15In general, the soil behavior type from the CPTs indicate the alluvium consists of sand mixtures of silty sand to sandy silt with interbeds of clean sands to silty sands.

7.3.2.2 Alluvium (drainage towards Solomon Canyon)

The alluvium in the canyons that drain towards Solomon Canyon (Areas 17, 18, 21 through 31) is primarily derived from the erosion of adjacent hillsides that consist of the Cebada Member of the Careaga Sandstone Formation bedrock (Tcac) in the upper portion of the canyons, Graciosa Member of the Careaga Sandstone Formation bedrock (Tcag) in the middle portions of the canyons, and Paso Robles Formation bedrock (QTp) near the mouth of the canyons. Due to the influence of these bedrock units, the alluvium consists of interbedded variable yellowish/orangish to dark brown silts, clays, silty sands, and clayey sands. Coarse-grained soils are generally loose to medium dense in the upper 45 ft (e.g., HS-8), and medium dense below 45 ft. Dry densities range from 89 to 121 pcf with moisture contents ranging from 2.4 to 30.6 percent (with an average of 10.6 percent). Our representative exploration in these canyons included:

- Areas 17, 18 and 31: HS-5, HS-48, HS-49, and ST-24.
- Areas 21 and 22: HS-9, HS-10, HS-14, HS-15, CPT-1 to CPT-5, CPT-13, ST-22, and ST-23.
- Areas 23 through 29: HS-6, HS-7, HS-8, HS-11, HS-12, HS-13, CPT-6 to CPT-12, and ST-18 to ST-21.
- Area 30: HS-47 and ST-17

7.3.2.3 Alluvium (drainage towards Harris Canyon)

The alluvium in the canyons that drain towards Harris Canyon (Area 15 and WWTP) is primarily derived from the erosion of adjacent hillsides that consist of the Graciosa Member of the Careaga Sandstone Formation bedrock (Tcag) in the upper portion of the canyons and Cebada Member of the Careaga Sandstone Formation bedrock (Tcac) the in the lower portions of the canyons. Due to the influence of these bedrock units, the alluvium consists of variable interbedded (light) yellowish-brown to brown/black silts, clays, silty sands, and clayey sands. Our representative exploration in this canyon included: CPT-20 to CPT-23, GT-160, and GT-173. In general, the soil behavior type

from the CPTs indicate the alluvium in Area 15 consists of sand mixtures of silty sand to sandy silt with interbeds of sandy silt to clayey silt and clean sands to silty sands. The alluvium at the WWTP consisted of a sand to a 15 ft (maximum depth of test pit).

7.3.2.4 Alluvium (drainage towards Careaga Canyon)

The alluvium in the canyons that drain south towards Careaga Canyon (Areas 1 through 14) is primarily derived from the erosion of adjacent hillsides that consist of the Graciosa Member of the Careaga Sandstone Formation bedrock (Tcag). Due to the influence of these bedrock units, the alluvium consists of variable interbedded (yellowish) brown to (dark) gray silts, clays, silty sands, and clayey sands. Dry densities range from 81 to 121 pcf with moisture contents ranging from 6.1 to 23.8 percent. Our representative exploration in this canyon included: CPT-17 to CPT-19, HS-16, HS-17, HS-38 to HS-46, GT-209 to GT-213, GT-237 and GT-238.

7.3.3 Slopewash (Qsw)

Slopewash, or colluvium, is a heterogeneous deposit formed on slopes as a result of weathering, sheet wash, creep and shallow debris flows on sloping ground. This unit is generally thickest in swales and side canyons, and at the toe of existing natural slopes, where it commonly interfingers with the canyon alluvial deposits. The slopewash generally consists of poorly sorted, pebbly silty sand, but varies depending on the composition of the underlying source material. The maximum thickness of slopewash encountered in our exploratory excavations is about 10 feet. Slopewash is noted on the geologic logs but is not shown on the Preliminary Geologic Map (Plate III).

7.3.4 Soil

Natural areas of the Property are mantled by surface soils consisting of moderate to yellowish-brown and yellowish-gray silty sand with scattered pebbles. This unit is noted on our geologic logs but is not shown on the Preliminary Geologic Map (Plate III).

7.4 Mass Movement Deposits

7.4.1 Landslides (Qls)

Landslides and suspected landslides are shown on the Preliminary Geologic Maps (**Plate III and IV**). The Property was initially evaluated for suspected landslide affect bedrock based on previously mapped slides from published maps, geomorphology observed during our field reconnaissance, slides interpreted from review of aerial photographs, geomorphology from topographic maps. Subsequent, subsurface exploration at some locations confirmed the presence of landslide affected bedrock and at other locations that landslide affected bedrock was not present. Queried landslides on the Preliminary

Geologic Maps which are without subsurface explorations are considered suspected landslides.

For discussion purposes, we have categorized the landslides into three groups: megalithic (depth >100 ft), intermediate (30 ft < depth < 100 ft) and moderate to small (depth < 30 ft).

Many of the mapped landslides are suspected to be relatively shallow (depth < 30 ft) owing to the overall geologic structure and to the generally sandy bedrock. Exceptions to this include some of the landslides on steep and high slopes adjacent to canyons that were deeply incised in late Pleistocene times. Notably, the landslide on the eastern side of Mt. Solomon and the landslide in the area of the baseball field are considered to be megalithic, deep-seated landslides (depth >100 ft). Intermediate landslides (30 ft < depth <100 ft) occur throughout the Property.

7.4.2 Surficial Failures (Qsf)

Shallow surficial failures involving soil, slopewash and (weathered) bedrock were observed. Approximate locations and extent are shown on the Preliminary Geologic Map. Any of the surficial failure material, which exists in areas of proposed development, shall be removed prior to the placement of the compacted engineered fill (Cef).

7.5 Artificial Fill (af)

Existing non-compacted artificial fill on the Property ranges from minor spill fills generated during past grading of minor roads and oil well pads. (Undocumented) artificial fill has been noted on the geologic logs but is not shown on the Preliminary Geologic Map.

7.6 Groundwater

Groundwater level records from the US Geological Survey website were reviewed for water wells in the vicinity of the Property (see the Groundwater Well Location Map). The water well in Solomon Canyon just south of the Property (Site Number 344936120214301) has a highest depth of measured groundwater below the ground surface of 198 ft. The highest depth of measured groundwater below the ground surface is 91 ft (Site Number 344841120242001), which is located west of the Property in the alluvial canyon that drains west towards Harris Canyon. The regional groundwater table is very deep, per the Orcutt Community Plan.

The groundwater encountered during our subsurface investigation of the alluvial canyons on the Property is opined to be perched condition in the alluvium above the bedrock. Groundwater was observed at the following locations and depths:

Location	Neighborhood Plan Land Uses	Boring/Test Pit	Depth Beneath Ground Surface (ft)
Alluvial Canyons draining east towards Solomon Cyn	Areas 23 – 29	HS-6	40
		HS-8	60
	Areas 21 & 22	HS-9	60
		ST-22	15
Alluvial Canyons draining south towards Careaga Canyon Cyn	Areas 1 - 14	HS-38	33
		HS-42	15
		GT-209	9 (small seep)
		GT-210	9 (small seep)
		GT-211	9 (small seep)
		GT-212	11 (small seep)
		GT-214	9 (small seep)

Groundwater in Areas 21 and 22 alluvium was observed at a depth of 60 ft in boring HS-9. However, ground water was not observed in borings HS-10, HS-14, and HS-15 (which extended to depths ranging from about 60 to 70 ft).

Groundwater in Areas 23 through 29 alluvium was observed at depths of 40 ft and 60 ft in borings HS-6 and HS-8, respectively. Ground water was not observed in borings HS-7, HS-11, HS-12, and HS-13 (which extended to depths ranging from about 50 to 65 ft).

Groundwater in Areas 1 through 14 alluvium was observed at depths of 150 ft and 33 ft in borings HS-42 and HS-38, respectively. Ground water was not observed in remaining alluvial explorations borings in these areas. The test pits GT-209 through GT-212 and GT-214 encountered water seeps at a typical depth of 9 ft.

The depths of historical high groundwater levels in the drainages adjacent to the Property are greater than 50 ft. However, at this time there is insufficient data to evaluate historical high groundwater levels in the canyon alluvial deposits at the Property. Our subsurface explorations indicate that there is a potential for groundwater in the alluvium at the Property. This groundwater is likely a perched condition on the underlying bedrock. Therefore, a 25-ft depth of groundwater was assumed in the liquefaction potential evaluation of the alluvial deposits.

Deciding on the design-depth of historical high ground water strongly affects estimates for liquefaction potential and its associated consequences, which are currently driving the geotechnical design features associated with the alluvial canyon deposits at the Property. Generally speaking, the shallower the assumed historical high groundwater for geotechnical analysis, the more stringent the geotechnical design feature requirements. The liquefaction

analyses can be further evaluated based on additional subsurface investigations. Further study of historic high ground water levels will likely identify even lower groundwater depths than our assumptions, which may provide an opportunity to reduce potential liquefaction hazards.

7.7 Soils Shear Strength

Direct Shear testing was performed on relatively undisturbed samples of alluvium, bedrock, landslide debris, and on remolded samples of on-site soils and bedrock from the Property. Remolded test specimens prepared to evaluate fill strength parameters were compacted to a moisture content close to Optimum Moisture Content and to about 90 percent of Maximum Dry Density, based on ASTM Test Method D1557. Re-sheared test specimens were used to evaluate shear strength parameters of fine-grained material oriented along bedding in cut slopes and natural slopes. Results of the testing are presented in **Appendix B** and were used to estimate design values of shear strength of the Property's materials. Soil shear strength parameters used in the design and analyses are presented in **Appendix E**, Slope Stability Analysis.

8.0 POTENTIAL GEOLOGIC AND GEOTECHNICAL HAZARDS/CONSTRAINTS AND POTENTIAL AVOIDANCE MEASURES AND DESIGN FEATURES

8.1 Seismic Considerations

8.1.1 Introduction

The subject Property is within the Coast Ranges Geomorphic Province of California. The Coast Ranges consist of northwest-trending mountain ranges and valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. The Solomon and Casmalia Hills form the southern edge of Santa Maria Valley. The Solomon Hills were formed by compressional forces uplifting the basement rocks, ultimately causing west-northwest trending folds and thrust faults. The Casmalia fault, also referred to as the Orcutt Frontal, is inferred to extend along the northeast flank of the Solomon Hills. Other faults near the Property are the Los Alamos, San Luis Range, Lion's Head, and West Huasna strike-slip and reverse/thrust faults.

The California region is traversed by the San Andreas Fault, which is a transform boundary between the Pacific Plate and the North American Plate. The San Andreas Fault is part of the San Andreas system of northwest-striking, right-lateral faults. The faults of this system are generally historically active, as evidenced by the June 28, 1992 Landers (M7.6).

The California region is seismically active and commonly experiences strong ground shaking resulting from earthquakes along active faults. Earthquakes along these faults are part of a continuous, naturally occurring process, which has contributed to the characteristic landscape of the region. Common geologic hazards associated with earthquakes are discussed below and include **Ground Rupture**, **Ground Motion**, and **Ground Failure**.

8.1.2 Ground Rupture

Earthquake faults in California that are defined as active may present a hazard of fault rupture. The California Department of Conservation, California Geologic Survey (CGS), Special Publication 42 defines an active fault as one which has had surface displacement within Holocene time (about the last 11,700 years). Review of the Earthquake Fault Zone Maps provided in the California Department of Conservation, Division of Mines and Geology, Special Publication 42 indicates that there are not any known active faults within the Property, per the criteria specified in the Alquist-Priolo Earthquake Fault Zoning Act.

The potential for ground rupture was further evaluated utilizing published maps in conjunction with field mapping and subsurface exploration programs. The California Geological Survey ("CGS") Fault Activity Map of California show the inferred trace of

the Casmalia Fault Zone, which includes a trace north of the Property, a potential south easterly extension along Solomon Canyon, and an Pezzoni-Casmalia fault trending into the southern portion of the Property. In addition, Orcutt Oil Field faults west of the Property (see **Quaternary Fault Location Map, Figure C1**). The CGS indicates late Quaternary fault displacement (during the past 130,000 years) for the Casmalia and Orcutt Oil Field faults.

8.1.2.1 Casmalia Fault (Orcutt Frontal)

The Casmalia Fault (Orcutt Frontal) was originally identified in the subsurface from oil field data in the Solomon Hills, and inferred to extend along the northeast flank of the Casmalia Range and Solomon Hills. Based upon oil well data, this fault is interpreted to be a blind thrust fault concealed below the ground surface. This fault is believed to be responsible for the uplift of the Casmalia Range and Solomon Hills. The Orcutt and Mt. Solomon anticlines are part of a series of en-echelon northwest trending anticlines that define the Casmalia-Orcutt anticlinal trend. These anticlinal folds are typically asymmetrical in cross section, wherein the southern limbs are long and gently dipping and the northern limbs are moderately to steeply dipping, consistent with folding typically found in the upper plate of a blind thrust fault.

The Casmalia Fault (Orcutt Frontal) is believed to be Late Quaternary in age by some authors and other authors believe that it is seismically active, as shown by recent seismicity attributed to it, including the May 29, 1980 Point Sal Earthquake (M = 5.1).

The fault is located north of the Mount Solomon anticlinal fold axes. Larger scale maps (1:24,000 scale map) indicate the concealed surface trace of the Casmalia Fault is located north of the Property (Dibblee, 1989 and Sweetkind, et al., 2021). The Fault Activity Map of California (Jennings and Bryant, 2010) show the Casmalia Fault (Orcutt Frontal) extending further to the east and bending to the southeast in Solomon Canyon along the eastern property line of the Property. Other maps (Jennings, 1987; Woodring, 1950 and Sweetkind, et al., 2021) show a fault near the same location in Solomon Canyon but do not show it connecting to the Casmalia Fault (Orcutt Frontal) system. The Dibblee geologic maps (1989 and 1994) do not show a fault in Solomon Canyon. In addition, the Fault Activity Map of California shows an inferred Pezzoni-Casmalia fault with it northern most location on the southern portion of Property.

There is a strong aerial photographic lineament east of Mount Solomon that is on trend with the eastern end of a Casmalia fault as mapped by Dibblee. Two backhoe trenches (GT-9 and GT-10) were excavated on either side of this strong aerial photographic lineament, east of Mt. Solomon to investigate the potential for faulting. The geologic

structure encountered in the trenches was consistent across the lineament, suggesting that the lineament is likely due to lithologic conditions rather than faulting.

The inferred fault mapped in the vicinity of Solomon Canyon is believed to be a blind thrust. Therefore, ground rupture hazard on the fault is considered to be low to practically non-existent. This fault is not illustrated on the Preliminary Geologic Map (**Plate I**) because of its speculative and uncertain location.

The Pezzoni-Casmalia fault that is mapped crossing the southern portion of the Property is an inferred location. Therefore, this fault is not illustrated on the Preliminary Geologic Map (**Plate III**). Bedrock bedding measured in our subsurface exploration in general has consistent shallow dips to the southwest, with only few exceptions at the very southwestern portion of the Property dipping to the northeast. Published maps (Dibblee, 1989 and 1994) indicate synclines to the east and west. The change in bedding dip directions is more than likely due to syncline structure, which is reasonable based on projections of Dibblee syncline axial traces. No evidence of faulting was observed or suspected at the southern portion of the Property.

8.1.2.2 Orcutt Oil Field Faults

Review of published geologic maps (Dibblee, 1989) that cover the Property indicate that the "Orcutt Oil Field faults" are west of the Property, except for a north-south trending fault that crosses the north west portion of the Property (See Regional Geologic Map, Plate II). The Orcutt Oil Field faults consist of a group of small east-west and north-south trending faults each generally less than 1 mile in length. Detailed mapping by the USGS indicates that some of these fault traces occur or are inferred to occur on the Property. The "Orcutt Oil Field fault" shown on the Regional Geologic Map (**Plate II)** are vertical to near-vertical in orientation and are believed to be Quaternary to Late Quaternary in age (i.e., not Holocene). Development is currently not proposed where the projection of this published map fault trace (located roughly 1,300 ft to the east) crosses the Property

On the adjacent Property to the west a 275 ft long trench was excavated and geologically logged across this eastern most published map trace of a north-south trending Orcutt Oil Field faults. We did not observe any evidence of faulting in this trench. Sandy and clayey bedrock units of the Paso Robles Formation (QTp) were observed in the trench. Published geologic maps (Dibblee, 1989) of this area show the Paso Robles Formation in fault contact with the Careaga Formation to the east, implying that the fault cuts across the younger Paso Robles Formation. Based on the findings in this trench, the Paso Robles Formation continues further to the east across the mapped trace of the fault.

This indicates that the fault is unlikely to reach the surface at this location and that the Paso Robles Formation is younger than the last episode of movement on this fault. Based upon this relationship, the fault is not considered to be active or to be a source of primary ground rupture hazard. Secondary seismic effects of this Orcutt Oil Field fault will need to be evaluated if future development is proposed over it. The closest fault trace (projection) is roughly 1,300 ft away from the currently proposed building pad's locations.

The potential for ground rupture hazard from the Orcutt Oil Field faults on the Property is considered to be low.

8.1.3 Building Setbacks due to Fault-Rupture Hazard

Based on lack of evidence for faults on the Property during our subsurface explorations, we judge that it is unlikely that there are fault traces on the Property that have produced surface ground rupture during the Holocene (~last 11,700 years). Therefore, under the current State of California criteria, no building setbacks to minimize potential ground rupture hazard are required at this time.

8.1.4 Ground Motion

8.1.4.1 General

The Property is located in California, which is in a geologically and seismically active region where large-magnitude, potentially destructive earthquakes are common. Therefore, it is reasonable to assume that moderate or large magnitude earthquakes along any of the numerous faults in the region are expected to produce strong ground shaking at the Property in the future.

The Casmalia fault, which has an inferred surface trace located about 0.9 mi north of the Property, is the closest known potentially active fault to the Property. The active **San Andreas fault** is located about 44 mi northeast of the Property. Large earthquakes along these, or along any of the other numerous faults in the region, are expected to produce strong ground shaking at the Property in the future.

The current standards for construction provided in the California Building Code are designed to safeguard against major failures and loss of life, but are not intended to limit damage, maintain functions or provide for easy repair. Per Structural Engineers Association of California (SEAOC), conformance to these recommendations does not constitute any kind of guarantee or assurance that significant structural damage will not occur in the event of a maximum level of earthquake ground motion. However, it is reasonable to expect that a well-planned and constructed structure will not collapse in a

major earthquake and that protection of life is reasonably provided, but not with complete assurance.

Although research on earthquakes during the last fifty years has greatly enhanced the level of understanding of earthquake faulting in California, the record is much too short to constrain behavior of all faults in Southern California and the attenuation characteristics of all areas relative to each future potential earthquake. Predicted accelerations should, therefore, be considered **rough estimates** rather than precise facts and ground motions from future earthquakes may exceed the predicted accelerations. Neither the **Time, Location, nor Magnitude** of an earthquake can be accurately predicted at this time.

8.1.4.2 Earthquake Magnitude

Earthquake **magnitude** is a quantitative measure of the strength of an earthquake or the strain energy released by it, as determined by seismographic or geologic observations. It does not vary with distance or the underlying earth material. This differs from **intensity**, which is a qualitative measure of the effects a given earthquake has on people, structures, loose objects, and the ground at a specific location. Intensity generally increases with increasing magnitude and in areas underlain by unconsolidated materials and decreases with distance from the epicenter. The approximate magnitude necessary to generate these effects is shown on the 1956 version of the Modified Mercalli intensity scale (Appendix C). Approximate locations of historic earthquakes are shown on the appended Earthquake Epicenter Location Map (**Figure C2**).

The table below presents the distances to nearby significant faults located within about 25 miles radius of the Property. The site-to-source distances were obtained from the USGS fault parameters online database (based on 2008 National Seismic Hazard Maps). The maximum earthquake magnitudes (M) were calculated using the Ellsworth-B magnitude-area scaling relationship presented in Appendix E of the Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3).

Summary of Major Known Faults Within 25 Miles

Distance (Miles)	Fault Name	Dip Degrees	Dip Direction	Slip Sense	Magnitude
0.09	Casmalia (Orcutt Frontal)	75	SW	reverse	6.7
5.99	Los Alamos-West Baseline	30	S	thrust	7.0
6.41	San Luis Range (So Margin)	45	N	thrust	7.2
7.19	Lions Head	75	NE	Reverse	6.8
20.58	Los Osos	45	SW	thrust	7.0

Distance (Miles)	Fault Name	Dip Degrees	Dip Direction	Slip Sense	Magnitude
20.95	Hosgri	80	E	strike slip	7.3
22.32	Santa Ynez (West)	70	S	strike slip	7.0
22.32	Santa Ynez Connected	70		strike slip	7.4

8.1.4.3 Evaluation of Peak Ground Acceleration

Peak ground acceleration (PGA) is equal to the maximum ground acceleration that occurs during earthquake shaking at a location. PGA is equal to the amplitude of the largest absolute acceleration recorded on an accelerogram at a site during a particular earthquake. PGA is an important parameter (also known as an intensity measure) for earthquake engineering.

The peak ground acceleration (PGA_M) consistent with maximum considered earthquake (MCE_R) ground motions was evaluated at the Property for alluvial soils (Site Class D, stiff soil) and bedrock (Site Class C, very dense soil and soft rock) conditions in accordance with ASCE 7-16. The mapped PGA_M adjusted for Site Class effects was determined using the OSHPD Seismic Design Maps web tool by the Structural Engineers Association of California (SEAOC) for a 2% probability of exceedance in 50 years (i.e., 2,475-year return period). Based on our evaluation, a probabilistic PGA_M of 0.49g (alluvial) and 0.50g (soft bedrock) would be produced by the maximum considered earthquake.

Standard ASCE 7-16 is an integral part of building codes in the United States and is adopted by reference into California Building Code, 2022. ASCE/SEI 7-16 includes contour maps of maximum considered earthquake geometric mean (MCE_G) Peak Ground Acceleration, PGA, Figs. 22-9 through 22-13, for use in geotechnical investigations. Based upon these figures, PGA's in California typically range from 0.3g to 1.2g, depending upon site location and other factors.

8.1.4.4 Deaggregation of Fault Hazard

A probabilistic analysis evaluates a range of magnitudes from 5.0 to the maximum magnitude for each fault. However, the dominant magnitude which statistically generates the peak acceleration within a limited time period (e.g., 2,475 years) is typically less than the maximum magnitude for a given fault.

In order to evaluate what dominant magnitude-distance combination produces the PGA_M, the hazard was deaggregated using the USGS *Beta – Unified Hazard Tool* and an estimated average shear wave velocity ($V_{S,30}$) for the upper 100 feet (~30 meters) of 259 meters per second based on Site Class D soil conditions. Review of the magnitude-

distance contributions to the hazard indicates that this acceleration would most likely be generated by a magnitude 6.11 earthquake on the Casmalia fault located at a distance (Rrup) of less than 1 km from the Property, as shown graphically in **Figure C3**.

A magnitude weighting factor of $M_W^{2.56}/10^{2.24}$ from Youd and Idriss (1997) was used to normalize the MCE_R ground motions to an "equivalent" magnitude 7.5 event. Based on this relationship a weighted peak ground acceleration of 0.29g was used for evaluation of liquefaction potential at the Property (see **Appendix D**).

8.1.5 Ground Failure

Ground Failure is a general term describing seismically induced secondary permanent ground deformation caused by strong ground motion. This includes liquefaction, lateral spreading, seismic settlement of poorly consolidated materials (dynamic densification), differential materials response, slope failures, sympathetic movement on weak bedding planes or non-causative faults, shattered ridge effects and ground lurching.

Potential secondary seismic hazards to potential development areas at the Property are described below. The potential for liquefaction and seismic settlement are evaluated in detail in **Appendix D**. The potential for adverse impacts to the proposed development from liquefaction and other secondary seismic effects is considered manageable for practical design purposes, provided that our recommendations are incorporated into future designs and implemented during construction.

8.1.5.1 Potential for Liquefaction and Associated Ground Failure

Potential for liquefaction at the Property and the magnitude of associated liquefaction-induced ground failure (i.e., seismic settlement, lateral spread displacements, and surface manifestation) were evaluated using data from our subsurface explorations, in compliance with the procedures and policies of the County of Santa Barbara and the State of California. Ground motions estimated using USGS seismic design map web applications and assumed historic high ground water levels were used in this evaluation. The procedures and results of the evaluation are described in detail in **Appendix D**.

Cone Penetration Test (CPT) soundings and hollow-stem-auger boring were performed by this firm to better evaluate the engineering characteristics of the Property's soils and the liquefaction potential. Liquefaction methods based on the CPT have the advantage of continuous, repeatable measurements, whereas SPT-based data by itself (from HS borings) collects point data typically every 5 ft, which usually results in an overestimation of seismically induced settlement. Therefore, our liquefaction analysis heavily relies on CPT soundings. As a geotechnical option (and not necessarily a requirement) to reduce potential over-conservatism during the evaluation of the future

improvement plans, consideration could be given to additional CPT Soundings, at least 50 ft deep (or practical refusal), particularly in the areas where SPT-based analysis (collected from HSAs) indicates large seismic deformations, including but not limited to Areas 17, 18 & 31, and Areas 1 through 14. Adequate "correlation" HSA borings also need to be drilled adjacent to new CPTs. Further adequate laboratory testing and analysis are also required accordingly. The foregoing will help to possibly reducing remedial earthwork design features and foundation requirements as the improvement plans develop.

Our liquefaction analysis, its rationale, consequences and the recommended design features are extensively discussed in **Appendix D**.

8.1.5.2 Potential for Other Modes of Ground Failure

Earthquake-induced slope failures include activation and reactivation of landslides, rock falls, debris flows and surficial failures. The potential for earthquake-induced slope failures to adversely impact the proposed development is considered manageable, provided that our recommendations and those of the Supervising Civil Engineer are incorporated into the proposed design and implemented during construction.

8.2 Slope Stability

Long-term static stability (overall and surficial) of slopes with a factor of safety of at least 1.5 and seismic stability of slopes with a factor of safety of at least 1.1 were assumed to be adequate. Seismic slope stability calculations were performed using a pseudo-static horizontal ground acceleration coefficient, k_h, of 0.1.

8.2.1 Proposed Cut-Slopes

The Grading Plan in general proposes slope gradients at 3.8:1 to 2.5:1 (H:V) or flatter. Based on ultimate shear strength values measured on in-situ specimens of geologic materials from the Property, global-overall static stability and static surficial stability of the following cut slope inclinations up to 105 feet are reasonably adequate with the assumption of favorable geological structure (e.g., bedding planes anti-dip to the slope face). Further, where warranted based on peak shear strength values of the same test specimens, pseudo-static seismic stability of the following cut slopes is adequate.

Geologic Formation	Allowable Cut Slope (Horizontal:Vertical)
Paso Robles Formation (QTp)	2.5:1
Cebada member (Tcac)	2.5:1
Graciosa member (Tcag)	2.5:1

In addition, identified are 7 proposed cut-slopes (100 feet or higher) on the Grading Plan. These cut-slopes have been designated as CS-1 through CS-7 on the Preliminary Geologic Map (Plate III). Cut-slope CS-1 is approximately 110 feet in height at a 2.5:1 (H:V) gradient. Cut-slopes CS-2 through C-7 range from 130 to 235 feet in height at gradients ranging from 3.6:1 (H:V) to 3.8:1 (H:V). The slope geometry, anticipated geologic conditions and recommended design features, if necessary, for each slope are presented in **Table 1 – Summary of Cut Slopes** located at the end of the text. Cross sections have been constructed to illustrate the anticipated geologic conditions relative to the grading design from Cut-slopes CS-3 through CS-6. The proposed cut slopes were evaluated and critical slopes that were analyzed within **Appendix E** satisfy the standard of care factor of safety requirements for slope stability for static and pseudo-static loading conditions. See the Slope Stability Appendix E for details.

If any of the smaller proposed cut-slopes (less than 25± feet in height) have adverse geologic or grading configurations (e.g., fill over cut) to address (potential) slope instability geotechnical design features can be implemented such as a standard 15- to 20-foot-wide key (depending on the proposed cut-slope height) and/or benching similar to a Stability Fill.

Permanent cut-slopes should be constructed at a slope ratio not steeper than 2:1 (H:V). All permanent cut-slopes in artificial fill, alluvium or slopewash should be constructed as a Stability Fill. Temporary cut slopes should be evaluated during the Grading Plan stage.

8.2.2 Proposed Fill Slopes

Review of the Grading Plan indicates that fill slopes are proposed at a 2.5:1 (H:V) gradient or flatter. The maximum proposed fill slope height is 145 feet (located at Cross Section 13-13') with a slope gradient of 3.1:1 (H:V). The second highest proposed fill slope is 125 feet (located at Cross Section 13-13') with a slope gradient of 3:1. Cross sections 13-13' and 14-14' illustrate the anticipated geologic conditions relative to the grading design at these two fill slope locations. These proposed fill slopes were evaluated and critical slopes that were analyzed within **Appendix E** satisfy the standard of care factor of safety requirements for slope stability for global-overall static, static surficial stability and pseudo-static loading conditions. See the Slope Stability Appendix E for details.

The maximum proposed 2.5:1 (H:V) gradient fill slope height is 105 feet adjacent to Area 8 pad. Slope stability analyses performed on a 2.5:1 (H:V) gradient fill slope up to 105 feet high was analyzed within **Appendix E** utilizing the various fill shear strengths depending on the source of the cut material for the compacted fill. Fill slopes with this configuration (i.e., height and gradient) satisfy the standard of care factor of safety

requirements for slope stability for global-overall static, static surficial stability and pseudostatic loading conditions. See the Slope Stability Appendix for details.

Typically, 2.5:1 (H:V) gradient slope over 30 ft in height will be practically 2:1 (H:V) gradient slope once drainage devices are incorporated into the slope configurations at the Tentative Tract Map and/or Grading Plan stage. The incorporation of drainage devices into the slope configuration is not anticipated to significantly impact the gross stability analysis. However, preliminary evaluation of surficial slope stability indicates that fill slopes constructed from fill derived from the Graciosa Member of the Careaga Sandstone Formation (Tcag) should be made at 2.25:1 (H:V) gradient or flatter.

The fill strength should further be evaluated at the improvement plan stages and during grading operations to confirm the fill strengths meet the minimum strength requirements for fill slope surficial stability standard of care factor of safety (i.e., 1.5).

8.2.3 Natural Slopes

Due to the complexity and variability of geometry, geology and geotechnical stability of the steeper natural slopes at the Property could have a significant impact on buildable areas for structures and roads in the vicinity of ascending natural slopes. Static stability of natural slopes at locations with advantageous bedding dip is adequate for bedrock slopes with an inclination of 2:1 (H:V), or flatter, for slope heights up to about 100 feet.

Risks associated with natural slopes with an insufficient slope stability factor of safety may be minimized by establishing a Restricted Use Area (RUA) on the down-slope side of the toe of slope in where habitable improvements (e.g., buildings and roads) are prohibited. Additional slope stability analyses will be required to determine the width of this RUA based on a hypothetical post-failure condition.

The height and gradient of ascending natural slopes adjacent to the proposed development were evaluated and cross sections (i.e., 2-2', 3-3', 5-5', 6-6', 7-7', 8-8' and 15-15') have been constructed at selected locations of ascending natural slopes adjacent to proposed development. The procedures and results of the evaluation are described in detail in **Appendix E**. If the slopes did not calculate stable, preliminary setback lines for road and/or buildings are indicated on the Cross Sections (e.g., 6-6', 7-7' and 8-8').

8.2.4 Debris Flow Hazards

Debris flows typically require a combination of loose colluvial soil, steep slopes and be exposed to period(s) of intense rainfall and/or may be triggered by an earthquake. Destructive debris flows originate on slopes with gradients between 26 to 56 degrees (Campbell 1975). Debris flows on slopes of 27 degrees or less do not tend to accelerate

and are not generally considered a geo-hazard. Potential for debris flow hazard for development proposed adjacent to ascending natural slopes steeper than 2:1 (H:V) gradient will need to be evaluated. Catchment areas and/or impact walls can be designed, where appropriate, to minimize areas of potential debris flow hazard.

Potential debris flow hazard on the natural slopes adjacent to the proposed "final" building pads should be evaluated by the geotechnical engineer/geologist of the record as the improvement plan moves forward. Typical methodology used to assess and identify the potential debris source areas are outlined below:

- Review of historic aerial photographs covering the Property and adjacent areas for evidence of debris flow in the form of scars, bare rock, variation of vegetation densities that might indicate locations where older debris source areas might be present and geomorphic lobes that might represent accumulation for a debris flow.
- Review of the topographic base map to determine areas that are steeper than approximately 26 degrees or approximately 2:1 (H:V).
- Field mapping by a qualified engineering geologist to determine locations and general composition of loose colluvial soil.

During the improvement plans stage, design features need to be developed such as a debris basin and conveyance channel, debris basin and/or impact walls to minimize risk associated with debris flow hazard for adequate containment of potential debris volumes.

8.3 Deep Fill Areas

The design grading of the Property proposes some areas of deep fills (up to 100 feet from the existing grade to the proposed pad grade). Due to the susceptibility of deeper fills to have a higher degree of settlement over time than thin fills, we recommend that settlement monitoring be performed for the deeper fill areas. Delineation of fills deeper than 40 ft and settlement monument locations should be performed at the Grading Plan stage. Fills placed deeper than 40 ft from the proposed grade should be compacted to at least 93 percent of Maximum Dry Density, per ASTM D1557. This higher compaction requirement is intended to reduce the amount of post grading settlement of the deeper fills.

8.4 Soil Compressibility and Hydro-consolidation

8.4.1 Hydro-Compression (Collapse)

Hydro-compression is volume reduction that occurs when unsaturated soil materials are inundated with water. Soil materials most prone to hydro-compression are sandy and silty soils with dry density less than about 108 pcf and moisture content less than about 8

percent. Some alluvial samples with dry density and moisture content values in this range were observed in the alluvial canyons that drain east towards Solomon Canyon to depths as great as about 50 to 60 ft in Area 17, 18 and 31 and Area 21 and 22 and up to 45 ft in Area 23 through 29, and up to 10 ft in the alluvial canyons that drain south towards Careaga Canyon. Hydro-compression (collapse) tests were performed on in-situ samples of alluvial deposits from these alluvial canyons. In general, compression of these specimens following inundation in water (at vertical pressures approximating the in-situ vertical pressure) was negligible and potential for additional settlement due to hydro-compression of these soils can be regarded to be low at this time. Given the wide area of the Property and our limited testing, further geotechnical confirmatory fieldwork and testing are recommended as the design phases move forward.

8.4.2 Compressibility of Alluvium

Settlement of alluvial soils could result from pressure applied to the soils by raising of grade and/or foundation loads. Based on field and laboratory test data, potentially compressible layers were encountered at depth in the alluvial canyons explored. Removal of compressible alluvial soils and replacement as compacted engineered fill (Cef) shall be performed to limit long-term (i.e., secondary) settlements of compacted fills and foundations under static loading. The depth of removal and re-compaction, in part, will be dependent on the height of proposed fills above the existing grade.

Primary settlement of alluvium that will be left in place is expected to take place rapidly after grade is raised. However, settlement monitoring is geotechnically required after the Property is raised to the design grade in order to decide when the rate of secondary settlement has reduced to a tolerable level for the proposed structures (e.g., less than 1 to 2 inches per 30 years). The settlement process depends on the variety of factors, including but not limited to, soil's permeability, water drainage paths, the thickness of fill placed, amount of vertical surcharge imposed, fluctuation in groundwater and pre-consolidation pressure, which is the maximum effective vertical overburden stress that a particular soil has sustained in the past. Further, cohesionless soils have higher permeability than cohesive soils that have small voids blocking the water movement. Therefore, settlement is more rapid in cohesionless soils versus cohesive soils. Given the size of the Property and variability of the foregoing parameters across the Property, it is not possible to determine the exact required length of the settlement monitoring program. Nevertheless, for preliminary planning purposes, and based upon our experience, the settlement monitoring can last from a few months to less than two years, in most cases within one year, and discontinued when the measured settlement during monitoring reaches a tolerance limit, so that the structures can be designed for the remaining settlement to occur.

8.5 Landslides

Determination of the existence, extent, and depth of the landslides should be performed on a case-by-case basis, as needed, at the Tentative Tract Map and/or Grading Plan stage. Proposed development on or adjacent to any landslide should be avoided where practical, unless sufficiently investigated and remediated. Landslides that may have the potential to impact the proposed development areas will require evaluation relative to gross stability. If calculated grossly unstable, avoidance measures and design features will be required that may include setbacks, complete removal and replacement with compacted engineered fill (Cef), stabilization utilizing a buttress fill, and/or a combination of buttress fill and shear key.

Development on or immediately adjacent to these deep-seated landslides (i.e., landslide east of Mount Solomon) should be avoided unless sufficiently investigated via subsurface exploration in order to define the three-dimensional geometry, material characteristics, and subsequent feasibility of remedial measures. A preliminary building setback line is shown on the Preliminary Geologic Map (Plate III) for the landslide on the eastern side of Mount Solomon.

Development adjacent to intermediate landslides may be possible with minimal remediation measures if favorable geometries occur with respect to the slope height, the slope gradient, and the basal landslide plane orientation. Risks related to the moderate to smaller landslides on the gentler slopes can be minimized by the removal and recompaction of landslide debris.

8.6 Expansion Potential

An Expansion Index of 46 (low expansion potential, per CBC classification) was measured on a clay sample from the Graciosa Member of the Careaga Sandstone Formation (Tcag) and an Expansion Index of 1 (very low expansion potential) was measured on a silty, clay sands from alluvial deposits and blends of alluvial and Tcag bedrock. Although expansion testing was not performed on samples from other geologic formations at the Property, expansion potential of the granular members of the untested formations (QTp and Tcac) is expected to be relatively low. However, the expansion potential can be very high for the clay beds in the Paso Robles Formation (QTp) and Cebada Member of the Careaga Sandstone Formation (Tcac).

Clayey materials from the Property are expected to have significant expansion potential when excavated and recompacted as fill. Ordinary construction practices for structures supported on expansive fill soils should be adequate to minimize problems associated with swell/shrink behavior of these soils that occurs as a result of cycles of wetting/drying. These practices include augmented embedment and reinforcement of footing foundations,

producing a high-water content in the upper 3 ft of fill prior to casting slabs-on-grade, and increasing slab-on-grade thickness and the quantity of reinforcement in slabs-on-grade. Since expansion potential of the Property's soils can reasonably be reduced by these practices, the presence of expansive soils is not expected to have significant impact on the feasibility of developing the Property.

Depending on the quantities of expansive materials present at the Property and on the sequence of construction, it may be possible to minimize the need for the expansion reduction practices of foundations listed above by placing expansive materials deep enough in fills or by mixing the expansive soils with sandy soils.

8.7 Potential Corrosivity of Soils

Soil is considered to be corrosive to concrete and/or steel if the measured resistivity is 1,000 ohm-cm or less, and/or if the sulfate concentration is 2,000 ppm (0.20%) or greater, and/or if the pH is 5.5 or less. Also, a soil with a chloride concentration greater than or equal to 500 ppm is considered deleterious to ferrous metals.

Soil resistivity, chloride content, soluble sulfate content, and pH were measured on alluvial soils and bedrock. Results of this testing was used to assess the potential corrosive effects on concrete and metals. The test results are summarized in Table B2 (**Appendix B**) and are discussed below.

- The measured resistivity values ranged from 1,329 to 13,751 ohm-cm (which classifies as mildly to corrosive to ferrous metals.
- Chloride content values ranged from 1 to 120 parts per million (ppm). Soils in this chloride content range have a negligible effect on concrete or ferrous metals.
- Sulfate content values ranged from 0.019 to non-detected. Soils in this sulfate content range have a negligible effect on concrete per ACI 318 (Table 4.3.1).
- Based on the pH value measured in the soil samples (6.4 to 8.15, with one sample at 5.2), measured acidity of the Property's soils is low and not anticipated to increase soil corrosivity.

Additional corrosivity testing of soils from the subgrades of footings and floor slabs should be performed following the Property's grading. This firm does not practice in areas of corrosion engineering, as it is not under the purview of geotechnical engineering services. A corrosion specialist may provide final recommendations for management of the potential corrosion of metals and concrete.

8.8 Soil Creep

Slope creep is an imperceptibly slow, progressive downward and outward movement of slope soils that can affect both the near-surface (surficial) soils and deep-seated (gross) soils. Slope softening is the result of increased moisture content as a result of rainfall and irrigation. As the soils approach saturation, an increase in the wet density and associated reduction in shear strength leads to slope deformation. For slope creep, cyclic wetting and drying of the soils also causes a reduction in shear strength that yields permanent deformation of surficial soils under their own weight. The progressive outward and downward movement due to slope softening or creep may cause distress to improvements near the top of slope. Some indications of slope softening or creep include lateral movement of patio slabs away from the home, tilting, stair-step cracking of walls oriented perpendicular to the slope, and downward deformation of improvements increasing with proximity to the slope.

Houses built on hillsides can fall victim to soil creep which causes the house to settle or slide. Soil creep not only leads to foundation damage but it can also create potentially hazardous conditions. Homes built on clay soils are susceptible to high pressure soil movement and excessive pressure on the foundation.

The Paso Robles Formation, observed onsite, is noted in the Seismic Safety Plan as a formation having potential soil creep susceptibility. Possible design features to address potential soil creep include, but are not limited to, avoidance, guniting of the slopes, structural design features (e.g., stiffening foundation system with additional reinforcement), and/or adequate planting of trees and other plants, designed and implemented by a qualified licensed landscape architect and/or an agricultural engineer. The more vegetation a surface has on it, the more the roots reinforce the soil, helping to keep the soil in place and minimizing, but not eliminating its movement. Not only does stabilizing the soil with root systems slow down soil creep, but it also it helps protect against erosion.

8.9 Subsidence

Per the County of Santa Barbara's Seismic Safety and Safety Element (amended July 2023): *"Despite inquiries to responsible agencies, no evidence of significant subsidence or problems related to subsidence in Santa Barbara County were uncovered. However, to our knowledge, no precise level lines or surveys have been measured in oil, gas or water producing areas in Santa Barbara County. Subsidence could be occurring in these areas, but if so, it is not significant since no problems have been reported. Establishment of a grid base and precise level surveys would be needed to determine subsidence.*"

8.10 Oil Wells

Review of the California Department of Conversation, Geologic Energy Management Division (CalGEM) well finder web page https://maps.conservation.ca.gov/doggr/wellfinder/#) indicates that numerous oil wells have been drilled on the Property. The oil wells are primarily located in the south western portion of the Property.

Where development is planned on or adjacent to existing oil wells, the wells should be evaluated and abandoned or re-abandoned following the recommendations from CalGEM, and all other applicable regulations. The development plans will likely need to be submitted to CalGEM for review relative to the proposed development and the wells. CalGEM reviews the well records relative to the proposed development and provides recommendations, which may include abandonment or re-abandonment to the latest CalGEM requirements. Typically, CalGEM policy is that structures not to be constructed above an oil well so that future access to the well may not be compromised in case of future leaks.

The permitting jurisdictional agency (e.g., Santa Barbara County) should also be consulted regarding policies relative to building in the vicinity of an oil well.

8.11 Building Setbacks

The standard building setbacks from ascending and descending man-made slope should be followed in accordance with the California Building Code, unless superseded by site-specific geologic and/or soils engineering evaluation.

8.12 Infiltration for Basins

The current design depicts several basins within the Property. Adequate infiltration testing at various depths, at the proposed location of basins (and other candidate locations), are recommended as the design team prepares improvement and construction plans. Applicable test methods, includes but are not limited to conventional infiltration testing in the boring, and ASTM D3385 Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer.

9.0 GENERAL CONSTRUCTION CONSIDERATIONS

9.1 Earthwork and Grading Recommendations

9.1.1 Removals and Benching

In order to provide a uniform firm bottom prior to placing fill soil, unconsolidated alluvium, artificial fill, slopewash, weathered bedrock, and landslide materials should be removed from areas to receive fill. The estimated depths of removals for alluvium in the canyons, slopewash, and weathered bedrock (excluding landslides) are 5 to 10 feet. A preliminary removal depth is indicated on the Preliminary Geologic Map (Plate III) at the explored subsurface location, that indicate deeper removals due to compressible soil, liquefaction and/or lateral spread. The excavated soils may be used as fill material, under observation and testing by the geotechnical engineer of the record.

Removal depths for these areas are based on our subsurface investigations, laboratory testing, proposed fill heights, and analysis results (including liquefaction, seismic settlement, and lateral spreading assessment) as well as geologic and geotechnical judgment.

In areas to receive compacted fill where the surface gradient is steeper than 5:1 (H:V) the soil mantle, colluvium and unsuitable material should be removed and such areas benched horizontally into the competent material prior to or in conjunction with fill placement (See **Appendix F, Fill Over Natural Slope**).

9.1.2 Cut-Fill Transitions (Over-Excavation)

Structures built on cut-fill transitions (transitions between bedrock/alluvium and fill) have the potential to be distress due to the differential settlements or differential material response to seismic events. It is recommended that the cut portion of cut-fill transition building pads be over-excavation and replaced as compacted fill. A typical minimum over-excavation is 5 below proposed pad grade. If on a cut/fill transition the maximum depth of fill exceeds 15 feet, then the thickness of the fill cap should be one-third of the deepest fill thickness below any proposed structure (see **Appendix F, Over-excavation for Transitional Cut and Cut-Fill Lot**). The depth of the over-excavation should be evaluated in more detail at the Grading Plan stage.

The bedrock may contain expansive claystone beds that could cause differential expansion. If excavation of the bedrock exposes expansive materials below proposed structures, then the bedrock should be over-excavated beneath the proposed structures and replaced with a compacted fill. A typical recommendation is an 8 ft minimum fill cap thickness to provide a surcharge of sufficient overburden pressure to limit bedrock

expansion to acceptable levels for proposed structures. The fill cap thickness required to provide a surcharge of sufficient overburden pressure to limit expansion should be evaluated during the grading operations based on swell testing of potentially expansive beds.

9.1.3 Fill Materials

The Property's soils that are free of debris, over-size rocks, topsoil and organic matter may be used as sources for compacted fills. Rock or similar irreducible material with a maximum dimension greater than eight (8) inches may not be placed in the fill. Rocks or hard fragments larger than four (4) inches shall not compose more than 25 percent of the fill and/or lift. Any large rock fragments over eight (8) inches in size, may be incorporated into the fill as rockfill in windrows after being reduced to the specific maximum rock fill size (see **Appendix F, Rock Disposal**). Where fill depths are too shallow to allow large rock disposal, special handling or removal may be required.

9.1.4 Fill Compaction

All fill material should be placed in uniform lifts not exceeding six (6) inches in its loose state, water conditioned to at least optimum moisture content, thoroughly mixed to obtain a near uniform moisture condition and uniform blend of materials, and compacted to a relative compaction to at least 90 percent of Maximum Dry Density (MDD), per ASTM D1557. For fills deeper than 40 feet, the portion of fill below a depth of 40 feet should be compacted to a relative compaction of at least 93 percent of MDD.

9.1.5 Construction of Fill Slopes

Fill slope inclination should not be steeper than 2:1 (h:v). The fill material within approximately one equipment width (typically 12 feet) of the slope face should be constructed with cohesive material obtained from the Property's soils.

Where fill slopes are constructed above natural ground with a gradient of 5:1 (H:V) or steeper, all topsoil, colluvium, and unsuitable material shall be removed and a keyway should be constructed at the toe of the fill slope with a minimum width of 15 feet, and a minimum depth of 3 feet into firm undisturbed earth (see **Fill Slope Over Natural Slope** detail in **Appendix F**). It is recommended that a minimum 15-foot width, measured horizontally from the slope face to the bench and/or backcut, be maintained.

Where fill slopes toe out on relatively level natural ground, the removals should be performed to a minimum 1:1 (H:V) projection from the toe of slope to the recommended removal depth, (see **Fill Slope Toeing Out on Flat Alluviated Canyon** detail in **Appendix F**).

Where sliver fill-slopes are proposed, it is recommended that the slope be constructed with a minimum 15-foot width Stability Fill throughout, which is keyed in at the toe of slope (see **Stability/Buttress Fill and Backdrains** detail in **Appendix F**).

9.1.6 Bulking/Shrinkage Behavior of Site Soil/Rock Deposits

Alluvial deposits, slopewash and weathered bedrock, and bedrock are expected to reduce in volume (i.e., shrink) when excavated and subsequently compacted to at least 90% of Maximum Dry Density. The calculated shrinkage estimates are based on a comparison of in-situ densities and compaction test data. In practice however, mixture of fine-grained and coarse-grained materials tends to produce fills with higher densities and shrinkage. Consequently, it would be prudent to assume that actual shrinkage could be on the order of ten percent higher than the calculated shrinkage estimates provided in the preceding tables. For purposes of preparing preliminary earthwork volume estimates, we recommend that the shrinkage factors provided in the right-hand column be used. Assumptions regarding design grades and/or earthwork quantities should be made accordingly. Calculated shrinkage values listed in the following table are based upon our limited laboratory testing.

Geologic Unit	Shrinkage (%)	
	Calculated	For Volume Estimation
Alluvium	7	15
Slopewash	N/A	15 – 20
Weathered Bedrock	N/A	10
Paso Robles (QTp)	7	17
Careaga Sandstone (Tcag/Tcac)	6	16

9.1.7 Compaction Characteristics

Ordinary earthwork methods may be used to place and compact fills composed of alluvium and bedrock derived from the Paso Robles (QTp) and Careaga Sandstone (Tcag/Tcac) formations.

9.2 Drainage Recommendations

Ground water and soil moisture conditions can vary seasonally or for other reasons. It must be recognized that we do not and cannot have complete knowledge of the subsurface conditions at the Property. It is possible that seepage could be encountered while stripping and excavating during Property's preparation at some areas (e.g., in drainages). Whenever seepage is observed, the condition must be evaluated by the Engineering Geologist and Geotechnical Engineer prior to covering with fill material.

9.2.1 Subsurface Water Control

Fill slopes, Buttress Fill and Stability Fills, as applicable, shall be provided with subsurface drainage as necessary for stability. A typical backdrain detail is included in **Appendix F**. Also, subdrains along the bottom of canyon fills should be constructed (see **Canyon Subdrain** detail in **Appendix G**). Recommended locations for canyon subdrains shall be provided at the grading plan stage.

Compacted fill shear keys that extend down to bedrock and across canyons are recommended to minimize the risks of potential lateral spreading. Subsurface drainage through these shear keys will be required to prevent the build-up of pore water pressure and ground water elevations up canyon from the shear keys. Recommendations for subsurface drainage devices shall be provided at the grading plan stage.

9.2.2 Surface Drainage and Erosion Control

The existing provisions in the Grading Ordinance for planting and irrigation of constructed slopes in conjunction with the following drainage recommendations will be sufficient protection against potential erosion within the Property.

Water should never be allowed to stand or pond on Building Pads nor should it be allowed to run over constructed slopes, but should be conducted to paved areas or natural waterways via non-erodible drainage devices and should flow. In addition, it is recommended that all drainage devices be inspected periodically and be kept clear of all debris.

Modification of the existing pad grades after approval of Fine Grading by the Project Supervising Civil Engineer could adversely affect the drainage of the Pads. Future landscaping, construction of walkways, garden walls, etc. must never modify the lot drainage unless additional remedial measures to ensure satisfactory drainage (area drains, additional grading, etc.) are designed and constructed in compliance with current Grading Ordinance Codes.

Positive surface drainage should be maintained away from buildings. The recommended drainage patterns should be established at the time of fine grading. Roof drainage should be collected in gutters and downspouts, which terminate at approved discharge points.

It should be expected that, even with the construction of carefully planned and designed erosion control measures, some erosion may occur during the first few wet seasons after the project is completed. Property's grading should be observed, particularly after heavy, prolonged rainfall, to identify erosion areas at an early stage. Maintenance work should be done as soon as practical to repair these areas and prevent their enlargement.

9.3 Sewage Disposal

We understand that sewage disposal will be by public sanitary sewers. A waste-water treatment plant is also proposed for this project, which appears "conceptually" feasible from a geotechnical and geological perspective. As the plant design moves forward and the footprints of applicable waste-water facilities (such as reservoirs, maintenance building, etc.) are determined, a project specific geotechnical investigation recommended for the proposed wastewater treatment, including but not limited to geotechnical borings at the location of reservoirs, to develop site-specific geotechnical recommendations as the improvement plans becomes available.

10.0 FEASIBILITY OF DEVELOPMENT

The Specific Plan and the grading proposed on the Overall Grading & Drainage Plan, dated October 15, 2023 is feasible for development from a of geologic and geotechnical standpoint provided our recommendations are followed and implemented throughout design and construction.

11.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations summarize the primary geologic and geotechnical issues that may impact the proposed development:

1. Potential for primary ground rupture on a fault at the Property is reasonably considered to be **low.**
2. The horizontal Peak Ground Acceleration (PGA) for an earthquake with a 2% probability of exceedance in 50 years (i.e., 2,475-year return period) is expected to be 0.49g in alluvial portions of the Property and 0.5g in portions of the Property where bedrock outcrops or is present at shallow depth. As discussed earlier, PGA's in California typically range from 0.3g to 1.2g, depending upon site location and other factors.
3. The alluvium valleys present in the canyon areas at the Property (see Preliminary Geologic Map, **Plate III**) are designated as a low problem rating relative to liquefaction with a no variation from the assigned rating within the Santa Barbara County Seismic Safety & Safety Element. Preliminary analysis using an assumed groundwater depth of 25 ft indicates potentially liquefiable alluvial soils are present at the Property at depths ranging from about 25 ft to 50 ft (i.e., the explored design depth for the purposes of liquefaction analysis). Removal and recompaction of the alluvial soils are standard project design features, which can minimize the total and differential settlements to tolerable levels. In addition, the potential for lateral spreading was identified in the alluvial areas. Potential for lateral spreading (following proposed grading and shear key constructions, where warranted as determined in the detailed design phase) is manageable for the preliminary design purposes.
4. The potential for earthquake-induced slope failures is moderate to high on the moderate to steep canyon slopes. To minimize risks, as the improvement plans develops further, all slopes should be evaluated at the design-level and during the grading by the Geotechnical Engineer/Geologist of the record, in order to design and implement suitable design features to further address potential risks associated with (possible) earthquake-induced slope failures.

5. The potential for seismic settlement (dynamic densification) during future seismic events can be practically ruled out in the bedrock portions for the Property but should be evaluated for in the alluvial, slopewash and landslide areas of the Property, as the improvement plan develops further.

6. Landslides and suspected landslides, have been mapped on the Property and along the anticipated secondary access to State Highway 135. However, there remains a possibility of unidentified landslides. Mapped landslides should be confirmed by subsurface exploration relative to their existence at the planning and design stages. All confirmed landslides will need to be evaluated with respect to the proposed development areas, anticipated secondary access to State Highway 135, and project design features to minimize potential risks and impacts implemented where necessary. Design features to address the issue by the Geotechnical/Geologist of the record, include but are not limited to, complete or partial removal of soil and/or replacement with engineered fill, adding shear keyways, buttressing, avoidance and/or implementation of Restricted Use Areas.

7. Proposed cut slopes anticipated to expose landslide material should be evaluated during the grading plan stage. These cut slopes may be stabilized with design features such as Buttress Fills and/or Shear Keys designed by a geotechnical engineer. These cut slopes can also be redesigned to avoid landslides.

8. Proposed fill and cut slopes should be evaluated for gross and surficial stability as the improvement plans develops. Proposed cut slopes will require subsurface investigation at to evaluate site-specific geologic conditions. Cut slopes with daylighted bedding conditions should be evaluated by the Geotechnical Engineer/Geologist of the record. Slopes that do not meet adequate factors of safety, and/or expose landslide materials, need design features, including but not limited to avoidance (e.g., setbacks), design at a shallower slope gradient, or constructing buttresses, stability fills and/or shear keys with compacted fill.

9. Steep natural slopes (e.g., gradients steeper than 2:1 (H:V)) and natural slopes with daylighted bedding conditions adjacent to the proposed development should be evaluated by the Geotechnical Engineer/Geologist of record as the improvement plans develop. This study should include subsurface investigation to determine the specific geologic conditions for evaluation. Natural slopes that will not have adequate factors of safety, will require design features such as buttresses and/or building/structural setbacks.

10. As the improvement plan develops for the anticipated secondary access to State Highway 135, a site-specific geotechnical study (with subsurface explorations along the proposed final alignment) should be conducted. This study should include, but not limited to,

stability evaluation of proposed cut-slopes, static settlements due to proposed fills heights above existing grades, R-Value testing and preliminary pavement sections.

11. A study should be conducted to evaluate potential debris flow hazard on ascending slope adjacent to proposed development. Avoidance of the hazard by selective structural locations, construction of impact or debris walls and/or debris basins, control of run-off or removal of loose surficial materials can be used to minimize potential debris flow hazard.

12. Rapidly buried silty sediments such as slopewash, alluvium and/or landslide debris may be subject to hydro-compression. Materials containing significant void space initially observed in the field and if characterized as susceptible to hydro-compression tests in the laboratory, should be removed prior to the placement of fill. During the grading plan stages, a study should be conducted to evaluate the hydro-compression potential of the thick slopewash deposits and portions of the alluvium and landslide debris.

13. The existing provisions in the latest version of the County of Santa Barbara Grading Ordinance 4477 (Erosion and Sediment Control Field Manual) for planting and irrigation of cut slopes and fill slopes will reduce, but not eliminate, the potential for erosion.

14. The bedrock competency, where explored, is variable across the Property. For preliminary planning purposes, grading operations are expected to be performed with the conventional equipment. Heavy single shank ripping will probably be required if massive conglomerate units are encountered.

15. Cobbles and small boulders could be present within the alluvium and the Paso Robles Formation on the Property. This oversize material may present difficulties during cutting operations with some types of equipment. In addition, oversize material will require special handling during fill construction.

16. During the improvement plan stage, a study should be conducted to evaluate the expansive potential of the fine-grained units of the bedrock formations as necessary depending on the design and construction stage. If these potentially expansive units are encountered in the final pad or street grades during construction, they should be evaluated by Expansion Index (EI) tests by the geotechnical engineer relative to risk reductions from special foundation designs and reinforcement. Alternatively, the expansive material can be removed to a specified depth determined by the geotechnical engineer and replaced with soil with very low to non-expansive characteristics. Alternatively, the expansive soil may be treated with additives to lower the expansion potential.

17. Soils on the Property may be corrosive to concrete and ferrous metals. Soil moisture, chemistry, and other physical characteristics all have important effects on corrosivity.

Testing during development will indicate what special measures, such as cement type in concrete and corrosion protection for metallic pipes, may be required for construction. A corrosion specialist may provide final recommendations to reduce the risk of potential corrosion of metals and concrete.

18. Planting and irrigation of cut slopes and fill slopes should be included in future design phases in order to improve surficial stability of slopes and to minimize potential for erosion.

12.0 LIMITATIONS

This report has been prepared by Allan E. Seward Engineering Geology, Inc. for the exclusive use of Solstra Communities California LLC and their contracted design consultants for the specific Property and development discussed herein. This report should not be considered transferable. Prior to use by others, this firm must be notified, as additional work may be required to update this report.

Additional investigation will be required to prepare recommendations for subsequent phases of development. In the event that any modifications in the design or location of the proposed development are planned, a written review by this firm will be required.

The proposed development is located in California, a geologically and tectonically active region, where large magnitude, potentially destructive earthquakes are common. Therefore, ground motions from moderate or large magnitude earthquakes could affect the Property during the design life of the proposed structure(s).

In performing these professional services, this firm has used the degree of care and skill ordinarily exercised under similar circumstances by reputable geologists and geotechnical engineers practicing in this or similar localities. The data presented in this report are based on results of preliminary field testing. It should be recognized that subsurface conditions can vary in time, and laterally, and with depth at a given property and that the conclusions and recommendations presented in this report are based on our observations and testing. Therefore, our **conclusions** and **recommendations** are **professional opinions** and are **not meant** to be a control of nature. We make no **warranty** of any kind, either **expressed** or **implied**.

This page intentionally left blank.

This opportunity of be of service is appreciated. If you have any questions regarding this report, please contact us.

Respectfully submitted,

Eric J. Seward, CEG 2110
Principal Engineering Geologist
Vice President



Martin Neely, MS, GE 2937
Principal Geotechnical Engineer



The following attachments and appendices complete this report.

Location Map following Page 6
References
Summary of Cut-Slopes **Table 1**
Preliminary Summary of Estimated Static Settlements at Selected Exploration Location **Table 2**

APPENDIX A – Subsurface Logs

- **Geologic Test Pits**
  - GT-1 to GT-29, GT-33 to GT-81, GT-100, and GT-103 to GT-124
  - GT-125 **Plate I**
  - GT-159 to GT-161, GT-166 to GT-174, and GT-197 to GT-244
- **Geotechnical Test Pits**
  - ST-17 through ST-24
- **Hollow Stem Auger Borings**
  - HS-5 to HS-17, and HS-38 to HS-49
  - Key to Symbols
- **Bucket-Auger Borings**
  - BA-1 to BA-6, BA-8 to BA-13, and BA-19 to BA-21
- **Cone Penetration Test Sounding Data**
  - CPT-1 to CPT-23

APPENDIX B – Laboratory Test Results

APPENDIX C – Seismicity

- Ground Motion and Response Spectra References
- Quaternary Fault Location Map Figure C1
- Modified Mercalli Scale, 1956 Version
- Earthquake Epicenter Location Map Figure C2
- Magnitude-Distance Contributions to Hazard Figure C3
- USGS Deaggregation Parameters and Output Table C1

APPENDIX D – Liquefaction Potential Assessment and Evaluation of Earthquake-Induced Settlements

APPENDIX E – Slope Stability Analyses

APPENDIX F – Construction Diagrams

- Fill Over Natural Slope 5:1 or Steeper
- Rock Disposal
- Fill Slope Over Natural Slope 5:1 or Steeper
- Fill Slope Toeing Out on Flat Alluviated Canyon
- Over-excavation for Transitional Cut and Cut-Fill Lots
- Stability/Buttress Fill and Backdrains
- Canyon Subdrain

APPENDIX G – Map and Cross Sections

- Solomon Hills Area Designations Map
- Solomon Hills Neighborhood Plan Land Uses, dated 8/28/2023
- Groundwater Well Location Map
- Groundwater Data **Table G1**
- Regional Geologic Map **Plate II**
- Cross Sections (1-1' thru 15-15')
- **Preliminary Geologic Map** **Plate III**
- **Preliminary Geologic Map** (Bicknell and Graciosa Rd Site Access) **Plate IV**

REFERENCES

Published

American Society of Civil Engineers, 2016, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-16), provisions and commentary.

American Society of Civil Engineers, 2021, Supplement No. 2 to the ASCE/SEI 7-16, October 14.

American Society of Civil Engineers, 2021, Supplement No. 3 to the ASCE/SEI 7-16, November 5.

ASTM International, Annual Book of ASTM Standards, 2023, Section 4 Construction, Volumes 04.08 and 04.09.

California Building Standards Commission, 2022, California Building Code (CBC): California Code of Regulations, Title 24, Part 2, Volumes 1 and 2

California Department of Conservation, California Geological Survey (CGS), 2018, Earthquake Fault Zones, A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California, Special Publication 42, 83 p.

California Department of Conservation, California Geological Survey, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A.

California Department of Conservation, California Geological Survey, 2018, Earthquake Zones of Required Investigation web application, https://maps.conservation.ca.gov/cgs/EQZApp/

California Department of Conservation, California Geological Survey, 2015, Fault Activity Map of California web application, https://maps.conservation.ca.gov/cgs/fam/.

CDCDMG, 1997, Guidelines for evaluating and mitigating seismic hazards in California: California Department of Conservation Division of Mines and Geology Special Publication 117.

Dibblee, T.W., Jr., 1994, Geologic Map of the Sisquoc Quadrangle, Santa Barbara County, California: Dibblee Geological Foundation Map DF-53, scale 1:24,000.

Dibblee, T.W., Jr., 1989, Geologic Map of the Casmalia and Orcutt Quadrangle, Santa Barbara County, California: Dibblee Geological Foundation Map DF-24, scale 1:24,000.

Hart, E.W., 1999, Fault-rupture hazard zones in California: California Division of Mines and Geology Special Publication 42, 24 p.

Jennings, C.W., and Bryant, W.A., 2010, Fault activity map of California: California Geological Survey, Geologic Data Map No. 6, map scale 1:750,000.

Jennings, C.W., Gutierrez, C., Bryant, W., Saucedo, G., and Wills, C., 2010, Geologic Map California: California Geological Survey, Geologic Data Map GDM-2.2010, 1 sheet, scale 1:750,000.

Seismic Safety & Safety Element, 2023, Santa Barbara County Comprehensive Plan.

Sweetkind, D.S., Langenheim, V.E., McDougall-Reid, K., Sorlien, C.C., Demas, S.C., Tennyson, M.E., and Johnson, S.Y., 2021, Geologic and geophysical maps of the Santa Maria and part of the Point Conception 30'×60' quadrangles, California: U.S. Geological Survey Scientific Investigation map 3472, 1 sheet, scale 1:100,000, 58-p pamphlet.

Sylvester, A.G., and Darrow, A.C., 1978, Structure and Neotectonics of the Western Santa Ynez fault system in southern California: Tectonophysics 52 (1979) 389-405.

University of Southern California (USC), Southern California Earthquake Center (SCEC), Workshop on "Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California", USC, Los Angeles, California, June 17, 1999.

U.S. Geological Survey, United States Seismic Design Maps web application, http://earthquake.usgs.gov/designmaps/us/application.php

REFERENCES

U.S. Geological Survey, Quaternary Faults and Folds in the U.S., Google Earth .kmz file, https://www.usgs.gov/natural-hazards/earthquake-hazards/google-earth-kml-files

U.S. Geological Survey, 2008 National Seismic Hazards Map – Source Parameters, https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/query_main.cfm

U.S. Geological Survey, Groundwater for USA: Water Levels, https://nwis.waterdata.usgs.gov/nwis/gwlevels

Woodring, W.P., and Bramlette, M.N., 1950, Geology and Paleontology of the Santa Maria District California: Geological Survey Professional Paper 222, 6 sheets scale 1:24,000, 185-p.

Table 1 – SUMMARY OF CUT-SLOPES

Proposed Cut-slope CS-1
(Area 16)

Slope Parameters: 110± feet high with a 2.5:1 (h:v) slope gradient

Direction Slope Faces: West to southwest

Cross Section: None

Anticipated Geologic Conditions: Anticipated to expose bedrock (Tcag and Tcac) dipping approximately 2 to 5° towards the proposed slope face. Comparison of the slope parameters and geologic conditions of this slope to a more critical proposed cut slope (i.e., Cut Slope CS-4) that satisfies the minimum factor of safety requirement of 1.50 indicates that this slope will also satisfy minimum safety factor requirements.

Comments: **Anticipated to be Grossly stable**.

Proposed Cut-slope CS-2
(Area 15)

Slope Parameters: 145± feet high with a 3.6:1 (h:v) slope gradient

Direction Slope Faces: West to southwest

Cross Section: None

Anticipated Geologic Conditions: Anticipated to expose bedrock (Tcag and Tcac) dipping approximately 4 to 9° towards the proposed slope face. Comparison of the slope parameters and geologic conditions of this slope to a more critical proposed cut slope (i.e., Cut Slope CS-4) that satisfies the minimum factor of safety requirement of 1.50 indicates that this slope will also satisfy minimum safety factor requirements.

Comments: **Anticipated to be Grossly stable**.

Proposed Cut-slope CS-3
(Area 15)

Slope Parameters: 210± feet high with a 3.7:1 (h:v) slope gradient

Direction Slope Faces: Southwest

Cross Sections: 12-12’

Anticipated Geologic Conditions: Bedrock (QTp and Tcag) anticipated to be dipping 7 to 9° towards the proposed slope face with apparent dips ranging 5 to 9°. Slope stability analysis on section 12-12’ satisfies the minimum factor of safety requirement of 1.50.

Comments: **Anticipated to be Grossly stable**.

Table 1 – SUMMARY OF CUT-SLOPES

Proposed Cut-slope CS-4
(Area 2)

Slope Parameters: 205± feet high with a 3.7:1 (h:v) slope gradient

Direction Slope Faces: Southwest to south

Cross Sections: 11-11'

Anticipated Geologic Conditions: Bedrock (QTp and Tcag) anticipated to be dipping 4 to12° towards the proposed slope face. Slope stability analysis on section 11-11'satisfies the minimum factor of safety requirement of 1.50.

Comments: **Anticipated to be Grossly stable**.

Proposed Cut-slope CS-5
(Area 1)

Slope Parameters: 235± feet high with a 3.8:1 (h:v) slope gradient

Direction Slope Faces: Semicircular – southwest to south

Cross Section: 10-10'

Anticipated Geologic Conditions: Bedrock anticipated to be dipping 2 to 12° towards the proposed slope face. Slope stability analysis on section 10-10'satisfies the minimum factor of safety requirement of 1.50.

Comments: **Anticipated to be Grossly stable**.

Proposed Cut-slope CS-6
(Area 1)

Slope Parameters: 215± feet high with a 3.7:1 (h:v) slope gradient

Direction Slope Faces: Southwest

Cross Section: 9-9'

Anticipated Geologic Conditions: Bedrock (QTp and Tcag) anticipated to be dipping 2 to12° towards the proposed slope face. Slope stability analysis on section 10-10'satisfies the minimum factor of safety requirement of 1.50.

Comments: **Anticipated to be Grossly stable**.

Table 1 – SUMMARY OF CUT-SLOPES

Proposed Cut-slope CS-7
(Area 1)

Slope Parameters: 140± feet high with a 3.7:1 (h:v) slope gradient

Direction Slope Faces: West to southwest

Cross Sections: none

Anticipated Geologic Conditions: Bedding (QTp and Tcag) anticipated to be dipping 7 to 12° towards the southwest with apparent dips anticipated to range between 5 to 7 degrees directly out of the proposed Slope face. Comparison of the slope parameters and geologic conditions of this slope to a more critical proposed cut slope (i.e., Cut-slope CS-6) that satisfies the minimum factor of safety requirement of 1.50 indicates that this slope will also satisfy minimum safety factor requirements.

Comments: **Anticipated to be Grossly stable**.

Table 2 – Preliminary Summary of Estimated Static Settlements at Selected Explored Location

Analyzed Location		Area #	Approx Boring EGL Elevation (feet)	Total Depth of applicable boring, BGS, (feet)	Depth to GW at the explored location, BGS (feet)	Assumed Min. Removal Depth, bgs (feet)	Maximum thickness of placed Fill/Cut (feet)	Estimated Static Primary Settlement (inches)	NOTES
Solomon Canyon	CPT-12	Basin @ Frontage Rd	779	50.3	Not Encountered	--	CUT 16±	Negligible	Located within proposed basin adjacent to Frontage Rd, 0 cut/fill @ road
	CPT-13	Frontage Rd	757	50	Not Encountered	--	CUT 1±	Negligible	
	CPT-14	~20	750	50.5	Not Encountered	5	0±	< ⅛	
	CPT-15	~19	725	50.4	Not Encountered	5	0±	< ⅛	
AREAS 17, 18 & 31	HS-5	3	738	70	Not Encountered	5	0±	< ⅛	
	HS-48	18	790	51.5	Not Encountered	5	1±	< ¼	Upper ~15' potentially compressible layers (NC-ML)
	HS-49	18	810	36.5	Not Encountered	5	5±	< ¼	Bedrock @ ~15 bgs
AREAS 21 & 22	CPT-1	22	774	50.7	Not Encountered	5	1±	< ¼	
	CPT-2	21	809	32.3	Not Encountered	5	1±	< ¼	
	CPT-3	21	840	33.9	Not Encountered	--	CUT 5±	Negligible	
	CPT-4	21	845	90.4	Not Encountered	--	CUT 10±	Negligible	
	CPT-5	21	838	50.5	Not Encountered	--	CUT 3±	Negligible	
	HS-9	21	822	65	60	10	8±	< 3½	Potential compressible layers from ~10' to ~20' bgs.
	HS-10	22	777	70	Not Encountered	5	0±	< ⅛	
	HS-14	21	857	60	Not Encountered	--	CUT 22±	Negligible	
	HS-15	21	801	70	Not Encountered	10	7±	< 2½	Assuming over-excavation & recompaction depth of at least 10' bgs (otherwise and additional ½ ft settlement will occur due to 7'raise in grade)

Table 2 – Preliminary Summary of Estimated Static Settlements at Selected Explored Location

Analyzed Location		Area #	Approx Boring EGL Elevation (feet)	Total Depth of applicable boring, BGS, (feet)	Depth to GW at the explored location, BGS (feet)	Assumed Min. Removal Depth, bgs (feet)	Maximum thickness of placed Fill/Cut (feet)	Estimated Static Primary Settlement (inches)	NOTES
AREAS 23 through 29	CPT-6	26	827	82.5	55.9	36½	3±	< 2	
	CPT-7	28	863	50.5	Not Encountered	31	22±	< 2½	
	CPT-8	28	891	48.7	Not Encountered	--	CUT 6±	Negligible	
	CPT-9	29	938	50.5	Not Encountered	--	CUT 3±	Negligible	
	CPT-10	24	897	67.9	Not Encountered	5	8±	< 4¼	
	CPT-11	24	882	38.5	Not Encountered	5	23±	< 3¼	
	HS-6	28	868	65	40	25	17±	< 5¼	
	HS-7	23	945	50	Not Encountered	--	CUT 30±	Negligible	
	HS-8	27	806	70	60	5	1±	< ¼	
	HS-11	29	917	65	Not Encountered	25	18±	< 2½	
	HS-12	24	880	60	Not Encountered	25	25±	< 2⅛	
	HS-13	24	893	60	Not Encountered	30	12±	< 1⅛	Assuming over-excavation & recompaction depth of at least 30' bgs, in part to eliminate potentially highly compressible clay layers from 17' bgs to 30' bgs

Table 2 – Preliminary Summary of Estimated Static Settlements at Selected Explored Location

Analyzed Location		Area #	Approx Boring EGL Elevation (feet)	Total Depth of applicable boring, BGS, (feet)	Depth to GW at the explored location, BGS (feet)	Assumed Min. Removal Depth, bgs (feet)	Maximum thickness of placed Fill/Cut (feet)	Estimated Static Primary Settlement (inches)	NOTES
AREAS 1 through 14	CPT-16	14	±1058	5.2	Not Encountered	--	CUT 18±	Negligible	
	CPT-17	13	±1037	10.3	Not Encountered	--	CUT 27±	Negligible	
	CPT-18	13 & 3	985	35.6	Not Encountered	5	25±	< 3	
	CPT-19	4	960	40.5	Not Encountered	5	20±	< 2¾	
	HS-16	14	1010	40	Not Encountered	15	30±	< ⅛	(Weathered) Bedrock @ 15' bgs
	HS-17	14	952	35	Not Encountered	15	28±	< ⅛	Bedrock @ 30' bgs
	HS-38 (~200' S of Fill Slope)	8	847	55.8	33	15	100±	< 11	Fill not specifically proposed @ boring location. Boring located ~70' south of toe fill slope of ~100' high).
	HS-39 (~585 S of Fill Slope)	8	830	61.4	Not Encountered	20	110±	< 14	Fill not specifically proposed @ boring location (Boring outside limits of grading), Boring ~315' south of fill slope toe.
	HS-40	8	836	26.4	Not Encountered	5	89±	< 8¼	Boring located down slope face (@ El 925), at top of slope 104' of fill.
	HS-41	9	867	50.7	Not Encountered	10	73±	< 9½	
	HS-42	9	858	35.8	15 (Perched GW)	5	82±	< 6	
	HS-43	11	885	43.7	Perched GW @ top of boring	5	75±	< 2	Bedrock @ ~10' bgs
	HS-44	9	949	41.3	Not Encountered	2	31±	Negligible	(Weathered) Bedrock at the ground surface
	HS-45	11	903	36.5	15 (Perched GW)	5	57±	< 9	
	HS-46	14	935	21.4	Not Encountered	5	45±	< ⅛	Bedrock ~5' bgs

Table 2 – Preliminary Summary of Estimated Static Settlements at Selected Explored Location

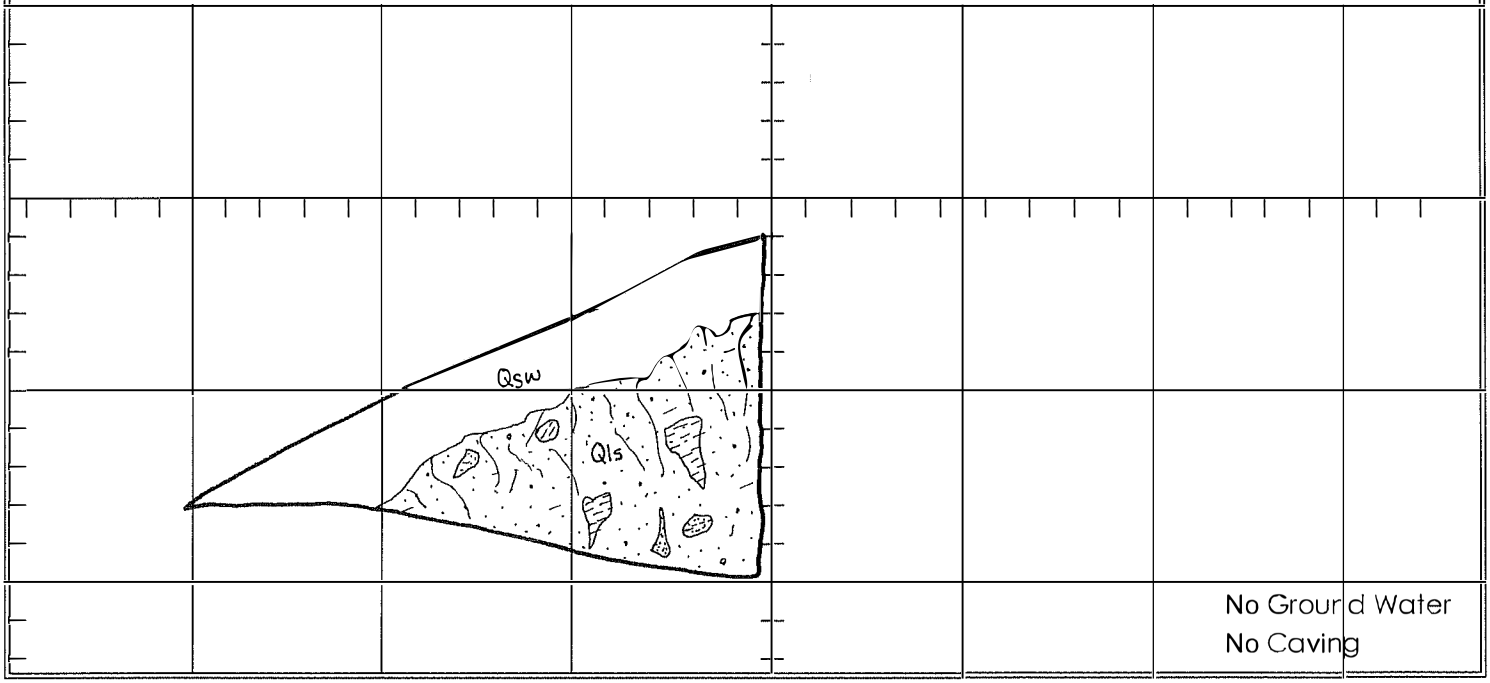
Analyzed Location		Area #	Approx Boring EGL Elevation (feet)	Total Depth of applicable boring, BGS, (feet)	Depth to GW at the explored location, BGS (feet)	Assumed Min. Removal Depth, bgs (feet)	Maximum thickness of placed Fill/Cut (feet)	Estimated Static Primary Settlement (inches)	NOTES
AREA 15	CPT-20	15	991	26.4	Not Encountered	5	34±	< 3¾	
	CPT-21	15	951	52	Not Encountered	28	74±	7	
	CPT-22	15	912	45.4	Not Encountered	30½	33±	6¼	
	CPT-23	15	937	48.2	Not Encountered	20	88±	11¼	
AREA 30	HS-47	30	865	51.4	Not Encountered	5	45±	< 5	Boring outside of grading limits, project to top of fill slope @ El. 920

Appendix A

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-1**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/2/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Medium- to dark-brown, sandy silt; loose; dry to damp **LANDSLIDE DEBRIS; Qls (2.5 - 9')** @ 2.5' Light yellowish-tan, very fine-grained, silty sandstone with blocks of light reddish-brown siltstone; soft to moderately hard; dry to damp COMMENTS: Highly weathered to 6' Landslide debris composed of Cebada member (Tcac)				
5									
10									
15									
20									

TOTAL DEPTH: 9 feet ←N76W SCALE: 1 inch = 5 feet

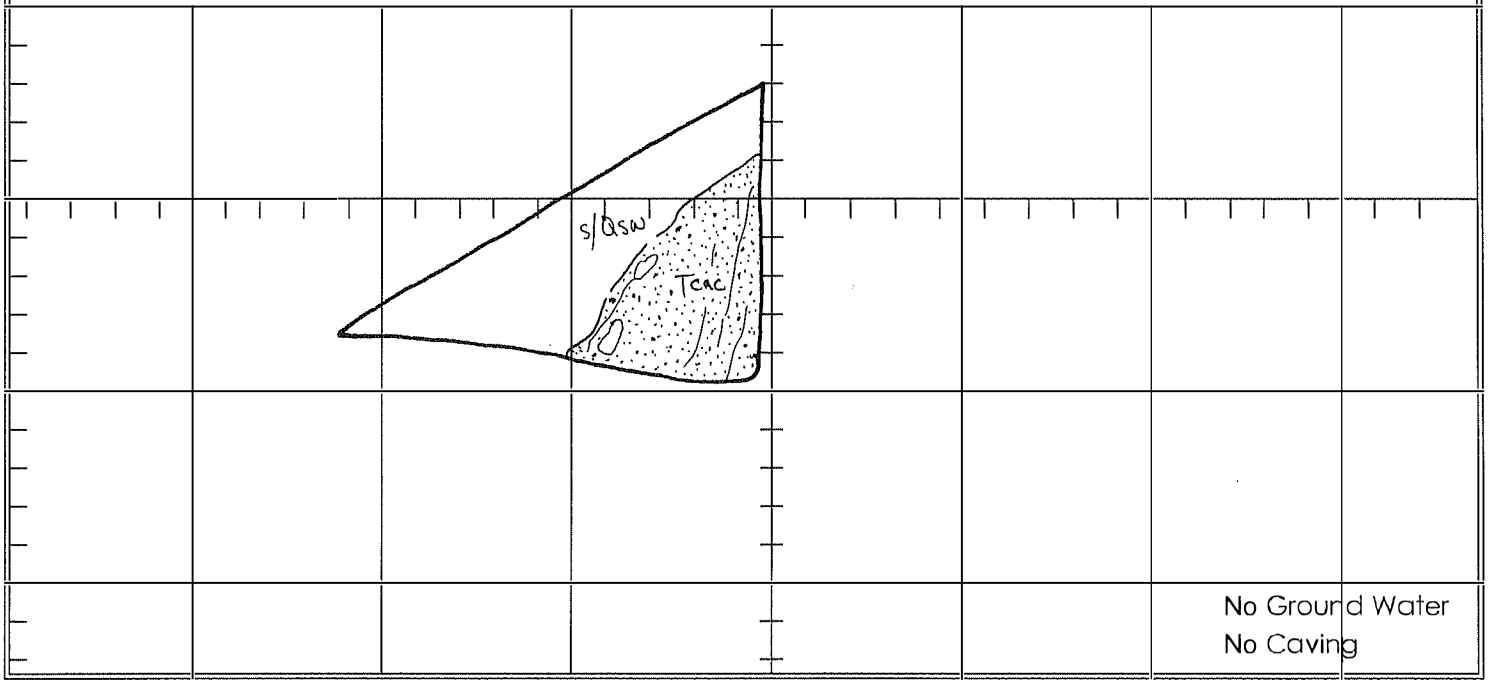


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-2**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/2/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Medium- to dark-brown, sandy silt; loose to medium dense; dry to damp **BEDROCK; Tcac (2 - 8')**				
5	X			CL-ML	@ 2' Light yellowish-tan, very fine-grained, silty sandstone; moderately hard; dry to damp; massive @ 3-8' Bulk sample	fr: N45E, 85SE			% fines=92.8 **Curve=D** Shear Test
10					COMMENTS: Highly weathered to 3.5'				
15									
20									

TOTAL DEPTH: 8 feet N55W→ SCALE: 1 inch = 5 feet

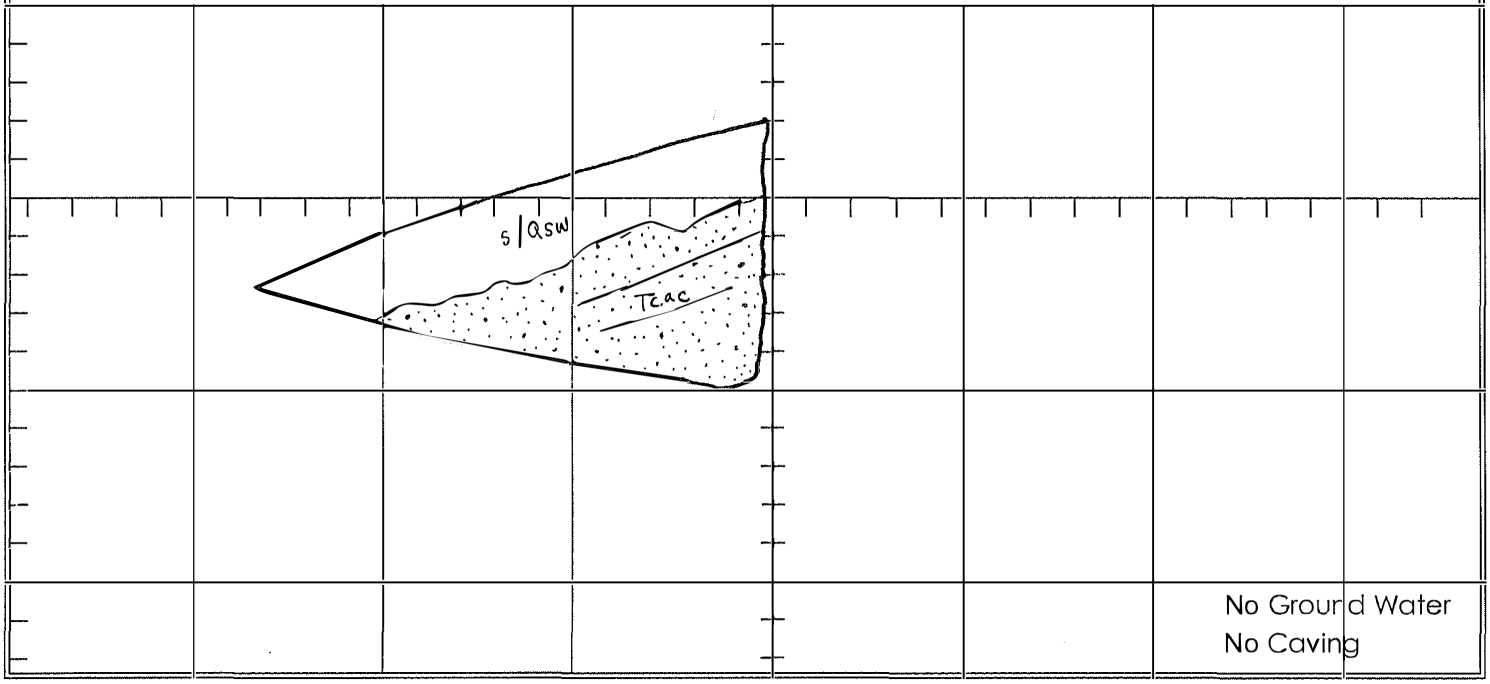


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-3**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/2/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Light- to medium-brown, silty sand; loose; damp to moist **BEDROCK; Tcac (2 - 7')** @ 2' Mottled light yellowish-tan and light orangish-brown, fine-grained sandstone; moderately hard; dry to damp; massive @ 3-7' Bulk sample COMMENTS: Highly weathered to 3.5' Near contact with Tcag, uphill to the north Bedrock is moderately hard but poorly cemented; cleans easily	fr: N80W, 30SW			
5									
10									
15									
20									

TOTAL DEPTH: 7 feet N2W→ SCALE: 1 inch = 5 feet

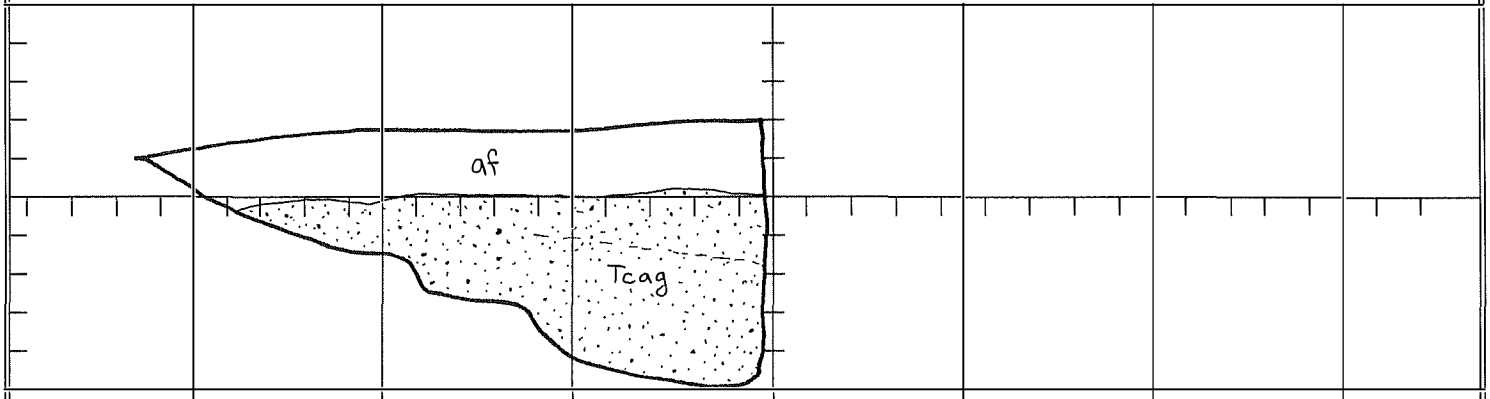


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-4**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/2/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**ROAD FILL; af (0 - 2')** @ 0' Dark-brown, silty sand with caliche pods; loose to medium dense; dry to damp **BEDROCK; Tcag (2 - 7')**				
5				SP-SM	@ 2' Light yellowish-tan, fine- to medium-grained sandstone; poorly consolidated but moderately hard; dry to damp @ 3-7' Bulk sample	B?: N25W, 13NE			**Curve=E** % fines=5.1 Shear Test
10					COMMENTS: Queried bedding attitude measured along planar exposure of caliche Excavated in road				
15									
20									

TOTAL DEPTH: 7 feet N17E→ SCALE: 1 inch = 5 feet

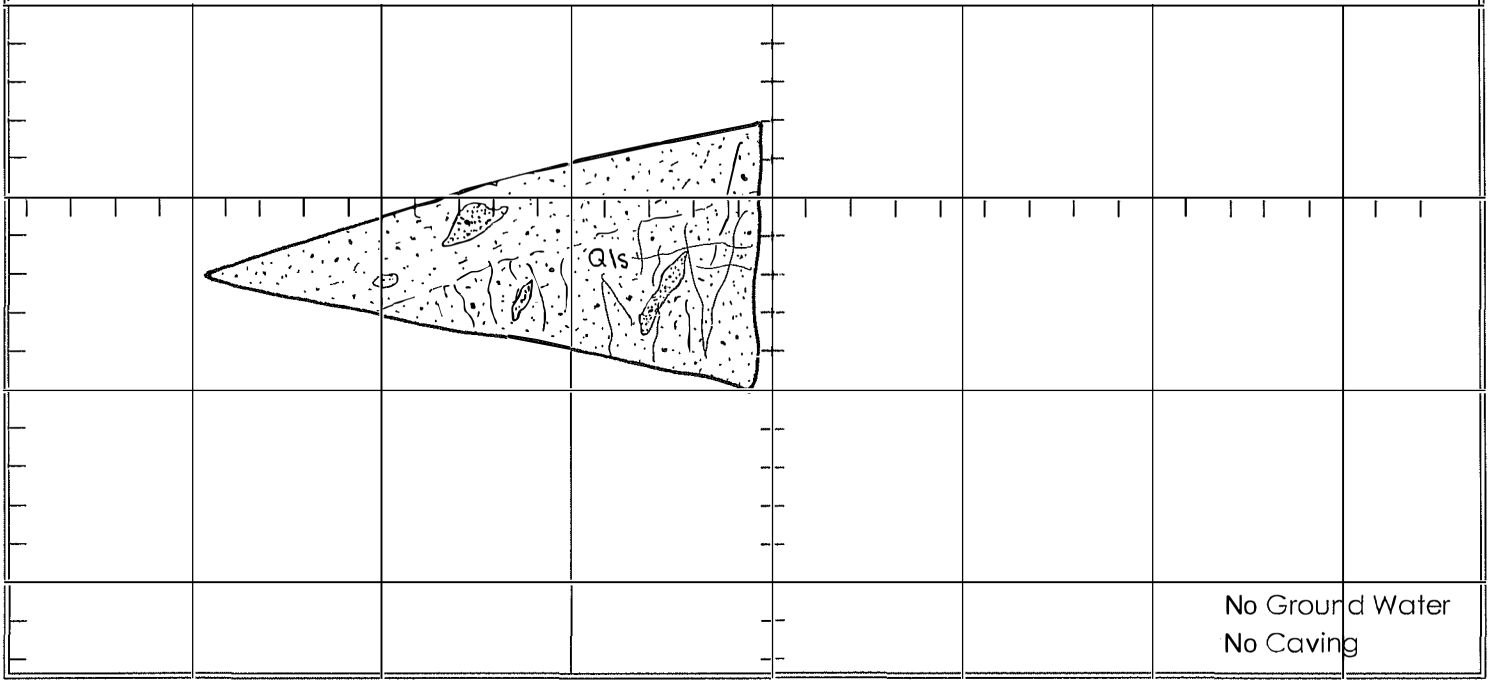


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-5**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/2/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Medium-brown, silty sand; loose; damp **LANDSLIDE DEBRIS; Qls (2 - 7')** @ 2' Mottled medium-brown, light yellowish-tan and orangish-brown sand with Tcag sandstone blocks; soft (friable) to moderately hard; damp @ 3-7' Bulk sample COMMENTS: Highly weathered to 7' Tcag resistant sandstone blocks/boulders (angular) on hilltop and in pit				
5	M								
10									
15									
20									

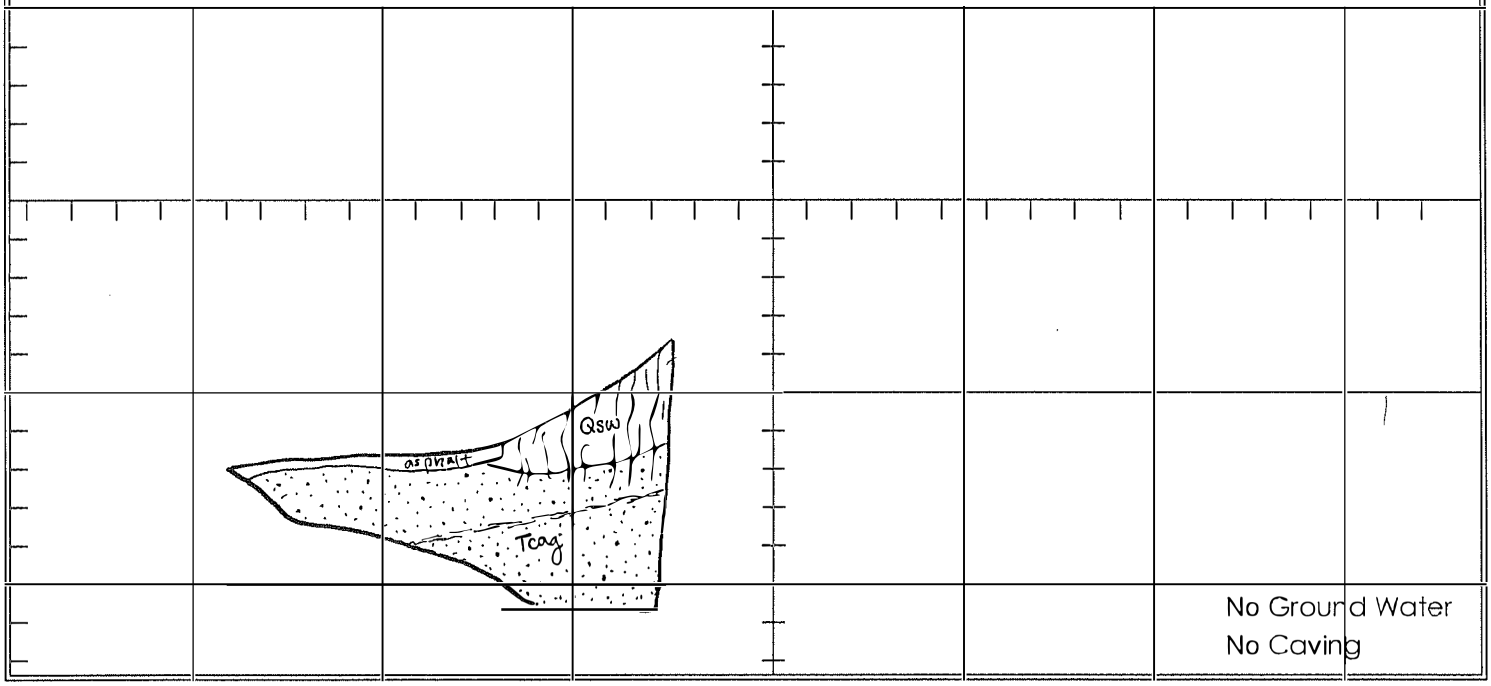
TOTAL DEPTH: 7 feet N28E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-6**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/2/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SLOPEWASH; Qsw (0 - 2.5')** Debris from weathering if backcut **BEDROCK; Tcag (2.5 - 7')** @ 2.5' Mottled light yellowish-tan and light orangish- tan, fine-grained, silty sand with scattered lime-green pebbles (1/8" to 1/4"); moderately hard; dry to damp; massive @ 3-7' Bulk sample COMMENTS: Highly weathered to 3' Excavated in abandoned oil pad backcut Moderately hard but cleans easily Indents with light hammer blows	B: N60E, 7SE			
5									
10									
15									
20									

TOTAL DEPTH: 7 feet N33W→ SCALE: 1 inch = 5 feet

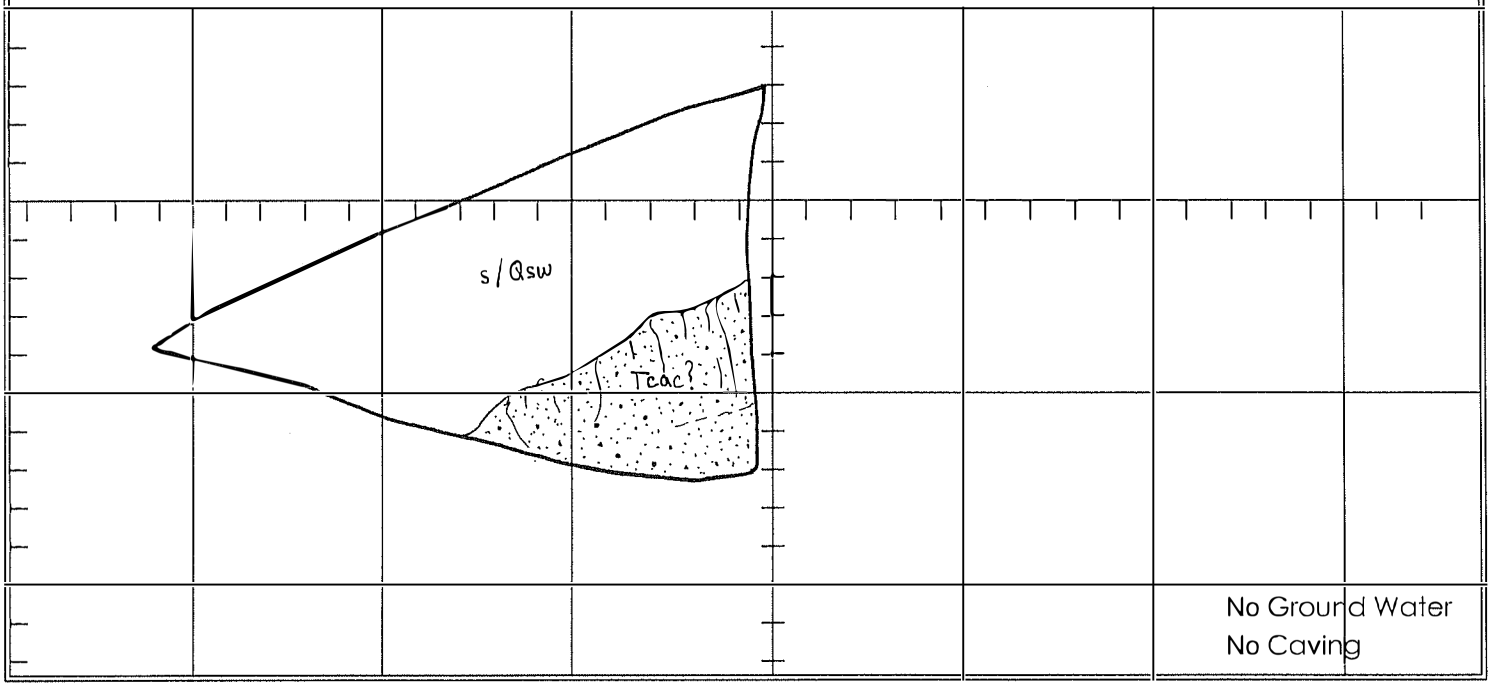


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-7**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 5')** @ 0' Dark-brown to black, sandy silt; loose to medium dense; damp to moist				
5					**BEDROCK?; Tcac? (5 - 10')** @ 5' Mottled light grayish-tan and light orangish-tan, silty sandstone to sandy siltstone; moderately hard; dry to damp				
10				CL-ML	@ 8-10' Bulk sample COMMENTS: Highly weathered to 7.5' Possible landslide debris but appears intact Soil is deep and well developed	Apx B: N80E, 19NW			% fines=97.4 **Curve=F**
15									
20									

TOTAL DEPTH: 10 feet ←N65E SCALE: 1 inch = 5 feet

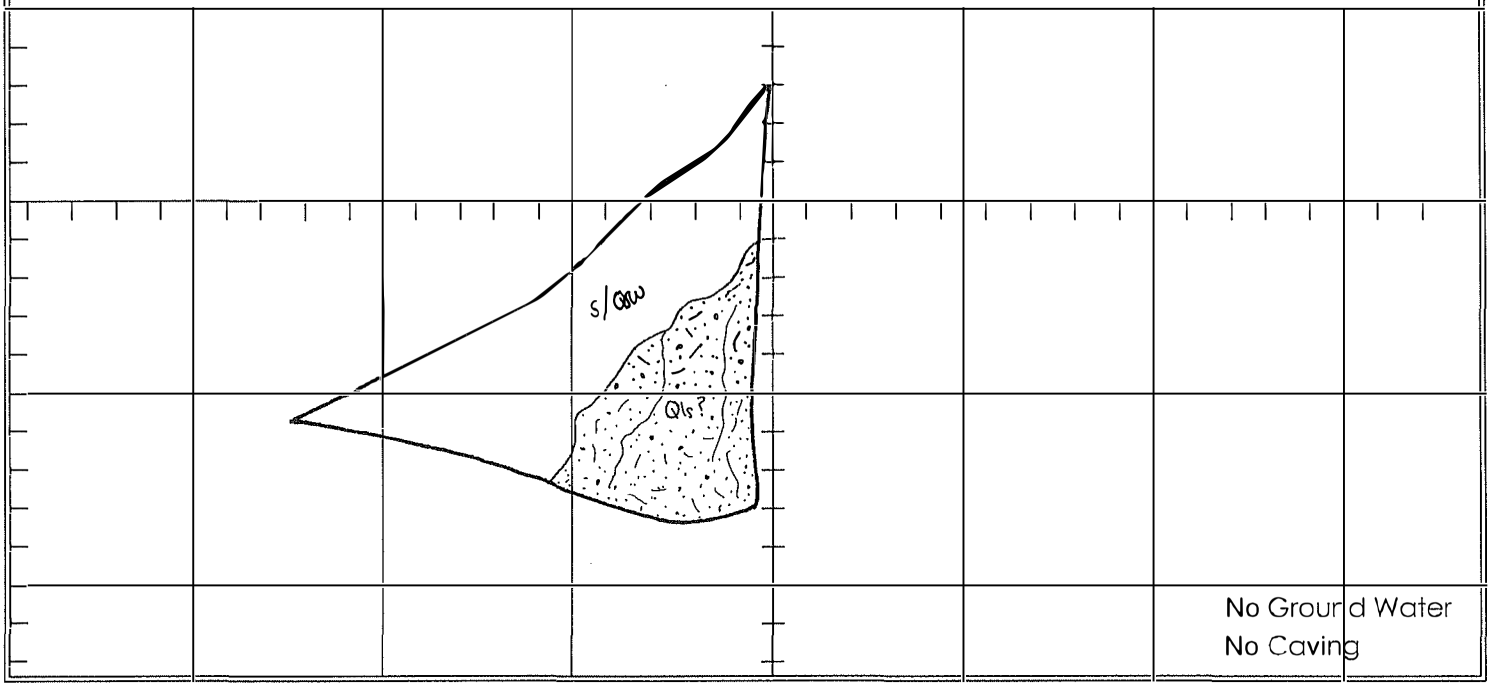


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-8**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4')** @ 0' Dark-brown to black, sandy silt; loose to moderately hard; damp to moist				
5	M				**LANDSLIDE DEBRIS?; Qls? (4 - 11')** @ 5' Mottled light- to medium-gray and light yellowish -tan silt and sand with Qsw inclusions; soft to moderately hard; damp @ 5-7' Bulk sample				
10					COMMENTS: Highly weathered to 11' No continuity to matrix; looks like Qsw but composed of bedrock				
15									
20									

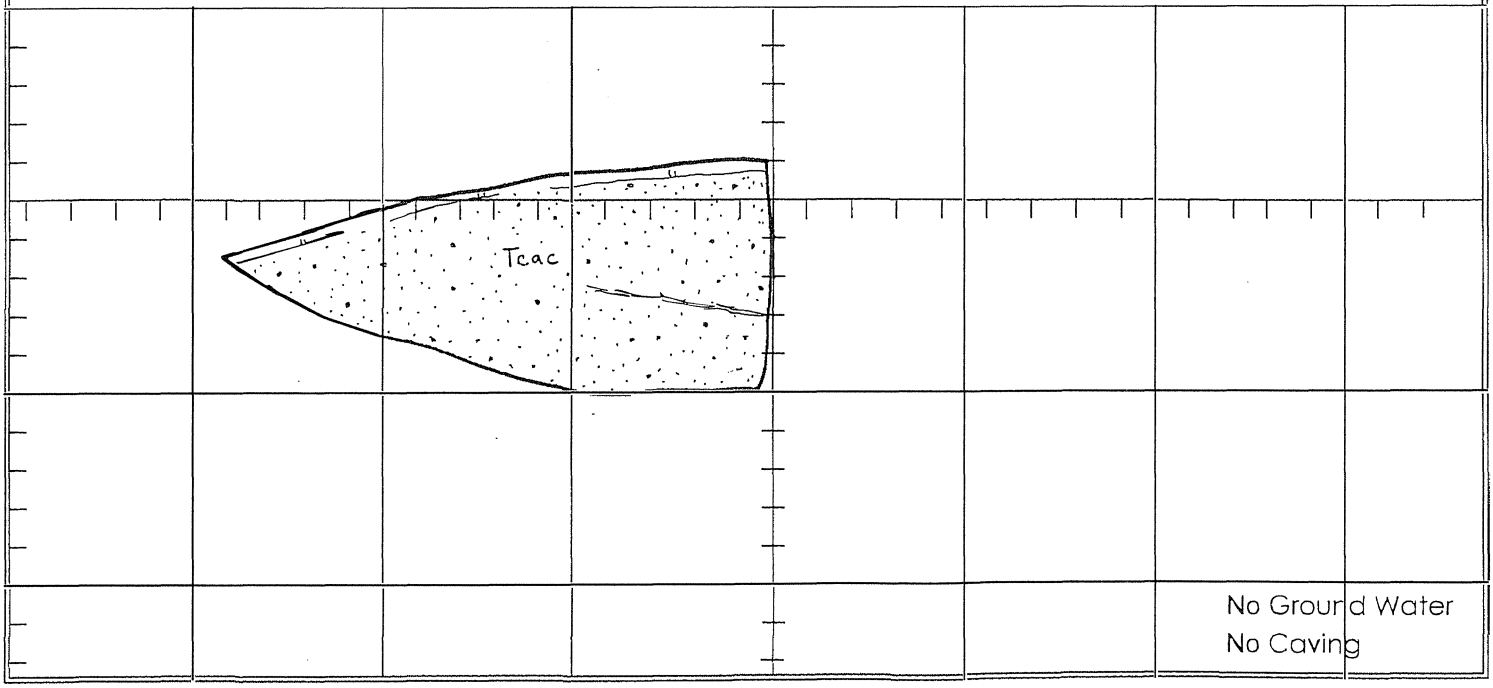
TOTAL DEPTH: 11 feet ←N60W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-9**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/3/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 3")** @ 0' Light-brown, silty sand with scattered pebbles; loose; dry **BEDROCK; Tcac (3" - 6')** @ 3" Mottled light yellowish-tan, light-gray and orangish-tan to brown, very fine-grained, silty sandstone; moderately hard; dry to damp; massive; moderately friable	B: N52W, 14NE			
5					COMMENTS: Highly weathered to 3'				
10									
15									
20									

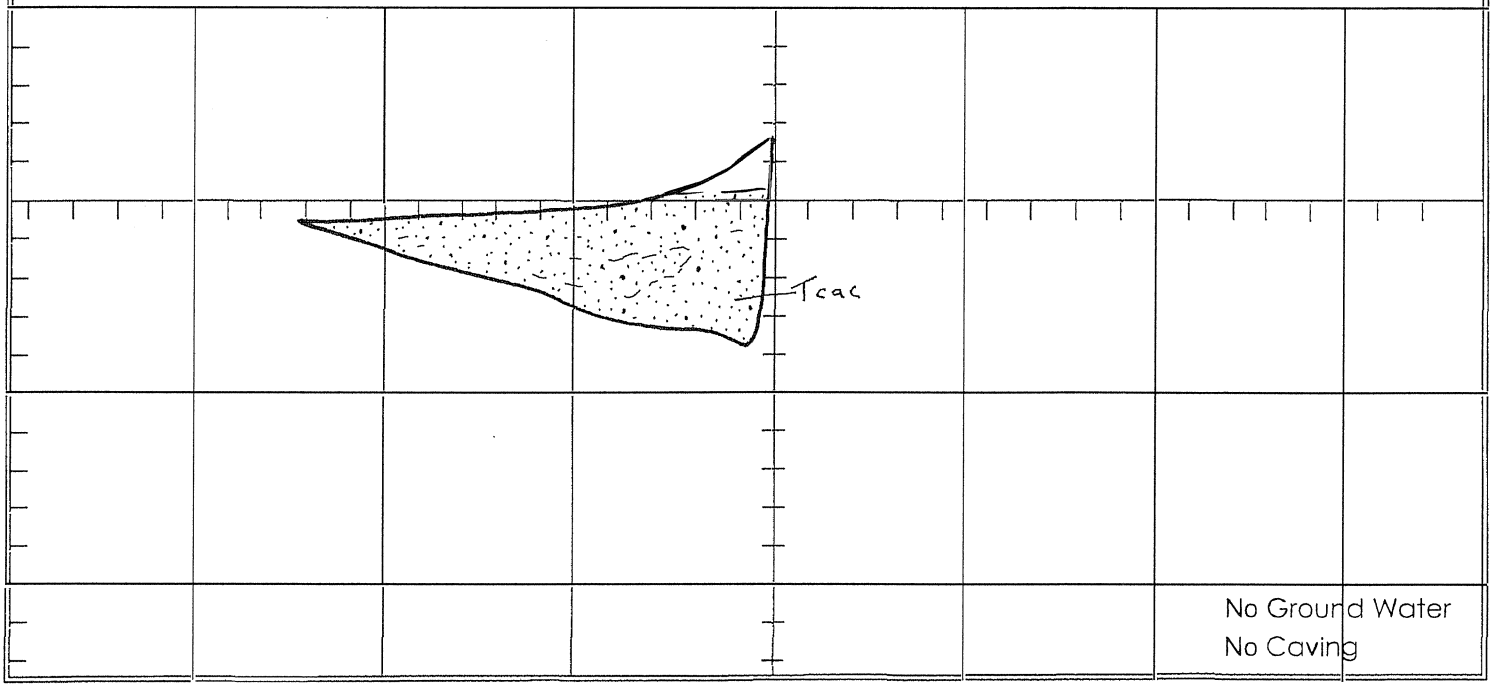
TOTAL DEPTH: 6 feet N68E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-10**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/3/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; Tcac (0 – 4')** @ 0' Light yellowish-tan, pebbly sandstone; moderately hard; dry to damp @ 1-4' Bulk sample (pebble and sand mix) COMMENTS: Excavated in low point of saddle in old road Cementation is fair in this unit				
5									
10									
15									
20									

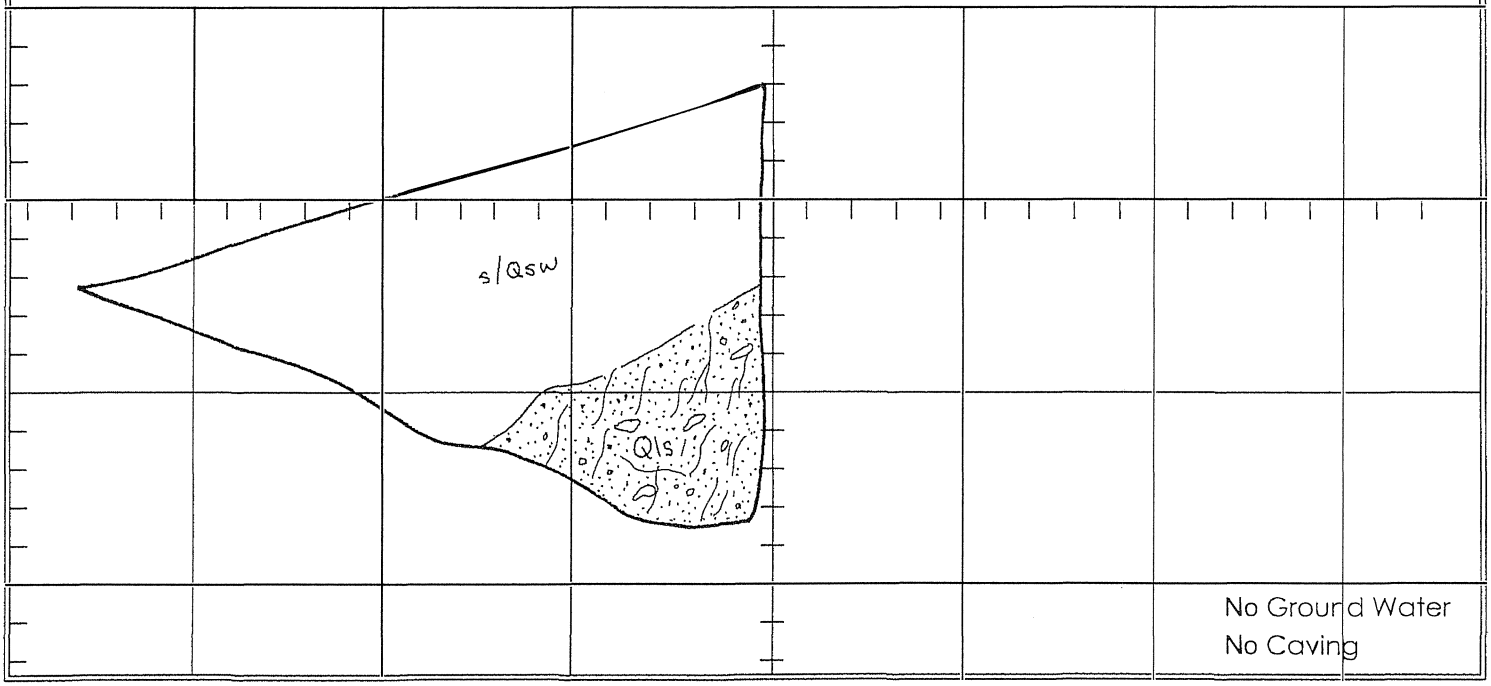
TOTAL DEPTH: 4 feet ←N67E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-11**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/3/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 5')** @ 0' Medium-brown, silty sand; loose; damp				
5					**LANDSLIDE DEBRIS?; Qls? (5 - 11.5')** @ 5' Light yellowish-tan to orangish-tan sandstone (Tcag) with angular and subrounded pebbles; moderately hard; damp; massive and moderately fractured	fr: N45W, 77NE			
10					COMMENTS: Highly weathered to 7'				
15									
20									

TOTAL DEPTH: 11.5 feet N80W→ SCALE: 1 inch = 5 feet

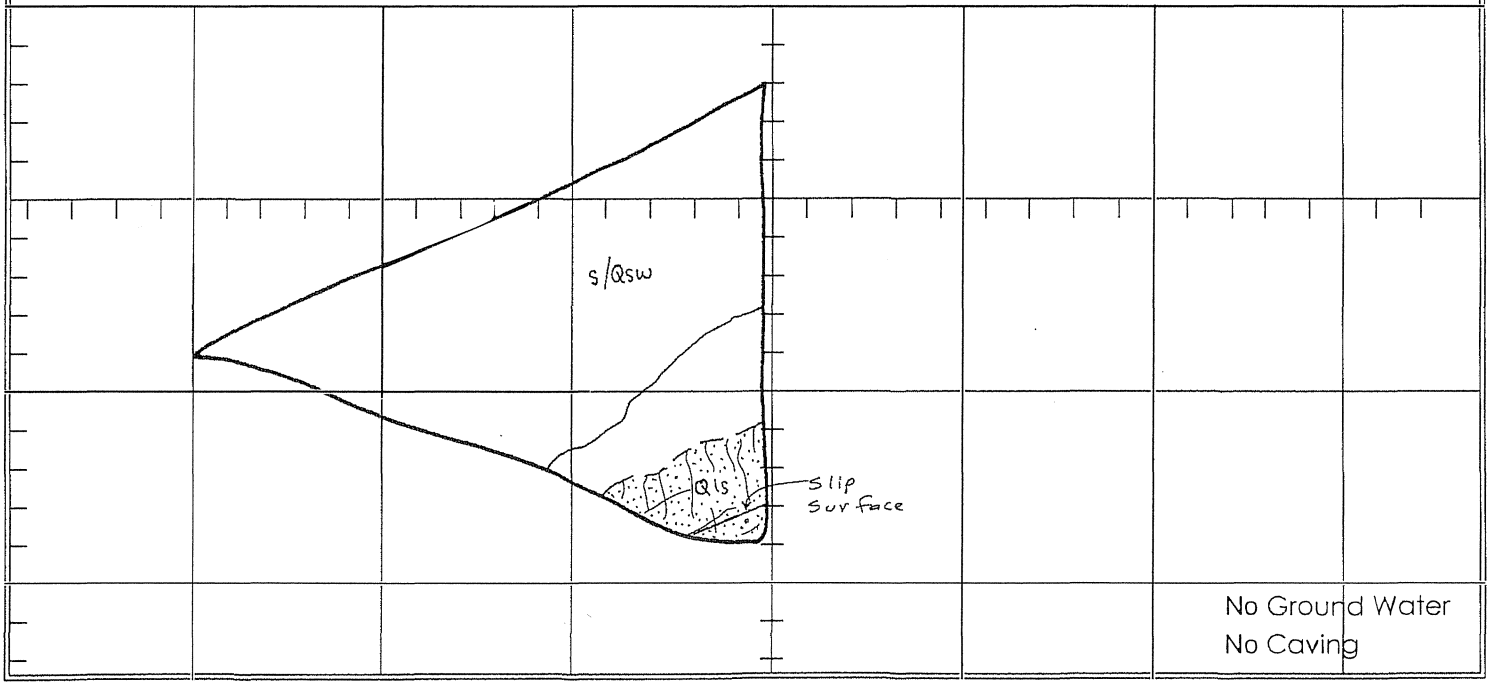


No Ground Water
No Caving

CLIENT:	Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-12**
PROJECT:	Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/3/06	
EXCAVATION METHOD:	4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH: s/Qsw (0 - 9')** @ 0' Black, clayey, silty sand; loose; moist				
5					@ 6' -mottled medium brown and dark brown				
10					**LANDSLIDE DEBRIS: Qls (9 - 12')** @ 9' Light-brown to tan sand; soft to moderately hard; damp to moist @ 11' Small bulk sample (slip surface plastic clay)	SS: N80W, 21NE			
15					COMMENTS: Highly weathered to 12'				
20									

TOTAL DEPTH: 12 feet ←N42W SCALE: 1 inch = 5 feet

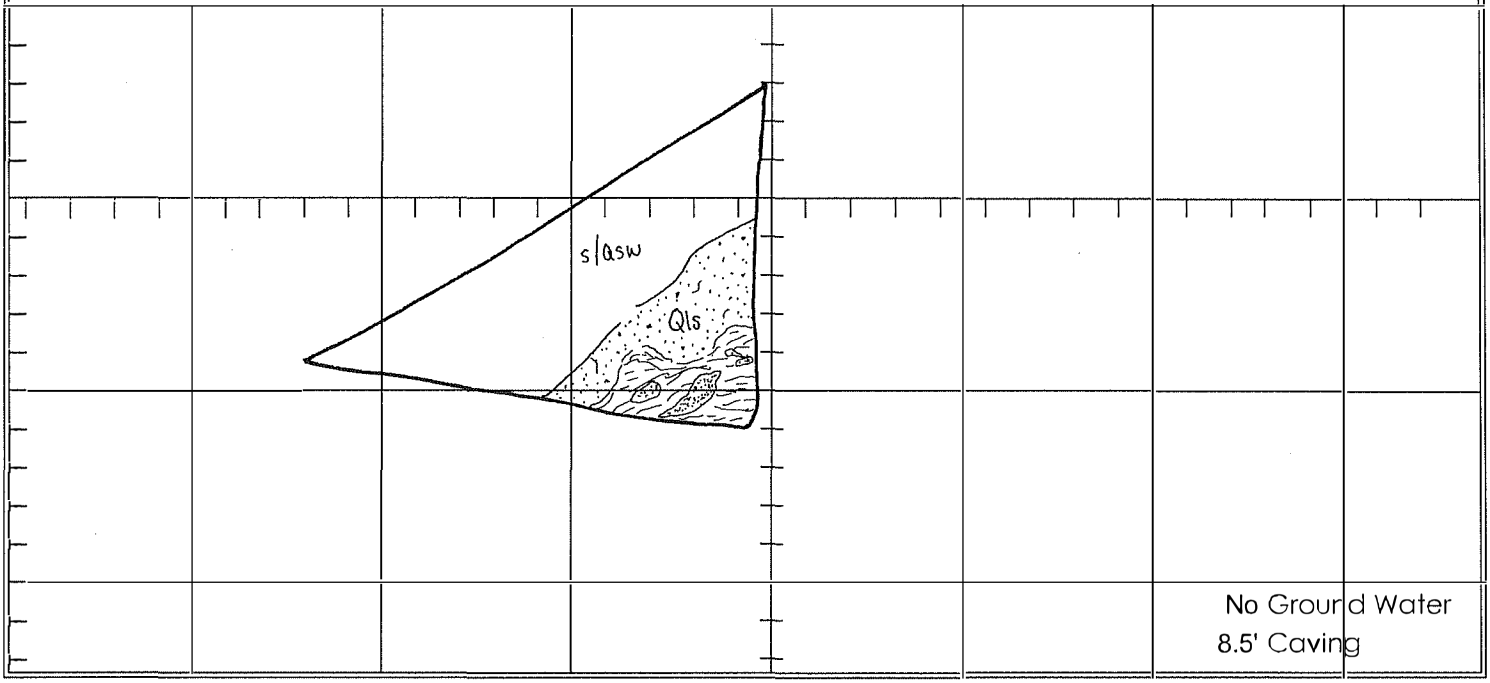


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-13**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/3/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3.5')** @ 0' Dark-brown, silty sand to sandy silt; loose; dry to damp				
5					**LANDSLIDE DEBRIS; Qls (3.5 - 9')** @ 3.5' Light-gray to olive-gray and light olive-brown, sandstone and siltstone; jumbled and soft; dry to damp; caliche pods and "veins"				
10					COMMENTS: Highly weathered to 9' Punky and mottled (looks like Qls); some large cobble sized clasts of resistant sandstone (QTp vs. Tcag)				
15									
20									

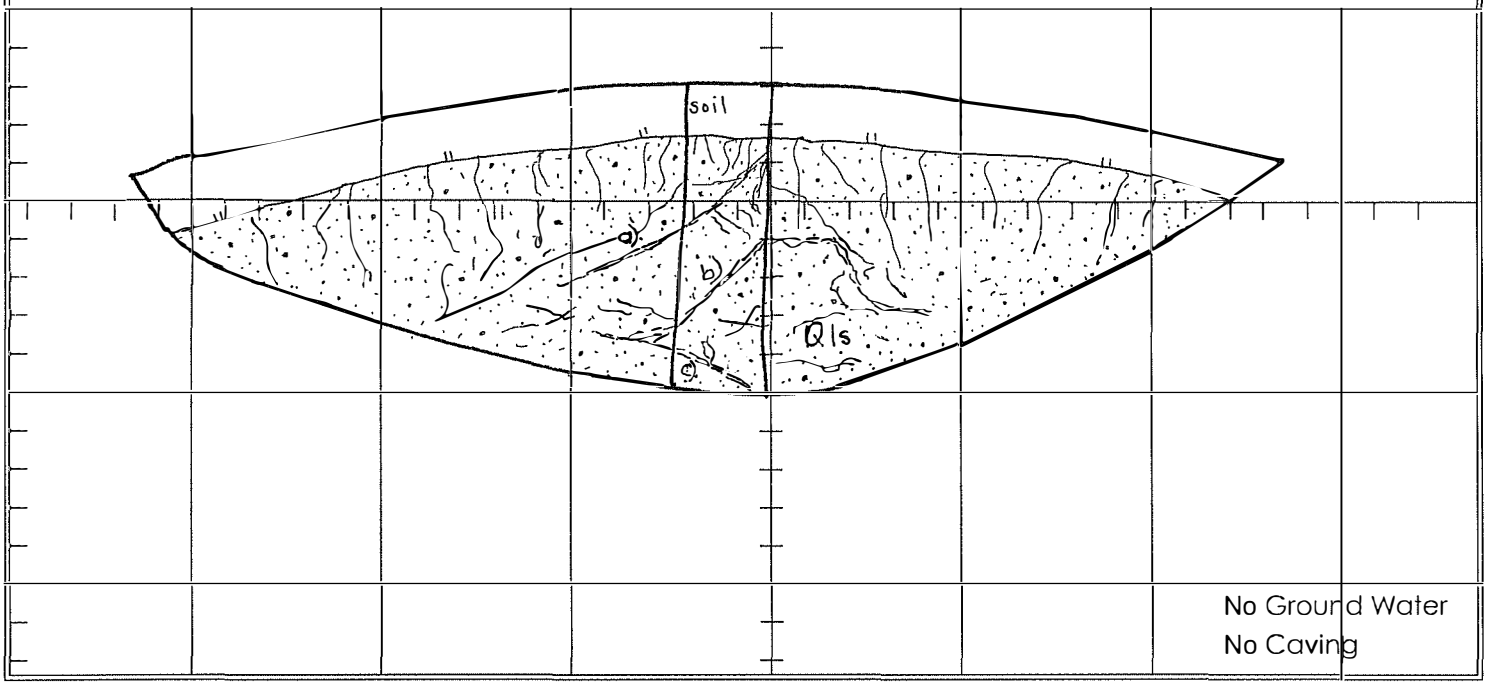
TOTAL DEPTH: 9 feet N28W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-14**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: / 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/9/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	Other Tests
0					**SOIL; s (0 - 1.5')** @ 0' Dark-brown, clayey sand; loose; damp to moist **LANDSLIDE DEBRIS; Qls (1.5 - 8')** @ 1.5' Mottled orangish-tan, light-gray, grayish-tan and light-brown, very fine-grained, sandstone to silty sandstone; moderately hard; dry to damp; massive	a) MF/Sh: N5W, 42SW b) MF/Sh: N65E, 47SE c) B?: N35E, 38NW			
5									
10					COMMENTS: Highly weathered to 3.5' Appears tight and intact, and tectonically disrupted; however, based on BA-3 it is interpreted as Qls				
15									
20									

TOTAL DEPTH: 8 feet ←N67E→ SCALE: 1 inch = 5 feet

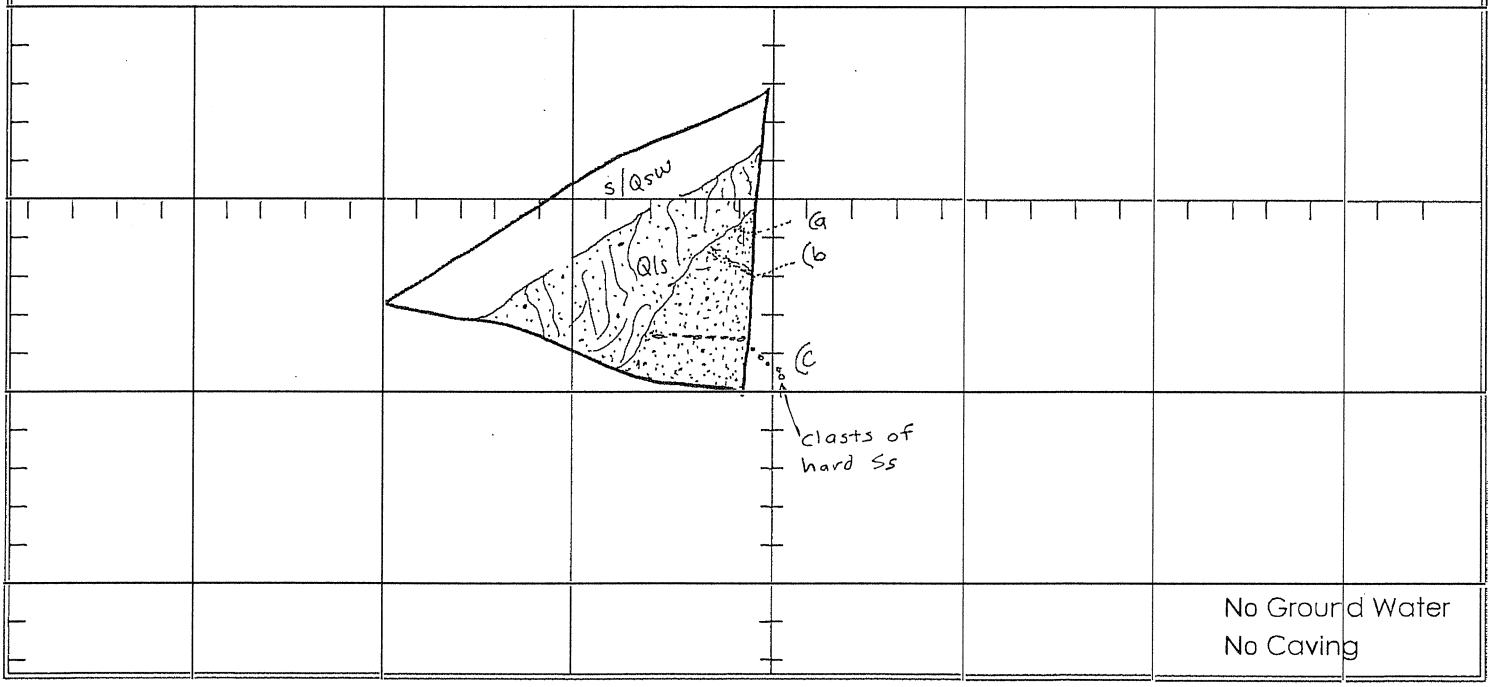


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-15**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/9/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Dark-brown, silty, clayey sand; loose; damp to moist **LANDSLIDE DEBRIS; Qls (1.5 - 8')** @ 1.5' Light-gray, light olive-brown, light greenish- to yellowish-tan, and light-brown, very fine-grained sandstone and silty sandstone (discontinuous blocks); soft to moderately hard; dry to damp	a) B: N20W, 15SW b) B: N6W, 26SW c) B: N37W, 33NE			
5									
10					COMMENTS: Highly weathered to 8' Qls is tight Light gray unit has the red and brown "specks" of weathered Tcac				
15									
20									

TOTAL DEPTH: 8 feet ←N54E SCALE: 1 inch = 5 feet

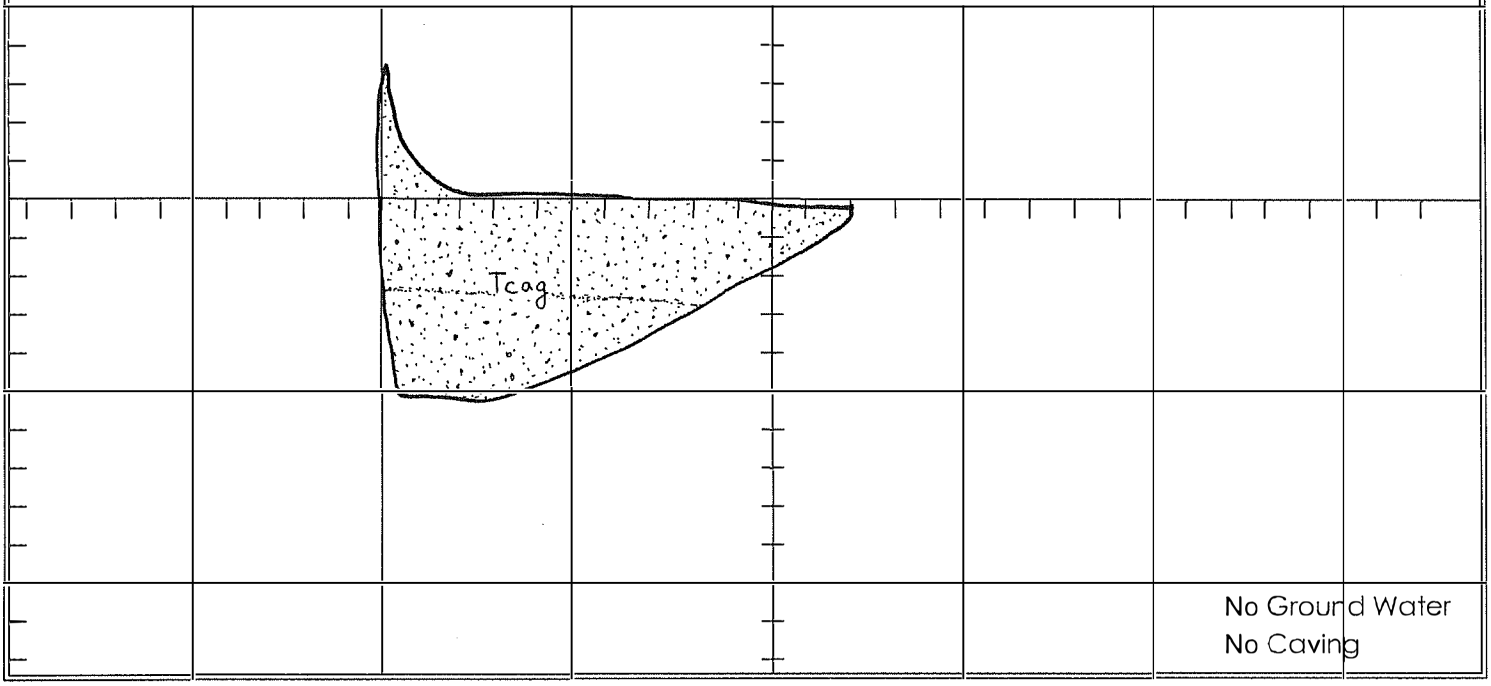


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-16**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/9/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; Tcag (0 - 9')** @ 0' Light-brown to light yellowish-brown and medium-brown, coarse- to medium-grained sandstone with scattered pebbles; damp to moist; massive and moderately friable				
5									
10					COMMENTS: Excavated in abandoned oil pad backcut. Shallow, southerly dips exposed in backcut.				
15									
20									

TOTAL DEPTH: 9 feet ←N65E SCALE: 1 inch = 5 feet

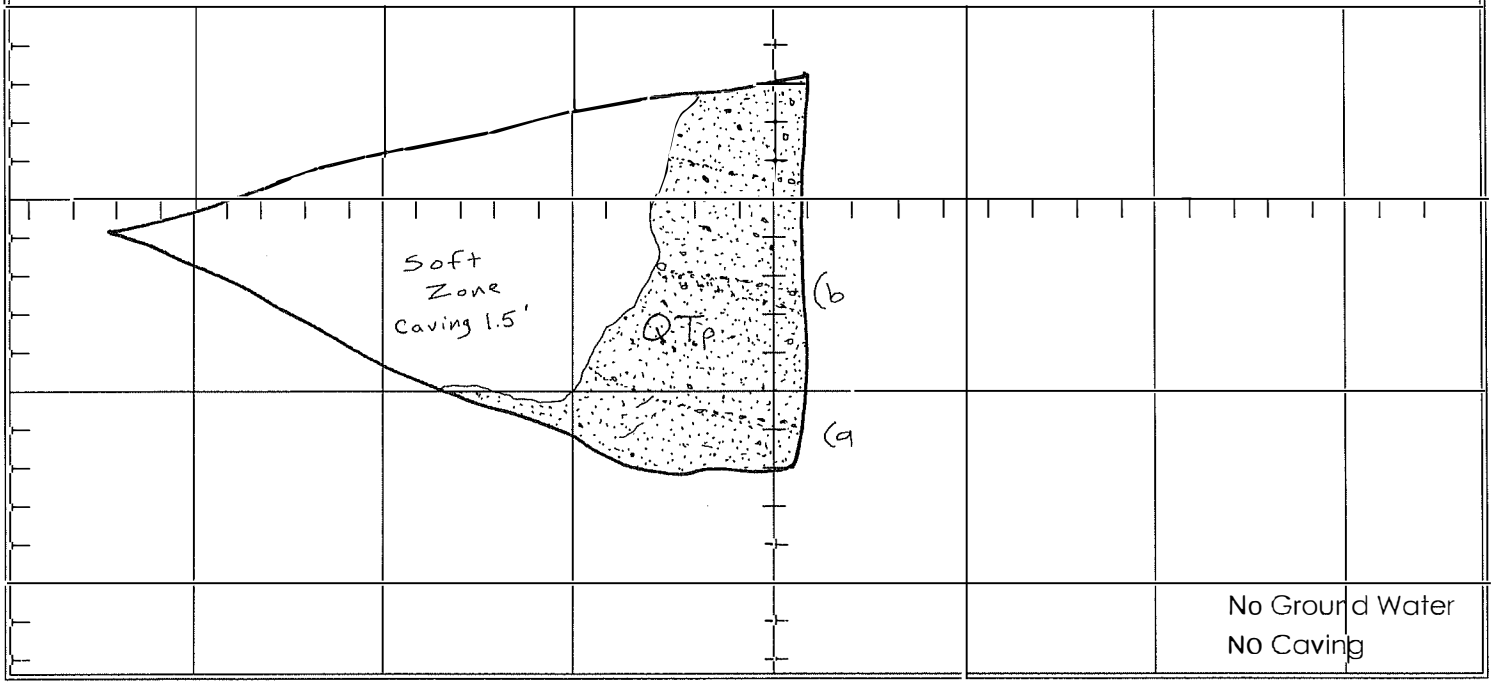


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-17**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/9/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; QTp (0 - 10')** @ 0' Light grayish-tan to brown, fine-grained, pebbly sandstone with conglomerate layers (1" to 4" thick; pebbles of quartzite and Tsq); soft (friable) to moderately hard; dry to damp	a) XB: N10W, 21NE b) B: N40W, 20NE			
5									
					@ 8' Bulk sample				
10					COMMENTS: Highly weathered to 3.5' Excavated in old man made cut				
15									
20									

TOTAL DEPTH: 10 feet North→ SCALE: 1 inch = 5 feet

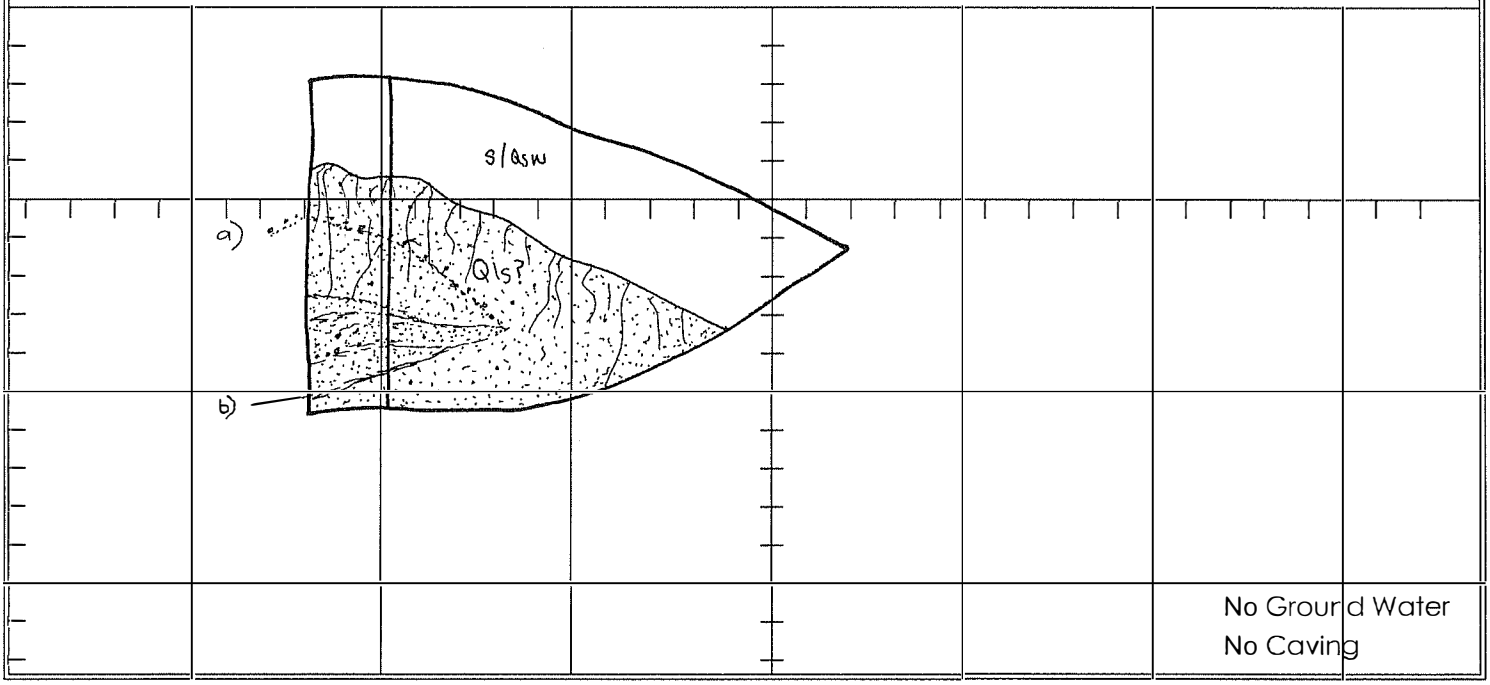


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-18**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/9/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Dark-brown, silty sand; loose; dry to damp				
5					**LANDSLIDE DEBRIS?; Qls? (2.5 - 9')** @ 2.5' Light grayish-tan to brown and light-gray, pebbly sandstone, conglomerate and fine-grained, silty sandstone; soft (friable); dry to damp	a) B: N50W, 34NE b) B?: N42W, 31SW			
10					COMMENTS: Highly weathered to 6' Possibly highly channeled and weathered QTp vs. Qls?				
15									
20									

TOTAL DEPTH: 9 feet ←N88W SCALE: 1 inch = 5 feet

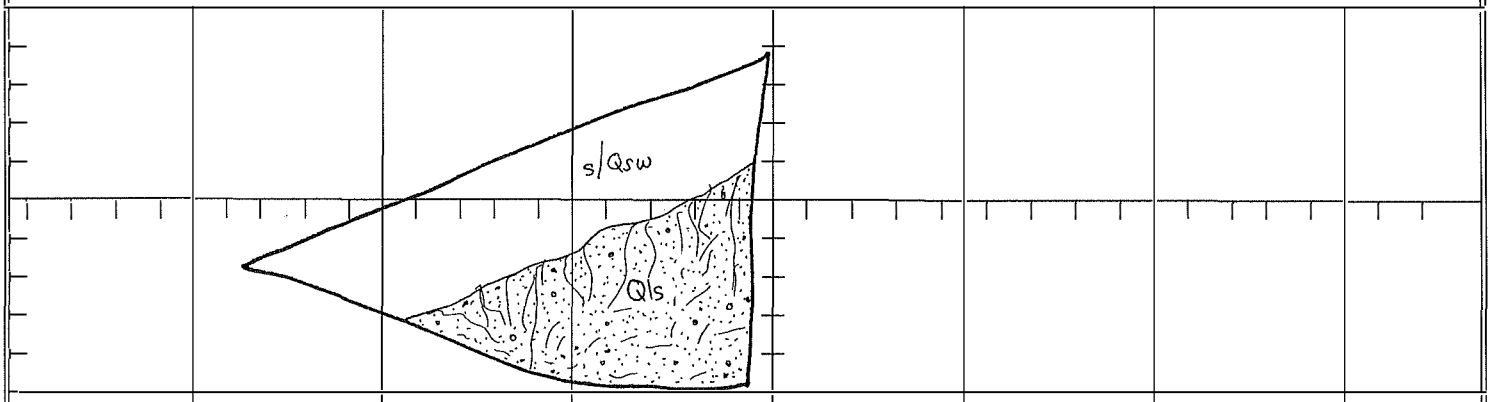


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-19**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/9/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Black, sandy clay; soft/loose; damp to moist				
5					**LANDSLIDE DEBRIS; Qls (3 - 9')** @ 3' Mottled light-brown and olive-brown, sandy clay with scattered pebbles and caliche pods (1" to 3"); moderately hard/stiff; damp				
					@ 7-9' Bulk sample				
10					COMMENTS: Highly weathered to 5.5' Very disturbed but not soft from 5-9'				
15									
20									

TOTAL DEPTH: 9 feet ←N42E SCALE: 1 inch = 5 feet

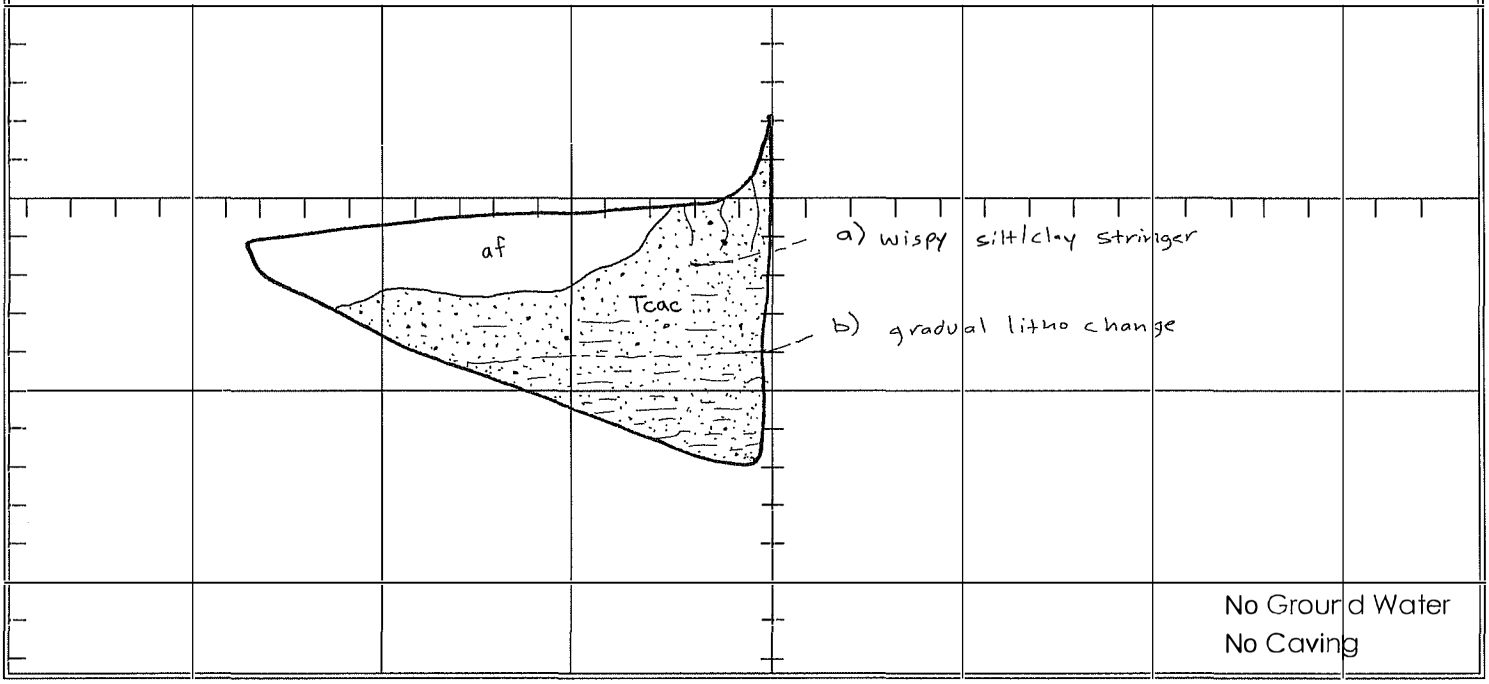


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-20**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/10/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	Other Tests
0					**BEDROCK; Tcac (0 - 9')** @ 0' Light grayish-white to grayish-tan, very fine-grained, silty sandstone (with clay?); moderately hard; dry to damp; massive	a) Apx B: N30E, 13NW b) Apx B: N20W, 15SW c)* B: N50W, 10SW			
5									
10					COMMENTS: Highly weathered to 3' Excavated in abandoned oil well pad *Inferred from cut slope for oil pad				
15									
20									

TOTAL DEPTH: 9 feet N22W→ SCALE: 1 inch = 5 feet

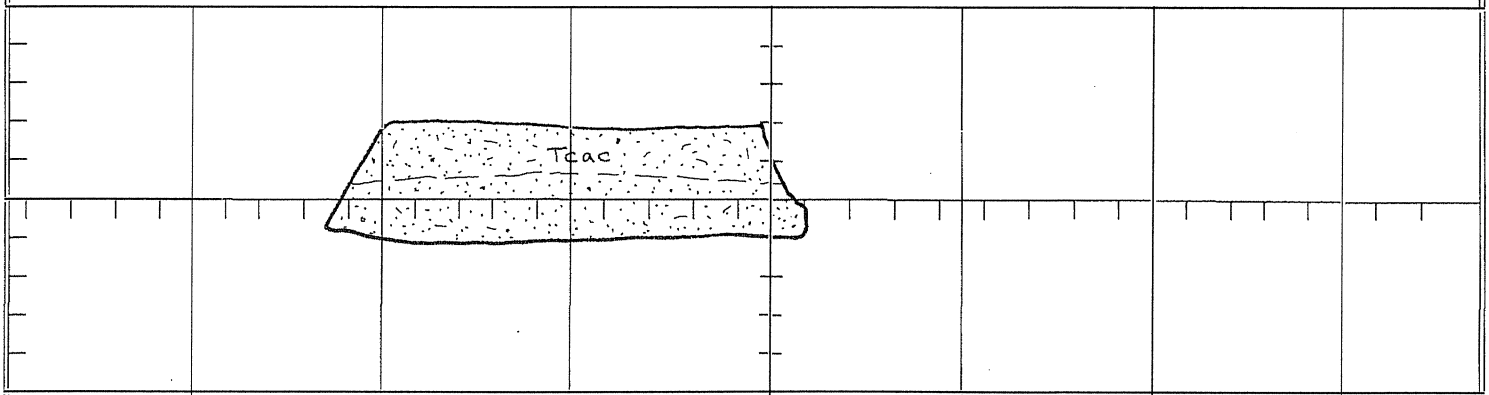


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-21**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/10/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK: Tcac (0 - 3')** @ 0' Light grayish-white to grayish-tan, very fine-grained, silty sandstone (with clay?); moderately hard; dry to damp; massive COMMENTS: Excavated on oil well drill pad	Apx B: N38E, 8NW			
5									
10									
15									
20									

TOTAL DEPTH: 3 feet ←N20W SCALE: 1 inch = 5 feet

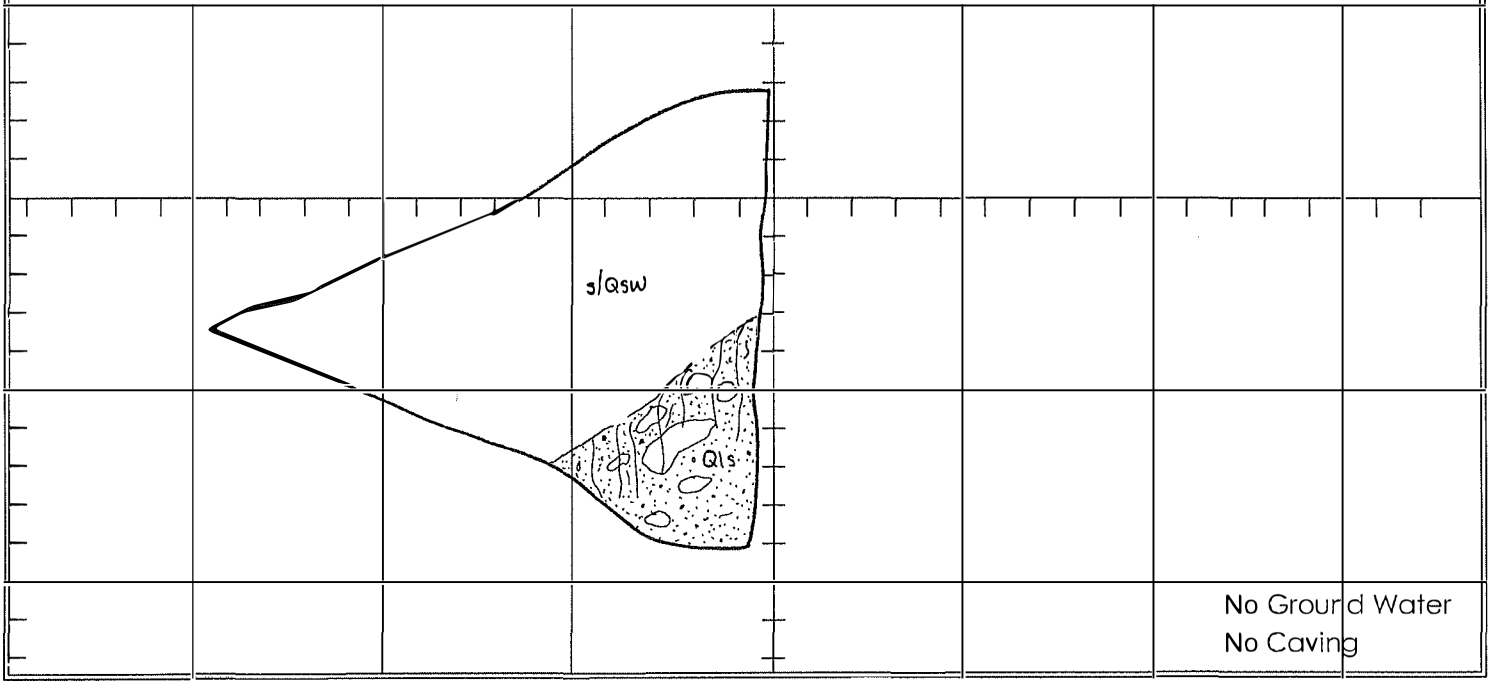


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-22**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/10/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 6')** @ 0' Medium-brown to brown, sandy silt; loose; dry to damp				
5					**LANDSLIDE DEBRIS; Qls (6 - 12')** @ 6' Chaotic assemblage of mottled light-gray to white with FeO_2 staining, very fine-grained sandstone (Tcac?) blocks and slopewash with caliche pods (2" to 1'); soft to moderately hard; dry to damp				
10					COMMENTS: Highly weathered to 9'				
15									
20									

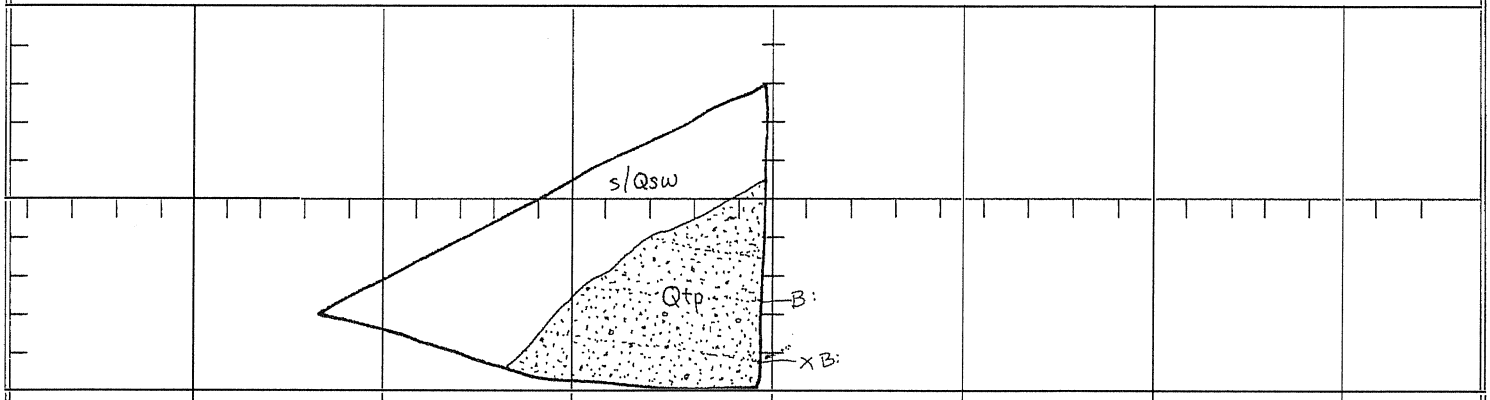
TOTAL DEPTH: 12 feet ←N88W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-23**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/10/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Medium-brown, silty sand to sandy silt; loose; dry to damp				
					BEDROCK; QTp (2.5 - 8') @ 2.5' Light grayish-tan to brown, pebbly sandstone and conglomerate with lenses of fine-grained sandstone; soft (friable) to moderately hard; dry to damp	B: N75W, 11NE XB: N75W, 16NE			
5									
10					COMMENTS: Highly weathered to 4.5' Bedrock is cross bedded				
15									
20									

TOTAL DEPTH: 8 feet N50E→ SCALE: 1 inch = 5 feet

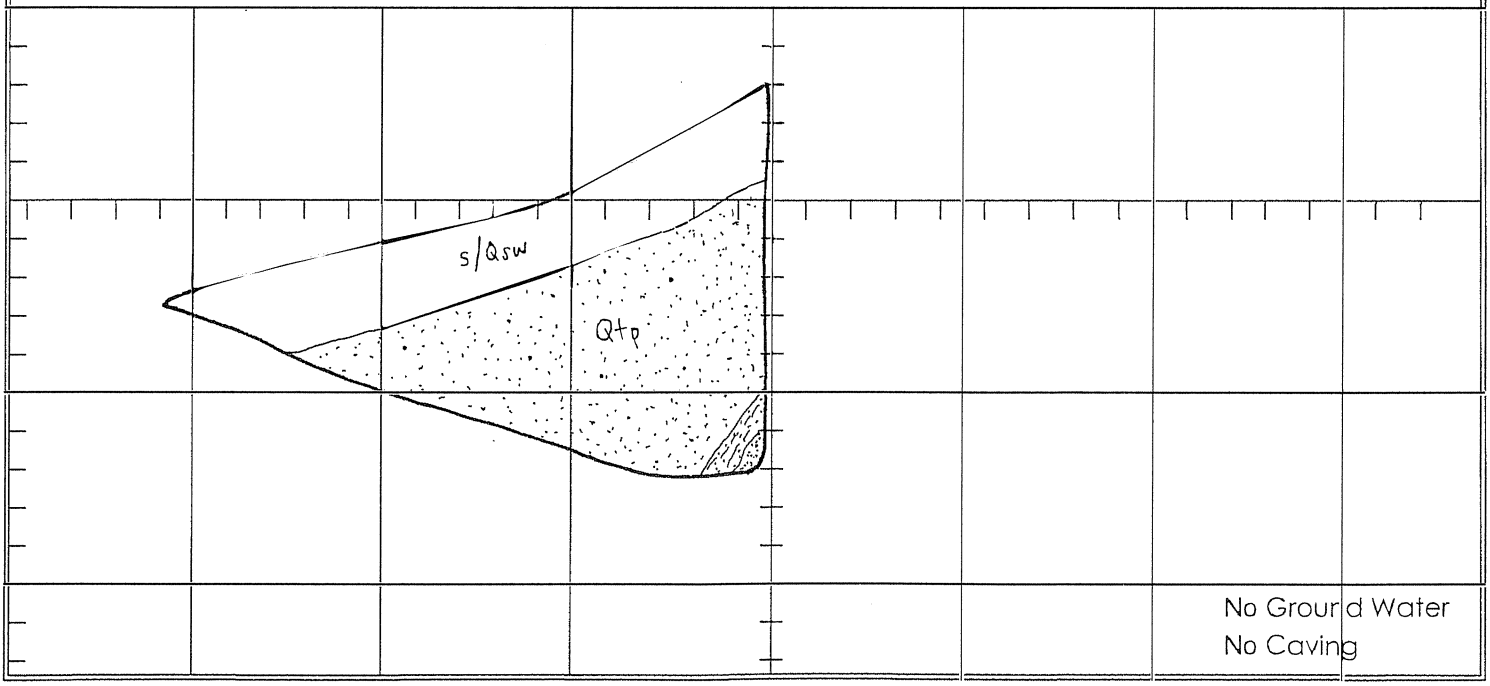


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-24**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/10/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Dark-brown, silty sand to sandy silt; loose; damp to moist **BEDROCK; QTp (2.5 - 10')** @ 2.5' Light-brown to tan, fine- to medium-grained sandstone with medium-brown to light grayish-brown, clayey siltstone to mudstone interbed; soft (friable)	B: N35W, 48NE			
5									
10					COMMENTS: Highly weathered to 5' Sand unit resembles Tcag (no pebbles)				
15									
20									

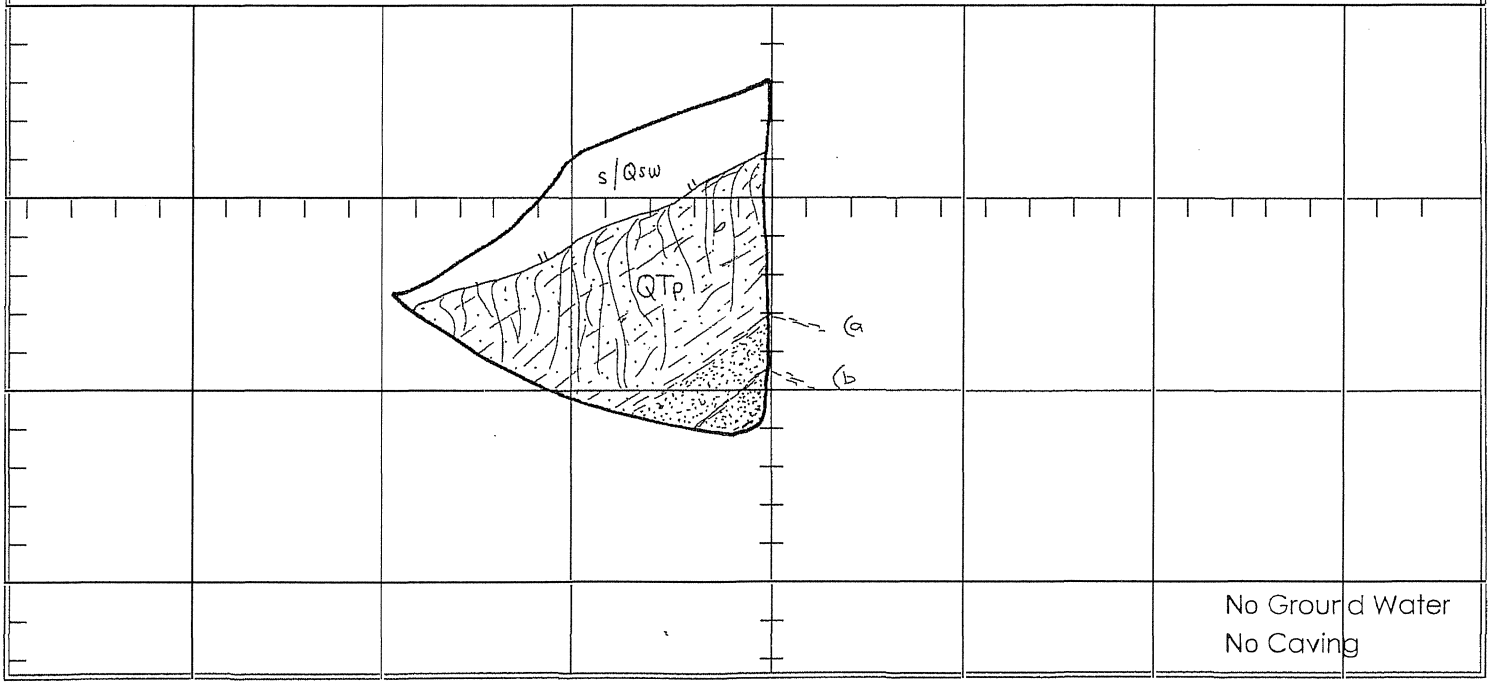
TOTAL DEPTH: 10 feet ←N60E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-25**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/13/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Dark-brown to black, sandy, silty clay; soft; damp to moist **BEDROCK; QTp (2 - 9')** @ 2' Light grayish-brown, sandy siltstone and silty sandstone with clayey siltstone interbeds (1-3"); moderately hard; dry to damp	a) B?: N43W, 36NE b) B: N51W, 38NE			
5									
10					COMMENTS: Highly weathered to 6' Excavated in old roadside cut From 2-6' caliche bends parallel to bedding and creep effected Queried bedding attitude may be slide plane at base of creep-affected zone				
15									
20									

TOTAL DEPTH: 9 feet ←N52E SCALE: 1 inch = 5 feet

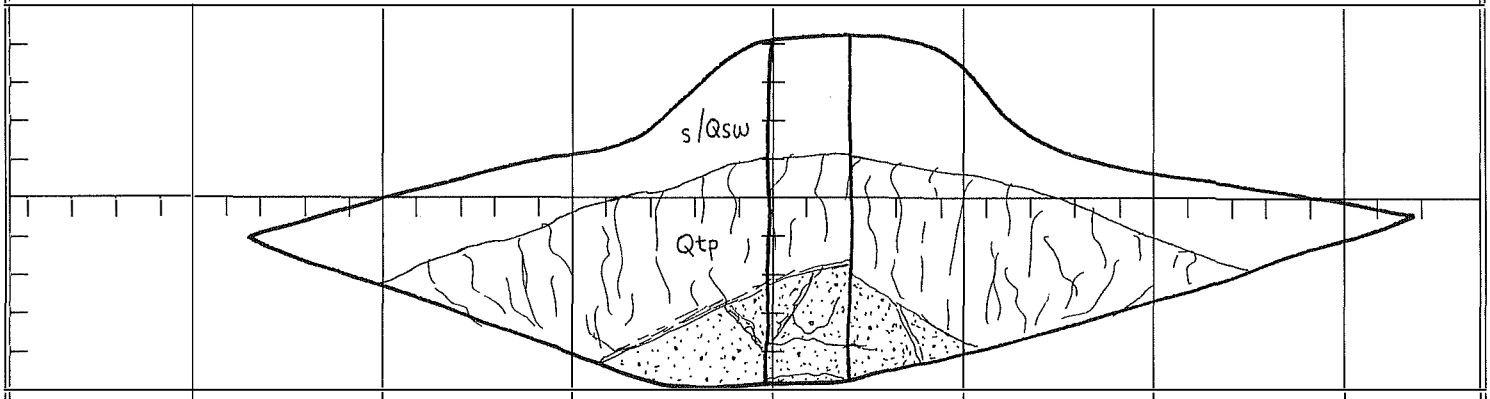


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-26**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/13/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Dark grayish-brown, sandy clay; soft; damp to moist				
5					**BEDROCK?; QTp (3 - 9')** @ 3' Light yellowish-brown and light grayish-tan, silty sandstone and clayey siltstone; moderately hard; dry to damp	a) MF: N70E, 78SE b) B: N62W, 43NE			
10					COMMENTS: Highly weathered to 6' Possible slide-affected QTp F: 1/4-1/2" reddish-brown to olive-gray gouge; offset not determined				
15									
20									

TOTAL DEPTH: 9 feet ←N60E→ SCALE: 1 inch = 5 feet

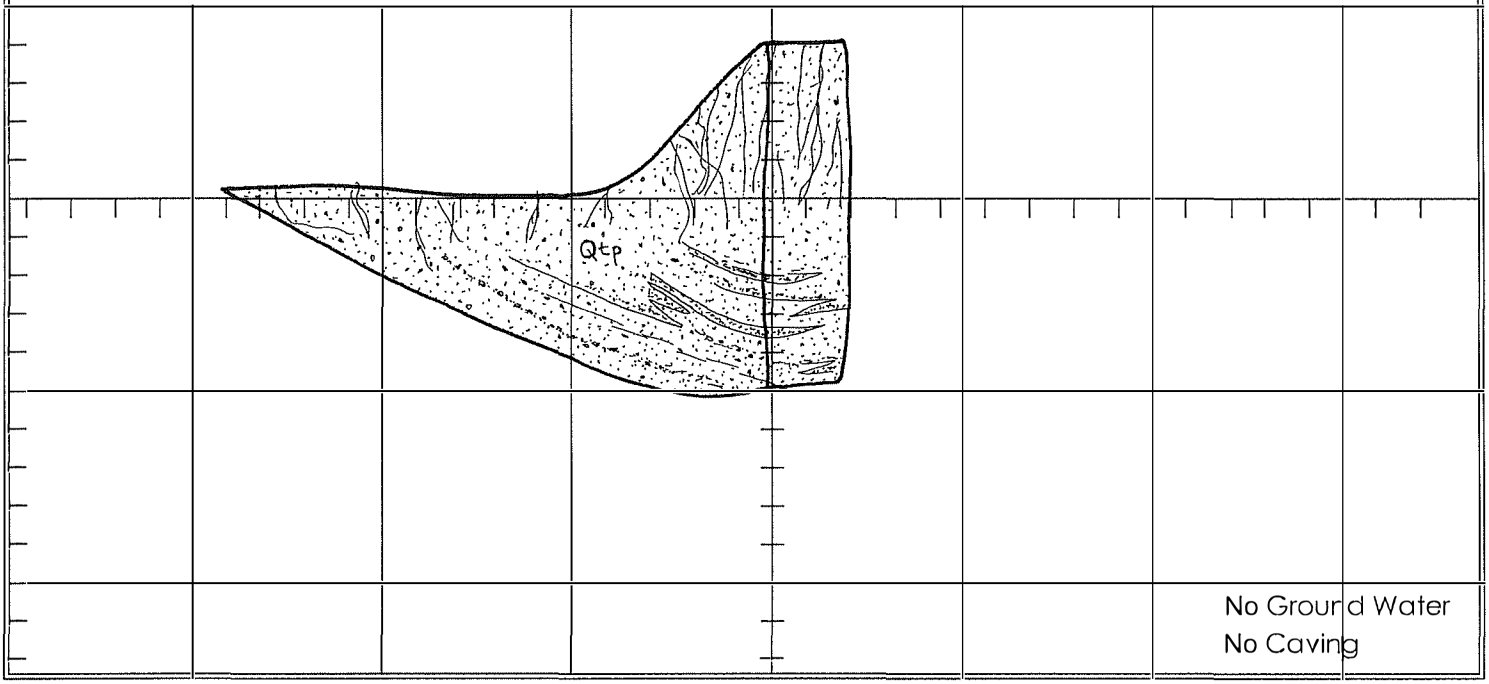


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-27**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/13/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; QTp (0 - 9')** @ 0' Light grayish-tan and light yellowish-brown, interfingering sandstone, silty sandstone, and pebbly sandstone to conglomerate; moderately hard (moderately friable); dry to damp				
5					@ 5-9' Bulk sample	B: N42W, 30NE			
10					COMMENTS: Highly weathered to 4' Excavated in old road "Textbook" sharp interfingering lenses				
15									
20									

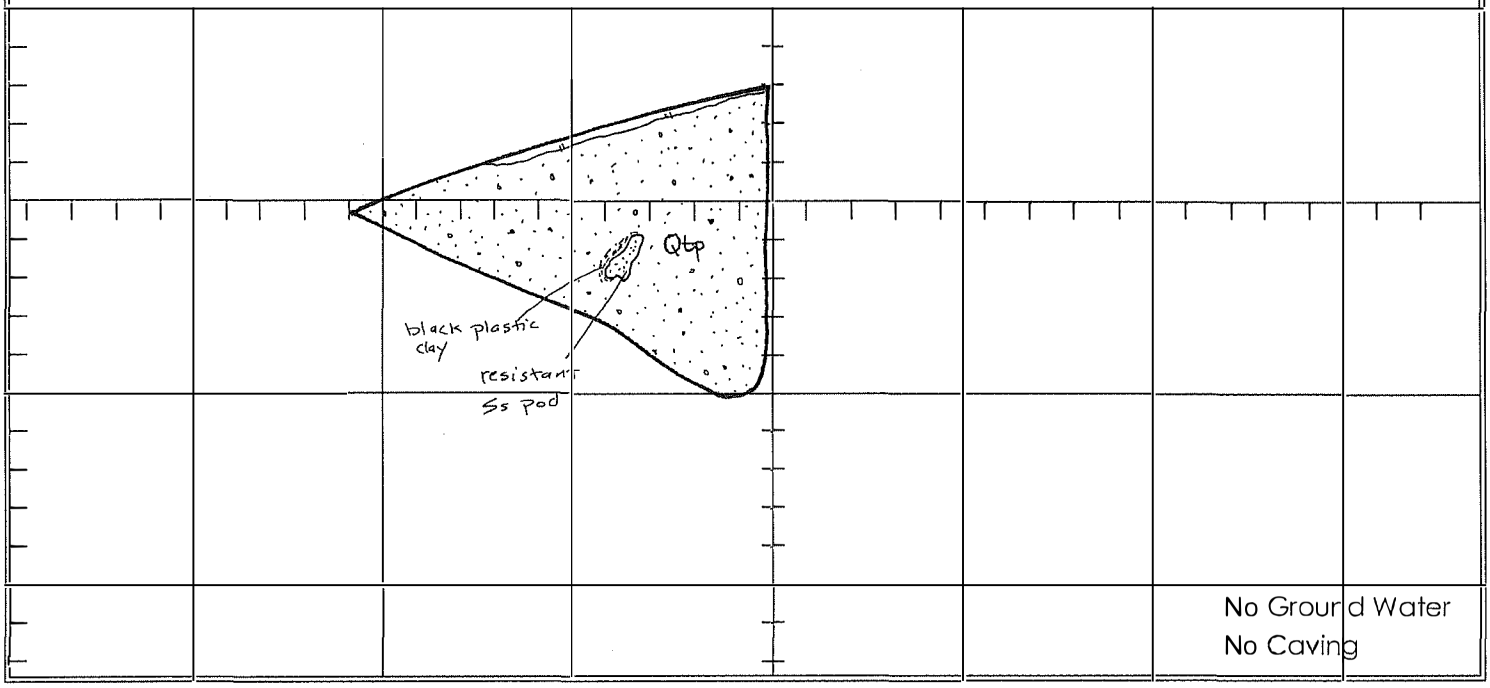
TOTAL DEPTH: 9 feet N65E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-28**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 2/13/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2")** @ 0' Light-brown, silty sand; loose; dry to damp **BEDROCK; QTp (2" - 8')** @ 2" Light-brown and light grayish-brown, silty sandstone with scattered pebbles; hard (well indurated); dry to damp; massive				
5									
10					COMMENTS: Highly weathered to 2' Massive and hard; no bedding Pods of resistant sandstone; some with clay lining				
15									
20									

TOTAL DEPTH: 8 feet N33W→ SCALE: 1 inch = 5 feet

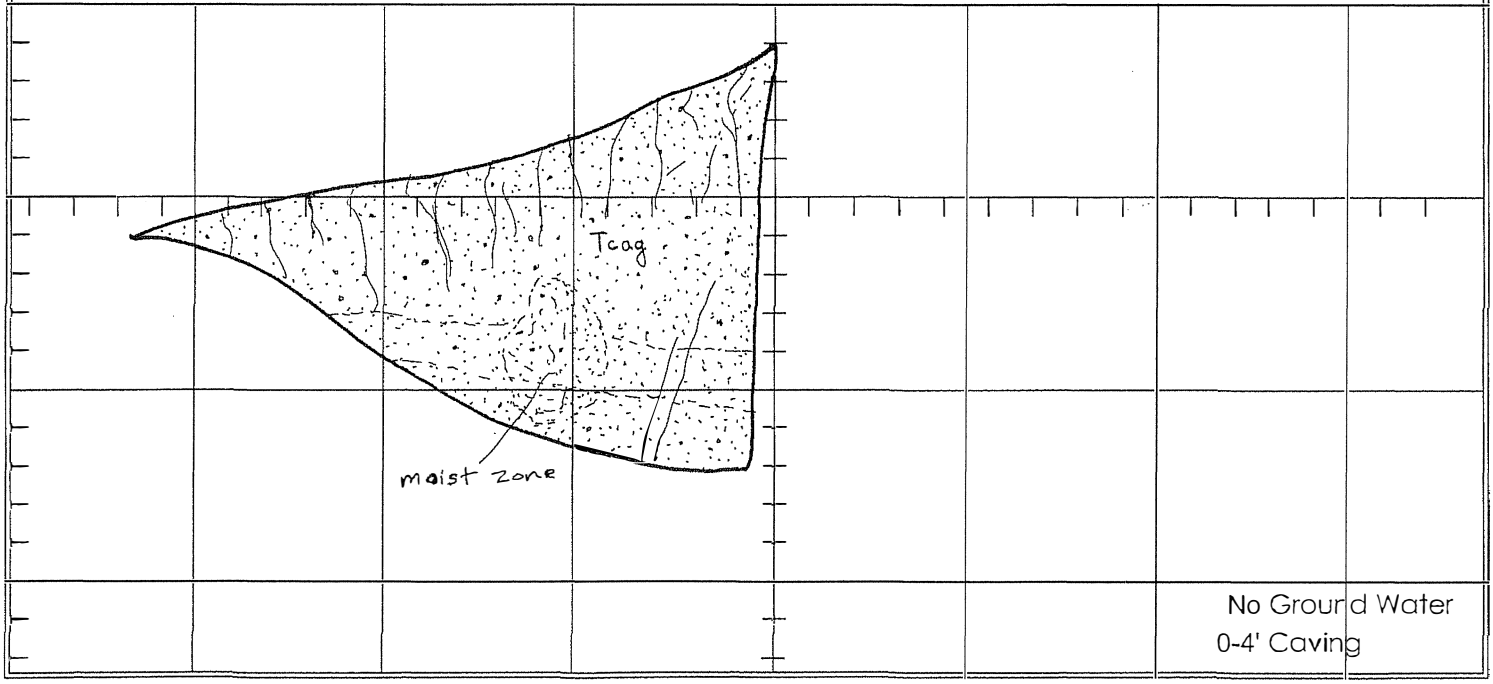


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 06-2195 (0)	**TRENCH LOG NO. GT-29**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 2/14/06	
EXCAVATION METHOD: 4WD Rubber-tire Backhoe with 24"		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; Tcag (0 - 11')** @ 0' Light grayish-tan and light-brown, medium- to coarse-grained sandstone; soft (friable): damp to moist	b) fr: N55E, 75SE a) B: N75W, 16NE			
5									
10									
15					COMMENTS: Highly weathered to 4' Cleans easily Laminae wavy and offset up to 1/2" in place (shattered ridge?)				
20									

TOTAL DEPTH: 11 feet N32E→ SCALE: 1 inch = 5 feet

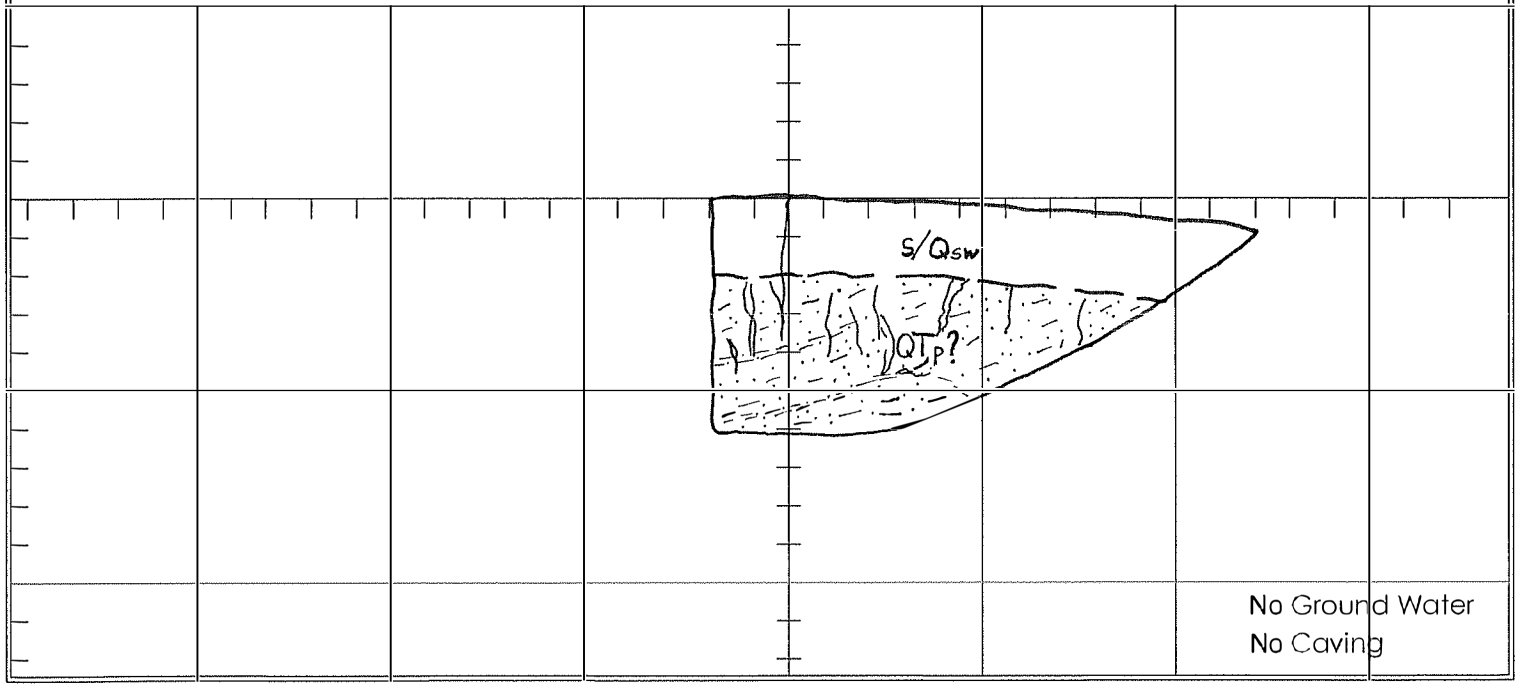


No Ground Water
0-4' Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-33**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
		EXCAVATED:	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Brown sandy silt with clay; soft; damp to dry; abundant rootlets **BEDROCK?; QTp? (2 - 6')** @ 2' Yellowish-brown to yellow silty fine-grained sandstone; soft; damp; abundant brown clayey silt-infilled fractures; jumbled appearance; creep affected @ 4' Brown siltstone interbed; pinches out to the north COMMENTS: Bedrock is weathered to > 6'				
5									
10									
15									
20									

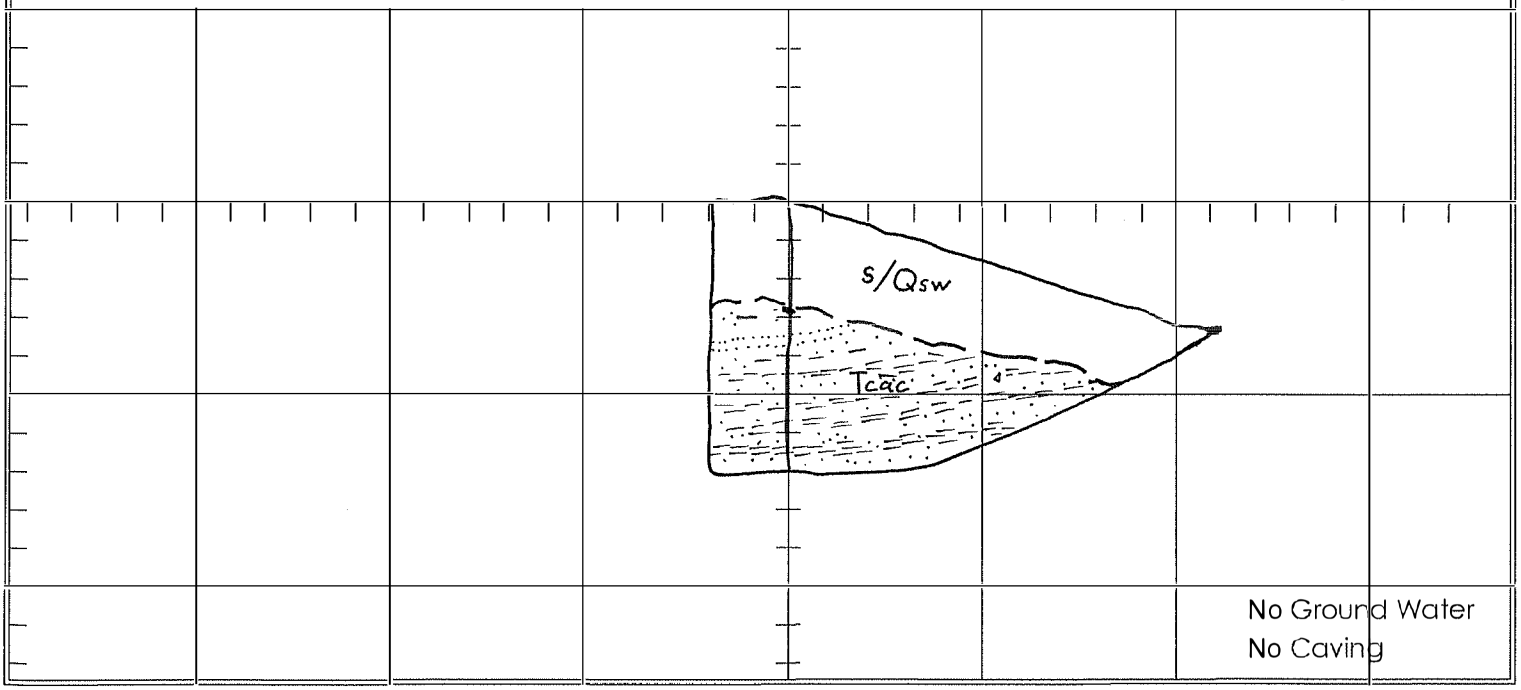
TOTAL DEPTH: 6 feet →N14E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-34**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
		EXCAVATED:	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Brown clayey silt with sand; soft to firm; dry to damp; abundant rootlets and voids; gradational contact with underlying bedrock **BEDROCK; Tcac (2.5 - 7')** @ 2.5' Interbedded brown, sandy silt with clay and yellowish-brown to yellow silty to clayey fine-grained sand; soft; damp @ 3.5' 3-inch-thick laminated section COMMENTS: Bedrock is weathered to 7'				
5									
10									
15									
20									

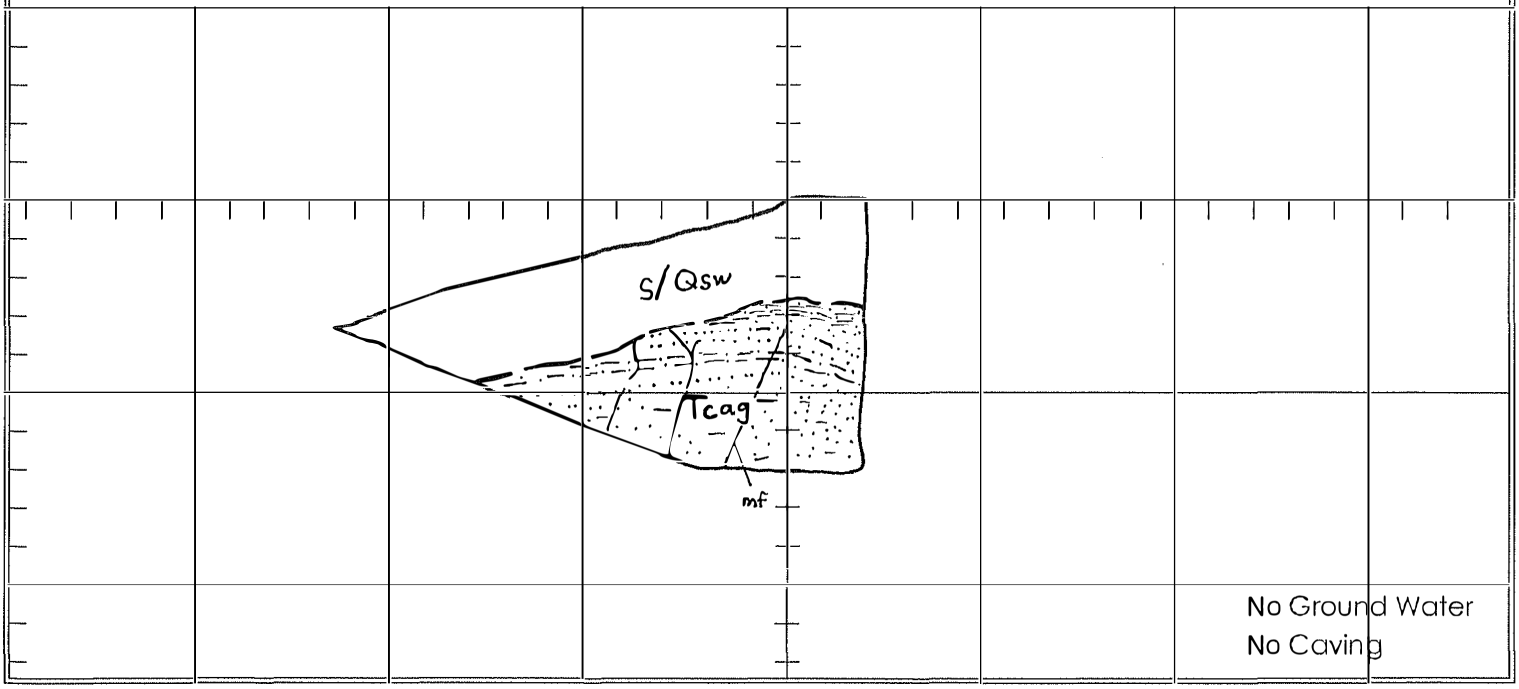
TOTAL DEPTH: 7 feet → N70W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-35**
PROJECT: Solomon Hills Specfic Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: MBW	
	EXCAVATED:	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Brown clayey silt with sand; loose; dry to damp; rootlets and voids				
5					**BEDROCK; Tcag (2.5 - 7')** @ 2.5' Dark brown claystone; hard; damp @ 3' White silty fine-grained sandstone; very hard; laminated; some oxidation staining in upper 2' @ 3.5' Minor fault; 2.5" of apparent reverse offset; 1/8"-thick dark brown clay gouge @ 4' 3-inch-thick yellowish-brown siltstone interbed @ 5' Massive COMMENTS: Bedrock is weathered to 3'	mf: N85W, 72SW B: N38W, 9NE B: N48W, 11NE B: N42W, 10NE			
10									
15									
20									

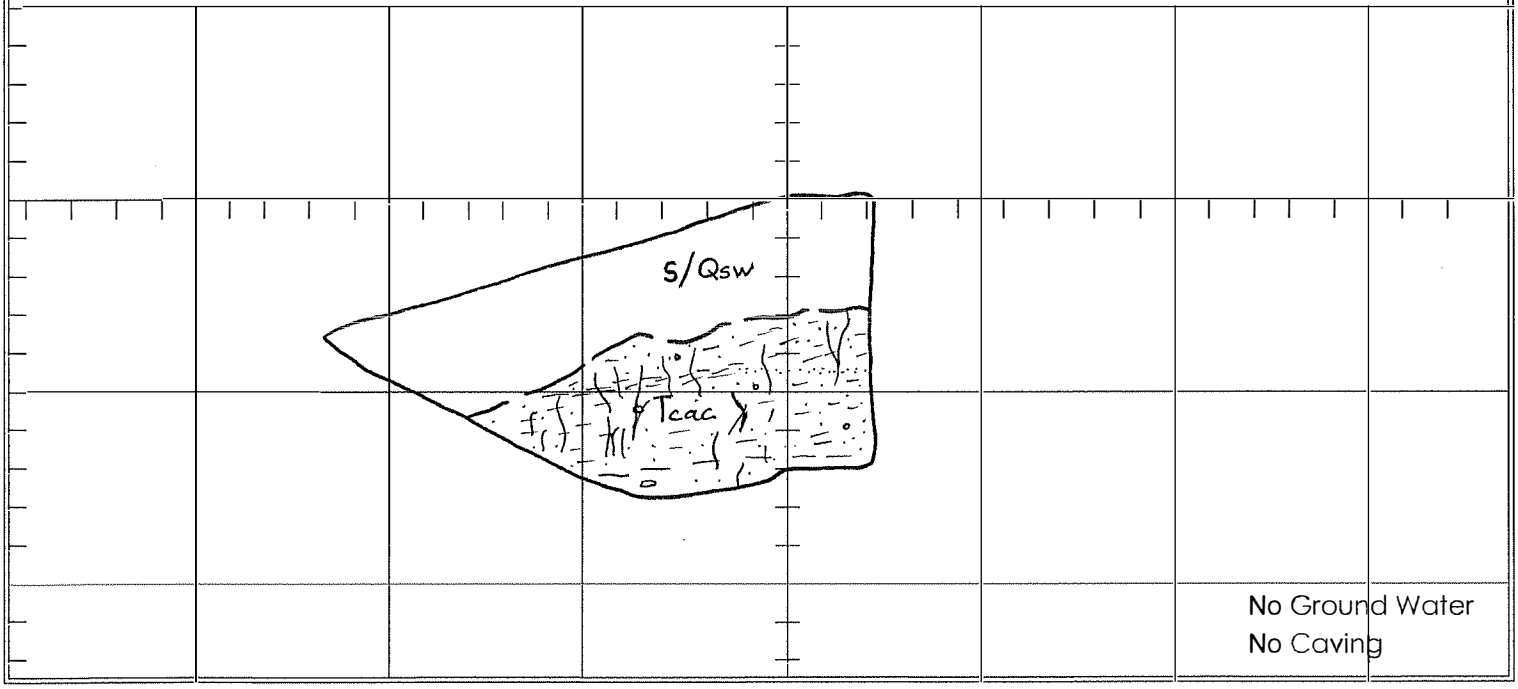
TOTAL DEPTH: 7 feet →N28W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-36**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
		EXCAVATED:	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Brown clayey silt with sand; loose; dry to damp; rootlets and voids				
5					**BEDROCK; Tcac (3 - 8')** @ 3' Brown to yellowish-brown sandy silt with pebbles; soft to medium hard; damp; massive; somewhat jumbled appearance; abundant wispy black clay; stringee; pebbles consist partly of mont shale; @ 4' Yellowish brown @ 4.5' Very vague laminations; not extensive @ 6' White diatomaceous shale; very hard; dry to damp; massive				
10					COMMENTS: Bedrock is weathered to 5'				
15									
20									

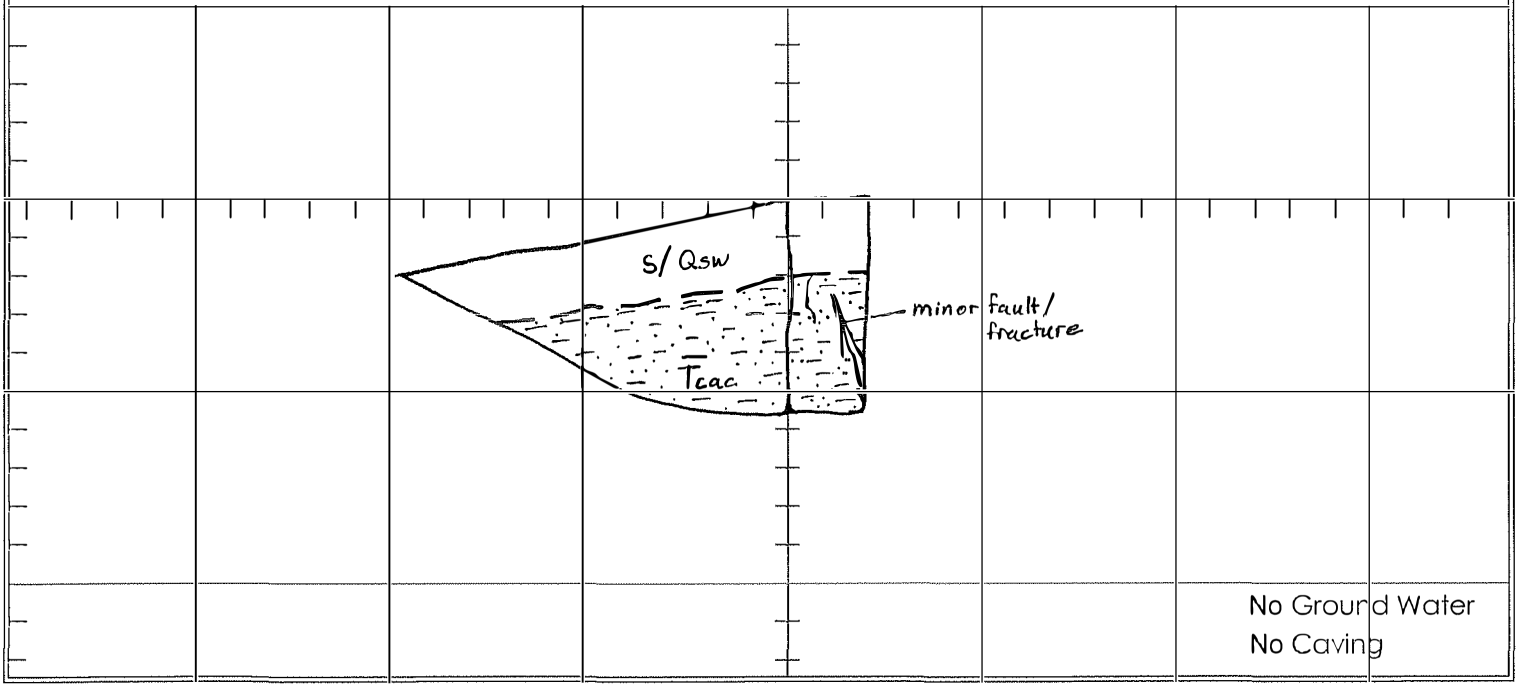
TOTAL DEPTH: 8 feet → N5W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-37**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: MBW	
	EXCAVATED:	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Brown to clayey brown clayey silt; soft; dry to damp **BEDROCK; Tcac (2 - 5.5')** @ 2' Mottled white and yellow silty fine-grained sandstone; hard to very hard; damp; massive COMMENTS: Contact between units marked by fairly planar 1/4-inch to 1/2-inch-thick dark brown to black clay Minor fault/fracture @ 2.5'; 1/4-inch to 1/2-inch thick dark brown to black clay gouge; no offset observed	mf/f: N50E, 86NW			
5									
10									
15									
20									

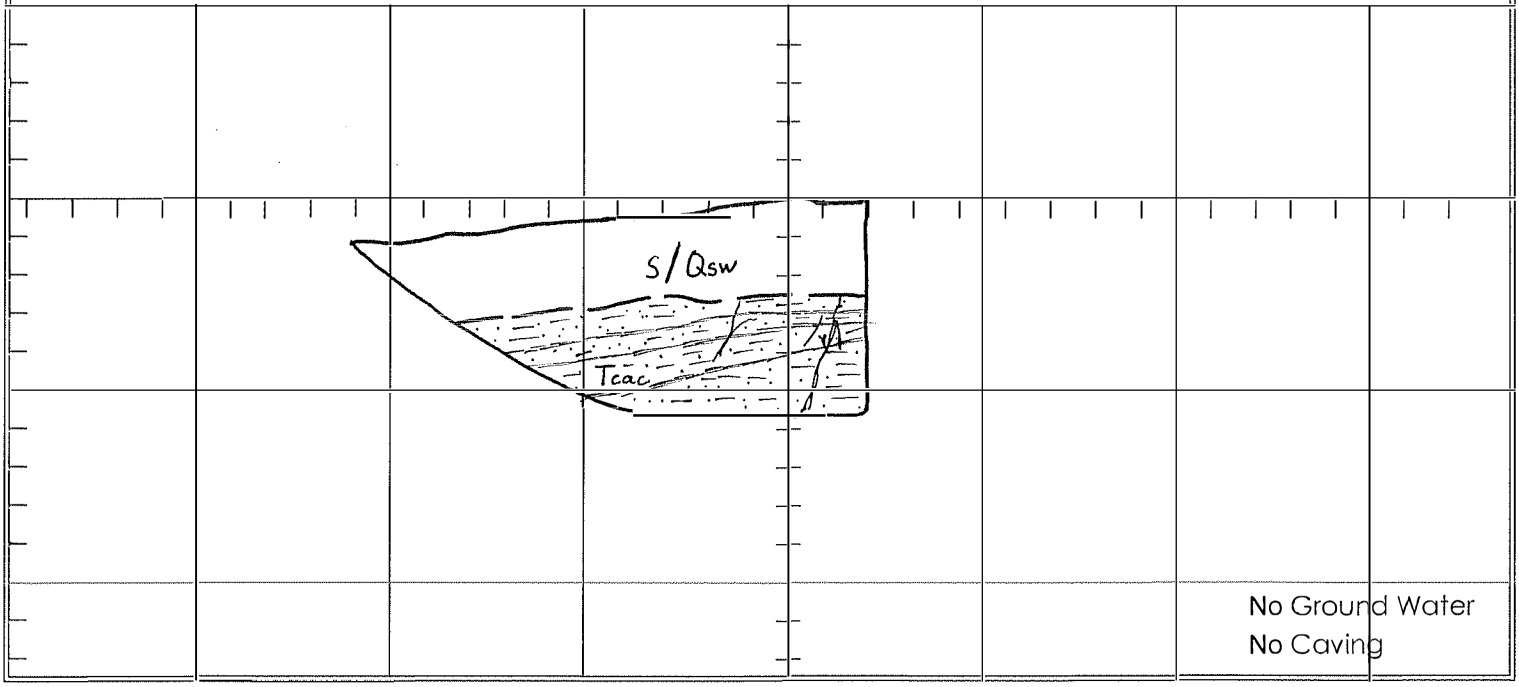
TOTAL DEPTH: 5.5 feet → West SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-38**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
		EXCAVATED:	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Brown to grayish-brown clayey silt with sand; soft; dry to damp; voids and rootlets @ 2' Brown to dark brown silty clay; damp **BEDROCK; Tcac (2.5 - 5.5')** @ 2.5' Yellow silty fine-grained sandstone; hard to very hard; damp; massive; some dark brown to black clay "beds" (1/4-inch to 1-inch thick)				
5									
10									
15									
20									

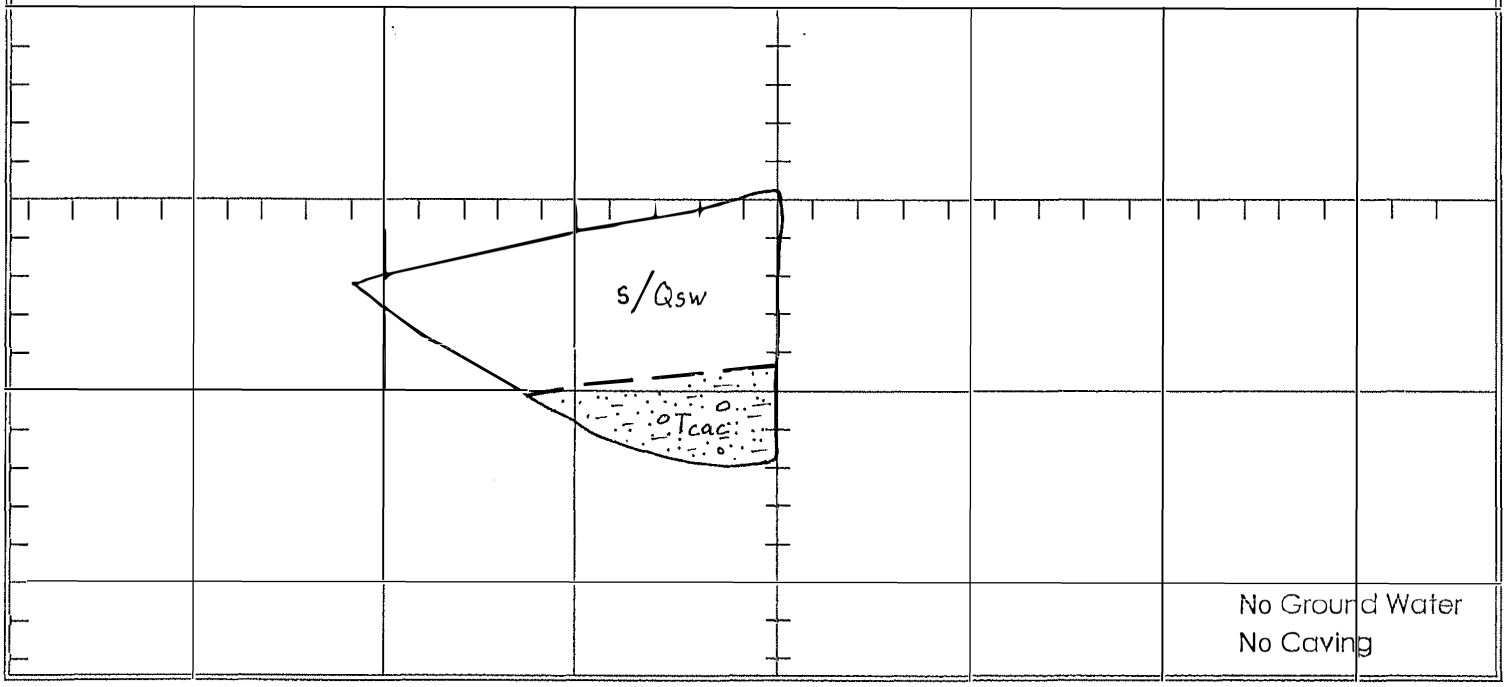
TOTAL DEPTH: 5.5 feet ←N66E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-39**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: MBW	
	EXCAVATED: 9/8/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4.5')** @ 0' Grayish-brown sandy silt; soft; dry to damp; voids and rootlets				
5					**BEDROCK; Tcac (4.5 - 7')** @ 4.5' Gray clayey fine-grained sandstone with pebbles; hard to very hard; dry to damp; massive; some voids up to 1/16"; some orange oxidation staining				
10									
15									
20									

TOTAL DEPTH: 7 feet ←N28E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC

PROJECT: Solomon Hills Specific Plan
Santa Barbara County, CA

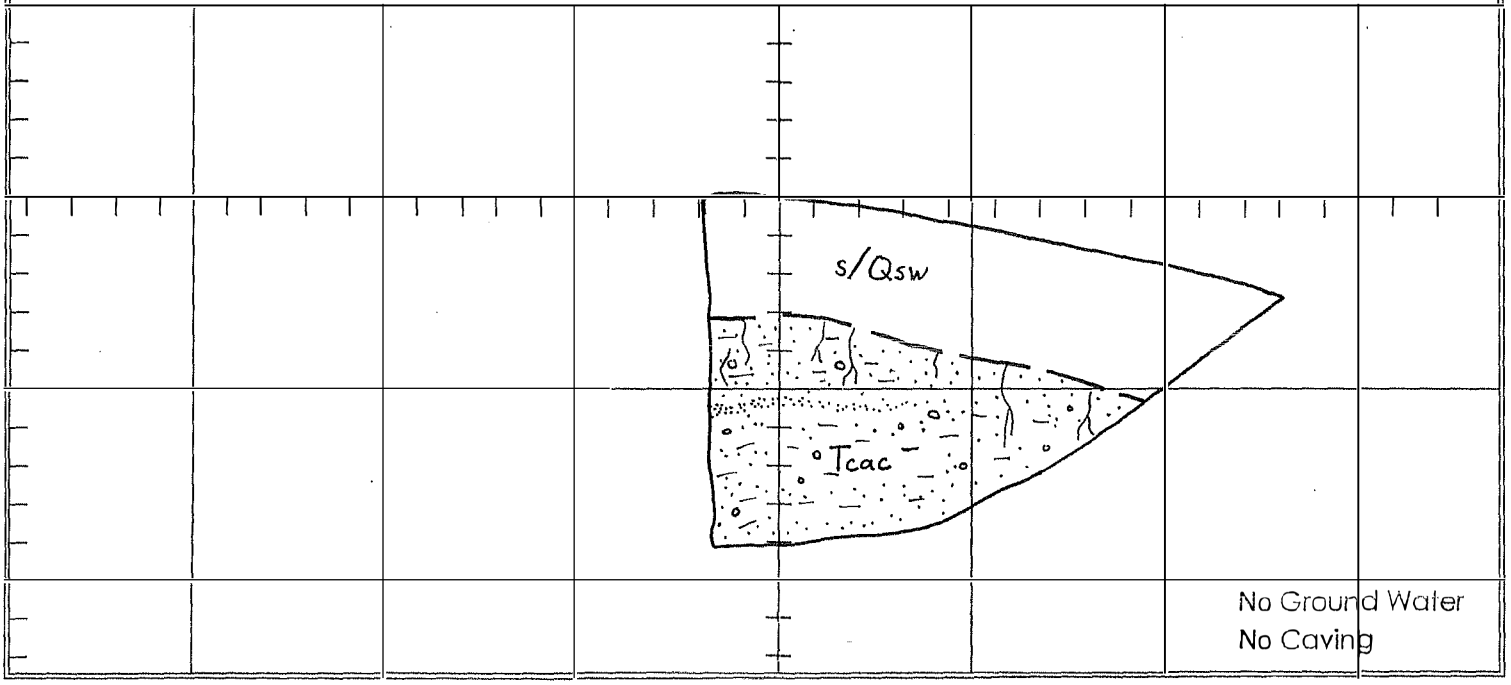
JOB NO: 22-2195s-1
DATE: 10/20/23
LOGGED BY: MBW
EXCAVATED: 9/8/06
ELEVATION: See map

EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket

TRENCH LOG NO. GT-40

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Brown to grayish-brown sandy silt; soft; dry to damp; numerous voids and roots				
5					**BEDROCK; Tcac (3 - 8')** @ 3' Brown clayey sandstone with pebbles; moderately hard; damp; massive; some roots and voids @ 4.75' Mottled brown, gray, and grayish brown; moderately hard to hard; some black discoloration @ 5.25' 3-inch-thick white fine-grained sandstone interbed; pinches out to north	Apx B: N60W, 3NW			
10					COMMENTS: Bedrock is weathered to 4.75'				
15									
20									

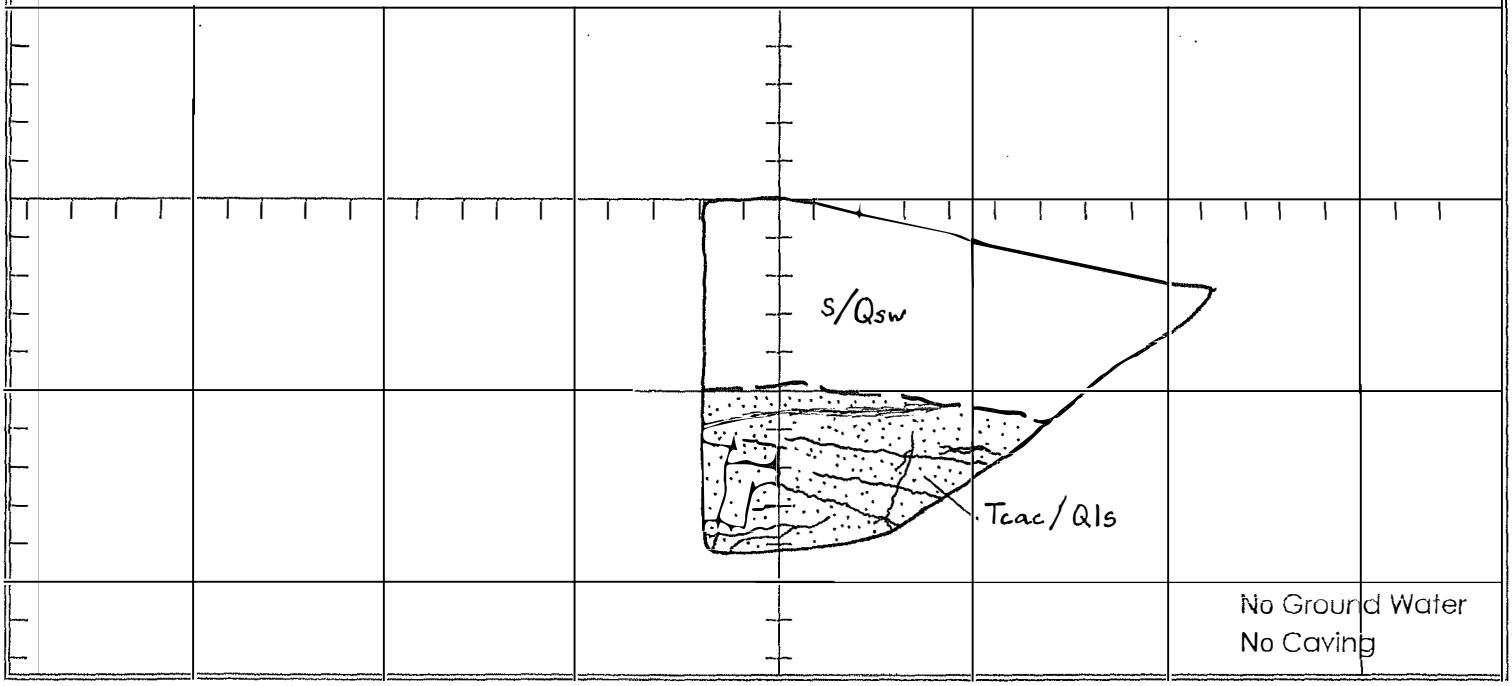
TOTAL DEPTH: 8 feet → N1E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-41**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: MBW	
	EXCAVATED: 9/8/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 -5')** @ 0' Brown to grayish-brown sandy silt; soft; dry to damp; numerous voids and roots				
5					**BEDROCK/LANDSLIDE DEPOSITS?; Tcac/Qls (5 - 9')** @ 5' White fine-grained sandstone with brown silty sandstone interbeds; soft to moderately hard; friable; dry to damp; some yellow staining; some fractures/minor faults exhibiting minor offsets, interbeds are undulating (may be weathering feature) @ 5.5' Thin (1/2") clay-lined fracture COMMENTS: Weathered to >9'	fr: N43E, 23NW			
10									
15									
20									

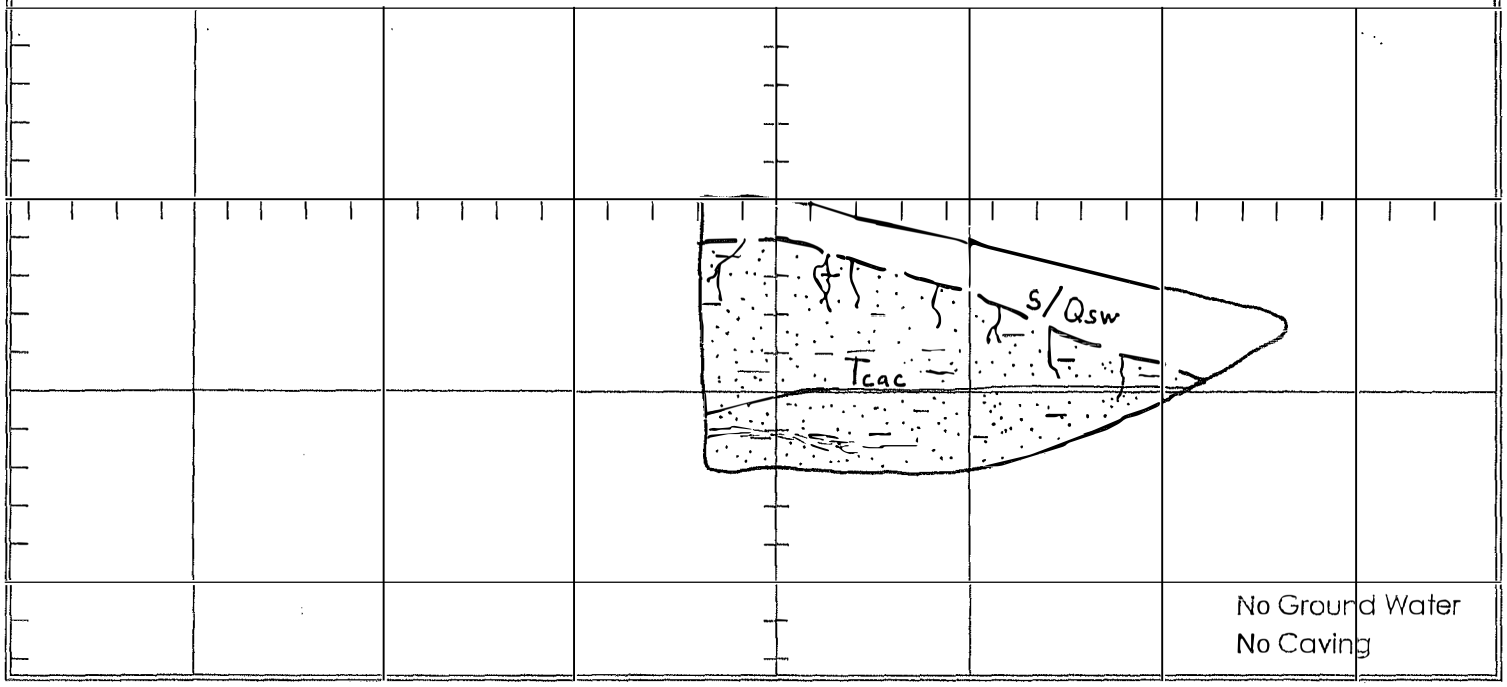
TOTAL DEPTH: 9 feet →N45E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-42**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
		EXCAVATED: 9/8/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1')** @ 0' Brown sandy silt; soft; damp; numberous voids and roots **BEDROCK; Tcac (1 - 8')** @ 1' Mottled white and orange (oxidized) silty fine-grained sandstone; moderately hard; some roots to 2.5'; fractured; massive				
5									
					COMMENTS: Bedrock is weathered to 2.5'				
10									
15									
20									

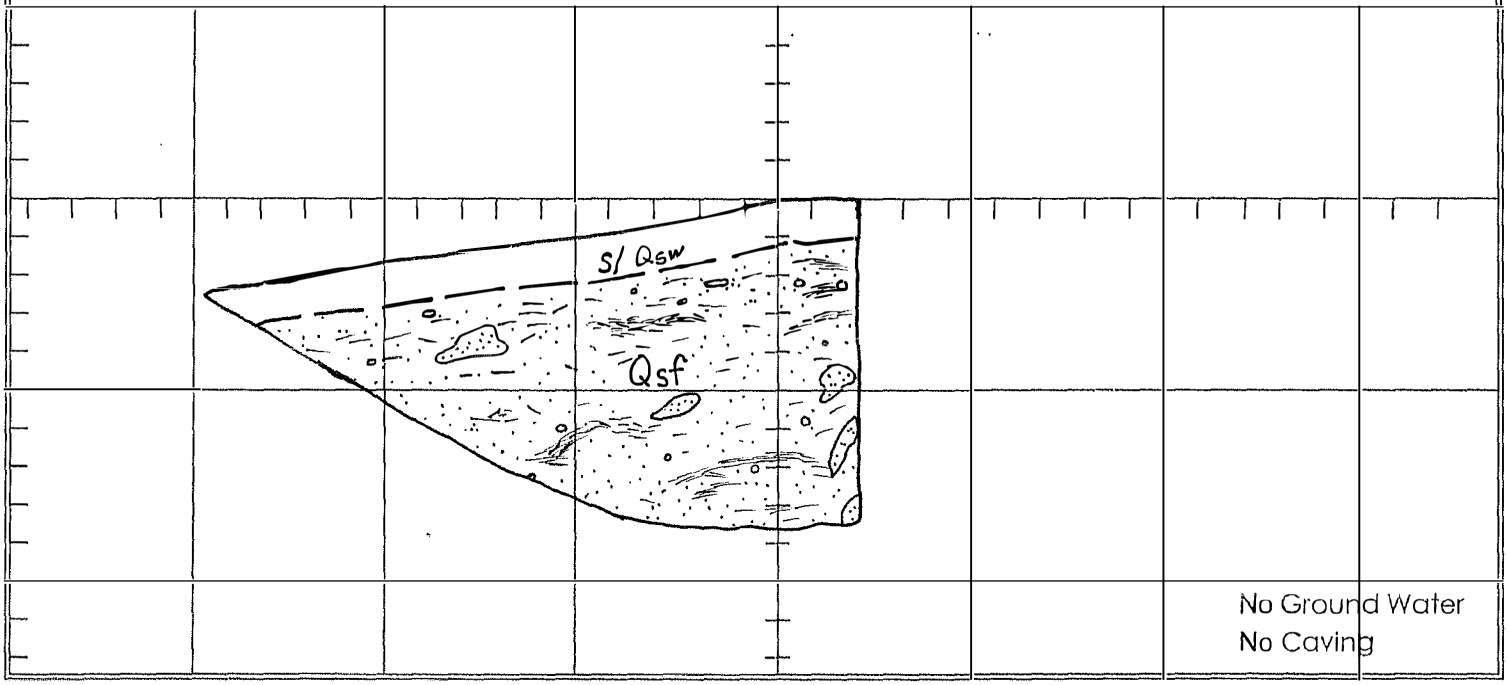
TOTAL DEPTH: 8 feet ←N51E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-43**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
		EXCAVATED: 9/8/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1')** @ 0' Brown sandy silt; soft; dry to damp **SURFICIAL FAILURE; Qsf (1 - 8.5')** @ 1' Jumbled brown, gray, black and tan sandstone, sandy mudstone, and clayey sandstone with pebbles; soft to moderately hard; damp; chaotic appearance @ 3' Soft; damp to moist				
5									
10									
15									
20									

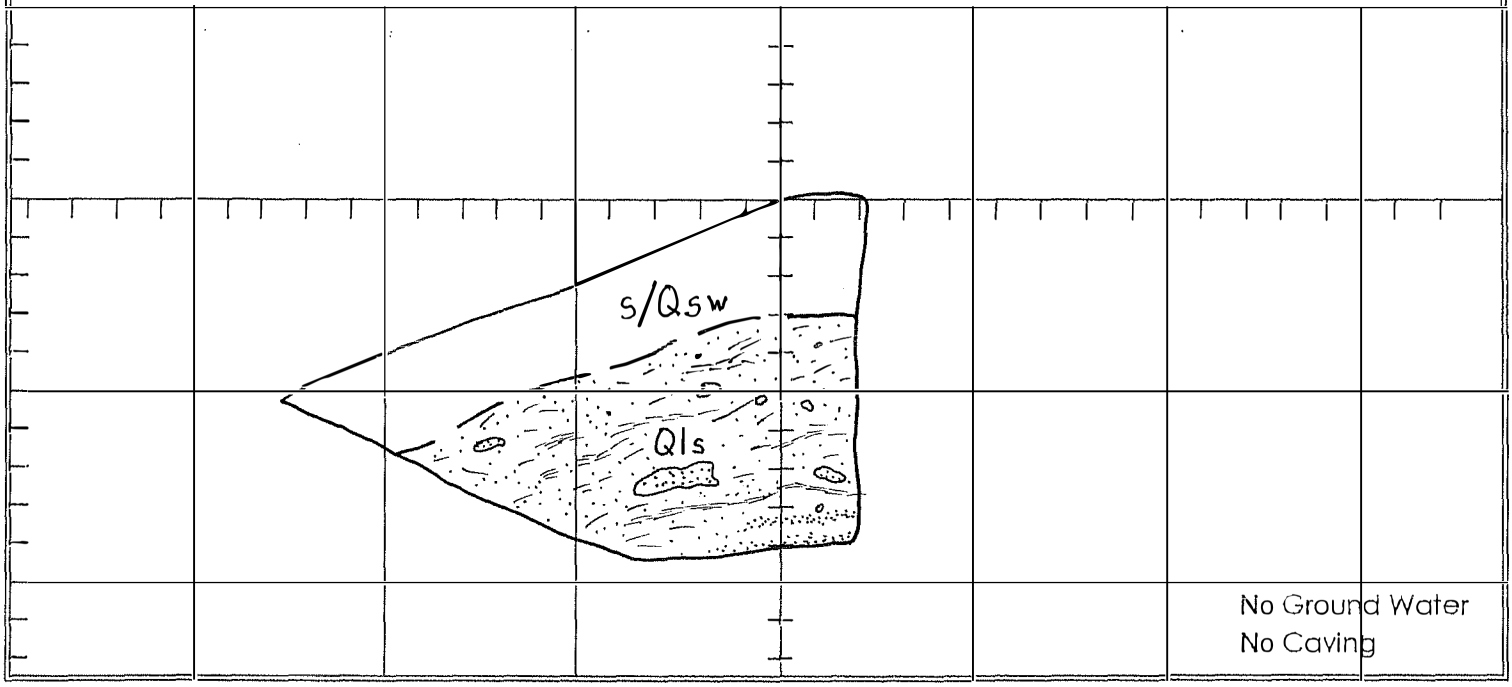
TOTAL DEPTH: 8.5 feet ←N30E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-44**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: MBW	
	EXCAVATED: 9/8/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Grayish-brown sandy silt with clay; soft; dry to damp; abundant voids and rootlets **LANDSLIDE DEPOSITS; Qls (3 - 9')** @ 3' Jumbled dary gray, brown, gray and stong brown sandy silt; clayey sand, and silty sand; soft; damp to moist; chaotic appearance @ 8.5 Yellow fine-grained sand				
5									
10									
15									
20									

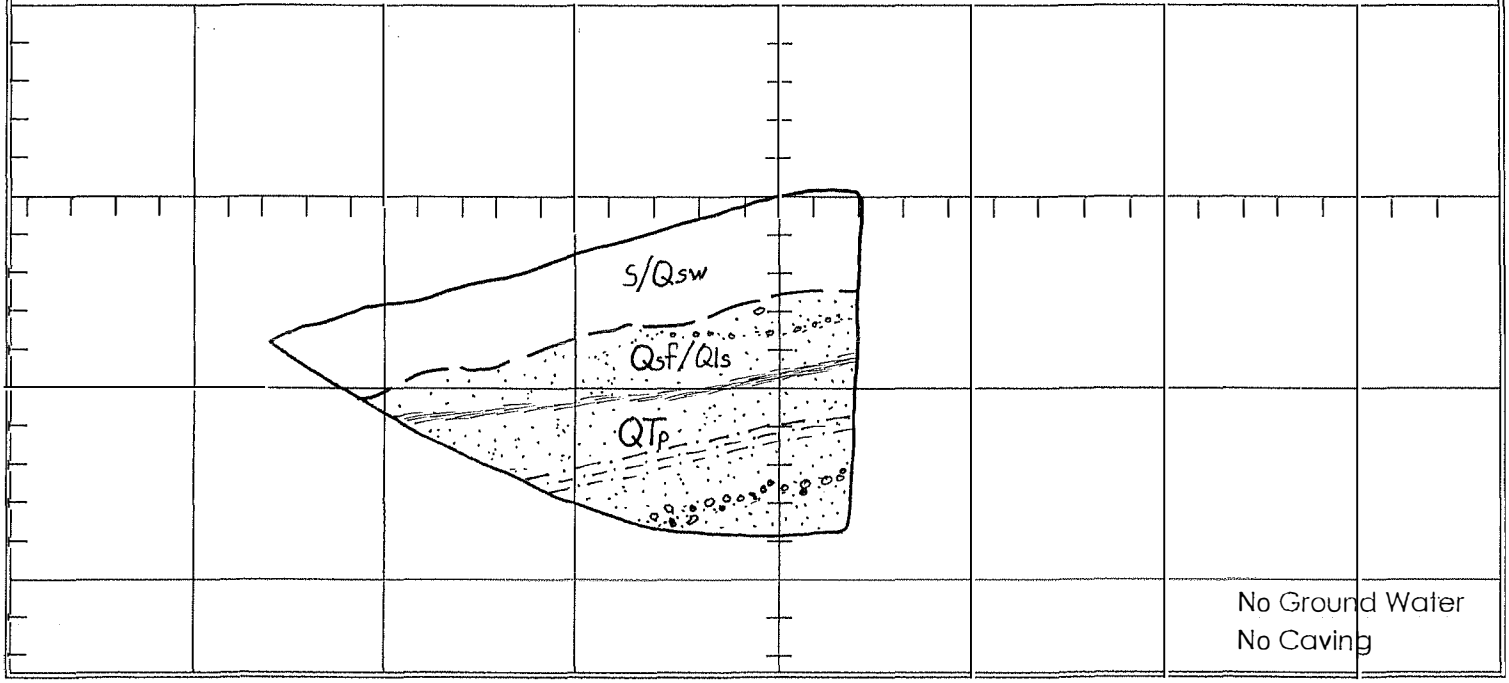
TOTAL DEPTH: 9 feet ←N18W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-45**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: MBW	
	EXCAVATED: 9/8/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Dark brown silty, pebbly sand; soft; damp to moist				
					SURFICIAL FAILURE; Qsf; Qls (2.5 - 5') @ 2.5' Brown pebbly sand; soft; friable; damp to moist @ 2.75' Brown to strong brown sand with pebbles @ 3' 3-inch-thick pebble line @ 4.75' Olive brown clay; 1-2" thick; moist very plastic	ss?: N63W, 18NE B: N60W, 20NE			
5					**BEDROCK; QTp (5 - 8.5')** @ 5' White silty fine-grained sandstone; soft to moderately hard; friable; damp to moist; massive @ 6' 2-inch-thick brown siltstone interbed @ 7' belling up to 0.75 feet @ 7.5 pebble/cobbly layer (6" thick)	Apx B: N56W, 23NE			
10									
15									
20									

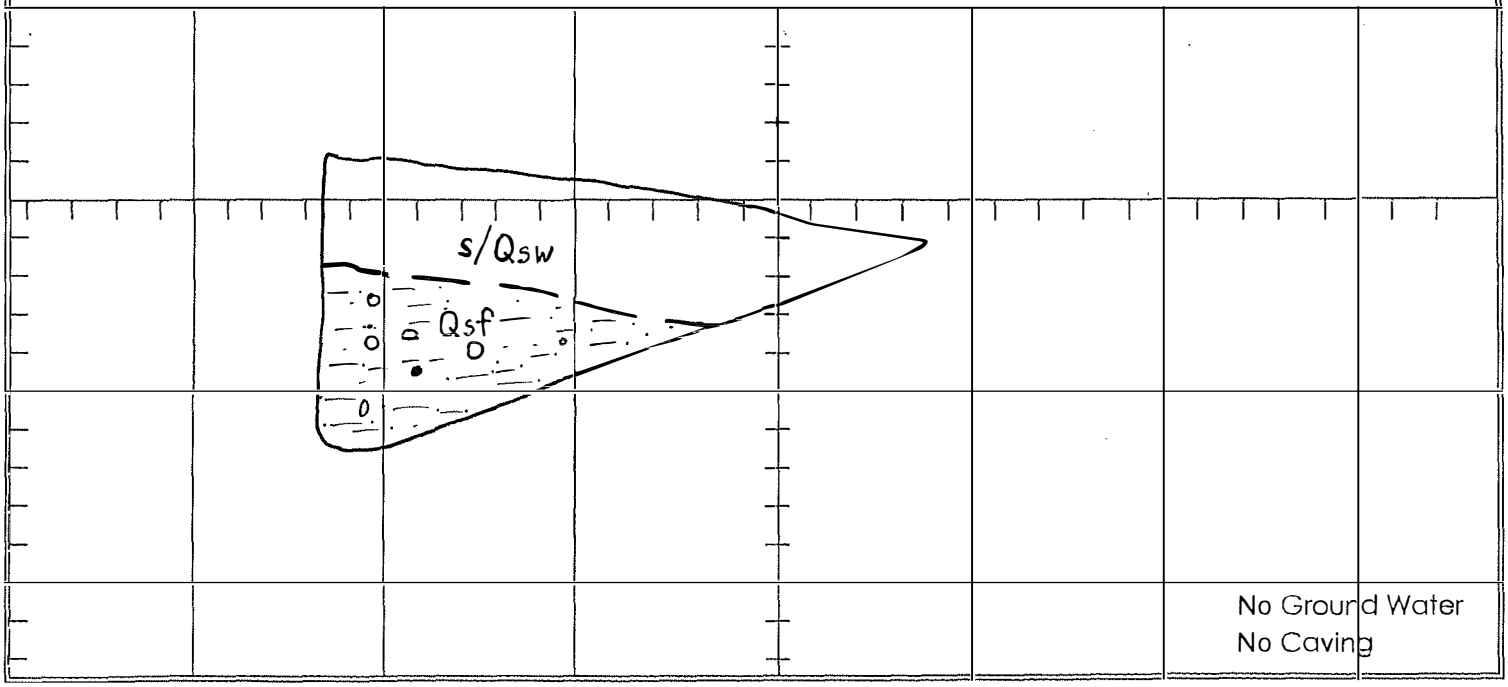
TOTAL DEPTH: 8.5 feet ←N35W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-46**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/11/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Dark brown to grayish-black, sandy clay; soft damp				
5					**SURFICIAL FAILURE; Qsf (3 - 7')** @ 3' Light yellowish-brown and orangish-brown, sandy clay and clayey siltstone with abundant caliche pods (1 - 3" diameter); moderately hard; damp				
10					**COMMENTS:** Appears chaotic but could be creep affected clayey bedrock				
15									
20									

TOTAL DEPTH: 7 feet ←N70E SCALE: 1 inch = 5 feet

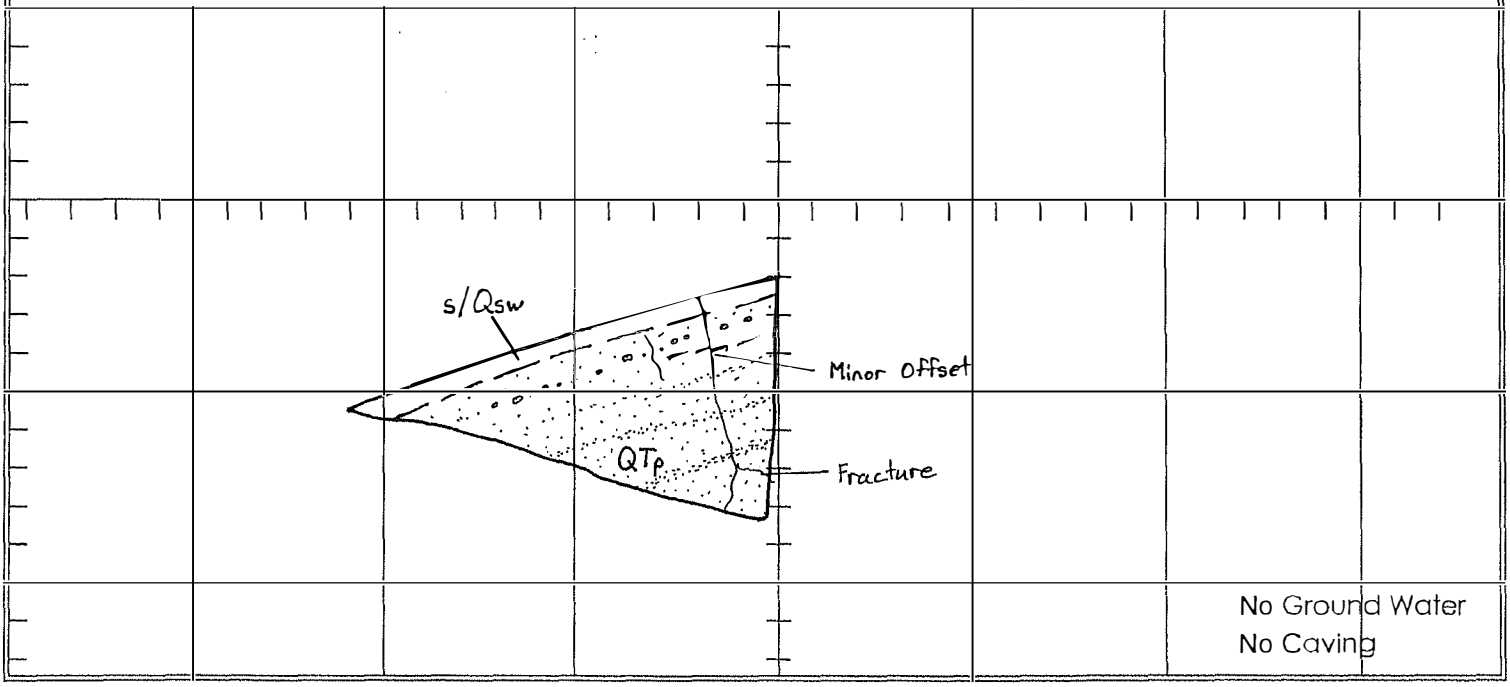


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-47**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/11/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 6")** @ 0' Light brown silty sand; medium dense; dry to damp **BEDROCK; QTp (6" - 6')** @ 6" Light tannish-brown sandstone with cross laminae and pebbly sandstone; moderately hard; damp	B: N52W; 19NE			
5					**COMMENTS:** Fractures 1/8" - 1/2" wide with black clay in filling Minor offset (1/3" rev.) at top of trench to no offeset with depth				
10									
15									
20									

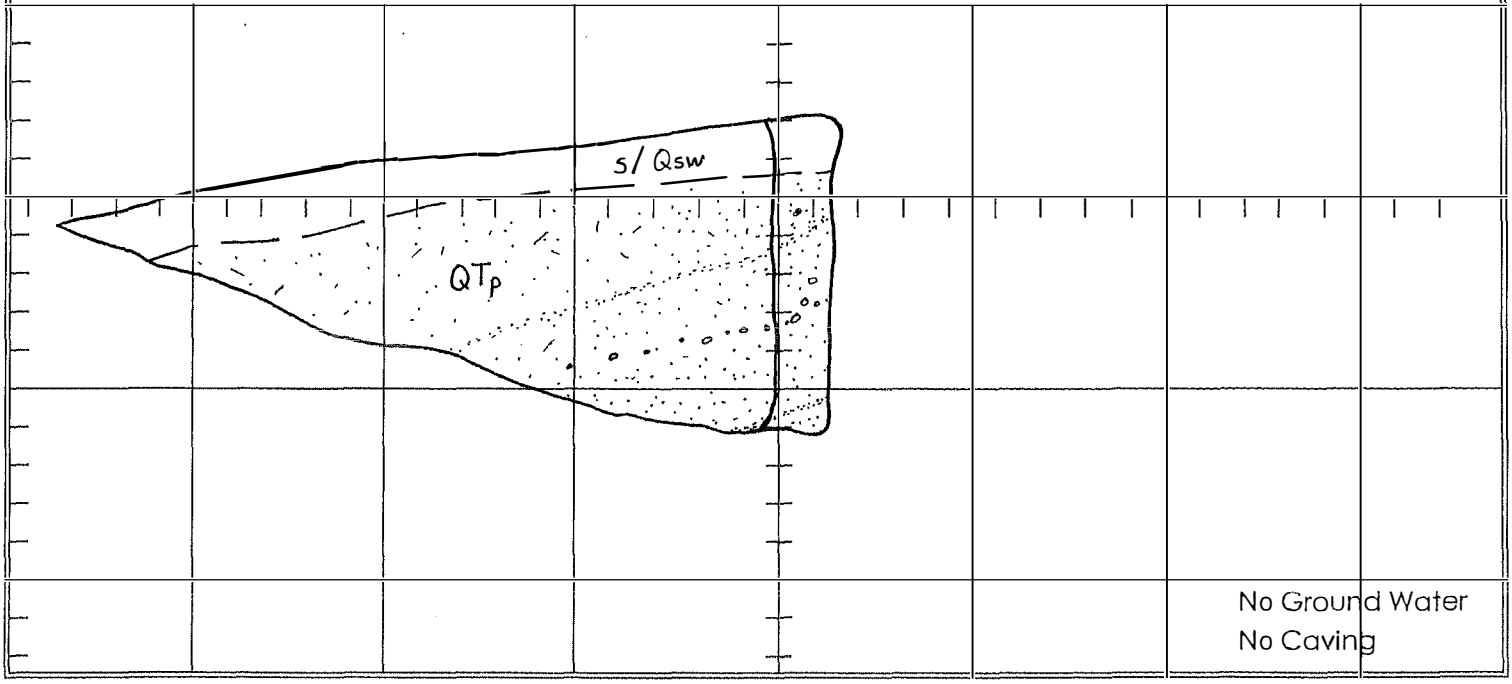
TOTAL DEPTH: 6 feet ←N42E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-48**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/11/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s/Qsw (0 - 1.5')** @ 0' Dark greenish-brown to black, silty clay; soft to stiff; damp				
5					**BEDROCK; QTp (1.5 - 8')** @ 1.5' Light yellowish-brown to grayish-brown silty sandstone, sandstone and pebbly sandstone; friable; moderately hard; dry to damp	B: N50W, 31NE (laminae)			
10					**COMMENTS:** Weathered to 3.5'				
15									
20									

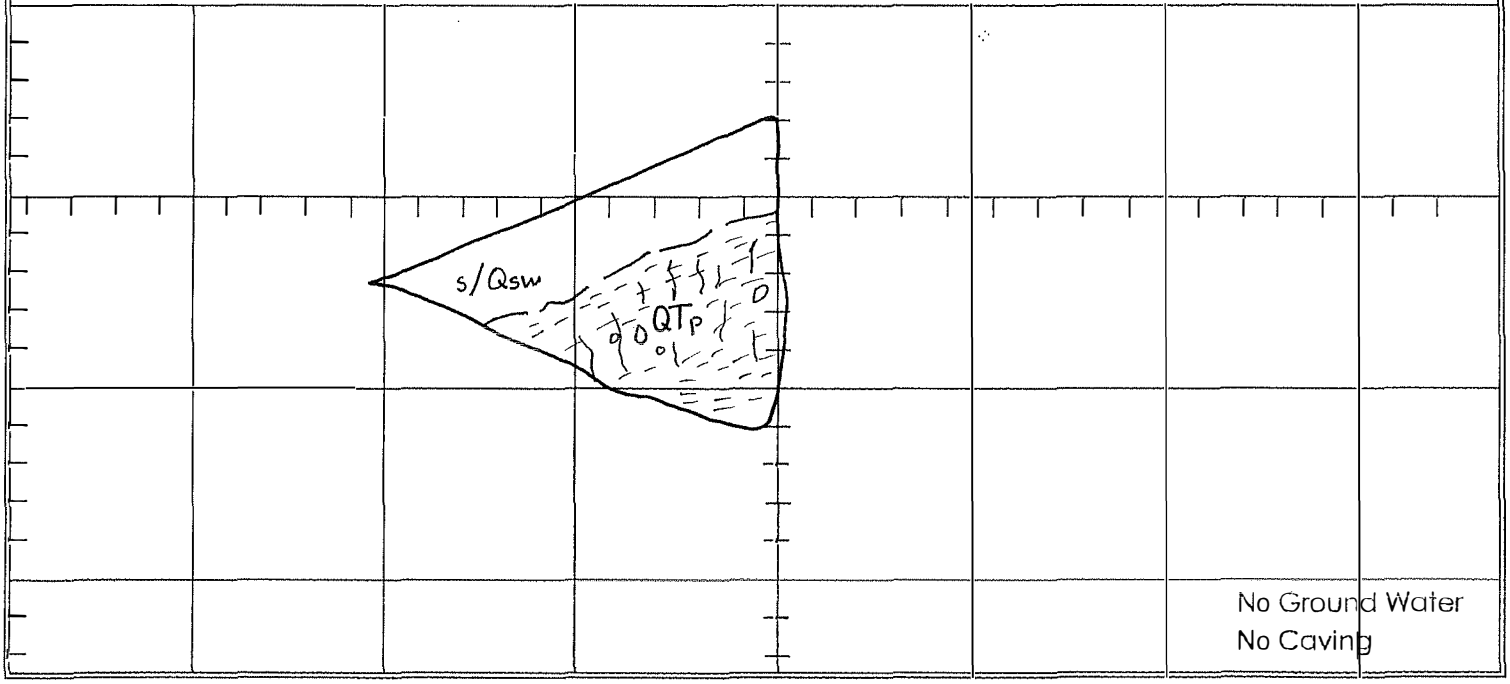
TOTAL DEPTH: 8 feet ←N6W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-49**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/11/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Dark grayish-brown to black sandy clay; soft to stiff; damp **BEDROCK; QTp (2.5 - 8')** @ 2.5' Light orangish-brown mottled and non-mottled mudstone/ claystone; (clay is plastic); soft to stiff; damp to moist **COMMENTS:** Weathered down to 5.5' Mottled portion in weathered zone Bulk Sample @ 7'				
5									
10									
15									
20									

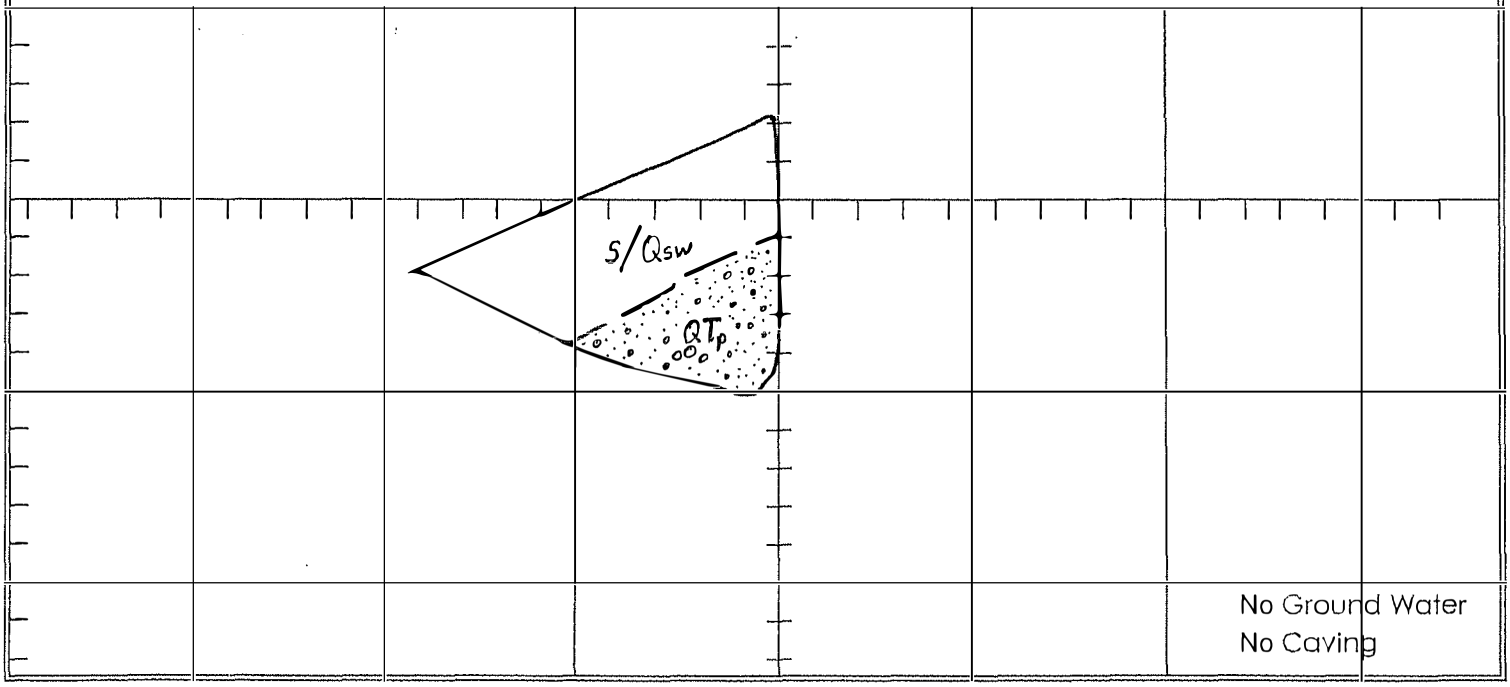
TOTAL DEPTH: 8 feet ←N32W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-50**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/11/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Medium- to dark-brown sandy silt; medium dense; dry				
5					**BEDROCK; QTp (3 - 7.5')** @ 3' Light grayish-brown to tan massive pebbly sandstone and pebble conglomerate; slightly friable; moderately hard; dry to damp				
10									
15									
20									

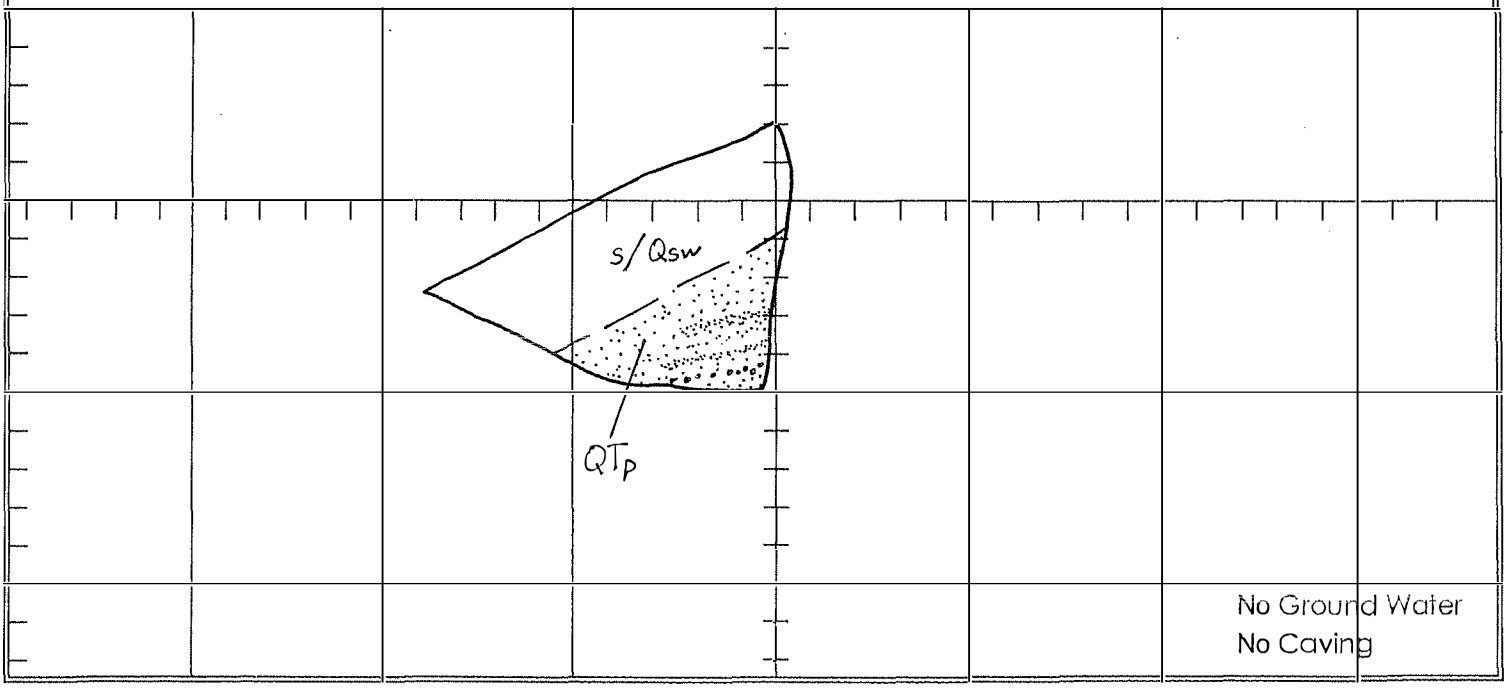
TOTAL DEPTH: 7 feet ←N73W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-51**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/11/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Medium- to dark-brown sandy silt; medium dense; dry				
5					**BEDROCK; QTp (3 - 7')** @ 3' Light grayish-tan fine grained sandstone with oxidized pebble lense; friable; moderately hard; dry to damp	a) XB: N20W; 23NE b) B: N40W, 25NE			
10					**COMMENTS:** Weathered down to 4.5'				
15									
20									

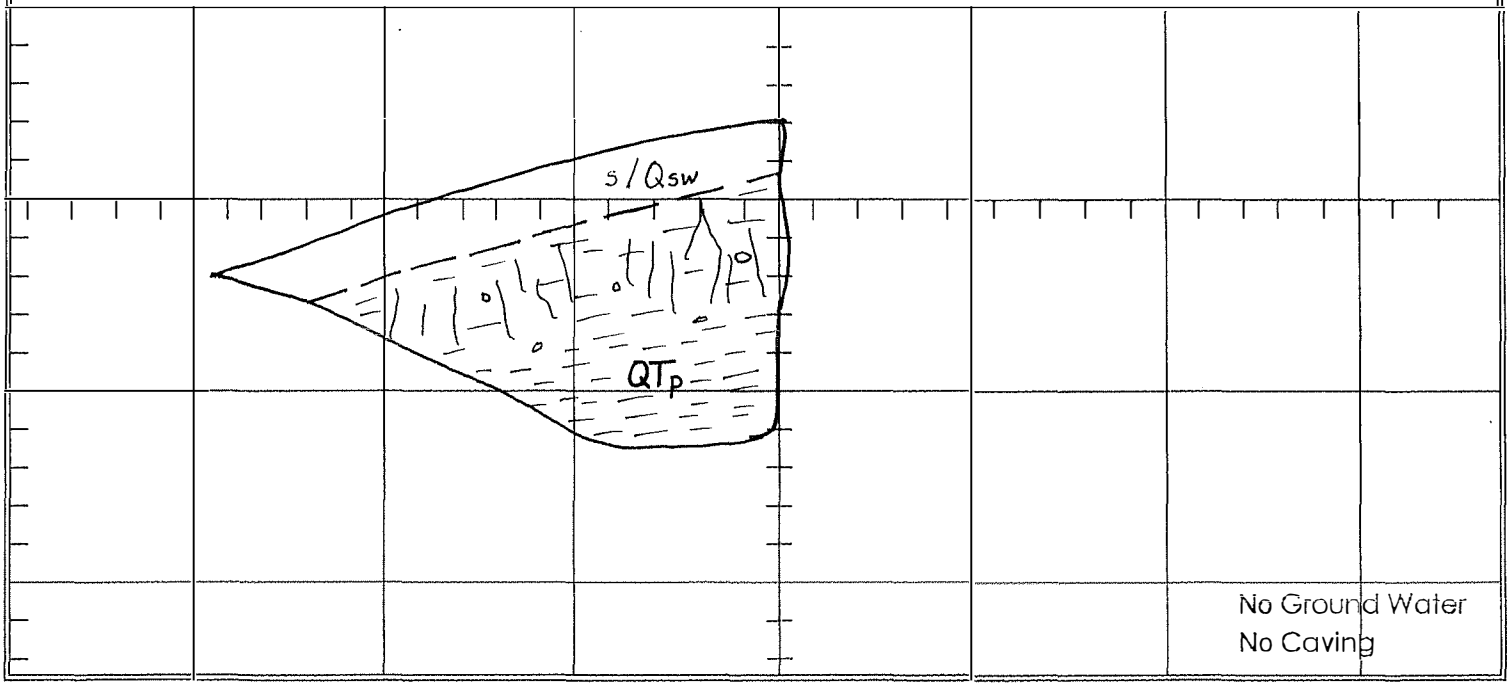
TOTAL DEPTH: 7 feet ←N21W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-52**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/11/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Dark grayish-brown to black silty clay; soft to stiff; dry to damp **BEDROCK; QTp (1.5 - 8')** @ 1.5' Light orangish-brown massive mudstone/claystone; (plastic); soft to stiff; damp	Massive			
5					**COMMENTS:** Weathered down to 5' mottled with scattered caliche pods				
10									
15									
20									

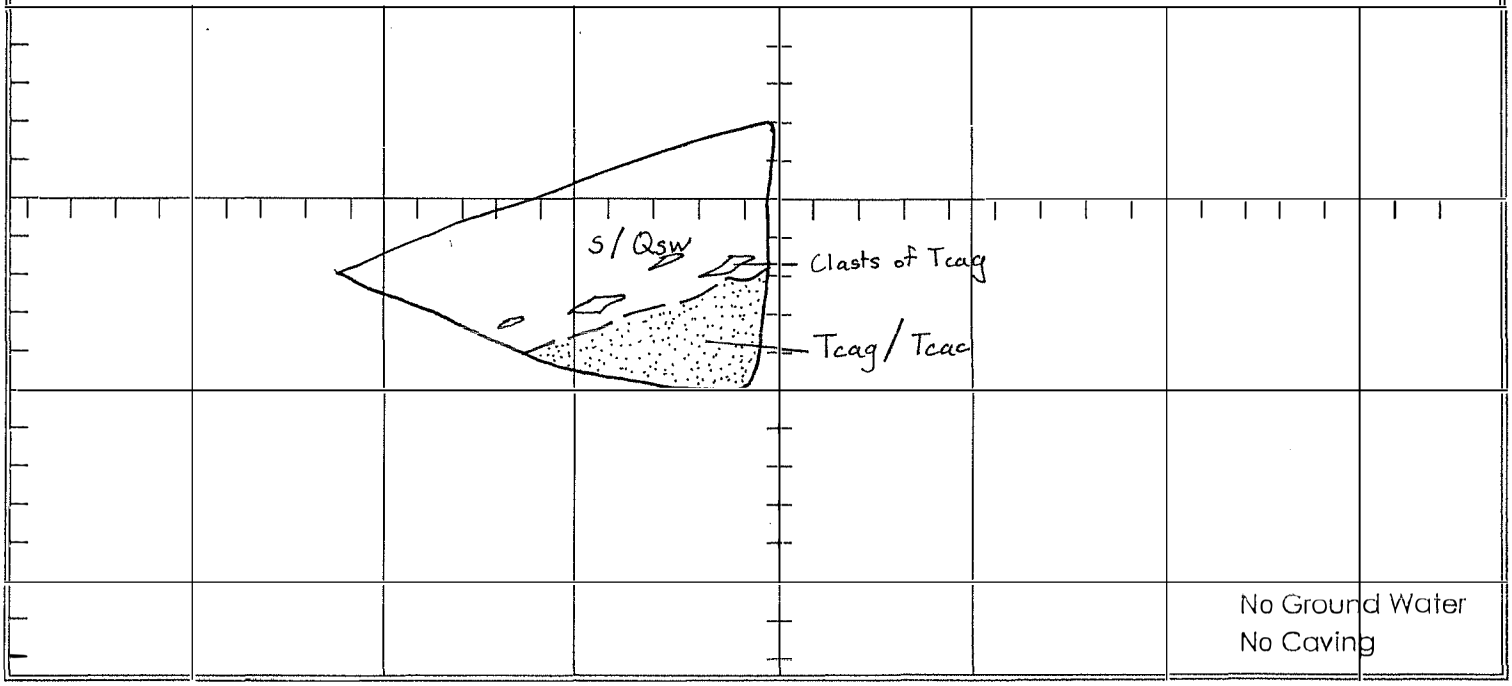
TOTAL DEPTH: 8 feet ←N57E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-53**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/11/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4')** @ 0' Light- to medium grayish-brown silty sand to sandy silt; loose to medium dense; dry				
5					**BEDROCK; Tcag/Tcac (4 - 7')** @ 4' Light yellowish-tan; massive; very fine grained; silty sandstone; moderately hard; dry to damp				
10									
15									
20									

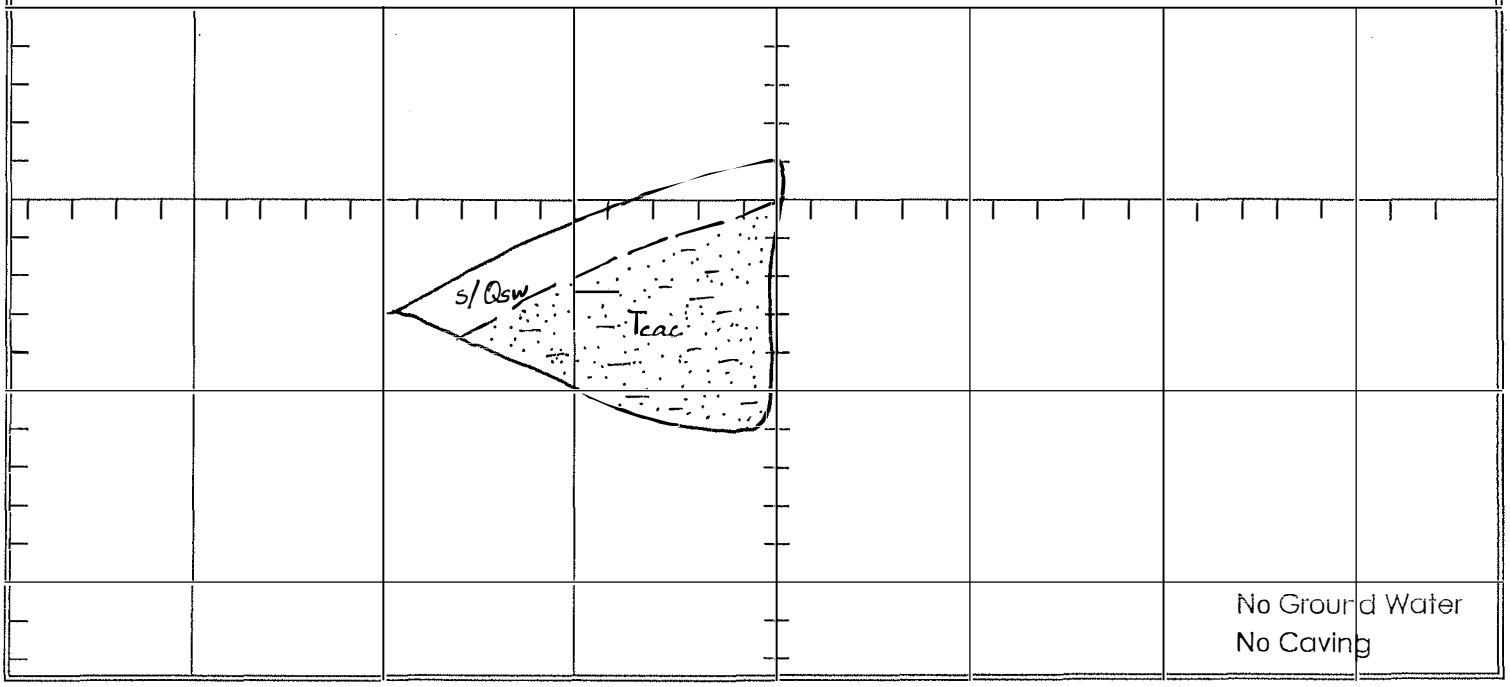
TOTAL DEPTH: 7 feet N8E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-54**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/11/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Light grayish-brown sandy silt; loose to medium dense; dry				
					BEDROCK; Tcac (1.5 - 7') @ 1.5' Light yellowish-white to light yellowish-tan, very fine, silty sandstone; massive; moderately hard; dry to damp	Massive			
5					**COMMENTS:** Some oxidation (FeO_2) staining				
10									
15									
20									

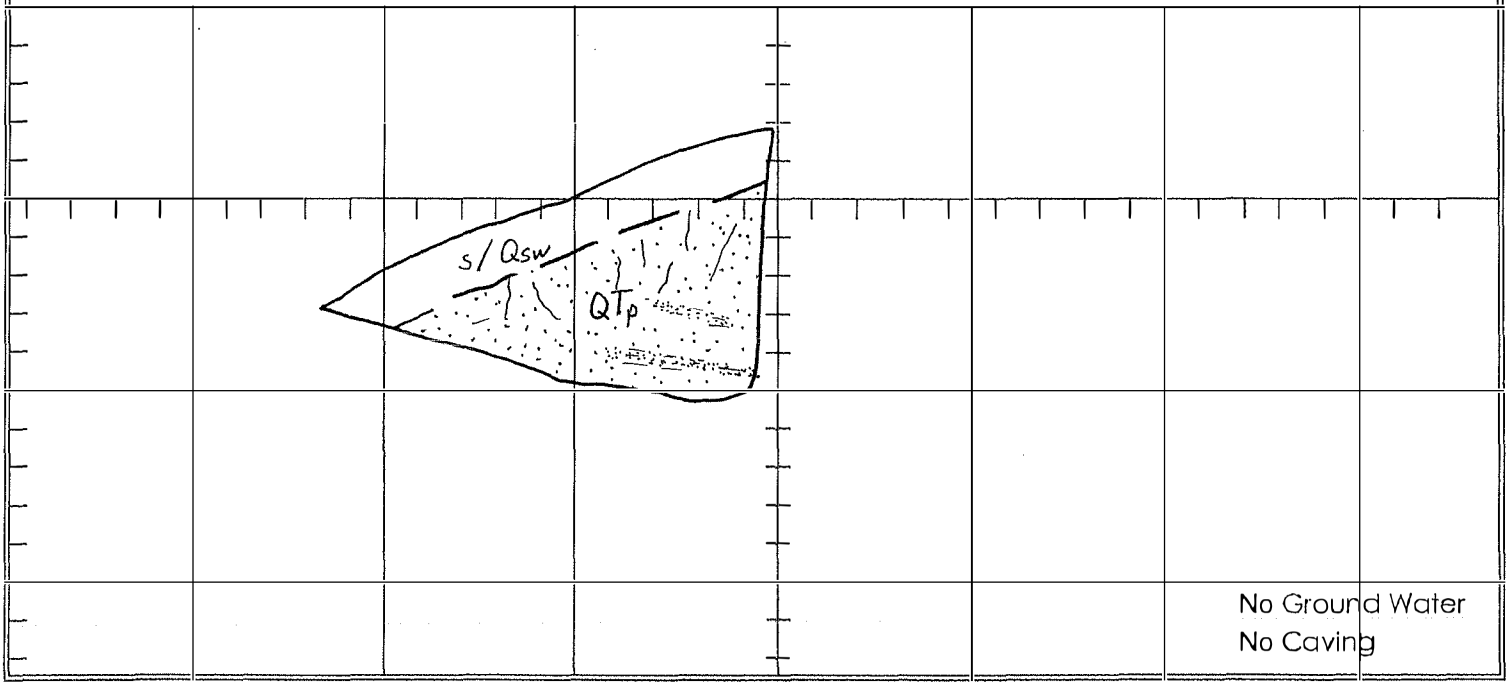
TOTAL DEPTH: 7 feet ←N60E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-55**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/12/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 1.5' Dark-brown clayey, sandy silt; loose to medium dense; dry to damp **BEDROCK; QTp (1.5 - 7')** @ 1.5' Light grayish-brown to grayish-white sandstone and silty sandstone; moderately hard; dry to damp **COMMENTS:** Weathered down to 3'	Apx B: N68W, 27NE			
5									
10									
15									
20									

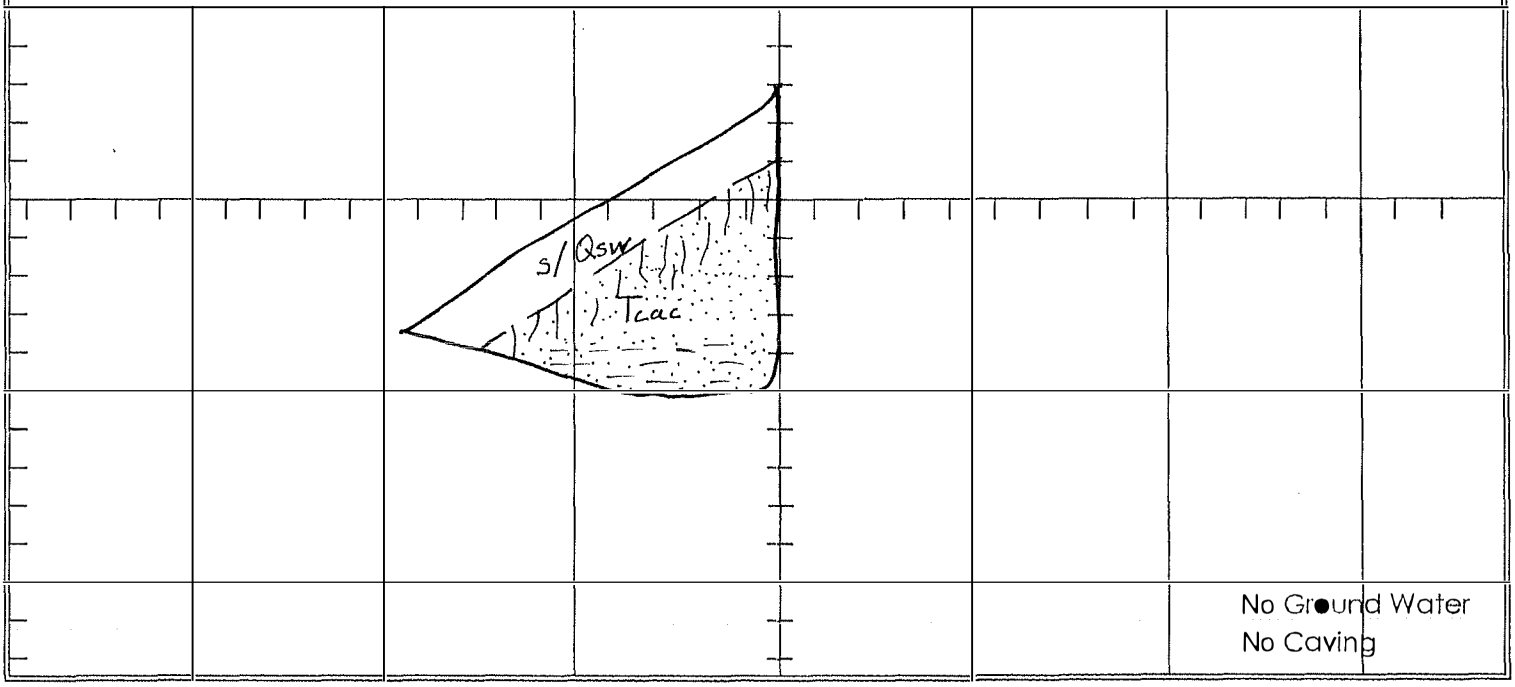
TOTAL DEPTH: 7 feet North→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-56**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/12/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Light grayish-brown silty sand to sandy silt; loose to moderately dense; dry to damp **BEDROCK; Tcac (2 - 8')** @ 2' Light yellowish-tan and light-brown sandstone and silty sandstone; moderately hard to hard; dry to damp **COMMENTS:** Weathered down to 3.5'	Apx B: N50W; 6SW			
5									
10									
15									
20									

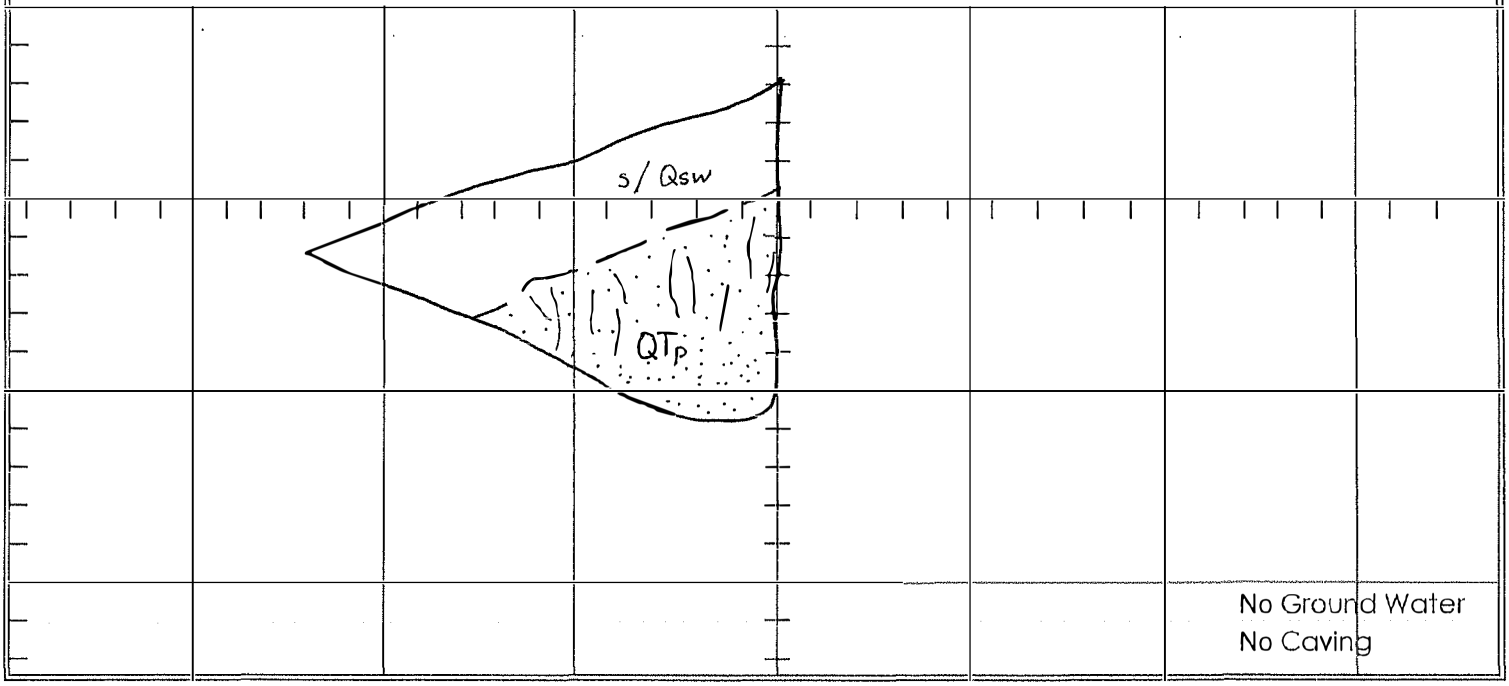
TOTAL DEPTH: 8 feet ←N87E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-57**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/12/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Light- to medium grayish-brown silty sand; loose; dry				
5					**BEDROCK; QTp (3 - 8.5')** @ 3' Light yellowish-brown sandstone; friable; moderately hard; dry to damp; massive	Massive			
10					**COMMENTS:** Weathered down to 6' Digs very easy "soft" due to friable nature				
15									
20									

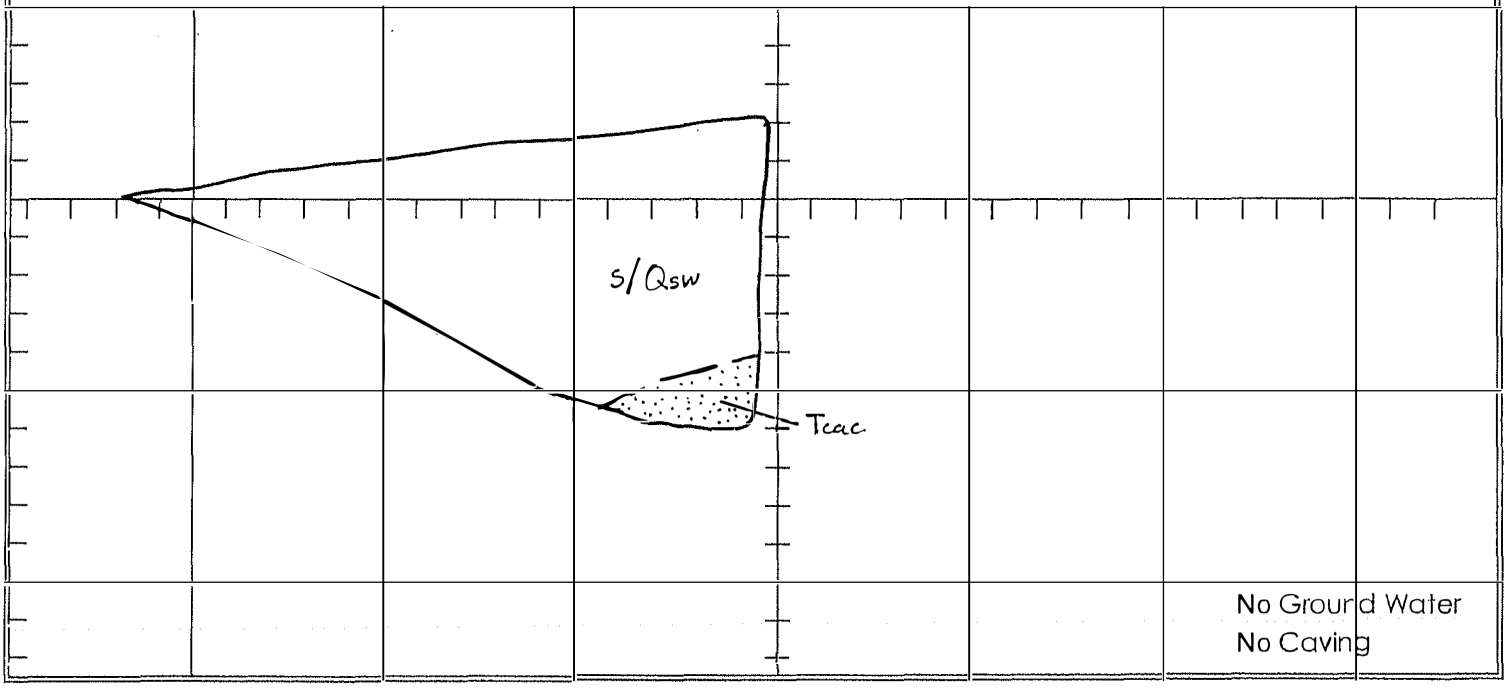
TOTAL DEPTH: 8.5 feet ←N18W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-58**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/12/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 6')** @ 0 - 4' Light grayish-brown, silty sand to sandy silt; loose to medium dense; dry @ 4 - 6' Medium-brown sandy, clayey silt; moderately dense; damp **BEDROCK; Tcac? (6 - 8')** @ 6' Light grayish-white silty sandstone; moderately hard; dry to damp	Massive			
5									
10									
15									
20									

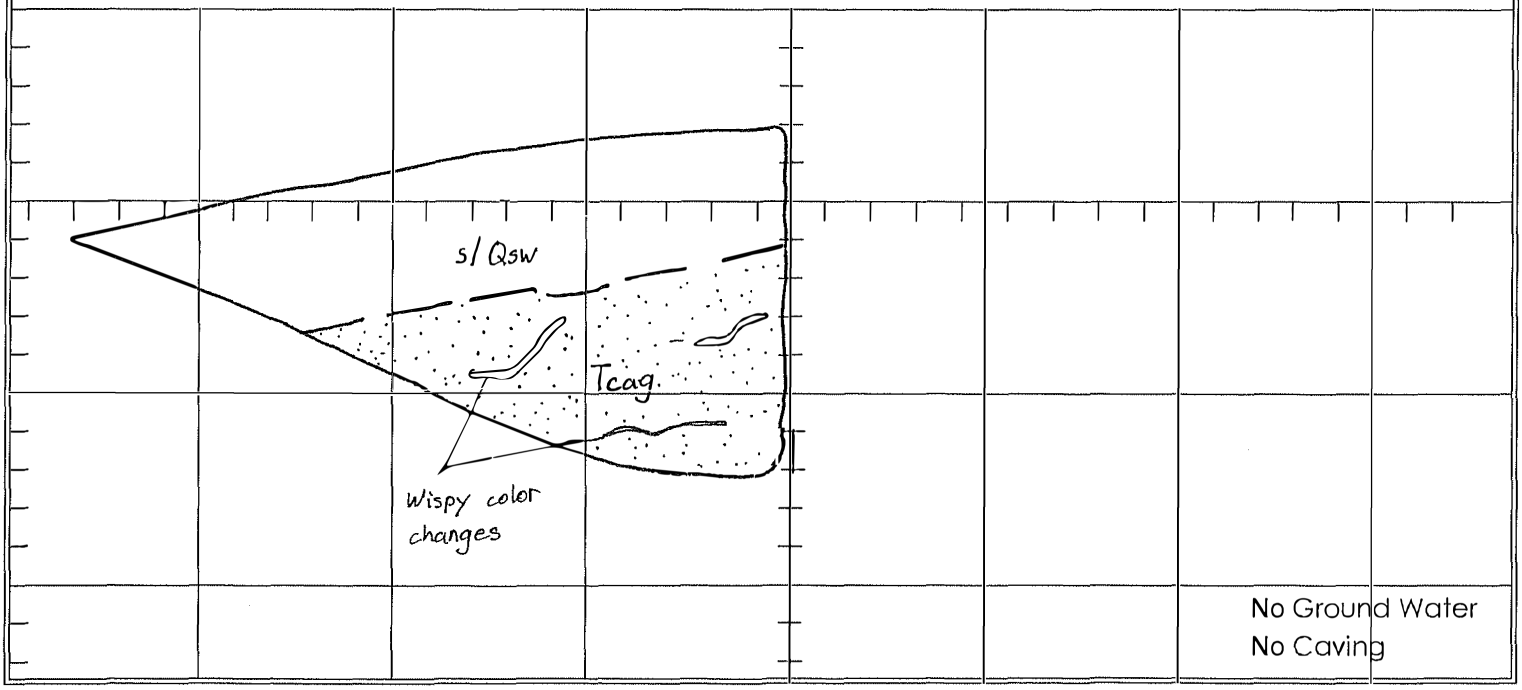
TOTAL DEPTH: 8 feet ←N42E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-59**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/12/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Light grayish-brown silty sand; loose to medium dense; dry				
5					**BEDROCK; Tcag (3 - 9')** @ 3' Light grayish-brown sandstone; moderately hard; dry to damp	Massive			
10					**COMMENTS:** Soil slopewash probably weathered "nearly in place" Tcag				
15									
20									

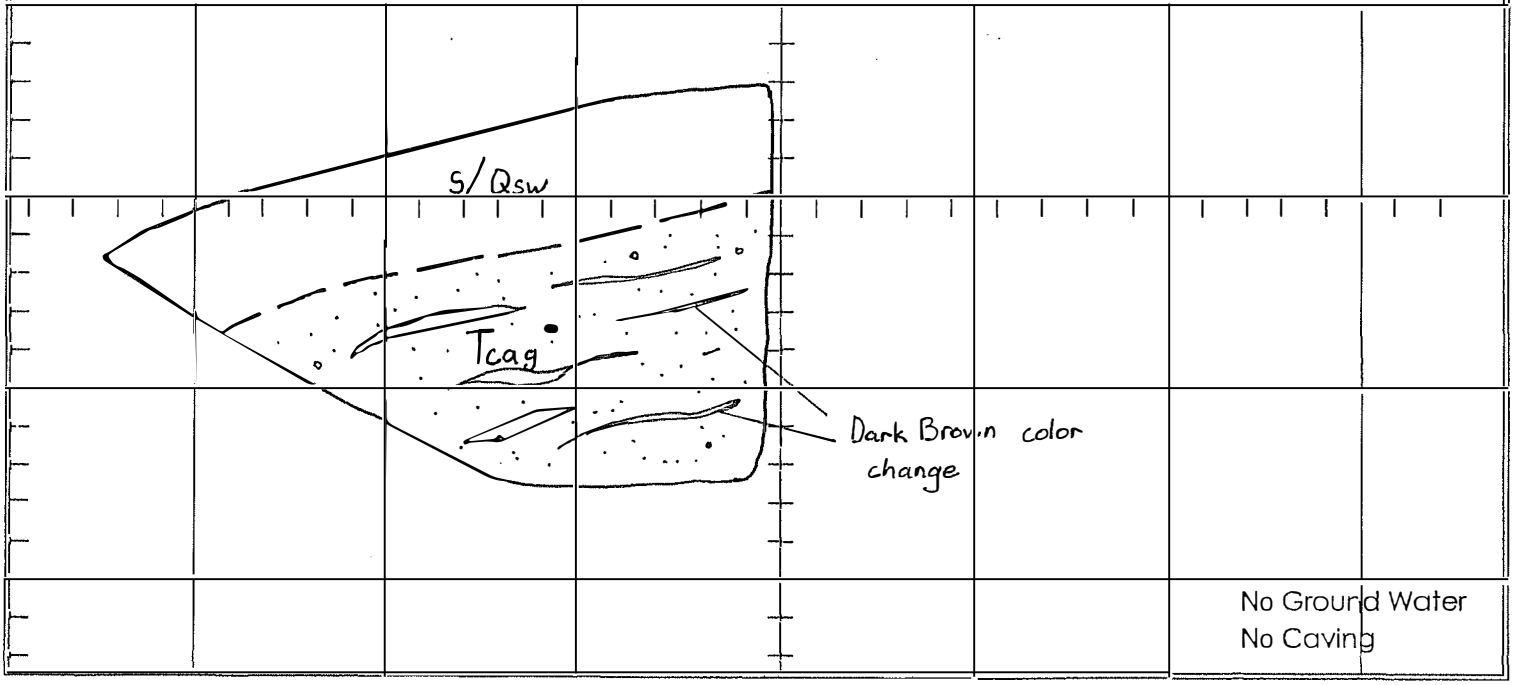
TOTAL DEPTH: 9 feet N27W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-60**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/12/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Light grayish-brown silty sand; loose to medium dense; dry				
5					**BEDROCK; Tcag? (3 - 10')** @ 3' Rusty-brown sandstone with scattered pebbles; friable; dry to damp				
10					**COMMENTS:** Weathered down to 9'				
15									
20									

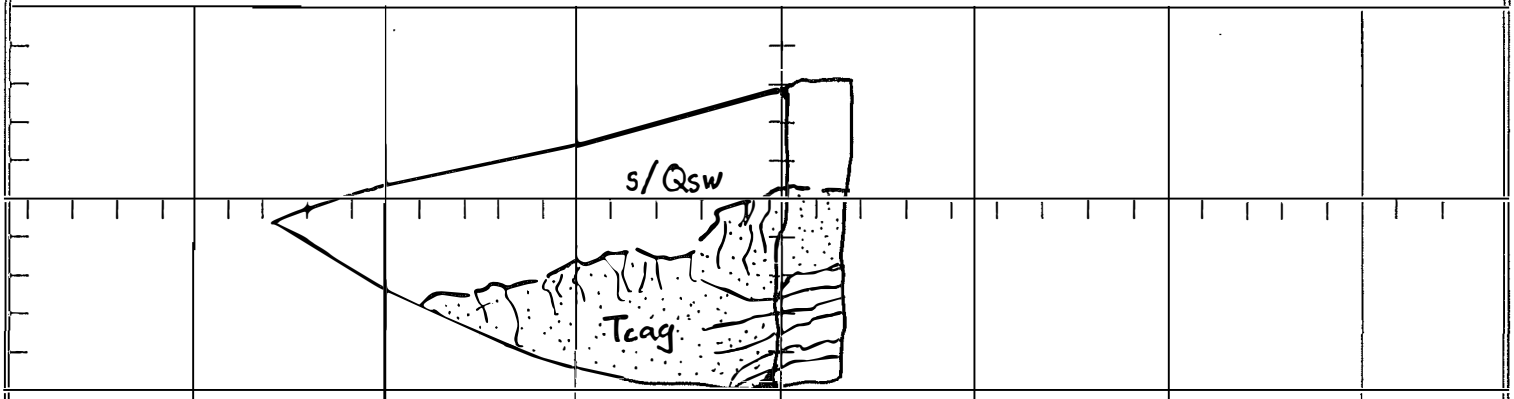
TOTAL DEPTH: 10 feet N18W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-61**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3.5')** @ 0' Light grayish-brown silty sand; loose to medium dense; dry				
5					**BEDROCK; Tcag (3.5 - 8')** @ 3.5' Light grayish-brown to brown to orangish-brown sandstone; (medium-grained); friable; moderately hard; damp				
10					**COMMENTS:** Weathered down to 5' Friable, very easy cleaning				
15									
20									

TOTAL DEPTH: 8 feet ←N79W SCALE: 1 inch = 5 feet

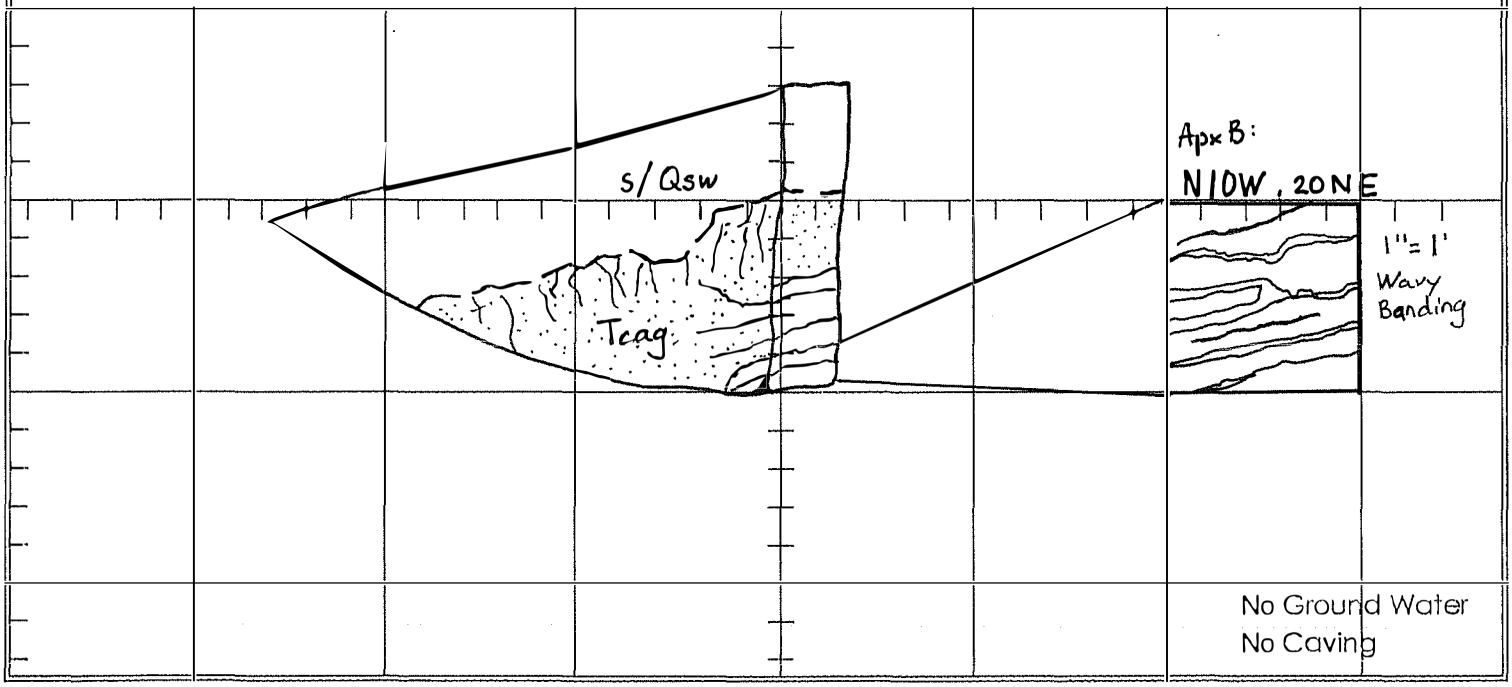


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-61**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3.5')** @ 0' Light grayish-brown silty sand; loose to medium dense; dry				
5					**BEDROCK; Tcag (3.5 - 8')** @ 3.5' Light grayish-brown to brown to orangish-brown sandstone; (medium-grained); friable; moderately hard; damp				
10					**COMMENTS:** Weathered down to 5' Friable, very easy cleaning				
15									
20									

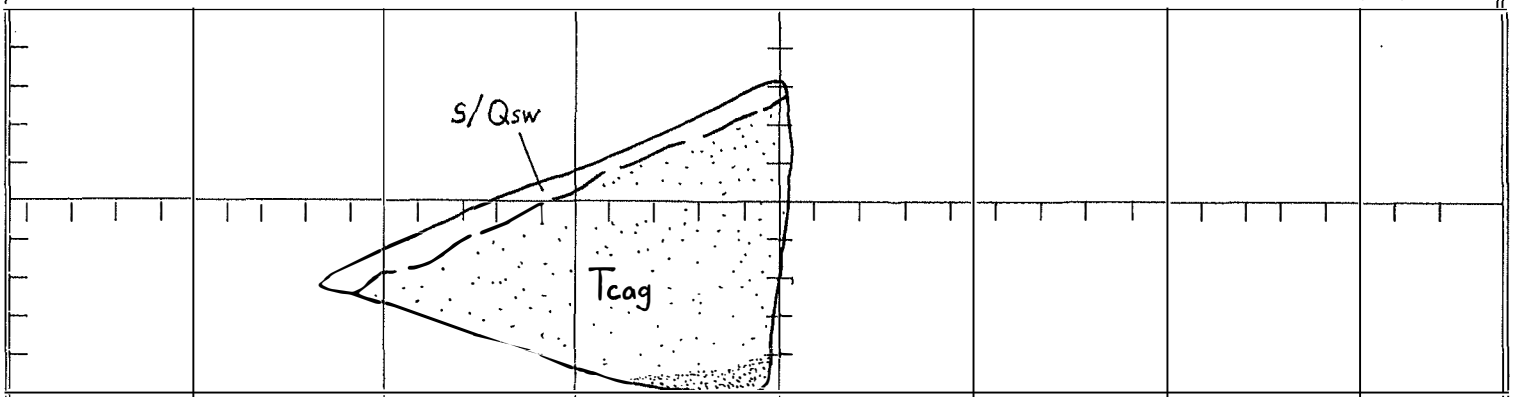
TOTAL DEPTH: 8 feet ←N79W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-62**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 6")** @ 0' Light-brown sand; loose; dry **BEDROCK; Tcag (6" - 8')** @ 6" Light-brown and tan, and light olive-tan sandstone and silty sandstone; massive; friable; moderately hard; damp	B: N25W; 7SW			
5									
10					**COMMENTS:** Weathered down to 4' Very easy digging = friable				
15									
20									

TOTAL DEPTH: 8 feet ←N55W SCALE: 1 inch = 5 feet

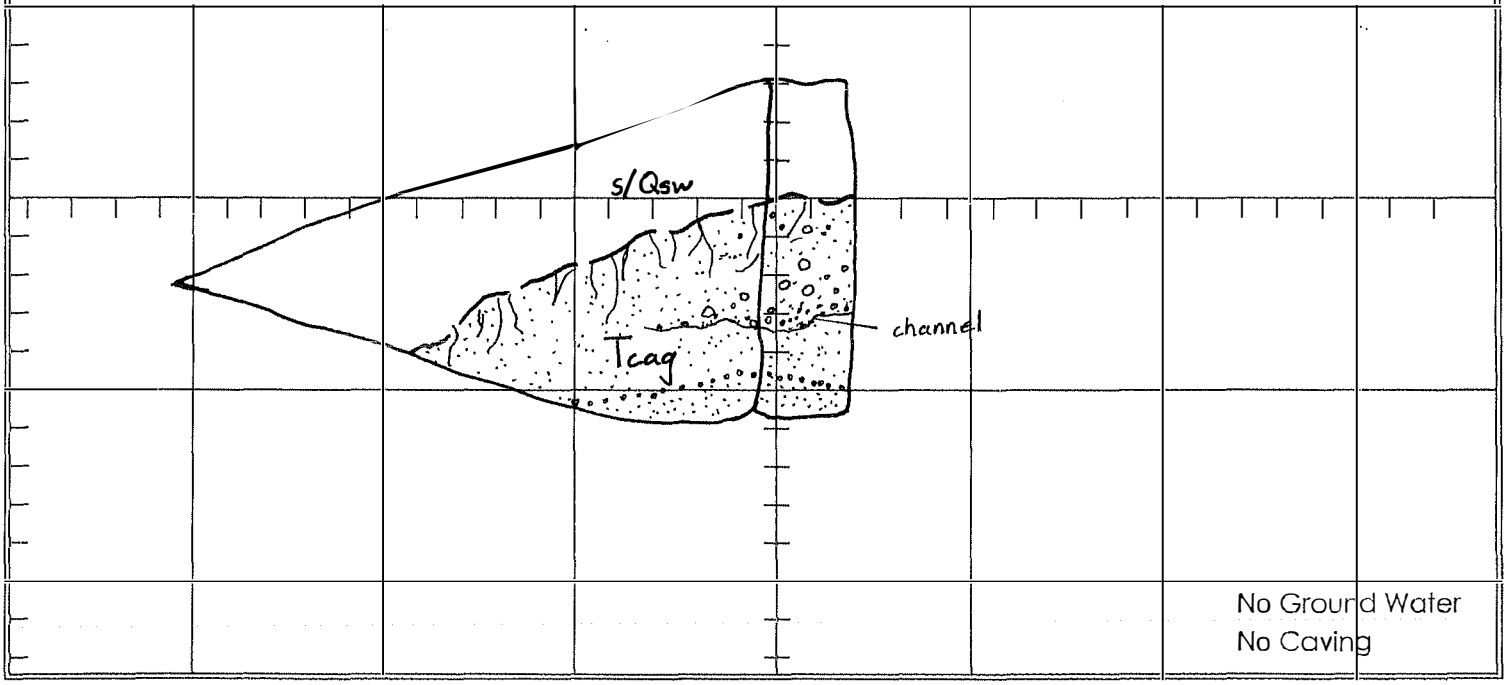


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-63**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Light grayish-brown silty sand with scattered pebbles; loose; dry				
5					**BEDROCK; Tcag (3 - 8.5')** @ 3' Light grayish-tan, light-brown and light olive-tan sandstone, pebbly sandstone, and silty sandstone; friable; moderately hard; damp	B: N70W; 6SW			
10					**COMMENTS:** Weathered down to 4.5' (Friable and digs easy)				
15									
20									

TOTAL DEPTH: 8.5 feet N51E→ SCALE: 1 inch = 5 feet

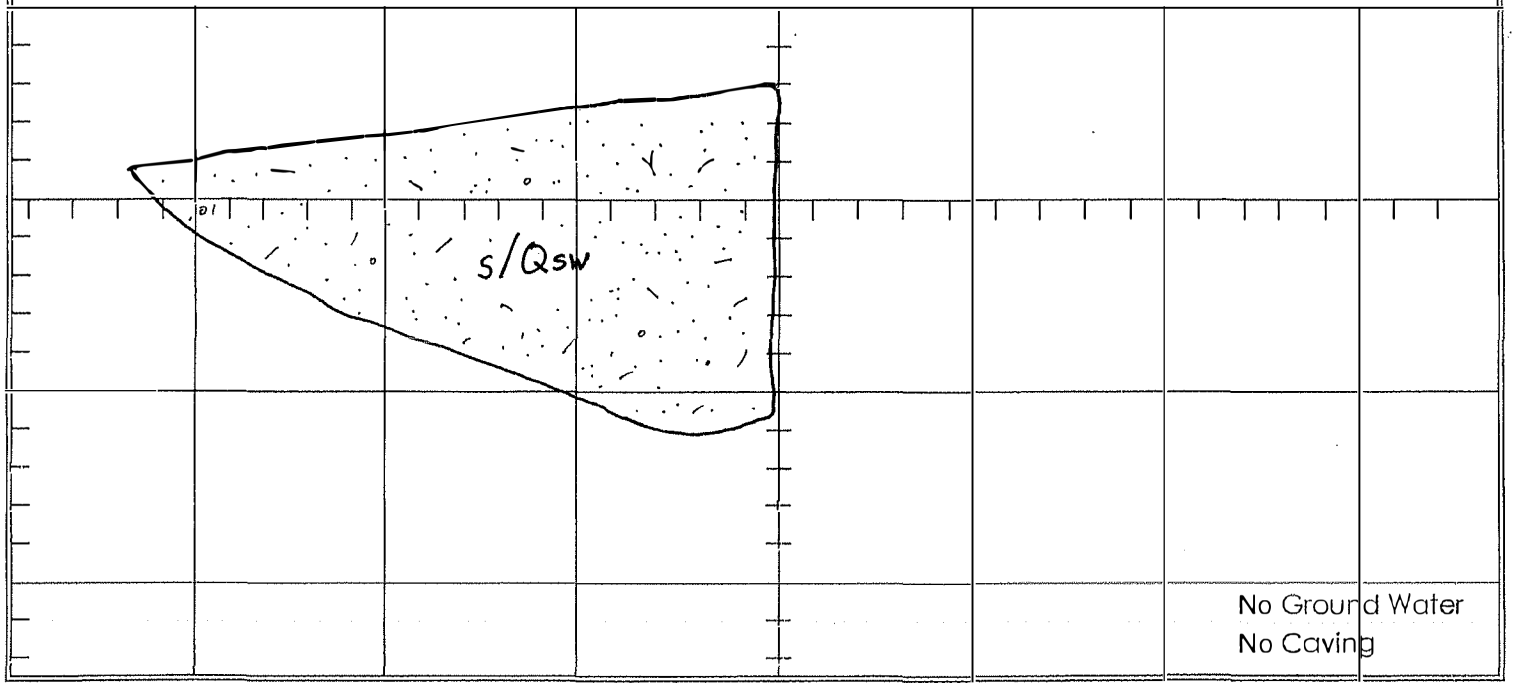


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-64**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 8.5')** @ 0' Medium-brown sandy silt to silty sand with scattered pebbles; loose to medium dense; dry to damp				
5									
					COMMENTS: Pin hole voids to bottom of trench				
10									
15									
20									

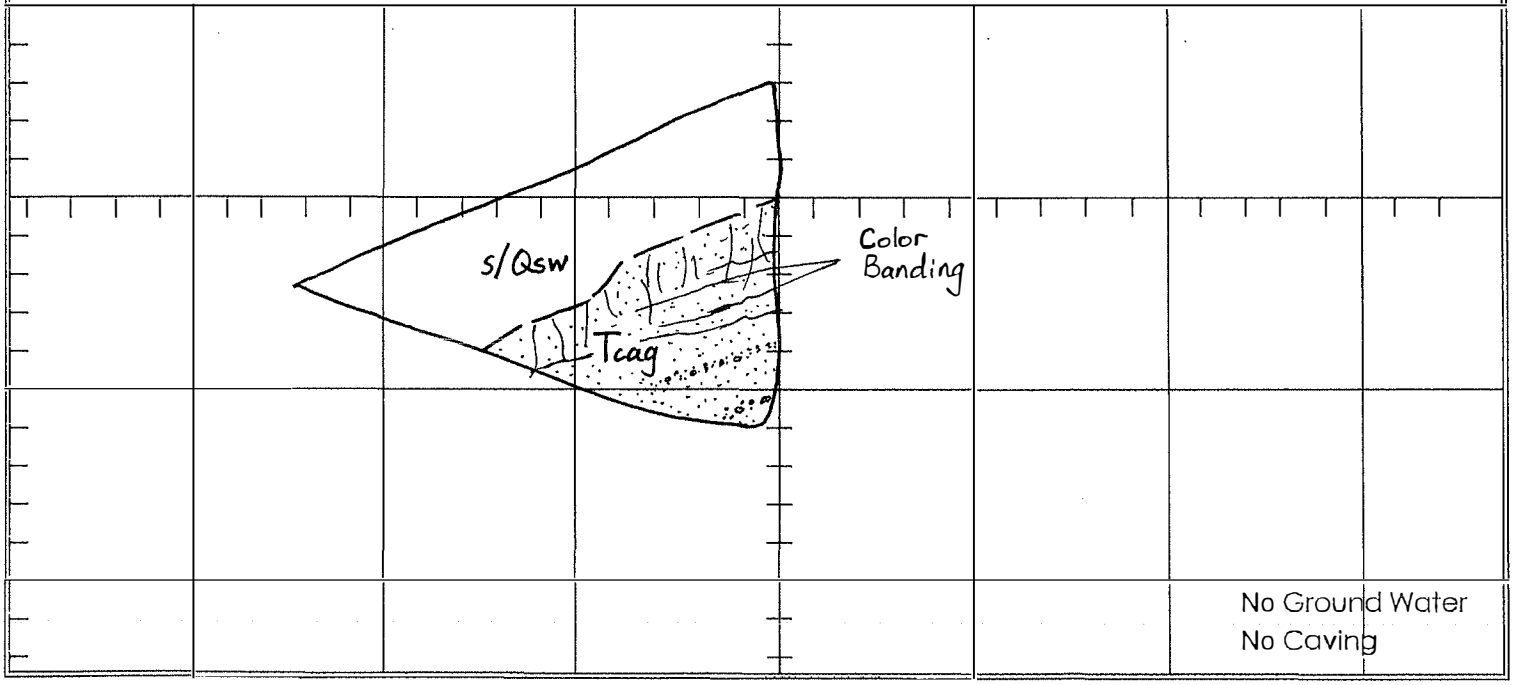
TOTAL DEPTH: 8.5 feet N32E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-65**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Light grayish-brown silty sand; loose to medium dense; dry				
5					**BEDROCK; Tcag (3 - 9')** @ 3' Medium-brown and light-brown to tan sandstone and silty sandstone with pebbly sandstone lenses; friable and slightly friable; moderately hard; damp	B: N48W; 9SW			
10					**COMMENTS:** Weathered down to 5'				
15									
20									

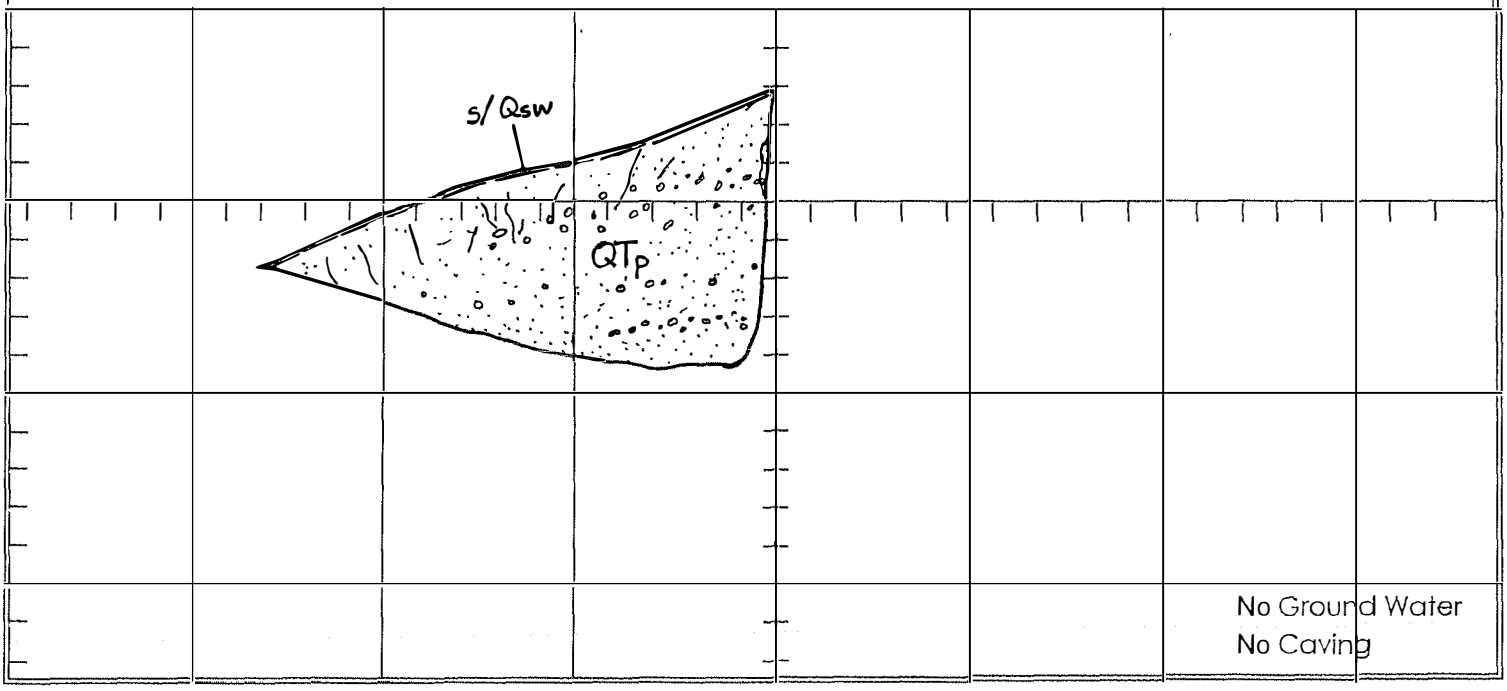
TOTAL DEPTH: 9 feet N83W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-66**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2")** @ 0' Dark-brown silty sand with pebbles; loose; dry; (residual soil) **BEDROCK; QTp (2" - 7')** @ 2" Medium-brown to orangish-brown, coarse-grained sandstone and pebble conglomerate; moderately hard; damp **COMMENTS:** Weathered down to 2.5' Igneous clasts and minor Tsq pebbles indicates QTp Also resistant limestone/sandstone bed on ridge to north	Apx B: N25W; 10SW Pebbly erosional contact			
5									
10									
15									
20									

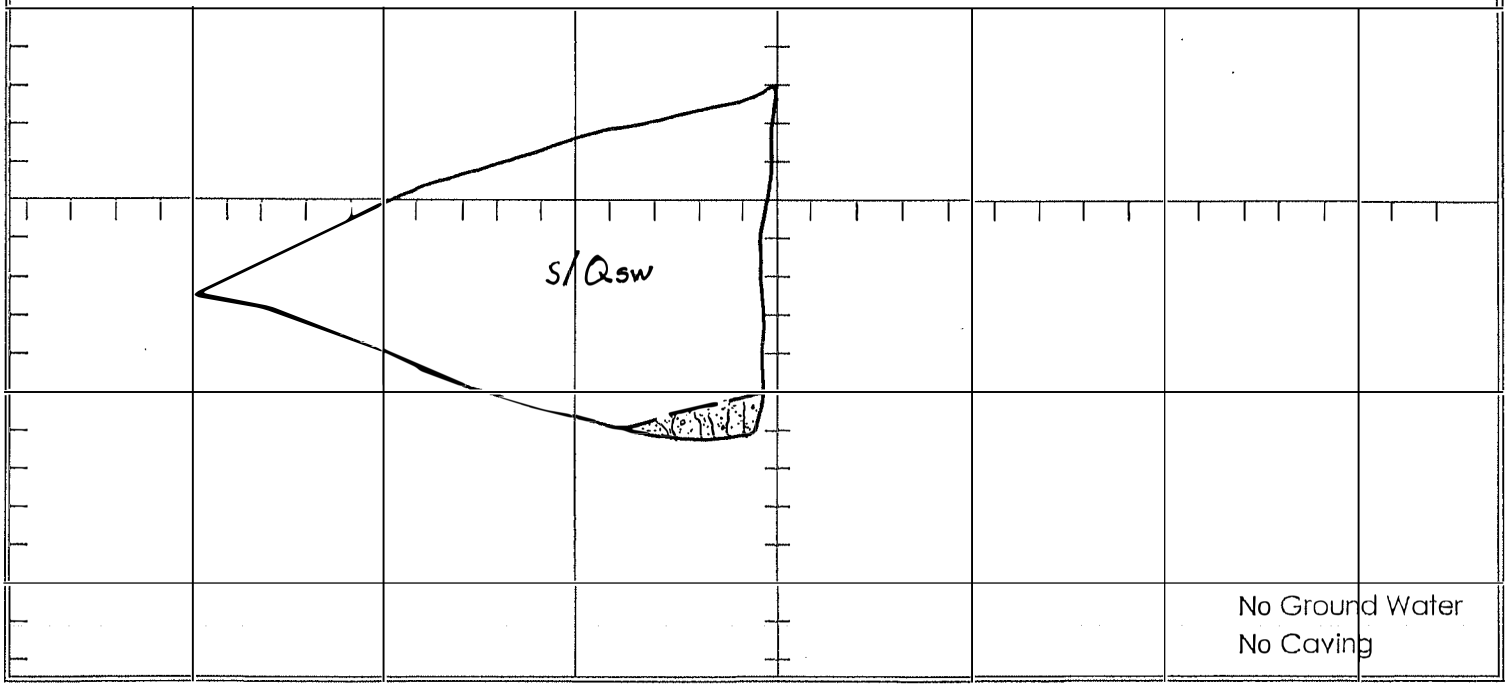
TOTAL DEPTH: 7 feet N16W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-67**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 8')** @ 0' Medium-brown silty sand with scattered pebbles; loose to medium dense; dry to damp				
5									
10					**BEDROCK; ? (8 - 9')** @ 8' Light- to medium-brown pebbly sandstone; moderately hard; dry to damp **COMMENTS:** Weathered down to 9'; 8- 9' appears to be weathered QTp bedrock "in place?"				
15									
20									

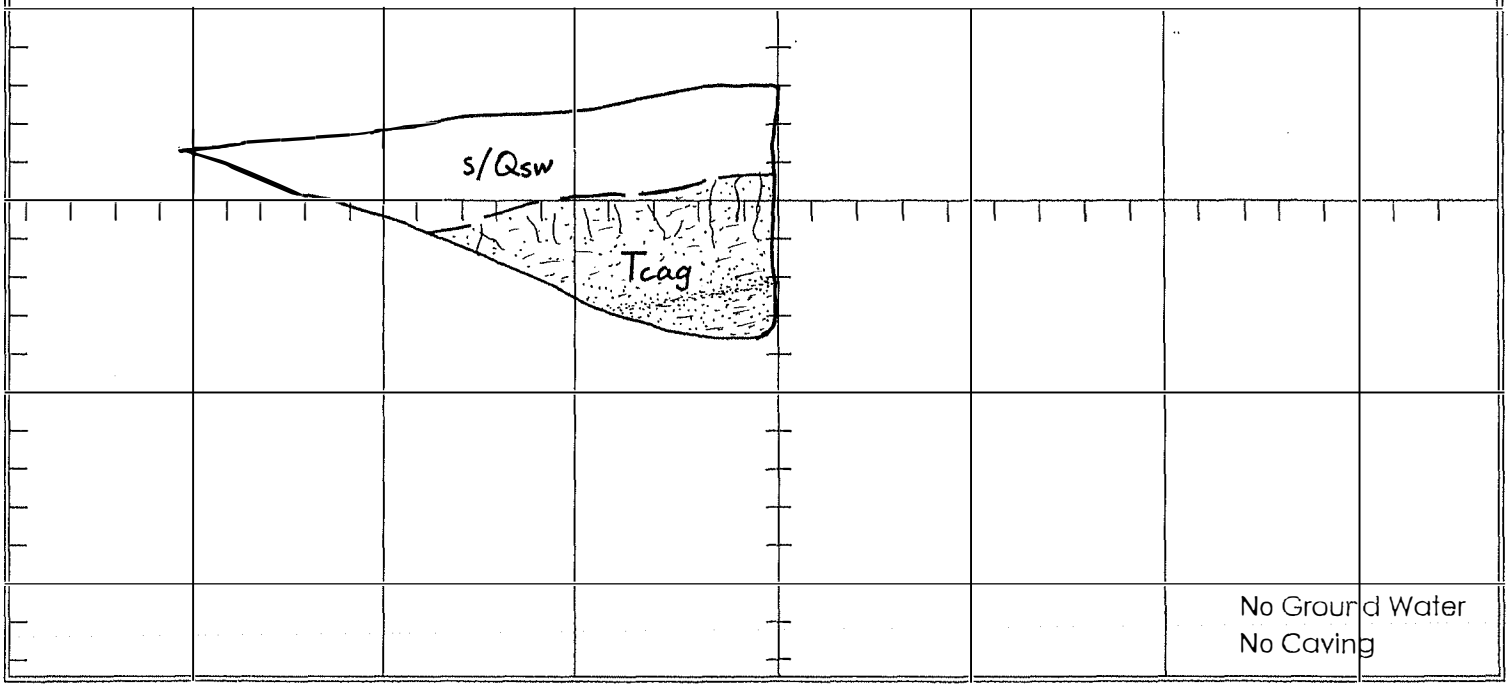
TOTAL DEPTH: 9 feet N82E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-68**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Light grayish-brown silty sand; loose to medium dense; dry				
					BEDROCK; Tcag (2.5 - 6.5') @ 2.5' Light grayish-brown and medium- to dark-brown silty sandstone; moderately hard; dry to damp	Apx B: N50W; 7SW			
5					**COMMENTS:** Weathered down to 4'				
10									
15									
20									

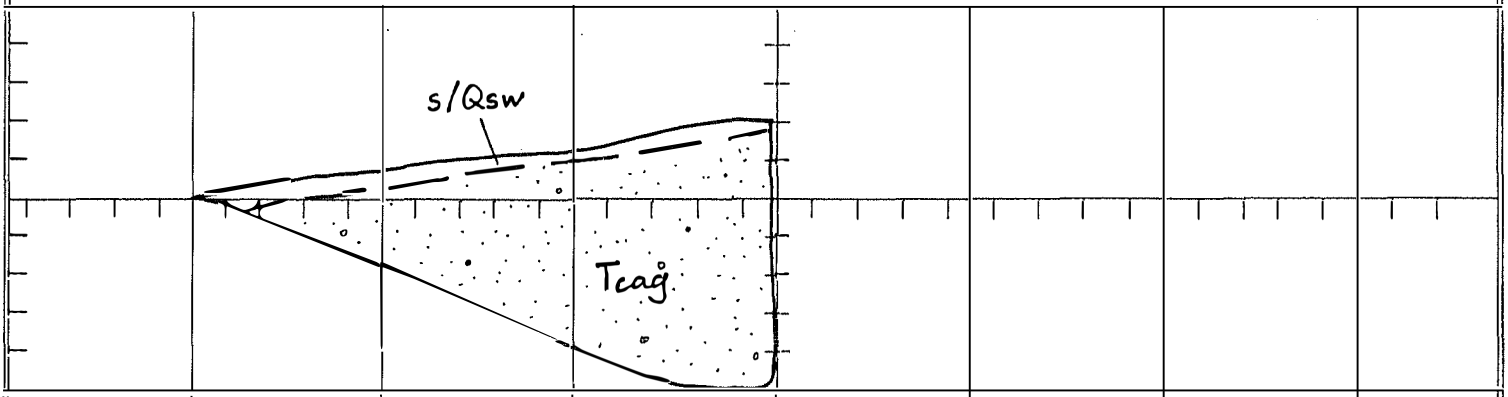
TOTAL DEPTH: 6.5 feet N25E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-69**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/13/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 6")** @ 0' Light grayish-brown sand; loose; dry **BEDROCK; Tcag (6" - 7')** @ 6" Light grayish-brown sandstone with scattered pebbles; moderately hard; friable; damp **COMMENTS:** Soft/easy digging = Friable				
5									
10									
15									
20									

TOTAL DEPTH: 7 feet N64E→ SCALE: 1 inch = 5 feet

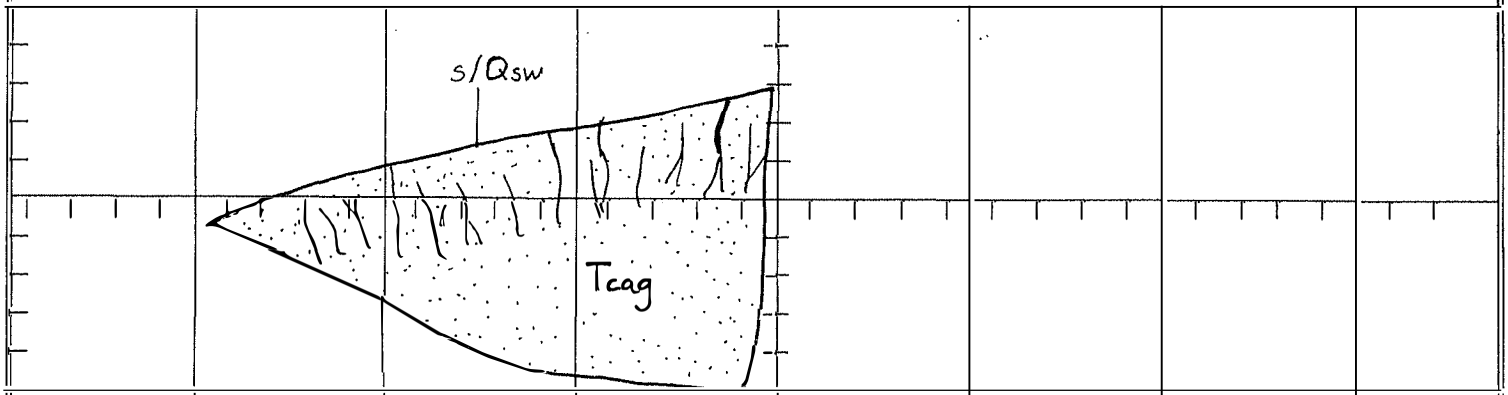


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-70**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/14/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1")** @ 0' 1" of residual soil **BEDROCK; Tcag (1" - 8')** @ 1" Light grayish-brown sandstone; friable; moderately hard; dry to damp **COMMENTS:** Weathered down to 3.5' Digs Easy = Friable				
5									
10									
15									
20									

TOTAL DEPTH: 8 feet ← SCALE: 1 inch = 5 feet

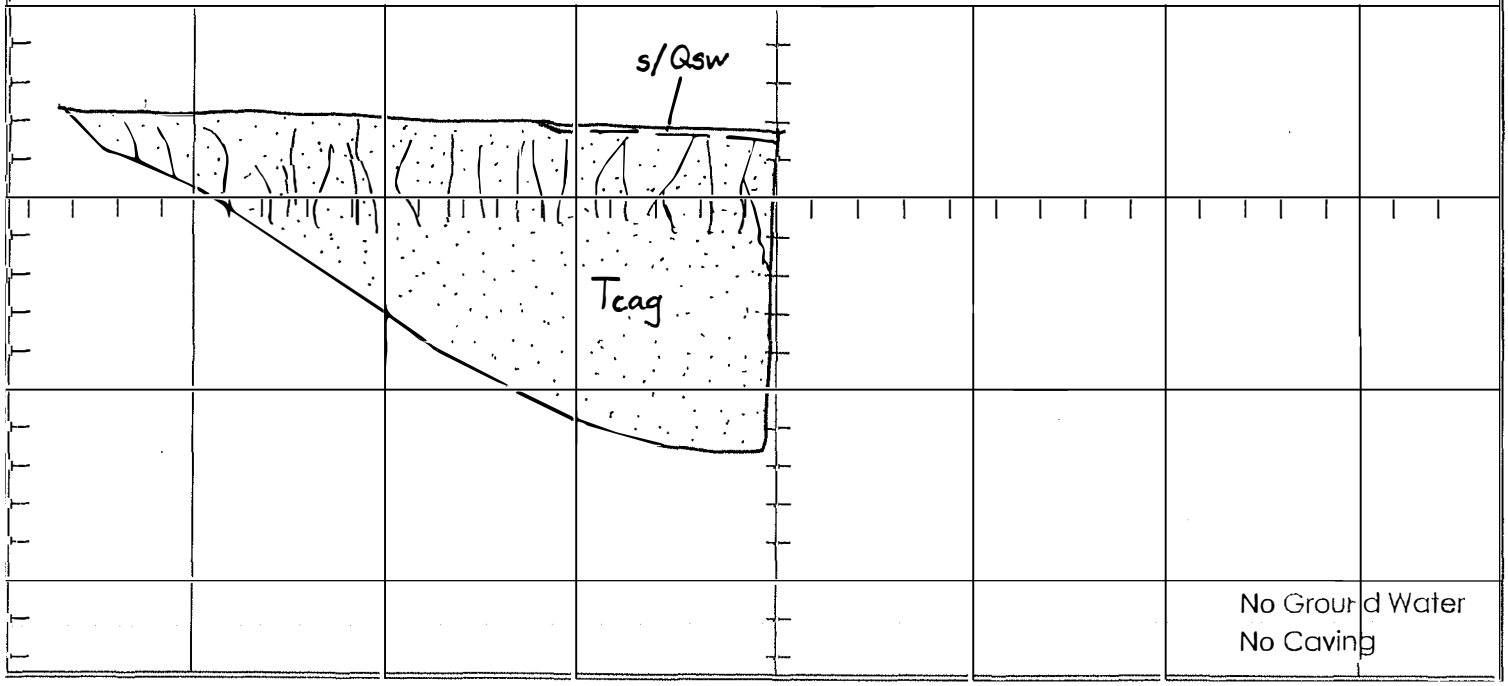


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-71**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/14/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2")** @ 0' Residual soil **BEDROCK; Tcag (2" - 8')** @ 2" Light yellowish-tan and yellowish-brown sandstone; friable; moderately hard; damp	Massive			
5									
10					**COMMENTS:** Weathered down to 3' Soft easy digging = Friable				
15									
20									

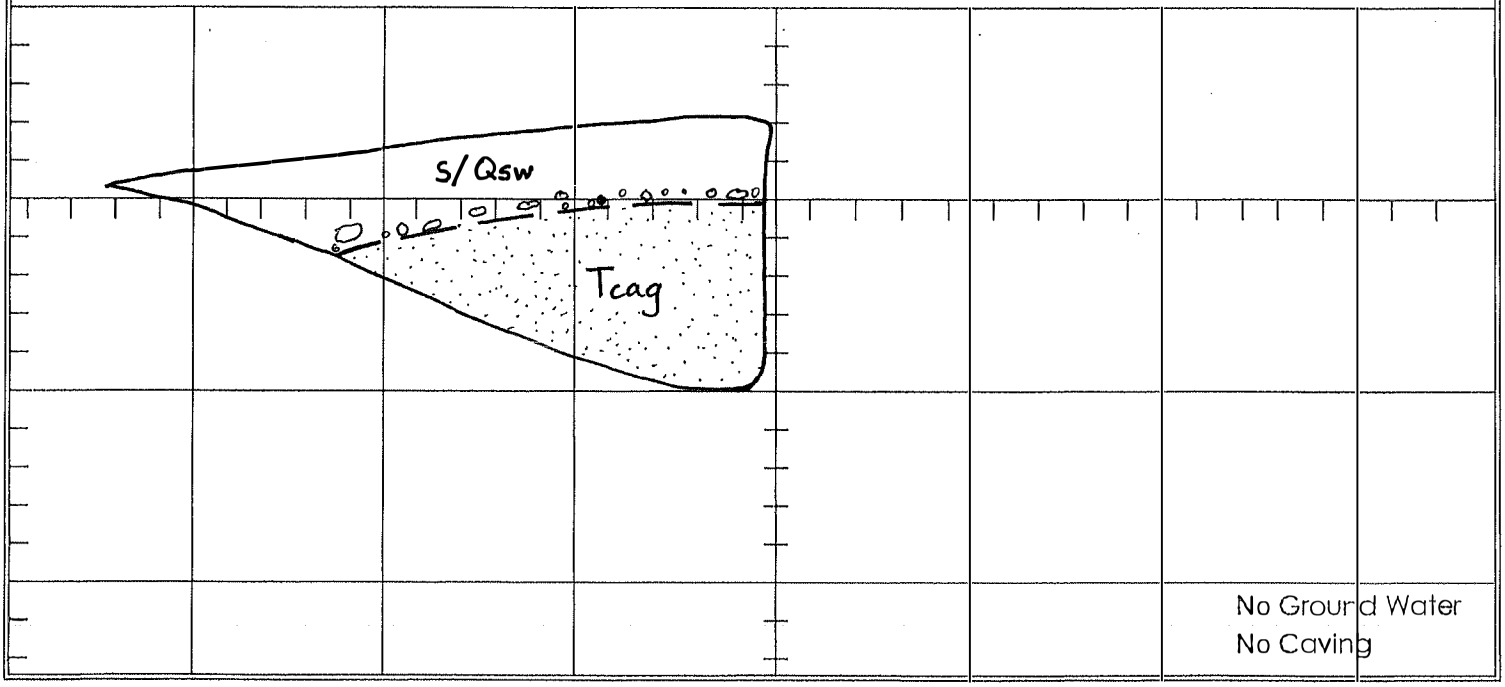
TOTAL DEPTH: 8 feet N34E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-72**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/14/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Medium to light grayish-brown sandy silt with basal rounded (igneous) pebble layer				
5					**BEDROCK; Tcag (2 - 7')** @ 2' Light yellowish-tan sandstone; friable; moderately hard; dry to damp	Massive			
10					**COMMENTS:** Weathered down to 3.5'				
15									
20									

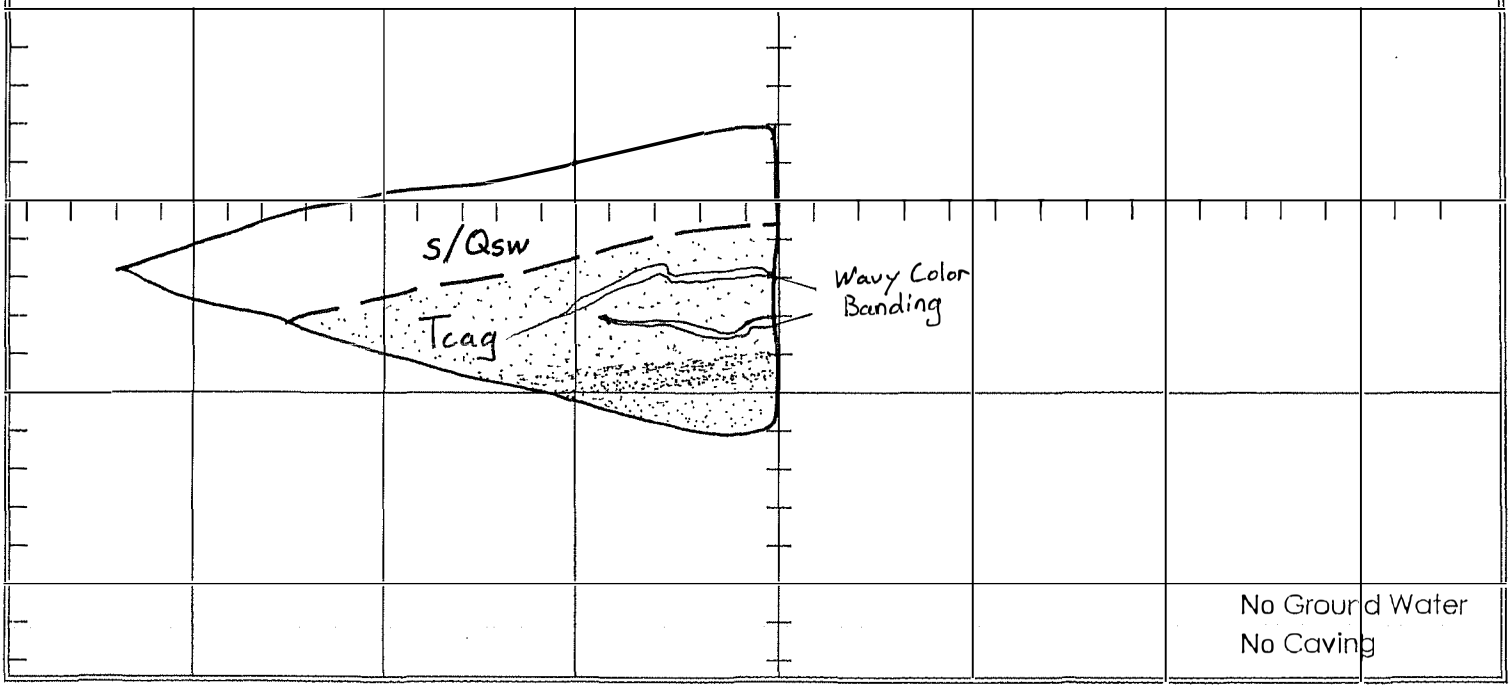
TOTAL DEPTH: 7 feet N41W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-73**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/14/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Dark-brown to black sandy clay; soft to stiff; damp; voids and dessication creeks **BEDROCK; Tcag (2.5 - 8')** @ 2.5' Light yellowish-white sand, light yellowish-tan sandstone; friable; moderately hard; dry to damp **COMMENTS:** Bedrock cross-bedded Weathered down to 3.5' Soil = Derived/remnant of basal QTp?	Apx B: N60E; 4SE			
5									
10									
15									
20									

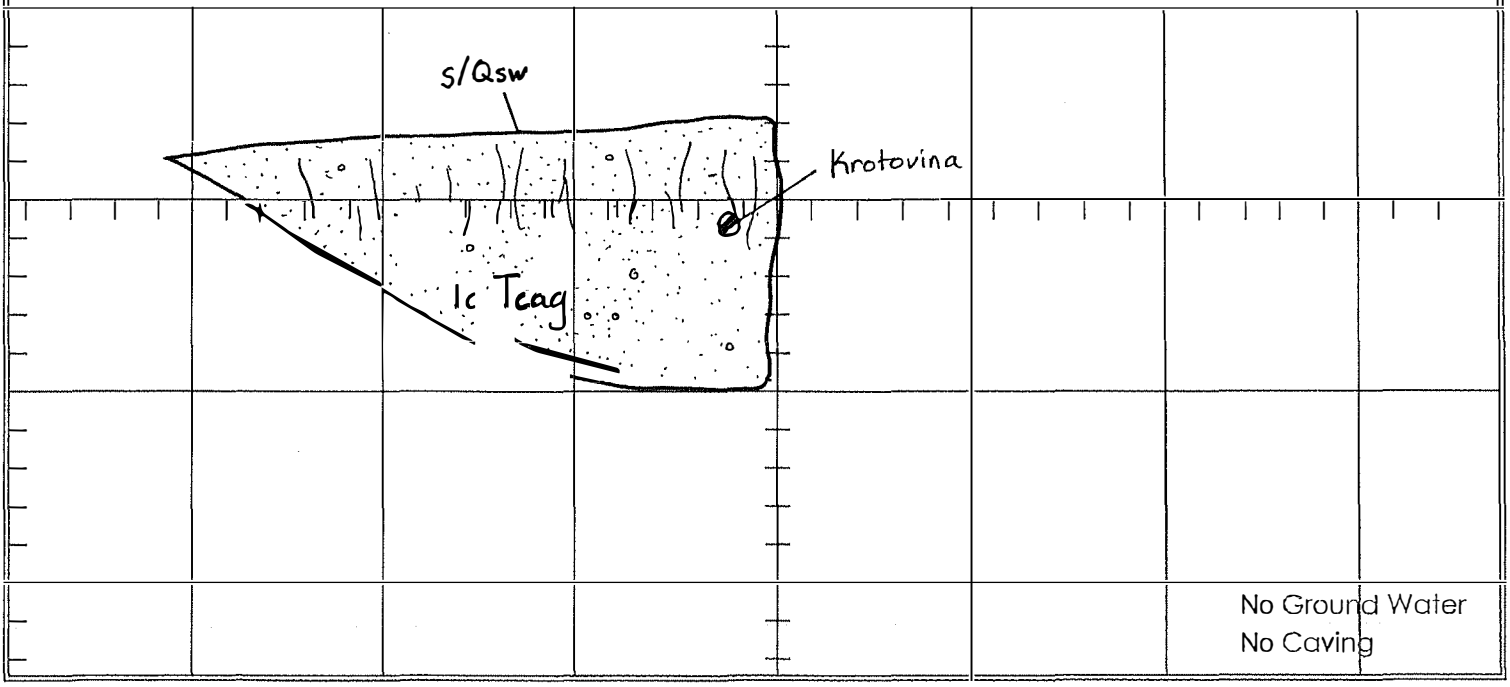
TOTAL DEPTH: 8 feet N83W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-74**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/14/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1")** @ 0' Residual soil **BEDROCK; Tcag (1" - 7')** @ 1" Light olive-tan to light brownish-tan sandstone with minor scattered pebbles; moderately hard; dry to damp **COMMENTS:** Weathered down to 3.5' 6" diameter Krotoviha @ 3'				
5									
10									
15									
20									

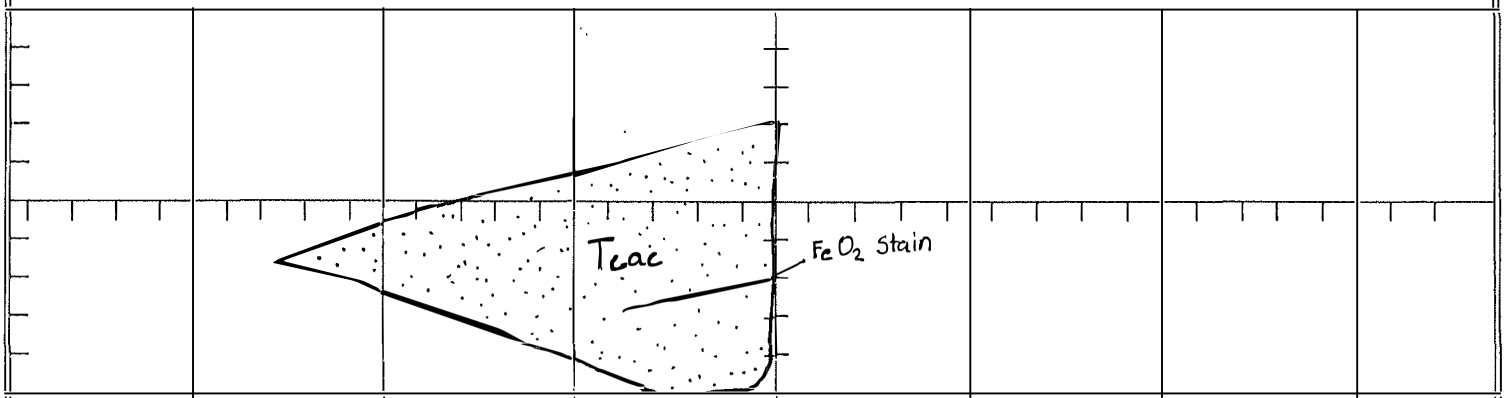
TOTAL DEPTH: 7 feet N64W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-75**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/14/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK: Tcac (0 - 7')** @ 0' Light olive-tan (with FeO_2 staining) sandstone; moderately hard; friable; dry to damp	B: N15W; 4SW (FeO_2 slain) Slightly clayey? Massive			
5									
					COMMENTS: Weathered down to 2.5'				
10									
15									
20									

TOTAL DEPTH: 7 feet North→ SCALE: 1 inch = 5 feet

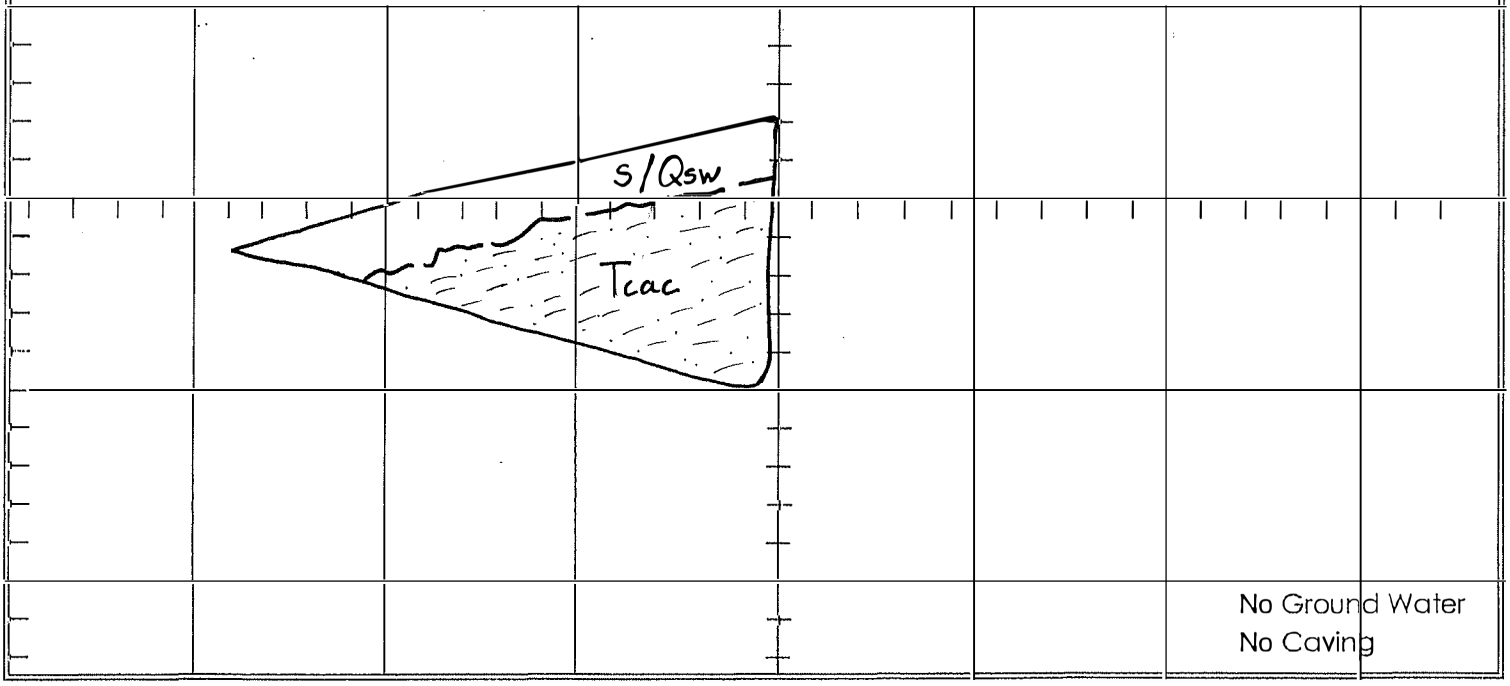


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-76**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/14/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Medium-brown clayey silt with sand; loose to medium dense; dry				
					BEDROCK; (1.5 - 7') @ 1.5' Light- to medium olive-tan siltstone to clayey siltstone; moderately hard; dry to damp	Massive			
5					**COMMENTS:** Some FeO_2 staining in verticle fractures and minor scattered pads of limonite Weathered Down to 3'				
10									
15									
20									

TOTAL DEPTH: 7 feet N16E→ SCALE: 1 inch = 5 feet



No Ground Water
No Caving

CLIENT: Solstra Communities California LLC
PROJECT: Solomon Hills Specific Plan
Santa Barbara County, CA

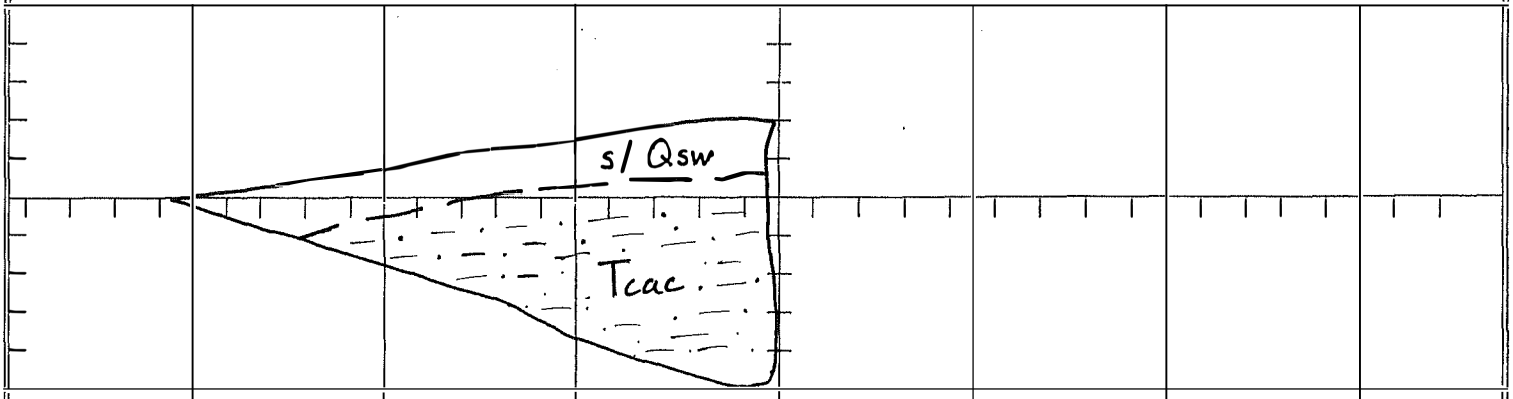
JOB NO: 22-2195s-1
DATE: 10/20/23
LOGGED BY: SKM
EXCAVATED: 9/14/06
ELEVATION: See map

EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket

TRENCH LOG NO. GT-77

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Light grayish-brown silt; loose; dry				
5					**BEDROCK; Tcac (1.5 - 7')** @ 1.5' Light olive-tan to light olive-brown sandy siltstone; moderately hard; dry to damp	Massive			
10									
15									
20									

TOTAL DEPTH: 7 feet N38E→ SCALE: 1 inch = 5 feet

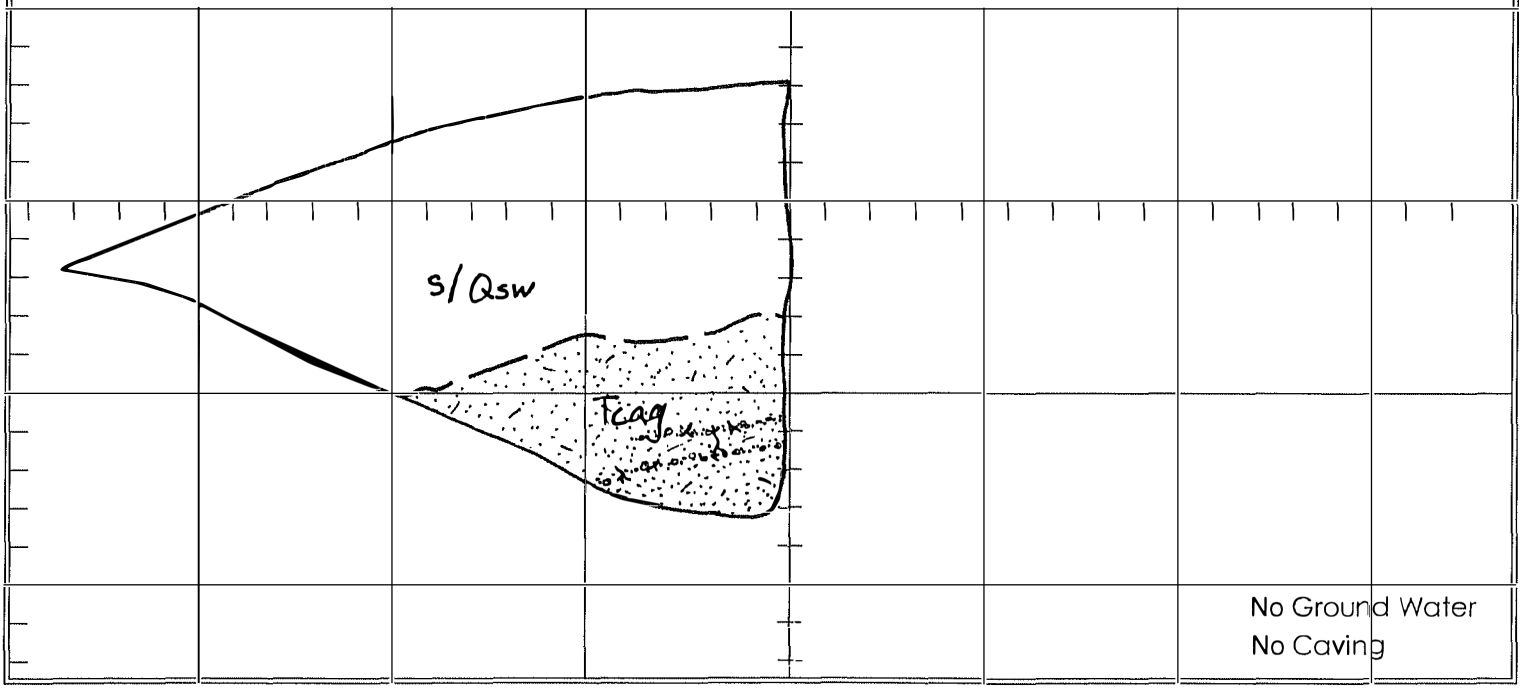


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-78**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/14/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 6')** @ 0' Light grayish-brown silty sand with pebbles; loose; dry to damp				
5					**BEDROCK; Tcag? (6 - 8')** @ 6' Light grayish-brown silty sand; loose; friable				
10					**COMMENTS:** Logged 0 - 8' then deepened to 11' Surface logged from 8 - 11' Weathered down to 10' Very soft and friable with roots down to 7'				
15									
20									

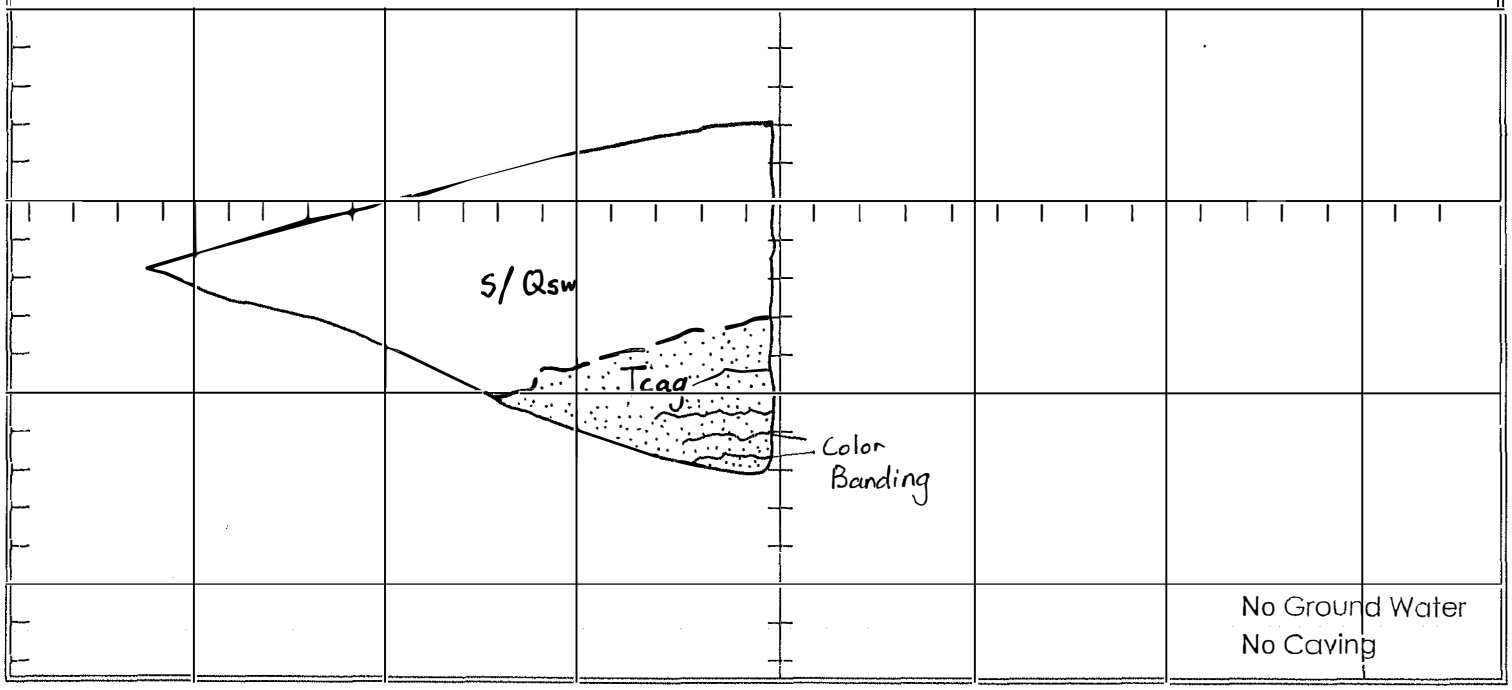
TOTAL DEPTH: 11 feet ←N84E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-79**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/14/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 5')** @ 0' Light grayish-brown silty sand with scattered pebbles; loose to moderately dense; dry to damp				
5					**BEDROCK; Tcag (5 - 9')** @ 5' Light olive-tan sandstone; moderately hard; friable; damp	Massive			
10					**COMMENTS:** Weathered down to 7' Digs easy friable sands				
15									
20									

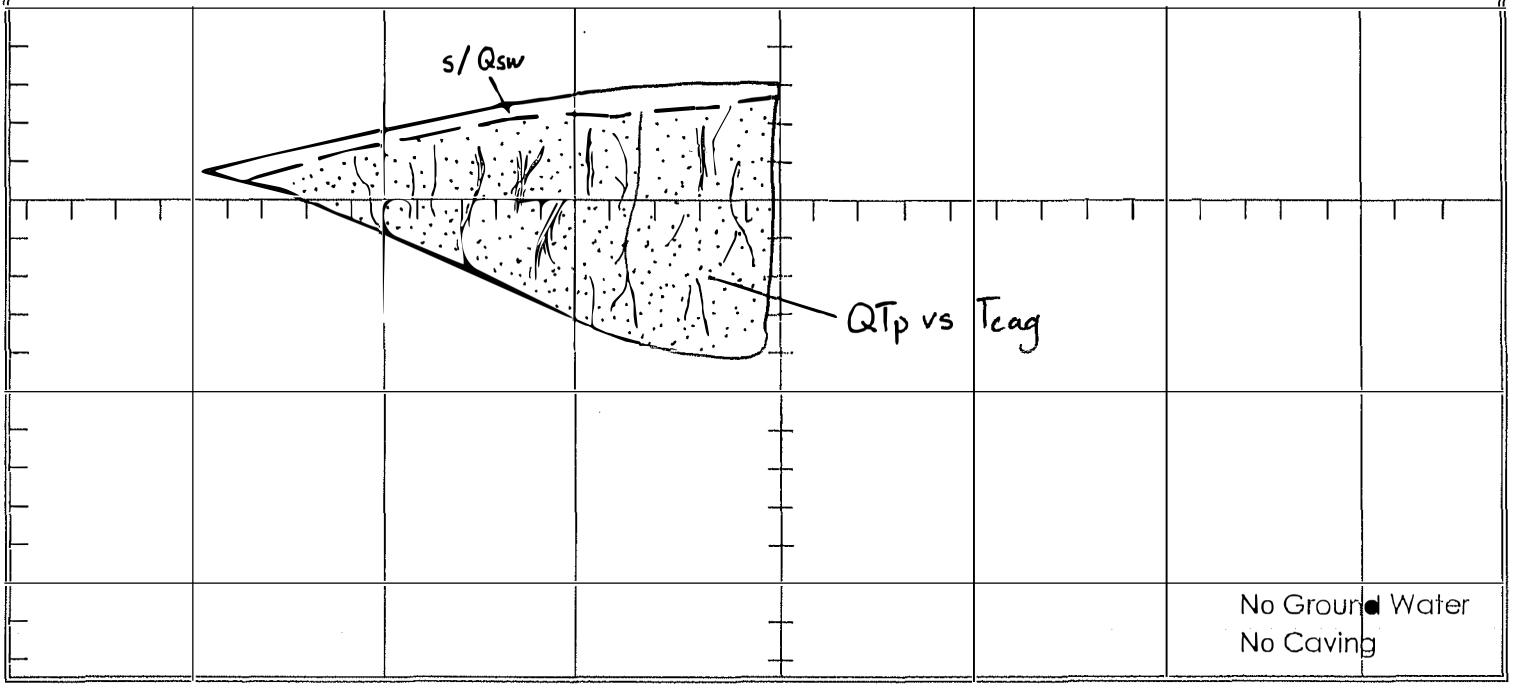
TOTAL DEPTH: 9 feet ←N79W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-80**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/15/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4")** @ 0' Residual soil; silty sand; loose; dry **BEDROCK; QTp vs. Tcag resistant bed (4" - 7')** @ 4" Mottled orangish-brown, light grayish-white to light grayish-brown sandstone; massive with numerous clay filled fractures (clay in fractures is dark-brown to black); moderately hard to hard; dry to damp **COMMENTS:** Weathered down to 6" Rock is hard				
5									
10									
15									
20									

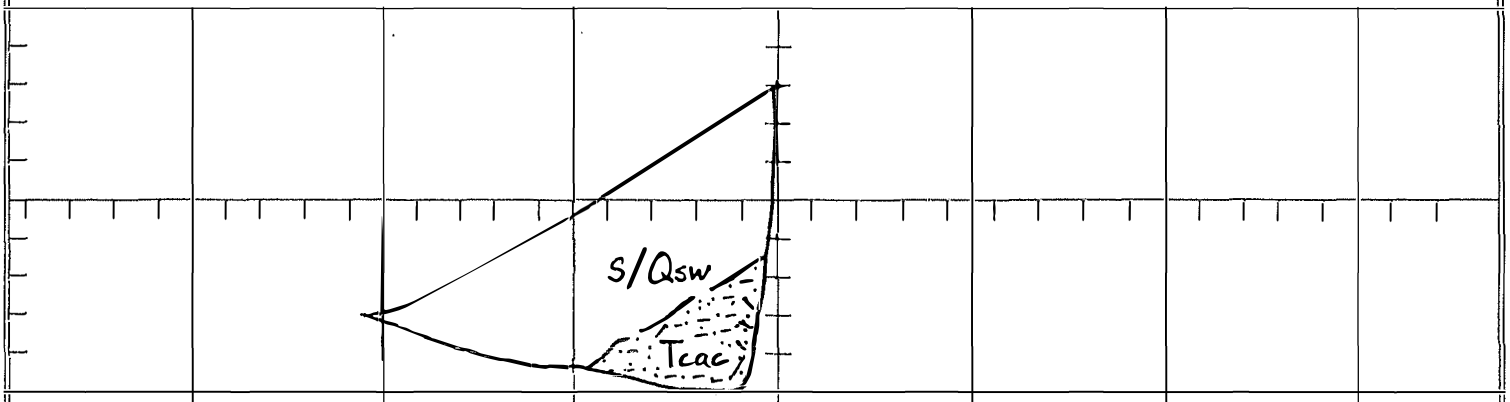
TOTAL DEPTH: 7 feet N66W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-81**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/15/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4.5')** @ 0' Light grayish-brown sandy silt; loose to medium dense; dry				
5					**BEDROCK; Tcac (4.5 - 8')** @ 4.5' Light yellowish-tan, very fine, sandy siltstone; moderately hard to hard; dry to damp	Massive			
10									
15									
20									

TOTAL DEPTH: 8 feet ←N85E SCALE: 1 inch = 5 feet

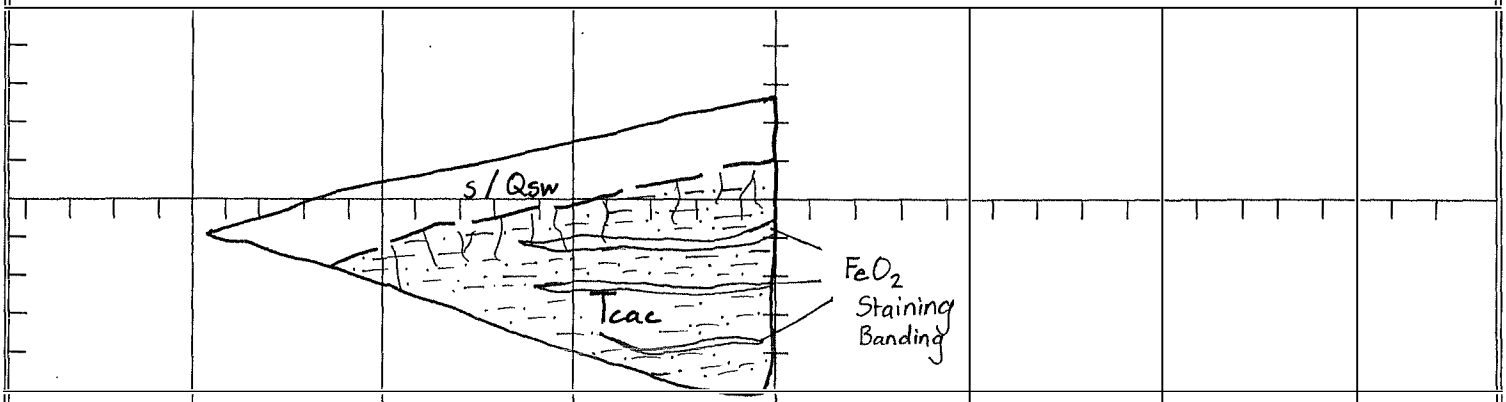


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-100**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/19/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Light grayish-brown sandy silt; loose; dry **BEDROCK; Tcac (1.5 - 7.5')** @ 1.5' Light olive-tan and orangish-tan clayey siltstone; moderately hard; damp **COMMENTS:** Weathered down to 3' Digs hard/cleans hard	Massive			
5									
10									
15									
20									

TOTAL DEPTH: 7.5 feet N3W→ SCALE: 1 inch = 5 feet

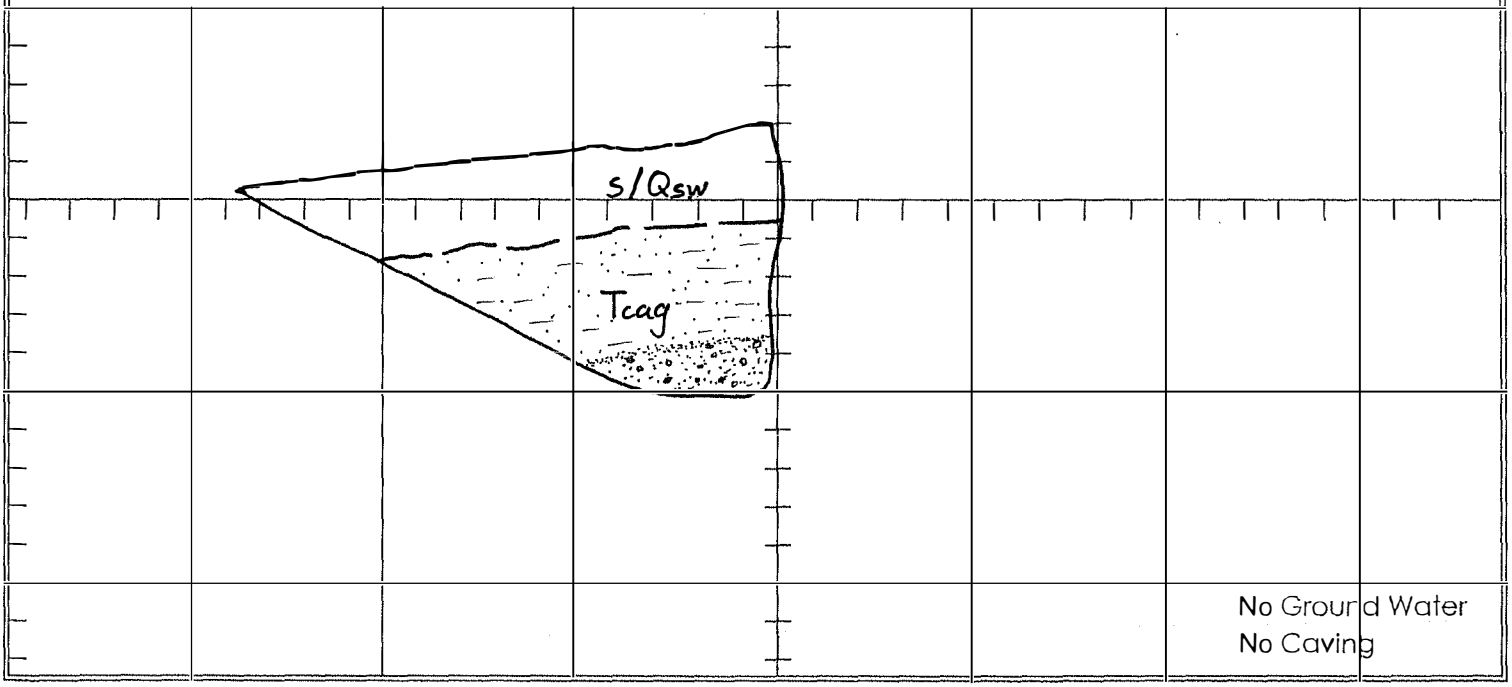


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-103**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/19/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Light grayish-brown sandy silt; loose; dry				
5					**BEDROCK; Tcag (2.5 - 7')** @ 2.5' Light grayish-brown silty sandstone (to sandy siltstone?) with scattered pebbles (some igneous) and pebbly sandstone; moderately hard; damp	Apx B: N63W; 7SW Fine sandstone over pebbly sandstone			
10					**COMMENTS:** Weathered down to 4'				
15									
20									

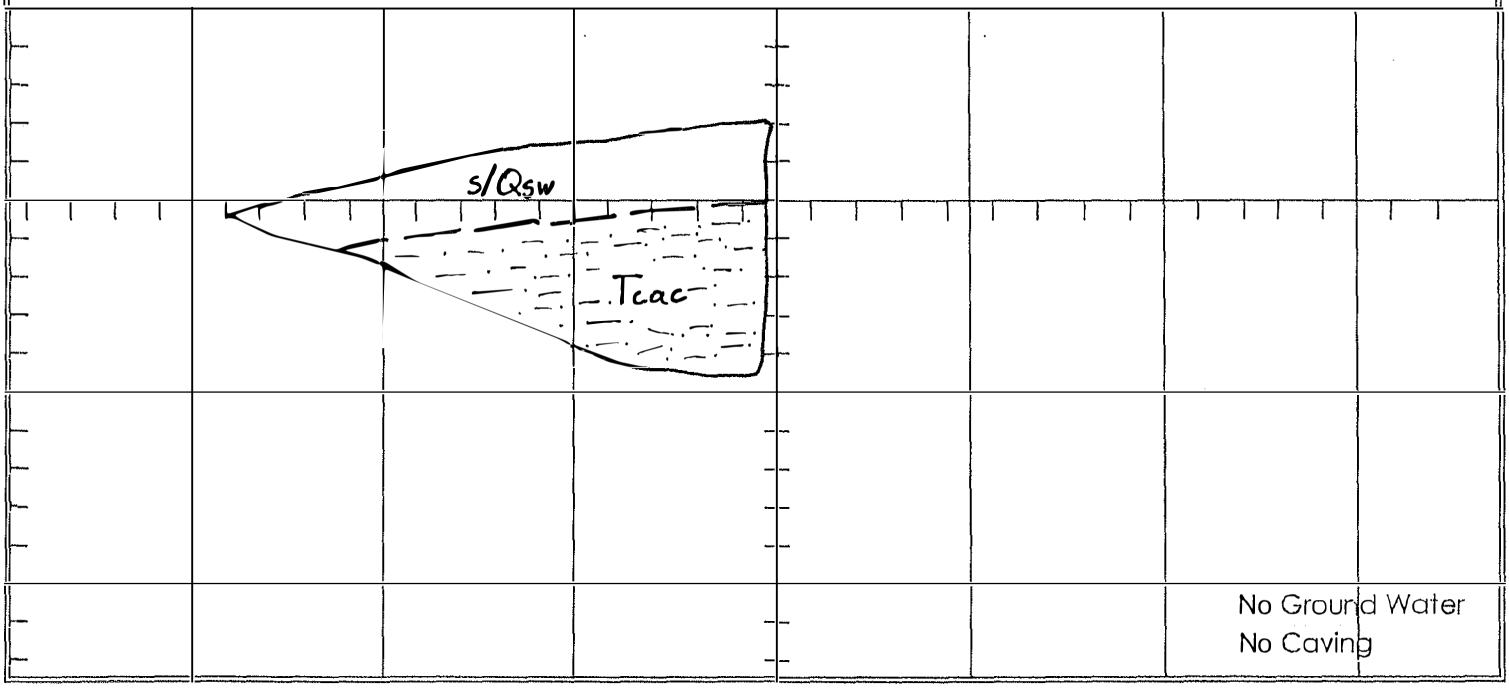
TOTAL DEPTH: 7 feet N57E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-104**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/19/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Medium-brown sandy silt and sandy silty clay; loose to moderately dense and stiff; dry				
5					**BEDROCK; Tcac (2 - 6.5')** @ 2' Light yellowish-tan with FeO_2 staining, sandy, clayey siltstone; moderately hard; dry to damp	Massive			
10					**COMMENTS:** Digs/cleans hard; not friable until crushed with fingers; classic Tcac; minor vertical to sub-vertical fractures with clay lining				
15									
20									

TOTAL DEPTH: 6.5 feet N47W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC
PROJECT: Solomon Hills Specific Plan
Santa Barbara County, CA

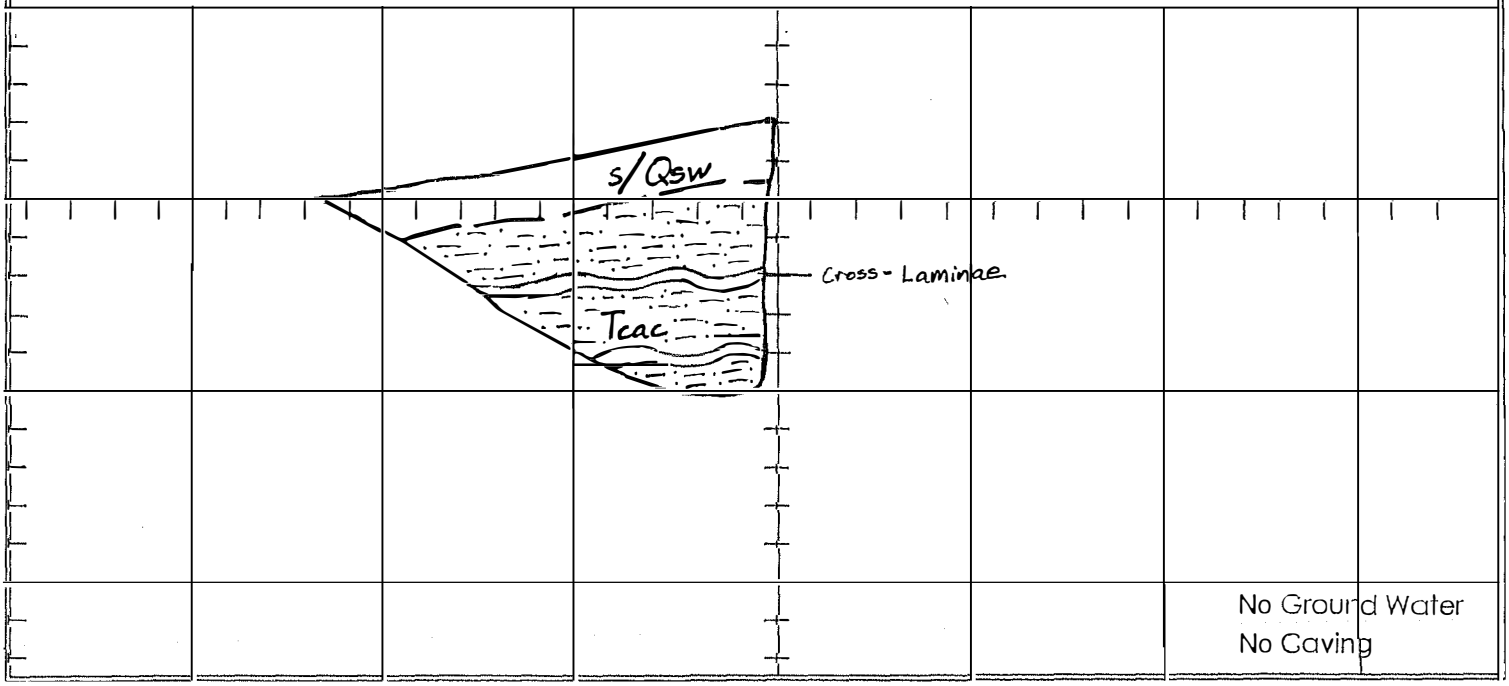
JOB NO: 22-2195s-1
DATE: 10/20/23
LOGGED BY: SKM
EXCAVATED: 9/19/06
ELEVATION: See map

EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket

TRENCH LOG NO. GT-105

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Light to medium grayish-brown sandy silt; loose to medium dense; dry **BEDROCK; Tcac (1.5 - 7')** @ 1.5' Light yellowish-tan sandy siltstone with clay "pods"; moderately hard; dry to damp; exhibits cross-laminae **COMMENTS:** Weathered down to 2'	Massive			
5									
10									
15									
20									

TOTAL DEPTH: 7 feet N44E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC
PROJECT: Solomon Hills Specific Plan
Santa Barbara County, CA

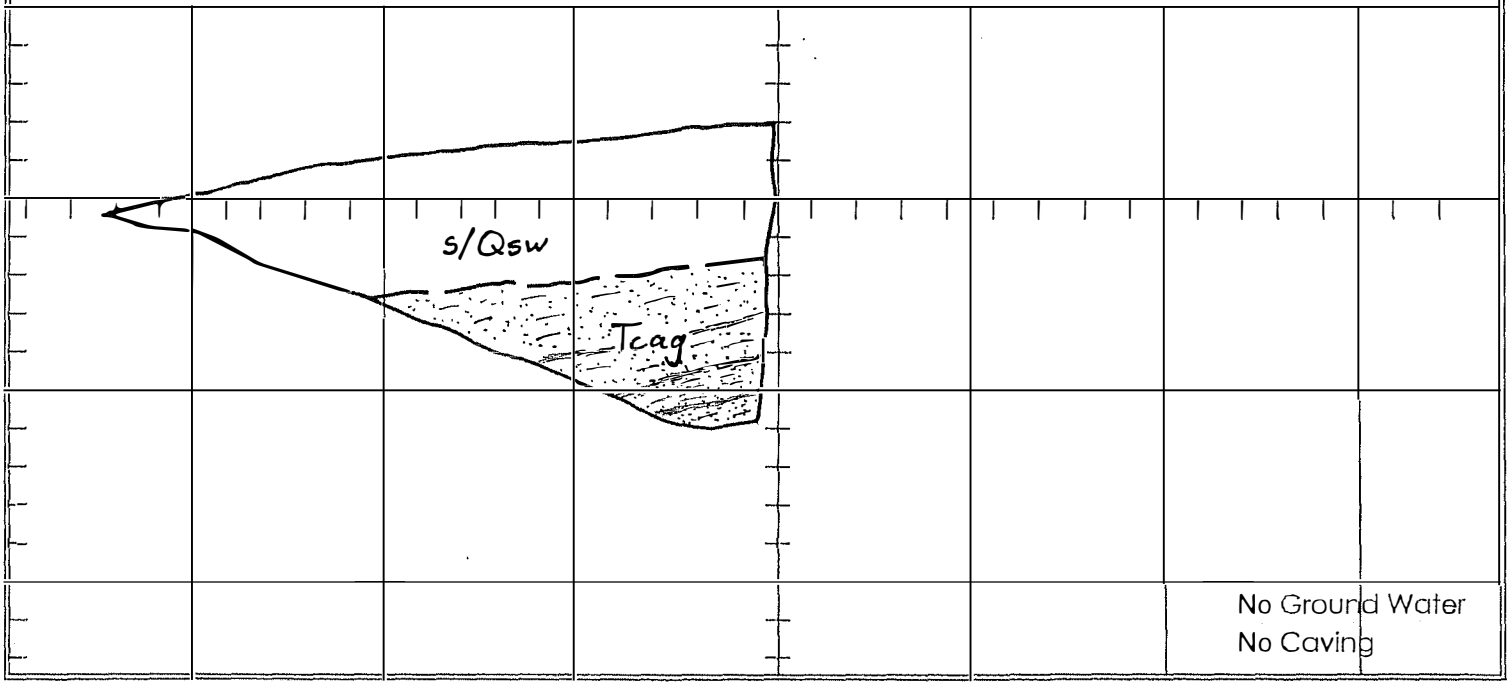
JOB NO: 22-2195s-1
DATE: 10/20/23
LOGGED BY: SKM
EXCAVATED: 9/20/06
ELEVATION: See map

EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket

TRENCH LOG NO. GT-106

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3.5')** @ 0' Medium grayish-brown silty sand; moderately dense; dry				
5					**BEDROCK; Tcag (3.5 - 8')** @ 3.5' Medium grayish-brown and dark-brown clayey, silty sandstone with scattered pebbles (diatomite); friable; moderately hard; damp to moist	Apx B: N80W; 7SW			
10					**COMMENTS:** Weathered down to 4' (Soft but dense and friable ?consol?)				
15									
20									

TOTAL DEPTH: 8 feet N7E→ SCALE: 1 inch = 5 feet

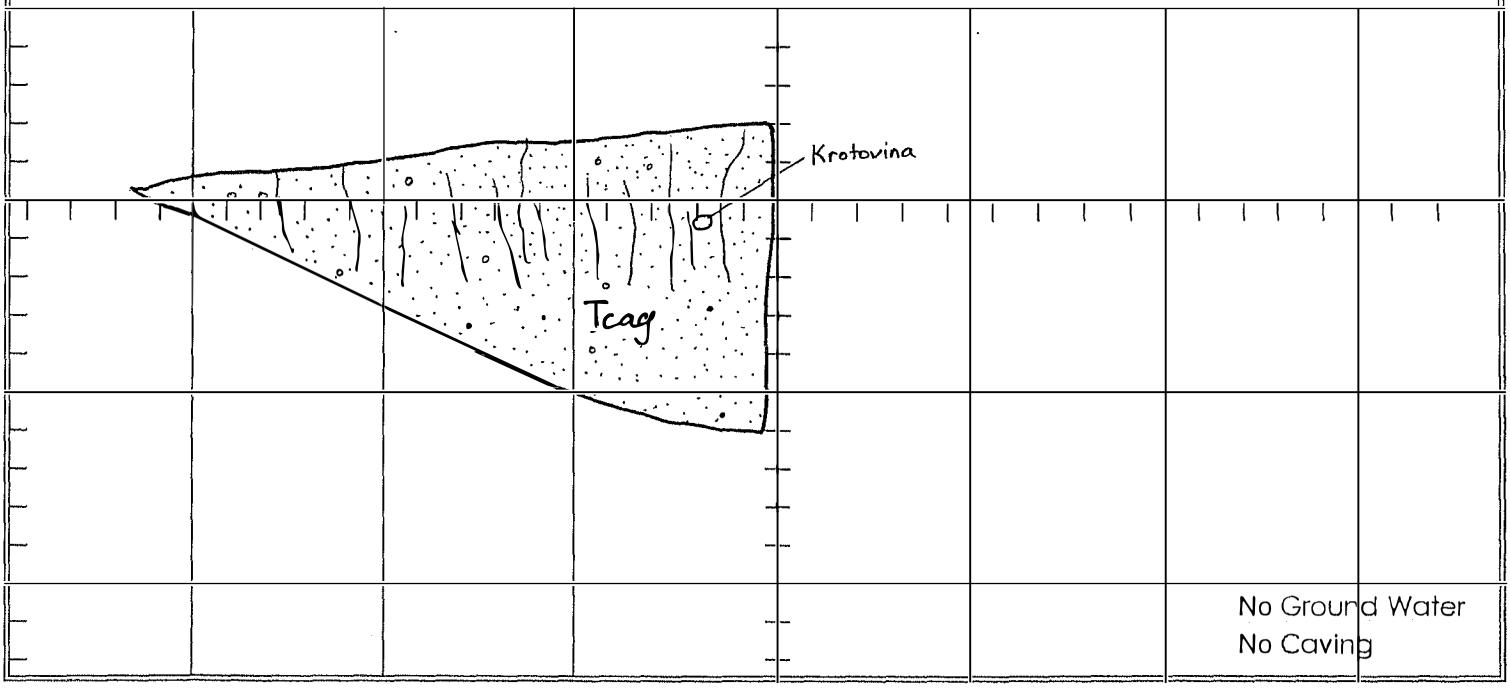


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-107**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/20/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; Tcag (0 - 8')** @ 0' Light grayish-brown sandstone; friable; moderately hard; dry to damp	Massive			
5									
					COMMENTS: Weathered down to 4'				
10									
15									
20									

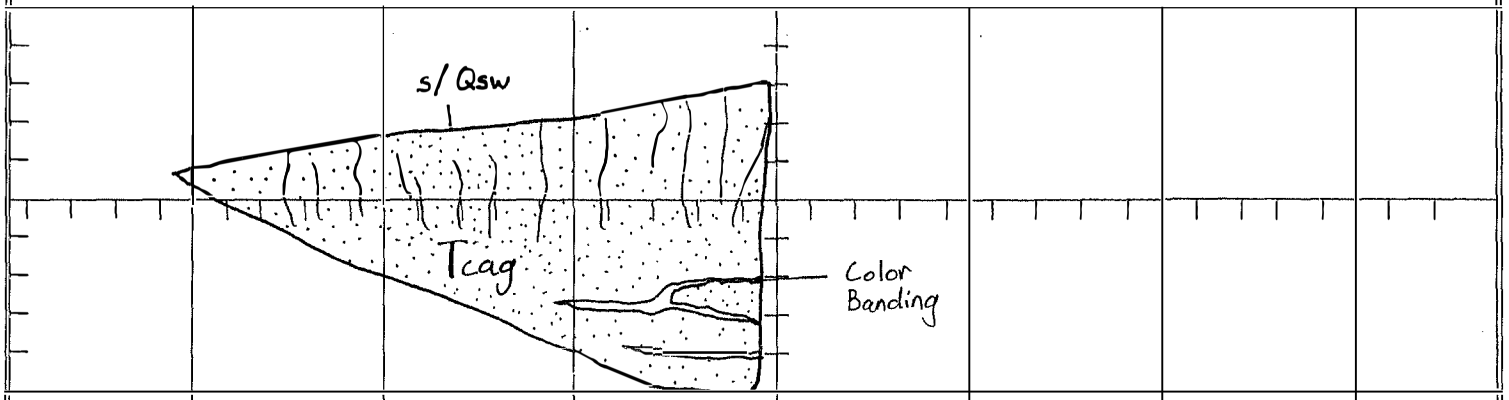
TOTAL DEPTH: 8 feet N52E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-108**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/20/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1")** @ 0' Residual soil **BEDROCK; Tcag (1" - 8')** @ 1" Light grayish-tan sandstone to silty sandstone with dark-brown color bends (1/4 - 1" thick); moderately hard; damp **COMMENTS:** Massive but with wavy color bands and steep fractures some bands terminate at fracture, others go across Weathered down to 3.5'				
5									
10									
15									
20									

TOTAL DEPTH: 8 feet N27W→ SCALE: 1 inch = 5 feet

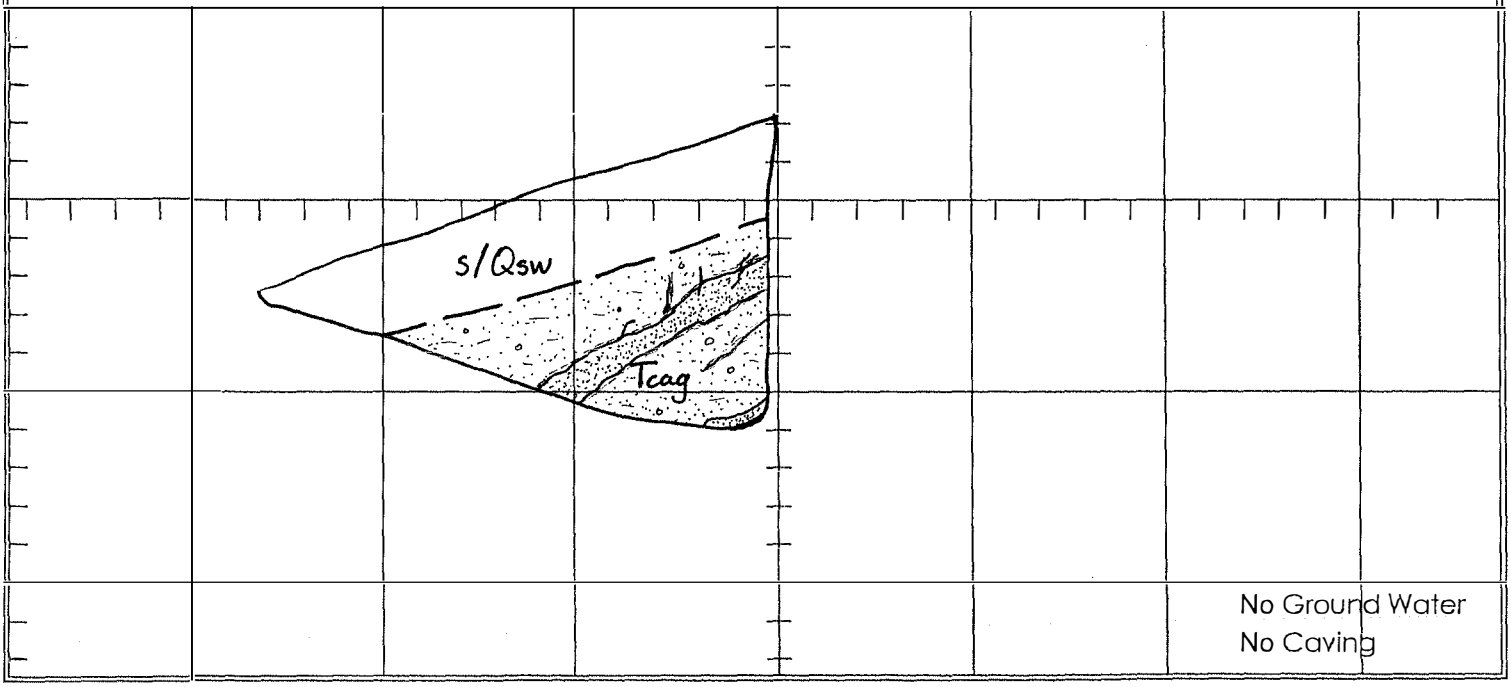


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-109**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/20/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Light- to medium grayish-brown clayey sand and sandy clay; (plastic); dry and damp **BEDROCK; Tcag (2.5 - 7.5')** @ 2.5' Mottled orangish-brown, dark-brown to black and medium brownish-gray silty sandstone with clay-lined fractures and scattered pebbles, and resistant sandstone lense (conuretionary) **COMMENTS:** Digs very hard, resistant lense like concrete clay-lined fractures above resistant lense				
5									
10									
15									
20									

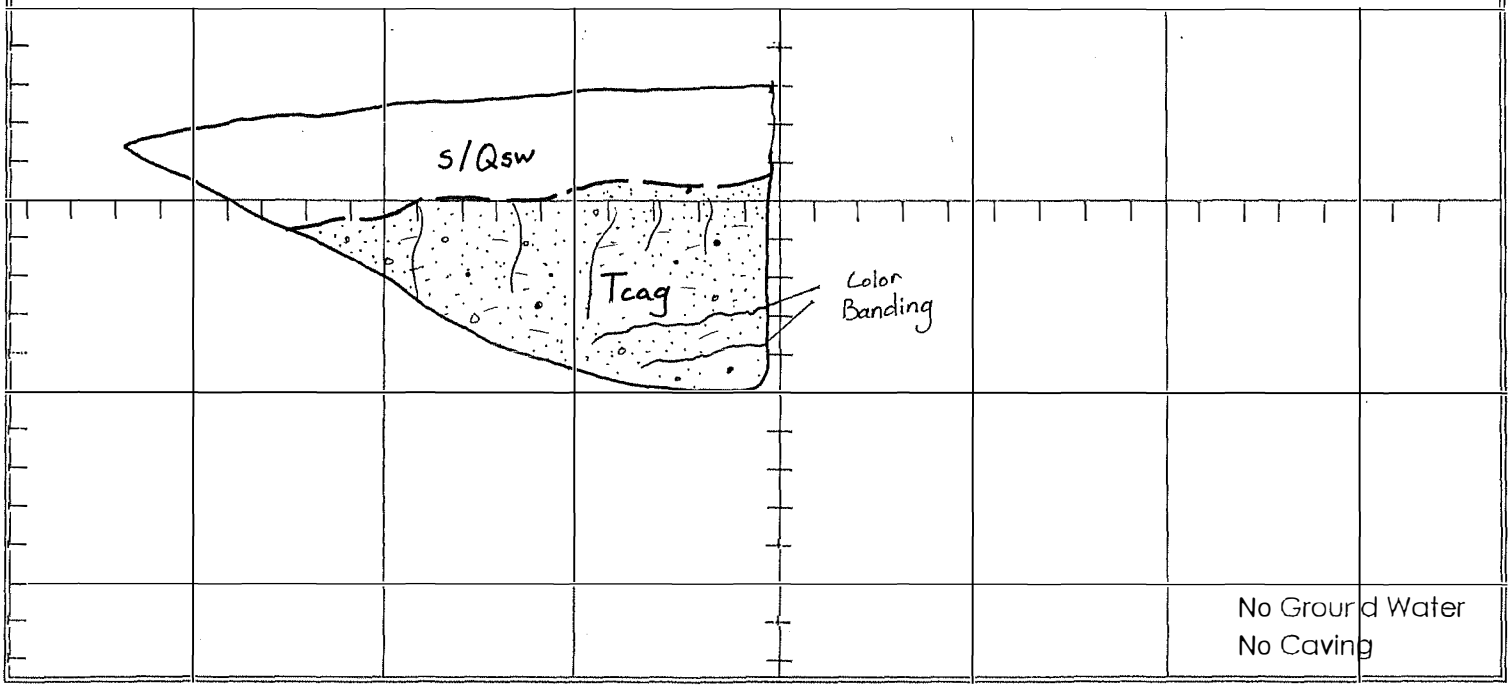
TOTAL DEPTH: 7.5 feet N50E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-110**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/20/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Medium grayish-brown silty sand; loose to moderately dense; dry				
5					**BEDROCK;? Tcag (2.5 - 8')** @ 2.5' Dark grayish-brown clayey silty sandstone with scattered pebbles (diatomite); moderately hard; damp to moist				
10									
15									
20									

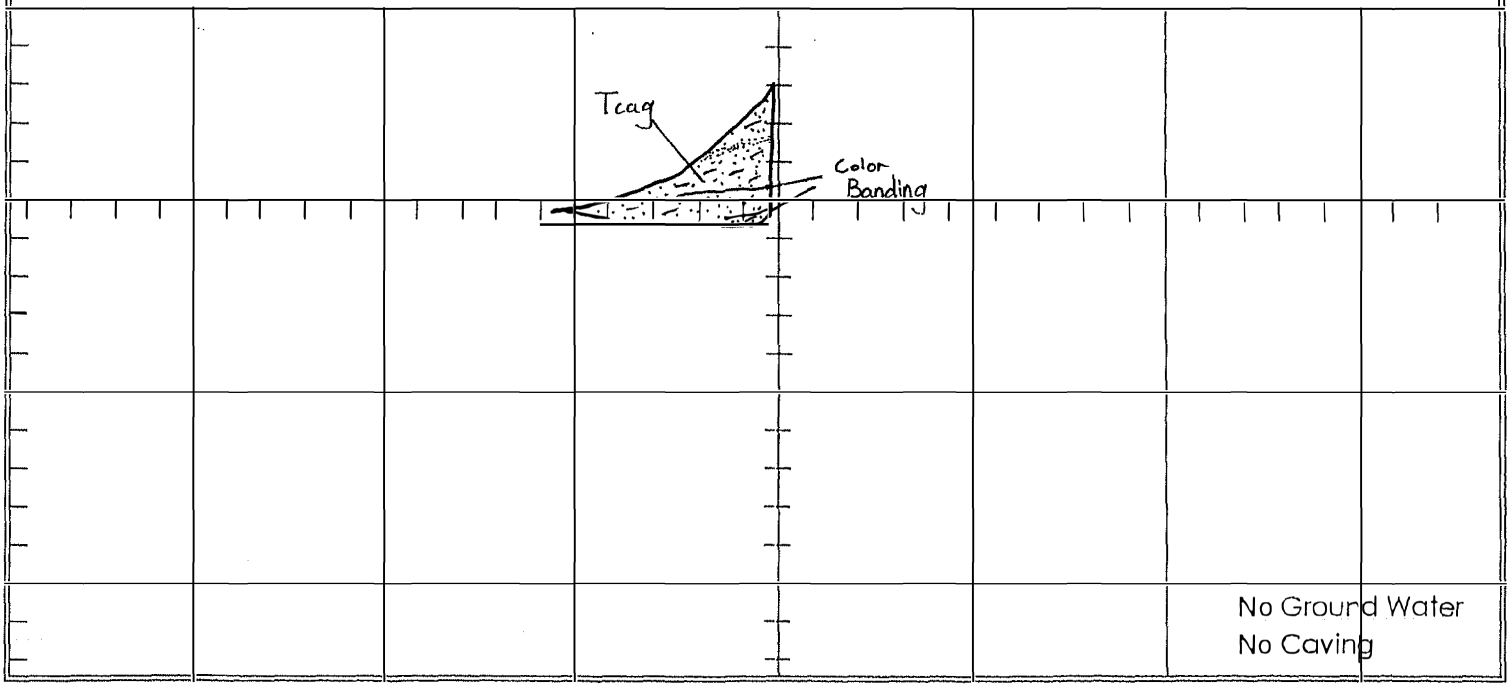
TOTAL DEPTH: 8 feet N22E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-111**
PROJECT: Solomon Hills Specifc Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/20/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	Other Tests
0					**BEDROCK; Tcag (0 - 3.5')** @ 0' Light yellowish-tan and light grayish-tan silty sandstone, sandstone, and sandy siltstone; moderately hard and hard; damp	a) B: ? N52W; 12SW b) B: ? N71W; 10SW			
5									
10					**COMMENTS:** Excavated in existing road cut				
15									
20									

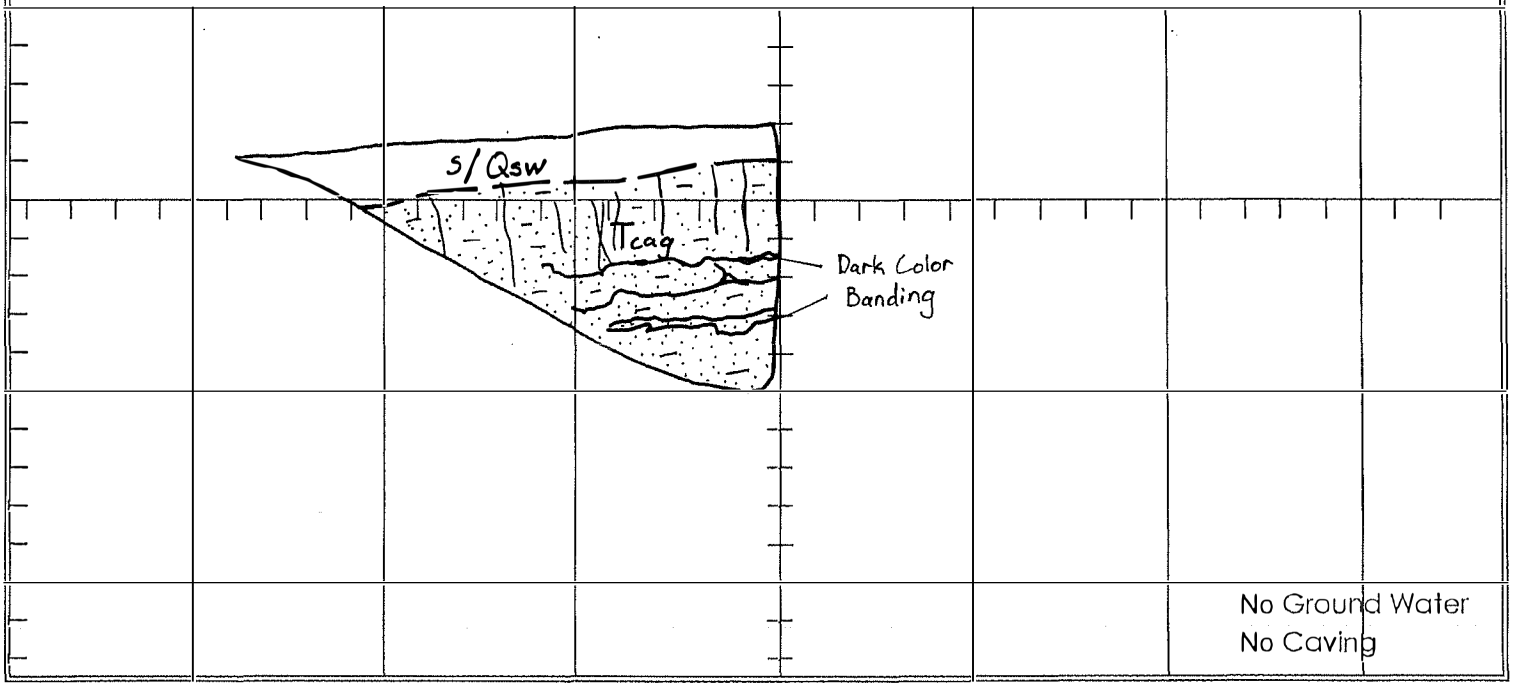
TOTAL DEPTH: 3.5 feet N28E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-112**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/20/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1')** @ 0' Light grayish-brown silty sand; loose; dry **BEDROCK; Tcag (1 - 7')** @ 1' Light- to medium grayish-brown silty sandstone; moderately hard; friable; dry and damp to moist **COMMENTS:** Weathered down to 4'				
5									
10									
15									
20									

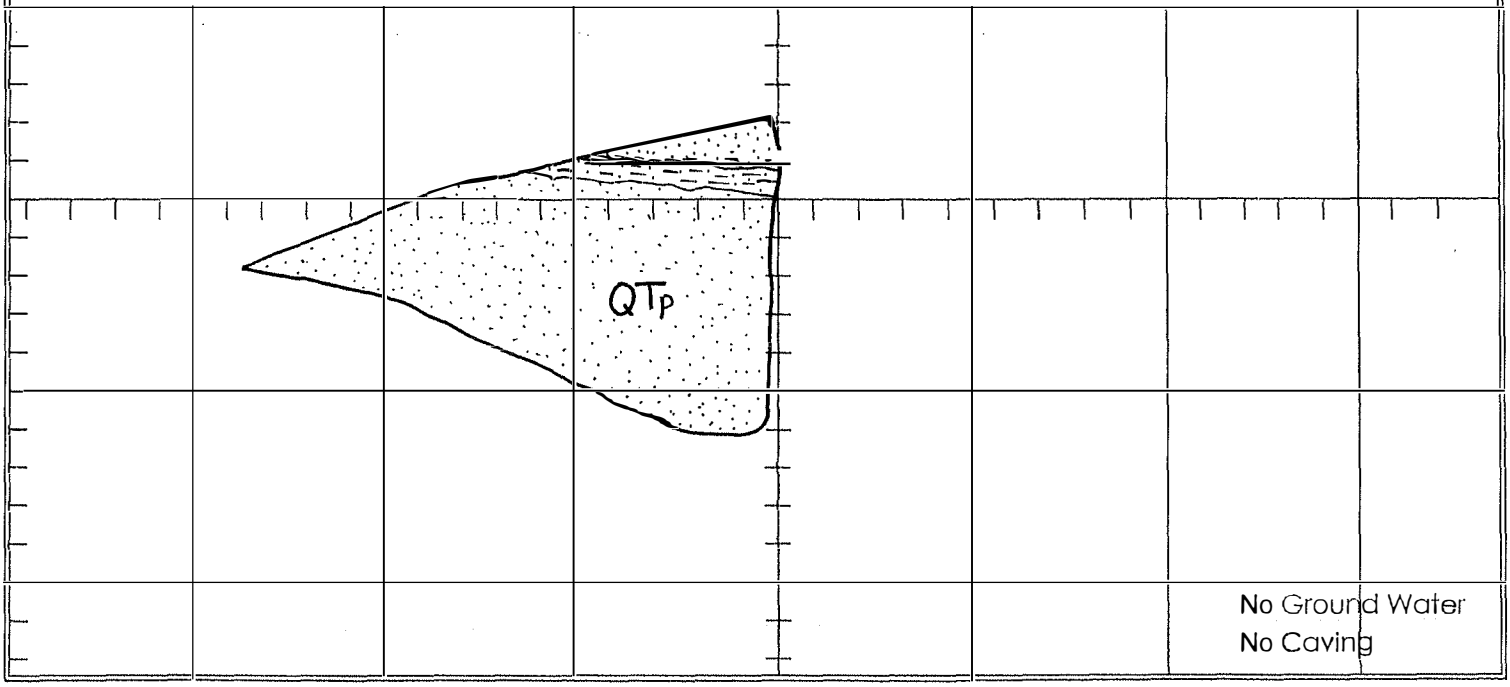
TOTAL DEPTH: 7 feet N45W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-113**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/20/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; QTp (0 - 8')** @ 0' Light-tan to grayish-white, well sorted, friable sandstone with little to no cohesion; moderately hard; damp and dark-brown and olive-green with FeO_2 staining siltstone and mudstone; moderately hard and stiff; dry to damp	B: Subhorizontal			
5									
					COMMENTS: Excavated in erosion gully Sandstone is massive and well sorted (no pebbles)				
10									
15									
20									

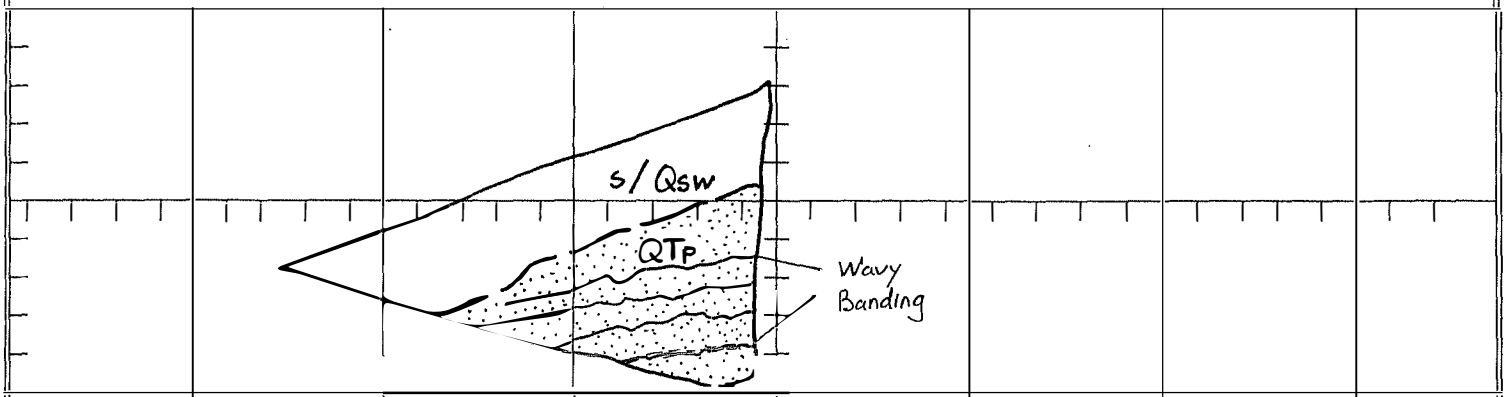
TOTAL DEPTH: 8 feet N52E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-114**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/20/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Dark grayish-brown silty sand; loose to moderately dense; dry to damp **BEDROCK; QTp ? (2.5 - 7.5')** @ 2.5' Light yellowish-tan and orangish-tan to light yellowish-brown to orangish-brown sandstone; moderately hard; friable; damp wavy bands of dark-brown sand with silt and possibly clay (1/4"-thick) **COMMENTS:** Weathered down to 3' No cohesion in sandstone, friable and medium-grained to coarse-grained				
5									
10									
15									
20									

TOTAL DEPTH: 7.5 feet N6W→ SCALE: 1 inch = 5 feet

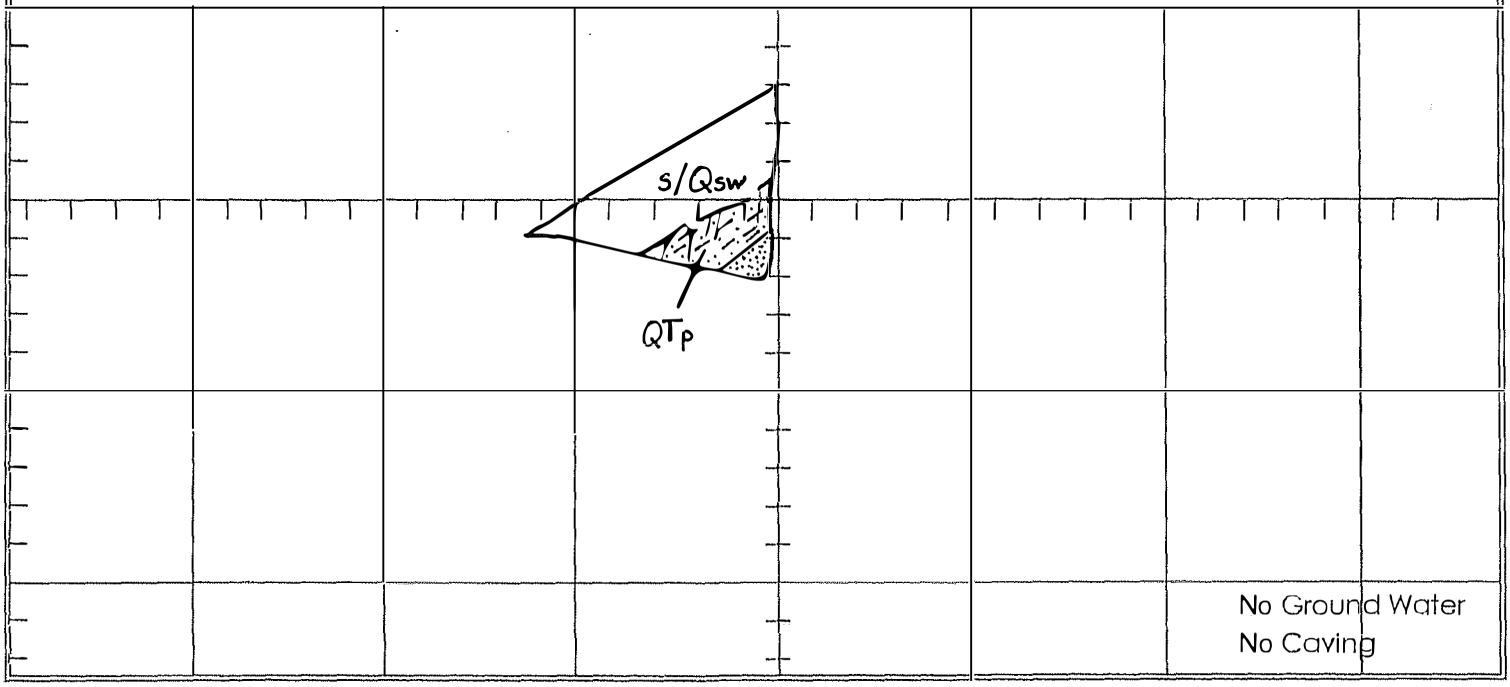


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-115**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Light grayish-brown sandy silt; loose; dry clasts of weathered QTp				
5					**BEDROCK; QTp (3 - 5')** @ 3' Light-gray to light grayish-brown sandstone and silty sandstone; moderately hard to hard; dry to damp	B: N33W; 37NE			
10					**COMMENTS:** Weathered down to 3.5' Caliche along bedding contact				
15									
20									

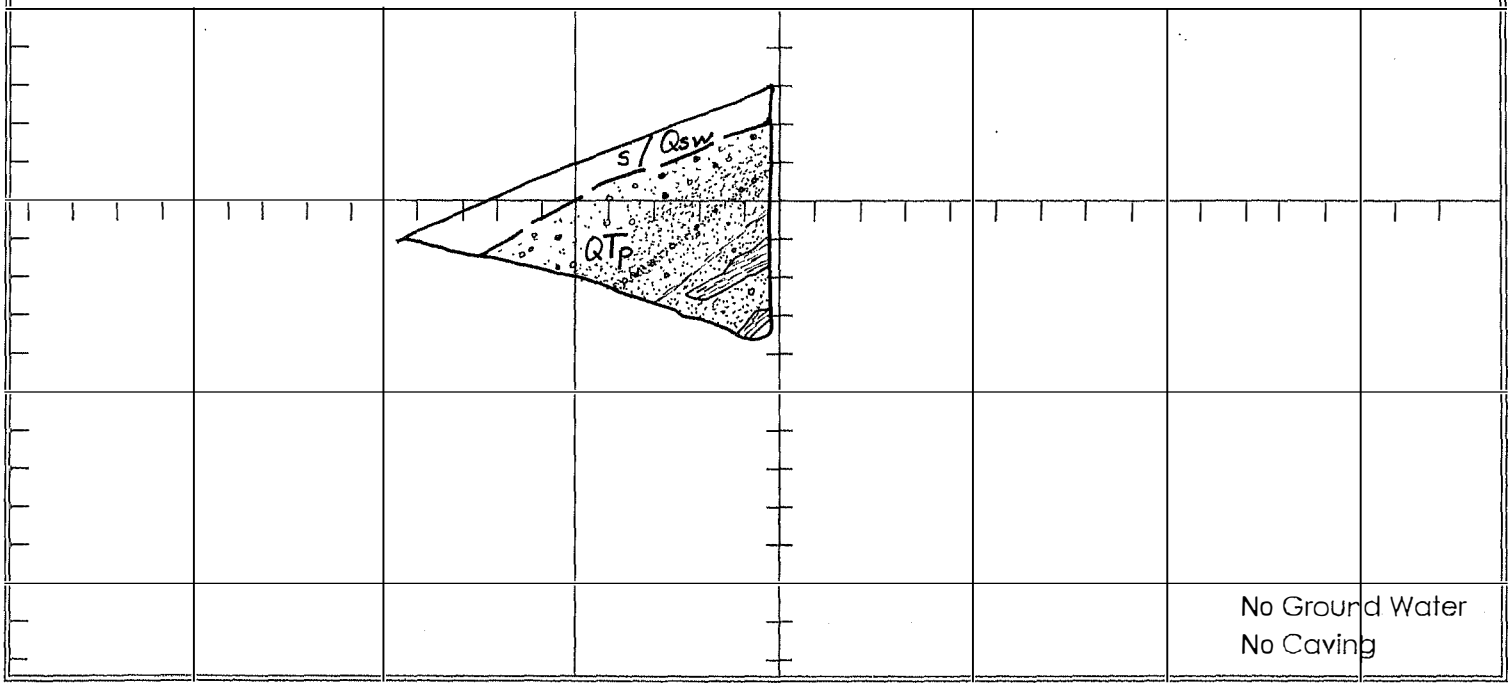
TOTAL DEPTH: 5 feet N73W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-116**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1')** @ 0' Dark grayish-brown silt with minor sand; loose; dry **BEDROCK; QTp (1 - 6.5')** @ 1' Light yellowish-gray and light orangish-brown, coarse-grained sandstone and pebbly sandstone with large rip up clasts (6" x 18") of silty clay (soft and plastic) **COMMENTS:** Abundant "diatomite" pebbles Weathered down to 2.5'	a) B: N56W; 39NE b) B: N55W; 46NE (laminae)			
5									
10									
15									
20									

TOTAL DEPTH: 6.5 feet N70W→ SCALE: 1 inch = 5 feet

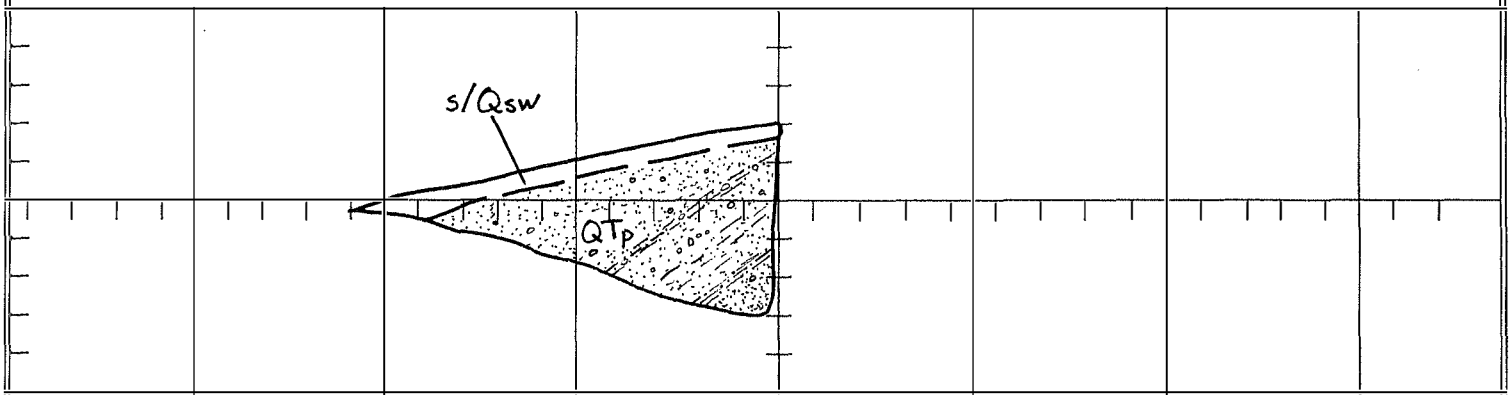


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-117**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 6")** @ 0' Dark grayish-brown silty sand to sandy silt; loose; dry **BEDROCK; QTp (6" - 5')** @ 6" Light- to medium grayish-brown pebbly sandstone and silty sandstone and sandy siltstone to silty sandstone; moderately hard to hard; dry to damp	B: N25W; 37NE			
5									
10									
15									
20									

TOTAL DEPTH: 5 feet N88W→ SCALE: 1 inch = 5 feet

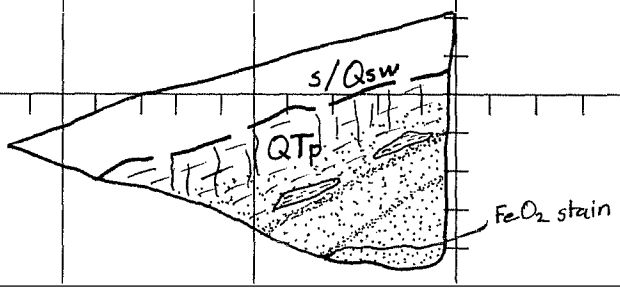


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-118**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Dark-brown sandy clay; stiff; dry **BEDROCK; QTp (1.5 - 6.5')** @ 1.5' Medium olive-gray, light-gray, and light orangish- to olive brownish-gray siltstone, sandstone, and mudstone; moderately hard; dry to damp **COMMENTS:** Weathered down to 2.5'	B: N37W; 32NE			
5									
10									
15									
20									

TOTAL DEPTH: 6.5 feet N73W→ SCALE: 1 inch = 5 feet

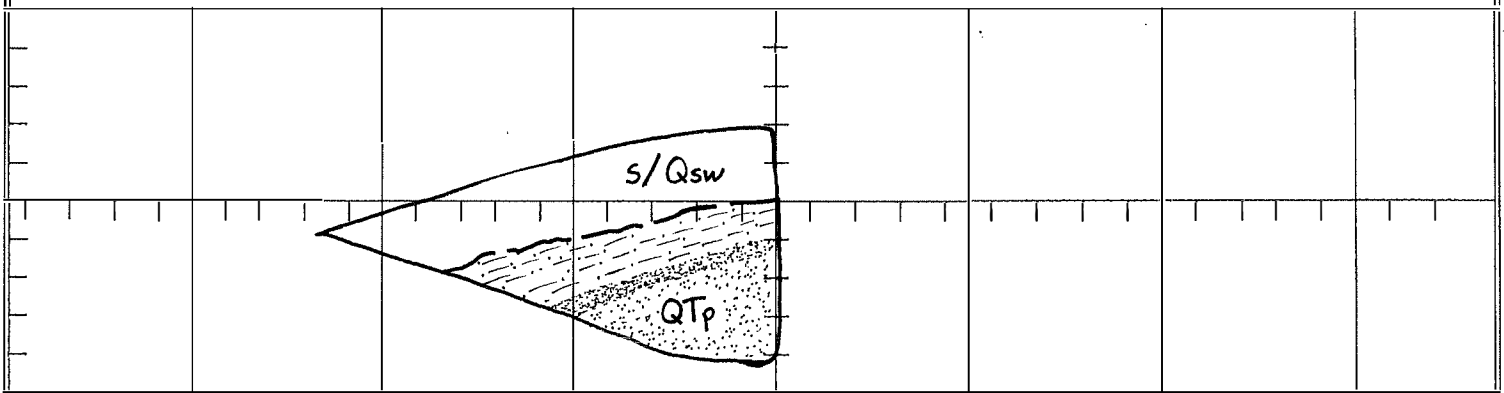


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-119**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Dark-brown to black and dark grayish-brown silty clay; soft to stiff; dry **BEDROCK; QTp (2 - 6')** @ 2' Light-olive gray-white and light greenish-tan siltstone, sandstone and silty sandstone; moderately hard and hard; dry to damp	B: N37W; 25NE			
5									
10									
15									
20									

TOTAL DEPTH: 6 feet N82W→ SCALE: 1 inch = 5 feet

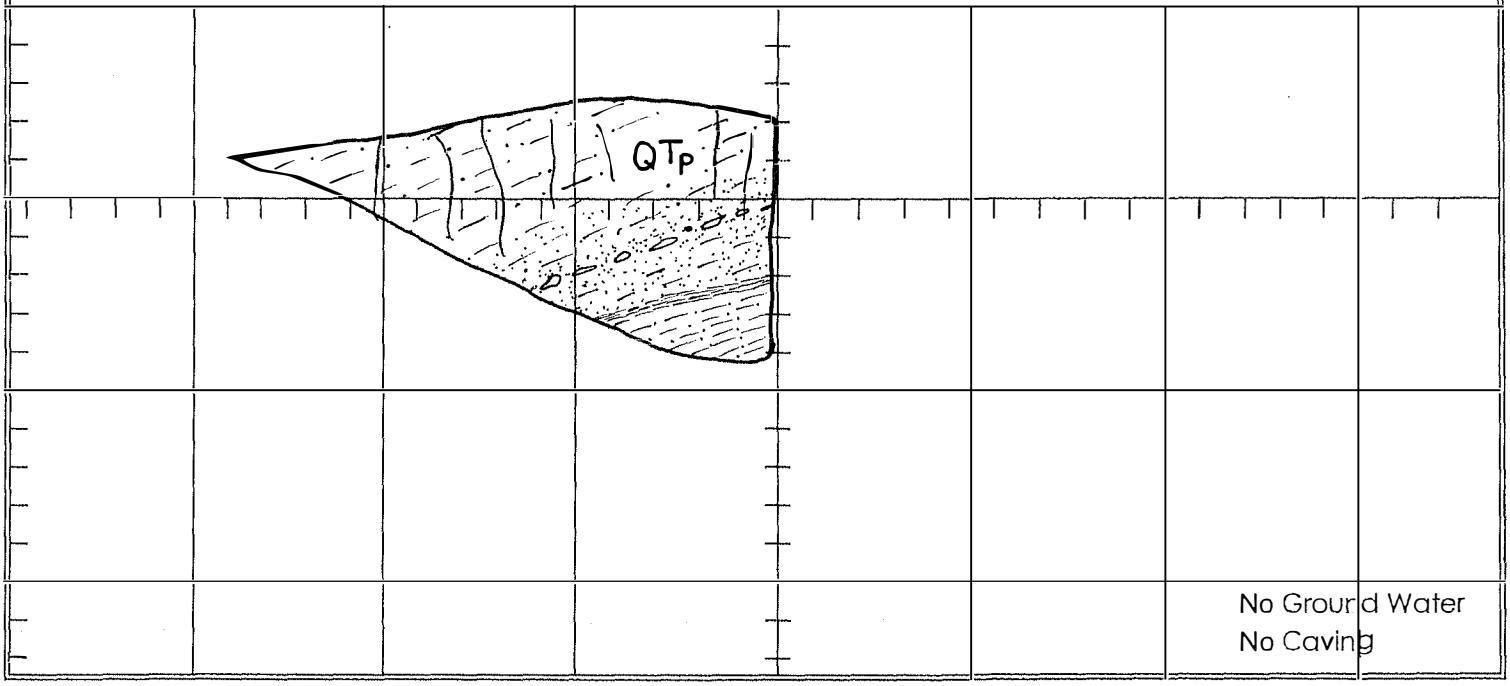


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-120**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1")** @ 0' Residual soil **BEDROCK; QTp (1" - 6')** @ 1" Light olive-gray, light olive-brown and grayish-white, sandy siltstone, siltstone and silty sandstone with clayey mudstone interbeds (approximately 1"-thick); moderately hard; dry to damp; caliche pods (1/2") at clayey mudstone contacts **COMMENTS:** Weathered down to 2.5'	a) B: N58W; 22NE b) B: N48W; 22NE			
5									
10									
15									
20									

TOTAL DEPTH: 6 feet ←N67E SCALE: 1 inch = 5 feet

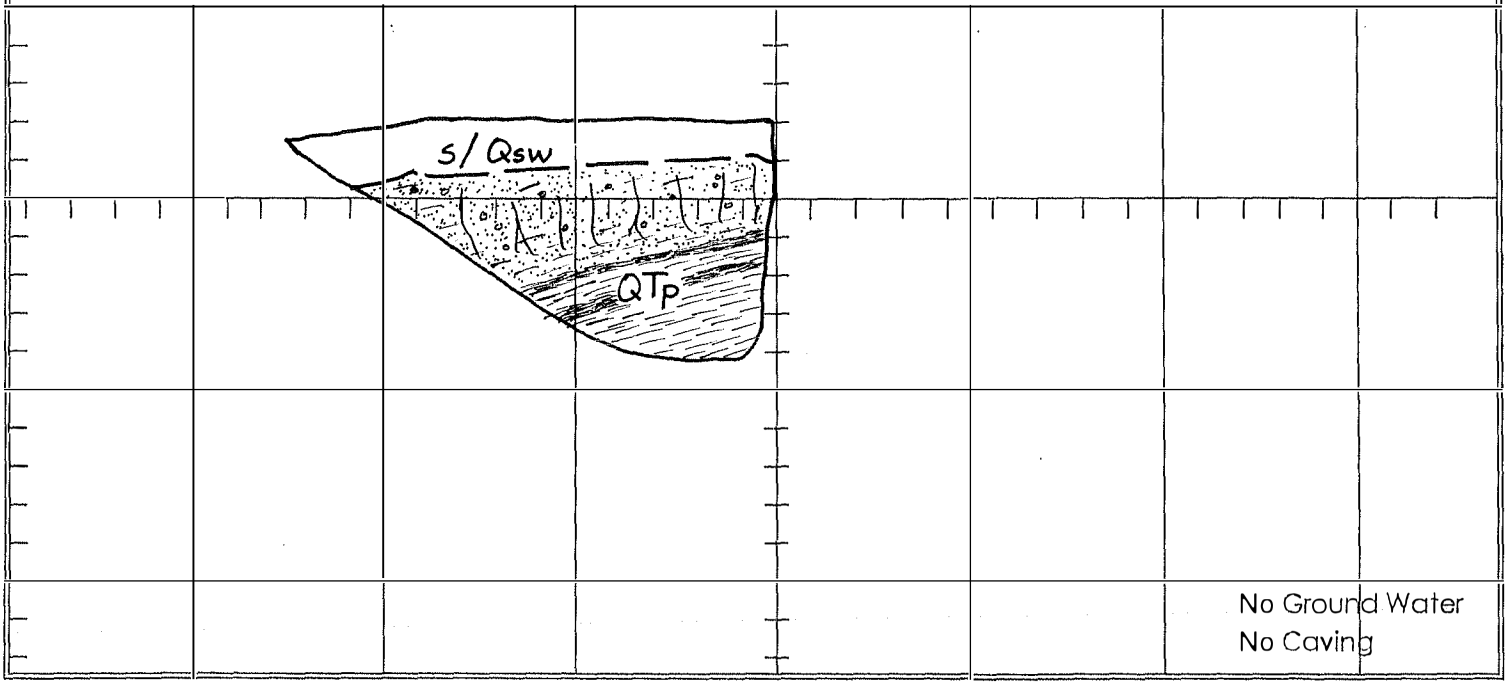


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-121**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1')** @ 0' Dark grayish-brown silty sand; loose to medium dense; dry **BEDROCK; QTp (1 - 6')** @ 1' Medium grayish-brown and light orangish-brown to light orangish-tan pebbly silty sandstone and clayey mudstone; moderately hard and very stiff; damp **COMMENTS:** Weathered down to 3' Mudstone is plastic	a) Apx B: N44W; 33NE (Faint laminae in clayey mudstone) b) Apx B: N42W; 27NE			
5									
10									
15									
20									

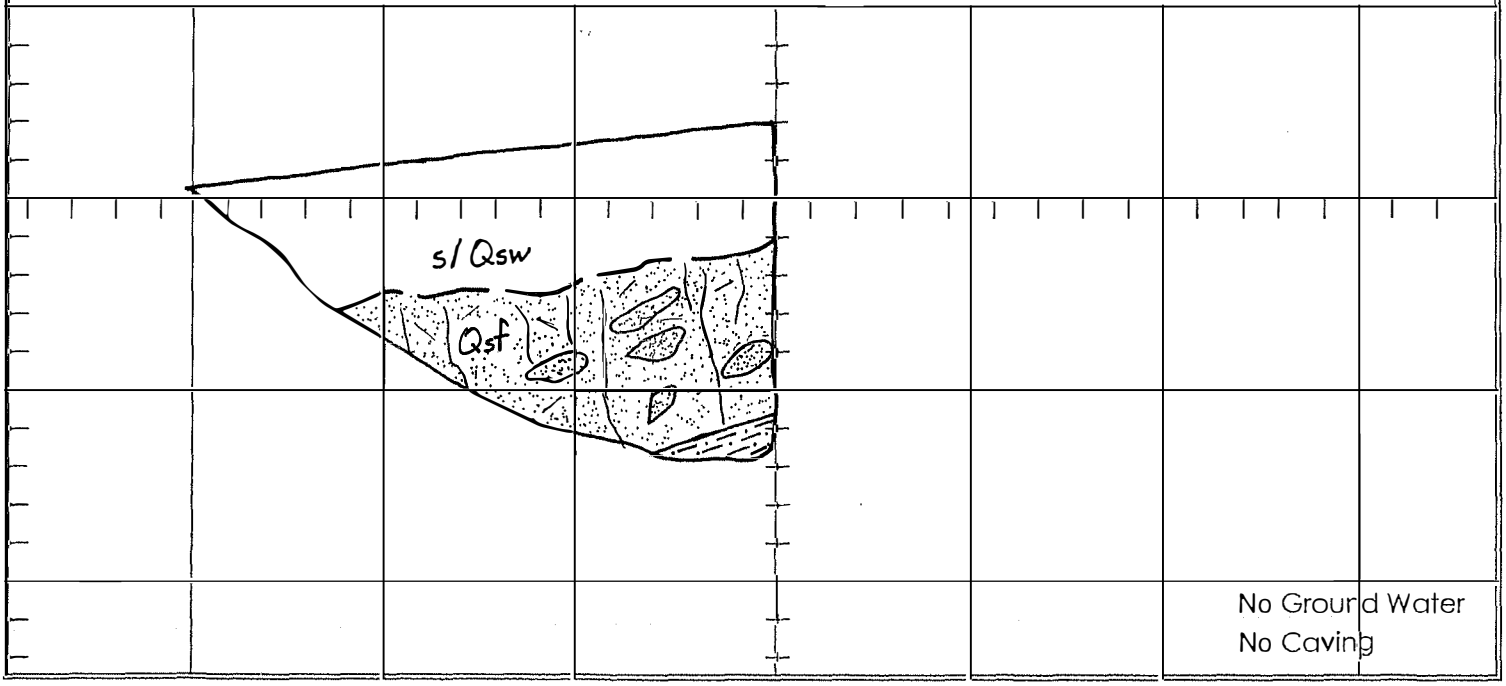
TOTAL DEPTH: 6 feet ←N6W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-122**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Dark-brown to black sandy silt to clay; loose to medium dense; dry to damp **SURFICIAL FAILURE; Qsf (3 - 7.5')** @ 3' Jumbled mix of QTp blocks and slopewash; loose; dry				
5									
10					**BEDROCK; QTp (7.5 - 8.5')** @ 7.5' Light olive-gray sandy siltstone; moderately hard; dry to damp **COMMENTS:** Weathered down to 7.5'	Weathered slip surface: N80W; 14NE			
15									
20									

TOTAL DEPTH: 8.5 feet ←N12E SCALE: 1 inch = 5 feet

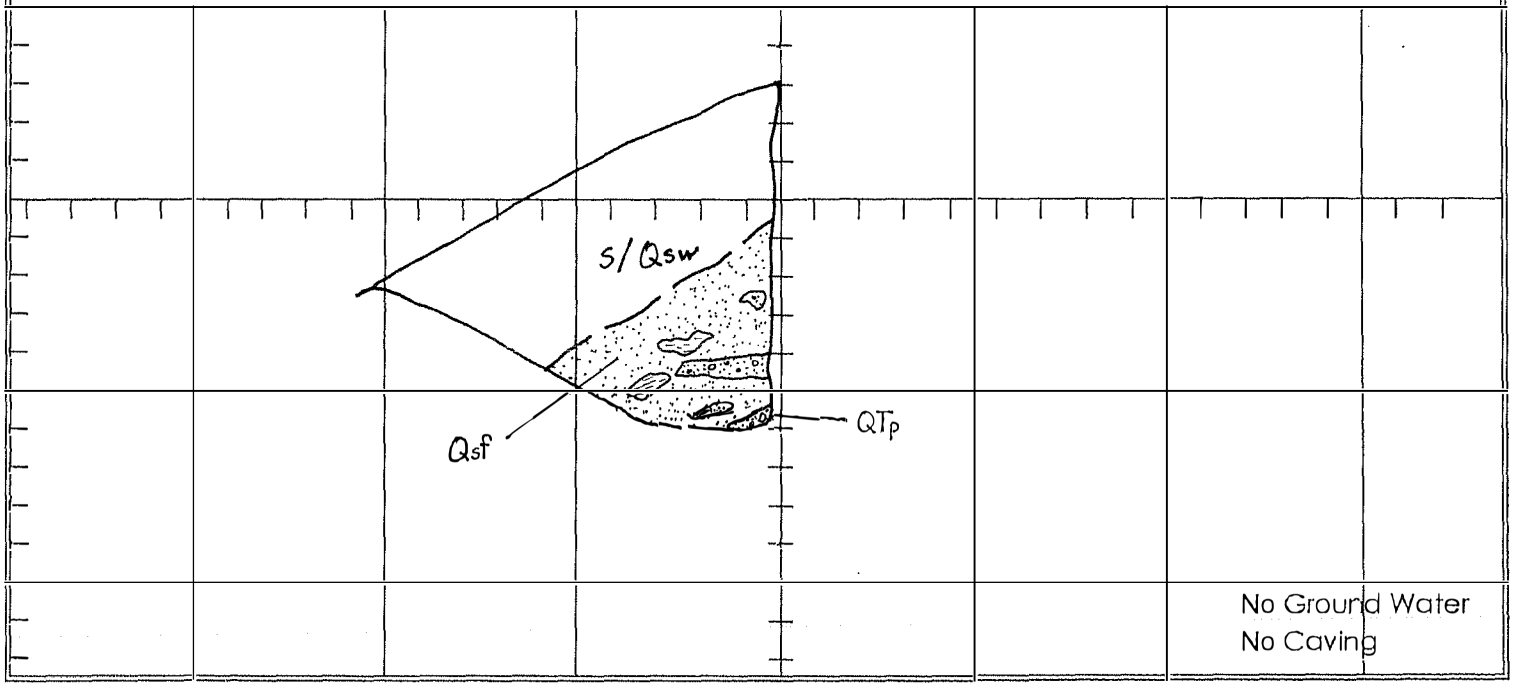


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-123**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3.5')** @ 0' Dark grayish-brown to black sandy silt; loose to medium dense; dry and dry to damp with depth **SURFICIAL FAILURE; Qsf (3.5 - 8.75')** @ 3.5' Jumbled QTp lithologies and slopewash "pods"; soft; dry to damp **BEDROCK; ? QTp (8.75 - 9')** @ 8.75' Light grayish-white pebbly sandstone; moderately hard; friable; dry to damp				
5									
10									
15									
20									

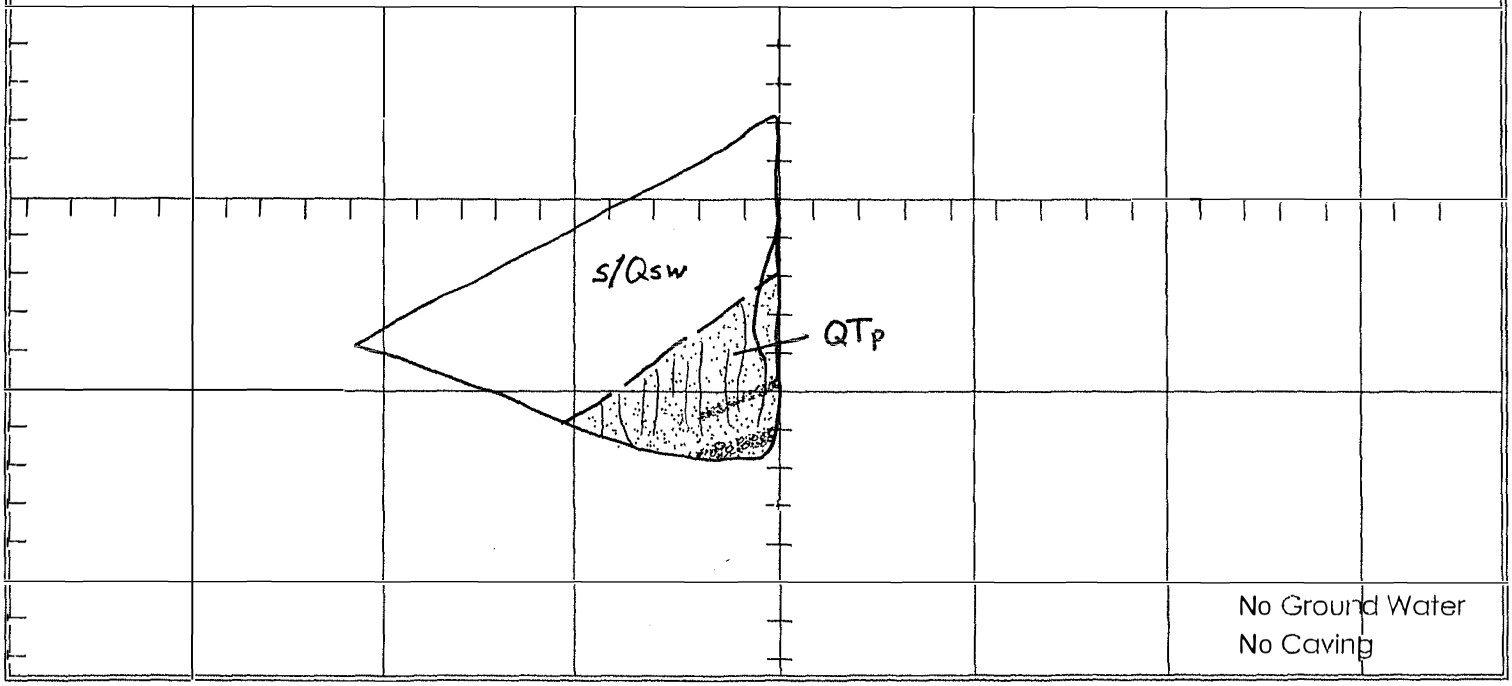
TOTAL DEPTH: 9 feet ←N80W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 22-2195s-1	**TRENCH LOG NO. GT-124**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 9/21/06	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See map	

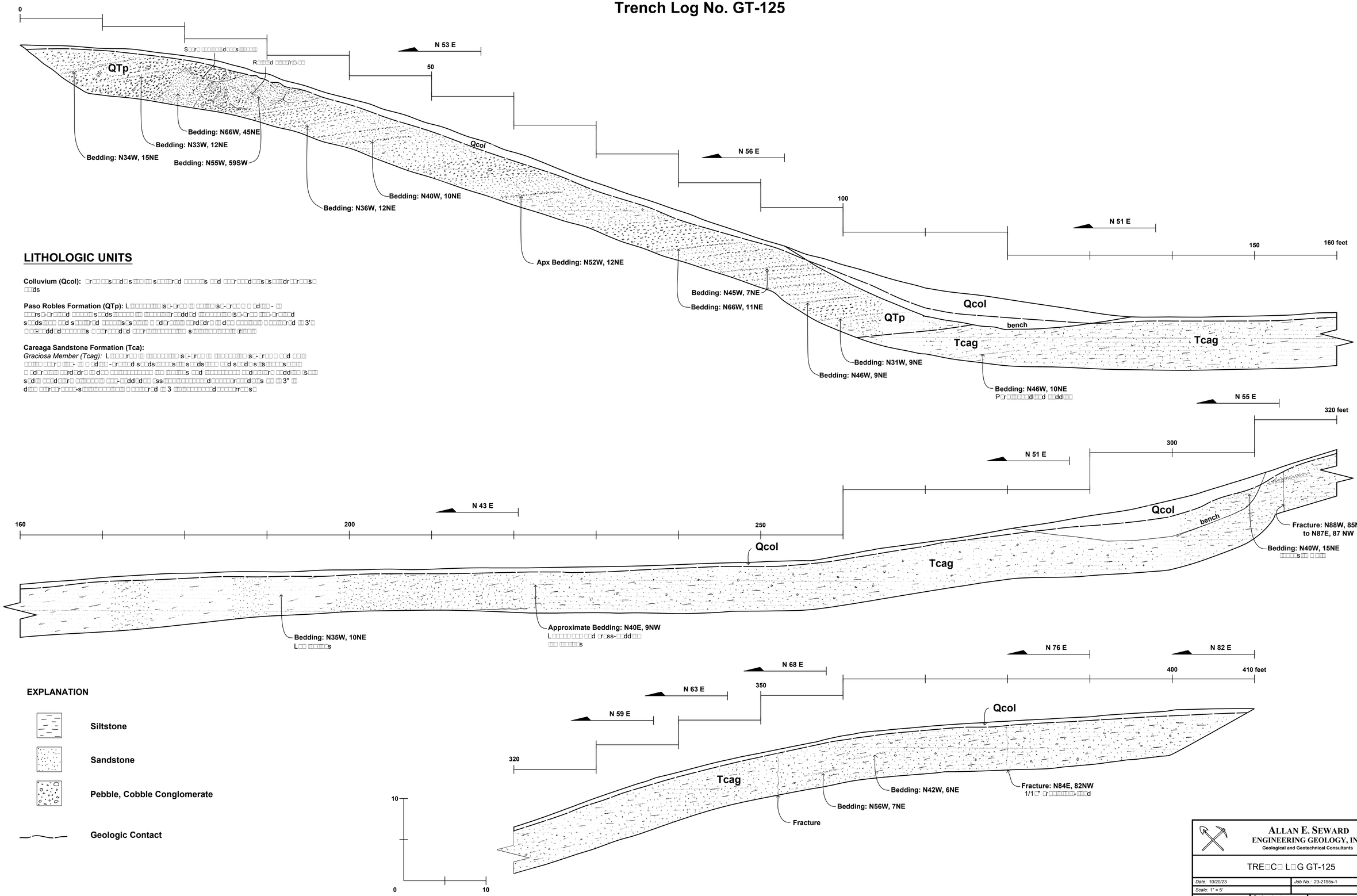
DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4')** @ 0' Dark grayish-brown to black sandy silt to silty clay with scattered pebbles and cobbles; loose to medium dense; dry to damp; abundant voids (1/8" diameter); "root tubes"				
5					**BEDROCK; ? QTp (4 - 8.5')** @ 4' Light olive-gray sandstone with pebble lenses, concretionary lenses and siltstone; friable; moderately hard; dry to damp	B: N40W; 30NE Pebbly lense			
10					**COMMENTS:** Weathered down to 8.5'				
15									
20									

TOTAL DEPTH: 8.5 feet ←N31W SCALE: 1 inch = 5 feet



No Ground Water
No Caving

Trench Log No. GT-125



LITHOLOGIC UNITS

Colluvium (Qcol): □r□□ □□s□□d□ s□□□□ □□□ s□□□□□r□d □□□□□□s □□d □□□□r□□□d□□□s□□s□□□□dr□□r□□□s□ □□□ds

Paso Robles Formation (QTp): L□□□□□□□□□□□□ s□-□r□□ □□ □□□□□□ s□-□r□□ □ □ □□d□□□ - □□ □□□rs□-□r□□□□d □□□□□□s□□ds□□□□□□□ □□□ □□□□□□□□□□r□□dd□□d □□□□□□□□□□□□□s□-□r□□ □□□□-□r□□□□d s□□ds□□□□ □□□d s□□□□□r□d □□□□□□s□s□□□□□ □ □d□r□□□□□ □□rd□dr□ □□ d□□ □□□□□□□□□□□□□ □□□ □□□□□□s □□d □□□□□□□□□□ □□d□□□□□r□ □□dd□□□ □s□□□ s□d□□ □□□d□□□r□ □□□□□□□□□ □□□-□□dd□d□□ □ss□□□□□□□□□□□□d□□□□□□r□□□d□□□s □□ □□ 3" □□ d□□□ □□□r□□r□□□□-s□□□□□□□□□□□□□□ □ □□□□□r□d □□ 3 □□□□□□□□□□□□□d□□□□□rr□□s□

Careaga Sandstone Formation (Tca):
Graciosa Member (Tcag): L□□□□□r□□ □□ □□□□□□□□□□□ s□-□r□□ □□ □□□□□□□□□□□ s□-□r□□ □ □□d □□□□□ □□□□□ □□□r□ □□□- □□ □ □d□□□ -□r□□□□d s□□ds□□□□□s□□□ s□□ds□□□□ □□d s□□d□s□□s□□□□□s□□□□□ □ □d□r□□□□□ □□rd□dr□ □□ d□□ □□□□□□□□□□□□□ □□□ □□□□□□s □□d □□□□□□□□□□ □□d□□□□□r□ □□dd□□□ □s□□□ s□d□□ □□□d□□□r□ □□□□□□□□ □□□-□□dd□d□□ □ss□□□□□□□□□□□□□d□□□□□□r□□□d□□□s □□ □□ 3" □□ d□□□ □□□r□□r□□□□-s□□□□□□□□□□□□□□ □ □□□□□r□d □□ 3 □□□□□□□□□□□□□d□□□□□rr□□s□

EXPLANATION

- Siltstone
- Sandstone
- Pebble, Cobble Conglomerate
- Geologic Contact

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

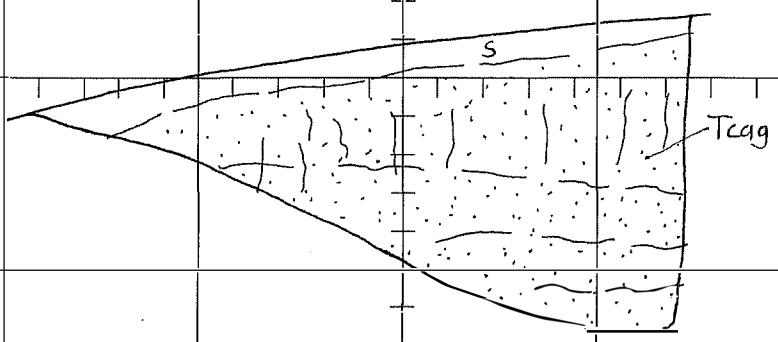
TRE□C□ L□G GT-125

Date: 10/20/23	Job No.: 23-2195s-1
Scale: 1" = 5'	
PLATE 1	Geology by: S□□□
	Drawn by: VCG
	Revised:

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-159**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 4/11/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 6")** **BEDROCK; Tcag (6" - 8')** @ 0.5' Light grayish-tan sandstone; moderately hard; dry to damp; friable; wavy color banding COMMENTS: Weathered down to 3.5'				
5									
10									
15									
20									

TOTAL DEPTH: 8 feet East→ SCALE: 1 inch = 5 feet

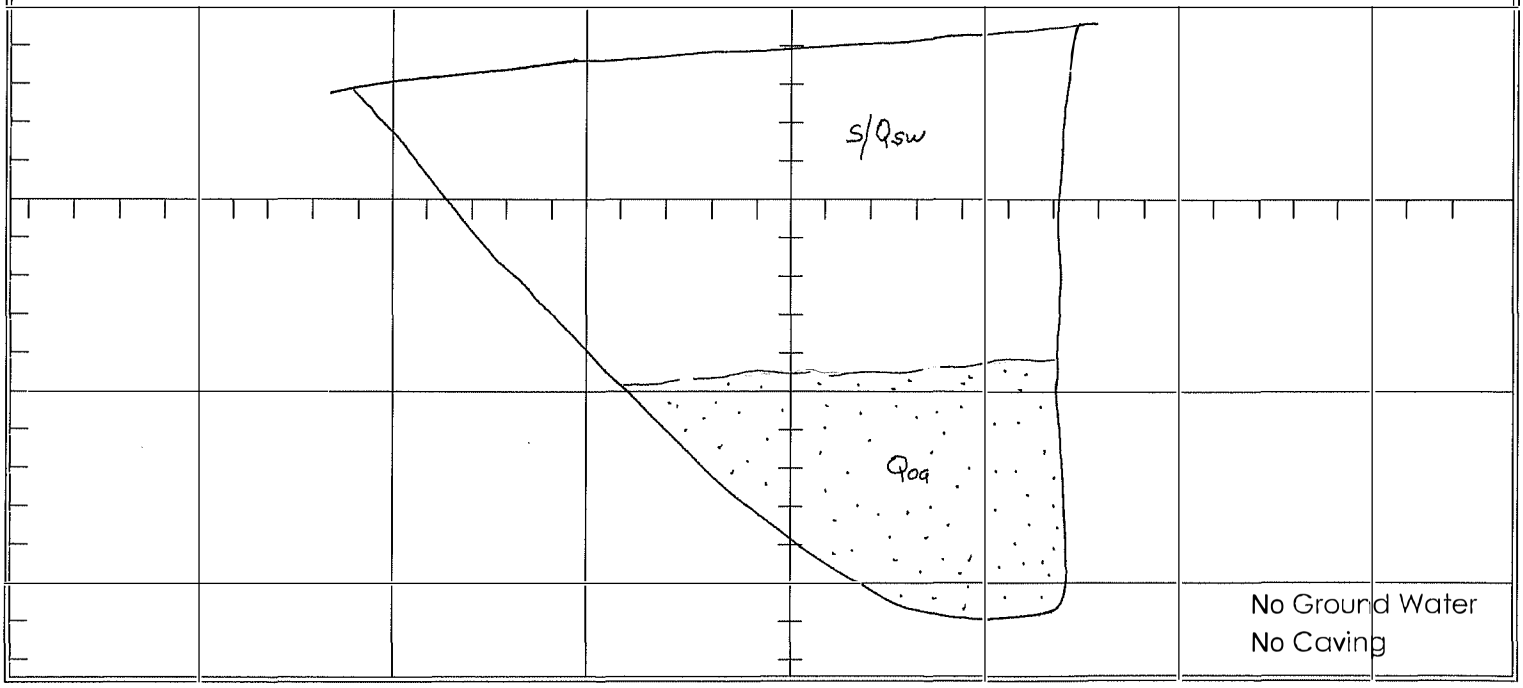


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-160**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 4/11/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 8.5')** @ 0' Medium-brown to black clayey silt with sand; loose; damp				
5									
10					**ALLUVIUM; Qa (8.5 - 15')** @ 8.5' Light grayish-tan sand; loose; damp				
15									
20									

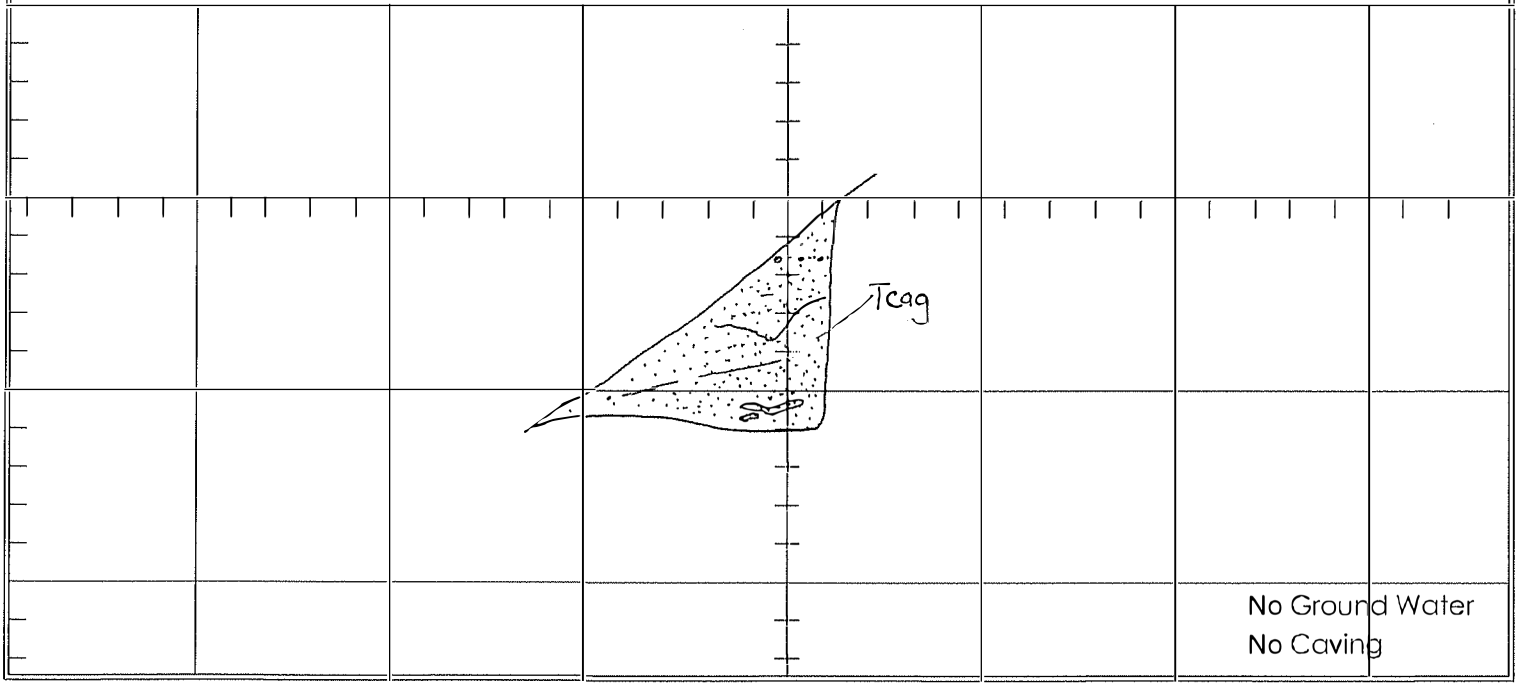
TOTAL DEPTH: 15 feet N28E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-161**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 4/11/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; Tcag (0 - 8')** @ 0' Light grayish-brown and grayish-tan sandstone with pebble lenses and coarse-grained sand lenses @ 1.75' Pebble lens	B: N27W, 9SW			
5									
10									
15									
20									

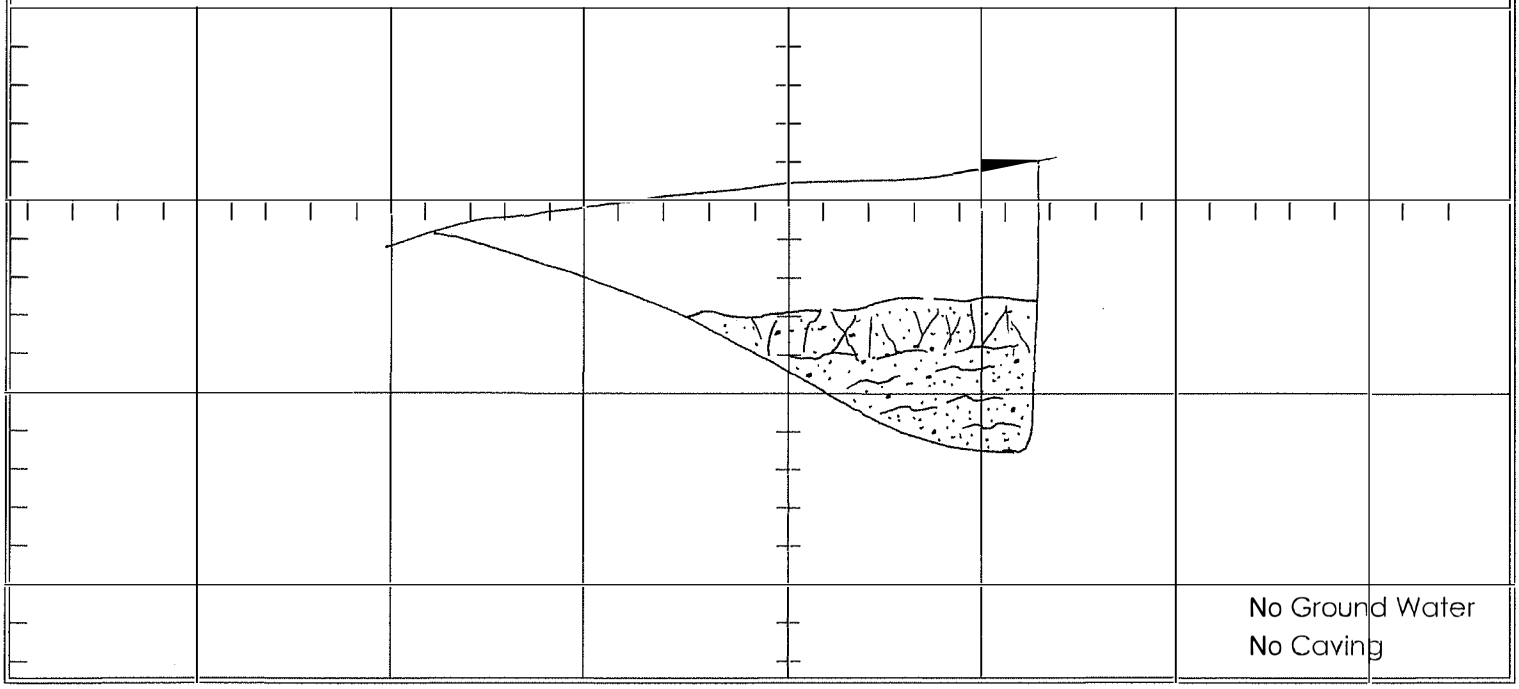
TOTAL DEPTH: 6 feet →N32W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-166**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 4/12/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3.5')** @ 0' Light grayish-brown to medium-brown silty sand; loose; damp to moist **BEDROCK; Tcag (3.5 - 7.5')** @ 3.5' Light grayish-brown sandstone with scattered pebbles; moderately hard; dry to damp; massive; friable; wavy color banding COMMENTS: Weathered down to 5' Abundant roots down to 4'				
5									
10									
15									
20									

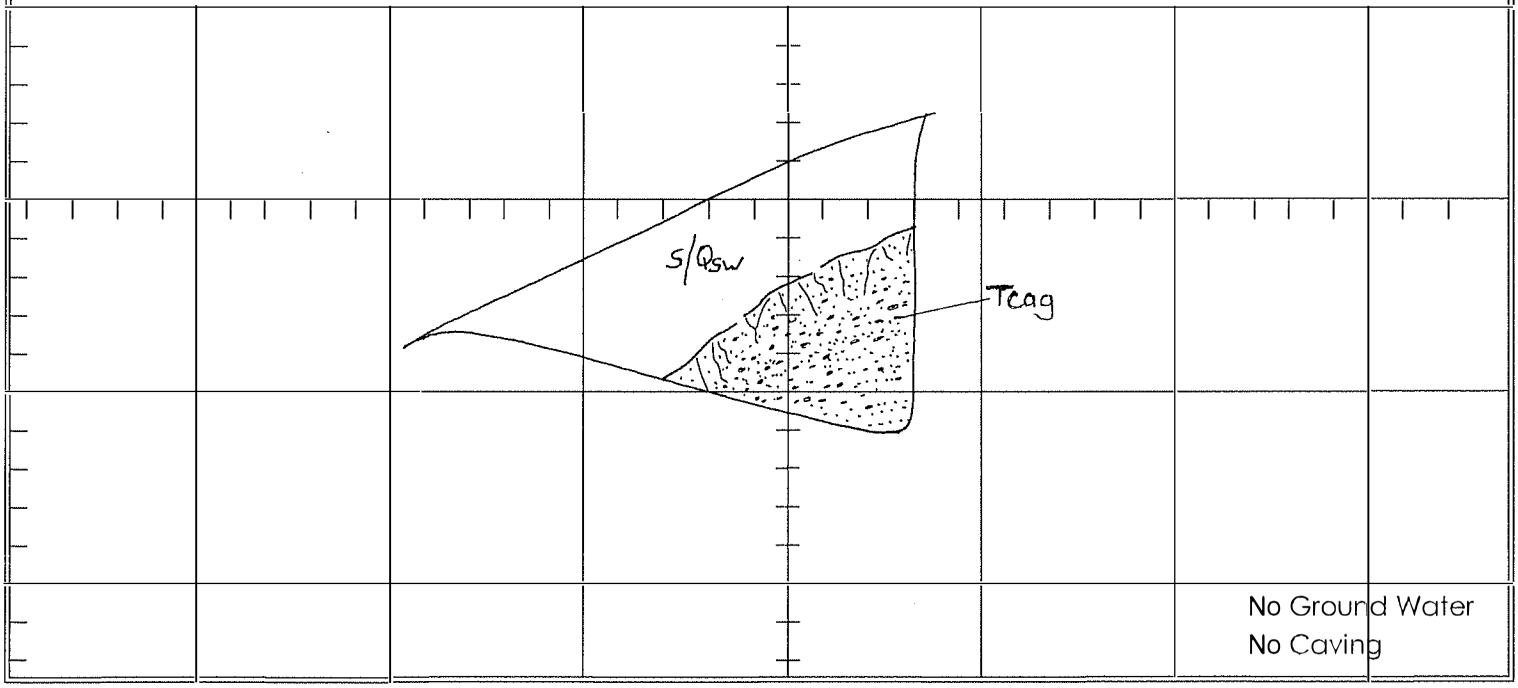
TOTAL DEPTH: 7.5 feet ←N58W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-167**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 4/12/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** 0' Light grayish-brown silty sand with pebbles; loose; dry **BEDROCK; Tcag (2.5 - 8')** @ 2.5' Light grayish-tan interbedded sandstone and pebbly sandstone to conglomerate; friable; moderately hard; dry to damp COMMENTS: Weathered down to 3.5'	B: N85W, 8SW			
5									
10									
15									
20									

TOTAL DEPTH: 8 feet →N32E SCALE: 1 inch = 5 feet

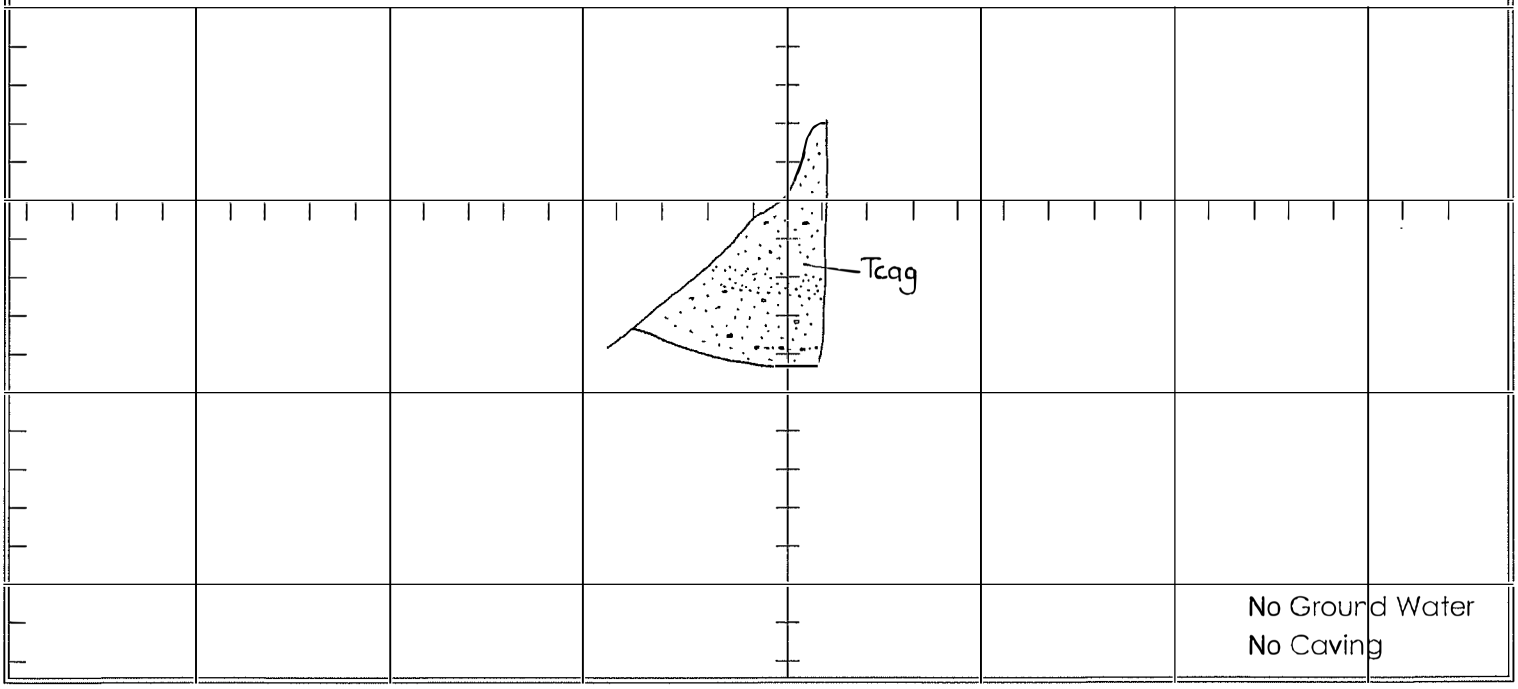


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-168**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 4/12/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; Tcag (0 - 6')** @ 0' Light grayish-tan to white sandstone and pebbly sandstone; moderately hard; dry to damp	B: N87W, 7SW			
5					COMMENTS: Weathered down to 2' Bedrock exhibits cross bedding				
10									
15									
20									

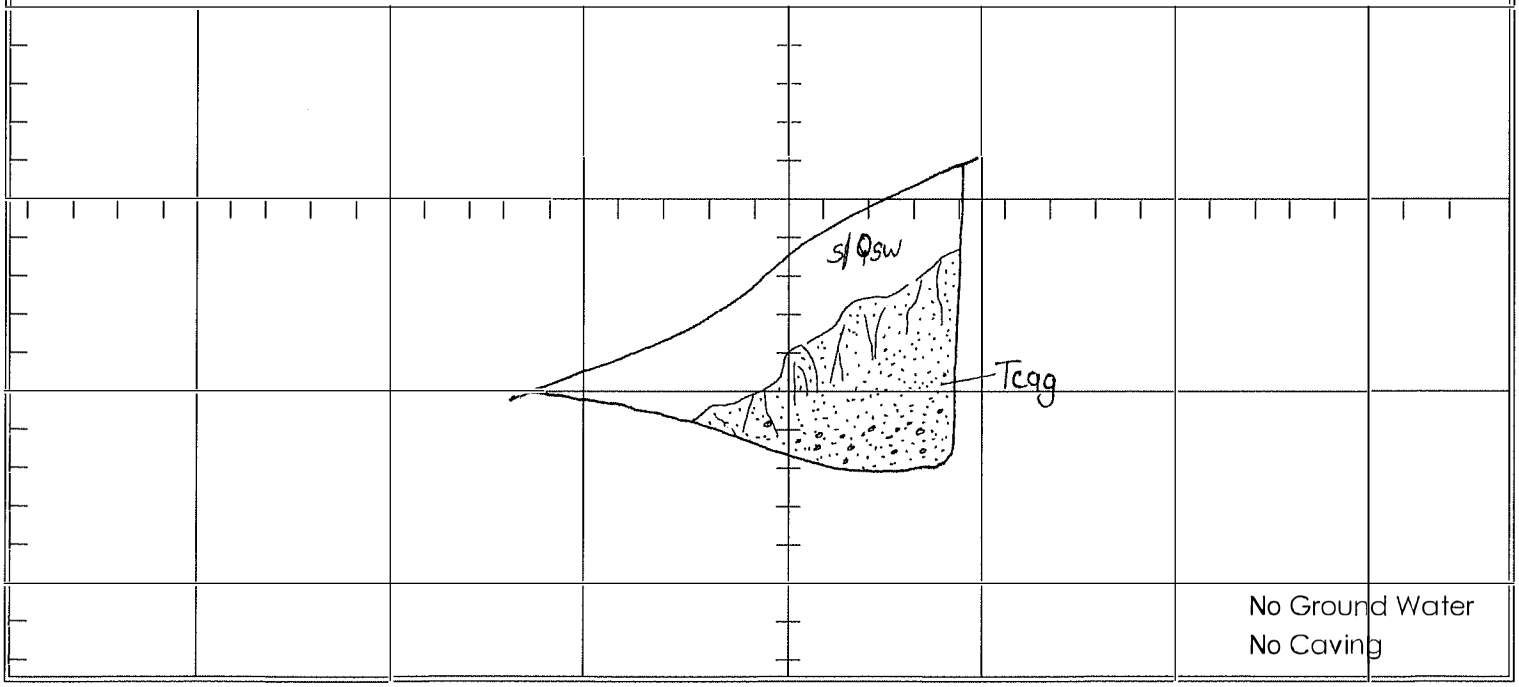
TOTAL DEPTH: 6 feet N26W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-169**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 4/12/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Light grayish-brown to medium-brown sandy silt to silty sand; loose; dry to damp **BEDROCK; Tcag (2 - 8')** @ 2' Light grayish-tan sandstone and pebbly sandstone; moderately hard; dry to damp; friable	B: N62W, 7SW			
5									
10					COMMENTS: Weathered down to 4' Abundant roots down to 3.5'				
15									
20									

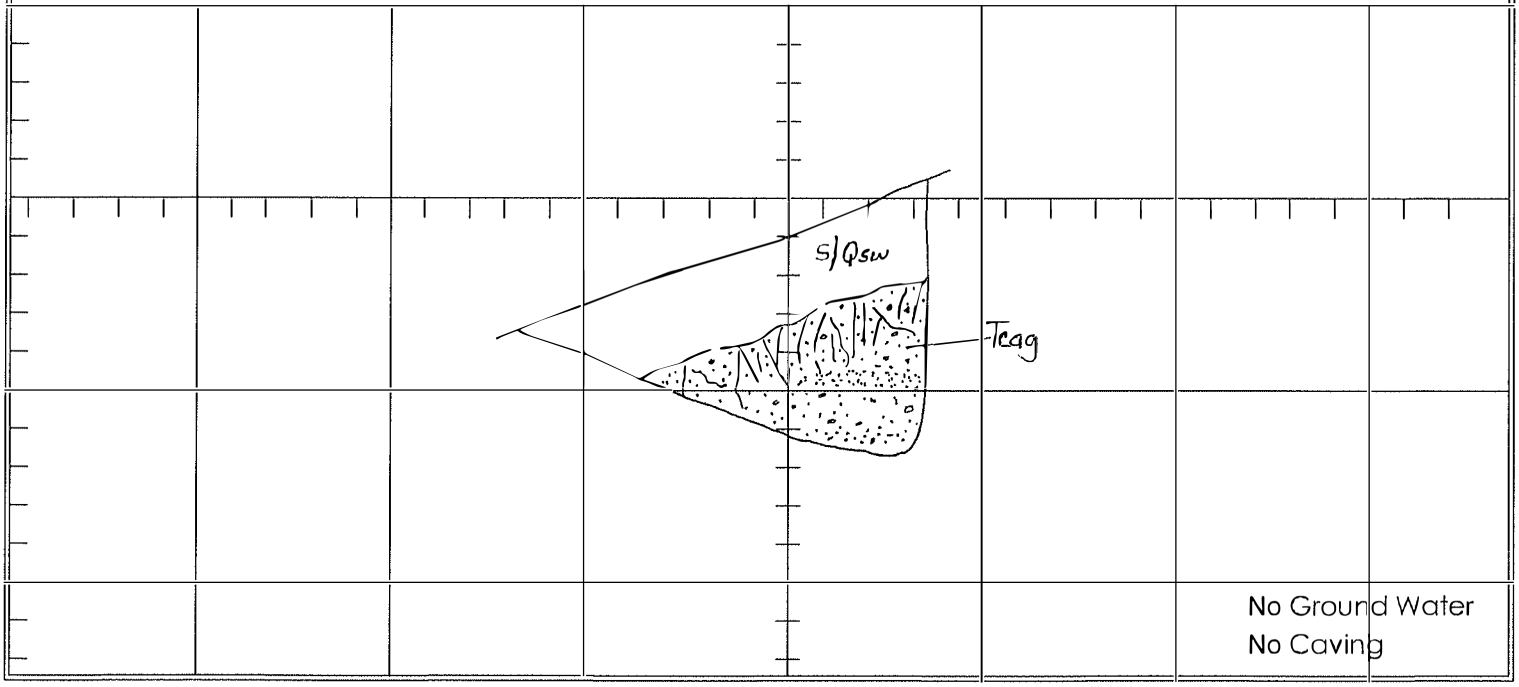
TOTAL DEPTH: 8 feet N73W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-170**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 4/12/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Dark brown to black sandy silt; loose; dry				
					BEDROCK; Tcag (2.5 - 7') @ 2.5' Light grayish-brown sandstone and pebbly sandstone; moderately hard; dry to damp	B: N57W, 8SW			
5					COMMENTS: Weathered down to 4.5' Abundant roots down to 2.5'				
10									
15									
20									

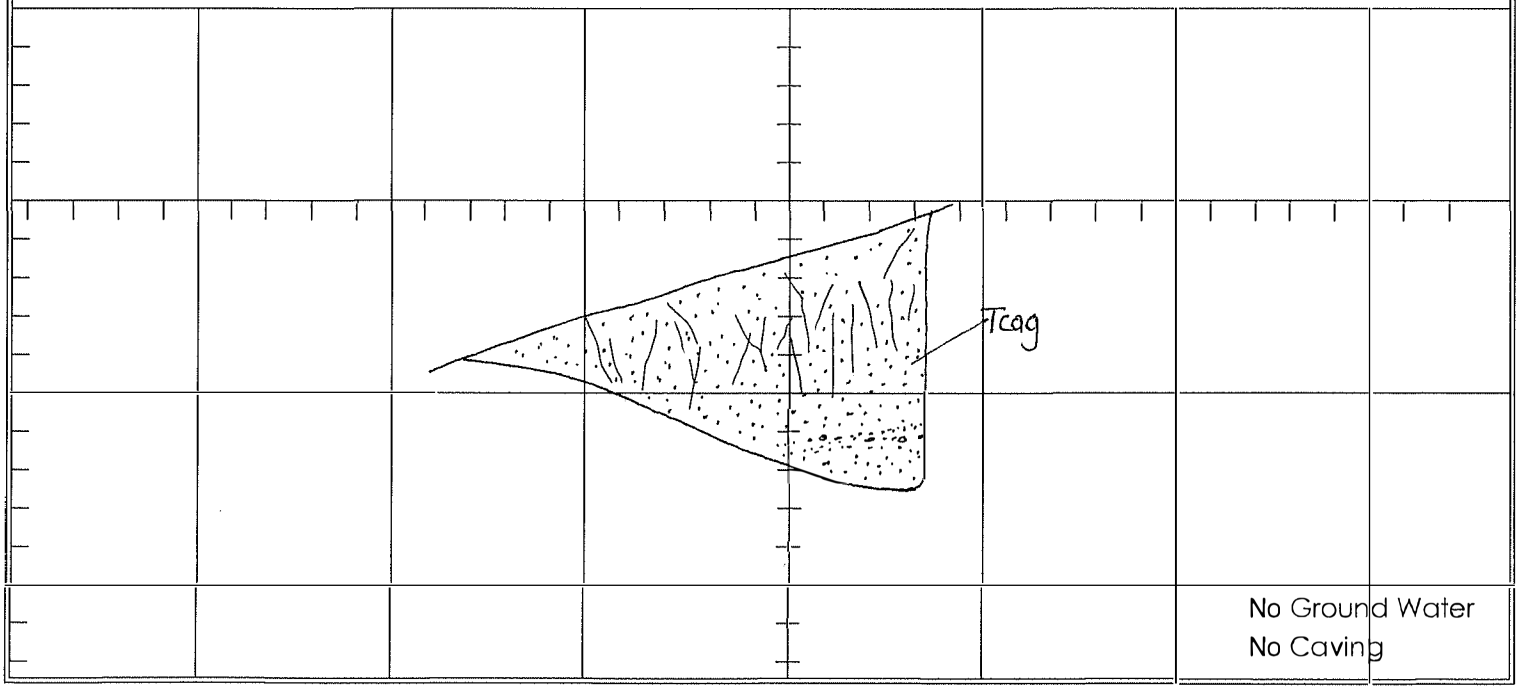
TOTAL DEPTH: 7 feet N6E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-171**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 4/12/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; Tcag (0 - 7')** @ 0' Light grayish-brown and light grayish-tan sandstone; moderately hard; dry to damp; friable				
5									
					COMMENTS: Weathered down to 4' Abundant roots down to 2'	B/XB: N43W, 8SW			
10									
15									
20									

TOTAL DEPTH: 7 feet N40W→ SCALE: 1 inch = 5 feet

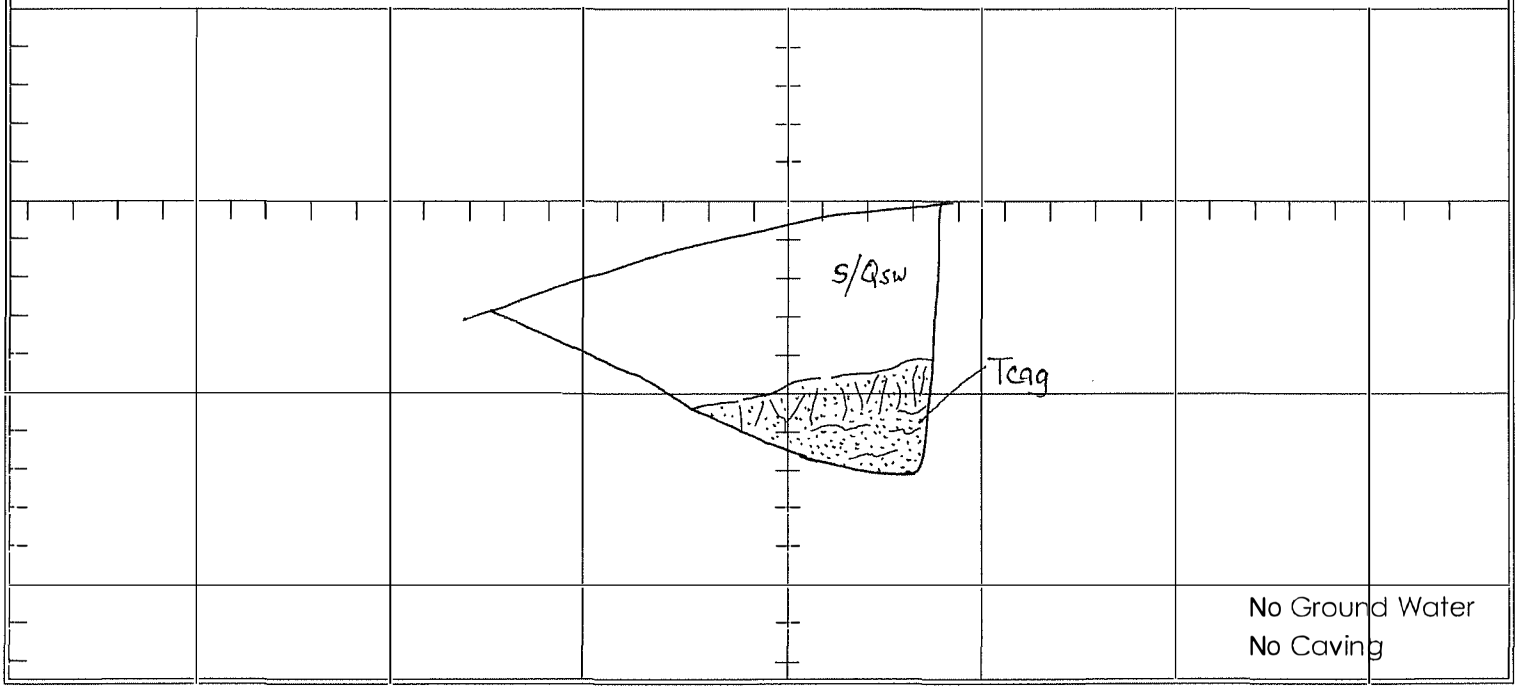


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-172**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: SKM	
	EXCAVATED: 4/12/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4')** @ 0' Light grayish-brown to light-brown sandy silt to silty sand; loose; dry				
5					**BEDROCK; Tcag (4 - 7')** @ 4' Light grayish-brown silty sandstone; moderately hard; dry to damp; wavy color banding COMMENTS: Weathered down to 5' Slightly friable				
10									
15									
20									

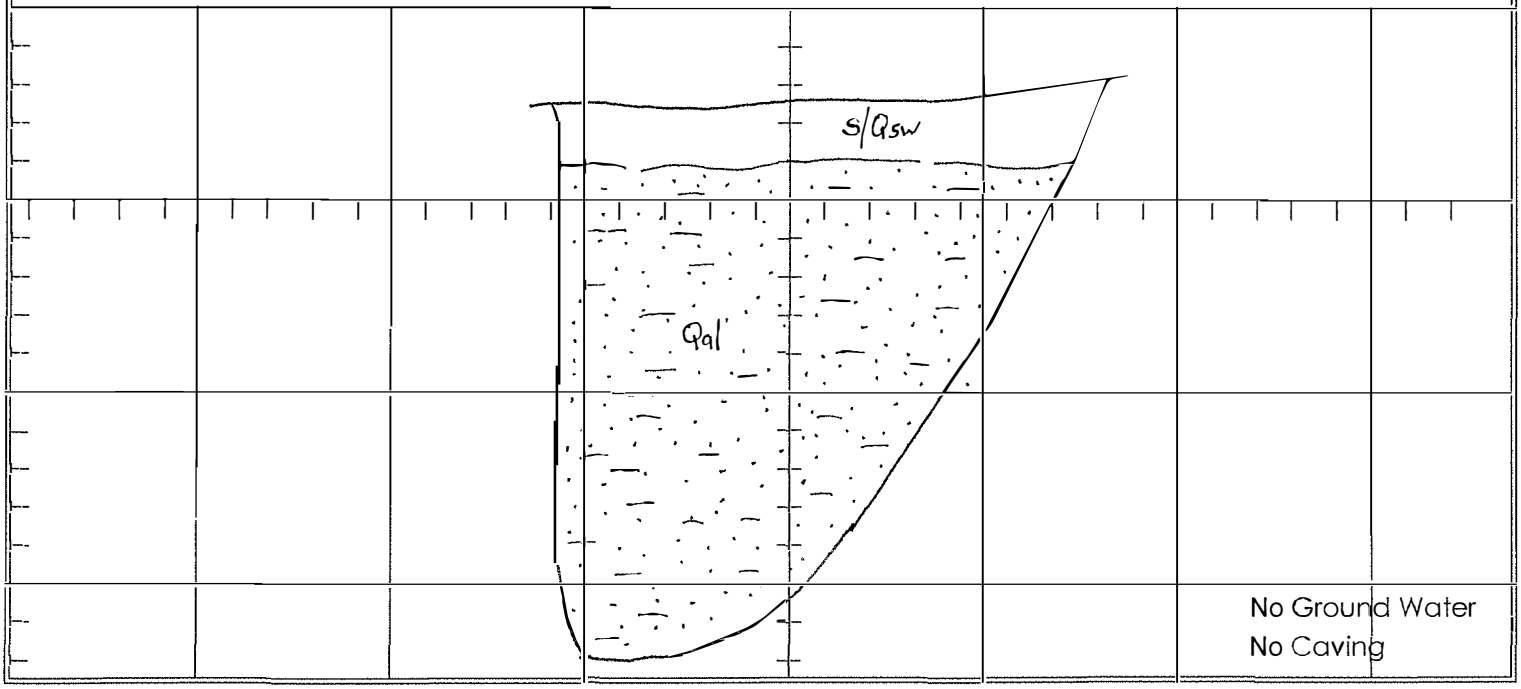
TOTAL DEPTH: 7 feet →N82W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-173**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 4/12/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Light grayish-brown silty sand; loose; dry **ALLUVIUM; Qal (1.5 - 14')** @ 1.5' Light grayish-brown silty sand; loose to moderately hard; damp @ 5' Moist @ 11' Moist to damp				
5									
10									
15									
20									

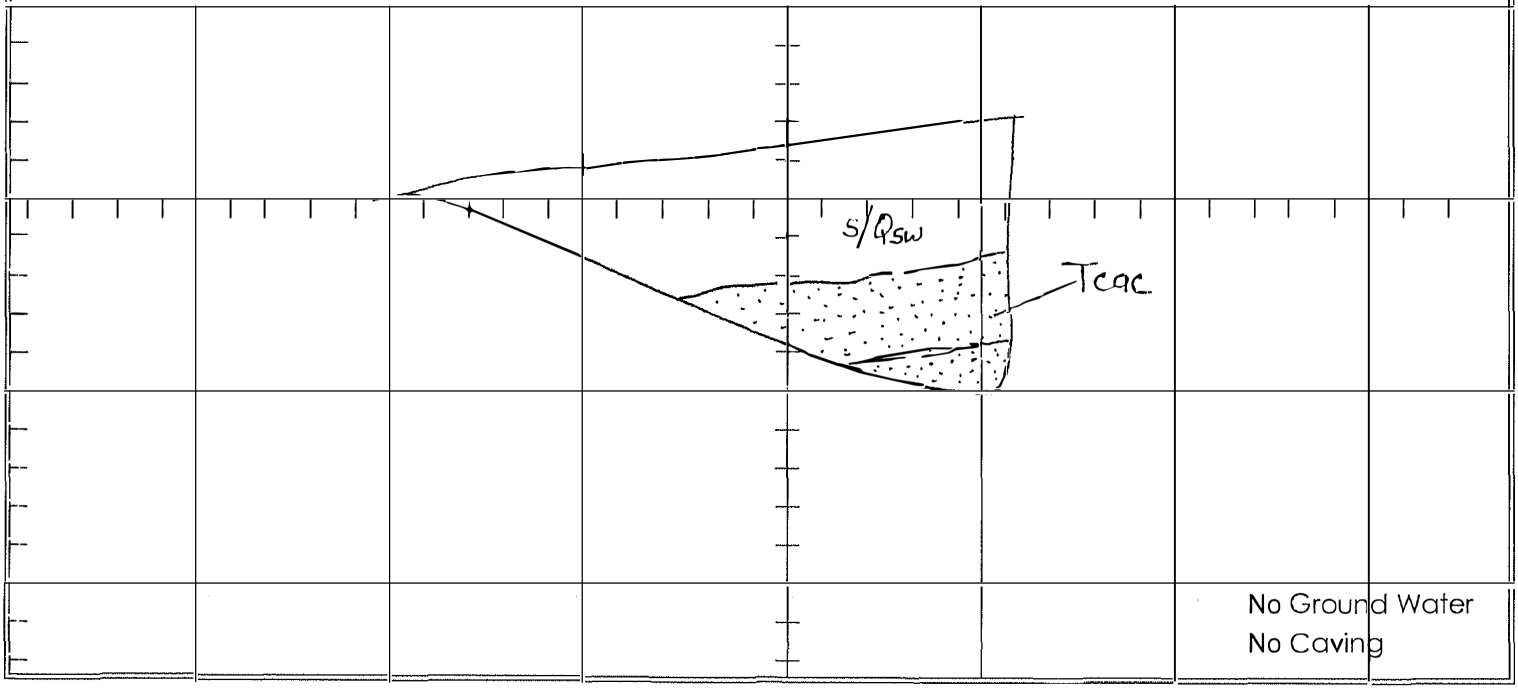
TOTAL DEPTH: 14 feet N15W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-174**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: SKM	
		EXCAVATED: 4/12/07	
EXCAVATION METHOD: Track-Mounted Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3.5')** @ 0' Light grayish-brown silty sand; loose; dry				
5					**BEDROCK; Tcac (3.5 - 7')** @ 3.5' Light yellowish-brown to light brown fine-grained sandstone; moderately hard; dry to damp; planar color band; friable	B: N60W, 8SW			
10					COMMENTS: Weathered down to 4'				
15									
20									

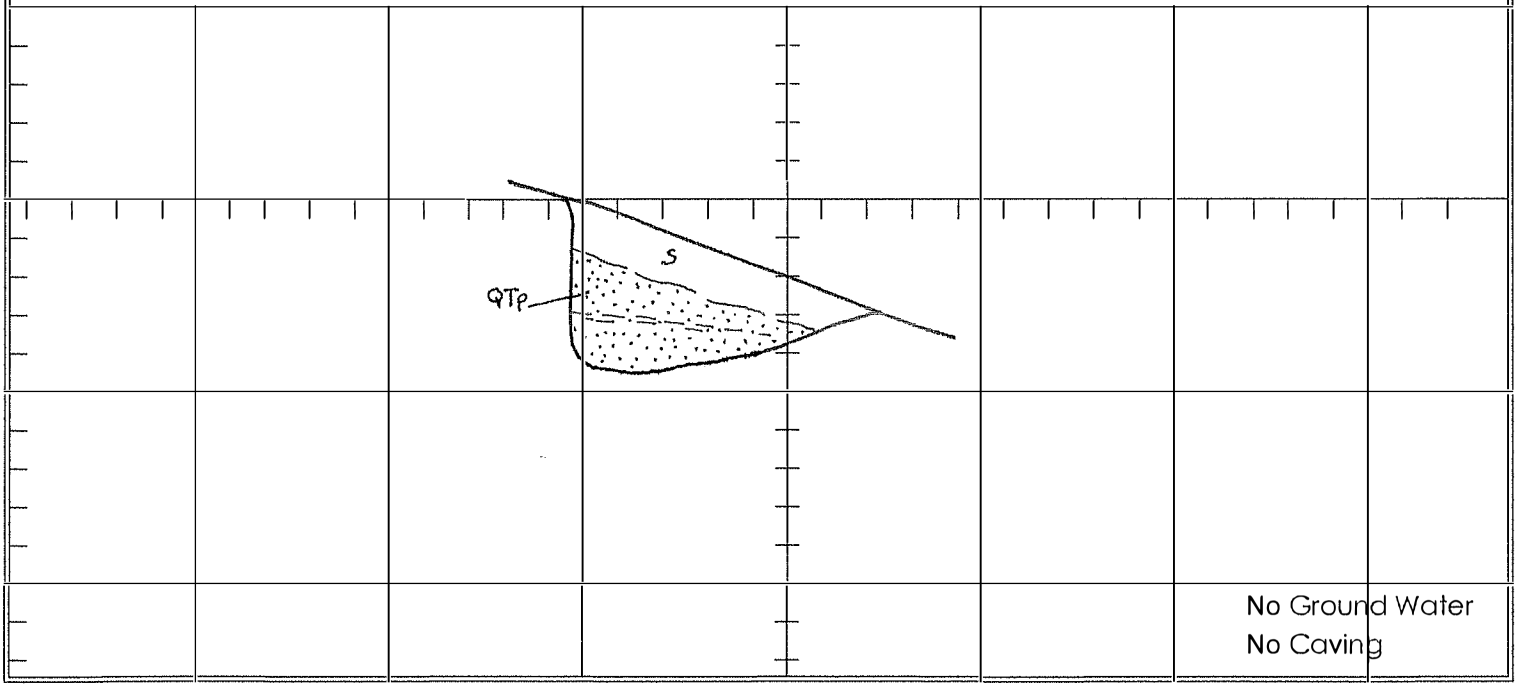
TOTAL DEPTH: 7 feet N13E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-197**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/22/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1.2')** @ 0' Medium- to grayish-brown silty sand; loose; damp; gradational contact with bedrock; roots to 8" **BEDROCK; QTp (1.2 - 4.5')** @ 1.2' Tan to light yellowish-brown to grayish-brown fine-grained sandstone with very minor 2" thick sandy siltstone lens; some minor mottling with light reddish- brown; damp; moderately hard; some stratification	B: N54W,7SW			Bulk Sample @ 3 - 4.5'
5									
10									
15									
20									

TOTAL DEPTH: 4.5 feet ←N60E SCALE: 1 inch = 5 feet

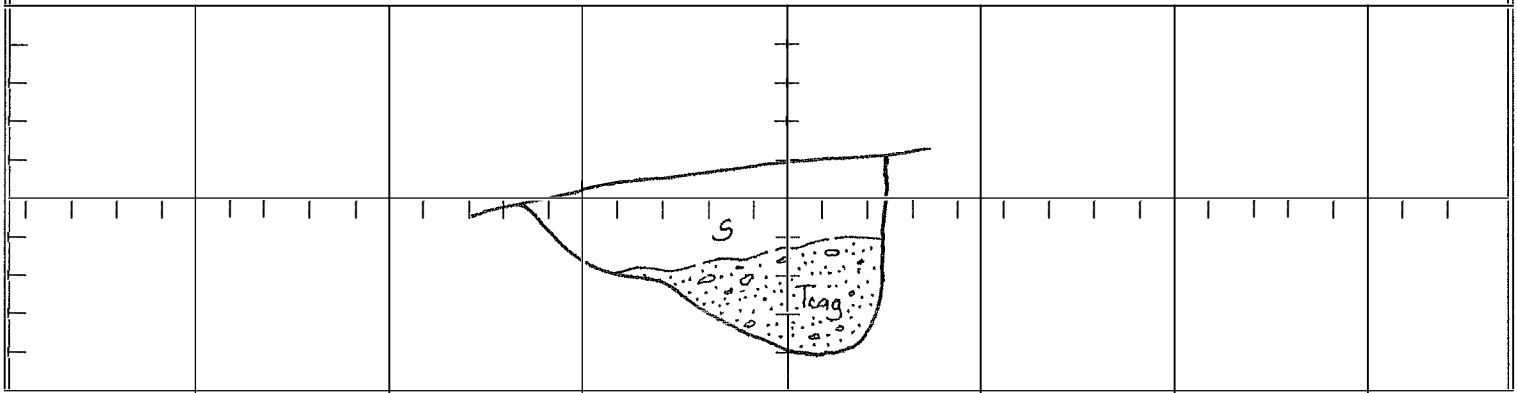


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-198**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/22/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2')** @ 0' Medium- to grayish-brown, fine- to medium-grained sand and gravelly sand; loose; damp; roots to 2'; gradational contact with bedrock **BEDROCK; Tcag (2 - 5')** @ 2' Medium brown to reddish-brown, fine- to medium-grained gravelly sandstone; moderatley hard to hard; damp; crudely bedded; angular to subrounded gravel COMMENTS: Some gravel clasts are composed of chert Difficult to Excavate	B: N74W,8SW			
5									
10									
15									
20									

TOTAL DEPTH: 5 feet N9E→ SCALE: 1 inch = 5 feet

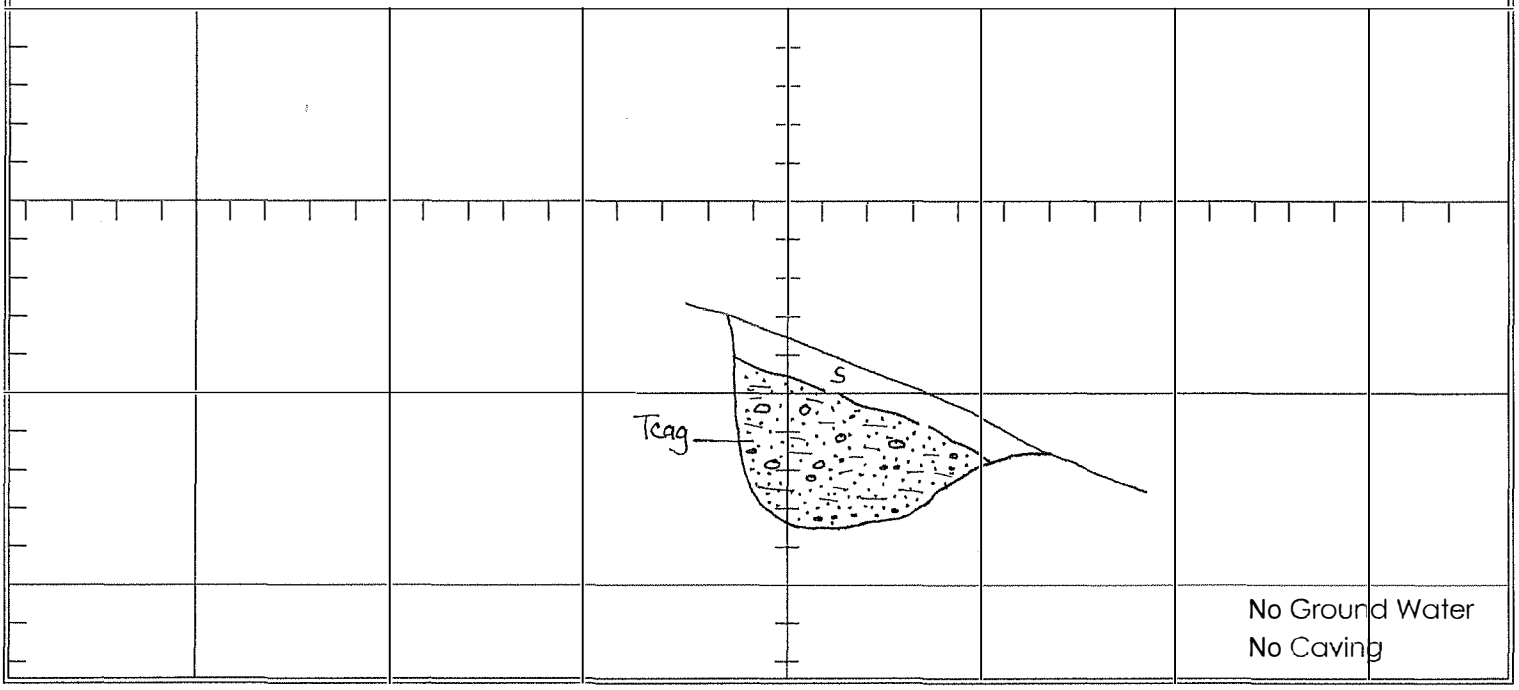


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-199**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/22/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Medium brown silty sand with scattered gravel; loose; damp; roots to 1.75' **BEDROCK; Tcag (1 - 5')** @ 1' Medium and light yellowish-brown, fine- to coarse-grained silty gravelly sandstone with scattered cobbles; moderately hard; damp to moist; crudely bedded at lower portion of trench; lower portion is bioturbated	Apx B: N74W,7SW			Bulk Sample @ 2 - 5'
5									
10									
15									
20									

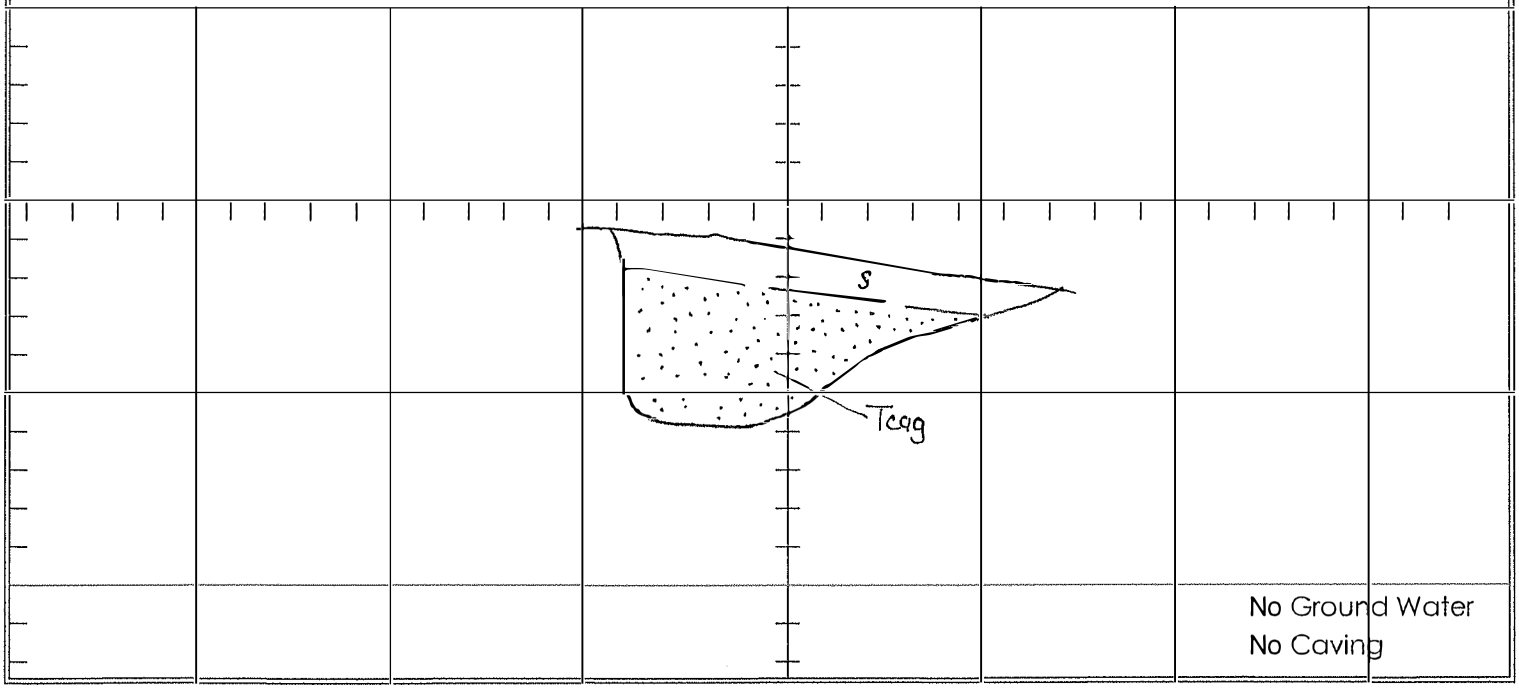
TOTAL DEPTH: 5 feet N71W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-200**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/22/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Light gray to light grayish-brown silty sand; loose; dry; roots **BEDROCK; Tcag (1 - 5')** @ 1' Light brown, fine-grained sandstone; loose to moderately dense; damp; friable; massive COMMENTS: Sandstone is not lithfied				
5									
10									
15									
20									

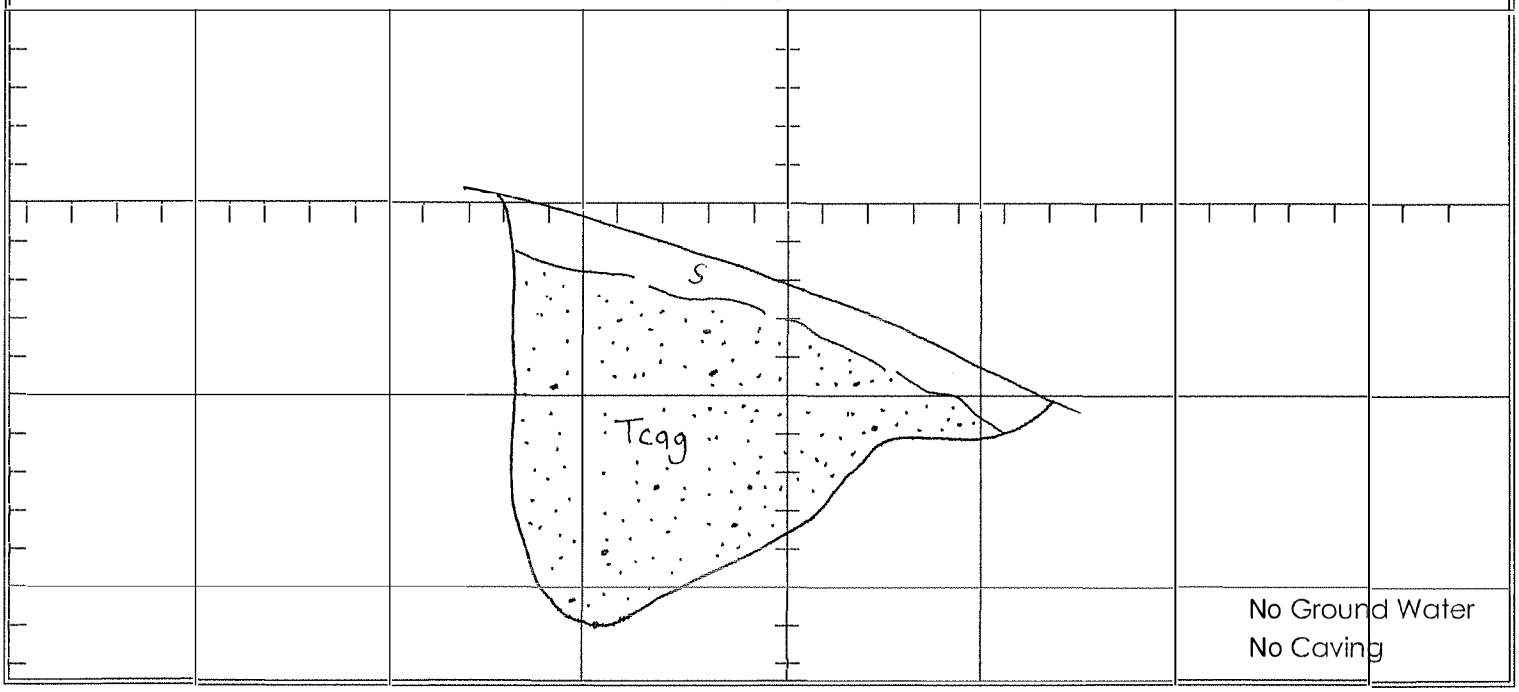
TOTAL DEPTH: 5 feet ←N75E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-201**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/22/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Light grayish-brown silty sand and sand with isolated gravel; loose; dry **BEDROCK; Tcag (1 - 11')** @ 1' Light brown to grayish-brown fine-grained sandstone with isolated gravel; moderately hard; dry to damp; very friable; no laminations/ structurless @ 4' - damp @ 8' - moist; light brown @ 10' - moist to wet COMMENTS: Sandstone is not lithified				Bulk Sample @ 6 - 11'
5									
10									
15									
20									

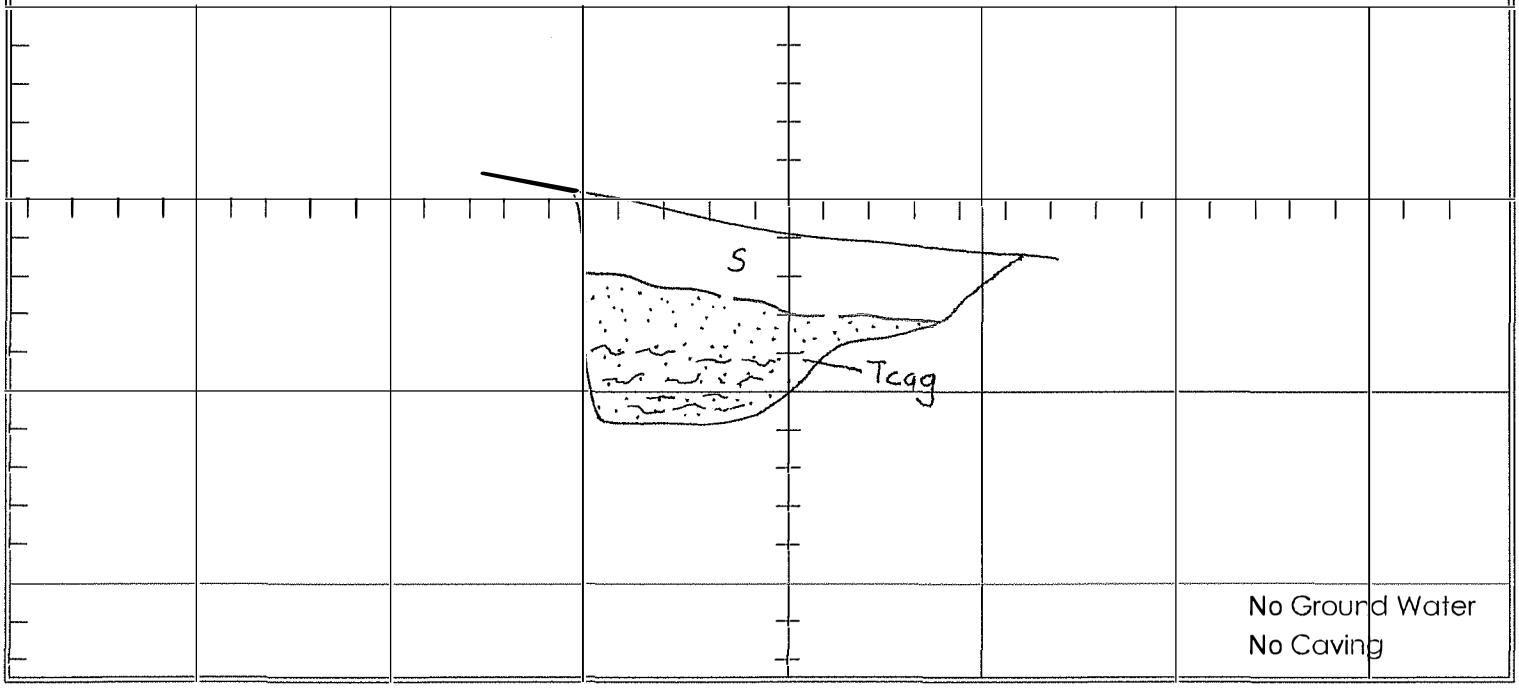
TOTAL DEPTH: 11 feet N86W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-202**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2')** @ 0' Light brown silty, fine-grained sand; loose; damp **BEDROCK; Tcag (2 - 6')** @ 2' Light- to medium-brown fine-grained sandstone; moderately hard; damp; friable; massive; roots to 3.5' @ 4' Grades to a light yellowish-brown to tan; damp to moist; thin wavey irregular 1/8 - 1/4" thick reddish-brown stringers (possible staining); lithilogically same as surrounding sandstone COMMENTS: Not lithified, would classify as sand				
5									
10									
15									
20									

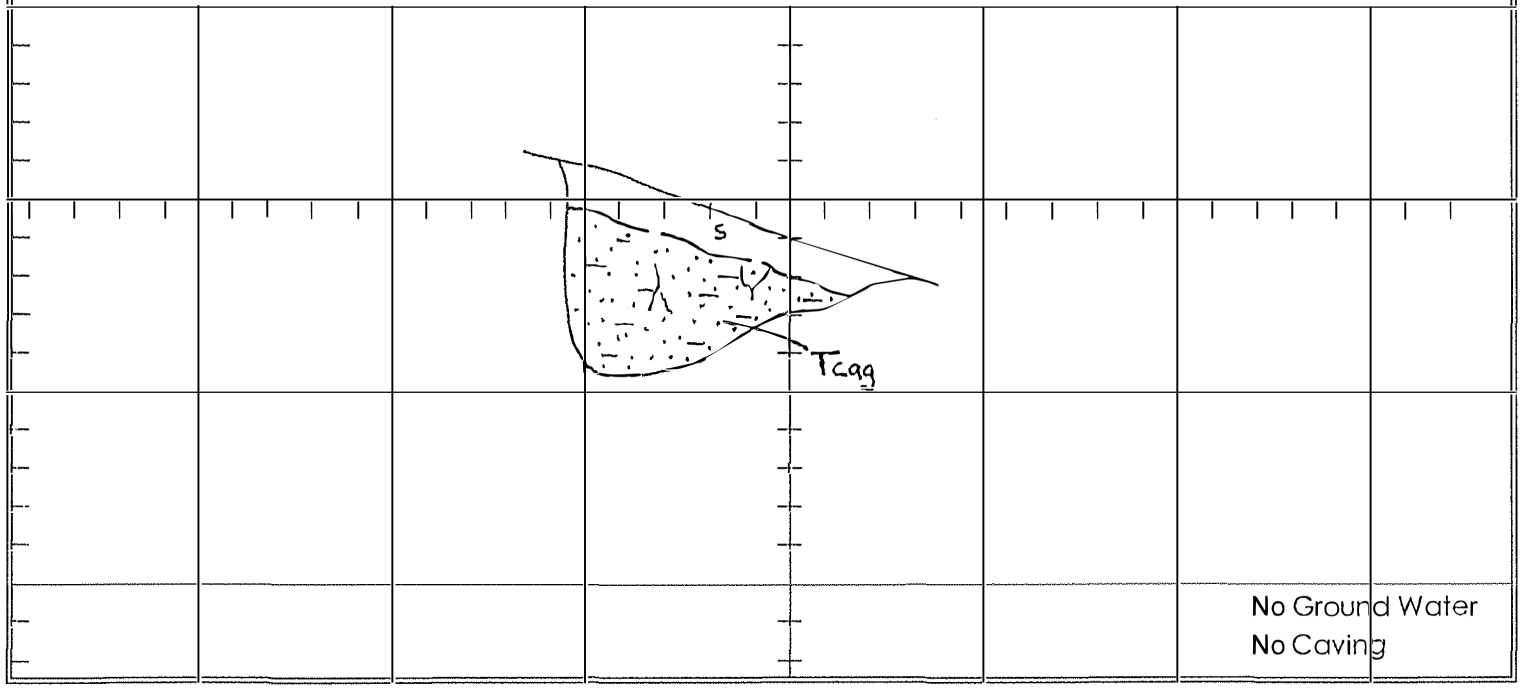
TOTAL DEPTH: 6 feet ←N70E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-203**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Light to medium brown, fine-grained sand; loose; dry to damp; gradational contact with bedrock **BEDROCK; Tcag (1 - 5.5')** @ 1' Light brown, fine-grained sandstone and silty sandstone; loose; damp; massive; very friable @ 3.5' - moderately hard; roots to 4' COMMENTS: Much denser at bottom of test pit				
5									
10									
15									
20									

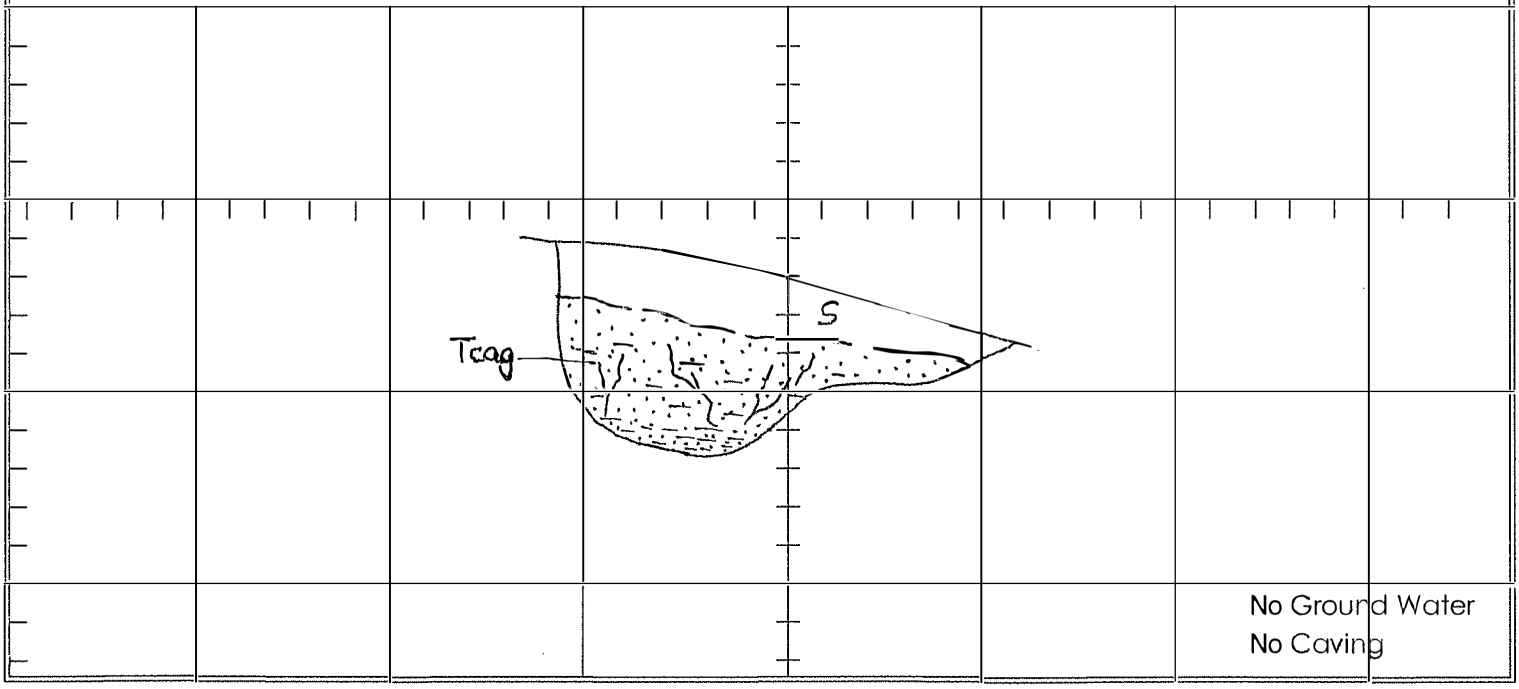
TOTAL DEPTH: 5.5 feet ←N67E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-204**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1.5')** @ 0' Light brown, fine-grained sand; loose; dry; abundant roots to 4.5' **BEDROCK; Tcag (1.5 - 5.5')** @ 1.5' Light brown, fine-grained sandstone and silty sandstone; loose; damp; friable; massive from 1.5 - 4.5' @ 3.5' - moderately hard @ 4.5' Mottled tan, dark gray and medium brown clayey sandstone; moderately hard; damp to moist COMMENTS: Possible soil is weathered Tcag South Dipping Much more lithified @ 4.5'	Apx B: N42W,7SW			
5									
10									
15									
20									

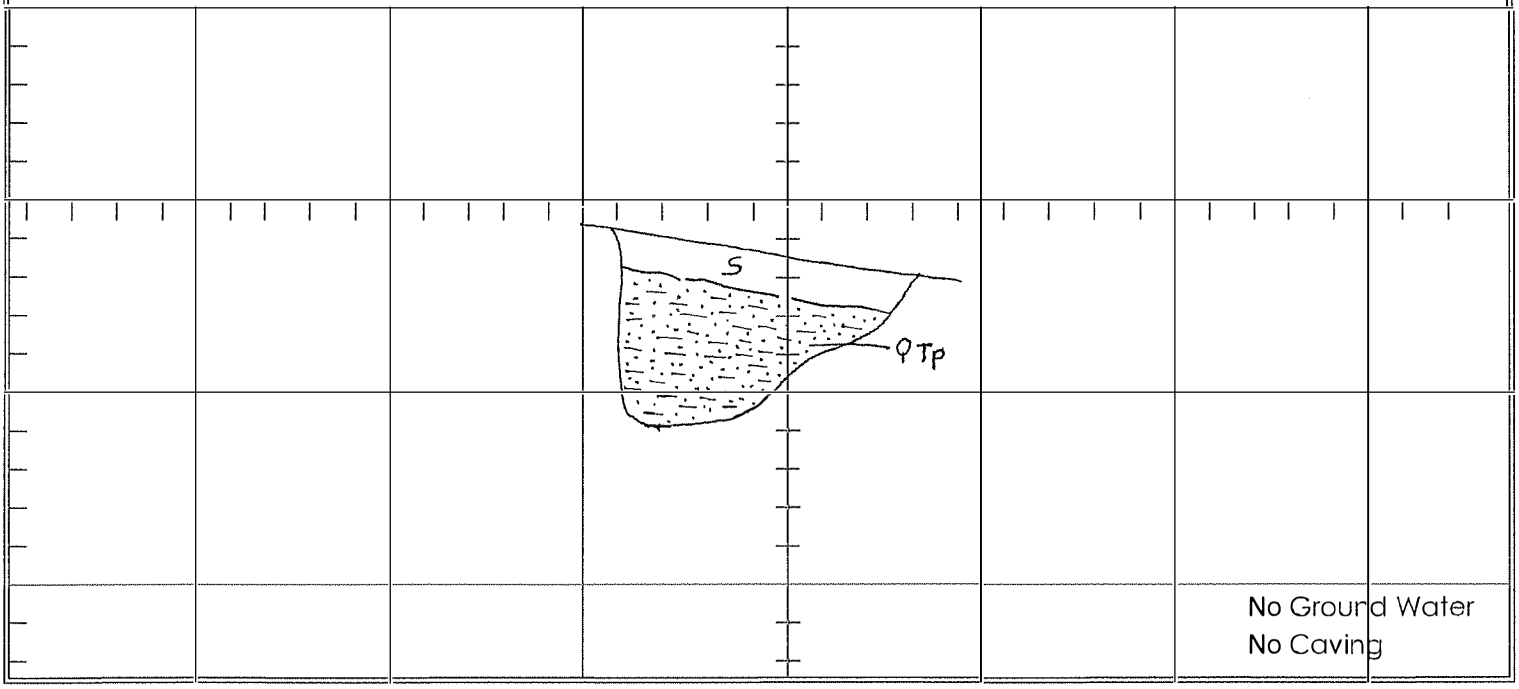
TOTAL DEPTH: 5.5 feet ←N28E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-205**	
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: VCG		
	EXCAVATED: 5/23/23		
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket	ELEVATION: See Map		

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Grayish-brown, fine-grained silty sand; loose; damp **BEDROCK; QTp (1 - 5')** @ 1' Dark brown clayey fine-grained sandstone @ 2.5' Orangish-brown to orange claystone with interbedded light olive gray silty claystone; sticky; hard; damp; some mottling with grayish-brown; variable bedding Comments: @ 3.5' 4 hand drive rings oriented perpendicular to bedding structure	B: N25E,11SE B: N34E,9SE B: N40E,11SE			
5				CH					Gradation %<#4 sieve= 100.0 % fines=98.3 %-5 micron=47.1 LL=68 PI=36 Shear Test
10									
15									
20									

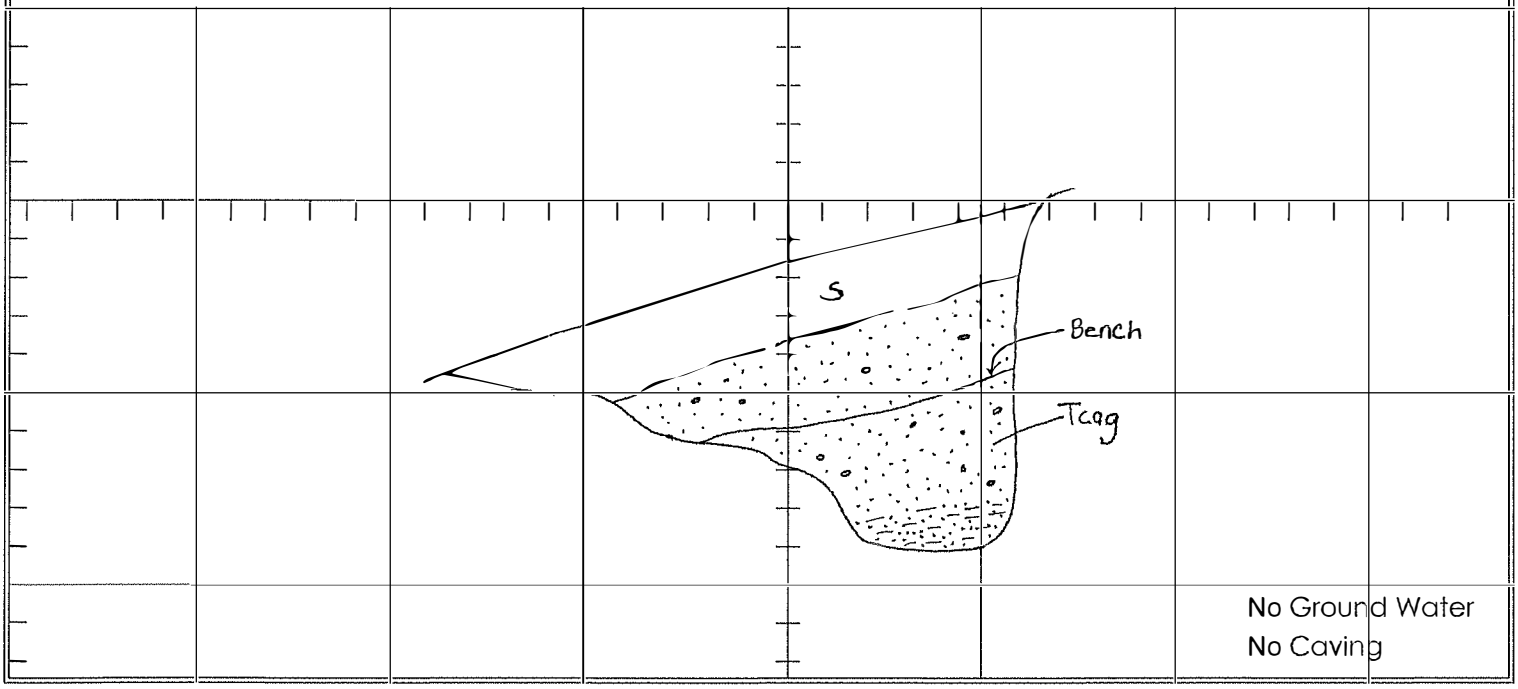
TOTAL DEPTH: 8 feet N30E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-206**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2')** @ 0' Light brown and grayish-brown fine-grained silty sand; loose; damp; gradational contact with bedrock **BEDROCK; Tcag (2 - 9')** @ 2' Light to medium brown, fine-grained sandstone with minor gravel; loose; damp; friable; massive @ 7' Light brown to tan; moderately hard @ 8' Silty sandstone COMMENTS: No bedding/laminations Logged from surface below 7' Excavates easy				
5									
10									
15									
20									

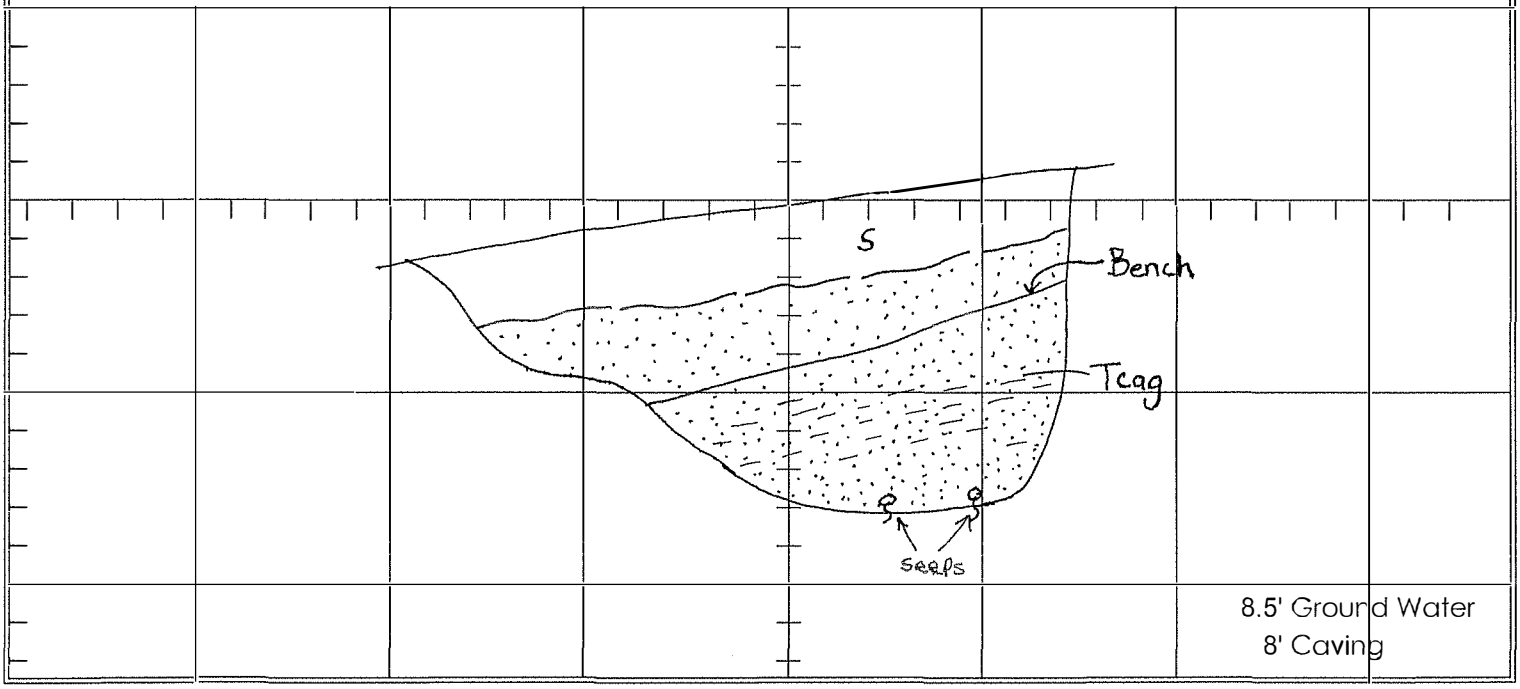
TOTAL DEPTH: 10 feet N80W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-207**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2')** @ 0' Light grayish-brown silty sand with scattered gravel; loose; damp				
					BEDROCK; Tcag (2 - 9') @ 2' Light to medium brown sandstone; loose; damp; friable				
5					@ 5' Light brown silty sandstone; loose; damp to moist @ 6' Clayey sandstone; moist				
					@ 7' Sandstone; wet @ 8' Minor caving @ 8.5' Water seepage into excavation				
10									
15									
20									

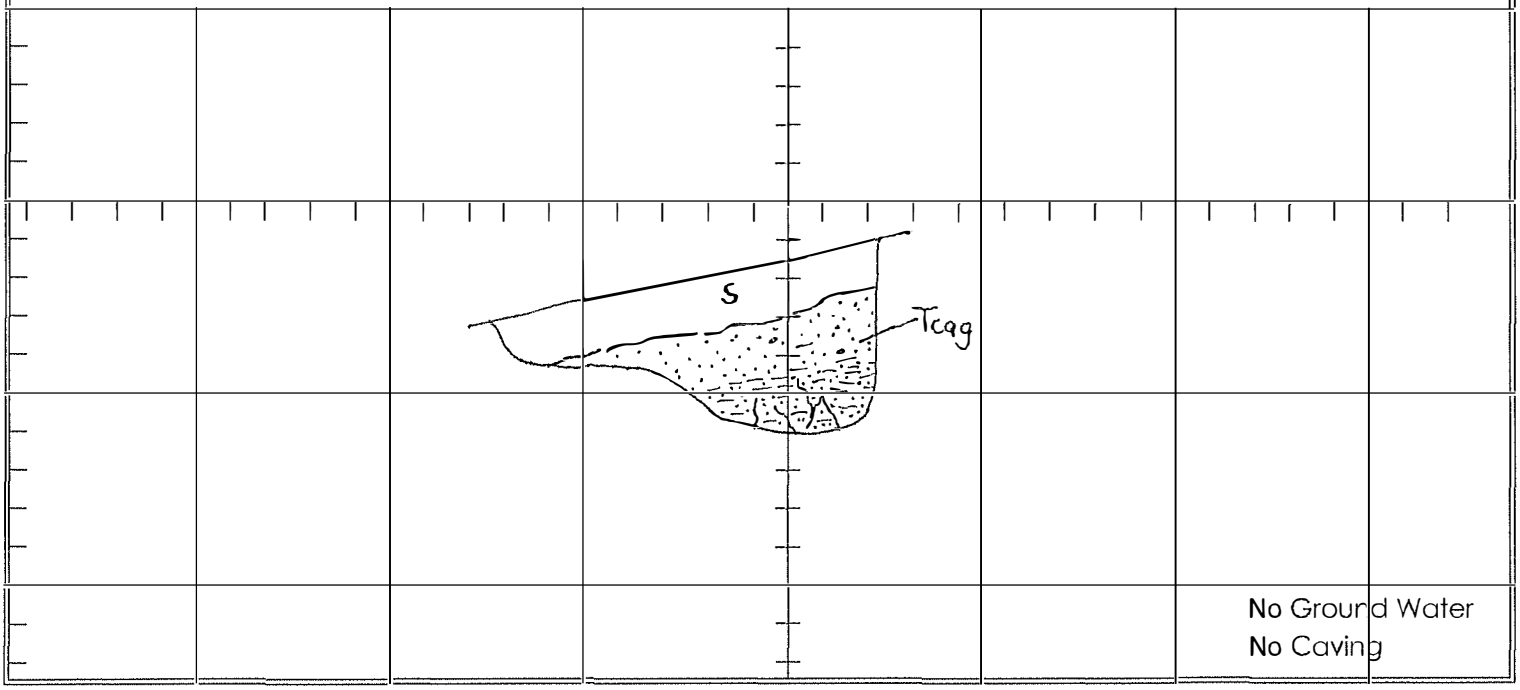
TOTAL DEPTH: 9 feet N60W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-208**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 306 Mini Excavator with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1.5')** @ 0' Light brown fine-grained silty sand and sand with minor gravel; loose; dry; gradational contact with bedrock **BEDROCK; Tcag (1.5 - 5')** @ 1.5' Light grayish-brown fine-grained sandstone; loose; damp; friable; massive @ 3.5' Clayey sandstone; moderately hard; irregular contact with upper unit @ 4' Pale yellow to light yellowish-brown fine-grained silty sandstone; bioturbated; dark brown wavey fractures; hard; no fractures present in upper clayey sandstone and sandstone	Apx B: N62E,11SE			
5									
10									
15									
20									

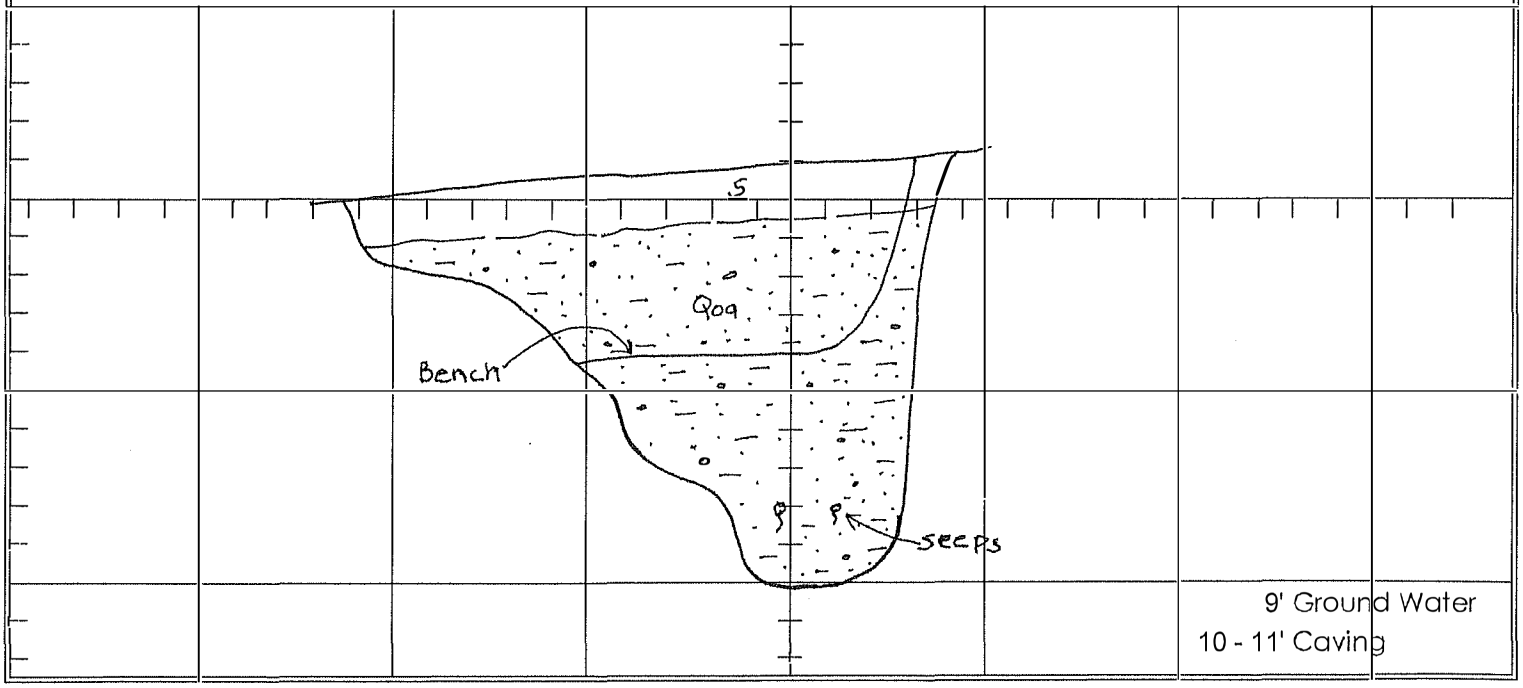
TOTAL DEPTH: 5 feet N20W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-209**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1.5')** @ 0' Medium brown silty sand with minor isolated gravel; loose; damp; gradational to older alluvium **ALLUVIUM: Qa (1.5 - 11')** @ 1.5' Dark grayish-brown to dark gray silty sand with scattered gravel; loose; damp; massive @ 4' medium brown @ 6' moist; tan to brown; roots to 5.5' @ 9' Wet - minor seepage				
5									
10									
15									
20									

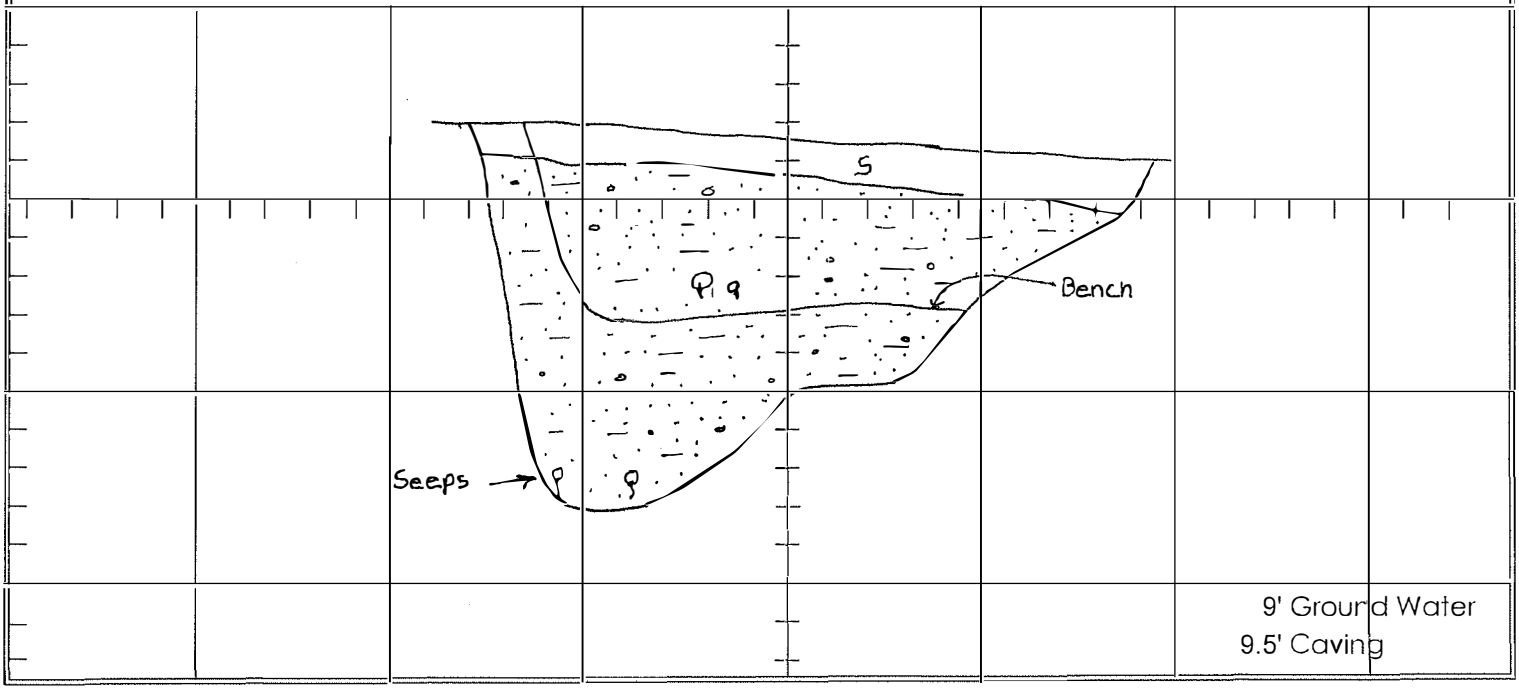
TOTAL DEPTH: 11 feet N76E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-210**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Medium brown silty sand; loose; damp; gradational contact to older alluvium **ALLUVIUM; Qa (0 - 10')** @ 0' Dark gray to dark brown silty sand with scattered gravel; loose; damp; roots to 5'				
5					@ 5' - moist				Bulk Sample @ 5 - 9'
					@ 6.5' - moist to wet				
					@ 9' - minor seepage @ 9.5' - minor caving				
10									
15									
20									

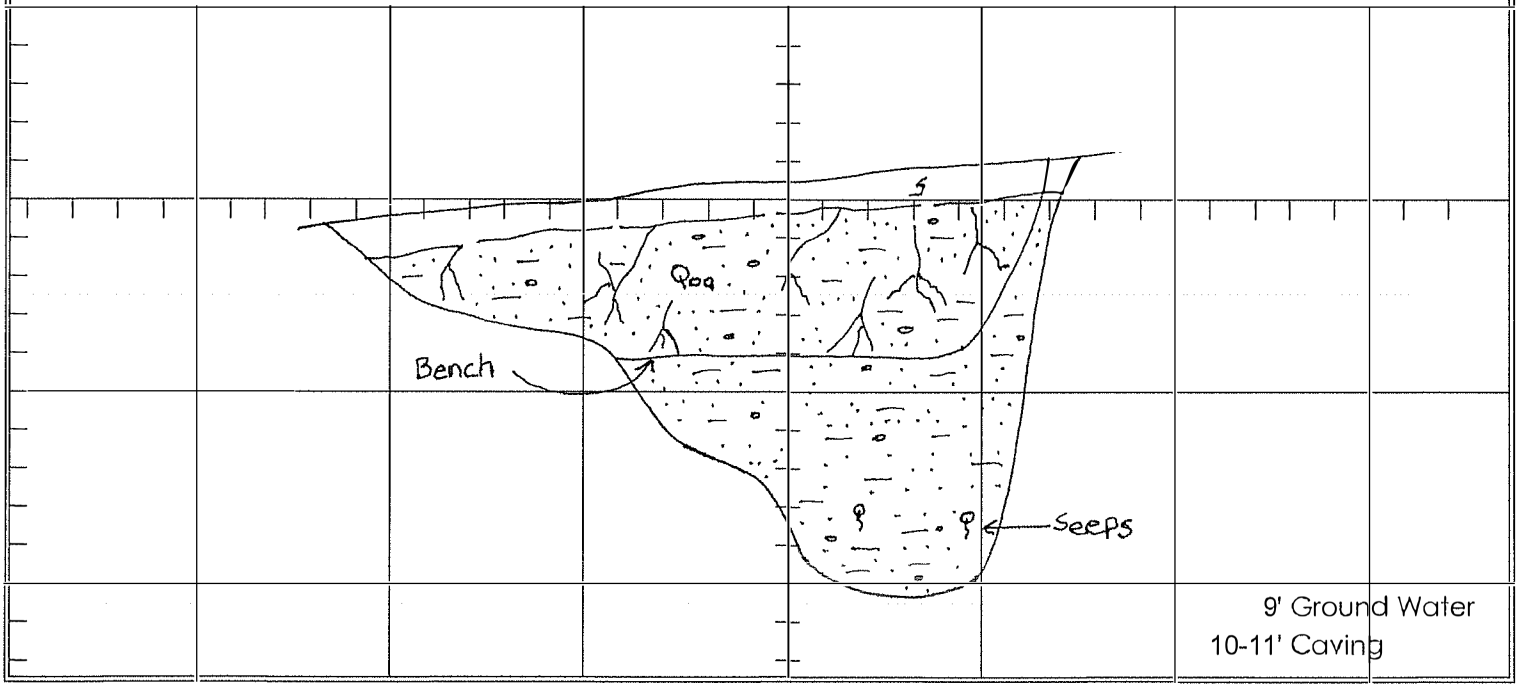
TOTAL DEPTH: 10 feet ←N39E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-211**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Medium brown silty sand; loose; damp; gradational contact with older alluvium **ALLUVIUM; Qa (0 - 11')** @ 0 ' Dark gray silty sand with scattered gravel; loose; damp; massive @ 3.5' - medium brown @ 5' - moist; roots to 5' @ 6' - moderately hard @ 8' - wet @ 9' - minor seepage @ 10' - minor caving				
5									
10									
15									
20									

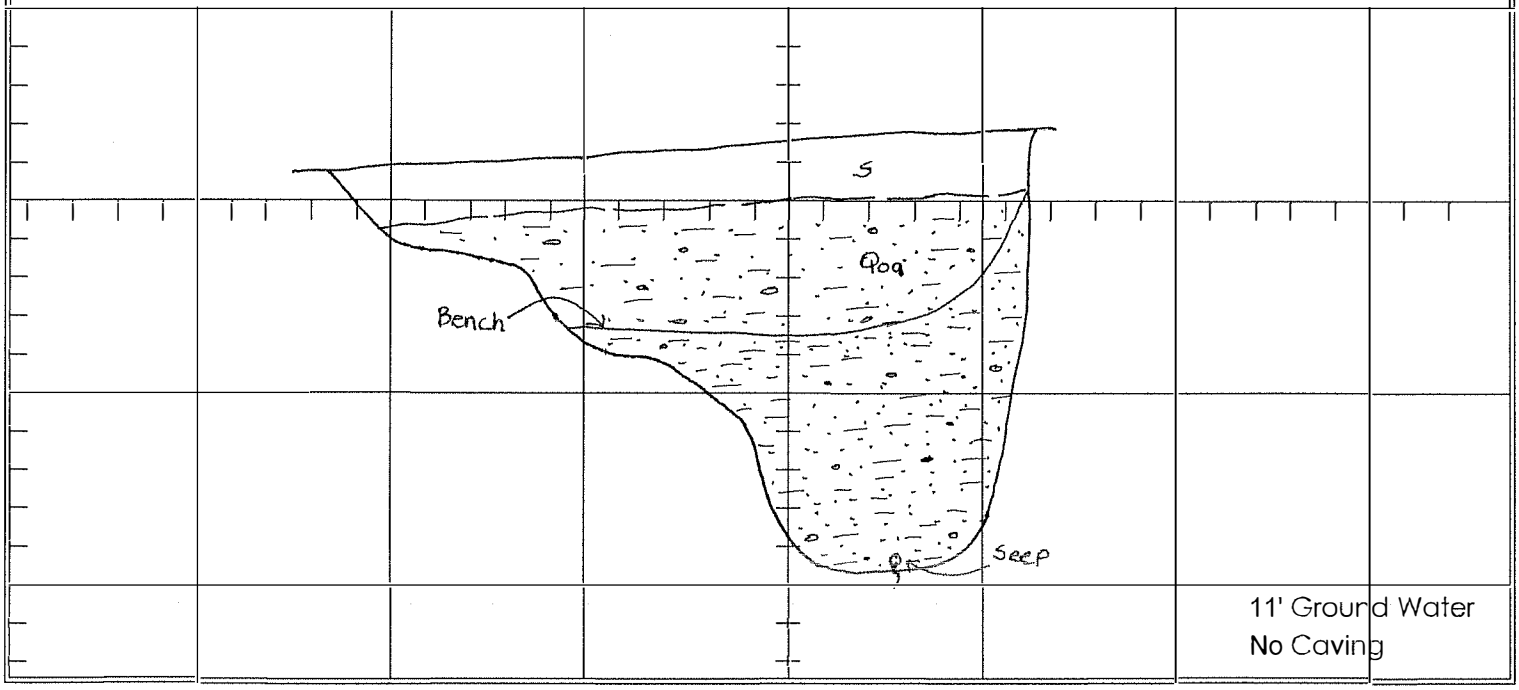
TOTAL DEPTH: 11 feet N33E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-212**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1.5')** @ 0' Medium brown silty sand with minor gravel; loose; damp **ALLUVIUM; Qa (0 - 11')** @ 0' Dark gray silty, fine-grained sand with scattered gravel; loose; damp @ 3' - some chert gravel clasts from 3 - 7' @ 5' Medium to dark brown silty clayey sand with gravel; loose; moist; massive @ 8' - moist to wet @ 10' - wet @ 11' - minor seepage				
5									
10									
15									
20									

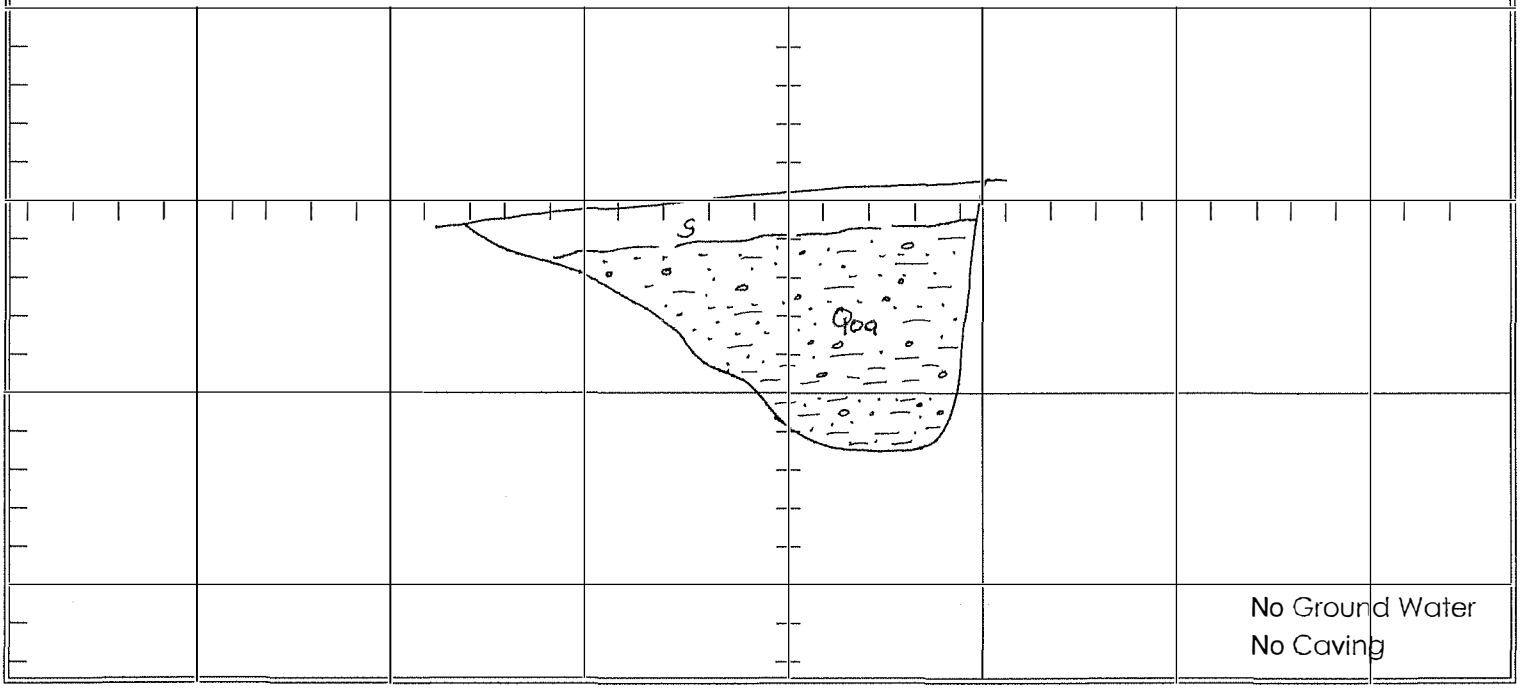
TOTAL DEPTH: 11 feet N50E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-213**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Medium brown to grayish-brown silty sand; loose; damp **ALLUVIUM; Qa (0 - 6.5')** 0' Gray to grayish-brown fine-grained silty sand with scattered gravel; loose; damp; massive @ 4' Medium brown fine-grained clayey sand with scattered gravel @ 6' - silty sand (no clay); moist				
5									
10									
15									
20									

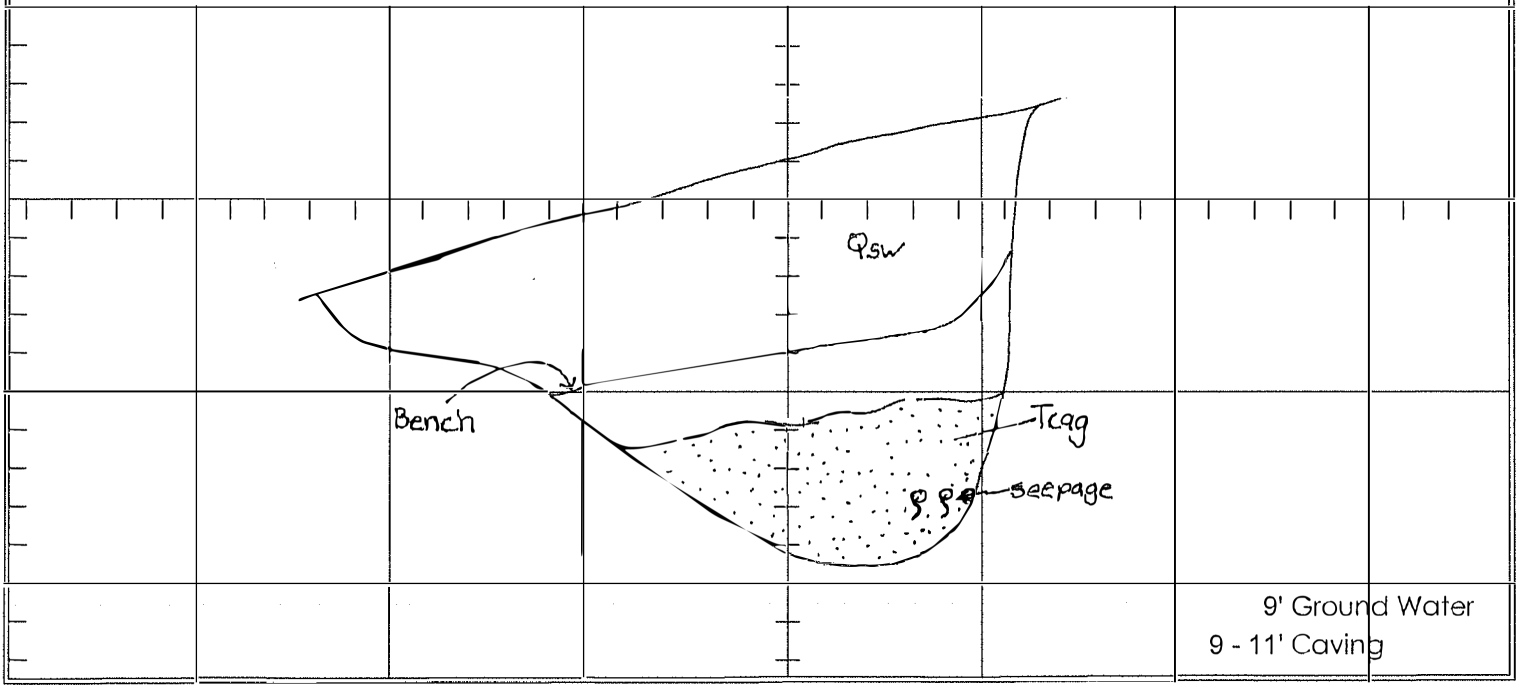
TOTAL DEPTH: 6.5 feet N41E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-214**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/23/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SLOPEWASH; Qsw (0 - 7')** @ 0' Medium brown silty fine-grained sand with scattered gravel; loose; damp				
5					@ 6' - moist				
					BEDROCK; Tcag (7 - 11') @ 7' Medium to light brown fine-grained sand; moderately hard; moist; friable; massive @ 9' Water seepage into the excavation; minor caving @ 9 - 11'				
10					COMMENTS: Logged from the surface below 7'				
15									
20									

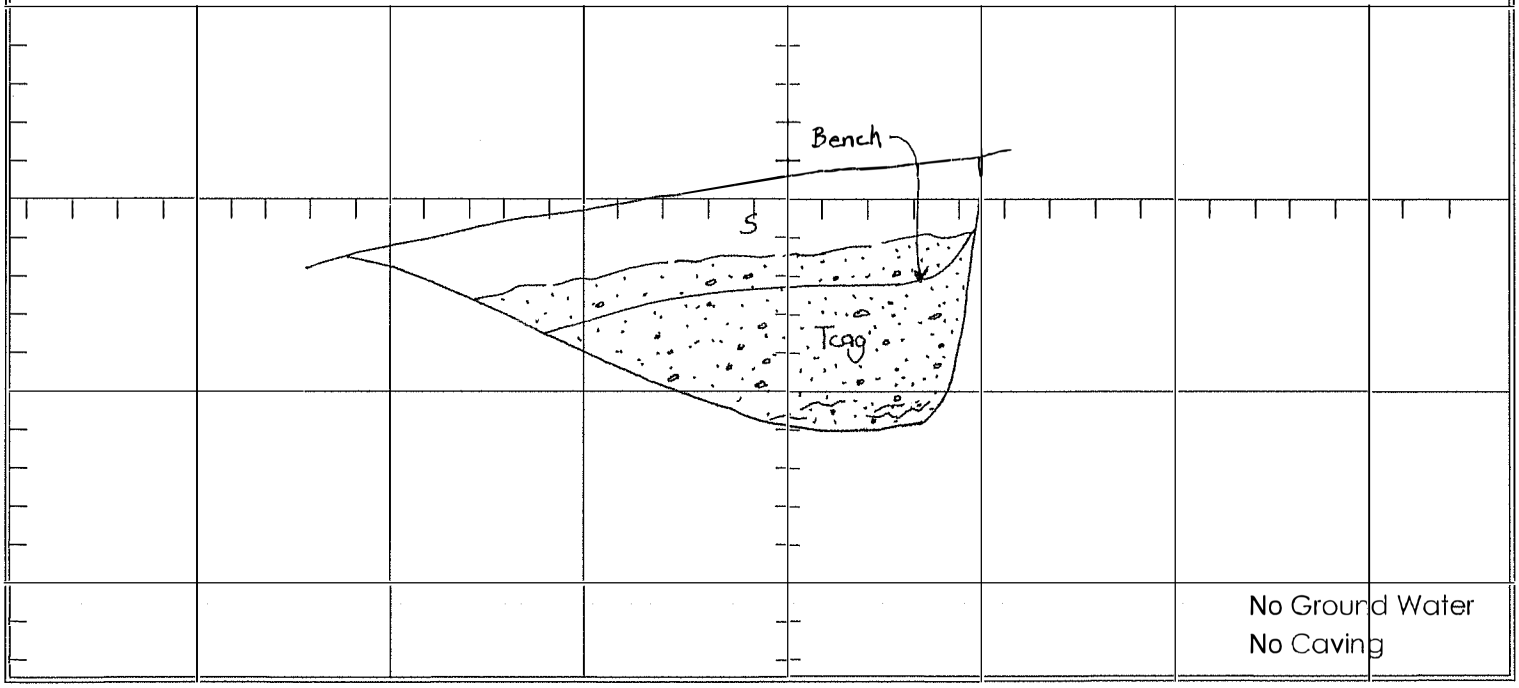
TOTAL DEPTH: 11 feet N80E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-215**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2')** @ 0' Light brown silty sand with minor gravel; loose; damp; gradational with bedrock **BEDROCK; Tcag (2 - 7')** @ 2' Light brown to light grayish-brown fine-grained sandstone and pebbly sandstone; loose; damp; massive @ 5' Light brown to pale yellowish-brown sandstone with minor gravel; wavey/jagged 1/8 - 1/4" thick (staining) stringers; moderatly hard; damp				Bulk Sample @ 5 - 7'
5									
10									
15									
20									

TOTAL DEPTH: 7 feet N2E→ SCALE: 1 inch = 5 feet

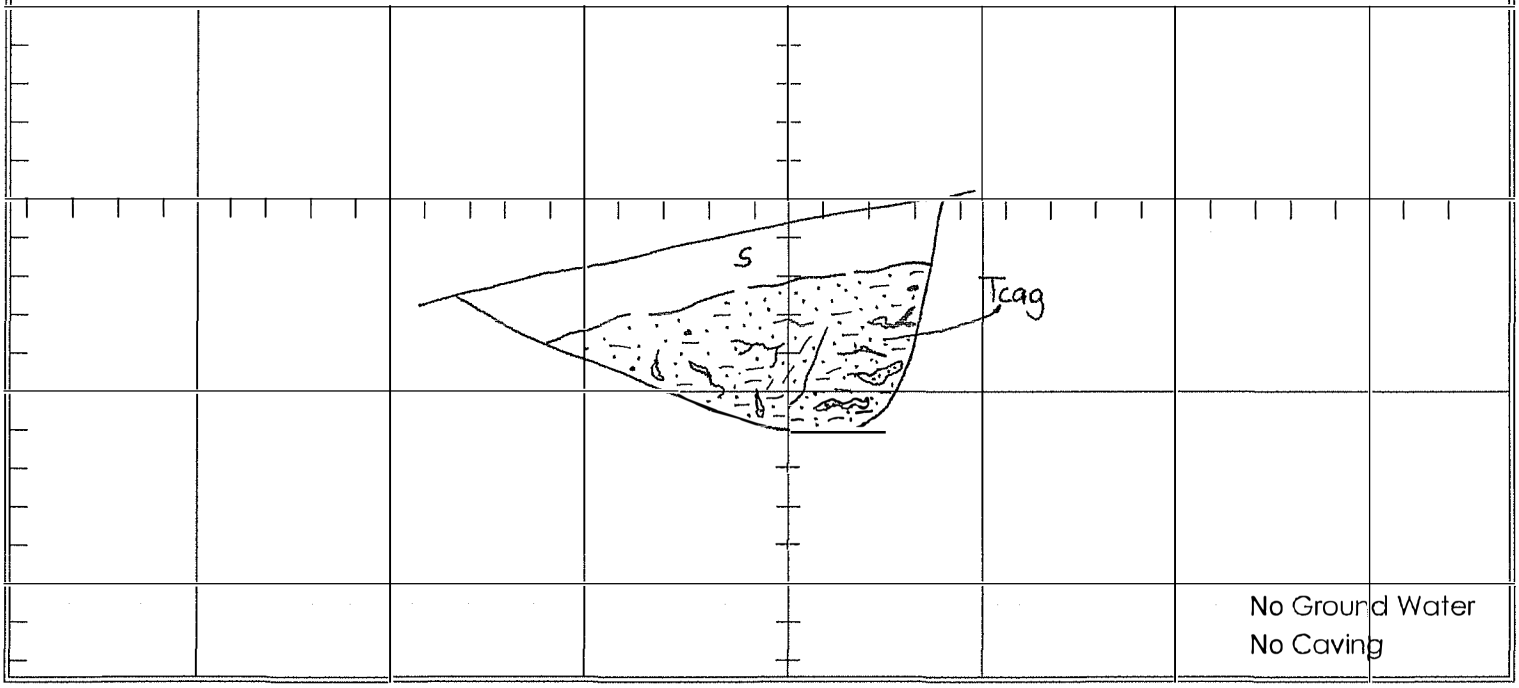


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-216**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1.5')** @ 0' Grayish-brown fine-grained silty sand with isolated pebbles; loose; dry **BEDROCK; Tcag (1.5 - 6')** @ 1.5' Light brown sandstone and silty sandstone; loose; dry to damp; friable; massive @ 3' - moderately hard @ 4' Clayey sandstone with irregular medium brown jagged blotchy and wavey stringers; continues to bottom of the trench; possibly bioturbated @ 5.5' Grades to light yellowish-brown COMMENTS: No laminations				
5									
10									
15									
20									

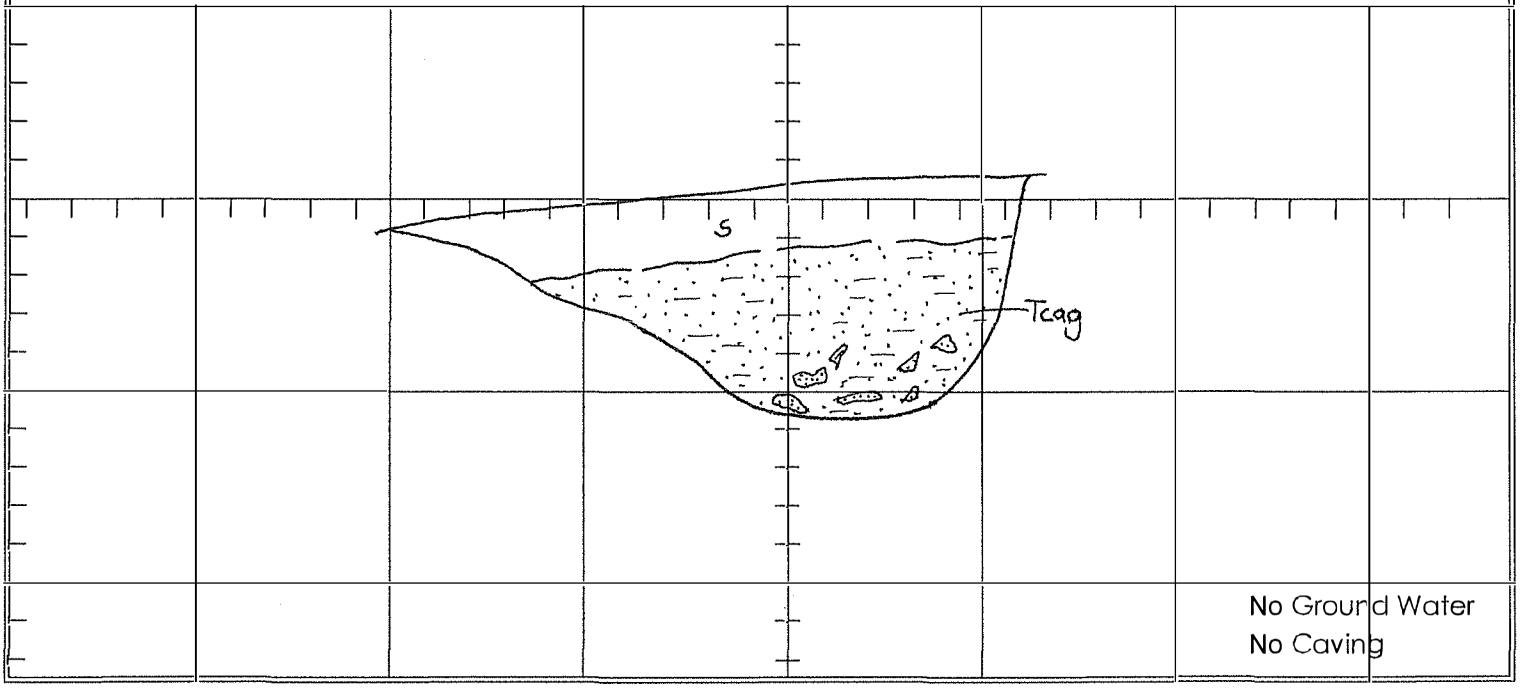
TOTAL DEPTH: 6 feet ←N10W SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-217**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1.5')** @ 0' Light grayish-brown fine-grained silty sand; loose; damp; gradational contact with bedrock **BEDROCK; Tcag (1.5 - 6')** @ 1.5' Light to medium brown fine-grained silty sandstone; loose; damp; massive; friable @ 4' Light grayish-brown; moist; possible bioturbated @ 5.5' - moderately hard; some medium brown irregular blotchy stains COMMENTS: All friable sandstone No laminations				
5									
10									
15									
20									

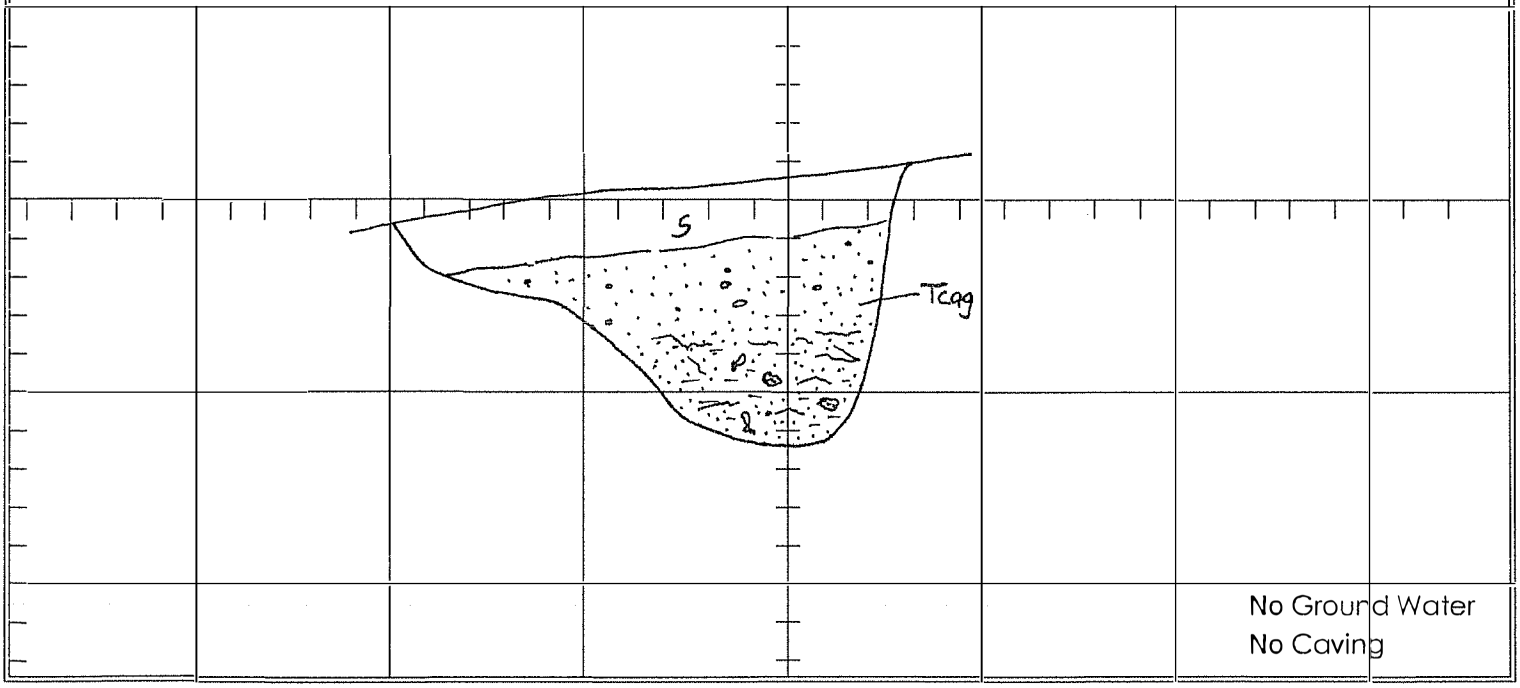
TOTAL DEPTH: 6 feet N23W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-218**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2')** @ 0' Light grayish-brown silty sand with pebbles; loose; dry **BEDROCK; Tcag (2 - 7')** @ 2' Medium to light brown fine-grained sandstone with scattered pebbles; loose; friable; massive @ 4' Tan to light brown; bioturbated; 1/8" thick wavey stringers and blotchy brown stains @ 5' Light yellowish-brown to rust brown silty sandstone with irregular blotchy stains; moderately hard; moist; bioturbated	B: N45W,7SW			Bulk Sample @ 5 - 7'
5									
10									
15									
20									

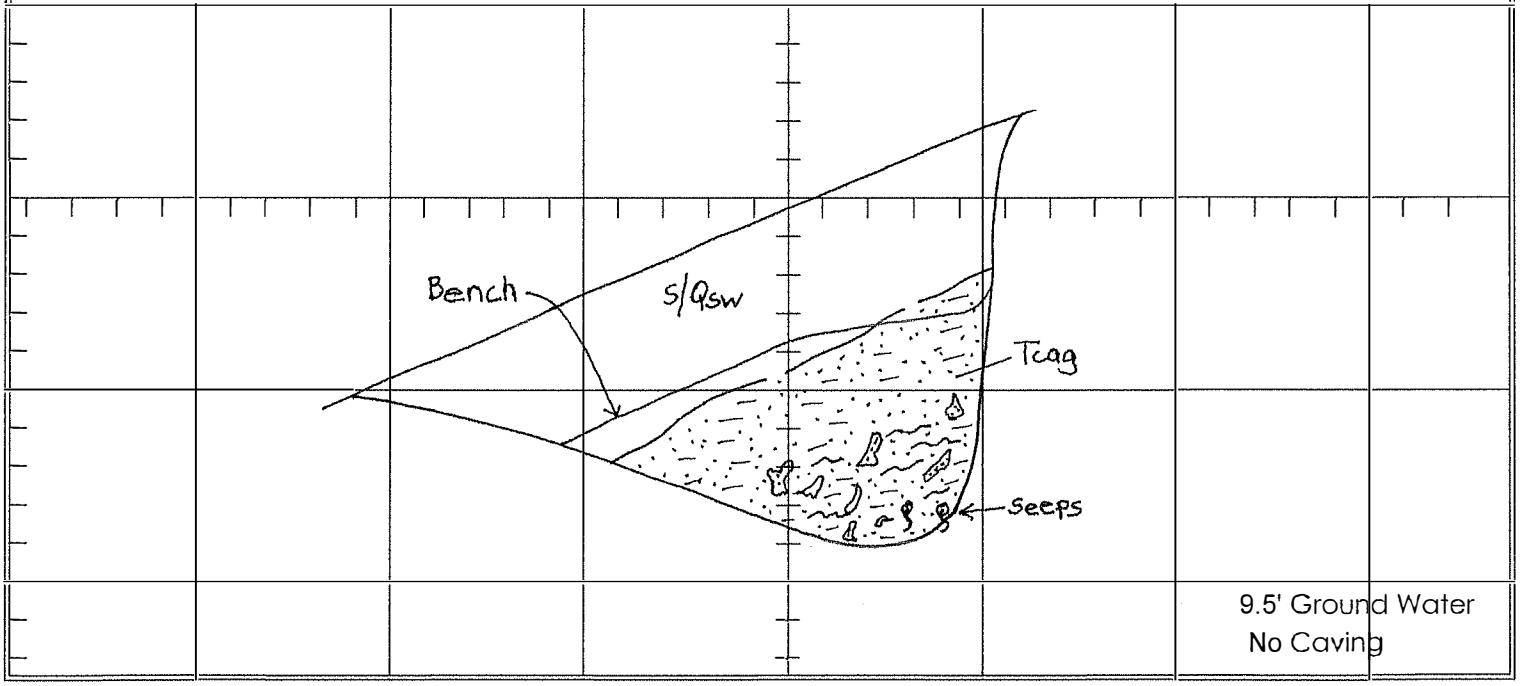
TOTAL DEPTH: 7 feet ←N12E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-219**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4')** @ 0' Medium to dark brown silty sand; loose; damp				
5					**BEDROCK; Tcag (4 - 10')** @ 4' Medium brown silty sandstone; loose; damp; massive @ 7' Light brown with irregular dark brown stringers and blotchy areas; moderately hard; moist				
10			▽		@ 9' - wet; pale yellowish-brown @ 9.5' - seepage				
15									
20									

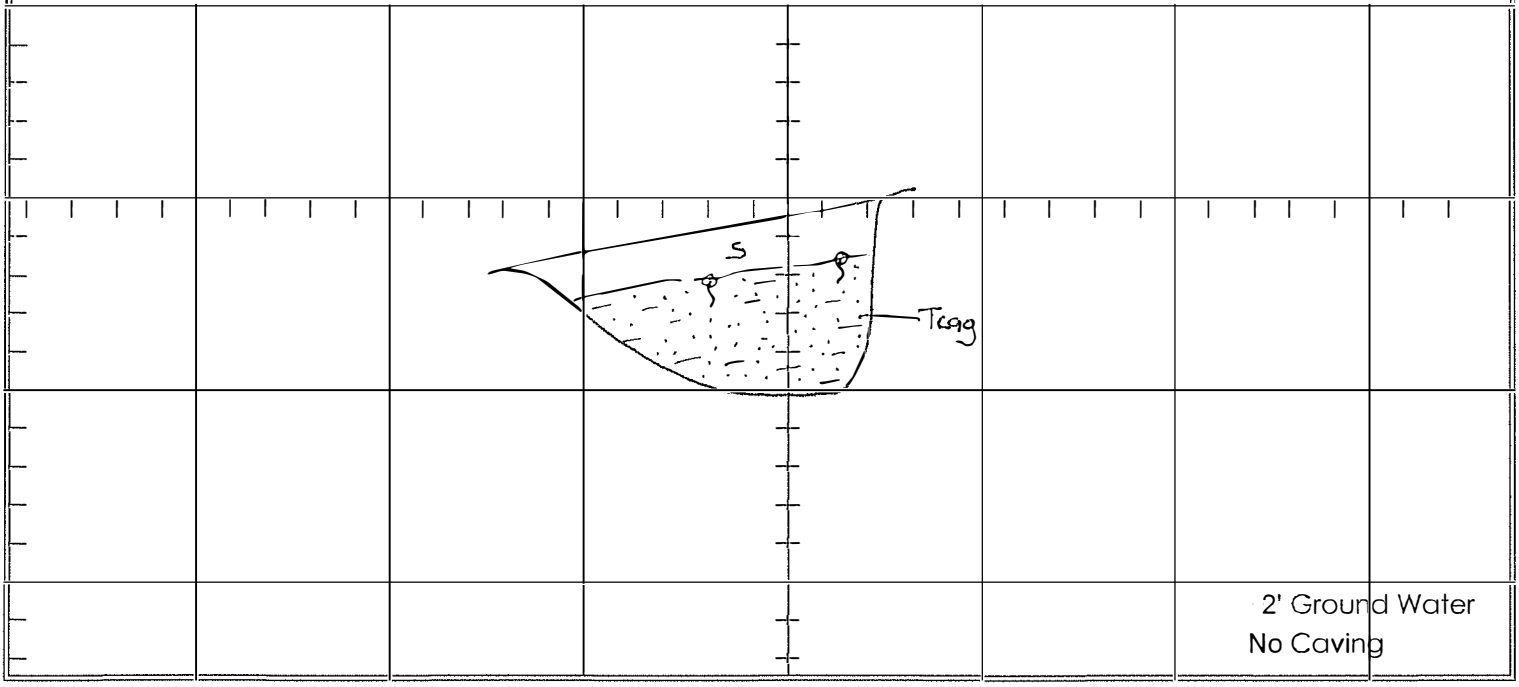
TOTAL DEPTH: 9.5 feet N11W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-220**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2')** @ 0' Dark brown silty sand with gravel; wet; loose **BEDROCK; Tcag (2 - 5')** @ 2' Medium brown silty sandstone; moderately hard; damp; massive COMMENTS: Water perched on top of the bedrock and is flowing into the excavation				
5									
10									
15									
20									

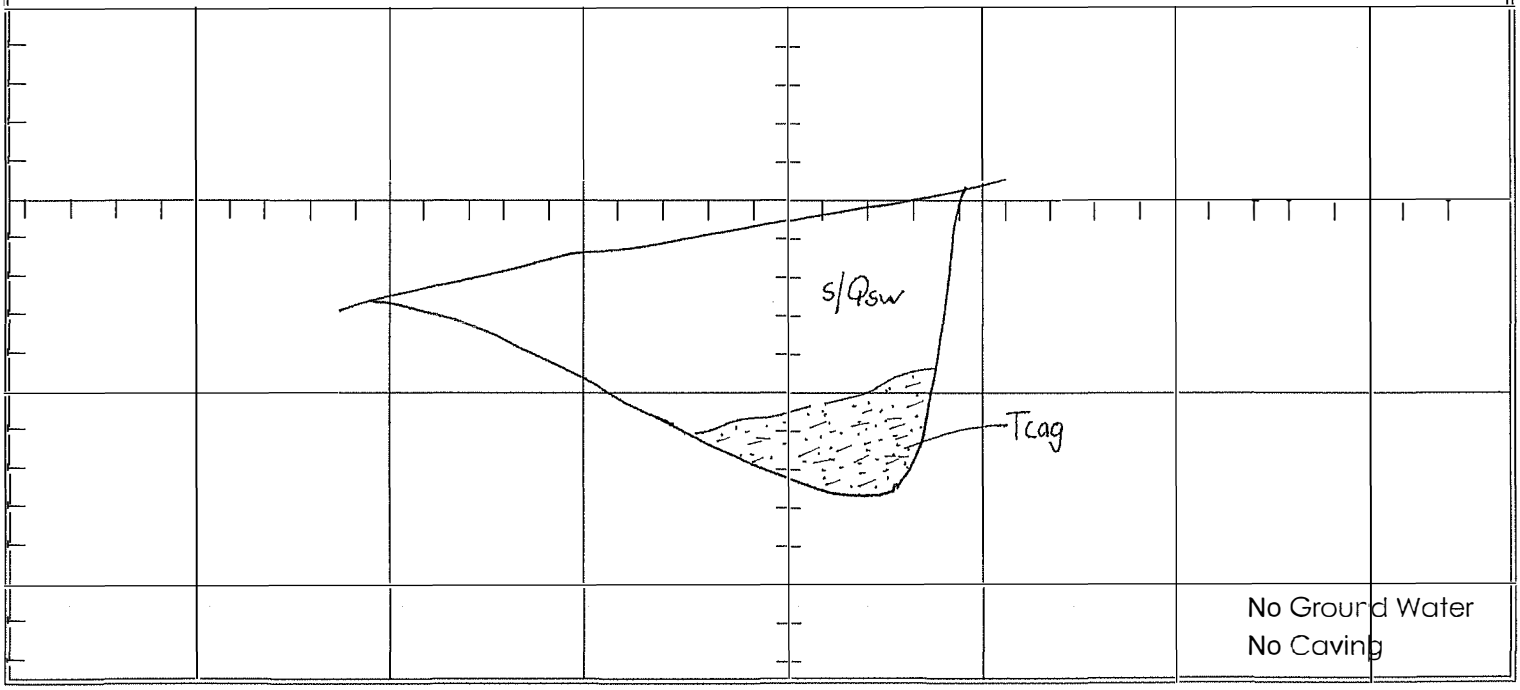
TOTAL DEPTH: 5 feet N54W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-221**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4.5')** @ 0' Medium- to dark-brown silty sand; loose; damp @ 4' - moist to wet **BEDROCK; Tcag (4.5 - 7.5')** @ 4.5' Light gray to light grayish-brown silty sandstone; moderately hard; damp	Apx B: N62W,7SW			
5									
10									
15									
20									

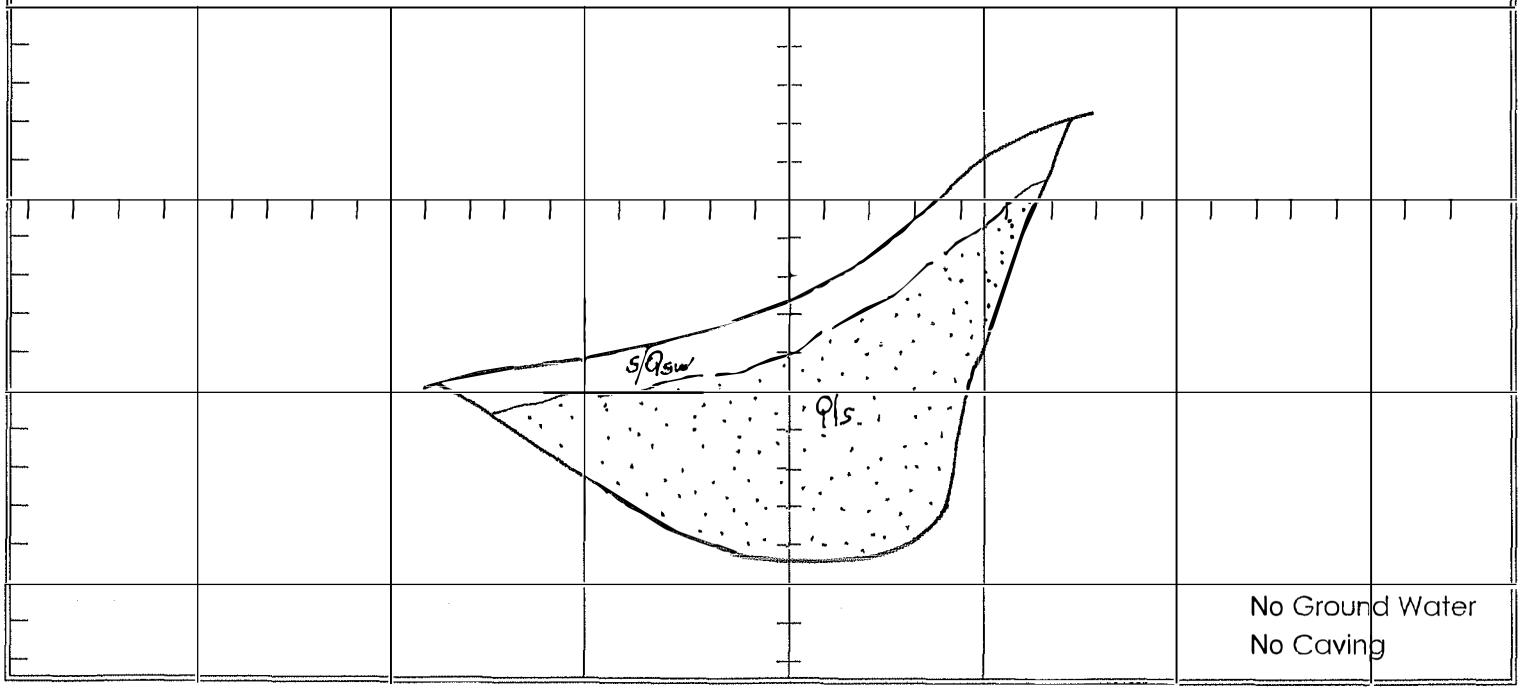
TOTAL DEPTH: 7.5 feet ←N75E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-222**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Light grayish-brown silty sand with scattered gravel; loose; dry to damp; gradational with Qls **LANDSLIDE; Qls (1.5 - 11')** @ 1.5' Light yellowish-brown and orangish-brown silty fine-grained sandstone; loose; damp; excavates easily; no blotchyness or stringers @ 5' - moist @ 9' - moist to wet; soft to bottom COMMENTS: No bedding structures; uniform				
5									
10									
15									
20									

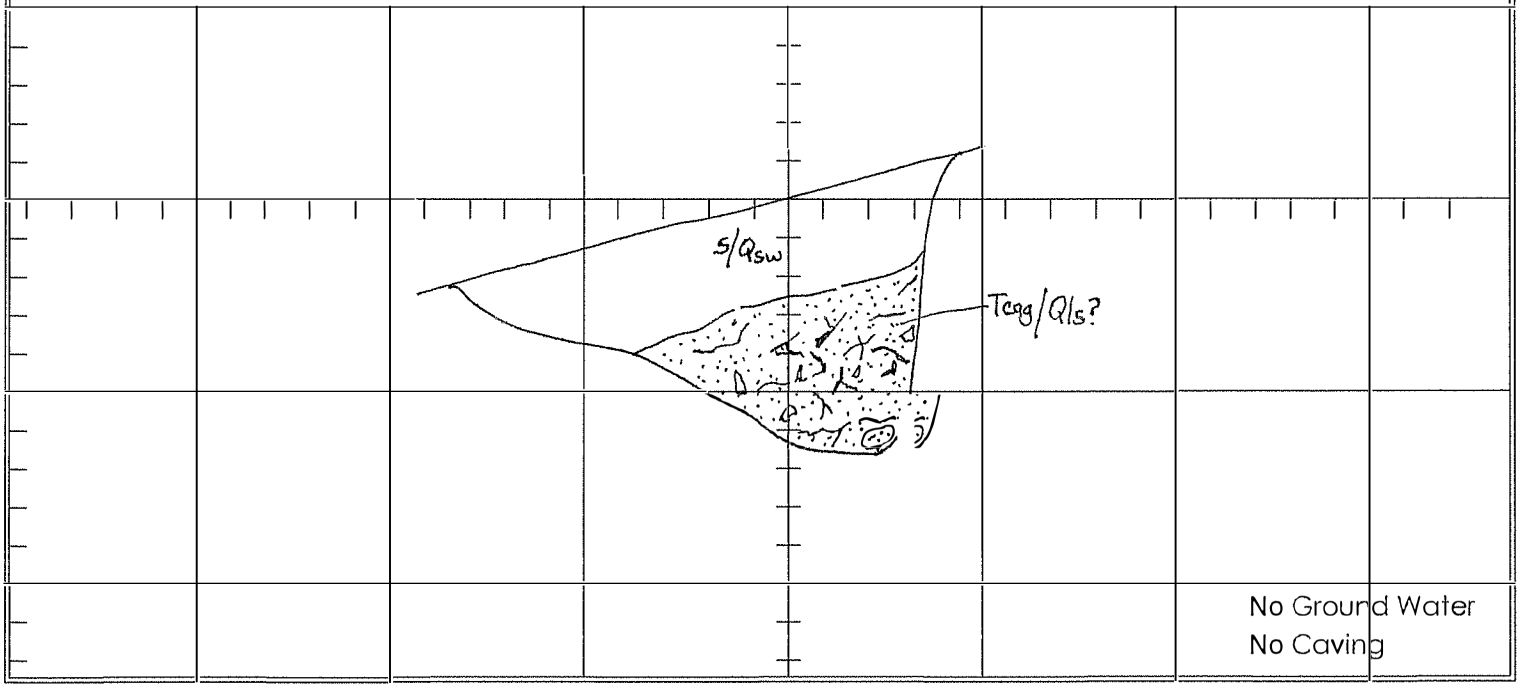
TOTAL DEPTH: 11 feet N58E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-223**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Medium to dark brown silty fine-grained sand; loose; damp; abundant roots **BEDROCK/LANDSLIDE DEPOSITS?; Tcag/Qls? (3 - 7')** @ 3' Medium brown and light yellowish-brown fine-grained sandstone with irregular blotchy zones and wavey stringers; friable; loose to bottom of trench; blotchy zones are medium brown color				
5									
10									
15									
20									

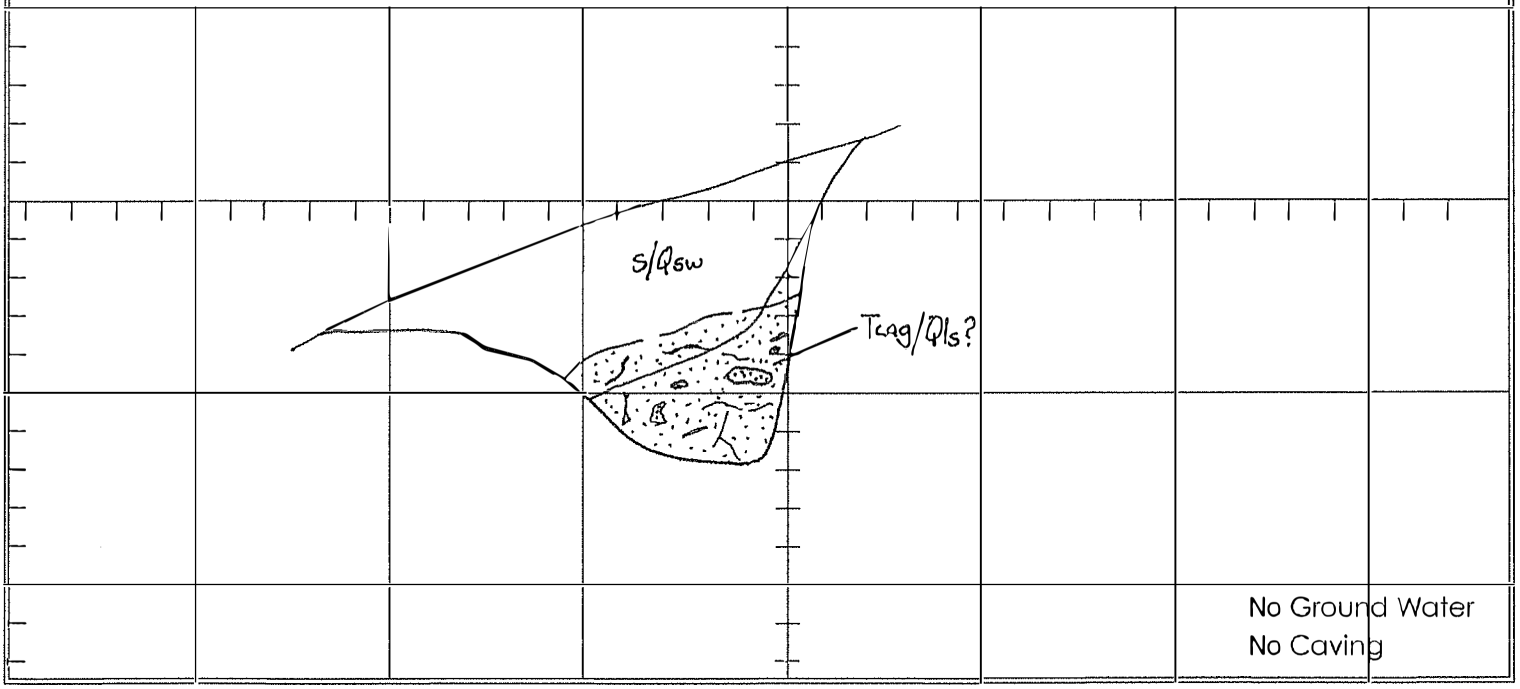
TOTAL DEPTH: 7 feet N75W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-224**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**<u>SOIL/SLOPEWASH</u>; s/Qsw (0 - 3.5')** @ 0' Light to grayish-brown silty sand; loose; dry to damp				
5					**<u>BEDROCK/LANDSLIDE DEPOSITS?</u>; Tcag/Qls? (3.5 - 8')** @ 3.5' Medium to light brown fine-grained sandstone and silty sandstone; friable; loose; damp; massive @ 5.5' Grades to tan; some medium brown blotchy zones and thin 1/8 - 1/4" thick stringers @ 7' slightly firmer/dense; moist; no laminations				
10									
15									
20									

TOTAL DEPTH: 8 feet ←N64W SCALE: 1 inch = 5 feet

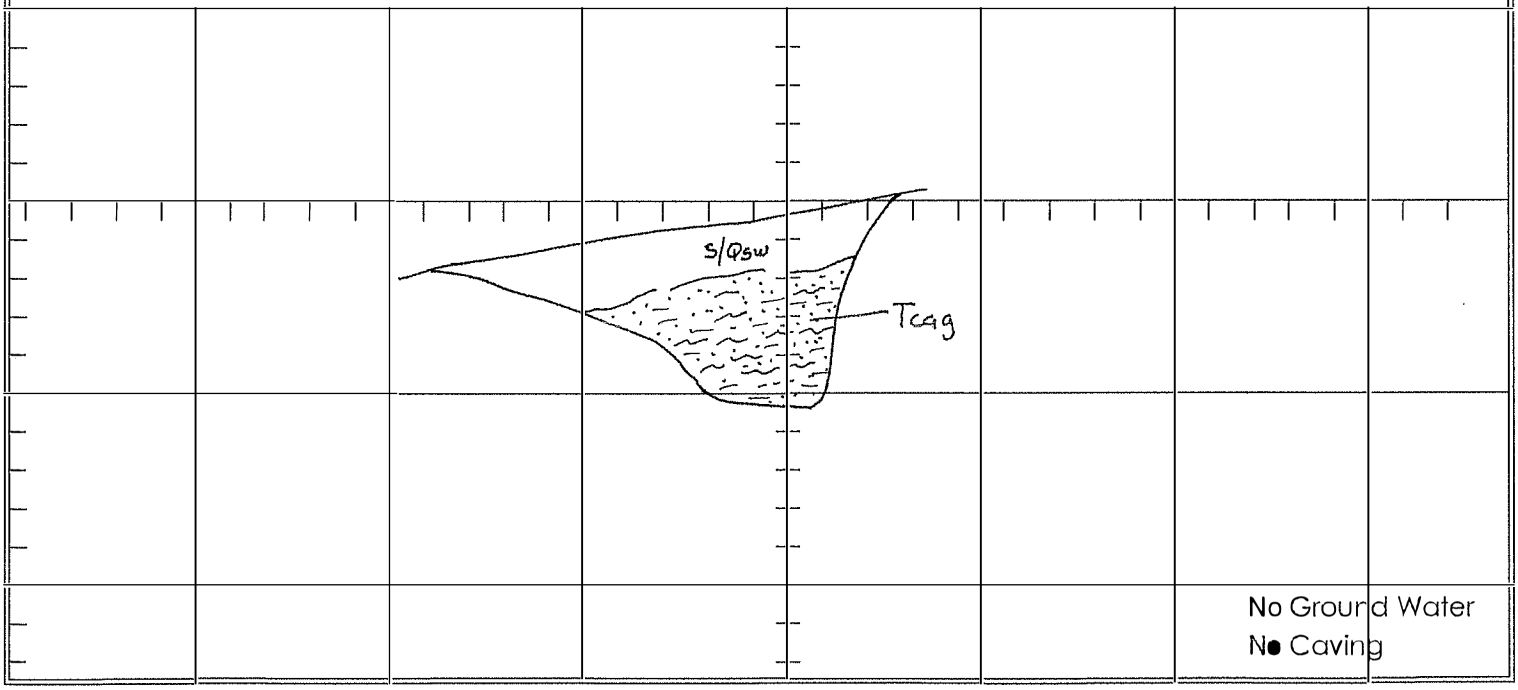


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-225**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Grayish-brown fine-grained sand with gravel and silty sand; loose; dry **BEDROCK; Tcag (1.5 - 5')** @ 1.5' Light yellowish-brown silty sandstone; damp; moderately hard; wavey stringers; bioturbated	ApxB:N39W,12SW			
5									
10									
15									
20									

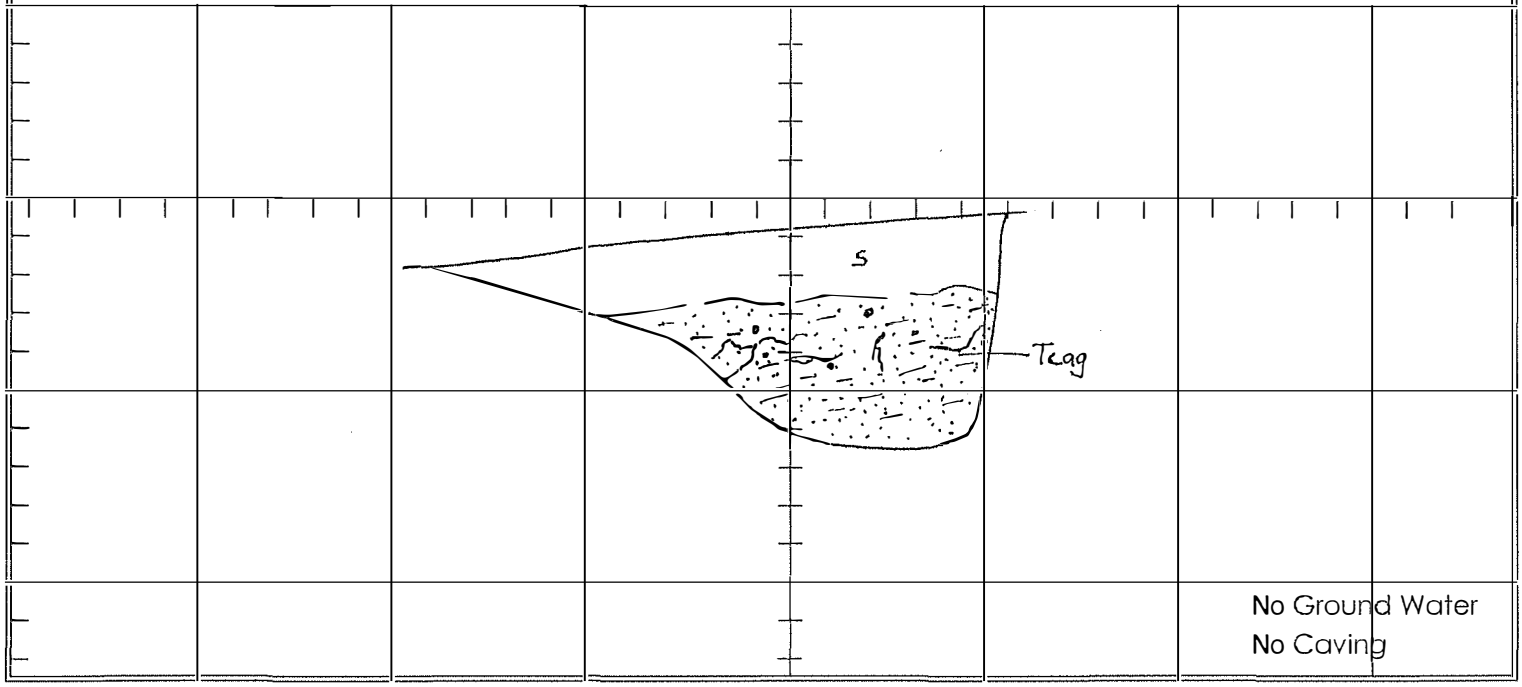
TOTAL DEPTH: 5 feet N4E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-226**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/24/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Light grayish- to medium-brown fine-grained sand; loose; dry to damp; gradational contact with bedrock **BEDROCK; Tcag (2 - 6')** @ 2' Medium to dark brown silty sandstone and sandstone with scattered pebbles; loose; damp; weathered; friable @ 4' -moderately hard @ 5' Mottled tan to rusty brown fine-grained sandstone; moderately hard to hard; sharp upper contact; damp to moist; bioturbated; rusty color at upper contact with friable sandstone	B: N75W,9SW			
5									
10									
15									
20									

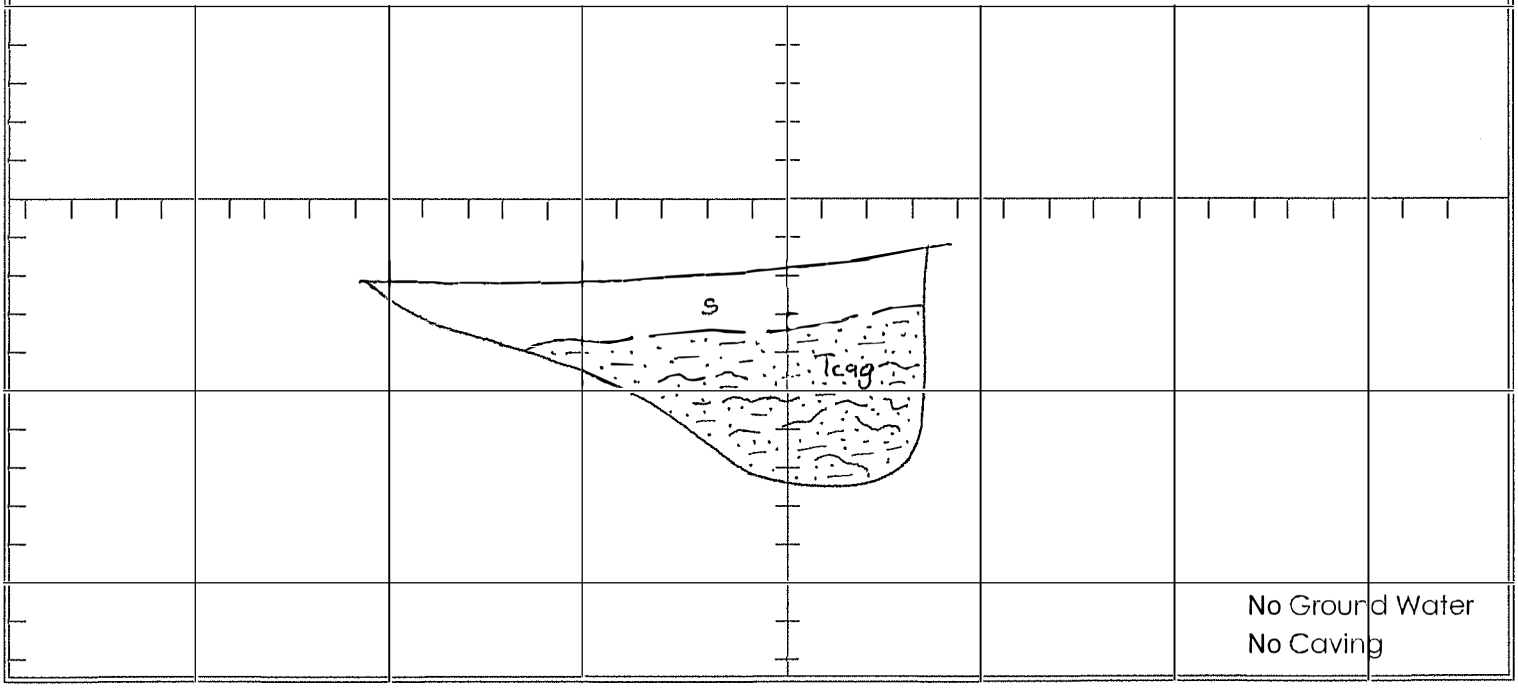
TOTAL DEPTH: 6 feet N43W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-227**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1.5')** @ 0' Grayish-brown fine-grained silty sand; loose; damp **BEDROCK; Tcag (1.5 - 6')** @ 1.5' Medium-brown and grayish-brown fine-grained silty sandstone; loose; damp; slightly friable; weathered @ 4' Grayish-brown and light olive brown silty sandstone; moderately hard; some rusty brown mottling; faint lamination but seems discontinuous; some wavey stringers, generally massive	Apx B: N90E,5S			
5									
10									
15									
20									

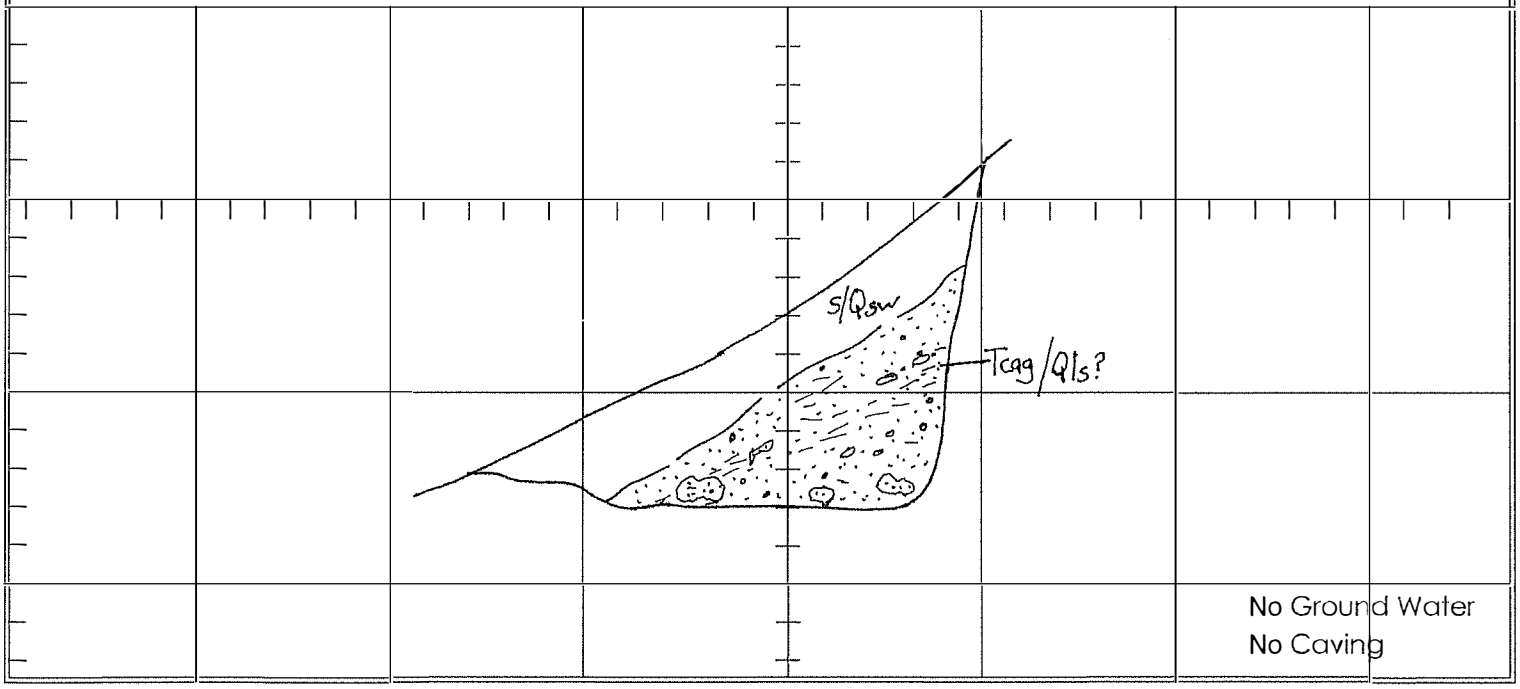
TOTAL DEPTH: 6 feet ←N40E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-228**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2.5')** @ 0' Grayish-brown silty gravelly sand; loose; dry to damp				
5					**BEDROCK/LANDSLIDE DEPOSITS?; Tcag/Qls? (2.5 - 8')** @ 2.5' Tan to rusty brown sandstone and silty sandstone with subrounded gravel; blotchy; loose to moderately hard; damp @ 4.5' Light olive and reddish-brown silty pebbly sandstone; loose to hard; blocks of cemented sandstone; irregular looking; bioturbated; some blotchy orangish-brown staining	ApxB:N20W,14SW			Bulk Sample @ 4.5 - 6'
10					COMMENTS: Difficult to determine if landslide; but irregular looking and variable density; very blotchy				
15									
20									

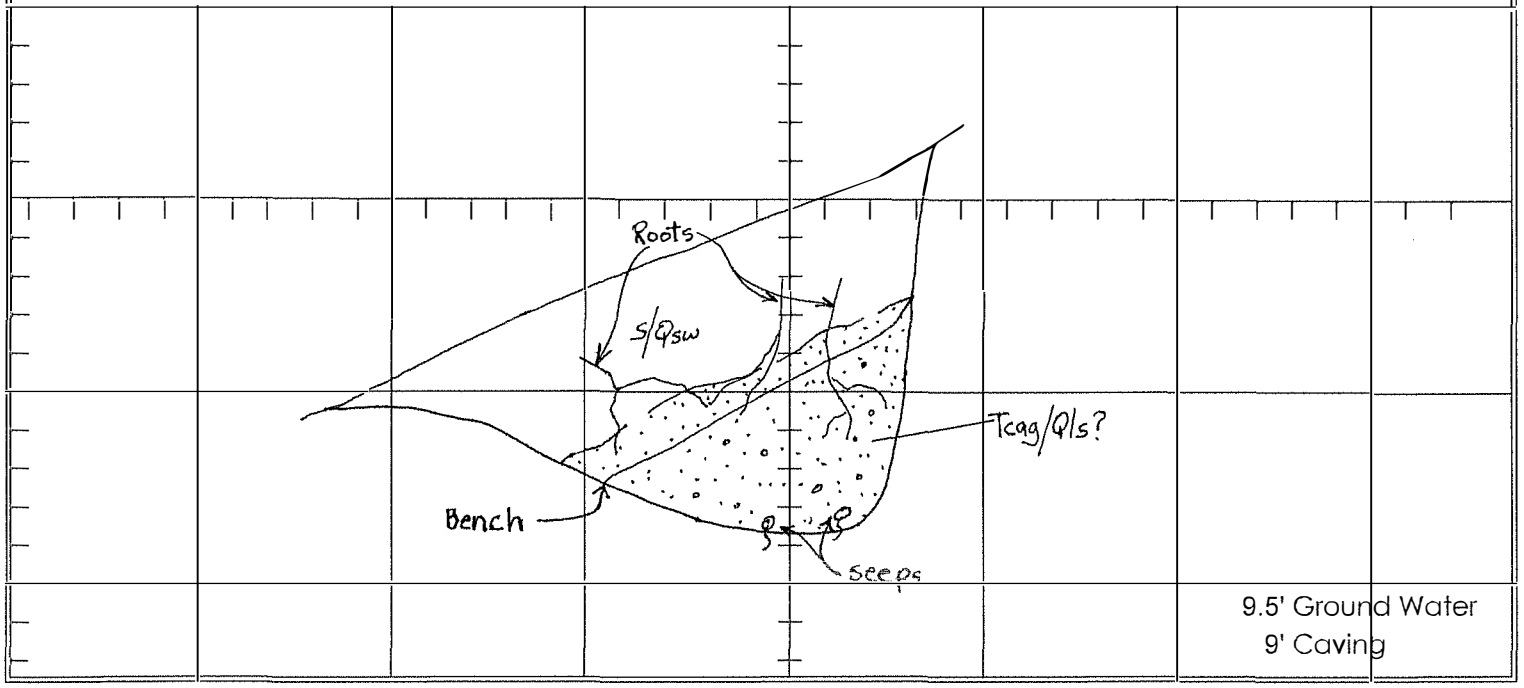
TOTAL DEPTH: 9 feet N58E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-229**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4')** @ 0' Grayish-brown silty sand; loose; damp; gradational contact with lower unit				
5					**BEDROCK/LANDSLIDE DEPOSITS?; Tcag/Qls? (4 - 10')** @ 4' Medium-brown fine-grained sandstone with isolated pebbles and gravel; loose; damp; friable; not lithified; massive; no laminations; roots to 7' @ 7' - moist				
10			▼		@ 9' - minor caving @ 9.5' - wet; water seeping in bottom of trench				
15									
20									

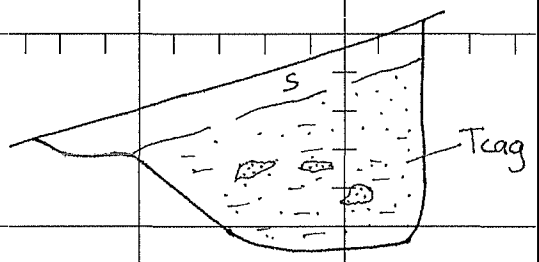
TOTAL DEPTH: 10 feet ←N35E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-230**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 1')** @ 0' Grayish-brown silty sand; loose; damp **BEDROCK; Tcag (1 - 5.5')** @ 1' Light grayish-brown sandstone and silty sandstone with some rusty brown blotchy zones; moderately hard to hard; damp; bioturbated; vague laminations	Apx B: N23W,4NE			
5									
10									
15									
20									

TOTAL DEPTH: 5.5 feet ←N68E SCALE: 1 inch = 5 feet

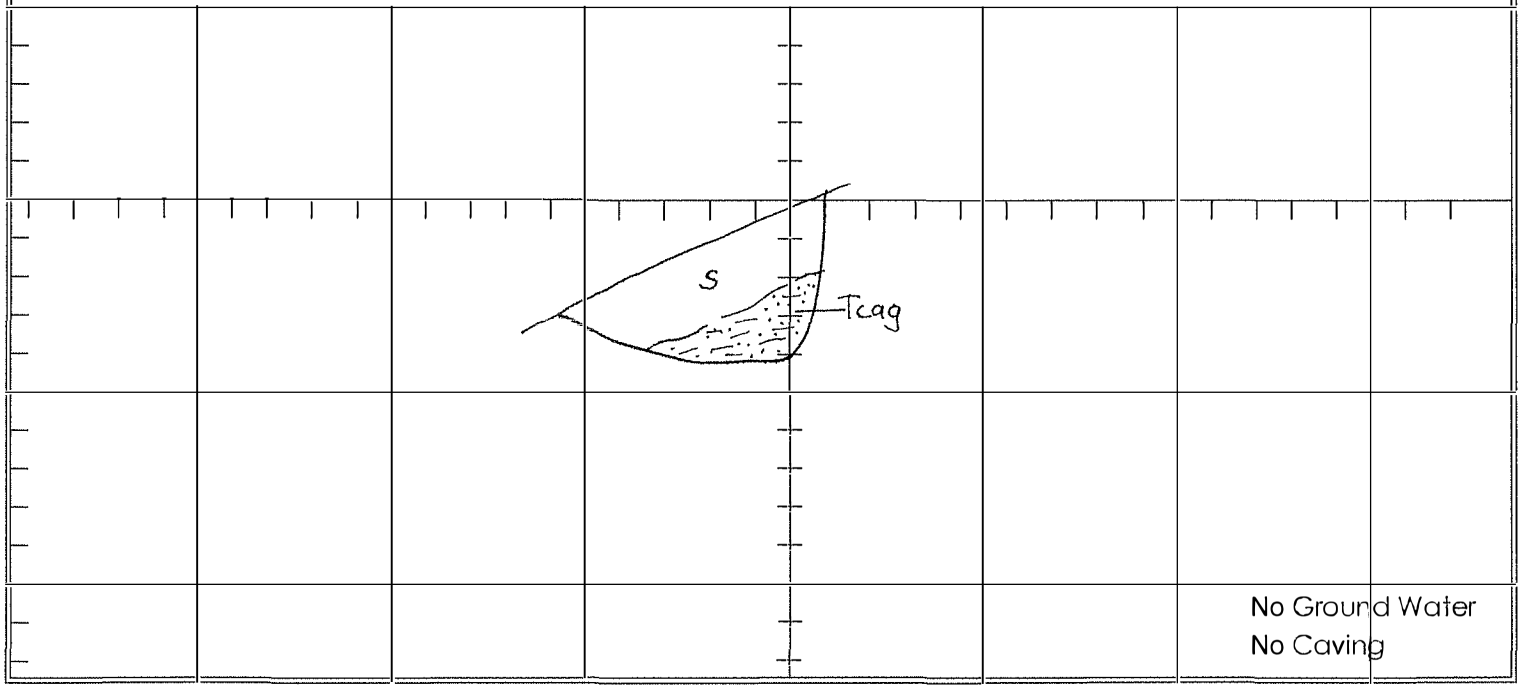


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-231**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2')** @ 0' Medium brown silty sand with isolated pebbles; loose; damp **BEDROCK; Tcag (2 - 5.5')** @ 2' Mottled tan and reddish-brown silty sandstone; moderately hard to hard; damp @ 3' Clayey sandstone	Apx B: N4W,12NE Apx B: N14E,14NE			
5									
10									
15									
20									

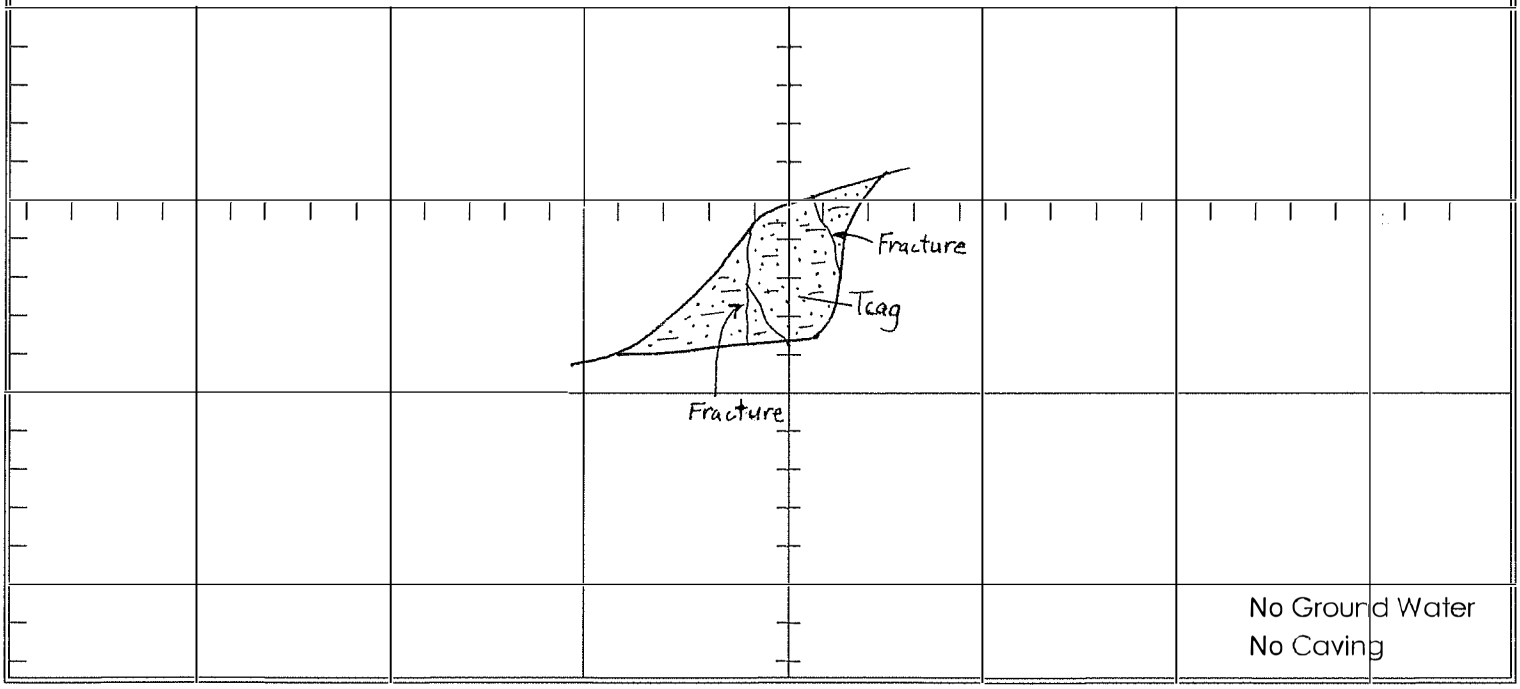
TOTAL DEPTH: 4 feet ←N15E SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-232**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**BEDROCK; Tcag (0 - 4')** @ 0' Mottled tan and rusty brown sandstone and clayey sandstone; moderately hard to hard; damp; massive; few minor fractures; excavates blocky	f: N52W, 74SW f: N22W, 69NE			
5									
10									
15									
20									

TOTAL DEPTH: 4 feet N38E→ SCALE: 1 inch = 5 feet

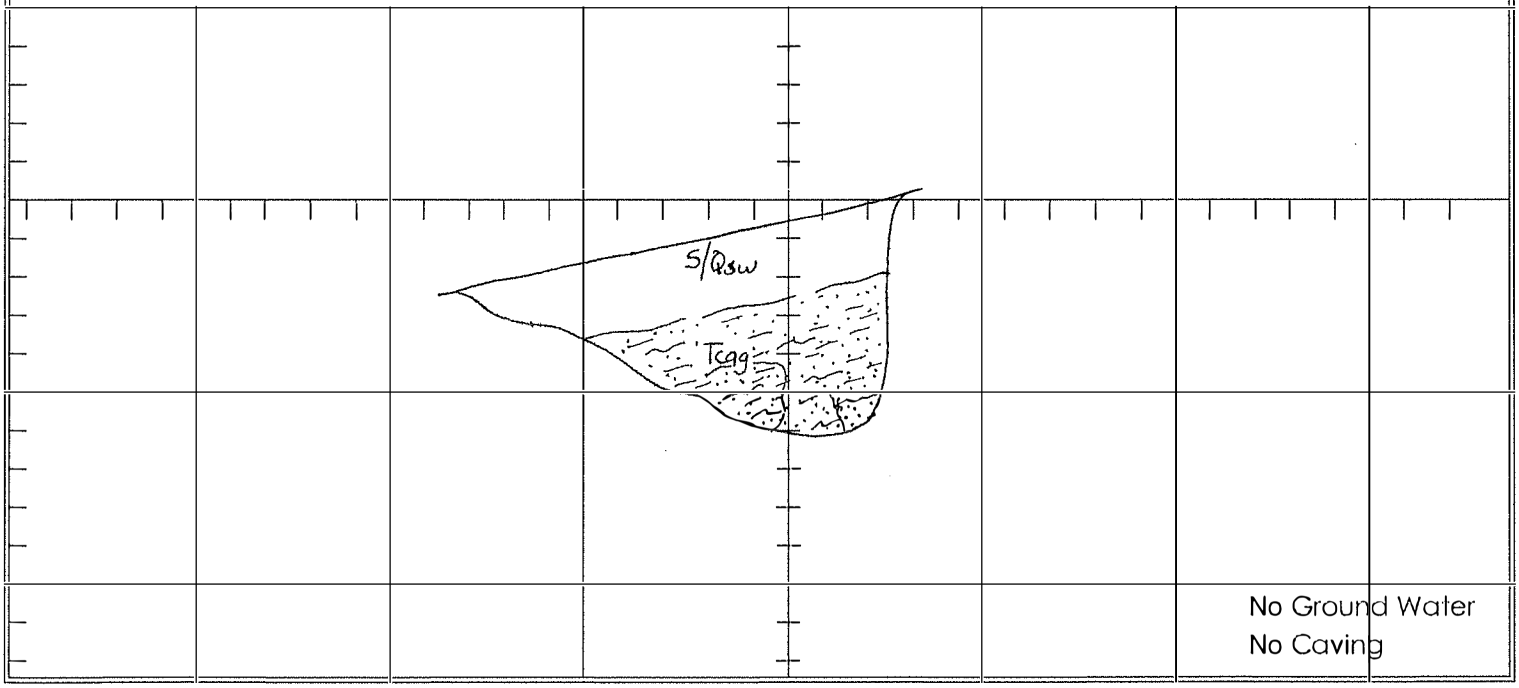


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-233**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Medium to grayish-brown silty sand; loose; damp **BEDROCK; Tcag (2 - 6')** @ 2' Medium brown sandstone and silty sandstone; loose; damp; friable @ 3' - moderately hard @ 4' Mottled grayish-brown and medium brown clayey sandstone with irregular wavey silty sand stringers; bioturbated				
5	▮								Bulk Sample @ 4 - 6'
10									
15									
20									

TOTAL DEPTH: 6 feet N38E→ SCALE: 1 inch = 5 feet

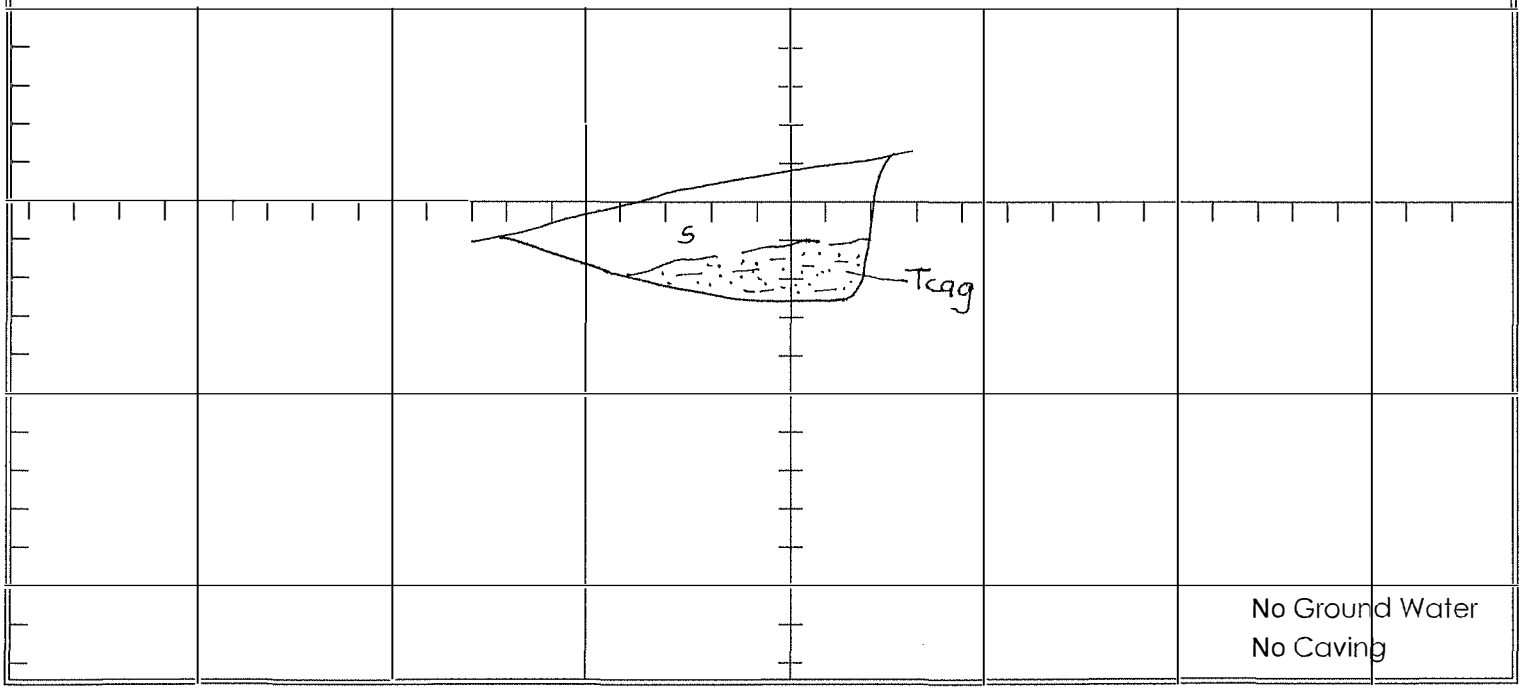


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-234**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 2')** @ 0' Brown and grayish-brown silty sand; loose; damp **BEDROCK; Tcag (2 - 3.5')** @ 2' Mottled reddish-brown and tan silty sandstone; hard; damp; massive COMMENTS: Difficult to excavate with backhoe				
5									
10									
15									
20									

TOTAL DEPTH: 3.5 feet N30W→ SCALE: 1 inch = 5 feet

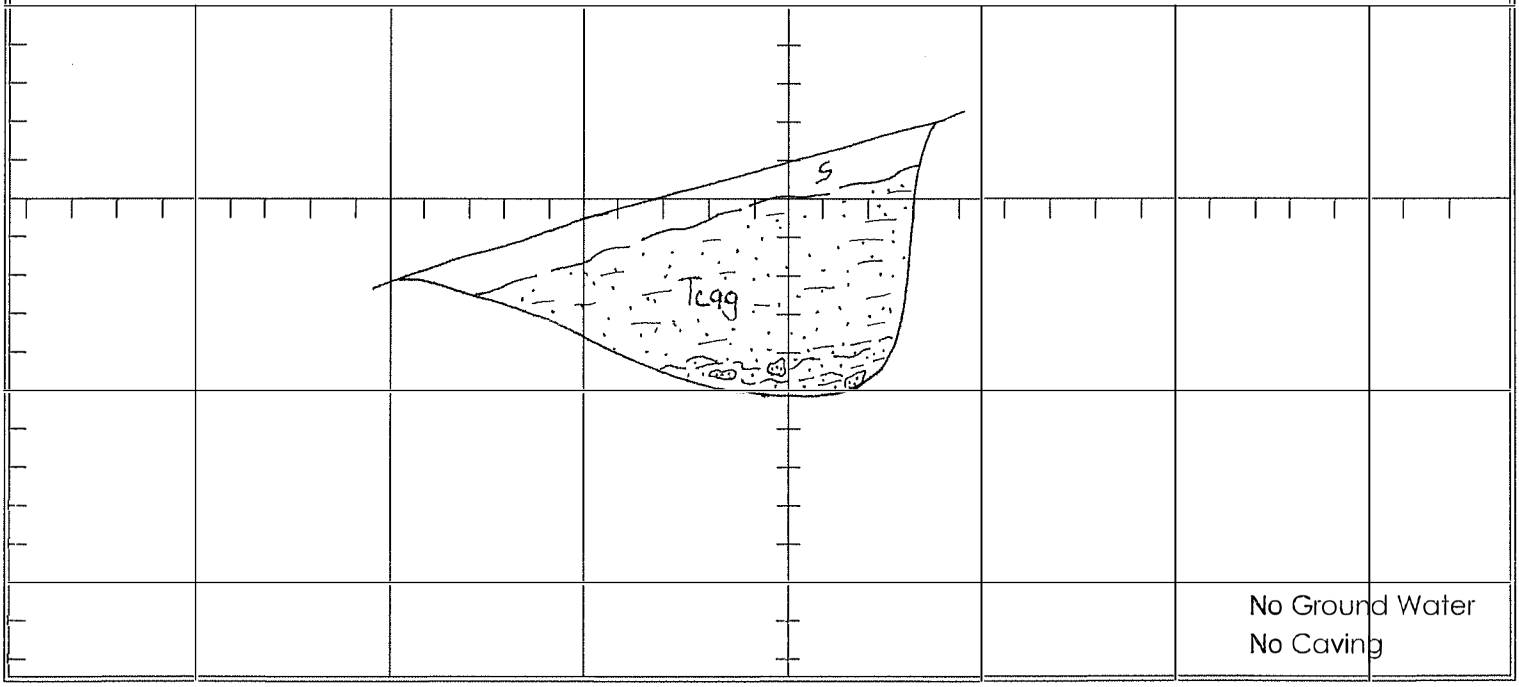


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-235**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Grayish-brown to medium brown silty fine-grained sand; loose; damp **BEDROCK; Tcag (1 - 7')** @ 1' Medium to light reddish-brown fine-grained sandstone and silty sandstone; friable; loose to moderately hard; damp; massive @ 5' Silty sandstone @ 5.5' Grades to mottled light yellow and medium brown clayey sandstone with irregular wavey and blotchy zones; appears bioturbated; no laminations				
5									
10									
15									
20									

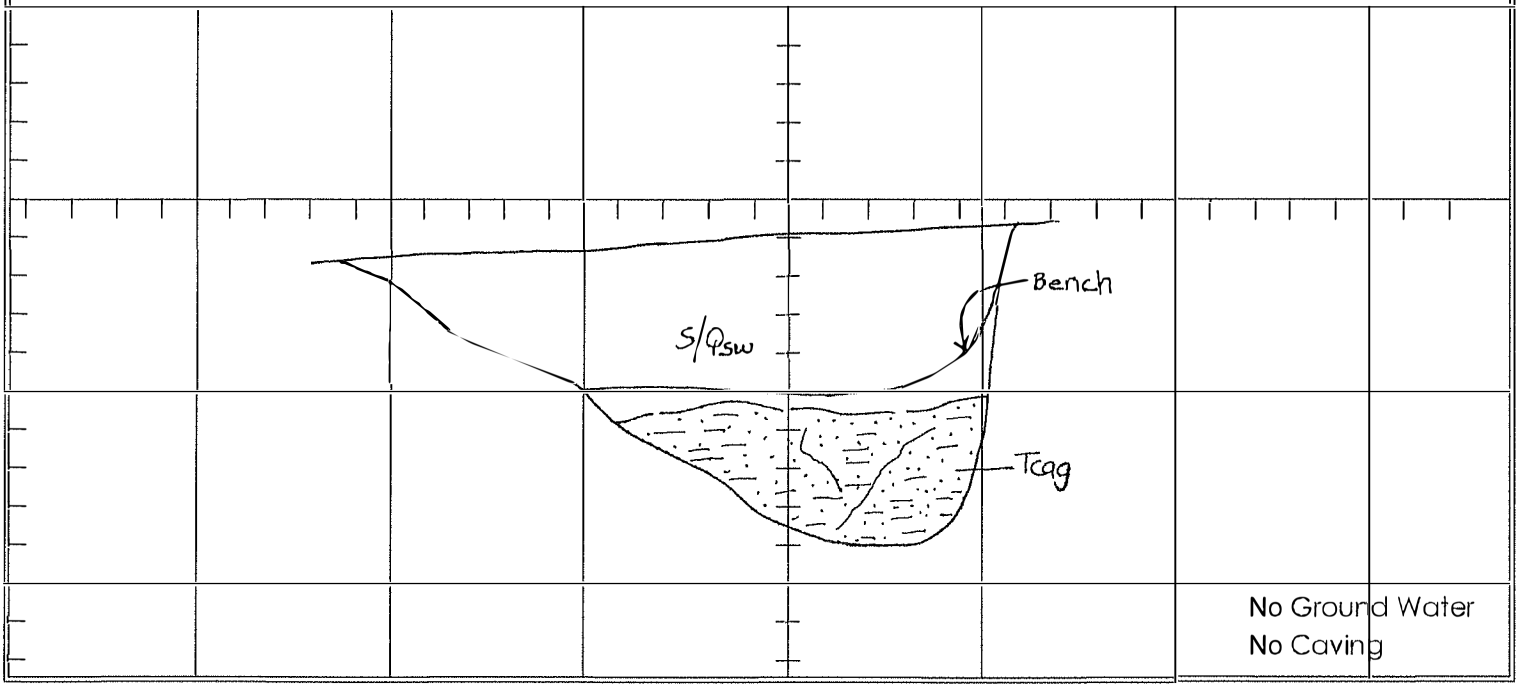
TOTAL DEPTH: 7 feet N12W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-236**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4.5')** @ 0' Medium brown and grayish-brown fine-grained silty sand; loose; damp @ 3' Clayey sand; damp to moist **BEDROCK; Tcag (4.5 - 8')** @ 4.5' Light grayish-brown and rusty brown clayey sandstone; moderately hard; damp; massive; minor fractures lined with dark brown staining				
5									
10									
15									
20									

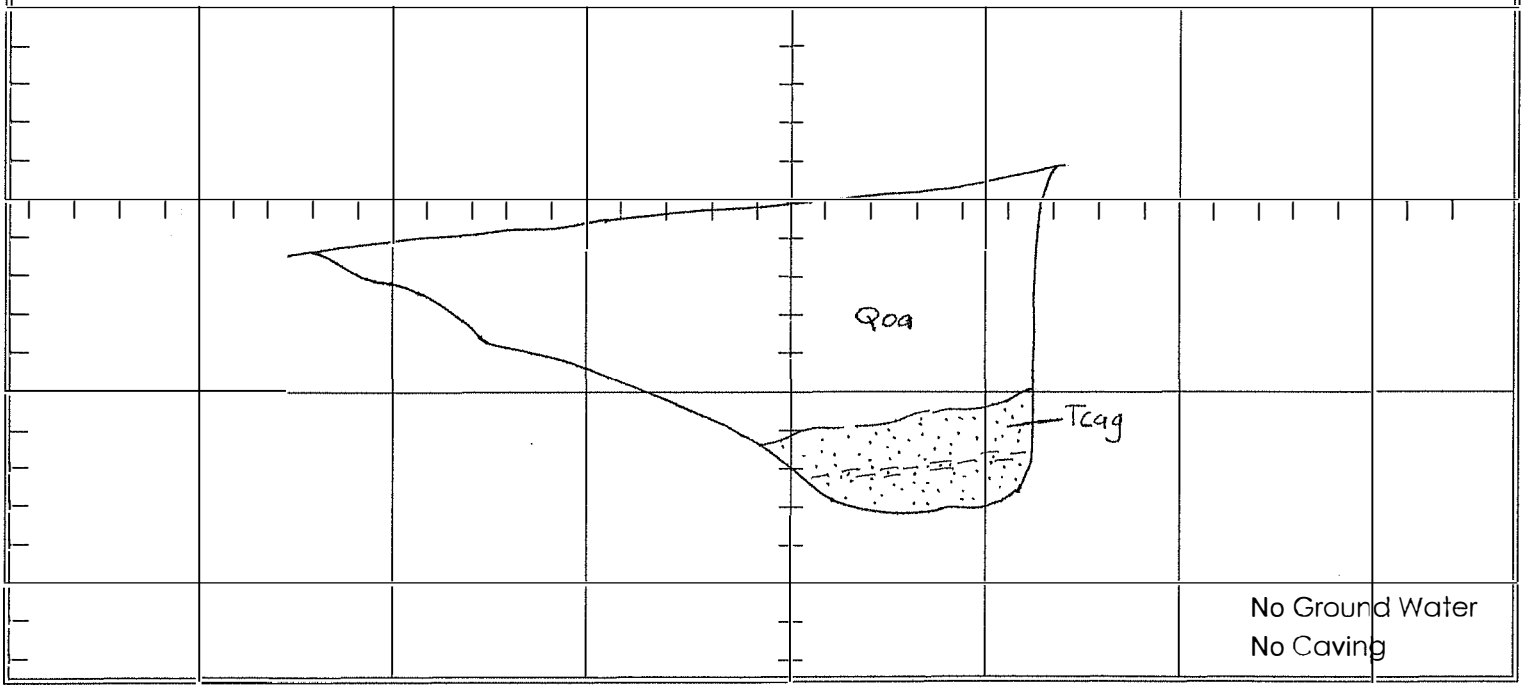
TOTAL DEPTH: 8 feet N48W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-237**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**ALLUVIUM; Qa (0 - 6')** @ 0' Grayish-brown silty sand with isolated gravel; loose; damp				
5					**BEDROCK; Tcag (6 - 8')** @ 6' Light yellowish-brown to tan sandstone and silty sandstone; moderately hard; damp to moist @ 7' - faint laminations	B: N63W,9SW			
10									
15									
20									

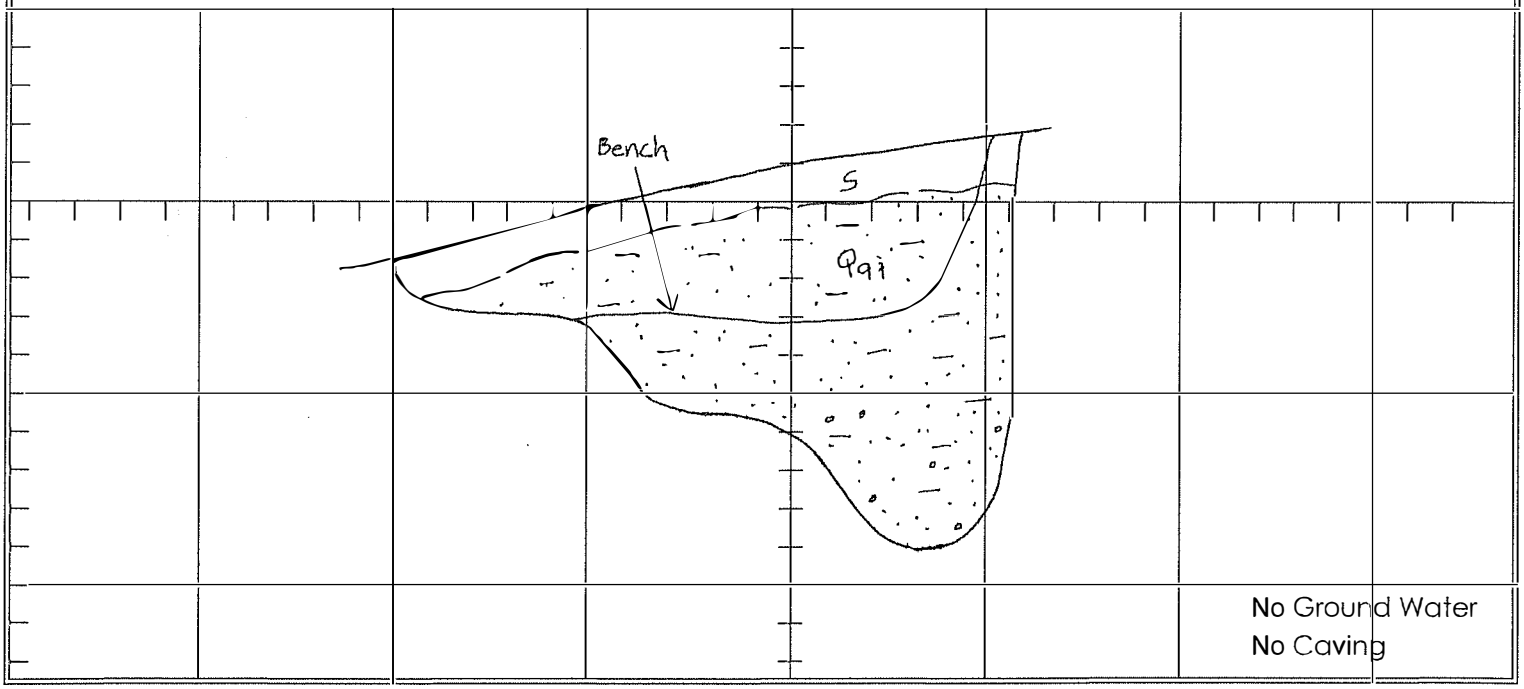
TOTAL DEPTH: 8 feet N33W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-238**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/25/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Medium to dark brown fine-grained silty sand; loose; damp **ALLUVIUM; Qa (1 - 10')** @ 1' Medium brown silty sand; loose; damp @ 5' - moist to wet @ 6' Medium to light brown clayey sand with isolated gravel @ 8' - moderately hard				
5									
10									
15									
20									

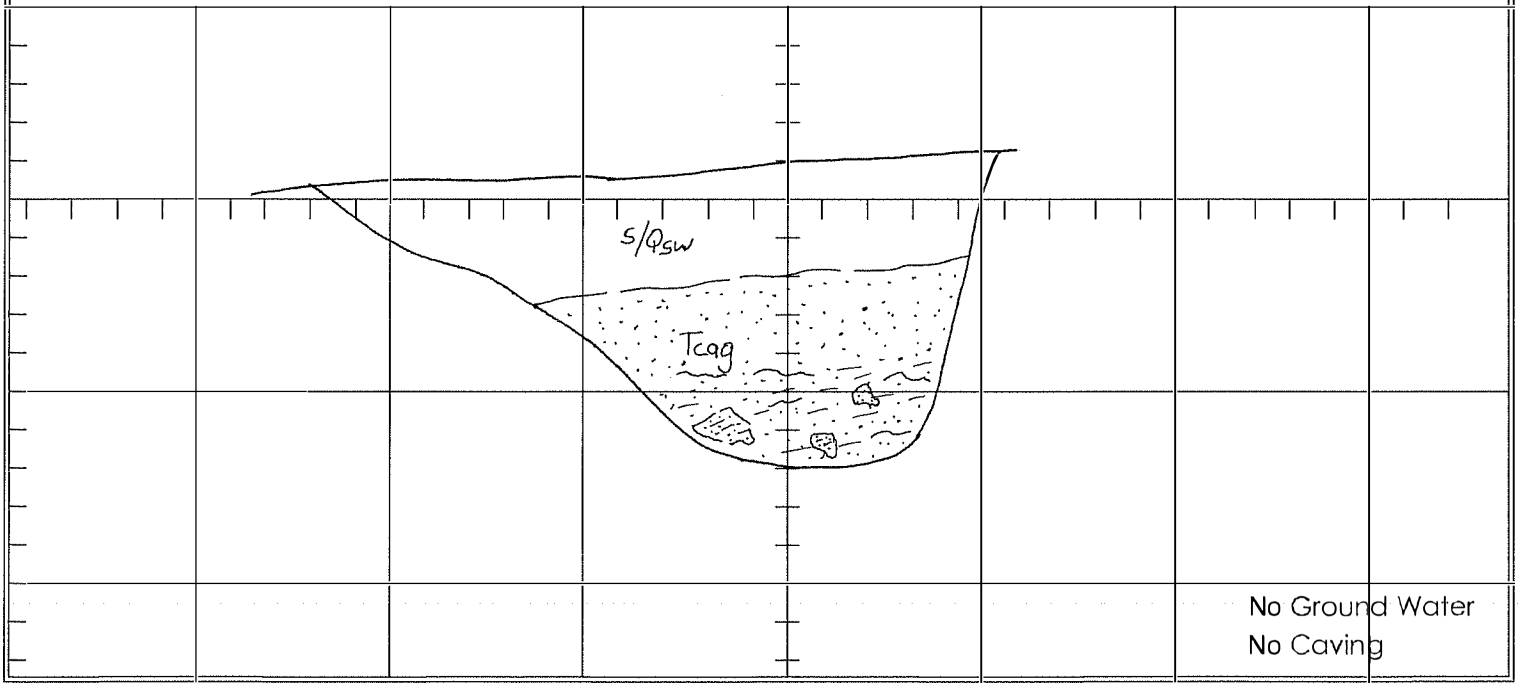
TOTAL DEPTH: 10 feet N27E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-239**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/26/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 3')** @ 0' Light to medium brown fine-grained sand; loose; damp **BEDROCK; Tcag (3 - 8')** @ 3' Medium brown and yellowish-brown fine-grained sandstone (not lithified); loose; damp; friable @ 5' Dark grayish-brown silty sandstone; irregular wavey and blotchy zones; moist COMMENTS: Wavey zones are not bedding				
5									
10									
15									
20									

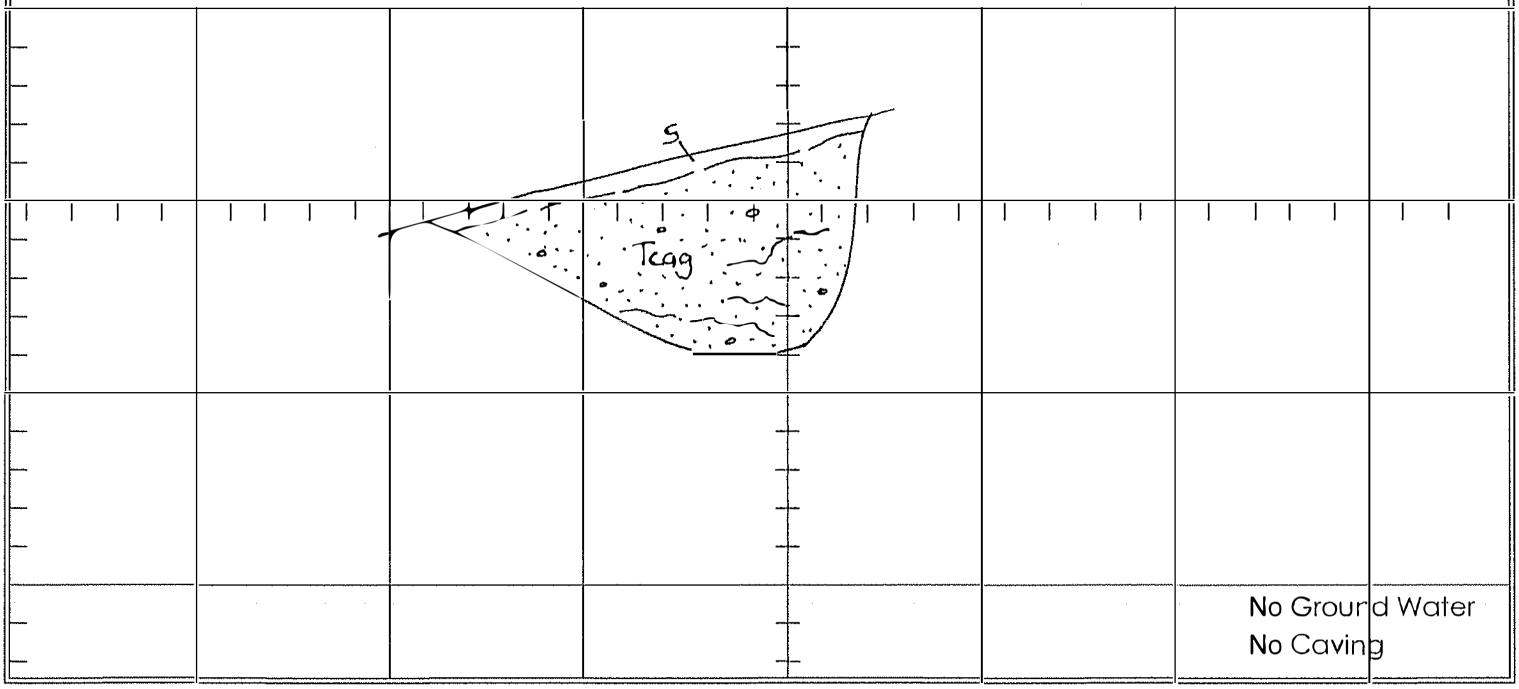
TOTAL DEPTH: 8 feet N82E→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-240**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/26/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 0.5')** @ 0' Light brown silty fine-grained sand; loose; dry; gradational contact with bedrock **BEDROCK; Tcag (0.5 - 6')** @ 0.5' Pale yellowish-brown to tan fine-grained sandstone; loose; damp; roots to 5'; very friable; few 1/4" thick wavey medium brown stringers; some isolated subrounded gravel COMMENTS: Not lithified				Bulk Sample @ 2 - 6'
5									
10									
15									
20									

TOTAL DEPTH: 6 feet North→ SCALE: 1 inch = 5 feet

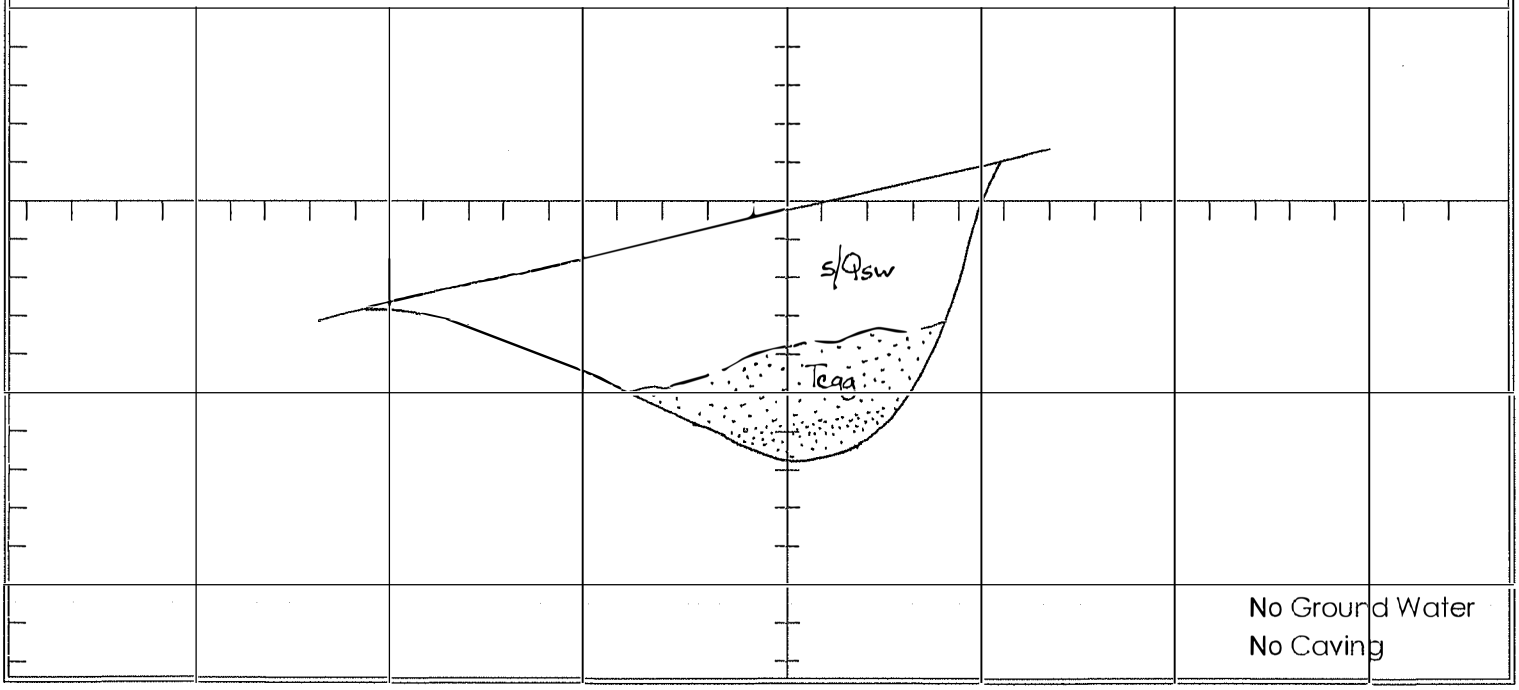


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-241**
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: VCG	
	EXCAVATED: 5/26/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket	ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 4')** @ 0' Light grayish-brown silty fine-grained sand; loose; damp; friable; gradational contact with bedrock				
5					**BEDROCK; Tcag (4 - 7')** @ 4' Medium to light brown sandstone; loose; damp; friable; weathered @ 6' Light brown to tan; vague laminations; damp to moist	ApxB:N78W,13SW			
10									
15									
20									

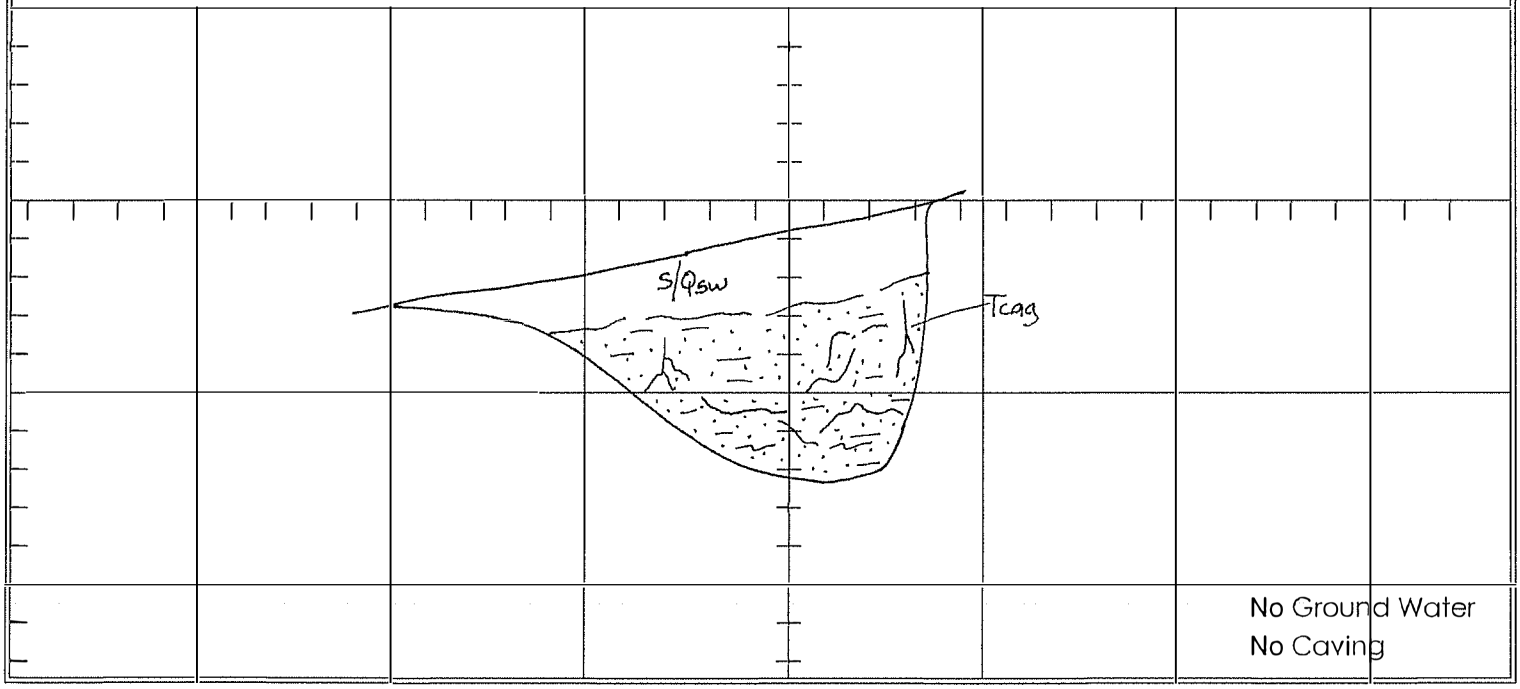
TOTAL DEPTH: 6 feet N22W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-242**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/26/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL/SLOPEWASH; s/Qsw (0 - 2')** @ 0' Light to medium brown fine-grained silty sand; loose; damp; abundant roots; friable **BEDROCK; Tcag (2 - 7')** @ 2' Medium to light brown fine-grained silty sandstone; loose; damp; friable; possible weathered; massive; roots to 4' @ 5' Light brown to tan; moderately hard; very friable; wavey medium brown stringers; some portions look bioturbated COMMENTS: Not lithified				
5									
10									
15									
20									

TOTAL DEPTH: 7 feet N52W→ SCALE: 1 inch = 5 feet

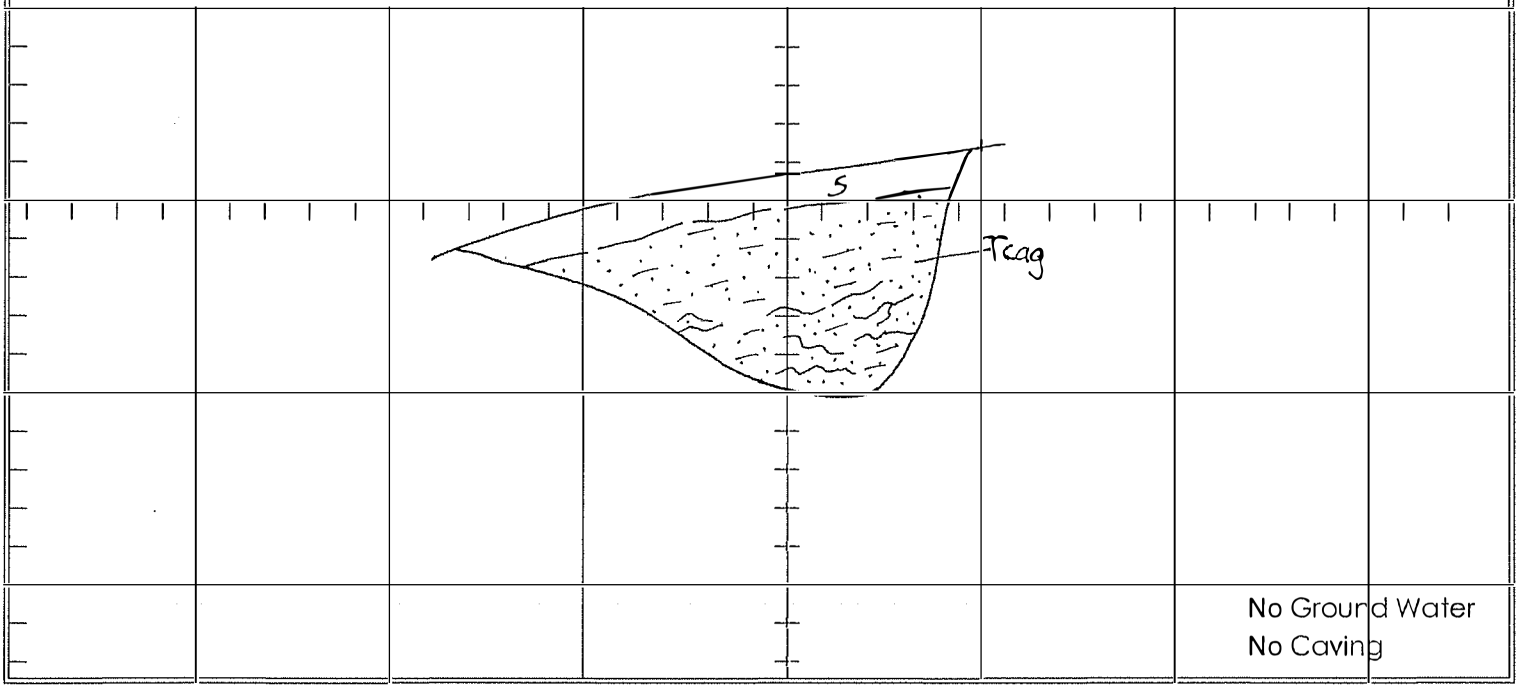


No Ground Water
No Caving

CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-243**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/26/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1')** @ 0' Light graysh-brown fine-grained silty sand; loose; damp; friable; gradational contact with bedrock **BEDROCK; Tcag (1 - 6')** @ 1' Medium brown fine-grained silty sandstone; moderately hard; damp; friable; few faint dark brown irregular wavey 1/4 to 1" thick stringers; bioturbated; massive; not lithified @ 4' Moist @ 5' Medium to light brown; moist to wet				
5									Bulk Sample @ 5 - 7'
10									
15									
20									

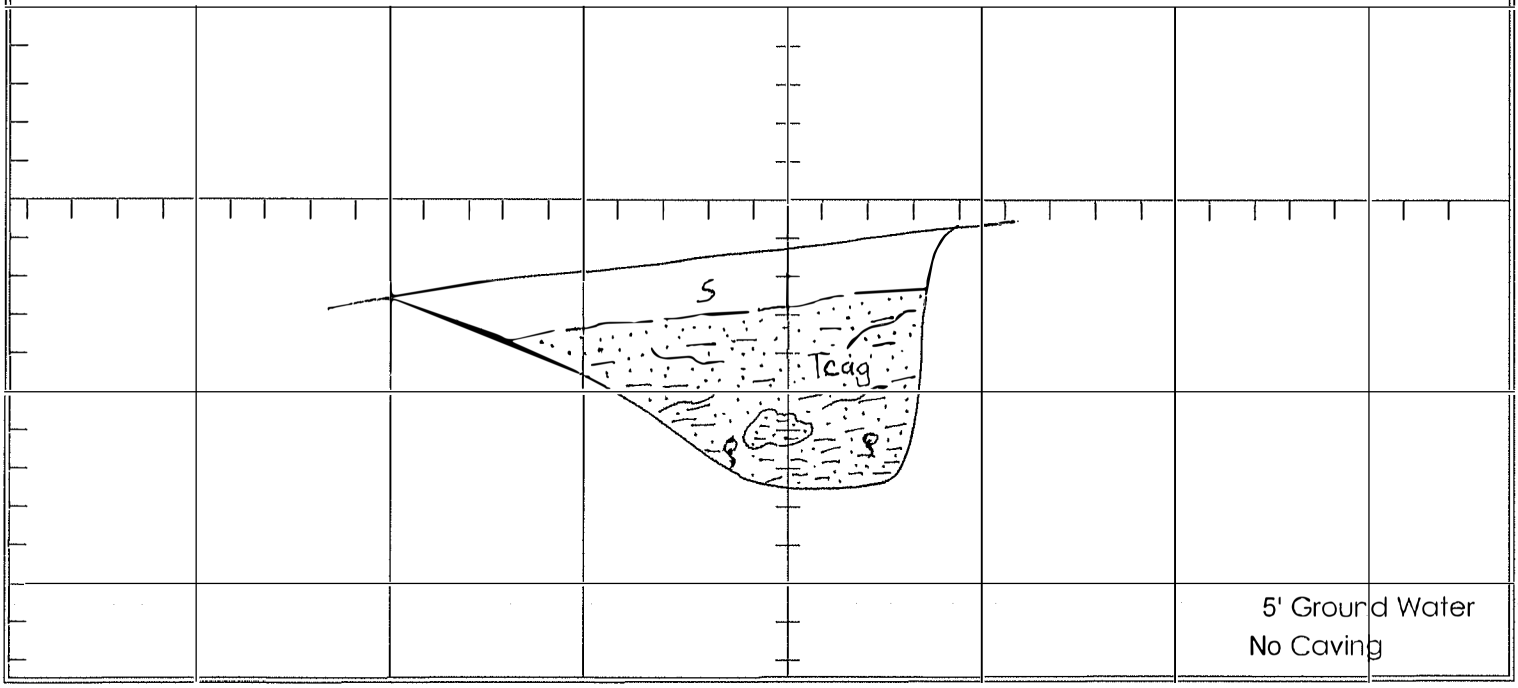
TOTAL DEPTH: 6 feet N15W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC		JOB NO: 23-2195s-1	**TRENCH LOG NO. GT-244**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: VCG	
		EXCAVATED: 5/26/23	
EXCAVATION METHOD: CAT 420 Backhoe with 24" Bucket		ELEVATION: See Map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; s (0 - 1.5')** @ 0' Light to medium brown silty sand; loose; damp **BEDROCK; Tcag (1.5 - 6.5')** @ 1.5' Medium to light brown silty sandstone; moderately hard; damp; friable; not lithified; some irregular wavey stringers @ 5' Moist; boulder in the sidewall (silty sandstone block); seepage into test pit @ 6' Mottled grayish-brown and rusty brown silty sandstone; hard; wet at contact COMMENTS: 1.5 - 6' Not lithified 6 - 6.5' Lithified silty sandstone	B: N58W,12SW			
5									
10									
15									
20									

TOTAL DEPTH: 6.5 feet N8W→ SCALE: 1 inch = 5 feet



CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. ST-17**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: KPC	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: Rubber tire backhoe w/24" bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; (0 - 9.5')** @ 0' Silty SAND; loose; damp to moist; dark brown to dark grayish brown; roots; voids @ 0-7' Bulk sample @ 4' -rootlets; occasional gravel				
10				SC-SM	**ALLUVIUM; Qa (9.5 - 13')** @ 9.5' Silty, clayey SAND; loose to medium dense; moist; reddish brown; pinhole voids @ 13' Bulk sample COMMENTS: Surface logged below 7'				
20									

TOTAL DEPTH: 13 feet

SCALE: 1 inch = 5 feet

No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. ST-18**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: KPC	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: Rubber tire backhoe w/24" bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; (0 - 3.5')** @ 0' Silty SAND; loose; damp; dark brown to dark grayish brown; rootlets; voids				
				SM	**ALLUVIUM; Qa (3.5 - 13.5')** @ 3.5' Silty SAND; medium dense; damp; grayish brown; few rootlets, voids @ 4.5' -with gravel; light grayish brown; no voids @ 6-7' Bulk sample @ 7' -moist; reddish brown; no rootlets @ 9' -reddish to yellowish brown @ 13.5' Bulk sample				
5									
10									
15					COMMENTS: Surface logged below 7'				
20									

TOTAL DEPTH: 13.5 feet

SCALE: 1 inch = 5 feet

No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. ST-19**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: KPC	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: Rubber tire backhoe w/24" bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**SOIL; (0 - 4')** @ 0' Silty SAND; loose; damp; dark brown to grayish brown; rootlets; voids @ 0-4' Bulk sample				
5				SM	**ALLUVIUM; Qa (4 - 14')** @ 4' Silty SAND; medium dense; damp; light to medium grayish brown @ 6' -medium dense to dense; damp to moist; medium to dark grayish brown				
10					@ 11' -medium to reddish brown @ 13-14' Bulk Sample				
15					COMMENTS: Surface logged below 8'				
20									

TOTAL DEPTH: 14 feet

SCALE: 1 inch = 5 feet

No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. ST-20**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: KPC	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: Rubber tire backhoe w/24" bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0				SM	**ALLUVIUM; Qa (0 - 14')** @ 0' Silty SAND; loose; damp; grayish brown; rootlets; voids; occasional gravel and small cobbles to 4.5'				
5					@ 4.5' -medium dense				
					@ 7' -medium to reddish brown				
10					@ 10-11' Bulk sample				
					@ 12' -yellowish brown				
15					COMMENTS: Surface logged below 6'				
20									

TOTAL DEPTH: 14 feet

SCALE: 1 inch = 5 feet

No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. ST-21**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: KPC	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: Rubber tire backhoe w/24" bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0				SC-SM	**ALLUVIUM; Qa (0 - 15.5')** @ 0' Silty, clayey SAND; loose; damp; dark brown to grayish brown; rootlets; voids; occasional gravel to 3. 5' @ 3.5' -medium dense; moist; no rootlets; no voids @ 6' -medium dense to dense; yellowish brown @ 8' Bulk sample @ 14' -damp; pale yellowish brown @ 14' Bulk sample COMMENTS: Surface logged below 7.5'				
5									
10									
15									
20									

TOTAL DEPTH: 15.5 feet

SCALE: 1 inch = 5 feet

No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. ST-22**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: KPC	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: Rubber tire backhoe w/24" bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0				SM	**ALLUVIUM; Qa (0 - 16')** @ 0' Silty SAND; loose; damp; interbedded grayish brown and yellowish brown; rootlets; occasional gravel to 3.5' @ 0-7' Bulk sample				
					@ 3.5' -no rootlets				
5					@ 4.5' 1"-thick interbed of clayey SAND with gravel; dense; moist; medium brown				
				SC	@ 6.5' Clayey SAND; medium dense; moist; dark brown				
10									
				SM	@ 12' Silty SAND; loose to medium dense; damp; pale yellowish brown				
15				CL-ML	@ 15' Sandy, silty CLAY; soft to firm; wet; yellowish brown @ 15' Bulk sample				
					COMMENTS: Surface logged below 7'				
20									

TOTAL DEPTH: 16 feet

SCALE: 1 inch = 5 feet

No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. ST-23**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: KPC	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: Rubber tire backhoe w/24" bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0					**<u>SOIL</u>; (0 - 2.5')** @ 0' Silty SAND; loose; damp; dark brown to dark grayish brown; rootlets; voids				
				SP-SM	**<u>ALLUVIUM</u>; Qa (2.5 - 13')** @ 2.5' Poorly graded SAND with silt; loose to medium dense; damp to moist; yellowish brown				
5				SM	@ 4' Silty SAND; medium dense; damp; grayish brown to dark brown				
10					@ 10' -yellowish brown				
					@ 12' -pale yellowish brown				
					@ 13' Bulk sample				
15					<u>COMMENTS</u>: Surface logged below 7'				
20									

TOTAL DEPTH: 13 feet

SCALE: 1 inch = 5 feet

No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO: 23-2195s-1	**TRENCH LOG NO. ST-24**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: KPC	
	EXCAVATED: 2/3/06	
EXCAVATION METHOD: Rubber tire backhoe w/24" bucket	ELEVATION: See map	

DEPTH (feet)	SAMPLE TYPE	SAMPLE NUMBER	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	ATTITUDES	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
0				SM	**ALLUVIUM; Qa (0 - 14.5')** @ 0' Silty SAND; loose; damp; grayish to medium brown; roots; voids @ 0-7' Bulk sample @ 1' -medium dense to dense; no voids; rootlets				
				SP-SM	@ 3.5' 3"-thick interbed of poorly graded SAND with silt and gravel; medium dense; moist; grayish brown				
5				SM	@ 4' Silty SAND; medium dense; moist; dark grayish brown				
					@ 7.5' -yellowish brown				
10									
15					@ 14.5' Bulk sample COMMENTS: Surface logged below 7'				
20									

TOTAL DEPTH: 14.5 feet

SCALE: 1 inch = 5 feet

No Ground Water
No Caving

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/7/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-5	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 738'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; Qa (0 - 5')**				
5	■	9		SC	**ALLUVIUM; Qa (5 - 70')** @ 5' Clayey SAND; loose; damp; medium to dark brown; voids	14.7	105		
10	◪	6			@ 10' -yellowish brown				
15	■	18		CL-ML	@ 15' Sandy, silty CLAY; stiff; damp; yellowish to orangish brown	14.2	104	63	
20	◪	4		SM	@ 20' Silty SAND; loose; damp; yellowish brown				
25	■	19			@ 25' -medium dense	6.5	104		
30	◪	7		SC-SM	@ 30' Silty, clayey SAND; loose; damp; yellowish brown			48	
35	■	22		SM	@ 35' Silty SAND; medium dense; damp; pale yellowish brown	7.8	98		Swell/Consol

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/7/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-5	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 738'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40		8			@ 40' -loose; 3" thick, medium brown, sandy lean clay interbed; firm; damp				
45		15		ML	@ 45' Sandy SILT; firm to stiff; damp; pale yellowish brown	8.2	97	53	
50		9		CL	@ 50' -light grayish brown @ 50.5' Lean CLAY; stiff; damp; pale yellowish to orangish brown				
55		39		SC-SM	@ 55' Silty, clayey SAND; medium dense; damp; pale yellowish to orangish brown	13.5	99		Swell/Consol
60		22		SM	@ 60' Silty SAND; medium dense; damp; pale yellowish brown				
65		28		CL	@ 65' Sandy lean CLAY; very stiff; damp; orangish to pale yellowish brown	16.3	102		
70		13			@ 70' -stiff				
					TOTAL DEPTH 70' No Ground Water				
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/8/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-6	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 868'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; Qa (0 - 5')**				
5		11		SM	**ALLUVIUM; Qa (5 - 70')** @ 5' Silty SAND; loose; damp; medium to dark grayish brown	8.5	98		
10		7			@ 10' -damp to moist			33	
15		14		SC-SM	@ 15' Silty, clayey SAND; loose; damp; medium grayish brown	16.5	110		
20		10		SM	@ 20' Silty SAND; loose; damp; yellowish brown				
25		16			@ 25' -moist; medium to yellowish brown	17.5	106		
30		20			@ 30' -medium dense; light grayish to yellowish brown			17	
35		21				11.4	108		

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/8/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-6	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 868'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
		15			@ 40' -wet				
45									
		10			@ 45' -no recovery				
		8		SC-SM	@ 48' Silty, clayey SAND; loose; wet; medium brown	13.8	112		
50									
		21		SM	@ 52' Silty SAND; medium dense; wet; light yellowish brown; and, Lean CLAY with sand; stiff; moist; pale yellowish brown				
55									
		27		SC-SM	@ 55' Silty, clayey SAND; medium dense; moist; light grayish brown to yellowish brown	18.0	105		
60									
		32		SM	@ 60' Silty SAND; dense; slightly moist; light grayish brown to yellowish brown				
65									
		26			@ 65' -medium dense; dry to damp; very light grayish brown to light yellowish brown	3.0	114		
					TOTAL DEPTH 65' Ground Water @ 40'				
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/8/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-7	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 945'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; Qa (0 - 5')**				
5		12		CL	**ALLUVIUM; Qa (5 - 50')** @ 5' Sandy lean CLAY; stiff; damp; dark grayish brown			60	
10		38			@ 10' -very stiff	16.1	114		
15		13		CL-ML	@ 15' Sandy, silty CLAY; stiff; damp; medium to dark brown			50	
20		29		SM	@ 20' Silty SAND; medium dense; damp; yellowish brown	13.1	109		
25		14							
30		20				10.5	109		
35		31			@ 35' -dense			15	

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/8/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-7	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 945'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40		27			@ 40' -medium dense; yellowish brown to pale yellowish brown	12.3	106		
45		17		SC	@ 45' Clayey SAND; medium dense; damp; medium brown @ 45-50' Bulk sample				
50		97/8"			**<u>BEDROCK</u>; Tcac (50')** @ 50' Siltstone; hard; damp; pale yellowish brown	21.6	104		
					TOTAL DEPTH 50' No Ground Water				
55									
60									
65									
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/8/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-8	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 806'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; Qa (0 - 5')**				
5		9		SC-SM	**ALLUVIUM; Qa (5 - 70')** @ 5' Silty, clayey SAND; loose; damp; medium to dark brown; roots				
10		16		CL	@ 10' Sandy lean CLAY; stiff; damp; yellowish brown	16.8	108	58	
15		11							
20		11		SM	@ 20' Silty SAND; loose; damp; light yellowish to pale yellowish brown	4.3	105		Swell/Consol
25		11			@ 25' -medium dense; pale yellowish brown				
30		11		SM	@ 30' -loose; yellowish brown; voids	12.6	105		Swell/Consol
35		11		SC-SM	@ 35' Silty, clayey SAND; medium dense; damp; yellowish to pale yellowish brown				

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: KPC	
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)		DRILLED: 2/8/06	
DRILLING METHOD: Hollow-Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-8
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs		ELEVATION: 806'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
		17		SM	@ 40' Silty SAND; loose; damp; light yellowish brown	7.8	96		Swell/Consol
45									
		10							
50									
		26			@ 50' -medium dense; yellowish brown	15.9	104		
55									
		33			@ 55' -dense				
60									
		push							
		18		SC	@ 63' Clayey SAND; loose; wet; medium brown	18.4	110		
				CL	@ 64' Lean CLAY with sand; stiff; wet; medium brown				
65									
70									
		25			@ 70' -very stiff; gray to grayish brown				
				SC	@ 70.5' Clayey SAND; medium dense; wet; grayish to yellowish brown				
					TOTAL DEPTH 70' Ground Water @ 60'				
75									

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: KPC	
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)		DRILLED: 2/9/06	
DRILLING METHOD: Hollow-Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-9
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs		ELEVATION: 822'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; Qa (0 - 5')**				
5		10		SM	**ALLUVIUM; Qa (5 - 70')** @ 5' Silty SAND; loose; damp; yellowish brown				
10		8		CL-ML	@ 10' Sandy, silty CLAY; firm; damp; yellowish brown	24.0	96	52	
15		8		SM/ML	@ 15' Silty SAND to SILT with sand; loose/firm; damp; yellowish brown				
20		20		SM	@ 20' Silty SAND (minor gravel); medium dense; damp; yellowish to orangish brown	14.0	106		
25		12							
30		13			@ 30' -loose; medium brown	11.6	107		
35		19		SC-SM	@ 35' Silty, clayey SAND; medium dense; damp; yellowish to orangish brown			43	

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: KPC	
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)		DRILLED: 2/9/06	
DRILLING METHOD: Hollow-Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-9
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs		ELEVATION: 822'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
	■	13		SM	@ 40' Silty SAND; loose; damp; yellowish brown	13.3	102		
45	◢	14			@ 45' -medium dense; yellowish to pale yellowish brown			22	
50	■	44			@ 50' -medium to dark brown	7.2	119		
55	◢	19			@ 55' -moist				
60	■	55			@ 60' -with gravel; dense; light grayish brown	11.5	121		
65	◢	23			@ 65' -no gravel; medium dense				
					TOTAL DEPTH 65' Ground Water @ 60'				
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/9/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-10	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 777'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; Qa (0 - 5')**				
5	■	29		CL-ML	**ALLUVIUM; Qa (5 - 70')** @ 5' Sandy, silty CLAY; very stiff; damp; yellowish brown	15.1	112	57	
10	◪	7			@ 10' -firm; light yellowish to orangish brown				
15	■	13		SM	@ 15' Silty SAND; loose; damp; yellowish to orangish brown	9.4	106		
20	◪	8							
25	■	10		ML	@ 25' Sandy SILT; firm; damp; yellowish brown	9.5	102	51	
30	◪	9		CL	@ 30' Sandy lean CLAY; stiff; damp; yellowish brown				
35	■	20		SM	@ 35' Silty SAND; medium dense; damp; yellowish to orangish brown	5.4	107		

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling (Daniel/Steve)	DRILLED: 2/9/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-10	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 777'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
		11		SM/ ML	@ 40' Silty SAND to sandy SILT; medium dense/stiff; damp; light yellowish to medium yellowish brown				
45									
		21		ML	@ 45' Sandy SILT; stiff; damp; light yellowish brown	11.1	102	53	
50									
		13		SM	@ 50' Silty SAND; medium dense; damp; light yellowish brown				
55									
		21				10.5	99		
60									
		19							
65									
		35			@ 65' -light grayish to yellowish brown	5.7	109		
70									
		11		SC	@ 70' -loose; light gray @ 70.5' Clayey SAND; loose; slightly moist; medium brown				
					TOTAL DEPTH 70' No Ground Water				
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/25/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-11	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 917'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0				SC-SM	**SOIL/ALLUVIUM; s/Qa (0 - 5')** @ 0-20' Bulk sample			37	Curve=R
5		14			**ALLUVIUM; Qa (5 - 60')** @ 5' -no recovery; brownish-gray cuttings; wet				
10		26		SC-SM	@ 10' Silty, clayey SAND; medium dense; damp; brownish gray	11.1	111		
15		18		SC-SM	@ 15' Silty, clayey SAND; loose; damp to moist; yellowish brown	9.0	115		
20		21		SM	@ 20' Silty SAND; medium dense; damp; yellowish brown	8.3	107		Swell/Consol
25		18			@ 25' - loose; damp; yellowish brown	13.1	106	35	
30		9		SC-SM	@ 30' Silty, clayey SAND; loose; damp to moist; brown	15.4	109		
35		30		SM	@ 35' Silty SAND; medium dense; wet; yellowish brown	11.1	105		

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/25/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-11	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 917'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
	■	38			@ 40' -with gravel; damp	4.9	118		
45				SM					
	■	13			@ 45' -loose	12.0	109	22	Swell/Consol
50									
	■	30			@ 50' -with gravel; medium dense	6.1	112		
55									
	■	30				4.0	110		
60									
	■	25			**<u>BEDROCK?</u>; Tcac (60 - 65')** @ 60' Silty claystone; stiff; damp	30.6	89		
65									
	■	83/ 10"			@ 65' -hard	27.2	94		
					TOTAL DEPTH 65' No Ground Water				
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/22/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-12	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 880'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; s/Qa (0 - 5')** @ 0 - 20' Bulk Sample				
5	■	18		SC-SM	**ALLUVIUM: Qa (5 - 60')** @ 5' Silty, clayey SAND; loose; damp to moist; grayish brown	6.6	108		
10	■	16				9.4	110		
15	■	15		SM	@ 15' Silty SAND; loose; damp; yellowish brown	7.0	104	10	
20	■	15		SM		6.1	105		Swell/Consol
25	■	16				5.8	105		
30	■	21		SM	@ 30' - medium dense; light yellowish brown	4.7	103	7	Swell/Consol
35	■	21				3.3	112		

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/22/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-12	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 880'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
		24				9.1	112		
45									
		23			@ 45' - yellowish brown	6.9	104	15	
50									
		26				11.7	105		
55									
		31			@ 55' - yellowish brown to brownish orange	14.0	101		
60									
		23			@ 60' - light yellowish brown	8.0	110		
					TOTAL DEPTH 60' No Ground Water				
65									
70									
75									

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: KPC	
DRILLING COMPANY: Valley Well Drilling		DRILLED: 9/22/06	
DRILLING METHOD: Hollow-Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-13
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs		ELEVATION: 893'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; s/Qa (0 - 10')**				
		2		SC-SM	@ 3' Silty, clayey SAND; very loose; damp to wet; dark brownish gray			38	
5									
		8			@ 7' - loose; moist to wet; grayish brown			36	
10		6		SC-SM	**ALLUVIUM; Qa (10 - 60')** @ 10' Silty, clayey SAND; loose; wet; yellowish brown			29	
		4						41	
15									
		6		CL-ML	@ 17' Sandy, silty CLAY; firm; moist; yellowish brown			53	
20		4			@ 20' - soft			50	
		6			@ 23' - firm			64	
25									
		7						55	
30		12		SC-SM	@ 30' Silty, clayey SAND; medium dense; moist; yellowish brown			33	
		15		SM	@ 33' Silty SAND; medium dense; damp; light yellowish brown			21	
35		14						32	
		12						36	

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/22/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-13	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 893'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
		13			@ 42' - yellowish brown			42	
45				ML	@ 45' Sandy SILT; stiff; damp; pale yellow				
		11		SM	@ 46' Silty SAND; medium dense; damp; yellowish brown			38	
				ML	@ 49' Sandy SILT; stiff; damp; light yellowish brown			77	
50		14		SM	@ 50' Silty SAND; ; medium dense; damp; yellowish brown				
		59			@ 52' - with gravel; very dense; dry to damp			31	
55		32		ML	@ 55' Sandy SILT; very stiff; moist; brownish gray	16.4	107		
60		50				17.9	107		
					TOTAL DEPTH 60' No Ground Water				
65									
70									
75									

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: KPC	
DRILLING COMPANY: Valley Well Drilling		DRILLED: 9/21/06	
DRILLING METHOD: Hollow-Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-14
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs		ELEVATION: 857'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; s/Qa (0 - 5')**				
5		17		SP-SM	**ALLUVIUM; Qa (5 - 60')** @ 5' Silty SAND; loose; damp; yellowish brown	6.2	105		
10		16				6.8	109	11	
15		12				8.3	106		
20		14				9.5	107		
25		14		SM		7.3	102	11	Swell/Consol
30		19			@ 30' - medium dense; light yellowish brown	6.0	104		
35		17			@ 35' - loose	6.5	104		

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: KPC	
DRILLING COMPANY: Valley Well Drilling		DRILLED: 9/21/06	
DRILLING METHOD: Hollow-Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-14
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs		ELEVATION: 857'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
	■	20			@ 40' - medium dense	11.0	98	9	
45	■	14		SM	@ 45' - loose	6.3	101		Swell/Consol
50	■	26			@ 50' - medium dense	7.5	114		
55	■	20				5.8	108	14	
60	■	20				12.9	97		
					TOTAL DEPTH 60' No Ground Water				
65									
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/21/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-15	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 801'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; s/Qa (0 - 10')**				
5		7		CL-ML	@ 5' Sandy, silty CLAY; soft; damp; dark grayish brown; rootlets; voids	11.0	107		
10		18		SM	**ALLUVIUM; Qa (10 - 70')** @ 10' Silty SAND; loose; damp; brownish yellow	8.6	111		
15		11		SM		9.4	99		Swell/Consol
20		17			@ 20' - with scattered gravel; light yellowish brown @ 20 - 30' Bulk sample	4.4	109		
25		7		SM	@ 25' - damp; pale yellowish brown	7.6	95	48	Swell/Consol
30		12				8.2	100		
35		18			@ 35' Silty SAND; loose; damp; yellowish brown to pale yellowish brown	10.2	105	46	

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/21/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-15	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 801'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40		16			@ 40' - damp to moist; yellowish brown	6.6	104		
45		13		SM	@ 45' - brown	7.1	105		Swell/Consol
50		15				8.8	110	22	
55		22			@ 55' - medium dense	7.5	106		
60		27		SC	@ 60' Clayey SAND; medium dense; damp; brown to dark brown	12.5	114		
65		25		SM	@ 65' Silty SAND; medium dense; moist; yellowish brown	6.3	104		
70		64		SC-SM	@ 70' Sandy, silty CLAY; hard; moist to wet; yellowish brown	25.5	95	38	
					TOTAL DEPTH 70' No Ground Water				
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/20/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-16	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 1,010'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**SOIL/ALLUVIUM; s/Qa (0 - 5')**				
5		25		CL-ML	**ALLUVIUM; Qa (5 - 15')** @ 5' Sandy, silty CLAY; stiff; damp to moist; dark grayish brown	11.8	81		
10		18				14.5	115	42	
15		52			**WEATHERED BEDROCK; (15 - 25')** @ 15' Grayish brown to orangish brown, silty, clayey sandstone; dense; moist	10.0	119		
20		57			@ 20' Grayish-brown, silty sandstone; dense; moist	13.9	111		
25		32			**BEDROCK; (25 - 40')** @ 25' Bluish-gray, silty sandstone; medium dense; damp	18.1	105		
30		33				18.4	101	25	
35		59			@ 35' - dense	10.8	116		

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/20/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-16	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 1,010'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
	■	55				13.9	109		
					TOTAL DEPTH 40' No Ground Water				
45									
50									
55									
60									
65									
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: KPC		
DRILLING COMPANY: Valley Well Drilling	DRILLED: 9/20/06		
DRILLING METHOD: Hollow-Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-17	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs	ELEVATION: 952'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0				SM	**SOIL/ALLUVIUM; s/Qa (0 - 5')** @ 0 - 20' Bulk sample			25	Curve=N Shear Test
5		24		SC-SM	**ALLUVIUM; Qa (5 - 30')** @ 5' Silty, clayey SAND; medium dense; damp to moist; grayish brown	10.9	111		
10		21			@ 10' - brown to yellowish brown	9.2	108	14	
15		23		SM	@ 15' Silty SAND; medium dense; damp to moist; grayish brown	10.3	110		
20		44		SC-SM	@ 20' Silty, clayey SAND; medium dense; moist; grayish brown with FeO_2 - staining	14.0	116		
25		74		SM	@ 25' Silty SAND with gravel; medium dense; damp to moist; yellowish brown	9.4	116	13	
30		64			**BEDROCK?; Tcag (30 - 35')** @ 30' Yellowish-brown, silty, clayey sandstone; dense; moist	12.3	112		
35		50				18.4	101		
					TOTAL DEPTH 35' No Ground Water				

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/22/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-38	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 847'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**ALLUVIUM; Qa (0 - 46')**				Bulk Sample @ 0 - 10'
5	■	5		SM	@ 5' Silty, fine- to medium-grained SAND; loose; wet; dark brown	23.8	102		
10	■	8			@ 10' - medium dense	13.0	114	22	
15	◢	15			@ 15' - fine-grained; orangish brown				
20	■	36		SM		16.8	108	26	Swell/Consol
25	■	5			@ 25' Disturbed sample, abundant water (1/2 of rings were filled)				
30	◢	29							
35	■	41		SP-SM	@ 35' Poorly graded SAND with silt; medium dense; wet; grayish- to medium brown	14.6	114		

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/22/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-38	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 847'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40		75			@ 40' - dense; moist; with gravel	12.3	117		
45		50/5"			**<u>BEDROCK</u>; Tcag (46 - 55.8')** @ 46' Light tan fine-grained sandstone; dense; moist; sparse coarse-grained sands				
50		50/3"			@ 50' - fine- to medium-grained sands	11.7	113		
55		50/4"				12.7	105		
					TOTAL DEPTH 55.8' (Elev. 791.2') Groundwater at 33' No Caving				
60									
65									
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/23/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-39	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 830'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**ALLUVIUM; Qa (0 - 60')**				
5		4		SM	@ 5' Silty, medium-grained SAND; loose; moist; tan to light brown				
10		18		SM SM	@ 10' - medium dense	13.6	108	12 24	Swell/Consol Bulk Sample @ 10 - 20' EI, Cor Curve=T Shear Test
15		30		CL	@ 15' Sandy CLAY; very stiff; moist; dark brown; fine grained sands	15.0	114	53	Swell/Consol
20		22		SP-SC	@ 20' Poorly graded SAND with clay; medium dense; moist; greyish chert nodules				
25		45				13.6	111	10	
30		24				12.4	116		
35		30		SP-SM	@ 35' Poorly graded SAND with silt; medium dense; moist; light brown				

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/23/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-39	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 830'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
		32				12.4	112		
45									
		41				12.1	110		
50									
		22			@ 50' - yellowish chert nodules				
55									
		65			@ 55' - dense; iron oxidation	12.0	121		
60									
		85/ 11"			**<u>BEDROCK</u>; Tcag (60 - 61.4')** @ 60' Tan to light-brown sandstone; dense; damp; fine- grained matrix with sparse coarse-grained sands; iron oxidation; friable	7.9	104		
					TOTAL DEPTH 61.4' (Elev. 768.6') No Groundwater No Caving				
65									
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/23/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-40	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 836'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**ALLUVIUM; Qa (0 - 25')**				
5		34		SC-SM	@ 5' Silty, clayey SAND; medium dense; moist; dark brown	14.5	117	33	Shear Test
10		21		SC-SM	@ 10 - wet	17.7	108	28	Swell/Consol
15		25		SM	@ 15' Silty SAND; medium dense; wet; dark brown				
20		34		SP-SM	@ 20' Poorly graded SAND with silt; medium dense; moist; fine-grained sand; light brown	17.3	106	11	Swell/Consol
25		87/11"			**BEDROCK; Tcag (25 - 26.4')** @ 25' Light tan to yellowish brown sandstone; dense; moist; white to yellow chert nodules	12.1	113		
30					TOTAL DEPTH 26.4' (Elev. 809.6') No Groundwater No Caving				
35									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/23/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-41	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 867'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**ALLUVIUM; Qa (0 - 30')**				
5		4		SM	@ 5' Silty SAND; loose; wet; dark brown				Bulk Sample @ 5 - 15'
10		25		SC-SM	@ 10' Silty, clayey SAND; medium dense; wet; fine- to medium-grained sands; tan to yellowish brown	16.8	106	13	Swell/Consol
15		12		SC-SM	@ 15' - with gravel; loose; moist; tan to yellowish brown	10.8	103	16	Swell/Consol
20		7			@ 20' - dark brown; jumbled inclusions of tan poorly graded sands				
25		62		SP-SM	@ 25' Poorly graded SAND with silt; medium dense; damp; medium brown	6.3	113		
30		72			**BEDROCK; Tcag (30 - 50.75')** @ 30' Yellowish-brown fine- to medium-grained sandstone with sparse coarse-grained sand; dense; damp; inclusions of clay; chert nodules and iron oxidation	7.5	116		
35		16			@ 35' - with clay				

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/2/23	
		LOGGED BY: CHS	
DRILLING COMPANY: Gregg Drilling, LLC		DRILLED: 5/23/23	
DRILLING METHOD: Hollow Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-41
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs.		ELEVATION: 867'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
	■	49			@ 40' - fine-grained sands; moist	10.0	116		
45	■	59				13.7	119		
50	■	50/3"				11.7	100		
					TOTAL DEPTH 50.75' (Elev. 816.25') No Groundwater No Caving				
55									
60									
65									
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/23/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-42	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 858'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0				**ALLUVIUM; Qa (0 - 20')**				
5	■	42	SM	@ 5' Silty, fine-grained SAND; medium dense; wet; dark brown	12.3	115		
10	■	7		@ 10' - roots	15.5	112		
15	◪	32	SC	@ 15' Clayey, SAND with sparse gravel; medium dense; moist				
20	■	83/ 10"	CL	@ 20' Sandy CLAY; stiff; moist; yellowish-brown	11.1	121		
				BEDROCK; Tcag (21 - 34.4') @ 21' Yellowish-brown silty, fine-grained sandstone; very dense; moist			20	
25	■	50/5"		@ 25' - chert nodules; white tabular inclusions	13.3	110	11	
30	◪	42		@ 30' Interbedded of yellowish brown sandstone and grayish- to yellowish-tan siltstone; medium dense; moist; chert nodules and intrusive gravel				
35	■	50/4"		@ 35' - dense	14.4	105		
				TOTAL DEPTH 35.8' (Elev. 822.2') Perched Groundwater at 15' No Caving				

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/24/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-43	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 885'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**ALLUVIUM; Qa (0 - 10')**				
5		8		SM	@ 5' Silty, fine-grained SAND; loose; wet; dark brown; sparse coarse-grained sand	12.6	109		
10		91			**BEDROCK; Tcag (10 - 43.8')** @ 10' Yellowish-brown fine-grained sandstone; very dense; damp; roots	6.1	133		Bulk Sample @ 10 - 20'
15		20			@ 15' - medium dense; dark yellowish-brown; chert nodules				
20		52			@ 20' - dense	13.8	117		
25		24			@ 25' - with silt and clay	16.3	112	12	
30		26							
35		45				13.6	113		
		74			@ 38' Pale yellow to yellowish-brown fine-grained sandstone with sparse	13.0	121		

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/24/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-43	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 885'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40					coarse-grained sand and gravel; dense; moist; iron oxidations				
		50/2"			@ 43' - very dense; damp	8.2	130		
45					TOTAL DEPTH 43.7' (Elev. 841.3') Perched Groundwater at top of boring No Caving				
50									
55									
60									
65									
70									
75									

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/2/23	
		LOGGED BY: CHS	
DRILLING COMPANY: Gregg Drilling, LLC		DRILLED: 5/24/23	
DRILLING METHOD: Hollow Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-44
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs.		ELEVATION: 949'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**<u>WEATHERED BEDROCK</u>; Tcag (0 - 10')**				
5		69			@ 5' Dark grayish-brown silty sandstone with sparse gravel; very dense; damp to moist; iron oxidation				
10		57			**<u>BEDROCK</u>; Tcag (10 - 41.25')** @ 10' Clayey, fine-grained SAND; dense; moist; light yellowish- to grayish-brown; well cemented	11.2	121		
15		68			@ 15' Gray to grayish-brown fine-grained sandstone with silt and sparse coarse-grained; dense; damp; well cemented	13.1	118	23	Shear Test
20		31							
25		47		CL	@ 25' Gray sandy mudstone; stiff; wet; interbeds of clayey sandstone and sandy mudstone	26.2	102	84	Sieve % -5 micron= 44 LL= 46 PI= 29 Shear Test
30		65			@ 30' Gray fine-grained sandstone; dense; damp	7.5	112		
35		39							

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/24/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-44	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 949'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
	■	92/9"			@ 40' - moist	12.9	116		
					TOTAL DEPTH 41.25' (Elev. 907.75') No Groundwater No Caving				
45									
50									
55									
60									
65									
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/24/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-45	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 903'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**<u>ALLUVIUM</u>; Qa (0 - 30')**				Bulk Sample @ 0 - 10'
5	■	38		SM	@ 5' Silty SAND; medium dense; wet; medium brown; sparse coarse-grained sands	16.5	113		
10	◤	10			@ 10' - loose; moist; fine-grained sands				
15	■	33			@ 15' - medium dense; pale brown	13.6	115		Groundwater perched @ 15' holed flooded to the top
20	■	18		SM	@ 20' - medium dense; dark yellowish-brown	17.0	109	24	Swell/Consol
25	◤	13							
30	■	64			**<u>BEDROCK</u>; Tcag (30 - 36.5')** @ 30' Grayish- to yellowish-brown silty, fine-grained sandstone; dense; moist	11.0	124	30	
35	■	49			@ 35' Gray clayey, fine-grained sandstone with gravel; hard; dense; moist	16.1	114	34	
					TOTAL DEPTH 36.5' (Elev. 866.5') Perched Groundwater at 15' No Caving				

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/2/23	
		LOGGED BY: CHS	
DRILLING COMPANY: Gregg Drilling, LLC		DRILLED: 5/24/23	
DRILLING METHOD: Hollow Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-46
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs.		ELEVATION: 935'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0				SC-SM	**ALLUVIUM; Qa (0 - 4.5')** @ 0' Silty, clayey fine-grained SAND; loose; damp; grayish-brown to light brown				
5		50/2"			**BEDROCK; Tcag (4.5 - 21.4')** @ 4.5' Pale tan to yellowish-brown silty, fine-grained sandstone with some gravel; dense; damp	8.5	110		
10		51			@ 10' - moist	11.0	121	38	
15		48							
20		67/10"			@ 20' - some sparse coarse-grained sands	8.6	121		
					TOTAL DEPTH 21.4' (Elev. 913.6') No Groundwater No Caving				
25									
30									
35									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/25/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-47	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 865'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**ALLUVIUM; Qa (0 - 25')**				
5	■	17		SC	@ 5' Clayey SAND; medium dense; wet; black to very dark brown	17.4	112		Bulk Sample @ 5 - 15'
10	◢	9			@ 10' - with sparse coarse-grained sand and gravel				
15	■	26		SC		17.5	111	47	Swell/Consol Shear Test
20	◢	7			@ 20' - fine-grained sand; medium to dark brown; no gravel				
25	■	58			**BEDROCK; Tcag (25 - 51.4')** @ 25' Yellowish-brown to tan sandstone; dense; moist; spotchy clay inclusions and roots; sparse gravel; jumbled gray silts and clays; chert fragments	10.3	113	14	
30	◢	72/ 11"			@ 30' - light tan to yellowish-brown fine-grained sandstone; damp; no roots				Harder Drilling @ 30'
35	■	50/5"			@ 35' - dry	3.1	110	8	Shear Test

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/25/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-47	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 865'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40		50/5"							
45		50/3"			@ 45' - damp	5.5	111		
50		92/ 10"			@ 50' - very dense				
					TOTAL DEPTH 51.4' (Elev. 813.6') No Groundwater No Caving				
55									
60									
65									
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/25/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-48	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 790'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**ALLUVIUM; Qa (0 - 51.5')**				Bulk Sample @ 0 - 10'
5		2		ML	@ 5' Sandy SILT with sparse gravel; very loose; moist; dark brown				
10		10		ML	@ 10' - stiff; wet	17.4	104	51	Swell/Consol
15		14		SM	@ 15' Silty, fine-grained SAND; medium dense; damp; yellowish-tan				
20		27			@ 20' - pale tan to light yellowish-brown	5.3	102		
25		11							
30		31			@ 30' - dry	2.4	106		
35		24							

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/2/23	
		LOGGED BY: CHS	
DRILLING COMPANY: Gregg Drilling, LLC		DRILLED: 5/25/23	
DRILLING METHOD: Hollow Stem Auger		HOLE DIA: 8"	**BORING NO.** HS-48
HAMMER TYPE: Automatic		AVERAGE DROP: 30"	
DRIVING WEIGHTS: 140 lbs.		ELEVATION: 790'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
40									
		39			@ 40' - with coarse-grained sands	2.5	105	17	
45		20							
50		29			@ 50' - damp	5.4	109		
					TOTAL DEPTH 51.5' (Elev. 738.5') No Groundwater No Caving				
55									
60									
65									
70									
75									

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/2/23		
	LOGGED BY: CHS		
DRILLING COMPANY: Gregg Drilling, LLC	DRILLED: 5/25/23		
DRILLING METHOD: Hollow Stem Auger	HOLE DIA: 8"	**BORING NO.** HS-49	
HAMMER TYPE: Automatic	AVERAGE DROP: 30"		
DRIVING WEIGHTS: 140 lbs.	ELEVATION: 810'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 12"	GRAPHIC LOG	USCS SYMBOL	DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	Dry Density (pcf)	% Fines	Other Tests
0					**ALLUVIUM; Qa (0 - 36.5')**				
5	■	14		SM	@ 5' Silty SAND; medium dense; moist; dark brown	13.7	107		
10	◪	6		SM				21	Bulk Sample @ 10 - 20' EI Curve=U Shear Test
15	■	15		SM	@ 15' Silty, fine-grained SAND with sparse coarse-grained sands; medium dense; moist; yellowish- to orangish-brown	12.4	107	30	
20	◪	6							
25	■	20			@ 25' - damp	7.5	107		
30	◪	9							
35	■	21				6.8	107		
					TOTAL DEPTH 36.5' (Elev. 773.5') No Groundwater No Caving				

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS: GRAPH	SYMBOLS: LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS: MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS: MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE SIZE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	Well-graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	Silty gravels, gravel-sand-silt mixtures
				GC	Clayey gravels, gravel-sand-clay mixtures
	SAND AND SANDY SOILS: MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE SIZE	CLEAN SANDS (LITTLE OR NO FINES)		SW	Well-graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
FINE GRAINED SOILS: MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	Inorganic silts and very fine sands, clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
				OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	Inorganic silts, micaceous or diatomaceous fine, sandy or silty soils, elastic silts
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS				PT	Peat and other highly organic soils

Notes:
(1) Dual USCS symbols, such as SP-SM, denote 5 to 12% of minor constituent.
(2) Dual USCS symbols, such as SM/ML, denote borderline soil classifications.
(3) Subsurface information from boring and test pit logs depict conditions only at the specific locations. and dates indicated. Soil conditions and water levels at other locations may differ from conditions at these locations. Also, the conditions at these locations may change with time.
(4) Blow counts on logs are the number of blows to drive the sampler with the weight and drop height indicated on each log.
(5) Split-barrel sampler driving record applies only to hollow-stem-auger and rotary-wash borings.
(6) These logs are subject to the limitations, conclusions, and recommendations in this report.

HS: Hollow-stem-auger boring
RW: Rotary-wash boring
B: Bucket-auger boring

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586 Test Method
- CALIFORNIA DRIVE — Split-barrel sampler in accordance with ASTM D-3550 Test Method
- DISTURBED CALIFORNIA DRIVE
- SHELBY TUBE — Thin-walled sampler in accordance with ASTM D-1587 Test Method
- BULK SAMPLE
- NO RECOVERY

GROUND WATER DATA

- GROUND WATER WHILE DRILLING
- GROUND WATER AFTER DRILLING

DENSITY OF GRANULAR SOILS	
DESCRIPTION	SPT BLOWS PER FOOT
Very Loose	< 4
Loose	4 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

STRENGTH OF COHESIVE SOILS	
CONSISTENCY	SPT BLOWS PER FOOT
Very Soft	< 2
Soft	2 - 4
Firm	5 - 8
Stiff	9 - 15
Very Stiff	16 - 30
Hard	> 30

SPLIT-BARREL SAMPLER DRIVING RECORD	
BLOW COUNT	DESCRIPTION
25	25 blows drove the sampler 12 inches, after initial 6 inches of seating
50/7"	50 blows drove the sampler 7 inches, after initial 6 inches of seating
Ref/3"	50 blows drove the sampler 3 inches during initial 6-inch seating interval

LABORATORY TESTING ABBREVIATIONS

Plasticity Index	PI	Compaction Curve	Curve=A
Liquid Limit	LL	Consolidation / Collapse	Consol
Hydrometer	%-5 micron	Direct Shear / Reshear / Remold	Shear Test
Expansion Index	EI		
Corrosivity Analysis	Cor		

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

USCS Soil Classification and Key to Boring Log Symbols

CLIENT: Solstra Communities California LLC		JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Tri-Valley Drilling		DRILLED: 2/9/06	
DRILLING METHOD: Bucket-Auger (116' Rig)		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-1
DRIVING WEIGHTS: 0-30' 5952lbs,30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lbs		ELEVATION: 777'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						<u>SOIL/SLOPEWASH</u>; s/Qsw (0 - 9') @ 0' Dark brown sandy clay; soft; moist; pinhole voids	@ 0-3' Casing
5			Soil/ Qsw				
10		3 4	QTp			**<u>BEDROCK</u>; QTp (9 - 62')** @ 9' Yellowish-brown sandy, clayey siltstone; soft to moderately hard; moist ; gradational contact with overlying soil/Qsw	
						@ 12' Coarsens down to silty fine-grained sandstone; moderately hard	
				B: N43W, 38NE		@ 13' 1-inch-thick dark brown clay bed	
15							
				B: N44W, 37NE		@ 18.5' 0.75-inch-thick yellowish-brown claystone interbed	
20		5 5		Apx B: N40W, 35NE		@ 20.5 2-inch-thick sandy claystone interbed	
25				B: N43W, 37NE		@ 26' 2.5-inch-thick brown claystone interbed; slightly plastic; no striations observed	@ 26 - 27' Bulk Sample
		4 7				@ 26.5' Dark yellowish-brown sandy mudstone; damp to moist @ 28' Grades to sandy siltstone	
30				Apx B: N48W, 33NE		@ 31' Pebbly sandstone interbed	
						@ 32' Fines slightly down to sandy mudstone	
						@ 33.5' Concretionary bed	
35							

CLIENT: Solstra Communities California LLC		JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Tri-Valley Drilling		DRILLED: 2/9/06	
DRILLING METHOD: Bucket-Auger (116' Rig)		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-1
DRIVING WEIGHTS: 0-30' 5952lbs,30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lbs		ELEVATION: 777'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
40						@ 38.5' Yellowish-brown silty sandstone; slightly irregular contact with overlying mudstone	
		13 13/1"				@ 40' Coarsens down to pale yellowish-brown fine-to medium grained sandstone; very friable; massive	Shear Test
						@ 41' Scattered pebbles; pebbles consist of subrounded to rounded clasts of diatomaceous mudstone	
45						@ 44' Hole is "belling" up to 8"	
				B: N45W, 35NE		@ 47' 1-foot-thick mudstone interbed; no striations observed	@ 47 - 48' Bulk Sample
			Qtp				
50		18 5/.05"					
55							
60		39/6"					
						@ 62' Caving; no progress after repeated bucket removals	Backfill lamped every 5'
						TOTAL DEPTH 62' (Elev. 715')	
						No Ground Water	
65						Caving @ 62'	
70							
75							

CLIENT: Solstra Communities California LLC	JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Tri-Valley Drilling	DRILLED: 2/10/06		
DRILLING METHOD: Bucket-Auger (116' Rig)	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-2	
DRIVING WEIGHTS: 0-30' 5952lbs,30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lbs	ELEVATION: 847'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
			Soil/ Qsw			**SOIL/SLOPEWASH; s/Qsw (0 - 5')** @ 0' Dark brown sandy silt/clay; soft; moist @ 3' Strong brown silty sand with pebbles; loose; moist to wet	@ 0 - 3' Casing
5						**QUATERNARY LANDSLIDE; Qls (5 - 14')** @ 5' Yellowish-brown silty, clayey fine-grained sand; soft; moist	
			Qls	Apx B: N50W, 34NE B: N50W, 31NE		@ 7' 1-inch-thick yellowish-brown clay interbed @ 8' Silty, pebbly sand; very friable	
10		4 3				@ 10' Jumbled silty sand and pebbly sand; chaotic liesegang banding @ 11' Chaotic assemblage of sand and clay; no continuity to the units	
		P/5" 5/7"					@ 12 - 13' Bulk Sample Shear Test
15				B: N22W, 27NE		**BEDROCK; QTp (14 - 38')** @ 14' Olive-gray mudstone; soft-to moderately hard; moist @ 15' Moderately hard	@ 14' Contact between Qls and QTp not planar or well-defined
			QTp	B: N38W, 33NE B: N40W, 32NE		@ 16' 2-inch-thick claystone interbed @ 17' Interbedded silty sandstone and mudstone; well-bedded	
20				B: N34W, 33NE B: N33W, 31NE		@ 19.5' Laminated fine-grained sandstone	
		P/9" 2/3" P/5" 4/7"		B: N31W, 30NE Apx B: N31W, 31NE		@ 20.5' Olive-gray claystone; damp; massive	
25							
30		4 5			CH		LL= 111 PI= 68 Shear Test
						@ 32' Scattered pebbles consisting of diatomaceous mudstone and brick-red pebbles of indeterminate origin (likely weathered ryholite)	
35							
			Tcag			@ 36' Sandy mudstone with pebbles @ 37' Resistant clayey siltstone bed	

CLIENT: Solstra Communities California LLC	JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Tri-Valley Drilling	DRILLED: 2/10/06		
DRILLING METHOD: Bucket-Auger (116' Rig)	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-2	
DRIVING WEIGHTS: 0-30' 5952lbs,30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lbs	ELEVATION: 847'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
		QTp		B: N30W, 31NE		**BEDROCK: Tcag? (38 - 65')**	@ 38' Driller said drilling became more difficult
40		Tcag		Apx B: N37W, 32NE		@ 38' Pale yellowish-brown fine-to medium-grained sandstone; moderately-hard; damp; generally massive, with some cross-bedding apparent; wispy laminae/ iron-oxide staining; friable	Shear Test
		9 16/3"		XB: N24W, 38NE		@ 42.5' Bedding attitude within sandstone may represent channelling	
45							
						@ 48' Hole is "belling" up to 6"; very friable	
50						@ 49' Shallower, undulatory laminations; channel deposits	
		13 18/3"		Apx B: N29W, 30NE			
55				fr: N32W, 55NE		@ 55' Iron-oxide-stained fracture	
				B: N50W, 31NE			
60		29/4"					
65						TOTAL DEPTH 65' (Elev 782') No Ground Water No Caving	Backfill tamped every 5'
70							
75							

CLIENT: Solstra Communities California LLC	JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Tri-Valley Drilling	DRILLED: 2/13/06		
DRILLING METHOD: Bucket-Auger (116' Rig)	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-3	
DRIVING WEIGHTS: 0-30' 5952lbs,30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lbs	ELEVATION: 970'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						SOIL; s (0 - 3') @ 0' Dark brown silty sand to sandy silt; soft; moist	@ 0 - 3.5' Casing
						QUATERNARY LANDSLIDE; Qls (3 - 24') @ 3.5' Yellowish-brown silty sand; soft to moderately hard; damp to moist; some wispy oxidized zones and laminae; jumbled appearance	
5						@ 5' Scattered pebbles	
						@ 7' friable	
10	■	4 5				@ 10' Grayish-brown fine-to medium-grained sand	@ 10 - 20' Bulk Sample
						@ 12' Moist	
15						@14' Very small seep	
						@ 18.5' Pebbly; soft	
20	■	4 5					
25				Apx B: horizontal		**BEDROCK/QUATERNARY LANDSLIDE? Tcac/Qls? (24 - 44')** @ 24' Pale yellowish-brown sandy siltstone; moderately hard; damp; friable; sharp, non-planar contact with overlying Qls; roughly horizontal laminations; laminations offset 1/4" to 4" by subvertical minor faults; minor faults only expressed by offset laminations	
						@ 26' 1-foot-diameter soft zone	
30	■	7 10			CL	@ 28.5' Grayish-brown sandy mudstone; massive; contact with overlying unit is sharp and slightly channelized; some iron-oxide staining @ 30' Minor faults not observed; may be due to the massive nature of the mudstone	LL= 43 PI= 20 Shear Test
				Apx B: horizontal		@ 32' Coarses down to yellowish-brown sandy siltstone to silty fine-grained sandstone; moist; massive	
35						@ 33' Grayish-brown clayey mudstone; moist; abundant oxidation staining	

CLIENT: Solstra Communities California LLC	JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: MBW	
DRILLING COMPANY: Tri-Valley Drilling	DRILLED: 2/13/06	
DRILLING METHOD: Bucket-Auger (116' Rig)	HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-3
DRIVING WEIGHTS: 0-30' 5952lbs,30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lbs	ELEVATION: 970'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
40		4 6	Tca.c./ Qls?			@ 42' Moist to wet @ 43' Caving; "belling" up to 18" @ 44' Ground Water	@ 44' Ground water presumed to be associated with cattle pond located just south of boring
45							Backfill tamped every 5'
50						TOTAL DEPTH 47' (Elev. 923') Minor seep @ 14' Ground Water @ 44' Caving @ 43'	
55							
60							
65							
70							
75							

CLIENT: Solstra Communities California LLC		JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Tri-Valley Drilling		DRILLED: 2/13/06	
DRILLING METHOD: Bucket-Auger (116' Rig)		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-4
DRIVING WEIGHTS: 0-30' 5952 lbs, 30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lb		ELEVATION: 833'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
			Soil Qsw			**SOIL/SLOPEWASH; s/Qsw (0 - 10')** @ 0' Dark brown to black clayey, silty sand with pebbles; loose; moist	@ 0 - 2.5' Casing
						@ 3' Dark brown clayey, silty sand with pebbles	
5						@ 5' Glass fragment brough up in bucket; possibly artificial fill	
10		P/3" 2/3" 3	QTp			**BEDROCK; QTp (10 - 50')** @ 10' Brown silty, pebbly sandstone; soft; moist; gradational contact with overlying soil/Qsw; friable; weathered to a depth of 12.5'	
						@ 12.5' Yellowish-brown pebbly fine-to coarse-grained sandstone; moderately hard; damp to moist	
15					SP-SC	@ 14.5' Abundant pebbles; predominately consist of clasts of diatomaceous mudstone	@ 15 - 20' Bulk Sample Shear Test Curve=A
				XB: N58W, 28NE		@ 16.5' Fine- to medium-grained sandstone; damp; some cross-bedding	
				XB: N42W, 30NE		@ 17.5' Locally laminated; some cross-bedding	
20		7 11		B: N40W, 24NE		@ 19.5' Caliche-lined fractures (1/4 to 1/2" wide)	
						@ 21' Abundant cross-bedded laminations	
						@ 22' Pebbly sandstone	
				B: N50W, 25NE			
25							
				B: N50W, 22NE		@ 27' Very pebbly sandstone; massive	
30		11 12/3"				@ 30' Mudstone rip-up	
35				B: N48W, 25NE		@ 35' Medium- to coarse-grained sandstone with pebbles	
				B: N43W, 20NE		@ 37' 1-foot-thick section of laminated sandstone	

CLIENT: Solstra Communities California LLC		JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Tri-Valley Drilling		DRILLED: 2/13/06	
DRILLING METHOD: Bucket-Auger (116' Rig)		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-4
DRIVING WEIGHTS: 0-30' 5952 lbs, 30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lb		ELEVATION: 833'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
40	■	19 12/2"	Qtp	B: N46W, 22NE		@ 41' Dark yellowish-brown sandy mudstone with scattered pebbles; damp to moist; massive	
45							
50	■	34/6"				TOTAL DEPTH 50' (Elev 783') No Ground Water No Caving	Backfill lamped every 5'
55							
60							
65							
70							
75							

CLIENT: Solstra Communities California LLC		JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Tri-Valley Drilling		DRILLED: 2/14/06	
DRILLING METHOD: Bucket-Auger (116'Rig)		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-5
DRIVING WEIGHTS: 0-30' 5952 lbs, 30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lb		ELEVATION: 805'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						SOIL/SLOPEWASH; s/Qsw (0 - 8')	@ 0 - 2.5' Casing
						@ 0' Dark brown to black silty, sandy clay; soft; moist	
						@ 3' Dark brown; local pebbles	
5							
						QUATERNARY OLDER ALLUVIUM; Qoa (8 - 34')	
						@ 8' Brown silty, clayey sand; loose; moist	
10	■	2 3					
						@ 14' Yellowish-brown silty sand with pebbles; medium dense; damp to moist; massive	
15						@ 16' 6-inch-thick pebbly sand lense	
						@ 18' Interbedded sand and pebbly sand; damp; massive; channelized	
20	■	3 5		B: N15E, 5NW	SP-SM		@ 20 - 30' Bulk Sample **Curve=B**
25				Apx B: N64W, 9NE			
				B: N43W, 6NE			
30	■	5 9		B: N70W, 8SW		@ 29.5' Extremely cross-bedded	
				Apx Cnt: N40-60W, 34NE		**BEDROCK; QTp (34 - 50')**	
35				fr: N82E, 62SE fr: N20W, 54NE		@ 34' Yellowish-brown fine-grained sandstone; moderately hard; friable; damp; some caliche-lined fractures and wispy black laminae; cross-bedded; non-planar contact with overlying Qoa	
				B: N43W, 36NE		@ 35' Iron-oxide-stained fracture	
				B: N60W, 35NE			

CLIENT: Solstra Communities California LLC		JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Tri-Valley Drilling		DRILLED: 2/14/06	
DRILLING METHOD: Bucket-Auger (116'Rig)		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-5
DRIVING WEIGHTS: 0-30' 5952 lbs, 30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lb		ELEVATION: 805'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
40	■	19 10/1"	QTp			@ 40' Hole is "belling" up to 9"	
45						@ 45' Caving; "belling" up to 24"	
50	■	18 10/1"				TOTAL DEPTH 50' (Elev. 755') No Ground Water Caving @ 45'	Backfill tamped every 5' Shear Test
55							
60							
65							
70							
75							

CLIENT: Solstra Communities California LLC	JOB NO.: 06-2195 (0)	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Tri-Valley Drilling	DRILLED: 2/14/06		
DRILLING METHOD: Bucket-Auger (116' Rig)	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-6	
DRIVING WEIGHTS: 30' 5952 lbs, 30-57' 3921 lbs, 57-86' 2531 lbs, 86-116' 1407 lb	ELEVATION: 1115'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						BEDROCK; Tcag (0 - 15')	Surface logged only
						@ 0' Dark grayish-brown pebbly sandstone with silt; moist	
						@ 3' Grayish-brown pebbly, clayey sandstone; moist; some iron-oxide staining	
5							
		7 8				@ 5' Grayish-brown sandy mudstone; moist; yellowish-brown silty fine-grained sandstone in the bottom of the sampler	@ 5 - 15' Bulk Sample
						@ 6' yellowish-brown silty fine-grained sandstone; damp to moist	
						@ 8' Yellowish-brown sandstone with pebbles	
10							
		8 10/3"				@ 10' Yellowish-brown sandy siltstone/silty sandstone; damp to moist	Shear Test
15							
		6 12				@ 15' Yellowish-brown to strong brown fine- to medium-grained sandstone; damp	Shear Test Backfill tamped every 5'
						TOTAL DEPTH 15' (Elev. 1100') No Ground Water No Caving	
20							
25							
30							
35							

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: All Ways Drilling Inc.	DRILLED: 9/11/06		
DRILLING METHOD: Track-mounted Spiradrill	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-8	
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs	ELEVATION: 985'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						SOIL/SLOPEWASH; s/Qsw (0 - 5') @ 0' Brown to dark-brown sandy silt; soft; moist	Casing @ 0 - 5'
5	■	3 6		112 / 14.9		**LANDSLIDE; Qls (5 - 28')** @ 5' Brown sandy silt with clay and pebbles; soft; moist	% fines = 42 Shear Test
						@ 8' Light-brown silty sand; very soft	
10				Ap xB: N24W, 10SW		@ 10' Soft to moderately hard; some vague bedding	
				Ap xCtc: N42E, 3SE		@ 11.75' Brown silty, fine-grained sandstone; moderately hard; moist; nonplanar, shallow contact with overlaying landslide debris	
				B: N85E, 4SE Ap xXB: N26W, 6SW		@ 13.5' Interbedded light-brown, fine-grained sandstone and brown sandy siltstone	
15	■	2 4		103 / 16.3		@ 14' Some channeling / cross-bedding	
20						@ 20' Pebbly fine-grained sandstone; moist to wet; massive	
						@ 23' Sandy, clayey siltstone	
25	■	2 5		B: N56W, 5NE XB: N41W, 8NE			
				Ap xB/Ctc: N67E, 10NW		**BEDROCK; Tcag (28 - 68.5')** @ 28' Olive-yellow silty fine-grained sandstone; dense but very friable; moist; wispy laminations	
30			Tcag				
	■	3 5		92 / 18.5 B: N34W, 7NE		@ 31.5' Laminated fine-grained sandstone	% fines = 35
35				Apx B: N80W, 3NE		@ 35.5' Some channeling / cross-bedding	

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: All Ways Drilling Inc.	DRILLED: 9/11/06		
DRILLING METHOD: Track-mounted Spiradrill	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-8	
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs	ELEVATION: 985'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
				B: N38W, 8NE		@ 38' Fairly planar laminations	
40							
		3 7		B: N42W, 7NE 101 / 10.9			
				B: N26W, 6NE			
45			Tcag				
						@ 48' Wispy silt-infilled fractures	
50		3 7		94 / 11.0			
				B: N54W, 10NE		@ 53' Wispy, undulatory laminations	
						@ 54' Brown sandstone; channel deposits	
55							
						@ 56' Light-brown fine-grained sandstone interbeds; extremely contorted; wispy	
				Apx B / XB: N32W, 10NE		@ 58.5' Pebble line	
60		4 9		102 / 10.6		@ 59' Cross-bedded laminations	
						@ 63' 1 foot thick cobbly pebble interbed	
65						@ 65' 6-inch thick pebbly sandstone interbed	
						<u>BEDROCK</u>; Tcac (68.5 - 75')	
70		40	Tcac	101 / 17.7		@ 68.5' Light brownish-gray sandy siltstone	% fines = 95 Shear Test

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: All Ways Drilling Inc.		DRILLED: 9/11/06	
DRILLING METHOD: Track-mounted Spiradrill		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-8
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs		ELEVATION: 985'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
75		6 12		100 / 18.6		TOTAL DEPTH 75' (Elev. 910') No Groundwater No Caving	
80							
85							
90							
95							
100							
105							
110							

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 9/12/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-9
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs		ELEVATION: 943'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						SOIL/SLOPEWASH; s/Qsw (0 - 4') @ 0' Brown sandy silt; soft; damp	Casing @ 0 - 5' Bulk Sample @ 0 - 15'
5	■	4 6		99 / 9.1		**BEDROCK; Tcac (4 - 75')** @ 5' Light gray sandy siltstone; moderately hard; damp; massive; scattered dark brown wispy fractures; some yellow discoloration	
				Apx B: N78W, 20NE		@ 6.5' Vague laminations	
10			Tcac				
15	■	3 7		100 / 6.9		@ 14' Fractures not as prevalent as above	% fines = 95 Shear Test
						@ 16' Some orangish-brown oxidation staining	
20							
25	■	6 15		106 / 9.5		@ 24' Moderately hard to hard @ 24.5' Abundant oxidation to 28'	
				B?: N88E, 23NW		@ 27' Oxidation banding; may represent bedding	
30							
35	■	8 14		103 / 12.6		@ 36' Abundant oxidation	

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 9/12/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-9
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs		ELEVATION: 943'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
				B?: N58E, 19NW B?: N72E, 16NW		@ 38' Oxidation banding; may represent bedding	
40				B?: N63E, 17NW			
45		10 17		107 / 13.6			
50			Tcgc			@ 50' 4-inch thick pebble bed @ 52' Grades to olive-yellow silty fine-grained sandstone; moderately friable	
55		15 20		Apx B: N60E, 23NW 100 / 9.5 XB: N23E, 24NW		@ 55' Vague laminations @ 56.5' Grayish-brown sandy siltstone; contact with overlying sandstone is sharp and slightly channelized	
60							
65		7 17		95 / 8.7			% fines = 78 Shear Test
70							

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 9/12/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-9
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs		ELEVATION: 943'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
75		15 25		96 / 7.3			
						TOTAL DEPTH 75' (Elev. 868') No Groundwater No Caving	
80							
85							
90							
95							
100							
105							
110							

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23	
	LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling	DRILLED: 9/13/06	
DRILLING METHOD: Bucket-Auger	HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-10
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs	ELEVATION: 914'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						<u>SOIL/SLOPEWASH</u>; s/Qsw (0 - 3') @ 0' Brown sandy silt; soft; damp	Casing @ 0 - 3'
5		8 10	Qls	B: N52W, 13NE		**<u>LANDSLIDE</u>; Qls (3 - 18')** @ 3' Brown silty sandstone with pebbles; moderately hard; damp; slightly disturbed; likely weathered and creep-affected bedrock @ 4' Mottled light gray and pale brown sandy mudstone; massive	
10						@ 7' Coarsens to silty fine-grained sandstone; slightly friable @ 8' Brown mudstone with gray sandstone clasts / channels; some scattered roots	
15		10 15		99 / 5.7		@ 13' Sandstone clasts / channels more abundant	
				Apx B: N50W, 9NE Apx B: N80E, 5NW		@ 16' 6-inch thick pebble bed @ 16.5' Light gray silty fine-grained sandstone; vague laminations @ 17' Vague, discontinuous laminations **<u>BEDROCK</u>; Tcac (18 - 36')** @ 18' Light gray silty fine-grained sandstone; moderately hard; dry to damp; appears to be less disturbed as above, but no slide plane observed	
20							
				Apx B: N45W, 18NE		@ 21.5' White to light gray sandy siltstone; damp; massive; some oxidation staining @ 22.5' Vague laminations	
25		10 15		113 / 6.6			% fines = 46 Shear Test
			Tcac			@ 25.5' Clay rip-up @ 26' Scattered pebbles @ 27' White fine-grained sandstone with silt and pebbles; massive; wispy brown features	
30							
35				102 / 7.7			

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 9/13/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-10
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs		ELEVATION: 914'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						TOTAL DEPTH 36' (Elev. 878') No Groundwater No Caving	
40							
45							
50							
55							
60							
65							
70							

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Allways Drilling	DRILLED: 9/13/06		
DRILLING METHOD: Bucket-Auger	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-11	
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs	ELEVATION: 918'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						LANDSLIDE; Qls (0 - 9.25')	Casing @ 0 - 3. 5'
						@ 3.5' Brown silty sand; soft; damp	
5						@ 4' 1.5-inch thick discontinuous white sand lens	
		5 8		102 / 10.0		@ 5.5' White sand; truncates to the north	% fines = 16 Shear Test
			Qls:			@ 8' Pale yellow sand; moist; very friable	
10				Ctc/B: N60W, 14NE		**LANDSLIDE; Qls? (9.25 - 26')** @ 9.25' Brown sand with silt and pebbles; soft; moist; much less jumbled than above; very planar contact	
			Qls?				
15				Apx B: Horizontal		@ 14' 1-inch thick gray silt interbed	
		3 5		113 / 9.8			% fines = 23 Shear Test
				Apx B: N80W, 2NE		@ 16' 1-inch thick gray silt interbed	
20						@ 20' Extreme belling (up to 1.5' laterally)	
						@ 21' Groundwater on 9/14/06	
						@ 22' Bottom of hole on 9/14/06 due to caving	
25						@ 24' Groundwater at time of drilling	
		3 4					
						TOTAL DEPTH 26' (Elev. 892') Groundwater @ 24' Caving @ 20'	
30							
35							

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Allways Drilling	DRILLED: 9/14/06		
DRILLING METHOD: Bucket-Auger	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-12	
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs	ELEVATION: 1,026'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						SOIL/SLOPEWASH; s/Qsw (0 - 2') @ 0' Brown sandy silt; soft; damp	Casing @ 0 - 5'
						BEDROCK; Tcac (2 - 36')	
5		10 20		106 / 9.9		@ 5' Olive-yellow siltstone with sand; moderately hard; damp; scattered light gray mottling	Bulk Sample @ 5 - 10'
			Tcac				
10						@ 9' Clay rip-up @ 10.5' Light gray caliche-rich clay pod; 9" diameter; surrounded by orangish-brown oxidized "halo" @ 12.5' Mottled olive yellow and light gray @ 13.5' Predominately light gray	
15		8 20		110 / 14.4		@ 16' Some oxidation staining	% fines = 84 Shear Test
20						@ 20' Grades to light gray clayey siltstone @ 21.5' Sandy siltstone @ 22' Vague laminations; not continuous	
25		7 20		107 / 15.6		@ 24' Vague laminations; small-scale cross bedding observed	
30						@ 28' Mottled light-gray and orangish-brown siltstone; abundant oxidation	
35		10 15		104 / 14.9			

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 9/14/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-12
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs		ELEVATION: 1,026'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						TOTAL DEPTH 36' (Elev. 990') No Groundwater No Caving	
40							
45							
50							
55							
60							
65							
70							

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 9/14/06 - 9/15/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-13
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs		ELEVATION: 733'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						SOIL/SLOPEWASH; s/Qsw (0 - 2.5') @ 0' Brown sandy silt with pebbles; soft; damp to moist	Casing @ 0 - 4'
						BEDROCK; QTp (2.5 - 75')	Bulk Sample @ 5 - 10'
5						@ 4' Yellowish-brown sandy siltstone; moderately hard; damp to moist	
		10 15		B: N15W, 51NE 102 / 4.3 B: N30W, 59NE		@ 5' 2-inch thick brownish-yellow claystone interbed @ 5.25' Pale yellowish-brown silty fine-grained sandstone	@ 5' Bedding orientation possibly affected by proximity of steel drill rig % fines = 34 Shear Test
						@ 7' Brownish-yellow clayey mudstone; massive	
10							
						@ 11' Coarsens gradationally to yellowish-brown clayey sandstone; moist; massive	
						@ 13' Sandstone with silt; damp to moist	
15			QTp				
		15 20		115 / 4.9		@ 15' Sandstone with pebbles	
						@ 18' Pebbly sandstone; friable	
20							
						@ 24' Pebbly, cobbly medium- to coarse-grained sandstone; minor belling	
25		6 12		113 / 6.1			
30				Apx B: N29W, 55NE		@ 30' 6-inch thick fine- to medium-grained sandstone interbed with vague laminations	
				XB: N44W, 57NE		@ 32' 3-inch thick sandy mudstone interbed; coarsens down to pebbly sandstone	
				B: N30W, 58NE		@ 34' 4-inch thick fine-grained sandstone interbed	
35		15 28		111 / 5.1		@ 35' Scattered boulders	

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Allways Drilling	DRILLED: 9/14/06 - 9/15/06		
DRILLING METHOD: Bucket-Auger	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-13	
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs	ELEVATION: 733'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
				B: N36W, 54NE		@ 38' 4-inch thick fine-grained sandstone interbed	
						@ 39' Belling up to 1 foot laterally	
40							
				Apx B: N40W, 48NE		@ 41' Planar pebble line	
				B: N33W, 54NE		@ 43.5' 6-inch thick fine- to medium-grained sandstone interbed	
45						@ 44' Sandy, cobbly and pebbly conglomerate; very friable; generally matrix-supported with some clast-supported sections	
		6 26		94 / 14.8			
50							
						@ 52' Medium- to coarse-grained sandstone; upper contact is very channelized	
			QTp				
55				106 / 10.3			% fines = 62 Shear Test
		5 10		B: N33W, 56NE		@ 56' Brownish-yellow sandy, clayey siltstone; massive	
				Apx B: N30W, 49NE		@ 57' 2-inch thick silty claystone interbed	
				B: N37W, 52NE		@ 59' Yellowish-brown silty fine-grained sandstone; damp	
60							
				B: N32W, 58NE		@ 60.5' 4-inch thick brownish-yellow claystone interbed	
				fr: N40W, 37SW B: N33W, 52NE		@ 63' 2- to 3-inch thick brownish-yellow clay-lined fracture; slightly undulatory and wispy; no offset of claystone interbed	
65						@ 63.5' Brownish-yellow claystone; coarsens down to sandy, clayey siltstone	
		8 17		97 / 21.1		@ 65' Yellowish-brown silty fine-grained sandstone; massive	
				B: N38W, 52NE		@ 68' Fines down to sandy, clayey siltstone	
70							

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 9/14/06 - 9/15/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-13
DRIVING WEIGHTS: 0 - 50' = 2,280 lbs, 50 - 75' = 1,250 lbs		ELEVATION: 733'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
75	■	15 25		93 / 26.3			
						TOTAL DEPTH 75' (Elev. 658') No Groundwater No Caving	
80							
85							
90							
95							
100							
105							
110							

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County' CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 10/3/06 - 10/4/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-19
DRIVING WEIGHTS: 0-24' = 3,750 lbs, 24-47' = 2,600 lbs, 47-72' = 1,600 lbs, 72-92' = 850 lbs		ELEVATION: 1,143'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						SOIL/SLOPEWASH; s/Qsw (0 - 4') @ 0' Light grayish-brown silty sand; soft; dry to damp	Casing @ 0 - 5'
5		P/12"		100 / 4.2		**BEDROCK; Tcag (4 - 90')** @ 5' Light-gray fine-grained sandstone with pebbles; moderately hard; damp; massive; scattered wispy dark-brown laminations @ 7' Brown poorly sorted clayey sandstone with pebbles; channelized; massive	
10		1 2		110 / 4.4	SC		Bulk Sample @ 10 - 20' % fines = 23 Curve=K Shear Test
				Apx B: N75W, 12SW		@ 12' Light-gray sandstone channel	
15		2 2		110 / 7.3	SM		% fines = 17
						@ 17' Light-gray sandstone channels	
20		2 4		111 / 7.9		@ 20' 0.5-inch thick siltstone interbed @ 21' Moist	
			Tcag				
25		2 2		113 / 11.2		@ 25' Very moist	
						@ 29' Brown pebbly sandstone with silt; massive	
30		1 3		110 / 9.2			
35				XB: N65W, 12NE		@ 36' Interbedded brown medium-grained sandstone and white fine-	

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan, Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Allways Drilling	DRILLED: 10/3/06 - 10/4/06		
DRILLING METHOD: Bucket-Auger	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-19	
DRIVING WEIGHTS: 0-24' = 3,750 lbs, 24-47' = 2,600 lbs, 47-72' = 1,600 lbs, 72-92' = 850 lbs	ELEVATION: 1,143'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						grained sandstone; laminated; abundant cross-beds; moist	
				B: N63W, 6SW			
				B: N73W, 7SW			
40				108 / 9.1	SM	@ 40' Brown medium- to coarse-grained sandstone; generally massive, with some vague laminations	% fines = 11
		4 8					
				Apx B: N72W, 7SW fr: N71W, 33SW		@ 42' 0.25-inch thick silt-infilled fracture; no offsets observed	
				Apx B: N38W, 13SW		@ 44' Mottled gray and orangish-brown mudstone; undulatory contact with overlying sandstone; small seep on northern side of boring	
45							
						@ 46.5' White fine-grained sandstone; very friable; undulatory contact with overlying mudstone; contact appears to dip shallowly to the south	
				B: N59W, 10SW		@ 49' Mottled gray and orangish-brown mudstone	
50				84 / 35.3			% fines = 86 Shear Test
		5 10					
				B: N63W, 10SW		@ 51' White fine-grained sandstone; damp	
				B: N66W, 10SW		@ 52' 0.25-inch thick gray claystone interbed	
				B: N64W, 9SW		@ 53' 0.25-inch thick gray claystone interbed	
						@ 54' Coarsens down to grayish-brown fine- to coarse-grained pebbly sandstone	
55							
				B: N68W, 10SW		@ 56' 1-foot thick section of laminated sandstone	
						@ 57' Yellowish-brown pebbly sandstone	
60				111 / 8.5			
		8 14					
				XB: N28W, 6SW		@ 61' Extremely cross-bedded	
						@ 64' Interbedded laminated sandstone and pebbly sandstone	
65				Apx B: N70W, 11SW		@ 65' Pebble line	
				B: N60W, 9SW			
70							
				B: N58W, 11SW			

CLIENT: Solstra Communities California LLC	JOB NO.: 23-2195s-1	**DRILL HOLE LOG**	
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA	DATE: 10/20/23		
	LOGGED BY: MBW		
DRILLING COMPANY: Allways Drilling	DRILLED: 10/3/06 - 10/4/06		
DRILLING METHOD: Bucket-Auger	HOLE DIA: 24"		
HAMMER TYPE: Telescoping Kelly Bar	AVERAGE DROP: 12"	**BORING NO.** BA-19	
DRIVING WEIGHTS: 0-24' = 3,750 lbs, 24-47' = 2,600 lbs, 47-72' = 1,600 lbs, 72-92' = 850 lbs	ELEVATION: 1,143'		

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
75							
				B: N65W, 8SW			
			Tsag				
80						@ 80' Massive pebbly sandstone	
85							
90						TOTAL DEPTH 90' (Elev. 1,053') Minor Seep @ 44' No Groundwater No Caving	
95							
100							
105							
110							

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 10/05/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-20
DRIVING WEIGHTS: 0-24' = 3,750 lbs, 24-47' = 2,600 lbs, 47-72' = 1,600 lbs, 72-92' = 850 lbs		ELEVATION: 997'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						BEDROCK; Tcag (0 - 25') @ 0' Yellowish-brown, silty, fine-grained sandstone with scattered pebbles; moderately hard; damp; massive	BA-20a surface logged down to 25' BA-20b down hole logged to 21'
						@ 3' Pebbles imbricated to the southwest	
5		2 7		97 / 8.7 XB: N17W,12SW	SM	@ 6' Pebble line	% fines = 13 Shear Test
10		2 4		B: N70W,7SW B: N62W, 8SW	SM	@ 11' Interbedded medium- to coarse-grained sandstone with pebbles and silty fine-grained sandstone	Bulk Sample @ 10 - 20 Cor % fines = 14 Curve=L Shear Test
15				B: N65W, 8SW		@ 15' 1-foot thick laminated sandstone bed @ 16' Fine- to medium-grained sandstone	
20		2 6		108 / 6.6		@ 21' Light gray, medium- to coarse-grained sandstone; very hard	BA-20b @ 21' drilling refusal
25						@ 24' Concretionary bed; very hard drilling; drilling BA-20b 15 feet east to determine if the hard drilling is a localized concretion bed or boulder	BA-20a @ 25' drilling refusal
						TOTAL DEPTH 25' (Elev. 972') No Groundwater No Caving	
30							
35							

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 10/5/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-21
DRIVING WEIGHTS: 0-24' = 3,750 lbs, 24-47' = 2,600 lbs, 47-72' = 1,600 lbs, 72-92' = 850 lbs		ELEVATION: 1,094'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
						SOIL/SLOPEWASH; s/Qsw (0 - 5.5') @ 0' Brown sandy silt; soft; damp	Casing @ 0 - 4.75'
5	P	2	s/Qsw	101 / 15.1		**BEDROCK; Tcac (5.5 - 80')** @ 5.5' Yellowish-brown silty fine-grained sandstone; soft to moderately hard; damp; massive; weathered to 8'	
						@ 8' Moderately hard	
						@ 9' Pebbly	
10		2 3		103 / 21.2	CL	@ 10' Light gray pebbly, clayey sandstone; damp to moist; minor belling	Bulk Sample @ 10 - 20' % fines = 73 Curve=M Shear Test E.I. = 46
				B: N35W, 5SW		@ 11' Yellowish-brown silty fine-grained sandstone	
			Tcac			@ 12' Fines down to sandy mudstone	
15		2 3		105 / 20.4		@ 14' Light gray mudstone	
						@ 16' Orangish-brown oxidation staining; does not follow bedding	
20		3 6		115 / 13.2		@ 19' Coarsens down gradationally	
						@ 21' Clayey sandstone with pebbles	
						@ 22.5' Grayish-brown medium- to coarse-grained sandstone with pebbles	
				B: N41W, 4SW		@ 23.5' Laminated silty fine-grained sandstone @ 24' Light gray sandy siltstone; massive	
25							
						@ 28' Wispy dark gray laminations	
30		2 5		102 / 13.9		@ 30' Sandy siltstone to silty fine-grained sandstone; massive	
35							

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 10/5/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-21
DRIVING WEIGHTS: 0-24' = 3,750 lbs, 24-47' = 2,600 lbs, 47-72' = 1,600 lbs, 72-92' = 850 lbs		ELEVATION: 1,094'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
40		8 11	Tcac	103 / 14.6			
45				B?: N20W, 8SW		@ 46' Oxidized layer	
50		5 10		102 / 19.4			
				Apx B?: N10W, 2SW		@ 52.5' Wispy, undulatory laminations @ 53' Scattered oxidation staining	
55				Apx B: N52W, 3SW		@ 55' Scattered pale yellow mottling; moderately hard to hard @ 56' Coarsens down gradationally to light gray silty fine grained sandstone	
60		9 20		B: N35W, 5SW 100 / 10.6		@ 60' Grayish-brown fine-grained sandstone; sharp contact with overlying silty sandstone	
65						@ 63' Fines down to silty fine-grained sandstone	
70						@ 67' Hard	

CLIENT: Solstra Communities California LLC		JOB NO.: 23-2195s-1	**DRILL HOLE LOG**
PROJECT: Solomon Hills Specific Plan Santa Barbara County, CA		DATE: 10/20/23	
		LOGGED BY: MBW	
DRILLING COMPANY: Allways Drilling		DRILLED: 10/5/06	
DRILLING METHOD: Bucket-Auger		HOLE DIA: 24"	
HAMMER TYPE: Telescoping Kelly Bar		AVERAGE DROP: 12"	**BORING NO.** BA-21
DRIVING WEIGHTS: 0-24' = 3,750 lbs, 24-47' = 2,600 lbs, 47-72' = 1,600 lbs, 72-92' = 850 lbs		ELEVATION: 1,094'	

DEPTH (feet)	SAMPLE TYPE	BLOWS / 6"	GRAPHIC LOG	ATTITUDES, DRY DENSITY (pcf)/ MOISTURE CONTENT (%)	USCS SYMBOL	DESCRIPTION	Remarks
75			Tgc				
80						TOTAL DEPTH 80' (Elev. 1,014') No Groundwater No Caving	
85							
90							
95							
100							
105							
110							

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/6/2006 14:52
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-01

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	111.6	0.76	Sands - clean sands to silty sand	1.59	1.00	
0.10	0.33	133.9	0.84	Sands - clean sands to silty sand	1.56	1.00	
0.15	0.49	84.5	1.27	Sands - clean sands to silty sand	1.83	1.13	
0.20	0.66	63.0	1.39	Sands - clean sands to silty sand	1.95	1.23	
0.25	0.82	56.4	1.26	Sands - clean sands to silty sand	1.96	1.24	
0.30	0.98	48.4	1.17	Sands - clean sands to silty sand	1.98	1.27	
0.35	1.15	41.0	1.05	Sands - clean sands to silty sand	2.01	1.31	
0.40	1.31	32.4	0.98	Sand mixtures - silty sand to sandy silt	2.07	1.40	
0.45	1.48	25.4	1.02	Sand mixtures - silty sand to sandy silt	2.17	1.59	
0.50	1.64	20.6	0.85	Sand mixtures - silty sand to sandy silt	2.21	1.67	
0.55	1.80	16.1	0.73	Sand mixtures - silty sand to sandy silt	2.27	1.84	
0.60	1.97	14.2	0.69	Sand mixtures - silty sand to sandy silt	2.30	1.95	
0.65	2.13	12.5	0.61	Sand mixtures - silty sand to sandy silt	2.33	2.03	
0.70	2.30	10.7	0.59	Sand mixtures - silty sand to sandy silt	2.38	2.24	
0.75	2.46	10.2	0.63	Sand mixtures - silty sand to sandy silt	2.42	2.37	
0.80	2.62	9.6	0.56	Sand mixtures - silty sand to sandy silt	2.42	2.39	
0.85	2.79	10.6	0.23	Sand mixtures - silty sand to sandy silt	2.25	1.00	
0.90	2.95	12.2	0.12	Sand mixtures - silty sand to sandy silt	2.13	1.00	
0.95	3.12	13.5	0.09	Sand mixtures - silty sand to sandy silt	2.07	1.00	
1.00	3.28	14.2	0.15	Sand mixtures - silty sand to sandy silt	2.08	1.00	
1.05	3.44	14.2	0.17	Sand mixtures - silty sand to sandy silt	2.09	1.00	
1.10	3.61	13.7	0.17	Sand mixtures - silty sand to sandy silt	2.11	1.00	
1.15	3.77	15.4	0.22	Sand mixtures - silty sand to sandy silt	2.09	1.00	
1.20	3.94	21.4	0.28	Sands - clean sands to silty sand	1.98	1.00	
1.25	4.10	29.1	0.36	Sands - clean sands to silty sand	1.90	1.00	
1.30	4.27	37.9	0.62	Sands - clean sands to silty sand	1.91	1.19	
1.35	4.43	41.0	1.14	Sands - clean sands to silty sand	2.04	1.34	
1.40	4.59	39.5	1.44	Sand mixtures - silty sand to sandy silt	2.11	1.47	
1.45	4.76	36.2	1.51	Sand mixtures - silty sand to sandy silt	2.16	1.56	
1.50	4.92	29.2	2.11	Sand mixtures - silty sand to sandy silt	2.32	2.02	
1.55	5.09	35.2	2.03	Sand mixtures - silty sand to sandy silt	2.25	1.79	
1.60	5.25	46.8	1.50	Sand mixtures - silty sand to sandy silt	2.07	1.39	
1.65	5.41	50.8	1.69	Sand mixtures - silty sand to sandy silt	2.08	1.41	
1.70	5.58	48.7	1.63	Sand mixtures - silty sand to sandy silt	2.08	1.42	
1.75	5.74	38.6	2.01	Sand mixtures - silty sand to sandy silt	2.22	1.70	
1.80	5.91	41.7	1.82	Sand mixtures - silty sand to sandy silt	2.17	1.58	
1.85	6.07	41.6	1.95	Sand mixtures - silty sand to sandy silt	2.19	1.62	
1.90	6.23	31.4	2.36	Sand mixtures - silty sand to sandy silt	2.33	2.05	
1.95	6.40	33.1	2.44	Sand mixtures - silty sand to sandy silt	2.33	2.03	
2.00	6.56	41.2	2.32	Sand mixtures - silty sand to sandy silt	2.24	1.77	
2.05	6.73	46.4	2.07	Sand mixtures - silty sand to sandy silt	2.17	1.59	
2.10	6.89	38.7	2.37	Sand mixtures - silty sand to sandy silt	2.27	1.85	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-01

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.15	7.05	37.2	2.65	Sand mixtures - silty sand to sandy silt	2.32	1.99	
2.20	7.22	32.7	2.93	Sand mixtures - silty sand to sandy silt	2.39	2.25	
2.25	7.38	36.4	2.25	Sand mixtures - silty sand to sandy silt	2.28	1.88	
2.30	7.55	41.6	1.64	Sand mixtures - silty sand to sandy silt	2.16	1.57	
2.35	7.71	55.4	1.24	Sands - clean sands to silty sand	2.01	1.30	
2.40	7.87	54.0	1.57	Sand mixtures - silty sand to sandy silt	2.08	1.42	
2.45	8.04	40.4	2.05	Sand mixtures - silty sand to sandy silt	2.25	1.77	
2.50	8.20	46.3	1.87	Sand mixtures - silty sand to sandy silt	2.19	1.62	
2.55	8.37	54.3	1.41	Sand mixtures - silty sand to sandy silt	2.06	1.39	
2.60	8.53	52.7	1.43	Sand mixtures - silty sand to sandy silt	2.08	1.41	
2.65	8.69	56.0	1.58	Sand mixtures - silty sand to sandy silt	2.10	1.44	
2.70	8.86	52.0	2.00	Sand mixtures - silty sand to sandy silt	2.19	1.63	
2.75	9.02	42.8	2.12	Sand mixtures - silty sand to sandy silt	2.26	1.82	
2.80	9.19	45.3	1.75	Sand mixtures - silty sand to sandy silt	2.20	1.65	
2.85	9.35	56.2	1.45	Sand mixtures - silty sand to sandy silt	2.09	1.42	
2.90	9.51	56.1	1.50	Sand mixtures - silty sand to sandy silt	2.10	1.44	
2.95	9.68	56.7	1.61	Sand mixtures - silty sand to sandy silt	2.12	1.48	
3.00	9.84	58.0	1.96	Sand mixtures - silty sand to sandy silt	2.17	1.59	
3.05	10.01	50.1	2.45	Sand mixtures - silty sand to sandy silt	2.28	1.89	
3.10	10.17	43.8	3.09	Sand mixtures - silty sand to sandy silt	2.40	2.28	
3.15	10.33	41.7	2.72	Sand mixtures - silty sand to sandy silt	2.37	2.20	
3.20	10.50	39.8	2.20	Sand mixtures - silty sand to sandy silt	2.33	2.03	
3.25	10.66	51.6	1.66	Sand mixtures - silty sand to sandy silt	2.18	1.60	
3.30	10.83	55.5	1.82	Sand mixtures - silty sand to sandy silt	2.18	1.62	
3.35	10.99	56.6	2.15	Sand mixtures - silty sand to sandy silt	2.23	1.74	
3.40	11.15	49.1	2.69	Sand mixtures - silty sand to sandy silt	2.34	2.08	
3.45	11.32	39.6	3.25	Silt mixtures - clayey silt to silty clay	2.47	2.58	
3.50	11.48	30.6	3.08	Silt mixtures - clayey silt to silty clay	2.53	3.35	
3.55	11.65	36.0	2.57	Sand mixtures - silty sand to sandy silt	2.43	2.42	
3.60	11.81	44.1	2.58	Sand mixtures - silty sand to sandy silt	2.38	2.20	
3.65	11.97	41.4	2.65	Sand mixtures - silty sand to sandy silt	2.40	2.32	
3.70	12.14	46.3	2.74	Sand mixtures - silty sand to sandy silt	2.39	2.24	
3.75	12.30	49.4	2.03	Sand mixtures - silty sand to sandy silt	2.28	1.88	
3.80	12.47	66.5	1.09	Sands - clean sands to silty sand	2.02	1.31	
3.85	12.63	70.5	0.77	Sands - clean sands to silty sand	1.91	1.19	
3.90	12.80	55.4	0.96	Sands - clean sands to silty sand	2.05	1.36	
3.95	12.96	37.6	1.68	Sand mixtures - silty sand to sandy silt	2.32	2.01	
4.00	13.12	21.1	3.01	Silt mixtures - clayey silt to silty clay	2.67	8.46	2.82
4.05	13.29	18.8	2.62	Silt mixtures - clayey silt to silty clay	2.67	8.58	2.51
4.10	13.45	19.3	2.86	Silt mixtures - clayey silt to silty clay	2.69	9.73	2.57
4.15	13.62	20.9	2.58	Silt mixtures - clayey silt to silty clay	2.64	7.08	2.79
4.20	13.78	19.0	3.04	Silt mixtures - clayey silt to silty clay	2.72		2.53
4.25	13.94	26.4	2.36	Silt mixtures - clayey silt to silty clay	2.55	3.90	
4.30	14.11	38.2	1.64	Sand mixtures - silty sand to sandy silt	2.33	2.05	
4.35	14.27	43.1	1.37	Sand mixtures - silty sand to sandy silt	2.25	1.78	
4.40	14.44	45.3	1.61	Sand mixtures - silty sand to sandy silt	2.28	1.87	
4.45	14.60	39.6	2.27	Sand mixtures - silty sand to sandy silt	2.42	2.40	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-01

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.50	14.76	26.2	3.01	Silt mixtures - clayey silt to silty clay	2.64	6.94	3.50
4.55	14.93	17.3	3.81	Clays - silty clay to clay	2.85		2.31
4.60	15.09	19.2	3.54	Silt mixtures - clayey silt to silty clay	2.79		2.56
4.65	15.26	22.1	3.34	Silt mixtures - clayey silt to silty clay	2.73		2.94
4.70	15.42	36.2	2.28	Sand mixtures - silty sand to sandy silt	2.47	2.60	
4.75	15.58	37.7	2.20	Sand mixtures - silty sand to sandy silt	2.45	2.51	
4.80	15.75	39.0	1.99	Sand mixtures - silty sand to sandy silt	2.41	2.35	
4.85	15.91	45.9	1.59	Sand mixtures - silty sand to sandy silt	2.30	1.93	
4.90	16.08	48.9	1.45	Sand mixtures - silty sand to sandy silt	2.25	1.79	
4.95	16.24	52.0	1.39	Sand mixtures - silty sand to sandy silt	2.22	1.72	
5.00	16.40	59.7	1.28	Sand mixtures - silty sand to sandy silt	2.16	1.56	
5.05	16.57	66.7	1.29	Sand mixtures - silty sand to sandy silt	2.13	1.50	
5.10	16.73	70.8	1.35	Sand mixtures - silty sand to sandy silt	2.12	1.49	
5.15	16.90	77.3	1.33	Sand mixtures - silty sand to sandy silt	2.09	1.43	
5.20	17.06	85.5	1.27	Sands - clean sands to silty sand	2.05	1.36	
5.25	17.22	89.1	1.22	Sands - clean sands to silty sand	2.03	1.33	
5.30	17.39	84.4	1.25	Sands - clean sands to silty sand	2.05	1.37	
5.35	17.55	76.7	1.28	Sand mixtures - silty sand to sandy silt	2.09	1.43	
5.40	17.72	71.7	1.37	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.45	17.88	69.3	1.50	Sand mixtures - silty sand to sandy silt	2.18	1.60	
5.50	18.04	72.1	1.48	Sand mixtures - silty sand to sandy silt	2.16	1.57	
5.55	18.21	74.1	1.39	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.60	18.37	78.5	1.49	Sand mixtures - silty sand to sandy silt	2.14	1.53	
5.65	18.54	90.2	1.28	Sand mixtures - silty sand to sandy silt	2.06	1.37	
5.70	18.70	101.4	1.53	Sand mixtures - silty sand to sandy silt	2.08	1.40	
5.75	18.86	106.1	1.60	Sand mixtures - silty sand to sandy silt	2.08	1.40	
5.80	19.03	97.1	1.30	Sands - clean sands to silty sand	2.04	1.35	
5.85	19.19	87.5	1.58	Sand mixtures - silty sand to sandy silt	2.14	1.51	
5.90	19.36	82.5	1.56	Sand mixtures - silty sand to sandy silt	2.15	1.55	
5.95	19.52	92.9	1.44	Sand mixtures - silty sand to sandy silt	2.09	1.43	
6.00	19.68	96.6	1.33	Sand mixtures - silty sand to sandy silt	2.06	1.38	
6.05	19.85	93.2	1.33	Sand mixtures - silty sand to sandy silt	2.07	1.40	
6.10	20.01	85.2	1.53	Sand mixtures - silty sand to sandy silt	2.15	1.53	
6.15	20.18	81.1	1.66	Sand mixtures - silty sand to sandy silt	2.19	1.63	
6.20	20.34	77.5	1.73	Sand mixtures - silty sand to sandy silt	2.22	1.70	
6.25	20.51	77.7	1.74	Sand mixtures - silty sand to sandy silt	2.22	1.71	
6.30	20.67	82.6	1.77	Sand mixtures - silty sand to sandy silt	2.21	1.68	
6.35	20.83	87.5	1.83	Sand mixtures - silty sand to sandy silt	2.20	1.67	
6.40	21.00	82.3	1.97	Sand mixtures - silty sand to sandy silt	2.25	1.78	
6.45	21.16	71.3	2.05	Sand mixtures - silty sand to sandy silt	2.31	1.96	
6.50	21.33	72.5	1.68	Sand mixtures - silty sand to sandy silt	2.24	1.77	
6.55	21.49	73.1	1.12	Sand mixtures - silty sand to sandy silt	2.12	1.49	
6.60	21.65	67.5	1.09	Sand mixtures - silty sand to sandy silt	2.15	1.54	
6.65	21.82	65.7	1.38	Sand mixtures - silty sand to sandy silt	2.22	1.72	
6.70	21.98	70.3	1.48	Sand mixtures - silty sand to sandy silt	2.22	1.72	
6.75	22.15	68.6	1.57	Sand mixtures - silty sand to sandy silt	2.25	1.79	
6.80	22.31	61.5	1.72	Sand mixtures - silty sand to sandy silt	2.32	2.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-01

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.85	22.47	53.7	1.78	Sand mixtures - silty sand to sandy silt	2.38	2.21	
6.90	22.64	52.0	1.73	Sand mixtures - silty sand to sandy silt	2.38	2.23	
6.95	22.80	55.2	1.73	Sand mixtures - silty sand to sandy silt	2.36	2.16	
7.00	22.97	59.5	1.62	Sand mixtures - silty sand to sandy silt	2.32	2.00	
7.05	23.13	59.4	1.63	Sand mixtures - silty sand to sandy silt	2.33	2.02	
7.10	23.29	57.3	1.70	Sand mixtures - silty sand to sandy silt	2.35	2.12	
7.15	23.46	53.9	1.83	Sand mixtures - silty sand to sandy silt	2.40	2.29	
7.20	23.62	53.0	1.85	Sand mixtures - silty sand to sandy silt	2.41	2.33	
7.25	23.79	57.6	1.79	Sand mixtures - silty sand to sandy silt	2.37	2.19	
7.30	23.95	65.8	1.66	Sand mixtures - silty sand to sandy silt	2.31	1.96	
7.35	24.11	81.1	1.40	Sand mixtures - silty sand to sandy silt	2.19	1.62	
7.40	24.28	88.2	1.29	Sand mixtures - silty sand to sandy silt	2.13	1.51	
7.45	24.44	71.0	1.47	Sand mixtures - silty sand to sandy silt	2.25	1.78	
7.50	24.61	53.6	1.66	Sand mixtures - silty sand to sandy silt	2.39	2.24	
7.55	24.77	49.3	1.56	Sand mixtures - silty sand to sandy silt	2.40	2.29	
7.60	24.93	49.1	1.74	Sand mixtures - silty sand to sandy silt	2.43	2.44	
7.65	25.10	45.7	1.59	Sand mixtures - silty sand to sandy silt	2.44	2.45	
7.70	25.26	46.9	1.50	Sand mixtures - silty sand to sandy silt	2.41	2.35	
7.75	25.43	34.4	2.03	Silt mixtures - clayey silt to silty clay	2.62	5.96	4.58
7.80	25.59	17.3	3.21	Clays - silty clay to clay	3.00		2.31
7.85	25.75	13.4	2.27	Clays - silty clay to clay	3.01		1.79
7.90	25.92	11.2	1.65	Clays - silty clay to clay	3.00		1.50
7.95	26.08	10.4	2.51	Clays - silty clay to clay	3.14		1.39
8.00	26.25	10.6	4.62	Clays - silty clay to clay	3.31		1.41
8.05	26.41	17.2	3.17	Clays - silty clay to clay	3.01		2.29
8.10	26.57	28.2	2.69	Silt mixtures - clayey silt to silty clay	2.79		3.75
8.15	26.74	24.3	3.23	Clays - silty clay to clay	2.90		3.24
8.20	26.90	15.4	3.81	Clays - silty clay to clay	3.11		2.05
8.25	27.07	33.3	2.58	Silt mixtures - clayey silt to silty clay	2.72		4.43
8.30	27.23	35.3	2.62	Silt mixtures - clayey silt to silty clay	2.71		4.70
8.35	27.39	26.1	4.24	Clays - silty clay to clay	2.96		3.48
8.40	27.56	27.2	3.29	Clays - silty clay to clay	2.87		3.63
8.45	27.72	30.6	2.98	Silt mixtures - clayey silt to silty clay	2.81		4.08
8.50	27.89	30.9	3.12	Silt mixtures - clayey silt to silty clay	2.82		4.11
8.55	28.05	28.6	3.34	Clays - silty clay to clay	2.87		3.81
8.60	28.21	31.0	2.71	Silt mixtures - clayey silt to silty clay	2.78		4.13
8.65	28.38	36.8	2.04	Silt mixtures - clayey silt to silty clay	2.63	6.68	4.91
8.70	28.54	38.2	1.88	Silt mixtures - clayey silt to silty clay	2.60	5.31	
8.75	28.71	38.9	1.78	Silt mixtures - clayey silt to silty clay	2.58	4.69	
8.80	28.87	40.0	1.97	Silt mixtures - clayey silt to silty clay	2.60	5.37	
8.85	29.04	39.0	2.32	Silt mixtures - clayey silt to silty clay	2.66	7.91	5.20
8.90	29.20	38.5	2.61	Silt mixtures - clayey silt to silty clay	2.70		5.13
8.95	29.36	44.1	2.20	Silt mixtures - clayey silt to silty clay	2.60	5.52	5.88
9.00	29.53	50.5	2.01	Silt mixtures - clayey silt to silty clay	2.53	3.40	
9.05	29.69	49.3	2.09	Silt mixtures - clayey silt to silty clay	2.55	3.94	
9.10	29.86	49.8	2.07	Silt mixtures - clayey silt to silty clay	2.55	3.80	
9.15	30.02	53.2	1.67	Sand mixtures - silty sand to sandy silt	2.46	2.56	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-01

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.20	30.18	45.9	1.53	Sand mixtures - silty sand to sandy silt	2.49	2.71	
9.25	30.35	40.4	1.49	Sand mixtures - silty sand to sandy silt	2.53	3.52	
9.30	30.51	38.9	1.51	Sand mixtures - silty sand to sandy silt	2.55	4.03	
9.35	30.68	48.2	1.08	Sand mixtures - silty sand to sandy silt	2.38	2.22	
9.40	30.84	49.9	1.12	Sand mixtures - silty sand to sandy silt	2.38	2.21	
9.45	31.00	40.4	1.55	Sand mixtures - silty sand to sandy silt	2.55	3.99	
9.50	31.17	29.9	2.58	Silt mixtures - clayey silt to silty clay	2.82		3.98
9.55	31.33	15.7	4.26	Clays - silty clay to clay	3.20		2.09
9.60	31.50	11.4	2.84	Clays - silty clay to clay	3.22		1.52
9.65	31.66	10.1	1.93	Clays - silty clay to clay	3.18		1.35
9.70	31.82	13.2	1.50	Clays - silty clay to clay	3.00		1.76
9.75	31.99	12.3	1.19	Clays - silty clay to clay	2.98		1.64
9.80	32.15	11.7	1.19	Clays - silty clay to clay	3.01		1.56
9.85	32.32	11.6	1.29	Clays - silty clay to clay	3.03		1.54
9.90	32.48	11.9	1.10	Clays - silty clay to clay	2.98		1.59
9.95	32.64	13.9	1.22	Silt mixtures - clayey silt to silty clay	2.95		1.85
10.00	32.81	13.8	1.88	Clays - silty clay to clay	3.05		1.84
10.05	32.97	16.9	1.92	Clays - silty clay to clay	2.98		2.25
10.10	33.14	18.5	1.47	Silt mixtures - clayey silt to silty clay	2.88		2.47
10.15	33.30	11.3	2.23	Clays - silty clay to clay	3.19		1.50
10.20	33.46	10.0	2.78	Clays - silty clay to clay	3.31		1.33
10.25	33.63	8.8	2.44	Clays - silty clay to clay	3.33		1.18
10.30	33.79	10.2	4.07	Clays - silty clay to clay	3.40		1.36
10.35	33.96	17.4	3.32	Clays - silty clay to clay	3.13		2.32
10.40	34.12	26.2	3.22	Clays - silty clay to clay	2.97		3.49
10.45	34.28	22.5	4.79	Clays - silty clay to clay	3.14		3.00
10.50	34.45	31.3	2.71	Silt mixtures - clayey silt to silty clay	2.86		4.17
10.55	34.61	50.0	1.87	Silt mixtures - clayey silt to silty clay	2.57	4.50	
10.60	34.78	69.9	1.42	Sand mixtures - silty sand to sandy silt	2.36	2.15	
10.65	34.94	86.6	1.15	Sand mixtures - silty sand to sandy silt	2.22	1.71	
10.70	35.10	92.9	0.94	Sand mixtures - silty sand to sandy silt	2.14	1.51	
10.75	35.27	84.4	0.97	Sand mixtures - silty sand to sandy silt	2.18	1.61	
10.80	35.43	64.9	1.48	Sand mixtures - silty sand to sandy silt	2.41	2.35	
10.85	35.60	36.7	2.54	Silt mixtures - clayey silt to silty clay	2.79		4.89
10.90	35.76	19.8	3.52	Clays - silty clay to clay	3.12		2.64
10.95	35.92	18.2	2.14	Clays - silty clay to clay	3.02		2.42
11.00	36.09	19.0	2.90	Clays - silty clay to clay	3.08		2.54
11.05	36.25	29.7	3.35	Clays - silty clay to clay	2.96		3.96
11.10	36.42	48.9	2.76	Silt mixtures - clayey silt to silty clay	2.72		6.52
11.15	36.58	69.1	1.90	Sand mixtures - silty sand to sandy silt	2.48	2.65	
11.20	36.74	81.4	1.38	Sand mixtures - silty sand to sandy silt	2.32	2.00	
11.25	36.91	68.1	1.56	Sand mixtures - silty sand to sandy silt	2.42	2.40	
11.30	37.07	56.5	1.69	Sand mixtures - silty sand to sandy silt	2.52	3.26	
11.35	37.24	50.3	2.34	Silt mixtures - clayey silt to silty clay	2.67	8.45	6.70
11.40	37.40	28.4	3.41	Clays - silty clay to clay	2.99		3.79
11.45	37.57	23.2	3.78	Clays - silty clay to clay	3.09		3.10
11.50	37.73	18.8	3.79	Clays - silty clay to clay	3.18		2.50

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-01

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.55	37.89	35.3	1.67	Silt mixtures - clayey silt to silty clay	2.72		4.70
11.60	38.06	38.7	1.91	Silt mixtures - clayey silt to silty clay	2.72		5.16
11.65	38.22	30.5	3.55	Clays - silty clay to clay	2.98		4.06
11.70	38.39	28.5	3.49	Clays - silty clay to clay	3.00		3.80
11.75	38.55	22.4	3.59	Clays - silty clay to clay	3.10		2.99
11.80	38.71	23.2	3.25	Clays - silty clay to clay	3.07		3.09
11.85	38.88	25.2	2.50	Clays - silty clay to clay	2.96		3.36
11.90	39.04	16.4	2.84	Clays - silty clay to clay	3.17		2.18
11.95	39.21	14.9	1.69	Clays - silty clay to clay	3.08		1.99
12.00	39.37	10.9	2.55	Clays - silty clay to clay	3.33		1.45
12.05	39.53	10.1	3.23	Clays - silty clay to clay	3.43		1.34
12.10	39.70	21.3	2.66	Clays - silty clay to clay	3.06		2.83
12.15	39.86	28.8	2.43	Clays - silty clay to clay	2.92		3.84
12.20	40.03	24.2	2.61	Clays - silty clay to clay	3.00		3.23
12.25	40.19	29.9	1.92	Silt mixtures - clayey silt to silty clay	2.84		3.99
12.30	40.35	23.9	2.38	Clays - silty clay to clay	2.99		3.18
12.35	40.52	22.5	1.90	Clays - silty clay to clay	2.95		3.00
12.40	40.68	19.1	2.16	Clays - silty clay to clay	3.06		2.54
12.45	40.85	15.7	4.07	Clays - silty clay to clay	3.31		2.09
12.50	41.01	22.8	3.67	Clays - silty clay to clay	3.13		3.04
12.55	41.17	36.6	2.93	Clays - silty clay to clay	2.89		4.88
12.60	41.34	36.0	2.51	Silt mixtures - clayey silt to silty clay	2.86		4.80
12.65	41.50	34.2	2.46	Silt mixtures - clayey silt to silty clay	2.87		4.56
12.70	41.67	37.5	2.52	Silt mixtures - clayey silt to silty clay	2.85		5.00
12.75	41.83	38.7	2.68	Silt mixtures - clayey silt to silty clay	2.85		5.16
12.80	41.99	45.5	2.80	Silt mixtures - clayey silt to silty clay	2.81		6.07
12.85	42.16	43.5	3.10	Clays - silty clay to clay	2.86		5.80
12.90	42.32	55.4	3.11	Silt mixtures - clayey silt to silty clay	2.77		7.39
12.95	42.49	57.4	3.36	Silt mixtures - clayey silt to silty clay	2.79		7.65
13.00	42.65	55.4	3.52	Clays - silty clay to clay	2.81		7.38
13.05	42.81	86.8	2.50	Silt mixtures - clayey silt to silty clay	2.55	3.87	
13.10	42.98	108.9	2.27	Sand mixtures - silty sand to sandy silt	2.43	2.44	
13.15	43.14	133.4	2.49	Sand mixtures - silty sand to sandy silt	2.40	2.28	
13.20	43.31	156.1	2.75	Sand mixtures - silty sand to sandy silt	2.38	2.22	
13.25	43.47	187.7	2.78	Sand mixtures - silty sand to sandy silt	2.32	2.02	
13.30	43.63	218.1	2.78	Sand mixtures - silty sand to sandy silt	2.28	1.86	
13.35	43.80	235.5	2.80	Sand mixtures - silty sand to sandy silt	2.26	1.81	
13.40	43.96	246.9	3.24	Sand mixtures - silty sand to sandy silt	2.30	1.93	
13.45	44.13	254.4	3.56	Sand mixtures - silty sand to sandy silt	2.33	2.03	
13.50	44.29	293.9	3.13	Sand mixtures - silty sand to sandy silt	2.24	1.75	
13.55	44.45	313.9	4.24	Very stiff, fine grained	2.34	2.07	
13.60	44.62	267.1	5.96	Very stiff, fine grained	2.52	3.27	
13.65	44.78	287.1	6.16	Very stiff, fine grained	2.52	3.15	
13.70	44.95	276.0	5.77	Very stiff, fine grained	2.50	2.86	
13.75	45.11	282.2	5.69	Very stiff, fine grained	2.49	2.71	
13.80	45.28	306.6	4.51	Very stiff, fine grained	2.38	2.20	
13.85	45.44	316.4	4.77	Very stiff, fine grained	2.39	2.26	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-01

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.90	45.60	289.8	5.87	Very stiff, fine grained	2.50	2.82	
13.95	45.77	278.7	6.29	Very stiff, fine grained	2.54	3.69	
14.00	45.93	277.5	6.27	Very stiff, fine grained	2.54	3.73	
14.05	46.10	255.3	6.49	Very stiff, fine grained	2.58	4.80	
14.10	46.26	180.1	7.85	Clays - silty clay to clay	2.74		24.02
14.15	46.42	144.1	6.05	Clays - silty clay to clay	2.72		19.21
14.20	46.59	102.2	5.11	Clays - silty clay to clay	2.76		13.63
14.25	46.75	56.0	4.21	Clays - silty clay to clay	2.90		7.46
14.30	46.92	45.6	4.09	Clays - silty clay to clay	2.96		6.08
14.35	47.08	51.3	4.20	Clays - silty clay to clay	2.93		6.85
14.40	47.24	56.9	5.25	Clays - silty clay to clay	2.96		7.58
14.45	47.41	61.0	6.41	Clays - silty clay to clay	3.00		8.13
14.50	47.57	71.5	4.81	Clays - silty clay to clay	2.86		9.53
14.55	47.74	57.7	4.65	Clays - silty clay to clay	2.92		7.69
14.60	47.90	48.7	5.12	Clays - silty clay to clay	3.01		6.49
14.65	48.06	48.5	5.85	Clays - silty clay to clay	3.06		6.46
14.70	48.23	52.0	7.80	Clays - silty clay to clay	3.12		6.94
14.75	48.39	113.3	5.80	Clays - silty clay to clay	2.79		15.10
14.80	48.56	160.5	4.97	Silt mixtures - clayey silt to silty clay	2.63	6.72	21.41
14.85	48.72	157.0	5.42	Clays - silty clay to clay	2.67	8.49	20.93
14.90	48.88	122.3	5.21	Clays - silty clay to clay	2.73		16.30
14.95	49.05	73.8	6.52	Clays - silty clay to clay	2.96		9.84
15.00	49.21	66.3	5.23	Clays - silty clay to clay	2.93		8.84
15.05	49.38	51.0	5.68	Clays - silty clay to clay	3.04		6.79
15.10	49.54	45.8	5.93	Clays - silty clay to clay	3.09		6.11
15.15	49.70	48.0	10.60	Clays - silty clay to clay	3.26		6.40
15.20	49.87	123.0	6.37	Clays - silty clay to clay	2.80		16.40
15.25	50.03	152.8	7.24	Clays - silty clay to clay	2.78		20.37
15.30	50.20	180.08	6.85	Clays - silty clay to clay	2.72		24.01
15.35	50.36	220.10	6.57	Clays - silty clay to clay	2.65	7.53	29.35
15.40	50.52	270.60	6.57	Very stiff, fine grained	2.60	5.35	
15.45	50.69	309.06	6.57	Very stiff, fine grained	2.56	4.30	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hill Specific Plan
DATE/TIME: 9/6/2006 13:44
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 32.3 feet
SOUNDING: CPT-02

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	63.2	0.73	Sands - clean sands to silty sand	1.76	1.08	
0.10	0.33	39.4	1.20	Sands - clean sands to silty sand	2.06	1.38	
0.15	0.49	37.5	1.18	Sand mixtures - silty sand to sandy silt	2.07	1.40	
0.20	0.66	32.4	1.25	Sand mixtures - silty sand to sandy silt	2.14	1.52	
0.25	0.82	33.9	1.09	Sand mixtures - silty sand to sandy silt	2.09	1.42	
0.30	0.98	34.2	1.11	Sand mixtures - silty sand to sandy silt	2.09	1.42	
0.35	1.15	30.9	1.29	Sand mixtures - silty sand to sandy silt	2.16	1.57	
0.40	1.31	25.4	1.26	Sand mixtures - silty sand to sandy silt	2.22	1.72	
0.45	1.48	18.9	0.95	Sand mixtures - silty sand to sandy silt	2.26	1.83	
0.50	1.64	20.1	0.86	Sand mixtures - silty sand to sandy silt	2.22	1.70	
0.55	1.80	20.0	1.13	Sand mixtures - silty sand to sandy silt	2.28	1.89	
0.60	1.97	18.6	1.29	Sand mixtures - silty sand to sandy silt	2.34	2.08	
0.65	2.13	20.0	0.93	Sand mixtures - silty sand to sandy silt	2.24	1.75	
0.70	2.30	18.9	1.07	Sand mixtures - silty sand to sandy silt	2.29	1.91	
0.75	2.46	18.8	1.00	Sand mixtures - silty sand to sandy silt	2.28	1.87	
0.80	2.62	20.7	1.04	Sand mixtures - silty sand to sandy silt	2.25	1.79	
0.85	2.79	22.1	1.19	Sand mixtures - silty sand to sandy silt	2.26	1.82	
0.90	2.95	24.7	1.05	Sand mixtures - silty sand to sandy silt	2.19	1.64	
0.95	3.12	24.5	1.00	Sand mixtures - silty sand to sandy silt	2.18	1.61	
1.00	3.28	17.7	1.08	Sand mixtures - silty sand to sandy silt	2.32	2.00	
1.05	3.44	13.8	1.20	Sand mixtures - silty sand to sandy silt	2.44	2.46	
1.10	3.61	13.7	1.25	Sand mixtures - silty sand to sandy silt	2.45	2.51	
1.15	3.77	18.9	0.83	Sand mixtures - silty sand to sandy silt	2.24	1.75	
1.20	3.94	19.6	0.77	Sand mixtures - silty sand to sandy silt	2.21	1.68	
1.25	4.10	14.3	0.93	Sand mixtures - silty sand to sandy silt	2.37	2.18	
1.30	4.27	13.7	1.37	Sand mixtures - silty sand to sandy silt	2.47	2.62	
1.35	4.43	16.3	1.17	Sand mixtures - silty sand to sandy silt	2.37	2.19	
1.40	4.59	13.8	1.24	Sand mixtures - silty sand to sandy silt	2.45	2.50	
1.45	4.76	14.5	0.72	Sand mixtures - silty sand to sandy silt	2.31	1.97	
1.50	4.92	19.4	0.77	Sand mixtures - silty sand to sandy silt	2.21	1.69	
1.55	5.09	19.6	0.83	Sand mixtures - silty sand to sandy silt	2.23	1.72	
1.60	5.25	18.8	1.05	Sand mixtures - silty sand to sandy silt	2.30	1.92	
1.65	5.41	20.0	0.99	Sand mixtures - silty sand to sandy silt	2.26	1.81	
1.70	5.58	25.2	1.07	Sand mixtures - silty sand to sandy silt	2.19	1.63	
1.75	5.74	29.8	1.11	Sand mixtures - silty sand to sandy silt	2.14	1.53	
1.80	5.91	28.1	1.30	Sand mixtures - silty sand to sandy silt	2.20	1.67	
1.85	6.07	27.4	1.11	Sand mixtures - silty sand to sandy silt	2.17	1.59	
1.90	6.23	24.8	1.19	Sand mixtures - silty sand to sandy silt	2.23	1.72	
1.95	6.40	26.0	1.21	Sand mixtures - silty sand to sandy silt	2.21	1.69	
2.00	6.56	29.2	1.40	Sand mixtures - silty sand to sandy silt	2.21	1.68	
2.05	6.73	39.6	1.39	Sand mixtures - silty sand to sandy silt	2.11	1.46	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-02

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	43.5	1.79	Sand mixtures - silty sand to sandy silt	2.16	1.55	
2.15	7.05	32.5	2.53	Sand mixtures - silty sand to sandy silt	2.35	2.09	
2.20	7.22	26.5	3.03	Silt mixtures - clayey silt to silty clay	2.47	2.59	
2.25	7.38	24.7	2.75	Silt mixtures - clayey silt to silty clay	2.46	2.56	
2.30	7.55	33.0	1.97	Sand mixtures - silty sand to sandy silt	2.28	1.86	
2.35	7.71	38.2	1.90	Sand mixtures - silty sand to sandy silt	2.23	1.73	
2.40	7.87	42.9	1.85	Sand mixtures - silty sand to sandy silt	2.19	1.64	
2.45	8.04	41.1	2.22	Sand mixtures - silty sand to sandy silt	2.26	1.82	
2.50	8.20	29.7	2.48	Sand mixtures - silty sand to sandy silt	2.39	2.26	
2.55	8.37	27.1	2.55	Sand mixtures - silty sand to sandy silt	2.43	2.41	
2.60	8.53	28.7	1.93	Sand mixtures - silty sand to sandy silt	2.34	2.07	
2.65	8.69	31.4	1.76	Sand mixtures - silty sand to sandy silt	2.29	1.91	
2.70	8.86	33.3	1.69	Sand mixtures - silty sand to sandy silt	2.27	1.84	
2.75	9.02	27.3	2.06	Sand mixtures - silty sand to sandy silt	2.38	2.24	
2.80	9.19	19.5	3.05	Silt mixtures - clayey silt to silty clay	2.60	5.27	
2.85	9.35	19.7	2.97	Silt mixtures - clayey silt to silty clay	2.59	5.08	
2.90	9.51	28.2	2.14	Sand mixtures - silty sand to sandy silt	2.40	2.29	
2.95	9.68	28.8	1.98	Sand mixtures - silty sand to sandy silt	2.37	2.20	
3.00	9.84	34.8	1.65	Sand mixtures - silty sand to sandy silt	2.27	1.86	
3.05	10.01	40.1	1.67	Sand mixtures - silty sand to sandy silt	2.24	1.75	
3.10	10.17	42.5	1.88	Sand mixtures - silty sand to sandy silt	2.26	1.81	
3.15	10.33	41.7	2.38	Sand mixtures - silty sand to sandy silt	2.33	2.05	
3.20	10.50	38.9	2.61	Sand mixtures - silty sand to sandy silt	2.39	2.24	
3.25	10.66	36.6	2.85	Silt mixtures - clayey silt to silty clay	2.43	2.44	
3.30	10.83	26.4	3.39	Silt mixtures - clayey silt to silty clay	2.58	4.83	
3.35	10.99	20.0	4.29	Silt mixtures - clayey silt to silty clay	2.74		2.66
3.40	11.15	22.6	3.71	Silt mixtures - clayey silt to silty clay	2.66	8.08	3.01
3.45	11.32	25.4	3.68	Silt mixtures - clayey silt to silty clay	2.63	6.59	3.38
3.50	11.48	20.8	4.01	Silt mixtures - clayey silt to silty clay	2.72		2.78
3.55	11.65	20.1	4.46	Clays - silty clay to clay	2.77		2.68
3.60	11.81	18.8	4.46	Clays - silty clay to clay	2.79		2.50
3.65	11.97	27.1	2.65	Silt mixtures - clayey silt to silty clay	2.53	3.44	
3.70	12.14	35.9	1.62	Sand mixtures - silty sand to sandy silt	2.31	1.97	
3.75	12.30	43.6	0.99	Sand mixtures - silty sand to sandy silt	2.12	1.48	
3.80	12.47	47.2	0.85	Sands - clean sands to silty sand	2.06	1.38	
3.85	12.63	48.3	0.85	Sands - clean sands to silty sand	2.06	1.37	
3.90	12.80	49.4	0.95	Sand mixtures - silty sand to sandy silt	2.08	1.41	
3.95	12.96	52.6	0.97	Sands - clean sands to silty sand	2.07	1.39	
4.00	13.12	55.0	0.91	Sands - clean sands to silty sand	2.04	1.35	
4.05	13.29	55.6	0.86	Sands - clean sands to silty sand	2.03	1.33	
4.10	13.45	54.5	0.84	Sands - clean sands to silty sand	2.03	1.33	
4.15	13.62	52.6	0.90	Sands - clean sands to silty sand	2.06	1.38	
4.20	13.78	55.0	0.87	Sands - clean sands to silty sand	2.04	1.35	
4.25	13.94	56.5	0.85	Sands - clean sands to silty sand	2.03	1.33	
4.30	14.11	55.4	0.81	Sands - clean sands to silty sand	2.03	1.33	
4.35	14.27	53.9	0.81	Sands - clean sands to silty sand	2.04	1.34	
4.40	14.44	52.9	0.84	Sands - clean sands to silty sand	2.05	1.37	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-02

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	51.5	0.87	Sands - clean sands to silty sand	2.08	1.40	
4.50	14.76	51.4	0.89	Sand mixtures - silty sand to sandy silt	2.09	1.42	
4.55	14.93	51.7	0.77	Sands - clean sands to silty sand	2.05	1.36	
4.60	15.09	51.8	0.76	Sands - clean sands to silty sand	2.05	1.36	
4.65	15.26	50.8	0.80	Sands - clean sands to silty sand	2.07	1.40	
4.70	15.42	51.6	0.84	Sand mixtures - silty sand to sandy silt	2.08	1.41	
4.75	15.58	54.3	0.86	Sands - clean sands to silty sand	2.07	1.40	
4.80	15.75	56.9	0.88	Sands - clean sands to silty sand	2.06	1.38	
4.85	15.91	59.7	0.86	Sands - clean sands to silty sand	2.05	1.36	
4.90	16.08	61.7	0.87	Sands - clean sands to silty sand	2.04	1.34	
4.95	16.24	62.1	0.89	Sands - clean sands to silty sand	2.05	1.36	
5.00	16.40	61.8	0.90	Sands - clean sands to silty sand	2.05	1.36	
5.05	16.57	61.8	0.92	Sands - clean sands to silty sand	2.06	1.38	
5.10	16.73	61.3	0.90	Sands - clean sands to silty sand	2.06	1.37	
5.15	16.90	60.2	0.92	Sands - clean sands to silty sand	2.07	1.40	
5.20	17.06	58.8	0.91	Sand mixtures - silty sand to sandy silt	2.08	1.41	
5.25	17.22	58.4	0.90	Sand mixtures - silty sand to sandy silt	2.08	1.42	
5.30	17.39	58.2	0.91	Sand mixtures - silty sand to sandy silt	2.09	1.43	
5.35	17.55	58.2	0.90	Sand mixtures - silty sand to sandy silt	2.09	1.43	
5.40	17.72	57.0	0.95	Sand mixtures - silty sand to sandy silt	2.11	1.47	
5.45	17.88	56.3	1.03	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.50	18.04	55.9	1.27	Sand mixtures - silty sand to sandy silt	2.20	1.66	
5.55	18.21	56.3	1.08	Sand mixtures - silty sand to sandy silt	2.16	1.56	
5.60	18.37	54.5	1.13	Sand mixtures - silty sand to sandy silt	2.18	1.62	
5.65	18.54	55.2	0.99	Sand mixtures - silty sand to sandy silt	2.15	1.53	
5.70	18.70	59.0	0.91	Sand mixtures - silty sand to sandy silt	2.10	1.45	
5.75	18.86	65.4	0.82	Sands - clean sands to silty sand	2.04	1.35	
5.80	19.03	58.8	0.95	Sand mixtures - silty sand to sandy silt	2.12	1.48	
5.85	19.19	57.4	0.98	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.90	19.36	60.9	0.96	Sand mixtures - silty sand to sandy silt	2.12	1.48	
5.95	19.52	63.3	0.99	Sand mixtures - silty sand to sandy silt	2.11	1.47	
6.00	19.68	65.3	0.93	Sand mixtures - silty sand to sandy silt	2.09	1.42	
6.05	19.85	67.0	0.88	Sands - clean sands to silty sand	2.07	1.39	
6.10	20.01	67.4	1.59	Sand mixtures - silty sand to sandy silt	2.23	1.74	
6.15	20.18	67.3	1.47	Sand mixtures - silty sand to sandy silt	2.21	1.69	
6.20	20.34	63.4	1.30	Sand mixtures - silty sand to sandy silt	2.20	1.66	
6.25	20.51	59.5	0.92	Sand mixtures - silty sand to sandy silt	2.13	1.50	
6.30	20.67	51.1	0.93	Sand mixtures - silty sand to sandy silt	2.19	1.62	
6.35	20.83	46.6	0.92	Sand mixtures - silty sand to sandy silt	2.22	1.71	
6.40	21.00	51.4	1.06	Sand mixtures - silty sand to sandy silt	2.22	1.72	
6.45	21.16	59.3	0.90	Sand mixtures - silty sand to sandy silt	2.13	1.51	
6.50	21.33	60.1	0.82	Sand mixtures - silty sand to sandy silt	2.11	1.46	
6.55	21.49	61.0	0.78	Sand mixtures - silty sand to sandy silt	2.09	1.43	
6.60	21.65	61.5	0.82	Sand mixtures - silty sand to sandy silt	2.10	1.45	
6.65	21.82	62.5	0.78	Sand mixtures - silty sand to sandy silt	2.08	1.42	
6.70	21.98	62.9	0.76	Sands - clean sands to silty sand	2.08	1.41	
6.75	22.15	60.2	0.77	Sand mixtures - silty sand to sandy silt	2.10	1.44	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-02

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	58.5	0.82	Sand mixtures - silty sand to sandy silt	2.13	1.50	
6.85	22.47	60.6	0.83	Sand mixtures - silty sand to sandy silt	2.12	1.48	
6.90	22.64	64.3	0.83	Sand mixtures - silty sand to sandy silt	2.10	1.45	
6.95	22.80	66.2	0.83	Sand mixtures - silty sand to sandy silt	2.09	1.43	
7.00	22.97	65.5	0.83	Sand mixtures - silty sand to sandy silt	2.10	1.44	
7.05	23.13	63.9	0.78	Sand mixtures - silty sand to sandy silt	2.09	1.43	
7.10	23.29	62.2	0.80	Sand mixtures - silty sand to sandy silt	2.11	1.47	
7.15	23.46	61.4	0.78	Sand mixtures - silty sand to sandy silt	2.11	1.47	
7.20	23.62	60.6	0.79	Sand mixtures - silty sand to sandy silt	2.12	1.49	
7.25	23.79	59.4	0.81	Sand mixtures - silty sand to sandy silt	2.14	1.52	
7.30	23.95	58.6	0.85	Sand mixtures - silty sand to sandy silt	2.16	1.56	
7.35	24.11	59.4	0.83	Sand mixtures - silty sand to sandy silt	2.15	1.54	
7.40	24.28	61.4	0.78	Sand mixtures - silty sand to sandy silt	2.12	1.49	
7.45	24.44	62.9	0.74	Sand mixtures - silty sand to sandy silt	2.10	1.45	
7.50	24.61	63.6	0.74	Sand mixtures - silty sand to sandy silt	2.10	1.45	
7.55	24.77	62.9	0.63	Sands - clean sands to silty sand	2.07	1.39	
7.60	24.93	62.5	0.67	Sand mixtures - silty sand to sandy silt	2.08	1.42	
7.65	25.10	62.9	0.70	Sand mixtures - silty sand to sandy silt	2.10	1.44	
7.70	25.26	63.6	0.73	Sand mixtures - silty sand to sandy silt	2.11	1.46	
7.75	25.43	65.1	0.77	Sand mixtures - silty sand to sandy silt	2.11	1.47	
7.80	25.59	68.4	0.76	Sand mixtures - silty sand to sandy silt	2.09	1.43	
7.85	25.75	71.7	0.77	Sands - clean sands to silty sand	2.08	1.41	
7.90	25.92	73.9	0.78	Sands - clean sands to silty sand	2.07	1.40	
7.95	26.08	75.5	0.77	Sands - clean sands to silty sand	2.06	1.38	
8.00	26.25	76.7	0.70	Sands - clean sands to silty sand	2.04	1.34	
8.05	26.41	75.6	0.66	Sands - clean sands to silty sand	2.03	1.33	
8.10	26.57	69.0	0.71	Sand mixtures - silty sand to sandy silt	2.08	1.42	
8.15	26.74	61.0	0.80	Sand mixtures - silty sand to sandy silt	2.16	1.57	
8.20	26.90	56.7	0.99	Sand mixtures - silty sand to sandy silt	2.25	1.78	
8.25	27.07	61.3	1.09	Sand mixtures - silty sand to sandy silt	2.25	1.78	
8.30	27.23	77.3	1.07	Sand mixtures - silty sand to sandy silt	2.16	1.56	
8.35	27.39	90.4	1.00	Sand mixtures - silty sand to sandy silt	2.09	1.42	
8.40	27.56	105.5	0.96	Sands - clean sands to silty sand	2.02	1.32	
8.45	27.72	109.9	0.92	Sands - clean sands to silty sand	1.99	1.28	
8.50	27.89	110.2	0.69	Sands - clean sands to silty sand	1.91	1.19	
8.55	28.05	107.1	0.70	Sands - clean sands to silty sand	1.93	1.21	
8.60	28.21	100.2	0.75	Sands - clean sands to silty sand	1.97	1.26	
8.65	28.38	96.9	0.71	Sands - clean sands to silty sand	1.97	1.26	
8.70	28.54	92.0	0.74	Sands - clean sands to silty sand	2.01	1.30	
8.75	28.71	84.6	0.66	Sands - clean sands to silty sand	2.01	1.30	
8.80	28.87	77.5	0.61	Sands - clean sands to silty sand	2.02	1.33	
8.85	29.04	73.5	0.55	Sands - clean sands to silty sand	2.02	1.32	
8.90	29.20	69.6	0.61	Sands - clean sands to silty sand	2.07	1.39	
8.95	29.36	70.0	0.68	Sand mixtures - silty sand to sandy silt	2.10	1.44	
9.00	29.53	73.1	0.72	Sand mixtures - silty sand to sandy silt	2.10	1.44	
9.05	29.69	80.3	0.70	Sands - clean sands to silty sand	2.05	1.37	
9.10	29.86	85.9	0.68	Sands - clean sands to silty sand	2.02	1.32	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-02

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	88.1	0.76	Sands - clean sands to silty sand	2.04	1.35	
9.20	30.18	91.0	0.79	Sands - clean sands to silty sand	2.05	1.36	
9.25	30.35	97.4	0.82	Sands - clean sands to silty sand	2.03	1.33	
9.30	30.51	102.6	0.79	Sands - clean sands to silty sand	2.00	1.29	
9.35	30.68	100.5	0.88	Sands - clean sands to silty sand	2.04	1.35	
9.40	30.84	96.5	0.92	Sands - clean sands to silty sand	2.07	1.40	
9.45	31.00	96.5	1.00	Sand mixtures - silty sand to sandy silt	2.10	1.44	
9.50	31.17	100.0	1.06	Sand mixtures - silty sand to sandy silt	2.10	1.45	
9.55	31.33	123.6	1.21	Sand mixtures - silty sand to sandy silt	2.07	1.39	
9.60	31.50	154.6	2.30	Sand mixtures - silty sand to sandy silt	2.21	1.69	
9.65	31.66	193.7	3.12	Sand mixtures - silty sand to sandy silt	2.26	1.81	
9.70	31.82	223.9	3.94	Very stiff sand to clayey sand	2.31	1.95	
9.75	31.99	327.8	4.20	Very stiff, fine grained	2.23	1.74	
9.80	32.15	412.2	4.20	Very stiff sand to clayey sand	2.18	1.60	
9.85	32.32	538.0	4.20	Very stiff sand to clayey sand	2.12	1.48	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hill Specific Plan
DATE/TIME: 9/6/2006 14:17
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 34 feet
SOUNDING: CPT-03

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	77.1	2.46	Sand mixtures - silty sand to sandy silt	2.07	1.40	
0.10	0.33	48.5	2.19	Sand mixtures - silty sand to sandy silt	2.17	1.59	
0.15	0.49	35.1	2.38	Sand mixtures - silty sand to sandy silt	2.30	1.92	
0.20	0.66	24.8	2.16	Sand mixtures - silty sand to sandy silt	2.38	2.22	
0.25	0.82	18.6	1.89	Sand mixtures - silty sand to sandy silt	2.44	2.46	
0.30	0.98	14.8	1.77	Sand mixtures - silty sand to sandy silt	2.50	2.82	
0.35	1.15	12.5	1.54	Sand mixtures - silty sand to sandy silt	2.53	3.40	
0.40	1.31	10.8	1.23	Sand mixtures - silty sand to sandy silt	2.53	3.44	
0.45	1.48	8.6	1.39	Silt mixtures - clayey silt to silty clay	2.65	7.22	1.14
0.50	1.64	7.6	0.87	Sand mixtures - silty sand to sandy silt	2.59	5.16	
0.55	1.80	7.1	1.35	Silt mixtures - clayey silt to silty clay	2.71		0.94
0.60	1.97	9.6	1.23	Sand mixtures - silty sand to sandy silt	2.58	4.68	
0.65	2.13	9.2	1.45	Silt mixtures - clayey silt to silty clay	2.63	6.50	1.23
0.70	2.30	10.1	1.19	Sand mixtures - silty sand to sandy silt	2.55	3.95	
0.75	2.46	10.0	1.25	Sand mixtures - silty sand to sandy silt	2.57	4.40	
0.80	2.62	10.2	1.25	Sand mixtures - silty sand to sandy silt	2.56	4.13	
0.85	2.79	10.5	1.02	Sand mixtures - silty sand to sandy silt	2.50	2.85	
0.90	2.95	9.7	1.82	Silt mixtures - clayey silt to silty clay	2.67	8.28	1.29
0.95	3.12	9.8	1.72	Silt mixtures - clayey silt to silty clay	2.65	7.39	1.31
1.00	3.28	10.3	1.62	Silt mixtures - clayey silt to silty clay	2.62	6.05	1.37
1.05	3.44	10.9	1.01	Sand mixtures - silty sand to sandy silt	2.49	2.69	
1.10	3.61	10.3	0.94	Sand mixtures - silty sand to sandy silt	2.49	2.73	
1.15	3.77	9.8	0.81	Sand mixtures - silty sand to sandy silt	2.49	2.69	
1.20	3.94	9.5	0.67	Sand mixtures - silty sand to sandy silt	2.46	2.57	
1.25	4.10	4.9	1.15	Silt mixtures - clayey silt to silty clay	2.84		0.65
1.30	4.27	3.7	1.70	Clays - silty clay to clay	3.03		0.50
1.35	4.43	3.4	1.93	Clays - silty clay to clay	3.09		0.46
1.40	4.59	5.5	1.18	Silt mixtures - clayey silt to silty clay	2.80		0.74
1.45	4.76	8.9	0.85	Sand mixtures - silty sand to sandy silt	2.54	3.62	
1.50	4.92	11.5	0.97	Sand mixtures - silty sand to sandy silt	2.46	2.57	
1.55	5.09	16.0	1.10	Sand mixtures - silty sand to sandy silt	2.36	2.16	
1.60	5.25	24.4	1.18	Sand mixtures - silty sand to sandy silt	2.23	1.73	
1.65	5.41	34.1	1.02	Sand mixtures - silty sand to sandy silt	2.07	1.40	
1.70	5.58	47.4	1.02	Sands - clean sands to silty sand	1.96	1.24	
1.75	5.74	56.7	1.82	Sand mixtures - silty sand to sandy silt	2.07	1.39	
1.80	5.91	59.3	2.16	Sand mixtures - silty sand to sandy silt	2.11	1.46	
1.85	6.07	58.6	2.51	Sand mixtures - silty sand to sandy silt	2.16	1.57	
1.90	6.23	64.8	2.18	Sand mixtures - silty sand to sandy silt	2.09	1.43	
1.95	6.40	59.8	2.65	Sand mixtures - silty sand to sandy silt	2.17	1.59	
2.00	6.56	51.3	2.63	Sand mixtures - silty sand to sandy silt	2.22	1.70	
2.05	6.73	41.6	2.89	Sand mixtures - silty sand to sandy silt	2.31	1.97	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-03

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	48.7	2.24	Sand mixtures - silty sand to sandy silt	2.19	1.63	
2.15	7.05	47.1	2.16	Sand mixtures - silty sand to sandy silt	2.19	1.64	
2.20	7.22	38.6	2.18	Sand mixtures - silty sand to sandy silt	2.25	1.79	
2.25	7.38	36.1	1.40	Sand mixtures - silty sand to sandy silt	2.16	1.55	
2.30	7.55	45.9	1.68	Sand mixtures - silty sand to sandy silt	2.14	1.52	
2.35	7.71	45.7	1.81	Sand mixtures - silty sand to sandy silt	2.17	1.58	
2.40	7.87	31.2	2.85	Sand mixtures - silty sand to sandy silt	2.41	2.33	
2.45	8.04	27.8	1.72	Sand mixtures - silty sand to sandy silt	2.30	1.94	
2.50	8.20	22.9	1.69	Sand mixtures - silty sand to sandy silt	2.36	2.14	
2.55	8.37	20.1	1.55	Sand mixtures - silty sand to sandy silt	2.38	2.23	
2.60	8.53	20.8	1.44	Sand mixtures - silty sand to sandy silt	2.36	2.14	
2.65	8.69	20.1	0.98	Sand mixtures - silty sand to sandy silt	2.28	1.88	
2.70	8.86	14.2	1.76	Sand mixtures - silty sand to sandy silt	2.54	3.56	
2.75	9.02	12.8	1.60	Sand mixtures - silty sand to sandy silt	2.55	3.93	
2.80	9.19	16.6	1.02	Sand mixtures - silty sand to sandy silt	2.37	2.17	
2.85	9.35	15.2	0.79	Sand mixtures - silty sand to sandy silt	2.35	2.10	
2.90	9.51	13.5	0.69	Sand mixtures - silty sand to sandy silt	2.36	2.15	
2.95	9.68	11.2	1.40	Silt mixtures - clayey silt to silty clay	2.58	4.80	
3.00	9.84	9.6	2.40	Silt mixtures - clayey silt to silty clay	2.77		1.28
3.05	10.01	18.4	1.63	Sand mixtures - silty sand to sandy silt	2.47	2.60	
3.10	10.17	23.5	1.19	Sand mixtures - silty sand to sandy silt	2.32	2.00	
3.15	10.33	22.9	1.14	Sand mixtures - silty sand to sandy silt	2.32	2.01	
3.20	10.50	15.6	1.72	Silt mixtures - clayey silt to silty clay	2.55	3.88	
3.25	10.66	18.9	1.55	Sand mixtures - silty sand to sandy silt	2.47	2.59	
3.30	10.83	23.6	1.81	Sand mixtures - silty sand to sandy silt	2.44	2.47	
3.35	10.99	29.1	1.26	Sand mixtures - silty sand to sandy silt	2.28	1.89	
3.40	11.15	33.2	1.45	Sand mixtures - silty sand to sandy silt	2.28	1.88	
3.45	11.32	39.6	1.59	Sand mixtures - silty sand to sandy silt	2.26	1.81	
3.50	11.48	38.4	1.68	Sand mixtures - silty sand to sandy silt	2.29	1.89	
3.55	11.65	40.2	1.54	Sand mixtures - silty sand to sandy silt	2.25	1.79	
3.60	11.81	37.6	1.49	Sand mixtures - silty sand to sandy silt	2.27	1.83	
3.65	11.97	34.8	1.54	Sand mixtures - silty sand to sandy silt	2.30	1.95	
3.70	12.14	28.3	1.59	Sand mixtures - silty sand to sandy silt	2.38	2.22	
3.75	12.30	25.3	1.74	Sand mixtures - silty sand to sandy silt	2.44	2.48	
3.80	12.47	30.0	1.45	Sand mixtures - silty sand to sandy silt	2.34	2.09	
3.85	12.63	34.0	1.23	Sand mixtures - silty sand to sandy silt	2.26	1.83	
3.90	12.80	36.3	1.19	Sand mixtures - silty sand to sandy silt	2.24	1.75	
3.95	12.96	37.5	1.31	Sand mixtures - silty sand to sandy silt	2.26	1.80	
4.00	13.12	34.3	1.50	Sand mixtures - silty sand to sandy silt	2.32	2.02	
4.05	13.29	35.9	1.44	Sand mixtures - silty sand to sandy silt	2.30	1.94	
4.10	13.45	34.9	1.46	Sand mixtures - silty sand to sandy silt	2.32	2.00	
4.15	13.62	38.8	1.28	Sand mixtures - silty sand to sandy silt	2.25	1.79	
4.20	13.78	46.5	1.23	Sand mixtures - silty sand to sandy silt	2.19	1.62	
4.25	13.94	47.5	1.34	Sand mixtures - silty sand to sandy silt	2.20	1.67	
4.30	14.11	45.1	1.43	Sand mixtures - silty sand to sandy silt	2.24	1.77	
4.35	14.27	41.7	1.29	Sand mixtures - silty sand to sandy silt	2.24	1.76	
4.40	14.44	41.3	1.17	Sand mixtures - silty sand to sandy silt	2.22	1.71	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-03

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	36.8	1.74	Sand mixtures - silty sand to sandy silt	2.37	2.19	
4.50	14.76	33.3	3.94	Silt mixtures - clayey silt to silty clay	2.65	7.30	4.44
4.55	14.93	44.7	2.39	Sand mixtures - silty sand to sandy silt	2.41	2.33	
4.60	15.09	36.4	2.43	Silt mixtures - clayey silt to silty clay	2.48	2.65	
4.65	15.26	38.3	1.37	Sand mixtures - silty sand to sandy silt	2.30	1.95	
4.70	15.42	42.2	1.39	Sand mixtures - silty sand to sandy silt	2.28	1.87	
4.75	15.58	42.3	1.18	Sand mixtures - silty sand to sandy silt	2.24	1.75	
4.80	15.75	37.2	1.21	Sand mixtures - silty sand to sandy silt	2.29	1.91	
4.85	15.91	34.5	1.04	Sand mixtures - silty sand to sandy silt	2.28	1.88	
4.90	16.08	29.5	1.07	Sand mixtures - silty sand to sandy silt	2.35	2.09	
4.95	16.24	25.2	1.24	Sand mixtures - silty sand to sandy silt	2.44	2.47	
5.00	16.40	25.7	1.59	Sand mixtures - silty sand to sandy silt	2.50	2.75	
5.05	16.57	27.7	0.96	Sand mixtures - silty sand to sandy silt	2.35	2.10	
5.10	16.73	29.1	0.90	Sand mixtures - silty sand to sandy silt	2.32	2.00	
5.15	16.90	23.8	0.99	Sand mixtures - silty sand to sandy silt	2.42	2.37	
5.20	17.06	23.8	1.00	Sand mixtures - silty sand to sandy silt	2.42	2.40	
5.25	17.22	21.8	1.19	Sand mixtures - silty sand to sandy silt	2.50	2.74	
5.30	17.39	27.5	1.16	Sand mixtures - silty sand to sandy silt	2.41	2.35	
5.35	17.55	32.4	1.25	Sand mixtures - silty sand to sandy silt	2.38	2.21	
5.40	17.72	38.1	1.23	Sand mixtures - silty sand to sandy silt	2.32	2.00	
5.45	17.88	44.3	1.23	Sand mixtures - silty sand to sandy silt	2.27	1.85	
5.50	18.04	47.9	1.00	Sand mixtures - silty sand to sandy silt	2.19	1.64	
5.55	18.21	49.3	1.04	Sand mixtures - silty sand to sandy silt	2.19	1.64	
5.60	18.37	50.2	1.10	Sand mixtures - silty sand to sandy silt	2.20	1.67	
5.65	18.54	46.9	1.03	Sand mixtures - silty sand to sandy silt	2.21	1.69	
5.70	18.70	45.0	1.57	Sand mixtures - silty sand to sandy silt	2.34	2.09	
5.75	18.86	47.3	1.61	Sand mixtures - silty sand to sandy silt	2.34	2.06	
5.80	19.03	40.5	1.53	Sand mixtures - silty sand to sandy silt	2.38	2.22	
5.85	19.19	40.9	1.44	Sand mixtures - silty sand to sandy silt	2.36	2.15	
5.90	19.36	41.7	1.45	Sand mixtures - silty sand to sandy silt	2.36	2.14	
5.95	19.52	45.5	1.50	Sand mixtures - silty sand to sandy silt	2.34	2.07	
6.00	19.68	50.1	1.43	Sand mixtures - silty sand to sandy silt	2.30	1.93	
6.05	19.85	53.8	1.40	Sand mixtures - silty sand to sandy silt	2.27	1.84	
6.10	20.01	58.5	1.31	Sand mixtures - silty sand to sandy silt	2.22	1.72	
6.15	20.18	61.5	1.28	Sand mixtures - silty sand to sandy silt	2.20	1.67	
6.20	20.34	61.5	1.29	Sand mixtures - silty sand to sandy silt	2.21	1.67	
6.25	20.51	61.5	1.36	Sand mixtures - silty sand to sandy silt	2.23	1.72	
6.30	20.67	61.9	1.62	Sand mixtures - silty sand to sandy silt	2.28	1.87	
6.35	20.83	67.0	1.66	Sand mixtures - silty sand to sandy silt	2.26	1.82	
6.40	21.00	67.6	1.33	Sand mixtures - silty sand to sandy silt	2.19	1.64	
6.45	21.16	75.0	1.15	Sand mixtures - silty sand to sandy silt	2.12	1.48	
6.50	21.33	73.3	1.26	Sand mixtures - silty sand to sandy silt	2.16	1.55	
6.55	21.49	76.0	1.14	Sand mixtures - silty sand to sandy silt	2.12	1.48	
6.60	21.65	75.5	1.19	Sand mixtures - silty sand to sandy silt	2.13	1.51	
6.65	21.82	72.0	1.14	Sand mixtures - silty sand to sandy silt	2.14	1.52	
6.70	21.98	68.7	1.09	Sand mixtures - silty sand to sandy silt	2.14	1.53	
6.75	22.15	60.7	1.25	Sand mixtures - silty sand to sandy silt	2.23	1.73	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-03

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	54.4	1.21	Sand mixtures - silty sand to sandy silt	2.26	1.81	
6.85	22.47	48.0	1.42	Sand mixtures - silty sand to sandy silt	2.35	2.11	
6.90	22.64	45.0	1.35	Sand mixtures - silty sand to sandy silt	2.36	2.15	
6.95	22.80	42.4	1.46	Sand mixtures - silty sand to sandy silt	2.41	2.32	
7.00	22.97	42.2	1.31	Sand mixtures - silty sand to sandy silt	2.38	2.22	
7.05	23.13	42.4	1.27	Sand mixtures - silty sand to sandy silt	2.37	2.20	
7.10	23.29	40.5	1.29	Sand mixtures - silty sand to sandy silt	2.40	2.29	
7.15	23.46	40.6	1.32	Sand mixtures - silty sand to sandy silt	2.40	2.31	
7.20	23.62	41.9	1.83	Sand mixtures - silty sand to sandy silt	2.49	2.69	
7.25	23.79	49.7	1.74	Sand mixtures - silty sand to sandy silt	2.42	2.36	
7.30	23.95	54.5	1.43	Sand mixtures - silty sand to sandy silt	2.33	2.03	
7.35	24.11	63.1	1.35	Sand mixtures - silty sand to sandy silt	2.26	1.82	
7.40	24.28	68.5	1.27	Sand mixtures - silty sand to sandy silt	2.22	1.70	
7.45	24.44	74.6	1.21	Sand mixtures - silty sand to sandy silt	2.18	1.60	
7.50	24.61	76.4	1.17	Sand mixtures - silty sand to sandy silt	2.16	1.56	
7.55	24.77	74.8	1.30	Sand mixtures - silty sand to sandy silt	2.20	1.65	
7.60	24.93	72.0	1.27	Sand mixtures - silty sand to sandy silt	2.21	1.68	
7.65	25.10	69.2	1.29	Sand mixtures - silty sand to sandy silt	2.23	1.73	
7.70	25.26	66.6	1.34	Sand mixtures - silty sand to sandy silt	2.25	1.80	
7.75	25.43	63.5	1.43	Sand mixtures - silty sand to sandy silt	2.29	1.92	
7.80	25.59	58.4	1.58	Sand mixtures - silty sand to sandy silt	2.35	2.12	
7.85	25.75	58.0	1.58	Sand mixtures - silty sand to sandy silt	2.36	2.14	
7.90	25.92	63.0	1.41	Sand mixtures - silty sand to sandy silt	2.30	1.93	
7.95	26.08	67.1	1.04	Sand mixtures - silty sand to sandy silt	2.19	1.63	
8.00	26.25	65.1	0.84	Sand mixtures - silty sand to sandy silt	2.14	1.53	
8.05	26.41	52.6	0.88	Sand mixtures - silty sand to sandy silt	2.24	1.76	
8.10	26.57	40.4	1.81	Silt mixtures - clayey silt to silty clay	2.54	3.64	
8.15	26.74	35.7	8.92	Clays - silty clay to clay	3.08		4.75
8.20	26.90	46.8	10.56	Clays - silty clay to clay	3.06		6.25
8.25	27.07	139.3	3.19	Sand mixtures - silty sand to sandy silt	2.32	2.00	
8.30	27.23	70.1	4.95	Silt mixtures - clayey silt to silty clay	2.69	9.31	9.34
8.35	27.39	59.1	2.68	Silt mixtures - clayey silt to silty clay	2.54	3.58	
8.40	27.56	46.9	2.33	Silt mixtures - clayey silt to silty clay	2.58	4.61	
8.45	27.72	41.7	2.54	Silt mixtures - clayey silt to silty clay	2.65	7.25	5.56
8.50	27.89	43.0	2.50	Silt mixtures - clayey silt to silty clay	2.63	6.65	5.74
8.55	28.05	52.4	2.08	Silt mixtures - clayey silt to silty clay	2.51	2.94	
8.60	28.21	60.4	1.64	Sand mixtures - silty sand to sandy silt	2.39	2.24	
8.65	28.38	65.4	1.34	Sand mixtures - silty sand to sandy silt	2.30	1.93	
8.70	28.54	61.6	1.38	Sand mixtures - silty sand to sandy silt	2.33	2.04	
8.75	28.71	52.2	1.44	Sand mixtures - silty sand to sandy silt	2.41	2.32	
8.80	28.87	45.3	1.23	Sand mixtures - silty sand to sandy silt	2.42	2.37	
8.85	29.04	43.8	1.14	Sand mixtures - silty sand to sandy silt	2.41	2.34	
8.90	29.20	45.3	1.11	Sand mixtures - silty sand to sandy silt	2.39	2.27	
8.95	29.36	45.3	1.00	Sand mixtures - silty sand to sandy silt	2.37	2.17	
9.00	29.53	42.5	1.45	Sand mixtures - silty sand to sandy silt	2.50	2.73	
9.05	29.69	43.9	1.74	Sand mixtures - silty sand to sandy silt	2.54	3.62	
9.10	29.86	49.7	2.47	Silt mixtures - clayey silt to silty clay	2.60	5.52	6.62

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-03

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	68.1	2.18	Sand mixtures - silty sand to sandy silt	2.45	2.53	
9.20	30.18	94.1	1.93	Sand mixtures - silty sand to sandy silt	2.30	1.95	
9.25	30.35	112.9	2.03	Sand mixtures - silty sand to sandy silt	2.26	1.82	
9.30	30.51	115.8	2.26	Sand mixtures - silty sand to sandy silt	2.29	1.91	
9.35	30.68	110.7	2.42	Sand mixtures - silty sand to sandy silt	2.33	2.04	
9.40	30.84	104.5	2.38	Sand mixtures - silty sand to sandy silt	2.34	2.09	
9.45	31.00	96.5	2.43	Sand mixtures - silty sand to sandy silt	2.38	2.22	
9.50	31.17	89.5	2.33	Sand mixtures - silty sand to sandy silt	2.39	2.27	
9.55	31.33	85.7	2.01	Sand mixtures - silty sand to sandy silt	2.36	2.15	
9.60	31.50	74.3	1.98	Sand mixtures - silty sand to sandy silt	2.41	2.33	
9.65	31.66	69.3	3.54	Silt mixtures - clayey silt to silty clay	2.63	6.40	9.24
9.70	31.82	79.2	6.65	Clays - silty clay to clay	2.80		10.57
9.75	31.99	152.0	5.65	Silt mixtures - clayey silt to silty clay	2.55	4.00	
9.80	32.15	272.1	4.87	Very stiff, fine grained	2.34	2.07	
9.85	32.32	352.2	5.31	Very stiff, fine grained	2.31	1.97	
9.90	32.48	400.8	5.84	Very stiff, fine grained	2.32	2.00	
9.95	32.64	424.9	6.08	Very stiff, fine grained	2.32	2.02	
10.00	32.81	426.7	6.34	Very stiff, fine grained	2.34	2.08	
10.05	32.97	426.1	6.51	Very stiff, fine grained	2.35	2.12	
10.10	33.14	448.3	6.25	Very stiff, fine grained	2.33	2.03	
10.15	33.30	466.3	6.17	Very stiff, fine grained	2.31	1.98	
10.20	33.46	465.1	6.26	Very stiff, fine grained	2.32	2.01	
10.25	33.63	461.3	5.16	Very stiff, fine grained	2.25	1.77	
10.30	33.79	443.2	5.16	Very stiff, fine grained	2.26	1.80	
10.35	33.96	463.4	5.16	Very stiff, fine grained	2.25	1.78	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hill Specific Plan
DATE/TIME: 9/6/2006 14:57
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	15.9	0.07	Sands - clean sands to silty sand	1.99	1.00	
0.10	0.33	38.2	0.08	Sands - clean sands to silty sand	1.62	1.00	
0.15	0.49	33.6	0.95	Sands - clean sands to silty sand	2.05	1.37	
0.20	0.66	28.9	0.11	Sands - clean sands to silty sand	1.76	1.00	
0.25	0.82	28.4	0.06	Sands - clean sands to silty sand	1.74	1.00	
0.30	0.98	26.6	0.06	Sands - clean sands to silty sand	1.77	1.00	
0.35	1.15	25.6	0.06	Sands - clean sands to silty sand	1.79	1.00	
0.40	1.31	25.6	0.07	Sands - clean sands to silty sand	1.79	1.00	
0.45	1.48	23.8	0.00	Sands - clean sands to silty sand	2.17	1.00	
0.50	1.64	19.7	0.03	Sands - clean sands to silty sand	1.92	1.00	
0.55	1.80	16.5	0.13	Sands - clean sands to silty sand	2.01	1.00	
0.60	1.97	16.8	0.23	Sand mixtures - silty sand to sandy silt	2.05	1.00	
0.65	2.13	18.9	0.10	Sands - clean sands to silty sand	1.93	1.00	
0.70	2.30	17.3	0.02	Sands - clean sands to silty sand	2.00	1.00	
0.75	2.46	17.9	0.03	Sands - clean sands to silty sand	1.96	1.00	
0.80	2.62	15.7	0.07	Sands - clean sands to silty sand	2.00	1.00	
0.85	2.79	16.7	0.15	Sands - clean sands to silty sand	2.02	1.00	
0.90	2.95	19.5	0.21	Sands - clean sands to silty sand	1.98	1.00	
0.95	3.12	22.4	0.17	Sands - clean sands to silty sand	1.90	1.00	
1.00	3.28	25.3	0.18	Sands - clean sands to silty sand	1.85	1.00	
1.05	3.44	28.7	0.20	Sands - clean sands to silty sand	1.82	1.00	
1.10	3.61	27.4	0.15	Sands - clean sands to silty sand	1.80	1.00	
1.15	3.77	26.6	0.31	Sands - clean sands to silty sand	1.91	1.00	
1.20	3.94	34.2	0.20	Sands - clean sands to silty sand	1.74	1.00	
1.25	4.10	54.3	0.21	Sands - clean sands to silty sand	1.56	1.00	
1.30	4.27	63.5	0.23	Sands - clean sands to silty sand	1.52	1.00	
1.35	4.43	64.5	0.26	Sands - clean sands to silty sand	1.54	1.00	
1.40	4.59	70.1	0.28	Sands - clean sands to silty sand	1.53	1.00	
1.45	4.76	81.1	0.30	Sands - clean sands to silty sand	1.49	1.00	
1.50	4.92	90.8	0.21	Sands - clean sands to silty sand	1.41	1.00	
1.55	5.09	86.3	0.13	Sands - clean sands to silty sand	1.37	1.00	
1.60	5.25	63.3	0.18	Sands - clean sands to silty sand	1.51	1.00	
1.65	5.41	48.2	0.29	Sands - clean sands to silty sand	1.67	1.00	
1.70	5.58	37.9	0.45	Sands - clean sands to silty sand	1.84	1.00	
1.75	5.74	32.4	0.55	Sands - clean sands to silty sand	1.94	1.23	
1.80	5.91	28.8	0.67	Sands - clean sands to silty sand	2.03	1.33	
1.85	6.07	28.8	0.71	Sands - clean sands to silty sand	2.05	1.36	
1.90	6.23	28.1	0.69	Sands - clean sands to silty sand	2.05	1.36	
1.95	6.40	26.6	0.74	Sand mixtures - silty sand to sandy silt	2.08	1.42	
2.00	6.56	29.3	0.75	Sands - clean sands to silty sand	2.05	1.36	
2.05	6.73	31.9	0.70	Sands - clean sands to silty sand	2.01	1.30	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	30.8	0.63	Sands - clean sands to silty sand	2.00	1.29	
2.15	7.05	26.0	0.55	Sands - clean sands to silty sand	2.03	1.33	
2.20	7.22	23.7	0.47	Sands - clean sands to silty sand	2.04	1.00	
2.25	7.38	23.9	0.54	Sands - clean sands to silty sand	2.07	1.39	
2.30	7.55	23.5	0.75	Sand mixtures - silty sand to sandy silt	2.14	1.53	
2.35	7.71	25.2	0.75	Sand mixtures - silty sand to sandy silt	2.12	1.49	
2.40	7.87	25.7	0.71	Sand mixtures - silty sand to sandy silt	2.11	1.47	
2.45	8.04	25.8	0.62	Sand mixtures - silty sand to sandy silt	2.09	1.42	
2.50	8.20	24.3	0.63	Sand mixtures - silty sand to sandy silt	2.12	1.47	
2.55	8.37	23.9	0.60	Sand mixtures - silty sand to sandy silt	2.11	1.47	
2.60	8.53	25.4	0.65	Sand mixtures - silty sand to sandy silt	2.12	1.47	
2.65	8.69	23.1	0.70	Sand mixtures - silty sand to sandy silt	2.17	1.58	
2.70	8.86	19.7	0.86	Sand mixtures - silty sand to sandy silt	2.27	1.83	
2.75	9.02	18.2	1.24	Sand mixtures - silty sand to sandy silt	2.38	2.22	
2.80	9.19	18.5	1.40	Sand mixtures - silty sand to sandy silt	2.41	2.33	
2.85	9.35	21.4	1.17	Sand mixtures - silty sand to sandy silt	2.32	2.01	
2.90	9.51	25.9	0.84	Sand mixtures - silty sand to sandy silt	2.19	1.63	
2.95	9.68	29.5	0.80	Sand mixtures - silty sand to sandy silt	2.14	1.52	
3.00	9.84	31.1	0.85	Sand mixtures - silty sand to sandy silt	2.14	1.52	
3.05	10.01	33.6	0.85	Sand mixtures - silty sand to sandy silt	2.12	1.49	
3.10	10.17	35.9	0.88	Sand mixtures - silty sand to sandy silt	2.11	1.47	
3.15	10.33	37.7	0.86	Sand mixtures - silty sand to sandy silt	2.09	1.43	
3.20	10.50	40.9	0.68	Sands - clean sands to silty sand	2.02	1.31	
3.25	10.66	43.2	0.71	Sands - clean sands to silty sand	2.01	1.31	
3.30	10.83	50.4	0.68	Sands - clean sands to silty sand	1.96	1.24	
3.35	10.99	61.5	0.51	Sands - clean sands to silty sand	1.83	1.12	
3.40	11.15	62.3	0.64	Sands - clean sands to silty sand	1.88	1.16	
3.45	11.32	64.1	0.70	Sands - clean sands to silty sand	1.89	1.18	
3.50	11.48	65.3	0.76	Sands - clean sands to silty sand	1.91	1.19	
3.55	11.65	64.7	0.86	Sands - clean sands to silty sand	1.95	1.23	
3.60	11.81	60.1	1.22	Sand mixtures - silty sand to sandy silt	2.07	1.39	
3.65	11.97	58.2	1.15	Sand mixtures - silty sand to sandy silt	2.06	1.38	
3.70	12.14	57.0	1.17	Sand mixtures - silty sand to sandy silt	2.08	1.41	
3.75	12.30	60.1	1.18	Sand mixtures - silty sand to sandy silt	2.07	1.39	
3.80	12.47	58.0	1.12	Sand mixtures - silty sand to sandy silt	2.07	1.39	
3.85	12.63	55.6	1.12	Sand mixtures - silty sand to sandy silt	2.08	1.42	
3.90	12.80	53.2	1.17	Sand mixtures - silty sand to sandy silt	2.11	1.47	
3.95	12.96	50.5	1.36	Sand mixtures - silty sand to sandy silt	2.17	1.59	
4.00	13.12	45.0	1.48	Sand mixtures - silty sand to sandy silt	2.23	1.74	
4.05	13.29	35.7	1.65	Sand mixtures - silty sand to sandy silt	2.34	2.07	
4.10	13.45	30.5	1.60	Sand mixtures - silty sand to sandy silt	2.39	2.24	
4.15	13.62	29.4	1.45	Sand mixtures - silty sand to sandy silt	2.37	2.20	
4.20	13.78	30.0	1.22	Sand mixtures - silty sand to sandy silt	2.33	2.03	
4.25	13.94	31.7	1.17	Sand mixtures - silty sand to sandy silt	2.30	1.94	
4.30	14.11	34.5	1.14	Sand mixtures - silty sand to sandy silt	2.27	1.85	
4.35	14.27	39.0	1.11	Sand mixtures - silty sand to sandy silt	2.22	1.72	
4.40	14.44	44.2	1.03	Sand mixtures - silty sand to sandy silt	2.17	1.58	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	48.6	1.11	Sand mixtures - silty sand to sandy silt	2.16	1.56	
4.50	14.76	53.4	1.14	Sand mixtures - silty sand to sandy silt	2.14	1.52	
4.55	14.93	56.0	1.17	Sand mixtures - silty sand to sandy silt	2.13	1.50	
4.60	15.09	58.9	1.06	Sand mixtures - silty sand to sandy silt	2.09	1.43	
4.65	15.26	56.4	1.04	Sand mixtures - silty sand to sandy silt	2.10	1.45	
4.70	15.42	56.1	0.94	Sand mixtures - silty sand to sandy silt	2.08	1.41	
4.75	15.58	56.0	0.87	Sands - clean sands to silty sand	2.06	1.39	
4.80	15.75	54.4	0.79	Sands - clean sands to silty sand	2.05	1.37	
4.85	15.91	53.7	0.94	Sand mixtures - silty sand to sandy silt	2.10	1.45	
4.90	16.08	56.7	0.94	Sand mixtures - silty sand to sandy silt	2.09	1.42	
4.95	16.24	55.2	0.88	Sand mixtures - silty sand to sandy silt	2.08	1.41	
5.00	16.40	53.6	0.93	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.05	16.57	58.7	1.01	Sand mixtures - silty sand to sandy silt	2.10	1.45	
5.10	16.73	65.7	1.10	Sand mixtures - silty sand to sandy silt	2.09	1.43	
5.15	16.90	72.1	1.16	Sand mixtures - silty sand to sandy silt	2.08	1.41	
5.20	17.06	72.8	1.14	Sand mixtures - silty sand to sandy silt	2.07	1.40	
5.25	17.22	65.9	1.39	Sand mixtures - silty sand to sandy silt	2.16	1.57	
5.30	17.39	64.1	1.61	Sand mixtures - silty sand to sandy silt	2.22	1.70	
5.35	17.55	61.1	1.80	Sand mixtures - silty sand to sandy silt	2.27	1.84	
5.40	17.72	58.4	1.84	Sand mixtures - silty sand to sandy silt	2.29	1.91	
5.45	17.88	59.3	1.68	Sand mixtures - silty sand to sandy silt	2.26	1.82	
5.50	18.04	60.9	1.52	Sand mixtures - silty sand to sandy silt	2.23	1.72	
5.55	18.21	66.2	1.45	Sand mixtures - silty sand to sandy silt	2.19	1.62	
5.60	18.37	70.4	1.51	Sand mixtures - silty sand to sandy silt	2.18	1.61	
5.65	18.54	73.7	1.51	Sand mixtures - silty sand to sandy silt	2.17	1.58	
5.70	18.70	73.7	1.56	Sand mixtures - silty sand to sandy silt	2.18	1.61	
5.75	18.86	75.7	1.56	Sand mixtures - silty sand to sandy silt	2.17	1.60	
5.80	19.03	87.8	1.41	Sand mixtures - silty sand to sandy silt	2.10	1.44	
5.85	19.19	99.6	1.22	Sands - clean sands to silty sand	2.02	1.32	
5.90	19.36	111.4	1.01	Sands - clean sands to silty sand	1.93	1.21	
5.95	19.52	118.4	0.90	Sands - clean sands to silty sand	1.87	1.16	
6.00	19.68	108.8	0.91	Sands - clean sands to silty sand	1.91	1.19	
6.05	19.85	98.6	0.96	Sands - clean sands to silty sand	1.96	1.24	
6.10	20.01	89.0	1.06	Sands - clean sands to silty sand	2.02	1.32	
6.15	20.18	85.3	1.09	Sands - clean sands to silty sand	2.05	1.36	
6.20	20.34	86.0	1.07	Sands - clean sands to silty sand	2.04	1.35	
6.25	20.51	72.9	1.09	Sand mixtures - silty sand to sandy silt	2.10	1.45	
6.30	20.67	55.0	1.24	Sand mixtures - silty sand to sandy silt	2.24	1.76	
6.35	20.83	41.8	1.33	Sand mixtures - silty sand to sandy silt	2.36	2.13	
6.40	21.00	35.7	1.47	Sand mixtures - silty sand to sandy silt	2.44	2.49	
6.45	21.16	33.1	1.20	Sand mixtures - silty sand to sandy silt	2.42	2.38	
6.50	21.33	34.3	1.18	Sand mixtures - silty sand to sandy silt	2.40	2.32	
6.55	21.49	34.9	1.15	Sand mixtures - silty sand to sandy silt	2.39	2.27	
6.60	21.65	35.6	1.10	Sand mixtures - silty sand to sandy silt	2.38	2.21	
6.65	21.82	34.0	1.08	Sand mixtures - silty sand to sandy silt	2.39	2.26	
6.70	21.98	34.2	1.13	Sand mixtures - silty sand to sandy silt	2.40	2.31	
6.75	22.15	36.1	1.13	Sand mixtures - silty sand to sandy silt	2.39	2.24	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	37.3	1.18	Sand mixtures - silty sand to sandy silt	2.39	2.25	
6.85	22.47	37.9	0.96	Sand mixtures - silty sand to sandy silt	2.33	2.04	
6.90	22.64	37.8	1.22	Sand mixtures - silty sand to sandy silt	2.40	2.29	
6.95	22.80	41.1	1.08	Sand mixtures - silty sand to sandy silt	2.34	2.06	
7.00	22.97	37.7	1.15	Sand mixtures - silty sand to sandy silt	2.39	2.25	
7.05	23.13	40.3	1.11	Sand mixtures - silty sand to sandy silt	2.35	2.12	
7.10	23.29	45.3	1.11	Sand mixtures - silty sand to sandy silt	2.31	1.98	
7.15	23.46	44.6	1.17	Sand mixtures - silty sand to sandy silt	2.34	2.06	
7.20	23.62	45.4	1.18	Sand mixtures - silty sand to sandy silt	2.34	2.05	
7.25	23.79	42.9	1.13	Sand mixtures - silty sand to sandy silt	2.35	2.10	
7.30	23.95	44.8	1.16	Sand mixtures - silty sand to sandy silt	2.34	2.07	
7.35	24.11	45.7	1.18	Sand mixtures - silty sand to sandy silt	2.34	2.07	
7.40	24.28	48.2	1.07	Sand mixtures - silty sand to sandy silt	2.30	1.93	
7.45	24.44	48.5	0.96	Sand mixtures - silty sand to sandy silt	2.27	1.84	
7.50	24.61	51.6	0.98	Sand mixtures - silty sand to sandy silt	2.25	1.79	
7.55	24.77	55.7	1.12	Sand mixtures - silty sand to sandy silt	2.26	1.82	
7.60	24.93	70.9	1.24	Sand mixtures - silty sand to sandy silt	2.21	1.67	
7.65	25.10	87.9	1.12	Sand mixtures - silty sand to sandy silt	2.10	1.45	
7.70	25.26	94.2	1.10	Sand mixtures - silty sand to sandy silt	2.07	1.40	
7.75	25.43	95.8	1.14	Sand mixtures - silty sand to sandy silt	2.08	1.41	
7.80	25.59	102.1	1.11	Sands - clean sands to silty sand	2.05	1.37	
7.85	25.75	104.1	1.17	Sand mixtures - silty sand to sandy silt	2.06	1.38	
7.90	25.92	105.9	1.12	Sands - clean sands to silty sand	2.05	1.36	
7.95	26.08	102.8	1.08	Sands - clean sands to silty sand	2.05	1.36	
8.00	26.25	99.9	1.08	Sands - clean sands to silty sand	2.06	1.38	
8.05	26.41	97.4	1.20	Sand mixtures - silty sand to sandy silt	2.10	1.45	
8.10	26.57	91.6	1.21	Sand mixtures - silty sand to sandy silt	2.13	1.50	
8.15	26.74	91.0	1.17	Sand mixtures - silty sand to sandy silt	2.12	1.49	
8.20	26.90	97.9	1.05	Sands - clean sands to silty sand	2.06	1.39	
8.25	27.07	98.6	0.95	Sands - clean sands to silty sand	2.04	1.34	
8.30	27.23	96.5	1.10	Sand mixtures - silty sand to sandy silt	2.09	1.42	
8.35	27.39	94.5	1.31	Sand mixtures - silty sand to sandy silt	2.15	1.54	
8.40	27.56	100.2	1.42	Sand mixtures - silty sand to sandy silt	2.16	1.56	
8.45	27.72	103.8	1.23	Sand mixtures - silty sand to sandy silt	2.10	1.45	
8.50	27.89	99.0	1.01	Sands - clean sands to silty sand	2.06	1.38	
8.55	28.05	87.4	1.11	Sand mixtures - silty sand to sandy silt	2.14	1.51	
8.60	28.21	82.7	1.21	Sand mixtures - silty sand to sandy silt	2.18	1.61	
8.65	28.38	81.1	1.24	Sand mixtures - silty sand to sandy silt	2.20	1.65	
8.70	28.54	76.4	1.13	Sand mixtures - silty sand to sandy silt	2.19	1.64	
8.75	28.71	76.5	1.55	Sand mixtures - silty sand to sandy silt	2.29	1.91	
8.80	28.87	84.5	1.69	Sand mixtures - silty sand to sandy silt	2.28	1.89	
8.85	29.04	97.6	1.35	Sand mixtures - silty sand to sandy silt	2.16	1.57	
8.90	29.20	96.9	1.26	Sand mixtures - silty sand to sandy silt	2.15	1.54	
8.95	29.36	95.3	1.35	Sand mixtures - silty sand to sandy silt	2.18	1.60	
9.00	29.53	90.0	1.31	Sand mixtures - silty sand to sandy silt	2.19	1.63	
9.05	29.69	88.3	1.30	Sand mixtures - silty sand to sandy silt	2.20	1.65	
9.10	29.86	92.2	1.32	Sand mixtures - silty sand to sandy silt	2.19	1.62	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	99.2	1.33	Sand mixtures - silty sand to sandy silt	2.17	1.58	
9.20	30.18	103.8	1.42	Sand mixtures - silty sand to sandy silt	2.17	1.59	
9.25	30.35	104.4	1.41	Sand mixtures - silty sand to sandy silt	2.17	1.58	
9.30	30.51	102.9	1.52	Sand mixtures - silty sand to sandy silt	2.20	1.65	
9.35	30.68	106.5	1.43	Sand mixtures - silty sand to sandy silt	2.17	1.58	
9.40	30.84	98.5	1.65	Sand mixtures - silty sand to sandy silt	2.24	1.77	
9.45	31.00	98.1	1.70	Sand mixtures - silty sand to sandy silt	2.26	1.81	
9.50	31.17	100.4	1.79	Sand mixtures - silty sand to sandy silt	2.27	1.83	
9.55	31.33	93.9	1.67	Sand mixtures - silty sand to sandy silt	2.27	1.84	
9.60	31.50	90.3	1.74	Sand mixtures - silty sand to sandy silt	2.30	1.93	
9.65	31.66	92.0	1.68	Sand mixtures - silty sand to sandy silt	2.28	1.88	
9.70	31.82	91.9	1.81	Sand mixtures - silty sand to sandy silt	2.31	1.96	
9.75	31.99	89.0	2.08	Sand mixtures - silty sand to sandy silt	2.37	2.17	
9.80	32.15	95.1	2.19	Sand mixtures - silty sand to sandy silt	2.36	2.15	
9.85	32.32	112.5	2.12	Sand mixtures - silty sand to sandy silt	2.30	1.92	
9.90	32.48	114.0	2.13	Sand mixtures - silty sand to sandy silt	2.30	1.92	
9.95	32.64	107.0	2.16	Sand mixtures - silty sand to sandy silt	2.32	2.01	
10.00	32.81	110.2	2.03	Sand mixtures - silty sand to sandy silt	2.29	1.92	
10.05	32.97	122.6	1.73	Sand mixtures - silty sand to sandy silt	2.20	1.67	
10.10	33.14	130.6	1.34	Sand mixtures - silty sand to sandy silt	2.10	1.45	
10.15	33.30	121.1	1.19	Sand mixtures - silty sand to sandy silt	2.09	1.43	
10.20	33.46	96.9	1.32	Sand mixtures - silty sand to sandy silt	2.21	1.67	
10.25	33.63	79.4	1.47	Sand mixtures - silty sand to sandy silt	2.32	1.99	
10.30	33.79	70.7	1.71	Sand mixtures - silty sand to sandy silt	2.41	2.32	
10.35	33.96	71.2	1.78	Sand mixtures - silty sand to sandy silt	2.42	2.37	
10.40	34.12	70.2	1.58	Sand mixtures - silty sand to sandy silt	2.39	2.25	
10.45	34.28	62.4	1.52	Sand mixtures - silty sand to sandy silt	2.42	2.38	
10.50	34.45	54.1	1.56	Sand mixtures - silty sand to sandy silt	2.49	2.68	
10.55	34.61	51.7	1.57	Sand mixtures - silty sand to sandy silt	2.51	2.91	
10.60	34.78	55.6	1.62	Sand mixtures - silty sand to sandy silt	2.49	2.71	
10.65	34.94	64.6	1.54	Sand mixtures - silty sand to sandy silt	2.42	2.38	
10.70	35.10	70.5	3.41	Silt mixtures - clayey silt to silty clay	2.65	7.34	9.39
10.75	35.27	83.4	3.03	Silt mixtures - clayey silt to silty clay	2.55	3.91	
10.80	35.43	125.2	2.81	Sand mixtures - silty sand to sandy silt	2.39	2.25	
10.85	35.60	131.6	2.52	Sand mixtures - silty sand to sandy silt	2.34	2.06	
10.90	35.76	77.5	2.79	Silt mixtures - clayey silt to silty clay	2.55	3.99	
10.95	35.92	71.6	1.83	Sand mixtures - silty sand to sandy silt	2.45	2.49	
11.00	36.09	76.4	1.63	Sand mixtures - silty sand to sandy silt	2.39	2.24	
11.05	36.25	69.5	1.96	Sand mixtures - silty sand to sandy silt	2.48	2.66	
11.10	36.42	58.3	3.22	Silt mixtures - clayey silt to silty clay	2.71		7.77
11.15	36.58	50.8	3.51	Silt mixtures - clayey silt to silty clay	2.79		6.78
11.20	36.74	58.3	2.55	Silt mixtures - clayey silt to silty clay	2.64	6.85	7.77
11.25	36.91	60.9	2.23	Silt mixtures - clayey silt to silty clay	2.58	4.72	
11.30	37.07	66.5	1.88	Sand mixtures - silty sand to sandy silt	2.49	2.72	
11.35	37.24	70.6	1.73	Sand mixtures - silty sand to sandy silt	2.45	2.50	
11.40	37.40	79.9	1.50	Sand mixtures - silty sand to sandy silt	2.36	2.14	
11.45	37.57	86.9	1.53	Sand mixtures - silty sand to sandy silt	2.33	2.05	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	86.4	1.64	Sand mixtures - silty sand to sandy silt	2.36	2.14	
11.55	37.89	86.7	1.60	Sand mixtures - silty sand to sandy silt	2.35	2.11	
11.60	38.06	82.2	1.79	Sand mixtures - silty sand to sandy silt	2.41	2.33	
11.65	38.22	87.8	1.50	Sand mixtures - silty sand to sandy silt	2.33	2.04	
11.70	38.39	87.7	1.67	Sand mixtures - silty sand to sandy silt	2.37	2.17	
11.75	38.55	91.2	1.55	Sand mixtures - silty sand to sandy silt	2.33	2.04	
11.80	38.71	84.6	1.61	Sand mixtures - silty sand to sandy silt	2.37	2.19	
11.85	38.88	90.5	1.64	Sand mixtures - silty sand to sandy silt	2.35	2.12	
11.90	39.04	83.4	2.47	Silt mixtures - clayey silt to silty clay	2.52	3.22	
11.95	39.21	104.7	2.08	Sand mixtures - silty sand to sandy silt	2.38	2.23	
12.00	39.37	92.9	1.81	Sand mixtures - silty sand to sandy silt	2.38	2.22	
12.05	39.53	88.0	1.63	Sand mixtures - silty sand to sandy silt	2.37	2.18	
12.10	39.70	84.6	1.54	Sand mixtures - silty sand to sandy silt	2.37	2.17	
12.15	39.86	80.4	1.47	Sand mixtures - silty sand to sandy silt	2.37	2.20	
12.20	40.03	74.3	1.47	Sand mixtures - silty sand to sandy silt	2.41	2.32	
12.25	40.19	69.4	1.45	Sand mixtures - silty sand to sandy silt	2.43	2.42	
12.30	40.35	69.5	1.49	Sand mixtures - silty sand to sandy silt	2.44	2.47	
12.35	40.52	70.4	1.69	Sand mixtures - silty sand to sandy silt	2.47	2.63	
12.40	40.68	79.1	1.50	Sand mixtures - silty sand to sandy silt	2.40	2.28	
12.45	40.85	90.8	1.58	Sand mixtures - silty sand to sandy silt	2.36	2.14	
12.50	41.01	78.6	1.53	Sand mixtures - silty sand to sandy silt	2.41	2.33	
12.55	41.17	64.3	1.62	Sand mixtures - silty sand to sandy silt	2.50	2.89	
12.60	41.34	64.4	1.32	Sand mixtures - silty sand to sandy silt	2.44	2.48	
12.65	41.50	65.4	1.36	Sand mixtures - silty sand to sandy silt	2.45	2.51	
12.70	41.67	68.4	1.49	Sand mixtures - silty sand to sandy silt	2.46	2.56	
12.75	41.83	75.0	1.80	Sand mixtures - silty sand to sandy silt	2.48	2.67	
12.80	41.99	83.4	2.08	Sand mixtures - silty sand to sandy silt	2.49	2.72	
12.85	42.16	95.5	1.84	Sand mixtures - silty sand to sandy silt	2.40	2.31	
12.90	42.32	110.8	1.48	Sand mixtures - silty sand to sandy silt	2.28	1.87	
12.95	42.49	103.9	1.55	Sand mixtures - silty sand to sandy silt	2.32	2.00	
13.00	42.65	90.7	1.49	Sand mixtures - silty sand to sandy silt	2.36	2.14	
13.05	42.81	84.6	1.36	Sand mixtures - silty sand to sandy silt	2.36	2.14	
13.10	42.98	80.6	1.30	Sand mixtures - silty sand to sandy silt	2.37	2.16	
13.15	43.14	75.3	1.41	Sand mixtures - silty sand to sandy silt	2.42	2.38	
13.20	43.31	74.9	1.57	Sand mixtures - silty sand to sandy silt	2.46	2.55	
13.25	43.47	77.0	1.69	Sand mixtures - silty sand to sandy silt	2.47	2.61	
13.30	43.63	83.7	1.73	Sand mixtures - silty sand to sandy silt	2.45	2.50	
13.35	43.80	87.5	1.68	Sand mixtures - silty sand to sandy silt	2.42	2.39	
13.40	43.96	84.1	1.85	Sand mixtures - silty sand to sandy silt	2.47	2.61	
13.45	44.13	83.5	1.93	Sand mixtures - silty sand to sandy silt	2.49	2.70	
13.50	44.29	86.8	1.77	Sand mixtures - silty sand to sandy silt	2.45	2.50	
13.55	44.45	88.9	1.83	Sand mixtures - silty sand to sandy silt	2.45	2.52	
13.60	44.62	91.4	1.88	Sand mixtures - silty sand to sandy silt	2.45	2.52	
13.65	44.78	94.0	1.97	Sand mixtures - silty sand to sandy silt	2.46	2.55	
13.70	44.95	93.3	1.99	Sand mixtures - silty sand to sandy silt	2.47	2.59	
13.75	45.11	94.2	2.06	Sand mixtures - silty sand to sandy silt	2.47	2.63	
13.80	45.28	99.9	2.20	Sand mixtures - silty sand to sandy silt	2.48	2.64	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	110.6	2.53	Silt mixtures - clayey silt to silty clay	2.49	2.70	
13.90	45.60	127.0	2.62	Silt mixtures - clayey silt to silty clay	2.45	2.53	
13.95	45.77	148.9	2.40	Sand mixtures - silty sand to sandy silt	2.37	2.17	
14.00	45.93	160.3	2.38	Sand mixtures - silty sand to sandy silt	2.34	2.07	
14.05	46.10	153.0	2.84	Sand mixtures - silty sand to sandy silt	2.42	2.39	
14.10	46.26	148.9	3.11	Silt mixtures - clayey silt to silty clay	2.47	2.59	
14.15	46.42	150.4	3.10	Silt mixtures - clayey silt to silty clay	2.46	2.57	
14.20	46.59	135.4	3.16	Silt mixtures - clayey silt to silty clay	2.51	2.95	
14.25	46.75	127.5	3.08	Silt mixtures - clayey silt to silty clay	2.52	3.21	
14.30	46.92	123.4	2.90	Silt mixtures - clayey silt to silty clay	2.51	3.05	
14.35	47.08	126.9	2.35	Sand mixtures - silty sand to sandy silt	2.43	2.42	
14.40	47.24	128.9	1.96	Sand mixtures - silty sand to sandy silt	2.36	2.14	
14.45	47.41	121.3	2.03	Sand mixtures - silty sand to sandy silt	2.40	2.29	
14.50	47.57	109.1	2.00	Sand mixtures - silty sand to sandy silt	2.43	2.44	
14.55	47.74	105.6	2.39	Silt mixtures - clayey silt to silty clay	2.51	2.95	
14.60	47.90	122.5	2.33	Sand mixtures - silty sand to sandy silt	2.45	2.49	
14.65	48.06	139.2	2.13	Sand mixtures - silty sand to sandy silt	2.37	2.18	
14.70	48.23	145.3	2.18	Sand mixtures - silty sand to sandy silt	2.36	2.15	
14.75	48.39	130.3	2.49	Sand mixtures - silty sand to sandy silt	2.45	2.52	
14.80	48.56	108.8	2.79	Silt mixtures - clayey silt to silty clay	2.56	4.14	
14.85	48.72	106.1	2.78	Silt mixtures - clayey silt to silty clay	2.57	4.41	
14.90	48.88	115.0	2.56	Silt mixtures - clayey silt to silty clay	2.51	3.02	
14.95	49.05	125.9	2.16	Sand mixtures - silty sand to sandy silt	2.42	2.38	
15.00	49.21	126.5	2.00	Sand mixtures - silty sand to sandy silt	2.39	2.27	
15.05	49.38	106.1	2.35	Silt mixtures - clayey silt to silty clay	2.51	3.09	
15.10	49.54	91.8	2.62	Silt mixtures - clayey silt to silty clay	2.61	5.76	12.24
15.15	49.70	109.9	2.17	Sand mixtures - silty sand to sandy silt	2.48	2.64	
15.20	49.87	128.0	1.64	Sand mixtures - silty sand to sandy silt	2.32	2.02	
15.25	50.03	124.9	1.76	Sand mixtures - silty sand to sandy silt	2.36	2.14	
15.30	50.20	119.65	1.95	Sand mixtures - silty sand to sandy silt	2.41	2.35	
15.35	50.36	105.73	2.72	Silt mixtures - clayey silt to silty clay	2.58	4.64	
15.40	50.52	83.76	3.46	Silt mixtures - clayey silt to silty clay	2.73		11.17
15.45	50.69	87.82	3.15	Silt mixtures - clayey silt to silty clay	2.69	9.44	11.71
15.50	50.9	95.0	2.3	Silt mixtures - clayey silt to silty clay	2.57	4.39	
15.55	51.0	86.3	3.4	Silt mixtures - clayey silt to silty clay	2.72		11.50
15.60	51.2	90.0	3.0	Silt mixtures - clayey silt to silty clay	2.67	8.38	12.00
15.65	51.3	113.5	2.4	Silt mixtures - clayey silt to silty clay	2.51	3.05	
15.70	51.5	101.5	2.5	Silt mixtures - clayey silt to silty clay	2.57	4.43	
15.75	51.7	76.8	4.4	Clays - silty clay to clay	2.83		10.24
15.80	51.8	76.6	4.6	Clays - silty clay to clay	2.85		10.21
15.85	52.0	127.3	2.5	Silt mixtures - clayey silt to silty clay	2.49	2.69	
15.90	52.2	138.5	2.1	Sand mixtures - silty sand to sandy silt	2.40	2.28	
15.95	52.3	112.6	2.7	Silt mixtures - clayey silt to silty clay	2.56	4.06	
16.00	52.5	101.3	2.6	Silt mixtures - clayey silt to silty clay	2.59	5.03	
16.05	52.7	100.7	2.3	Silt mixtures - clayey silt to silty clay	2.55	4.02	
16.10	52.8	78.1	2.6	Silt mixtures - clayey silt to silty clay	2.68	9.00	10.42
16.15	53.0	61.1	3.3	Clays - silty clay to clay	2.83		8.15

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
16.20	53.2	61.7	4.2	Clays - silty clay to clay	2.90		8.23
16.25	53.3	112.7	2.6	Silt mixtures - clayey silt to silty clay	2.55	4.01	
16.30	53.5	129.8	2.4	Sand mixtures - silty sand to sandy silt	2.46	2.58	
16.35	53.6	118.6	3.0	Silt mixtures - clayey silt to silty clay	2.59	5.01	
16.40	53.8	94.2	3.4	Silt mixtures - clayey silt to silty clay	2.70	10.09	12.56
16.45	54.0	91.7	3.3	Silt mixtures - clayey silt to silty clay	2.70	10.16	12.23
16.50	54.1	79.8	3.7	Silt mixtures - clayey silt to silty clay	2.78		10.64
16.55	54.3	85.4	3.6	Silt mixtures - clayey silt to silty clay	2.75		11.39
16.60	54.5	104.0	2.5	Silt mixtures - clayey silt to silty clay	2.58	4.74	
16.65	54.6	128.7	1.8	Sand mixtures - silty sand to sandy silt	2.38	2.21	
16.70	54.8	117.3	1.7	Sand mixtures - silty sand to sandy silt	2.40	2.30	
16.75	55.0	106.7	1.9	Sand mixtures - silty sand to sandy silt	2.47	2.59	
16.80	55.1	99.3	1.9	Sand mixtures - silty sand to sandy silt	2.51	2.91	
16.85	55.3	96.2	1.9	Sand mixtures - silty sand to sandy silt	2.51	3.07	
16.90	55.5	99.7	2.0	Silt mixtures - clayey silt to silty clay	2.52	3.25	
16.95	55.6	103.8	2.2	Silt mixtures - clayey silt to silty clay	2.53	3.43	
17.00	55.8	108.5	2.5	Silt mixtures - clayey silt to silty clay	2.57	4.46	
17.05	55.9	97.6	4.1	Silt mixtures - clayey silt to silty clay	2.75		13.02
17.10	56.1	97.9	4.2	Clays - silty clay to clay	2.76		13.05
17.15	56.3	107.0	3.6	Silt mixtures - clayey silt to silty clay	2.68	9.16	14.27
17.20	56.4	125.1	2.4	Silt mixtures - clayey silt to silty clay	2.49	2.72	
17.25	56.6	128.4	1.9	Sand mixtures - silty sand to sandy silt	2.41	2.34	
17.30	56.8	122.4	2.1	Sand mixtures - silty sand to sandy silt	2.46	2.58	
17.35	56.9	111.6	2.3	Silt mixtures - clayey silt to silty clay	2.52	3.25	
17.40	57.1	109.7	2.9	Silt mixtures - clayey silt to silty clay	2.62	6.07	14.63
17.45	57.3	78.4	4.0	Clays - silty clay to clay	2.83		10.45
17.50	57.4	61.2	4.9	Clays - silty clay to clay	2.97		8.16
17.55	57.6	92.9	3.0	Silt mixtures - clayey silt to silty clay	2.68	9.12	12.39
17.60	57.7	118.6	2.1	Sand mixtures - silty sand to sandy silt	2.47	2.63	
17.65	57.9	124.7	1.9	Sand mixtures - silty sand to sandy silt	2.42	2.38	
17.70	58.1	120.5	2.0	Sand mixtures - silty sand to sandy silt	2.45	2.51	
17.75	58.2	108.7	2.3	Silt mixtures - clayey silt to silty clay	2.54	3.71	
17.80	58.4	98.0	2.4	Silt mixtures - clayey silt to silty clay	2.60	5.30	
17.85	58.6	107.1	2.3	Silt mixtures - clayey silt to silty clay	2.55	4.01	
17.90	58.7	95.0	2.8	Silt mixtures - clayey silt to silty clay	2.66	7.89	12.67
17.95	58.9	91.1	2.8	Silt mixtures - clayey silt to silty clay	2.67	8.49	12.15
18.00	59.1	103.9	2.4	Silt mixtures - clayey silt to silty clay	2.59	4.99	
18.05	59.2	117.0	2.4	Silt mixtures - clayey silt to silty clay	2.54	3.71	
18.10	59.4	114.8	3.0	Silt mixtures - clayey silt to silty clay	2.62	6.10	15.31
18.15	59.6	92.3	3.5	Silt mixtures - clayey silt to silty clay	2.74		12.30
18.20	59.7	121.6	2.3	Silt mixtures - clayey silt to silty clay	2.51	3.09	
18.25	59.9	125.6	2.0	Sand mixtures - silty sand to sandy silt	2.45	2.50	
18.30	60.0	119.7	2.1	Sand mixtures - silty sand to sandy silt	2.48	2.67	
18.35	60.2	100.9	2.9	Silt mixtures - clayey silt to silty clay	2.65	7.41	13.45
18.40	60.4	95.0	3.0	Silt mixtures - clayey silt to silty clay	2.69	9.45	12.66
18.45	60.5	102.6	3.1	Silt mixtures - clayey silt to silty clay	2.66	8.15	13.68
18.50	60.7	109.2	2.4	Silt mixtures - clayey silt to silty clay	2.57	4.45	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
18.55	60.9	111.0	2.3	Silt mixtures - clayey silt to silty clay	2.54	3.76	
18.60	61.0	120.8	2.4	Silt mixtures - clayey silt to silty clay	2.53	3.48	
18.65	61.2	104.5	2.5	Silt mixtures - clayey silt to silty clay	2.60	5.44	13.94
18.70	61.4	103.6	2.4	Silt mixtures - clayey silt to silty clay	2.59	4.92	
18.75	61.5	104.0	2.3	Silt mixtures - clayey silt to silty clay	2.58	4.82	
18.80	61.7	99.6	2.7	Silt mixtures - clayey silt to silty clay	2.64	7.02	13.27
18.85	61.8	92.5	2.5	Silt mixtures - clayey silt to silty clay	2.65	7.24	12.33
18.90	62.0	99.4	2.6	Silt mixtures - clayey silt to silty clay	2.63	6.61	13.25
18.95	62.2	80.6	2.2	Silt mixtures - clayey silt to silty clay	2.66	7.86	10.74
19.00	62.3	53.4	2.9	Clays - silty clay to clay	2.88		7.11
19.05	62.5	49.4	4.6	Clays - silty clay to clay	3.04		6.59
19.10	62.7	69.9	4.1	Clays - silty clay to clay	2.89		9.32
19.15	62.8	119.0	2.5	Silt mixtures - clayey silt to silty clay	2.56	4.10	
19.20	63.0	133.5	2.3	Silt mixtures - clayey silt to silty clay	2.49	2.69	
19.25	63.2	115.9	2.5	Silt mixtures - clayey silt to silty clay	2.57	4.55	
19.30	63.3	86.8	2.5	Silt mixtures - clayey silt to silty clay	2.67	8.33	11.57
19.35	63.5	67.0	2.3	Silt mixtures - clayey silt to silty clay	2.74		8.93
19.40	63.7	61.1	2.8	Silt mixtures - clayey silt to silty clay	2.83		8.14
19.45	63.8	84.3	2.7	Silt mixtures - clayey silt to silty clay	2.71		11.24
19.50	64.0	55.7	3.2	Clays - silty clay to clay	2.90		7.43
19.55	64.1	43.9	3.3	Clays - silty clay to clay	2.99		5.85
19.60	64.3	47.3	2.9	Clays - silty clay to clay	2.93		6.31
19.65	64.5	49.5	3.6	Clays - silty clay to clay	2.98		6.60
19.70	64.6	62.3	3.1	Clays - silty clay to clay	2.85		8.31
19.75	64.8	54.5	3.2	Clays - silty clay to clay	2.91		7.27
19.80	65.0	84.3	3.4	Silt mixtures - clayey silt to silty clay	2.78		11.25
19.85	65.1	77.7	3.3	Silt mixtures - clayey silt to silty clay	2.80		10.36
19.90	65.3	119.0	2.0	Sand mixtures - silty sand to sandy silt	2.50	2.73	
19.95	65.5	119.5	1.7	Sand mixtures - silty sand to sandy silt	2.44	2.49	
20.00	65.6	113.6	2.3	Silt mixtures - clayey silt to silty clay	2.57	4.34	
20.05	65.8	74.1	2.3	Silt mixtures - clayey silt to silty clay	2.71		9.88
20.10	65.9	46.5	2.3	Silt mixtures - clayey silt to silty clay	2.88		6.20
20.15	66.1	63.2	3.0	Clays - silty clay to clay	2.85		8.42
20.20	66.3	61.7	2.5	Silt mixtures - clayey silt to silty clay	2.80		8.22
20.25	66.4	58.1	3.1	Clays - silty clay to clay	2.88		7.74
20.30	66.6	66.1	2.6	Silt mixtures - clayey silt to silty clay	2.79		8.81
20.35	66.8	49.0	2.9	Clays - silty clay to clay	2.93		6.53
20.40	66.9	58.7	2.9	Clays - silty clay to clay	2.86		7.83
20.45	67.1	83.5	3.1	Silt mixtures - clayey silt to silty clay	2.76		11.13
20.50	67.3	83.7	3.3	Silt mixtures - clayey silt to silty clay	2.78		11.15
20.55	67.4	84.3	5.0	Clays - silty clay to clay	2.91		11.24
20.60	67.6	94.0	4.9	Clays - silty clay to clay	2.86		12.53
20.65	67.8	142.3	3.2	Silt mixtures - clayey silt to silty clay	2.60	5.36	
20.70	67.9	150.5	2.6	Silt mixtures - clayey silt to silty clay	2.51	3.09	
20.75	68.1	142.8	2.5	Silt mixtures - clayey silt to silty clay	2.52	3.28	
20.80	68.2	122.9	2.7	Silt mixtures - clayey silt to silty clay	2.60	5.31	
20.85	68.4	108.3	3.5	Silt mixtures - clayey silt to silty clay	2.71		14.44

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
20.90	68.6	84.5	3.3	Silt mixtures - clayey silt to silty clay	2.78		11.27
20.95	68.7	57.5	4.8	Clays - silty clay to clay	3.02		7.67
21.00	68.9	73.0	3.7	Clays - silty clay to clay	2.87		9.74
21.05	69.1	125.2	2.6	Silt mixtures - clayey silt to silty clay	2.58	4.70	
21.10	69.2	117.2	3.0	Silt mixtures - clayey silt to silty clay	2.64	7.06	15.62
21.15	69.4	103.4	3.0	Silt mixtures - clayey silt to silty clay	2.68	9.22	13.78
21.20	69.6	114.5	3.4	Silt mixtures - clayey silt to silty clay	2.69	9.44	15.27
21.25	69.7	93.5	5.0	Clays - silty clay to clay	2.88		12.47
21.30	69.9	110.8	4.4	Clays - silty clay to clay	2.78		14.78
21.35	70.1	168.6	2.8	Silt mixtures - clayey silt to silty clay	2.51	2.91	
21.40	70.2	164.6	3.1	Silt mixtures - clayey silt to silty clay	2.55	3.87	
21.45	70.4	144.9	3.7	Silt mixtures - clayey silt to silty clay	2.65	7.29	19.33
21.50	70.5	152.7	3.1	Silt mixtures - clayey silt to silty clay	2.57	4.53	
21.55	70.7	155.1	2.4	Silt mixtures - clayey silt to silty clay	2.48	2.66	
21.60	70.9	137.4	3.1	Silt mixtures - clayey silt to silty clay	2.61	5.67	18.31
21.65	71.0	79.3	4.5	Clays - silty clay to clay	2.91		10.57
21.70	71.2	68.8	4.2	Clays - silty clay to clay	2.93		9.17
21.75	71.4	104.0	3.6	Silt mixtures - clayey silt to silty clay	2.75		13.86
21.80	71.5	94.5	3.3	Silt mixtures - clayey silt to silty clay	2.75		12.60
21.85	71.7	99.0	3.2	Silt mixtures - clayey silt to silty clay	2.73		13.21
21.90	71.9	85.1	3.0	Silt mixtures - clayey silt to silty clay	2.76		11.35
21.95	72.0	57.8	3.6	Clays - silty clay to clay	2.95		7.70
22.00	72.2	71.3	3.9	Clays - silty clay to clay	2.90		9.51
22.05	72.3	80.9	4.0	Clays - silty clay to clay	2.86		10.79
22.10	72.5	105.8	3.4	Silt mixtures - clayey silt to silty clay	2.73		14.10
22.15	72.7	127.4	2.7	Silt mixtures - clayey silt to silty clay	2.60	5.35	
22.20	72.8	137.9	3.6	Silt mixtures - clayey silt to silty clay	2.66	7.77	18.39
22.25	73.0	125.0	4.9	Clays - silty clay to clay	2.79		16.67
22.30	73.2	158.8	4.1	Silt mixtures - clayey silt to silty clay	2.66	7.73	21.18
22.35	73.3	209.5	3.2	Silt mixtures - clayey silt to silty clay	2.50	2.73	
22.40	73.5	211.7	3.1	Silt mixtures - clayey silt to silty clay	2.48	2.66	
22.45	73.7	201.3	3.4	Silt mixtures - clayey silt to silty clay	2.53	3.39	
22.50	73.8	183.9	3.6	Silt mixtures - clayey silt to silty clay	2.57	4.59	
22.55	74.0	190.4	2.9	Silt mixtures - clayey silt to silty clay	2.50	2.73	
22.60	74.2	195.2	2.3	Sand mixtures - silty sand to sandy silt	2.39	2.27	
22.65	74.3	204.2	2.4	Sand mixtures - silty sand to sandy silt	2.41	2.32	
22.70	74.5	152.3	4.0	Silt mixtures - clayey silt to silty clay	2.67	8.32	20.30
22.75	74.6	78.4	5.8	Clays - silty clay to clay	3.00		10.46
22.80	74.8	90.1	4.6	Clays - silty clay to clay	2.88		12.01
22.85	75.0	107.4	3.4	Silt mixtures - clayey silt to silty clay	2.73		14.31
22.90	75.1	87.3	4.6	Clays - silty clay to clay	2.89		11.64
22.95	75.3	100.9	4.6	Clays - silty clay to clay	2.84		13.45
23.00	75.5	119.6	3.9	Silt mixtures - clayey silt to silty clay	2.74		15.95
23.05	75.6	161.7	2.8	Silt mixtures - clayey silt to silty clay	2.54	3.76	
23.10	75.8	168.1	2.6	Silt mixtures - clayey silt to silty clay	2.51	2.92	
23.15	76.0	153.2	3.6	Silt mixtures - clayey silt to silty clay	2.63	6.65	20.43
23.20	76.1	136.9	4.6	Clays - silty clay to clay	2.75		18.25

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
23.25	76.3	165.4	3.9	Silt mixtures - clayey silt to silty clay	2.64	6.92	22.05
23.30	76.4	193.7	3.5	Silt mixtures - clayey silt to silty clay	2.56	4.07	
23.35	76.6	193.3	3.8	Silt mixtures - clayey silt to silty clay	2.59	5.01	
23.40	76.8	199.0	3.7	Silt mixtures - clayey silt to silty clay	2.56	4.28	
23.45	76.9	215.4	2.9	Silt mixtures - clayey silt to silty clay	2.46	2.57	
23.50	77.1	196.9	2.7	Silt mixtures - clayey silt to silty clay	2.46	2.58	
23.55	77.3	158.9	3.7	Silt mixtures - clayey silt to silty clay	2.64	6.80	21.18
23.60	77.4	142.5	4.0	Silt mixtures - clayey silt to silty clay	2.70	9.94	19.00
23.65	77.6	155.7	3.8	Silt mixtures - clayey silt to silty clay	2.65	7.68	20.76
23.70	77.8	128.8	3.6	Silt mixtures - clayey silt to silty clay	2.70	10.18	17.17
23.75	77.9	77.5	4.4	Clays - silty clay to clay	2.93		10.34
23.80	78.1	57.0	4.0	Clays - silty clay to clay	3.01		7.60
23.85	78.3	49.9	4.9	Clays - silty clay to clay	3.12		6.65
23.90	78.4	52.3	6.2	Clays - silty clay to clay	3.17		6.97
23.95	78.6	87.5	4.5	Clays - silty clay to clay	2.89		11.67
24.00	78.7	91.4	4.4	Clays - silty clay to clay	2.87		12.18
24.05	78.9	109.0	3.8	Silt mixtures - clayey silt to silty clay	2.77		14.53
24.10	79.1	107.0	4.0	Clays - silty clay to clay	2.79		14.27
24.15	79.2	106.0	3.5	Silt mixtures - clayey silt to silty clay	2.76		14.14
24.20	79.4	103.7	3.8	Clays - silty clay to clay	2.79		13.82
24.25	79.6	102.1	3.7	Clays - silty clay to clay	2.79		13.61
24.30	79.7	107.8	3.5	Silt mixtures - clayey silt to silty clay	2.76		14.37
24.35	79.9	92.0	4.0	Clays - silty clay to clay	2.85		12.27
24.40	80.1	69.2	5.0	Clays - silty clay to clay	3.01		9.22
24.45	80.2	87.9	3.8	Clays - silty clay to clay	2.85		11.72
24.50	80.4	106.5	3.0	Silt mixtures - clayey silt to silty clay	2.72		14.20
24.55	80.5	107.5	3.3	Silt mixtures - clayey silt to silty clay	2.74		14.33
24.60	80.7	115.8	3.5	Silt mixtures - clayey silt to silty clay	2.73		15.44
24.65	80.9	121.3	3.7	Silt mixtures - clayey silt to silty clay	2.73		16.18
24.70	81.0	126.1	4.0	Silt mixtures - clayey silt to silty clay	2.75		16.82
24.75	81.2	129.3	3.8	Silt mixtures - clayey silt to silty clay	2.72		17.24
24.80	81.4	138.2	3.5	Silt mixtures - clayey silt to silty clay	2.68	8.97	18.43
24.85	81.5	133.3	3.7	Silt mixtures - clayey silt to silty clay	2.71		17.78
24.90	81.7	135.0	4.1	Silt mixtures - clayey silt to silty clay	2.73		18.00
24.95	81.9	144.8	3.9	Silt mixtures - clayey silt to silty clay	2.69	9.87	19.30
25.00	82.0	150.5	3.6	Silt mixtures - clayey silt to silty clay	2.66	7.81	20.07
25.05	82.2	144.5	4.3	Silt mixtures - clayey silt to silty clay	2.73		19.27
25.10	82.4	125.8	5.0	Clays - silty clay to clay	2.82		16.78
25.15	82.5	122.1	5.1	Clays - silty clay to clay	2.84		16.28
25.20	82.7	156.6	4.6	Clays - silty clay to clay	2.73		20.88
25.25	82.8	178.1	4.3	Silt mixtures - clayey silt to silty clay	2.67	8.30	23.74
25.30	83.0	172.5	4.4	Silt mixtures - clayey silt to silty clay	2.68	9.27	23.01
25.35	83.2	179.0	4.0	Silt mixtures - clayey silt to silty clay	2.64	7.03	23.87
25.40	83.3	173.6	3.8	Silt mixtures - clayey silt to silty clay	2.64	6.79	23.14
25.45	83.5	173.7	3.7	Silt mixtures - clayey silt to silty clay	2.62	6.30	23.15
25.50	83.7	166.7	3.8	Silt mixtures - clayey silt to silty clay	2.65	7.58	22.23
25.55	83.8	159.1	3.1	Silt mixtures - clayey silt to silty clay	2.60	5.44	21.22

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-04

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
25.60	84.0	158.0	3.1	Silt mixtures - clayey silt to silty clay	2.60	5.38	
25.65	84.2	137.7	3.6	Silt mixtures - clayey silt to silty clay	2.69	9.85	18.36
25.70	84.3	92.3	4.6	Clays - silty clay to clay	2.90		12.31
25.75	84.5	79.1	4.3	Clays - silty clay to clay	2.93		10.54
25.80	84.6	101.7	3.5	Silt mixtures - clayey silt to silty clay	2.79		13.57
25.85	84.8	97.7	2.9	Silt mixtures - clayey silt to silty clay	2.75		13.03
25.90	85.0	113.6	3.1	Silt mixtures - clayey silt to silty clay	2.72		15.15
25.95	85.1	109.2	3.4	Silt mixtures - clayey silt to silty clay	2.76		14.56
26.00	85.3	108.3	4.2	Clays - silty clay to clay	2.83		14.45
26.05	85.5	145.2	4.0	Silt mixtures - clayey silt to silty clay	2.71		19.36
26.10	85.6	163.3	4.0	Silt mixtures - clayey silt to silty clay	2.67	8.68	21.77
26.15	85.8	164.3	3.7	Silt mixtures - clayey silt to silty clay	2.65	7.59	21.90
26.20	86.0	183.5	2.8	Silt mixtures - clayey silt to silty clay	2.52	3.29	
26.25	86.1	187.0	2.5	Silt mixtures - clayey silt to silty clay	2.49	2.72	
26.30	86.3	174.1	2.5	Silt mixtures - clayey silt to silty clay	2.51	3.01	
26.35	86.5	166.9	2.8	Silt mixtures - clayey silt to silty clay	2.57	4.34	
26.40	86.6	136.8	3.1	Silt mixtures - clayey silt to silty clay	2.65	7.58	18.24
26.45	86.8	120.9	3.8	Silt mixtures - clayey silt to silty clay	2.76		16.12
26.50	86.9	105.1	4.0	Clays - silty clay to clay	2.82		14.01
26.55	87.1	100.2	4.0	Clays - silty clay to clay	2.84		13.36
26.60	87.3	117.5	3.2	Silt mixtures - clayey silt to silty clay	2.72		15.66
26.65	87.4	151.6	2.5	Silt mixtures - clayey silt to silty clay	2.56	4.22	
26.70	87.6	170.2	2.8	Silt mixtures - clayey silt to silty clay	2.56	4.20	
26.75	87.8	192.2	2.6	Silt mixtures - clayey silt to silty clay	2.50	2.75	
26.80	87.9	207.2	3.0	Silt mixtures - clayey silt to silty clay	2.52	3.16	
26.85	88.1	166.8	4.1	Silt mixtures - clayey silt to silty clay	2.69	9.32	22.25
26.90	88.3	141.5	2.8	Silt mixtures - clayey silt to silty clay	2.62	6.20	18.87
26.95	88.4	88.5	3.1	Silt mixtures - clayey silt to silty clay	2.81		11.80
27.00	88.6	83.5	3.2	Clays - silty clay to clay	2.84		11.14
27.05	88.8	59.1	4.5	Clays - silty clay to clay	3.06		7.88
27.10	88.9	57.7	4.6	Clays - silty clay to clay	3.08		7.70
27.15	89.1	99.3	4.6	Clays - silty clay to clay	2.89		13.24
27.20	89.2	103.0	7.5	Clays - silty clay to clay	3.04		13.73
27.25	89.4	196.3	5.7	Clays - silty clay to clay	2.75		26.18
27.30	89.6	231.2	6.5	Clays - silty clay to clay	2.75		30.83
27.35	89.7	236.2	7.4	Clays - silty clay to clay	2.79		31.49
27.40	89.9	269.2	7.8	Clays - silty clay to clay	2.77		35.90
27.45	90.1	287.1	10.0	Very stiff, fine grained	2.84		38.28
27.50	90.2	342.7	10.0	Very stiff, fine grained	2.79		45.70
27.55	90.4	409.6	10.0	Very stiff, fine grained	2.75		54.62

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/6/2006 17:02
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-05

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	84.6	0.03	Gravelly sand to dense sand	1.31	1.00	
0.10	0.33	75.3	0.06	Gravelly sand to dense sand	1.32	1.00	
0.15	0.49	63.2	0.05	Sands - clean sands to silty sand	1.40	1.00	
0.20	0.66	50.7	0.04	Sands - clean sands to silty sand	1.50	1.00	
0.25	0.82	41.9	0.06	Sands - clean sands to silty sand	1.57	1.00	
0.30	0.98	31.2	0.05	Sands - clean sands to silty sand	1.70	1.00	
0.35	1.15	23.5	0.01	Sands - clean sands to silty sand	2.02	1.00	
0.40	1.31	18.7	0.01	Sands - clean sands to silty sand	2.11	1.00	
0.45	1.48	16.2	0.07	Sands - clean sands to silty sand	1.99	1.00	
0.50	1.64	17.6	0.04	Sands - clean sands to silty sand	1.96	1.00	
0.55	1.8	25.2	0.07	Sands - clean sands to silty sand	1.80	1.00	
0.60	1.97	31.9	0.01	Sands - clean sands to silty sand	1.82	1.00	
0.65	2.13	38.9	0.01	Sands - clean sands to silty sand	1.75	1.00	
0.70	2.3	45.7	0.05	Sands - clean sands to silty sand	1.54	1.00	
0.75	2.46	50.7	0.07	Sands - clean sands to silty sand	1.49	1.00	
0.80	2.62	54.9	0.02	Sands - clean sands to silty sand	1.51	1.00	
0.85	2.79	58.5	0.02	Sands - clean sands to silty sand	1.49	1.00	
0.90	2.95	60.9	0.02	Sands - clean sands to silty sand	1.47	1.00	
0.95	3.12	62.0	0.02	Gravelly sand to dense sand	1.46	1.00	
1.00	3.28	63.1	0.02	Gravelly sand to dense sand	1.45	1.00	
1.05	3.44	62.3	0.02	Gravelly sand to dense sand	1.46	1.00	
1.10	3.61	62.3	0.00	Gravelly sand to dense sand	1.98	1.00	
1.15	3.77	64.6	0.17	Sands - clean sands to silty sand	1.46	1.00	
1.20	3.94	66.5	1.24	Sands - clean sands to silty sand	1.90	1.18	
1.25	4.1	78.6	1.40	Sands - clean sands to silty sand	1.89	1.17	
1.30	4.27	70.7	1.12	Sands - clean sands to silty sand	1.85	1.14	
1.35	4.43	71.8	0.79	Sands - clean sands to silty sand	1.75	1.06	
1.40	4.59	74.1	0.70	Sands - clean sands to silty sand	1.70	1.03	
1.45	4.76	75.6	0.70	Sands - clean sands to silty sand	1.70	1.03	
1.50	4.92	75.6	0.66	Sands - clean sands to silty sand	1.69	1.02	
1.55	5.09	78.0	0.66	Sands - clean sands to silty sand	1.68	1.02	
1.60	5.25	81.6	0.68	Sands - clean sands to silty sand	1.68	1.02	
1.65	5.41	84.5	0.63	Sands - clean sands to silty sand	1.66	1.00	
1.70	5.58	88.4	0.65	Sands - clean sands to silty sand	1.65	1.00	
1.75	5.74	91.5	0.70	Sands - clean sands to silty sand	1.67	1.01	
1.80	5.91	93.1	0.58	Sands - clean sands to silty sand	1.62	1.00	
1.85	6.07	93.4	0.56	Sands - clean sands to silty sand	1.62	1.00	
1.90	6.23	92.0	0.67	Sands - clean sands to silty sand	1.67	1.01	
1.95	6.4	94.3	0.63	Sands - clean sands to silty sand	1.65	1.00	
2.00	6.56	96.0	0.67	Sands - clean sands to silty sand	1.66	1.01	
2.05	6.73	98.4	0.60	Sands - clean sands to silty sand	1.63	1.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-05

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	100.4	0.63	Sands - clean sands to silty sand	1.64	0.99	
2.15	7.05	101.5	0.63	Sands - clean sands to silty sand	1.64	1.00	
2.20	7.22	101.9	0.59	Sands - clean sands to silty sand	1.63	1.00	
2.25	7.38	95.4	0.66	Sands - clean sands to silty sand	1.68	1.02	
2.30	7.55	100.3	0.59	Sands - clean sands to silty sand	1.64	0.99	
2.35	7.71	98.2	0.59	Sands - clean sands to silty sand	1.65	1.00	
2.40	7.87	98.7	0.61	Sands - clean sands to silty sand	1.66	1.01	
2.45	8.04	99.7	0.51	Sands - clean sands to silty sand	1.62	1.00	
2.50	8.2	99.6	0.56	Sands - clean sands to silty sand	1.64	0.99	
2.55	8.37	103.4	1.40	Sands - clean sands to silty sand	1.89	1.17	
2.60	8.53	128.9	0.39	Sands - clean sands to silty sand	1.49	1.00	
2.65	8.69	70.0	2.30	Sand mixtures - silty sand to sandy silt	2.15	1.54	
2.70	8.86	120.7	1.31	Sands - clean sands to silty sand	1.83	1.13	
2.75	9.02	85.9	1.69	Sands - clean sands to silty sand	2.00	1.30	
2.80	9.19	75.7	1.06	Sands - clean sands to silty sand	1.91	1.19	
2.85	9.35	70.3	1.24	Sands - clean sands to silty sand	1.98	1.26	
2.90	9.51	66.0	1.17	Sands - clean sands to silty sand	1.98	1.27	
2.95	9.68	68.0	1.11	Sands - clean sands to silty sand	1.96	1.25	
3.00	9.84	69.8	0.94	Sands - clean sands to silty sand	1.91	1.20	
3.05	10.01	66.0	1.01	Sands - clean sands to silty sand	1.95	1.24	
3.10	10.17	66.6	0.94	Sands - clean sands to silty sand	1.93	1.21	
3.15	10.33	63.3	0.93	Sands - clean sands to silty sand	1.95	1.23	
3.20	10.5	62.7	1.09	Sands - clean sands to silty sand	2.00	1.29	
3.25	10.66	63.4	1.13	Sands - clean sands to silty sand	2.01	1.30	
3.30	10.83	65.0	0.73	Sands - clean sands to silty sand	1.89	1.17	
3.35	10.99	67.7	0.84	Sands - clean sands to silty sand	1.91	1.20	
3.40	11.15	68.5	0.86	Sands - clean sands to silty sand	1.92	1.20	
3.45	11.32	64.6	0.93	Sands - clean sands to silty sand	1.96	1.25	
3.50	11.48	62.4	0.96	Sands - clean sands to silty sand	1.99	1.27	
3.55	11.65	60.8	0.95	Sands - clean sands to silty sand	1.99	1.28	
3.60	11.81	59.7	1.18	Sands - clean sands to silty sand	2.06	1.38	
3.65	11.97	57.0	1.10	Sands - clean sands to silty sand	2.06	1.38	
3.70	12.14	52.5	1.16	Sand mixtures - silty sand to sandy silt	2.10	1.45	
3.75	12.3	47.3	1.04	Sand mixtures - silty sand to sandy silt	2.11	1.46	
3.80	12.47	41.5	1.06	Sand mixtures - silty sand to sandy silt	2.16	1.56	
3.85	12.63	36.6	1.13	Sand mixtures - silty sand to sandy silt	2.22	1.70	
3.90	12.8	33.9	1.22	Sand mixtures - silty sand to sandy silt	2.27	1.84	
3.95	12.96	33.9	1.23	Sand mixtures - silty sand to sandy silt	2.27	1.85	
4.00	13.12	36.2	1.15	Sand mixtures - silty sand to sandy silt	2.24	1.75	
4.05	13.29	37.1	1.12	Sand mixtures - silty sand to sandy silt	2.23	1.72	
4.10	13.45	37.2	1.14	Sand mixtures - silty sand to sandy silt	2.23	1.74	
4.15	13.62	37.5	1.11	Sand mixtures - silty sand to sandy silt	2.23	1.72	
4.20	13.78	36.8	1.16	Sand mixtures - silty sand to sandy silt	2.25	1.78	
4.25	13.94	36.1	1.32	Sand mixtures - silty sand to sandy silt	2.29	1.90	
4.30	14.11	35.8	1.27	Sand mixtures - silty sand to sandy silt	2.28	1.89	
4.35	14.27	36.8	0.99	Sand mixtures - silty sand to sandy silt	2.21	1.69	
4.40	14.44	39.5	0.96	Sand mixtures - silty sand to sandy silt	2.19	1.62	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-05

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.6	38.0	1.09	Sand mixtures - silty sand to sandy silt	2.23	1.74	
4.50	14.76	38.6	1.14	Sand mixtures - silty sand to sandy silt	2.24	1.77	
4.55	14.93	39.3	1.28	Sand mixtures - silty sand to sandy silt	2.27	1.85	
4.60	15.09	40.7	1.50	Sand mixtures - silty sand to sandy silt	2.31	1.95	
4.65	15.26	44.0	1.65	Sand mixtures - silty sand to sandy silt	2.31	1.97	
4.70	15.42	50.1	1.69	Sand mixtures - silty sand to sandy silt	2.28	1.87	
4.75	15.58	58.8	1.58	Sand mixtures - silty sand to sandy silt	2.21	1.68	
4.80	15.75	63.5	1.48	Sand mixtures - silty sand to sandy silt	2.17	1.59	
4.85	15.91	63.0	1.47	Sand mixtures - silty sand to sandy silt	2.17	1.59	
4.90	16.08	57.3	1.55	Sand mixtures - silty sand to sandy silt	2.22	1.71	
4.95	16.24	46.4	1.79	Sand mixtures - silty sand to sandy silt	2.33	2.05	
5.00	16.4	34.7	2.11	Sand mixtures - silty sand to sandy silt	2.48	2.64	
5.05	16.57	30.8	2.07	Silt mixtures - clayey silt to silty clay	2.51	3.10	
5.10	16.73	30.0	1.80	Sand mixtures - silty sand to sandy silt	2.49	2.69	
5.15	16.9	30.3	1.76	Sand mixtures - silty sand to sandy silt	2.48	2.65	
5.20	17.06	30.9	1.57	Sand mixtures - silty sand to sandy silt	2.45	2.49	
5.25	17.22	33.1	2.36	Silt mixtures - clayey silt to silty clay	2.54	3.66	
5.30	17.39	42.3	1.75	Sand mixtures - silty sand to sandy silt	2.37	2.20	
5.35	17.55	40.4	1.60	Sand mixtures - silty sand to sandy silt	2.37	2.18	
5.40	17.72	40.8	2.09	Sand mixtures - silty sand to sandy silt	2.44	2.49	
5.45	17.88	43.8	2.55	Silt mixtures - clayey silt to silty clay	2.48	2.68	
5.50	18.04	53.1	2.31	Sand mixtures - silty sand to sandy silt	2.40	2.28	
5.55	18.21	64.1	1.98	Sand mixtures - silty sand to sandy silt	2.29	1.91	
5.60	18.37	68.6	1.82	Sand mixtures - silty sand to sandy silt	2.25	1.77	
5.65	18.54	76.9	1.65	Sand mixtures - silty sand to sandy silt	2.18	1.61	
5.70	18.7	79.7	1.60	Sand mixtures - silty sand to sandy silt	2.16	1.57	
5.75	18.86	83.8	1.76	Sand mixtures - silty sand to sandy silt	2.18	1.61	
5.80	19.03	99.5	1.61	Sand mixtures - silty sand to sandy silt	2.10	1.44	
5.85	19.19	119.5	1.26	Sands - clean sands to silty sand	1.97	1.25	
5.90	19.36	124.6	1.01	Sands - clean sands to silty sand	1.89	1.17	
5.95	19.52	118.7	0.97	Sands - clean sands to silty sand	1.89	1.18	
6.00	19.68	110.8	0.98	Sands - clean sands to silty sand	1.92	1.20	
6.05	19.85	102.6	0.96	Sands - clean sands to silty sand	1.94	1.23	
6.10	20.01	92.1	1.03	Sands - clean sands to silty sand	2.00	1.29	
6.15	20.18	82.7	1.26	Sand mixtures - silty sand to sandy silt	2.10	1.44	
6.20	20.34	80.8	1.37	Sand mixtures - silty sand to sandy silt	2.13	1.51	
6.25	20.51	84.3	1.34	Sand mixtures - silty sand to sandy silt	2.11	1.47	
6.30	20.67	83.4	1.25	Sand mixtures - silty sand to sandy silt	2.10	1.45	
6.35	20.83	67.8	0.94	Sand mixtures - silty sand to sandy silt	2.09	1.44	
6.40	21	50.8	1.16	Sand mixtures - silty sand to sandy silt	2.25	1.80	
6.45	21.16	32.9	1.84	Silt mixtures - clayey silt to silty clay	2.54	3.59	
6.50	21.33	27.2	2.05	Silt mixtures - clayey silt to silty clay	2.64	6.91	3.62
6.55	21.49	25.9	2.22	Silt mixtures - clayey silt to silty clay	2.68	8.98	3.46
6.60	21.65	28.7	2.24	Silt mixtures - clayey silt to silty clay	2.65	7.42	3.83
6.65	21.82	36.3	2.49	Silt mixtures - clayey silt to silty clay	2.60	5.48	4.84
6.70	21.98	57.9	2.04	Sand mixtures - silty sand to sandy silt	2.39	2.25	
6.75	22.15	92.7	1.47	Sand mixtures - silty sand to sandy silt	2.13	1.51	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-05

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	116.2	1.20	Sands - clean sands to silty sand	2.00	1.29	
6.85	22.47	118.9	1.25	Sands - clean sands to silty sand	2.01	1.30	
6.90	22.64	107.1	1.33	Sand mixtures - silty sand to sandy silt	2.06	1.38	
6.95	22.8	96.3	1.31	Sand mixtures - silty sand to sandy silt	2.09	1.43	
7.00	22.97	91.1	1.39	Sand mixtures - silty sand to sandy silt	2.13	1.50	
7.05	23.13	79.7	1.36	Sand mixtures - silty sand to sandy silt	2.17	1.59	
7.10	23.29	72.3	1.38	Sand mixtures - silty sand to sandy silt	2.21	1.68	
7.15	23.46	66.2	1.38	Sand mixtures - silty sand to sandy silt	2.24	1.77	
7.20	23.62	70.9	1.21	Sand mixtures - silty sand to sandy silt	2.18	1.61	
7.25	23.79	74.0	1.34	Sand mixtures - silty sand to sandy silt	2.20	1.66	
7.30	23.95	72.6	1.12	Sand mixtures - silty sand to sandy silt	2.16	1.56	
7.35	24.11	69.5	1.16	Sand mixtures - silty sand to sandy silt	2.18	1.62	
7.40	24.28	63.7	1.27	Sand mixtures - silty sand to sandy silt	2.24	1.77	
7.45	24.44	63.1	1.28	Sand mixtures - silty sand to sandy silt	2.25	1.79	
7.50	24.61	60.4	1.25	Sand mixtures - silty sand to sandy silt	2.26	1.82	
7.55	24.77	53.0	1.39	Sand mixtures - silty sand to sandy silt	2.34	2.08	
7.60	24.93	45.2	1.49	Sand mixtures - silty sand to sandy silt	2.42	2.39	
7.65	25.1	42.1	1.35	Sand mixtures - silty sand to sandy silt	2.42	2.39	
7.70	25.26	37.7	1.82	Silt mixtures - clayey silt to silty clay	2.55	3.86	
7.75	25.43	45.0	1.63	Sand mixtures - silty sand to sandy silt	2.45	2.53	
7.80	25.59	38.0	1.86	Silt mixtures - clayey silt to silty clay	2.56	4.07	
7.85	25.75	37.5	1.61	Sand mixtures - silty sand to sandy silt	2.52	3.22	
7.90	25.92	37.8	1.59	Sand mixtures - silty sand to sandy silt	2.52	3.15	
7.95	26.08	39.4	1.46	Sand mixtures - silty sand to sandy silt	2.48	2.65	
8.00	26.25	39.5	1.37	Sand mixtures - silty sand to sandy silt	2.46	2.57	
8.05	26.41	38.3	1.33	Sand mixtures - silty sand to sandy silt	2.47	2.60	
8.10	26.57	41.4	1.39	Sand mixtures - silty sand to sandy silt	2.45	2.54	
8.15	26.74	45.3	1.18	Sand mixtures - silty sand to sandy silt	2.38	2.21	
8.20	26.9	49.6	1.11	Sand mixtures - silty sand to sandy silt	2.33	2.03	
8.25	27.07	52.4	1.10	Sand mixtures - silty sand to sandy silt	2.31	1.97	
8.30	27.23	55.2	1.12	Sand mixtures - silty sand to sandy silt	2.30	1.92	
8.35	27.39	60.3	1.00	Sand mixtures - silty sand to sandy silt	2.23	1.74	
8.40	27.56	60.8	0.99	Sand mixtures - silty sand to sandy silt	2.23	1.73	
8.45	27.72	54.2	1.20	Sand mixtures - silty sand to sandy silt	2.33	2.03	
8.50	27.89	47.9	1.33	Sand mixtures - silty sand to sandy silt	2.41	2.32	
8.55	28.05	42.9	1.42	Sand mixtures - silty sand to sandy silt	2.47	2.60	
8.60	28.21	41.3	1.35	Sand mixtures - silty sand to sandy silt	2.47	2.60	
8.65	28.38	41.2	1.23	Sand mixtures - silty sand to sandy silt	2.45	2.50	
8.70	28.54	41.6	1.13	Sand mixtures - silty sand to sandy silt	2.42	2.39	
8.75	28.71	42.3	1.15	Sand mixtures - silty sand to sandy silt	2.42	2.40	
8.80	28.87	42.6	1.19	Sand mixtures - silty sand to sandy silt	2.43	2.43	
8.85	29.04	42.5	1.23	Sand mixtures - silty sand to sandy silt	2.44	2.48	
8.90	29.2	42.2	1.26	Sand mixtures - silty sand to sandy silt	2.45	2.53	
8.95	29.36	42.6	1.21	Sand mixtures - silty sand to sandy silt	2.44	2.48	
9.00	29.53	43.3	1.12	Sand mixtures - silty sand to sandy silt	2.42	2.37	
9.05	29.69	42.1	1.16	Sand mixtures - silty sand to sandy silt	2.44	2.47	
9.10	29.86	38.3	1.29	Sand mixtures - silty sand to sandy silt	2.51	2.92	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-05

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	35.4	1.49	Silt mixtures - clayey silt to silty clay	2.58	4.74	
9.20	30.18	35.8	2.38	Silt mixtures - clayey silt to silty clay	2.72		4.78
9.25	30.35	43.9	1.99	Silt mixtures - clayey silt to silty clay	2.59	4.97	
9.30	30.51	53.1	1.60	Sand mixtures - silty sand to sandy silt	2.45	2.53	
9.35	30.68	68.4	1.08	Sand mixtures - silty sand to sandy silt	2.25	1.78	
9.40	30.84	70.0	1.02	Sand mixtures - silty sand to sandy silt	2.22	1.71	
9.45	31	66.6	1.14	Sand mixtures - silty sand to sandy silt	2.28	1.86	
9.50	31.17	67.2	1.13	Sand mixtures - silty sand to sandy silt	2.27	1.85	
9.55	31.33	67.3	1.10	Sand mixtures - silty sand to sandy silt	2.26	1.83	
9.60	31.5	65.9	1.15	Sand mixtures - silty sand to sandy silt	2.29	1.90	
9.65	31.66	65.3	1.26	Sand mixtures - silty sand to sandy silt	2.32	2.00	
9.70	31.82	66.5	1.41	Sand mixtures - silty sand to sandy silt	2.35	2.10	
9.75	31.99	69.8	1.64	Sand mixtures - silty sand to sandy silt	2.38	2.21	
9.80	32.15	72.7	1.54	Sand mixtures - silty sand to sandy silt	2.34	2.09	
9.85	32.32	71.3	1.47	Sand mixtures - silty sand to sandy silt	2.34	2.07	
9.90	32.48	71.4	1.42	Sand mixtures - silty sand to sandy silt	2.33	2.04	
9.95	32.64	71.8	1.43	Sand mixtures - silty sand to sandy silt	2.33	2.05	
10.00	32.81	76.1	1.42	Sand mixtures - silty sand to sandy silt	2.31	1.97	
10.05	32.97	81.5	1.42	Sand mixtures - silty sand to sandy silt	2.29	1.90	
10.10	33.14	87.0	1.20	Sand mixtures - silty sand to sandy silt	2.21	1.69	
10.15	33.3	88.9	1.45	Sand mixtures - silty sand to sandy silt	2.26	1.83	
10.20	33.46	92.3	1.76	Sand mixtures - silty sand to sandy silt	2.31	1.98	
10.25	33.63	91.8	1.89	Sand mixtures - silty sand to sandy silt	2.34	2.08	
10.30	33.79	88.5	1.39	Sand mixtures - silty sand to sandy silt	2.26	1.81	
10.35	33.96	83.0	1.27	Sand mixtures - silty sand to sandy silt	2.26	1.81	
10.40	34.12	80.2	1.27	Sand mixtures - silty sand to sandy silt	2.27	1.85	
10.45	34.28	80.9	1.33	Sand mixtures - silty sand to sandy silt	2.28	1.89	
10.50	34.45	84.6	1.32	Sand mixtures - silty sand to sandy silt	2.27	1.83	
10.55	34.61	88.2	1.25	Sand mixtures - silty sand to sandy silt	2.24	1.75	
10.60	34.78	92.7	1.35	Sand mixtures - silty sand to sandy silt	2.24	1.77	
10.65	34.94	97.1	1.31	Sand mixtures - silty sand to sandy silt	2.22	1.70	
10.70	35.1	98.5	1.21	Sand mixtures - silty sand to sandy silt	2.19	1.63	
10.75	35.27	94.2	1.30	Sand mixtures - silty sand to sandy silt	2.23	1.73	
10.80	35.43	91.1	1.31	Sand mixtures - silty sand to sandy silt	2.25	1.77	
10.85	35.6	88.7	1.28	Sand mixtures - silty sand to sandy silt	2.25	1.79	
10.90	35.76	90.0	1.27	Sand mixtures - silty sand to sandy silt	2.24	1.77	
10.95	35.92	90.9	1.37	Sand mixtures - silty sand to sandy silt	2.26	1.83	
11.00	36.09	92.3	1.23	Sand mixtures - silty sand to sandy silt	2.23	1.73	
11.05	36.25	94.7	1.24	Sand mixtures - silty sand to sandy silt	2.22	1.71	
11.10	36.42	94.6	1.30	Sand mixtures - silty sand to sandy silt	2.24	1.76	
11.15	36.58	92.5	1.32	Sand mixtures - silty sand to sandy silt	2.25	1.80	
11.20	36.74	92.8	1.31	Sand mixtures - silty sand to sandy silt	2.25	1.80	
11.25	36.91	95.9	1.26	Sand mixtures - silty sand to sandy silt	2.23	1.73	
11.30	37.07	98.6	1.19	Sand mixtures - silty sand to sandy silt	2.20	1.66	
11.35	37.24	99.9	1.06	Sand mixtures - silty sand to sandy silt	2.17	1.58	
11.40	37.4	92.3	1.03	Sand mixtures - silty sand to sandy silt	2.19	1.63	
11.45	37.57	82.6	1.03	Sand mixtures - silty sand to sandy silt	2.23	1.74	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-05

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	76.5	1.23	Sand mixtures - silty sand to sandy silt	2.32	1.99	
11.55	37.89	72.6	1.21	Sand mixtures - silty sand to sandy silt	2.33	2.05	
11.60	38.06	69.6	1.43	Sand mixtures - silty sand to sandy silt	2.40	2.30	
11.65	38.22	68.5	1.33	Sand mixtures - silty sand to sandy silt	2.39	2.25	
11.70	38.39	71.5	1.24	Sand mixtures - silty sand to sandy silt	2.35	2.11	
11.75	38.55	68.4	1.17	Sand mixtures - silty sand to sandy silt	2.35	2.12	
11.80	38.71	69.4	1.31	Sand mixtures - silty sand to sandy silt	2.38	2.23	
11.85	38.88	68.2	1.35	Sand mixtures - silty sand to sandy silt	2.40	2.31	
11.90	39.04	68.7	1.25	Sand mixtures - silty sand to sandy silt	2.38	2.20	
11.95	39.21	70.2	1.15	Sand mixtures - silty sand to sandy silt	2.35	2.09	
12.00	39.37	70.4	1.08	Sand mixtures - silty sand to sandy silt	2.33	2.03	
12.05	39.53	68.9	1.08	Sand mixtures - silty sand to sandy silt	2.34	2.07	
12.10	39.7	68.2	1.20	Sand mixtures - silty sand to sandy silt	2.38	2.20	
12.15	39.86	67.6	1.28	Sand mixtures - silty sand to sandy silt	2.40	2.29	
12.20	40.03	68.8	1.28	Sand mixtures - silty sand to sandy silt	2.39	2.27	
12.25	40.19	70.1	1.69	Sand mixtures - silty sand to sandy silt	2.47	2.62	
12.30	40.35	75.5	1.28	Sand mixtures - silty sand to sandy silt	2.36	2.14	
12.35	40.52	76.6	1.26	Sand mixtures - silty sand to sandy silt	2.35	2.12	
12.40	40.68	77.2	1.10	Sand mixtures - silty sand to sandy silt	2.31	1.97	
12.45	40.85	75.3	1.28	Sand mixtures - silty sand to sandy silt	2.37	2.17	
12.50	41.01	67.2	1.48	Sand mixtures - silty sand to sandy silt	2.46	2.55	
12.55	41.17	68.2	1.26	Sand mixtures - silty sand to sandy silt	2.40	2.32	
12.60	41.34	64.1	1.43	Sand mixtures - silty sand to sandy silt	2.47	2.60	
12.65	41.5	61.7	1.39	Sand mixtures - silty sand to sandy silt	2.48	2.64	
12.70	41.67	63.4	1.46	Sand mixtures - silty sand to sandy silt	2.48	2.67	
12.75	41.83	73.0	1.39	Sand mixtures - silty sand to sandy silt	2.41	2.35	
12.80	41.99	83.4	1.28	Sand mixtures - silty sand to sandy silt	2.34	2.06	
12.85	42.16	89.7	1.32	Sand mixtures - silty sand to sandy silt	2.32	2.00	
12.90	42.32	90.4	1.46	Sand mixtures - silty sand to sandy silt	2.35	2.11	
12.95	42.49	93.6	1.75	Sand mixtures - silty sand to sandy silt	2.40	2.29	
13.00	42.65	109.6	1.95	Sand mixtures - silty sand to sandy silt	2.38	2.21	
13.05	42.81	135.7	1.66	Sand mixtures - silty sand to sandy silt	2.25	1.78	
13.10	42.98	153.2	1.41	Sand mixtures - silty sand to sandy silt	2.15	1.54	
13.15	43.14	149.0	1.41	Sand mixtures - silty sand to sandy silt	2.16	1.56	
13.20	43.31	136.2	1.41	Sand mixtures - silty sand to sandy silt	2.19	1.64	
13.25	43.47	119.1	1.66	Sand mixtures - silty sand to sandy silt	2.30	1.93	
13.30	43.63	114.8	1.66	Sand mixtures - silty sand to sandy silt	2.31	1.98	
13.35	43.8	118.1	1.64	Sand mixtures - silty sand to sandy silt	2.30	1.94	
13.40	43.96	118.6	1.56	Sand mixtures - silty sand to sandy silt	2.29	1.89	
13.45	44.13	120.2	1.52	Sand mixtures - silty sand to sandy silt	2.27	1.85	
13.50	44.29	115.6	1.46	Sand mixtures - silty sand to sandy silt	2.28	1.86	
13.55	44.45	115.5	1.51	Sand mixtures - silty sand to sandy silt	2.29	1.90	
13.60	44.62	117.4	1.48	Sand mixtures - silty sand to sandy silt	2.28	1.87	
13.65	44.78	127.0	1.28	Sand mixtures - silty sand to sandy silt	2.20	1.66	
13.70	44.95	122.7	1.25	Sand mixtures - silty sand to sandy silt	2.21	1.68	
13.75	45.11	107.8	1.40	Sand mixtures - silty sand to sandy silt	2.29	1.92	
13.80	45.28	101.7	1.38	Sand mixtures - silty sand to sandy silt	2.32	1.99	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-05

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	101.8	1.59	Sand mixtures - silty sand to sandy silt	2.36	2.15	
13.90	45.6	108.7	1.71	Sand mixtures - silty sand to sandy silt	2.36	2.16	
13.95	45.77	118.5	1.87	Sand mixtures - silty sand to sandy silt	2.36	2.15	
14.00	45.93	130.2	1.84	Sand mixtures - silty sand to sandy silt	2.32	2.01	
14.05	46.1	141.1	1.85	Sand mixtures - silty sand to sandy silt	2.30	1.93	
14.10	46.26	143.1	1.95	Sand mixtures - silty sand to sandy silt	2.31	1.97	
14.15	46.42	143.6	2.06	Sand mixtures - silty sand to sandy silt	2.33	2.04	
14.20	46.59	146.4	2.24	Sand mixtures - silty sand to sandy silt	2.36	2.13	
14.25	46.75	152.7	2.29	Sand mixtures - silty sand to sandy silt	2.35	2.11	
14.30	46.92	164.2	2.22	Sand mixtures - silty sand to sandy silt	2.32	1.99	
14.35	47.08	165.8	2.01	Sand mixtures - silty sand to sandy silt	2.28	1.86	
14.40	47.24	166.7	2.17	Sand mixtures - silty sand to sandy silt	2.30	1.95	
14.45	47.41	173.8	1.97	Sand mixtures - silty sand to sandy silt	2.26	1.80	
14.50	47.57	174.2	1.77	Sand mixtures - silty sand to sandy silt	2.22	1.70	
14.55	47.74	162.3	1.68	Sand mixtures - silty sand to sandy silt	2.23	1.73	
14.60	47.9	145.0	1.79	Sand mixtures - silty sand to sandy silt	2.29	1.91	
14.65	48.06	138.7	1.87	Sand mixtures - silty sand to sandy silt	2.32	2.01	
14.70	48.23	152.8	1.72	Sand mixtures - silty sand to sandy silt	2.26	1.82	
14.75	48.39	173.8	1.05	Sands - clean sands to silty sand	2.05	1.36	
14.80	48.56	169.7	0.81	Sands - clean sands to silty sand	1.98	1.26	
14.85	48.72	149.7	1.12	Sand mixtures - silty sand to sandy silt	2.13	1.50	
14.90	48.88	126.1	1.34	Sand mixtures - silty sand to sandy silt	2.25	1.80	
14.95	49.05	114.2	1.21	Sand mixtures - silty sand to sandy silt	2.26	1.82	
15.00	49.21	111.7	1.38	Sand mixtures - silty sand to sandy silt	2.31	1.98	
15.05	49.38	112.4	1.22	Sand mixtures - silty sand to sandy silt	2.27	1.86	
15.10	49.54	114.5	1.21	Sand mixtures - silty sand to sandy silt	2.27	1.83	
15.15	49.7	118.4	1.61	Sand mixtures - silty sand to sandy silt	2.35	2.10	
15.20	49.87	119.0	1.18	Sand mixtures - silty sand to sandy silt	2.25	1.77	
15.25	50.03	112.6	1.59	Sand mixtures - silty sand to sandy silt	2.36	2.16	
15.30	50.2	127.10	1.26	Sand mixtures - silty sand to sandy silt	2.24	1.76	
15.35	50.36	120.83	1.26	Sand mixtures - silty sand to sandy silt	2.26	1.82	
15.40	50.52	117.98	1.26	Sand mixtures - silty sand to sandy silt	2.27	1.85	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 8:52
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	252.0	0.93	Sands - clean sands to silty sand	1.43	1.00	
0.10	0.33	208.1	1.78	Sands - clean sands to silty sand	1.71	1.04	
0.15	0.49	167.9	2.59	Very stiff sand to clayey sand	1.90	1.18	
0.20	0.66	137.6	2.96	Very stiff sand to clayey sand	1.99	1.28	
0.25	0.82	110.6	3.13	Very stiff sand to clayey sand	2.07	1.39	
0.30	0.98	90.3	3.21	Very stiff sand to clayey sand	2.13	1.49	
0.35	1.15	74.7	3.43	Very stiff sand to clayey sand	2.20	1.65	
0.40	1.31	68.7	2.69	Sand mixtures - silty sand to sandy silt	2.14	1.51	
0.45	1.48	56.3	2.90	Sand mixtures - silty sand to sandy silt	2.22	1.70	
0.50	1.64	46.0	2.56	Sand mixtures - silty sand to sandy silt	2.24	1.75	
0.55	1.80	44.3	2.02	Sand mixtures - silty sand to sandy silt	2.17	1.60	
0.60	1.97	48.4	1.80	Sand mixtures - silty sand to sandy silt	2.11	1.47	
0.65	2.13	55.4	1.87	Sand mixtures - silty sand to sandy silt	2.08	1.41	
0.70	2.30	55.2	1.85	Sand mixtures - silty sand to sandy silt	2.08	1.41	
0.75	2.46	50.8	2.30	Sand mixtures - silty sand to sandy silt	2.17	1.59	
0.80	2.62	48.6	2.39	Sand mixtures - silty sand to sandy silt	2.20	1.66	
0.85	2.79	48.0	2.44	Sand mixtures - silty sand to sandy silt	2.21	1.68	
0.90	2.95	47.8	2.15	Sand mixtures - silty sand to sandy silt	2.17	1.59	
0.95	3.12	42.1	2.04	Sand mixtures - silty sand to sandy silt	2.19	1.64	
1.00	3.28	38.4	1.44	Sand mixtures - silty sand to sandy silt	2.12	1.49	
1.05	3.44	35.1	2.94	Sand mixtures - silty sand to sandy silt	2.36	2.16	
1.10	3.61	36.0	2.45	Sand mixtures - silty sand to sandy silt	2.30	1.93	
1.15	3.77	22.3	2.69	Silt mixtures - clayey silt to silty clay	2.48	2.66	
1.20	3.94	21.2	1.32	Sand mixtures - silty sand to sandy silt	2.30	1.95	
1.25	4.10	21.4	1.39	Sand mixtures - silty sand to sandy silt	2.31	1.98	
1.30	4.27	20.8	1.54	Sand mixtures - silty sand to sandy silt	2.35	2.11	
1.35	4.43	21.7	1.34	Sand mixtures - silty sand to sandy silt	2.30	1.94	
1.40	4.59	17.9	1.48	Sand mixtures - silty sand to sandy silt	2.40	2.28	
1.45	4.76	16.9	2.97	Silt mixtures - clayey silt to silty clay	2.60	5.56	2.25
1.50	4.92	20.0	3.71	Silt mixtures - clayey silt to silty clay	2.61	5.90	2.66
1.55	5.09	26.2	3.62	Silt mixtures - clayey silt to silty clay	2.52	3.22	
1.60	5.25	31.7	3.59	Silt mixtures - clayey silt to silty clay	2.46	2.55	
1.65	5.41	34.2	3.77	Silt mixtures - clayey silt to silty clay	2.45	2.52	
1.70	5.58	38.6	3.46	Silt mixtures - clayey silt to silty clay	2.39	2.25	
1.75	5.74	42.1	3.23	Sand mixtures - silty sand to sandy silt	2.34	2.07	
1.80	5.91	43.8	3.04	Sand mixtures - silty sand to sandy silt	2.31	1.96	
1.85	6.07	40.1	3.17	Sand mixtures - silty sand to sandy silt	2.35	2.10	
1.90	6.23	40.8	2.83	Sand mixtures - silty sand to sandy silt	2.31	1.96	
1.95	6.40	43.4	2.42	Sand mixtures - silty sand to sandy silt	2.24	1.76	
2.00	6.56	39.3	2.23	Sand mixtures - silty sand to sandy silt	2.25	1.78	
2.05	6.73	36.2	2.25	Sand mixtures - silty sand to sandy silt	2.27	1.86	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	35.2	2.51	Sand mixtures - silty sand to sandy silt	2.32	1.99	
2.15	7.05	34.7	2.68	Sand mixtures - silty sand to sandy silt	2.34	2.08	
2.20	7.22	36.4	2.34	Sand mixtures - silty sand to sandy silt	2.29	1.90	
2.25	7.38	35.6	2.37	Sand mixtures - silty sand to sandy silt	2.30	1.94	
2.30	7.55	37.2	2.18	Sand mixtures - silty sand to sandy silt	2.27	1.85	
2.35	7.71	40.6	2.01	Sand mixtures - silty sand to sandy silt	2.23	1.73	
2.40	7.87	41.3	2.13	Sand mixtures - silty sand to sandy silt	2.24	1.77	
2.45	8.04	41.7	1.93	Sand mixtures - silty sand to sandy silt	2.22	1.70	
2.50	8.20	42.8	2.01	Sand mixtures - silty sand to sandy silt	2.23	1.73	
2.55	8.37	42.6	2.13	Sand mixtures - silty sand to sandy silt	2.25	1.79	
2.60	8.53	41.7	2.23	Sand mixtures - silty sand to sandy silt	2.27	1.85	
2.65	8.69	43.5	2.05	Sand mixtures - silty sand to sandy silt	2.24	1.76	
2.70	8.86	43.1	2.07	Sand mixtures - silty sand to sandy silt	2.25	1.79	
2.75	9.02	45.2	1.95	Sand mixtures - silty sand to sandy silt	2.22	1.72	
2.80	9.19	46.2	2.04	Sand mixtures - silty sand to sandy silt	2.23	1.75	
2.85	9.35	43.8	2.35	Sand mixtures - silty sand to sandy silt	2.30	1.92	
2.90	9.51	45.3	2.46	Sand mixtures - silty sand to sandy silt	2.30	1.94	
2.95	9.68	51.0	2.50	Sand mixtures - silty sand to sandy silt	2.28	1.87	
3.00	9.84	57.5	2.02	Sand mixtures - silty sand to sandy silt	2.19	1.62	
3.05	10.01	70.2	1.56	Sand mixtures - silty sand to sandy silt	2.06	1.37	
3.10	10.17	71.1	1.11	Sands - clean sands to silty sand	1.96	1.24	
3.15	10.33	61.7	1.61	Sand mixtures - silty sand to sandy silt	2.11	1.46	
3.20	10.50	52.2	1.62	Sand mixtures - silty sand to sandy silt	2.16	1.57	
3.25	10.66	43.3	2.70	Sand mixtures - silty sand to sandy silt	2.37	2.18	
3.30	10.83	36.1	3.42	Silt mixtures - clayey silt to silty clay	2.50	2.73	
3.35	10.99	31.3	4.00	Silt mixtures - clayey silt to silty clay	2.59	5.00	
3.40	11.15	31.9	3.29	Silt mixtures - clayey silt to silty clay	2.53	3.34	
3.45	11.32	34.5	2.45	Sand mixtures - silty sand to sandy silt	2.42	2.39	
3.50	11.48	34.7	2.46	Sand mixtures - silty sand to sandy silt	2.42	2.40	
3.55	11.65	36.1	3.58	Silt mixtures - clayey silt to silty clay	2.53	3.38	
3.60	11.81	33.1	3.72	Silt mixtures - clayey silt to silty clay	2.57	4.42	
3.65	11.97	41.5	3.11	Silt mixtures - clayey silt to silty clay	2.45	2.53	
3.70	12.14	53.1	2.71	Sand mixtures - silty sand to sandy silt	2.34	2.08	
3.75	12.30	60.8	2.52	Sand mixtures - silty sand to sandy silt	2.29	1.89	
3.80	12.47	73.0	2.15	Sand mixtures - silty sand to sandy silt	2.19	1.62	
3.85	12.63	76.1	1.66	Sand mixtures - silty sand to sandy silt	2.10	1.44	
3.90	12.80	68.4	1.80	Sand mixtures - silty sand to sandy silt	2.16	1.56	
3.95	12.96	66.1	1.94	Sand mixtures - silty sand to sandy silt	2.19	1.64	
4.00	13.12	77.6	1.95	Sand mixtures - silty sand to sandy silt	2.15	1.54	
4.05	13.29	96.7	1.47	Sands - clean sands to silty sand	2.00	1.29	
4.10	13.45	109.7	1.11	Sands - clean sands to silty sand	1.88	1.17	
4.15	13.62	106.0	1.04	Sands - clean sands to silty sand	1.88	1.16	
4.20	13.78	91.7	0.94	Sands - clean sands to silty sand	1.90	1.18	
4.25	13.94	65.8	1.43	Sand mixtures - silty sand to sandy silt	2.12	1.48	
4.30	14.11	52.6	1.50	Sand mixtures - silty sand to sandy silt	2.21	1.67	
4.35	14.27	36.5	2.00	Sand mixtures - silty sand to sandy silt	2.41	2.32	
4.40	14.44	28.0	2.43	Silt mixtures - clayey silt to silty clay	2.55	3.88	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	25.4	2.32	Silt mixtures - clayey silt to silty clay	2.57	4.50	
4.50	14.76	23.6	1.89	Silt mixtures - clayey silt to silty clay	2.54	3.73	
4.55	14.93	23.3	1.59	Sand mixtures - silty sand to sandy silt	2.50	2.89	
4.60	15.09	21.2	1.71	Silt mixtures - clayey silt to silty clay	2.56	4.15	
4.65	15.26	21.4	1.89	Silt mixtures - clayey silt to silty clay	2.58	4.87	
4.70	15.42	21.0	2.25	Silt mixtures - clayey silt to silty clay	2.64	7.07	2.81
4.75	15.58	22.4	2.41	Silt mixtures - clayey silt to silty clay	2.64	7.10	2.99
4.80	15.75	29.0	1.87	Sand mixtures - silty sand to sandy silt	2.49	2.71	
4.85	15.91	36.8	1.58	Sand mixtures - silty sand to sandy silt	2.37	2.18	
4.90	16.08	49.3	1.47	Sand mixtures - silty sand to sandy silt	2.25	1.80	
4.95	16.24	60.2	1.59	Sand mixtures - silty sand to sandy silt	2.22	1.69	
5.00	16.40	68.6	1.59	Sand mixtures - silty sand to sandy silt	2.18	1.60	
5.05	16.57	73.9	1.52	Sand mixtures - silty sand to sandy silt	2.14	1.53	
5.10	16.73	81.1	1.22	Sands - clean sands to silty sand	2.05	1.36	
5.15	16.90	92.9	1.17	Sands - clean sands to silty sand	2.00	1.29	
5.20	17.06	108.9	0.85	Sands - clean sands to silty sand	1.86	1.14	
5.25	17.22	126.6	0.73	Sands - clean sands to silty sand	1.76	1.08	
5.30	17.39	138.6	0.50	Sands - clean sands to silty sand	1.63	1.00	
5.35	17.55	173.2	1.33	Sands - clean sands to silty sand	1.85	1.14	
5.40	17.72	179.8	1.84	Sands - clean sands to silty sand	1.96	1.24	
5.45	17.88	174.1	1.73	Sands - clean sands to silty sand	1.95	1.23	
5.50	18.04	155.5	1.07	Sands - clean sands to silty sand	1.82	1.12	
5.55	18.21	162.3	0.93	Sands - clean sands to silty sand	1.77	1.08	
5.60	18.37	152.8	0.93	Sands - clean sands to silty sand	1.79	1.09	
5.65	18.54	138.4	0.81	Sands - clean sands to silty sand	1.78	1.09	
5.70	18.70	125.1	0.74	Sands - clean sands to silty sand	1.79	1.09	
5.75	18.86	105.2	0.81	Sands - clean sands to silty sand	1.87	1.16	
5.80	19.03	82.5	0.75	Sands - clean sands to silty sand	1.94	1.22	
5.85	19.19	61.2	0.90	Sand mixtures - silty sand to sandy silt	2.09	1.44	
5.90	19.36	48.8	1.10	Sand mixtures - silty sand to sandy silt	2.23	1.73	
5.95	19.52	39.9	1.05	Sand mixtures - silty sand to sandy silt	2.29	1.91	
6.00	19.68	32.2	1.28	Sand mixtures - silty sand to sandy silt	2.42	2.39	
6.05	19.85	30.7	1.26	Sand mixtures - silty sand to sandy silt	2.44	2.45	
6.10	20.01	30.7	1.28	Sand mixtures - silty sand to sandy silt	2.44	2.49	
6.15	20.18	33.0	1.22	Sand mixtures - silty sand to sandy silt	2.41	2.33	
6.20	20.34	36.2	1.04	Sand mixtures - silty sand to sandy silt	2.34	2.06	
6.25	20.51	40.7	0.98	Sand mixtures - silty sand to sandy silt	2.28	1.88	
6.30	20.67	44.2	1.05	Sand mixtures - silty sand to sandy silt	2.27	1.85	
6.35	20.83	49.3	1.14	Sand mixtures - silty sand to sandy silt	2.26	1.81	
6.40	21.00	59.7	1.13	Sand mixtures - silty sand to sandy silt	2.19	1.63	
6.45	21.16	66.7	1.11	Sand mixtures - silty sand to sandy silt	2.15	1.54	
6.50	21.33	66.3	1.22	Sand mixtures - silty sand to sandy silt	2.18	1.61	
6.55	21.49	68.4	1.13	Sand mixtures - silty sand to sandy silt	2.15	1.54	
6.60	21.65	74.6	1.25	Sand mixtures - silty sand to sandy silt	2.15	1.54	
6.65	21.82	73.6	1.23	Sand mixtures - silty sand to sandy silt	2.15	1.55	
6.70	21.98	76.7	1.20	Sand mixtures - silty sand to sandy silt	2.13	1.51	
6.75	22.15	84.3	1.14	Sand mixtures - silty sand to sandy silt	2.09	1.42	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	90.0	1.03	Sands - clean sands to silty sand	2.04	1.35	
6.85	22.47	89.0	1.05	Sands - clean sands to silty sand	2.05	1.36	
6.90	22.64	87.2	1.13	Sand mixtures - silty sand to sandy silt	2.08	1.41	
6.95	22.80	85.6	1.23	Sand mixtures - silty sand to sandy silt	2.11	1.47	
7.00	22.97	88.2	1.33	Sand mixtures - silty sand to sandy silt	2.13	1.50	
7.05	23.13	90.3	1.30	Sand mixtures - silty sand to sandy silt	2.12	1.47	
7.10	23.29	92.8	1.30	Sand mixtures - silty sand to sandy silt	2.11	1.46	
7.15	23.46	106.0	1.28	Sand mixtures - silty sand to sandy silt	2.06	1.38	
7.20	23.62	112.2	1.14	Sands - clean sands to silty sand	2.01	1.30	
7.25	23.79	114.2	1.16	Sands - clean sands to silty sand	2.01	1.30	
7.30	23.95	118.0	1.22	Sands - clean sands to silty sand	2.02	1.31	
7.35	24.11	121.8	1.28	Sands - clean sands to silty sand	2.02	1.32	
7.40	24.28	124.8	1.36	Sands - clean sands to silty sand	2.03	1.34	
7.45	24.44	142.2	1.17	Sands - clean sands to silty sand	1.94	1.23	
7.50	24.61	156.2	1.11	Sands - clean sands to silty sand	1.90	1.18	
7.55	24.77	164.3	1.06	Sands - clean sands to silty sand	1.87	1.16	
7.60	24.93	157.7	1.12	Sands - clean sands to silty sand	1.90	1.18	
7.65	25.10	155.0	1.15	Sands - clean sands to silty sand	1.92	1.20	
7.70	25.26	161.4	1.16	Sands - clean sands to silty sand	1.91	1.19	
7.75	25.43	163.7	1.21	Sands - clean sands to silty sand	1.92	1.20	
7.80	25.59	163.0	1.18	Sands - clean sands to silty sand	1.91	1.20	
7.85	25.75	165.6	1.16	Sands - clean sands to silty sand	1.90	1.19	
7.90	25.92	172.7	1.11	Sands - clean sands to silty sand	1.88	1.16	
7.95	26.08	175.2	1.11	Sands - clean sands to silty sand	1.88	1.16	
8.00	26.25	164.6	1.19	Sands - clean sands to silty sand	1.92	1.20	
8.05	26.41	162.0	1.19	Sands - clean sands to silty sand	1.93	1.21	
8.10	26.57	174.8	1.07	Sands - clean sands to silty sand	1.87	1.16	
8.15	26.74	176.4	1.12	Sands - clean sands to silty sand	1.88	1.17	
8.20	26.90	176.5	1.05	Sands - clean sands to silty sand	1.86	1.15	
8.25	27.07	214.4	1.26	Sands - clean sands to silty sand	1.86	1.15	
8.30	27.23	268.5	1.12	Sands - clean sands to silty sand	1.75	1.07	
8.35	27.39	311.1	0.85	Sands - clean sands to silty sand	1.61	1.00	
8.40	27.56	270.9	0.88	Sands - clean sands to silty sand	1.67	1.01	
8.45	27.72	242.9	1.13	Sands - clean sands to silty sand	1.79	1.10	
8.50	27.89	248.4	0.82	Sands - clean sands to silty sand	1.68	1.02	
8.55	28.05	229.1	0.98	Sands - clean sands to silty sand	1.76	1.08	
8.60	28.21	225.9	1.11	Sands - clean sands to silty sand	1.81	1.11	
8.65	28.38	220.0	1.17	Sands - clean sands to silty sand	1.84	1.13	
8.70	28.54	210.3	1.10	Sands - clean sands to silty sand	1.83	1.13	
8.75	28.71	205.8	1.13	Sands - clean sands to silty sand	1.85	1.14	
8.80	28.87	214.8	1.02	Sands - clean sands to silty sand	1.80	1.10	
8.85	29.04	217.5	1.03	Sands - clean sands to silty sand	1.80	1.10	
8.90	29.20	221.0	1.00	Sands - clean sands to silty sand	1.79	1.09	
8.95	29.36	210.2	1.00	Sands - clean sands to silty sand	1.81	1.11	
9.00	29.53	203.9	1.29	Sands - clean sands to silty sand	1.91	1.19	
9.05	29.69	192.4	1.36	Sands - clean sands to silty sand	1.94	1.23	
9.10	29.86	182.4	1.28	Sands - clean sands to silty sand	1.94	1.22	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	177.0	1.17	Sands - clean sands to silty sand	1.92	1.21	
9.20	30.18	183.7	1.45	Sands - clean sands to silty sand	1.99	1.28	
9.25	30.35	205.3	1.32	Sands - clean sands to silty sand	1.92	1.20	
9.30	30.51	227.5	1.29	Sands - clean sands to silty sand	1.88	1.16	
9.35	30.68	235.5	1.34	Sands - clean sands to silty sand	1.88	1.17	
9.40	30.84	228.0	1.16	Sands - clean sands to silty sand	1.84	1.13	
9.45	31.00	222.1	1.14	Sands - clean sands to silty sand	1.85	1.14	
9.50	31.17	199.1	1.21	Sands - clean sands to silty sand	1.91	1.19	
9.55	31.33	188.2	1.07	Sands - clean sands to silty sand	1.88	1.17	
9.60	31.50	165.8	1.25	Sands - clean sands to silty sand	1.98	1.27	
9.65	31.66	146.7	1.23	Sands - clean sands to silty sand	2.02	1.32	
9.70	31.82	135.5	1.17	Sands - clean sands to silty sand	2.03	1.34	
9.75	31.99	117.2	1.21	Sand mixtures - silty sand to sandy silt	2.10	1.44	
9.80	32.15	94.5	1.28	Sand mixtures - silty sand to sandy silt	2.19	1.64	
9.85	32.32	86.4	1.01	Sand mixtures - silty sand to sandy silt	2.16	1.56	
9.90	32.48	87.0	1.36	Sand mixtures - silty sand to sandy silt	2.24	1.77	
9.95	32.64	76.0	2.02	Sand mixtures - silty sand to sandy silt	2.42	2.38	
10.00	32.81	51.9	2.51	Silt mixtures - clayey silt to silty clay	2.63	6.51	6.92
10.05	32.97	42.4	2.56	Silt mixtures - clayey silt to silty clay	2.71		5.65
10.10	33.14	67.6	2.14	Sand mixtures - silty sand to sandy silt	2.49	2.68	
10.15	33.30	110.1	1.09	Sand mixtures - silty sand to sandy silt	2.10	1.44	
10.20	33.46	132.5	0.59	Sands - clean sands to silty sand	1.85	1.14	
10.25	33.63	107.3	0.99	Sand mixtures - silty sand to sandy silt	2.08	1.42	
10.30	33.79	84.2	1.78	Sand mixtures - silty sand to sandy silt	2.35	2.12	
10.35	33.96	73.2	1.65	Sand mixtures - silty sand to sandy silt	2.38	2.23	
10.40	34.12	68.2	1.59	Sand mixtures - silty sand to sandy silt	2.40	2.30	
10.45	34.28	68.0	1.37	Sand mixtures - silty sand to sandy silt	2.36	2.13	
10.50	34.45	63.2	1.21	Sand mixtures - silty sand to sandy silt	2.35	2.11	
10.55	34.61	57.1	1.17	Sand mixtures - silty sand to sandy silt	2.38	2.23	
10.60	34.78	52.5	1.49	Sand mixtures - silty sand to sandy silt	2.49	2.69	
10.65	34.94	47.0	1.79	Silt mixtures - clayey silt to silty clay	2.59	4.97	
10.70	35.10	39.3	2.05	Silt mixtures - clayey silt to silty clay	2.70	10.11	5.24
10.75	35.27	40.3	1.66	Silt mixtures - clayey silt to silty clay	2.63	6.50	5.37
10.80	35.43	39.7	1.45	Silt mixtures - clayey silt to silty clay	2.60	5.32	
10.85	35.60	39.7	1.37	Silt mixtures - clayey silt to silty clay	2.58	4.84	
10.90	35.76	38.3	1.57	Silt mixtures - clayey silt to silty clay	2.64	6.91	5.10
10.95	35.92	40.6	1.50	Silt mixtures - clayey silt to silty clay	2.60	5.53	5.42
11.00	36.09	44.2	1.28	Sand mixtures - silty sand to sandy silt	2.53	3.34	
11.05	36.25	45.6	1.27	Sand mixtures - silty sand to sandy silt	2.51	3.09	
11.10	36.42	49.2	1.23	Sand mixtures - silty sand to sandy silt	2.48	2.63	
11.15	36.58	53.2	1.39	Sand mixtures - silty sand to sandy silt	2.48	2.67	
11.20	36.74	56.8	1.43	Sand mixtures - silty sand to sandy silt	2.47	2.59	
11.25	36.91	59.4	1.95	Silt mixtures - clayey silt to silty clay	2.55	3.80	
11.30	37.07	59.0	1.80	Sand mixtures - silty sand to sandy silt	2.52	3.31	
11.35	37.24	56.6	1.70	Sand mixtures - silty sand to sandy silt	2.53	3.32	
11.40	37.40	54.0	1.68	Sand mixtures - silty sand to sandy silt	2.54	3.73	
11.45	37.57	48.3	1.76	Silt mixtures - clayey silt to silty clay	2.60	5.45	6.44

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	43.6	1.57	Silt mixtures - clayey silt to silty clay	2.61	5.83	5.81
11.55	37.89	42.0	1.47	Silt mixtures - clayey silt to silty clay	2.61	5.74	5.60
11.60	38.06	44.0	1.35	Sand mixtures - silty sand to sandy silt	2.57	4.37	
11.65	38.22	46.0	1.39	Sand mixtures - silty sand to sandy silt	2.56	4.13	
11.70	38.39	47.6	1.21	Sand mixtures - silty sand to sandy silt	2.51	2.94	
11.75	38.55	43.3	1.51	Silt mixtures - clayey silt to silty clay	2.61	5.84	5.77
11.80	38.71	40.4	2.22	Silt mixtures - clayey silt to silty clay	2.76		5.38
11.85	38.88	45.2	1.78	Silt mixtures - clayey silt to silty clay	2.65	7.34	6.02
11.90	39.04	43.6	1.70	Silt mixtures - clayey silt to silty clay	2.65	7.37	5.82
11.95	39.21	44.5	1.40	Silt mixtures - clayey silt to silty clay	2.58	4.91	
12.00	39.37	43.6	1.35	Silt mixtures - clayey silt to silty clay	2.59	4.93	
12.05	39.53	43.8	1.65	Silt mixtures - clayey silt to silty clay	2.65	7.24	5.84
12.10	39.70	58.5	1.24	Sand mixtures - silty sand to sandy silt	2.45	2.49	
12.15	39.86	55.3	1.30	Sand mixtures - silty sand to sandy silt	2.48	2.68	
12.20	40.03	55.6	1.48	Sand mixtures - silty sand to sandy silt	2.52	3.26	
12.25	40.19	51.9	2.17	Silt mixtures - clayey silt to silty clay	2.67	8.38	6.92
12.30	40.35	47.1	3.20	Silt mixtures - clayey silt to silty clay	2.82		6.28
12.35	40.52	44.5	3.35	Clays - silty clay to clay	2.85		5.94
12.40	40.68	52.2	2.26	Silt mixtures - clayey silt to silty clay	2.69	9.30	6.96
12.45	40.85	55.4	1.97	Silt mixtures - clayey silt to silty clay	2.62	6.16	7.39
12.50	41.01	43.7	2.65	Silt mixtures - clayey silt to silty clay	2.80		5.83
12.55	41.17	29.5	4.27	Clays - silty clay to clay	3.08		3.93
12.60	41.34	28.2	3.87	Clays - silty clay to clay	3.07		3.76
12.65	41.50	31.0	3.58	Clays - silty clay to clay	3.01		4.14
12.70	41.67	41.6	2.32	Silt mixtures - clayey silt to silty clay	2.78		5.55
12.75	41.83	66.8	1.54	Sand mixtures - silty sand to sandy silt	2.48	2.66	
12.80	41.99	80.5	1.10	Sand mixtures - silty sand to sandy silt	2.31	1.96	
12.85	42.16	62.2	1.44	Sand mixtures - silty sand to sandy silt	2.49	2.72	
12.90	42.32	48.1	2.06	Silt mixtures - clayey silt to silty clay	2.71		6.41
12.95	42.49	36.4	3.54	Clays - silty clay to clay	2.96		4.85
13.00	42.65	24.4	4.94	Clays - silty clay to clay	3.21		3.25
13.05	42.81	21.8	4.56	Clays - silty clay to clay	3.23		2.90
13.10	42.98	26.0	3.70	Clays - silty clay to clay	3.10		3.47
13.15	43.14	27.4	3.53	Clays - silty clay to clay	3.07		3.65
13.20	43.31	29.7	3.65	Clays - silty clay to clay	3.05		3.95
13.25	43.47	35.4	2.68	Clays - silty clay to clay	2.90		4.72
13.30	43.63	41.9	2.37	Silt mixtures - clayey silt to silty clay	2.81		5.59
13.35	43.80	47.5	2.17	Silt mixtures - clayey silt to silty clay	2.74		6.34
13.40	43.96	48.5	2.60	Silt mixtures - clayey silt to silty clay	2.78		6.47
13.45	44.13	45.1	3.08	Clays - silty clay to clay	2.86		6.01
13.50	44.29	40.2	3.36	Clays - silty clay to clay	2.93		5.36
13.55	44.45	36.7	2.65	Clays - silty clay to clay	2.89		4.90
13.60	44.62	52.6	1.61	Silt mixtures - clayey silt to silty clay	2.62	6.15	7.01
13.65	44.78	73.3	0.96	Sand mixtures - silty sand to sandy silt	2.33	2.04	
13.70	44.95	71.9	0.96	Sand mixtures - silty sand to sandy silt	2.34	2.08	
13.75	45.11	70.3	1.01	Sand mixtures - silty sand to sandy silt	2.37	2.17	
13.80	45.28	72.2	1.23	Sand mixtures - silty sand to sandy silt	2.41	2.36	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	73.6	1.31	Sand mixtures - silty sand to sandy silt	2.43	2.42	
13.90	45.60	64.3	1.70	Silt mixtures - clayey silt to silty clay	2.57	4.33	
13.95	45.77	62.3	1.65	Silt mixtures - clayey silt to silty clay	2.57	4.48	
14.00	45.93	67.3	1.50	Sand mixtures - silty sand to sandy silt	2.51	3.06	
14.05	46.10	58.0	1.38	Sand mixtures - silty sand to sandy silt	2.55	3.85	
14.10	46.26	53.7	1.54	Silt mixtures - clayey silt to silty clay	2.62	6.01	7.16
14.15	46.42	48.1	1.65	Silt mixtures - clayey silt to silty clay	2.68	9.19	6.42
14.20	46.59	38.2	2.87	Clays - silty clay to clay	2.92		5.09
14.25	46.75	28.2	3.27	Clays - silty clay to clay	3.07		3.76
14.30	46.92	34.6	2.48	Clays - silty clay to clay	2.92		4.61
14.35	47.08	44.9	1.58	Silt mixtures - clayey silt to silty clay	2.70		5.99
14.40	47.24	41.5	2.29	Silt mixtures - clayey silt to silty clay	2.83		5.53
14.45	47.41	38.6	2.05	Silt mixtures - clayey silt to silty clay	2.83		5.15
14.50	47.57	40.2	1.76	Silt mixtures - clayey silt to silty clay	2.78		5.36
14.55	47.74	41.2	1.84	Silt mixtures - clayey silt to silty clay	2.78		5.49
14.60	47.90	39.2	2.24	Silt mixtures - clayey silt to silty clay	2.85		5.23
14.65	48.06	36.7	2.10	Silt mixtures - clayey silt to silty clay	2.86		4.90
14.70	48.23	46.5	1.61	Silt mixtures - clayey silt to silty clay	2.71		6.20
14.75	48.39	62.4	1.50	Silt mixtures - clayey silt to silty clay	2.57	4.37	
14.80	48.56	78.8	1.26	Sand mixtures - silty sand to sandy silt	2.42	2.38	
14.85	48.72	102.0	1.20	Sand mixtures - silty sand to sandy silt	2.30	1.94	
14.90	48.88	102.0	1.19	Sand mixtures - silty sand to sandy silt	2.30	1.94	
14.95	49.05	95.8	1.50	Sand mixtures - silty sand to sandy silt	2.40	2.30	
15.00	49.21	74.6	1.87	Silt mixtures - clayey silt to silty clay	2.57	4.56	
15.05	49.38	70.5	1.57	Sand mixtures - silty sand to sandy silt	2.54	3.69	
15.10	49.54	65.9	1.93	Silt mixtures - clayey silt to silty clay	2.64	6.88	8.79
15.15	49.70	62.9	1.56	Silt mixtures - clayey silt to silty clay	2.59	5.10	
15.20	49.87	69.9	1.23	Sand mixtures - silty sand to sandy silt	2.48	2.63	
15.25	50.03	79.4	1.41	Sand mixtures - silty sand to sandy silt	2.47	2.59	
15.30	50.20	118.74	1.18	Sand mixtures - silty sand to sandy silt	2.25	1.78	
15.35	50.36	160.95	0.98	Sands - clean sands to silty sand	2.07	1.39	
15.40	50.52	152.80	0.92	Sands - clean sands to silty sand	2.07	1.39	
15.45	50.69	123.75	1.07	Sand mixtures - silty sand to sandy silt	2.20	1.67	
15.50	50.85	99.16	1.39	Sand mixtures - silty sand to sandy silt	2.38	2.21	
15.55	51.02	109.49	1.36	Sand mixtures - silty sand to sandy silt	2.33	2.03	
15.60	51.18	142.22	1.17	Sand mixtures - silty sand to sandy silt	2.18	1.61	
15.65	51.34	183.04	1.07	Sands - clean sands to silty sand	2.05	1.37	
15.70	51.51	209.73	1.11	Sands - clean sands to silty sand	2.01	1.31	
15.75	51.67	183.76	1.25	Sand mixtures - silty sand to sandy silt	2.10	1.45	
15.80	51.84	145.35	1.48	Sand mixtures - silty sand to sandy silt	2.25	1.79	
15.85	52.00	108.11	1.59	Sand mixtures - silty sand to sandy silt	2.39	2.26	
15.90	52.16	82.54	1.60	Sand mixtures - silty sand to sandy silt	2.50	2.82	
15.95	52.33	73.07	1.89	Silt mixtures - clayey silt to silty clay	2.61	5.61	9.74
16.00	52.49	83.02	1.73	Sand mixtures - silty sand to sandy silt	2.53	3.34	
16.05	52.66	191.18	1.34	Sand mixtures - silty sand to sandy silt	2.12	1.48	
16.10	52.82	298.50	0.97	Sands - clean sands to silty sand	1.84	1.13	
16.15	52.98	286.40	0.90	Sands - clean sands to silty sand	1.83	1.12	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
16.20	53.15	283.28	0.77	Sands - clean sands to silty sand	1.78	1.09	
16.25	53.31	296.74	0.91	Sands - clean sands to silty sand	1.82	1.12	
16.30	53.48	335.64	1.16	Sands - clean sands to silty sand	1.86	1.15	
16.35	53.64	377.84	1.02	Sands - clean sands to silty sand	1.78	1.08	
16.40	53.81	363.47	1.04	Sands - clean sands to silty sand	1.80	1.10	
16.45	53.97	373.41	1.01	Sands - clean sands to silty sand	1.78	1.08	
16.50	54.13	351.12	0.91	Sands - clean sands to silty sand	1.76	1.07	
16.55	54.30	331.94	0.97	Sands - clean sands to silty sand	1.81	1.11	
16.60	54.46	317.39	0.83	Sands - clean sands to silty sand	1.77	1.08	
16.65	54.63	277.30	0.94	Sands - clean sands to silty sand	1.86	1.15	
16.70	54.79	231.07	0.82	Sands - clean sands to silty sand	1.89	1.17	
16.75	54.95	174.87	0.84	Sands - clean sands to silty sand	2.01	1.30	
16.80	55.12	127.01	0.80	Sand mixtures - silty sand to sandy silt	2.12	1.48	
16.85	55.28	93.06	0.86	Sand mixtures - silty sand to sandy silt	2.27	1.85	
16.90	55.45	67.55	1.01	Sand mixtures - silty sand to sandy silt	2.46	2.56	
16.95	55.61	47.17	1.17	Silt mixtures - clayey silt to silty clay	2.66	7.79	6.29
17.00	55.77	38.39	1.21	Silt mixtures - clayey silt to silty clay	2.75		5.12
17.05	55.94	37.87	1.48	Silt mixtures - clayey silt to silty clay	2.80		5.05
17.10	56.10	42.18	1.48	Silt mixtures - clayey silt to silty clay	2.76		5.62
17.15	56.27	41.38	1.58	Silt mixtures - clayey silt to silty clay	2.79		5.52
17.20	56.43	51.00	0.96	Sand mixtures - silty sand to sandy silt	2.57	4.53	
17.25	56.59	42.49	1.16	Silt mixtures - clayey silt to silty clay	2.70		5.66
17.30	56.76	33.61	2.03	Clays - silty clay to clay	2.93		4.48
17.35	56.92	20.04	2.85	Clays - silty clay to clay	3.24		2.67
17.40	57.09	25.12	1.59	Clays - silty clay to clay	2.99		3.35
17.45	57.25	56.62	1.12	Sand mixtures - silty sand to sandy silt	2.58	4.62	
17.50	57.41	86.63	0.91	Sand mixtures - silty sand to sandy silt	2.33	2.04	
17.55	57.58	111.06	0.90	Sand mixtures - silty sand to sandy silt	2.22	1.72	
17.60	57.74	124.98	0.91	Sand mixtures - silty sand to sandy silt	2.18	1.61	
17.65	57.91	129.28	1.56	Sand mixtures - silty sand to sandy silt	2.34	2.08	
17.70	58.07	150.35	1.57	Sand mixtures - silty sand to sandy silt	2.29	1.90	
17.75	58.23	142.30	1.48	Sand mixtures - silty sand to sandy silt	2.29	1.90	
17.80	58.40	125.57	1.22	Sand mixtures - silty sand to sandy silt	2.27	1.85	
17.85	58.56	130.56	1.02	Sand mixtures - silty sand to sandy silt	2.20	1.66	
17.90	58.73	120.10	1.07	Sand mixtures - silty sand to sandy silt	2.25	1.79	
17.95	58.89	112.73	1.08	Sand mixtures - silty sand to sandy silt	2.28	1.88	
18.00	59.05	118.33	1.07	Sand mixtures - silty sand to sandy silt	2.26	1.81	
18.05	59.22	131.56	0.95	Sand mixtures - silty sand to sandy silt	2.18	1.60	
18.10	59.38	135.74	0.84	Sand mixtures - silty sand to sandy silt	2.13	1.49	
18.15	59.55	118.42	0.76	Sand mixtures - silty sand to sandy silt	2.16	1.55	
18.20	59.71	89.08	0.89	Sand mixtures - silty sand to sandy silt	2.32	2.01	
18.25	59.87	60.39	0.92	Sand mixtures - silty sand to sandy silt	2.50	2.89	
18.30	60.04	38.48	0.93	Silt mixtures - clayey silt to silty clay	2.70		5.13
18.35	60.20	20.82	0.76	Silt mixtures - clayey silt to silty clay	2.92		2.78
18.40	60.37	9.90	0.76	Clays - silty clay to clay	3.29		1.32
18.45	60.53	9.20	1.54	Clays - silty clay to clay	3.50		1.23
18.50	60.69	11.45	2.16	Clays - silty clay to clay	3.46		1.53

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
18.55	60.86	12.10	1.70	Clays - silty clay to clay	3.37		1.61
18.60	61.02	11.91	2.22	Clays - silty clay to clay	3.45		1.59
18.65	61.19	17.22	1.61	Clays - silty clay to clay	3.18		2.30
18.70	61.35	26.95	1.57	Clays - silty clay to clay	2.98		3.59
18.75	61.52	30.29	1.38	Silt mixtures - clayey silt to silty clay	2.90		4.04
18.80	61.68	22.53	1.78	Clays - silty clay to clay	3.09		3.00
18.85	61.84	15.31	2.80	Clays - silty clay to clay	3.38		2.04
18.90	62.01	36.11	1.82	Silt mixtures - clayey silt to silty clay	2.90		4.81
18.95	62.17	39.77	1.46	Silt mixtures - clayey silt to silty clay	2.81		5.30
19.00	62.34	82.53	0.72	Sand mixtures - silty sand to sandy silt	2.31	1.96	
19.05	62.50	95.64	0.76	Sand mixtures - silty sand to sandy silt	2.26	1.81	
19.10	62.66	88.15	0.88	Sand mixtures - silty sand to sandy silt	2.34	2.07	
19.15	62.83	66.48	1.87	Silt mixtures - clayey silt to silty clay	2.68	9.00	8.86
19.20	62.99	34.55	3.16	Clays - silty clay to clay	3.07		4.61
19.25	63.16	23.24	3.14	Clays - silty clay to clay	3.23		3.10
19.30	63.32	60.65	1.26	Silt mixtures - clayey silt to silty clay	2.61	5.85	8.09
19.35	63.48	52.03	2.40	Silt mixtures - clayey silt to silty clay	2.84		6.94
19.40	63.65	25.12	3.95	Clays - silty clay to clay	3.26		3.35
19.45	63.81	15.69	3.74	Clays - silty clay to clay	3.46		2.09
19.50	63.98	33.75	1.61	Silt mixtures - clayey silt to silty clay	2.90		4.50
19.55	64.14	74.69	0.87	Sand mixtures - silty sand to sandy silt	2.42	2.36	
19.60	64.30	67.49	1.31	Silt mixtures - clayey silt to silty clay	2.58	4.88	
19.65	64.47	68.44	1.85	Silt mixtures - clayey silt to silty clay	2.67	8.60	9.13
19.70	64.63	40.82	1.42	Silt mixtures - clayey silt to silty clay	2.80		5.44
19.75	64.80	23.34	2.70	Clays - silty clay to clay	3.20		3.11
19.80	64.96	29.98	2.06	Clays - silty clay to clay	3.02		4.00
19.85	65.12	38.20	1.90	Silt mixtures - clayey silt to silty clay	2.90		5.09
19.90	65.29	53.57	1.31	Silt mixtures - clayey silt to silty clay	2.67	8.70	7.14
19.95	65.45	68.27	1.05	Sand mixtures - silty sand to sandy silt	2.51	3.10	
20.00	65.62	74.28	0.90	Sand mixtures - silty sand to sandy silt	2.43	2.43	
20.05	65.78	77.50	0.80	Sand mixtures - silty sand to sandy silt	2.38	2.22	
20.10	65.94	79.66	0.91	Sand mixtures - silty sand to sandy silt	2.41	2.33	
20.15	66.11	80.47	0.79	Sand mixtures - silty sand to sandy silt	2.36	2.16	
20.20	66.27	79.16	0.89	Sand mixtures - silty sand to sandy silt	2.40	2.32	
20.25	66.44	76.52	0.83	Sand mixtures - silty sand to sandy silt	2.40	2.31	
20.30	66.60	74.24	0.84	Sand mixtures - silty sand to sandy silt	2.42	2.38	
20.35	66.76	70.44	0.89	Sand mixtures - silty sand to sandy silt	2.46	2.56	
20.40	66.93	71.77	1.18	Sand mixtures - silty sand to sandy silt	2.54	3.59	
20.45	67.09	73.73	1.35	Sand mixtures - silty sand to sandy silt	2.57	4.40	
20.50	67.26	79.58	1.10	Sand mixtures - silty sand to sandy silt	2.47	2.61	
20.55	67.42	74.61	0.85	Sand mixtures - silty sand to sandy silt	2.42	2.40	
20.60	67.58	73.76	0.90	Sand mixtures - silty sand to sandy silt	2.45	2.50	
20.65	67.75	75.75	0.94	Sand mixtures - silty sand to sandy silt	2.45	2.51	
20.70	67.91	84.09	1.36	Sand mixtures - silty sand to sandy silt	2.52	3.17	
20.75	68.08	77.98	2.24	Silt mixtures - clayey silt to silty clay	2.69	9.68	10.40
20.80	68.24	63.57	2.03	Silt mixtures - clayey silt to silty clay	2.74		8.48
20.85	68.40	79.45	1.19	Sand mixtures - silty sand to sandy silt	2.50	2.87	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
20.90	68.57	95.20	0.81	Sand mixtures - silty sand to sandy silt	2.31	1.97	
20.95	68.73	99.87	0.76	Sand mixtures - silty sand to sandy silt	2.27	1.84	
21.00	68.90	94.91	0.78	Sand mixtures - silty sand to sandy silt	2.30	1.93	
21.05	69.06	94.63	0.78	Sand mixtures - silty sand to sandy silt	2.30	1.94	
21.10	69.22	95.56	0.76	Sand mixtures - silty sand to sandy silt	2.29	1.91	
21.15	69.39	92.80	0.83	Sand mixtures - silty sand to sandy silt	2.33	2.03	
21.20	69.55	87.27	1.31	Sand mixtures - silty sand to sandy silt	2.50	2.74	
21.25	69.72	81.96	1.38	Sand mixtures - silty sand to sandy silt	2.54	3.75	
21.30	69.88	84.53	1.01	Sand mixtures - silty sand to sandy silt	2.43	2.43	
21.35	70.05	86.52	0.80	Sand mixtures - silty sand to sandy silt	2.35	2.11	
21.40	70.21	82.23	0.87	Sand mixtures - silty sand to sandy silt	2.40	2.30	
21.45	70.37	80.00	0.91	Sand mixtures - silty sand to sandy silt	2.43	2.41	
21.50	70.54	78.57	1.05	Sand mixtures - silty sand to sandy silt	2.48	2.65	
21.55	70.70	76.40	0.91	Sand mixtures - silty sand to sandy silt	2.45	2.51	
21.60	70.87	78.60	0.97	Sand mixtures - silty sand to sandy silt	2.46	2.55	
21.65	71.03	82.57	0.87	Sand mixtures - silty sand to sandy silt	2.40	2.31	
21.70	71.19	87.25	0.80	Sand mixtures - silty sand to sandy silt	2.35	2.12	
21.75	71.36	93.00	0.90	Sand mixtures - silty sand to sandy silt	2.36	2.15	
21.80	71.52	101.06	0.85	Sand mixtures - silty sand to sandy silt	2.31	1.96	
21.85	71.69	105.27	0.89	Sand mixtures - silty sand to sandy silt	2.30	1.95	
21.90	71.85	110.78	0.84	Sand mixtures - silty sand to sandy silt	2.27	1.84	
21.95	72.01	111.79	0.86	Sand mixtures - silty sand to sandy silt	2.27	1.85	
22.00	72.18	104.99	0.93	Sand mixtures - silty sand to sandy silt	2.32	2.02	
22.05	72.34	104.48	1.02	Sand mixtures - silty sand to sandy silt	2.35	2.12	
22.10	72.51	111.12	0.96	Sand mixtures - silty sand to sandy silt	2.31	1.97	
22.15	72.67	116.62	1.07	Sand mixtures - silty sand to sandy silt	2.33	2.02	
22.20	72.83	119.82	1.13	Sand mixtures - silty sand to sandy silt	2.33	2.05	
22.25	73.00	111.33	1.59	Sand mixtures - silty sand to sandy silt	2.48	2.64	
22.30	73.16	116.28	1.49	Sand mixtures - silty sand to sandy silt	2.44	2.47	
22.35	73.33	125.46	1.72	Sand mixtures - silty sand to sandy silt	2.46	2.55	
22.40	73.49	146.55	1.31	Sand mixtures - silty sand to sandy silt	2.30	1.94	
22.45	73.65	168.91	1.15	Sand mixtures - silty sand to sandy silt	2.20	1.66	
22.50	73.82	154.82	1.19	Sand mixtures - silty sand to sandy silt	2.25	1.78	
22.55	73.98	143.72	1.15	Sand mixtures - silty sand to sandy silt	2.27	1.84	
22.60	74.15	134.67	1.12	Sand mixtures - silty sand to sandy silt	2.29	1.89	
22.65	74.31	130.30	1.11	Sand mixtures - silty sand to sandy silt	2.30	1.93	
22.70	74.47	124.66	1.60	Sand mixtures - silty sand to sandy silt	2.44	2.48	
22.75	74.64	116.91	1.70	Sand mixtures - silty sand to sandy silt	2.49	2.69	
22.80	74.80	126.04	1.28	Sand mixtures - silty sand to sandy silt	2.36	2.15	
22.85	74.97	137.89	0.96	Sand mixtures - silty sand to sandy silt	2.23	1.73	
22.90	75.13	140.86	1.04	Sand mixtures - silty sand to sandy silt	2.25	1.78	
22.95	75.29	138.52	1.13	Sand mixtures - silty sand to sandy silt	2.28	1.89	
23.00	75.46	140.07	1.14	Sand mixtures - silty sand to sandy silt	2.28	1.88	
23.05	75.62	145.12	1.15	Sand mixtures - silty sand to sandy silt	2.27	1.85	
23.10	75.79	136.11	1.69	Sand mixtures - silty sand to sandy silt	2.43	2.43	
23.15	75.95	134.42	1.36	Sand mixtures - silty sand to sandy silt	2.36	2.15	
23.20	76.11	117.07	1.23	Sand mixtures - silty sand to sandy silt	2.39	2.24	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-06

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
23.25	76.28	110.17	1.28	Sand mixtures - silty sand to sandy silt	2.42	2.40	
23.30	76.44	91.16	1.62	Silt mixtures - clayey silt to silty clay	2.58	4.63	
23.35	76.61	71.86	2.35	Silt mixtures - clayey silt to silty clay	2.76		9.58
23.40	76.77	65.25	3.43	Clays - silty clay to clay	2.91		8.70
23.45	76.93	35.82	3.46	Clays - silty clay to clay	3.14		4.78
23.50	77.10	18.97	3.96	Clays - silty clay to clay	3.46		2.53
23.55	77.26	20.71	3.48	Clays - silty clay to clay	3.38		2.76
23.60	77.43	26.36	3.78	Clays - silty clay to clay	3.29		3.51
23.65	77.59	45.36	3.21	Clays - silty clay to clay	3.03		6.05
23.70	77.75	46.15	5.01	Clays - silty clay to clay	3.15		6.15
23.75	77.92	52.78	4.14	Clays - silty clay to clay	3.04		7.04
23.80	78.08	36.23	5.24	Clays - silty clay to clay	3.26		4.83
23.85	78.25	51.86	3.72	Clays - silty clay to clay	3.02		6.91
23.90	78.41	36.71	4.40	Clays - silty clay to clay	3.20		4.89
23.95	78.58	28.50	4.86	Clays - silty clay to clay	3.34		3.80
24.00	78.74	44.99	4.06	Clays - silty clay to clay	3.10		6.00
24.05	78.90	57.75	4.23	Clays - silty clay to clay	3.02		7.70
24.10	79.07	50.83	4.38	Clays - silty clay to clay	3.08		6.78
24.15	79.23	36.84	4.08	Clays - silty clay to clay	3.18		4.91
24.20	79.40	98.85	1.30	Sand mixtures - silty sand to sandy silt	2.49	2.71	
24.25	79.56	145.82	1.62	Sand mixtures - silty sand to sandy silt	2.41	2.32	
24.30	79.72	145.08	2.71	Silt mixtures - clayey silt to silty clay	2.58	4.66	
24.35	79.89	104.48	4.35	Clays - silty clay to clay	2.83		13.93
24.40	80.05	159.26	3.02	Silt mixtures - clayey silt to silty clay	2.58	4.80	
24.45	80.22	255.18	2.30	Sand mixtures - silty sand to sandy silt	2.33	2.03	
24.50	80.38	329.81	1.81	Sand mixtures - silty sand to sandy silt	2.14	1.53	
24.55	80.54	418.71	1.67	Sand mixtures - silty sand to sandy silt	2.03	1.33	
24.60	80.71	470.68	1.70	Sands - clean sands to silty sand	2.00	1.29	
24.65	80.87	476.40	2.02	Sand mixtures - silty sand to sandy silt	2.06	1.39	
24.70	81.04	470.21	2.17	Sand mixtures - silty sand to sandy silt	2.10	1.44	
24.75	81.20	478.85	2.18	Sand mixtures - silty sand to sandy silt	2.10	1.44	
24.80	81.36	498.12	2.08	Sand mixtures - silty sand to sandy silt	2.06	1.39	
24.85	81.53	504.14	2.15	Sand mixtures - silty sand to sandy silt	2.07	1.40	
24.90	81.69	511.80	2.22	Sand mixtures - silty sand to sandy silt	2.08	1.42	
24.95	81.86	514.22	2.31	Sand mixtures - silty sand to sandy silt	2.10	1.45	
25.00	82.02	531.32	2.19	Sand mixtures - silty sand to sandy silt	2.07	1.39	
25.05	82.18	567.84	2.00	Sand mixtures - silty sand to sandy silt	2.01	1.30	
25.10	82.35	580.88	2.00	Sand mixtures - silty sand to sandy silt	2.00	1.30	
25.15	82.51	597.83	2.00	Sands - clean sands to silty sand	1.99	1.28	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 10:40
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-07

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	11.8	0.01	Sand mixtures - silty sand to sandy silt	2.26	1.00	
0.10	0.33	17.7	0.01	Sands - clean sands to silty sand	2.10	1.00	
0.15	0.49	10.5	0.01	Sand mixtures - silty sand to sandy silt	2.31	1.00	
0.20	0.66	14.9	0.01	Sands - clean sands to silty sand	2.17	1.00	
0.25	0.82	16.3	0.01	Sands - clean sands to silty sand	2.13	1.00	
0.30	0.98	12.3	0.01	Sand mixtures - silty sand to sandy silt	2.24	1.00	
0.35	1.15	12.5	0.01	Sand mixtures - silty sand to sandy silt	2.24	1.00	
0.40	1.31	18.8	0.01	Sands - clean sands to silty sand	2.07	1.00	
0.45	1.48	26.2	0.01	Sands - clean sands to silty sand	1.94	1.00	
0.50	1.64	24.3	0.01	Sands - clean sands to silty sand	1.97	1.00	
0.55	1.80	20.4	0.01	Sands - clean sands to silty sand	2.04	1.00	
0.60	1.97	21.1	0.01	Sands - clean sands to silty sand	2.03	1.00	
0.65	2.13	26.9	0.01	Sands - clean sands to silty sand	1.93	1.00	
0.70	2.30	30.8	0.01	Sands - clean sands to silty sand	1.83	1.00	
0.75	2.46	32.9	0.22	Sands - clean sands to silty sand	1.77	1.00	
0.80	2.62	35.5	0.19	Sands - clean sands to silty sand	1.72	1.00	
0.85	2.79	41.5	0.04	Sands - clean sands to silty sand	1.59	1.00	
0.90	2.95	44.0	0.04	Sands - clean sands to silty sand	1.57	1.00	
0.95	3.12	53.5	0.02	Sands - clean sands to silty sand	1.53	1.00	
1.00	3.28	63.2	0.01	Gravelly sand to dense sand	1.58	1.00	
1.05	3.44	77.7	0.01	Gravelly sand to dense sand	1.47	1.00	
1.10	3.61	83.7	0.41	Sands - clean sands to silty sand	1.52	1.00	
1.15	3.77	85.5	0.45	Sands - clean sands to silty sand	1.53	1.00	
1.20	3.94	93.2	0.77	Sands - clean sands to silty sand	1.65	1.00	
1.25	4.10	108.5	0.72	Sands - clean sands to silty sand	1.59	1.00	
1.30	4.27	108.3	0.71	Sands - clean sands to silty sand	1.58	1.00	
1.35	4.43	107.7	0.74	Sands - clean sands to silty sand	1.60	1.00	
1.40	4.59	102.3	1.01	Sands - clean sands to silty sand	1.70	1.04	
1.45	4.76	101.0	1.17	Sands - clean sands to silty sand	1.75	1.07	
1.50	4.92	106.9	0.98	Sands - clean sands to silty sand	1.69	1.03	
1.55	5.09	117.1	0.58	Sands - clean sands to silty sand	1.54	1.00	
1.60	5.25	117.7	0.78	Sands - clean sands to silty sand	1.62	1.00	
1.65	5.41	118.6	0.96	Sands - clean sands to silty sand	1.68	1.02	
1.70	5.58	111.9	1.00	Sands - clean sands to silty sand	1.71	1.04	
1.75	5.74	103.2	1.03	Sands - clean sands to silty sand	1.74	1.06	
1.80	5.91	102.7	0.98	Sands - clean sands to silty sand	1.73	1.05	
1.85	6.07	92.1	1.21	Sands - clean sands to silty sand	1.82	1.12	
1.90	6.23	79.9	1.26	Sands - clean sands to silty sand	1.87	1.16	
1.95	6.40	69.6	1.72	Sands - clean sands to silty sand	2.00	1.30	
2.00	6.56	65.4	1.96	Sand mixtures - silty sand to sandy silt	2.06	1.39	
2.05	6.73	62.0	2.35	Sand mixtures - silty sand to sandy silt	2.14	1.52	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-07

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	62.4	1.90	Sand mixtures - silty sand to sandy silt	2.08	1.40	
2.15	7.05	68.5	1.62	Sands - clean sands to silty sand	2.01	1.30	
2.20	7.22	95.0	1.11	Sands - clean sands to silty sand	1.82	1.11	
2.25	7.38	108.9	1.05	Sands - clean sands to silty sand	1.77	1.08	
2.30	7.55	116.0	1.09	Sands - clean sands to silty sand	1.76	1.07	
2.35	7.71	106.0	1.71	Sands - clean sands to silty sand	1.93	1.21	
2.40	7.87	88.3	2.22	Sand mixtures - silty sand to sandy silt	2.06	1.37	
2.45	8.04	61.7	3.60	Sand mixtures - silty sand to sandy silt	2.30	1.95	
2.50	8.20	64.7	2.19	Sand mixtures - silty sand to sandy silt	2.14	1.52	
2.55	8.37	65.7	2.38	Sand mixtures - silty sand to sandy silt	2.17	1.58	
2.60	8.53	53.2	3.85	Silt mixtures - clayey silt to silty clay	2.37	2.20	
2.65	8.69	48.1	4.74	Silt mixtures - clayey silt to silty clay	2.47	2.61	
2.70	8.86	47.7	4.60	Silt mixtures - clayey silt to silty clay	2.47	2.60	
2.75	9.02	65.7	2.80	Sand mixtures - silty sand to sandy silt	2.23	1.74	
2.80	9.19	91.9	1.54	Sands - clean sands to silty sand	1.96	1.25	
2.85	9.35	103.2	1.25	Sands - clean sands to silty sand	1.87	1.15	
2.90	9.51	108.7	1.24	Sands - clean sands to silty sand	1.86	1.14	
2.95	9.68	119.6	1.10	Sands - clean sands to silty sand	1.80	1.10	
3.00	9.84	115.3	0.97	Sands - clean sands to silty sand	1.77	1.08	
3.05	10.01	106.7	1.27	Sands - clean sands to silty sand	1.88	1.16	
3.10	10.17	103.7	1.26	Sands - clean sands to silty sand	1.88	1.17	
3.15	10.33	98.2	1.23	Sands - clean sands to silty sand	1.90	1.18	
3.20	10.50	92.6	1.31	Sands - clean sands to silty sand	1.94	1.22	
3.25	10.66	87.7	1.22	Sands - clean sands to silty sand	1.93	1.21	
3.30	10.83	85.4	1.20	Sands - clean sands to silty sand	1.94	1.22	
3.35	10.99	85.1	1.22	Sands - clean sands to silty sand	1.95	1.23	
3.40	11.15	85.0	1.17	Sands - clean sands to silty sand	1.94	1.22	
3.45	11.32	91.6	1.02	Sands - clean sands to silty sand	1.88	1.16	
3.50	11.48	102.8	0.67	Sands - clean sands to silty sand	1.74	1.06	
3.55	11.65	111.7	0.83	Sands - clean sands to silty sand	1.77	1.08	
3.60	11.81	117.3	0.86	Sands - clean sands to silty sand	1.77	1.08	
3.65	11.97	123.2	0.97	Sands - clean sands to silty sand	1.79	1.09	
3.70	12.14	130.1	0.87	Sands - clean sands to silty sand	1.74	1.06	
3.75	12.30	135.8	1.03	Sands - clean sands to silty sand	1.78	1.09	
3.80	12.47	149.7	1.45	Sands - clean sands to silty sand	1.86	1.15	
3.85	12.63	147.6	2.39	Sand mixtures - silty sand to sandy silt	2.04	1.34	
3.90	12.80	191.9	2.03	Sands - clean sands to silty sand	1.92	1.20	
3.95	12.96	157.2	1.57	Sands - clean sands to silty sand	1.88	1.17	
4.00	13.12	134.4	1.03	Sands - clean sands to silty sand	1.80	1.10	
4.05	13.29	126.1	0.93	Sands - clean sands to silty sand	1.79	1.09	
4.10	13.45	116.5	0.93	Sands - clean sands to silty sand	1.81	1.11	
4.15	13.62	105.2	0.88	Sands - clean sands to silty sand	1.83	1.12	
4.20	13.78	91.1	0.90	Sands - clean sands to silty sand	1.89	1.17	
4.25	13.94	84.5	0.95	Sands - clean sands to silty sand	1.93	1.21	
4.30	14.11	82.0	1.04	Sands - clean sands to silty sand	1.96	1.25	
4.35	14.27	77.5	1.10	Sands - clean sands to silty sand	2.00	1.29	
4.40	14.44	69.1	1.18	Sands - clean sands to silty sand	2.06	1.38	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-07

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	70.5	1.10	Sands - clean sands to silty sand	2.03	1.34	
4.50	14.76	78.7	0.79	Sands - clean sands to silty sand	1.91	1.20	
4.55	14.93	87.3	0.73	Sands - clean sands to silty sand	1.86	1.15	
4.60	15.09	95.6	0.95	Sands - clean sands to silty sand	1.91	1.19	
4.65	15.26	98.2	0.90	Sands - clean sands to silty sand	1.88	1.17	
4.70	15.42	99.8	0.96	Sands - clean sands to silty sand	1.90	1.18	
4.75	15.58	103.4	0.88	Sands - clean sands to silty sand	1.86	1.15	
4.80	15.75	105.3	0.86	Sands - clean sands to silty sand	1.85	1.14	
4.85	15.91	105.1	0.94	Sands - clean sands to silty sand	1.88	1.17	
4.90	16.08	114.9	0.96	Sands - clean sands to silty sand	1.86	1.15	
4.95	16.24	128.8	0.85	Sands - clean sands to silty sand	1.79	1.09	
5.00	16.40	135.4	0.95	Sands - clean sands to silty sand	1.81	1.11	
5.05	16.57	135.8	0.87	Sands - clean sands to silty sand	1.78	1.09	
5.10	16.73	123.5	0.93	Sands - clean sands to silty sand	1.84	1.13	
5.15	16.90	118.9	0.88	Sands - clean sands to silty sand	1.83	1.13	
5.20	17.06	124.5	0.89	Sands - clean sands to silty sand	1.83	1.12	
5.25	17.22	115.3	0.96	Sands - clean sands to silty sand	1.88	1.16	
5.30	17.39	100.9	1.19	Sands - clean sands to silty sand	1.98	1.27	
5.35	17.55	91.3	1.29	Sands - clean sands to silty sand	2.04	1.35	
5.40	17.72	84.1	1.35	Sand mixtures - silty sand to sandy silt	2.08	1.42	
5.45	17.88	78.4	1.03	Sands - clean sands to silty sand	2.03	1.33	
5.50	18.04	76.9	0.99	Sands - clean sands to silty sand	2.03	1.33	
5.55	18.21	79.6	0.99	Sands - clean sands to silty sand	2.02	1.32	
5.60	18.37	86.4	0.85	Sands - clean sands to silty sand	1.95	1.23	
5.65	18.54	93.1	0.83	Sands - clean sands to silty sand	1.92	1.20	
5.70	18.70	88.8	1.32	Sand mixtures - silty sand to sandy silt	2.07	1.40	
5.75	18.86	89.1	1.58	Sand mixtures - silty sand to sandy silt	2.13	1.50	
5.80	19.03	84.1	2.20	Sand mixtures - silty sand to sandy silt	2.25	1.79	
5.85	19.19	81.2	1.47	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.90	19.36	75.7	1.14	Sand mixtures - silty sand to sandy silt	2.09	1.43	
5.95	19.52	77.8	1.93	Sand mixtures - silty sand to sandy silt	2.24	1.76	
6.00	19.68	82.1	1.50	Sand mixtures - silty sand to sandy silt	2.15	1.54	
6.05	19.85	62.0	1.79	Sand mixtures - silty sand to sandy silt	2.30	1.92	
6.10	20.01	55.5	1.40	Sand mixtures - silty sand to sandy silt	2.26	1.82	
6.15	20.18	55.0	1.27	Sand mixtures - silty sand to sandy silt	2.24	1.76	
6.20	20.34	56.8	1.06	Sand mixtures - silty sand to sandy silt	2.18	1.61	
6.25	20.51	61.0	0.88	Sand mixtures - silty sand to sandy silt	2.11	1.46	
6.30	20.67	64.0	0.90	Sand mixtures - silty sand to sandy silt	2.10	1.44	
6.35	20.83	65.3	0.91	Sand mixtures - silty sand to sandy silt	2.10	1.44	
6.40	21.00	64.1	0.82	Sands - clean sands to silty sand	2.08	1.41	
6.45	21.16	58.7	1.13	Sand mixtures - silty sand to sandy silt	2.20	1.65	
6.50	21.33	57.3	0.72	Sand mixtures - silty sand to sandy silt	2.09	1.43	
6.55	21.49	63.6	0.90	Sand mixtures - silty sand to sandy silt	2.11	1.47	
6.60	21.65	66.7	0.89	Sand mixtures - silty sand to sandy silt	2.09	1.43	
6.65	21.82	70.1	1.18	Sand mixtures - silty sand to sandy silt	2.16	1.56	
6.70	21.98	72.9	1.09	Sand mixtures - silty sand to sandy silt	2.12	1.49	
6.75	22.15	76.6	1.13	Sand mixtures - silty sand to sandy silt	2.12	1.48	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-07

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	86.5	0.89	Sands - clean sands to silty sand	2.01	1.31	
6.85	22.47	86.5	1.11	Sand mixtures - silty sand to sandy silt	2.07	1.40	
6.90	22.64	89.6	1.61	Sand mixtures - silty sand to sandy silt	2.18	1.60	
6.95	22.80	89.1	1.65	Sand mixtures - silty sand to sandy silt	2.19	1.63	
7.00	22.97	87.2	1.65	Sand mixtures - silty sand to sandy silt	2.20	1.65	
7.05	23.13	83.6	1.43	Sand mixtures - silty sand to sandy silt	2.17	1.58	
7.10	23.29	88.4	1.22	Sand mixtures - silty sand to sandy silt	2.11	1.46	
7.15	23.46	95.2	1.12	Sands - clean sands to silty sand	2.06	1.37	
7.20	23.62	98.0	1.15	Sands - clean sands to silty sand	2.06	1.37	
7.25	23.79	94.4	1.22	Sand mixtures - silty sand to sandy silt	2.09	1.43	
7.30	23.95	91.3	1.25	Sand mixtures - silty sand to sandy silt	2.11	1.46	
7.35	24.11	92.0	1.15	Sand mixtures - silty sand to sandy silt	2.08	1.42	
7.40	24.28	94.3	1.25	Sand mixtures - silty sand to sandy silt	2.10	1.45	
7.45	24.44	98.7	1.12	Sands - clean sands to silty sand	2.05	1.37	
7.50	24.61	98.9	0.88	Sands - clean sands to silty sand	1.99	1.28	
7.55	24.77	100.9	0.85	Sands - clean sands to silty sand	1.97	1.26	
7.60	24.93	87.5	1.00	Sands - clean sands to silty sand	2.07	1.39	
7.65	25.10	79.9	0.97	Sand mixtures - silty sand to sandy silt	2.09	1.44	
7.70	25.26	85.7	0.99	Sand mixtures - silty sand to sandy silt	2.08	1.41	
7.75	25.43	100.4	0.94	Sands - clean sands to silty sand	2.01	1.30	
7.80	25.59	104.9	1.11	Sands - clean sands to silty sand	2.04	1.35	
7.85	25.75	108.2	1.61	Sand mixtures - silty sand to sandy silt	2.15	1.54	
7.90	25.92	122.2	1.20	Sands - clean sands to silty sand	2.02	1.32	
7.95	26.08	110.0	1.25	Sand mixtures - silty sand to sandy silt	2.07	1.39	
8.00	26.25	108.3	1.08	Sands - clean sands to silty sand	2.03	1.34	
8.05	26.41	106.9	1.02	Sands - clean sands to silty sand	2.02	1.32	
8.10	26.57	92.9	0.99	Sands - clean sands to silty sand	2.06	1.38	
8.15	26.74	72.8	1.02	Sand mixtures - silty sand to sandy silt	2.16	1.57	
8.20	26.90	54.1	1.24	Sand mixtures - silty sand to sandy silt	2.33	2.03	
8.25	27.07	43.4	1.40	Sand mixtures - silty sand to sandy silt	2.45	2.50	
8.30	27.23	43.7	1.33	Sand mixtures - silty sand to sandy silt	2.43	2.43	
8.35	27.39	51.2	1.08	Sand mixtures - silty sand to sandy silt	2.32	1.99	
8.40	27.56	60.0	0.95	Sand mixtures - silty sand to sandy silt	2.22	1.71	
8.45	27.72	66.9	0.93	Sand mixtures - silty sand to sandy silt	2.18	1.61	
8.50	27.89	71.5	0.73	Sand mixtures - silty sand to sandy silt	2.09	1.43	
8.55	28.05	75.6	0.86	Sand mixtures - silty sand to sandy silt	2.12	1.48	
8.60	28.21	79.6	1.04	Sand mixtures - silty sand to sandy silt	2.15	1.55	
8.65	28.38	86.6	1.07	Sand mixtures - silty sand to sandy silt	2.13	1.50	
8.70	28.54	99.4	1.08	Sand mixtures - silty sand to sandy silt	2.08	1.42	
8.75	28.71	112.0	1.06	Sands - clean sands to silty sand	2.04	1.35	
8.80	28.87	120.0	1.13	Sands - clean sands to silty sand	2.04	1.34	
8.85	29.04	140.7	1.15	Sands - clean sands to silty sand	1.99	1.28	
8.90	29.20	170.5	0.93	Sands - clean sands to silty sand	1.86	1.14	
8.95	29.36	189.1	1.00	Sands - clean sands to silty sand	1.85	1.14	
9.00	29.53	179.4	1.10	Sands - clean sands to silty sand	1.90	1.18	
9.05	29.69	170.2	1.20	Sands - clean sands to silty sand	1.94	1.22	
9.10	29.86	162.5	1.11	Sands - clean sands to silty sand	1.94	1.22	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-07

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	154.6	0.94	Sands - clean sands to silty sand	1.90	1.18	
9.20	30.18	142.5	0.90	Sands - clean sands to silty sand	1.92	1.20	
9.25	30.35	138.1	0.86	Sands - clean sands to silty sand	1.92	1.20	
9.30	30.51	137.8	0.94	Sands - clean sands to silty sand	1.95	1.23	
9.35	30.68	136.3	0.87	Sands - clean sands to silty sand	1.93	1.21	
9.40	30.84	129.2	0.82	Sands - clean sands to silty sand	1.93	1.21	
9.45	31.00	123.1	0.78	Sands - clean sands to silty sand	1.94	1.22	
9.50	31.17	111.1	0.84	Sands - clean sands to silty sand	2.00	1.29	
9.55	31.33	98.3	0.75	Sands - clean sands to silty sand	2.01	1.31	
9.60	31.50	84.9	0.83	Sand mixtures - silty sand to sandy silt	2.10	1.44	
9.65	31.66	72.3	0.86	Sand mixtures - silty sand to sandy silt	2.17	1.59	
9.70	31.82	67.0	1.01	Sand mixtures - silty sand to sandy silt	2.25	1.78	
9.75	31.99	67.8	0.90	Sand mixtures - silty sand to sandy silt	2.21	1.69	
9.80	32.15	62.0	0.83	Sand mixtures - silty sand to sandy silt	2.23	1.72	
9.85	32.32	54.1	0.84	Sand mixtures - silty sand to sandy silt	2.29	1.89	
9.90	32.48	49.5	0.91	Sand mixtures - silty sand to sandy silt	2.35	2.09	
9.95	32.64	54.3	1.06	Sand mixtures - silty sand to sandy silt	2.35	2.11	
10.00	32.81	62.3	1.03	Sand mixtures - silty sand to sandy silt	2.29	1.91	
10.05	32.97	75.3	1.00	Sand mixtures - silty sand to sandy silt	2.21	1.69	
10.10	33.14	90.6	0.91	Sand mixtures - silty sand to sandy silt	2.12	1.48	
10.15	33.30	100.1	0.89	Sands - clean sands to silty sand	2.07	1.40	
10.20	33.46	93.0	0.98	Sand mixtures - silty sand to sandy silt	2.13	1.50	
10.25	33.63	83.4	1.50	Sand mixtures - silty sand to sandy silt	2.30	1.95	
10.30	33.79	78.8	1.47	Sand mixtures - silty sand to sandy silt	2.32	2.00	
10.35	33.96	94.6	1.20	Sand mixtures - silty sand to sandy silt	2.19	1.63	
10.40	34.12	117.5	0.83	Sands - clean sands to silty sand	2.00	1.29	
10.45	34.28	111.6	0.78	Sands - clean sands to silty sand	2.00	1.30	
10.50	34.45	98.3	0.66	Sands - clean sands to silty sand	2.01	1.30	
10.55	34.61	93.0	0.84	Sand mixtures - silty sand to sandy silt	2.10	1.44	
10.60	34.78	94.8	0.86	Sand mixtures - silty sand to sandy silt	2.10	1.45	
10.65	34.94	108.0	0.93	Sand mixtures - silty sand to sandy silt	2.07	1.40	
10.70	35.10	107.0	0.80	Sands - clean sands to silty sand	2.04	1.34	
10.75	35.27	84.4	0.93	Sand mixtures - silty sand to sandy silt	2.17	1.59	
10.80	35.43	59.7	1.03	Sand mixtures - silty sand to sandy silt	2.34	2.06	
10.85	35.60	45.5	1.28	Sand mixtures - silty sand to sandy silt	2.51	2.96	
10.90	35.76	43.5	1.12	Sand mixtures - silty sand to sandy silt	2.49	2.71	
10.95	35.92	56.8	0.82	Sand mixtures - silty sand to sandy silt	2.30	1.94	
11.00	36.09	61.8	1.03	Sand mixtures - silty sand to sandy silt	2.33	2.04	
11.05	36.25	61.9	1.07	Sand mixtures - silty sand to sandy silt	2.34	2.09	
11.10	36.42	62.8	0.96	Sand mixtures - silty sand to sandy silt	2.31	1.96	
11.15	36.58	72.4	0.83	Sand mixtures - silty sand to sandy silt	2.21	1.69	
11.20	36.74	93.0	0.64	Sands - clean sands to silty sand	2.05	1.36	
11.25	36.91	114.9	0.91	Sands - clean sands to silty sand	2.06	1.38	
11.30	37.07	123.3	1.03	Sand mixtures - silty sand to sandy silt	2.07	1.40	
11.35	37.24	135.0	0.65	Sands - clean sands to silty sand	1.91	1.19	
11.40	37.40	162.8	0.59	Sands - clean sands to silty sand	1.81	1.10	
11.45	37.57	161.0	0.92	Sands - clean sands to silty sand	1.95	1.23	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-07

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	121.2	1.66	Sand mixtures - silty sand to sandy silt	2.24	1.76	
11.55	37.89	95.9	1.78	Sand mixtures - silty sand to sandy silt	2.35	2.10	
11.60	38.06	66.7	1.61	Sand mixtures - silty sand to sandy silt	2.46	2.54	
11.65	38.22	62.8	1.17	Sand mixtures - silty sand to sandy silt	2.38	2.23	
11.70	38.39	59.8	1.03	Sand mixtures - silty sand to sandy silt	2.37	2.18	
11.75	38.55	57.1	0.93	Sand mixtures - silty sand to sandy silt	2.36	2.15	
11.80	38.71	61.2	1.09	Sand mixtures - silty sand to sandy silt	2.38	2.22	
11.85	38.88	82.6	0.91	Sand mixtures - silty sand to sandy silt	2.21	1.68	
11.90	39.04	92.4	0.87	Sand mixtures - silty sand to sandy silt	2.15	1.55	
11.95	39.21	83.2	0.71	Sand mixtures - silty sand to sandy silt	2.14	1.53	
12.00	39.37	75.5	0.88	Sand mixtures - silty sand to sandy silt	2.24	1.76	
12.05	39.53	76.3	0.90	Sand mixtures - silty sand to sandy silt	2.25	1.77	
12.10	39.70	83.6	0.86	Sand mixtures - silty sand to sandy silt	2.20	1.65	
12.15	39.86	74.1	0.97	Sand mixtures - silty sand to sandy silt	2.28	1.88	
12.20	40.03	69.2	1.01	Sand mixtures - silty sand to sandy silt	2.32	2.01	
12.25	40.19	66.5	1.41	Sand mixtures - silty sand to sandy silt	2.44	2.46	
12.30	40.35	71.4	1.20	Sand mixtures - silty sand to sandy silt	2.36	2.16	
12.35	40.52	66.0	1.29	Sand mixtures - silty sand to sandy silt	2.42	2.38	
12.40	40.68	79.6	1.12	Sand mixtures - silty sand to sandy silt	2.30	1.95	
12.45	40.85	95.1	1.16	Sand mixtures - silty sand to sandy silt	2.24	1.77	
12.50	41.01	102.7	1.25	Sand mixtures - silty sand to sandy silt	2.24	1.76	
12.55	41.17	115.9	1.30	Sand mixtures - silty sand to sandy silt	2.21	1.68	
12.60	41.34	110.0	1.20	Sand mixtures - silty sand to sandy silt	2.20	1.67	
12.65	41.50	100.2	1.22	Sand mixtures - silty sand to sandy silt	2.25	1.78	
12.70	41.67	86.6	1.28	Sand mixtures - silty sand to sandy silt	2.32	2.01	
12.75	41.83	70.2	1.42	Sand mixtures - silty sand to sandy silt	2.44	2.45	
12.80	41.99	65.1	1.32	Sand mixtures - silty sand to sandy silt	2.45	2.50	
12.85	42.16	60.4	1.10	Sand mixtures - silty sand to sandy silt	2.42	2.39	
12.90	42.32	61.1	0.99	Sand mixtures - silty sand to sandy silt	2.39	2.27	
12.95	42.49	61.7	1.01	Sand mixtures - silty sand to sandy silt	2.39	2.27	
13.00	42.65	58.1	1.14	Sand mixtures - silty sand to sandy silt	2.46	2.54	
13.05	42.81	59.0	1.32	Sand mixtures - silty sand to sandy silt	2.49	2.72	
13.10	42.98	63.8	1.30	Sand mixtures - silty sand to sandy silt	2.46	2.55	
13.15	43.14	72.3	1.39	Sand mixtures - silty sand to sandy silt	2.43	2.43	
13.20	43.31	87.1	1.36	Sand mixtures - silty sand to sandy silt	2.35	2.12	
13.25	43.47	108.6	1.21	Sand mixtures - silty sand to sandy silt	2.23	1.74	
13.30	43.63	100.2	1.44	Sand mixtures - silty sand to sandy silt	2.32	2.00	
13.35	43.80	97.3	1.41	Sand mixtures - silty sand to sandy silt	2.32	2.02	
13.40	43.96	82.9	1.57	Sand mixtures - silty sand to sandy silt	2.42	2.40	
13.45	44.13	80.9	1.52	Sand mixtures - silty sand to sandy silt	2.42	2.40	
13.50	44.29	87.3	1.49	Sand mixtures - silty sand to sandy silt	2.39	2.26	
13.55	44.45	108.6	1.08	Sand mixtures - silty sand to sandy silt	2.21	1.67	
13.60	44.62	118.0	1.07	Sand mixtures - silty sand to sandy silt	2.17	1.59	
13.65	44.78	104.4	1.31	Sand mixtures - silty sand to sandy silt	2.28	1.89	
13.70	44.95	92.1	1.54	Sand mixtures - silty sand to sandy silt	2.39	2.24	
13.75	45.11	88.1	1.73	Sand mixtures - silty sand to sandy silt	2.44	2.48	
13.80	45.28	90.5	1.69	Sand mixtures - silty sand to sandy silt	2.43	2.41	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-07

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	88.2	1.85	Sand mixtures - silty sand to sandy silt	2.47	2.60	
13.90	45.60	84.4	1.93	Sand mixtures - silty sand to sandy silt	2.50	2.81	
13.95	45.77	88.5	1.77	Sand mixtures - silty sand to sandy silt	2.45	2.53	
14.00	45.93	100.4	1.66	Sand mixtures - silty sand to sandy silt	2.39	2.25	
14.05	46.10	123.9	1.46	Sand mixtures - silty sand to sandy silt	2.27	1.83	
14.10	46.26	136.0	1.42	Sand mixtures - silty sand to sandy silt	2.22	1.71	
14.15	46.42	122.2	1.41	Sand mixtures - silty sand to sandy silt	2.26	1.82	
14.20	46.59	105.4	1.56	Sand mixtures - silty sand to sandy silt	2.35	2.12	
14.25	46.75	104.1	1.64	Sand mixtures - silty sand to sandy silt	2.38	2.20	
14.30	46.92	102.9	2.25	Silt mixtures - clayey silt to silty clay	2.49	2.70	
14.35	47.08	95.0	1.52	Sand mixtures - silty sand to sandy silt	2.39	2.26	
14.40	47.24	82.9	1.35	Sand mixtures - silty sand to sandy silt	2.41	2.33	
14.45	47.41	71.9	1.01	Sand mixtures - silty sand to sandy silt	2.38	2.23	
14.50	47.57	63.7	0.79	Sand mixtures - silty sand to sandy silt	2.36	2.16	
14.55	47.74	59.5	0.90	Sand mixtures - silty sand to sandy silt	2.43	2.43	
14.60	47.90	56.4	1.03	Sand mixtures - silty sand to sandy silt	2.49	2.72	
14.65	48.06	52.9	1.45	Silt mixtures - clayey silt to silty clay	2.62	6.28	7.05
14.70	48.23	52.6	1.58	Silt mixtures - clayey silt to silty clay	2.65	7.64	7.02
14.75	48.39	57.7	1.69	Silt mixtures - clayey silt to silty clay	2.64	6.85	7.69
14.80	48.56	55.2	1.74	Silt mixtures - clayey silt to silty clay	2.67	8.20	7.36
14.85	48.72	54.4	1.41	Silt mixtures - clayey silt to silty clay	2.61	5.77	7.25
14.90	48.88	52.0	1.14	Sand mixtures - silty sand to sandy silt	2.57	4.36	
14.95	49.05	47.6	1.05	Sand mixtures - silty sand to sandy silt	2.58	4.90	
15.00	49.21	43.0	1.08	Silt mixtures - clayey silt to silty clay	2.64	6.92	5.74
15.05	49.38	42.6	1.09	Silt mixtures - clayey silt to silty clay	2.65	7.31	5.68
15.10	49.54	43.2	1.13	Silt mixtures - clayey silt to silty clay	2.65	7.64	5.77
15.15	49.70	43.7	1.18	Silt mixtures - clayey silt to silty clay	2.66	8.07	5.83
15.20	49.87	43.9	1.26	Silt mixtures - clayey silt to silty clay	2.68	8.95	5.85
15.25	50.03	45.2	1.31	Silt mixtures - clayey silt to silty clay	2.68	8.87	6.03
15.30	50.20	47.05	1.18	Silt mixtures - clayey silt to silty clay	2.64	6.82	6.27
15.35	50.36	47.65	1.18	Silt mixtures - clayey silt to silty clay	2.63	6.62	6.35
15.40	50.52	50.12	1.18	Silt mixtures - clayey silt to silty clay	2.61	5.78	6.68

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 11:39
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-08

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	38.7	0.14	Sands - clean sands to silty sand	1.65	1.00	
0.10	0.33	43.4	0.05	Sands - clean sands to silty sand	1.56	1.00	
0.15	0.49	40.8	0.03	Sands - clean sands to silty sand	1.60	1.00	
0.20	0.66	37.7	0.03	Sands - clean sands to silty sand	1.65	1.00	
0.25	0.82	36.0	0.03	Sands - clean sands to silty sand	1.67	1.00	
0.30	0.98	50.0	0.05	Sands - clean sands to silty sand	1.50	1.00	
0.35	1.15	64.1	0.18	Sands - clean sands to silty sand	1.46	1.00	
0.40	1.31	60.7	0.25	Sands - clean sands to silty sand	1.54	1.00	
0.45	1.48	61.0	0.10	Sands - clean sands to silty sand	1.43	1.00	
0.50	1.64	68.7	0.03	Gravelly sand to dense sand	1.39	1.00	
0.55	1.80	61.7	0.07	Sands - clean sands to silty sand	1.40	1.00	
0.60	1.97	49.2	0.02	Sands - clean sands to silty sand	1.57	1.00	
0.65	2.13	43.6	0.02	Sands - clean sands to silty sand	1.61	1.00	
0.70	2.30	39.7	0.03	Sands - clean sands to silty sand	1.64	1.00	
0.75	2.46	37.1	0.05	Sands - clean sands to silty sand	1.63	1.00	
0.80	2.62	37.2	0.05	Sands - clean sands to silty sand	1.63	1.00	
0.85	2.79	40.7	0.01	Sands - clean sands to silty sand	1.89	1.00	
0.90	2.95	39.6	0.10	Sands - clean sands to silty sand	1.61	1.00	
0.95	3.12	39.6	0.13	Sands - clean sands to silty sand	1.63	1.00	
1.00	3.28	27.9	0.12	Sands - clean sands to silty sand	1.77	1.00	
1.05	3.44	25.4	0.06	Sands - clean sands to silty sand	1.79	1.00	
1.10	3.61	27.6	0.00	Sands - clean sands to silty sand	2.07	1.00	
1.15	3.77	28.3	0.03	Sands - clean sands to silty sand	1.77	1.00	
1.20	3.94	25.1	0.04	Sands - clean sands to silty sand	1.80	1.00	
1.25	4.10	23.6	0.06	Sands - clean sands to silty sand	1.82	1.00	
1.30	4.27	21.6	0.03	Sands - clean sands to silty sand	1.90	1.00	
1.35	4.43	21.3	0.01	Sands - clean sands to silty sand	1.98	1.00	
1.40	4.59	21.4	0.05	Sands - clean sands to silty sand	1.87	1.00	
1.45	4.76	20.5	0.02	Sands - clean sands to silty sand	1.94	1.00	
1.50	4.92	19.8	0.05	Sands - clean sands to silty sand	1.90	1.00	
1.55	5.09	20.3	0.05	Sands - clean sands to silty sand	1.89	1.00	
1.60	5.25	21.6	0.05	Sands - clean sands to silty sand	1.87	1.00	
1.65	5.41	23.2	0.04	Sands - clean sands to silty sand	1.84	1.00	
1.70	5.58	24.4	0.01	Sands - clean sands to silty sand	2.00	1.00	
1.75	5.74	24.8	0.01	Sands - clean sands to silty sand	2.02	1.00	
1.80	5.91	24.1	0.04	Sands - clean sands to silty sand	1.82	1.00	
1.85	6.07	23.4	0.03	Sands - clean sands to silty sand	1.84	1.00	
1.90	6.23	25.8	0.09	Sands - clean sands to silty sand	1.80	1.00	
1.95	6.40	24.9	0.05	Sands - clean sands to silty sand	1.81	1.00	
2.00	6.56	23.4	0.08	Sands - clean sands to silty sand	1.84	1.00	
2.05	6.73	21.9	0.18	Sands - clean sands to silty sand	1.92	1.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-08

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	23.1	0.17	Sands - clean sands to silty sand	1.89	1.00	
2.15	7.05	27.4	0.16	Sands - clean sands to silty sand	1.83	1.00	
2.20	7.22	34.5	0.14	Sands - clean sands to silty sand	1.74	1.00	
2.25	7.38	40.7	0.12	Sands - clean sands to silty sand	1.68	1.00	
2.30	7.55	42.3	0.11	Sands - clean sands to silty sand	1.66	1.00	
2.35	7.71	44.2	0.25	Sands - clean sands to silty sand	1.74	1.00	
2.40	7.87	46.7	0.72	Sands - clean sands to silty sand	1.93	1.21	
2.45	8.04	60.6	0.84	Sands - clean sands to silty sand	1.89	1.17	
2.50	8.20	58.5	1.85	Sand mixtures - silty sand to sandy silt	2.12	1.48	
2.55	8.37	66.6	1.39	Sands - clean sands to silty sand	2.00	1.30	
2.60	8.53	55.9	1.35	Sand mixtures - silty sand to sandy silt	2.05	1.36	
2.65	8.69	50.0	1.22	Sands - clean sands to silty sand	2.06	1.37	
2.70	8.86	48.5	1.08	Sands - clean sands to silty sand	2.04	1.34	
2.75	9.02	50.6	0.91	Sands - clean sands to silty sand	1.99	1.27	
2.80	9.19	54.3	1.02	Sands - clean sands to silty sand	2.00	1.29	
2.85	9.35	54.9	0.99	Sands - clean sands to silty sand	1.99	1.28	
2.90	9.51	49.5	1.35	Sand mixtures - silty sand to sandy silt	2.11	1.46	
2.95	9.68	43.7	1.34	Sand mixtures - silty sand to sandy silt	2.15	1.53	
3.00	9.84	39.4	1.20	Sand mixtures - silty sand to sandy silt	2.15	1.55	
3.05	10.01	47.1	0.85	Sands - clean sands to silty sand	2.01	1.31	
3.10	10.17	53.2	0.88	Sands - clean sands to silty sand	1.99	1.28	
3.15	10.33	52.4	0.94	Sands - clean sands to silty sand	2.01	1.31	
3.20	10.50	50.5	1.15	Sand mixtures - silty sand to sandy silt	2.08	1.41	
3.25	10.66	44.6	1.30	Sand mixtures - silty sand to sandy silt	2.15	1.55	
3.30	10.83	38.3	1.06	Sand mixtures - silty sand to sandy silt	2.15	1.54	
3.35	10.99	47.8	1.32	Sand mixtures - silty sand to sandy silt	2.14	1.53	
3.40	11.15	58.4	0.78	Sands - clean sands to silty sand	1.94	1.23	
3.45	11.32	63.9	1.22	Sands - clean sands to silty sand	2.04	1.35	
3.50	11.48	78.7	1.38	Sands - clean sands to silty sand	2.01	1.31	
3.55	11.65	73.9	1.57	Sand mixtures - silty sand to sandy silt	2.07	1.40	
3.60	11.81	72.8	1.48	Sand mixtures - silty sand to sandy silt	2.06	1.38	
3.65	11.97	88.1	1.57	Sands - clean sands to silty sand	2.03	1.33	
3.70	12.14	90.2	1.62	Sand mixtures - silty sand to sandy silt	2.03	1.34	
3.75	12.30	83.6	1.82	Sand mixtures - silty sand to sandy silt	2.09	1.44	
3.80	12.47	78.7	1.97	Sand mixtures - silty sand to sandy silt	2.14	1.52	
3.85	12.63	84.2	1.74	Sand mixtures - silty sand to sandy silt	2.08	1.42	
3.90	12.80	100.3	1.53	Sands - clean sands to silty sand	2.00	1.29	
3.95	12.96	109.2	1.43	Sands - clean sands to silty sand	1.95	1.24	
4.00	13.12	117.3	1.32	Sands - clean sands to silty sand	1.91	1.19	
4.05	13.29	122.6	1.38	Sands - clean sands to silty sand	1.91	1.19	
4.10	13.45	118.5	1.49	Sands - clean sands to silty sand	1.95	1.23	
4.15	13.62	115.9	1.44	Sands - clean sands to silty sand	1.95	1.23	
4.20	13.78	111.2	1.22	Sands - clean sands to silty sand	1.91	1.19	
4.25	13.94	101.5	1.13	Sands - clean sands to silty sand	1.92	1.20	
4.30	14.11	96.9	0.99	Sands - clean sands to silty sand	1.90	1.18	
4.35	14.27	97.1	0.98	Sands - clean sands to silty sand	1.90	1.18	
4.40	14.44	97.7	1.00	Sands - clean sands to silty sand	1.90	1.18	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-08

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	99.9	0.96	Sands - clean sands to silty sand	1.89	1.17	
4.50	14.76	100.4	1.11	Sands - clean sands to silty sand	1.93	1.21	
4.55	14.93	92.5	1.41	Sands - clean sands to silty sand	2.03	1.33	
4.60	15.09	81.3	1.61	Sand mixtures - silty sand to sandy silt	2.11	1.46	
4.65	15.26	77.7	1.52	Sand mixtures - silty sand to sandy silt	2.11	1.46	
4.70	15.42	75.3	1.26	Sand mixtures - silty sand to sandy silt	2.07	1.39	
4.75	15.58	79.5	1.13	Sands - clean sands to silty sand	2.02	1.32	
4.80	15.75	81.3	1.10	Sands - clean sands to silty sand	2.01	1.30	
4.85	15.91	81.6	1.03	Sands - clean sands to silty sand	1.99	1.28	
4.90	16.08	81.7	1.03	Sands - clean sands to silty sand	1.99	1.28	
4.95	16.24	79.8	1.04	Sands - clean sands to silty sand	2.00	1.30	
5.00	16.40	78.4	1.34	Sand mixtures - silty sand to sandy silt	2.08	1.42	
5.05	16.57	76.2	1.34	Sand mixtures - silty sand to sandy silt	2.10	1.44	
5.10	16.73	73.1	1.22	Sand mixtures - silty sand to sandy silt	2.08	1.42	
5.15	16.90	70.0	1.22	Sand mixtures - silty sand to sandy silt	2.10	1.45	
5.20	17.06	66.9	1.08	Sand mixtures - silty sand to sandy silt	2.08	1.42	
5.25	17.22	65.6	1.01	Sand mixtures - silty sand to sandy silt	2.07	1.40	
5.30	17.39	70.4	1.00	Sands - clean sands to silty sand	2.05	1.36	
5.35	17.55	80.0	1.00	Sands - clean sands to silty sand	2.01	1.31	
5.40	17.72	88.6	0.93	Sands - clean sands to silty sand	1.96	1.24	
5.45	17.88	97.5	0.99	Sands - clean sands to silty sand	1.94	1.23	
5.50	18.04	98.2	1.04	Sands - clean sands to silty sand	1.96	1.24	
5.55	18.21	93.2	1.19	Sands - clean sands to silty sand	2.02	1.32	
5.60	18.37	91.2	1.45	Sand mixtures - silty sand to sandy silt	2.09	1.42	
5.65	18.54	92.0	1.29	Sands - clean sands to silty sand	2.05	1.36	
5.70	18.70	87.2	1.12	Sands - clean sands to silty sand	2.03	1.33	
5.75	18.86	83.8	1.13	Sands - clean sands to silty sand	2.05	1.36	
5.80	19.03	82.1	1.16	Sands - clean sands to silty sand	2.06	1.38	
5.85	19.19	80.0	1.29	Sand mixtures - silty sand to sandy silt	2.10	1.45	
5.90	19.36	80.8	1.23	Sand mixtures - silty sand to sandy silt	2.09	1.43	
5.95	19.52	81.7	1.13	Sands - clean sands to silty sand	2.06	1.38	
6.00	19.68	85.7	1.17	Sands - clean sands to silty sand	2.06	1.38	
6.05	19.85	88.6	1.09	Sands - clean sands to silty sand	2.03	1.33	
6.10	20.01	93.0	1.00	Sands - clean sands to silty sand	1.99	1.28	
6.15	20.18	94.4	1.08	Sands - clean sands to silty sand	2.01	1.30	
6.20	20.34	94.3	1.00	Sands - clean sands to silty sand	1.99	1.28	
6.25	20.51	94.5	1.03	Sands - clean sands to silty sand	2.00	1.29	
6.30	20.67	94.7	1.06	Sands - clean sands to silty sand	2.01	1.30	
6.35	20.83	95.9	0.97	Sands - clean sands to silty sand	1.98	1.27	
6.40	21.00	94.3	1.02	Sands - clean sands to silty sand	2.00	1.30	
6.45	21.16	89.1	0.92	Sands - clean sands to silty sand	2.00	1.29	
6.50	21.33	85.0	1.15	Sand mixtures - silty sand to sandy silt	2.08	1.41	
6.55	21.49	88.2	1.10	Sands - clean sands to silty sand	2.05	1.37	
6.60	21.65	86.4	1.05	Sands - clean sands to silty sand	2.05	1.36	
6.65	21.82	86.1	1.03	Sands - clean sands to silty sand	2.05	1.36	
6.70	21.98	81.6	1.02	Sands - clean sands to silty sand	2.06	1.39	
6.75	22.15	73.9	1.01	Sand mixtures - silty sand to sandy silt	2.10	1.44	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-08

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	71.2	0.95	Sand mixtures - silty sand to sandy silt	2.10	1.44	
6.85	22.47	70.2	0.91	Sand mixtures - silty sand to sandy silt	2.09	1.43	
6.90	22.64	75.4	0.79	Sands - clean sands to silty sand	2.03	1.34	
6.95	22.80	77.2	0.81	Sands - clean sands to silty sand	2.03	1.34	
7.00	22.97	77.6	0.84	Sands - clean sands to silty sand	2.04	1.35	
7.05	23.13	86.9	0.69	Sands - clean sands to silty sand	1.95	1.23	
7.10	23.29	84.6	0.68	Sands - clean sands to silty sand	1.96	1.24	
7.15	23.46	80.6	0.92	Sands - clean sands to silty sand	2.06	1.38	
7.20	23.62	71.9	1.12	Sand mixtures - silty sand to sandy silt	2.16	1.56	
7.25	23.79	57.5	1.36	Sand mixtures - silty sand to sandy silt	2.29	1.91	
7.30	23.95	40.1	1.22	Sand mixtures - silty sand to sandy silt	2.40	2.28	
7.35	24.11	38.2	0.94	Sand mixtures - silty sand to sandy silt	2.35	2.09	
7.40	24.28	45.0	1.14	Sand mixtures - silty sand to sandy silt	2.34	2.07	
7.45	24.44	58.7	0.62	Sand mixtures - silty sand to sandy silt	2.09	1.42	
7.50	24.61	77.2	0.63	Sands - clean sands to silty sand	1.99	1.27	
7.55	24.77	81.0	0.90	Sands - clean sands to silty sand	2.06	1.38	
7.60	24.93	76.1	1.09	Sand mixtures - silty sand to sandy silt	2.14	1.53	
7.65	25.10	67.7	1.16	Sand mixtures - silty sand to sandy silt	2.21	1.67	
7.70	25.26	59.0	1.30	Sand mixtures - silty sand to sandy silt	2.29	1.91	
7.75	25.43	46.3	1.27	Sand mixtures - silty sand to sandy silt	2.37	2.19	
7.80	25.59	51.8	0.86	Sand mixtures - silty sand to sandy silt	2.23	1.73	
7.85	25.75	63.2	0.71	Sand mixtures - silty sand to sandy silt	2.11	1.46	
7.90	25.92	66.4	0.79	Sand mixtures - silty sand to sandy silt	2.12	1.48	
7.95	26.08	60.7	1.00	Sand mixtures - silty sand to sandy silt	2.22	1.69	
8.00	26.25	58.2	0.89	Sand mixtures - silty sand to sandy silt	2.20	1.66	
8.05	26.41	62.7	0.76	Sand mixtures - silty sand to sandy silt	2.13	1.51	
8.10	26.57	69.1	0.73	Sand mixtures - silty sand to sandy silt	2.09	1.43	
8.15	26.74	64.6	0.80	Sand mixtures - silty sand to sandy silt	2.14	1.52	
8.20	26.90	60.3	0.91	Sand mixtures - silty sand to sandy silt	2.20	1.66	
8.25	27.07	62.3	0.82	Sand mixtures - silty sand to sandy silt	2.16	1.57	
8.30	27.23	66.7	0.75	Sand mixtures - silty sand to sandy silt	2.12	1.48	
8.35	27.39	60.6	1.08	Sand mixtures - silty sand to sandy silt	2.25	1.79	
8.40	27.56	60.5	1.39	Sand mixtures - silty sand to sandy silt	2.33	2.03	
8.45	27.72	55.4	1.32	Sand mixtures - silty sand to sandy silt	2.35	2.09	
8.50	27.89	56.9	0.80	Sand mixtures - silty sand to sandy silt	2.20	1.66	
8.55	28.05	61.9	0.48	Sands - clean sands to silty sand	2.05	1.00	
8.60	28.21	65.8	0.55	Sands - clean sands to silty sand	2.06	1.37	
8.65	28.38	55.9	0.97	Sand mixtures - silty sand to sandy silt	2.27	1.83	
8.70	28.54	49.3	0.58	Sand mixtures - silty sand to sandy silt	2.19	1.62	
8.75	28.71	67.5	0.42	Sands - clean sands to silty sand	1.99	1.00	
8.80	28.87	61.7	1.33	Sand mixtures - silty sand to sandy silt	2.32	2.02	
8.85	29.04	36.1	1.57	Silt mixtures - clayey silt to silty clay	2.57	4.60	
8.90	29.20	22.6	1.38	Silt mixtures - clayey silt to silty clay	2.72		3.01
8.95	29.36	41.8	0.64	Sand mixtures - silty sand to sandy silt	2.29	1.89	
9.00	29.53	75.5	0.51	Sands - clean sands to silty sand	2.00	1.29	
9.05	29.69	95.6	0.49	Sands - clean sands to silty sand	1.89	1.00	
9.10	29.86	106.9	0.60	Sands - clean sands to silty sand	1.90	1.19	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-08

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	102.7	0.72	Sands - clean sands to silty sand	1.97	1.26	
9.20	30.18	106.4	0.95	Sands - clean sands to silty sand	2.04	1.35	
9.25	30.35	110.8	1.27	Sand mixtures - silty sand to sandy silt	2.11	1.47	
9.30	30.51	115.8	1.64	Sand mixtures - silty sand to sandy silt	2.18	1.61	
9.35	30.68	98.5	1.48	Sand mixtures - silty sand to sandy silt	2.21	1.68	
9.40	30.84	91.3	0.90	Sand mixtures - silty sand to sandy silt	2.09	1.42	
9.45	31.00	80.8	0.72	Sands - clean sands to silty sand	2.07	1.40	
9.50	31.17	80.4	0.53	Sands - clean sands to silty sand	2.00	1.29	
9.55	31.33	85.9	0.51	Sands - clean sands to silty sand	1.96	1.25	
9.60	31.50	99.0	0.49	Sands - clean sands to silty sand	1.90	1.18	
9.65	31.66	102.0	0.54	Sands - clean sands to silty sand	1.92	1.20	
9.70	31.82	100.6	0.71	Sands - clean sands to silty sand	1.99	1.28	
9.75	31.99	105.2	0.79	Sands - clean sands to silty sand	2.01	1.30	
9.80	32.15	108.7	0.83	Sands - clean sands to silty sand	2.01	1.31	
9.85	32.32	114.5	0.72	Sands - clean sands to silty sand	1.95	1.24	
9.90	32.48	104.0	0.66	Sands - clean sands to silty sand	1.97	1.25	
9.95	32.64	86.4	0.85	Sand mixtures - silty sand to sandy silt	2.11	1.47	
10.00	32.81	70.8	0.90	Sand mixtures - silty sand to sandy silt	2.21	1.67	
10.05	32.97	75.4	0.39	Sands - clean sands to silty sand	1.98	1.00	
10.10	33.14	94.7	0.37	Sands - clean sands to silty sand	1.87	1.00	
10.15	33.30	85.7	0.55	Sands - clean sands to silty sand	2.01	1.30	
10.20	33.46	84.0	0.72	Sand mixtures - silty sand to sandy silt	2.08	1.42	
10.25	33.63	86.0	0.88	Sand mixtures - silty sand to sandy silt	2.13	1.51	
10.30	33.79	88.3	0.96	Sand mixtures - silty sand to sandy silt	2.15	1.54	
10.35	33.96	102.3	0.96	Sand mixtures - silty sand to sandy silt	2.09	1.43	
10.40	34.12	134.3	0.74	Sands - clean sands to silty sand	1.92	1.20	
10.45	34.28	148.6	0.71	Sands - clean sands to silty sand	1.87	1.15	
10.50	34.45	152.1	0.70	Sands - clean sands to silty sand	1.86	1.14	
10.55	34.61	147.9	0.67	Sands - clean sands to silty sand	1.86	1.14	
10.60	34.78	135.9	0.55	Sands - clean sands to silty sand	1.83	1.13	
10.65	34.94	129.4	0.71	Sands - clean sands to silty sand	1.93	1.21	
10.70	35.10	121.1	0.81	Sands - clean sands to silty sand	1.99	1.28	
10.75	35.27	109.2	1.24	Sand mixtures - silty sand to sandy silt	2.16	1.56	
10.80	35.43	97.5	1.21	Sand mixtures - silty sand to sandy silt	2.20	1.65	
10.85	35.60	72.0	0.93	Sand mixtures - silty sand to sandy silt	2.24	1.75	
10.90	35.76	121.0	0.74	Sands - clean sands to silty sand	1.97	1.26	
10.95	35.92	155.2	0.86	Sands - clean sands to silty sand	1.92	1.20	
11.00	36.09	171.9	0.93	Sands - clean sands to silty sand	1.91	1.19	
11.05	36.25	187.5	0.82	Sands - clean sands to silty sand	1.84	1.13	
11.10	36.42	178.6	0.68	Sands - clean sands to silty sand	1.80	1.10	
11.15	36.58	152.8	0.62	Sands - clean sands to silty sand	1.84	1.13	
11.20	36.74	122.4	0.58	Sands - clean sands to silty sand	1.91	1.19	
11.25	36.91	87.5	0.99	Sand mixtures - silty sand to sandy silt	2.19	1.64	
11.30	37.07	55.3	1.45	Sand mixtures - silty sand to sandy silt	2.49	2.68	
11.35	37.24	37.5	1.14	Sand mixtures - silty sand to sandy silt	2.58	4.62	
11.40	37.40	37.0	0.68	Sand mixtures - silty sand to sandy silt	2.45	2.51	
11.45	37.57	49.0	0.51	Sand mixtures - silty sand to sandy silt	2.26	1.83	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-08

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	45.1	1.69	Silt mixtures - clayey silt to silty clay	2.62	6.08	6.01
11.55	37.89	28.7	1.19	Silt mixtures - clayey silt to silty clay	2.71		3.82
11.60	38.06	16.6	0.68	Silt mixtures - clayey silt to silty clay	2.82		2.21
11.65	38.22	8.7	0.73	Clays - silty clay to clay	3.13		1.16
11.70	38.39	10.8	1.94	Clays - silty clay to clay	3.25		1.44
11.75	38.55	10.1	7.48	Unstable clayey silts	3.65		1.35
11.80	38.71	31.9	4.73	Clays - silty clay to clay	3.06		4.25
11.85	38.88	104.7	2.70	Silt mixtures - clayey silt to silty clay	2.47	2.60	
11.90	39.04	146.2	2.64	Sand mixtures - silty sand to sandy silt	2.35	2.10	
11.95	39.21	129.5	2.45	Sand mixtures - silty sand to sandy silt	2.36	2.16	
12.00	39.37	89.6	2.48	Silt mixtures - clayey silt to silty clay	2.50	2.75	
12.05	39.53	63.9	3.79	Silt mixtures - clayey silt to silty clay	2.76		8.53
12.10	39.70	64.1	3.11	Silt mixtures - clayey silt to silty clay	2.70		8.54
12.15	39.86	69.1	2.86	Silt mixtures - clayey silt to silty clay	2.65	7.30	9.21
12.20	40.03	66.6	2.77	Silt mixtures - clayey silt to silty clay	2.65	7.49	8.88
12.25	40.19	61.6	2.96	Silt mixtures - clayey silt to silty clay	2.70		8.21
12.30	40.35	51.6	3.47	Clays - silty clay to clay	2.81		6.88
12.35	40.52	47.8	3.55	Clays - silty clay to clay	2.85		6.37
12.40	40.68	51.6	2.79	Silt mixtures - clayey silt to silty clay	2.75		6.88
12.45	40.85	48.8	2.56	Silt mixtures - clayey silt to silty clay	2.75		6.50
12.50	41.01	40.1	3.92	Clays - silty clay to clay	2.94		5.35
12.55	41.17	46.8	3.93	Clays - silty clay to clay	2.89		6.23
12.60	41.34	58.1	2.25	Silt mixtures - clayey silt to silty clay	2.65	7.40	7.74
12.65	41.50	42.5	2.92	Silt mixtures - clayey silt to silty clay	2.84		5.67
12.70	41.67	47.7	2.09	Silt mixtures - clayey silt to silty clay	2.71		6.36
12.75	41.83	42.3	2.38	Silt mixtures - clayey silt to silty clay	2.79		5.63
12.80	41.99	41.1	2.52	Silt mixtures - clayey silt to silty clay	2.82		5.48
12.85	42.16	40.7	2.62	Silt mixtures - clayey silt to silty clay	2.83		5.43
12.90	42.32	46.6	2.66	Silt mixtures - clayey silt to silty clay	2.79		6.22
12.95	42.49	50.2	2.34	Silt mixtures - clayey silt to silty clay	2.73		6.70
13.00	42.65	42.1	4.13	Clays - silty clay to clay	2.95		5.62
13.05	42.81	80.6	2.32	Silt mixtures - clayey silt to silty clay	2.55	3.92	
13.10	42.98	93.2	2.82	Silt mixtures - clayey silt to silty clay	2.57	4.31	
13.15	43.14	79.6	3.72	Silt mixtures - clayey silt to silty clay	2.72		10.61
13.20	43.31	56.9	5.65	Clays - silty clay to clay	2.96		7.58
13.25	43.47	64.4	4.77	Clays - silty clay to clay	2.86		8.59
13.30	43.63	75.8	3.70	Silt mixtures - clayey silt to silty clay	2.73		10.10
13.35	43.80	89.0	3.42	Silt mixtures - clayey silt to silty clay	2.66	7.81	11.87
13.40	43.96	105.8	3.20	Silt mixtures - clayey silt to silty clay	2.57	4.57	
13.45	44.13	73.2	4.64	Clays - silty clay to clay	2.82		9.76
13.50	44.29	76.0	4.52	Clays - silty clay to clay	2.80		10.14
13.55	44.45	82.7	4.53	Clays - silty clay to clay	2.77		11.03
13.60	44.62	73.9	5.94	Clays - silty clay to clay	2.90		9.85
13.65	44.78	61.4	6.43	Clays - silty clay to clay	2.98		8.18
13.70	44.95	96.3	5.27	Clays - silty clay to clay	2.78		12.84
13.75	45.11	214.0	2.88	Sand mixtures - silty sand to sandy silt	2.31	1.96	
13.80	45.28	282.4	3.01	Sand mixtures - silty sand to sandy silt	2.24	1.76	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-08

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	283.6	3.10	Sand mixtures - silty sand to sandy silt	2.25	1.79	
13.90	45.60	286.3	4.84	Very stiff, fine grained	2.43	2.41	
13.95	45.77	304.7	4.78	Very stiff, fine grained	2.40	2.32	
14.00	45.93	289.0	5.60	Very stiff, fine grained	2.49	2.68	
14.05	46.10	343.4	4.18	Very stiff, fine grained	2.32	2.00	
14.10	46.26	334.6	3.31	Sand mixtures - silty sand to sandy silt	2.23	1.74	
14.15	46.42	373.3	2.86	Sand mixtures - silty sand to sandy silt	2.14	1.53	
14.20	46.59	375.1	3.11	Sand mixtures - silty sand to sandy silt	2.18	1.60	
14.25	46.75	381.0	4.17	Very stiff, fine grained	2.29	1.91	
14.30	46.92	395.1	5.65	Very stiff, fine grained	2.41	2.34	
14.35	47.08	353.3	7.83	Very stiff, fine grained	2.58	4.67	
14.40	47.24	338.6	7.11	Very stiff, fine grained	2.55	3.89	
14.45	47.41	264.4	6.10	Very stiff, fine grained	2.56	4.09	
14.50	47.57	269.9	3.42	Sand mixtures - silty sand to sandy silt	2.32	2.00	
14.55	47.74	294.5	2.99	Sand mixtures - silty sand to sandy silt	2.24	1.76	
14.60	47.90	245.3	4.41	Silt mixtures - clayey silt to silty clay	2.45	2.52	
14.65	48.06	259.9	4.18	Silt mixtures - clayey silt to silty clay	2.41	2.36	
14.70	48.23	337.1	3.65	Very stiff sand to clayey sand	2.28	1.89	
14.75	48.39	391.4	4.06	Very stiff, fine grained	2.29	1.89	
14.80	48.56	432.3	0.00	Gravelly sand to dense sand	1.76	1.00	
14.85	48.72	421.3	0.00	Gravelly sand to dense sand	1.75	1.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 13:36
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-09

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	29.2	0.75	Sands - clean sands to silty sand	2.05	1.36	
0.10	0.33	23.9	1.43	Sand mixtures - silty sand to sandy silt	2.28	1.86	
0.15	0.49	23.1	1.78	Sand mixtures - silty sand to sandy silt	2.35	2.10	
0.20	0.66	24.3	1.67	Sand mixtures - silty sand to sandy silt	2.31	1.99	
0.25	0.82	21.9	1.61	Sand mixtures - silty sand to sandy silt	2.34	2.07	
0.30	0.98	21.7	1.43	Sand mixtures - silty sand to sandy silt	2.31	1.98	
0.35	1.15	23.4	1.34	Sand mixtures - silty sand to sandy silt	2.27	1.84	
0.40	1.31	26.0	1.26	Sand mixtures - silty sand to sandy silt	2.22	1.70	
0.45	1.48	22.8	1.38	Sand mixtures - silty sand to sandy silt	2.29	1.89	
0.50	1.64	17.4	0.75	Sand mixtures - silty sand to sandy silt	2.24	1.76	
0.55	1.80	16.0	0.99	Sand mixtures - silty sand to sandy silt	2.33	2.05	
0.60	1.97	18.5	1.13	Sand mixtures - silty sand to sandy silt	2.31	1.98	
0.65	2.13	25.9	1.28	Sand mixtures - silty sand to sandy silt	2.22	1.72	
0.70	2.30	30.2	1.41	Sand mixtures - silty sand to sandy silt	2.20	1.65	
0.75	2.46	30.1	1.43	Sand mixtures - silty sand to sandy silt	2.20	1.66	
0.80	2.62	28.6	1.55	Sand mixtures - silty sand to sandy silt	2.24	1.76	
0.85	2.79	24.7	1.64	Sand mixtures - silty sand to sandy silt	2.31	1.95	
0.90	2.95	21.5	1.78	Sand mixtures - silty sand to sandy silt	2.38	2.20	
0.95	3.12	21.4	1.71	Sand mixtures - silty sand to sandy silt	2.37	2.17	
1.00	3.28	19.5	1.87	Sand mixtures - silty sand to sandy silt	2.43	2.40	
1.05	3.44	16.8	1.87	Sand mixtures - silty sand to sandy silt	2.48	2.64	
1.10	3.61	15.2	1.86	Sand mixtures - silty sand to sandy silt	2.51	3.01	
1.15	3.77	16.9	1.69	Sand mixtures - silty sand to sandy silt	2.45	2.51	
1.20	3.94	18.3	1.69	Sand mixtures - silty sand to sandy silt	2.42	2.39	
1.25	4.10	19.7	1.52	Sand mixtures - silty sand to sandy silt	2.37	2.16	
1.30	4.27	17.2	1.66	Sand mixtures - silty sand to sandy silt	2.44	2.46	
1.35	4.43	17.4	1.78	Sand mixtures - silty sand to sandy silt	2.45	2.53	
1.40	4.59	20.1	1.61	Sand mixtures - silty sand to sandy silt	2.38	2.20	
1.45	4.76	23.3	1.54	Sand mixtures - silty sand to sandy silt	2.31	1.98	
1.50	4.92	24.2	1.57	Sand mixtures - silty sand to sandy silt	2.31	1.95	
1.55	5.09	26.2	1.00	Sand mixtures - silty sand to sandy silt	2.16	1.57	
1.60	5.25	27.0	0.95	Sand mixtures - silty sand to sandy silt	2.14	1.52	
1.65	5.41	27.1	1.13	Sand mixtures - silty sand to sandy silt	2.18	1.61	
1.70	5.58	29.4	1.26	Sand mixtures - silty sand to sandy silt	2.18	1.61	
1.75	5.74	37.2	1.16	Sand mixtures - silty sand to sandy silt	2.07	1.40	
1.80	5.91	41.6	1.26	Sand mixtures - silty sand to sandy silt	2.06	1.38	
1.85	6.07	42.1	1.40	Sand mixtures - silty sand to sandy silt	2.09	1.42	
1.90	6.23	41.0	1.45	Sand mixtures - silty sand to sandy silt	2.11	1.45	
1.95	6.40	39.9	1.37	Sand mixtures - silty sand to sandy silt	2.10	1.44	
2.00	6.56	36.0	1.13	Sand mixtures - silty sand to sandy silt	2.08	1.41	
2.05	6.73	33.6	0.92	Sands - clean sands to silty sand	2.05	1.37	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-09

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	30.2	0.65	Sands - clean sands to silty sand	2.01	1.31	
2.15	7.05	30.5	1.22	Sand mixtures - silty sand to sandy silt	2.16	1.56	
2.20	7.22	38.6	0.81	Sands - clean sands to silty sand	2.00	1.29	
2.25	7.38	24.8	0.90	Sand mixtures - silty sand to sandy silt	2.16	1.56	
2.30	7.55	26.5	0.85	Sand mixtures - silty sand to sandy silt	2.13	1.51	
2.35	7.71	34.1	1.39	Sand mixtures - silty sand to sandy silt	2.18	1.61	
2.40	7.87	37.7	1.50	Sand mixtures - silty sand to sandy silt	2.17	1.60	
2.45	8.04	38.9	1.43	Sand mixtures - silty sand to sandy silt	2.16	1.56	
2.50	8.20	42.6	0.72	Sands - clean sands to silty sand	1.96	1.25	
2.55	8.37	32.6	0.93	Sand mixtures - silty sand to sandy silt	2.11	1.46	
2.60	8.53	28.9	1.08	Sand mixtures - silty sand to sandy silt	2.19	1.63	
2.65	8.69	32.0	1.06	Sand mixtures - silty sand to sandy silt	2.16	1.56	
2.70	8.86	28.6	1.62	Sand mixtures - silty sand to sandy silt	2.30	1.94	
2.75	9.02	29.2	1.35	Sand mixtures - silty sand to sandy silt	2.25	1.79	
2.80	9.19	27.7	1.22	Sand mixtures - silty sand to sandy silt	2.25	1.78	
2.85	9.35	30.0	0.42	Sands - clean sands to silty sand	2.00	1.00	
2.90	9.51	29.0	0.17	Sands - clean sands to silty sand	1.88	1.00	
2.95	9.68	20.6	1.35	Sand mixtures - silty sand to sandy silt	2.38	2.21	
3.00	9.84	21.2	1.41	Sand mixtures - silty sand to sandy silt	2.38	2.24	
3.05	10.01	35.9	1.17	Sand mixtures - silty sand to sandy silt	2.18	1.60	
3.10	10.17	37.3	1.52	Sand mixtures - silty sand to sandy silt	2.24	1.75	
3.15	10.33	35.5	1.51	Sand mixtures - silty sand to sandy silt	2.25	1.80	
3.20	10.50	38.9	1.42	Sand mixtures - silty sand to sandy silt	2.21	1.69	
3.25	10.66	40.3	1.57	Sand mixtures - silty sand to sandy silt	2.23	1.74	
3.30	10.83	46.9	1.20	Sand mixtures - silty sand to sandy silt	2.12	1.48	
3.35	10.99	49.1	1.19	Sand mixtures - silty sand to sandy silt	2.11	1.46	
3.40	11.15	45.7	1.35	Sand mixtures - silty sand to sandy silt	2.17	1.58	
3.45	11.32	46.7	1.12	Sand mixtures - silty sand to sandy silt	2.11	1.47	
3.50	11.48	54.8	0.78	Sands - clean sands to silty sand	1.97	1.26	
3.55	11.65	60.3	1.39	Sand mixtures - silty sand to sandy silt	2.10	1.44	
3.60	11.81	56.7	1.65	Sand mixtures - silty sand to sandy silt	2.17	1.59	
3.65	11.97	46.8	2.05	Sand mixtures - silty sand to sandy silt	2.29	1.91	
3.70	12.14	56.6	0.84	Sands - clean sands to silty sand	1.99	1.28	
3.75	12.30	63.0	0.65	Sands - clean sands to silty sand	1.90	1.18	
3.80	12.47	65.4	0.57	Sands - clean sands to silty sand	1.86	1.15	
3.85	12.63	68.2	0.69	Sands - clean sands to silty sand	1.89	1.18	
3.90	12.80	65.5	0.62	Sands - clean sands to silty sand	1.88	1.17	
3.95	12.96	52.9	1.08	Sand mixtures - silty sand to sandy silt	2.09	1.43	
4.00	13.12	40.3	0.60	Sands - clean sands to silty sand	2.04	1.35	
4.05	13.29	25.6	0.09	Sands - clean sands to silty sand	1.95	1.00	
4.10	13.45	13.7	1.63	Silt mixtures - clayey silt to silty clay	2.66	7.71	1.83
4.15	13.62	14.7	1.12	Sand mixtures - silty sand to sandy silt	2.55	3.86	
4.20	13.78	25.1	1.01	Sand mixtures - silty sand to sandy silt	2.34	2.07	
4.25	13.94	20.8	0.53	Sand mixtures - silty sand to sandy silt	2.27	1.85	
4.30	14.11	13.9	1.21	Silt mixtures - clayey silt to silty clay	2.60	5.30	
4.35	14.27	18.5	1.04	Sand mixtures - silty sand to sandy silt	2.46	2.58	
4.40	14.44	29.8	0.48	Sand mixtures - silty sand to sandy silt	2.13	1.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-09

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	16.8	0.45	Sand mixtures - silty sand to sandy silt	2.33	1.00	
4.50	14.76	18.1	1.02	Sand mixtures - silty sand to sandy silt	2.48	2.65	
4.55	14.93	26.8	0.67	Sand mixtures - silty sand to sandy silt	2.25	1.78	
4.60	15.09	38.3	0.48	Sands - clean sands to silty sand	2.05	1.00	
4.65	15.26	47.7	1.15	Sand mixtures - silty sand to sandy silt	2.18	1.62	
4.70	15.42	59.1	1.08	Sand mixtures - silty sand to sandy silt	2.10	1.44	
4.75	15.58	49.4	0.79	Sand mixtures - silty sand to sandy silt	2.08	1.41	
4.80	15.75	46.2	0.93	Sand mixtures - silty sand to sandy silt	2.15	1.54	
4.85	15.91	52.6	2.84	Silt mixtures - clayey silt to silty clay	2.43	2.42	
4.90	16.08	56.7	2.14	Sand mixtures - silty sand to sandy silt	2.32	2.01	
4.95	16.24	47.1	1.88	Sand mixtures - silty sand to sandy silt	2.34	2.08	
5.00	16.40	56.3	1.13	Sand mixtures - silty sand to sandy silt	2.14	1.53	
5.05	16.57	58.4	1.07	Sand mixtures - silty sand to sandy silt	2.12	1.48	
5.10	16.73	53.3	0.98	Sand mixtures - silty sand to sandy silt	2.13	1.50	
5.15	16.90	51.3	0.85	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.20	17.06	44.4	0.77	Sand mixtures - silty sand to sandy silt	2.14	1.51	
5.25	17.22	45.4	1.17	Sand mixtures - silty sand to sandy silt	2.24	1.75	
5.30	17.39	54.5	1.17	Sand mixtures - silty sand to sandy silt	2.18	1.61	
5.35	17.55	53.8	1.20	Sand mixtures - silty sand to sandy silt	2.19	1.64	
5.40	17.72	54.5	1.07	Sand mixtures - silty sand to sandy silt	2.16	1.57	
5.45	17.88	54.3	1.02	Sand mixtures - silty sand to sandy silt	2.15	1.54	
5.50	18.04	51.5	1.07	Sand mixtures - silty sand to sandy silt	2.18	1.62	
5.55	18.21	44.0	0.90	Sand mixtures - silty sand to sandy silt	2.20	1.65	
5.60	18.37	35.4	1.16	Sand mixtures - silty sand to sandy silt	2.34	2.08	
5.65	18.54	42.4	1.08	Sand mixtures - silty sand to sandy silt	2.26	1.82	
5.70	18.70	53.0	0.81	Sand mixtures - silty sand to sandy silt	2.11	1.47	
5.75	18.86	60.9	0.57	Sands - clean sands to silty sand	1.98	1.27	
5.80	19.03	73.7	0.95	Sands - clean sands to silty sand	2.04	1.35	
5.85	19.19	85.2	0.98	Sands - clean sands to silty sand	2.00	1.30	
5.90	19.36	87.0	1.42	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.95	19.52	84.9	1.74	Sand mixtures - silty sand to sandy silt	2.18	1.61	
6.00	19.68	87.7	1.71	Sand mixtures - silty sand to sandy silt	2.17	1.58	
6.05	19.85	87.7	1.59	Sand mixtures - silty sand to sandy silt	2.15	1.53	
6.10	20.01	66.6	2.14	Sand mixtures - silty sand to sandy silt	2.33	2.03	
6.15	20.18	47.9	2.01	Sand mixtures - silty sand to sandy silt	2.42	2.38	
6.20	20.34	40.9	1.74	Sand mixtures - silty sand to sandy silt	2.43	2.44	
6.25	20.51	66.0	1.05	Sand mixtures - silty sand to sandy silt	2.13	1.50	
6.30	20.67	77.2	0.87	Sands - clean sands to silty sand	2.02	1.32	
6.35	20.83	77.3	0.95	Sands - clean sands to silty sand	2.05	1.36	
6.40	21.00	57.2	0.59	Sands - clean sands to silty sand	2.04	1.34	
6.45	21.16	35.3	1.15	Sand mixtures - silty sand to sandy silt	2.38	2.23	
6.50	21.33	31.9	1.11	Sand mixtures - silty sand to sandy silt	2.41	2.36	
6.55	21.49	33.4	2.05	Silt mixtures - clayey silt to silty clay	2.57	4.42	
6.60	21.65	34.3	2.88	Silt mixtures - clayey silt to silty clay	2.66	8.05	4.57
6.65	21.82	45.2	2.30	Silt mixtures - clayey silt to silty clay	2.50	2.88	
6.70	21.98	77.3	1.67	Sand mixtures - silty sand to sandy silt	2.23	1.73	
6.75	22.15	76.5	1.81	Sand mixtures - silty sand to sandy silt	2.26	1.81	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-09

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	78.1	1.65	Sand mixtures - silty sand to sandy silt	2.23	1.72	
6.85	22.47	98.2	1.64	Sand mixtures - silty sand to sandy silt	2.15	1.55	
6.90	22.64	86.4	2.24	Sand mixtures - silty sand to sandy silt	2.30	1.92	
6.95	22.80	63.6	2.78	Silt mixtures - clayey silt to silty clay	2.46	2.58	
7.00	22.97	42.6	2.63	Silt mixtures - clayey silt to silty clay	2.58	4.80	
7.05	23.13	33.3	1.86	Silt mixtures - clayey silt to silty clay	2.57	4.38	
7.10	23.29	26.2	1.97	Silt mixtures - clayey silt to silty clay	2.67	8.55	3.49
7.15	23.46	26.3	2.13	Silt mixtures - clayey silt to silty clay	2.70	9.96	3.50
7.20	23.62	29.3	1.51	Silt mixtures - clayey silt to silty clay	2.56	4.27	
7.25	23.79	26.3	1.62	Silt mixtures - clayey silt to silty clay	2.63	6.37	3.51
7.30	23.95	23.6	1.91	Silt mixtures - clayey silt to silty clay	2.71		3.14
7.35	24.11	25.3	1.51	Silt mixtures - clayey silt to silty clay	2.63	6.36	3.38
7.40	24.28	26.3	1.07	Sand mixtures - silty sand to sandy silt	2.52	3.26	
7.45	24.44	18.5	1.96	Silt mixtures - clayey silt to silty clay	2.82		2.46
7.50	24.61	26.1	2.30	Silt mixtures - clayey silt to silty clay	2.74		3.48
7.55	24.77	38.8	1.72	Sand mixtures - silty sand to sandy silt	2.51	3.09	
7.60	24.93	37.0	1.93	Silt mixtures - clayey silt to silty clay	2.57	4.36	
7.65	25.10	38.3	1.58	Sand mixtures - silty sand to sandy silt	2.50	2.74	
7.70	25.26	45.8	1.21	Sand mixtures - silty sand to sandy silt	2.36	2.15	
7.75	25.43	58.5	1.06	Sand mixtures - silty sand to sandy silt	2.24	1.75	
7.80	25.59	70.2	0.98	Sand mixtures - silty sand to sandy silt	2.15	1.54	
7.85	25.75	76.2	1.28	Sand mixtures - silty sand to sandy silt	2.20	1.66	
7.90	25.92	83.0	1.33	Sand mixtures - silty sand to sandy silt	2.18	1.61	
7.95	26.08	83.4	1.46	Sand mixtures - silty sand to sandy silt	2.21	1.69	
8.00	26.25	79.0	1.55	Sand mixtures - silty sand to sandy silt	2.25	1.79	
8.05	26.41	77.4	1.53	Sand mixtures - silty sand to sandy silt	2.26	1.80	
8.10	26.57	73.2	1.50	Sand mixtures - silty sand to sandy silt	2.27	1.84	
8.15	26.74	65.9	1.46	Sand mixtures - silty sand to sandy silt	2.30	1.94	
8.20	26.90	55.2	1.46	Sand mixtures - silty sand to sandy silt	2.37	2.17	
8.25	27.07	71.0	1.19	Sand mixtures - silty sand to sandy silt	2.22	1.70	
8.30	27.23	72.0	1.44	Sand mixtures - silty sand to sandy silt	2.27	1.85	
8.35	27.39	65.7	1.78	Sand mixtures - silty sand to sandy silt	2.37	2.18	
8.40	27.56	55.1	1.58	Sand mixtures - silty sand to sandy silt	2.40	2.30	
8.45	27.72	43.0	1.80	Sand mixtures - silty sand to sandy silt	2.53	3.44	
8.50	27.89	41.3	1.74	Sand mixtures - silty sand to sandy silt	2.54	3.59	
8.55	28.05	53.4	1.98	Sand mixtures - silty sand to sandy silt	2.48	2.68	
8.60	28.21	78.9	2.21	Sand mixtures - silty sand to sandy silt	2.39	2.24	
8.65	28.38	93.1	1.73	Sand mixtures - silty sand to sandy silt	2.25	1.80	
8.70	28.54	72.1	1.71	Sand mixtures - silty sand to sandy silt	2.34	2.07	
8.75	28.71	62.4	1.52	Sand mixtures - silty sand to sandy silt	2.36	2.13	
8.80	28.87	55.2	1.43	Sand mixtures - silty sand to sandy silt	2.39	2.24	
8.85	29.04	59.9	1.60	Sand mixtures - silty sand to sandy silt	2.39	2.26	
8.90	29.20	61.8	1.37	Sand mixtures - silty sand to sandy silt	2.34	2.06	
8.95	29.36	57.6	1.71	Sand mixtures - silty sand to sandy silt	2.43	2.42	
9.00	29.53	54.3	1.53	Sand mixtures - silty sand to sandy silt	2.42	2.38	
9.05	29.69	53.7	1.52	Sand mixtures - silty sand to sandy silt	2.42	2.40	
9.10	29.86	55.2	1.27	Sand mixtures - silty sand to sandy silt	2.36	2.16	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-09

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	57.6	1.35	Sand mixtures - silty sand to sandy silt	2.37	2.17	
9.20	30.18	60.2	1.35	Sand mixtures - silty sand to sandy silt	2.35	2.11	
9.25	30.35	62.4	1.26	Sand mixtures - silty sand to sandy silt	2.32	2.00	
9.30	30.51	63.0	1.30	Sand mixtures - silty sand to sandy silt	2.33	2.03	
9.35	30.68	59.5	1.48	Sand mixtures - silty sand to sandy silt	2.39	2.26	
9.40	30.84	58.3	1.63	Sand mixtures - silty sand to sandy silt	2.43	2.42	
9.45	31.00	60.7	1.66	Sand mixtures - silty sand to sandy silt	2.42	2.38	
9.50	31.17	59.1	1.43	Sand mixtures - silty sand to sandy silt	2.39	2.25	
9.55	31.33	51.3	1.65	Sand mixtures - silty sand to sandy silt	2.48	2.68	
9.60	31.50	40.9	1.54	Sand mixtures - silty sand to sandy silt	2.55	4.01	
9.65	31.66	46.5	0.82	Sand mixtures - silty sand to sandy silt	2.33	2.05	
9.70	31.82	54.2	1.55	Sand mixtures - silty sand to sandy silt	2.45	2.52	
9.75	31.99	65.2	1.80	Sand mixtures - silty sand to sandy silt	2.43	2.43	
9.80	32.15	69.2	1.83	Sand mixtures - silty sand to sandy silt	2.42	2.37	
9.85	32.32	55.2	1.91	Sand mixtures - silty sand to sandy silt	2.51	3.09	
9.90	32.48	50.3	2.11	Silt mixtures - clayey silt to silty clay	2.58	4.80	
9.95	32.64	34.1	2.15	Silt mixtures - clayey silt to silty clay	2.74		4.55
10.00	32.81	37.1	1.49	Silt mixtures - clayey silt to silty clay	2.60	5.32	
10.05	32.97	41.6	1.48	Sand mixtures - silty sand to sandy silt	2.55	4.01	
10.10	33.14	38.9	1.92	Silt mixtures - clayey silt to silty clay	2.66	7.87	5.19
10.15	33.30	34.4	1.85	Silt mixtures - clayey silt to silty clay	2.70	10.03	4.59
10.20	33.46	34.8	1.66	Silt mixtures - clayey silt to silty clay	2.66	8.09	4.64
10.25	33.63	34.5	1.40	Silt mixtures - clayey silt to silty clay	2.62	6.18	4.60
10.30	33.79	41.2	1.04	Sand mixtures - silty sand to sandy silt	2.47	2.61	
10.35	33.96	45.3	1.12	Sand mixtures - silty sand to sandy silt	2.45	2.53	
10.40	34.12	48.0	1.31	Sand mixtures - silty sand to sandy silt	2.48	2.64	
10.45	34.28	49.3	1.37	Sand mixtures - silty sand to sandy silt	2.48	2.66	
10.50	34.45	50.9	1.36	Sand mixtures - silty sand to sandy silt	2.47	2.60	
10.55	34.61	59.5	1.05	Sand mixtures - silty sand to sandy silt	2.34	2.06	
10.60	34.78	66.4	1.17	Sand mixtures - silty sand to sandy silt	2.32	2.02	
10.65	34.94	67.5	1.33	Sand mixtures - silty sand to sandy silt	2.36	2.13	
10.70	35.10	69.1	1.55	Sand mixtures - silty sand to sandy silt	2.40	2.29	
10.75	35.27	77.7	1.47	Sand mixtures - silty sand to sandy silt	2.34	2.07	
10.80	35.43	88.9	1.48	Sand mixtures - silty sand to sandy silt	2.29	1.91	
10.85	35.60	105.8	1.44	Sand mixtures - silty sand to sandy silt	2.22	1.71	
10.90	35.76	126.1	1.44	Sand mixtures - silty sand to sandy silt	2.16	1.57	
10.95	35.92	141.4	1.47	Sand mixtures - silty sand to sandy silt	2.13	1.50	
11.00	36.09	151.0	1.41	Sand mixtures - silty sand to sandy silt	2.09	1.44	
11.05	36.25	160.5	1.40	Sand mixtures - silty sand to sandy silt	2.07	1.40	
11.10	36.42	163.1	1.46	Sand mixtures - silty sand to sandy silt	2.08	1.41	
11.15	36.58	153.8	1.74	Sand mixtures - silty sand to sandy silt	2.16	1.57	
11.20	36.74	138.6	2.04	Sand mixtures - silty sand to sandy silt	2.25	1.80	
11.25	36.91	124.2	2.13	Sand mixtures - silty sand to sandy silt	2.31	1.96	
11.30	37.07	115.2	1.89	Sand mixtures - silty sand to sandy silt	2.30	1.92	
11.35	37.24	106.1	1.61	Sand mixtures - silty sand to sandy silt	2.27	1.85	
11.40	37.40	102.1	1.43	Sand mixtures - silty sand to sandy silt	2.25	1.79	
11.45	37.57	115.1	1.31	Sand mixtures - silty sand to sandy silt	2.18	1.61	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-09

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	136.5	1.30	Sand mixtures - silty sand to sandy silt	2.12	1.48	
11.55	37.89	156.3	1.37	Sand mixtures - silty sand to sandy silt	2.09	1.43	
11.60	38.06	163.3	1.43	Sand mixtures - silty sand to sandy silt	2.09	1.42	
11.65	38.22	164.0	1.20	Sands - clean sands to silty sand	2.03	1.33	
11.70	38.39	155.3	1.27	Sand mixtures - silty sand to sandy silt	2.07	1.39	
11.75	38.55	150.6	1.38	Sand mixtures - silty sand to sandy silt	2.11	1.46	
11.80	38.71	146.0	1.39	Sand mixtures - silty sand to sandy silt	2.12	1.49	
11.85	38.88	134.3	1.60	Sand mixtures - silty sand to sandy silt	2.20	1.66	
11.90	39.04	126.6	1.72	Sand mixtures - silty sand to sandy silt	2.25	1.78	
11.95	39.21	132.6	1.53	Sand mixtures - silty sand to sandy silt	2.20	1.64	
12.00	39.37	149.9	1.39	Sand mixtures - silty sand to sandy silt	2.12	1.48	
12.05	39.53	186.7	1.31	Sands - clean sands to silty sand	2.02	1.32	
12.10	39.70	198.1	1.27	Sands - clean sands to silty sand	1.99	1.28	
12.15	39.86	156.5	1.66	Sand mixtures - silty sand to sandy silt	2.17	1.58	
12.20	40.03	141.7	1.58	Sand mixtures - silty sand to sandy silt	2.19	1.63	
12.25	40.19	137.5	1.31	Sand mixtures - silty sand to sandy silt	2.14	1.52	
12.30	40.35	140.7	1.00	Sands - clean sands to silty sand	2.04	1.35	
12.35	40.52	136.3	0.91	Sands - clean sands to silty sand	2.03	1.33	
12.40	40.68	134.5	2.33	Sand mixtures - silty sand to sandy silt	2.35	2.10	
12.45	40.85	147.3	1.88	Sand mixtures - silty sand to sandy silt	2.24	1.76	
12.50	41.01	117.7	1.81	Sand mixtures - silty sand to sandy silt	2.31	1.97	
12.55	41.17	127.1	1.15	Sand mixtures - silty sand to sandy silt	2.13	1.51	
12.60	41.34	119.2	1.23	Sand mixtures - silty sand to sandy silt	2.18	1.62	
12.65	41.50	111.0	1.26	Sand mixtures - silty sand to sandy silt	2.22	1.70	
12.70	41.67	107.6	1.42	Sand mixtures - silty sand to sandy silt	2.27	1.84	
12.75	41.83	105.3	1.48	Sand mixtures - silty sand to sandy silt	2.29	1.91	
12.80	41.99	110.1	1.54	Sand mixtures - silty sand to sandy silt	2.29	1.91	
12.85	42.16	109.8	1.80	Sand mixtures - silty sand to sandy silt	2.34	2.09	
12.90	42.32	93.5	2.01	Sand mixtures - silty sand to sandy silt	2.44	2.48	
12.95	42.49	73.0	1.62	Sand mixtures - silty sand to sandy silt	2.47	2.60	
13.00	42.65	100.6	1.08	Sand mixtures - silty sand to sandy silt	2.22	1.70	
13.05	42.81	109.1	1.39	Sand mixtures - silty sand to sandy silt	2.27	1.84	
13.10	42.98	110.5	1.23	Sand mixtures - silty sand to sandy silt	2.23	1.72	
13.15	43.14	124.4	1.05	Sand mixtures - silty sand to sandy silt	2.13	1.51	
13.20	43.31	134.0	1.10	Sand mixtures - silty sand to sandy silt	2.12	1.48	
13.25	43.47	139.9	1.09	Sand mixtures - silty sand to sandy silt	2.10	1.45	
13.30	43.63	105.6	1.73	Sand mixtures - silty sand to sandy silt	2.36	2.14	
13.35	43.80	155.7	1.27	Sand mixtures - silty sand to sandy silt	2.11	1.47	
13.40	43.96	165.8	1.24	Sand mixtures - silty sand to sandy silt	2.08	1.42	
13.45	44.13	168.6	1.25	Sand mixtures - silty sand to sandy silt	2.08	1.41	
13.50	44.29	169.7	1.22	Sand mixtures - silty sand to sandy silt	2.07	1.40	
13.55	44.45	160.0	1.26	Sand mixtures - silty sand to sandy silt	2.11	1.46	
13.60	44.62	137.8	1.37	Sand mixtures - silty sand to sandy silt	2.19	1.63	
13.65	44.78	109.1	2.16	Sand mixtures - silty sand to sandy silt	2.43	2.44	
13.70	44.95	76.7	2.77	Silt mixtures - clayey silt to silty clay	2.65	7.48	10.23
13.75	45.11	63.8	2.73	Silt mixtures - clayey silt to silty clay	2.71		8.50
13.80	45.28	122.9	1.42	Sand mixtures - silty sand to sandy silt	2.25	1.79	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-09

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	145.6	0.98	Sands - clean sands to silty sand	2.07	1.39	
13.90	45.60	120.2	0.89	Sand mixtures - silty sand to sandy silt	2.12	1.47	
13.95	45.77	109.6	1.45	Sand mixtures - silty sand to sandy silt	2.31	1.96	
14.00	45.93	113.9	1.49	Sand mixtures - silty sand to sandy silt	2.30	1.94	
14.05	46.10	130.1	1.94	Sand mixtures - silty sand to sandy silt	2.34	2.08	
14.10	46.26	150.4	1.50	Sand mixtures - silty sand to sandy silt	2.20	1.67	
14.15	46.42	131.3	1.40	Sand mixtures - silty sand to sandy silt	2.23	1.74	
14.20	46.59	115.6	1.24	Sand mixtures - silty sand to sandy silt	2.24	1.77	
14.25	46.75	102.1	1.50	Sand mixtures - silty sand to sandy silt	2.35	2.12	
14.30	46.92	99.2	1.51	Sand mixtures - silty sand to sandy silt	2.37	2.17	
14.35	47.08	91.3	1.71	Sand mixtures - silty sand to sandy silt	2.44	2.49	
14.40	47.24	63.6	1.81	Silt mixtures - clayey silt to silty clay	2.61	5.63	8.49
14.45	47.41	44.8	2.01	Silt mixtures - clayey silt to silty clay	2.77		5.98
14.50	47.57	63.0	1.64	Silt mixtures - clayey silt to silty clay	2.58	4.86	
14.55	47.74	54.3	1.88	Silt mixtures - clayey silt to silty clay	2.69	9.29	7.25
14.60	47.90	69.5	1.39	Sand mixtures - silty sand to sandy silt	2.50	2.73	
14.65	48.06	84.0	0.98	Sand mixtures - silty sand to sandy silt	2.31	1.98	
14.70	48.23	88.2	1.22	Sand mixtures - silty sand to sandy silt	2.36	2.15	
14.75	48.39	101.7	1.30	Sand mixtures - silty sand to sandy silt	2.33	2.02	
14.80	48.56	130.5	1.46	Sand mixtures - silty sand to sandy silt	2.27	1.84	
14.85	48.72	162.0	1.33	Sand mixtures - silty sand to sandy silt	2.15	1.55	
14.90	48.88	181.2	1.47	Sand mixtures - silty sand to sandy silt	2.15	1.54	
14.95	49.05	162.4	1.37	Sand mixtures - silty sand to sandy silt	2.17	1.58	
15.00	49.21	136.2	1.60	Sand mixtures - silty sand to sandy silt	2.29	1.90	
15.05	49.38	119.0	1.51	Sand mixtures - silty sand to sandy silt	2.32	2.01	
15.10	49.54	132.1	1.49	Sand mixtures - silty sand to sandy silt	2.28	1.87	
15.15	49.70	121.8	1.82	Sand mixtures - silty sand to sandy silt	2.38	2.21	
15.20	49.87	92.6	2.23	Silt mixtures - clayey silt to silty clay	2.55	3.99	
15.25	50.03	59.4	3.00	Silt mixtures - clayey silt to silty clay	2.80		7.92
15.30	50.20	45.47	2.63	Silt mixtures - clayey silt to silty clay	2.86		6.06
15.35	50.36	72.91	2.63	Silt mixtures - clayey silt to silty clay	2.70	9.92	9.72
15.40	50.52	85.57	2.63	Silt mixtures - clayey silt to silty clay	2.64	7.10	11.41

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 14:24
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-10

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	34.4	1.67	Sand mixtures - silty sand to sandy silt	2.20	1.65	
0.10	0.33	57.6	1.87	Sand mixtures - silty sand to sandy silt	2.07	1.39	
0.15	0.49	62.5	2.78	Sand mixtures - silty sand to sandy silt	2.17	1.59	
0.20	0.66	59.6	3.06	Sand mixtures - silty sand to sandy silt	2.22	1.70	
0.25	0.82	42.2	3.56	Silt mixtures - clayey silt to silty clay	2.37	2.17	
0.30	0.98	36.6	3.21	Sand mixtures - silty sand to sandy silt	2.38	2.20	
0.35	1.15	34.4	2.94	Sand mixtures - silty sand to sandy silt	2.37	2.17	
0.40	1.31	31.2	2.82	Sand mixtures - silty sand to sandy silt	2.38	2.24	
0.45	1.48	27.5	2.44	Sand mixtures - silty sand to sandy silt	2.38	2.23	
0.50	1.64	28.0	2.22	Sand mixtures - silty sand to sandy silt	2.35	2.10	
0.55	1.80	31.9	2.17	Sand mixtures - silty sand to sandy silt	2.30	1.94	
0.60	1.97	36.2	1.98	Sand mixtures - silty sand to sandy silt	2.23	1.74	
0.65	2.13	35.5	2.11	Sand mixtures - silty sand to sandy silt	2.26	1.81	
0.70	2.30	34.6	2.02	Sand mixtures - silty sand to sandy silt	2.25	1.79	
0.75	2.46	31.7	2.20	Sand mixtures - silty sand to sandy silt	2.31	1.96	
0.80	2.62	32.5	2.06	Sand mixtures - silty sand to sandy silt	2.28	1.87	
0.85	2.79	28.1	2.12	Sand mixtures - silty sand to sandy silt	2.34	2.05	
0.90	2.95	23.7	2.14	Sand mixtures - silty sand to sandy silt	2.39	2.27	
0.95	3.12	21.2	2.05	Sand mixtures - silty sand to sandy silt	2.42	2.38	
1.00	3.28	18.4	2.07	Sand mixtures - silty sand to sandy silt	2.47	2.61	
1.05	3.44	16.5	2.05	Sand mixtures - silty sand to sandy silt	2.51	2.94	
1.10	3.61	14.8	1.85	Sand mixtures - silty sand to sandy silt	2.52	3.19	
1.15	3.77	15.0	1.64	Sand mixtures - silty sand to sandy silt	2.48	2.67	
1.20	3.94	15.8	1.57	Sand mixtures - silty sand to sandy silt	2.45	2.53	
1.25	4.10	14.4	1.62	Sand mixtures - silty sand to sandy silt	2.50	2.73	
1.30	4.27	13.3	1.62	Sand mixtures - silty sand to sandy silt	2.53	3.35	
1.35	4.43	13.1	1.54	Sand mixtures - silty sand to sandy silt	2.52	3.21	
1.40	4.59	14.6	1.47	Sand mixtures - silty sand to sandy silt	2.47	2.60	
1.45	4.76	14.4	1.57	Sand mixtures - silty sand to sandy silt	2.49	2.71	
1.50	4.92	12.8	1.34	Sand mixtures - silty sand to sandy silt	2.50	2.74	
1.55	5.09	11.1	1.36	Sand mixtures - silty sand to sandy silt	2.55	3.99	
1.60	5.25	11.1	1.32	Sand mixtures - silty sand to sandy silt	2.55	3.80	
1.65	5.41	13.2	1.18	Sand mixtures - silty sand to sandy silt	2.46	2.54	
1.70	5.58	14.0	1.01	Sand mixtures - silty sand to sandy silt	2.40	2.29	
1.75	5.74	14.4	1.03	Sand mixtures - silty sand to sandy silt	2.39	2.26	
1.80	5.91	12.7	1.04	Sand mixtures - silty sand to sandy silt	2.44	2.48	
1.85	6.07	11.9	0.91	Sand mixtures - silty sand to sandy silt	2.44	2.46	
1.90	6.23	14.4	0.95	Sand mixtures - silty sand to sandy silt	2.38	2.20	
1.95	6.40	16.1	0.69	Sand mixtures - silty sand to sandy silt	2.26	1.83	
2.00	6.56	14.9	1.10	Sand mixtures - silty sand to sandy silt	2.40	2.28	
2.05	6.73	10.5	1.69	Silt mixtures - clayey silt to silty clay	2.63	6.54	1.41

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-10

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	10.1	1.90	Silt mixtures - clayey silt to silty clay	2.68	8.79	1.34
2.15	7.05	12.6	2.30	Silt mixtures - clayey silt to silty clay	2.64	7.07	1.68
2.20	7.22	12.9	2.81	Silt mixtures - clayey silt to silty clay	2.69	9.47	1.72
2.25	7.38	12.1	1.91	Silt mixtures - clayey silt to silty clay	2.61	5.72	1.62
2.30	7.55	12.2	1.11	Sand mixtures - silty sand to sandy silt	2.48	2.64	
2.35	7.71	10.6	1.66	Silt mixtures - clayey silt to silty clay	2.62	6.32	1.42
2.40	7.87	15.4	0.40	Sand mixtures - silty sand to sandy silt	2.18	1.00	
2.45	8.04	13.0	0.89	Sand mixtures - silty sand to sandy silt	2.41	2.32	
2.50	8.20	12.4	0.31	Sand mixtures - silty sand to sandy silt	2.23	1.00	
2.55	8.37	16.4	0.56	Sand mixtures - silty sand to sandy silt	2.22	1.72	
2.60	8.53	14.9	0.95	Sand mixtures - silty sand to sandy silt	2.37	2.17	
2.65	8.69	12.2	1.39	Sand mixtures - silty sand to sandy silt	2.53	3.45	
2.70	8.86	9.3	1.75	Silt mixtures - clayey silt to silty clay	2.69	9.64	1.25
2.75	9.02	10.2	1.78	Silt mixtures - clayey silt to silty clay	2.66	7.98	1.36
2.80	9.19	11.7	1.67	Silt mixtures - clayey silt to silty clay	2.60	5.25	
2.85	9.35	11.9	1.35	Sand mixtures - silty sand to sandy silt	2.54	3.73	
2.90	9.51	12.1	1.37	Sand mixtures - silty sand to sandy silt	2.55	3.81	
2.95	9.68	13.2	1.57	Silt mixtures - clayey silt to silty clay	2.56	4.08	
3.00	9.84	13.9	1.71	Silt mixtures - clayey silt to silty clay	2.57	4.31	
3.05	10.01	20.5	1.35	Sand mixtures - silty sand to sandy silt	2.39	2.26	
3.10	10.17	22.0	1.23	Sand mixtures - silty sand to sandy silt	2.35	2.10	
3.15	10.33	22.7	0.94	Sand mixtures - silty sand to sandy silt	2.28	1.88	
3.20	10.50	22.1	0.58	Sand mixtures - silty sand to sandy silt	2.19	1.63	
3.25	10.66	24.6	0.06	Sands - clean sands to silty sand	1.90	1.00	
3.30	10.83	28.3	2.06	Sand mixtures - silty sand to sandy silt	2.42	2.38	
3.35	10.99	54.0	2.40	Sand mixtures - silty sand to sandy silt	2.28	1.87	
3.40	11.15	56.9	2.67	Sand mixtures - silty sand to sandy silt	2.30	1.94	
3.45	11.32	15.8	5.28	Clays - silty clay to clay	2.88		2.11
3.50	11.48	13.6	2.72	Silt mixtures - clayey silt to silty clay	2.74		1.81
3.55	11.65	17.4	1.72	Silt mixtures - clayey silt to silty clay	2.54	3.76	
3.60	11.81	20.4	2.26	Silt mixtures - clayey silt to silty clay	2.57	4.46	
3.65	11.97	21.4	1.81	Sand mixtures - silty sand to sandy silt	2.50	2.75	
3.70	12.14	22.0	2.67	Silt mixtures - clayey silt to silty clay	2.60	5.41	2.94
3.75	12.30	34.5	1.88	Sand mixtures - silty sand to sandy silt	2.37	2.17	
3.80	12.47	32.8	1.99	Sand mixtures - silty sand to sandy silt	2.40	2.31	
3.85	12.63	36.6	1.81	Sand mixtures - silty sand to sandy silt	2.34	2.09	
3.90	12.80	39.6	1.63	Sand mixtures - silty sand to sandy silt	2.29	1.92	
3.95	12.96	38.1	1.74	Sand mixtures - silty sand to sandy silt	2.33	2.03	
4.00	13.12	35.2	1.78	Sand mixtures - silty sand to sandy silt	2.36	2.15	
4.05	13.29	29.9	1.95	Sand mixtures - silty sand to sandy silt	2.44	2.48	
4.10	13.45	30.1	1.66	Sand mixtures - silty sand to sandy silt	2.40	2.30	
4.15	13.62	23.5	2.13	Silt mixtures - clayey silt to silty clay	2.55	3.93	
4.20	13.78	17.4	2.40	Silt mixtures - clayey silt to silty clay	2.69	9.38	2.31
4.25	13.94	30.5	1.77	Sand mixtures - silty sand to sandy silt	2.42	2.39	
4.30	14.11	26.7	2.03	Sand mixtures - silty sand to sandy silt	2.51	2.95	
4.35	14.27	20.8	2.17	Silt mixtures - clayey silt to silty clay	2.61	5.78	2.77
4.40	14.44	17.7	2.73	Silt mixtures - clayey silt to silty clay	2.73		2.36

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-10

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	24.3	2.11	Silt mixtures - clayey silt to silty clay	2.56	4.11	
4.50	14.76	23.3	2.26	Silt mixtures - clayey silt to silty clay	2.60	5.26	
4.55	14.93	23.9	2.76	Silt mixtures - clayey silt to silty clay	2.65	7.25	3.19
4.60	15.09	26.0	2.85	Silt mixtures - clayey silt to silty clay	2.63	6.68	3.46
4.65	15.26	20.9	2.30	Silt mixtures - clayey silt to silty clay	2.65	7.32	2.78
4.70	15.42	25.8	1.53	Sand mixtures - silty sand to sandy silt	2.47	2.60	
4.75	15.58	32.6	1.49	Sand mixtures - silty sand to sandy silt	2.39	2.25	
4.80	15.75	42.9	1.41	Sand mixtures - silty sand to sandy silt	2.28	1.89	
4.85	15.91	52.8	1.50	Sand mixtures - silty sand to sandy silt	2.23	1.75	
4.90	16.08	48.5	1.78	Sand mixtures - silty sand to sandy silt	2.32	1.99	
4.95	16.24	46.5	1.76	Sand mixtures - silty sand to sandy silt	2.33	2.03	
5.00	16.40	45.9	1.71	Sand mixtures - silty sand to sandy silt	2.33	2.02	
5.05	16.57	47.7	1.55	Sand mixtures - silty sand to sandy silt	2.29	1.90	
5.10	16.73	45.5	1.54	Sand mixtures - silty sand to sandy silt	2.31	1.95	
5.15	16.90	40.8	2.09	Sand mixtures - silty sand to sandy silt	2.43	2.43	
5.20	17.06	37.6	2.06	Sand mixtures - silty sand to sandy silt	2.46	2.54	
5.25	17.22	37.6	1.98	Sand mixtures - silty sand to sandy silt	2.45	2.50	
5.30	17.39	43.6	1.73	Sand mixtures - silty sand to sandy silt	2.36	2.15	
5.35	17.55	44.7	1.87	Sand mixtures - silty sand to sandy silt	2.38	2.22	
5.40	17.72	43.3	2.27	Sand mixtures - silty sand to sandy silt	2.45	2.51	
5.45	17.88	32.4	2.26	Silt mixtures - clayey silt to silty clay	2.55	3.83	
5.50	18.04	21.1	2.43	Silt mixtures - clayey silt to silty clay	2.71		2.82
5.55	18.21	24.6	2.05	Silt mixtures - clayey silt to silty clay	2.62	6.05	3.28
5.60	18.37	28.3	2.18	Silt mixtures - clayey silt to silty clay	2.59	5.07	
5.65	18.54	25.5	2.27	Silt mixtures - clayey silt to silty clay	2.64	6.98	3.41
5.70	18.70	19.7	2.43	Silt mixtures - clayey silt to silty clay	2.75		2.63
5.75	18.86	19.0	2.63	Silt mixtures - clayey silt to silty clay	2.79		2.54
5.80	19.03	22.9	2.40	Silt mixtures - clayey silt to silty clay	2.70		3.05
5.85	19.19	19.9	2.83	Silt mixtures - clayey silt to silty clay	2.80		2.65
5.90	19.36	23.5	2.41	Silt mixtures - clayey silt to silty clay	2.70		3.14
5.95	19.52	25.7	2.44	Silt mixtures - clayey silt to silty clay	2.68	8.77	3.42
6.00	19.68	27.8	2.60	Silt mixtures - clayey silt to silty clay	2.67	8.41	3.71
6.05	19.85	25.1	2.70	Silt mixtures - clayey silt to silty clay	2.72		3.35
6.10	20.01	26.5	2.25	Silt mixtures - clayey silt to silty clay	2.65	7.54	3.53
6.15	20.18	29.4	2.09	Silt mixtures - clayey silt to silty clay	2.60	5.30	
6.20	20.34	30.6	1.93	Silt mixtures - clayey silt to silty clay	2.56	4.22	
6.25	20.51	31.0	2.04	Silt mixtures - clayey silt to silty clay	2.58	4.66	
6.30	20.67	25.8	3.15	Silt mixtures - clayey silt to silty clay	2.77		3.44
6.35	20.83	21.4	3.75	Clays - silty clay to clay	2.89		2.85
6.40	21.00	16.9	3.61	Clays - silty clay to clay	2.96		2.26
6.45	21.16	14.7	3.43	Clays - silty clay to clay	3.00		1.96
6.50	21.33	15.8	2.39	Silt mixtures - clayey silt to silty clay	2.88		2.11
6.55	21.49	14.6	2.77	Clays - silty clay to clay	2.95		1.94
6.60	21.65	23.4	2.33	Silt mixtures - clayey silt to silty clay	2.73		3.12
6.65	21.82	23.3	2.85	Silt mixtures - clayey silt to silty clay	2.80		3.11
6.70	21.98	24.7	2.61	Silt mixtures - clayey silt to silty clay	2.75		3.29
6.75	22.15	26.0	2.49	Silt mixtures - clayey silt to silty clay	2.72		3.47

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-10

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	15.9	2.99	Clays - silty clay to clay	2.96		2.13
6.85	22.47	11.4	3.53	Clays - silty clay to clay	3.13		1.52
6.90	22.64	12.1	2.45	Clays - silty clay to clay	3.01		1.61
6.95	22.80	11.4	2.74	Clays - silty clay to clay	3.07		1.52
7.00	22.97	11.0	2.25	Clays - silty clay to clay	3.03		1.47
7.05	23.13	9.6	3.91	Clays - silty clay to clay	3.24		1.28
7.10	23.29	12.0	3.18	Clays - silty clay to clay	3.10		1.60
7.15	23.46	11.1	3.76	Clays - silty clay to clay	3.18		1.48
7.20	23.62	13.7	4.04	Clays - silty clay to clay	3.12		1.83
7.25	23.79	20.1	3.11	Clays - silty clay to clay	2.91		2.69
7.30	23.95	33.9	2.07	Silt mixtures - clayey silt to silty clay	2.60	5.56	4.52
7.35	24.11	52.8	2.00	Sand mixtures - silty sand to sandy silt	2.44	2.48	
7.40	24.28	49.4	2.09	Sand mixtures - silty sand to sandy silt	2.48	2.65	
7.45	24.44	43.0	1.94	Sand mixtures - silty sand to sandy silt	2.51	2.97	
7.50	24.61	44.2	2.68	Silt mixtures - clayey silt to silty clay	2.60	5.37	
7.55	24.77	50.5	2.01	Sand mixtures - silty sand to sandy silt	2.47	2.59	
7.60	24.93	58.3	1.30	Sand mixtures - silty sand to sandy silt	2.29	1.90	
7.65	25.10	65.0	1.45	Sand mixtures - silty sand to sandy silt	2.28	1.89	
7.70	25.26	77.0	1.96	Sand mixtures - silty sand to sandy silt	2.32	2.01	
7.75	25.43	83.2	1.42	Sand mixtures - silty sand to sandy silt	2.20	1.65	
7.80	25.59	77.1	1.45	Sand mixtures - silty sand to sandy silt	2.23	1.73	
7.85	25.75	75.2	1.26	Sand mixtures - silty sand to sandy silt	2.20	1.66	
7.90	25.92	60.5	1.47	Sand mixtures - silty sand to sandy silt	2.32	2.02	
7.95	26.08	50.4	1.88	Sand mixtures - silty sand to sandy silt	2.46	2.58	
8.00	26.25	40.0	2.71	Silt mixtures - clayey silt to silty clay	2.66	7.93	5.34
8.05	26.41	34.1	2.66	Silt mixtures - clayey silt to silty clay	2.71		4.55
8.10	26.57	35.1	2.04	Silt mixtures - clayey silt to silty clay	2.63	6.39	4.68
8.15	26.74	38.6	1.64	Sand mixtures - silty sand to sandy silt	2.53	3.43	
8.20	26.90	47.5	1.43	Sand mixtures - silty sand to sandy silt	2.42	2.37	
8.25	27.07	56.4	1.22	Sand mixtures - silty sand to sandy silt	2.31	1.97	
8.30	27.23	61.6	1.30	Sand mixtures - silty sand to sandy silt	2.30	1.93	
8.35	27.39	63.0	1.22	Sand mixtures - silty sand to sandy silt	2.27	1.86	
8.40	27.56	65.4	1.59	Sand mixtures - silty sand to sandy silt	2.34	2.07	
8.45	27.72	67.3	1.45	Sand mixtures - silty sand to sandy silt	2.30	1.95	
8.50	27.89	64.5	1.45	Sand mixtures - silty sand to sandy silt	2.32	2.01	
8.55	28.05	64.6	1.46	Sand mixtures - silty sand to sandy silt	2.32	2.02	
8.60	28.21	66.7	1.11	Sand mixtures - silty sand to sandy silt	2.23	1.74	
8.65	28.38	62.6	1.28	Sand mixtures - silty sand to sandy silt	2.30	1.94	
8.70	28.54	59.3	1.32	Sand mixtures - silty sand to sandy silt	2.33	2.04	
8.75	28.71	60.4	1.34	Sand mixtures - silty sand to sandy silt	2.33	2.05	
8.80	28.87	64.0	1.32	Sand mixtures - silty sand to sandy silt	2.31	1.97	
8.85	29.04	72.8	1.39	Sand mixtures - silty sand to sandy silt	2.28	1.87	
8.90	29.20	85.8	1.32	Sand mixtures - silty sand to sandy silt	2.21	1.67	
8.95	29.36	91.9	1.49	Sand mixtures - silty sand to sandy silt	2.22	1.70	
9.00	29.53	101.2	1.44	Sand mixtures - silty sand to sandy silt	2.18	1.61	
9.05	29.69	112.0	1.39	Sand mixtures - silty sand to sandy silt	2.13	1.51	
9.10	29.86	121.3	1.38	Sand mixtures - silty sand to sandy silt	2.11	1.46	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-10

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	124.9	1.49	Sand mixtures - silty sand to sandy silt	2.12	1.48	
9.20	30.18	120.5	1.38	Sand mixtures - silty sand to sandy silt	2.11	1.46	
9.25	30.35	111.2	1.33	Sand mixtures - silty sand to sandy silt	2.13	1.50	
9.30	30.51	97.8	1.49	Sand mixtures - silty sand to sandy silt	2.21	1.68	
9.35	30.68	86.8	1.71	Sand mixtures - silty sand to sandy silt	2.30	1.93	
9.40	30.84	66.4	2.28	Silt mixtures - clayey silt to silty clay	2.49	2.68	
9.45	31.00	54.2	3.06	Silt mixtures - clayey silt to silty clay	2.65	7.66	7.23
9.50	31.17	37.4	3.26	Silt mixtures - clayey silt to silty clay	2.81		4.99
9.55	31.33	33.5	2.35	Silt mixtures - clayey silt to silty clay	2.75		4.47
9.60	31.50	50.3	1.35	Sand mixtures - silty sand to sandy silt	2.44	2.46	
9.65	31.66	53.1	1.65	Sand mixtures - silty sand to sandy silt	2.48	2.63	
9.70	31.82	57.6	1.65	Sand mixtures - silty sand to sandy silt	2.45	2.51	
9.75	31.99	76.2	2.12	Sand mixtures - silty sand to sandy silt	2.43	2.41	
9.80	32.15	98.0	1.56	Sand mixtures - silty sand to sandy silt	2.24	1.76	
9.85	32.32	90.4	1.97	Sand mixtures - silty sand to sandy silt	2.35	2.10	
9.90	32.48	91.3	1.15	Sand mixtures - silty sand to sandy silt	2.18	1.60	
9.95	32.64	85.5	1.29	Sand mixtures - silty sand to sandy silt	2.24	1.75	
10.00	32.81	87.4	1.28	Sand mixtures - silty sand to sandy silt	2.23	1.73	
10.05	32.97	79.6	1.42	Sand mixtures - silty sand to sandy silt	2.29	1.92	
10.10	33.14	59.0	2.21	Silt mixtures - clayey silt to silty clay	2.54	3.78	
10.15	33.30	36.8	3.37	Clays - silty clay to clay	2.85		4.91
10.20	33.46	27.9	3.42	Clays - silty clay to clay	2.95		3.72
10.25	33.63	37.3	2.35	Silt mixtures - clayey silt to silty clay	2.74		4.97
10.30	33.79	34.1	2.54	Silt mixtures - clayey silt to silty clay	2.80		4.55
10.35	33.96	26.6	3.66	Clays - silty clay to clay	2.99		3.55
10.40	34.12	22.4	3.27	Clays - silty clay to clay	3.03		2.99
10.45	34.28	21.7	3.28	Clays - silty clay to clay	3.04		2.89
10.50	34.45	26.6	2.61	Clays - silty clay to clay	2.91		3.54
10.55	34.61	34.9	1.82	Silt mixtures - clayey silt to silty clay	2.70		4.65
10.60	34.78	37.4	2.04	Silt mixtures - clayey silt to silty clay	2.71		4.99
10.65	34.94	47.1	1.53	Sand mixtures - silty sand to sandy silt	2.54	3.63	
10.70	35.10	49.8	1.83	Silt mixtures - clayey silt to silty clay	2.57	4.57	
10.75	35.27	55.8	1.57	Sand mixtures - silty sand to sandy silt	2.49	2.68	
10.80	35.43	59.3	1.76	Sand mixtures - silty sand to sandy silt	2.50	2.75	
10.85	35.60	60.9	1.47	Sand mixtures - silty sand to sandy silt	2.44	2.45	
10.90	35.76	59.4	1.51	Sand mixtures - silty sand to sandy silt	2.45	2.53	
10.95	35.92	58.7	1.97	Silt mixtures - clayey silt to silty clay	2.54	3.73	
11.00	36.09	64.1	1.96	Sand mixtures - silty sand to sandy silt	2.51	3.01	
11.05	36.25	65.2	1.90	Sand mixtures - silty sand to sandy silt	2.50	2.73	
11.10	36.42	67.3	2.07	Silt mixtures - clayey silt to silty clay	2.51	3.05	
11.15	36.58	69.8	1.93	Sand mixtures - silty sand to sandy silt	2.48	2.65	
11.20	36.74	70.4	1.88	Sand mixtures - silty sand to sandy silt	2.47	2.60	
11.25	36.91	66.8	1.72	Sand mixtures - silty sand to sandy silt	2.46	2.57	
11.30	37.07	61.1	1.84	Sand mixtures - silty sand to sandy silt	2.52	3.19	
11.35	37.24	59.0	1.88	Silt mixtures - clayey silt to silty clay	2.54	3.66	
11.40	37.40	63.0	1.80	Sand mixtures - silty sand to sandy silt	2.50	2.88	
11.45	37.57	68.5	1.86	Sand mixtures - silty sand to sandy silt	2.48	2.68	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-10

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	78.4	1.73	Sand mixtures - silty sand to sandy silt	2.41	2.35	
11.55	37.89	89.6	1.37	Sand mixtures - silty sand to sandy silt	2.29	1.91	
11.60	38.06	98.1	1.33	Sand mixtures - silty sand to sandy silt	2.25	1.78	
11.65	38.22	103.5	1.56	Sand mixtures - silty sand to sandy silt	2.28	1.88	
11.70	38.39	109.8	1.91	Sand mixtures - silty sand to sandy silt	2.33	2.03	
11.75	38.55	108.0	1.38	Sand mixtures - silty sand to sandy silt	2.23	1.73	
11.80	38.71	104.3	1.46	Sand mixtures - silty sand to sandy silt	2.26	1.82	
11.85	38.88	109.2	1.26	Sand mixtures - silty sand to sandy silt	2.20	1.66	
11.90	39.04	112.5	1.36	Sand mixtures - silty sand to sandy silt	2.22	1.69	
11.95	39.21	116.1	1.34	Sand mixtures - silty sand to sandy silt	2.20	1.65	
12.00	39.37	116.8	0.97	Sand mixtures - silty sand to sandy silt	2.10	1.44	
12.05	39.53	94.2	1.17	Sand mixtures - silty sand to sandy silt	2.24	1.76	
12.10	39.70	80.6	1.33	Sand mixtures - silty sand to sandy silt	2.34	2.07	
12.15	39.86	71.4	1.64	Sand mixtures - silty sand to sandy silt	2.45	2.53	
12.20	40.03	67.3	1.93	Silt mixtures - clayey silt to silty clay	2.53	3.40	
12.25	40.19	63.3	2.20	Silt mixtures - clayey silt to silty clay	2.60	5.32	
12.30	40.35	59.8	2.27	Silt mixtures - clayey silt to silty clay	2.63	6.58	7.98
12.35	40.52	57.4	2.28	Silt mixtures - clayey silt to silty clay	2.65	7.42	7.65
12.40	40.68	55.1	2.13	Silt mixtures - clayey silt to silty clay	2.64	7.20	7.35
12.45	40.85	49.6	2.35	Silt mixtures - clayey silt to silty clay	2.72		6.62
12.50	41.01	44.8	2.17	Silt mixtures - clayey silt to silty clay	2.73		5.98
12.55	41.17	44.9	1.68	Silt mixtures - clayey silt to silty clay	2.66	7.88	5.98
12.60	41.34	40.7	1.77	Silt mixtures - clayey silt to silty clay	2.72		5.43
12.65	41.50	37.4	1.77	Silt mixtures - clayey silt to silty clay	2.75		4.99
12.70	41.67	43.9	1.57	Silt mixtures - clayey silt to silty clay	2.65	7.62	5.85
12.75	41.83	48.3	1.66	Silt mixtures - clayey silt to silty clay	2.63	6.68	6.43
12.80	41.99	49.2	1.77	Silt mixtures - clayey silt to silty clay	2.65	7.35	6.55
12.85	42.16	53.9	1.82	Silt mixtures - clayey silt to silty clay	2.62	6.20	7.18
12.90	42.32	58.7	1.85	Silt mixtures - clayey silt to silty clay	2.59	5.18	
12.95	42.49	63.2	1.81	Silt mixtures - clayey silt to silty clay	2.56	4.18	
13.00	42.65	65.1	1.77	Silt mixtures - clayey silt to silty clay	2.54	3.74	
13.05	42.81	63.1	1.94	Silt mixtures - clayey silt to silty clay	2.59	4.92	
13.10	42.98	61.0	1.84	Silt mixtures - clayey silt to silty clay	2.58	4.86	
13.15	43.14	61.1	1.70	Silt mixtures - clayey silt to silty clay	2.56	4.19	
13.20	43.31	64.3	1.46	Sand mixtures - silty sand to sandy silt	2.49	2.73	
13.25	43.47	60.0	1.62	Silt mixtures - clayey silt to silty clay	2.56	4.05	
13.30	43.63	59.7	1.74	Silt mixtures - clayey silt to silty clay	2.58	4.82	
13.35	43.80	55.1	1.97	Silt mixtures - clayey silt to silty clay	2.66	7.68	7.34
13.40	43.96	50.4	2.14	Silt mixtures - clayey silt to silty clay	2.71		6.72
13.45	44.13	53.1	2.07	Silt mixtures - clayey silt to silty clay	2.69	9.48	7.08
13.50	44.29	53.1	2.10	Silt mixtures - clayey silt to silty clay	2.69	9.83	7.08
13.55	44.45	51.9	1.99	Silt mixtures - clayey silt to silty clay	2.69	9.52	6.93
13.60	44.62	46.6	1.98	Silt mixtures - clayey silt to silty clay	2.73		6.21
13.65	44.78	46.8	1.72	Silt mixtures - clayey silt to silty clay	2.69	9.60	6.24
13.70	44.95	51.3	1.81	Silt mixtures - clayey silt to silty clay	2.67	8.41	6.84
13.75	45.11	54.5	2.02	Silt mixtures - clayey silt to silty clay	2.68	9.10	7.26
13.80	45.28	55.4	2.15	Silt mixtures - clayey silt to silty clay	2.69	9.85	7.38

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-10

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	52.8	2.45	Silt mixtures - clayey silt to silty clay	2.75		7.04
13.90	45.60	62.0	2.11	Silt mixtures - clayey silt to silty clay	2.65	7.45	8.26
13.95	45.77	62.0	2.31	Silt mixtures - clayey silt to silty clay	2.68	8.93	8.27
14.00	45.93	61.4	2.28	Silt mixtures - clayey silt to silty clay	2.68	9.02	8.19
14.05	46.10	57.5	2.48	Silt mixtures - clayey silt to silty clay	2.73		7.66
14.10	46.26	56.0	2.69	Silt mixtures - clayey silt to silty clay	2.76		7.46
14.15	46.42	68.5	2.39	Silt mixtures - clayey silt to silty clay	2.66	7.91	9.13
14.20	46.59	52.1	2.95	Silt mixtures - clayey silt to silty clay	2.82		6.95
14.25	46.75	49.2	2.37	Silt mixtures - clayey silt to silty clay	2.78		6.56
14.30	46.92	61.5	1.63	Silt mixtures - clayey silt to silty clay	2.58	4.86	
14.35	47.08	66.3	2.14	Silt mixtures - clayey silt to silty clay	2.64	7.16	8.84
14.40	47.24	76.5	1.78	Sand mixtures - silty sand to sandy silt	2.53	3.39	
14.45	47.41	68.2	1.64	Silt mixtures - clayey silt to silty clay	2.55	3.90	
14.50	47.57	70.9	1.38	Sand mixtures - silty sand to sandy silt	2.48	2.66	
14.55	47.74	71.5	1.10	Sand mixtures - silty sand to sandy silt	2.41	2.34	
14.60	47.90	68.1	1.51	Sand mixtures - silty sand to sandy silt	2.53	3.40	
14.65	48.06	60.7	1.59	Silt mixtures - clayey silt to silty clay	2.59	5.22	
14.70	48.23	54.7	1.81	Silt mixtures - clayey silt to silty clay	2.68	8.78	7.29
14.75	48.39	54.1	1.65	Silt mixtures - clayey silt to silty clay	2.66	7.79	7.22
14.80	48.56	51.5	1.78	Silt mixtures - clayey silt to silty clay	2.70	9.93	6.87
14.85	48.72	50.5	1.83	Silt mixtures - clayey silt to silty clay	2.71		6.73
14.90	48.88	35.8	1.92	Silt mixtures - clayey silt to silty clay	2.86		4.77
14.95	49.05	23.1	2.29	Clays - silty clay to clay	3.08		3.08
15.00	49.21	59.3	1.39	Silt mixtures - clayey silt to silty clay	2.58	4.61	
15.05	49.38	69.2	1.58	Sand mixtures - silty sand to sandy silt	2.55	3.95	
15.10	49.54	74.2	1.82	Silt mixtures - clayey silt to silty clay	2.57	4.47	
15.15	49.70	76.4	1.84	Silt mixtures - clayey silt to silty clay	2.56	4.25	
15.20	49.87	73.4	2.52	Silt mixtures - clayey silt to silty clay	2.68	8.85	9.79
15.25	50.03	83.7	2.16	Silt mixtures - clayey silt to silty clay	2.58	4.85	
15.30	50.20	86.72	1.83	Sand mixtures - silty sand to sandy silt	2.52	3.11	
15.35	50.36	87.76	2.02	Silt mixtures - clayey silt to silty clay	2.54	3.75	
15.40	50.52	69.50	2.24	Silt mixtures - clayey silt to silty clay	2.67	8.29	9.27
15.45	50.69	46.27	2.30	Silt mixtures - clayey silt to silty clay	2.82		6.17
15.50	50.85	54.28	1.53	Silt mixtures - clayey silt to silty clay	2.65	7.57	7.24
15.55	51.02	65.51	1.31	Sand mixtures - silty sand to sandy silt	2.53	3.36	
15.60	51.18	59.39	1.78	Silt mixtures - clayey silt to silty clay	2.66	8.00	7.92
15.65	51.34	57.65	1.96	Silt mixtures - clayey silt to silty clay	2.70	10.09	7.69
15.70	51.51	58.61	2.10	Silt mixtures - clayey silt to silty clay	2.71		7.81
15.75	51.67	60.92	2.12	Silt mixtures - clayey silt to silty clay	2.70		8.12
15.80	51.84	69.26	1.66	Silt mixtures - clayey silt to silty clay	2.58	4.85	
15.85	52.00	82.60	1.65	Sand mixtures - silty sand to sandy silt	2.51	3.01	
15.90	52.16	84.54	1.93	Silt mixtures - clayey silt to silty clay	2.55	3.99	
15.95	52.33	84.17	1.91	Silt mixtures - clayey silt to silty clay	2.55	3.97	
16.00	52.49	58.31	2.30	Silt mixtures - clayey silt to silty clay	2.74		7.78
16.05	52.66	49.90	2.18	Silt mixtures - clayey silt to silty clay	2.79		6.65
16.10	52.82	54.93	1.87	Silt mixtures - clayey silt to silty clay	2.71		7.32
16.15	52.98	45.11	1.61	Silt mixtures - clayey silt to silty clay	2.74		6.02

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-10

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
16.20	53.15	53.94	1.63	Silt mixtures - clayey silt to silty clay	2.68	9.09	7.19
16.25	53.31	73.48	1.73	Silt mixtures - clayey silt to silty clay	2.58	4.74	
16.30	53.48	93.80	1.82	Sand mixtures - silty sand to sandy silt	2.50	2.75	
16.35	53.64	106.07	2.01	Sand mixtures - silty sand to sandy silt	2.48	2.68	
16.40	53.81	118.96	1.89	Sand mixtures - silty sand to sandy silt	2.42	2.39	
16.45	53.97	140.25	1.71	Sand mixtures - silty sand to sandy silt	2.32	2.02	
16.50	54.13	139.23	1.78	Sand mixtures - silty sand to sandy silt	2.34	2.07	
16.55	54.30	121.42	1.89	Sand mixtures - silty sand to sandy silt	2.42	2.37	
16.60	54.46	104.19	2.24	Silt mixtures - clayey silt to silty clay	2.53	3.52	
16.65	54.63	95.17	2.01	Silt mixtures - clayey silt to silty clay	2.53	3.48	
16.70	54.79	92.05	2.08	Silt mixtures - clayey silt to silty clay	2.56	4.11	
16.75	54.95	90.74	2.32	Silt mixtures - clayey silt to silty clay	2.60	5.50	12.10
16.80	55.12	81.78	2.63	Silt mixtures - clayey silt to silty clay	2.67	8.69	10.90
16.85	55.28	58.76	2.89	Silt mixtures - clayey silt to silty clay	2.82		7.83
16.90	55.45	51.93	2.95	Clays - silty clay to clay	2.87		6.92
16.95	55.61	53.95	2.89	Silt mixtures - clayey silt to silty clay	2.85		7.19
17.00	55.77	83.22	2.36	Silt mixtures - clayey silt to silty clay	2.64	7.00	11.10
17.05	55.94	95.02	2.32	Silt mixtures - clayey silt to silty clay	2.59	5.03	
17.10	56.10	89.92	2.17	Silt mixtures - clayey silt to silty clay	2.59	5.01	
17.15	56.27	87.06	2.22	Silt mixtures - clayey silt to silty clay	2.61	5.74	11.61
17.20	56.43	104.11	2.15	Silt mixtures - clayey silt to silty clay	2.53	3.41	
17.25	56.59	102.09	2.41	Silt mixtures - clayey silt to silty clay	2.58	4.68	
17.30	56.76	99.82	2.56	Silt mixtures - clayey silt to silty clay	2.61	5.64	13.31
17.35	56.92	99.72	2.97	Silt mixtures - clayey silt to silty clay	2.65	7.54	13.30
17.40	57.09	101.97	2.78	Silt mixtures - clayey silt to silty clay	2.62	6.34	13.60
17.45	57.25	104.14	2.81	Silt mixtures - clayey silt to silty clay	2.62	6.24	13.89
17.50	57.41	105.69	2.61	Silt mixtures - clayey silt to silty clay	2.60	5.25	
17.55	57.58	109.15	2.35	Silt mixtures - clayey silt to silty clay	2.55	3.88	
17.60	57.74	111.11	2.21	Silt mixtures - clayey silt to silty clay	2.52	3.23	
17.65	57.91	116.90	2.38	Silt mixtures - clayey silt to silty clay	2.53	3.37	
17.70	58.07	128.97	2.57	Silt mixtures - clayey silt to silty clay	2.52	3.19	
17.75	58.23	132.98	2.66	Silt mixtures - clayey silt to silty clay	2.52	3.25	
17.80	58.40	131.69	2.69	Silt mixtures - clayey silt to silty clay	2.53	3.42	
17.85	58.56	130.03	2.76	Silt mixtures - clayey silt to silty clay	2.55	3.78	
17.90	58.73	127.68	2.70	Silt mixtures - clayey silt to silty clay	2.54	3.78	
17.95	58.89	119.46	2.78	Silt mixtures - clayey silt to silty clay	2.58	4.75	
18.00	59.05	107.21	2.66	Silt mixtures - clayey silt to silty clay	2.60	5.51	14.29
18.05	59.22	97.96	2.81	Silt mixtures - clayey silt to silty clay	2.65	7.39	13.06
18.10	59.38	100.88	2.79	Silt mixtures - clayey silt to silty clay	2.64	6.89	13.45
18.15	59.55	98.12	2.84	Silt mixtures - clayey silt to silty clay	2.65	7.58	13.08
18.20	59.71	104.62	2.66	Silt mixtures - clayey silt to silty clay	2.61	5.88	13.95
18.25	59.87	91.92	2.88	Silt mixtures - clayey silt to silty clay	2.68	8.98	12.26
18.30	60.04	91.13	2.66	Silt mixtures - clayey silt to silty clay	2.66	7.94	12.15
18.35	60.20	77.66	2.54	Silt mixtures - clayey silt to silty clay	2.70		10.35
18.40	60.37	71.16	2.80	Silt mixtures - clayey silt to silty clay	2.76		9.49
18.45	60.53	82.79	2.63	Silt mixtures - clayey silt to silty clay	2.69	9.61	11.04
18.50	60.69	74.22	2.60	Silt mixtures - clayey silt to silty clay	2.73		9.90

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-10

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
18.55	60.86	77.92	3.00	Silt mixtures - clayey silt to silty clay	2.75		10.39
18.60	61.02	80.53	2.65	Silt mixtures - clayey silt to silty clay	2.70		10.74
18.65	61.19	81.44	3.15	Silt mixtures - clayey silt to silty clay	2.75		10.86
18.70	61.35	80.91	3.14	Silt mixtures - clayey silt to silty clay	2.75		10.79
18.75	61.52	70.28	2.45	Silt mixtures - clayey silt to silty clay	2.73		9.37
18.80	61.68	53.52	2.72	Silt mixtures - clayey silt to silty clay	2.86		7.14
18.85	61.84	56.55	2.37	Silt mixtures - clayey silt to silty clay	2.80		7.54
18.90	62.01	47.69	2.90	Clays - silty clay to clay	2.92		6.36
18.95	62.17	51.41	3.35	Clays - silty clay to clay	2.93		6.85
19.00	62.34	52.92	2.13	Silt mixtures - clayey silt to silty clay	2.80		7.06
19.05	62.50	48.13	1.96	Silt mixtures - clayey silt to silty clay	2.81		6.42
19.10	62.66	51.24	3.24	Clays - silty clay to clay	2.93		6.83
19.15	62.83	85.99	3.07	Silt mixtures - clayey silt to silty clay	2.73		11.46
19.20	62.99	93.96	3.26	Silt mixtures - clayey silt to silty clay	2.72		12.53
19.25	63.16	103.45	3.24	Silt mixtures - clayey silt to silty clay	2.69	9.42	13.79
19.30	63.32	118.11	2.95	Silt mixtures - clayey silt to silty clay	2.62	6.03	15.75
19.35	63.48	114.68	3.28	Silt mixtures - clayey silt to silty clay	2.66	7.90	15.29
19.40	63.65	123.90	3.23	Silt mixtures - clayey silt to silty clay	2.63	6.58	16.52
19.45	63.81	120.95	3.53	Silt mixtures - clayey silt to silty clay	2.67	8.24	16.13
19.50	63.98	118.03	2.95	Silt mixtures - clayey silt to silty clay	2.62	6.13	15.74
19.55	64.14	107.41	2.91	Silt mixtures - clayey silt to silty clay	2.65	7.26	14.32
19.60	64.30	136.87	2.26	Sand mixtures - silty sand to sandy silt	2.48	2.66	
19.65	64.47	158.29	2.11	Sand mixtures - silty sand to sandy silt	2.40	2.30	
19.70	64.63	141.71	4.01	Silt mixtures - clayey silt to silty clay	2.66	7.90	18.89
19.75	64.80	124.28	4.46	Clays - silty clay to clay	2.73		16.57
19.80	64.96	61.33	8.59	Clays - silty clay to clay	3.17		8.18
19.85	65.12	81.70	2.87	Silt mixtures - clayey silt to silty clay	2.74		10.89
19.90	65.29	78.10	4.04	Clays - silty clay to clay	2.86		10.41
19.95	65.45	89.00	3.11	Silt mixtures - clayey silt to silty clay	2.73		11.87
20.00	65.62	78.69	6.65	Clays - silty clay to clay	3.01		10.49
20.05	65.78	213.71	3.48	Silt mixtures - clayey silt to silty clay	2.49	2.70	
20.10	65.94	295.33	3.32	Sand mixtures - silty sand to sandy silt	2.36	2.16	
20.15	66.11	270.59	4.69	Silt mixtures - clayey silt to silty clay	2.53	3.38	
20.20	66.27	227.23	6.38	Clays - silty clay to clay	2.68	9.13	30.30
20.25	66.44	205.93	7.76	Clays - silty clay to clay	2.78		27.46
20.30	66.60	283.54	5.67	Silt mixtures - clayey silt to silty clay	2.58	4.83	
20.35	66.76	222.63	8.33	Clays - silty clay to clay	2.78		29.68
20.40	66.93	448.06	4.46	Very stiff, fine grained	2.36	2.15	
20.45	67.09	524.83	4.11	Very stiff, fine grained	2.28	1.89	
20.50	67.26	486.95	4.37	Very stiff, fine grained	2.33	2.04	
20.55	67.42	433.60	4.71	Very stiff, fine grained	2.40	2.29	
20.60	67.58	399.26	5.00	Very stiff, fine grained	2.45	2.51	
20.65	67.75	425.24	5.00	Very stiff, fine grained	2.43	2.43	
20.70	67.91	538.06	5.00	Very stiff, fine grained	2.37	2.16	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 15:34
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 38.5 feet
SOUNDING: CPT-11

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	82.2	1.06	Sands - clean sands to silty sand	1.78	1.09	
0.10	0.33	62.9	1.58	Sands - clean sands to silty sand	1.99	1.28	
0.15	0.49	51.0	1.79	Sand mixtures - silty sand to sandy silt	2.09	1.43	
0.20	0.66	49.9	1.60	Sand mixtures - silty sand to sandy silt	2.07	1.39	
0.25	0.82	51.5	1.55	Sand mixtures - silty sand to sandy silt	2.05	1.36	
0.30	0.98	45.7	1.72	Sand mixtures - silty sand to sandy silt	2.11	1.47	
0.35	1.15	39.7	1.78	Sand mixtures - silty sand to sandy silt	2.17	1.59	
0.40	1.31	38.4	1.97	Sand mixtures - silty sand to sandy silt	2.21	1.68	
0.45	1.48	40.9	1.02	Sands - clean sands to silty sand	2.00	1.30	
0.50	1.64	13.6	2.03	Silt mixtures - clayey silt to silty clay	2.57	4.38	
0.55	1.80	9.4	2.77	Silt mixtures - clayey silt to silty clay	2.78		1.26
0.60	1.97	10.4	3.31	Silt mixtures - clayey silt to silty clay	2.79		1.39
0.65	2.13	17.7	2.07	Sand mixtures - silty sand to sandy silt	2.48	2.67	
0.70	2.30	23.3	1.43	Sand mixtures - silty sand to sandy silt	2.29	1.90	
0.75	2.46	19.8	1.46	Sand mixtures - silty sand to sandy silt	2.35	2.11	
0.80	2.62	19.9	1.81	Sand mixtures - silty sand to sandy silt	2.41	2.33	
0.85	2.79	25.8	1.99	Sand mixtures - silty sand to sandy silt	2.35	2.09	
0.90	2.95	40.3	1.92	Sand mixtures - silty sand to sandy silt	2.19	1.63	
0.95	3.12	60.6	1.47	Sands - clean sands to silty sand	1.98	1.27	
1.00	3.28	73.8	1.72	Sands - clean sands to silty sand	1.97	1.26	
1.05	3.44	64.6	1.73	Sands - clean sands to silty sand	2.01	1.31	
1.10	3.61	58.6	1.76	Sand mixtures - silty sand to sandy silt	2.05	1.36	
1.15	3.77	80.4	1.60	Sands - clean sands to silty sand	1.92	1.20	
1.20	3.94	117.9	1.42	Sands - clean sands to silty sand	1.77	1.08	
1.25	4.10	146.9	1.42	Sands - clean sands to silty sand	1.72	1.04	
1.30	4.27	159.4	1.41	Sands - clean sands to silty sand	1.69	1.03	
1.35	4.43	169.3	1.59	Sands - clean sands to silty sand	1.72	1.05	
1.40	4.59	165.8	1.31	Sands - clean sands to silty sand	1.67	1.01	
1.45	4.76	152.4	1.39	Sands - clean sands to silty sand	1.71	1.04	
1.50	4.92	142.5	2.21	Sands - clean sands to silty sand	1.88	1.16	
1.55	5.09	144.4	2.06	Sands - clean sands to silty sand	1.86	1.14	
1.60	5.25	133.9	1.74	Sands - clean sands to silty sand	1.82	1.12	
1.65	5.41	137.1	1.55	Sands - clean sands to silty sand	1.78	1.09	
1.70	5.58	138.9	1.44	Sands - clean sands to silty sand	1.76	1.07	
1.75	5.74	135.8	1.46	Sands - clean sands to silty sand	1.77	1.08	
1.80	5.91	138.4	1.10	Sands - clean sands to silty sand	1.69	1.03	
1.85	6.07	137.2	1.29	Sands - clean sands to silty sand	1.74	1.06	
1.90	6.23	138.0	1.31	Sands - clean sands to silty sand	1.75	1.06	
1.95	6.40	132.1	1.33	Sands - clean sands to silty sand	1.77	1.08	
2.00	6.56	123.0	1.22	Sands - clean sands to silty sand	1.76	1.07	
2.05	6.73	116.6	1.11	Sands - clean sands to silty sand	1.75	1.07	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-11

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	110.6	1.30	Sands - clean sands to silty sand	1.82	1.11	
2.15	7.05	108.4	1.14	Sands - clean sands to silty sand	1.78	1.09	
2.20	7.22	108.4	0.59	Sands - clean sands to silty sand	1.61	1.00	
2.25	7.38	112.4	1.73	Sands - clean sands to silty sand	1.91	1.19	
2.30	7.55	134.3	1.33	Sands - clean sands to silty sand	1.79	1.09	
2.35	7.71	96.6	2.26	Sand mixtures - silty sand to sandy silt	2.04	1.34	
2.40	7.87	94.7	1.27	Sands - clean sands to silty sand	1.87	1.16	
2.45	8.04	93.6	0.86	Sands - clean sands to silty sand	1.77	1.08	
2.50	8.20	88.8	1.13	Sands - clean sands to silty sand	1.86	1.15	
2.55	8.37	89.1	1.14	Sands - clean sands to silty sand	1.87	1.15	
2.60	8.53	90.8	1.30	Sands - clean sands to silty sand	1.90	1.18	
2.65	8.69	88.9	1.33	Sands - clean sands to silty sand	1.92	1.20	
2.70	8.86	89.4	1.26	Sands - clean sands to silty sand	1.90	1.18	
2.75	9.02	88.7	1.12	Sands - clean sands to silty sand	1.88	1.16	
2.80	9.19	89.3	1.16	Sands - clean sands to silty sand	1.89	1.17	
2.85	9.35	86.9	1.13	Sands - clean sands to silty sand	1.89	1.17	
2.90	9.51	77.6	1.22	Sands - clean sands to silty sand	1.95	1.23	
2.95	9.68	69.7	1.33	Sands - clean sands to silty sand	2.01	1.30	
3.00	9.84	60.6	1.34	Sand mixtures - silty sand to sandy silt	2.05	1.37	
3.05	10.01	53.6	1.47	Sand mixtures - silty sand to sandy silt	2.12	1.48	
3.10	10.17	50.4	1.36	Sand mixtures - silty sand to sandy silt	2.12	1.48	
3.15	10.33	45.1	2.41	Sand mixtures - silty sand to sandy silt	2.32	1.99	
3.20	10.50	53.7	2.17	Sand mixtures - silty sand to sandy silt	2.24	1.76	
3.25	10.66	42.1	2.93	Sand mixtures - silty sand to sandy silt	2.40	2.30	
3.30	10.83	55.2	1.91	Sand mixtures - silty sand to sandy silt	2.20	1.66	
3.35	10.99	70.5	1.43	Sand mixtures - silty sand to sandy silt	2.05	1.36	
3.40	11.15	78.9	1.18	Sands - clean sands to silty sand	1.96	1.25	
3.45	11.32	79.4	0.99	Sands - clean sands to silty sand	1.92	1.20	
3.50	11.48	82.9	0.88	Sands - clean sands to silty sand	1.87	1.16	
3.55	11.65	75.8	1.52	Sand mixtures - silty sand to sandy silt	2.06	1.37	
3.60	11.81	91.3	1.27	Sands - clean sands to silty sand	1.95	1.23	
3.65	11.97	85.7	1.59	Sand mixtures - silty sand to sandy silt	2.04	1.35	
3.70	12.14	84.0	1.41	Sands - clean sands to silty sand	2.01	1.31	
3.75	12.30	81.2	1.36	Sands - clean sands to silty sand	2.01	1.31	
3.80	12.47	79.6	1.23	Sands - clean sands to silty sand	1.99	1.29	
3.85	12.63	76.8	1.21	Sands - clean sands to silty sand	2.00	1.30	
3.90	12.80	71.7	1.25	Sands - clean sands to silty sand	2.04	1.34	
3.95	12.96	69.9	1.27	Sands - clean sands to silty sand	2.05	1.36	
4.00	13.12	69.4	1.29	Sand mixtures - silty sand to sandy silt	2.06	1.38	
4.05	13.29	68.9	1.44	Sand mixtures - silty sand to sandy silt	2.10	1.44	
4.10	13.45	68.4	1.37	Sand mixtures - silty sand to sandy silt	2.09	1.43	
4.15	13.62	68.3	1.30	Sand mixtures - silty sand to sandy silt	2.08	1.41	
4.20	13.78	68.5	1.28	Sand mixtures - silty sand to sandy silt	2.07	1.40	
4.25	13.94	70.1	1.22	Sands - clean sands to silty sand	2.06	1.37	
4.30	14.11	71.0	1.19	Sands - clean sands to silty sand	2.05	1.36	
4.35	14.27	72.0	1.21	Sands - clean sands to silty sand	2.05	1.36	
4.40	14.44	75.0	1.36	Sand mixtures - silty sand to sandy silt	2.07	1.40	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-11

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	73.6	1.70	Sand mixtures - silty sand to sandy silt	2.15	1.54	
4.50	14.76	78.5	1.42	Sand mixtures - silty sand to sandy silt	2.08	1.41	
4.55	14.93	72.3	1.30	Sand mixtures - silty sand to sandy silt	2.08	1.41	
4.60	15.09	70.1	1.28	Sand mixtures - silty sand to sandy silt	2.09	1.42	
4.65	15.26	63.7	1.32	Sand mixtures - silty sand to sandy silt	2.13	1.50	
4.70	15.42	57.3	1.37	Sand mixtures - silty sand to sandy silt	2.18	1.60	
4.75	15.58	54.7	1.52	Sand mixtures - silty sand to sandy silt	2.22	1.71	
4.80	15.75	54.8	1.38	Sand mixtures - silty sand to sandy silt	2.20	1.65	
4.85	15.91	59.8	1.38	Sand mixtures - silty sand to sandy silt	2.17	1.59	
4.90	16.08	68.8	1.28	Sand mixtures - silty sand to sandy silt	2.11	1.46	
4.95	16.24	75.4	1.42	Sand mixtures - silty sand to sandy silt	2.11	1.47	
5.00	16.40	80.3	1.28	Sand mixtures - silty sand to sandy silt	2.06	1.38	
5.05	16.57	80.2	1.35	Sand mixtures - silty sand to sandy silt	2.08	1.41	
5.10	16.73	83.0	1.12	Sands - clean sands to silty sand	2.02	1.32	
5.15	16.90	87.9	1.30	Sands - clean sands to silty sand	2.05	1.36	
5.20	17.06	95.0	1.28	Sands - clean sands to silty sand	2.02	1.32	
5.25	17.22	94.3	1.37	Sands - clean sands to silty sand	2.04	1.35	
5.30	17.39	98.4	1.67	Sand mixtures - silty sand to sandy silt	2.09	1.43	
5.35	17.55	101.7	1.45	Sand mixtures - silty sand to sandy silt	2.04	1.35	
5.40	17.72	101.1	1.37	Sands - clean sands to silty sand	2.03	1.33	
5.45	17.88	98.7	1.12	Sands - clean sands to silty sand	1.98	1.26	
5.50	18.04	96.0	1.27	Sands - clean sands to silty sand	2.03	1.33	
5.55	18.21	93.4	1.79	Sand mixtures - silty sand to sandy silt	2.14	1.53	
5.60	18.37	98.3	1.85	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.65	18.54	108.1	1.46	Sands - clean sands to silty sand	2.04	1.34	
5.70	18.70	108.9	1.42	Sands - clean sands to silty sand	2.03	1.33	
5.75	18.86	107.3	1.40	Sands - clean sands to silty sand	2.03	1.33	
5.80	19.03	103.6	1.43	Sand mixtures - silty sand to sandy silt	2.05	1.36	
5.85	19.19	97.5	1.50	Sand mixtures - silty sand to sandy silt	2.09	1.42	
5.90	19.36	88.7	1.54	Sand mixtures - silty sand to sandy silt	2.13	1.50	
5.95	19.52	86.3	1.59	Sand mixtures - silty sand to sandy silt	2.15	1.54	
6.00	19.68	86.6	1.57	Sand mixtures - silty sand to sandy silt	2.14	1.53	
6.05	19.85	87.8	1.54	Sand mixtures - silty sand to sandy silt	2.14	1.51	
6.10	20.01	89.5	1.60	Sand mixtures - silty sand to sandy silt	2.14	1.53	
6.15	20.18	89.6	1.54	Sand mixtures - silty sand to sandy silt	2.13	1.51	
6.20	20.34	91.2	1.39	Sand mixtures - silty sand to sandy silt	2.10	1.44	
6.25	20.51	92.1	1.34	Sand mixtures - silty sand to sandy silt	2.09	1.42	
6.30	20.67	96.2	1.36	Sand mixtures - silty sand to sandy silt	2.08	1.41	
6.35	20.83	102.9	1.32	Sands - clean sands to silty sand	2.05	1.36	
6.40	21.00	108.8	0.97	Sands - clean sands to silty sand	1.94	1.22	
6.45	21.16	109.3	1.34	Sands - clean sands to silty sand	2.04	1.34	
6.50	21.33	101.4	1.49	Sand mixtures - silty sand to sandy silt	2.10	1.44	
6.55	21.49	99.1	1.41	Sand mixtures - silty sand to sandy silt	2.09	1.43	
6.60	21.65	102.0	1.45	Sand mixtures - silty sand to sandy silt	2.09	1.43	
6.65	21.82	113.7	1.25	Sands - clean sands to silty sand	2.01	1.31	
6.70	21.98	112.8	1.20	Sands - clean sands to silty sand	2.00	1.30	
6.75	22.15	106.1	1.19	Sands - clean sands to silty sand	2.02	1.32	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-11

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	90.9	1.29	Sand mixtures - silty sand to sandy silt	2.10	1.45	
6.85	22.47	71.0	1.52	Sand mixtures - silty sand to sandy silt	2.23	1.74	
6.90	22.64	57.0	1.83	Sand mixtures - silty sand to sandy silt	2.37	2.17	
6.95	22.80	51.3	1.84	Sand mixtures - silty sand to sandy silt	2.41	2.33	
7.00	22.97	46.1	2.08	Sand mixtures - silty sand to sandy silt	2.48	2.67	
7.05	23.13	40.1	1.82	Sand mixtures - silty sand to sandy silt	2.50	2.73	
7.10	23.29	31.6	1.59	Sand mixtures - silty sand to sandy silt	2.54	3.74	
7.15	23.46	19.4	2.55	Silt mixtures - clayey silt to silty clay	2.86		2.58
7.20	23.62	14.2	6.27	Clays - silty clay to clay	3.24		1.89
7.25	23.79	20.7	8.62	Clays - silty clay to clay	3.21		2.76
7.30	23.95	42.4	6.27	Clays - silty clay to clay	2.88		5.65
7.35	24.11	64.3	4.88	Silt mixtures - clayey silt to silty clay	2.67	8.28	8.57
7.40	24.28	73.2	4.96	Silt mixtures - clayey silt to silty clay	2.64	6.80	9.76
7.45	24.44	84.0	5.20	Silt mixtures - clayey silt to silty clay	2.61	5.89	11.20
7.50	24.61	85.5	5.66	Clays - silty clay to clay	2.64	7.00	11.40
7.55	24.77	121.5	4.53	Silt mixtures - clayey silt to silty clay	2.46	2.56	
7.60	24.93	132.6	5.58	Very stiff, fine grained	2.51	3.09	
7.65	25.10	131.5	6.83	Very stiff, fine grained	2.59	5.22	
7.70	25.26	171.6	5.89	Very stiff, fine grained	2.47	2.61	
7.75	25.43	158.4	6.29	Very stiff, fine grained	2.52	3.16	
7.80	25.59	147.2	6.50	Very stiff, fine grained	2.55	3.95	
7.85	25.75	146.4	6.90	Very stiff, fine grained	2.58	4.67	
7.90	25.92	186.2	5.54	Very stiff, fine grained	2.43	2.44	
7.95	26.08	166.8	6.47	Very stiff, fine grained	2.52	3.25	
8.00	26.25	162.8	6.25	Very stiff, fine grained	2.52	3.14	
8.05	26.41	153.6	6.25	Very stiff, fine grained	2.53	3.51	
8.10	26.57	142.0	6.36	Very stiff, fine grained	2.56	4.25	
8.15	26.74	131.9	6.32	Very stiff, fine grained	2.58	4.83	
8.20	26.90	137.1	6.43	Very stiff, fine grained	2.58	4.76	
8.25	27.07	138.6	6.54	Very stiff, fine grained	2.59	4.93	
8.30	27.23	139.2	6.41	Very stiff, fine grained	2.58	4.71	
8.35	27.39	133.7	6.79	Very stiff, fine grained	2.61	5.87	17.82
8.40	27.56	140.7	6.15	Very stiff, fine grained	2.56	4.26	
8.45	27.72	135.0	6.10	Very stiff, fine grained	2.57	4.54	
8.50	27.89	128.8	6.85	Very stiff, fine grained	2.63	6.62	17.17
8.55	28.05	114.5	6.78	Clays - silty clay to clay	2.66	8.04	15.27
8.60	28.21	118.9	6.22	Clays - silty clay to clay	2.62	6.19	15.86
8.65	28.38	103.3	6.91	Clays - silty clay to clay	2.70		13.77
8.70	28.54	112.6	6.37	Clays - silty clay to clay	2.65	7.42	15.02
8.75	28.71	113.9	5.90	Clays - silty clay to clay	2.62	6.12	15.19
8.80	28.87	97.5	6.09	Clays - silty clay to clay	2.68	8.92	12.99
8.85	29.04	93.1	5.48	Clays - silty clay to clay	2.66	7.73	12.41
8.90	29.20	92.8	6.06	Clays - silty clay to clay	2.70	9.88	12.38
8.95	29.36	96.4	6.13	Clays - silty clay to clay	2.69	9.54	12.86
9.00	29.53	110.7	5.77	Clays - silty clay to clay	2.63	6.49	14.76
9.05	29.69	106.7	5.25	Silt mixtures - clayey silt to silty clay	2.61	5.62	14.23
9.10	29.86	94.0	5.57	Clays - silty clay to clay	2.67	8.32	12.53

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-11

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	85.9	5.57	Clays - silty clay to clay	2.70	10.01	11.45
9.20	30.18	84.8	5.07	Silt mixtures - clayey silt to silty clay	2.67	8.40	11.31
9.25	30.35	84.9	4.84	Silt mixtures - clayey silt to silty clay	2.65	7.65	11.32
9.30	30.51	80.4	5.72	Clays - silty clay to clay	2.73		10.72
9.35	30.68	97.1	4.99	Silt mixtures - clayey silt to silty clay	2.63	6.44	12.95
9.40	30.84	92.1	4.72	Silt mixtures - clayey silt to silty clay	2.63	6.38	12.27
9.45	31.00	84.2	4.06	Silt mixtures - clayey silt to silty clay	2.60	5.47	11.23
9.50	31.17	82.8	5.02	Clays - silty clay to clay	2.68	9.23	11.04
9.55	31.33	101.4	4.62	Silt mixtures - clayey silt to silty clay	2.59	5.16	
9.60	31.50	99.5	5.36	Silt mixtures - clayey silt to silty clay	2.65	7.66	13.26
9.65	31.66	106.6	4.79	Silt mixtures - clayey silt to silty clay	2.59	5.21	
9.70	31.82	97.8	5.45	Clays - silty clay to clay	2.67	8.41	13.04
9.75	31.99	96.2	5.07	Silt mixtures - clayey silt to silty clay	2.65	7.44	12.82
9.80	32.15	100.0	5.53	Clays - silty clay to clay	2.67	8.53	13.33
9.85	32.32	111.5	5.96	Clays - silty clay to clay	2.67	8.34	14.87
9.90	32.48	108.4	6.18	Clays - silty clay to clay	2.69	9.66	14.45
9.95	32.64	104.2	5.40	Clays - silty clay to clay	2.66	7.69	13.90
10.00	32.81	97.2	5.34	Clays - silty clay to clay	2.67	8.69	12.95
10.05	32.97	84.6	5.74	Clays - silty clay to clay	2.75		11.27
10.10	33.14	95.7	5.00	Silt mixtures - clayey silt to silty clay	2.66	7.88	12.76
10.15	33.30	87.0	5.80	Clays - silty clay to clay	2.74		11.60
10.20	33.46	89.3	5.18	Clays - silty clay to clay	2.70	10.01	11.91
10.25	33.63	91.1	4.80	Silt mixtures - clayey silt to silty clay	2.67	8.20	12.15
10.30	33.79	77.1	6.05	Clays - silty clay to clay	2.80		10.28
10.35	33.96	100.7	4.97	Silt mixtures - clayey silt to silty clay	2.65	7.43	13.42
10.40	34.12	101.7	4.55	Silt mixtures - clayey silt to silty clay	2.62	6.01	13.55
10.45	34.28	89.1	4.15	Silt mixtures - clayey silt to silty clay	2.63	6.46	11.88
10.50	34.45	85.1	4.31	Silt mixtures - clayey silt to silty clay	2.66	7.81	11.35
10.55	34.61	75.8	4.78	Clays - silty clay to clay	2.73		10.10
10.60	34.78	77.4	4.34	Silt mixtures - clayey silt to silty clay	2.69	9.87	10.32
10.65	34.94	73.2	4.18	Silt mixtures - clayey silt to silty clay	2.70		9.77
10.70	35.10	77.4	5.50	Clays - silty clay to clay	2.78		10.32
10.75	35.27	89.5	5.78	Clays - silty clay to clay	2.75		11.93
10.80	35.43	120.0	4.76	Silt mixtures - clayey silt to silty clay	2.59	5.18	
10.85	35.60	118.0	5.89	Clays - silty clay to clay	2.68	8.97	15.73
10.90	35.76	134.8	7.24	Clays - silty clay to clay	2.72		17.97
10.95	35.92	180.9	6.25	Very stiff, fine grained	2.58	4.74	
11.00	36.09	170.8	6.35	Very stiff, fine grained	2.60	5.54	22.78
11.05	36.25	144.4	6.84	Clays - silty clay to clay	2.68	9.16	19.26
11.10	36.42	144.3	6.71	Clays - silty clay to clay	2.68	8.82	19.24
11.15	36.58	132.7	6.93	Clays - silty clay to clay	2.72		17.69
11.20	36.74	129.0	6.09	Clays - silty clay to clay	2.68	8.81	17.20
11.25	36.91	124.7	5.94	Clays - silty clay to clay	2.68	8.95	16.63
11.30	37.07	129.8	6.15	Clays - silty clay to clay	2.68	9.09	17.31
11.35	37.24	129.1	7.03	Clays - silty clay to clay	2.73		17.21
11.40	37.40	157.9	6.81	Clays - silty clay to clay	2.67	8.22	21.06
11.45	37.57	183.6	6.21	Very stiff, fine grained	2.59	5.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-11

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	238.5	5.73	Very stiff, fine grained	2.48	2.67	
11.55	37.89	206.5	6.42	Very stiff, fine grained	2.57	4.46	
11.60	38.06	190.9	7.96	Very stiff, fine grained	2.68	8.95	25.46
11.65	38.22	221.8	7.38	Very stiff, fine grained	2.61	5.73	29.58
11.70	38.39	217.5	7.38	Very stiff, fine grained	2.62	5.99	29.00
11.75	38.55	236.8	7.38	Very stiff, fine grained	2.59	5.21	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 4:22:14 PM
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-12

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	47.9	0.54	Sands - clean sands to silty sand	1.79	1.09	
0.10	0.33	50.9	1.09	Sands - clean sands to silty sand	1.95	1.23	
0.15	0.49	47.0	1.70	Sand mixtures - silty sand to sandy silt	2.10	1.45	
0.20	0.66	45.3	1.81	Sand mixtures - silty sand to sandy silt	2.13	1.51	
0.25	0.82	38.7	2.13	Sand mixtures - silty sand to sandy silt	2.23	1.74	
0.30	0.98	34.1	1.87	Sand mixtures - silty sand to sandy silt	2.23	1.74	
0.35	1.15	31.3	2.02	Sand mixtures - silty sand to sandy silt	2.28	1.89	
0.40	1.31	29.9	1.80	Sand mixtures - silty sand to sandy silt	2.27	1.83	
0.45	1.48	30.2	1.18	Sand mixtures - silty sand to sandy silt	2.15	1.54	
0.50	1.64	32.2	1.51	Sand mixtures - silty sand to sandy silt	2.19	1.64	
0.55	1.80	33.5	1.64	Sand mixtures - silty sand to sandy silt	2.20	1.66	
0.60	1.97	34.1	1.86	Sand mixtures - silty sand to sandy silt	2.23	1.74	
0.65	2.13	36.1	1.92	Sand mixtures - silty sand to sandy silt	2.22	1.72	
0.70	2.30	35.1	1.95	Sand mixtures - silty sand to sandy silt	2.24	1.75	
0.75	2.46	36.8	1.82	Sand mixtures - silty sand to sandy silt	2.20	1.66	
0.80	2.62	39.5	1.71	Sand mixtures - silty sand to sandy silt	2.16	1.57	
0.85	2.79	39.8	1.71	Sand mixtures - silty sand to sandy silt	2.16	1.56	
0.90	2.95	43.1	1.63	Sand mixtures - silty sand to sandy silt	2.12	1.48	
0.95	3.12	45.9	1.68	Sand mixtures - silty sand to sandy silt	2.11	1.46	
1.00	3.28	44.6	2.15	Sand mixtures - silty sand to sandy silt	2.19	1.64	
1.05	3.44	40.5	2.07	Sand mixtures - silty sand to sandy silt	2.21	1.68	
1.10	3.61	35.3	2.32	Sand mixtures - silty sand to sandy silt	2.29	1.90	
1.15	3.77	31.6	2.13	Sand mixtures - silty sand to sandy silt	2.30	1.93	
1.20	3.94	25.7	2.19	Sand mixtures - silty sand to sandy silt	2.37	2.20	
1.25	4.10	22.8	2.09	Sand mixtures - silty sand to sandy silt	2.40	2.31	
1.30	4.27	22.4	1.55	Sand mixtures - silty sand to sandy silt	2.33	2.03	
1.35	4.43	25.6	1.54	Sand mixtures - silty sand to sandy silt	2.28	1.87	
1.40	4.59	24.4	1.85	Sand mixtures - silty sand to sandy silt	2.35	2.09	
1.45	4.76	22.5	1.90	Sand mixtures - silty sand to sandy silt	2.38	2.22	
1.50	4.92	23.3	1.58	Sand mixtures - silty sand to sandy silt	2.32	2.00	
1.55	5.09	23.7	0.93	Sand mixtures - silty sand to sandy silt	2.18	1.61	
1.60	5.25	26.8	3.28	Silt mixtures - clayey silt to silty clay	2.48	2.67	
1.65	5.41	41.1	2.06	Sand mixtures - silty sand to sandy silt	2.21	1.67	
1.70	5.58	27.4	3.08	Silt mixtures - clayey silt to silty clay	2.46	2.55	
1.75	5.74	25.0	2.72	Silt mixtures - clayey silt to silty clay	2.45	2.51	
1.80	5.91	21.8	2.88	Silt mixtures - clayey silt to silty clay	2.51	3.05	
1.85	6.07	28.1	2.48	Sand mixtures - silty sand to sandy silt	2.39	2.24	
1.90	6.23	41.3	2.12	Sand mixtures - silty sand to sandy silt	2.21	1.69	
1.95	6.40	54.8	2.49	Sand mixtures - silty sand to sandy silt	2.18	1.61	
2.00	6.56	56.9	2.92	Sand mixtures - silty sand to sandy silt	2.22	1.71	
2.05	6.73	46.7	3.30	Sand mixtures - silty sand to sandy silt	2.32	2.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-12

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	40.3	4.18	Silt mixtures - clayey silt to silty clay	2.44	2.46	
2.15	7.05	41.8	4.99	Very stiff, fine grained	2.49	2.69	
2.20	7.22	47.1	5.53	Very stiff, fine grained	2.49	2.70	
2.25	7.38	56.8	5.11	Very stiff, fine grained	2.42	2.39	
2.30	7.55	48.0	6.26	Very stiff, fine grained	2.53	3.49	
2.35	7.71	50.9	5.14	Very stiff, fine grained	2.46	2.55	
2.40	7.87	52.3	6.29	Very stiff, fine grained	2.52	3.28	
2.45	8.04	65.5	5.73	Very stiff, fine grained	2.44	2.49	
2.50	8.20	68.1	6.14	Very stiff, fine grained	2.46	2.58	
2.55	8.37	70.9	6.02	Very stiff, fine grained	2.45	2.52	
2.60	8.53	71.8	6.29	Very stiff, fine grained	2.47	2.59	
2.65	8.69	87.6	4.76	Very stiff, fine grained	2.33	2.04	
2.70	8.86	99.4	3.81	Very stiff sand to clayey sand	2.23	1.73	
2.75	9.02	131.6	2.64	Sand mixtures - silty sand to sandy silt	2.04	1.35	
2.80	9.19	145.6	2.30	Sands - clean sands to silty sand	1.97	1.26	
2.85	9.35	151.1	2.21	Sands - clean sands to silty sand	1.95	1.24	
2.90	9.51	151.6	2.08	Sands - clean sands to silty sand	1.93	1.22	
2.95	9.68	151.3	1.90	Sands - clean sands to silty sand	1.91	1.19	
3.00	9.84	142.7	1.90	Sands - clean sands to silty sand	1.92	1.21	
3.05	10.01	129.6	1.94	Sands - clean sands to silty sand	1.96	1.24	
3.10	10.17	117.7	1.90	Sands - clean sands to silty sand	1.98	1.27	
3.15	10.33	109.6	1.90	Sands - clean sands to silty sand	2.00	1.29	
3.20	10.50	105.0	1.88	Sand mixtures - silty sand to sandy silt	2.01	1.31	
3.25	10.66	100.5	1.85	Sand mixtures - silty sand to sandy silt	2.02	1.32	
3.30	10.83	98.4	1.85	Sand mixtures - silty sand to sandy silt	2.03	1.33	
3.35	10.99	98.4	1.60	Sands - clean sands to silty sand	1.99	1.28	
3.40	11.15	99.7	1.62	Sands - clean sands to silty sand	1.99	1.28	
3.45	11.32	98.7	1.66	Sands - clean sands to silty sand	2.00	1.30	
3.50	11.48	97.8	1.72	Sands - clean sands to silty sand	2.02	1.32	
3.55	11.65	94.7	1.64	Sands - clean sands to silty sand	2.02	1.31	
3.60	11.81	96.4	1.53	Sands - clean sands to silty sand	1.99	1.28	
3.65	11.97	93.8	1.59	Sands - clean sands to silty sand	2.01	1.31	
3.70	12.14	93.8	1.63	Sands - clean sands to silty sand	2.02	1.33	
3.75	12.30	93.4	1.62	Sands - clean sands to silty sand	2.03	1.33	
3.80	12.47	89.7	1.61	Sand mixtures - silty sand to sandy silt	2.04	1.35	
3.85	12.63	85.4	1.63	Sand mixtures - silty sand to sandy silt	2.06	1.38	
3.90	12.80	80.2	1.80	Sand mixtures - silty sand to sandy silt	2.11	1.46	
3.95	12.96	75.4	1.95	Sand mixtures - silty sand to sandy silt	2.16	1.55	
4.00	13.12	71.4	2.26	Sand mixtures - silty sand to sandy silt	2.22	1.71	
4.05	13.29	69.5	2.54	Sand mixtures - silty sand to sandy silt	2.27	1.84	
4.10	13.45	65.4	2.69	Sand mixtures - silty sand to sandy silt	2.31	1.95	
4.15	13.62	64.4	2.49	Sand mixtures - silty sand to sandy silt	2.29	1.90	
4.20	13.78	63.7	2.21	Sand mixtures - silty sand to sandy silt	2.26	1.81	
4.25	13.94	68.5	1.98	Sand mixtures - silty sand to sandy silt	2.20	1.67	
4.30	14.11	79.1	1.86	Sand mixtures - silty sand to sandy silt	2.15	1.53	
4.35	14.27	92.5	1.51	Sand mixtures - silty sand to sandy silt	2.04	1.34	
4.40	14.44	103.3	1.47	Sands - clean sands to silty sand	2.00	1.29	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-12

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	103.8	1.56	Sands - clean sands to silty sand	2.02	1.32	
4.50	14.76	105.8	1.67	Sand mixtures - silty sand to sandy silt	2.04	1.34	
4.55	14.93	114.4	1.63	Sands - clean sands to silty sand	2.01	1.30	
4.60	15.09	121.6	1.55	Sands - clean sands to silty sand	1.98	1.26	
4.65	15.26	122.4	1.49	Sands - clean sands to silty sand	1.97	1.25	
4.70	15.42	122.3	1.42	Sands - clean sands to silty sand	1.95	1.23	
4.75	15.58	117.2	1.41	Sands - clean sands to silty sand	1.97	1.25	
4.80	15.75	109.2	1.43	Sands - clean sands to silty sand	1.99	1.28	
4.85	15.91	104.2	1.41	Sands - clean sands to silty sand	2.00	1.30	
4.90	16.08	100.9	1.41	Sands - clean sands to silty sand	2.02	1.31	
4.95	16.24	89.0	1.55	Sand mixtures - silty sand to sandy silt	2.09	1.42	
5.00	16.40	83.8	1.64	Sand mixtures - silty sand to sandy silt	2.12	1.49	
5.05	16.57	84.1	1.66	Sand mixtures - silty sand to sandy silt	2.13	1.50	
5.10	16.73	89.6	1.75	Sand mixtures - silty sand to sandy silt	2.13	1.50	
5.15	16.90	101.7	1.84	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.20	17.06	117.8	1.75	Sand mixtures - silty sand to sandy silt	2.05	1.36	
5.25	17.22	143.5	1.57	Sands - clean sands to silty sand	1.96	1.24	
5.30	17.39	157.9	1.54	Sands - clean sands to silty sand	1.93	1.21	
5.35	17.55	158.9	1.34	Sands - clean sands to silty sand	1.88	1.17	
5.40	17.72	147.5	1.39	Sands - clean sands to silty sand	1.92	1.20	
5.45	17.88	131.9	1.37	Sands - clean sands to silty sand	1.95	1.23	
5.50	18.04	132.9	1.30	Sands - clean sands to silty sand	1.93	1.21	
5.55	18.21	127.5	1.37	Sands - clean sands to silty sand	1.96	1.25	
5.60	18.37	128.3	1.49	Sands - clean sands to silty sand	1.99	1.28	
5.65	18.54	138.6	1.47	Sands - clean sands to silty sand	1.96	1.25	
5.70	18.70	152.3	1.50	Sands - clean sands to silty sand	1.94	1.23	
5.75	18.86	162.5	1.56	Sands - clean sands to silty sand	1.94	1.22	
5.80	19.03	179.4	1.51	Sands - clean sands to silty sand	1.90	1.19	
5.85	19.19	192.4	1.51	Sands - clean sands to silty sand	1.88	1.17	
5.90	19.36	194.5	1.34	Sands - clean sands to silty sand	1.84	1.13	
5.95	19.52	195.4	1.08	Sands - clean sands to silty sand	1.77	1.08	
6.00	19.68	201.2	0.92	Sands - clean sands to silty sand	1.71	1.04	
6.05	19.85	204.8	0.69	Sands - clean sands to silty sand	1.62	1.00	
6.10	20.01	187.3	0.60	Sands - clean sands to silty sand	1.61	1.00	
6.15	20.18	174.9	0.73	Sands - clean sands to silty sand	1.69	1.03	
6.20	20.34	153.1	0.70	Sands - clean sands to silty sand	1.73	1.05	
6.25	20.51	118.6	1.23	Sands - clean sands to silty sand	1.98	1.27	
6.30	20.67	91.7	0.96	Sands - clean sands to silty sand	1.99	1.28	
6.35	20.83	60.7	1.21	Sand mixtures - silty sand to sandy silt	2.20	1.66	
6.40	21.00	44.3	1.29	Sand mixtures - silty sand to sandy silt	2.33	2.04	
6.45	21.16	37.5	1.54	Sand mixtures - silty sand to sandy silt	2.44	2.48	
6.50	21.33	35.6	1.91	Sand mixtures - silty sand to sandy silt	2.52	3.25	
6.55	21.49	34.0	2.04	Silt mixtures - clayey silt to silty clay	2.56	4.19	
6.60	21.65	34.1	1.66	Sand mixtures - silty sand to sandy silt	2.50	2.87	
6.65	21.82	37.1	1.51	Sand mixtures - silty sand to sandy silt	2.45	2.51	
6.70	21.98	46.9	1.27	Sand mixtures - silty sand to sandy silt	2.32	2.01	
6.75	22.15	58.0	1.31	Sand mixtures - silty sand to sandy silt	2.26	1.81	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-12

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	58.2	1.16	Sand mixtures - silty sand to sandy silt	2.22	1.72	
6.85	22.47	69.2	1.17	Sand mixtures - silty sand to sandy silt	2.17	1.58	
6.90	22.64	75.3	1.24	Sand mixtures - silty sand to sandy silt	2.16	1.56	
6.95	22.80	79.5	1.48	Sand mixtures - silty sand to sandy silt	2.19	1.64	
7.00	22.97	77.2	2.14	Sand mixtures - silty sand to sandy silt	2.32	2.00	
7.05	23.13	73.8	1.64	Sand mixtures - silty sand to sandy silt	2.25	1.80	
7.10	23.29	55.7	1.57	Sand mixtures - silty sand to sandy silt	2.34	2.07	
7.15	23.46	45.6	1.48	Sand mixtures - silty sand to sandy silt	2.39	2.27	
7.20	23.62	40.9	1.69	Sand mixtures - silty sand to sandy silt	2.47	2.62	
7.25	23.79	42.5	1.77	Sand mixtures - silty sand to sandy silt	2.48	2.63	
7.30	23.95	46.5	1.68	Sand mixtures - silty sand to sandy silt	2.43	2.42	
7.35	24.11	51.6	1.46	Sand mixtures - silty sand to sandy silt	2.36	2.13	
7.40	24.28	56.0	1.58	Sand mixtures - silty sand to sandy silt	2.35	2.11	
7.45	24.44	65.6	1.49	Sand mixtures - silty sand to sandy silt	2.28	1.88	
7.50	24.61	72.1	1.68	Sand mixtures - silty sand to sandy silt	2.29	1.89	
7.55	24.77	73.1	1.66	Sand mixtures - silty sand to sandy silt	2.28	1.88	
7.60	24.93	59.5	1.80	Sand mixtures - silty sand to sandy silt	2.38	2.21	
7.65	25.10	48.0	2.08	Sand mixtures - silty sand to sandy silt	2.50	2.75	
7.70	25.26	39.9	1.96	Silt mixtures - clayey silt to silty clay	2.55	3.87	
7.75	25.43	28.4	2.13	Silt mixtures - clayey silt to silty clay	2.70	10.15	3.79
7.80	25.59	18.4	2.83	Clays - silty clay to clay	2.94		2.45
7.85	25.75	14.8	3.34	Clays - silty clay to clay	3.07		1.98
7.90	25.92	17.1	3.11	Clays - silty clay to clay	3.00		2.28
7.95	26.08	24.8	2.38	Silt mixtures - clayey silt to silty clay	2.79		3.30
8.00	26.25	30.7	1.99	Silt mixtures - clayey silt to silty clay	2.66	8.11	4.09
8.05	26.41	34.1	2.01	Silt mixtures - clayey silt to silty clay	2.63	6.55	4.55
8.10	26.57	35.9	2.14	Silt mixtures - clayey silt to silty clay	2.63	6.61	4.78
8.15	26.74	37.5	2.31	Silt mixtures - clayey silt to silty clay	2.64	7.06	5.00
8.20	26.90	41.7	2.36	Silt mixtures - clayey silt to silty clay	2.61	5.85	5.56
8.25	27.07	45.7	2.48	Silt mixtures - clayey silt to silty clay	2.60	5.30	
8.30	27.23	47.3	2.81	Silt mixtures - clayey silt to silty clay	2.63	6.40	6.30
8.35	27.39	51.8	3.51	Silt mixtures - clayey silt to silty clay	2.67	8.41	6.91
8.40	27.56	56.4	2.66	Silt mixtures - clayey silt to silty clay	2.55	3.98	
8.45	27.72	44.8	2.71	Silt mixtures - clayey silt to silty clay	2.64	6.99	5.98
8.50	27.89	40.8	2.41	Silt mixtures - clayey silt to silty clay	2.64	7.00	5.44
8.55	28.05	38.0	2.16	Silt mixtures - clayey silt to silty clay	2.64	6.78	5.06
8.60	28.21	36.8	2.52	Silt mixtures - clayey silt to silty clay	2.70	9.90	4.90
8.65	28.38	37.6	4.18	Clays - silty clay to clay	2.85		5.01
8.70	28.54	55.1	2.39	Silt mixtures - clayey silt to silty clay	2.54	3.63	
8.75	28.71	43.4	3.07	Silt mixtures - clayey silt to silty clay	2.70		5.79
8.80	28.87	45.3	2.61	Silt mixtures - clayey silt to silty clay	2.64	6.98	6.05
8.85	29.04	43.1	2.29	Silt mixtures - clayey silt to silty clay	2.62	6.10	5.75
8.90	29.20	44.1	1.93	Silt mixtures - clayey silt to silty clay	2.56	4.22	
8.95	29.36	41.3	1.81	Silt mixtures - clayey silt to silty clay	2.57	4.39	
9.00	29.53	41.7	1.83	Silt mixtures - clayey silt to silty clay	2.57	4.49	
9.05	29.69	42.5	1.90	Silt mixtures - clayey silt to silty clay	2.58	4.66	
9.10	29.86	40.8	1.87	Silt mixtures - clayey silt to silty clay	2.59	5.09	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-12

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	37.2	2.03	Silt mixtures - clayey silt to silty clay	2.65	7.45	4.96
9.20	30.18	33.5	2.24	Silt mixtures - clayey silt to silty clay	2.72		4.46
9.25	30.35	33.4	2.40	Silt mixtures - clayey silt to silty clay	2.75		4.45
9.30	30.51	33.4	2.28	Silt mixtures - clayey silt to silty clay	2.73		4.45
9.35	30.68	34.7	2.00	Silt mixtures - clayey silt to silty clay	2.68	9.06	4.63
9.40	30.84	36.2	2.09	Silt mixtures - clayey silt to silty clay	2.68	9.06	4.82
9.45	31.00	38.3	1.88	Silt mixtures - clayey silt to silty clay	2.63	6.58	5.11
9.50	31.17	38.0	2.30	Silt mixtures - clayey silt to silty clay	2.70	9.92	5.06
9.55	31.33	38.0	2.37	Silt mixtures - clayey silt to silty clay	2.71		5.07
9.60	31.50	38.0	2.33	Silt mixtures - clayey silt to silty clay	2.70		5.07
9.65	31.66	37.6	2.40	Silt mixtures - clayey silt to silty clay	2.72		5.01
9.70	31.82	37.2	2.46	Silt mixtures - clayey silt to silty clay	2.73		4.96
9.75	31.99	38.4	2.53	Silt mixtures - clayey silt to silty clay	2.73		5.12
9.80	32.15	39.9	2.64	Silt mixtures - clayey silt to silty clay	2.73		5.32
9.85	32.32	41.4	2.73	Silt mixtures - clayey silt to silty clay	2.73		5.51
9.90	32.48	40.5	2.81	Silt mixtures - clayey silt to silty clay	2.75		5.40
9.95	32.64	38.4	2.83	Silt mixtures - clayey silt to silty clay	2.78		5.12
10.00	32.81	38.4	2.84	Silt mixtures - clayey silt to silty clay	2.78		5.12
10.05	32.97	40.1	2.82	Silt mixtures - clayey silt to silty clay	2.76		5.35
10.10	33.14	41.3	2.80	Silt mixtures - clayey silt to silty clay	2.75		5.51
10.15	33.30	39.9	2.97	Silt mixtures - clayey silt to silty clay	2.78		5.33
10.20	33.46	36.8	3.04	Silt mixtures - clayey silt to silty clay	2.82		4.90
10.25	33.63	35.9	2.91	Silt mixtures - clayey silt to silty clay	2.82		4.79
10.30	33.79	31.2	3.01	Clays - silty clay to clay	2.88		4.16
10.35	33.96	27.9	3.15	Clays - silty clay to clay	2.93		3.72
10.40	34.12	27.4	3.24	Clays - silty clay to clay	2.95		3.66
10.45	34.28	29.2	3.23	Clays - silty clay to clay	2.93		3.89
10.50	34.45	31.4	2.79	Silt mixtures - clayey silt to silty clay	2.86		4.19
10.55	34.61	34.5	2.81	Silt mixtures - clayey silt to silty clay	2.83		4.60
10.60	34.78	35.2	3.11	Clays - silty clay to clay	2.86		4.69
10.65	34.94	36.3	3.54	Clays - silty clay to clay	2.89		4.84
10.70	35.10	32.7	3.66	Clays - silty clay to clay	2.93		4.36
10.75	35.27	28.5	3.87	Clays - silty clay to clay	3.00		3.79
10.80	35.43	31.4	3.04	Clays - silty clay to clay	2.90		4.19
10.85	35.60	33.2	2.80	Silt mixtures - clayey silt to silty clay	2.86		4.42
10.90	35.76	35.0	2.69	Silt mixtures - clayey silt to silty clay	2.83		4.67
10.95	35.92	39.1	2.39	Silt mixtures - clayey silt to silty clay	2.76		5.22
11.00	36.09	42.5	2.37	Silt mixtures - clayey silt to silty clay	2.73		5.67
11.05	36.25	41.9	2.55	Silt mixtures - clayey silt to silty clay	2.75		5.59
11.10	36.42	41.4	2.68	Silt mixtures - clayey silt to silty clay	2.78		5.52
11.15	36.58	39.5	2.88	Silt mixtures - clayey silt to silty clay	2.81		5.27
11.20	36.74	36.2	3.01	Clays - silty clay to clay	2.86		4.83
11.25	36.91	29.1	3.58	Clays - silty clay to clay	2.99		3.88
11.30	37.07	21.1	3.59	Clays - silty clay to clay	3.11		2.82
11.35	37.24	11.5	4.96	Clays - silty clay to clay	3.46		1.53
11.40	37.40	8.9	4.13	Clays - silty clay to clay	3.53		1.18
11.45	37.57	8.2	4.18	Clays - silty clay to clay	3.57		1.09

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-12

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	7.8	4.82	Unstable clayey silts	3.64		1.04
11.55	37.89	8.5	7.49	Unstable clayey silts	3.72		1.14
11.60	38.06	12.1	6.47	Unstable clayey silts	3.52		1.61
11.65	38.22	38.2	2.83	Silt mixtures - clayey silt to silty clay	2.84		5.10
11.70	38.39	67.2	1.85	Sand mixtures - silty sand to sandy silt	2.50	2.80	
11.75	38.55	86.5	1.37	Sand mixtures - silty sand to sandy silt	2.31	1.97	
11.80	38.71	89.6	1.34	Sand mixtures - silty sand to sandy silt	2.29	1.91	
11.85	38.88	90.9	1.33	Sand mixtures - silty sand to sandy silt	2.29	1.89	
11.90	39.04	89.9	1.32	Sand mixtures - silty sand to sandy silt	2.29	1.90	
11.95	39.21	84.8	1.24	Sand mixtures - silty sand to sandy silt	2.29	1.92	
12.00	39.37	75.7	1.16	Sand mixtures - silty sand to sandy silt	2.32	2.01	
12.05	39.53	63.0	1.72	Sand mixtures - silty sand to sandy silt	2.51	3.06	
12.10	39.70	65.5	2.27	Silt mixtures - clayey silt to silty clay	2.59	5.00	
12.15	39.86	86.7	2.03	Sand mixtures - silty sand to sandy silt	2.45	2.51	
12.20	40.03	110.7	1.98	Sand mixtures - silty sand to sandy silt	2.35	2.12	
12.25	40.19	131.6	1.77	Sand mixtures - silty sand to sandy silt	2.26	1.80	
12.30	40.35	145.1	1.75	Sand mixtures - silty sand to sandy silt	2.22	1.70	
12.35	40.52	152.3	1.65	Sand mixtures - silty sand to sandy silt	2.18	1.62	
12.40	40.68	157.5	1.98	Sand mixtures - silty sand to sandy silt	2.24	1.75	
12.45	40.85	190.4	1.83	Sand mixtures - silty sand to sandy silt	2.14	1.53	
12.50	41.01	220.4	1.93	Sand mixtures - silty sand to sandy silt	2.12	1.47	
12.55	41.17	258.6	1.74	Sand mixtures - silty sand to sandy silt	2.03	1.33	
12.60	41.34	289.0	1.64	Sands - clean sands to silty sand	1.97	1.26	
12.65	41.50	328.9	1.32	Sands - clean sands to silty sand	1.85	1.14	
12.70	41.67	333.4	1.27	Sands - clean sands to silty sand	1.83	1.13	
12.75	41.83	310.7	1.55	Sands - clean sands to silty sand	1.93	1.21	
12.80	41.99	273.6	1.59	Sands - clean sands to silty sand	1.98	1.27	
12.85	42.16	264.4	1.87	Sand mixtures - silty sand to sandy silt	2.05	1.37	
12.90	42.32	273.1	1.95	Sand mixtures - silty sand to sandy silt	2.06	1.38	
12.95	42.49	315.4	1.53	Sands - clean sands to silty sand	1.92	1.21	
13.00	42.65	344.0	1.71	Sands - clean sands to silty sand	1.94	1.22	
13.05	42.81	399.1	1.61	Sands - clean sands to silty sand	1.87	1.16	
13.10	42.98	444.5	1.27	Sands - clean sands to silty sand	1.75	1.07	
13.15	43.14	458.1	0.97	Sands - clean sands to silty sand	1.64	1.00	
13.20	43.31	433.9	0.77	Sands - clean sands to silty sand	1.57	1.00	
13.25	43.47	404.0	1.03	Sands - clean sands to silty sand	1.70	1.04	
13.30	43.63	360.0	1.15	Sands - clean sands to silty sand	1.78	1.09	
13.35	43.80	316.6	1.73	Sands - clean sands to silty sand	1.98	1.27	
13.40	43.96	334.8	1.47	Sands - clean sands to silty sand	1.90	1.18	
13.45	44.13	338.6	1.56	Sands - clean sands to silty sand	1.92	1.20	
13.50	44.29	309.4	1.21	Sands - clean sands to silty sand	1.86	1.14	
13.55	44.45	327.8	1.85	Sands - clean sands to silty sand	2.00	1.29	
13.60	44.62	267.4	2.39	Sand mixtures - silty sand to sandy silt	2.16	1.57	
13.65	44.78	287.9	2.80	Sand mixtures - silty sand to sandy silt	2.20	1.66	
13.70	44.95	226.6	2.93	Sand mixtures - silty sand to sandy silt	2.29	1.92	
13.75	45.11	126.8	3.28	Silt mixtures - clayey silt to silty clay	2.53	3.44	
13.80	45.28	118.9	2.44	Sand mixtures - silty sand to sandy silt	2.45	2.50	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-12

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	128.1	2.02	Sand mixtures - silty sand to sandy silt	2.36	2.13	
13.90	45.60	143.8	1.99	Sand mixtures - silty sand to sandy silt	2.31	1.98	
13.95	45.77	162.5	2.25	Sand mixtures - silty sand to sandy silt	2.31	1.98	
14.00	45.93	161.3	3.21	Silt mixtures - clayey silt to silty clay	2.45	2.50	
14.05	46.10	197.8	5.05	Silt mixtures - clayey silt to silty clay	2.56	4.11	
14.10	46.26	241.2	6.16	Very stiff, fine grained	2.58	4.70	
14.15	46.42	288.1	7.43	Very stiff, fine grained	2.60	5.58	38.42
14.20	46.59	309.0	7.65	Very stiff, fine grained	2.60	5.37	
14.25	46.75	383.2	5.97	Very stiff, fine grained	2.44	2.47	
14.30	46.92	376.2	5.62	Very stiff, fine grained	2.42	2.39	
14.35	47.08	367.3	5.57	Very stiff, fine grained	2.43	2.40	
14.40	47.24	408.1	4.84	Very stiff, fine grained	2.34	2.07	
14.45	47.41	385.9	5.78	Very stiff, fine grained	2.43	2.42	
14.50	47.57	323.4	6.29	Very stiff, fine grained	2.51	3.07	
14.55	47.74	257.8	7.99	Very stiff, fine grained	2.67	8.25	34.37
14.60	47.90	271.6	7.49	Very stiff, fine grained	2.63	6.59	36.21
14.65	48.06	242.9	7.75	Very stiff, fine grained	2.67	8.57	32.38
14.70	48.23	195.1	7.25	Clays - silty clay to clay	2.71		26.01
14.75	48.39	121.0	6.42	Clays - silty clay to clay	2.80		16.13
14.80	48.56	93.5	4.84	Clays - silty clay to clay	2.79		12.47
14.85	48.72	85.5	5.66	Clays - silty clay to clay	2.87		11.40
14.90	48.88	104.3	5.71	Clays - silty clay to clay	2.81		13.91
14.95	49.05	137.3	5.90	Clays - silty clay to clay	2.74		18.31
15.00	49.21	126.1	6.74	Clays - silty clay to clay	2.81		16.81
15.05	49.38	117.9	5.77	Clays - silty clay to clay	2.78		15.71
15.10	49.54	108.8	5.82	Clays - silty clay to clay	2.81		14.51
15.15	49.70	102.4	5.55	Clays - silty clay to clay	2.81		13.65
15.20	49.87	99.9	4.95	Clays - silty clay to clay	2.78		13.32
15.25	50.03	99.4	4.75	Clays - silty clay to clay	2.77		13.25
15.30	50.20	98.72	4.75	Clays - silty clay to clay	2.78		13.16
15.35	50.36	95.68	4.75	Clays - silty clay to clay	2.79		12.76

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 17:10
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-13

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	129.7	1.48	Sands - clean sands to silty sand	1.76	1.07	
0.10	0.33	148.9	2.36	Sands - clean sands to silty sand	1.89	1.17	
0.15	0.49	130.6	3.49	Very stiff sand to clayey sand	2.07	1.39	
0.20	0.66	107.3	2.81	Very stiff sand to clayey sand	2.03	1.34	
0.25	0.82	92.5	3.43	Very stiff sand to clayey sand	2.14	1.53	
0.30	0.98	80.3	3.58	Very stiff sand to clayey sand	2.19	1.64	
0.35	1.15	67.2	3.44	Very stiff sand to clayey sand	2.23	1.72	
0.40	1.31	55.4	3.62	Sand mixtures - silty sand to sandy silt	2.30	1.92	
0.45	1.48	49.5	2.79	Sand mixtures - silty sand to sandy silt	2.24	1.76	
0.50	1.64	39.9	3.41	Sand mixtures - silty sand to sandy silt	2.37	2.18	
0.55	1.80	32.6	3.48	Silt mixtures - clayey silt to silty clay	2.44	2.45	
0.60	1.97	23.4	4.06	Silt mixtures - clayey silt to silty clay	2.59	4.93	
0.65	2.13	15.7	4.16	Silt mixtures - clayey silt to silty clay	2.72		2.09
0.70	2.30	12.4	3.51	Silt mixtures - clayey silt to silty clay	2.75		1.66
0.75	2.46	12.4	2.62	Silt mixtures - clayey silt to silty clay	2.67	8.41	1.66
0.80	2.62	12.4	2.23	Silt mixtures - clayey silt to silty clay	2.63	6.47	1.65
0.85	2.79	12.2	1.66	Silt mixtures - clayey silt to silty clay	2.56	4.14	
0.90	2.95	10.8	1.36	Sand mixtures - silty sand to sandy silt	2.56	4.15	
0.95	3.12	9.7	1.39	Silt mixtures - clayey silt to silty clay	2.60	5.49	1.29
1.00	3.28	9.6	1.68	Silt mixtures - clayey silt to silty clay	2.65	7.59	1.28
1.05	3.44	9.6	1.62	Silt mixtures - clayey silt to silty clay	2.65	7.23	1.27
1.10	3.61	9.3	1.80	Silt mixtures - clayey silt to silty clay	2.68	9.07	1.24
1.15	3.77	9.1	1.77	Silt mixtures - clayey silt to silty clay	2.69	9.29	1.22
1.20	3.94	8.8	1.69	Silt mixtures - clayey silt to silty clay	2.69	9.51	1.17
1.25	4.10	8.1	1.70	Silt mixtures - clayey silt to silty clay	2.72		1.08
1.30	4.27	7.9	1.66	Silt mixtures - clayey silt to silty clay	2.73		1.05
1.35	4.43	7.8	1.69	Silt mixtures - clayey silt to silty clay	2.74		1.04
1.40	4.59	8.0	1.57	Silt mixtures - clayey silt to silty clay	2.71		1.07
1.45	4.76	8.3	1.43	Silt mixtures - clayey silt to silty clay	2.67	8.64	1.11
1.50	4.92	8.6	1.36	Silt mixtures - clayey silt to silty clay	2.65	7.37	1.15
1.55	5.09	8.6	1.29	Silt mixtures - clayey silt to silty clay	2.64	7.06	1.14
1.60	5.25	8.8	0.78	Sand mixtures - silty sand to sandy silt	2.53	3.39	
1.65	5.41	8.7	1.01	Sand mixtures - silty sand to sandy silt	2.58	4.85	
1.70	5.58	11.1	1.06	Sand mixtures - silty sand to sandy silt	2.50	2.74	
1.75	5.74	16.4	1.32	Sand mixtures - silty sand to sandy silt	2.40	2.30	
1.80	5.91	28.3	1.71	Sand mixtures - silty sand to sandy silt	2.28	1.86	
1.85	6.07	52.5	1.99	Sand mixtures - silty sand to sandy silt	2.12	1.48	
1.90	6.23	74.2	2.60	Sand mixtures - silty sand to sandy silt	2.11	1.46	
1.95	6.40	76.5	3.30	Very stiff sand to clayey sand	2.18	1.62	
2.00	6.56	65.7	4.41	Very stiff, fine grained	2.32	2.01	
2.05	6.73	72.0	4.18	Very stiff, fine grained	2.28	1.89	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-13

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	83.3	3.43	Very stiff sand to clayey sand	2.19	1.63	
2.15	7.05	91.3	3.28	Very stiff sand to clayey sand	2.16	1.56	
2.20	7.22	92.4	2.99	Sand mixtures - silty sand to sandy silt	2.13	1.50	
2.25	7.38	81.2	3.68	Very stiff sand to clayey sand	2.23	1.74	
2.30	7.55	51.7	4.60	Very stiff, fine grained	2.41	2.36	
2.35	7.71	34.8	4.93	Silt mixtures - clayey silt to silty clay	2.54	3.62	
2.40	7.87	65.7	2.34	Sand mixtures - silty sand to sandy silt	2.15	1.54	
2.45	8.04	74.8	1.79	Sand mixtures - silty sand to sandy silt	2.04	1.35	
2.50	8.20	74.6	1.52	Sands - clean sands to silty sand	1.99	1.28	
2.55	8.37	76.6	0.99	Sands - clean sands to silty sand	1.87	1.15	
2.60	8.53	75.6	1.11	Sands - clean sands to silty sand	1.91	1.19	
2.65	8.69	64.9	1.08	Sands - clean sands to silty sand	1.95	1.23	
2.70	8.86	59.0	1.29	Sands - clean sands to silty sand	2.03	1.33	
2.75	9.02	59.1	0.96	Sands - clean sands to silty sand	1.95	1.23	
2.80	9.19	58.4	1.27	Sands - clean sands to silty sand	2.03	1.34	
2.85	9.35	52.0	1.80	Sand mixtures - silty sand to sandy silt	2.17	1.58	
2.90	9.51	45.1	2.39	Sand mixtures - silty sand to sandy silt	2.30	1.92	
2.95	9.68	33.1	3.04	Silt mixtures - clayey silt to silty clay	2.46	2.55	
3.00	9.84	20.6	3.57	Silt mixtures - clayey silt to silty clay	2.64	7.17	2.74
3.05	10.01	12.1	3.30	Silt mixtures - clayey silt to silty clay	2.79		1.61
3.10	10.17	10.8	2.27	Silt mixtures - clayey silt to silty clay	2.73		1.44
3.15	10.33	10.7	2.40	Silt mixtures - clayey silt to silty clay	2.75		1.43
3.20	10.50	10.3	2.70	Silt mixtures - clayey silt to silty clay	2.80		1.38
3.25	10.66	9.4	3.16	Clays - silty clay to clay	2.88		1.25
3.30	10.83	9.7	3.20	Clays - silty clay to clay	2.87		1.29
3.35	10.99	9.8	3.12	Clays - silty clay to clay	2.87		1.30
3.40	11.15	9.7	3.07	Clays - silty clay to clay	2.87		1.29
3.45	11.32	9.7	1.86	Silt mixtures - clayey silt to silty clay	2.75		1.29
3.50	11.48	9.8	2.24	Silt mixtures - clayey silt to silty clay	2.80		1.30
3.55	11.65	11.1	2.37	Silt mixtures - clayey silt to silty clay	2.78		1.47
3.60	11.81	10.5	3.28	Clays - silty clay to clay	2.88		1.41
3.65	11.97	11.9	2.65	Silt mixtures - clayey silt to silty clay	2.79		1.59
3.70	12.14	11.3	3.06	Clays - silty clay to clay	2.85		1.50
3.75	12.30	10.2	2.95	Clays - silty clay to clay	2.88		1.36
3.80	12.47	9.8	2.85	Clays - silty clay to clay	2.89		1.30
3.85	12.63	10.4	2.67	Silt mixtures - clayey silt to silty clay	2.86		1.39
3.90	12.80	11.0	2.59	Silt mixtures - clayey silt to silty clay	2.83		1.47
3.95	12.96	10.5	2.92	Clays - silty clay to clay	2.89		1.40
4.00	13.12	9.3	3.36	Clays - silty clay to clay	2.97		1.24
4.05	13.29	10.0	3.63	Clays - silty clay to clay	2.97		1.33
4.10	13.45	14.4	2.99	Silt mixtures - clayey silt to silty clay	2.80		1.92
4.15	13.62	17.8	3.13	Silt mixtures - clayey silt to silty clay	2.75		2.38
4.20	13.78	18.2	3.20	Silt mixtures - clayey silt to silty clay	2.75		2.43
4.25	13.94	18.3	3.55	Silt mixtures - clayey silt to silty clay	2.78		2.43
4.30	14.11	21.3	3.06	Silt mixtures - clayey silt to silty clay	2.70	9.91	2.84
4.35	14.27	27.3	2.94	Silt mixtures - clayey silt to silty clay	2.61	5.74	3.64
4.40	14.44	30.6	3.45	Silt mixtures - clayey silt to silty clay	2.62	6.34	4.08

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-13

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	26.3	3.13	Silt mixtures - clayey silt to silty clay	2.65	7.24	3.51
4.50	14.76	29.3	3.39	Silt mixtures - clayey silt to silty clay	2.64	6.96	3.91
4.55	14.93	31.8	2.91	Silt mixtures - clayey silt to silty clay	2.57	4.51	
4.60	15.09	38.8	2.38	Sand mixtures - silty sand to sandy silt	2.45	2.52	
4.65	15.26	45.6	1.99	Sand mixtures - silty sand to sandy silt	2.35	2.11	
4.70	15.42	51.5	1.95	Sand mixtures - silty sand to sandy silt	2.31	1.98	
4.75	15.58	59.9	1.77	Sand mixtures - silty sand to sandy silt	2.24	1.76	
4.80	15.75	69.3	1.73	Sand mixtures - silty sand to sandy silt	2.19	1.63	
4.85	15.91	82.1	1.69	Sand mixtures - silty sand to sandy silt	2.13	1.51	
4.90	16.08	92.9	1.76	Sand mixtures - silty sand to sandy silt	2.11	1.46	
4.95	16.24	104.8	1.71	Sand mixtures - silty sand to sandy silt	2.07	1.39	
5.00	16.40	115.4	1.75	Sand mixtures - silty sand to sandy silt	2.05	1.36	
5.05	16.57	128.3	1.73	Sands - clean sands to silty sand	2.02	1.31	
5.10	16.73	142.8	1.63	Sands - clean sands to silty sand	1.97	1.25	
5.15	16.90	157.0	1.70	Sands - clean sands to silty sand	1.96	1.24	
5.20	17.06	151.6	1.72	Sands - clean sands to silty sand	1.97	1.26	
5.25	17.22	135.4	1.77	Sand mixtures - silty sand to sandy silt	2.02	1.31	
5.30	17.39	120.1	1.45	Sands - clean sands to silty sand	1.99	1.28	
5.35	17.55	105.3	1.57	Sand mixtures - silty sand to sandy silt	2.06	1.37	
5.40	17.72	100.6	1.84	Sand mixtures - silty sand to sandy silt	2.12	1.49	
5.45	17.88	100.3	2.13	Sand mixtures - silty sand to sandy silt	2.17	1.59	
5.50	18.04	97.9	1.77	Sand mixtures - silty sand to sandy silt	2.12	1.49	
5.55	18.21	92.3	2.41	Sand mixtures - silty sand to sandy silt	2.24	1.76	
5.60	18.37	90.1	2.60	Sand mixtures - silty sand to sandy silt	2.28	1.86	
5.65	18.54	86.4	2.55	Sand mixtures - silty sand to sandy silt	2.28	1.89	
5.70	18.70	79.4	2.37	Sand mixtures - silty sand to sandy silt	2.29	1.90	
5.75	18.86	84.3	2.30	Sand mixtures - silty sand to sandy silt	2.26	1.82	
5.80	19.03	90.5	2.22	Sand mixtures - silty sand to sandy silt	2.23	1.74	
5.85	19.19	97.4	2.28	Sand mixtures - silty sand to sandy silt	2.22	1.71	
5.90	19.36	104.4	2.18	Sand mixtures - silty sand to sandy silt	2.19	1.63	
5.95	19.52	88.7	2.51	Sand mixtures - silty sand to sandy silt	2.28	1.89	
6.00	19.68	71.3	2.71	Sand mixtures - silty sand to sandy silt	2.38	2.21	
6.05	19.85	56.1	2.94	Silt mixtures - clayey silt to silty clay	2.48	2.66	
6.10	20.01	43.3	3.09	Silt mixtures - clayey silt to silty clay	2.58	4.79	
6.15	20.18	34.7	2.83	Silt mixtures - clayey silt to silty clay	2.63	6.53	4.62
6.20	20.34	31.1	2.30	Silt mixtures - clayey silt to silty clay	2.61	5.69	4.15
6.25	20.51	32.3	2.01	Silt mixtures - clayey silt to silty clay	2.56	4.14	
6.30	20.67	38.1	1.85	Sand mixtures - silty sand to sandy silt	2.48	2.66	
6.35	20.83	45.8	2.16	Sand mixtures - silty sand to sandy silt	2.47	2.58	
6.40	21.00	55.6	1.63	Sand mixtures - silty sand to sandy silt	2.32	2.00	
6.45	21.16	58.0	1.94	Sand mixtures - silty sand to sandy silt	2.36	2.14	
6.50	21.33	63.9	2.05	Sand mixtures - silty sand to sandy silt	2.35	2.09	
6.55	21.49	71.8	1.18	Sand mixtures - silty sand to sandy silt	2.15	1.53	
6.60	21.65	76.3	1.46	Sand mixtures - silty sand to sandy silt	2.19	1.63	
6.65	21.82	78.0	1.80	Sand mixtures - silty sand to sandy silt	2.25	1.78	
6.70	21.98	88.9	2.02	Sand mixtures - silty sand to sandy silt	2.24	1.77	
6.75	22.15	99.4	1.85	Sand mixtures - silty sand to sandy silt	2.18	1.61	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-13

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	91.2	2.05	Sand mixtures - silty sand to sandy silt	2.24	1.77	
6.85	22.47	71.4	2.50	Sand mixtures - silty sand to sandy silt	2.39	2.26	
6.90	22.64	64.7	2.63	Sand mixtures - silty sand to sandy silt	2.44	2.46	
6.95	22.80	90.5	1.69	Sand mixtures - silty sand to sandy silt	2.19	1.64	
7.00	22.97	131.8	1.36	Sands - clean sands to silty sand	2.00	1.29	
7.05	23.13	130.9	1.52	Sand mixtures - silty sand to sandy silt	2.04	1.35	
7.10	23.29	130.3	1.61	Sand mixtures - silty sand to sandy silt	2.06	1.38	
7.15	23.46	121.9	1.61	Sand mixtures - silty sand to sandy silt	2.09	1.42	
7.20	23.62	103.6	1.82	Sand mixtures - silty sand to sandy silt	2.18	1.61	
7.25	23.79	90.4	1.94	Sand mixtures - silty sand to sandy silt	2.25	1.78	
7.30	23.95	72.8	2.15	Sand mixtures - silty sand to sandy silt	2.35	2.12	
7.35	24.11	57.4	2.08	Sand mixtures - silty sand to sandy silt	2.42	2.40	
7.40	24.28	57.5	1.70	Sand mixtures - silty sand to sandy silt	2.36	2.16	
7.45	24.44	90.9	0.91	Sands - clean sands to silty sand	2.02	1.32	
7.50	24.61	85.1	1.40	Sand mixtures - silty sand to sandy silt	2.18	1.60	
7.55	24.77	58.8	1.27	Sand mixtures - silty sand to sandy silt	2.28	1.87	
7.60	24.93	36.3	2.37	Silt mixtures - clayey silt to silty clay	2.63	6.74	4.83
7.65	25.10	32.7	1.87	Silt mixtures - clayey silt to silty clay	2.60	5.58	4.35
7.70	25.26	27.8	1.75	Silt mixtures - clayey silt to silty clay	2.65	7.40	3.71
7.75	25.43	25.5	1.59	Silt mixtures - clayey silt to silty clay	2.66	7.77	3.40
7.80	25.59	22.9	1.94	Silt mixtures - clayey silt to silty clay	2.76		3.05
7.85	25.75	22.9	2.04	Silt mixtures - clayey silt to silty clay	2.77		3.06
7.90	25.92	25.9	2.12	Silt mixtures - clayey silt to silty clay	2.74		3.45
7.95	26.08	13.8	3.40	Clays - silty clay to clay	3.11		1.84
8.00	26.25	8.7	2.53	Clays - silty clay to clay	3.23		1.15
8.05	26.41	7.0	2.46	Clays - silty clay to clay	3.32		0.93
8.10	26.57	6.8	3.16	Clays - silty clay to clay	3.40		0.91
8.15	26.74	7.2	3.86	Clays - silty clay to clay	3.43		0.96
8.20	26.90	13.4	4.18	Clays - silty clay to clay	3.19		1.79
8.25	27.07	24.7	3.33	Clays - silty clay to clay	2.91		3.29
8.30	27.23	29.8	3.08	Silt mixtures - clayey silt to silty clay	2.82		3.97
8.35	27.39	22.6	3.25	Clays - silty clay to clay	2.93		3.02
8.40	27.56	11.1	4.43	Clays - silty clay to clay	3.30		1.47
8.45	27.72	6.9	1.97	Clays - silty clay to clay	3.29		0.92
8.50	27.89	5.9	1.95	Clays - silty clay to clay	3.37		0.78
8.55	28.05	5.6	1.63	Clays - silty clay to clay	3.36		0.74
8.60	28.21	5.3	1.80	Clays - silty clay to clay	3.41		0.71
8.65	28.38	5.6	1.56	Clays - silty clay to clay	3.35		0.74
8.70	28.54	4.8	1.35	Clays - silty clay to clay	3.40		0.65
8.75	28.71	4.6	1.86	Clays - silty clay to clay	3.51		0.61
8.80	28.87	5.0	2.09	Clays - silty clay to clay	3.49		0.67
8.85	29.04	5.5	2.36	Clays - silty clay to clay	3.48		0.73
8.90	29.20	5.1	2.65	Clays - silty clay to clay	3.55		0.68
8.95	29.36	6.3	3.20	Clays - silty clay to clay	3.50		0.83
9.00	29.53	6.9	5.06	Unstable clayey silts	3.58		0.92
9.05	29.69	8.6	4.35	Clays - silty clay to clay	3.44		1.14
9.10	29.86	14.4	2.83	Clays - silty clay to clay	3.10		1.93

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-13

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	21.0	2.25	Silt mixtures - clayey silt to silty clay	2.90		2.80
9.20	30.18	24.1	1.79	Silt mixtures - clayey silt to silty clay	2.78		3.22
9.25	30.35	25.1	2.25	Silt mixtures - clayey silt to silty clay	2.84		3.34
9.30	30.51	26.1	2.85	Clays - silty clay to clay	2.89		3.48
9.35	30.68	28.7	3.28	Clays - silty clay to clay	2.90		3.83
9.40	30.84	31.1	3.23	Clays - silty clay to clay	2.87		4.15
9.45	31.00	30.9	3.49	Clays - silty clay to clay	2.89		4.12
9.50	31.17	30.2	3.65	Clays - silty clay to clay	2.92		4.03
9.55	31.33	28.5	3.73	Clays - silty clay to clay	2.94		3.80
9.60	31.50	26.2	4.41	Clays - silty clay to clay	3.03		3.49
9.65	31.66	27.2	4.81	Clays - silty clay to clay	3.04		3.63
9.70	31.82	27.5	5.17	Clays - silty clay to clay	3.06		3.67
9.75	31.99	28.5	5.56	Clays - silty clay to clay	3.07		3.80
9.80	32.15	28.2	6.73	Clays - silty clay to clay	3.14		3.76
9.85	32.32	32.0	6.39	Clays - silty clay to clay	3.08		4.26
9.90	32.48	34.5	5.24	Clays - silty clay to clay	2.99		4.60
9.95	32.64	31.4	5.43	Clays - silty clay to clay	3.04		4.18
10.00	32.81	30.8	4.42	Clays - silty clay to clay	2.98		4.11
10.05	32.97	26.1	4.96	Clays - silty clay to clay	3.08		3.48
10.10	33.14	24.3	5.56	Clays - silty clay to clay	3.14		3.25
10.15	33.30	33.5	4.07	Clays - silty clay to clay	2.94		4.47
10.20	33.46	34.4	4.04	Clays - silty clay to clay	2.93		4.58
10.25	33.63	33.1	5.40	Clays - silty clay to clay	3.03		4.42
10.30	33.79	33.5	4.66	Clays - silty clay to clay	2.98		4.47
10.35	33.96	28.6	4.35	Clays - silty clay to clay	3.02		3.81
10.40	34.12	21.9	4.59	Clays - silty clay to clay	3.13		2.92
10.45	34.28	20.8	3.49	Clays - silty clay to clay	3.08		2.77
10.50	34.45	19.3	3.84	Clays - silty clay to clay	3.13		2.57
10.55	34.61	16.6	3.20	Clays - silty clay to clay	3.14		2.21
10.60	34.78	17.8	2.75	Clays - silty clay to clay	3.08		2.37
10.65	34.94	19.2	2.84	Clays - silty clay to clay	3.06		2.56
10.70	35.10	20.3	2.79	Clays - silty clay to clay	3.03		2.71
10.75	35.27	24.8	2.88	Clays - silty clay to clay	2.97		3.30
10.80	35.43	26.7	2.13	Silt mixtures - clayey silt to silty clay	2.86		3.55
10.85	35.60	23.2	2.87	Clays - silty clay to clay	3.00		3.09
10.90	35.76	19.8	2.25	Clays - silty clay to clay	2.99		2.64
10.95	35.92	21.4	2.20	Clays - silty clay to clay	2.96		2.86
11.00	36.09	22.3	2.81	Clays - silty clay to clay	3.01		2.98
11.05	36.25	32.2	2.91	Clays - silty clay to clay	2.89		4.29
11.10	36.42	27.9	5.95	Clays - silty clay to clay	3.15		3.72
11.15	36.58	49.4	3.78	Clays - silty clay to clay	2.82		6.58
11.20	36.74	86.7	2.78	Silt mixtures - clayey silt to silty clay	2.52	3.28	
11.25	36.91	82.3	2.78	Silt mixtures - clayey silt to silty clay	2.54	3.72	
11.30	37.07	48.4	3.59	Clays - silty clay to clay	2.81		6.45
11.35	37.24	34.4	3.33	Clays - silty clay to clay	2.91		4.59
11.40	37.40	37.9	2.62	Silt mixtures - clayey silt to silty clay	2.81		5.05
11.45	37.57	41.8	1.32	Sand mixtures - silty sand to sandy silt	2.57	4.57	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-13

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	38.8	0.76	Sand mixtures - silty sand to sandy silt	2.46	2.56	
11.55	37.89	33.1	0.88	Sand mixtures - silty sand to sandy silt	2.57	4.38	
11.60	38.06	27.8	1.19	Silt mixtures - clayey silt to silty clay	2.72		3.71
11.65	38.22	29.4	1.47	Silt mixtures - clayey silt to silty clay	2.76		3.92
11.70	38.39	30.1	1.60	Silt mixtures - clayey silt to silty clay	2.77		4.01
11.75	38.55	29.5	1.80	Silt mixtures - clayey silt to silty clay	2.81		3.93
11.80	38.71	31.7	1.82	Silt mixtures - clayey silt to silty clay	2.79		4.23
11.85	38.88	37.2	1.21	Silt mixtures - clayey silt to silty clay	2.61	5.92	4.96
11.90	39.04	33.1	1.56	Silt mixtures - clayey silt to silty clay	2.74		4.41
11.95	39.21	31.3	2.15	Silt mixtures - clayey silt to silty clay	2.84		4.18
12.00	39.37	30.7	2.79	Clays - silty clay to clay	2.92		4.09
12.05	39.53	30.4	3.07	Clays - silty clay to clay	2.96		4.05
12.10	39.70	31.8	2.81	Clays - silty clay to clay	2.92		4.24
12.15	39.86	32.3	2.96	Clays - silty clay to clay	2.93		4.31
12.20	40.03	33.5	2.81	Clays - silty clay to clay	2.90		4.46
12.25	40.19	33.2	2.62	Clays - silty clay to clay	2.89		4.43
12.30	40.35	30.7	2.40	Silt mixtures - clayey silt to silty clay	2.89		4.09
12.35	40.52	29.3	2.94	Clays - silty clay to clay	2.97		3.91
12.40	40.68	33.3	3.48	Clays - silty clay to clay	2.97		4.44
12.45	40.85	36.4	3.60	Clays - silty clay to clay	2.95		4.85
12.50	41.01	33.6	4.00	Clays - silty clay to clay	3.01		4.48
12.55	41.17	34.6	3.60	Clays - silty clay to clay	2.97		4.61
12.60	41.34	34.4	3.67	Clays - silty clay to clay	2.98		4.59
12.65	41.50	35.5	3.65	Clays - silty clay to clay	2.97		4.73
12.70	41.67	42.1	3.24	Clays - silty clay to clay	2.88		5.61
12.75	41.83	51.2	3.71	Clays - silty clay to clay	2.85		6.82
12.80	41.99	57.9	4.65	Clays - silty clay to clay	2.88		7.72
12.85	42.16	70.9	4.31	Clays - silty clay to clay	2.79		9.46
12.90	42.32	67.3	5.50	Clays - silty clay to clay	2.88		8.97
12.95	42.49	76.5	4.30	Clays - silty clay to clay	2.77		10.19
13.00	42.65	55.4	5.25	Clays - silty clay to clay	2.94		7.38
13.05	42.81	48.4	4.97	Clays - silty clay to clay	2.96		6.45
13.10	42.98	43.5	5.17	Clays - silty clay to clay	3.01		5.81
13.15	43.14	47.2	4.31	Clays - silty clay to clay	2.93		6.29
13.20	43.31	38.9	3.98	Clays - silty clay to clay	2.98		5.18
13.25	43.47	40.9	3.28	Clays - silty clay to clay	2.91		5.45
13.30	43.63	39.8	2.62	Silt mixtures - clayey silt to silty clay	2.85		5.30
13.35	43.80	37.1	2.57	Silt mixtures - clayey silt to silty clay	2.87		4.95
13.40	43.96	35.1	3.69	Clays - silty clay to clay	3.00		4.68
13.45	44.13	39.9	5.25	Clays - silty clay to clay	3.06		5.31
13.50	44.29	53.5	4.29	Clays - silty clay to clay	2.90		7.13
13.55	44.45	50.2	3.55	Clays - silty clay to clay	2.86		6.69
13.60	44.62	36.5	3.43	Clays - silty clay to clay	2.97		4.87
13.65	44.78	33.8	3.38	Clays - silty clay to clay	2.99		4.51
13.70	44.95	35.9	3.71	Clays - silty clay to clay	3.00		4.79
13.75	45.11	39.7	3.99	Clays - silty clay to clay	2.99		5.30
13.80	45.28	46.7	3.40	Clays - silty clay to clay	2.88		6.23

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-13

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	38.9	4.46	Clays - silty clay to clay	3.03		5.19
13.90	45.60	41.6	2.77	Clays - silty clay to clay	2.87		5.55
13.95	45.77	31.5	3.23	Clays - silty clay to clay	3.02		4.21
14.00	45.93	27.1	4.48	Clays - silty clay to clay	3.17		3.61
14.05	46.10	36.4	4.64	Clays - silty clay to clay	3.07		4.85
14.10	46.26	35.6	5.38	Clays - silty clay to clay	3.12		4.74
14.15	46.42	32.4	5.13	Clays - silty clay to clay	3.14		4.32
14.20	46.59	33.6	4.09	Clays - silty clay to clay	3.07		4.48
14.25	46.75	34.0	4.77	Clays - silty clay to clay	3.11		4.53
14.30	46.92	40.0	4.89	Clays - silty clay to clay	3.06		5.33
14.35	47.08	56.7	3.86	Clays - silty clay to clay	2.87		7.56
14.40	47.24	47.6	3.54	Clays - silty clay to clay	2.91		6.35
14.45	47.41	32.9	4.26	Clays - silty clay to clay	3.09		4.39
14.50	47.57	29.6	5.12	Clays - silty clay to clay	3.19		3.94
14.55	47.74	31.5	4.99	Clays - silty clay to clay	3.16		4.21
14.60	47.90	31.7	5.30	Clays - silty clay to clay	3.18		4.22
14.65	48.06	29.3	4.76	Clays - silty clay to clay	3.17		3.91
14.70	48.23	30.6	4.14	Clays - silty clay to clay	3.12		4.07
14.75	48.39	32.4	2.72	Clays - silty clay to clay	2.98		4.32
14.80	48.56	28.4	2.80	Clays - silty clay to clay	3.04		3.79
14.85	48.72	26.9	3.26	Clays - silty clay to clay	3.11		3.59
14.90	48.88	29.1	3.39	Clays - silty clay to clay	3.09		3.88
14.95	49.05	36.7	3.09	Clays - silty clay to clay	2.98		4.89
15.00	49.21	34.5	3.81	Clays - silty clay to clay	3.06		4.60
15.05	49.38	44.1	2.88	Clays - silty clay to clay	2.89		5.88
15.10	49.54	38.2	3.20	Clays - silty clay to clay	2.97		5.09
15.15	49.70	36.4	2.63	Clays - silty clay to clay	2.94		4.85
15.20	49.87	33.8	2.63	Clays - silty clay to clay	2.97		4.50
15.25	50.03	37.1	2.63	Clays - silty clay to clay	2.94		4.94

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 17:58
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-14

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	34.8	2.76	Sand mixtures - silty sand to sandy silt	2.34	2.08	
0.10	0.33	56.4	2.81	Sand mixtures - silty sand to sandy silt	2.21	1.67	
0.15	0.49	45.4	3.35	Sand mixtures - silty sand to sandy silt	2.33	2.02	
0.20	0.66	34.0	3.64	Silt mixtures - clayey silt to silty clay	2.44	2.45	
0.25	0.82	29.5	3.59	Silt mixtures - clayey silt to silty clay	2.48	2.63	
0.30	0.98	30.4	3.47	Silt mixtures - clayey silt to silty clay	2.46	2.54	
0.35	1.15	30.2	3.67	Silt mixtures - clayey silt to silty clay	2.48	2.63	
0.40	1.31	28.1	3.94	Silt mixtures - clayey silt to silty clay	2.52	3.19	
0.45	1.48	27.1	4.09	Silt mixtures - clayey silt to silty clay	2.54	3.71	
0.50	1.64	27.3	3.94	Silt mixtures - clayey silt to silty clay	2.53	3.40	
0.55	1.80	25.8	3.21	Silt mixtures - clayey silt to silty clay	2.48	2.67	
0.60	1.97	22.2	3.46	Silt mixtures - clayey silt to silty clay	2.55	4.01	
0.65	2.13	18.4	3.72	Silt mixtures - clayey silt to silty clay	2.64	6.83	2.45
0.70	2.30	16.6	3.66	Silt mixtures - clayey silt to silty clay	2.66	8.17	2.22
0.75	2.46	16.1	3.35	Silt mixtures - clayey silt to silty clay	2.65	7.46	2.14
0.80	2.62	15.6	3.20	Silt mixtures - clayey silt to silty clay	2.65	7.32	2.08
0.85	2.79	14.6	3.06	Silt mixtures - clayey silt to silty clay	2.66	7.82	1.95
0.90	2.95	13.5	2.86	Silt mixtures - clayey silt to silty clay	2.67	8.24	1.80
0.95	3.12	13.1	2.58	Silt mixtures - clayey silt to silty clay	2.65	7.41	1.74
1.00	3.28	13.0	2.29	Silt mixtures - clayey silt to silty clay	2.62	6.19	1.73
1.05	3.44	12.8	2.27	Silt mixtures - clayey silt to silty clay	2.62	6.34	1.70
1.10	3.61	14.8	2.46	Silt mixtures - clayey silt to silty clay	2.60	5.24	
1.15	3.77	17.6	2.21	Silt mixtures - clayey silt to silty clay	2.51	2.91	
1.20	3.94	17.8	2.10	Sand mixtures - silty sand to sandy silt	2.49	2.69	
1.25	4.10	20.1	2.28	Sand mixtures - silty sand to sandy silt	2.47	2.61	
1.30	4.27	24.6	2.50	Sand mixtures - silty sand to sandy silt	2.43	2.42	
1.35	4.43	27.8	2.68	Sand mixtures - silty sand to sandy silt	2.41	2.34	
1.40	4.59	28.1	2.64	Sand mixtures - silty sand to sandy silt	2.40	2.31	
1.45	4.76	24.3	2.11	Sand mixtures - silty sand to sandy silt	2.38	2.24	
1.50	4.92	21.0	2.19	Sand mixtures - silty sand to sandy silt	2.45	2.49	
1.55	5.09	20.3	1.79	Sand mixtures - silty sand to sandy silt	2.40	2.31	
1.60	5.25	20.0	1.71	Sand mixtures - silty sand to sandy silt	2.39	2.28	
1.65	5.41	23.2	1.70	Sand mixtures - silty sand to sandy silt	2.34	2.08	
1.70	5.58	26.6	1.73	Sand mixtures - silty sand to sandy silt	2.30	1.94	
1.75	5.74	27.4	2.13	Sand mixtures - silty sand to sandy silt	2.35	2.10	
1.80	5.91	26.9	1.99	Sand mixtures - silty sand to sandy silt	2.34	2.06	
1.85	6.07	23.5	2.11	Sand mixtures - silty sand to sandy silt	2.40	2.29	
1.90	6.23	21.7	1.64	Sand mixtures - silty sand to sandy silt	2.36	2.13	
1.95	6.40	22.7	1.88	Sand mixtures - silty sand to sandy silt	2.38	2.21	
2.00	6.56	23.5	1.55	Sand mixtures - silty sand to sandy silt	2.31	1.98	
2.05	6.73	21.0	1.87	Sand mixtures - silty sand to sandy silt	2.40	2.31	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-14

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	21.6	1.54	Sand mixtures - silty sand to sandy silt	2.34	2.08	
2.15	7.05	22.4	1.68	Sand mixtures - silty sand to sandy silt	2.35	2.12	
2.20	7.22	27.1	1.86	Sand mixtures - silty sand to sandy silt	2.31	1.98	
2.25	7.38	33.4	1.89	Sand mixtures - silty sand to sandy silt	2.26	1.81	
2.30	7.55	38.0	1.97	Sand mixtures - silty sand to sandy silt	2.24	1.75	
2.35	7.71	40.5	1.21	Sand mixtures - silty sand to sandy silt	2.09	1.43	
2.40	7.87	42.3	1.39	Sand mixtures - silty sand to sandy silt	2.12	1.48	
2.45	8.04	44.5	1.58	Sand mixtures - silty sand to sandy silt	2.15	1.53	
2.50	8.20	50.1	1.78	Sand mixtures - silty sand to sandy silt	2.15	1.54	
2.55	8.37	58.4	1.93	Sand mixtures - silty sand to sandy silt	2.14	1.51	
2.60	8.53	60.5	1.92	Sand mixtures - silty sand to sandy silt	2.13	1.50	
2.65	8.69	58.4	2.15	Sand mixtures - silty sand to sandy silt	2.17	1.60	
2.70	8.86	59.4	2.11	Sand mixtures - silty sand to sandy silt	2.17	1.58	
2.75	9.02	59.6	2.11	Sand mixtures - silty sand to sandy silt	2.17	1.59	
2.80	9.19	63.0	2.07	Sand mixtures - silty sand to sandy silt	2.15	1.55	
2.85	9.35	69.0	2.04	Sand mixtures - silty sand to sandy silt	2.13	1.50	
2.90	9.51	70.8	2.22	Sand mixtures - silty sand to sandy silt	2.15	1.54	
2.95	9.68	66.7	2.69	Sand mixtures - silty sand to sandy silt	2.23	1.73	
3.00	9.84	64.4	2.76	Sand mixtures - silty sand to sandy silt	2.25	1.78	
3.05	10.01	71.9	2.57	Sand mixtures - silty sand to sandy silt	2.20	1.66	
3.10	10.17	77.8	2.61	Sand mixtures - silty sand to sandy silt	2.19	1.63	
3.15	10.33	70.1	2.97	Sand mixtures - silty sand to sandy silt	2.26	1.82	
3.20	10.50	65.2	3.08	Sand mixtures - silty sand to sandy silt	2.29	1.92	
3.25	10.66	64.3	2.94	Sand mixtures - silty sand to sandy silt	2.29	1.89	
3.30	10.83	61.6	2.85	Sand mixtures - silty sand to sandy silt	2.29	1.91	
3.35	10.99	58.6	2.41	Sand mixtures - silty sand to sandy silt	2.26	1.81	
3.40	11.15	59.6	2.54	Sand mixtures - silty sand to sandy silt	2.27	1.85	
3.45	11.32	60.7	2.66	Sand mixtures - silty sand to sandy silt	2.28	1.89	
3.50	11.48	62.6	2.81	Sand mixtures - silty sand to sandy silt	2.30	1.92	
3.55	11.65	62.4	2.75	Sand mixtures - silty sand to sandy silt	2.29	1.91	
3.60	11.81	59.1	2.68	Sand mixtures - silty sand to sandy silt	2.30	1.95	
3.65	11.97	57.8	2.66	Sand mixtures - silty sand to sandy silt	2.31	1.97	
3.70	12.14	60.1	2.62	Sand mixtures - silty sand to sandy silt	2.30	1.93	
3.75	12.30	64.6	2.51	Sand mixtures - silty sand to sandy silt	2.27	1.83	
3.80	12.47	69.3	2.35	Sand mixtures - silty sand to sandy silt	2.23	1.73	
3.85	12.63	72.7	2.22	Sand mixtures - silty sand to sandy silt	2.20	1.66	
3.90	12.80	75.6	2.42	Sand mixtures - silty sand to sandy silt	2.22	1.71	
3.95	12.96	76.9	2.44	Sand mixtures - silty sand to sandy silt	2.22	1.71	
4.00	13.12	72.3	2.48	Sand mixtures - silty sand to sandy silt	2.25	1.78	
4.05	13.29	70.5	2.42	Sand mixtures - silty sand to sandy silt	2.25	1.78	
4.10	13.45	70.4	2.48	Sand mixtures - silty sand to sandy silt	2.26	1.81	
4.15	13.62	70.9	2.56	Sand mixtures - silty sand to sandy silt	2.27	1.84	
4.20	13.78	76.3	2.61	Sand mixtures - silty sand to sandy silt	2.26	1.81	
4.25	13.94	86.2	2.59	Sand mixtures - silty sand to sandy silt	2.22	1.72	
4.30	14.11	93.1	2.66	Sand mixtures - silty sand to sandy silt	2.21	1.69	
4.35	14.27	97.5	2.79	Sand mixtures - silty sand to sandy silt	2.22	1.71	
4.40	14.44	103.8	2.81	Sand mixtures - silty sand to sandy silt	2.21	1.67	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-14

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	106.2	2.34	Sand mixtures - silty sand to sandy silt	2.14	1.53	
4.50	14.76	102.8	2.53	Sand mixtures - silty sand to sandy silt	2.18	1.61	
4.55	14.93	97.2	2.43	Sand mixtures - silty sand to sandy silt	2.18	1.62	
4.60	15.09	91.2	2.30	Sand mixtures - silty sand to sandy silt	2.19	1.63	
4.65	15.26	93.5	2.00	Sand mixtures - silty sand to sandy silt	2.14	1.52	
4.70	15.42	99.9	1.68	Sand mixtures - silty sand to sandy silt	2.06	1.39	
4.75	15.58	107.4	1.56	Sands - clean sands to silty sand	2.02	1.32	
4.80	15.75	106.7	1.34	Sands - clean sands to silty sand	1.98	1.27	
4.85	15.91	95.5	1.48	Sand mixtures - silty sand to sandy silt	2.05	1.36	
4.90	16.08	96.3	1.60	Sand mixtures - silty sand to sandy silt	2.07	1.39	
4.95	16.24	96.2	1.98	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.00	16.40	97.1	2.09	Sand mixtures - silty sand to sandy silt	2.16	1.56	
5.05	16.57	98.5	2.00	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.10	16.73	101.8	1.91	Sand mixtures - silty sand to sandy silt	2.12	1.48	
5.15	16.90	100.9	2.16	Sand mixtures - silty sand to sandy silt	2.16	1.57	
5.20	17.06	92.9	2.26	Sand mixtures - silty sand to sandy silt	2.20	1.66	
5.25	17.22	84.3	2.19	Sand mixtures - silty sand to sandy silt	2.22	1.72	
5.30	17.39	79.0	1.98	Sand mixtures - silty sand to sandy silt	2.21	1.69	
5.35	17.55	76.8	1.71	Sand mixtures - silty sand to sandy silt	2.18	1.61	
5.40	17.72	72.9	1.13	Sand mixtures - silty sand to sandy silt	2.08	1.41	
5.45	17.88	59.0	1.32	Sand mixtures - silty sand to sandy silt	2.19	1.64	
5.50	18.04	47.2	1.45	Sand mixtures - silty sand to sandy silt	2.30	1.92	
5.55	18.21	35.7	2.37	Silt mixtures - clayey silt to silty clay	2.53	3.50	
5.60	18.37	28.0	2.36	Silt mixtures - clayey silt to silty clay	2.62	6.02	3.73
5.65	18.54	24.0	2.66	Silt mixtures - clayey silt to silty clay	2.71		3.20
5.70	18.70	21.9	2.80	Silt mixtures - clayey silt to silty clay	2.76		2.92
5.75	18.86	21.7	2.53	Silt mixtures - clayey silt to silty clay	2.73		2.89
5.80	19.03	21.4	2.06	Silt mixtures - clayey silt to silty clay	2.68	9.24	2.85
5.85	19.19	19.2	1.67	Silt mixtures - clayey silt to silty clay	2.67	8.36	2.57
5.90	19.36	11.1	1.96	Silt mixtures - clayey silt to silty clay	2.92		1.48
5.95	19.52	12.0	1.84	Silt mixtures - clayey silt to silty clay	2.88		1.60
6.00	19.68	14.2	2.18	Silt mixtures - clayey silt to silty clay	2.86		1.90
6.05	19.85	18.6	2.15	Silt mixtures - clayey silt to silty clay	2.76		2.48
6.10	20.01	30.2	1.50	Sand mixtures - silty sand to sandy silt	2.49	2.71	
6.15	20.18	27.1	1.91	Silt mixtures - clayey silt to silty clay	2.60	5.40	
6.20	20.34	24.7	2.73	Silt mixtures - clayey silt to silty clay	2.74		3.30
6.25	20.51	24.9	3.00	Silt mixtures - clayey silt to silty clay	2.76		3.32
6.30	20.67	23.1	2.86	Silt mixtures - clayey silt to silty clay	2.78		3.08
6.35	20.83	21.1	2.83	Silt mixtures - clayey silt to silty clay	2.81		2.81
6.40	21.00	22.5	2.77	Silt mixtures - clayey silt to silty clay	2.78		3.00
6.45	21.16	28.2	2.07	Silt mixtures - clayey silt to silty clay	2.63	6.35	3.77
6.50	21.33	42.9	2.03	Sand mixtures - silty sand to sandy silt	2.48	2.64	
6.55	21.49	49.8	2.17	Sand mixtures - silty sand to sandy silt	2.45	2.51	
6.60	21.65	40.3	2.85	Silt mixtures - clayey silt to silty clay	2.61	5.59	5.37
6.65	21.82	31.7	3.18	Silt mixtures - clayey silt to silty clay	2.72		4.22
6.70	21.98	26.6	3.55	Clays - silty clay to clay	2.82		3.54
6.75	22.15	24.1	3.51	Clays - silty clay to clay	2.85		3.21

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-14

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	23.1	2.99	Silt mixtures - clayey silt to silty clay	2.82		3.08
6.85	22.47	22.1	2.95	Silt mixtures - clayey silt to silty clay	2.84		2.95
6.90	22.64	22.6	2.81	Silt mixtures - clayey silt to silty clay	2.82		3.02
6.95	22.80	23.4	2.73	Silt mixtures - clayey silt to silty clay	2.80		3.12
7.00	22.97	23.0	2.64	Silt mixtures - clayey silt to silty clay	2.80		3.06
7.05	23.13	22.4	2.57	Silt mixtures - clayey silt to silty clay	2.80		2.99
7.10	23.29	25.2	2.30	Silt mixtures - clayey silt to silty clay	2.73		3.36
7.15	23.46	29.4	1.93	Silt mixtures - clayey silt to silty clay	2.63	6.46	3.92
7.20	23.62	29.0	1.83	Silt mixtures - clayey silt to silty clay	2.62	6.16	3.86
7.25	23.79	28.1	1.85	Silt mixtures - clayey silt to silty clay	2.64	6.89	3.74
7.30	23.95	32.8	2.05	Silt mixtures - clayey silt to silty clay	2.61	5.89	4.37
7.35	24.11	39.2	3.39	Silt mixtures - clayey silt to silty clay	2.71		5.23
7.40	24.28	50.9	2.45	Silt mixtures - clayey silt to silty clay	2.52	3.16	
7.45	24.44	48.0	2.29	Silt mixtures - clayey silt to silty clay	2.52	3.19	
7.50	24.61	54.5	2.03	Sand mixtures - silty sand to sandy silt	2.44	2.47	
7.55	24.77	58.3	2.35	Sand mixtures - silty sand to sandy silt	2.47	2.58	
7.60	24.93	64.6	2.55	Silt mixtures - clayey silt to silty clay	2.46	2.55	
7.65	25.10	73.7	2.46	Sand mixtures - silty sand to sandy silt	2.41	2.33	
7.70	25.26	79.6	2.19	Sand mixtures - silty sand to sandy silt	2.35	2.09	
7.75	25.43	79.4	1.79	Sand mixtures - silty sand to sandy silt	2.28	1.89	
7.80	25.59	72.5	1.93	Sand mixtures - silty sand to sandy silt	2.34	2.07	
7.85	25.75	68.3	2.28	Sand mixtures - silty sand to sandy silt	2.42	2.36	
7.90	25.92	69.3	2.56	Sand mixtures - silty sand to sandy silt	2.45	2.51	
7.95	26.08	74.5	2.51	Sand mixtures - silty sand to sandy silt	2.42	2.39	
8.00	26.25	78.6	2.46	Sand mixtures - silty sand to sandy silt	2.40	2.29	
8.05	26.41	79.5	2.42	Sand mixtures - silty sand to sandy silt	2.39	2.27	
8.10	26.57	80.3	2.29	Sand mixtures - silty sand to sandy silt	2.37	2.19	
8.15	26.74	83.4	2.35	Sand mixtures - silty sand to sandy silt	2.37	2.18	
8.20	26.90	85.9	2.55	Sand mixtures - silty sand to sandy silt	2.39	2.26	
8.25	27.07	88.6	2.60	Sand mixtures - silty sand to sandy silt	2.39	2.25	
8.30	27.23	95.2	2.38	Sand mixtures - silty sand to sandy silt	2.34	2.06	
8.35	27.39	105.9	2.20	Sand mixtures - silty sand to sandy silt	2.28	1.87	
8.40	27.56	115.7	1.78	Sand mixtures - silty sand to sandy silt	2.18	1.61	
8.45	27.72	132.7	1.68	Sand mixtures - silty sand to sandy silt	2.12	1.48	
8.50	27.89	146.9	1.64	Sand mixtures - silty sand to sandy silt	2.08	1.41	
8.55	28.05	149.1	1.90	Sand mixtures - silty sand to sandy silt	2.13	1.49	
8.60	28.21	158.8	1.95	Sand mixtures - silty sand to sandy silt	2.12	1.48	
8.65	28.38	198.4	1.44	Sands - clean sands to silty sand	1.94	1.23	
8.70	28.54	237.3	0.95	Sands - clean sands to silty sand	1.75	1.06	
8.75	28.71	238.4	0.95	Sands - clean sands to silty sand	1.75	1.06	
8.80	28.87	228.6	1.20	Sands - clean sands to silty sand	1.84	1.13	
8.85	29.04	221.8	0.94	Sands - clean sands to silty sand	1.77	1.08	
8.90	29.20	214.0	1.15	Sands - clean sands to silty sand	1.85	1.14	
8.95	29.36	205.3	1.03	Sands - clean sands to silty sand	1.83	1.12	
9.00	29.53	163.0	0.96	Sands - clean sands to silty sand	1.88	1.17	
9.05	29.69	123.4	1.69	Sand mixtures - silty sand to sandy silt	2.16	1.57	
9.10	29.86	115.4	1.85	Sand mixtures - silty sand to sandy silt	2.22	1.70	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-14

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	89.5	2.07	Sand mixtures - silty sand to sandy silt	2.34	2.08	
9.20	30.18	79.1	2.16	Sand mixtures - silty sand to sandy silt	2.40	2.30	
9.25	30.35	75.3	2.07	Sand mixtures - silty sand to sandy silt	2.41	2.32	
9.30	30.51	76.7	2.05	Sand mixtures - silty sand to sandy silt	2.40	2.29	
9.35	30.68	83.8	1.82	Sand mixtures - silty sand to sandy silt	2.33	2.04	
9.40	30.84	95.7	1.40	Sand mixtures - silty sand to sandy silt	2.20	1.66	
9.45	31.00	106.4	1.20	Sand mixtures - silty sand to sandy silt	2.12	1.48	
9.50	31.17	104.9	1.45	Sand mixtures - silty sand to sandy silt	2.19	1.62	
9.55	31.33	103.2	1.74	Sand mixtures - silty sand to sandy silt	2.25	1.79	
9.60	31.50	102.7	1.86	Sand mixtures - silty sand to sandy silt	2.27	1.86	
9.65	31.66	99.0	1.63	Sand mixtures - silty sand to sandy silt	2.25	1.78	
9.70	31.82	79.4	1.65	Sand mixtures - silty sand to sandy silt	2.33	2.04	
9.75	31.99	84.5	1.42	Sand mixtures - silty sand to sandy silt	2.26	1.83	
9.80	32.15	80.5	2.12	Sand mixtures - silty sand to sandy silt	2.41	2.34	
9.85	32.32	77.7	2.36	Sand mixtures - silty sand to sandy silt	2.46	2.55	
9.90	32.48	66.2	2.70	Silt mixtures - clayey silt to silty clay	2.56	4.20	
9.95	32.64	53.5	3.01	Silt mixtures - clayey silt to silty clay	2.67	8.66	7.13
10.00	32.81	40.6	2.99	Silt mixtures - clayey silt to silty clay	2.77		5.41
10.05	32.97	32.9	3.04	Clays - silty clay to clay	2.85		4.38
10.10	33.14	30.8	2.87	Clays - silty clay to clay	2.86		4.10
10.15	33.30	30.8	2.56	Silt mixtures - clayey silt to silty clay	2.83		4.11
10.20	33.46	30.7	2.49	Silt mixtures - clayey silt to silty clay	2.83		4.09
10.25	33.63	30.1	2.50	Silt mixtures - clayey silt to silty clay	2.84		4.02
10.30	33.79	30.3	2.43	Silt mixtures - clayey silt to silty clay	2.83		4.05
10.35	33.96	30.1	2.50	Silt mixtures - clayey silt to silty clay	2.84		4.01
10.40	34.12	30.3	2.27	Silt mixtures - clayey silt to silty clay	2.81		4.04
10.45	34.28	31.1	2.44	Silt mixtures - clayey silt to silty clay	2.83		4.15
10.50	34.45	31.5	2.68	Silt mixtures - clayey silt to silty clay	2.85		4.20
10.55	34.61	33.5	2.60	Silt mixtures - clayey silt to silty clay	2.82		4.47
10.60	34.78	35.6	2.78	Silt mixtures - clayey silt to silty clay	2.82		4.74
10.65	34.94	39.5	2.63	Silt mixtures - clayey silt to silty clay	2.77		5.27
10.70	35.10	40.9	2.77	Silt mixtures - clayey silt to silty clay	2.78		5.45
10.75	35.27	42.0	2.80	Silt mixtures - clayey silt to silty clay	2.77		5.60
10.80	35.43	45.1	2.70	Silt mixtures - clayey silt to silty clay	2.74		6.01
10.85	35.60	47.5	2.76	Silt mixtures - clayey silt to silty clay	2.73		6.33
10.90	35.76	50.7	2.68	Silt mixtures - clayey silt to silty clay	2.69	9.84	6.75
10.95	35.92	54.3	2.63	Silt mixtures - clayey silt to silty clay	2.66	8.13	7.24
11.00	36.09	59.9	2.49	Silt mixtures - clayey silt to silty clay	2.61	5.83	7.98
11.05	36.25	64.8	2.52	Silt mixtures - clayey silt to silty clay	2.59	5.05	
11.10	36.42	71.1	2.67	Silt mixtures - clayey silt to silty clay	2.58	4.65	
11.15	36.58	84.8	2.59	Silt mixtures - clayey silt to silty clay	2.50	2.89	
11.20	36.74	102.8	2.25	Sand mixtures - silty sand to sandy silt	2.39	2.27	
11.25	36.91	113.1	1.98	Sand mixtures - silty sand to sandy silt	2.32	1.99	
11.30	37.07	109.5	2.16	Sand mixtures - silty sand to sandy silt	2.36	2.14	
11.35	37.24	102.3	2.65	Silt mixtures - clayey silt to silty clay	2.45	2.53	
11.40	37.40	90.0	2.70	Silt mixtures - clayey silt to silty clay	2.51	2.92	
11.45	37.57	75.3	2.95	Silt mixtures - clayey silt to silty clay	2.60	5.47	10.05

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-14

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	69.2	2.98	Silt mixtures - clayey silt to silty clay	2.64	6.88	9.22
11.55	37.89	63.1	3.14	Silt mixtures - clayey silt to silty clay	2.69	9.58	8.42
11.60	38.06	60.3	2.99	Silt mixtures - clayey silt to silty clay	2.69	9.67	8.04
11.65	38.22	60.9	2.91	Silt mixtures - clayey silt to silty clay	2.68	9.05	8.12
11.70	38.39	60.2	2.69	Silt mixtures - clayey silt to silty clay	2.66	8.03	8.02
11.75	38.55	48.8	2.67	Silt mixtures - clayey silt to silty clay	2.74		6.50
11.80	38.71	41.5	2.82	Silt mixtures - clayey silt to silty clay	2.81		5.53
11.85	38.88	39.8	2.91	Silt mixtures - clayey silt to silty clay	2.84		5.31
11.90	39.04	44.3	2.66	Silt mixtures - clayey silt to silty clay	2.78		5.91
11.95	39.21	50.1	2.37	Silt mixtures - clayey silt to silty clay	2.70	10.10	6.68
12.00	39.37	54.1	2.08	Silt mixtures - clayey silt to silty clay	2.63	6.58	7.21
12.05	39.53	56.4	2.74	Silt mixtures - clayey silt to silty clay	2.70		7.52
12.10	39.70	64.4	2.53	Silt mixtures - clayey silt to silty clay	2.63	6.60	8.59
12.15	39.86	67.5	2.32	Silt mixtures - clayey silt to silty clay	2.59	4.95	
12.20	40.03	73.0	2.17	Silt mixtures - clayey silt to silty clay	2.54	3.58	
12.25	40.19	77.4	2.13	Silt mixtures - clayey silt to silty clay	2.51	2.99	
12.30	40.35	81.0	2.28	Silt mixtures - clayey silt to silty clay	2.52	3.15	
12.35	40.52	77.7	2.61	Silt mixtures - clayey silt to silty clay	2.58	4.74	
12.40	40.68	67.7	2.89	Silt mixtures - clayey silt to silty clay	2.67	8.27	9.03
12.45	40.85	60.0	2.57	Silt mixtures - clayey silt to silty clay	2.67	8.70	8.00
12.50	41.01	51.3	2.86	Silt mixtures - clayey silt to silty clay	2.76		6.84
12.55	41.17	41.0	3.52	Clays - silty clay to clay	2.90		5.46
12.60	41.34	36.0	3.83	Clays - silty clay to clay	2.98		4.80
12.65	41.50	31.7	3.52	Clays - silty clay to clay	3.00		4.22
12.70	41.67	22.3	5.20	Clays - silty clay to clay	3.24		2.98
12.75	41.83	20.3	5.39	Clays - silty clay to clay	3.29		2.71
12.80	41.99	25.0	5.82	Clays - silty clay to clay	3.24		3.34
12.85	42.16	33.1	4.71	Clays - silty clay to clay	3.07		4.42
12.90	42.32	50.3	3.54	Clays - silty clay to clay	2.85		6.71
12.95	42.49	58.0	3.27	Silt mixtures - clayey silt to silty clay	2.78		7.73
13.00	42.65	51.1	3.49	Clays - silty clay to clay	2.84		6.82
13.05	42.81	52.8	2.77	Silt mixtures - clayey silt to silty clay	2.76		7.04
13.10	42.98	63.0	2.43	Silt mixtures - clayey silt to silty clay	2.66	7.98	8.40
13.15	43.14	69.8	1.52	Sand mixtures - silty sand to sandy silt	2.47	2.62	
13.20	43.31	81.9	2.14	Silt mixtures - clayey silt to silty clay	2.52	3.28	
13.25	43.47	96.5	1.84	Sand mixtures - silty sand to sandy silt	2.41	2.35	
13.30	43.63	90.3	2.52	Silt mixtures - clayey silt to silty clay	2.54	3.76	
13.35	43.80	115.8	1.77	Sand mixtures - silty sand to sandy silt	2.33	2.05	
13.40	43.96	131.9	1.38	Sand mixtures - silty sand to sandy silt	2.20	1.67	
13.45	44.13	139.7	0.94	Sands - clean sands to silty sand	2.06	1.38	
13.50	44.29	141.2	0.72	Sands - clean sands to silty sand	1.98	1.26	
13.55	44.45	134.9	0.93	Sands - clean sands to silty sand	2.07	1.40	
13.60	44.62	121.4	1.49	Sand mixtures - silty sand to sandy silt	2.27	1.83	
13.65	44.78	115.3	2.14	Sand mixtures - silty sand to sandy silt	2.41	2.33	
13.70	44.95	121.0	2.30	Sand mixtures - silty sand to sandy silt	2.42	2.38	
13.75	45.11	140.4	2.01	Sand mixtures - silty sand to sandy silt	2.32	2.00	
13.80	45.28	162.4	1.42	Sand mixtures - silty sand to sandy silt	2.15	1.54	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-14

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	173.4	1.16	Sands - clean sands to silty sand	2.06	1.37	
13.90	45.60	157.0	1.09	Sand mixtures - silty sand to sandy silt	2.07	1.40	
13.95	45.77	129.4	1.25	Sand mixtures - silty sand to sandy silt	2.19	1.64	
14.00	45.93	117.4	1.48	Sand mixtures - silty sand to sandy silt	2.29	1.90	
14.05	46.10	125.9	1.34	Sand mixtures - silty sand to sandy silt	2.23	1.74	
14.10	46.26	146.7	0.93	Sands - clean sands to silty sand	2.05	1.37	
14.15	46.42	150.5	0.72	Sands - clean sands to silty sand	1.97	1.25	
14.20	46.59	126.0	0.57	Sands - clean sands to silty sand	1.98	1.26	
14.25	46.75	97.6	0.75	Sand mixtures - silty sand to sandy silt	2.16	1.57	
14.30	46.92	80.9	0.65	Sand mixtures - silty sand to sandy silt	2.20	1.66	
14.35	47.08	62.1	0.87	Sand mixtures - silty sand to sandy silt	2.40	2.29	
14.40	47.24	43.6	1.74	Silt mixtures - clayey silt to silty clay	2.74		5.81
14.45	47.41	28.5	3.38	Clays - silty clay to clay	3.08		3.80
14.50	47.57	19.1	4.50	Clays - silty clay to clay	3.32		2.54
14.55	47.74	17.2	4.19	Clays - silty clay to clay	3.35		2.29
14.60	47.90	17.0	3.54	Clays - silty clay to clay	3.31		2.27
14.65	48.06	15.5	3.79	Clays - silty clay to clay	3.37		2.07
14.70	48.23	18.3	3.65	Clays - silty clay to clay	3.29		2.44
14.75	48.39	23.4	3.30	Clays - silty clay to clay	3.16		3.12
14.80	48.56	30.7	3.71	Clays - silty clay to clay	3.09		4.09
14.85	48.72	32.3	3.40	Clays - silty clay to clay	3.05		4.31
14.90	48.88	27.2	4.07	Clays - silty clay to clay	3.17		3.62
14.95	49.05	28.1	3.02	Clays - silty clay to clay	3.07		3.74
15.00	49.21	36.9	2.44	Clays - silty clay to clay	2.91		4.91
15.05	49.38	43.0	2.22	Silt mixtures - clayey silt to silty clay	2.83		5.73
15.10	49.54	40.0	2.63	Clays - silty clay to clay	2.90		5.33
15.15	49.70	44.5	2.16	Silt mixtures - clayey silt to silty clay	2.81		5.94
15.20	49.87	51.9	1.79	Silt mixtures - clayey silt to silty clay	2.71		6.91
15.25	50.03	64.1	1.75	Silt mixtures - clayey silt to silty clay	2.62	6.27	8.55
15.30	50.20	63.47	1.61	Silt mixtures - clayey silt to silty clay	2.60	5.44	8.46
15.35	50.36	54.69	1.61	Silt mixtures - clayey silt to silty clay	2.66	8.02	7.29
15.40	50.52	52.76	1.61	Silt mixtures - clayey silt to silty clay	2.68	8.74	7.03

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/7/2006 18:45
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-15

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	148.5	2.28	Sands - clean sands to silty sand	1.88	1.16	
0.10	0.33	153.8	2.85	Very stiff sand to clayey sand	1.95	1.24	
0.15	0.49	122.3	2.79	Very stiff sand to clayey sand	2.00	1.29	
0.20	0.66	86.2	2.62	Sand mixtures - silty sand to sandy silt	2.07	1.39	
0.25	0.82	56.3	3.59	Sand mixtures - silty sand to sandy silt	2.29	1.90	
0.30	0.98	38.9	3.65	Silt mixtures - clayey silt to silty clay	2.40	2.29	
0.35	1.15	26.7	3.69	Silt mixtures - clayey silt to silty clay	2.51	3.08	
0.40	1.31	24.0	3.53	Silt mixtures - clayey silt to silty clay	2.53	3.52	
0.45	1.48	23.6	3.06	Silt mixtures - clayey silt to silty clay	2.50	2.74	
0.50	1.64	20.0	2.57	Silt mixtures - clayey silt to silty clay	2.50	2.82	
0.55	1.80	17.7	2.08	Sand mixtures - silty sand to sandy silt	2.48	2.67	
0.60	1.97	17.1	1.24	Sand mixtures - silty sand to sandy silt	2.36	2.15	
0.65	2.13	17.5	1.59	Sand mixtures - silty sand to sandy silt	2.42	2.37	
0.70	2.30	18.0	1.85	Sand mixtures - silty sand to sandy silt	2.45	2.50	
0.75	2.46	17.6	1.95	Sand mixtures - silty sand to sandy silt	2.47	2.60	
0.80	2.62	17.5	2.05	Sand mixtures - silty sand to sandy silt	2.49	2.68	
0.85	2.79	19.4	2.32	Sand mixtures - silty sand to sandy silt	2.48	2.67	
0.90	2.95	19.2	3.85	Silt mixtures - clayey silt to silty clay	2.63	6.72	2.56
0.95	3.12	19.8	3.32	Silt mixtures - clayey silt to silty clay	2.58	4.78	
1.00	3.28	14.3	2.99	Silt mixtures - clayey silt to silty clay	2.66	7.84	1.91
1.05	3.44	16.6	1.70	Sand mixtures - silty sand to sandy silt	2.46	2.54	
1.10	3.61	23.1	1.51	Sand mixtures - silty sand to sandy silt	2.31	1.96	
1.15	3.77	31.1	1.70	Sand mixtures - silty sand to sandy silt	2.24	1.76	
1.20	3.94	45.4	1.63	Sand mixtures - silty sand to sandy silt	2.10	1.45	
1.25	4.10	55.9	1.58	Sands - clean sands to silty sand	2.03	1.33	
1.30	4.27	58.5	1.70	Sand mixtures - silty sand to sandy silt	2.04	1.34	
1.35	4.43	59.1	1.95	Sand mixtures - silty sand to sandy silt	2.08	1.41	
1.40	4.59	53.6	2.27	Sand mixtures - silty sand to sandy silt	2.15	1.55	
1.45	4.76	42.3	2.59	Sand mixtures - silty sand to sandy silt	2.27	1.84	
1.50	4.92	30.5	2.64	Sand mixtures - silty sand to sandy silt	2.38	2.20	
1.55	5.09	22.2	2.67	Silt mixtures - clayey silt to silty clay	2.48	2.67	
1.60	5.25	19.7	1.34	Sand mixtures - silty sand to sandy silt	2.34	2.06	
1.65	5.41	17.0	1.63	Sand mixtures - silty sand to sandy silt	2.44	2.47	
1.70	5.58	15.3	1.88	Sand mixtures - silty sand to sandy silt	2.52	3.13	
1.75	5.74	15.2	1.80	Sand mixtures - silty sand to sandy silt	2.51	2.95	
1.80	5.91	16.1	2.19	Silt mixtures - clayey silt to silty clay	2.54	3.60	
1.85	6.07	14.3	2.07	Silt mixtures - clayey silt to silty clay	2.57	4.33	
1.90	6.23	12.5	2.40	Silt mixtures - clayey silt to silty clay	2.65	7.65	1.66
1.95	6.40	12.8	2.16	Silt mixtures - clayey silt to silty clay	2.62	6.02	1.71
2.00	6.56	13.6	2.07	Silt mixtures - clayey silt to silty clay	2.59	4.96	
2.05	6.73	15.8	1.63	Sand mixtures - silty sand to sandy silt	2.47	2.60	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-15

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	15.0	1.76	Sand mixtures - silty sand to sandy silt	2.51	2.95	
2.15	7.05	16.8	1.67	Sand mixtures - silty sand to sandy silt	2.45	2.53	
2.20	7.22	17.3	1.85	Sand mixtures - silty sand to sandy silt	2.47	2.61	
2.25	7.38	17.2	1.91	Sand mixtures - silty sand to sandy silt	2.48	2.66	
2.30	7.55	18.0	2.13	Sand mixtures - silty sand to sandy silt	2.50	2.73	
2.35	7.71	19.4	1.79	Sand mixtures - silty sand to sandy silt	2.42	2.39	
2.40	7.87	19.8	1.65	Sand mixtures - silty sand to sandy silt	2.39	2.27	
2.45	8.04	22.1	1.76	Sand mixtures - silty sand to sandy silt	2.38	2.21	
2.50	8.20	23.4	1.60	Sand mixtures - silty sand to sandy silt	2.34	2.07	
2.55	8.37	21.0	1.73	Sand mixtures - silty sand to sandy silt	2.40	2.28	
2.60	8.53	20.0	1.27	Sand mixtures - silty sand to sandy silt	2.34	2.07	
2.65	8.69	18.8	1.49	Sand mixtures - silty sand to sandy silt	2.40	2.31	
2.70	8.86	16.7	1.59	Sand mixtures - silty sand to sandy silt	2.46	2.57	
2.75	9.02	12.3	1.46	Sand mixtures - silty sand to sandy silt	2.54	3.69	
2.80	9.19	10.8	2.11	Silt mixtures - clayey silt to silty clay	2.68	9.17	1.44
2.85	9.35	23.1	1.74	Sand mixtures - silty sand to sandy silt	2.40	2.29	
2.90	9.51	41.1	1.69	Sand mixtures - silty sand to sandy silt	2.22	1.71	
2.95	9.68	51.4	2.06	Sand mixtures - silty sand to sandy silt	2.22	1.70	
3.00	9.84	42.8	2.76	Sand mixtures - silty sand to sandy silt	2.36	2.15	
3.05	10.01	36.5	2.97	Silt mixtures - clayey silt to silty clay	2.43	2.43	
3.10	10.17	36.1	2.39	Sand mixtures - silty sand to sandy silt	2.37	2.19	
3.15	10.33	36.4	2.58	Sand mixtures - silty sand to sandy silt	2.40	2.29	
3.20	10.50	38.1	2.73	Sand mixtures - silty sand to sandy silt	2.41	2.32	
3.25	10.66	40.1	2.84	Sand mixtures - silty sand to sandy silt	2.41	2.32	
3.30	10.83	41.3	2.69	Sand mixtures - silty sand to sandy silt	2.38	2.24	
3.35	10.99	44.2	2.55	Sand mixtures - silty sand to sandy silt	2.35	2.12	
3.40	11.15	46.7	2.76	Sand mixtures - silty sand to sandy silt	2.37	2.16	
3.45	11.32	46.8	1.84	Sand mixtures - silty sand to sandy silt	2.25	1.78	
3.50	11.48	48.5	2.29	Sand mixtures - silty sand to sandy silt	2.30	1.95	
3.55	11.65	51.0	2.58	Sand mixtures - silty sand to sandy silt	2.33	2.04	
3.60	11.81	53.5	3.07	Sand mixtures - silty sand to sandy silt	2.37	2.19	
3.65	11.97	51.8	3.39	Silt mixtures - clayey silt to silty clay	2.42	2.37	
3.70	12.14	44.0	3.96	Silt mixtures - clayey silt to silty clay	2.51	3.09	
3.75	12.30	34.5	4.25	Silt mixtures - clayey silt to silty clay	2.61	5.71	4.61
3.80	12.47	37.0	3.58	Silt mixtures - clayey silt to silty clay	2.54	3.63	
3.85	12.63	37.1	3.52	Silt mixtures - clayey silt to silty clay	2.54	3.58	
3.90	12.80	37.7	3.29	Silt mixtures - clayey silt to silty clay	2.51	3.09	
3.95	12.96	36.1	3.25	Silt mixtures - clayey silt to silty clay	2.53	3.36	
4.00	13.12	32.5	3.65	Silt mixtures - clayey silt to silty clay	2.60	5.30	
4.05	13.29	30.5	3.82	Silt mixtures - clayey silt to silty clay	2.63	6.70	4.06
4.10	13.45	31.6	3.99	Silt mixtures - clayey silt to silty clay	2.64	6.95	4.22
4.15	13.62	27.8	4.75	Clays - silty clay to clay	2.73		3.71
4.20	13.78	22.8	6.13	Clays - silty clay to clay	2.88		3.04
4.25	13.94	23.8	4.90	Clays - silty clay to clay	2.80		3.17
4.30	14.11	30.3	3.45	Silt mixtures - clayey silt to silty clay	2.62	6.21	4.04
4.35	14.27	30.9	3.67	Silt mixtures - clayey silt to silty clay	2.64	6.86	4.13
4.40	14.44	26.2	4.54	Clays - silty clay to clay	2.76		3.50

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-15

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	26.2	4.72	Clays - silty clay to clay	2.77		3.49
4.50	14.76	24.1	5.22	Clays - silty clay to clay	2.83		3.21
4.55	14.93	20.7	5.86	Clays - silty clay to clay	2.92		2.76
4.60	15.09	26.5	4.29	Clays - silty clay to clay	2.75		3.53
4.65	15.26	30.1	3.84	Silt mixtures - clayey silt to silty clay	2.68	8.93	4.02
4.70	15.42	27.4	4.40	Clays - silty clay to clay	2.75		3.65
4.75	15.58	26.0	4.16	Clays - silty clay to clay	2.76		3.47
4.80	15.75	33.1	3.32	Silt mixtures - clayey silt to silty clay	2.62	5.97	4.41
4.85	15.91	33.6	3.23	Silt mixtures - clayey silt to silty clay	2.60	5.58	4.47
4.90	16.08	33.6	2.98	Silt mixtures - clayey silt to silty clay	2.58	4.85	
4.95	16.24	30.8	3.18	Silt mixtures - clayey silt to silty clay	2.63	6.71	4.11
5.00	16.40	30.8	3.19	Silt mixtures - clayey silt to silty clay	2.64	6.87	4.11
5.05	16.57	31.5	3.07	Silt mixtures - clayey silt to silty clay	2.62	6.27	4.20
5.10	16.73	31.4	2.90	Silt mixtures - clayey silt to silty clay	2.61	5.75	4.18
5.15	16.90	34.1	3.09	Silt mixtures - clayey silt to silty clay	2.60	5.58	4.55
5.20	17.06	38.3	2.87	Silt mixtures - clayey silt to silty clay	2.55	3.88	
5.25	17.22	43.6	2.98	Silt mixtures - clayey silt to silty clay	2.52	3.25	
5.30	17.39	53.1	2.90	Silt mixtures - clayey silt to silty clay	2.46	2.54	
5.35	17.55	61.6	2.91	Sand mixtures - silty sand to sandy silt	2.41	2.36	
5.40	17.72	66.2	2.77	Sand mixtures - silty sand to sandy silt	2.38	2.22	
5.45	17.88	72.6	2.59	Sand mixtures - silty sand to sandy silt	2.33	2.05	
5.50	18.04	82.8	2.14	Sand mixtures - silty sand to sandy silt	2.23	1.74	
5.55	18.21	88.9	1.72	Sand mixtures - silty sand to sandy silt	2.15	1.53	
5.60	18.37	86.8	1.48	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.65	18.54	77.9	1.00	Sands - clean sands to silty sand	2.03	1.34	
5.70	18.70	63.9	1.36	Sand mixtures - silty sand to sandy silt	2.19	1.62	
5.75	18.86	48.6	1.84	Sand mixtures - silty sand to sandy silt	2.37	2.17	
5.80	19.03	37.2	2.79	Silt mixtures - clayey silt to silty clay	2.58	4.86	
5.85	19.19	33.2	2.83	Silt mixtures - clayey silt to silty clay	2.63	6.45	4.43
5.90	19.36	31.4	2.66	Silt mixtures - clayey silt to silty clay	2.63	6.58	4.19
5.95	19.52	29.7	2.69	Silt mixtures - clayey silt to silty clay	2.66	7.69	3.97
6.00	19.68	27.9	2.96	Silt mixtures - clayey silt to silty clay	2.71		3.72
6.05	19.85	25.6	3.16	Silt mixtures - clayey silt to silty clay	2.76		3.42
6.10	20.01	25.4	3.14	Silt mixtures - clayey silt to silty clay	2.76		3.39
6.15	20.18	25.7	3.04	Silt mixtures - clayey silt to silty clay	2.75		3.43
6.20	20.34	25.8	3.16	Silt mixtures - clayey silt to silty clay	2.77		3.44
6.25	20.51	28.6	3.15	Silt mixtures - clayey silt to silty clay	2.73		3.81
6.30	20.67	29.3	3.49	Silt mixtures - clayey silt to silty clay	2.76		3.91
6.35	20.83	27.6	3.74	Clays - silty clay to clay	2.80		3.69
6.40	21.00	27.2	3.50	Silt mixtures - clayey silt to silty clay	2.79		3.63
6.45	21.16	25.6	3.43	Silt mixtures - clayey silt to silty clay	2.81		3.41
6.50	21.33	25.7	3.28	Silt mixtures - clayey silt to silty clay	2.80		3.43
6.55	21.49	26.1	3.08	Silt mixtures - clayey silt to silty clay	2.77		3.48
6.60	21.65	27.0	3.02	Silt mixtures - clayey silt to silty clay	2.76		3.59
6.65	21.82	27.3	2.37	Silt mixtures - clayey silt to silty clay	2.69	9.34	3.64
6.70	21.98	28.7	2.67	Silt mixtures - clayey silt to silty clay	2.71		3.82
6.75	22.15	29.6	2.86	Silt mixtures - clayey silt to silty clay	2.72		3.94

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-15

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	31.9	2.87	Silt mixtures - clayey silt to silty clay	2.70	9.97	4.25
6.85	22.47	38.7	2.60	Silt mixtures - clayey silt to silty clay	2.60	5.53	5.16
6.90	22.64	52.7	2.24	Sand mixtures - silty sand to sandy silt	2.46	2.54	
6.95	22.80	72.6	1.87	Sand mixtures - silty sand to sandy silt	2.30	1.92	
7.00	22.97	81.6	1.65	Sand mixtures - silty sand to sandy silt	2.22	1.71	
7.05	23.13	81.0	1.58	Sand mixtures - silty sand to sandy silt	2.21	1.69	
7.10	23.29	77.7	1.91	Sand mixtures - silty sand to sandy silt	2.29	1.89	
7.15	23.46	72.2	2.16	Sand mixtures - silty sand to sandy silt	2.35	2.11	
7.20	23.62	68.8	2.38	Sand mixtures - silty sand to sandy silt	2.40	2.30	
7.25	23.79	69.5	2.45	Sand mixtures - silty sand to sandy silt	2.41	2.33	
7.30	23.95	70.2	2.51	Sand mixtures - silty sand to sandy silt	2.41	2.36	
7.35	24.11	66.9	2.58	Sand mixtures - silty sand to sandy silt	2.44	2.47	
7.40	24.28	55.6	2.66	Silt mixtures - clayey silt to silty clay	2.51	3.08	
7.45	24.44	43.4	2.92	Silt mixtures - clayey silt to silty clay	2.63	6.50	5.79
7.50	24.61	38.1	3.23	Silt mixtures - clayey silt to silty clay	2.71		5.08
7.55	24.77	35.4	3.46	Silt mixtures - clayey silt to silty clay	2.76		4.72
7.60	24.93	36.4	3.16	Silt mixtures - clayey silt to silty clay	2.72		4.85
7.65	25.10	38.8	3.15	Silt mixtures - clayey silt to silty clay	2.70		5.18
7.70	25.26	34.6	3.35	Silt mixtures - clayey silt to silty clay	2.76		4.62
7.75	25.43	33.5	3.40	Silt mixtures - clayey silt to silty clay	2.78		4.46
7.80	25.59	32.1	3.39	Silt mixtures - clayey silt to silty clay	2.80		4.28
7.85	25.75	36.2	3.02	Silt mixtures - clayey silt to silty clay	2.72		4.83
7.90	25.92	41.3	2.55	Silt mixtures - clayey silt to silty clay	2.63	6.38	5.51
7.95	26.08	49.8	1.91	Sand mixtures - silty sand to sandy silt	2.47	2.62	
8.00	26.25	50.8	2.01	Sand mixtures - silty sand to sandy silt	2.48	2.68	
8.05	26.41	48.8	2.40	Silt mixtures - clayey silt to silty clay	2.55	4.01	
8.10	26.57	50.4	2.81	Silt mixtures - clayey silt to silty clay	2.60	5.24	
8.15	26.74	53.4	2.80	Silt mixtures - clayey silt to silty clay	2.58	4.67	
8.20	26.90	51.1	3.02	Silt mixtures - clayey silt to silty clay	2.62	6.05	6.82
8.25	27.07	48.8	3.37	Silt mixtures - clayey silt to silty clay	2.67	8.51	6.51
8.30	27.23	45.3	3.90	Silt mixtures - clayey silt to silty clay	2.75		6.04
8.35	27.39	42.1	4.06	Clays - silty clay to clay	2.79		5.61
8.40	27.56	41.5	4.11	Clays - silty clay to clay	2.80		5.54
8.45	27.72	44.1	3.75	Silt mixtures - clayey silt to silty clay	2.75		5.88
8.50	27.89	47.6	2.94	Silt mixtures - clayey silt to silty clay	2.65	7.31	6.35
8.55	28.05	52.3	3.02	Silt mixtures - clayey silt to silty clay	2.63	6.38	6.97
8.60	28.21	58.9	2.93	Silt mixtures - clayey silt to silty clay	2.58	4.65	
8.65	28.38	66.9	2.72	Silt mixtures - clayey silt to silty clay	2.51	3.02	
8.70	28.54	82.3	2.24	Sand mixtures - silty sand to sandy silt	2.38	2.22	
8.75	28.71	103.3	1.62	Sand mixtures - silty sand to sandy silt	2.20	1.65	
8.80	28.87	103.9	1.29	Sand mixtures - silty sand to sandy silt	2.13	1.50	
8.85	29.04	80.7	1.31	Sand mixtures - silty sand to sandy silt	2.22	1.71	
8.90	29.20	54.6	1.89	Sand mixtures - silty sand to sandy silt	2.48	2.64	
8.95	29.36	37.3	2.83	Silt mixtures - clayey silt to silty clay	2.74		4.97
9.00	29.53	28.6	4.11	Clays - silty clay to clay	2.95		3.82
9.05	29.69	22.2	4.91	Clays - silty clay to clay	3.09		2.96
9.10	29.86	16.7	5.39	Clays - silty clay to clay	3.23		2.23

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-15

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	14.5	4.44	Clays - silty clay to clay	3.23		1.94
9.20	30.18	14.0	4.15	Clays - silty clay to clay	3.22		1.87
9.25	30.35	14.7	4.41	Clays - silty clay to clay	3.22		1.96
9.30	30.51	16.3	4.66	Clays - silty clay to clay	3.20		2.17
9.35	30.68	18.7	4.68	Clays - silty clay to clay	3.15		2.50
9.40	30.84	21.7	4.54	Clays - silty clay to clay	3.09		2.89
9.45	31.00	20.4	4.90	Clays - silty clay to clay	3.14		2.73
9.50	31.17	24.2	3.58	Clays - silty clay to clay	2.99		3.23
9.55	31.33	32.8	2.33	Silt mixtures - clayey silt to silty clay	2.76		4.38
9.60	31.50	33.6	2.49	Silt mixtures - clayey silt to silty clay	2.77		4.49
9.65	31.66	30.1	3.17	Clays - silty clay to clay	2.88		4.01
9.70	31.82	29.8	3.39	Clays - silty clay to clay	2.91		3.97
9.75	31.99	31.9	3.27	Clays - silty clay to clay	2.87		4.25
9.80	32.15	34.0	3.37	Clays - silty clay to clay	2.86		4.54
9.85	32.32	37.6	3.32	Clays - silty clay to clay	2.83		5.02
9.90	32.48	38.4	3.51	Clays - silty clay to clay	2.84		5.13
9.95	32.64	37.8	3.62	Clays - silty clay to clay	2.85		5.04
10.00	32.81	32.3	3.63	Clays - silty clay to clay	2.91		4.31
10.05	32.97	26.1	3.79	Clays - silty clay to clay	3.00		3.47
10.10	33.14	23.2	3.68	Clays - silty clay to clay	3.04		3.09
10.15	33.30	24.7	3.56	Clays - silty clay to clay	3.01		3.29
10.20	33.46	29.6	3.40	Clays - silty clay to clay	2.93		3.95
10.25	33.63	35.6	3.47	Clays - silty clay to clay	2.87		4.75
10.30	33.79	44.1	3.57	Clays - silty clay to clay	2.81		5.88
10.35	33.96	58.4	3.22	Silt mixtures - clayey silt to silty clay	2.68	9.01	7.79
10.40	34.12	60.7	3.01	Silt mixtures - clayey silt to silty clay	2.65	7.32	8.09
10.45	34.28	54.8	3.13	Silt mixtures - clayey silt to silty clay	2.70	10.06	7.31
10.50	34.45	52.8	3.11	Silt mixtures - clayey silt to silty clay	2.71		7.04
10.55	34.61	55.3	3.20	Silt mixtures - clayey silt to silty clay	2.71		7.38
10.60	34.78	69.5	2.62	Silt mixtures - clayey silt to silty clay	2.56	4.18	
10.65	34.94	73.0	2.51	Silt mixtures - clayey silt to silty clay	2.53	3.42	
10.70	35.10	71.4	2.26	Silt mixtures - clayey silt to silty clay	2.51	2.90	
10.75	35.27	73.3	2.71	Silt mixtures - clayey silt to silty clay	2.56	4.09	
10.80	35.43	68.9	2.91	Silt mixtures - clayey silt to silty clay	2.61	5.60	9.18
10.85	35.60	65.2	2.82	Silt mixtures - clayey silt to silty clay	2.62	5.99	8.70
10.90	35.76	70.6	2.68	Silt mixtures - clayey silt to silty clay	2.57	4.53	
10.95	35.92	82.1	2.44	Silt mixtures - clayey silt to silty clay	2.49	2.70	
11.00	36.09	100.1	1.89	Sand mixtures - silty sand to sandy silt	2.34	2.06	
11.05	36.25	111.2	1.60	Sand mixtures - silty sand to sandy silt	2.25	1.78	
11.10	36.42	104.0	1.69	Sand mixtures - silty sand to sandy silt	2.29	1.90	
11.15	36.58	91.9	2.13	Sand mixtures - silty sand to sandy silt	2.41	2.34	
11.20	36.74	84.9	2.52	Silt mixtures - clayey silt to silty clay	2.50	2.74	
11.25	36.91	84.0	2.65	Silt mixtures - clayey silt to silty clay	2.52	3.20	
11.30	37.07	88.7	2.33	Sand mixtures - silty sand to sandy silt	2.46	2.55	
11.35	37.24	84.5	2.43	Silt mixtures - clayey silt to silty clay	2.49	2.71	
11.40	37.40	67.1	2.87	Silt mixtures - clayey silt to silty clay	2.63	6.65	8.95
11.45	37.57	59.0	3.11	Silt mixtures - clayey silt to silty clay	2.71		7.87

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-15

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	55.2	3.14	Silt mixtures - clayey silt to silty clay	2.74		7.36
11.55	37.89	56.1	3.20	Silt mixtures - clayey silt to silty clay	2.74		7.47
11.60	38.06	61.3	3.28	Silt mixtures - clayey silt to silty clay	2.72		8.17
11.65	38.22	68.3	3.18	Silt mixtures - clayey silt to silty clay	2.67	8.39	9.10
11.70	38.39	75.8	2.47	Silt mixtures - clayey silt to silty clay	2.55	3.86	
11.75	38.55	78.0	2.73	Silt mixtures - clayey silt to silty clay	2.57	4.54	
11.80	38.71	73.9	3.06	Silt mixtures - clayey silt to silty clay	2.63	6.67	9.85
11.85	38.88	73.7	3.02	Silt mixtures - clayey silt to silty clay	2.63	6.60	9.82
11.90	39.04	73.8	3.01	Silt mixtures - clayey silt to silty clay	2.63	6.60	9.84
11.95	39.21	70.8	2.83	Silt mixtures - clayey silt to silty clay	2.63	6.44	9.45
12.00	39.37	67.6	3.11	Silt mixtures - clayey silt to silty clay	2.68	8.86	9.01
12.05	39.53	70.4	3.01	Silt mixtures - clayey silt to silty clay	2.65	7.65	9.39
12.10	39.70	76.2	2.80	Silt mixtures - clayey silt to silty clay	2.60	5.48	10.16
12.15	39.86	80.3	2.87	Silt mixtures - clayey silt to silty clay	2.59	5.18	
12.20	40.03	84.6	2.84	Silt mixtures - clayey silt to silty clay	2.57	4.52	
12.25	40.19	87.2	2.66	Silt mixtures - clayey silt to silty clay	2.54	3.70	
12.30	40.35	90.4	2.74	Silt mixtures - clayey silt to silty clay	2.54	3.68	
12.35	40.52	87.7	3.09	Silt mixtures - clayey silt to silty clay	2.59	5.22	
12.40	40.68	74.0	3.44	Silt mixtures - clayey silt to silty clay	2.69	9.81	9.86
12.45	40.85	53.5	3.81	Clays - silty clay to clay	2.83		7.13
12.50	41.01	37.3	4.31	Clays - silty clay to clay	3.00		4.97
12.55	41.17	28.5	4.85	Clays - silty clay to clay	3.13		3.80
12.60	41.34	30.9	3.58	Clays - silty clay to clay	3.01		4.12
12.65	41.50	32.8	3.09	Clays - silty clay to clay	2.95		4.37
12.70	41.67	32.3	2.52	Clays - silty clay to clay	2.90		4.30
12.75	41.83	29.5	3.00	Clays - silty clay to clay	2.98		3.93
12.80	41.99	28.1	3.33	Clays - silty clay to clay	3.03		3.74
12.85	42.16	29.6	3.27	Clays - silty clay to clay	3.01		3.95
12.90	42.32	30.5	2.94	Clays - silty clay to clay	2.97		4.06
12.95	42.49	31.6	2.86	Clays - silty clay to clay	2.95		4.21
13.00	42.65	41.8	1.98	Silt mixtures - clayey silt to silty clay	2.75		5.57
13.05	42.81	47.8	2.14	Silt mixtures - clayey silt to silty clay	2.72		6.38
13.10	42.98	57.9	2.16	Silt mixtures - clayey silt to silty clay	2.66	7.73	7.73
13.15	43.14	63.2	2.39	Silt mixtures - clayey silt to silty clay	2.66	7.74	8.43
13.20	43.31	71.0	2.56	Silt mixtures - clayey silt to silty clay	2.64	6.84	9.47
13.25	43.47	89.3	2.11	Sand mixtures - silty sand to sandy silt	2.49	2.68	
13.30	43.63	109.1	1.70	Sand mixtures - silty sand to sandy silt	2.34	2.08	
13.35	43.80	110.6	1.80	Sand mixtures - silty sand to sandy silt	2.36	2.13	
13.40	43.96	100.2	1.74	Sand mixtures - silty sand to sandy silt	2.39	2.24	
13.45	44.13	84.9	2.15	Silt mixtures - clayey silt to silty clay	2.52	3.18	
13.50	44.29	78.3	2.79	Silt mixtures - clayey silt to silty clay	2.64	6.92	10.44
13.55	44.45	78.9	2.56	Silt mixtures - clayey silt to silty clay	2.61	5.70	10.53
13.60	44.62	79.1	2.37	Silt mixtures - clayey silt to silty clay	2.58	4.87	
13.65	44.78	71.1	2.66	Silt mixtures - clayey silt to silty clay	2.66	8.11	9.48
13.70	44.95	61.1	2.77	Silt mixtures - clayey silt to silty clay	2.73		8.15
13.75	45.11	47.5	3.62	Clays - silty clay to clay	2.90		6.33
13.80	45.28	35.5	3.98	Clays - silty clay to clay	3.03		4.73

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-15

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	28.2	4.34	Clays - silty clay to clay	3.14		3.76
13.90	45.60	26.4	4.21	Clays - silty clay to clay	3.16		3.52
13.95	45.77	18.3	5.52	Clays - silty clay to clay	3.38		2.44
14.00	45.93	14.6	5.69	Clays - silty clay to clay	3.49		1.95
14.05	46.10	17.1	4.72	Clays - silty clay to clay	3.37		2.28
14.10	46.26	18.3	4.65	Clays - silty clay to clay	3.34		2.44
14.15	46.42	16.0	5.06	Clays - silty clay to clay	3.42		2.13
14.20	46.59	16.3	5.23	Clays - silty clay to clay	3.42		2.17
14.25	46.75	16.2	6.68	Clays - silty clay to clay	3.50		2.16
14.30	46.92	19.6	6.72	Clays - silty clay to clay	3.42		2.61
14.35	47.08	19.4	8.27	Unstable clayey silts	3.49		2.59
14.40	47.24	27.4	6.02	Clays - silty clay to clay	3.26		3.65
14.45	47.41	21.6	7.71	Clays - silty clay to clay	3.43		2.89
14.50	47.57	23.9	6.36	Clays - silty clay to clay	3.33		3.19
14.55	47.74	21.6	7.56	Clays - silty clay to clay	3.43		2.89
14.60	47.90	23.4	6.84	Clays - silty clay to clay	3.37		3.12
14.65	48.06	25.8	7.28	Clays - silty clay to clay	3.35		3.45
14.70	48.23	27.1	6.92	Clays - silty clay to clay	3.32		3.61
14.75	48.39	26.5	7.18	Clays - silty clay to clay	3.34		3.53
14.80	48.56	31.9	6.00	Clays - silty clay to clay	3.22		4.25
14.85	48.72	28.5	6.75	Clays - silty clay to clay	3.29		3.80
14.90	48.88	31.6	5.89	Clays - silty clay to clay	3.22		4.22
14.95	49.05	27.2	7.81	Clays - silty clay to clay	3.36		3.63
15.00	49.21	34.4	7.18	Clays - silty clay to clay	3.25		4.58
15.05	49.38	33.1	7.27	Clays - silty clay to clay	3.27		4.41
15.10	49.54	31.6	6.16	Clays - silty clay to clay	3.23		4.22
15.15	49.70	33.2	5.52	Clays - silty clay to clay	3.19		4.43
15.20	49.87	33.9	5.64	Clays - silty clay to clay	3.19		4.52
15.25	50.03	35.1	5.80	Clays - silty clay to clay	3.18		4.68
15.30	50.20	36.45	5.80	Clays - silty clay to clay	3.17		4.86
15.35	50.36	35.35	5.80	Clays - silty clay to clay	3.18		4.71

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/12/2006 6:26
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 5 feet
SOUNDING: CPT-16

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	11.6	4.18	Clays - silty clay to clay	2.81		1.55
0.10	0.33	11.6	3.07	Silt mixtures - clayey silt to silty clay	2.73		1.55
0.15	0.49	7.2	2.87	Clays - silty clay to clay	2.88		0.97
0.20	0.66	8.1	4.35	Clays - silty clay to clay	2.95		1.08
0.25	0.82	26.5	2.11	Sand mixtures - silty sand to sandy silt	2.35	2.11	
0.30	0.98	28.3	2.23	Sand mixtures - silty sand to sandy silt	2.34	2.09	
0.35	1.15	25.0	2.21	Sand mixtures - silty sand to sandy silt	2.38	2.23	
0.40	1.31	18.9	1.82	Sand mixtures - silty sand to sandy silt	2.42	2.40	
0.45	1.48	16.5	1.81	Sand mixtures - silty sand to sandy silt	2.47	2.61	
0.50	1.64	19.9	0.63	Sand mixtures - silty sand to sandy silt	2.15	1.55	
0.55	1.80	0.8	2.58	Unstable clayey silts	3.72		0.11
0.60	1.97	0.9	1.11	Sensitive, fine-grained	3.51		0.12
0.65	2.13	1.2	0.89	Sensitive, fine-grained	3.37		0.16
0.70	2.30	10.2	3.94	Clays - silty clay to clay	2.85		1.36
0.75	2.46	54.4	2.21	Sand mixtures - silty sand to sandy silt	2.14	1.52	
0.80	2.62	87.2	2.38	Sand mixtures - silty sand to sandy silt	2.03	1.33	
0.85	2.79	118.0	2.43	Sands - clean sands to silty sand	1.96	1.24	
0.90	2.95	143.1	2.49	Very stiff sand to clayey sand	1.92	1.20	
0.95	3.12	171.4	2.54	Very stiff sand to clayey sand	1.89	1.17	
1.00	3.28	221.4	2.91	Very stiff sand to clayey sand	1.89	1.17	
1.05	3.44	297.1	3.22	Very stiff sand to clayey sand	1.87	1.16	
1.10	3.61	344.3	3.53	Very stiff sand to clayey sand	1.89	1.17	
1.15	3.77	355.3	3.58	Very stiff sand to clayey sand	1.89	1.17	
1.20	3.94	342.1	3.29	Very stiff sand to clayey sand	1.86	1.15	
1.25	4.10	325.9	3.28	Very stiff sand to clayey sand	1.86	1.15	
1.30	4.27	310.5	3.25	Very stiff sand to clayey sand	1.87	1.15	
1.35	4.43	306.5	3.14	Very stiff sand to clayey sand	1.86	1.15	
1.40	4.59	312.2	3.26	Very stiff sand to clayey sand	1.87	1.16	
1.45	4.76	332.1	3.11	Very stiff sand to clayey sand	1.85	1.14	
1.50	4.92	387.1	2.68	Very stiff sand to clayey sand	1.77	1.08	
1.55	5.09	428.1	0.00	Gravelly sand to dense sand	1.51	1.00	
1.60	5.25	624.8	0.00	Gravelly sand to dense sand	1.60	1.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/12/2006 17:31
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-17

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	20.2	1.70	Sand mixtures - silty sand to sandy silt	2.38	2.23	
0.10	0.33	31.7	0.82	Sands - clean sands to silty sand	2.04	1.34	
0.15	0.49	14.3	2.40	Silt mixtures - clayey silt to silty clay	2.59	5.14	
0.20	0.66	26.3	2.91	Silt mixtures - clayey silt to silty clay	2.45	2.50	
0.25	0.82	51.4	1.92	Sand mixtures - silty sand to sandy silt	2.11	1.47	
0.30	0.98	28.0	2.58	Sand mixtures - silty sand to sandy silt	2.39	2.26	
0.35	1.15	14.7	2.43	Silt mixtures - clayey silt to silty clay	2.59	4.95	
0.40	1.31	13.4	3.11	Silt mixtures - clayey silt to silty clay	2.69	9.44	1.78
0.45	1.48	19.4	2.73	Silt mixtures - clayey silt to silty clay	2.53	3.35	
0.50	1.64	18.8	2.88	Silt mixtures - clayey silt to silty clay	2.55	3.99	
0.55	1.80	15.5	3.03	Silt mixtures - clayey silt to silty clay	2.63	6.67	2.06
0.60	1.97	17.8	2.53	Silt mixtures - clayey silt to silty clay	2.54	3.55	
0.65	2.13	25.0	2.32	Sand mixtures - silty sand to sandy silt	2.40	2.29	
0.70	2.30	33.2	2.24	Sand mixtures - silty sand to sandy silt	2.30	1.93	
0.75	2.46	43.7	2.62	Sand mixtures - silty sand to sandy silt	2.26	1.82	
0.80	2.62	58.8	2.47	Sand mixtures - silty sand to sandy silt	2.15	1.55	
0.85	2.79	77.4	2.56	Sand mixtures - silty sand to sandy silt	2.09	1.42	
0.90	2.95	106.8	2.59	Sand mixtures - silty sand to sandy silt	2.01	1.30	
0.95	3.12	157.6	2.76	Very stiff sand to clayey sand	1.94	1.22	
1.00	3.28	245.3	2.74	Very stiff sand to clayey sand	1.84	1.13	
1.05	3.44	335.8	2.82	Very stiff sand to clayey sand	1.80	1.10	
1.10	3.61	370.3	2.98	Very stiff sand to clayey sand	1.81	1.10	
1.15	3.77	382.4	2.91	Very stiff sand to clayey sand	1.79	1.09	
1.20	3.94	387.7	2.66	Very stiff sand to clayey sand	1.75	1.07	
1.25	4.10	388.0	2.53	Very stiff sand to clayey sand	1.73	1.06	
1.30	4.27	386.0	2.54	Very stiff sand to clayey sand	1.74	1.06	
1.35	4.43	375.6	2.52	Very stiff sand to clayey sand	1.74	1.06	
1.40	4.59	352.9	2.76	Very stiff sand to clayey sand	1.79	1.09	
1.45	4.76	322.4	2.84	Very stiff sand to clayey sand	1.82	1.11	
1.50	4.92	270.5	2.27	Very stiff sand to clayey sand	1.76	1.08	
1.55	5.09	271.6	2.30	Very stiff sand to clayey sand	1.77	1.08	
1.60	5.25	255.9	2.48	Very stiff sand to clayey sand	1.81	1.11	
1.65	5.41	264.2	2.38	Very stiff sand to clayey sand	1.79	1.10	
1.70	5.58	262.7	2.40	Very stiff sand to clayey sand	1.80	1.10	
1.75	5.74	260.5	2.44	Very stiff sand to clayey sand	1.81	1.11	
1.80	5.91	252.7	2.41	Very stiff sand to clayey sand	1.82	1.11	
1.85	6.07	243.6	2.30	Very stiff sand to clayey sand	1.81	1.11	
1.90	6.23	240.0	2.24	Very stiff sand to clayey sand	1.81	1.10	
1.95	6.40	242.5	2.14	Very stiff sand to clayey sand	1.79	1.09	
2.00	6.56	235.1	2.12	Sands - clean sands to silty sand	1.80	1.10	
2.05	6.73	221.8	2.15	Sands - clean sands to silty sand	1.82	1.11	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-17

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	208.0	2.20	Sands - clean sands to silty sand	1.84	1.13	
2.15	7.05	201.9	2.08	Sands - clean sands to silty sand	1.83	1.12	
2.20	7.22	208.6	2.06	Sands - clean sands to silty sand	1.82	1.12	
2.25	7.38	228.3	2.14	Sands - clean sands to silty sand	1.82	1.11	
2.30	7.55	234.3	2.20	Very stiff sand to clayey sand	1.83	1.12	
2.35	7.71	232.1	2.11	Sands - clean sands to silty sand	1.82	1.11	
2.40	7.87	230.3	2.00	Sands - clean sands to silty sand	1.80	1.10	
2.45	8.04	236.0	1.97	Sands - clean sands to silty sand	1.79	1.10	
2.50	8.20	243.2	2.00	Sands - clean sands to silty sand	1.79	1.10	
2.55	8.37	245.7	1.83	Sands - clean sands to silty sand	1.76	1.08	
2.60	8.53	242.0	1.88	Sands - clean sands to silty sand	1.78	1.09	
2.65	8.69	232.1	2.00	Sands - clean sands to silty sand	1.81	1.11	
2.70	8.86	235.5	2.00	Sands - clean sands to silty sand	1.81	1.11	
2.75	9.02	238.2	2.04	Sands - clean sands to silty sand	1.82	1.11	
2.80	9.19	246.7	2.02	Sands - clean sands to silty sand	1.81	1.11	
2.85	9.35	264.2	1.89	Sands - clean sands to silty sand	1.77	1.08	
2.90	9.51	306.1	1.87	Sands - clean sands to silty sand	1.74	1.06	
2.95	9.68	398.5	2.28	Very stiff sand to clayey sand	1.76	1.08	
3.00	9.84	498.9	2.28	Very stiff sand to clayey sand	1.73	1.05	
3.05	10.01	552.3	2.28	Very stiff sand to clayey sand	1.71	1.04	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hill Specific Plan
DATE/TIME: 9/12/2006 19:15
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-18

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	42.7	1.38	Sand mixtures - silty sand to sandy silt	2.07	1.40	
0.10	0.33	133.3	1.27	Sands - clean sands to silty sand	1.70	1.03	
0.15	0.49	149.5	1.69	Sands - clean sands to silty sand	1.77	1.08	
0.20	0.66	143.7	2.15	Sands - clean sands to silty sand	1.87	1.15	
0.25	0.82	137.9	2.33	Sands - clean sands to silty sand	1.91	1.19	
0.30	0.98	123.3	1.93	Sands - clean sands to silty sand	1.87	1.15	
0.35	1.15	115.7	1.75	Sands - clean sands to silty sand	1.85	1.14	
0.40	1.31	116.8	1.77	Sands - clean sands to silty sand	1.85	1.14	
0.45	1.48	107.3	2.02	Sands - clean sands to silty sand	1.92	1.20	
0.50	1.64	91.2	2.02	Sands - clean sands to silty sand	1.96	1.25	
0.55	1.80	69.6	2.86	Sand mixtures - silty sand to sandy silt	2.15	1.55	
0.60	1.97	57.4	3.30	Sand mixtures - silty sand to sandy silt	2.26	1.80	
0.65	2.13	49.6	3.54	Sand mixtures - silty sand to sandy silt	2.32	2.00	
0.70	2.30	37.2	4.01	Silt mixtures - clayey silt to silty clay	2.44	2.48	
0.75	2.46	33.9	3.62	Silt mixtures - clayey silt to silty clay	2.44	2.46	
0.80	2.62	31.8	3.91	Silt mixtures - clayey silt to silty clay	2.48	2.66	
0.85	2.79	23.0	4.73	Silt mixtures - clayey silt to silty clay	2.64	7.01	3.06
0.90	2.95	20.4	5.24	Clays - silty clay to clay	2.71		2.72
0.95	3.12	23.9	4.33	Silt mixtures - clayey silt to silty clay	2.60	5.46	3.18
1.00	3.28	30.1	3.24	Silt mixtures - clayey silt to silty clay	2.44	2.47	
1.05	3.44	36.2	2.81	Sand mixtures - silty sand to sandy silt	2.34	2.07	
1.10	3.61	35.6	2.47	Sand mixtures - silty sand to sandy silt	2.31	1.95	
1.15	3.77	35.6	2.53	Sand mixtures - silty sand to sandy silt	2.31	1.98	
1.20	3.94	37.9	2.20	Sand mixtures - silty sand to sandy silt	2.25	1.79	
1.25	4.10	47.2	1.69	Sand mixtures - silty sand to sandy silt	2.10	1.45	
1.30	4.27	51.5	1.47	Sands - clean sands to silty sand	2.03	1.34	
1.35	4.43	51.9	1.40	Sands - clean sands to silty sand	2.02	1.31	
1.40	4.59	50.0	1.41	Sands - clean sands to silty sand	2.03	1.33	
1.45	4.76	45.0	1.43	Sand mixtures - silty sand to sandy silt	2.07	1.39	
1.50	4.92	38.0	0.90	Sands - clean sands to silty sand	2.00	1.29	
1.55	5.09	33.3	1.36	Sand mixtures - silty sand to sandy silt	2.16	1.56	
1.60	5.25	27.8	1.15	Sand mixtures - silty sand to sandy silt	2.18	1.60	
1.65	5.41	19.5	1.36	Sand mixtures - silty sand to sandy silt	2.34	2.09	
1.70	5.58	16.8	1.39	Sand mixtures - silty sand to sandy silt	2.41	2.32	
1.75	5.74	24.3	0.73	Sand mixtures - silty sand to sandy silt	2.11	1.47	
1.80	5.91	22.0	1.04	Sand mixtures - silty sand to sandy silt	2.24	1.75	
1.85	6.07	14.0	1.71	Sand mixtures - silty sand to sandy silt	2.52	3.30	
1.90	6.23	19.8	1.04	Sand mixtures - silty sand to sandy silt	2.27	1.86	
1.95	6.40	27.0	0.71	Sands - clean sands to silty sand	2.07	1.39	
2.00	6.56	32.4	0.71	Sands - clean sands to silty sand	2.00	1.29	
2.05	6.73	32.8	0.70	Sands - clean sands to silty sand	2.00	1.29	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-18

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	42.6	0.74	Sands - clean sands to silty sand	1.94	1.22	
2.15	7.05	38.2	0.86	Sands - clean sands to silty sand	2.01	1.30	
2.20	7.22	31.9	1.46	Sand mixtures - silty sand to sandy silt	2.20	1.65	
2.25	7.38	33.2	1.37	Sand mixtures - silty sand to sandy silt	2.17	1.59	
2.30	7.55	42.5	1.19	Sand mixtures - silty sand to sandy silt	2.07	1.39	
2.35	7.71	38.7	1.36	Sand mixtures - silty sand to sandy silt	2.14	1.52	
2.40	7.87	50.2	1.01	Sands - clean sands to silty sand	1.99	1.28	
2.45	8.04	70.4	1.09	Sands - clean sands to silty sand	1.91	1.19	
2.50	8.20	96.1	1.36	Sands - clean sands to silty sand	1.89	1.18	
2.55	8.37	136.4	1.10	Sands - clean sands to silty sand	1.74	1.06	
2.60	8.53	123.5	1.70	Sands - clean sands to silty sand	1.90	1.18	
2.65	8.69	106.3	2.69	Sand mixtures - silty sand to sandy silt	2.09	1.43	
2.70	8.86	86.3	4.79	Very stiff, fine grained	2.34	2.07	
2.75	9.02	166.7	3.57	Very stiff sand to clayey sand	2.09	1.43	
2.80	9.19	160.4	4.23	Very stiff sand to clayey sand	2.17	1.58	
2.85	9.35	84.7	5.94	Very stiff, fine grained	2.43	2.41	
2.90	9.51	58.9	6.43	Very stiff, fine grained	2.54	3.73	
2.95	9.68	121.3	3.77	Very stiff sand to clayey sand	2.19	1.64	
3.00	9.84	144.1	3.69	Very stiff sand to clayey sand	2.15	1.54	
3.05	10.01	146.5	4.69	Very stiff, fine grained	2.24	1.75	
3.10	10.17	169.3	4.27	Very stiff sand to clayey sand	2.17	1.59	
3.15	10.33	163.5	4.45	Very stiff, fine grained	2.20	1.65	
3.20	10.50	146.9	4.42	Very stiff, fine grained	2.22	1.71	
3.25	10.66	140.4	4.34	Very stiff, fine grained	2.23	1.73	
3.30	10.83	142.8	3.61	Very stiff sand to clayey sand	2.16	1.56	
3.35	10.99	180.3	2.92	Very stiff sand to clayey sand	2.03	1.34	
3.40	11.15	162.3	3.34	Very stiff sand to clayey sand	2.11	1.46	
3.45	11.32	192.2	2.92	Very stiff sand to clayey sand	2.02	1.32	
3.50	11.48	198.1	2.50	Sand mixtures - silty sand to sandy silt	1.96	1.25	
3.55	11.65	219.2	2.32	Sands - clean sands to silty sand	1.92	1.20	
3.60	11.81	207.6	2.54	Sand mixtures - silty sand to sandy silt	1.96	1.25	
3.65	11.97	202.5	2.75	Very stiff sand to clayey sand	2.00	1.29	
3.70	12.14	187.0	2.81	Very stiff sand to clayey sand	2.03	1.33	
3.75	12.30	216.2	2.28	Sands - clean sands to silty sand	1.92	1.20	
3.80	12.47	186.2	2.49	Sand mixtures - silty sand to sandy silt	1.99	1.28	
3.85	12.63	159.2	2.92	Very stiff sand to clayey sand	2.09	1.42	
3.90	12.80	160.7	2.99	Very stiff sand to clayey sand	2.09	1.44	
3.95	12.96	133.2	3.55	Very stiff sand to clayey sand	2.20	1.66	
4.00	13.12	130.0	3.61	Very stiff sand to clayey sand	2.22	1.70	
4.05	13.29	134.1	3.43	Very stiff sand to clayey sand	2.19	1.64	
4.10	13.45	148.4	3.24	Very stiff sand to clayey sand	2.15	1.55	
4.15	13.62	141.3	2.78	Sand mixtures - silty sand to sandy silt	2.11	1.47	
4.20	13.78	144.9	2.27	Sand mixtures - silty sand to sandy silt	2.04	1.34	
4.25	13.94	144.0	2.18	Sand mixtures - silty sand to sandy silt	2.03	1.33	
4.30	14.11	125.6	2.40	Sand mixtures - silty sand to sandy silt	2.10	1.44	
4.35	14.27	106.1	3.44	Sand mixtures - silty sand to sandy silt	2.27	1.84	
4.40	14.44	110.7	2.71	Sand mixtures - silty sand to sandy silt	2.18	1.60	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-18

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	128.6	2.59	Sand mixtures - silty sand to sandy silt	2.13	1.49	
4.50	14.76	156.2	1.65	Sands - clean sands to silty sand	1.92	1.20	
4.55	14.93	153.1	2.52	Sand mixtures - silty sand to sandy silt	2.07	1.40	
4.60	15.09	132.7	2.75	Sand mixtures - silty sand to sandy silt	2.14	1.53	
4.65	15.26	124.8	3.16	Sand mixtures - silty sand to sandy silt	2.21	1.68	
4.70	15.42	172.0	2.48	Sand mixtures - silty sand to sandy silt	2.04	1.35	
4.75	15.58	187.3	2.64	Sand mixtures - silty sand to sandy silt	2.05	1.36	
4.80	15.75	184.0	2.78	Sand mixtures - silty sand to sandy silt	2.07	1.40	
4.85	15.91	185.5	2.71	Sand mixtures - silty sand to sandy silt	2.06	1.38	
4.90	16.08	163.5	3.35	Very stiff sand to clayey sand	2.17	1.59	
4.95	16.24	134.2	3.20	Sand mixtures - silty sand to sandy silt	2.21	1.68	
5.00	16.40	93.2	4.54	Very stiff, fine grained	2.43	2.42	
5.05	16.57	160.2	3.02	Sand mixtures - silty sand to sandy silt	2.15	1.54	
5.10	16.73	203.8	2.78	Sand mixtures - silty sand to sandy silt	2.06	1.38	
5.15	16.90	220.3	2.76	Sand mixtures - silty sand to sandy silt	2.04	1.35	
5.20	17.06	259.5	2.43	Sands - clean sands to silty sand	1.95	1.24	
5.25	17.22	282.9	2.38	Sands - clean sands to silty sand	1.93	1.21	
5.30	17.39	275.8	2.70	Very stiff sand to clayey sand	1.98	1.27	
5.35	17.55	271.5	2.89	Very stiff sand to clayey sand	2.01	1.31	
5.40	17.72	276.8	2.74	Very stiff sand to clayey sand	1.99	1.28	
5.45	17.88	269.3	2.68	Very stiff sand to clayey sand	1.99	1.28	
5.50	18.04	254.1	2.88	Very stiff sand to clayey sand	2.03	1.34	
5.55	18.21	277.4	2.25	Sands - clean sands to silty sand	1.92	1.20	
5.60	18.37	325.7	2.20	Sands - clean sands to silty sand	1.87	1.16	
5.65	18.54	318.3	2.16	Sands - clean sands to silty sand	1.87	1.16	
5.70	18.70	323.7	2.03	Sands - clean sands to silty sand	1.85	1.14	
5.75	18.86	331.0	2.41	Very stiff sand to clayey sand	1.91	1.19	
5.80	19.03	368.0	2.10	Sands - clean sands to silty sand	1.83	1.13	
5.85	19.19	365.1	2.44	Very stiff sand to clayey sand	1.89	1.18	
5.90	19.36	378.1	1.65	Sands - clean sands to silty sand	1.74	1.06	
5.95	19.52	442.8	1.80	Sands - clean sands to silty sand	1.74	1.06	
6.00	19.68	414.8	1.83	Sands - clean sands to silty sand	1.76	1.07	
6.05	19.85	357.3	2.26	Sands - clean sands to silty sand	1.88	1.16	
6.10	20.01	378.6	1.94	Sands - clean sands to silty sand	1.81	1.10	
6.15	20.18	413.8	1.84	Sands - clean sands to silty sand	1.76	1.08	
6.20	20.34	403.3	1.71	Sands - clean sands to silty sand	1.74	1.06	
6.25	20.51	320.9	2.45	Sands - clean sands to silty sand	1.94	1.22	
6.30	20.67	227.4	3.22	Very stiff sand to clayey sand	2.13	1.49	
6.35	20.83	181.4	3.46	Very stiff sand to clayey sand	2.21	1.68	
6.40	21.00	173.1	3.33	Very stiff sand to clayey sand	2.21	1.68	
6.45	21.16	180.8	2.57	Sand mixtures - silty sand to sandy silt	2.11	1.46	
6.50	21.33	166.6	2.77	Sand mixtures - silty sand to sandy silt	2.16	1.56	
6.55	21.49	131.6	3.48	Sand mixtures - silty sand to sandy silt	2.31	1.96	
6.60	21.65	139.0	4.18	Very stiff, fine grained	2.36	2.14	
6.65	21.82	170.1	3.61	Very stiff sand to clayey sand	2.25	1.80	
6.70	21.98	138.7	3.50	Sand mixtures - silty sand to sandy silt	2.30	1.94	
6.75	22.15	108.3	3.26	Sand mixtures - silty sand to sandy silt	2.35	2.10	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-18

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	95.4	3.23	Sand mixtures - silty sand to sandy silt	2.38	2.23	
6.85	22.47	84.2	2.34	Sand mixtures - silty sand to sandy silt	2.32	1.99	
6.90	22.64	52.6	3.58	Silt mixtures - clayey silt to silty clay	2.61	5.60	7.01
6.95	22.80	42.3	5.17	Clays - silty clay to clay	2.80		5.64
7.00	22.97	54.7	3.04	Silt mixtures - clayey silt to silty clay	2.54	3.76	
7.05	23.13	45.7	3.12	Silt mixtures - clayey silt to silty clay	2.61	5.91	6.09
7.10	23.29	33.9	4.29	Clays - silty clay to clay	2.82		4.52
7.15	23.46	24.0	5.28	Clays - silty clay to clay	3.00		3.20
7.20	23.62	21.2	4.47	Clays - silty clay to clay	2.99		2.83
7.25	23.79	21.6	4.95	Clays - silty clay to clay	3.02		2.88
7.30	23.95	28.3	3.15	Silt mixtures - clayey silt to silty clay	2.79		3.77
7.35	24.11	22.7	3.61	Clays - silty clay to clay	2.91		3.03
7.40	24.28	22.5	4.29	Clays - silty clay to clay	2.97		3.00
7.45	24.44	28.6	4.14	Clays - silty clay to clay	2.88		3.82
7.50	24.61	32.4	3.78	Clays - silty clay to clay	2.81		4.32
7.55	24.77	26.7	5.18	Clays - silty clay to clay	2.98		3.55
7.60	24.93	32.5	4.12	Clays - silty clay to clay	2.84		4.34
7.65	25.10	147.7	1.12	Sands - clean sands to silty sand	1.93	1.21	
7.70	25.26	157.9	1.38	Sands - clean sands to silty sand	1.97	1.26	
7.75	25.43	162.3	2.42	Sand mixtures - silty sand to sandy silt	2.16	1.56	
7.80	25.59	158.2	2.96	Sand mixtures - silty sand to sandy silt	2.24	1.76	
7.85	25.75	125.2	3.80	Silt mixtures - clayey silt to silty clay	2.40	2.29	
7.90	25.92	198.5	2.47	Sand mixtures - silty sand to sandy silt	2.11	1.47	
7.95	26.08	230.9	2.31	Sand mixtures - silty sand to sandy silt	2.05	1.36	
8.00	26.25	245.2	2.32	Sand mixtures - silty sand to sandy silt	2.03	1.34	
8.05	26.41	255.3	2.15	Sand mixtures - silty sand to sandy silt	2.00	1.29	
8.10	26.57	253.6	1.97	Sands - clean sands to silty sand	1.97	1.25	
8.15	26.74	247.4	2.05	Sands - clean sands to silty sand	1.99	1.28	
8.20	26.90	258.3	2.14	Sand mixtures - silty sand to sandy silt	1.99	1.28	
8.25	27.07	266.4	2.26	Sand mixtures - silty sand to sandy silt	2.01	1.30	
8.30	27.23	278.4	2.36	Sand mixtures - silty sand to sandy silt	2.01	1.31	
8.35	27.39	285.9	2.51	Sand mixtures - silty sand to sandy silt	2.03	1.33	
8.40	27.56	288.4	2.43	Sand mixtures - silty sand to sandy silt	2.02	1.32	
8.45	27.72	303.6	2.35	Sand mixtures - silty sand to sandy silt	1.99	1.28	
8.50	27.89	311.6	2.30	Sand mixtures - silty sand to sandy silt	1.98	1.26	
8.55	28.05	303.2	2.16	Sands - clean sands to silty sand	1.96	1.25	
8.60	28.21	263.2	2.30	Sand mixtures - silty sand to sandy silt	2.03	1.33	
8.65	28.38	248.3	2.03	Sand mixtures - silty sand to sandy silt	2.00	1.29	
8.70	28.54	254.8	1.96	Sands - clean sands to silty sand	1.98	1.27	
8.75	28.71	193.2	3.23	Sand mixtures - silty sand to sandy silt	2.24	1.77	
8.80	28.87	191.0	3.28	Sand mixtures - silty sand to sandy silt	2.25	1.80	
8.85	29.04	163.1	4.53	Very stiff, fine grained	2.42	2.39	
8.90	29.20	146.2	4.53	Silt mixtures - clayey silt to silty clay	2.45	2.53	
8.95	29.36	145.4	3.20	Sand mixtures - silty sand to sandy silt	2.33	2.03	
9.00	29.53	224.5	1.97	Sand mixtures - silty sand to sandy silt	2.03	1.33	
9.05	29.69	239.1	1.93	Sands - clean sands to silty sand	2.00	1.29	
9.10	29.86	251.8	1.97	Sands - clean sands to silty sand	2.00	1.29	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-18

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	263.7	2.01	Sands - clean sands to silty sand	1.99	1.28	
9.20	30.18	276.7	2.09	Sand mixtures - silty sand to sandy silt	1.99	1.28	
9.25	30.35	292.3	2.09	Sands - clean sands to silty sand	1.98	1.26	
9.30	30.51	294.1	2.11	Sands - clean sands to silty sand	1.98	1.27	
9.35	30.68	297.5	2.09	Sands - clean sands to silty sand	1.98	1.26	
9.40	30.84	302.1	2.15	Sands - clean sands to silty sand	1.98	1.27	
9.45	31.00	308.5	2.18	Sand mixtures - silty sand to sandy silt	1.98	1.27	
9.50	31.17	316.7	2.13	Sands - clean sands to silty sand	1.97	1.25	
9.55	31.33	316.2	2.10	Sands - clean sands to silty sand	1.97	1.25	
9.60	31.50	312.7	2.05	Sands - clean sands to silty sand	1.96	1.24	
9.65	31.66	299.1	2.16	Sand mixtures - silty sand to sandy silt	1.99	1.28	
9.70	31.82	285.1	2.35	Sand mixtures - silty sand to sandy silt	2.04	1.35	
9.75	31.99	271.9	2.52	Sand mixtures - silty sand to sandy silt	2.08	1.41	
9.80	32.15	268.4	2.46	Sand mixtures - silty sand to sandy silt	2.08	1.41	
9.85	32.32	260.8	2.29	Sand mixtures - silty sand to sandy silt	2.06	1.38	
9.90	32.48	245.2	2.55	Sand mixtures - silty sand to sandy silt	2.12	1.48	
9.95	32.64	219.7	2.76	Sand mixtures - silty sand to sandy silt	2.18	1.62	
10.00	32.81	129.7	3.40	Silt mixtures - clayey silt to silty clay	2.42	2.38	
10.05	32.97	71.0	4.02	Silt mixtures - clayey silt to silty clay	2.68	8.84	9.47
10.10	33.14	51.0	3.99	Clays - silty clay to clay	2.79		6.80
10.15	33.30	51.2	4.28	Clays - silty clay to clay	2.81		6.82
10.20	33.46	61.9	4.42	Clays - silty clay to clay	2.76		8.26
10.25	33.63	89.3	3.63	Silt mixtures - clayey silt to silty clay	2.57	4.53	
10.30	33.79	78.6	5.79	Clays - silty clay to clay	2.78		10.48
10.35	33.96	97.2	4.93	Silt mixtures - clayey silt to silty clay	2.66	7.84	12.95
10.40	34.12	72.5	6.51	Clays - silty clay to clay	2.84		9.66
10.45	34.28	77.4	5.39	Clays - silty clay to clay	2.76		10.32
10.50	34.45	100.9	4.59	Silt mixtures - clayey silt to silty clay	2.63	6.36	13.45
10.55	34.61	127.7	5.15	Silt mixtures - clayey silt to silty clay	2.60	5.27	
10.60	34.78	155.7	4.68	Silt mixtures - clayey silt to silty clay	2.50	2.84	
10.65	34.94	233.2	3.73	Very stiff sand to clayey sand	2.30	1.93	
10.70	35.10	348.5	3.26	Very stiff sand to clayey sand	2.14	1.52	
10.75	35.27	391.7	3.95	Very stiff sand to clayey sand	2.19	1.62	
10.80	35.43	261.8	3.95	Very stiff sand to clayey sand	2.29	1.91	
10.85	35.60	228.4	3.95	Very stiff, fine grained	2.33	2.04	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/12/2006 18:41
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-19

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	29.1	6.06	Clays - silty clay to clay	2.65	7.26	3.88
0.10	0.33	97.0	3.99	Very stiff sand to clayey sand	2.18	1.62	
0.15	0.49	199.7	3.19	Very stiff sand to clayey sand	1.94	1.22	
0.20	0.66	227.3	3.27	Very stiff sand to clayey sand	1.93	1.21	
0.25	0.82	195.1	3.58	Very stiff sand to clayey sand	1.99	1.28	
0.30	0.98	164.0	3.59	Very stiff sand to clayey sand	2.03	1.33	
0.35	1.15	168.6	3.36	Very stiff sand to clayey sand	2.00	1.29	
0.40	1.31	178.2	3.17	Very stiff sand to clayey sand	1.96	1.25	
0.45	1.48	187.1	3.17	Very stiff sand to clayey sand	1.95	1.23	
0.50	1.64	216.8	3.05	Very stiff sand to clayey sand	1.91	1.19	
0.55	1.80	249.7	2.97	Very stiff sand to clayey sand	1.87	1.16	
0.60	1.97	297.6	2.19	Very stiff sand to clayey sand	1.72	1.05	
0.65	2.13	363.7	2.49	Very stiff sand to clayey sand	1.74	1.06	
0.70	2.30	381.1	2.99	Very stiff sand to clayey sand	1.80	1.10	
0.75	2.46	388.5	3.35	Very stiff sand to clayey sand	1.85	1.14	
0.80	2.62	384.2	3.76	Very stiff sand to clayey sand	1.90	1.18	
0.85	2.79	386.5	3.85	Very stiff sand to clayey sand	1.90	1.19	
0.90	2.95	369.0	3.81	Very stiff sand to clayey sand	1.91	1.19	
0.95	3.12	338.7	3.73	Very stiff sand to clayey sand	1.91	1.19	
1.00	3.28	297.3	3.81	Very stiff sand to clayey sand	1.94	1.22	
1.05	3.44	253.7	4.18	Very stiff sand to clayey sand	2.00	1.30	
1.10	3.61	218.7	4.67	Very stiff sand to clayey sand	2.07	1.40	
1.15	3.77	195.8	5.05	Very stiff, fine grained	2.13	1.49	
1.20	3.94	207.9	4.09	Very stiff sand to clayey sand	2.03	1.34	
1.25	4.10	196.8	3.65	Very stiff sand to clayey sand	2.00	1.29	
1.30	4.27	176.3	3.16	Very stiff sand to clayey sand	1.96	1.25	
1.35	4.43	161.6	2.78	Very stiff sand to clayey sand	1.93	1.22	
1.40	4.59	146.3	2.83	Very stiff sand to clayey sand	1.96	1.25	
1.45	4.76	136.8	3.37	Very stiff sand to clayey sand	2.04	1.35	
1.50	4.92	118.2	3.81	Very stiff sand to clayey sand	2.12	1.49	
1.55	5.09	123.3	3.59	Very stiff sand to clayey sand	2.09	1.43	
1.60	5.25	119.3	3.71	Very stiff sand to clayey sand	2.11	1.47	
1.65	5.41	93.6	4.00	Very stiff sand to clayey sand	2.20	1.65	
1.70	5.58	84.2	4.48	Very stiff, fine grained	2.26	1.82	
1.75	5.74	86.6	3.49	Very stiff sand to clayey sand	2.17	1.58	
1.80	5.91	119.4	2.17	Sands - clean sands to silty sand	1.93	1.22	
1.85	6.07	124.4	2.43	Sand mixtures - silty sand to sandy silt	1.97	1.25	
1.90	6.23	108.8	2.82	Very stiff sand to clayey sand	2.05	1.36	
1.95	6.40	69.1	5.08	Very stiff, fine grained	2.36	2.13	
2.00	6.56	57.6	5.19	Very stiff, fine grained	2.41	2.35	
2.05	6.73	45.3	5.42	Very stiff, fine grained	2.49	2.71	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-19

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	39.1	4.47	Silt mixtures - clayey silt to silty clay	2.47	2.60	
2.15	7.05	28.0	4.72	Silt mixtures - clayey silt to silty clay	2.59	4.93	
2.20	7.22	25.8	5.16	Silt mixtures - clayey silt to silty clay	2.64	6.93	3.45
2.25	7.38	28.0	5.05	Silt mixtures - clayey silt to silty clay	2.61	5.69	3.73
2.30	7.55	33.6	4.50	Silt mixtures - clayey silt to silty clay	2.52	3.13	
2.35	7.71	29.8	5.08	Silt mixtures - clayey silt to silty clay	2.59	5.12	
2.40	7.87	30.3	5.19	Silt mixtures - clayey silt to silty clay	2.59	5.21	
2.45	8.04	30.9	3.96	Silt mixtures - clayey silt to silty clay	2.51	3.02	
2.50	8.20	25.7	4.58	Silt mixtures - clayey silt to silty clay	2.61	5.73	3.42
2.55	8.37	25.1	5.48	Clays - silty clay to clay	2.68	8.73	3.34
2.60	8.53	43.9	4.12	Silt mixtures - clayey silt to silty clay	2.45	2.49	
2.65	8.69	77.9	3.10	Sand mixtures - silty sand to sandy silt	2.21	1.69	
2.70	8.86	67.2	3.80	Very stiff sand to clayey sand	2.32	2.00	
2.75	9.02	73.3	3.73	Very stiff sand to clayey sand	2.30	1.93	
2.80	9.19	48.6	3.56	Silt mixtures - clayey silt to silty clay	2.39	2.26	
2.85	9.35	22.8	4.14	Silt mixtures - clayey silt to silty clay	2.64	7.18	3.05
2.90	9.51	19.8	3.79	Silt mixtures - clayey silt to silty clay	2.66	8.08	2.64
2.95	9.68	20.8	5.77	Clays - silty clay to clay	2.78		2.77
3.00	9.84	28.1	4.44	Silt mixtures - clayey silt to silty clay	2.62	6.20	3.74
3.05	10.01	28.4	3.98	Silt mixtures - clayey silt to silty clay	2.59	5.06	
3.10	10.17	25.1	3.57	Silt mixtures - clayey silt to silty clay	2.60	5.26	
3.15	10.33	23.6	5.15	Clays - silty clay to clay	2.73		3.15
3.20	10.50	38.6	4.17	Silt mixtures - clayey silt to silty clay	2.53	3.44	
3.25	10.66	40.4	4.90	Silt mixtures - clayey silt to silty clay	2.57	4.56	
3.30	10.83	34.5	4.99	Silt mixtures - clayey silt to silty clay	2.63	6.37	4.61
3.35	10.99	31.8	5.24	Clays - silty clay to clay	2.67	8.31	4.24
3.40	11.15	34.4	4.27	Silt mixtures - clayey silt to silty clay	2.59	4.92	
3.45	11.32	44.2	2.76	Sand mixtures - silty sand to sandy silt	2.38	2.23	
3.50	11.48	41.0	3.43	Silt mixtures - clayey silt to silty clay	2.48	2.63	
3.55	11.65	38.8	3.78	Silt mixtures - clayey silt to silty clay	2.52	3.31	
3.60	11.81	32.8	5.01	Silt mixtures - clayey silt to silty clay	2.66	8.14	4.37
3.65	11.97	51.3	2.68	Sand mixtures - silty sand to sandy silt	2.35	2.09	
3.70	12.14	77.2	2.08	Sand mixtures - silty sand to sandy silt	2.15	1.55	
3.75	12.30	83.2	2.14	Sand mixtures - silty sand to sandy silt	2.15	1.53	
3.80	12.47	66.0	2.49	Sand mixtures - silty sand to sandy silt	2.26	1.82	
3.85	12.63	50.5	2.75	Sand mixtures - silty sand to sandy silt	2.37	2.18	
3.90	12.80	63.9	2.33	Sand mixtures - silty sand to sandy silt	2.25	1.80	
3.95	12.96	72.6	2.44	Sand mixtures - silty sand to sandy silt	2.24	1.75	
4.00	13.12	81.4	2.23	Sand mixtures - silty sand to sandy silt	2.18	1.61	
4.05	13.29	104.8	1.97	Sand mixtures - silty sand to sandy silt	2.07	1.39	
4.10	13.45	116.8	1.72	Sands - clean sands to silty sand	2.00	1.29	
4.15	13.62	137.6	1.71	Sands - clean sands to silty sand	1.95	1.24	
4.20	13.78	136.2	1.84	Sands - clean sands to silty sand	1.98	1.27	
4.25	13.94	139.9	1.86	Sands - clean sands to silty sand	1.98	1.27	
4.30	14.11	155.9	2.10	Sand mixtures - silty sand to sandy silt	2.00	1.29	
4.35	14.27	141.3	3.03	Sand mixtures - silty sand to sandy silt	2.15	1.54	
4.40	14.44	110.4	4.32	Very stiff, fine grained	2.34	2.07	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-19

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	73.0	5.74	Very stiff, fine grained	2.55	3.86	
4.50	14.76	76.0	5.15	Very stiff, fine grained	2.50	2.84	
4.55	14.93	95.3	4.56	Very stiff, fine grained	2.40	2.31	
4.60	15.09	68.3	5.44	Silt mixtures - clayey silt to silty clay	2.55	4.03	
4.65	15.26	55.4	4.98	Silt mixtures - clayey silt to silty clay	2.58	4.88	
4.70	15.42	61.8	4.86	Silt mixtures - clayey silt to silty clay	2.55	3.86	
4.75	15.58	64.2	4.85	Silt mixtures - clayey silt to silty clay	2.54	3.67	
4.80	15.75	77.8	4.08	Silt mixtures - clayey silt to silty clay	2.43	2.43	
4.85	15.91	89.9	3.46	Sand mixtures - silty sand to sandy silt	2.34	2.06	
4.90	16.08	74.3	4.61	Silt mixtures - clayey silt to silty clay	2.49	2.71	
4.95	16.24	86.0	3.65	Silt mixtures - clayey silt to silty clay	2.37	2.19	
5.00	16.40	74.2	5.84	Silt mixtures - clayey silt to silty clay	2.58	4.69	
5.05	16.57	88.8	5.45	Very stiff, fine grained	2.51	2.98	
5.10	16.73	115.5	4.64	Very stiff, fine grained	2.39	2.24	
5.15	16.90	171.1	3.44	Very stiff sand to clayey sand	2.18	1.61	
5.20	17.06	145.3	4.25	Very stiff, fine grained	2.30	1.94	
5.25	17.22	86.6	5.32	Very stiff, fine grained	2.52	3.13	
5.30	17.39	111.8	3.78	Very stiff sand to clayey sand	2.33	2.04	
5.35	17.55	163.5	3.34	Very stiff sand to clayey sand	2.19	1.63	
5.40	17.72	158.4	3.43	Very stiff sand to clayey sand	2.21	1.68	
5.45	17.88	149.5	3.22	Sand mixtures - silty sand to sandy silt	2.20	1.66	
5.50	18.04	170.4	2.63	Sand mixtures - silty sand to sandy silt	2.10	1.44	
5.55	18.21	175.9	2.90	Sand mixtures - silty sand to sandy silt	2.13	1.50	
5.60	18.37	166.9	3.74	Very stiff sand to clayey sand	2.23	1.74	
5.65	18.54	153.8	3.70	Very stiff sand to clayey sand	2.25	1.80	
5.70	18.70	151.5	4.06	Very stiff, fine grained	2.29	1.91	
5.75	18.86	148.2	3.77	Very stiff sand to clayey sand	2.27	1.85	
5.80	19.03	154.4	3.32	Sand mixtures - silty sand to sandy silt	2.22	1.70	
5.85	19.19	158.4	3.73	Very stiff sand to clayey sand	2.26	1.81	
5.90	19.36	145.4	3.90	Very stiff sand to clayey sand	2.30	1.93	
5.95	19.52	143.1	4.14	Very stiff, fine grained	2.32	2.02	
6.00	19.68	143.3	3.90	Very stiff sand to clayey sand	2.30	1.95	
6.05	19.85	157.7	3.45	Very stiff sand to clayey sand	2.24	1.75	
6.10	20.01	166.4	3.43	Very stiff sand to clayey sand	2.22	1.71	
6.15	20.18	174.6	3.59	Very stiff sand to clayey sand	2.23	1.73	
6.20	20.34	142.2	4.04	Very stiff, fine grained	2.33	2.02	
6.25	20.51	127.5	3.80	Very stiff sand to clayey sand	2.34	2.06	
6.30	20.67	155.7	2.57	Sand mixtures - silty sand to sandy silt	2.14	1.53	
6.35	20.83	160.2	2.09	Sand mixtures - silty sand to sandy silt	2.07	1.39	
6.40	21.00	154.4	1.99	Sand mixtures - silty sand to sandy silt	2.06	1.38	
6.45	21.16	144.6	2.52	Sand mixtures - silty sand to sandy silt	2.16	1.57	
6.50	21.33	130.3	3.04	Sand mixtures - silty sand to sandy silt	2.26	1.82	
6.55	21.49	131.0	3.56	Sand mixtures - silty sand to sandy silt	2.32	1.99	
6.60	21.65	102.3	3.31	Sand mixtures - silty sand to sandy silt	2.36	2.15	
6.65	21.82	57.6	5.58	Clays - silty clay to clay	2.71		7.68
6.70	21.98	86.3	4.24	Silt mixtures - clayey silt to silty clay	2.50	2.85	
6.75	22.15	110.8	4.01	Silt mixtures - clayey silt to silty clay	2.41	2.35	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-19

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	85.1	4.97	Silt mixtures - clayey silt to silty clay	2.57	4.34	
6.85	22.47	71.5	5.71	Clays - silty clay to clay	2.67	8.33	9.53
6.90	22.64	74.7	5.95	Clays - silty clay to clay	2.67	8.55	9.96
6.95	22.80	91.4	5.15	Silt mixtures - clayey silt to silty clay	2.56	4.30	
7.00	22.97	144.6	3.72	Very stiff sand to clayey sand	2.32	2.00	
7.05	23.13	199.1	2.96	Sand mixtures - silty sand to sandy silt	2.15	1.55	
7.10	23.29	185.8	3.29	Sand mixtures - silty sand to sandy silt	2.21	1.68	
7.15	23.46	188.4	2.99	Sand mixtures - silty sand to sandy silt	2.17	1.60	
7.20	23.62	217.5	2.53	Sand mixtures - silty sand to sandy silt	2.08	1.40	
7.25	23.79	203.9	2.89	Sand mixtures - silty sand to sandy silt	2.14	1.53	
7.30	23.95	168.9	3.86	Very stiff sand to clayey sand	2.30	1.95	
7.35	24.11	153.3	4.07	Very stiff, fine grained	2.35	2.11	
7.40	24.28	241.6	2.49	Sand mixtures - silty sand to sandy silt	2.05	1.36	
7.45	24.44	242.5	2.08	Sands - clean sands to silty sand	1.98	1.27	
7.50	24.61	223.6	2.37	Sand mixtures - silty sand to sandy silt	2.05	1.37	
7.55	24.77	156.1	3.36	Sand mixtures - silty sand to sandy silt	2.28	1.88	
7.60	24.93	112.2	4.77	Silt mixtures - clayey silt to silty clay	2.50	2.87	
7.65	25.10	109.1	4.32	Silt mixtures - clayey silt to silty clay	2.48	2.64	
7.70	25.26	170.3	3.00	Sand mixtures - silty sand to sandy silt	2.22	1.71	
7.75	25.43	204.3	3.03	Sand mixtures - silty sand to sandy silt	2.17	1.60	
7.80	25.59	179.6	3.00	Sand mixtures - silty sand to sandy silt	2.21	1.68	
7.85	25.75	315.1	1.23	Sands - clean sands to silty sand	1.73	1.05	
7.90	25.92	367.2	1.01	Sands - clean sands to silty sand	1.61	1.00	
7.95	26.08	367.1	1.16	Sands - clean sands to silty sand	1.66	1.01	
8.00	26.25	321.5	1.51	Sands - clean sands to silty sand	1.80	1.10	
8.05	26.41	275.9	1.98	Sands - clean sands to silty sand	1.94	1.22	
8.10	26.57	252.9	2.10	Sand mixtures - silty sand to sandy silt	1.99	1.28	
8.15	26.74	246.8	1.52	Sands - clean sands to silty sand	1.88	1.17	
8.20	26.90	246.3	1.30	Sands - clean sands to silty sand	1.83	1.12	
8.25	27.07	249.4	2.19	Sand mixtures - silty sand to sandy silt	2.01	1.31	
8.30	27.23	182.9	3.02	Sand mixtures - silty sand to sandy silt	2.22	1.71	
8.35	27.39	140.7	3.53	Silt mixtures - clayey silt to silty clay	2.36	2.13	
8.40	27.56	147.0	2.58	Sand mixtures - silty sand to sandy silt	2.23	1.74	
8.45	27.72	145.0	2.48	Sand mixtures - silty sand to sandy silt	2.22	1.72	
8.50	27.89	129.4	2.54	Sand mixtures - silty sand to sandy silt	2.27	1.84	
8.55	28.05	119.7	2.98	Sand mixtures - silty sand to sandy silt	2.35	2.11	
8.60	28.21	96.6	3.15	Silt mixtures - clayey silt to silty clay	2.44	2.46	
8.65	28.38	95.3	3.50	Silt mixtures - clayey silt to silty clay	2.48	2.66	
8.70	28.54	99.6	2.96	Sand mixtures - silty sand to sandy silt	2.41	2.34	
8.75	28.71	96.9	3.62	Silt mixtures - clayey silt to silty clay	2.49	2.71	
8.80	28.87	71.7	2.87	Silt mixtures - clayey silt to silty clay	2.51	3.04	
8.85	29.04	39.0	4.29	Clays - silty clay to clay	2.85		5.20
8.90	29.20	51.0	4.74	Clays - silty clay to clay	2.80		6.81
8.95	29.36	95.5	4.26	Silt mixtures - clayey silt to silty clay	2.56	4.19	
9.00	29.53	109.5	4.00	Silt mixtures - clayey silt to silty clay	2.50	2.74	
9.05	29.69	145.4	3.13	Sand mixtures - silty sand to sandy silt	2.33	2.02	
9.10	29.86	177.1	2.76	Sand mixtures - silty sand to sandy silt	2.22	1.71	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-19

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	133.0	3.37	Silt mixtures - clayey silt to silty clay	2.38	2.23	
9.20	30.18	173.5	2.58	Sand mixtures - silty sand to sandy silt	2.21	1.67	
9.25	30.35	215.2	2.28	Sand mixtures - silty sand to sandy silt	2.10	1.44	
9.30	30.51	222.6	2.06	Sand mixtures - silty sand to sandy silt	2.05	1.37	
9.35	30.68	189.4	2.38	Sand mixtures - silty sand to sandy silt	2.16	1.55	
9.40	30.84	156.2	2.47	Sand mixtures - silty sand to sandy silt	2.23	1.73	
9.45	31.00	123.8	3.05	Sand mixtures - silty sand to sandy silt	2.38	2.21	
9.50	31.17	103.4	3.41	Silt mixtures - clayey silt to silty clay	2.48	2.64	
9.55	31.33	94.9	3.03	Silt mixtures - clayey silt to silty clay	2.46	2.58	
9.60	31.50	120.3	2.63	Sand mixtures - silty sand to sandy silt	2.34	2.07	
9.65	31.66	137.3	2.23	Sand mixtures - silty sand to sandy silt	2.24	1.76	
9.70	31.82	129.1	2.21	Sand mixtures - silty sand to sandy silt	2.26	1.81	
9.75	31.99	120.5	2.79	Sand mixtures - silty sand to sandy silt	2.37	2.16	
9.80	32.15	120.8	3.11	Silt mixtures - clayey silt to silty clay	2.40	2.32	
9.85	32.32	117.2	3.12	Silt mixtures - clayey silt to silty clay	2.42	2.37	
9.90	32.48	149.9	2.15	Sand mixtures - silty sand to sandy silt	2.21	1.67	
9.95	32.64	170.0	2.30	Sand mixtures - silty sand to sandy silt	2.19	1.64	
10.00	32.81	146.5	2.96	Sand mixtures - silty sand to sandy silt	2.33	2.05	
10.05	32.97	85.9	4.88	Silt mixtures - clayey silt to silty clay	2.68	9.18	11.45
10.10	33.14	91.3	5.70	Clays - silty clay to clay	2.72		12.17
10.15	33.30	154.7	4.55	Silt mixtures - clayey silt to silty clay	2.48	2.65	
10.20	33.46	187.6	3.92	Very stiff, fine grained	2.37	2.17	
10.25	33.63	213.4	3.08	Sand mixtures - silty sand to sandy silt	2.24	1.76	
10.30	33.79	251.5	2.11	Sand mixtures - silty sand to sandy silt	2.05	1.36	
10.35	33.96	246.1	1.95	Sand mixtures - silty sand to sandy silt	2.03	1.33	
10.40	34.12	234.1	1.98	Sand mixtures - silty sand to sandy silt	2.05	1.37	
10.45	34.28	222.4	1.97	Sand mixtures - silty sand to sandy silt	2.07	1.39	
10.50	34.45	210.8	1.71	Sand mixtures - silty sand to sandy silt	2.04	1.34	
10.55	34.61	209.2	1.53	Sands - clean sands to silty sand	2.00	1.29	
10.60	34.78	195.6	1.81	Sand mixtures - silty sand to sandy silt	2.08	1.42	
10.65	34.94	186.7	2.26	Sand mixtures - silty sand to sandy silt	2.18	1.60	
10.70	35.10	178.6	2.92	Sand mixtures - silty sand to sandy silt	2.29	1.89	
10.75	35.27	102.8	3.45	Silt mixtures - clayey silt to silty clay	2.53	3.32	
10.80	35.43	96.8	2.90	Silt mixtures - clayey silt to silty clay	2.49	2.68	
10.85	35.60	128.5	2.88	Sand mixtures - silty sand to sandy silt	2.39	2.26	
10.90	35.76	113.0	3.35	Silt mixtures - clayey silt to silty clay	2.49	2.70	
10.95	35.92	121.9	3.45	Silt mixtures - clayey silt to silty clay	2.48	2.64	
11.00	36.09	116.2	2.96	Silt mixtures - clayey silt to silty clay	2.44	2.46	
11.05	36.25	78.4	3.88	Silt mixtures - clayey silt to silty clay	2.67	8.35	10.45
11.10	36.42	125.2	2.53	Sand mixtures - silty sand to sandy silt	2.36	2.15	
11.15	36.58	189.5	1.97	Sand mixtures - silty sand to sandy silt	2.14	1.52	
11.20	36.74	210.9	1.86	Sand mixtures - silty sand to sandy silt	2.08	1.42	
11.25	36.91	199.2	2.32	Sand mixtures - silty sand to sandy silt	2.18	1.61	
11.30	37.07	167.6	3.19	Sand mixtures - silty sand to sandy silt	2.36	2.13	
11.35	37.24	139.4	3.55	Silt mixtures - clayey silt to silty clay	2.46	2.54	
11.40	37.40	207.1	2.28	Sand mixtures - silty sand to sandy silt	2.17	1.58	
11.45	37.57	218.8	1.98	Sand mixtures - silty sand to sandy silt	2.10	1.45	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-19

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	219.4	1.69	Sand mixtures - silty sand to sandy silt	2.04	1.35	
11.55	37.89	217.4	1.79	Sand mixtures - silty sand to sandy silt	2.07	1.39	
11.60	38.06	197.2	2.01	Sand mixtures - silty sand to sandy silt	2.14	1.53	
11.65	38.22	171.3	2.38	Sand mixtures - silty sand to sandy silt	2.25	1.79	
11.70	38.39	160.7	2.71	Sand mixtures - silty sand to sandy silt	2.32	2.01	
11.75	38.55	172.2	2.50	Sand mixtures - silty sand to sandy silt	2.27	1.85	
11.80	38.71	191.0	2.14	Sand mixtures - silty sand to sandy silt	2.18	1.61	
11.85	38.88	204.8	1.89	Sand mixtures - silty sand to sandy silt	2.12	1.47	
11.90	39.04	248.8	1.62	Sands - clean sands to silty sand	2.00	1.29	
11.95	39.21	254.0	1.56	Sands - clean sands to silty sand	1.98	1.27	
12.00	39.37	258.1	2.67	Sand mixtures - silty sand to sandy silt	2.18	1.60	
12.05	39.53	263.3	2.85	Sand mixtures - silty sand to sandy silt	2.20	1.65	
12.10	39.70	277.3	2.75	Sand mixtures - silty sand to sandy silt	2.17	1.58	
12.15	39.86	301.0	2.31	Sand mixtures - silty sand to sandy silt	2.08	1.41	
12.20	40.03	336.2	2.13	Sand mixtures - silty sand to sandy silt	2.01	1.31	
12.25	40.19	360.0	2.27	Sand mixtures - silty sand to sandy silt	2.02	1.32	
12.30	40.35	398.1	2.27	Sand mixtures - silty sand to sandy silt	1.99	1.28	
12.35	40.52	516.3	2.27	Sands - clean sands to silty sand	1.92	1.20	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/8/2006 9:17
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-20

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	42.6	0.78	Sands - clean sands to silty sand	1.92	1.20	
0.10	0.33	26.7	1.67	Sand mixtures - silty sand to sandy silt	2.28	1.88	
0.15	0.49	27.0	1.71	Sand mixtures - silty sand to sandy silt	2.28	1.89	
0.20	0.66	27.8	2.05	Sand mixtures - silty sand to sandy silt	2.33	2.02	
0.25	0.82	24.1	1.98	Sand mixtures - silty sand to sandy silt	2.36	2.16	
0.30	0.98	23.0	1.87	Sand mixtures - silty sand to sandy silt	2.36	2.15	
0.35	1.15	21.9	1.61	Sand mixtures - silty sand to sandy silt	2.34	2.07	
0.40	1.31	20.8	1.52	Sand mixtures - silty sand to sandy silt	2.34	2.08	
0.45	1.48	21.6	1.46	Sand mixtures - silty sand to sandy silt	2.32	2.01	
0.50	1.64	22.1	1.55	Sand mixtures - silty sand to sandy silt	2.33	2.03	
0.55	1.80	23.9	1.83	Sand mixtures - silty sand to sandy silt	2.35	2.10	
0.60	1.97	27.9	1.89	Sand mixtures - silty sand to sandy silt	2.30	1.95	
0.65	2.13	31.5	1.83	Sand mixtures - silty sand to sandy silt	2.26	1.80	
0.70	2.30	32.3	1.82	Sand mixtures - silty sand to sandy silt	2.24	1.77	
0.75	2.46	33.0	1.73	Sand mixtures - silty sand to sandy silt	2.22	1.72	
0.80	2.62	31.7	1.72	Sand mixtures - silty sand to sandy silt	2.24	1.75	
0.85	2.79	30.6	1.80	Sand mixtures - silty sand to sandy silt	2.26	1.81	
0.90	2.95	31.2	1.96	Sand mixtures - silty sand to sandy silt	2.28	1.87	
0.95	3.12	33.8	1.91	Sand mixtures - silty sand to sandy silt	2.25	1.77	
1.00	3.28	34.1	1.81	Sand mixtures - silty sand to sandy silt	2.23	1.73	
1.05	3.44	32.5	1.46	Sand mixtures - silty sand to sandy silt	2.18	1.61	
1.10	3.61	25.8	2.39	Sand mixtures - silty sand to sandy silt	2.40	2.29	
1.15	3.77	23.3	2.74	Silt mixtures - clayey silt to silty clay	2.47	2.62	
1.20	3.94	21.8	2.95	Silt mixtures - clayey silt to silty clay	2.52	3.11	
1.25	4.10	27.7	1.72	Sand mixtures - silty sand to sandy silt	2.28	1.88	
1.30	4.27	32.8	1.64	Sand mixtures - silty sand to sandy silt	2.21	1.69	
1.35	4.43	35.3	1.67	Sand mixtures - silty sand to sandy silt	2.19	1.64	
1.40	4.59	35.9	1.74	Sand mixtures - silty sand to sandy silt	2.20	1.65	
1.45	4.76	37.4	1.76	Sand mixtures - silty sand to sandy silt	2.19	1.63	
1.50	4.92	39.5	1.77	Sand mixtures - silty sand to sandy silt	2.17	1.59	
1.55	5.09	42.9	1.49	Sand mixtures - silty sand to sandy silt	2.10	1.44	
1.60	5.25	41.2	1.46	Sand mixtures - silty sand to sandy silt	2.10	1.45	
1.65	5.41	40.3	1.56	Sand mixtures - silty sand to sandy silt	2.13	1.51	
1.70	5.58	35.8	1.81	Sand mixtures - silty sand to sandy silt	2.21	1.69	
1.75	5.74	36.6	1.74	Sand mixtures - silty sand to sandy silt	2.19	1.64	
1.80	5.91	35.2	1.76	Sand mixtures - silty sand to sandy silt	2.21	1.68	
1.85	6.07	35.4	1.78	Sand mixtures - silty sand to sandy silt	2.21	1.69	
1.90	6.23	36.4	1.80	Sand mixtures - silty sand to sandy silt	2.21	1.67	
1.95	6.40	41.2	1.70	Sand mixtures - silty sand to sandy silt	2.15	1.54	
2.00	6.56	51.7	1.40	Sands - clean sands to silty sand	2.03	1.33	
2.05	6.73	61.4	1.87	Sand mixtures - silty sand to sandy silt	2.07	1.40	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-20

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	68.9	2.06	Sand mixtures - silty sand to sandy silt	2.07	1.40	
2.15	7.05	71.5	2.09	Sand mixtures - silty sand to sandy silt	2.07	1.40	
2.20	7.22	70.1	1.62	Sands - clean sands to silty sand	2.01	1.30	
2.25	7.38	71.7	1.59	Sands - clean sands to silty sand	2.00	1.29	
2.30	7.55	69.6	1.59	Sands - clean sands to silty sand	2.01	1.31	
2.35	7.71	68.9	1.62	Sands - clean sands to silty sand	2.02	1.32	
2.40	7.87	69.7	1.34	Sands - clean sands to silty sand	1.97	1.25	
2.45	8.04	74.8	1.35	Sands - clean sands to silty sand	1.96	1.24	
2.50	8.20	74.3	1.53	Sands - clean sands to silty sand	2.00	1.29	
2.55	8.37	72.6	1.57	Sands - clean sands to silty sand	2.01	1.31	
2.60	8.53	71.2	1.38	Sands - clean sands to silty sand	1.99	1.27	
2.65	8.69	69.1	1.43	Sands - clean sands to silty sand	2.01	1.30	
2.70	8.86	69.6	1.47	Sands - clean sands to silty sand	2.02	1.32	
2.75	9.02	71.2	1.53	Sands - clean sands to silty sand	2.03	1.33	
2.80	9.19	73.2	1.58	Sand mixtures - silty sand to sandy silt	2.03	1.34	
2.85	9.35	72.2	1.60	Sand mixtures - silty sand to sandy silt	2.04	1.35	
2.90	9.51	70.2	1.63	Sand mixtures - silty sand to sandy silt	2.06	1.38	
2.95	9.68	68.7	1.78	Sand mixtures - silty sand to sandy silt	2.09	1.44	
3.00	9.84	63.7	2.36	Sand mixtures - silty sand to sandy silt	2.20	1.67	
3.05	10.01	53.7	3.22	Sand mixtures - silty sand to sandy silt	2.35	2.11	
3.10	10.17	44.2	4.58	Silt mixtures - clayey silt to silty clay	2.52	3.15	
3.15	10.33	43.2	4.55	Silt mixtures - clayey silt to silty clay	2.52	3.31	
3.20	10.50	45.4	4.28	Silt mixtures - clayey silt to silty clay	2.50	2.73	
3.25	10.66	44.7	4.44	Silt mixtures - clayey silt to silty clay	2.52	3.10	
3.30	10.83	29.6	5.98	Clays - silty clay to clay	2.72		3.95
3.35	10.99	23.5	7.48	Clays - silty clay to clay	2.86		3.13
3.40	11.15	32.1	6.09	Clays - silty clay to clay	2.72		4.29
3.45	11.32	41.9	5.04	Silt mixtures - clayey silt to silty clay	2.59	5.01	
3.50	11.48	34.4	5.68	Clays - silty clay to clay	2.68	9.19	4.59
3.55	11.65	44.7	4.03	Silt mixtures - clayey silt to silty clay	2.51	2.91	
3.60	11.81	44.0	4.68	Silt mixtures - clayey silt to silty clay	2.56	4.23	
3.65	11.97	46.2	5.10	Silt mixtures - clayey silt to silty clay	2.58	4.74	
3.70	12.14	65.3	3.86	Silt mixtures - clayey silt to silty clay	2.40	2.29	
3.75	12.30	84.0	2.85	Sand mixtures - silty sand to sandy silt	2.24	1.75	
3.80	12.47	91.8	2.16	Sand mixtures - silty sand to sandy silt	2.12	1.49	
3.85	12.63	66.3	3.55	Silt mixtures - clayey silt to silty clay	2.38	2.21	
3.90	12.80	57.2	4.23	Silt mixtures - clayey silt to silty clay	2.48	2.64	
3.95	12.96	87.5	2.88	Sand mixtures - silty sand to sandy silt	2.24	1.76	
4.00	13.12	104.1	2.28	Sand mixtures - silty sand to sandy silt	2.12	1.48	
4.05	13.29	95.6	2.90	Sand mixtures - silty sand to sandy silt	2.22	1.71	
4.10	13.45	84.3	2.82	Sand mixtures - silty sand to sandy silt	2.25	1.79	
4.15	13.62	88.1	1.99	Sand mixtures - silty sand to sandy silt	2.13	1.50	
4.20	13.78	85.6	1.60	Sand mixtures - silty sand to sandy silt	2.07	1.40	
4.25	13.94	81.2	1.65	Sand mixtures - silty sand to sandy silt	2.10	1.44	
4.30	14.11	86.3	1.62	Sand mixtures - silty sand to sandy silt	2.08	1.41	
4.35	14.27	91.6	1.62	Sand mixtures - silty sand to sandy silt	2.06	1.38	
4.40	14.44	92.8	1.73	Sand mixtures - silty sand to sandy silt	2.08	1.41	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-20

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	91.5	2.42	Sand mixtures - silty sand to sandy silt	2.19	1.64	
4.50	14.76	93.9	2.11	Sand mixtures - silty sand to sandy silt	2.15	1.53	
4.55	14.93	83.7	2.12	Sand mixtures - silty sand to sandy silt	2.18	1.61	
4.60	15.09	82.9	1.68	Sand mixtures - silty sand to sandy silt	2.12	1.47	
4.65	15.26	82.2	1.62	Sand mixtures - silty sand to sandy silt	2.11	1.46	
4.70	15.42	82.3	1.49	Sand mixtures - silty sand to sandy silt	2.09	1.42	
4.75	15.58	80.2	1.45	Sand mixtures - silty sand to sandy silt	2.09	1.43	
4.80	15.75	71.6	1.71	Sand mixtures - silty sand to sandy silt	2.18	1.60	
4.85	15.91	65.7	1.90	Sand mixtures - silty sand to sandy silt	2.24	1.75	
4.90	16.08	66.3	1.53	Sand mixtures - silty sand to sandy silt	2.17	1.59	
4.95	16.24	67.6	1.31	Sand mixtures - silty sand to sandy silt	2.12	1.49	
5.00	16.40	69.2	1.47	Sand mixtures - silty sand to sandy silt	2.15	1.55	
5.05	16.57	70.1	1.55	Sand mixtures - silty sand to sandy silt	2.16	1.57	
5.10	16.73	72.1	1.56	Sand mixtures - silty sand to sandy silt	2.16	1.57	
5.15	16.90	75.6	1.59	Sand mixtures - silty sand to sandy silt	2.15	1.55	
5.20	17.06	74.7	1.57	Sand mixtures - silty sand to sandy silt	2.16	1.55	
5.25	17.22	71.0	1.50	Sand mixtures - silty sand to sandy silt	2.16	1.56	
5.30	17.39	74.2	2.09	Sand mixtures - silty sand to sandy silt	2.25	1.79	
5.35	17.55	77.7	1.73	Sand mixtures - silty sand to sandy silt	2.18	1.61	
5.40	17.72	65.1	1.64	Sand mixtures - silty sand to sandy silt	2.22	1.71	
5.45	17.88	64.3	1.49	Sand mixtures - silty sand to sandy silt	2.20	1.65	
5.50	18.04	61.1	2.35	Sand mixtures - silty sand to sandy silt	2.36	2.13	
5.55	18.21	63.0	2.04	Sand mixtures - silty sand to sandy silt	2.31	1.95	
5.60	18.37	55.7	1.91	Sand mixtures - silty sand to sandy silt	2.33	2.03	
5.65	18.54	57.0	1.28	Sand mixtures - silty sand to sandy silt	2.21	1.67	
5.70	18.70	59.7	1.29	Sand mixtures - silty sand to sandy silt	2.20	1.65	
5.75	18.86	61.6	1.33	Sand mixtures - silty sand to sandy silt	2.20	1.65	
5.80	19.03	62.8	1.47	Sand mixtures - silty sand to sandy silt	2.22	1.71	
5.85	19.19	64.9	1.44	Sand mixtures - silty sand to sandy silt	2.21	1.67	
5.90	19.36	68.5	1.67	Sand mixtures - silty sand to sandy silt	2.23	1.75	
5.95	19.52	75.7	1.68	Sand mixtures - silty sand to sandy silt	2.21	1.67	
6.00	19.68	77.3	1.77	Sand mixtures - silty sand to sandy silt	2.22	1.70	
6.05	19.85	84.6	1.67	Sand mixtures - silty sand to sandy silt	2.17	1.59	
6.10	20.01	88.4	1.87	Sand mixtures - silty sand to sandy silt	2.20	1.65	
6.15	20.18	84.9	2.14	Sand mixtures - silty sand to sandy silt	2.26	1.80	
6.20	20.34	87.9	2.10	Sand mixtures - silty sand to sandy silt	2.24	1.76	
6.25	20.51	92.5	1.89	Sand mixtures - silty sand to sandy silt	2.19	1.64	
6.30	20.67	91.1	1.83	Sand mixtures - silty sand to sandy silt	2.19	1.63	
6.35	20.83	85.4	1.73	Sand mixtures - silty sand to sandy silt	2.19	1.64	
6.40	21.00	80.7	1.84	Sand mixtures - silty sand to sandy silt	2.23	1.74	
6.45	21.16	68.8	2.36	Sand mixtures - silty sand to sandy silt	2.36	2.16	
6.50	21.33	62.0	2.53	Sand mixtures - silty sand to sandy silt	2.42	2.39	
6.55	21.49	61.1	2.55	Sand mixtures - silty sand to sandy silt	2.43	2.43	
6.60	21.65	58.7	2.52	Sand mixtures - silty sand to sandy silt	2.44	2.48	
6.65	21.82	55.3	2.56	Silt mixtures - clayey silt to silty clay	2.47	2.60	
6.70	21.98	48.6	3.50	Silt mixtures - clayey silt to silty clay	2.61	5.92	6.48
6.75	22.15	58.4	2.72	Silt mixtures - clayey silt to silty clay	2.48	2.63	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-20

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	74.6	2.70	Sand mixtures - silty sand to sandy silt	2.40	2.29	
6.85	22.47	77.1	3.24	Silt mixtures - clayey silt to silty clay	2.45	2.52	
6.90	22.64	77.4	3.55	Silt mixtures - clayey silt to silty clay	2.48	2.66	
6.95	22.80	83.6	3.52	Silt mixtures - clayey silt to silty clay	2.46	2.55	
7.00	22.97	93.7	4.07	Silt mixtures - clayey silt to silty clay	2.48	2.64	
7.05	23.13	100.5	4.65	Silt mixtures - clayey silt to silty clay	2.51	2.91	
7.10	23.29	99.8	5.19	Silt mixtures - clayey silt to silty clay	2.55	3.87	
7.15	23.46	112.2	5.12	Silt mixtures - clayey silt to silty clay	2.51	3.05	
7.20	23.62	121.7	5.65	Very stiff, fine grained	2.53	3.38	
7.25	23.79	129.0	5.87	Very stiff, fine grained	2.53	3.39	
7.30	23.95	132.4	6.24	Very stiff, fine grained	2.55	3.82	
7.35	24.11	147.0	5.55	Very stiff, fine grained	2.48	2.64	
7.40	24.28	132.5	5.63	Very stiff, fine grained	2.51	3.03	
7.45	24.44	121.8	5.56	Very stiff, fine grained	2.53	3.47	
7.50	24.61	128.7	6.37	Very stiff, fine grained	2.57	4.42	
7.55	24.77	137.3	6.26	Very stiff, fine grained	2.55	3.83	
7.60	24.93	134.2	7.07	Very stiff, fine grained	2.60	5.44	17.89
7.65	25.10	144.2	6.97	Very stiff, fine grained	2.58	4.70	
7.70	25.26	189.7	5.90	Very stiff, fine grained	2.45	2.49	
7.75	25.43	245.2	5.95	Very stiff, fine grained	2.39	2.25	
7.80	25.59	263.6	5.92	Very stiff, fine grained	2.37	2.18	
7.85	25.75	312.0	5.66	Very stiff, fine grained	2.31	1.98	
7.90	25.92	238.6	7.86	Very stiff, fine grained	2.51	2.96	
7.95	26.08	315.9	6.23	Very stiff, fine grained	2.35	2.11	
8.00	26.25	447.5	6.23	Very stiff, fine grained	2.28	1.87	
8.05	26.41	495.4	6.23	Very stiff, fine grained	2.26	1.81	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/8/2006 9:59
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 50 feet
SOUNDING: CPT-21

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	46.9	1.28	Sands - clean sands to silty sand	2.02	1.32	
0.10	0.33	42.4	1.93	Sand mixtures - silty sand to sandy silt	2.17	1.59	
0.15	0.49	35.7	1.79	Sand mixtures - silty sand to sandy silt	2.20	1.67	
0.20	0.66	32.2	1.79	Sand mixtures - silty sand to sandy silt	2.24	1.76	
0.25	0.82	31.3	1.78	Sand mixtures - silty sand to sandy silt	2.25	1.78	
0.30	0.98	30.2	1.90	Sand mixtures - silty sand to sandy silt	2.28	1.86	
0.35	1.15	29.3	2.25	Sand mixtures - silty sand to sandy silt	2.34	2.06	
0.40	1.31	29.6	2.04	Sand mixtures - silty sand to sandy silt	2.31	1.95	
0.45	1.48	27.3	1.93	Sand mixtures - silty sand to sandy silt	2.32	1.99	
0.50	1.64	29.0	1.90	Sand mixtures - silty sand to sandy silt	2.29	1.91	
0.55	1.80	29.9	1.96	Sand mixtures - silty sand to sandy silt	2.29	1.91	
0.60	1.97	29.9	2.01	Sand mixtures - silty sand to sandy silt	2.30	1.93	
0.65	2.13	25.7	2.14	Sand mixtures - silty sand to sandy silt	2.37	2.16	
0.70	2.30	20.3	1.90	Sand mixtures - silty sand to sandy silt	2.41	2.35	
0.75	2.46	17.1	2.19	Silt mixtures - clayey silt to silty clay	2.51	2.99	
0.80	2.62	20.8	2.02	Sand mixtures - silty sand to sandy silt	2.42	2.39	
0.85	2.79	28.2	1.86	Sand mixtures - silty sand to sandy silt	2.30	1.93	
0.90	2.95	31.7	1.85	Sand mixtures - silty sand to sandy silt	2.26	1.81	
0.95	3.12	28.8	1.62	Sand mixtures - silty sand to sandy silt	2.25	1.79	
1.00	3.28	24.0	1.54	Sand mixtures - silty sand to sandy silt	2.30	1.94	
1.05	3.44	19.3	2.35	Silt mixtures - clayey silt to silty clay	2.49	2.70	
1.10	3.61	15.8	2.47	Silt mixtures - clayey silt to silty clay	2.57	4.55	
1.15	3.77	13.6	1.68	Sand mixtures - silty sand to sandy silt	2.53	3.33	
1.20	3.94	16.9	1.70	Sand mixtures - silty sand to sandy silt	2.45	2.51	
1.25	4.10	21.8	1.51	Sand mixtures - silty sand to sandy silt	2.33	2.04	
1.30	4.27	19.5	1.68	Sand mixtures - silty sand to sandy silt	2.40	2.29	
1.35	4.43	16.2	1.73	Sand mixtures - silty sand to sandy silt	2.47	2.61	
1.40	4.59	15.0	1.70	Sand mixtures - silty sand to sandy silt	2.49	2.72	
1.45	4.76	18.8	0.95	Sand mixtures - silty sand to sandy silt	2.27	1.85	
1.50	4.92	28.7	2.50	Sand mixtures - silty sand to sandy silt	2.38	2.22	
1.55	5.09	90.2	1.61	Sands - clean sands to silty sand	1.89	1.17	
1.60	5.25	134.9	2.56	Very stiff sand to clayey sand	1.95	1.23	
1.65	5.41	143.1	2.43	Sands - clean sands to silty sand	1.92	1.20	
1.70	5.58	105.0	2.45	Sand mixtures - silty sand to sandy silt	1.99	1.29	
1.75	5.74	97.5	1.50	Sands - clean sands to silty sand	1.86	1.15	
1.80	5.91	89.9	0.96	Sands - clean sands to silty sand	1.76	1.07	
1.85	6.07	86.8	0.83	Sands - clean sands to silty sand	1.74	1.06	
1.90	6.23	77.4	1.09	Sands - clean sands to silty sand	1.84	1.13	
1.95	6.40	70.8	1.18	Sands - clean sands to silty sand	1.89	1.18	
2.00	6.56	62.2	1.58	Sands - clean sands to silty sand	2.01	1.31	
2.05	6.73	67.2	1.50	Sands - clean sands to silty sand	1.98	1.27	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-21

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	73.8	1.24	Sands - clean sands to silty sand	1.91	1.19	
2.15	7.05	73.9	1.25	Sands - clean sands to silty sand	1.92	1.20	
2.20	7.22	72.8	1.19	Sands - clean sands to silty sand	1.91	1.19	
2.25	7.38	63.0	1.29	Sands - clean sands to silty sand	1.97	1.26	
2.30	7.55	57.8	1.18	Sands - clean sands to silty sand	1.98	1.27	
2.35	7.71	57.4	0.96	Sands - clean sands to silty sand	1.93	1.21	
2.40	7.87	55.8	0.92	Sands - clean sands to silty sand	1.93	1.21	
2.45	8.04	55.6	1.06	Sands - clean sands to silty sand	1.97	1.26	
2.50	8.20	56.5	0.90	Sands - clean sands to silty sand	1.93	1.21	
2.55	8.37	57.9	0.74	Sands - clean sands to silty sand	1.88	1.16	
2.60	8.53	53.4	0.83	Sands - clean sands to silty sand	1.93	1.22	
2.65	8.69	49.1	0.94	Sands - clean sands to silty sand	1.99	1.29	
2.70	8.86	48.2	0.89	Sands - clean sands to silty sand	1.99	1.28	
2.75	9.02	47.1	1.41	Sand mixtures - silty sand to sandy silt	2.12	1.49	
2.80	9.19	51.3	1.53	Sand mixtures - silty sand to sandy silt	2.12	1.49	
2.85	9.35	53.8	1.37	Sand mixtures - silty sand to sandy silt	2.08	1.41	
2.90	9.51	51.0	1.18	Sand mixtures - silty sand to sandy silt	2.06	1.38	
2.95	9.68	57.7	0.87	Sands - clean sands to silty sand	1.95	1.23	
3.00	9.84	58.7	0.87	Sands - clean sands to silty sand	1.95	1.23	
3.05	10.01	60.5	0.79	Sands - clean sands to silty sand	1.92	1.20	
3.10	10.17	59.4	0.89	Sands - clean sands to silty sand	1.95	1.24	
3.15	10.33	58.5	0.96	Sands - clean sands to silty sand	1.98	1.27	
3.20	10.50	60.3	1.07	Sands - clean sands to silty sand	2.00	1.30	
3.25	10.66	63.2	0.95	Sands - clean sands to silty sand	1.96	1.25	
3.30	10.83	63.9	1.14	Sands - clean sands to silty sand	2.01	1.31	
3.35	10.99	64.2	0.91	Sands - clean sands to silty sand	1.95	1.24	
3.40	11.15	60.3	1.20	Sands - clean sands to silty sand	2.05	1.36	
3.45	11.32	62.3	0.90	Sands - clean sands to silty sand	1.97	1.25	
3.50	11.48	64.8	0.79	Sands - clean sands to silty sand	1.92	1.20	
3.55	11.65	64.9	0.69	Sands - clean sands to silty sand	1.89	1.17	
3.60	11.81	68.1	0.69	Sands - clean sands to silty sand	1.88	1.16	
3.65	11.97	69.6	0.65	Sands - clean sands to silty sand	1.86	1.15	
3.70	12.14	73.3	0.72	Sands - clean sands to silty sand	1.87	1.16	
3.75	12.30	76.9	0.76	Sands - clean sands to silty sand	1.87	1.16	
3.80	12.47	81.4	0.83	Sands - clean sands to silty sand	1.88	1.16	
3.85	12.63	81.4	0.81	Sands - clean sands to silty sand	1.88	1.16	
3.90	12.80	86.8	0.80	Sands - clean sands to silty sand	1.85	1.14	
3.95	12.96	90.3	0.86	Sands - clean sands to silty sand	1.86	1.15	
4.00	13.12	91.9	0.98	Sands - clean sands to silty sand	1.90	1.18	
4.05	13.29	89.5	0.97	Sands - clean sands to silty sand	1.90	1.19	
4.10	13.45	86.8	0.89	Sands - clean sands to silty sand	1.89	1.17	
4.15	13.62	86.1	0.97	Sands - clean sands to silty sand	1.92	1.20	
4.20	13.78	85.1	1.40	Sands - clean sands to silty sand	2.03	1.34	
4.25	13.94	88.5	1.45	Sands - clean sands to silty sand	2.03	1.34	
4.30	14.11	90.6	1.54	Sand mixtures - silty sand to sandy silt	2.05	1.36	
4.35	14.27	91.3	1.43	Sands - clean sands to silty sand	2.03	1.33	
4.40	14.44	90.6	1.43	Sands - clean sands to silty sand	2.03	1.33	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-21

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	93.1	1.13	Sands - clean sands to silty sand	1.95	1.24	
4.50	14.76	90.3	1.43	Sands - clean sands to silty sand	2.04	1.34	
4.55	14.93	87.2	1.34	Sands - clean sands to silty sand	2.03	1.33	
4.60	15.09	75.9	1.46	Sand mixtures - silty sand to sandy silt	2.10	1.44	
4.65	15.26	58.8	1.82	Sand mixtures - silty sand to sandy silt	2.25	1.78	
4.70	15.42	44.5	2.24	Sand mixtures - silty sand to sandy silt	2.40	2.30	
4.75	15.58	43.3	2.16	Sand mixtures - silty sand to sandy silt	2.40	2.30	
4.80	15.75	44.3	1.67	Sand mixtures - silty sand to sandy silt	2.32	2.00	
4.85	15.91	46.8	1.46	Sand mixtures - silty sand to sandy silt	2.27	1.84	
4.90	16.08	51.4	1.47	Sand mixtures - silty sand to sandy silt	2.24	1.76	
4.95	16.24	58.3	1.43	Sand mixtures - silty sand to sandy silt	2.20	1.65	
5.00	16.40	65.6	1.49	Sand mixtures - silty sand to sandy silt	2.17	1.59	
5.05	16.57	72.7	1.47	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.10	16.73	80.0	1.47	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.15	16.90	83.8	1.54	Sand mixtures - silty sand to sandy silt	2.11	1.47	
5.20	17.06	90.3	1.68	Sand mixtures - silty sand to sandy silt	2.12	1.48	
5.25	17.22	97.7	1.48	Sand mixtures - silty sand to sandy silt	2.06	1.37	
5.30	17.39	99.7	1.53	Sand mixtures - silty sand to sandy silt	2.06	1.38	
5.35	17.55	101.1	1.66	Sand mixtures - silty sand to sandy silt	2.09	1.42	
5.40	17.72	96.2	1.58	Sand mixtures - silty sand to sandy silt	2.09	1.42	
5.45	17.88	85.6	1.65	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.50	18.04	72.9	1.60	Sand mixtures - silty sand to sandy silt	2.18	1.62	
5.55	18.21	60.8	1.79	Sand mixtures - silty sand to sandy silt	2.28	1.86	
5.60	18.37	56.0	1.88	Sand mixtures - silty sand to sandy silt	2.32	2.01	
5.65	18.54	57.7	1.80	Sand mixtures - silty sand to sandy silt	2.30	1.94	
5.70	18.70	60.2	1.58	Sand mixtures - silty sand to sandy silt	2.25	1.79	
5.75	18.86	61.3	1.50	Sand mixtures - silty sand to sandy silt	2.23	1.74	
5.80	19.03	62.9	1.49	Sand mixtures - silty sand to sandy silt	2.22	1.72	
5.85	19.19	62.0	1.56	Sand mixtures - silty sand to sandy silt	2.24	1.77	
5.90	19.36	63.1	1.57	Sand mixtures - silty sand to sandy silt	2.24	1.77	
5.95	19.52	66.3	1.62	Sand mixtures - silty sand to sandy silt	2.24	1.75	
6.00	19.68	72.4	1.56	Sand mixtures - silty sand to sandy silt	2.20	1.66	
6.05	19.85	76.9	1.53	Sand mixtures - silty sand to sandy silt	2.18	1.60	
6.10	20.01	80.5	1.58	Sand mixtures - silty sand to sandy silt	2.17	1.60	
6.15	20.18	82.6	1.63	Sand mixtures - silty sand to sandy silt	2.18	1.60	
6.20	20.34	84.1	1.71	Sand mixtures - silty sand to sandy silt	2.19	1.63	
6.25	20.51	87.3	1.62	Sand mixtures - silty sand to sandy silt	2.16	1.57	
6.30	20.67	85.7	1.58	Sand mixtures - silty sand to sandy silt	2.16	1.57	
6.35	20.83	76.3	1.60	Sand mixtures - silty sand to sandy silt	2.21	1.67	
6.40	21.00	63.7	1.77	Sand mixtures - silty sand to sandy silt	2.30	1.93	
6.45	21.16	53.8	1.87	Sand mixtures - silty sand to sandy silt	2.37	2.19	
6.50	21.33	48.7	1.78	Sand mixtures - silty sand to sandy silt	2.39	2.28	
6.55	21.49	46.7	1.56	Sand mixtures - silty sand to sandy silt	2.37	2.19	
6.60	21.65	44.5	1.45	Sand mixtures - silty sand to sandy silt	2.37	2.18	
6.65	21.82	38.2	1.71	Sand mixtures - silty sand to sandy silt	2.47	2.62	
6.70	21.98	40.1	1.55	Sand mixtures - silty sand to sandy silt	2.43	2.44	
6.75	22.15	44.7	1.52	Sand mixtures - silty sand to sandy silt	2.39	2.26	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-21

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	43.8	1.85	Sand mixtures - silty sand to sandy silt	2.46	2.54	
6.85	22.47	46.6	1.91	Sand mixtures - silty sand to sandy silt	2.45	2.50	
6.90	22.64	59.8	1.66	Sand mixtures - silty sand to sandy silt	2.32	2.01	
6.95	22.80	65.7	1.76	Sand mixtures - silty sand to sandy silt	2.31	1.97	
7.00	22.97	57.6	3.08	Silt mixtures - clayey silt to silty clay	2.53	3.46	
7.05	23.13	48.3	3.38	Silt mixtures - clayey silt to silty clay	2.62	6.20	6.44
7.10	23.29	56.5	2.96	Silt mixtures - clayey silt to silty clay	2.53	3.41	
7.15	23.46	89.1	1.92	Sand mixtures - silty sand to sandy silt	2.24	1.77	
7.20	23.62	86.6	1.80	Sand mixtures - silty sand to sandy silt	2.23	1.75	
7.25	23.79	86.1	1.56	Sand mixtures - silty sand to sandy silt	2.19	1.64	
7.30	23.95	88.7	1.50	Sand mixtures - silty sand to sandy silt	2.17	1.60	
7.35	24.11	94.9	1.55	Sand mixtures - silty sand to sandy silt	2.16	1.57	
7.40	24.28	100.4	1.58	Sand mixtures - silty sand to sandy silt	2.15	1.55	
7.45	24.44	100.8	1.23	Sand mixtures - silty sand to sandy silt	2.08	1.40	
7.50	24.61	74.2	1.02	Sand mixtures - silty sand to sandy silt	2.13	1.50	
7.55	24.77	46.0	1.84	Sand mixtures - silty sand to sandy silt	2.47	2.62	
7.60	24.93	29.7	2.81	Silt mixtures - clayey silt to silty clay	2.76		3.95
7.65	25.10	23.2	3.73	Clays - silty clay to clay	2.93		3.09
7.70	25.26	21.3	3.28	Clays - silty clay to clay	2.93		2.84
7.75	25.43	17.7	3.22	Clays - silty clay to clay	2.99		2.35
7.80	25.59	19.9	2.80	Clays - silty clay to clay	2.91		2.65
7.85	25.75	18.0	3.46	Clays - silty clay to clay	3.01		2.39
7.90	25.92	16.7	3.72	Clays - silty clay to clay	3.06		2.22
7.95	26.08	18.8	3.37	Clays - silty clay to clay	2.99		2.51
8.00	26.25	24.6	2.96	Clays - silty clay to clay	2.86		3.28
8.05	26.41	26.1	2.15	Silt mixtures - clayey silt to silty clay	2.75		3.48
8.10	26.57	31.5	1.87	Silt mixtures - clayey silt to silty clay	2.64	6.99	4.21
8.15	26.74	35.1	1.54	Sand mixtures - silty sand to sandy silt	2.55	3.84	
8.20	26.90	32.8	1.66	Silt mixtures - clayey silt to silty clay	2.60	5.29	
8.25	27.07	28.5	1.84	Silt mixtures - clayey silt to silty clay	2.68	9.09	3.80
8.30	27.23	26.4	1.68	Silt mixtures - clayey silt to silty clay	2.69	9.40	3.52
8.35	27.39	24.5	1.22	Silt mixtures - clayey silt to silty clay	2.63	6.70	3.27
8.40	27.56	23.6	1.22	Silt mixtures - clayey silt to silty clay	2.65	7.45	3.15
8.45	27.72	25.6	1.53	Silt mixtures - clayey silt to silty clay	2.68	8.97	3.42
8.50	27.89	35.2	1.65	Silt mixtures - clayey silt to silty clay	2.58	4.82	
8.55	28.05	41.7	2.08	Silt mixtures - clayey silt to silty clay	2.59	5.05	
8.60	28.21	48.4	2.59	Silt mixtures - clayey silt to silty clay	2.61	5.60	6.46
8.65	28.38	54.5	2.73	Silt mixtures - clayey silt to silty clay	2.58	4.83	
8.70	28.54	61.8	2.65	Silt mixtures - clayey silt to silty clay	2.53	3.45	
8.75	28.71	75.1	2.12	Sand mixtures - silty sand to sandy silt	2.39	2.28	
8.80	28.87	91.3	1.56	Sand mixtures - silty sand to sandy silt	2.23	1.74	
8.85	29.04	107.7	1.24	Sand mixtures - silty sand to sandy silt	2.11	1.46	
8.90	29.20	94.4	1.38	Sand mixtures - silty sand to sandy silt	2.19	1.62	
8.95	29.36	77.9	1.56	Sand mixtures - silty sand to sandy silt	2.29	1.92	
9.00	29.53	67.8	1.58	Sand mixtures - silty sand to sandy silt	2.35	2.10	
9.05	29.69	61.5	1.45	Sand mixtures - silty sand to sandy silt	2.36	2.14	
9.10	29.86	51.9	1.45	Sand mixtures - silty sand to sandy silt	2.42	2.40	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-21

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	39.4	1.42	Sand mixtures - silty sand to sandy silt	2.53	3.32	
9.20	30.18	29.6	1.69	Silt mixtures - clayey silt to silty clay	2.69	9.43	3.95
9.25	30.35	23.6	1.92	Silt mixtures - clayey silt to silty clay	2.82		3.15
9.30	30.51	19.9	2.41	Clays - silty clay to clay	2.94		2.65
9.35	30.68	21.3	2.13	Silt mixtures - clayey silt to silty clay	2.89		2.84
9.40	30.84	22.5	1.96	Silt mixtures - clayey silt to silty clay	2.84		3.00
9.45	31.00	23.5	1.93	Silt mixtures - clayey silt to silty clay	2.83		3.13
9.50	31.17	29.9	2.29	Silt mixtures - clayey silt to silty clay	2.79		3.99
9.55	31.33	30.5	2.60	Silt mixtures - clayey silt to silty clay	2.82		4.07
9.60	31.50	32.4	2.90	Silt mixtures - clayey silt to silty clay	2.83		4.32
9.65	31.66	43.2	2.33	Silt mixtures - clayey silt to silty clay	2.66	7.86	5.76
9.70	31.82	54.1	2.24	Silt mixtures - clayey silt to silty clay	2.57	4.31	
9.75	31.99	59.2	2.16	Silt mixtures - clayey silt to silty clay	2.52	3.26	
9.80	32.15	53.6	2.39	Silt mixtures - clayey silt to silty clay	2.59	5.16	
9.85	32.32	49.1	2.47	Silt mixtures - clayey silt to silty clay	2.64	6.85	6.55
9.90	32.48	46.8	2.39	Silt mixtures - clayey silt to silty clay	2.65	7.28	6.24
9.95	32.64	46.9	2.50	Silt mixtures - clayey silt to silty clay	2.66	8.04	6.25
10.00	32.81	54.3	2.13	Silt mixtures - clayey silt to silty clay	2.56	4.15	
10.05	32.97	57.8	1.94	Sand mixtures - silty sand to sandy silt	2.51	2.99	
10.10	33.14	54.1	2.03	Silt mixtures - clayey silt to silty clay	2.55	3.92	
10.15	33.30	48.2	2.04	Silt mixtures - clayey silt to silty clay	2.60	5.28	
10.20	33.46	44.1	2.33	Silt mixtures - clayey silt to silty clay	2.67	8.59	5.89
10.25	33.63	49.5	2.30	Silt mixtures - clayey silt to silty clay	2.63	6.49	6.60
10.30	33.79	64.0	1.88	Sand mixtures - silty sand to sandy silt	2.47	2.61	
10.35	33.96	76.0	1.77	Sand mixtures - silty sand to sandy silt	2.39	2.27	
10.40	34.12	84.1	1.74	Sand mixtures - silty sand to sandy silt	2.35	2.11	
10.45	34.28	81.4	1.99	Sand mixtures - silty sand to sandy silt	2.41	2.33	
10.50	34.45	77.3	1.89	Sand mixtures - silty sand to sandy silt	2.41	2.35	
10.55	34.61	73.3	2.16	Sand mixtures - silty sand to sandy silt	2.48	2.64	
10.60	34.78	73.0	2.15	Sand mixtures - silty sand to sandy silt	2.48	2.64	
10.65	34.94	71.3	2.00	Sand mixtures - silty sand to sandy silt	2.46	2.58	
10.70	35.10	68.2	1.87	Sand mixtures - silty sand to sandy silt	2.46	2.56	
10.75	35.27	62.6	1.73	Sand mixtures - silty sand to sandy silt	2.47	2.61	
10.80	35.43	65.6	1.93	Sand mixtures - silty sand to sandy silt	2.49	2.70	
10.85	35.60	68.7	2.15	Silt mixtures - clayey silt to silty clay	2.51	2.96	
10.90	35.76	76.0	2.10	Sand mixtures - silty sand to sandy silt	2.47	2.59	
10.95	35.92	86.5	1.82	Sand mixtures - silty sand to sandy silt	2.37	2.20	
11.00	36.09	95.9	1.54	Sand mixtures - silty sand to sandy silt	2.29	1.89	
11.05	36.25	112.4	1.22	Sand mixtures - silty sand to sandy silt	2.15	1.55	
11.10	36.42	119.7	1.35	Sand mixtures - silty sand to sandy silt	2.16	1.57	
11.15	36.58	124.5	1.46	Sand mixtures - silty sand to sandy silt	2.18	1.61	
11.20	36.74	123.3	1.74	Sand mixtures - silty sand to sandy silt	2.24	1.76	
11.25	36.91	126.2	1.92	Sand mixtures - silty sand to sandy silt	2.27	1.84	
11.30	37.07	128.4	1.98	Sand mixtures - silty sand to sandy silt	2.27	1.86	
11.35	37.24	124.1	2.02	Sand mixtures - silty sand to sandy silt	2.29	1.92	
11.40	37.40	118.0	2.17	Sand mixtures - silty sand to sandy silt	2.34	2.06	
11.45	37.57	116.1	2.23	Sand mixtures - silty sand to sandy silt	2.35	2.12	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-21

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	114.1	2.08	Sand mixtures - silty sand to sandy silt	2.34	2.06	
11.55	37.89	109.9	1.80	Sand mixtures - silty sand to sandy silt	2.30	1.95	
11.60	38.06	101.0	1.70	Sand mixtures - silty sand to sandy silt	2.32	1.99	
11.65	38.22	92.0	1.99	Sand mixtures - silty sand to sandy silt	2.40	2.32	
11.70	38.39	88.2	2.23	Sand mixtures - silty sand to sandy silt	2.46	2.56	
11.75	38.55	92.2	2.13	Sand mixtures - silty sand to sandy silt	2.43	2.42	
11.80	38.71	91.6	2.15	Sand mixtures - silty sand to sandy silt	2.44	2.45	
11.85	38.88	87.9	2.18	Sand mixtures - silty sand to sandy silt	2.46	2.55	
11.90	39.04	82.0	2.17	Sand mixtures - silty sand to sandy silt	2.48	2.67	
11.95	39.21	78.2	2.17	Silt mixtures - clayey silt to silty clay	2.50	2.84	
12.00	39.37	77.2	2.13	Silt mixtures - clayey silt to silty clay	2.50	2.86	
12.05	39.53	78.7	1.97	Sand mixtures - silty sand to sandy silt	2.47	2.61	
12.10	39.70	86.7	2.02	Sand mixtures - silty sand to sandy silt	2.45	2.50	
12.15	39.86	98.9	1.98	Sand mixtures - silty sand to sandy silt	2.39	2.27	
12.20	40.03	104.6	2.02	Sand mixtures - silty sand to sandy silt	2.38	2.22	
12.25	40.19	104.5	2.16	Sand mixtures - silty sand to sandy silt	2.41	2.32	
12.30	40.35	112.0	2.16	Sand mixtures - silty sand to sandy silt	2.38	2.23	
12.35	40.52	131.8	1.97	Sand mixtures - silty sand to sandy silt	2.29	1.92	
12.40	40.68	145.4	1.62	Sand mixtures - silty sand to sandy silt	2.19	1.64	
12.45	40.85	148.1	1.67	Sand mixtures - silty sand to sandy silt	2.20	1.66	
12.50	41.01	136.6	1.60	Sand mixtures - silty sand to sandy silt	2.22	1.69	
12.55	41.17	124.9	1.59	Sand mixtures - silty sand to sandy silt	2.25	1.78	
12.60	41.34	119.7	1.82	Sand mixtures - silty sand to sandy silt	2.31	1.97	
12.65	41.50	120.2	1.74	Sand mixtures - silty sand to sandy silt	2.29	1.92	
12.70	41.67	138.5	1.34	Sand mixtures - silty sand to sandy silt	2.16	1.55	
12.75	41.83	140.6	1.41	Sand mixtures - silty sand to sandy silt	2.17	1.58	
12.80	41.99	138.0	1.32	Sand mixtures - silty sand to sandy silt	2.15	1.55	
12.85	42.16	128.6	1.60	Sand mixtures - silty sand to sandy silt	2.25	1.78	
12.90	42.32	133.5	1.67	Sand mixtures - silty sand to sandy silt	2.25	1.79	
12.95	42.49	148.8	1.59	Sand mixtures - silty sand to sandy silt	2.19	1.64	
13.00	42.65	149.3	1.61	Sand mixtures - silty sand to sandy silt	2.20	1.65	
13.05	42.81	128.4	1.86	Sand mixtures - silty sand to sandy silt	2.31	1.95	
13.10	42.98	97.3	2.32	Silt mixtures - clayey silt to silty clay	2.48	2.67	
13.15	43.14	83.7	2.72	Silt mixtures - clayey silt to silty clay	2.59	5.21	
13.20	43.31	90.7	2.52	Silt mixtures - clayey silt to silty clay	2.54	3.64	
13.25	43.47	103.2	2.29	Sand mixtures - silty sand to sandy silt	2.46	2.57	
13.30	43.63	117.3	2.19	Sand mixtures - silty sand to sandy silt	2.40	2.30	
13.35	43.80	137.1	1.86	Sand mixtures - silty sand to sandy silt	2.29	1.90	
13.40	43.96	145.3	1.55	Sand mixtures - silty sand to sandy silt	2.21	1.68	
13.45	44.13	128.3	1.96	Sand mixtures - silty sand to sandy silt	2.34	2.06	
13.50	44.29	110.2	1.94	Sand mixtures - silty sand to sandy silt	2.39	2.25	
13.55	44.45	101.9	2.00	Sand mixtures - silty sand to sandy silt	2.43	2.42	
13.60	44.62	109.7	1.96	Sand mixtures - silty sand to sandy silt	2.40	2.29	
13.65	44.78	115.2	2.19	Sand mixtures - silty sand to sandy silt	2.42	2.37	
13.70	44.95	121.7	2.50	Sand mixtures - silty sand to sandy silt	2.45	2.50	
13.75	45.11	130.7	2.70	Silt mixtures - clayey silt to silty clay	2.45	2.51	
13.80	45.28	146.6	2.50	Sand mixtures - silty sand to sandy silt	2.38	2.23	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-21

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	165.7	2.29	Sand mixtures - silty sand to sandy silt	2.31	1.97	
13.90	45.60	191.0	2.28	Sand mixtures - silty sand to sandy silt	2.26	1.82	
13.95	45.77	201.7	2.52	Sand mixtures - silty sand to sandy silt	2.28	1.88	
14.00	45.93	209.8	1.94	Sand mixtures - silty sand to sandy silt	2.17	1.59	
14.05	46.10	215.6	1.71	Sand mixtures - silty sand to sandy silt	2.12	1.48	
14.10	46.26	193.2	1.46	Sand mixtures - silty sand to sandy silt	2.10	1.45	
14.15	46.42	186.8	1.33	Sand mixtures - silty sand to sandy silt	2.08	1.42	
14.20	46.59	179.3	1.28	Sand mixtures - silty sand to sandy silt	2.09	1.42	
14.25	46.75	147.3	1.71	Sand mixtures - silty sand to sandy silt	2.26	1.81	
14.30	46.92	123.2	2.24	Sand mixtures - silty sand to sandy silt	2.42	2.38	
14.35	47.08	120.3	2.30	Sand mixtures - silty sand to sandy silt	2.44	2.47	
14.40	47.24	131.9	2.46	Sand mixtures - silty sand to sandy silt	2.43	2.44	
14.45	47.41	154.8	2.10	Sand mixtures - silty sand to sandy silt	2.32	2.00	
14.50	47.57	159.4	1.90	Sand mixtures - silty sand to sandy silt	2.27	1.86	
14.55	47.74	152.4	1.41	Sand mixtures - silty sand to sandy silt	2.19	1.63	
14.60	47.90	132.6	1.51	Sand mixtures - silty sand to sandy silt	2.27	1.84	
14.65	48.06	121.8	1.84	Sand mixtures - silty sand to sandy silt	2.37	2.17	
14.70	48.23	126.9	1.93	Sand mixtures - silty sand to sandy silt	2.37	2.18	
14.75	48.39	128.0	2.11	Sand mixtures - silty sand to sandy silt	2.40	2.29	
14.80	48.56	132.1	2.12	Sand mixtures - silty sand to sandy silt	2.39	2.26	
14.85	48.72	141.2	2.01	Sand mixtures - silty sand to sandy silt	2.35	2.10	
14.90	48.88	163.1	1.78	Sand mixtures - silty sand to sandy silt	2.25	1.80	
14.95	49.05	192.1	1.79	Sand mixtures - silty sand to sandy silt	2.20	1.66	
15.00	49.21	217.2	1.58	Sand mixtures - silty sand to sandy silt	2.11	1.47	
15.05	49.38	240.2	1.55	Sand mixtures - silty sand to sandy silt	2.07	1.39	
15.10	49.54	246.3	1.09	Sands - clean sands to silty sand	1.94	1.22	
15.15	49.70	216.6	1.00	Sands - clean sands to silty sand	1.96	1.24	
15.20	49.87	198.7	0.93	Sands - clean sands to silty sand	1.97	1.25	
15.25	50.03	164.2	0.91	Sands - clean sands to silty sand	2.03	1.34	
15.30	50.20	124.08	1.70	Sand mixtures - silty sand to sandy silt	2.35	2.11	
15.35	50.36	95.30	0.05	Sands - clean sands to silty sand	1.77	1.00	
15.40	50.52	74.62	0.01	Sands - clean sands to silty sand	2.00	1.00	
15.45	50.69	2.14	0.01	Sensitive, fine-grained	3.65		0.28
15.50	50.85	2.14	0.01	Sensitive, fine-grained	3.65		0.28
15.55	51.02	2.14	0.01	Sensitive, fine-grained	3.66		0.28
15.60	51.18	2.14	0.01	Sensitive, fine-grained	3.66		0.28
15.65	51.34	2.14	0.01	Sensitive, fine-grained	3.66		0.28
15.70	51.51	2.14	0.01	Sensitive, fine-grained	3.66		0.28
15.75	51.67	2.14	0.01	Sensitive, fine-grained	3.66		0.28
15.80	51.84	2.14	0.01	Sensitive, fine-grained	3.66		0.28
15.85	52.00	2.14	0.01	Sensitive, fine-grained	3.66		0.28

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/8/2006 12:08
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 45 feet
SOUNDING: CPT-22

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	48.4	3.02	Sand mixtures - silty sand to sandy silt	2.27	1.85	
0.10	0.33	61.2	2.31	Sand mixtures - silty sand to sandy silt	2.12	1.48	
0.15	0.49	70.6	2.32	Sand mixtures - silty sand to sandy silt	2.08	1.41	
0.20	0.66	84.3	2.48	Sand mixtures - silty sand to sandy silt	2.05	1.37	
0.25	0.82	86.9	2.52	Sand mixtures - silty sand to sandy silt	2.05	1.36	
0.30	0.98	79.7	2.51	Sand mixtures - silty sand to sandy silt	2.07	1.40	
0.35	1.15	71.3	2.54	Sand mixtures - silty sand to sandy silt	2.11	1.46	
0.40	1.31	56.7	2.64	Sand mixtures - silty sand to sandy silt	2.18	1.62	
0.45	1.48	38.3	3.16	Sand mixtures - silty sand to sandy silt	2.36	2.13	
0.50	1.64	29.1	2.82	Sand mixtures - silty sand to sandy silt	2.41	2.33	
0.55	1.80	32.3	2.63	Sand mixtures - silty sand to sandy silt	2.35	2.12	
0.60	1.97	41.9	2.06	Sand mixtures - silty sand to sandy silt	2.20	1.65	
0.65	2.13	42.3	1.52	Sand mixtures - silty sand to sandy silt	2.11	1.46	
0.70	2.30	34.5	1.21	Sand mixtures - silty sand to sandy silt	2.11	1.46	
0.75	2.46	30.1	1.55	Sand mixtures - silty sand to sandy silt	2.22	1.71	
0.80	2.62	33.8	1.91	Sand mixtures - silty sand to sandy silt	2.24	1.77	
0.85	2.79	35.1	2.07	Sand mixtures - silty sand to sandy silt	2.26	1.80	
0.90	2.95	31.6	2.19	Sand mixtures - silty sand to sandy silt	2.31	1.96	
0.95	3.12	30.7	2.10	Sand mixtures - silty sand to sandy silt	2.30	1.95	
1.00	3.28	31.5	1.97	Sand mixtures - silty sand to sandy silt	2.28	1.86	
1.05	3.44	30.9	1.86	Sand mixtures - silty sand to sandy silt	2.27	1.84	
1.10	3.61	30.2	1.75	Sand mixtures - silty sand to sandy silt	2.26	1.81	
1.15	3.77	30.7	1.54	Sand mixtures - silty sand to sandy silt	2.22	1.69	
1.20	3.94	33.7	1.46	Sand mixtures - silty sand to sandy silt	2.17	1.59	
1.25	4.10	39.9	1.49	Sand mixtures - silty sand to sandy silt	2.12	1.48	
1.30	4.27	48.3	1.13	Sands - clean sands to silty sand	1.98	1.26	
1.35	4.43	52.4	1.36	Sands - clean sands to silty sand	2.00	1.30	
1.40	4.59	53.6	1.67	Sand mixtures - silty sand to sandy silt	2.06	1.38	
1.45	4.76	60.0	1.86	Sand mixtures - silty sand to sandy silt	2.06	1.38	
1.50	4.92	68.6	1.42	Sands - clean sands to silty sand	1.93	1.21	
1.55	5.09	70.9	1.46	Sands - clean sands to silty sand	1.93	1.21	
1.60	5.25	74.3	1.32	Sands - clean sands to silty sand	1.89	1.17	
1.65	5.41	75.6	1.39	Sands - clean sands to silty sand	1.90	1.18	
1.70	5.58	76.9	1.20	Sands - clean sands to silty sand	1.86	1.14	
1.75	5.74	81.7	0.91	Sands - clean sands to silty sand	1.77	1.08	
1.80	5.91	72.8	1.12	Sands - clean sands to silty sand	1.86	1.15	
1.85	6.07	58.5	1.16	Sands - clean sands to silty sand	1.93	1.21	
1.90	6.23	44.4	1.17	Sands - clean sands to silty sand	2.02	1.32	
1.95	6.40	38.6	0.78	Sands - clean sands to silty sand	1.96	1.25	
2.00	6.56	38.9	0.56	Sands - clean sands to silty sand	1.90	1.18	
2.05	6.73	35.6	0.55	Sands - clean sands to silty sand	1.92	1.20	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-22

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	34.9	0.74	Sands - clean sands to silty sand	2.00	1.29	
2.15	7.05	34.6	0.86	Sands - clean sands to silty sand	2.04	1.35	
2.20	7.22	38.4	0.83	Sands - clean sands to silty sand	2.00	1.30	
2.25	7.38	45.6	0.65	Sands - clean sands to silty sand	1.90	1.18	
2.30	7.55	47.3	1.30	Sand mixtures - silty sand to sandy silt	2.06	1.38	
2.35	7.71	50.6	1.39	Sand mixtures - silty sand to sandy silt	2.06	1.39	
2.40	7.87	54.4	1.11	Sands - clean sands to silty sand	1.99	1.28	
2.45	8.04	56.9	0.94	Sands - clean sands to silty sand	1.94	1.22	
2.50	8.20	58.4	0.92	Sands - clean sands to silty sand	1.93	1.21	
2.55	8.37	57.7	0.84	Sands - clean sands to silty sand	1.91	1.19	
2.60	8.53	56.4	0.98	Sands - clean sands to silty sand	1.96	1.24	
2.65	8.69	55.1	0.94	Sands - clean sands to silty sand	1.96	1.24	
2.70	8.86	54.4	0.77	Sands - clean sands to silty sand	1.92	1.20	
2.75	9.02	53.8	0.79	Sands - clean sands to silty sand	1.93	1.21	
2.80	9.19	52.4	0.96	Sands - clean sands to silty sand	1.99	1.28	
2.85	9.35	49.4	0.81	Sands - clean sands to silty sand	1.97	1.26	
2.90	9.51	40.4	0.79	Sands - clean sands to silty sand	2.03	1.34	
2.95	9.68	31.1	1.12	Sand mixtures - silty sand to sandy silt	2.20	1.67	
3.00	9.84	59.1	1.13	Sands - clean sands to silty sand	2.01	1.31	
3.05	10.01	83.0	1.18	Sands - clean sands to silty sand	1.93	1.21	
3.10	10.17	93.3	1.10	Sands - clean sands to silty sand	1.88	1.16	
3.15	10.33	88.1	1.11	Sands - clean sands to silty sand	1.90	1.18	
3.20	10.50	71.5	1.13	Sands - clean sands to silty sand	1.97	1.25	
3.25	10.66	45.8	1.47	Sand mixtures - silty sand to sandy silt	2.18	1.61	
3.30	10.83	35.1	1.10	Sand mixtures - silty sand to sandy silt	2.19	1.63	
3.35	10.99	28.4	0.88	Sand mixtures - silty sand to sandy silt	2.21	1.67	
3.40	11.15	33.0	0.81	Sand mixtures - silty sand to sandy silt	2.14	1.52	
3.45	11.32	43.9	0.87	Sands - clean sands to silty sand	2.07	1.39	
3.50	11.48	36.4	1.36	Sand mixtures - silty sand to sandy silt	2.25	1.77	
3.55	11.65	27.4	1.57	Sand mixtures - silty sand to sandy silt	2.38	2.20	
3.60	11.81	29.3	1.18	Sand mixtures - silty sand to sandy silt	2.28	1.89	
3.65	11.97	32.9	0.84	Sand mixtures - silty sand to sandy silt	2.17	1.58	
3.70	12.14	29.8	1.30	Sand mixtures - silty sand to sandy silt	2.31	1.97	
3.75	12.30	32.6	1.71	Sand mixtures - silty sand to sandy silt	2.36	2.14	
3.80	12.47	38.4	1.62	Sand mixtures - silty sand to sandy silt	2.30	1.92	
3.85	12.63	43.0	1.65	Sand mixtures - silty sand to sandy silt	2.27	1.84	
3.90	12.80	58.6	1.33	Sand mixtures - silty sand to sandy silt	2.12	1.48	
3.95	12.96	55.9	1.33	Sand mixtures - silty sand to sandy silt	2.13	1.51	
4.00	13.12	56.6	1.31	Sand mixtures - silty sand to sandy silt	2.13	1.50	
4.05	13.29	60.5	1.03	Sands - clean sands to silty sand	2.04	1.35	
4.10	13.45	67.4	0.99	Sands - clean sands to silty sand	2.00	1.29	
4.15	13.62	73.8	1.02	Sands - clean sands to silty sand	1.98	1.27	
4.20	13.78	79.9	1.34	Sands - clean sands to silty sand	2.04	1.35	
4.25	13.94	87.2	1.05	Sands - clean sands to silty sand	1.94	1.23	
4.30	14.11	97.3	0.69	Sands - clean sands to silty sand	1.80	1.10	
4.35	14.27	99.7	0.87	Sands - clean sands to silty sand	1.85	1.14	
4.40	14.44	99.6	1.15	Sands - clean sands to silty sand	1.94	1.22	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-22

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	92.1	1.23	Sands - clean sands to silty sand	1.98	1.27	
4.50	14.76	86.8	1.21	Sands - clean sands to silty sand	2.00	1.29	
4.55	14.93	78.4	1.35	Sand mixtures - silty sand to sandy silt	2.07	1.39	
4.60	15.09	69.0	1.69	Sand mixtures - silty sand to sandy silt	2.17	1.59	
4.65	15.26	63.6	2.09	Sand mixtures - silty sand to sandy silt	2.26	1.83	
4.70	15.42	62.5	2.09	Sand mixtures - silty sand to sandy silt	2.27	1.85	
4.75	15.58	47.6	2.55	Sand mixtures - silty sand to sandy silt	2.42	2.38	
4.80	15.75	35.7	2.33	Silt mixtures - clayey silt to silty clay	2.49	2.68	
4.85	15.91	38.6	1.89	Sand mixtures - silty sand to sandy silt	2.40	2.31	
4.90	16.08	43.2	1.92	Sand mixtures - silty sand to sandy silt	2.37	2.20	
4.95	16.24	47.5	1.85	Sand mixtures - silty sand to sandy silt	2.34	2.06	
5.00	16.40	55.9	1.79	Sand mixtures - silty sand to sandy silt	2.28	1.86	
5.05	16.57	48.8	2.56	Sand mixtures - silty sand to sandy silt	2.43	2.42	
5.10	16.73	34.6	3.33	Silt mixtures - clayey silt to silty clay	2.62	6.18	4.61
5.15	16.90	31.9	2.93	Silt mixtures - clayey silt to silty clay	2.61	5.76	4.25
5.20	17.06	37.5	2.28	Silt mixtures - clayey silt to silty clay	2.49	2.69	
5.25	17.22	48.8	1.75	Sand mixtures - silty sand to sandy silt	2.33	2.02	
5.30	17.39	51.5	2.00	Sand mixtures - silty sand to sandy silt	2.35	2.11	
5.35	17.55	57.1	1.97	Sand mixtures - silty sand to sandy silt	2.32	1.99	
5.40	17.72	67.4	1.33	Sand mixtures - silty sand to sandy silt	2.15	1.54	
5.45	17.88	76.1	1.38	Sand mixtures - silty sand to sandy silt	2.12	1.49	
5.50	18.04	81.4	1.46	Sand mixtures - silty sand to sandy silt	2.12	1.48	
5.55	18.21	90.4	1.54	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.60	18.37	84.5	1.60	Sand mixtures - silty sand to sandy silt	2.14	1.52	
5.65	18.54	69.0	1.71	Sand mixtures - silty sand to sandy silt	2.23	1.73	
5.70	18.70	60.2	1.82	Sand mixtures - silty sand to sandy silt	2.29	1.91	
5.75	18.86	61.7	1.71	Sand mixtures - silty sand to sandy silt	2.27	1.84	
5.80	19.03	58.9	1.92	Sand mixtures - silty sand to sandy silt	2.32	2.01	
5.85	19.19	56.4	2.19	Sand mixtures - silty sand to sandy silt	2.38	2.21	
5.90	19.36	59.2	2.24	Sand mixtures - silty sand to sandy silt	2.37	2.18	
5.95	19.52	71.4	1.96	Sand mixtures - silty sand to sandy silt	2.27	1.85	
6.00	19.68	78.1	1.85	Sand mixtures - silty sand to sandy silt	2.23	1.73	
6.05	19.85	71.5	1.93	Sand mixtures - silty sand to sandy silt	2.27	1.85	
6.10	20.01	66.4	2.23	Sand mixtures - silty sand to sandy silt	2.34	2.08	
6.15	20.18	69.4	2.20	Sand mixtures - silty sand to sandy silt	2.33	2.02	
6.20	20.34	76.4	2.08	Sand mixtures - silty sand to sandy silt	2.28	1.88	
6.25	20.51	79.5	1.80	Sand mixtures - silty sand to sandy silt	2.23	1.72	
6.30	20.67	78.3	2.26	Sand mixtures - silty sand to sandy silt	2.30	1.95	
6.35	20.83	87.4	1.66	Sand mixtures - silty sand to sandy silt	2.17	1.59	
6.40	21.00	99.4	1.62	Sand mixtures - silty sand to sandy silt	2.13	1.50	
6.45	21.16	111.3	1.38	Sands - clean sands to silty sand	2.04	1.35	
6.50	21.33	114.9	1.53	Sand mixtures - silty sand to sandy silt	2.07	1.39	
6.55	21.49	111.0	1.59	Sand mixtures - silty sand to sandy silt	2.09	1.43	
6.60	21.65	104.0	1.62	Sand mixtures - silty sand to sandy silt	2.12	1.48	
6.65	21.82	94.9	1.70	Sand mixtures - silty sand to sandy silt	2.17	1.58	
6.70	21.98	86.3	1.92	Sand mixtures - silty sand to sandy silt	2.24	1.75	
6.75	22.15	89.6	1.86	Sand mixtures - silty sand to sandy silt	2.22	1.70	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-22

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	93.3	1.88	Sand mixtures - silty sand to sandy silt	2.21	1.68	
6.85	22.47	94.1	1.83	Sand mixtures - silty sand to sandy silt	2.20	1.66	
6.90	22.64	90.9	1.96	Sand mixtures - silty sand to sandy silt	2.23	1.74	
6.95	22.80	91.9	1.91	Sand mixtures - silty sand to sandy silt	2.23	1.72	
7.00	22.97	93.1	1.92	Sand mixtures - silty sand to sandy silt	2.23	1.72	
7.05	23.13	88.2	2.08	Sand mixtures - silty sand to sandy silt	2.27	1.84	
7.10	23.29	92.1	2.06	Sand mixtures - silty sand to sandy silt	2.25	1.80	
7.15	23.46	95.2	1.90	Sand mixtures - silty sand to sandy silt	2.22	1.70	
7.20	23.62	111.0	1.68	Sand mixtures - silty sand to sandy silt	2.13	1.51	
7.25	23.79	119.4	1.19	Sands - clean sands to silty sand	2.00	1.30	
7.30	23.95	117.3	1.45	Sand mixtures - silty sand to sandy silt	2.07	1.40	
7.35	24.11	112.1	1.61	Sand mixtures - silty sand to sandy silt	2.12	1.49	
7.40	24.28	108.3	1.85	Sand mixtures - silty sand to sandy silt	2.18	1.61	
7.45	24.44	101.8	2.18	Sand mixtures - silty sand to sandy silt	2.26	1.80	
7.50	24.61	98.9	2.41	Sand mixtures - silty sand to sandy silt	2.30	1.94	
7.55	24.77	106.7	1.90	Sand mixtures - silty sand to sandy silt	2.20	1.65	
7.60	24.93	130.5	1.41	Sands - clean sands to silty sand	2.04	1.35	
7.65	25.10	165.4	1.34	Sands - clean sands to silty sand	1.95	1.23	
7.70	25.26	184.2	1.37	Sands - clean sands to silty sand	1.92	1.20	
7.75	25.43	184.8	1.51	Sands - clean sands to silty sand	1.96	1.24	
7.80	25.59	181.5	1.79	Sand mixtures - silty sand to sandy silt	2.02	1.32	
7.85	25.75	182.7	1.05	Sands - clean sands to silty sand	1.84	1.13	
7.90	25.92	192.7	2.99	Sand mixtures - silty sand to sandy silt	2.19	1.63	
7.95	26.08	198.8	2.27	Sand mixtures - silty sand to sandy silt	2.08	1.42	
8.00	26.25	136.9	1.83	Sand mixtures - silty sand to sandy silt	2.12	1.49	
8.05	26.41	137.7	1.45	Sand mixtures - silty sand to sandy silt	2.05	1.36	
8.10	26.57	120.2	1.61	Sand mixtures - silty sand to sandy silt	2.13	1.49	
8.15	26.74	93.7	1.84	Sand mixtures - silty sand to sandy silt	2.25	1.79	
8.20	26.90	59.7	2.34	Silt mixtures - clayey silt to silty clay	2.48	2.67	
8.25	27.07	47.8	1.82	Sand mixtures - silty sand to sandy silt	2.49	2.69	
8.30	27.23	46.0	1.02	Sand mixtures - silty sand to sandy silt	2.34	2.07	
8.35	27.39	50.0	0.81	Sand mixtures - silty sand to sandy silt	2.25	1.78	
8.40	27.56	52.9	0.92	Sand mixtures - silty sand to sandy silt	2.26	1.82	
8.45	27.72	53.1	0.79	Sand mixtures - silty sand to sandy silt	2.22	1.71	
8.50	27.89	50.6	0.62	Sand mixtures - silty sand to sandy silt	2.18	1.62	
8.55	28.05	50.9	0.50	Sand mixtures - silty sand to sandy silt	2.13	1.51	
8.60	28.21	44.2	0.71	Sand mixtures - silty sand to sandy silt	2.27	1.86	
8.65	28.38	42.5	0.61	Sand mixtures - silty sand to sandy silt	2.25	1.80	
8.70	28.54	47.3	0.38	Sand mixtures - silty sand to sandy silt	2.11	1.00	
8.75	28.71	43.7	0.29	Sand mixtures - silty sand to sandy silt	2.10	1.00	
8.80	28.87	30.9	0.44	Sand mixtures - silty sand to sandy silt	2.32	1.00	
8.85	29.04	29.9	0.61	Sand mixtures - silty sand to sandy silt	2.41	2.33	
8.90	29.20	42.1	0.51	Sand mixtures - silty sand to sandy silt	2.23	1.73	
8.95	29.36	51.8	0.59	Sand mixtures - silty sand to sandy silt	2.18	1.62	
9.00	29.53	51.2	0.47	Sand mixtures - silty sand to sandy silt	2.14	1.00	
9.05	29.69	52.8	0.43	Sand mixtures - silty sand to sandy silt	2.11	1.00	
9.10	29.86	49.6	0.38	Sand mixtures - silty sand to sandy silt	2.11	1.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-22

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	47.9	0.67	Sand mixtures - silty sand to sandy silt	2.25	1.78	
9.20	30.18	56.9	0.35	Sands - clean sands to silty sand	2.04	1.00	
9.25	30.35	67.8	0.24	Sands - clean sands to silty sand	1.89	1.00	
9.30	30.51	57.4	0.60	Sand mixtures - silty sand to sandy silt	2.16	1.56	
9.35	30.68	36.6	0.42	Sand mixtures - silty sand to sandy silt	2.27	1.00	
9.40	30.84	19.1	1.25	Silt mixtures - clayey silt to silty clay	2.79		2.54
9.45	31.00	18.1	1.88	Silt mixtures - clayey silt to silty clay	2.92		2.41
9.50	31.17	75.7	0.77	Sand mixtures - silty sand to sandy silt	2.12	1.48	
9.55	31.33	95.3	0.75	Sands - clean sands to silty sand	2.03	1.33	
9.60	31.50	92.5	0.83	Sands - clean sands to silty sand	2.07	1.39	
9.65	31.66	78.9	0.95	Sand mixtures - silty sand to sandy silt	2.17	1.58	
9.70	31.82	68.4	1.20	Sand mixtures - silty sand to sandy silt	2.29	1.90	
9.75	31.99	55.8	1.35	Sand mixtures - silty sand to sandy silt	2.40	2.31	
9.80	32.15	52.6	2.92	Silt mixtures - clayey silt to silty clay	2.66	8.12	7.02
9.85	32.32	94.8	1.68	Sand mixtures - silty sand to sandy silt	2.28	1.87	
9.90	32.48	112.1	1.29	Sand mixtures - silty sand to sandy silt	2.14	1.52	
9.95	32.64	127.8	0.97	Sands - clean sands to silty sand	2.00	1.30	
10.00	32.81	133.6	0.93	Sands - clean sands to silty sand	1.97	1.26	
10.05	32.97	122.5	1.06	Sands - clean sands to silty sand	2.05	1.36	
10.10	33.14	115.9	1.23	Sand mixtures - silty sand to sandy silt	2.12	1.48	
10.15	33.30	116.3	1.28	Sand mixtures - silty sand to sandy silt	2.13	1.50	
10.20	33.46	120.0	1.55	Sand mixtures - silty sand to sandy silt	2.18	1.61	
10.25	33.63	125.5	1.16	Sand mixtures - silty sand to sandy silt	2.07	1.40	
10.30	33.79	140.3	1.26	Sand mixtures - silty sand to sandy silt	2.06	1.38	
10.35	33.96	145.7	1.24	Sands - clean sands to silty sand	2.04	1.35	
10.40	34.12	173.2	1.30	Sands - clean sands to silty sand	2.00	1.30	
10.45	34.28	191.0	1.72	Sand mixtures - silty sand to sandy silt	2.07	1.39	
10.50	34.45	215.5	1.24	Sands - clean sands to silty sand	1.92	1.20	
10.55	34.61	213.0	1.12	Sands - clean sands to silty sand	1.89	1.17	
10.60	34.78	164.4	1.56	Sand mixtures - silty sand to sandy silt	2.09	1.42	
10.65	34.94	97.1	1.87	Sand mixtures - silty sand to sandy silt	2.33	2.04	
10.70	35.10	42.2	1.72	Silt mixtures - clayey silt to silty clay	2.62	6.08	5.63
10.75	35.27	19.2	1.17	Silt mixtures - clayey silt to silty clay	2.84		2.56
10.80	35.43	13.5	2.28	Clays - silty clay to clay	3.15		1.79
10.85	35.60	20.6	2.76	Clays - silty clay to clay	3.03		2.74
10.90	35.76	52.7	1.38	Sand mixtures - silty sand to sandy silt	2.47	2.62	
10.95	35.92	61.9	0.97	Sand mixtures - silty sand to sandy silt	2.31	1.97	
11.00	36.09	50.3	0.72	Sand mixtures - silty sand to sandy silt	2.32	1.99	
11.05	36.25	28.7	0.64	Sand mixtures - silty sand to sandy silt	2.53	3.42	
11.10	36.42	20.3	0.98	Silt mixtures - clayey silt to silty clay	2.79		2.70
11.15	36.58	28.9	0.43	Sand mixtures - silty sand to sandy silt	2.44	2.49	
11.20	36.74	32.2	0.53	Sand mixtures - silty sand to sandy silt	2.44	2.48	
11.25	36.91	22.7	1.02	Silt mixtures - clayey silt to silty clay	2.76		3.03
11.30	37.07	24.6	0.92	Silt mixtures - clayey silt to silty clay	2.70	10.03	3.27
11.35	37.24	46.4	0.61	Sand mixtures - silty sand to sandy silt	2.33	2.02	
11.40	37.40	54.3	0.46	Sand mixtures - silty sand to sandy silt	2.20	1.00	
11.45	37.57	76.8	0.42	Sands - clean sands to silty sand	2.02	1.00	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-22

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	94.4	0.48	Sands - clean sands to silty sand	1.97	1.00	
11.55	37.89	95.4	0.69	Sands - clean sands to silty sand	2.06	1.38	
11.60	38.06	100.5	0.78	Sands - clean sands to silty sand	2.08	1.41	
11.65	38.22	119.1	0.62	Sands - clean sands to silty sand	1.95	1.23	
11.70	38.39	118.5	0.82	Sands - clean sands to silty sand	2.03	1.34	
11.75	38.55	75.1	1.53	Sand mixtures - silty sand to sandy silt	2.40	2.29	
11.80	38.71	39.6	2.49	Silt mixtures - clayey silt to silty clay	2.79		5.28
11.85	38.88	19.7	3.00	Clays - silty clay to clay	3.11		2.63
11.90	39.04	10.7	2.43	Clays - silty clay to clay	3.32		1.42
11.95	39.21	9.9	1.72	Clays - silty clay to clay	3.27		1.32
12.00	39.37	9.0	1.89	Clays - silty clay to clay	3.34		1.19
12.05	39.53	7.9	2.73	Clays - silty clay to clay	3.50		1.05
12.10	39.70	8.9	2.24	Clays - silty clay to clay	3.40		1.18
12.15	39.86	12.5	2.14	Clays - silty clay to clay	3.23		1.66
12.20	40.03	12.8	1.68	Clays - silty clay to clay	3.16		1.71
12.25	40.19	11.6	1.50	Clays - silty clay to clay	3.18		1.54
12.30	40.35	8.7	1.46	Clays - silty clay to clay	3.31		1.15
12.35	40.52	8.8	1.54	Clays - silty clay to clay	3.32		1.18
12.40	40.68	9.9	1.65	Clays - silty clay to clay	3.28		1.31
12.45	40.85	9.4	1.70	Clays - silty clay to clay	3.31		1.25
12.50	41.01	7.5	2.31	Clays - silty clay to clay	3.51		1.00
12.55	41.17	5.9	3.05	Unstable clayey silts	3.73		0.79
12.60	41.34	7.9	2.68	Clays - silty clay to clay	3.53		1.05
12.65	41.50	15.3	2.15	Clays - silty clay to clay	3.16		2.04
12.70	41.67	18.2	2.37	Clays - silty clay to clay	3.11		2.43
12.75	41.83	19.6	2.38	Clays - silty clay to clay	3.08		2.61
12.80	41.99	21.5	2.12	Clays - silty clay to clay	3.02		2.86
12.85	42.16	24.7	2.04	Clays - silty clay to clay	2.95		3.29
12.90	42.32	29.2	2.03	Silt mixtures - clayey silt to silty clay	2.89		3.89
12.95	42.49	32.2	2.29	Silt mixtures - clayey silt to silty clay	2.88		4.30
13.00	42.65	37.0	2.04	Silt mixtures - clayey silt to silty clay	2.80		4.94
13.05	42.81	40.5	2.01	Silt mixtures - clayey silt to silty clay	2.77		5.39
13.10	42.98	43.6	2.26	Silt mixtures - clayey silt to silty clay	2.77		5.81
13.15	43.14	48.5	2.28	Silt mixtures - clayey silt to silty clay	2.74		6.47
13.20	43.31	50.8	2.16	Silt mixtures - clayey silt to silty clay	2.71		6.77
13.25	43.47	55.4	2.35	Silt mixtures - clayey silt to silty clay	2.70		7.38
13.30	43.63	53.0	2.63	Silt mixtures - clayey silt to silty clay	2.75		7.06
13.35	43.80	46.4	2.78	Silt mixtures - clayey silt to silty clay	2.82		6.19
13.40	43.96	47.6	3.90	Clays - silty clay to clay	2.91		6.35
13.45	44.13	61.5	4.27	Clays - silty clay to clay	2.85		8.20
13.50	44.29	86.0	4.17	Silt mixtures - clayey silt to silty clay	2.74		11.47
13.55	44.45	101.9	4.23	Silt mixtures - clayey silt to silty clay	2.69	9.48	13.59
13.60	44.62	86.0	4.73	Clays - silty clay to clay	2.78		11.47
13.65	44.78	61.0	6.27	Clays - silty clay to clay	2.98		8.13
13.70	44.95	79.5	8.60	Clays - silty clay to clay	3.00		10.60
13.75	45.11	124.4	12.59	Clays - silty clay to clay	3.00		16.58
13.80	45.28	372.1	12.59	Very stiff, fine grained	2.73		49.62

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-22

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	815.3	12.59	Very stiff, fine grained	2.58	4.69	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

CPT INTERPRETATION

PROJECT: Solomon Hills Specific Plan
DATE/TIME: 9/8/2006 11:06
PROJECT NO.: 23-2195s
CONE/RIG: DSG0906
ASSUMED DEPTH OF WATER TABLE: 48 feet
SOUNDING: CPT-23

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
0.05	0.16	60.7	2.31	Sand mixtures - silty sand to sandy silt	2.12	1.49	
0.10	0.33	48.9	3.04	Sand mixtures - silty sand to sandy silt	2.27	1.85	
0.15	0.49	38.5	3.18	Sand mixtures - silty sand to sandy silt	2.36	2.13	
0.20	0.66	36.1	2.95	Sand mixtures - silty sand to sandy silt	2.35	2.12	
0.25	0.82	38.1	2.86	Sand mixtures - silty sand to sandy silt	2.33	2.02	
0.30	0.98	46.1	2.97	Sand mixtures - silty sand to sandy silt	2.28	1.88	
0.35	1.15	40.7	3.35	Sand mixtures - silty sand to sandy silt	2.36	2.14	
0.40	1.31	34.7	3.27	Silt mixtures - clayey silt to silty clay	2.40	2.29	
0.45	1.48	30.9	3.35	Silt mixtures - clayey silt to silty clay	2.44	2.47	
0.50	1.64	29.3	2.89	Sand mixtures - silty sand to sandy silt	2.41	2.34	
0.55	1.80	31.7	2.64	Sand mixtures - silty sand to sandy silt	2.36	2.14	
0.60	1.97	40.7	2.42	Sand mixtures - silty sand to sandy silt	2.26	1.81	
0.65	2.13	47.1	2.84	Sand mixtures - silty sand to sandy silt	2.26	1.82	
0.70	2.30	44.0	3.16	Sand mixtures - silty sand to sandy silt	2.32	1.99	
0.75	2.46	35.4	3.32	Silt mixtures - clayey silt to silty clay	2.40	2.29	
0.80	2.62	25.9	3.35	Silt mixtures - clayey silt to silty clay	2.50	2.74	
0.85	2.79	14.7	3.73	Silt mixtures - clayey silt to silty clay	2.71		1.96
0.90	2.95	15.9	3.79	Silt mixtures - clayey silt to silty clay	2.69	9.62	2.12
0.95	3.12	19.2	3.21	Silt mixtures - clayey silt to silty clay	2.58	4.76	
1.00	3.28	21.9	2.78	Silt mixtures - clayey silt to silty clay	2.50	2.73	
1.05	3.44	26.1	2.63	Sand mixtures - silty sand to sandy silt	2.42	2.39	
1.10	3.61	32.7	2.67	Sand mixtures - silty sand to sandy silt	2.36	2.13	
1.15	3.77	33.0	2.93	Sand mixtures - silty sand to sandy silt	2.38	2.23	
1.20	3.94	33.7	4.20	Silt mixtures - clayey silt to silty clay	2.49	2.70	
1.25	4.10	47.9	3.55	Sand mixtures - silty sand to sandy silt	2.33	2.04	
1.30	4.27	45.3	3.45	Sand mixtures - silty sand to sandy silt	2.34	2.06	
1.35	4.43	47.9	2.61	Sand mixtures - silty sand to sandy silt	2.23	1.74	
1.40	4.59	53.3	2.11	Sand mixtures - silty sand to sandy silt	2.13	1.51	
1.45	4.76	54.7	2.33	Sand mixtures - silty sand to sandy silt	2.16	1.56	
1.50	4.92	54.5	2.03	Sand mixtures - silty sand to sandy silt	2.11	1.47	
1.55	5.09	57.1	1.93	Sand mixtures - silty sand to sandy silt	2.08	1.42	
1.60	5.25	62.8	2.14	Sand mixtures - silty sand to sandy silt	2.09	1.43	
1.65	5.41	70.3	2.43	Sand mixtures - silty sand to sandy silt	2.10	1.44	
1.70	5.58	70.0	2.41	Sand mixtures - silty sand to sandy silt	2.10	1.44	
1.75	5.74	66.0	2.60	Sand mixtures - silty sand to sandy silt	2.14	1.52	
1.80	5.91	68.6	2.40	Sand mixtures - silty sand to sandy silt	2.10	1.45	
1.85	6.07	71.1	2.48	Sand mixtures - silty sand to sandy silt	2.10	1.45	
1.90	6.23	73.6	2.45	Sand mixtures - silty sand to sandy silt	2.09	1.44	
1.95	6.40	76.0	2.21	Sand mixtures - silty sand to sandy silt	2.06	1.38	
2.00	6.56	78.7	1.95	Sand mixtures - silty sand to sandy silt	2.02	1.31	
2.05	6.73	77.1	1.91	Sand mixtures - silty sand to sandy silt	2.02	1.32	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-23

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
2.10	6.89	76.4	1.93	Sand mixtures - silty sand to sandy silt	2.03	1.33	
2.15	7.05	76.3	2.01	Sand mixtures - silty sand to sandy silt	2.04	1.35	
2.20	7.22	71.0	2.06	Sand mixtures - silty sand to sandy silt	2.08	1.40	
2.25	7.38	69.4	2.12	Sand mixtures - silty sand to sandy silt	2.09	1.43	
2.30	7.55	70.5	1.89	Sand mixtures - silty sand to sandy silt	2.06	1.38	
2.35	7.71	70.6	1.89	Sand mixtures - silty sand to sandy silt	2.06	1.38	
2.40	7.87	72.3	2.06	Sand mixtures - silty sand to sandy silt	2.09	1.42	
2.45	8.04	75.6	1.51	Sands - clean sands to silty sand	1.98	1.27	
2.50	8.20	76.8	1.76	Sand mixtures - silty sand to sandy silt	2.03	1.33	
2.55	8.37	73.7	1.88	Sand mixtures - silty sand to sandy silt	2.06	1.38	
2.60	8.53	72.7	1.92	Sand mixtures - silty sand to sandy silt	2.08	1.41	
2.65	8.69	70.0	1.77	Sand mixtures - silty sand to sandy silt	2.07	1.39	
2.70	8.86	67.4	1.81	Sand mixtures - silty sand to sandy silt	2.09	1.42	
2.75	9.02	69.5	1.80	Sand mixtures - silty sand to sandy silt	2.08	1.41	
2.80	9.19	68.3	1.89	Sand mixtures - silty sand to sandy silt	2.10	1.45	
2.85	9.35	62.5	2.04	Sand mixtures - silty sand to sandy silt	2.15	1.55	
2.90	9.51	61.8	1.86	Sand mixtures - silty sand to sandy silt	2.13	1.51	
2.95	9.68	61.1	1.77	Sand mixtures - silty sand to sandy silt	2.13	1.49	
3.00	9.84	65.3	1.70	Sand mixtures - silty sand to sandy silt	2.10	1.44	
3.05	10.01	66.4	1.67	Sand mixtures - silty sand to sandy silt	2.09	1.43	
3.10	10.17	64.2	1.58	Sand mixtures - silty sand to sandy silt	2.09	1.42	
3.15	10.33	62.7	1.47	Sand mixtures - silty sand to sandy silt	2.08	1.41	
3.20	10.50	59.8	1.52	Sand mixtures - silty sand to sandy silt	2.10	1.45	
3.25	10.66	56.6	1.51	Sand mixtures - silty sand to sandy silt	2.12	1.49	
3.30	10.83	54.1	1.61	Sand mixtures - silty sand to sandy silt	2.16	1.56	
3.35	10.99	52.8	1.68	Sand mixtures - silty sand to sandy silt	2.18	1.61	
3.40	11.15	53.4	1.31	Sand mixtures - silty sand to sandy silt	2.11	1.46	
3.45	11.32	54.4	1.46	Sand mixtures - silty sand to sandy silt	2.14	1.52	
3.50	11.48	64.9	1.26	Sands - clean sands to silty sand	2.05	1.36	
3.55	11.65	64.4	1.46	Sand mixtures - silty sand to sandy silt	2.09	1.43	
3.60	11.81	56.4	0.52	Sands - clean sands to silty sand	1.87	1.16	
3.65	11.97	44.7	0.55	Sands - clean sands to silty sand	1.97	1.25	
3.70	12.14	39.7	0.55	Sands - clean sands to silty sand	2.01	1.31	
3.75	12.30	35.4	0.90	Sand mixtures - silty sand to sandy silt	2.17	1.58	
3.80	12.47	35.3	1.09	Sand mixtures - silty sand to sandy silt	2.22	1.70	
3.85	12.63	35.4	1.22	Sand mixtures - silty sand to sandy silt	2.25	1.79	
3.90	12.80	37.0	1.48	Sand mixtures - silty sand to sandy silt	2.29	1.91	
3.95	12.96	41.8	1.50	Sand mixtures - silty sand to sandy silt	2.26	1.81	
4.00	13.12	46.6	1.34	Sand mixtures - silty sand to sandy silt	2.20	1.65	
4.05	13.29	42.3	1.58	Sand mixtures - silty sand to sandy silt	2.28	1.86	
4.10	13.45	34.1	1.45	Sand mixtures - silty sand to sandy silt	2.32	2.01	
4.15	13.62	35.9	1.54	Sand mixtures - silty sand to sandy silt	2.33	2.02	
4.20	13.78	41.4	1.59	Sand mixtures - silty sand to sandy silt	2.29	1.91	
4.25	13.94	42.6	1.57	Sand mixtures - silty sand to sandy silt	2.28	1.88	
4.30	14.11	44.3	1.56	Sand mixtures - silty sand to sandy silt	2.27	1.85	
4.35	14.27	44.7	1.61	Sand mixtures - silty sand to sandy silt	2.28	1.88	
4.40	14.44	44.2	1.52	Sand mixtures - silty sand to sandy silt	2.27	1.85	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-23

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
4.45	14.60	45.2	1.45	Sand mixtures - silty sand to sandy silt	2.25	1.80	
4.50	14.76	48.8	1.56	Sand mixtures - silty sand to sandy silt	2.25	1.80	
4.55	14.93	49.9	1.15	Sand mixtures - silty sand to sandy silt	2.16	1.57	
4.60	15.09	43.9	0.62	Sands - clean sands to silty sand	2.06	1.38	
4.65	15.26	35.4	0.64	Sand mixtures - silty sand to sandy silt	2.15	1.53	
4.70	15.42	31.3	0.99	Sand mixtures - silty sand to sandy silt	2.29	1.91	
4.75	15.58	43.4	1.19	Sand mixtures - silty sand to sandy silt	2.23	1.74	
4.80	15.75	45.1	1.17	Sand mixtures - silty sand to sandy silt	2.22	1.70	
4.85	15.91	32.8	0.84	Sand mixtures - silty sand to sandy silt	2.25	1.77	
4.90	16.08	34.1	1.30	Sand mixtures - silty sand to sandy silt	2.35	2.09	
4.95	16.24	51.0	1.27	Sand mixtures - silty sand to sandy silt	2.20	1.67	
5.00	16.40	53.5	1.17	Sand mixtures - silty sand to sandy silt	2.17	1.58	
5.05	16.57	52.0	0.59	Sands - clean sands to silty sand	2.01	1.31	
5.10	16.73	46.9	0.41	Sands - clean sands to silty sand	1.97	1.00	
5.15	16.90	40.6	0.51	Sands - clean sands to silty sand	2.07	1.40	
5.20	17.06	41.3	0.61	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.25	17.22	54.9	0.69	Sands - clean sands to silty sand	2.04	1.35	
5.30	17.39	48.4	0.76	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.35	17.55	46.5	0.71	Sand mixtures - silty sand to sandy silt	2.11	1.46	
5.40	17.72	56.2	0.86	Sand mixtures - silty sand to sandy silt	2.09	1.43	
5.45	17.88	56.1	1.03	Sand mixtures - silty sand to sandy silt	2.14	1.53	
5.50	18.04	61.9	1.06	Sand mixtures - silty sand to sandy silt	2.12	1.48	
5.55	18.21	63.5	1.35	Sand mixtures - silty sand to sandy silt	2.18	1.61	
5.60	18.37	64.5	0.73	Sands - clean sands to silty sand	2.01	1.31	
5.65	18.54	66.2	0.91	Sands - clean sands to silty sand	2.06	1.38	
5.70	18.70	68.0	1.06	Sand mixtures - silty sand to sandy silt	2.10	1.44	
5.75	18.86	60.1	0.91	Sand mixtures - silty sand to sandy silt	2.10	1.45	
5.80	19.03	63.0	0.73	Sands - clean sands to silty sand	2.03	1.33	
5.85	19.19	68.9	0.98	Sand mixtures - silty sand to sandy silt	2.08	1.41	
5.90	19.36	66.0	1.08	Sand mixtures - silty sand to sandy silt	2.12	1.48	
5.95	19.52	54.8	1.01	Sand mixtures - silty sand to sandy silt	2.17	1.59	
6.00	19.68	51.4	0.61	Sands - clean sands to silty sand	2.07	1.39	
6.05	19.85	54.0	0.77	Sand mixtures - silty sand to sandy silt	2.11	1.46	
6.10	20.01	47.4	0.70	Sand mixtures - silty sand to sandy silt	2.14	1.51	
6.15	20.18	43.8	0.42	Sands - clean sands to silty sand	2.06	1.00	
6.20	20.34	34.7	0.30	Sand mixtures - silty sand to sandy silt	2.09	1.00	
6.25	20.51	27.5	0.58	Sand mixtures - silty sand to sandy silt	2.31	1.96	
6.30	20.67	30.8	0.67	Sand mixtures - silty sand to sandy silt	2.30	1.92	
6.35	20.83	45.5	0.67	Sand mixtures - silty sand to sandy silt	2.15	1.55	
6.40	21.00	45.9	0.55	Sand mixtures - silty sand to sandy silt	2.10	1.45	
6.45	21.16	39.2	0.32	Sands - clean sands to silty sand	2.06	1.00	
6.50	21.33	34.3	0.52	Sand mixtures - silty sand to sandy silt	2.21	1.67	
6.55	21.49	31.3	0.67	Sand mixtures - silty sand to sandy silt	2.30	1.95	
6.60	21.65	39.5	0.74	Sand mixtures - silty sand to sandy silt	2.24	1.76	
6.65	21.82	53.3	0.93	Sand mixtures - silty sand to sandy silt	2.19	1.63	
6.70	21.98	60.0	0.94	Sand mixtures - silty sand to sandy silt	2.15	1.55	
6.75	22.15	49.2	0.81	Sand mixtures - silty sand to sandy silt	2.19	1.62	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-23

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
6.80	22.31	43.5	0.59	Sand mixtures - silty sand to sandy silt	2.16	1.56	
6.85	22.47	37.1	0.74	Sand mixtures - silty sand to sandy silt	2.28	1.86	
6.90	22.64	30.6	1.06	Sand mixtures - silty sand to sandy silt	2.44	2.46	
6.95	22.80	39.0	0.76	Sand mixtures - silty sand to sandy silt	2.27	1.83	
7.00	22.97	50.7	0.81	Sand mixtures - silty sand to sandy silt	2.19	1.62	
7.05	23.13	54.5	0.98	Sand mixtures - silty sand to sandy silt	2.21	1.69	
7.10	23.29	46.9	0.94	Sand mixtures - silty sand to sandy silt	2.26	1.81	
7.15	23.46	43.3	0.52	Sand mixtures - silty sand to sandy silt	2.15	1.54	
7.20	23.62	39.1	0.57	Sand mixtures - silty sand to sandy silt	2.21	1.69	
7.25	23.79	39.1	0.58	Sand mixtures - silty sand to sandy silt	2.22	1.70	
7.30	23.95	49.4	0.78	Sand mixtures - silty sand to sandy silt	2.20	1.66	
7.35	24.11	55.9	1.05	Sand mixtures - silty sand to sandy silt	2.23	1.74	
7.40	24.28	57.0	1.22	Sand mixtures - silty sand to sandy silt	2.27	1.85	
7.45	24.44	54.4	0.91	Sand mixtures - silty sand to sandy silt	2.21	1.68	
7.50	24.61	41.7	0.70	Sand mixtures - silty sand to sandy silt	2.25	1.78	
7.55	24.77	43.7	0.73	Sand mixtures - silty sand to sandy silt	2.24	1.76	
7.60	24.93	46.2	0.80	Sand mixtures - silty sand to sandy silt	2.24	1.77	
7.65	25.10	45.2	1.18	Sand mixtures - silty sand to sandy silt	2.36	2.13	
7.70	25.26	52.0	1.09	Sand mixtures - silty sand to sandy silt	2.29	1.89	
7.75	25.43	52.5	1.19	Sand mixtures - silty sand to sandy silt	2.31	1.96	
7.80	25.59	56.8	1.26	Sand mixtures - silty sand to sandy silt	2.30	1.93	
7.85	25.75	58.1	1.25	Sand mixtures - silty sand to sandy silt	2.29	1.90	
7.90	25.92	53.5	1.31	Sand mixtures - silty sand to sandy silt	2.34	2.05	
7.95	26.08	49.1	1.00	Sand mixtures - silty sand to sandy silt	2.30	1.92	
8.00	26.25	46.7	0.57	Sand mixtures - silty sand to sandy silt	2.18	1.60	
8.05	26.41	47.3	0.84	Sand mixtures - silty sand to sandy silt	2.27	1.84	
8.10	26.57	48.9	1.20	Sand mixtures - silty sand to sandy silt	2.35	2.11	
8.15	26.74	47.4	1.44	Sand mixtures - silty sand to sandy silt	2.42	2.36	
8.20	26.90	45.7	1.73	Sand mixtures - silty sand to sandy silt	2.49	2.68	
8.25	27.07	45.3	1.68	Sand mixtures - silty sand to sandy silt	2.48	2.66	
8.30	27.23	41.3	1.89	Silt mixtures - clayey silt to silty clay	2.55	3.98	
8.35	27.39	36.7	1.87	Silt mixtures - clayey silt to silty clay	2.60	5.26	
8.40	27.56	35.3	2.01	Silt mixtures - clayey silt to silty clay	2.63	6.70	4.71
8.45	27.72	40.5	1.89	Silt mixtures - clayey silt to silty clay	2.57	4.36	
8.50	27.89	43.9	1.38	Sand mixtures - silty sand to sandy silt	2.45	2.51	
8.55	28.05	45.7	1.82	Sand mixtures - silty sand to sandy silt	2.52	3.13	
8.60	28.21	46.5	2.29	Silt mixtures - clayey silt to silty clay	2.58	4.77	
8.65	28.38	49.4	2.36	Silt mixtures - clayey silt to silty clay	2.57	4.46	
8.70	28.54	49.6	2.28	Silt mixtures - clayey silt to silty clay	2.56	4.21	
8.75	28.71	48.4	2.22	Silt mixtures - clayey silt to silty clay	2.56	4.27	
8.80	28.87	48.7	2.24	Silt mixtures - clayey silt to silty clay	2.57	4.37	
8.85	29.04	50.4	2.08	Silt mixtures - clayey silt to silty clay	2.53	3.51	
8.90	29.20	55.1	1.82	Sand mixtures - silty sand to sandy silt	2.46	2.57	
8.95	29.36	54.2	1.91	Sand mixtures - silty sand to sandy silt	2.48	2.68	
9.00	29.53	51.6	2.04	Silt mixtures - clayey silt to silty clay	2.53	3.32	
9.05	29.69	54.4	2.10	Silt mixtures - clayey silt to silty clay	2.52	3.16	
9.10	29.86	53.1	2.33	Silt mixtures - clayey silt to silty clay	2.56	4.18	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-23

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
9.15	30.02	45.2	2.72	Silt mixtures - clayey silt to silty clay	2.67	8.39	6.02
9.20	30.18	40.9	2.95	Silt mixtures - clayey silt to silty clay	2.73		5.45
9.25	30.35	38.9	2.84	Silt mixtures - clayey silt to silty clay	2.74		5.19
9.30	30.51	38.3	2.74	Silt mixtures - clayey silt to silty clay	2.74		5.11
9.35	30.68	37.6	2.79	Silt mixtures - clayey silt to silty clay	2.75		5.02
9.40	30.84	36.8	2.81	Silt mixtures - clayey silt to silty clay	2.77		4.90
9.45	31.00	37.2	2.67	Silt mixtures - clayey silt to silty clay	2.75		4.96
9.50	31.17	37.7	2.48	Silt mixtures - clayey silt to silty clay	2.72		5.03
9.55	31.33	36.7	2.23	Silt mixtures - clayey silt to silty clay	2.70		4.89
9.60	31.50	36.3	2.42	Silt mixtures - clayey silt to silty clay	2.73		4.83
9.65	31.66	35.4	2.53	Silt mixtures - clayey silt to silty clay	2.76		4.72
9.70	31.82	35.1	2.59	Silt mixtures - clayey silt to silty clay	2.77		4.68
9.75	31.99	36.5	2.57	Silt mixtures - clayey silt to silty clay	2.76		4.86
9.80	32.15	38.8	2.60	Silt mixtures - clayey silt to silty clay	2.74		5.17
9.85	32.32	41.9	2.85	Silt mixtures - clayey silt to silty clay	2.74		5.59
9.90	32.48	45.5	3.09	Silt mixtures - clayey silt to silty clay	2.74		6.06
9.95	32.64	47.9	3.20	Silt mixtures - clayey silt to silty clay	2.73		6.39
10.00	32.81	47.4	3.26	Silt mixtures - clayey silt to silty clay	2.75		6.31
10.05	32.97	44.4	3.27	Silt mixtures - clayey silt to silty clay	2.77		5.92
10.10	33.14	41.7	3.28	Silt mixtures - clayey silt to silty clay	2.80		5.56
10.15	33.30	39.8	3.27	Silt mixtures - clayey silt to silty clay	2.81		5.31
10.20	33.46	39.4	3.19	Silt mixtures - clayey silt to silty clay	2.81		5.26
10.25	33.63	39.8	3.19	Silt mixtures - clayey silt to silty clay	2.81		5.31
10.30	33.79	39.6	3.37	Clays - silty clay to clay	2.83		5.27
10.35	33.96	40.4	3.47	Clays - silty clay to clay	2.83		5.39
10.40	34.12	40.3	3.69	Clays - silty clay to clay	2.85		5.38
10.45	34.28	36.4	3.72	Clays - silty clay to clay	2.89		4.85
10.50	34.45	27.6	4.38	Clays - silty clay to clay	3.04		3.68
10.55	34.61	34.6	3.73	Clays - silty clay to clay	2.91		4.61
10.60	34.78	44.6	2.78	Silt mixtures - clayey silt to silty clay	2.74		5.95
10.65	34.94	50.7	2.96	Silt mixtures - clayey silt to silty clay	2.72		6.76
10.70	35.10	52.8	3.16	Silt mixtures - clayey silt to silty clay	2.72		7.03
10.75	35.27	53.6	3.18	Silt mixtures - clayey silt to silty clay	2.72		7.15
10.80	35.43	54.9	3.24	Silt mixtures - clayey silt to silty clay	2.72		7.32
10.85	35.60	56.8	3.23	Silt mixtures - clayey silt to silty clay	2.71		7.57
10.90	35.76	57.8	3.26	Silt mixtures - clayey silt to silty clay	2.71		7.71
10.95	35.92	55.7	3.31	Silt mixtures - clayey silt to silty clay	2.73		7.42
11.00	36.09	53.0	3.35	Silt mixtures - clayey silt to silty clay	2.75		7.07
11.05	36.25	50.8	3.36	Silt mixtures - clayey silt to silty clay	2.77		6.78
11.10	36.42	50.2	3.30	Silt mixtures - clayey silt to silty clay	2.77		6.70
11.15	36.58	51.0	3.16	Silt mixtures - clayey silt to silty clay	2.75		6.80
11.20	36.74	51.9	3.09	Silt mixtures - clayey silt to silty clay	2.74		6.92
11.25	36.91	52.6	3.09	Silt mixtures - clayey silt to silty clay	2.74		7.01
11.30	37.07	52.5	3.40	Silt mixtures - clayey silt to silty clay	2.77		7.00
11.35	37.24	51.8	3.55	Silt mixtures - clayey silt to silty clay	2.79		6.90
11.40	37.40	50.1	3.64	Clays - silty clay to clay	2.81		6.68
11.45	37.57	51.7	3.71	Clays - silty clay to clay	2.81		6.90

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-23

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
11.50	37.73	52.5	3.68	Clays - silty clay to clay	2.80		7.00
11.55	37.89	53.1	2.72	Silt mixtures - clayey silt to silty clay	2.71		7.08
11.60	38.06	60.1	3.18	Silt mixtures - clayey silt to silty clay	2.71		8.01
11.65	38.22	83.8	3.18	Silt mixtures - clayey silt to silty clay	2.60	5.30	
11.70	38.39	125.9	2.84	Sand mixtures - silty sand to sandy silt	2.42	2.38	
11.75	38.55	152.2	3.00	Sand mixtures - silty sand to sandy silt	2.38	2.21	
11.80	38.71	179.0	3.42	Silt mixtures - clayey silt to silty clay	2.38	2.20	
11.85	38.88	210.8	3.70	Silt mixtures - clayey silt to silty clay	2.36	2.13	
11.90	39.04	234.3	3.98	Very stiff, fine grained	2.36	2.13	
11.95	39.21	257.6	4.13	Very stiff, fine grained	2.34	2.09	
12.00	39.37	279.5	4.16	Very stiff, fine grained	2.33	2.02	
12.05	39.53	301.3	4.00	Very stiff sand to clayey sand	2.29	1.90	
12.10	39.70	313.9	3.97	Very stiff sand to clayey sand	2.28	1.87	
12.15	39.86	309.2	3.80	Very stiff sand to clayey sand	2.27	1.83	
12.20	40.03	298.3	3.63	Very stiff sand to clayey sand	2.26	1.81	
12.25	40.19	268.9	3.57	Sand mixtures - silty sand to sandy silt	2.28	1.88	
12.30	40.35	239.1	3.52	Sand mixtures - silty sand to sandy silt	2.31	1.98	
12.35	40.52	206.3	3.85	Silt mixtures - clayey silt to silty clay	2.39	2.27	
12.40	40.68	177.0	4.05	Silt mixtures - clayey silt to silty clay	2.46	2.56	
12.45	40.85	157.0	3.79	Silt mixtures - clayey silt to silty clay	2.47	2.63	
12.50	41.01	151.9	3.62	Silt mixtures - clayey silt to silty clay	2.47	2.61	
12.55	41.17	150.4	3.61	Silt mixtures - clayey silt to silty clay	2.47	2.62	
12.60	41.34	161.4	2.80	Sand mixtures - silty sand to sandy silt	2.36	2.14	
12.65	41.50	199.0	2.89	Sand mixtures - silty sand to sandy silt	2.30	1.95	
12.70	41.67	231.4	3.57	Sand mixtures - silty sand to sandy silt	2.34	2.07	
12.75	41.83	281.5	3.82	Very stiff sand to clayey sand	2.31	1.96	
12.80	41.99	337.7	3.96	Very stiff sand to clayey sand	2.27	1.85	
12.85	42.16	382.0	4.26	Very stiff, fine grained	2.27	1.84	
12.90	42.32	416.3	4.19	Very stiff, fine grained	2.24	1.76	
12.95	42.49	445.8	3.57	Very stiff sand to clayey sand	2.16	1.56	
13.00	42.65	441.4	3.59	Very stiff sand to clayey sand	2.16	1.57	
13.05	42.81	364.7	4.34	Very stiff, fine grained	2.29	1.92	
13.10	42.98	264.4	5.37	Very stiff, fine grained	2.47	2.61	
13.15	43.14	146.0	7.96	Clays - silty clay to clay	2.79		19.47
13.20	43.31	125.9	7.75	Clays - silty clay to clay	2.82		16.78
13.25	43.47	143.9	7.57	Clays - silty clay to clay	2.77		19.19
13.30	43.63	172.8	6.99	Clays - silty clay to clay	2.70	10.05	23.04
13.35	43.80	249.4	4.64	Very stiff, fine grained	2.44	2.45	
13.40	43.96	243.0	4.42	Very stiff, fine grained	2.43	2.40	
13.45	44.13	177.6	5.96	Clays - silty clay to clay	2.64	6.91	23.68
13.50	44.29	140.9	6.54	Clays - silty clay to clay	2.74		18.79
13.55	44.45	118.4	6.34	Clays - silty clay to clay	2.78		15.79
13.60	44.62	103.8	6.00	Clays - silty clay to clay	2.80		13.84
13.65	44.78	95.8	7.59	Clays - silty clay to clay	2.90		12.77
13.70	44.95	111.0	8.95	Clays - silty clay to clay	2.91		14.79
13.75	45.11	204.2	6.61	Clays - silty clay to clay	2.64	7.14	27.23
13.80	45.28	342.6	4.50	Very stiff, fine grained	2.34	2.08	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

PROJECT NO.: 23-2195s SOUNDING: CPT-23

Depth (m)	Depth (ft)	Total Cone Resistance (tsf)	Friction Ratio (%)	Soil Behavior Type	I_c	K_c	s_u (ksf)
13.85	45.44	375.5	4.37	Very stiff, fine grained	2.31	1.96	
13.90	45.60	313.3	5.02	Very stiff, fine grained	2.42	2.36	
13.95	45.77	201.1	5.90	Silt mixtures - clayey silt to silty clay	2.61	5.80	26.81
14.00	45.93	142.4	7.79	Clays - silty clay to clay	2.80		18.98
14.05	46.10	155.4	7.12	Clays - silty clay to clay	2.75		20.72
14.10	46.26	163.7	5.13	Silt mixtures - clayey silt to silty clay	2.62	6.31	21.83
14.15	46.42	110.3	5.82	Clays - silty clay to clay	2.78		14.70
14.20	46.59	98.1	5.64	Clays - silty clay to clay	2.81		13.08
14.25	46.75	115.5	8.28	Clays - silty clay to clay	2.89		15.40
14.30	46.92	181.3	7.59	Clays - silty clay to clay	2.73		24.18
14.35	47.08	180.9	8.49	Clays - silty clay to clay	2.78		24.12
14.40	47.24	175.7	7.83	Clays - silty clay to clay	2.76		23.43
14.45	47.41	142.3	10.80	Clays - silty clay to clay	2.93		18.98
14.50	47.57	264.7	6.43	Very stiff, fine grained	2.58	4.74	
14.55	47.74	370.1	5.50	Very stiff, fine grained	2.42	2.39	
14.60	47.90	434.1	5.02	Very stiff, fine grained	2.34	2.08	
14.65	48.06	488.9	5.02	Very stiff, fine grained	2.31	1.98	
14.70	48.23	511.6	5.02	Very stiff, fine grained	2.30	1.94	

Ic=soil behavior type index
Kc= grain characteristics cor. factor
Su= normalized undrained shear strength

Appendix B

APPENDIX B

GEOTECHNICAL LABORATORY INVESTIGATION

1. General

   a. The laboratory investigation used current, accepted test procedures of the American Society of Testing and Materials (ASTM) and/or California Test Standards, wherever practical.

   b. Bulk samples, Standard Penetration Test samples, and Modified California ring samples were obtained during the field investigation. Laboratory sample identification is by project name and number, boring number or trench number, and depth.

2. Geotechnical Index Parameter Tests

The following Geotechnical Index Parameters tests were performed on samples of in-situ soil/rock collected during the field exploration.

TEST TYPE	NUMBER OF TESTS PERFORMED	TESTING STANDARD
In-situ Moisture Content and Dry Density	255	ASTM D2216 and D7263
Percent-Finer Than #200 Sieve	107	ASTM D1140
Particle-Size Analysis	2	ASTM D6913
Particle-Size Distribution of Fine-Grained Soils Using the Sedimentation Analysis	2	ASTM D7928
Atterberg Limits	4	ASTM D4318
Expansion Index	4	ASTM D4829

The purpose of each test type is briefly described below.

a. In-Situ Moisture Content (ASTM D2216) and Dry Density (ASTM D7263) testing of soils provide an indication of the strength and compressibility of in-situ soils. These data, in conjunction with sampler blow count data, aid in evaluation of soil consistency and in selection of samples for additional laboratory testing. Results of Moisture Content and Dry Density testing are recorded on the Boring and Trench Logs within **Appendix A**.

b. Percent Finer than #200 Sieve (ASTM D1140) testing was performed on soil samples to aid in classification of the samples in accordance with the Unified Soil Classification System (USCS). Results of Percent Finer than #200 Sieve testing are recorded on the Boring and Trench Logs within **Appendix A** and on applicable laboratory test reports in this Appendix.

c. Particle-Size Distribution of Soils Using Sieve Analysis (ASTM D6913) testing was performed to determine the gradation of soil between the 3-in and No. 200 sieves.

APPENDIX B

Particle-Size Distribution of Fine-Grained Soils Using the Sedimentation Analysis (ASTM D7928) testing was performed to determine the gradation of soil that is finer than the No. 200 sieve and larger than about 0.2-µm. This testing aided in classification of soils in accordance with the Unified Soil Classification System (USCS). Results of the particle-size distribution testing are presented on the Particle Size Distribution Test Reports **Figures B1.1** and **B1.2** in this Appendix.

d. Liquid Limit and Plastic Limit tests (ASTM D4318) aid in classification of soils in accordance with the USCS. Results of the Liquid Limit and Plastic Limit testing performed on a selected soil sample are presented on Lab Report **Figure B2.1** and **B2.2** in this Appendix.

e. Expansion Index tests (ASTM D4829) are used to assess expansion potential of soils when inundated with water. Results of Expansion Index testing performed on Property's soils are presented in the **Table B1** in this Appendix.

3. Geotechnical Engineering Parameters Tests

The following Geotechnical Engineering Parameters Tests were performed on Modified California ring samples of soil/rock collected at the Property.

Test Type	Number of Tests Performed	Testing Standard
Modified Proctor	12	ASTM D1557
Collapse of Soils	22	ASTM D4546
Consolidation	2	ASTM D2435
Direct Shear	36	ASTM D3080

The purpose of each test type is briefly described below.

a. Modified Proctor (ASTM D1557) tests were performed on selected bulk samples to assess their compacted moisture-density relationship for future use during grading operations. Results of the Modified Proctor tests are presented on **Figures B3.1** through **B3.12** in this Appendix.

b. One-dimensional Collapse of Soils (ASTM D4546) testing was performed on California drive ring samples to assess the hydro-compression potential of alluvial soils when inundated with water under future loading conditions. The samples were incrementally loaded to normal pressures ranging from 150 to 19,200 psf in accordance with Procedure B. The "hydro-compression" was taken as the percent strain when inundated with water under an applied pressure approximately equal to the existing overburden pressure plus future applied foundation bearing pressure at that depth. Results of collapse testing are presented on **Figures B4.1** through **B4.22**

in this Appendix.

c. One-dimensional Consolidation (ASTM D2435) testing was performed on selected ring samples to assess in-situ soil compressibility at applied vertical pressures ranging from 200 psf to 19,200 psf. The soil samples were allowed to consolidate under each applied pressure until the rate of settlement was less than 0.0002 inches per hour. Results of the consolidation testing are presented on **Figures B5.1** and **B5.2** in this Appendix. Time-rate of consolidation test data is presented on **Figures B6.1** through **B6.2**

d. Direct Shear (ASTM D3080) testing was performed on a mixture of soil from Trenches (remolded to approximately 90 percent of maximum dry density) and on California drive ring samples of bedrock, landslide, terrace deposits and alluvium using a displacement-controlled Direct Shear machine. Prior to shearing, the samples were inundated and consolidated under normal pressures ranging from 600 psf to 12,000 psf. Thereafter, the samples were sheared horizontally at a controlled displacement rate until the horizontal shear force reduced to a stable value. For remolded specimens, material passing the No. 4 sieve was used. Results of the Direct Shear testing, including interpreted peak strength and residual shear strength parameters, are presented on **Figures B7.1** through **B7.36** within this Appendix.

   Family plots presenting shear strength data, obtained during this investigation are presented on **Figures B8.1** through **B8.19** and include interpreted peak, ultimate, and/or residual shear strength parameters.

4. Corrosion Tests

The following corrosivity tests were performed on a mixture of bulk samples of bedrock and alluvial soil obtained at the Property.

Test Type	Number of Tests Performed	Testing Standard
Sulfate-Content	8	California Test Method 417
Chloride-Content	8	California Test Method 422
Resistivity and pH	8	California Test 643

Soluble Sulfates Content, Chloride Content, Resistivity, and pH tests were performed to evaluate corrosivity of soil/rock material from the Property to concrete, ferrous metals, and non-ferrous metals. Results of the testing are presented in the **Table B2** in this Appendix.

APPENDIX B

The following attachments complete this Appendix.

LABORATORY TEST RESULTS

Summary of Compaction and Expansion Index Test Data
Corrosivity Testing Summary

• Summary of Compaction and Expansion Index Test Data	Table	B1
• Corrosivity Testing Summary	Table	B2
• Particle Size Distribution Test Reports	Figures	B1.1 and B1.2
• Liquid and Plastic Limits Test Report	Figure	B2.1 and B2.2
• Compaction Test Reports	Figures	B3.1 thru B3.12
• Collapse of Soils Test Reports	Figures	B4.1 thru B4.22
• Consolidation Test Reports	Figures	B5.1 thru B5.2
• Dial Reading vs. Time	Figures	B6.1 and B6.2
• Direct Shear Test Reports	Figures	B7.1 thru B7.36
• Direct Shear Family Plots	Figures	B8.1 thru B8.19

APPENDIX B

SUMMARY OF COMPACTION AND EXPANSION INDEX TEST DATA

Sample Location	Depth (ft)	Soil Type		Percent Fines	Expansion Index (CBC)	Expansion Classification (CBC)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
		Geologic Unit	USCS					
BA-4 (Curve A)	15 - 20	QTp	SP-SC	11.3	--	--	128.6	8.7
BA-5 (Curve B)	20 - 30	Qa	SP-SM	9.9	--	--	129.0	7.5
GT-2 (Curve D)	3 - 8	Tcac	CL-ML	92.8	--	--	108.8	16.8
GT-4 (Curve E)	3 - 7	Tcag	SP-SM	5.1	--	--	103.1	13.3
GT-7 (Curve F)	8 - 10	Tcac	CL-ML	97.4	--	--	113.7	13.5
BA-19 (Curve K)	10 - 20	Tcag	SC	23.0	--	--	124.7	9.4
BA-20 (Curve L)	10 - 20	Tcag	SM	14.4	--	--	120.0	9.0
BA-21 (Curve M)	10 - 20	Tcag	CL	73.4	46	Low	117.0	12.3
HS-17 (Curve N)	0 - 20	Qa, Qsw & Tcag	SM	24.7	--	--	128.0	8.0
HS-11 (Curve R)	0 - 20	Qa	SC-SM	36.5	< 1	Very Low	127.0	9.0
HS-39 (Curve T)	0 - 20	Qa	SM	23.5	< 1	Very Low	125.8	8.9
HS-49 (Curve U)	10 - 20	Qa & Tcag	SM	20.7	1.1	Very Low	117.3	9.7

APPENDIX B

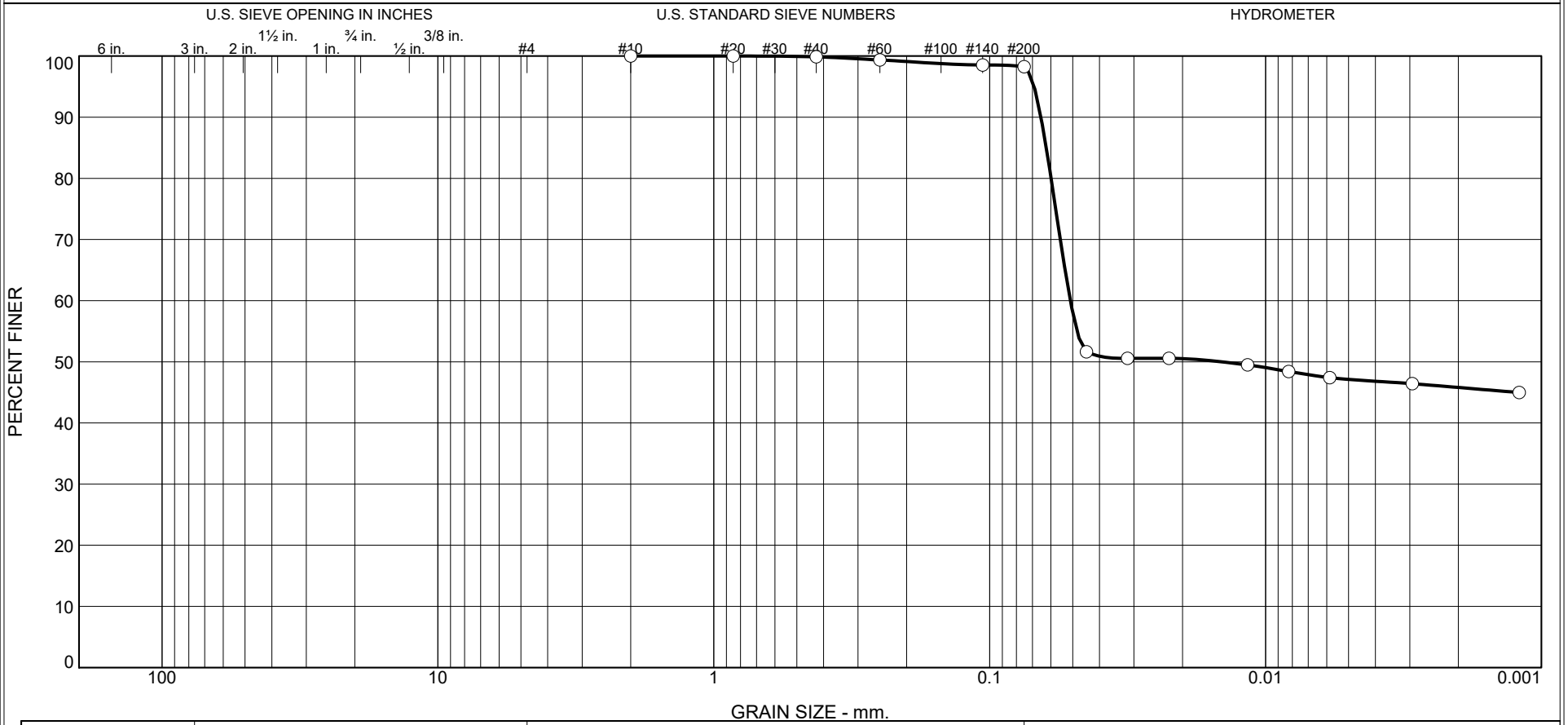
CORROSIVITY TESTING SUMMARY

Source	Depth (ft)	USCS Classification	Resistivity		Chemical Analyses			
			Saturated (ohm-cm)	Corrosion Characteristics	pH	Chloride Cl (ppm)	Sulfate SO_4 (%)	Concrete exposure to sulfate[1]
GT-2 (Tcac)	3 - 8	CL-ML	2,159	Moderately Corrosive	5.2	0.9	0.019	Negligible
BA-19 (Tcag)	10 - 20	SC	3,919	Moderately Corrosive	6.4	5.4	N/D	Negligible
BA-20 (Tcag)	10 - 20	SM	5,713	Moderately Corrosive	6.4	2.7	N/D	Negligible
BA-21 (Tcac)	10 - 20	CL	1,329	Corrosive	7.2	3.6	N/D	Negligible
HS-11 (Qa)	0 - 20	SC-SM	3,654	Moderately Corrosive	7.0	2.7	N/D	Negligible
HS-17 (Qa/Qsw/Tcag)	0 - 20	SM	7,972	Moderately Corrosive	6.8	17.1	N/D	Negligible
HS-39 (Qa)	10 - 20	SM	9,327	Moderately Corrosive	8.8	108	0.007	Negligible
HS-49 (Qa/Tcag)	10 - 20	SM	13,751	Mildly Corrosive	8.1	120	0.002	Negligible

N/D = Not Detected

[1] Per ACI 318 – Table 4.3.1

Particle Size Distribution Test Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	1.6	52.5	45.8

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	GT-205		3.5'	5/23/23	CH	fat clay		68	32

Client Solstra Communities California LLC

Project Solomon Hills Specific Plan

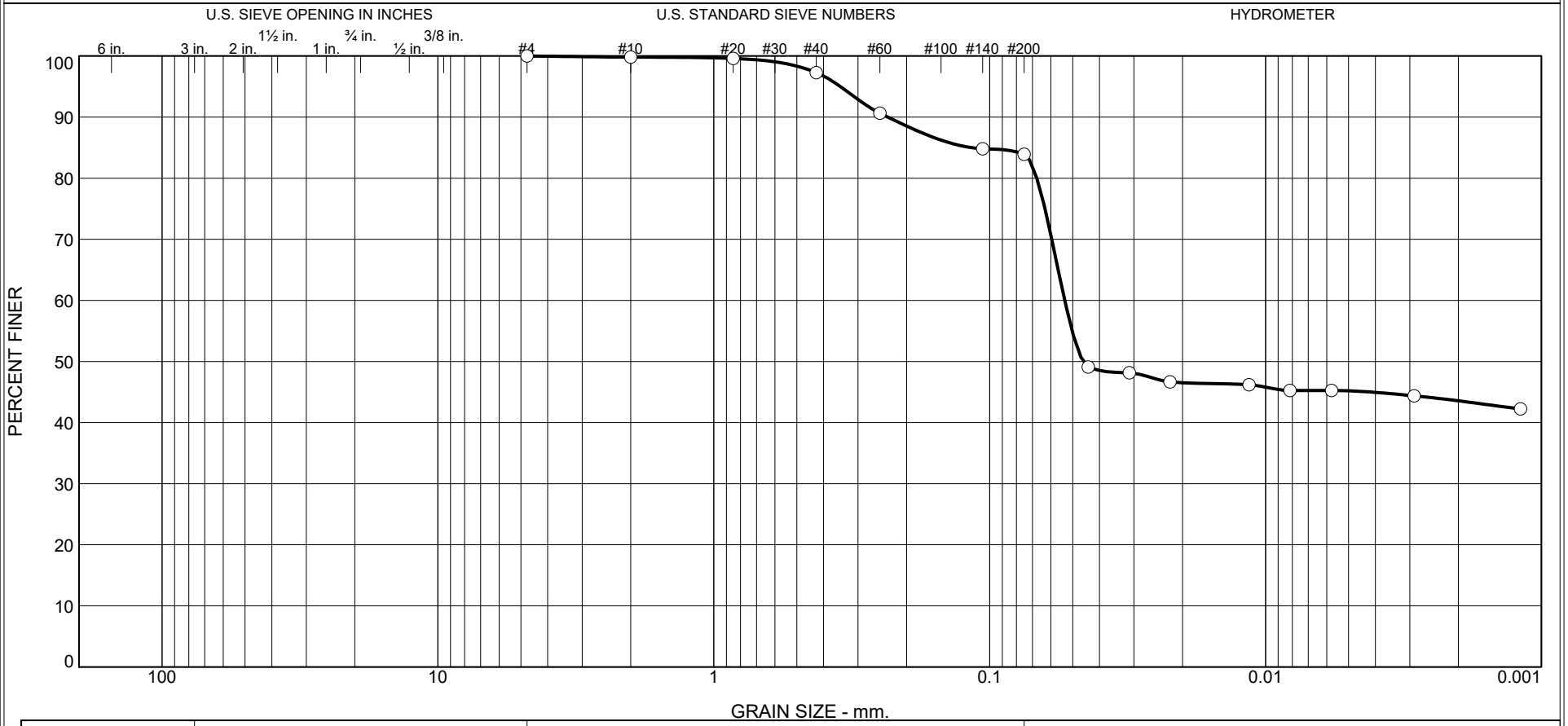
Santa Barbara County, CA

Project No. 23-2195s-1 Figure B1.1

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Valencia, California

○ QTp

Particle Size Distribution Test Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	2.5	13.4	40.3	43.6

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	HS-44		25'	5/23/23	CL	sandy lean clay		46	17

Client Solstra Communities California LLC

Project Solomon Hills Specific Plan

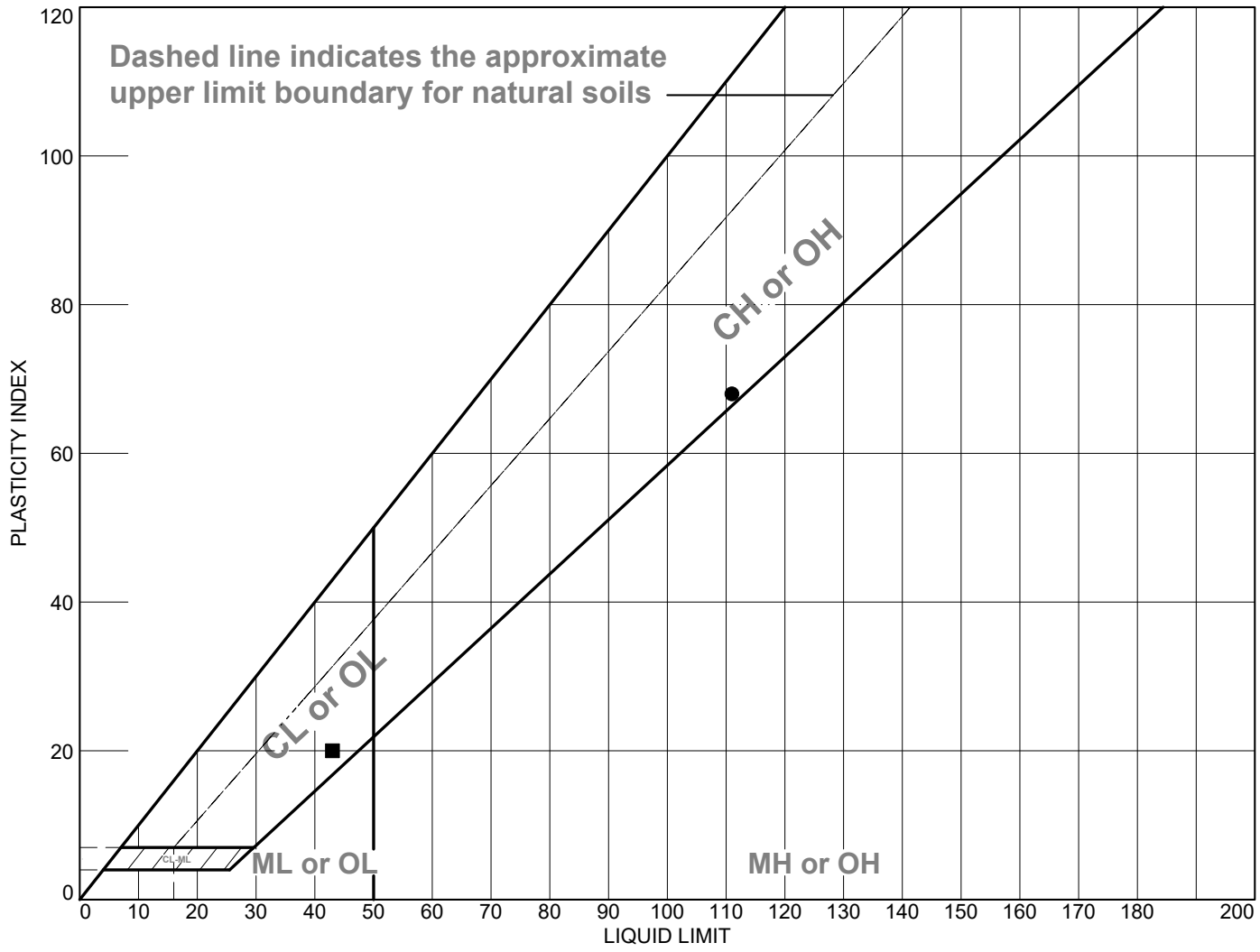
Santa Barbara County, CA

Project No. 23-2195s-1 Figure B1.2

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Valencia, California

○ Tcag

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Fat claystone	111	43	68		97.7	CH
■	Claystone with sand	43	23	20		82.3	CL

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan

Santa Barbara County, CA

● **Source of Sample:** BA-2 **Depth:** 30'

■ **Source of Sample:** BA-3 **Depth:** 30'

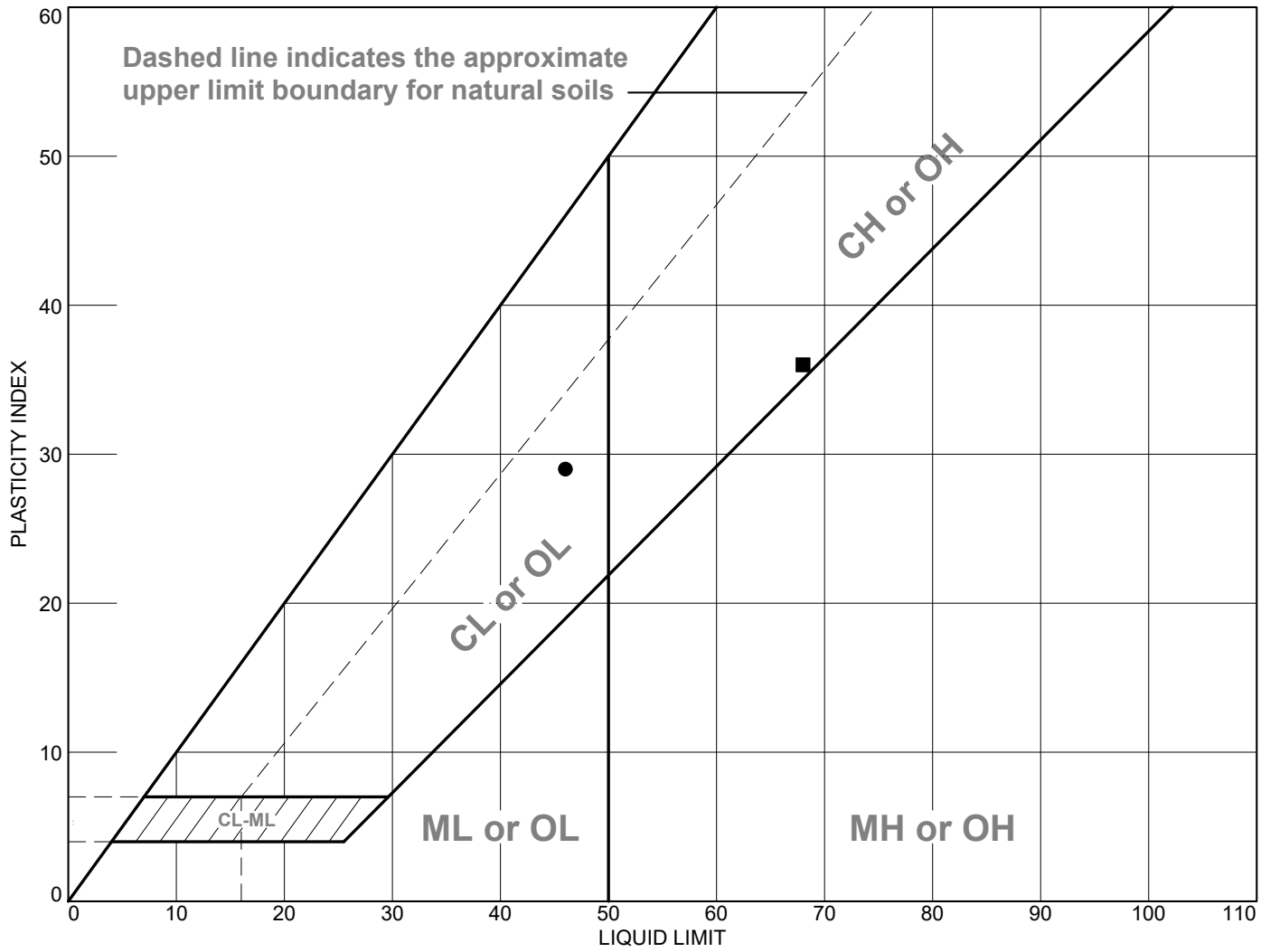
Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B2.1

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy lean clay	46	17	29	97.3	83.9	CL
■	fat clay	68	32	36	99.9	98.3	CH

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan

Santa Barbara County, CA

● **Source of Sample:** HS-44 **Depth:** 25'

■ **Source of Sample:** GT-205 **Depth:** 3.5'

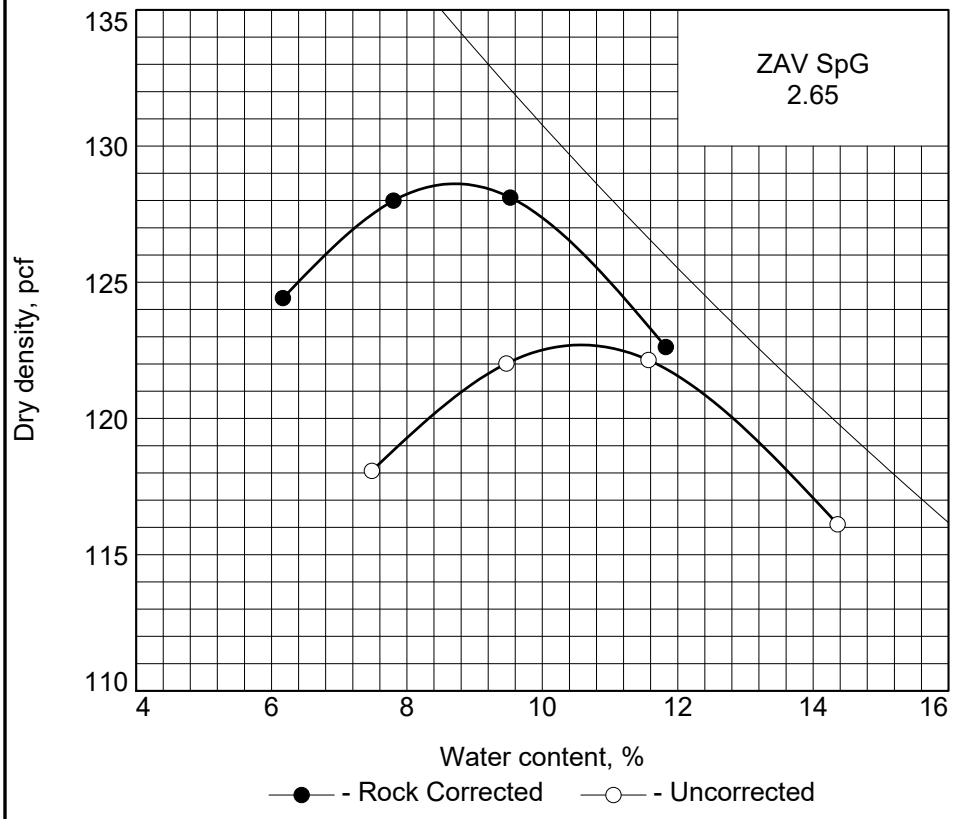
Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B2.2

COMPACTION TEST REPORT



Curve No.
A

Test Specification:
ASTM D 1557-12 Method A Modified
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers five **Blows/Layer** 25
Mold Size 0.03333 cu. ft.
Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.65
%>#4 17.8 **%<No.200** 11.3
USCS SP-SC **AASHTO**
Date Sampled 2/13/06
Date Received 2/15/06
Date Tested
Tested By M. Serrano

TESTING DATA	1	2	3	4	5	6
WM + WS	8.65	8.87	8.96	8.85		
WM	4.42	4.42	4.42	4.42		
WW + T #1	468.9	487.8	498.9	525.0		
WD + T #1	438.5	448.4	450.5	463.1		
TARE #1	32.4	32.1	31.8	32.3		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	6.2	7.8	9.5	11.8		
DRY DENSITY	124.4	128.0	128.1	122.6		

ROCK CORRECTED TEST RESULTS

Maximum dry density = 128.6 pcf

Optimum moisture = 8.7 %

Material Description

Light yellowish brown, poorly graded SAND with clay

Remarks:
Paso Robles Formation (QTp)

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** BA-4 **Depth:** 15-20

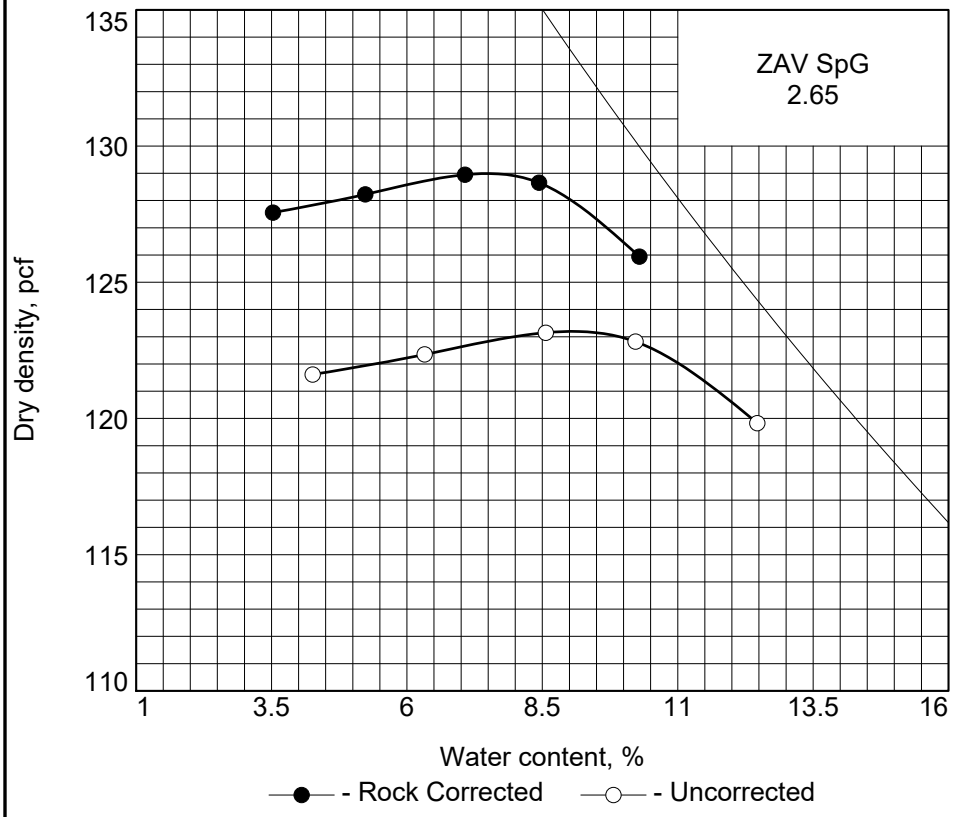
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.1

COMPACTION TEST REPORT



Curve No.
B

Test Specification:
ASTM D 1557-12 Method A Modified
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers five **Blows/Layer** 25
Mold Size 0.03333 cu. ft.

Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.65
%>#4 17.6 **%<No.200** 9.9
USCS SP-SM **AASHTO**
Date Sampled 2/13/06
Date Received 2/15/06
Date Tested
Tested By M. Serrano

TESTING DATA	1	2	3	4	5	6
WM + WS	8.65	8.76	8.88	8.93	8.91	
WM	4.42	4.42	4.42	4.42	4.42	
WW + T #1	434.8	467.8	488.4	503.3	522.6	
WD + T #1	418.3	441.9	452.3	459.4	468.1	
TARE #1	31.5	32.3	31.5	30.4	31.2	
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	3.5	5.2	7.1	8.4	10.3	
DRY DENSITY	127.6	128.2	128.9	128.7	125.9	

ROCK CORRECTED TEST RESULTS

Maximum dry density = 129.0 pcf

Optimum moisture = 7.5 %

Material Description

Yellowish brown, poorly graded SAND with silt and gravel

Remarks:
Alluvium (Qa)

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** BA-5 **Depth:** 20-30

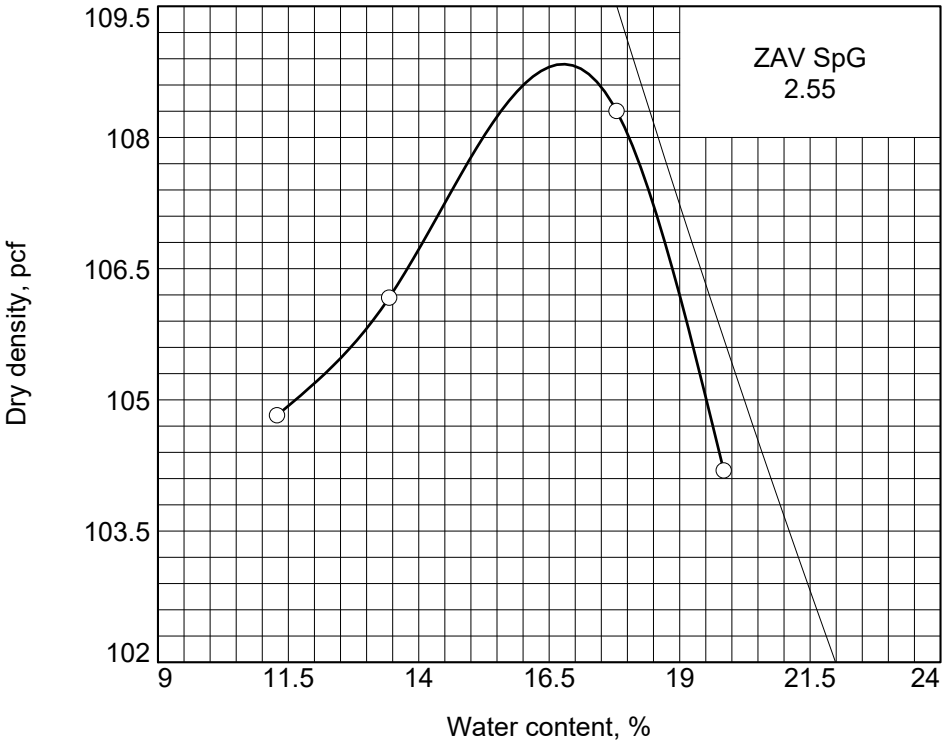
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.2

COMPACTION TEST REPORT



Curve No.
D

Test Specification:
ASTM D 1557-12 Method A Modified

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers five **Blows/Layer** 25
Mold Size 0.03333 cu. ft.
Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.55
%>#4 0.0 **%<No.200** 92.8
USCS CL-ML **AASHTO**
Date Sampled 2/02/06
Date Received 2/06/06
Date Tested
Tested By M. Serrano

TESTING DATA	1	2	3	4	5	6
WM + WS	8.32	8.45	8.68	8.59		
WM	4.43	4.43	4.43	4.43		
WW + T #1	523.4	527.9	533.3	550.4		
WD + T #1	473.4	469.4	457.2	464.6		
TARE #1	29.9	34.1	29.6	31.9		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	11.3	13.4	17.8	19.8		
DRY DENSITY	104.8	106.2	108.3	104.2		

TEST RESULTS

Maximum dry density = 108.8 pcf

Optimum moisture = 16.8 %

Material Description

Pale yellow, silty CLAY

Remarks:
Carreaga Formation (Tcac), Cebada member

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** GT-2 **Depth:** 3-8'

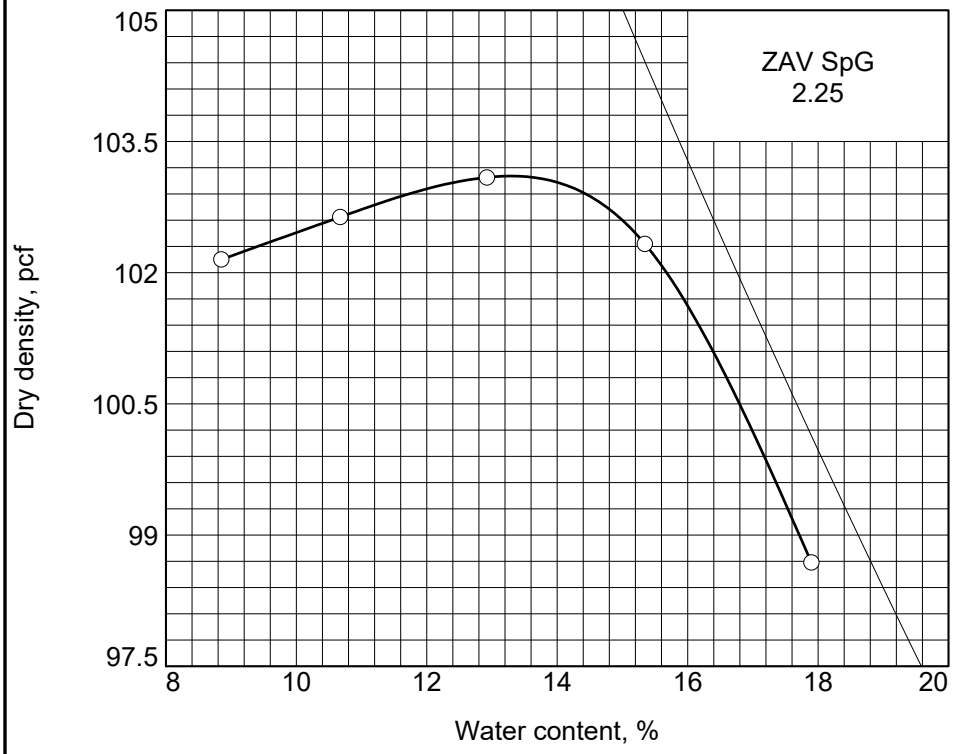
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.3

COMPACTION TEST REPORT



Curve No.
E

Test Specification:
ASTM D 1557-12 Method A Modified

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers five **Blows/Layer** 25
Mold Size 0.03333 cu. ft.
Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.25
%>#4 0.0 **%<No.200** 5.1
USCS SP-SM **AASHTO**
Date Sampled 2/02/06
Date Received 2/06/06
Date Tested
Tested By M. Serrano

TESTING DATA	1	2	3	4	5	6
WM + WS	8.14	8.22	8.31	8.37	8.31	
WM	4.43	4.43	4.43	4.43	4.43	
WW + T #1	534.0	542.8	556.7	570.6	580.3	
WD + T #1	492.9	493.5	496.3	499.4	497.1	
TARE #1	29.5	31.9	29.3	35.3	32.4	
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	8.8	10.7	12.9	15.3	17.9	
DRY DENSITY	102.2	102.6	103.1	102.3	98.7	

TEST RESULTS

Maximum dry density = 103.1 pcf

Optimum moisture = 13.3 %

Material Description

Very light brownish gray, poorly graded SAND with silt

Remarks:
Carreaga Formation (Tcag), Graciosa member

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** GT-4 **Depth:** 3-7'

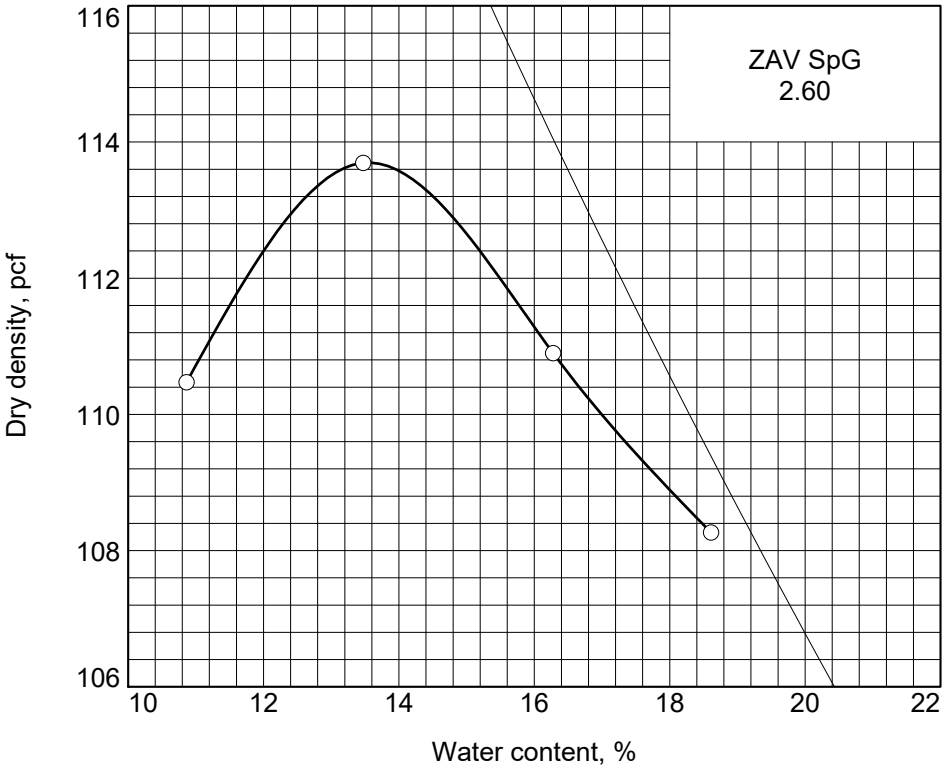
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.4

COMPACTION TEST REPORT



Curve No.
F

Test Specification:
ASTM D 1557-12 Method A Modified

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers five **Blows/Layer** 25
Mold Size 0.03333 cu. ft.
Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.60
%>#4 2.1 **%<No.200** 97.4
USCS CL-ML **AASHTO**
Date Sampled 2/03/06
Date Received 2/06/06
Date Tested
Tested By M. Serrano

TESTING DATA	1	2	3	4	5	6
WM + WS	8.51	8.73	8.73	8.71		
WM	4.43	4.43	4.43	4.43		
WW + T #1	461.4	496.5	460.5	472.1		
WD + T #1	419.1	441.3	400.1	403.0		
TARE #1	29.4	31.8	29.4	31.5		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	10.9	13.5	16.3	18.6		
DRY DENSITY	110.5	113.7	110.9	108.3		

TEST RESULTS

Maximum dry density = 113.7 pcf

Optimum moisture = 13.5 %

Material Description

Yellowish brown, silty CLAY

Remarks:
Carreaga Formation (Tcac), Cebada member

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** GT-7 **Depth:** 8-10'

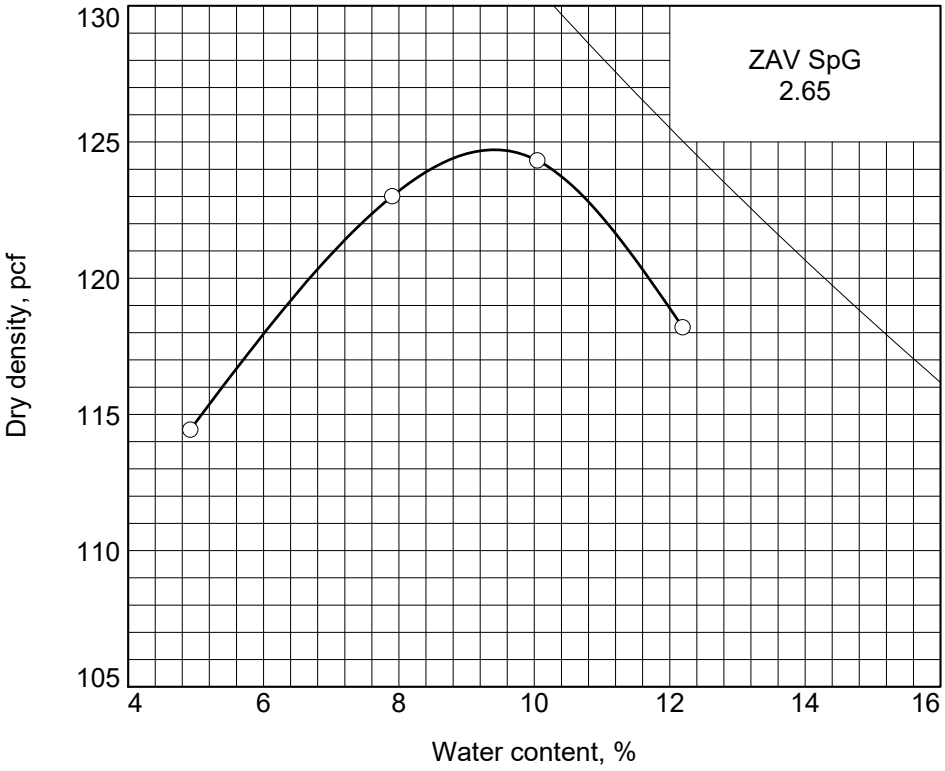
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.5

COMPACTION TEST REPORT



Curve No.
K

Test Specification:
ASTM D 1557-12 Method A Modified

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers five **Blows/Layer** 25
Mold Size 0.03333 cu. ft.

Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.65
%>#4 1.9 **%<No.200** 23.0
USCS SC **AASHTO**
Date Sampled 10/04/06
Date Received
Date Tested
Tested By M. Serrano

TESTING DATA	1	2	3	4	5	6
WM + WS	8.43	8.85	8.99	8.85		
WM	4.43	4.43	4.43	4.43		
WW + T #1	467.8	520.5	532.7	545.6		
WD + T #1	447.4	484.6	487.0	489.5		
TARE #1	32.2	31.3	31.6	29.4		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	4.9	7.9	10.0	12.2		
DRY DENSITY	114.4	123.0	124.3	118.2		

TEST RESULTS

Maximum dry density = 124.7 pcf

Optimum moisture = 9.4 %

Material Description

Clayey SAND

Remarks:
Carreaga Formation (Tcag) Graciosa member

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** BA-19 **Depth:** 10-20

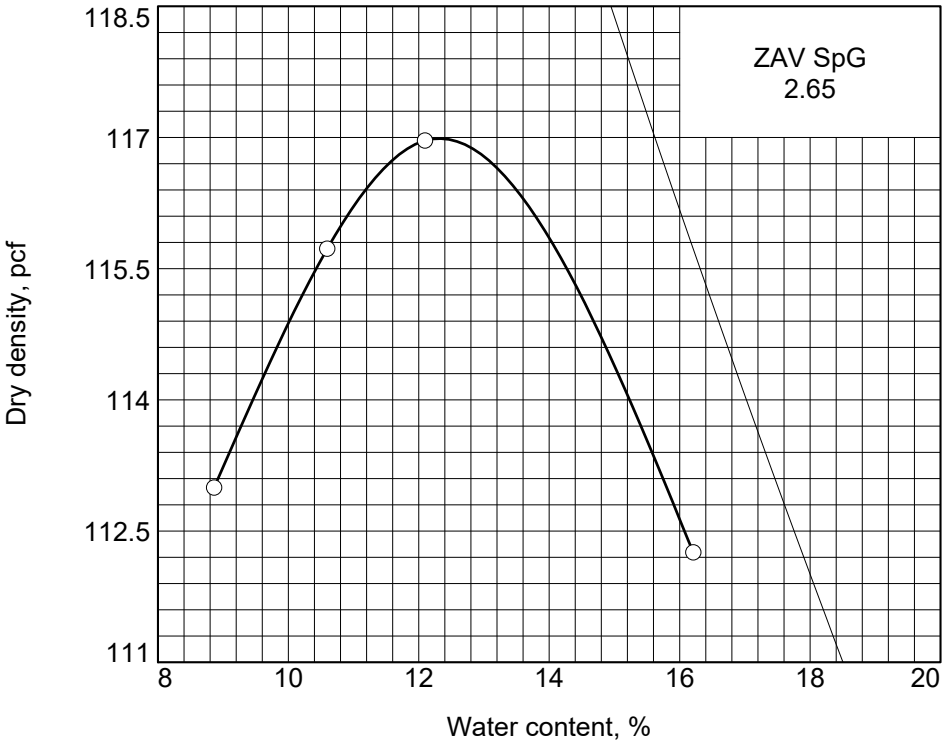
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.6

COMPACTION TEST REPORT



Curve No.
M

Test Specification:
ASTM D 1557-12 Method A Modified

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers five **Blows/Layer** 25
Mold Size 0.03333 cu. ft.
Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.65
%>#4 1.2 **%<No.200** 73.4
USCS CL **AASHTO**
Date Sampled 10/04/06
Date Received
Date Tested
Tested By M. Serrano

TESTING DATA	1	2	3	4	5	6
WM + WS	8.53	8.70	8.80	8.78		
WM	4.43	4.43	4.43	4.43		
WW + T #1	498.7	519.4	527.3	540.0		
WD + T #1	460.8	472.7	473.6	468.8		
TARE #1	33.4	32.4	29.4	29.2		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	8.9	10.6	12.1	16.2		
DRY DENSITY	113.0	115.7	117.0	112.3		

TEST RESULTS

Maximum dry density = 117.0 pcf

Optimum moisture = 12.3 %

Material Description

Lean CLAY with sand

Remarks:
Carreaga Formation (Tcag) Graciosa member

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** BA-21 **Depth:** 10-20

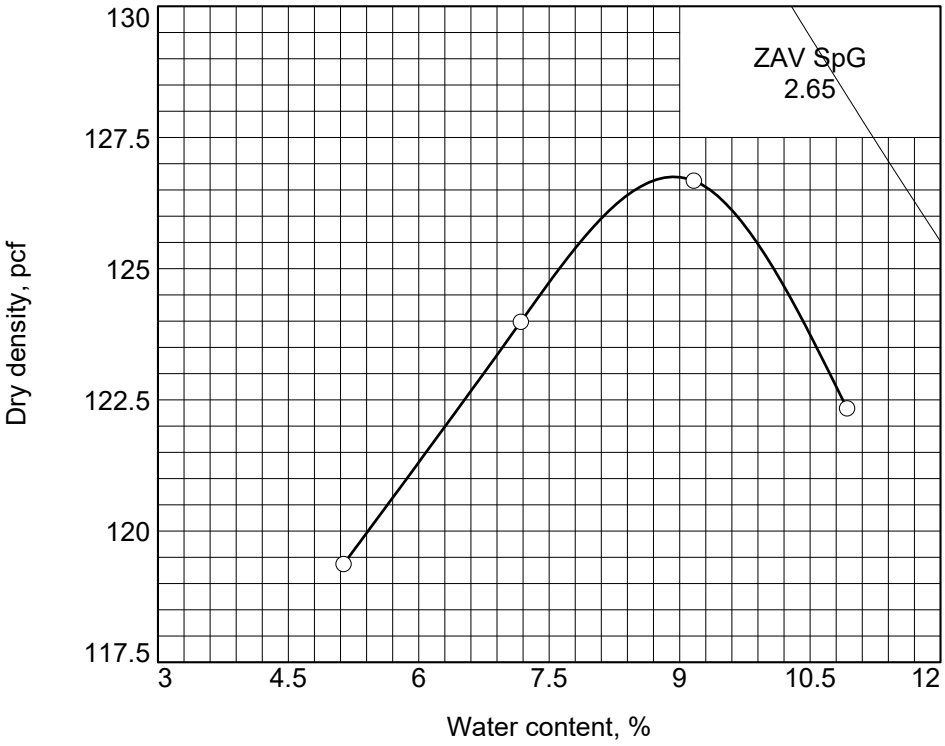
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.7

COMPACTION TEST REPORT



Curve No.
R

Test Specification:
ASTM D 1557-02 Method A Modified

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers 5 **Blows/Layer** 25
Mold Size 0.03333 cu. ft.
Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.65
%>#4 2.0 **%<No.200** 36.5
USCS SC-SM **AASHTO**
Date Sampled 9/25/06
Date Received
Date Tested
Tested By M. Serrano

TESTING DATA	1	2	3	4	5	6
WM + WS	8.62	8.86	9.04	8.96		
WM	4.43	4.43	4.43	4.43		
WW + T #1	523.3	508.9	519.5	537.4		
WD + T #1	500.3	477.1	478.4	487.5		
TARE #1	52.3	33.9	29.6	31.4		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	5.1	7.2	9.2	10.9		
DRY DENSITY	119.4	124.0	126.7	122.3		

TEST RESULTS

Maximum dry density = 127.0 pcf

Optimum moisture = 9.0 %

Material Description

Dark brown, silty, clayey SAND

Remarks:
Alluvium (Qa)

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** HS-11 **Depth:** 0-20'

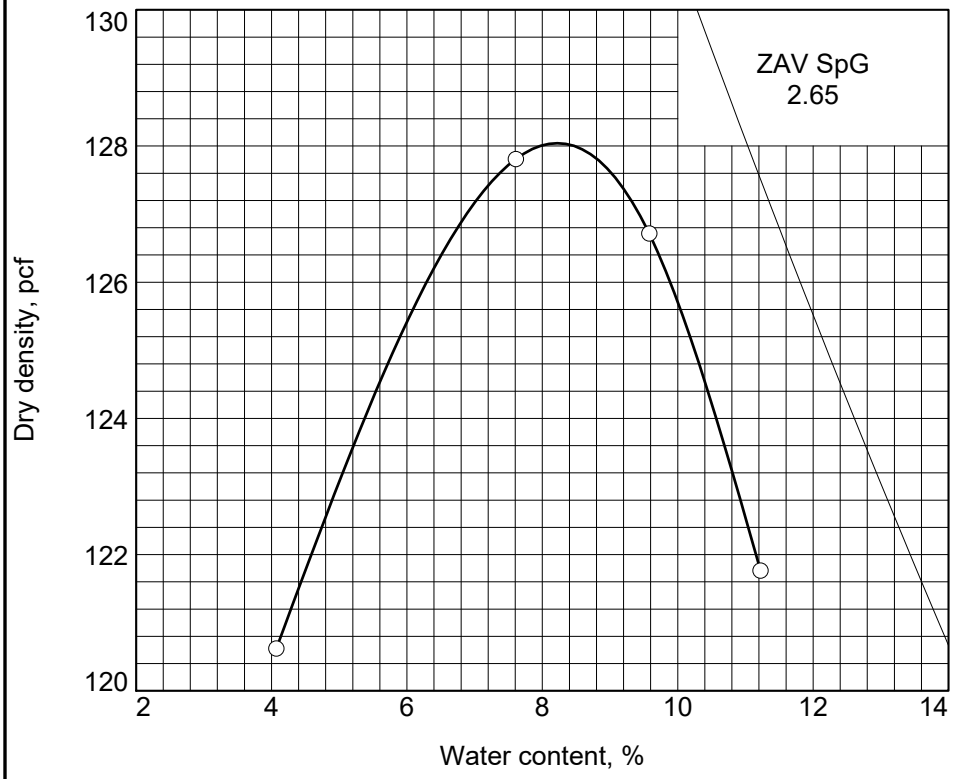
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.8

COMPACTION TEST REPORT



Curve No.
N

Test Specification:
ASTM D 1557-02 Method A Modified

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers 5 **Blows/Layer** 25
Mold Size 0.03333 cu. ft.
Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.65
%>#4 0.4 **%<No.200** 24.7
USCS SM **AASHTO**
Date Sampled 9/10/06
Date Received
Date Tested
Tested By M. Serrano

TESTING DATA	1	2	3	4	5	6
WM + WS	8.61	9.01	9.06	8.94		
WM	4.43	4.43	4.43	4.43		
WW + T #1	524.4	532.5	536.8	544.5		
WD + T #1	505.1	497.1	492.7	492.7		
TARE #1	32.2	32.0	31.7	32.0		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	4.1	7.6	9.6	11.2		
DRY DENSITY	120.6	127.8	126.7	121.8		

TEST RESULTS

Maximum dry density = 128.0 pcf

Optimum moisture = 8.0 %

Material Description

Silty SAND

Remarks:
Blend of Alluvium (Qa), Slopewash, Carreaga Formation (Tcag) Graciosa member

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** HS-17 **Depth:** 0-20'

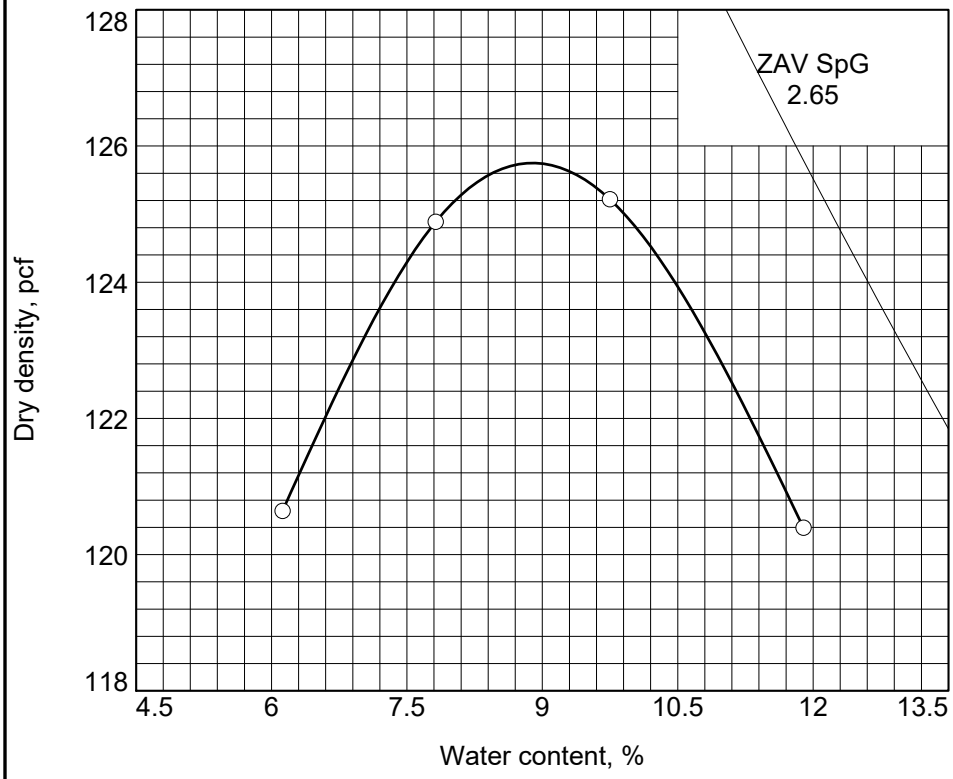
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.9

COMPACTION TEST REPORT



Curve No.
T

Test Specification:
ASTM D 1557-12 Method A Modified

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers five **Blows/Layer** 25
Mold Size 0.03333 cu. ft.
Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.65
%>#4 3.2 **%<No.200** 23.5
USCS SM **AASHTO**
Date Sampled 5/23/23
Date Received 5/26/23
Date Tested 6/25/23
Tested By E. Parr

TESTING DATA	1	2	3	4	5	6
WM + WS	8.82	8.91	8.82	8.60		
WM	4.35	4.35	4.35	4.35		
WW + T #1	887.6	873.9	846.7	965.5		
WD + T #1	826.4	800.3	761.3	912.4		
TARE #1	43.7	44.8	43.7	44.1		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	7.8	9.7	11.9	6.1		
DRY DENSITY	124.9	125.2	120.4	120.6		

TEST RESULTS

Maximum dry density = 125.8 pcf

Optimum moisture = 8.9 %

Material Description

silty, fine-grained SAND

Remarks:
Alluvium (Qa)

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** HS-39 **Depth:** 10' - 20'

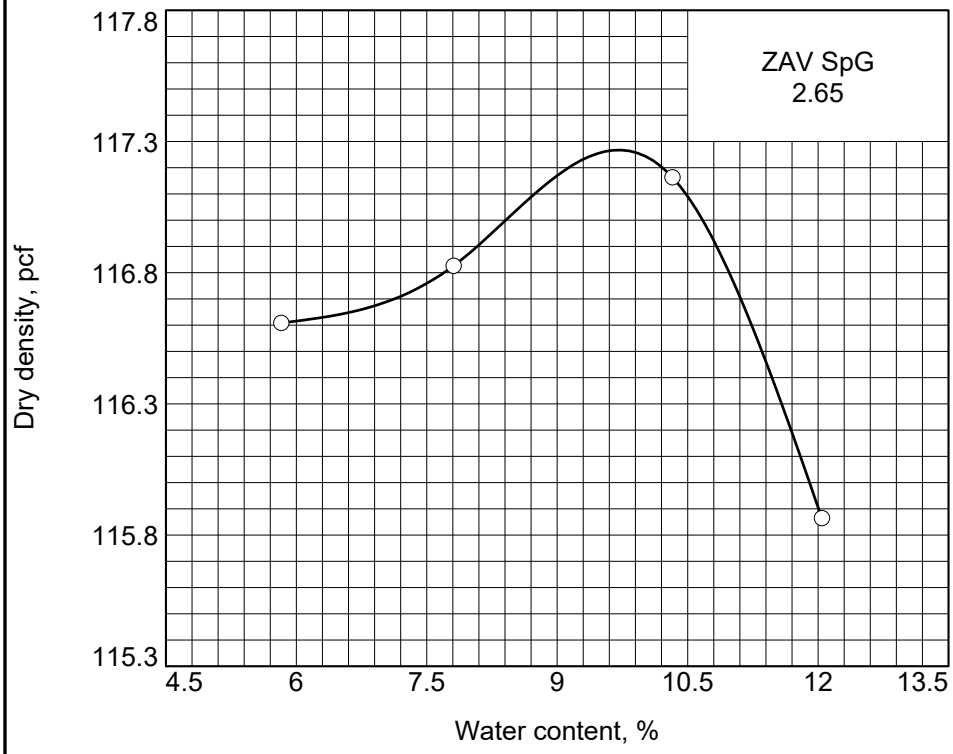
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.10

COMPACTION TEST REPORT



Curve No.
U

Test Specification:
ASTM D 1557-12 Method A Modified

Preparation Method Moist
Hammer Wt. 10 lb.
Hammer Drop 18 in.
Hammer Type: automatic
Layers five **Blows/Layer** 25
Mold Size 0.03333 cu. ft.
Test Performed on Material Passing #4 **Sieve**

NM **LL** **PI**
Sp.G. (assumed): 2.65
%>#4 2.1 **%<No.200** 20.7
USCS SM **AASHTO**
Date Sampled 5/25/23
Date Received 5/26/23
Date Tested 6/26/23
Tested By E. Parr

TESTING DATA	1	2	3	4	5	6
WM + WS	8.45	8.53	8.64	8.66		
WM	4.35	4.35	4.35	4.35		
WW + T #1	845.0	898.3	928.8	788.5		
WD + T #1	800.9	836.4	846.0	708.5		
TARE #1	44.1	43.7	44.6	44.3		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	5.8	7.8	10.3	12.0		
DRY DENSITY	116.6	116.8	117.2	115.9		

TEST RESULTS

Maximum dry density = 117.3 pcf

Optimum moisture = 9.7 %

Material Description

silty, fine-grained SAND

Remarks:
Blend of Alluvium (Qa) and Carreaga Formation (Tcag) Graciosa member

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC
Project: Solomon Hills Specific Plan
Orcutt, CA
○ **Source of Sample:** HS-49 **Depth:** 10' - 20'

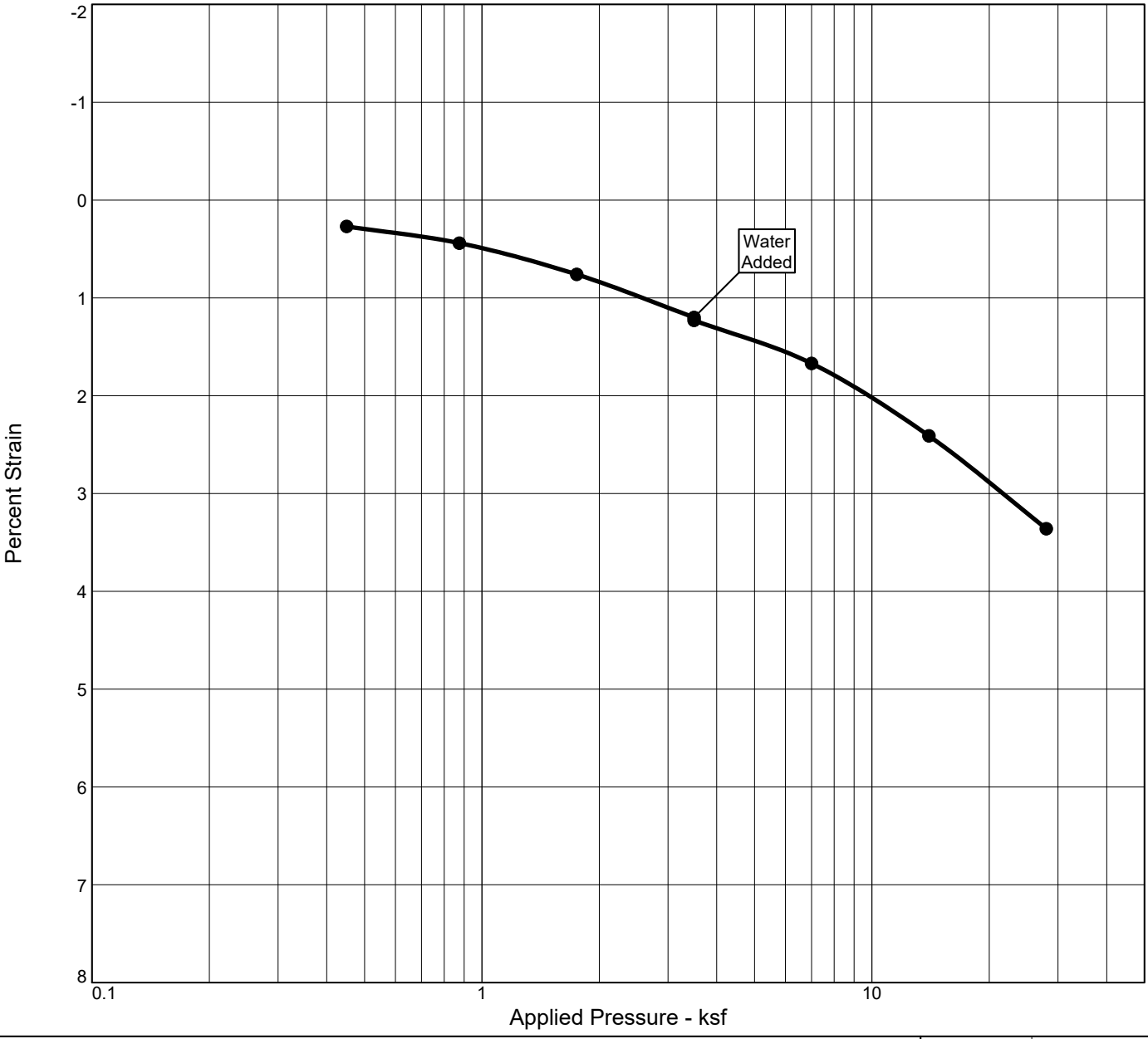
Checked by: E. Seward
Title: Principal

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B3.11

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	3.5	94.2	97.5	10.2 %	26.3	35.6 %	100.0	0.756	0.697	8.9	0.06

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 3,500 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-5 **Depth:** 35'

Remarks:
Alluvium (Qa)

Checked By: M. Neely

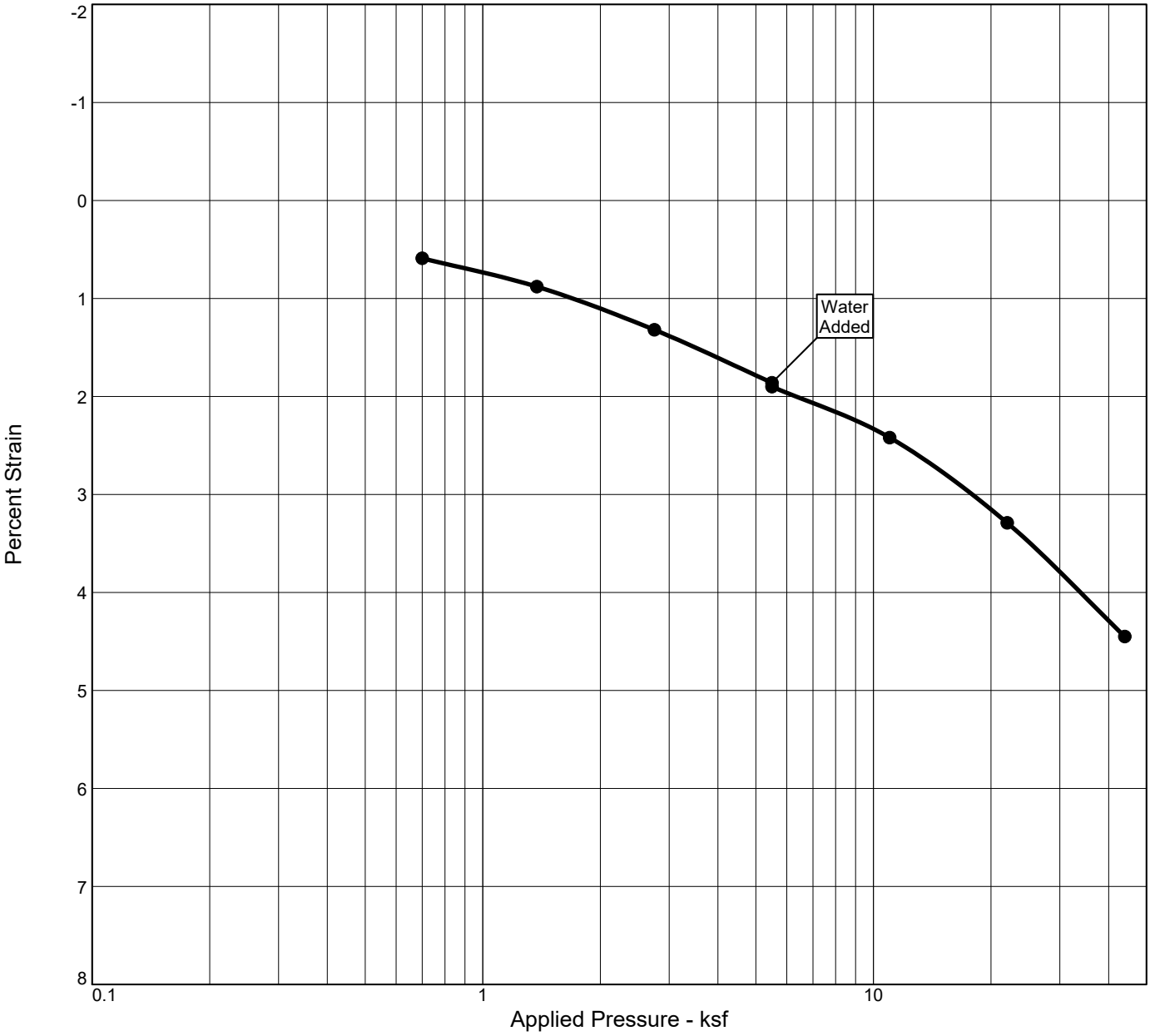
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.1

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty, clayey SAND	SC-SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	5.5	100.2	104.8	10.2 %	21.8	41.3 %	100.0	0.652	0.578	14.5	0.06

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 5,500 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-5 **Depth:** 55'

Remarks:
Alluvium (Qa)

Checked By: M. Neely

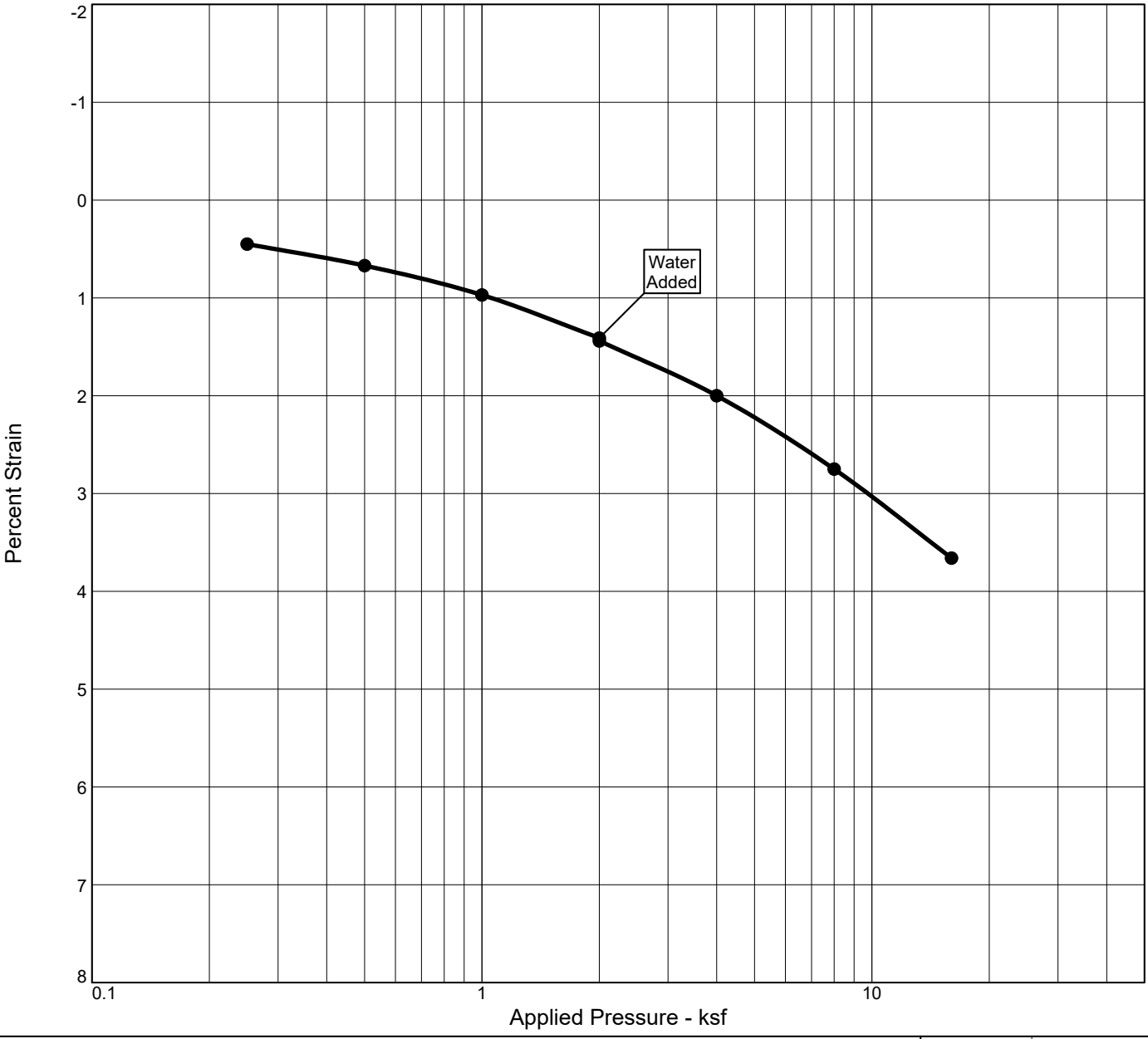
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.2

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	2	101.0	104.8	7.5 %	21.9	31.0 %	100.0	0.639	0.579	3.5	0.05

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 2,000 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-8 **Depth:** 20'

Remarks:
Alluvium (Qa)

Checked By: M. Neely

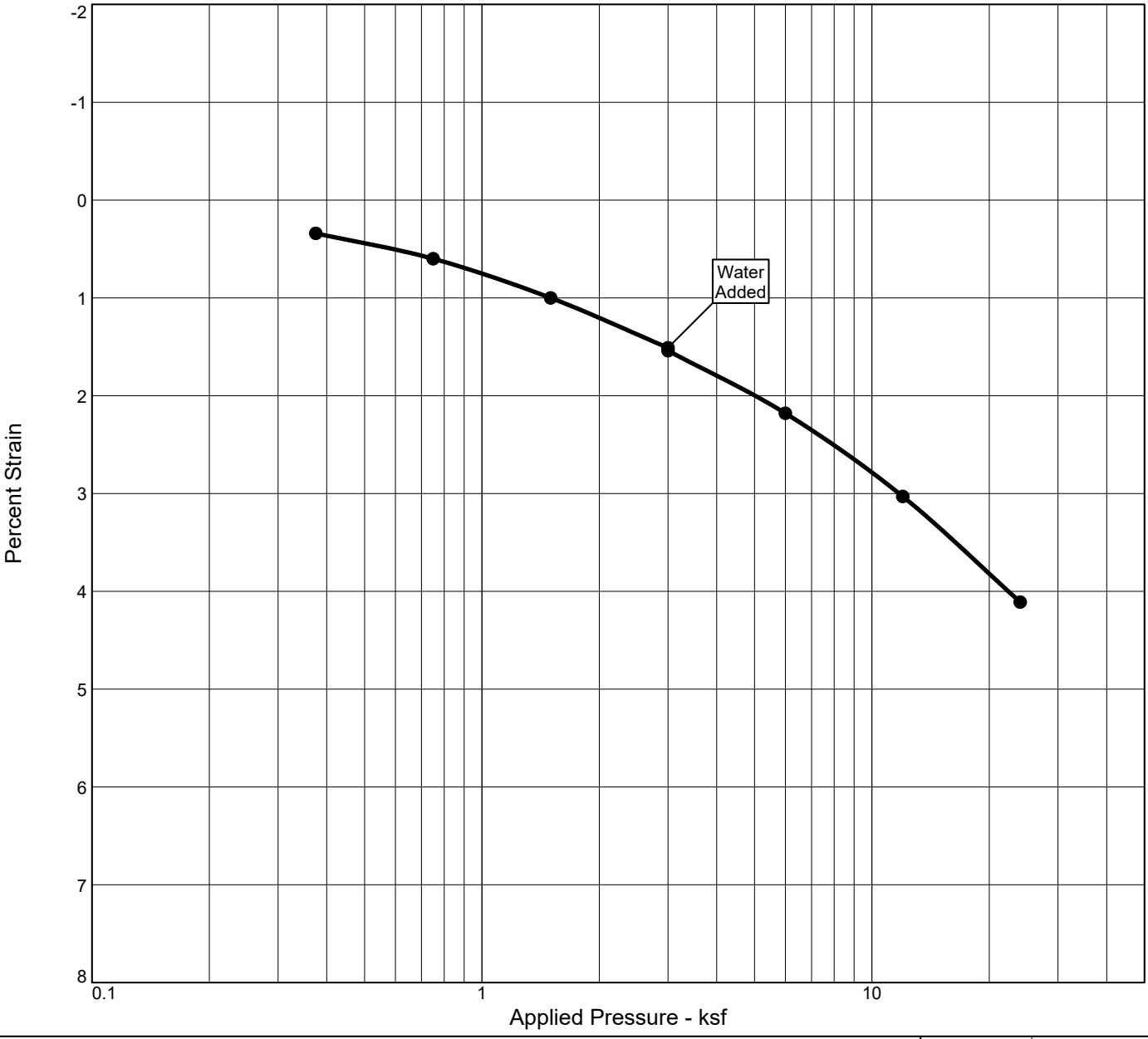
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.3

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	3	106.4	111.0	13.8 %	18.5	65.8 %	100.0	0.555	0.491		0.06

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 3,000 psf

D2435 Method	C_r	Swell Press. (ksf)	Swell %
D4546			

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-8 **Depth:** 30'

Remarks:
Alluvium (Qa)

Checked By: M. Neely

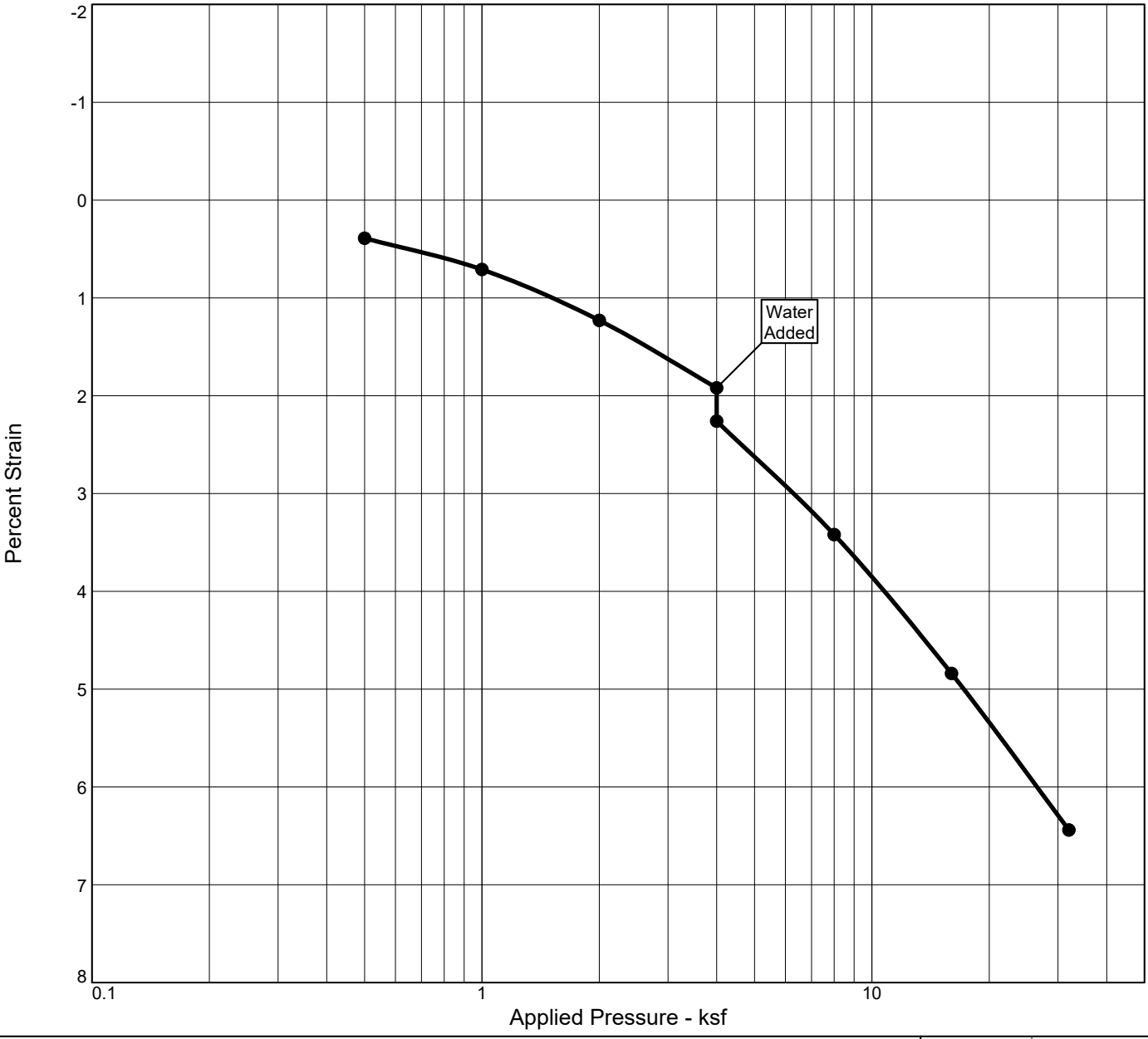
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.4

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	4.0	98.1	104.9	6.8 %	21.8	26.4 %	100.0	0.686	0.578		0.09

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 4,000 psf

D2435 Method	C_r	Swell Press. (ksf)	Swell %
D4546			

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-8 **Depth:** 40'

Remarks:
Alluvium (Qa)

Checked By: M. Neely

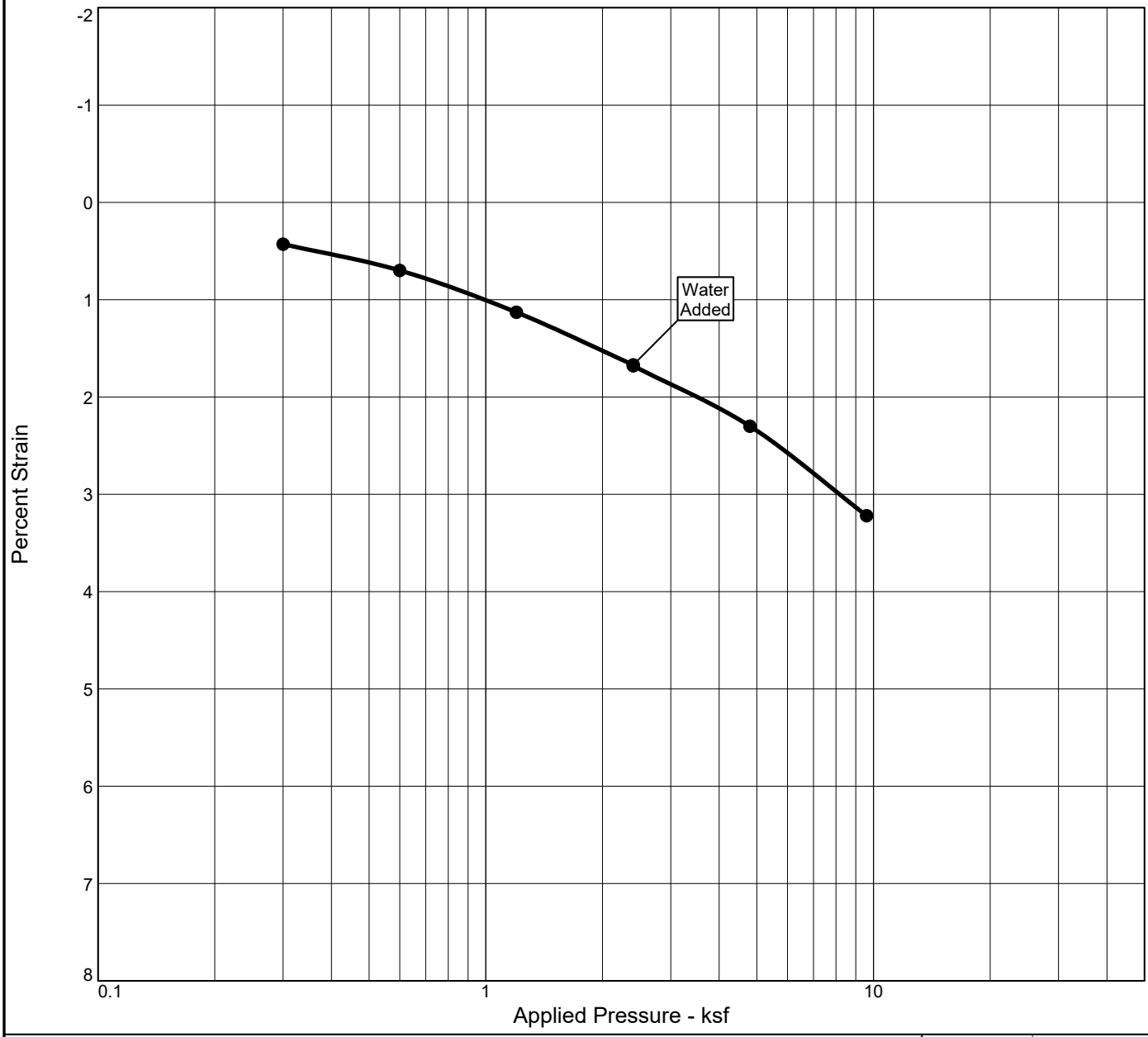
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.5

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	2.4	104.5	107.9	8.9 %	20.1	40.4 %	100.0	0.583	0.532	5.0	0.05

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 2,400 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-11 **Depth:** 20'

Remarks:
Alluvium (Qa)

Checked By: M. Neely

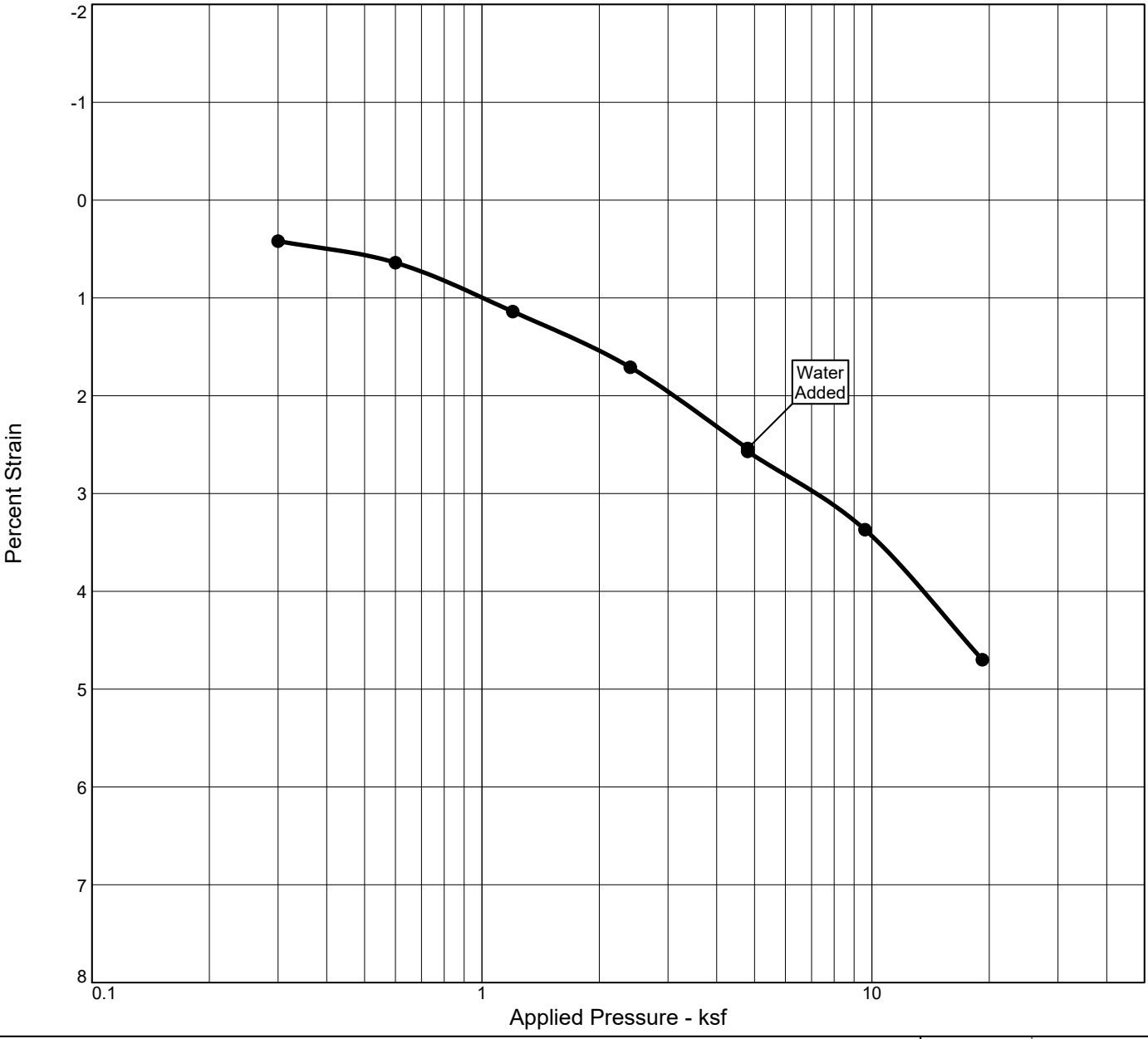
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.6

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	5.4	102.1	106.9	20.0 %	20.5	85.5 %	100.0	0.621	0.544	7.3	0.07

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 4,800 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-11 **Depth:** 45

Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

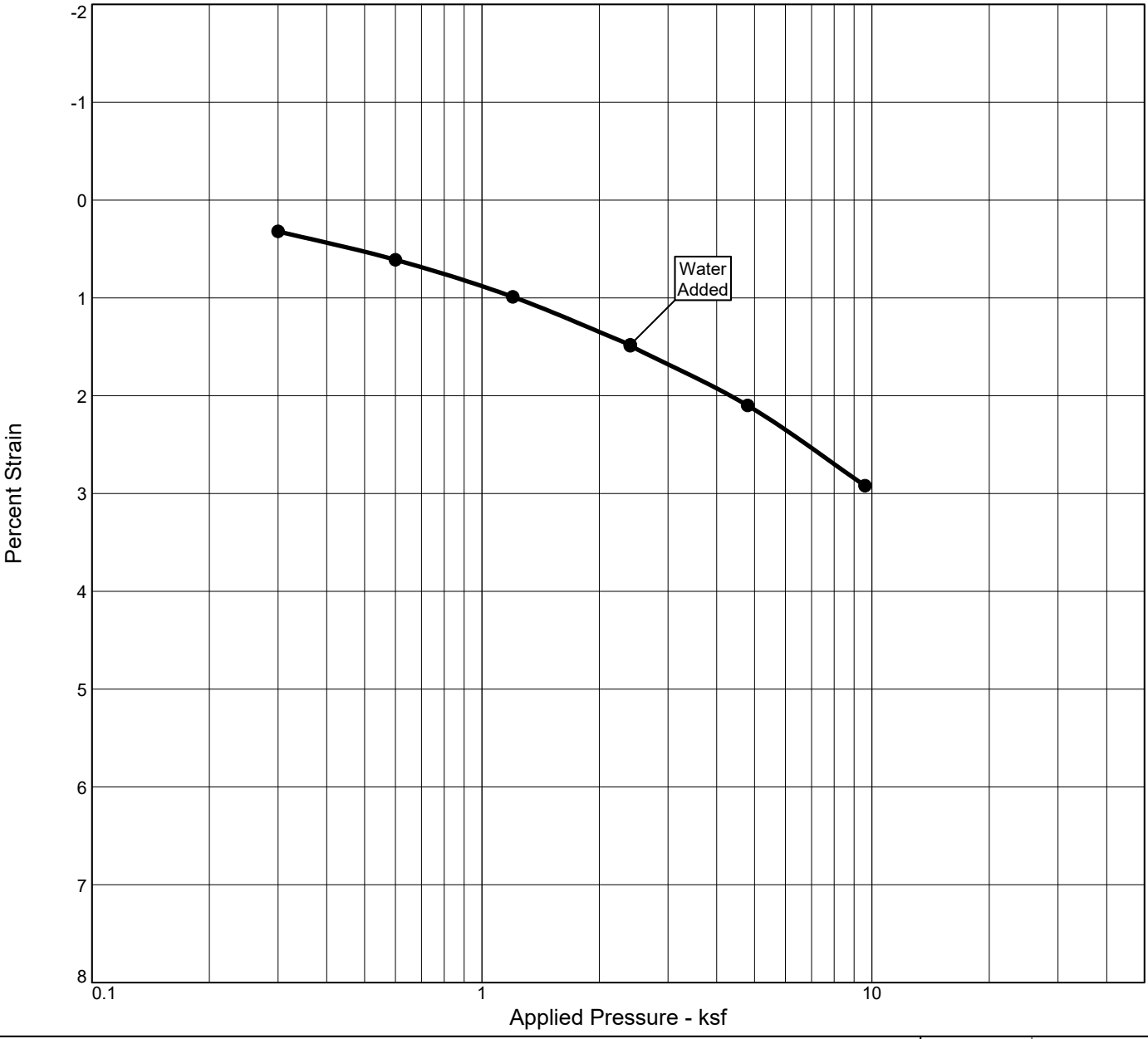
Valencia, California

Checked By: M. Neely

Title: Geotechnical Engineer

Figure B4.7

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	2.4	105.5	108.6	6.1 %	19.7	28.6 %	100.0	0.567	0.522	5.0	0.04

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 2,400 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-12 **Depth:** 20'

Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

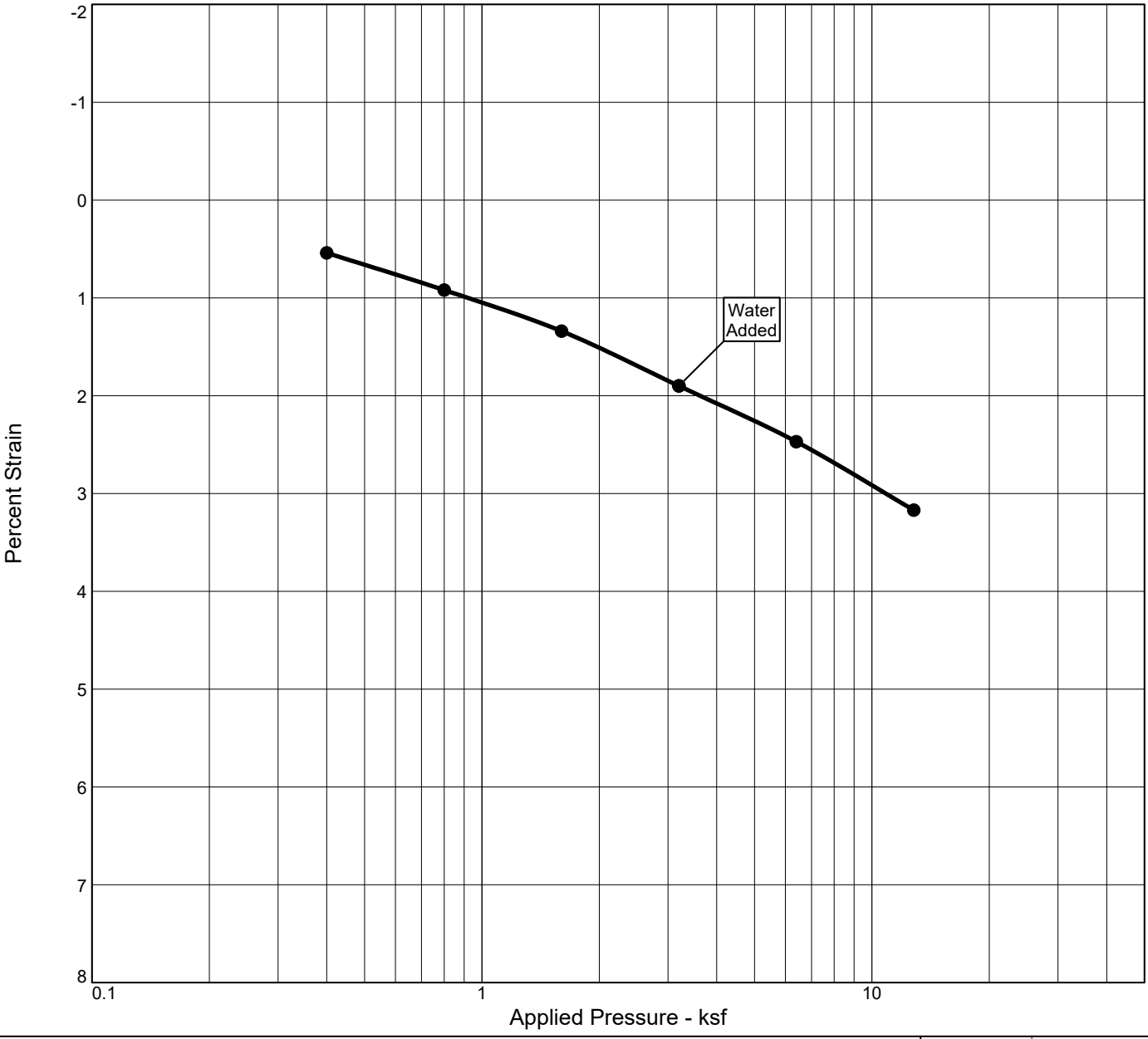
Valencia, California

Checked By: M. Neely

Title: Geotechnical Engineer

Figure B4.8

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	3.6	97.6	100.7	8.8 %	24.2	33.4 %	100.0	0.695	0.641	4.1	0.04

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 3,200 psf

D2435 Method	C_r	Swell Press. (ksf)	Swell %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-12 **Depth:** 30'

Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

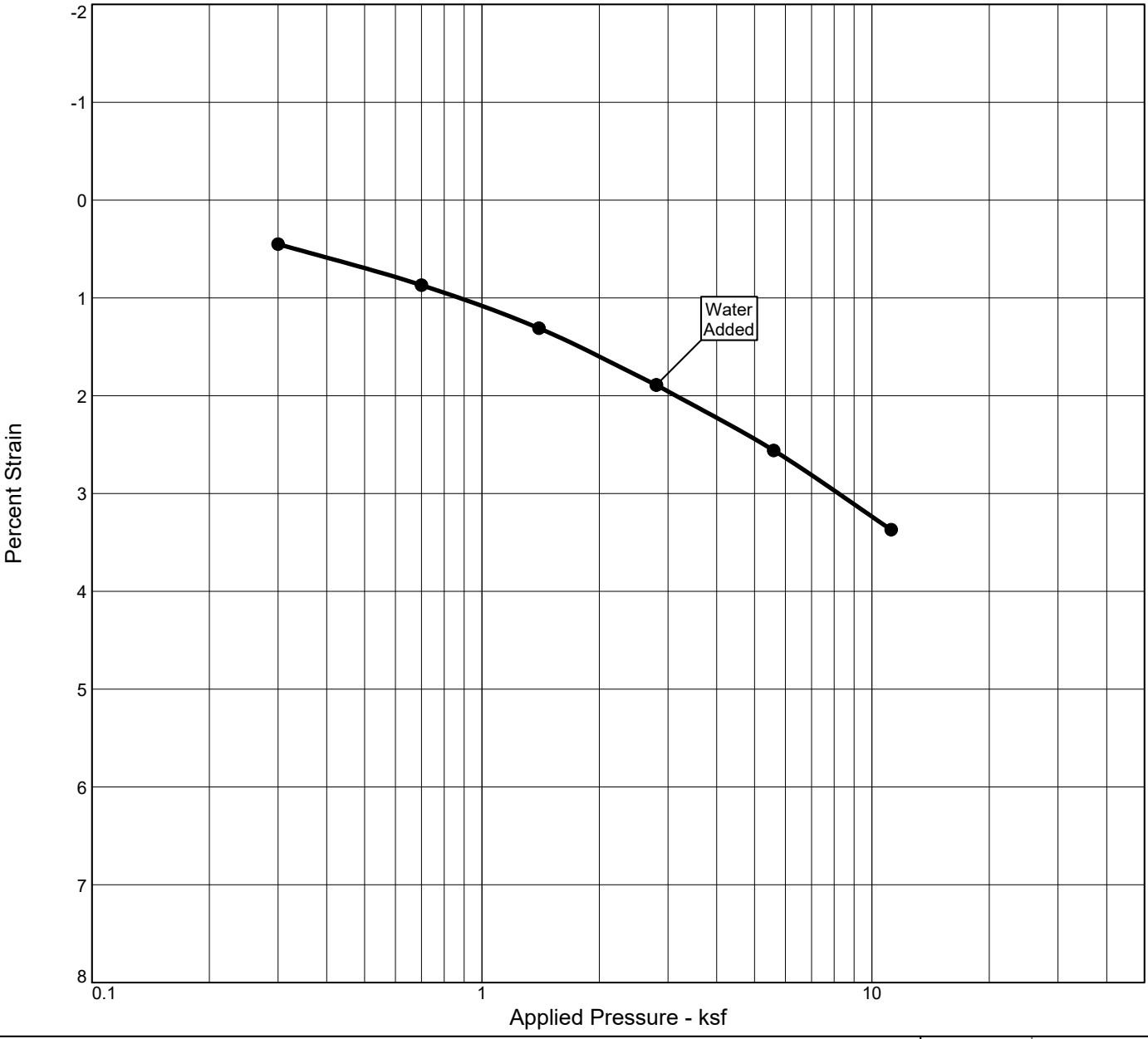
Valencia, California

Checked By: M. Neely

Title: Geotechnical Engineer

Figure B4.9

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	3.0	103.4	106.9	5.2 %	20.6	23.2 %	100.0	0.599	0.546	3.5	0.04

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 2,800 psf

D2435 Method	C_r	Swell Press. (ksf)	Swell %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-14 **Depth:** 25'

Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

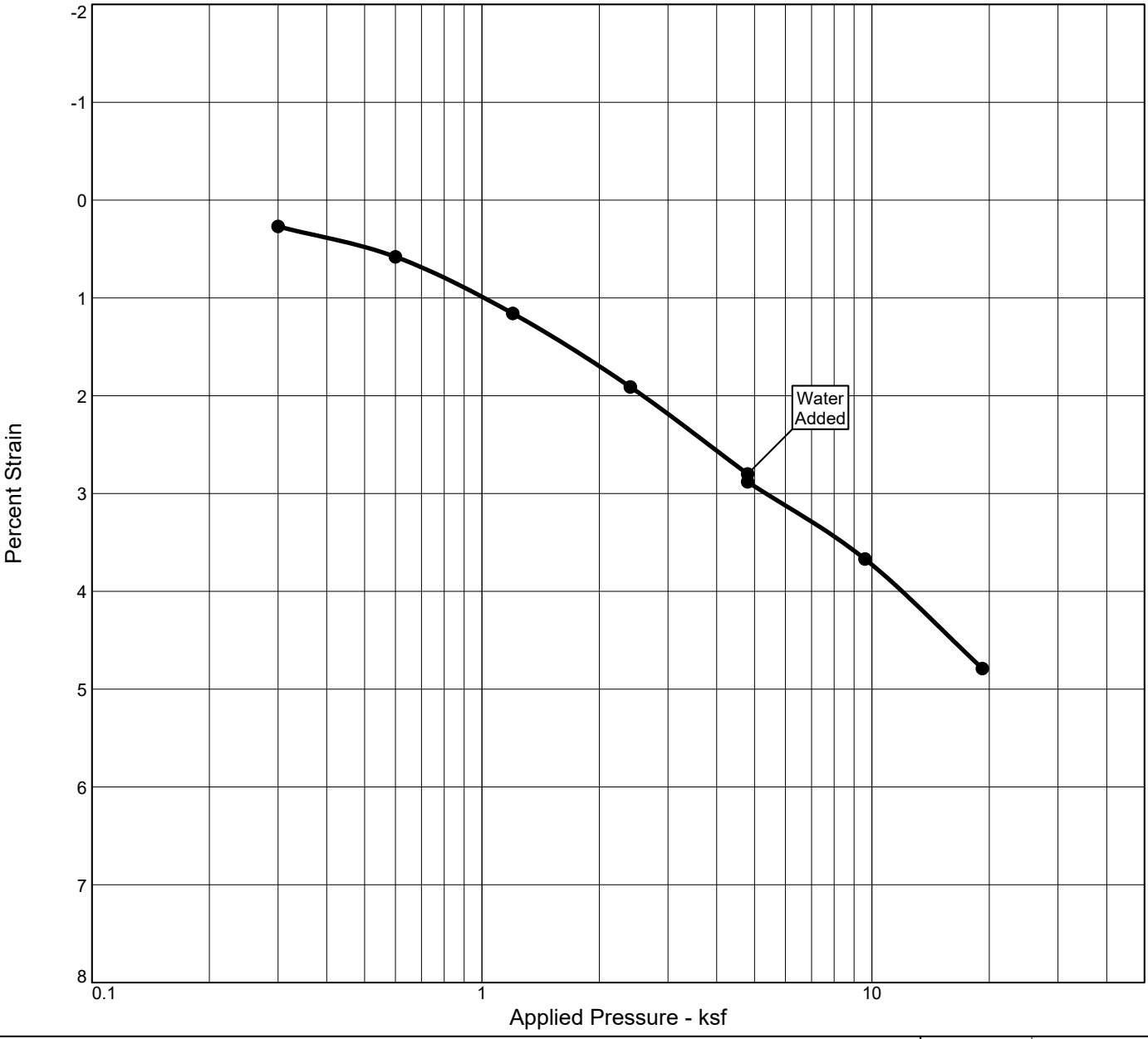
Valencia, California

Checked By: M. Neely

Title: Geotechnical Engineer

Figure B4.10

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	5.4	102.6	107.5	5.7 %	20.2	24.8 %	100.0	0.612	0.535	6.8	0.06

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 4,800 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.1

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-14 **Depth:** 45'

Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

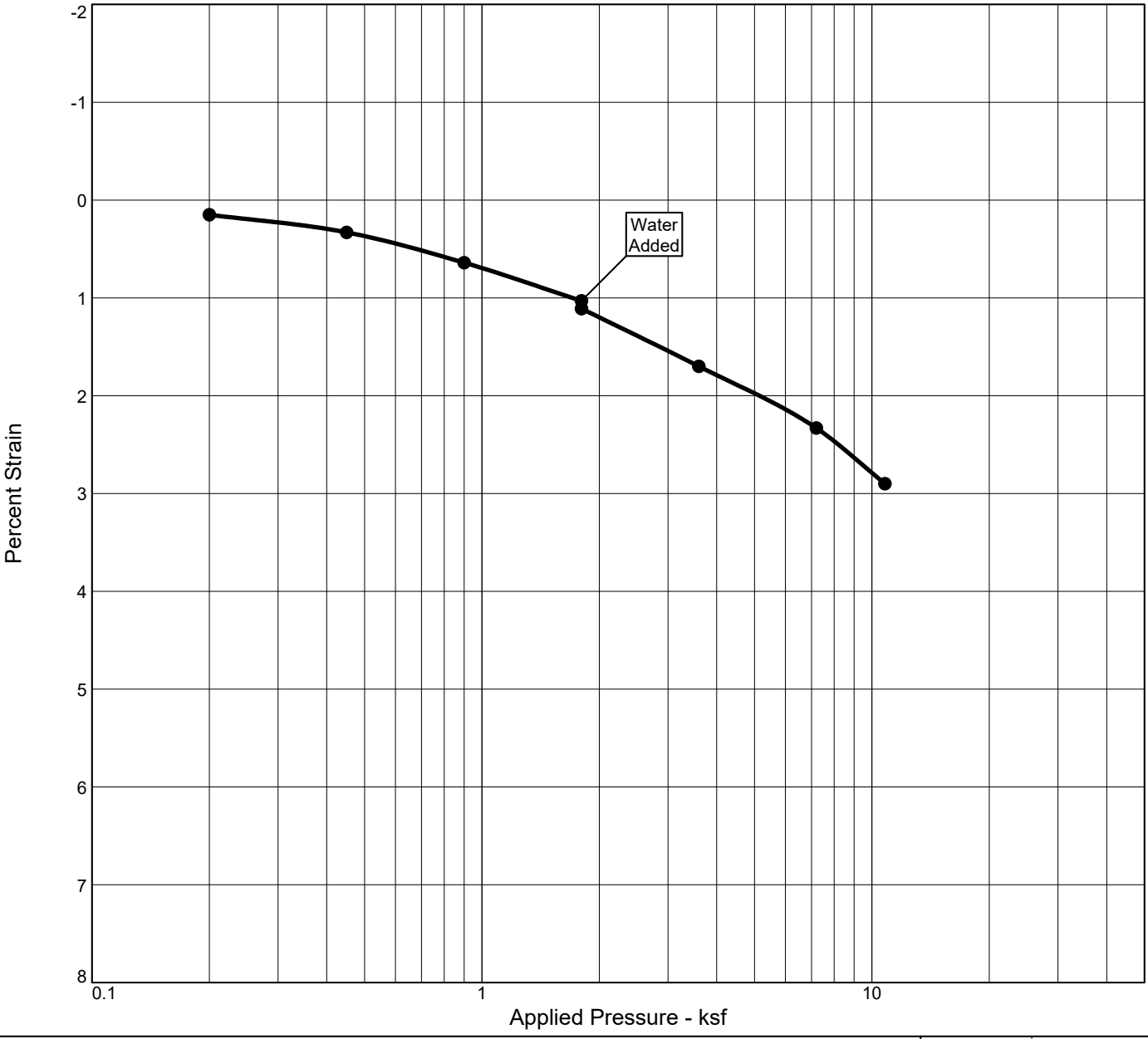
Valencia, California

Checked By: M. Neely

Title: Geotechnical Engineer

Figure B4.11

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	1.8	102.2	105.2	4.8 %	21.6	20.8 %	100.0	0.618	0.571	7.3	0.05

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 1,800 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.1

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-15 **Depth:** 15

Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

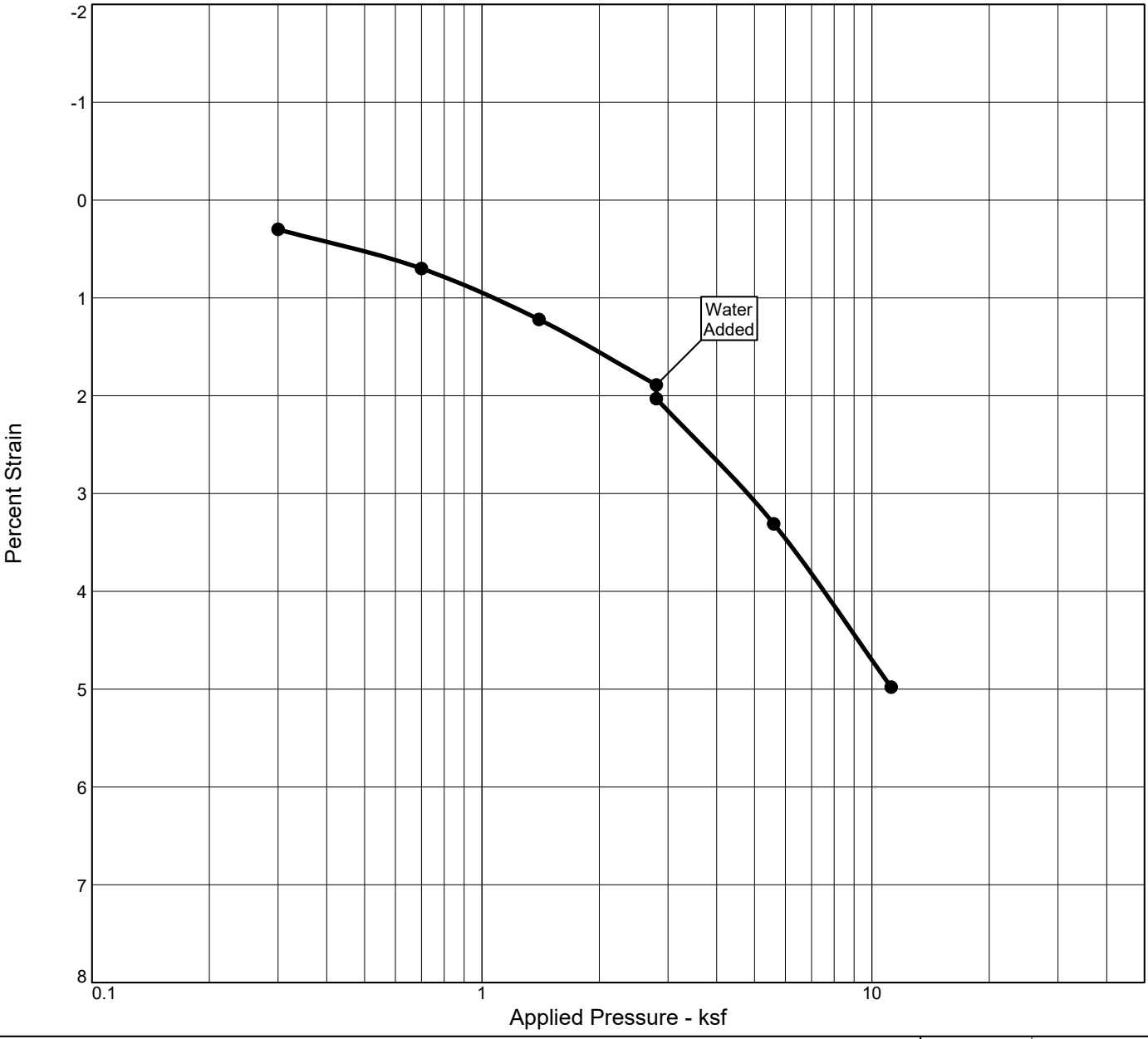
Valencia, California

Checked By: M. Neely

Title: Geotechnical Engineer

Figure B4.12

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	3.0	94.5	99.2	8.4 %	25.0	29.5 %	100.0	0.750	0.663	5.8	0.10

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 2,800 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.1

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-15 **Depth:** 25'

Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

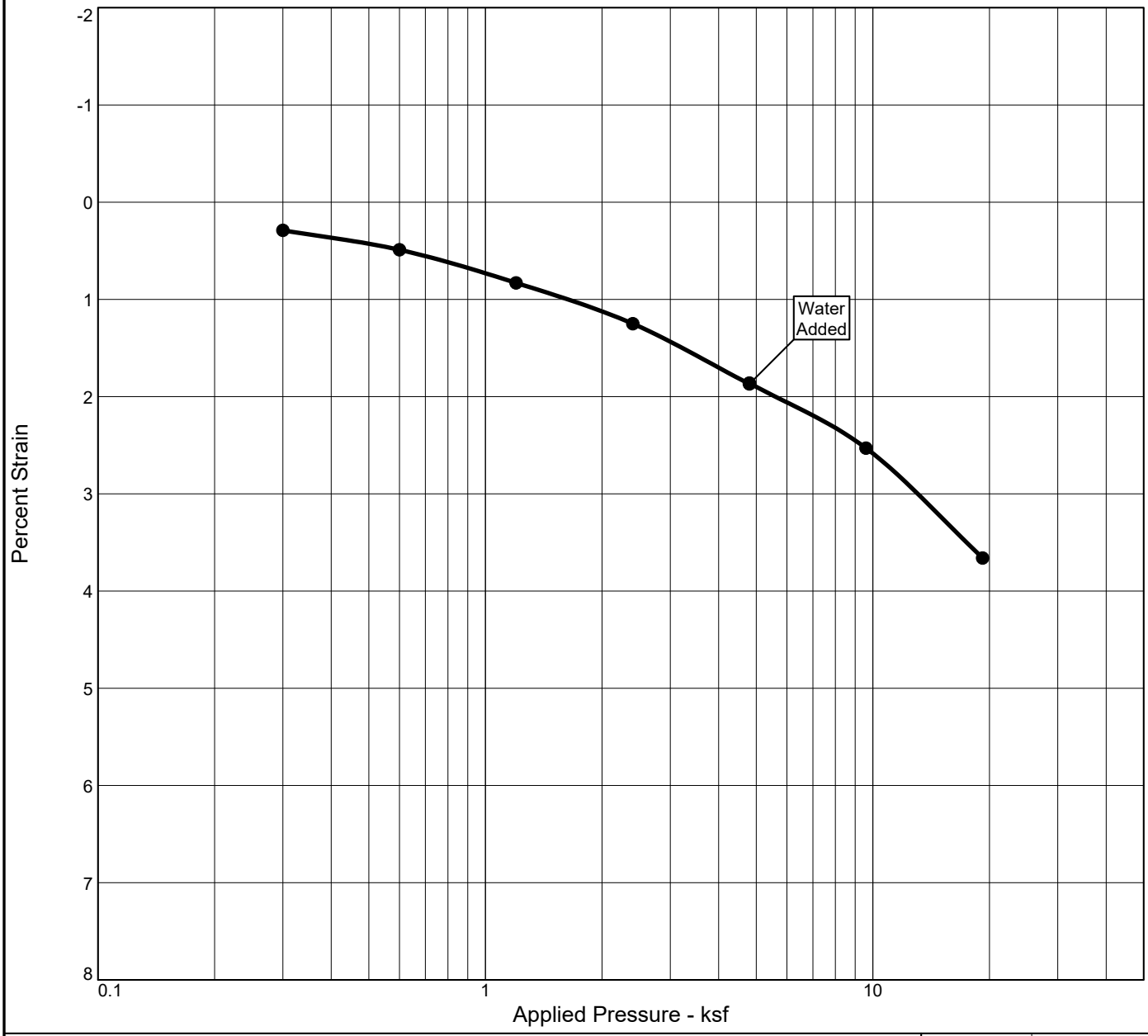
Valencia, California

Checked By: M. Neely

Title: Geotechnical Engineer

Figure B4.13

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty SAND	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	5.4	104.9	108.7	10.8 %	19.6	49.5 %	100.0	0.577	0.520	10.2	0.06

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 4,800 psf

D2435 Method	C_r	Swell Press. (ksf)	Swell %
D4546		0.1	0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-15 **Depth:** 45

Remarks:

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

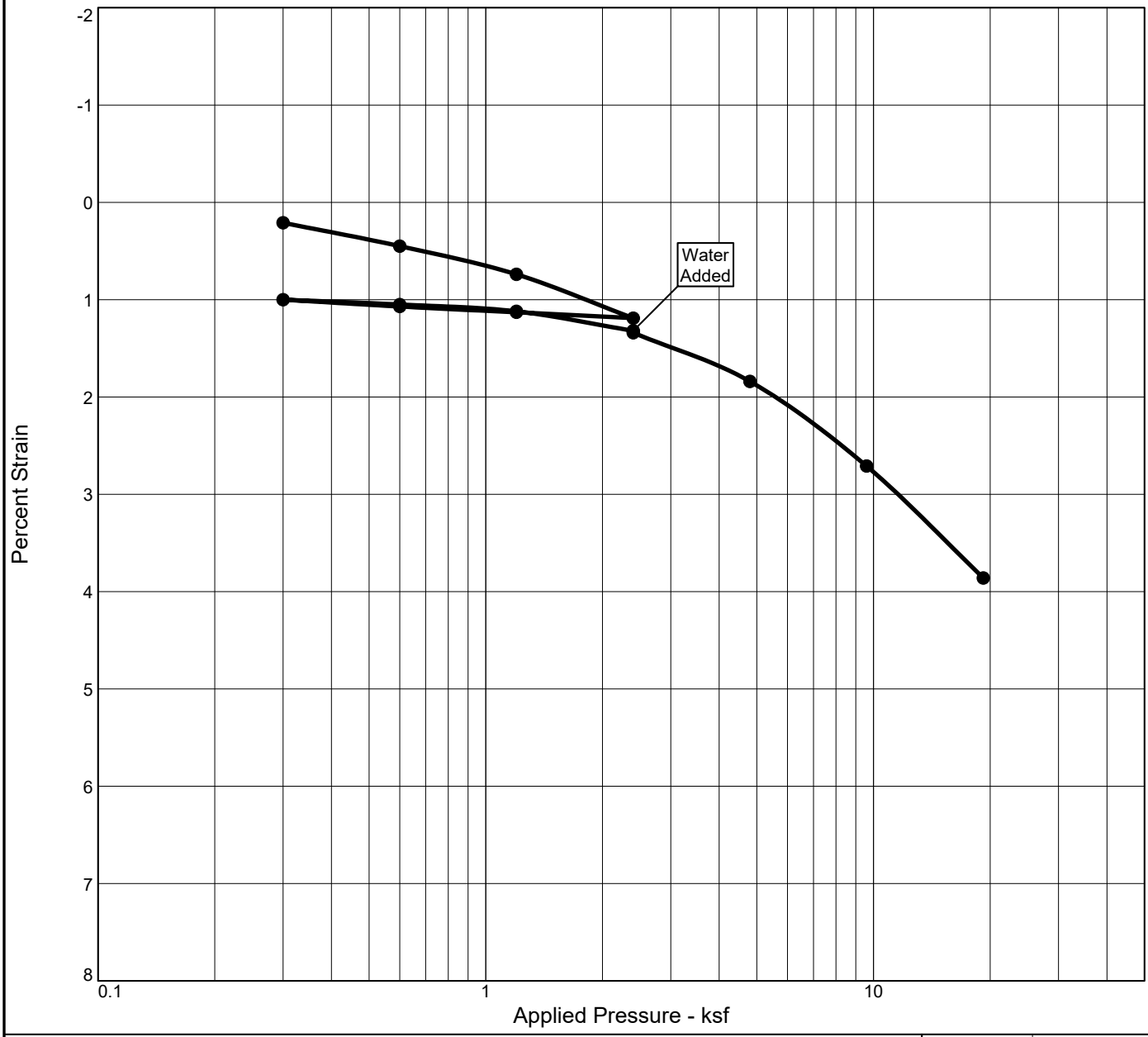
Valencia, California

Checked By: M. Neely

Title: Geotechnical Engineer

Figure B4.14

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty, fine-grained sand	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	2.625	112.4	116.9	15.3 %	15.7	85.8 %	100.0	0.472	0.415	6.2	0.06

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 2,400 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-38 **Depth:** 20'

Remarks:
Alluvium (Qa)
% Fines = 26.0

Checked By: M. Neely

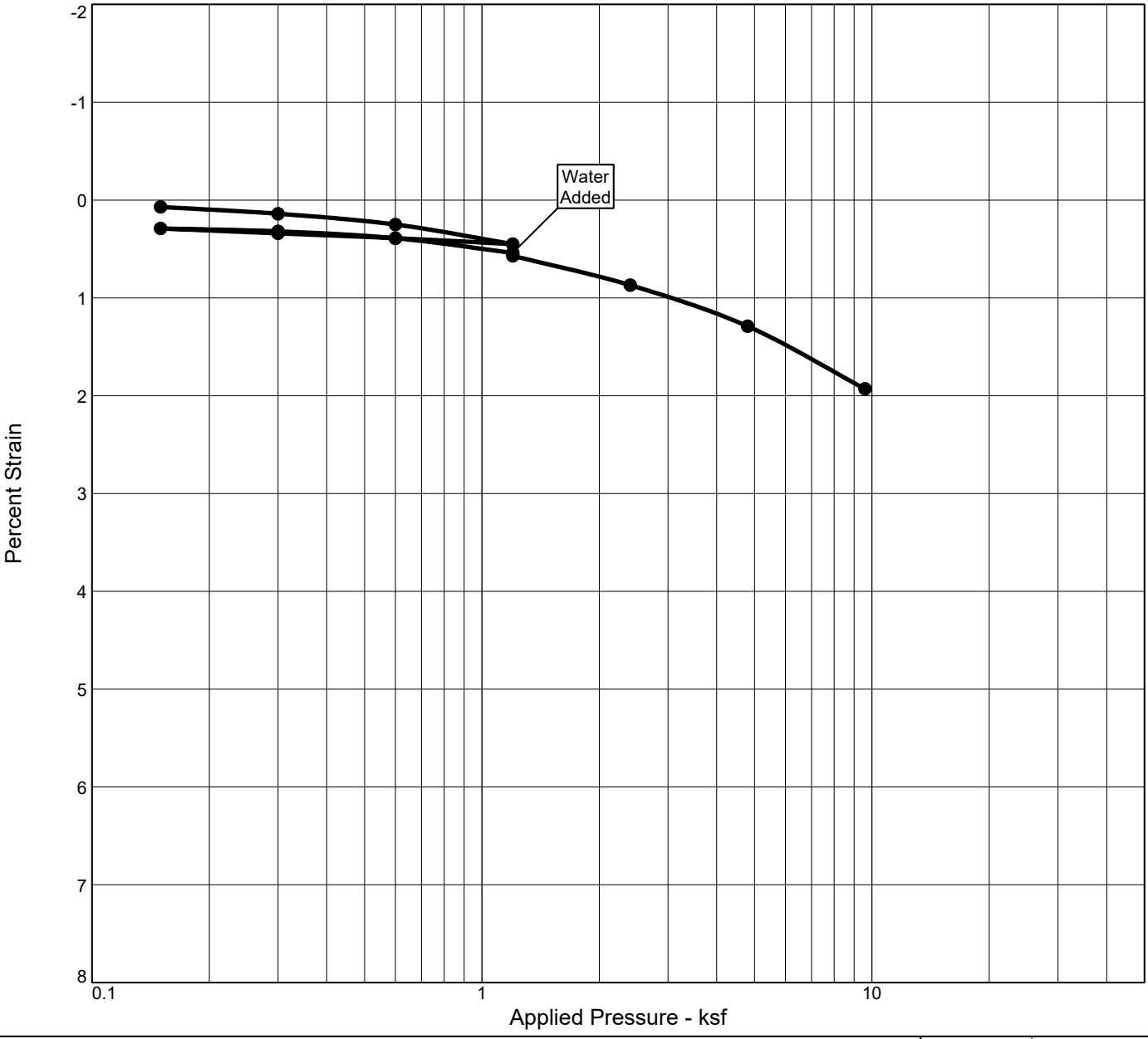
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.15

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty, fine-grained sand	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	1.25	106.3	108.5	16.2 %	19.9	77.3 %	100.0	0.556	0.526	4.3	0.03

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 1,200 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-39 **Depth:** 10'

Remarks:
Alluvium (Qa)
% Fines = 23.5

Checked By: M. Neely

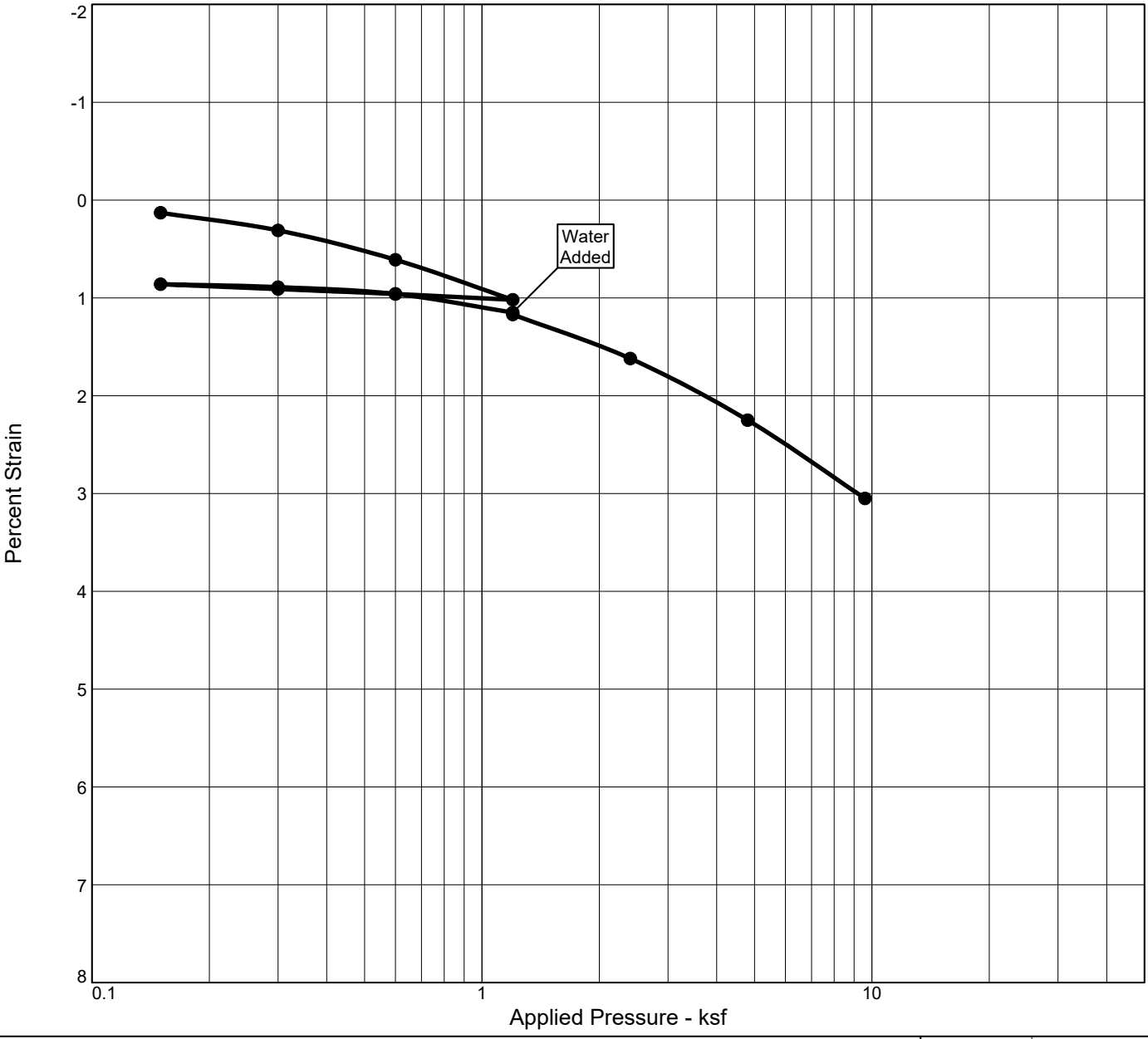
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.16

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty, clayey sand	SC-SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	1.25	105.7	109.0	18.6 %	19.5	87.1 %	100.0	0.564	0.517	3.1	0.04

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 1,200 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-40 **Depth:** 10'

Remarks:
Alluvium (Qa)
% Fines = 27.6

Checked By: M. Neely

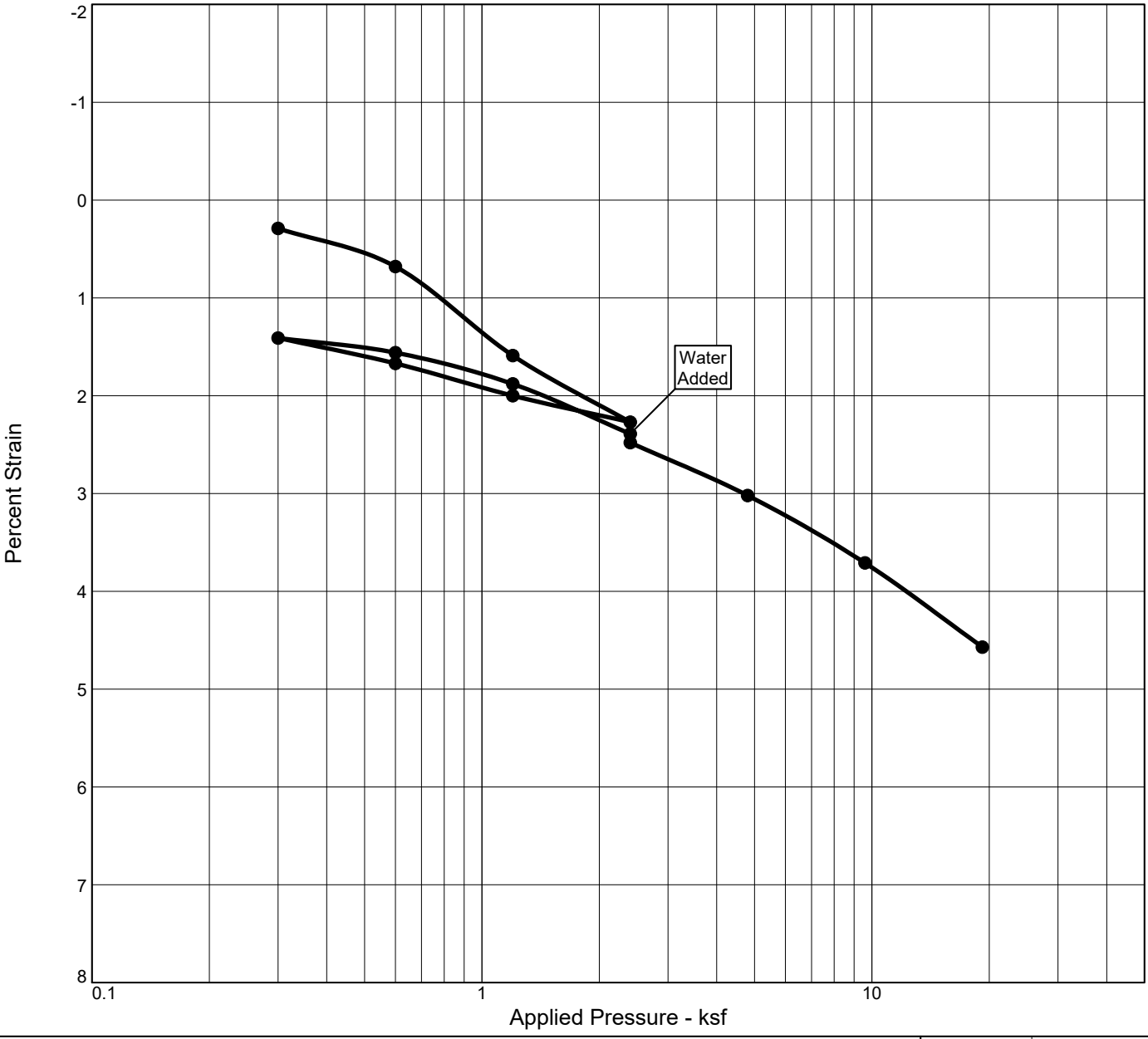
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.17

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
poorly graded sand with silt	SP-SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	2.5	104.0	109.0	16.3 %	19.6	73.2 %	100.0	0.590	0.517	6.1	0.05

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 2,400 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.1

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-40 **Depth:** 20'

Remarks:
Alluvium (Qa)
% Fines = 10.8

Checked By: M. Neely

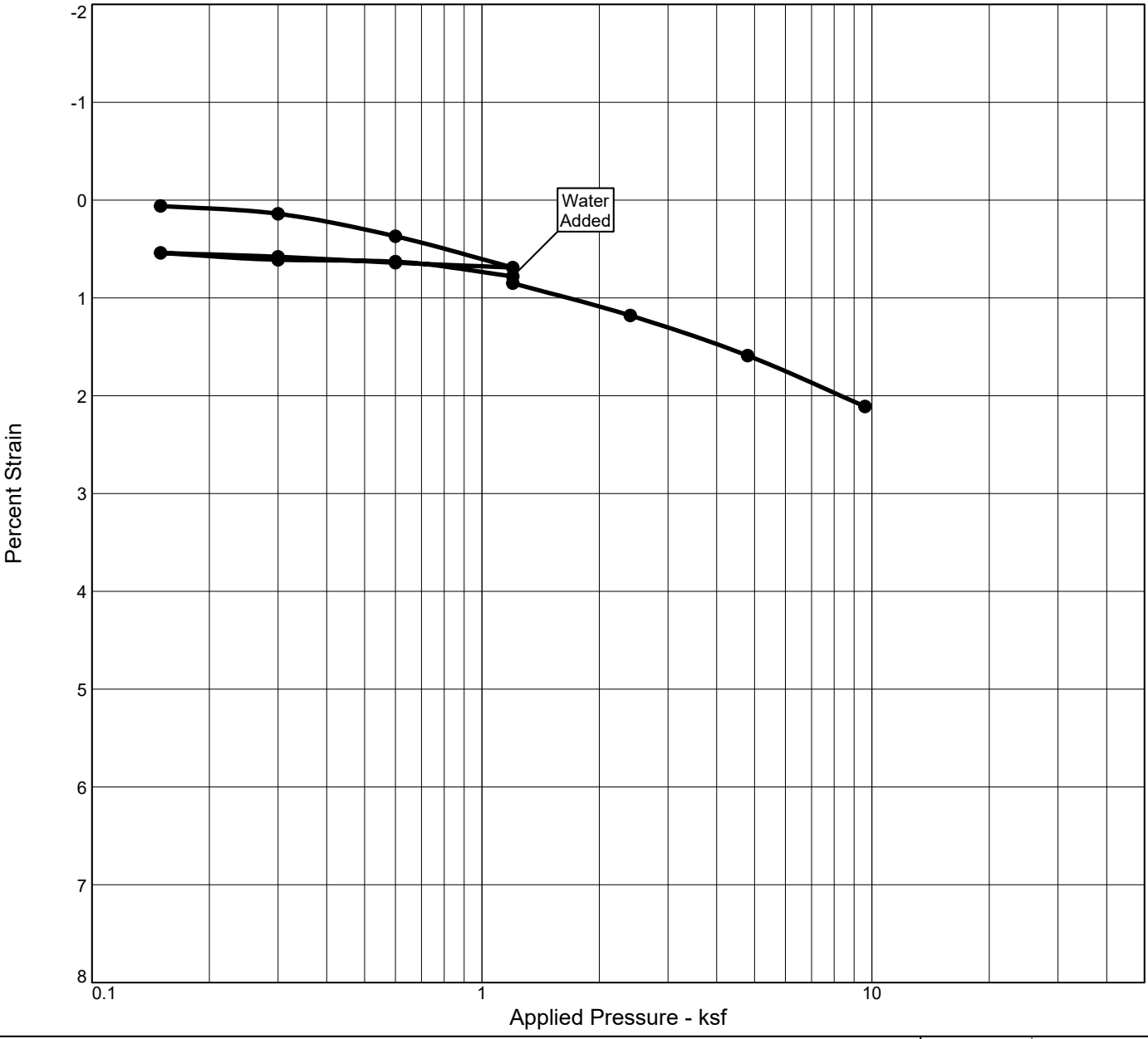
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.18

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty, clayey sand	SC-SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	1.25	105.6	107.9	15.3 %	20.1	71.6 %	100.0	0.566	0.533	4.3	0.03

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 1,200 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.1

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-41 **Depth:** 10'

Remarks:
Alluvium (Qa)
% Fines = 13.2

Checked By: M. Neely

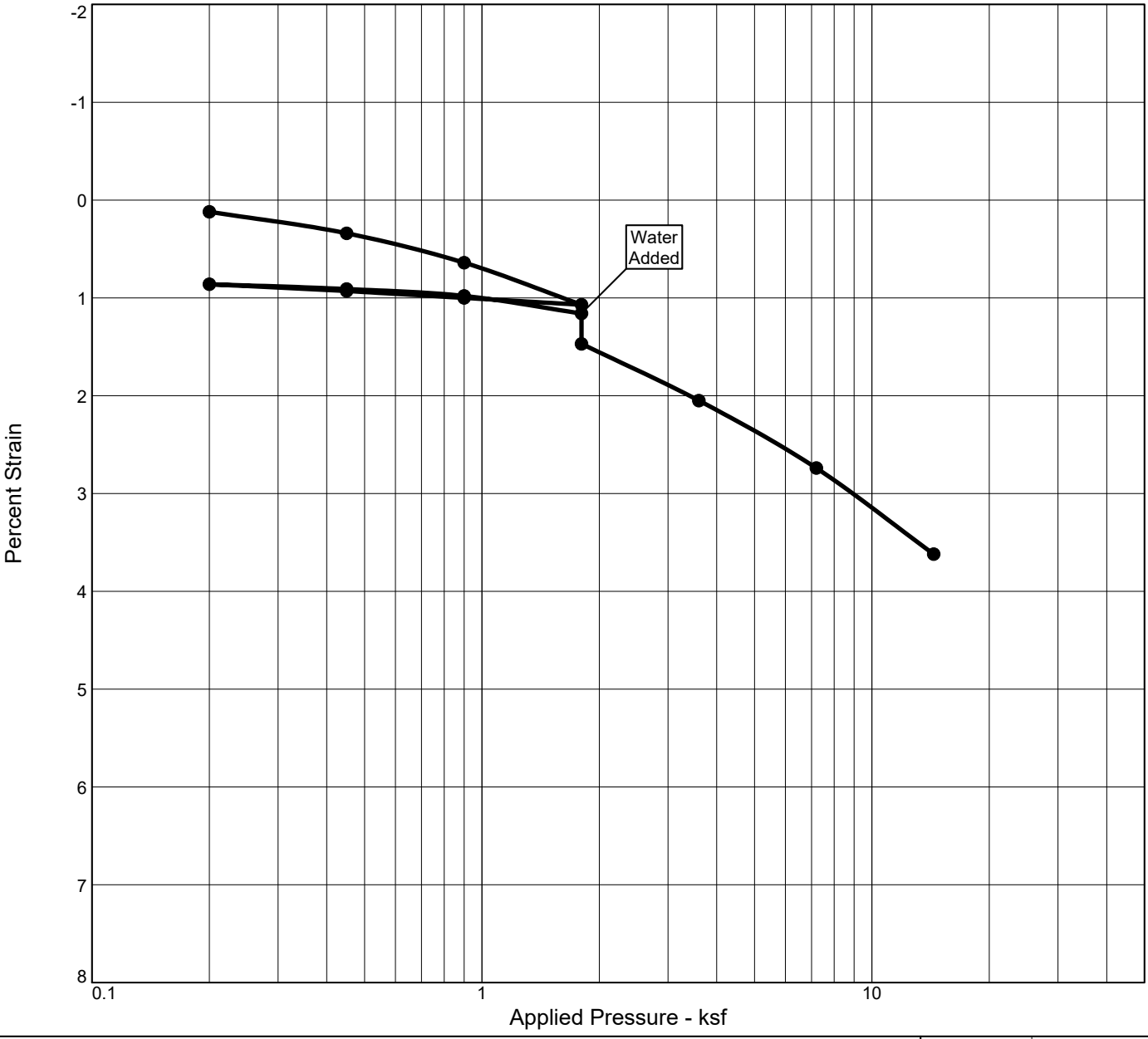
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.19

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty, clayey sand	SC-SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	1.88	102.0	105.8	9.9 %	21.3	42.1 %	100.0	0.622	0.563	7.4	0.05

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 1,800 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.3

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-41 **Depth:** 15'

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

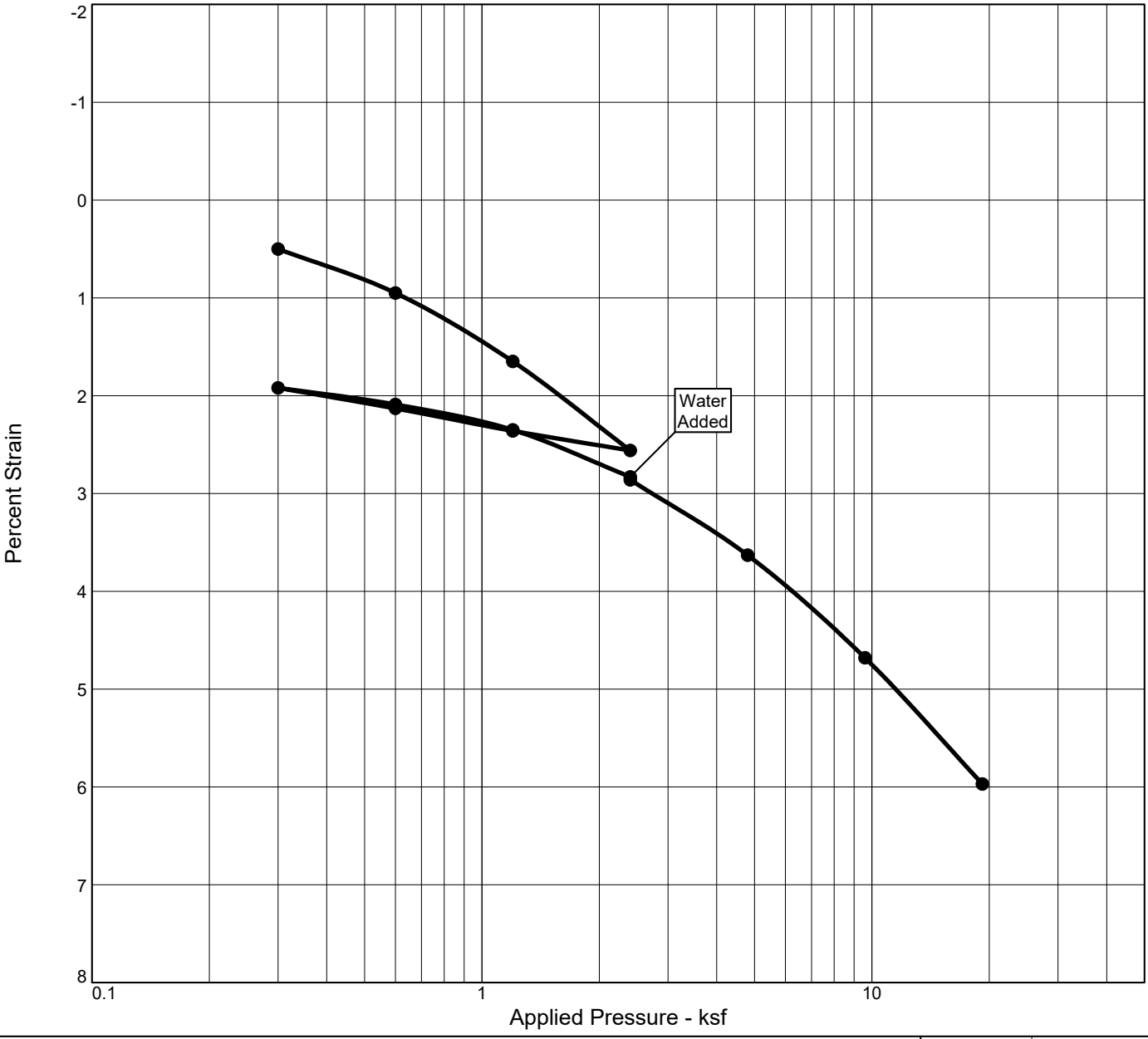
Remarks:
Alluvium (Qa)
% Fines = 15.7

Checked By: M. Neely

Title: Geotechnical Engineer

Figure B4.20

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
silty sand	SM	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	2.5	111.6	118.7	15.1 %	14.9	82.9 %	100.0	0.482	0.394	6.0	0.06

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 2,400 psf

D2435 Method	C_r	Swell Press. (ksf)	Clpse. %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-45 **Depth:** 20'

Remarks:
Alluvium (Qa)
% Fines = 24.0

Checked By: M. Neely

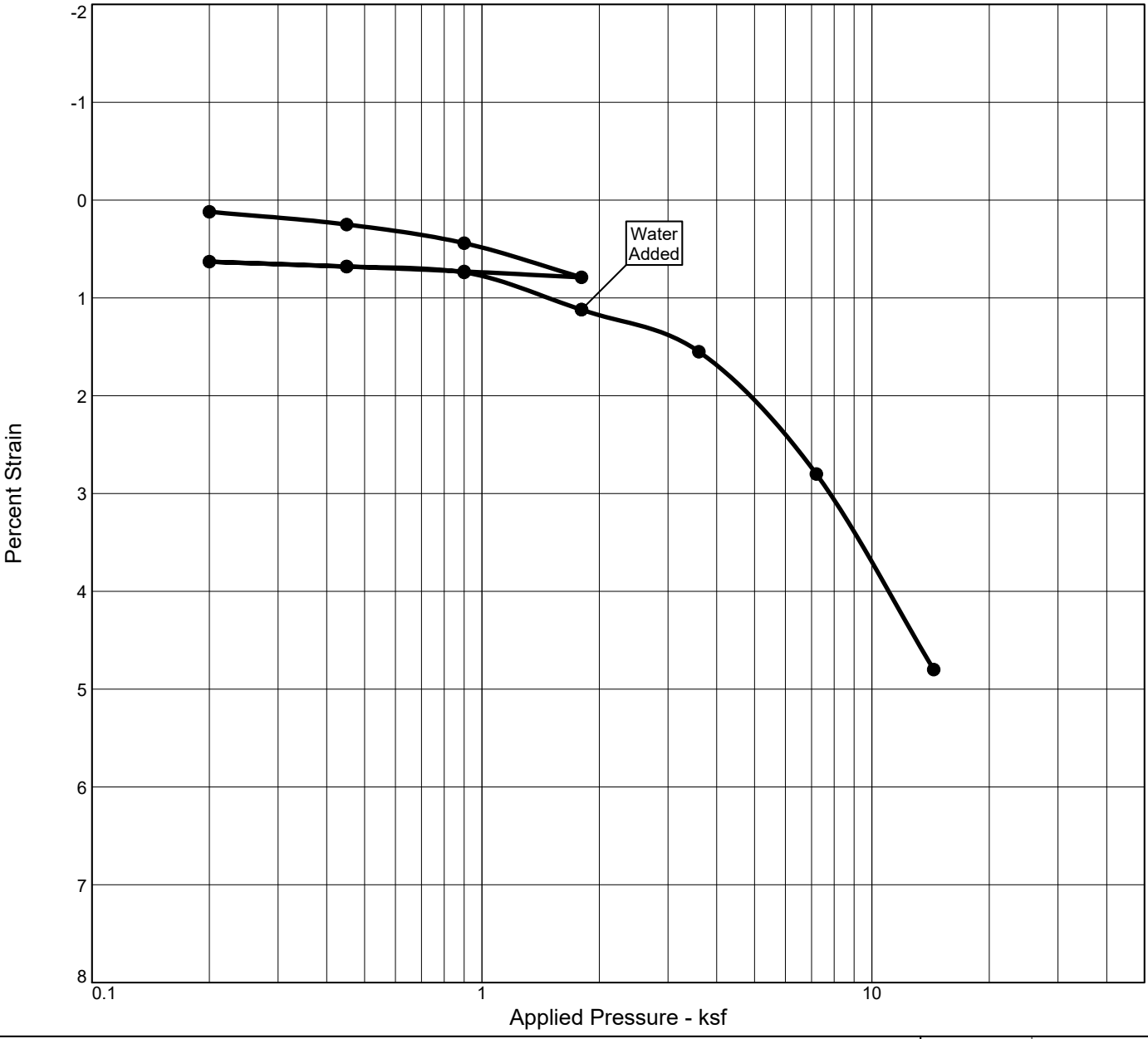
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.21

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
clayey sand	SC	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	1.85	110.7	116.3	17.1 %	16.0	91.7 %	100.0	0.494	0.423	5.1	0.10

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 1,800 psf

D2435 Method	C_r	Swell Press. (ksf)	Swell %
D4546			0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-47 **Depth:** 15'

Remarks:
Alluvium (Qa)
% Fines = 47.0

Checked By: M. Neely

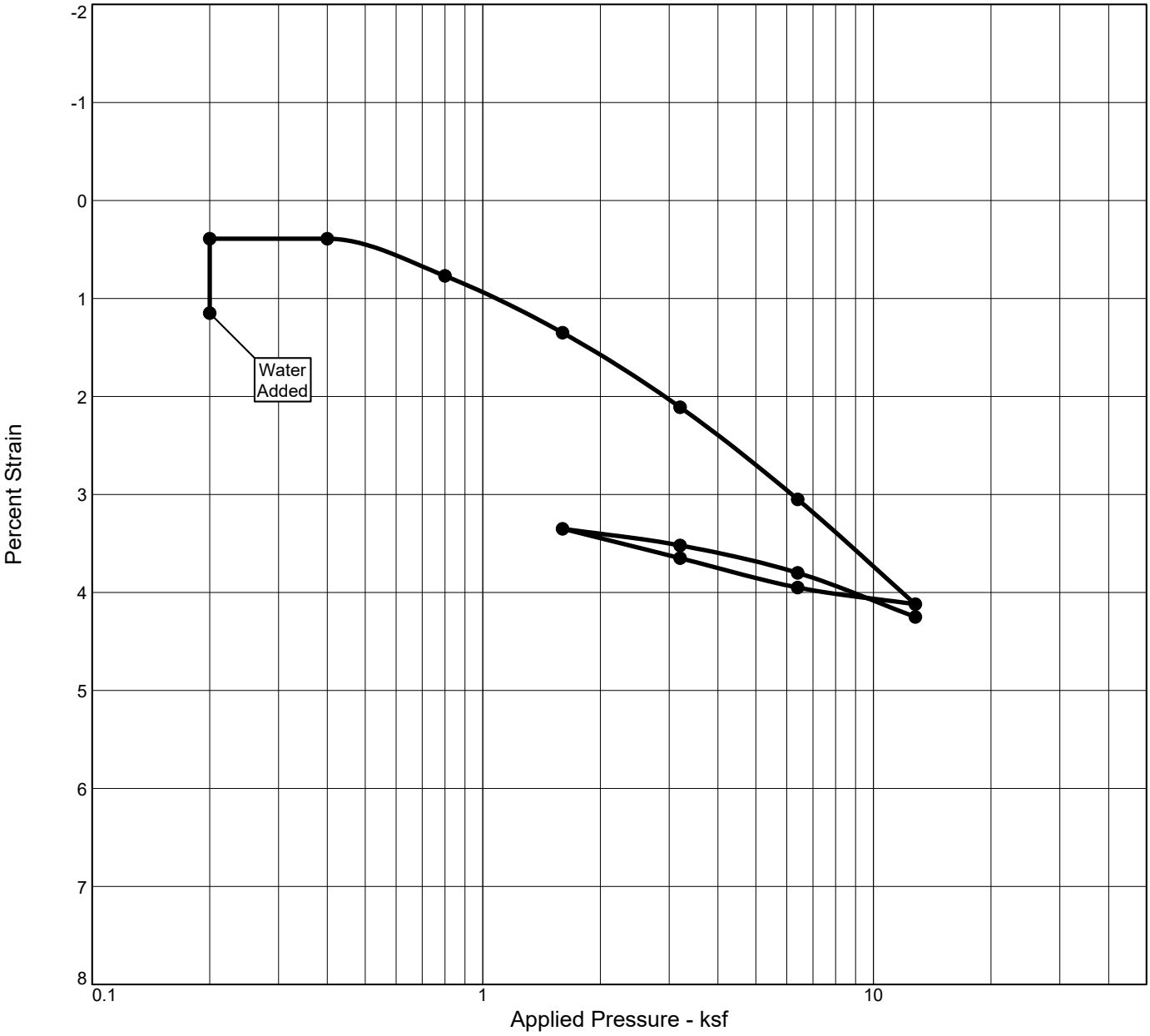
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B4.22

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
sandy clay	CL	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	2.0	113.9	119.0	14.8 %	14.8	86.7 %	100.0	0.453	0.391	2.1	0.05

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 200 psf

D2435 Method	C_r	Swell Press. (ksf)	Swell %
B		1.1	0.8

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-39 **Depth:** 15'

Remarks:
Alluvium (Qa)
% Fines = 52.5

Checked By: M. Neely

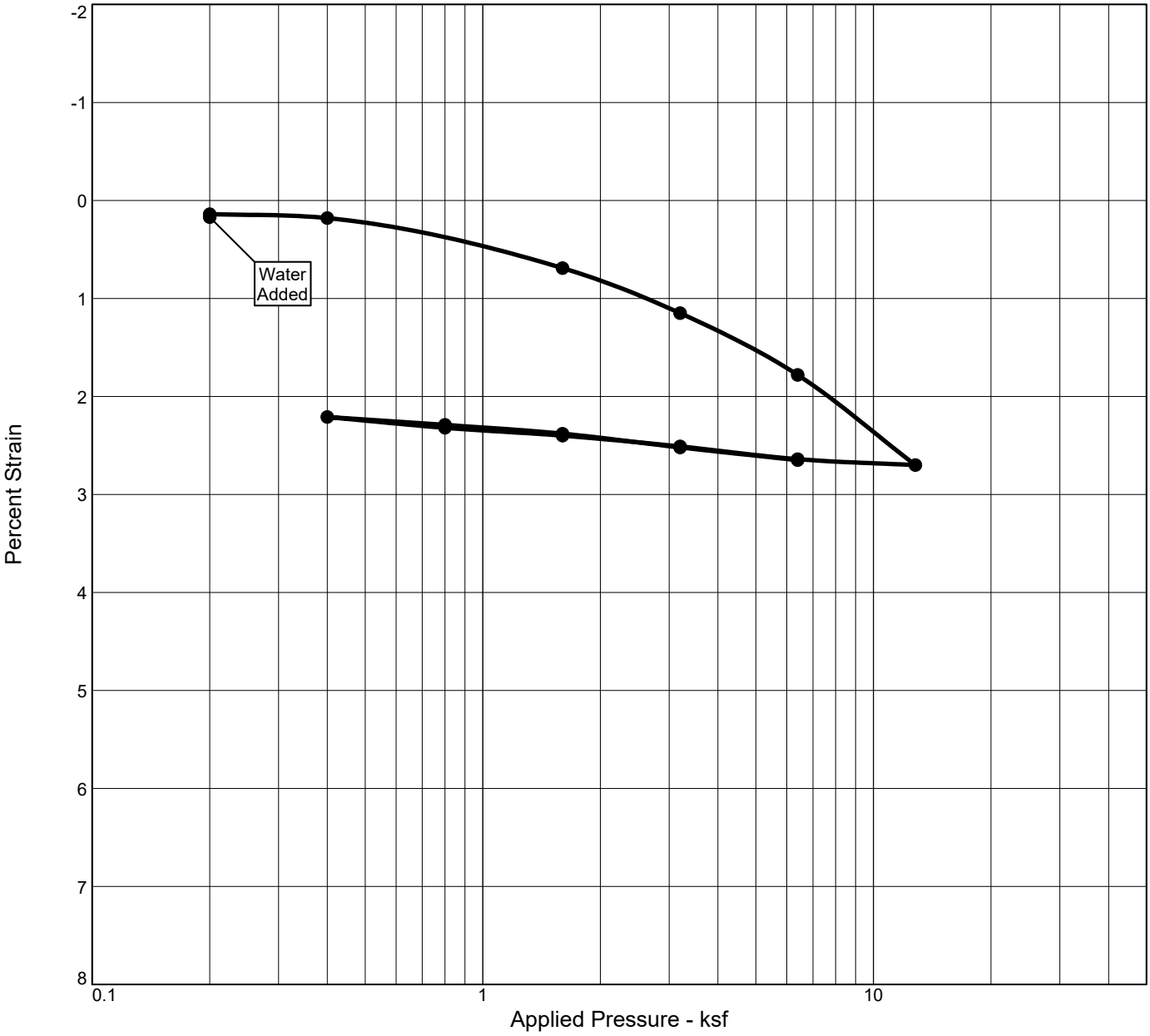
Title: Geotechnical Engineer

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Figure B5.1

SWELL/CONSOLIDATION TEST REPORT



MATERIAL DESCRIPTION	USCS	AASHTO
sandy silt	ML	

LL	PI	Sp. Gr.	Overburden (ksf)	Dry Dens. (pcf)		Moisture		Saturation		Void Ratio		P_c (ksf)	C_c
				Init.	Final	Init.	Final	Init.	Final	Init.	Final		
		2.65	1.32	105.1	108.3	16.7 %	20.1	77.2 %	100.0	0.573	0.532	2.2	0.05

Preparation Process: Tested directly in a ring from a ring lined sampler

Condition of Test: Inundated with distilled water at 200 psf

D2435 Method	C_r	Swell Press. (ksf)	Swell %
B		0.2	0.0

Project No. 23-2195s-1 **Client:** Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA

Source of Sample: HS-48 **Depth:** 10'

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.

Valencia, California

Remarks:
Alluvium (Qa)
% Fines = 51.1

Checked By: M. Neely

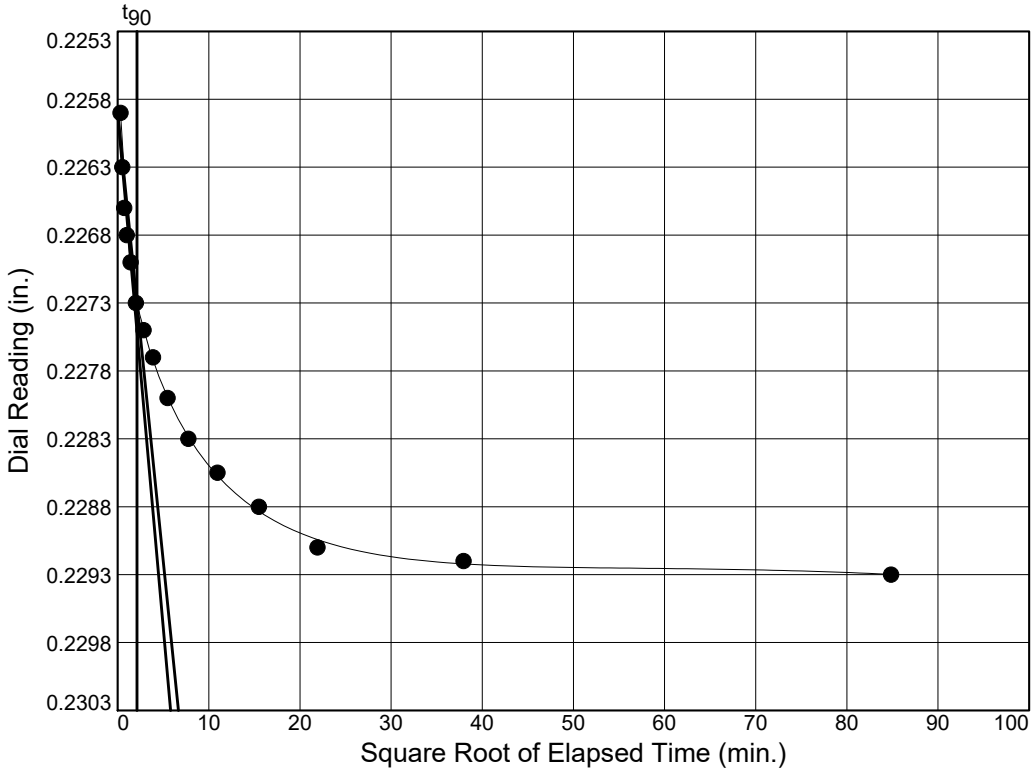
Title: Geotechnical Engineer

Figure B5.2

Dial Reading vs. Time

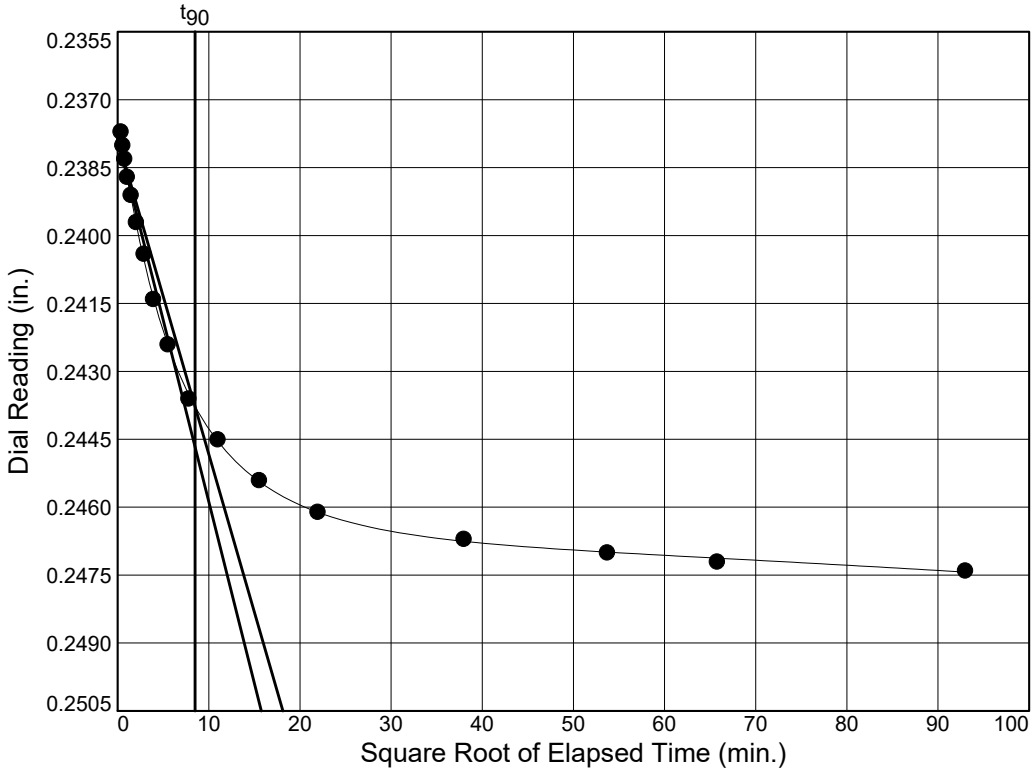
Project No.: 23-2195s-1
Project: Solomon Hills Specific Plan

Source of Sample: HS-39 Depth: 15'



Load No.= 5
Load= 1.60 ksf
D_0 = 0.2259
D_{90} = 0.2273
D_{100} = 0.2275
T_{90} = 4.48 min.

C_v @ T_{90}
0.047 $in.^2$/min.



Load No.= 7
Load= 6.40 ksf
D_0 = 0.2379
D_{90} = 0.2438
D_{100} = 0.2444
T_{90} = 72.03 min.

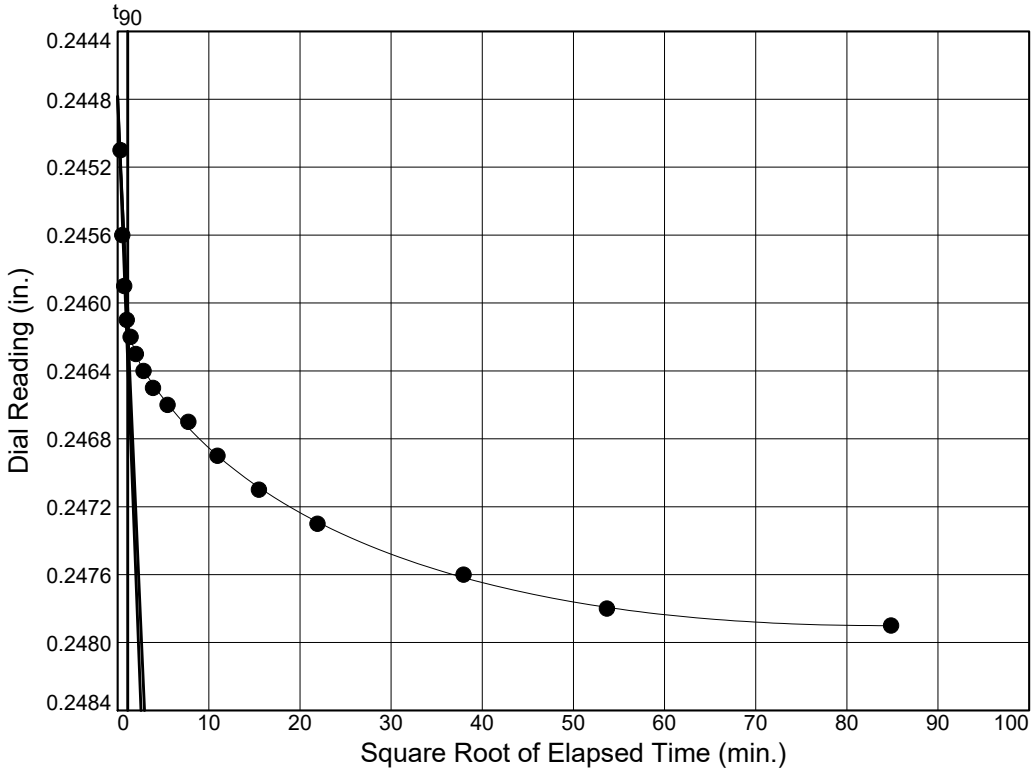
C_v @ T_{90}
0.003 $in.^2$/min.

Figure B6.1

Dial Reading vs. Time

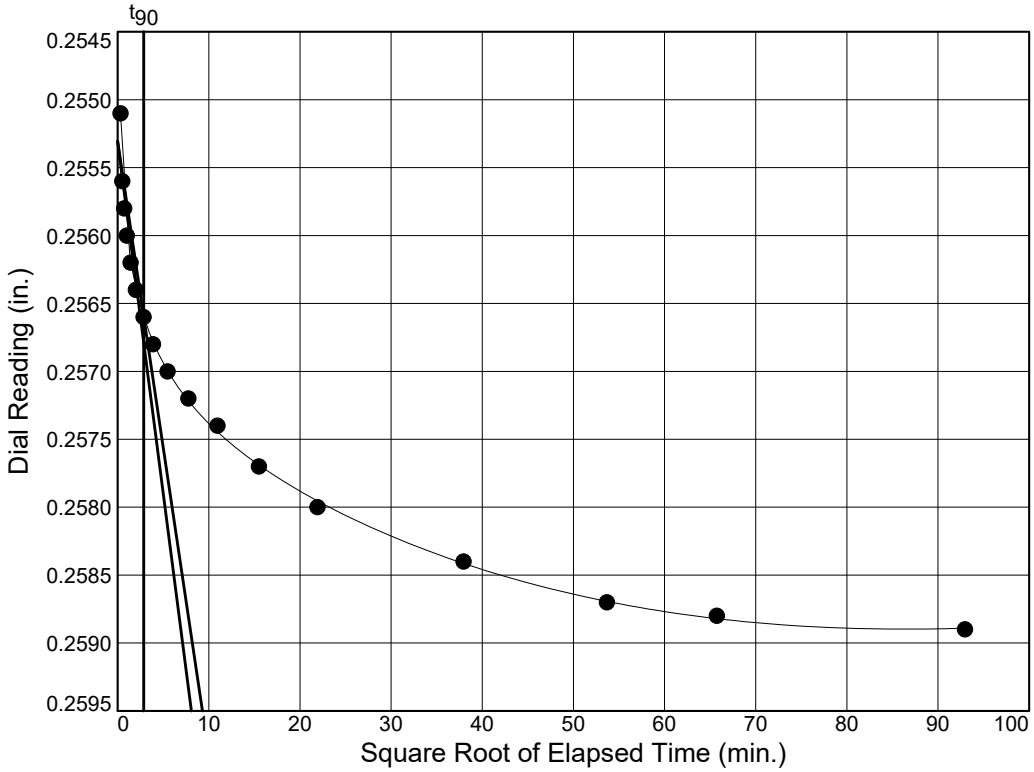
Project No.: 23-2195s-1
Project: Solomon Hills Specific Plan

Source of Sample: HS-48 Depth: 10



Load No.= 3
Load= 0.80 ksf
D_0 = 0.2448
D_{90} = 0.2461
D_{100} = 0.2463
T_{90} = 1.20 min.

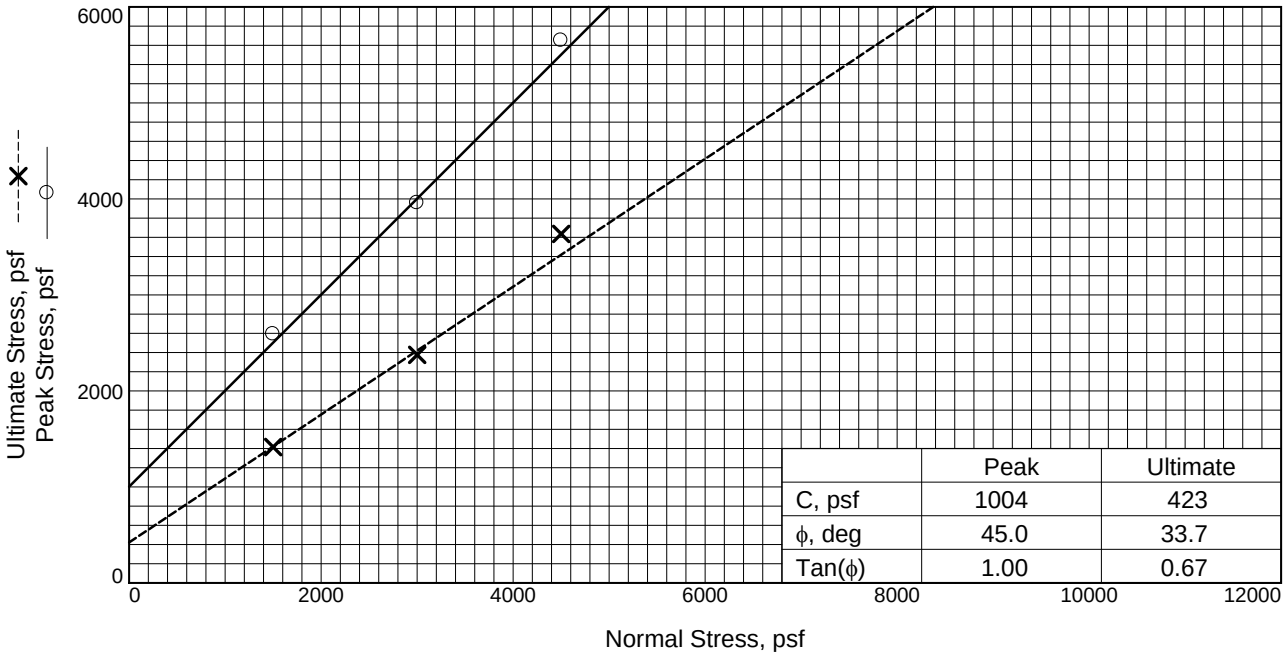
C_v @ T_{90}
0.175 $in.^2$/min.



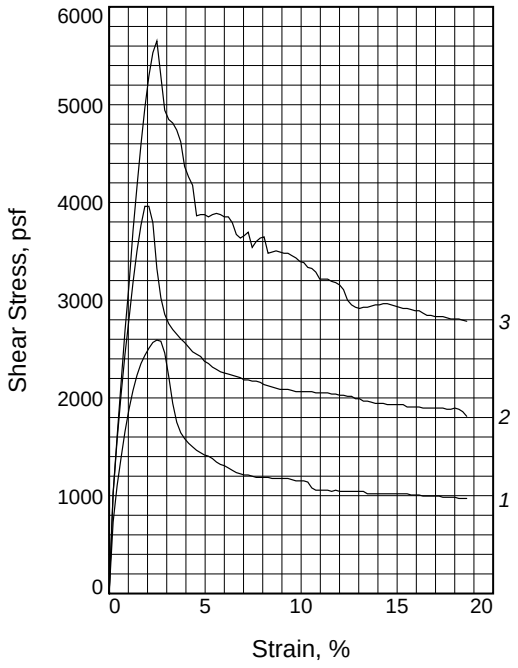
Load No.= 5
Load= 3.20 ksf
D_0 = 0.2553
D_{90} = 0.2566
D_{100} = 0.2567
T_{90} = 8.17 min.

C_v @ T_{90}
0.025 $in.^2$/min.

Figure B6.2



	Peak	Ultimate
C, psf	1004	423
ϕ, deg	45.0	33.7
Tan(ϕ)	1.00	0.67



Sample No.		1	2	3
Initial	Water Content, %	24.4	23.3	22.5
	Dry Density, pcf	98.3	98.8	100.5
	Saturation, %	94.9	91.5	92.3
	Void Ratio	0.6824	0.6738	0.6461
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	25.4	24.7	23.3
	Dry Density, pcf	98.8	99.9	102.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6740	0.6552	0.6186
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	0.99	0.98
Normal Stress, psf		1500	3000	4500
Peak Stress, psf		2592	3960	5651
Strain, %		2.5	1.9	2.5
Ultimate Stress, psf		1416	2376	3636
Strain, %		5.0	5.0	7.9
Strain rate, in./min.		0.005	0.005	0.005

Sample Type: Undisturbed
Description: Claystone with sand

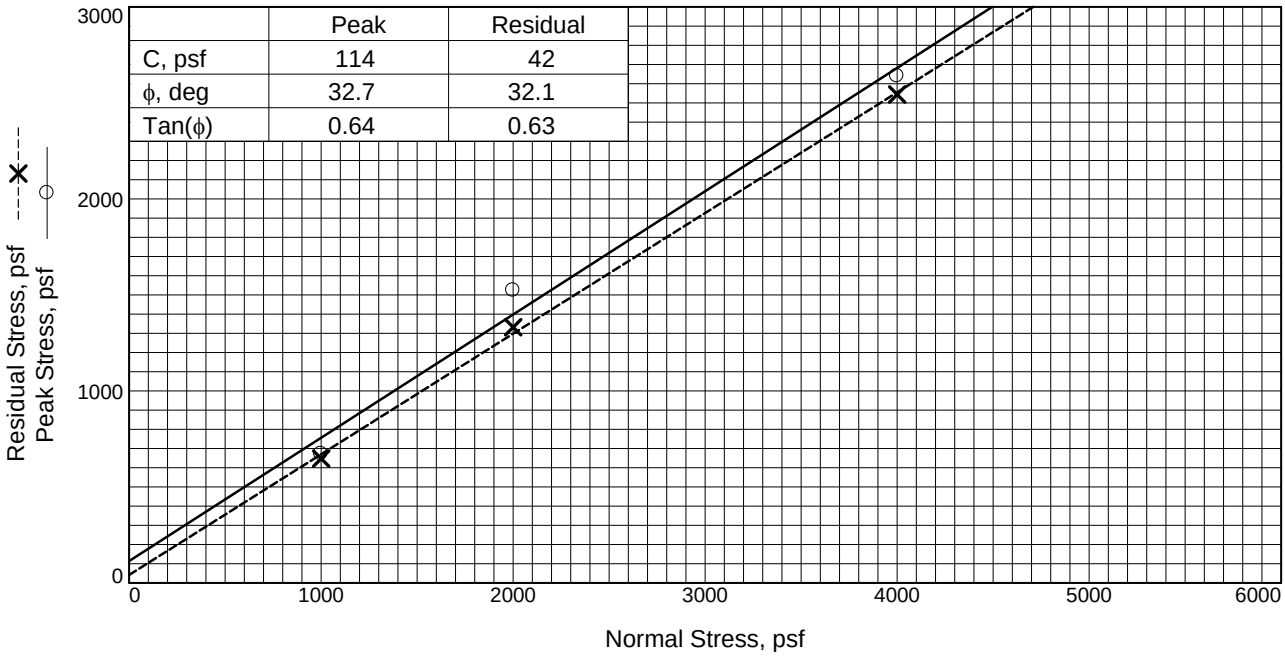
LL= 43 **PL=** 23 **PI=** 20
Specific Gravity= 2.65
Remarks: Bedrock/Landslide? (Tcac/Qls?)
Carreaga Formation, Cebada member
Cross bedding
% Fines = 82.3
Figure B7.1

Client: Solstra Communities California LLC

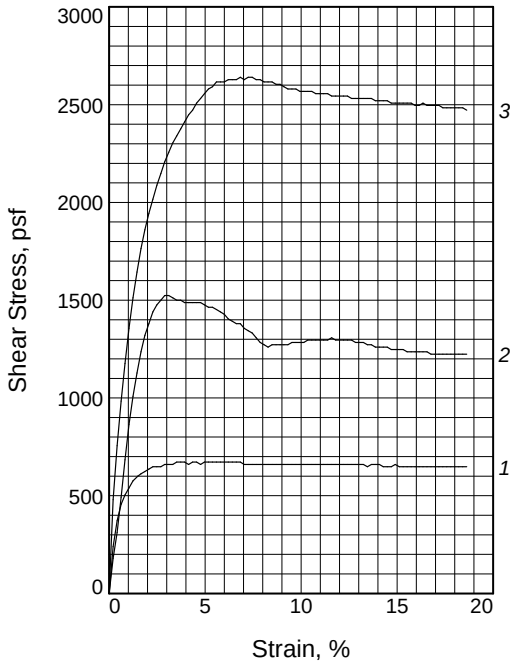
Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-3 **Depth:** 30'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California



	Peak	Residual
C, psf	114	42
ϕ, deg	32.7	32.1
Tan(ϕ)	0.64	0.63



Sample No.		1	2	3
Initial	Water Content, %	8.6	9.0	10.3
	Dry Density, pcf	96.2	97.2	92.9
	Saturation, %	31.6	33.9	34.8
	Void Ratio	0.7198	0.7017	0.7810
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	26.1	25.2	26.1
	Dry Density, pcf	97.9	99.1	97.8
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6905	0.6689	0.6921
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.98	0.98	0.95
Normal Stress, psf		1000	2000	4000
Peak Stress, psf		672	1524	2640
Strain, %		3.5	2.9	6.8
Residual Stress, psf		648	1332	2544
Strain, %		18.6	7.5	12.0
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Claystone

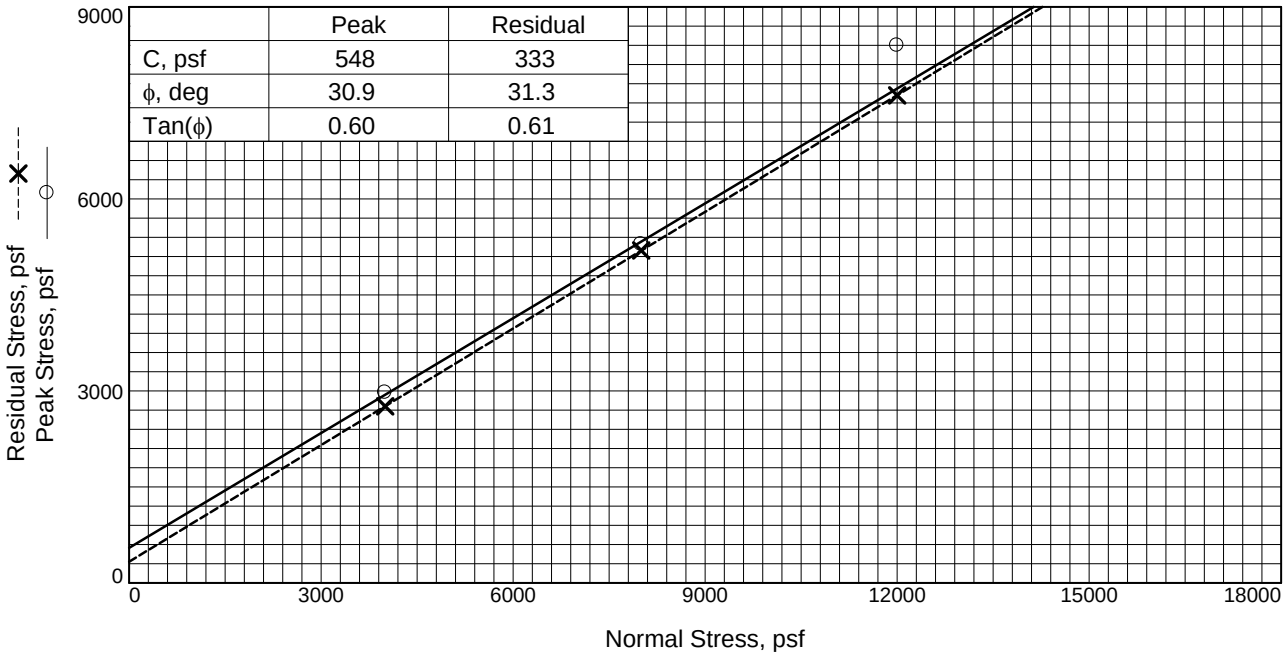
Specific Gravity= 2.65
Remarks: Bedrock (Tcac)
Carreaga Formation, Cebada member
Cross bedding
% Fines = 94.6
Figure B7.2

Client: Solstra Communities California LLC

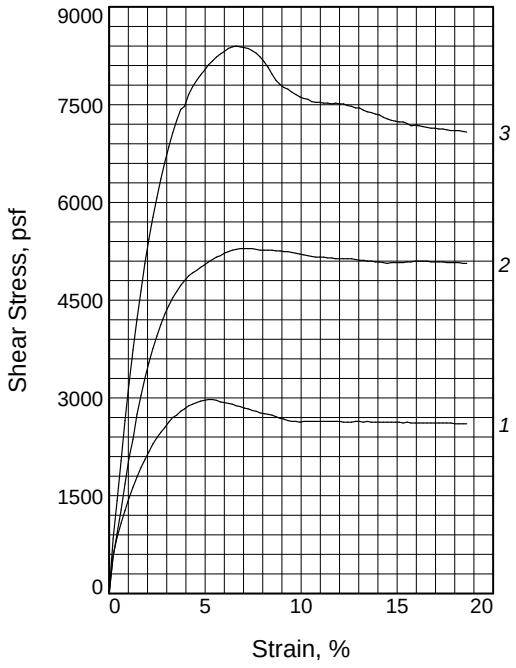
Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-9 **Depth:** 15'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California



	Peak	Residual
C, psf	548	333
ϕ, deg	30.9	31.3
Tan(ϕ)	0.60	0.61



Sample No.		1	2	3
Initial	Water Content, %	10.4	10.1	10.4
	Dry Density, pcf	94.8	95.1	98.0
	Saturation, %	37.1	36.2	40.0
	Void Ratio	0.7445	0.7396	0.6873
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	23.6	23.5	23.6
	Dry Density, pcf	99.8	100.0	103.8
	Saturation, %	95.3	95.0	105.4
	Void Ratio	0.6571	0.6540	0.5941
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.95	0.95	0.94
Normal Stress, psf		4000	8000	12000
Peak Stress, psf		2976	5292	8399
Strain, %		5.2	6.8	6.6
Residual Stress, psf		2760	5196	7619
Strain, %		8.1	10.1	9.9
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Claystone with sand

Specific Gravity= 2.65
Remarks: Bedrock (Tcac), cross bedding
Carreaga Formation, Cebada member
% Fines = 78.0

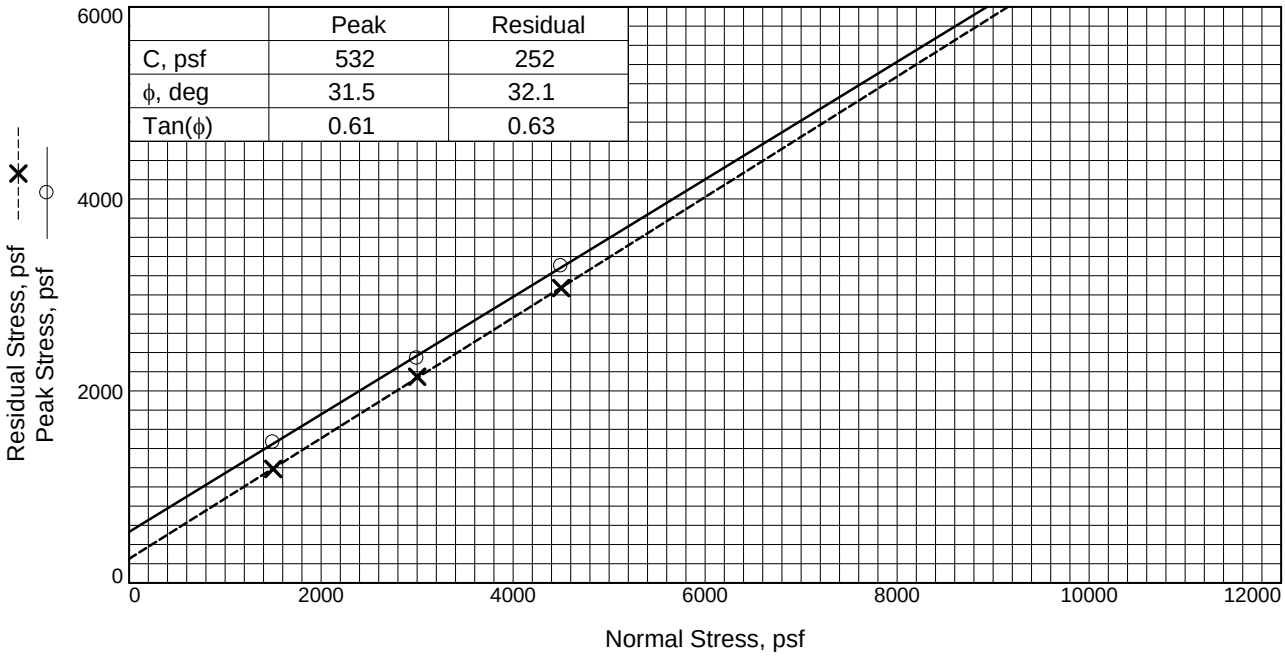
Figure B7.3

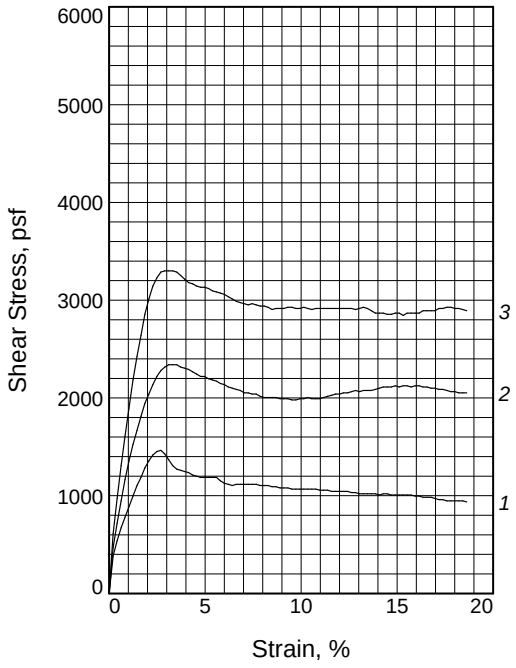
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-9 **Depth:** 65'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	8.0	8.1	8.8
	Dry Density, pcf	104.7	109.7	110.3
	Saturation, %	36.6	42.3	47.0
	Void Ratio	0.5804	0.5079	0.4994
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	20.0	17.4	16.9
	Dry Density, pcf	108.0	113.3	114.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5312	0.4607	0.4474
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.97	0.97	0.97
Normal Stress, psf		1500	3000	4500
Peak Stress, psf		1464	2340	3300
Strain, %		2.7	3.1	2.9
Residual Stress, psf		1188	2148	3072
Strain, %		5.6	5.8	5.8
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Silty sandstone

Specific Gravity= 2.65
Remarks: Bedrock (Tcac), Cross bedding
Carreage Formation, Cebada member
% Fines = 46.1

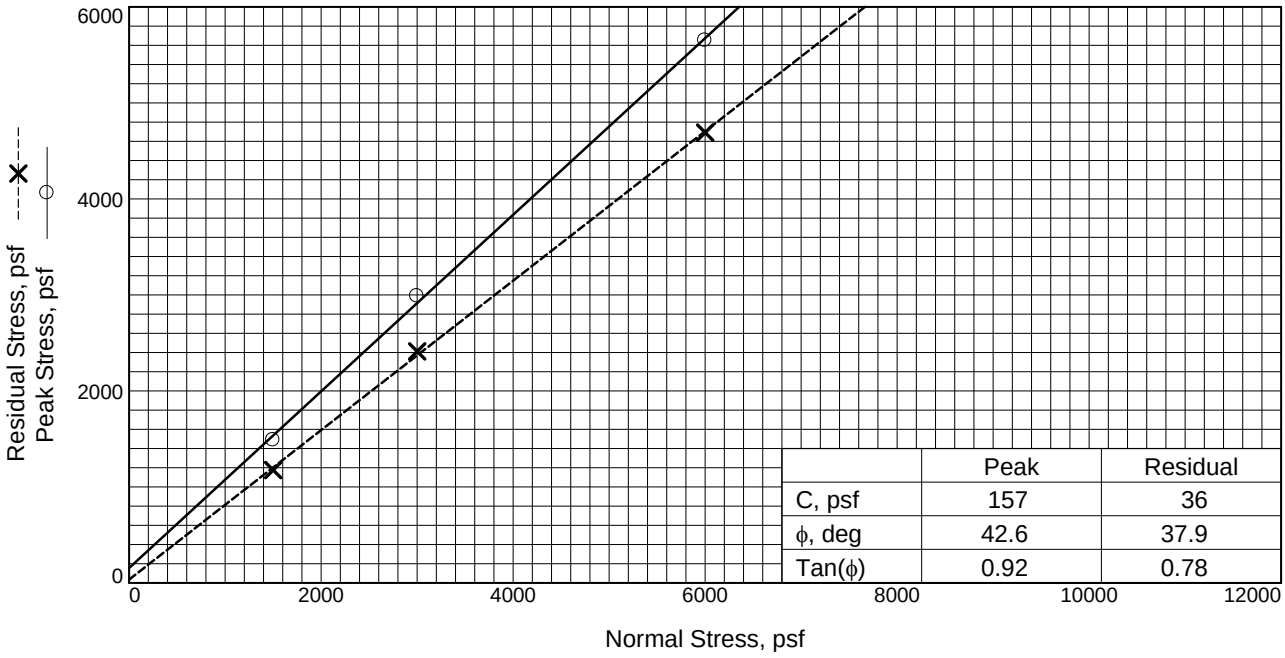
Figure B7.4

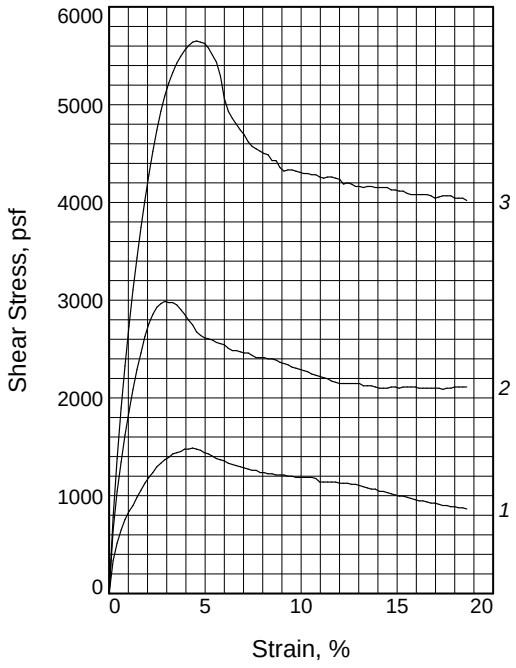
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-10 **Depth:** 25'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	16.8	16.4	16.9
	Dry Density, pcf	101.7	104.8	103.5
	Saturation, %	71.2	75.2	75.1
	Void Ratio	0.6271	0.5793	0.5984
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	27.0	24.4	24.9
	Dry Density, pcf	100.0	106.8	108.2
	Saturation, %	109.6	118.0	124.8
	Void Ratio	0.6542	0.5483	0.5289
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.02	0.98	0.96
Normal Stress, psf		1500	3000	6000
Peak Stress, psf		1488	2988	5651
Strain, %		4.3	2.9	4.6
Residual Stress, psf		1176	2412	4692
Strain, %		10.8	8.1	7.0
Strain rate, %/min.		0.0050	0.0050	0.0050

Sample Type: Undisturbed
Description: Claystone

Specific Gravity= 2.65
Remarks: Bedrock (Tcac), Cross bedding
Carreaga Formation, Cebada member
% Fines = 83.7

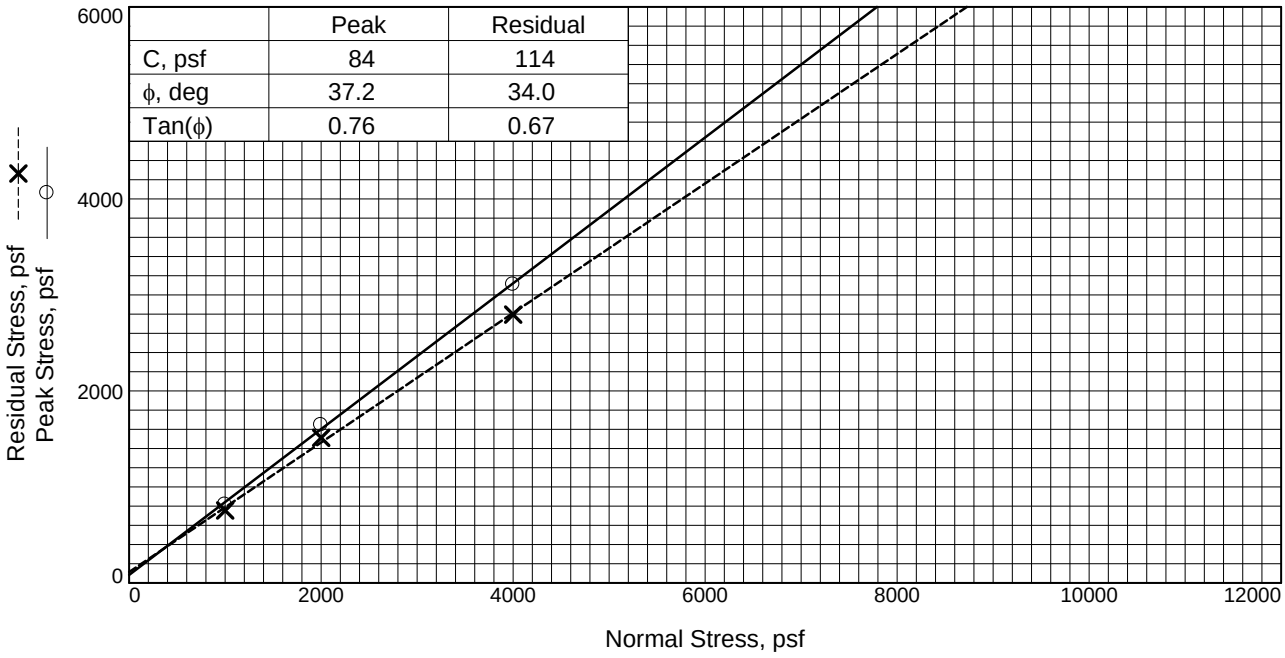
Figure B7.5

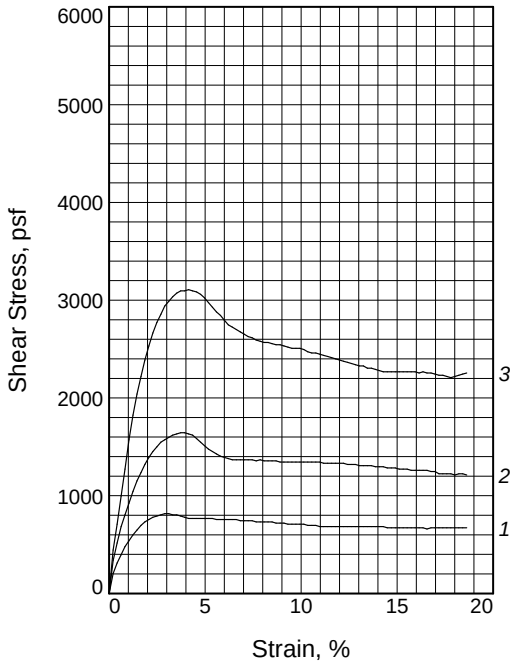
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-12 **Depth:** 15'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	9.5	9.2	11.2
	Dry Density, pcf	94.9	95.7	96.2
	Saturation, %	33.8	33.5	41.2
	Void Ratio	0.7424	0.7283	0.7202
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	21.0	21.2	21.8
	Dry Density, pcf	93.5	97.2	100.8
	Saturation, %	72.4	80.1	90.0
	Void Ratio	0.7702	0.7012	0.6420
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.02	0.98	0.95
Normal Stress, psf		1000	2000	4000
Peak Stress, psf		816	1644	3108
Strain, %		2.9	3.7	4.1
Residual Stress, psf		756	1512	2796
Strain, %		6.6	5.0	6.0
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Silty sandstone

Specific Gravity= 2.65
Remarks: Bedrock (Tcag), Cross bedding
Carreaga Formation, Graciosa member
% Fines = 12.5

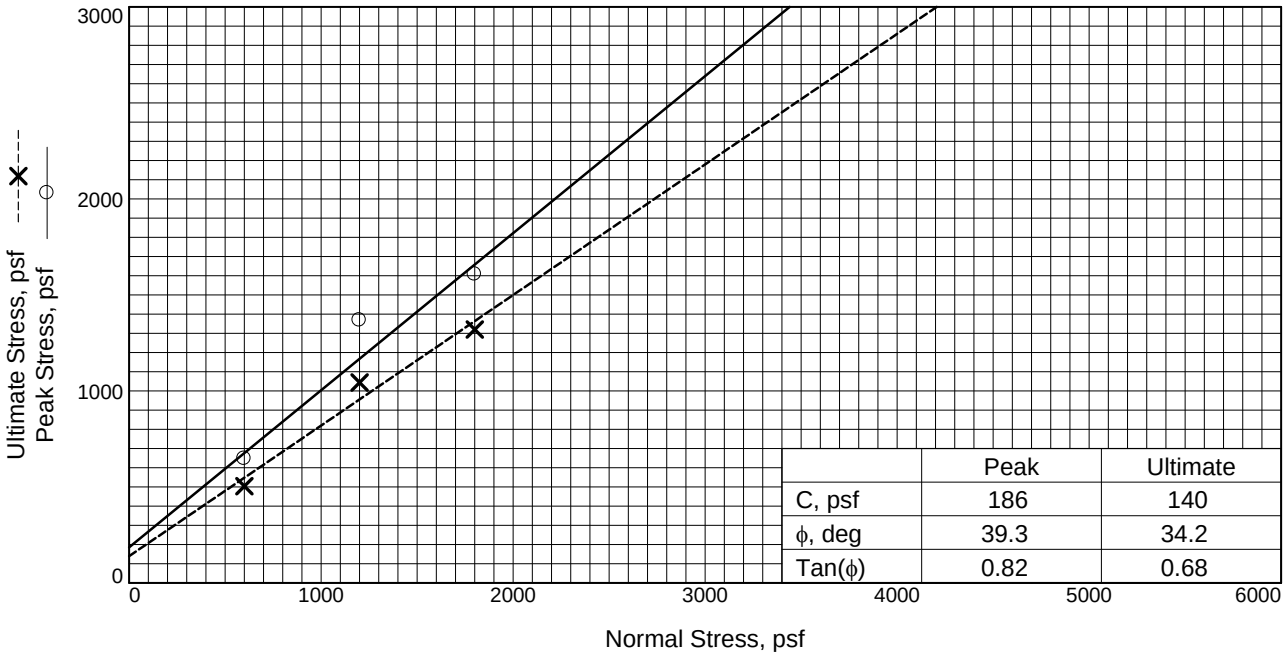
Figure B7.6

Client: Solstra Communities California LLC

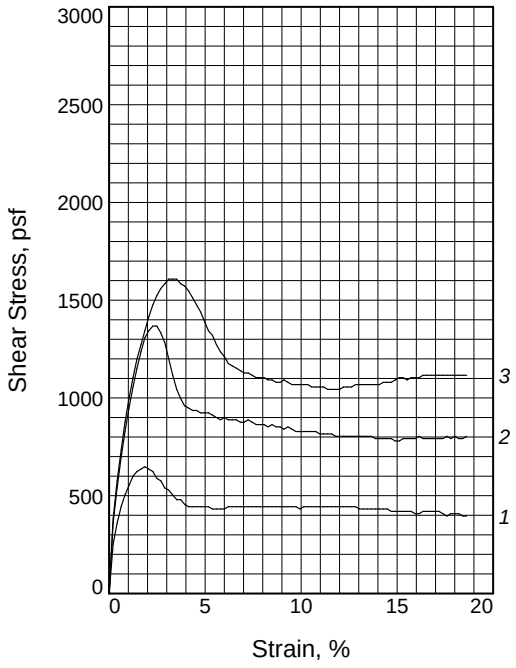
Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-20 **Depth:** 5'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California



	Peak	Ultimate
C, psf	186	140
ϕ, deg	39.3	34.2
Tan(ϕ)	0.82	0.68



Sample No.		1	2	3
Initial	Water Content, %	8.6	9.7	8.8
	Dry Density, pcf	106.4	108.9	106.1
	Saturation, %	42.4	51.4	43.2
	Void Ratio	0.5253	0.4902	0.5298
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	19.9	17.9	19.6
	Dry Density, pcf	107.0	110.7	107.4
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5164	0.4667	0.5110
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.98	0.99
Normal Stress, psf		600	1200	1800
Peak Stress, psf		648	1368	1608
Strain, %		1.9	2.3	3.1
Ultimate Stress, psf		504	1044	1320
Strain, %		3.3	3.5	5.4
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Undisturbed
Description: Silty sandstone

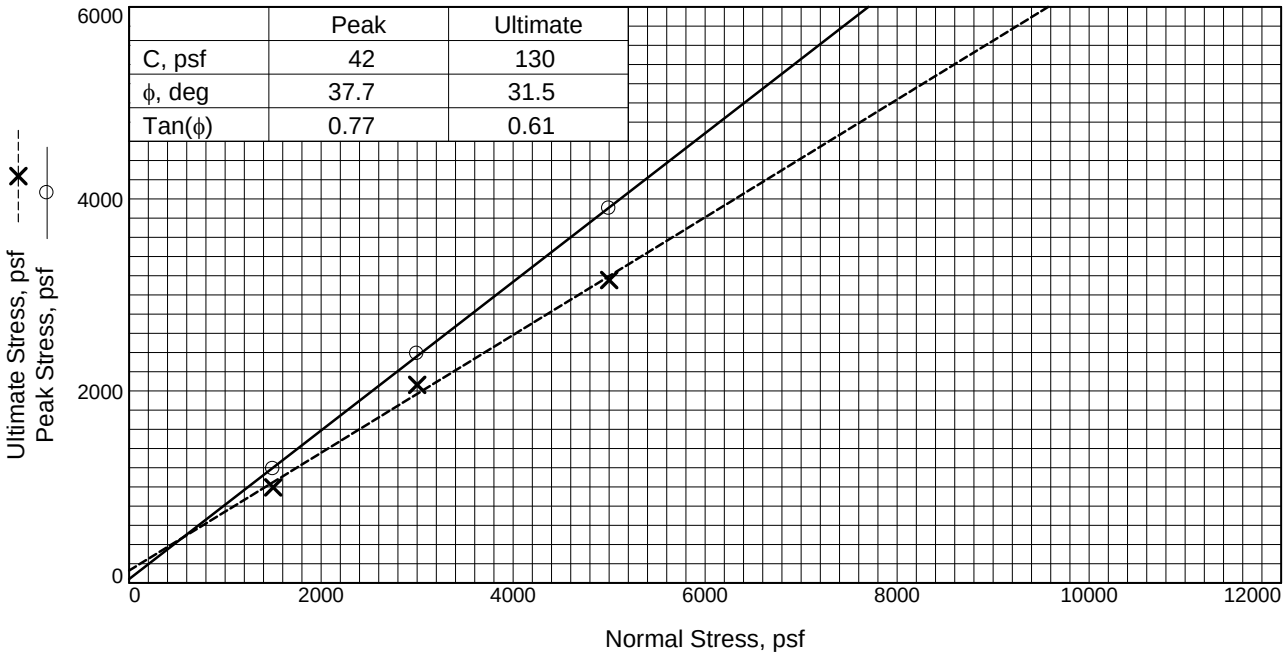
Specific Gravity= 2.60
Remarks: Bedrock (Tcag)
Cross bedding
Carreaga Formation, Graciosa member
% Fines = 15.8
Figure B7.7

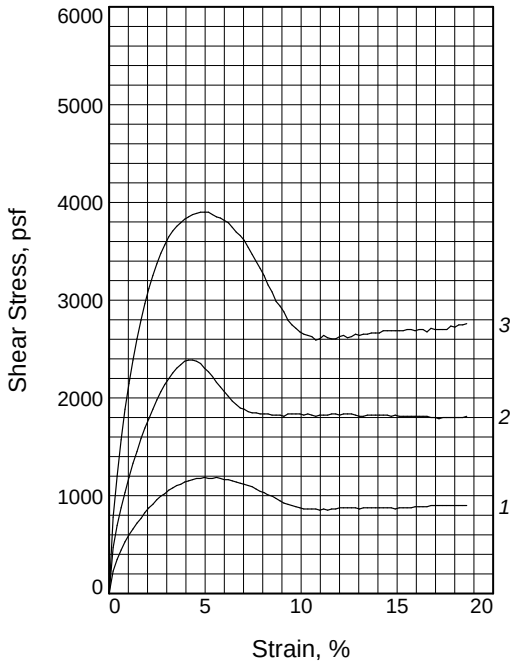
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-6 **Depth:** 10'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	4.0	5.1	5.4
	Dry Density, pcf	106.8	107.4	108.2
	Saturation, %	19.5	25.0	27.1
	Void Ratio	0.5495	0.5409	0.5294
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	16.2	17.0	16.7
	Dry Density, pcf	105.3	109.3	111.4
	Saturation, %	75.4	87.7	91.2
	Void Ratio	0.5704	0.5141	0.4844
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.01	0.98	0.97
Normal Stress, psf		1500	3000	5000
Peak Stress, psf		1188	2388	3900
Strain, %		5.0	4.1	4.8
Ultimate Stress, psf		996	2064	3156
Strain, %		8.5	6.0	8.3
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Undisturbed
Description: Sandstone

Specific Gravity= 2.65
Remarks: Bedrock (Tcag), cross bedding
Carreaga Formation, Graciosa member

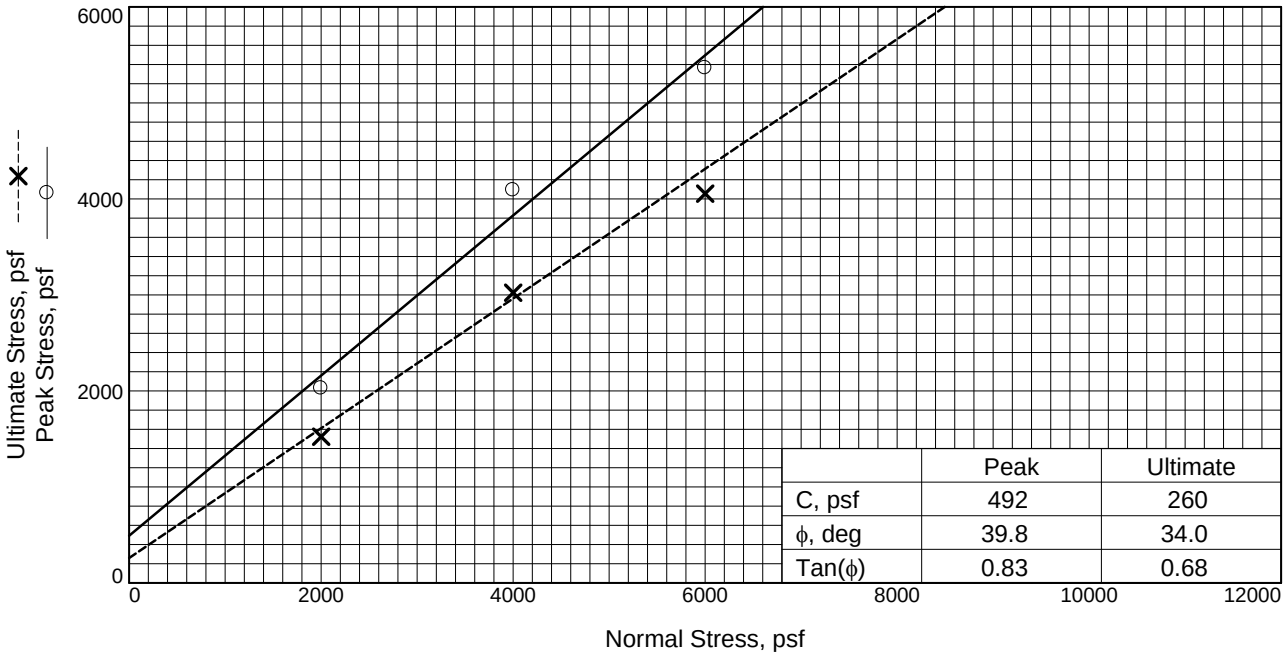
Figure B7.8

Client: Solstra Communities California LLC

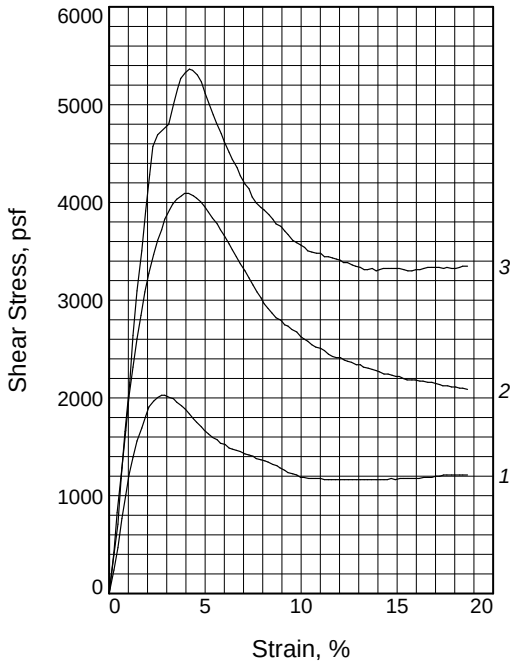
Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-6 **Depth:** 15'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California



	Peak	Ultimate
C, psf	492	260
ϕ, deg	39.8	34.0
Tan(ϕ)	0.83	0.68



Sample No.		1	2	3
Initial	Water Content, %	11.1	13.2	11.9
	Dry Density, pcf	119.4	117.0	117.8
	Saturation, %	76.1	84.5	78.0
	Void Ratio	0.3852	0.4138	0.4049
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	14.2	15.0	14.4
	Dry Density, pcf	120.3	118.5	119.7
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.3752	0.3964	0.3822
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		2000	4000	6000
Peak Stress, psf		2028	4092	5364
Strain, %		2.7	3.9	4.2
Ultimate Stress, psf		1524	3024	4056
Strain, %		6.0	7.9	7.5
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Modified California Drive
Description: silty, fine-grained sandstone

Assumed Specific Gravity= 2.65
Remarks: Bedrock (Tcag) Cross bedding
Careaga Formation, Graciosa member
% Fines = 22.8

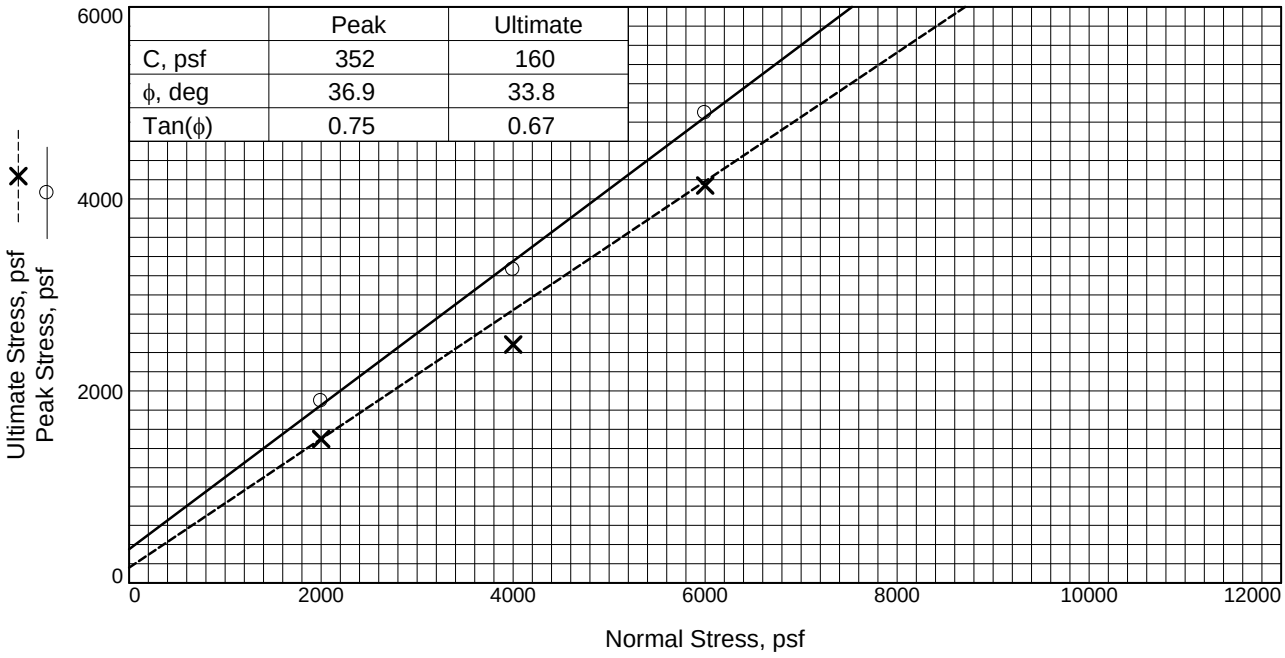
Figure B7.9

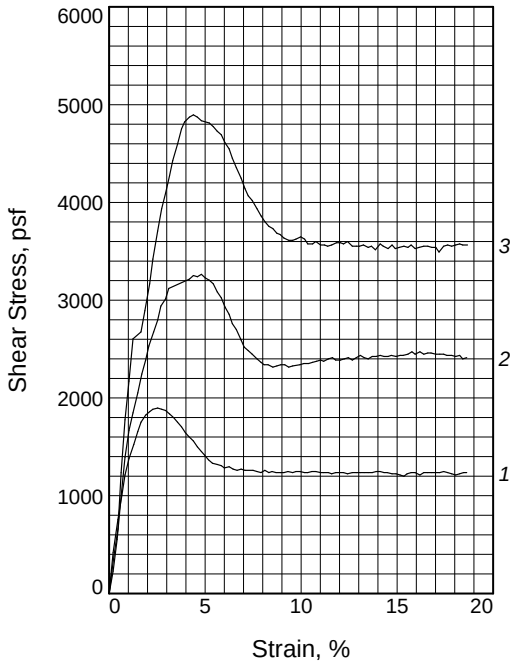
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: HS-44 **Depth:** 15'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	5.2	3.0	5.2
	Dry Density, pcf	105.6	105.7	103.3
	Saturation, %	24.4	14.1	23.0
	Void Ratio	0.5660	0.5650	0.6017
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	20.9	20.5	21.5
	Dry Density, pcf	106.4	107.1	105.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5544	0.5445	0.5686
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		2000	4000	6000
Peak Stress, psf		1896	3264	4896
Strain, %		2.5	4.8	4.4
Ultimate Stress, psf		1500	2484	4140
Strain, %		4.6	7.2	7.1
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Modified California Drive
Description: fine-grained sandstone

Assumed Specific Gravity= 2.65
Remarks: Bedrock (Tcag) Cross bedding
Carreage Formation, Graciosa member
% Fines = 8.4

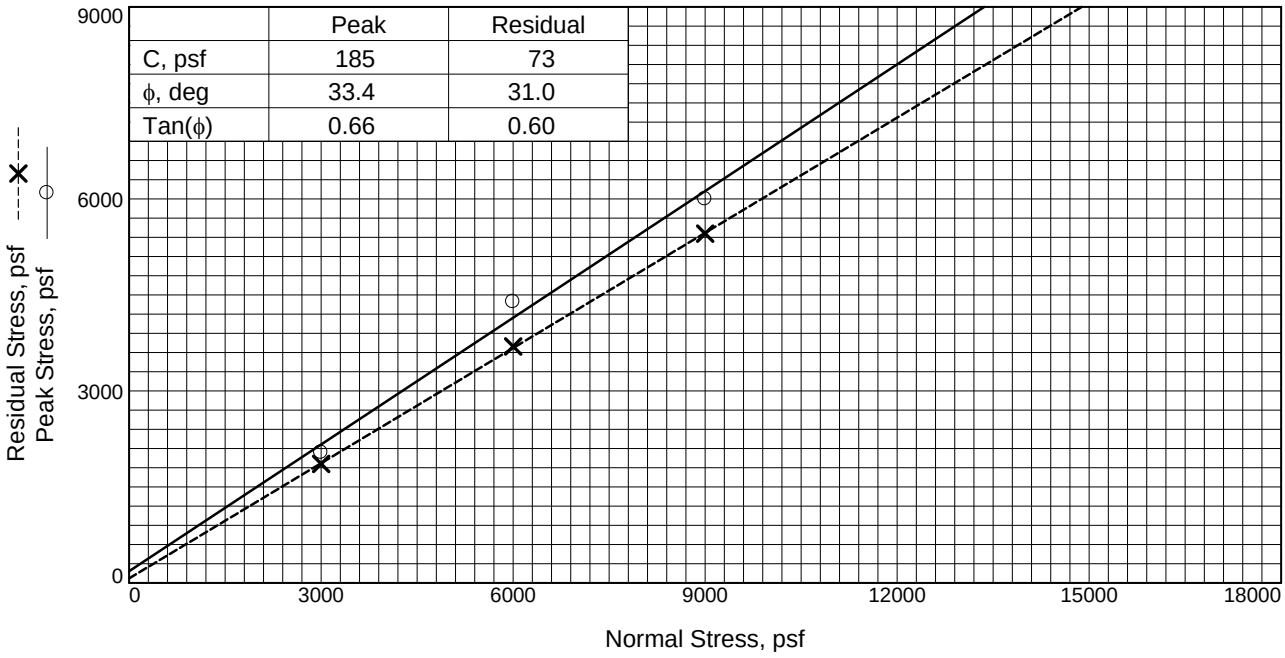
Figure B7.10

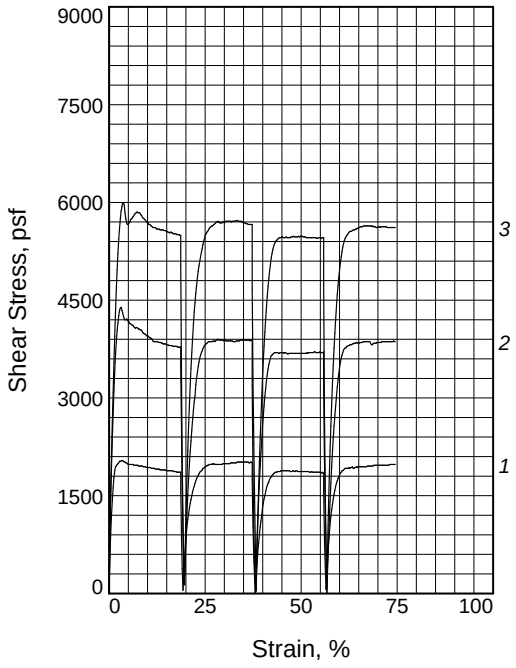
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: HS-47 **Depth:** 35'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	18.5	18.1	18.9
	Dry Density, pcf	95.8	98.1	98.9
	Saturation, %	67.4	70.0	74.4
	Void Ratio	0.7268	0.6868	0.6731
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	28.7	24.5	23.4
	Dry Density, pcf	94.0	100.3	102.1
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7601	0.6501	0.6206
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.02	0.98	0.97
Normal Stress, psf		3000	6000	9000
Peak Stress, psf		2040	4392	5999
Strain, %		3.3	3.1	3.7
Residual Stress, psf		1860	3696	5459
Strain, %		55.5	55.7	55.9
Strain rate, %/min.		0.0050	0.0050	0.0050

Sample Type: Undisturbed
Description: Lean claystone

Specific Gravity= 2.65
Remarks: Bedrock (Tcac), Along bedding
Careaga Formation, Cebada member
% Fines = 94.7

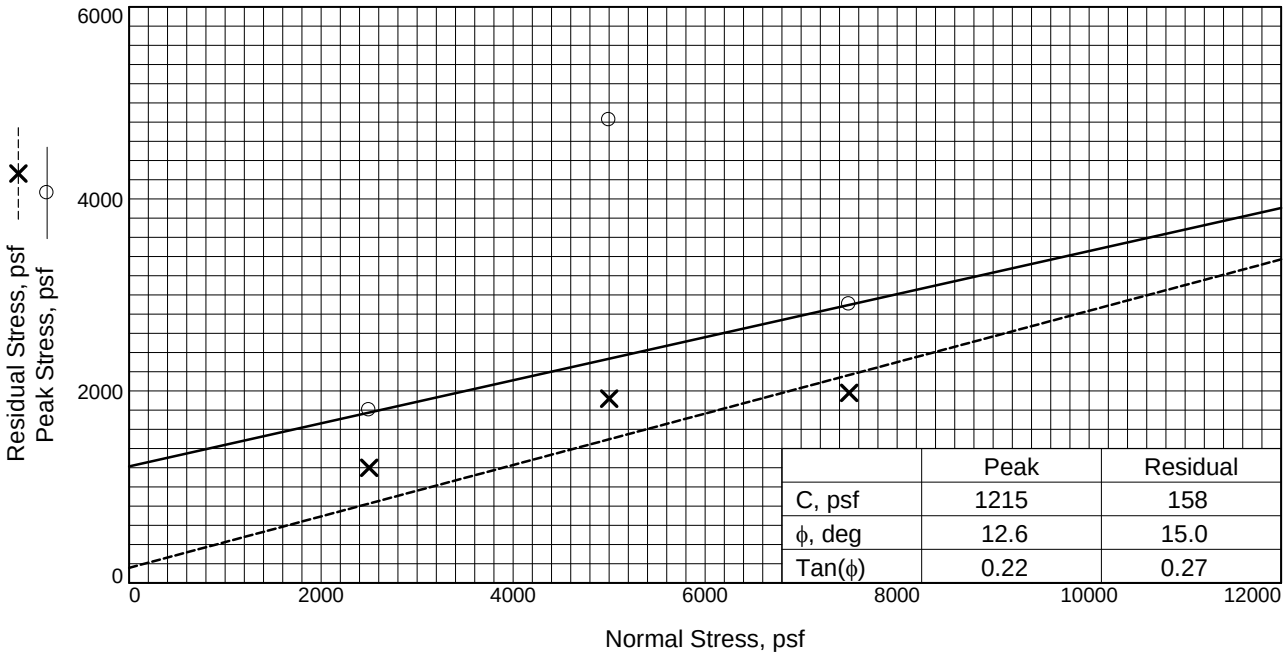
Figure B7.11

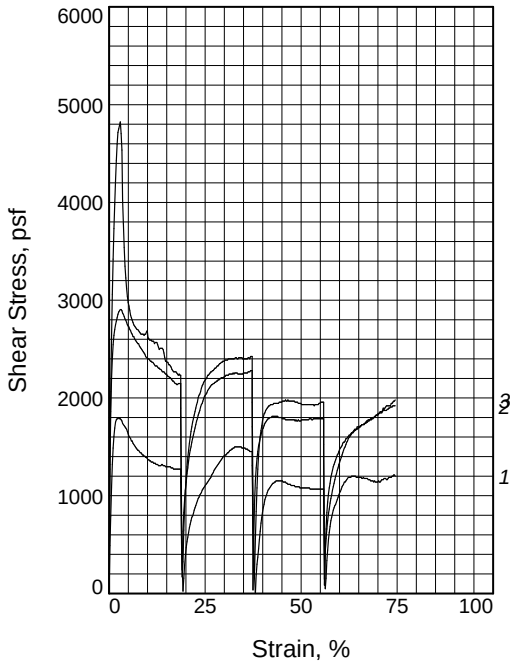
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-8 **Depth:** 70'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	38.1	34.2	34.9
	Dry Density, pcf	77.0	79.3	78.9
	Saturation, %	88.0	83.3	84.2
	Void Ratio	1.1487	1.0870	1.0978
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	44.5	35.3	37.4
	Dry Density, pcf	75.9	80.6	80.6
	Saturation, %	100.0	88.9	94.1
	Void Ratio	1.1803	1.0526	1.0531
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.01	0.98	0.98
Normal Stress, psf		2500	5000	7500
Peak Stress, psf		1800	4824	2904
Strain, %		2.5	2.9	2.9
Residual Stress, psf		1200	1920	1980
Strain, %		74.5	74.5	74.5
Strain rate, %/min.		0.0050	0.0050	0.0050

Sample Type: Undisturbed
Description: Claystone

Specific Gravity= 2.65
Remarks: Bedrock (Tcag), Along bedding
Carreaga Formation, Graciosa member
% Fines = 86.3

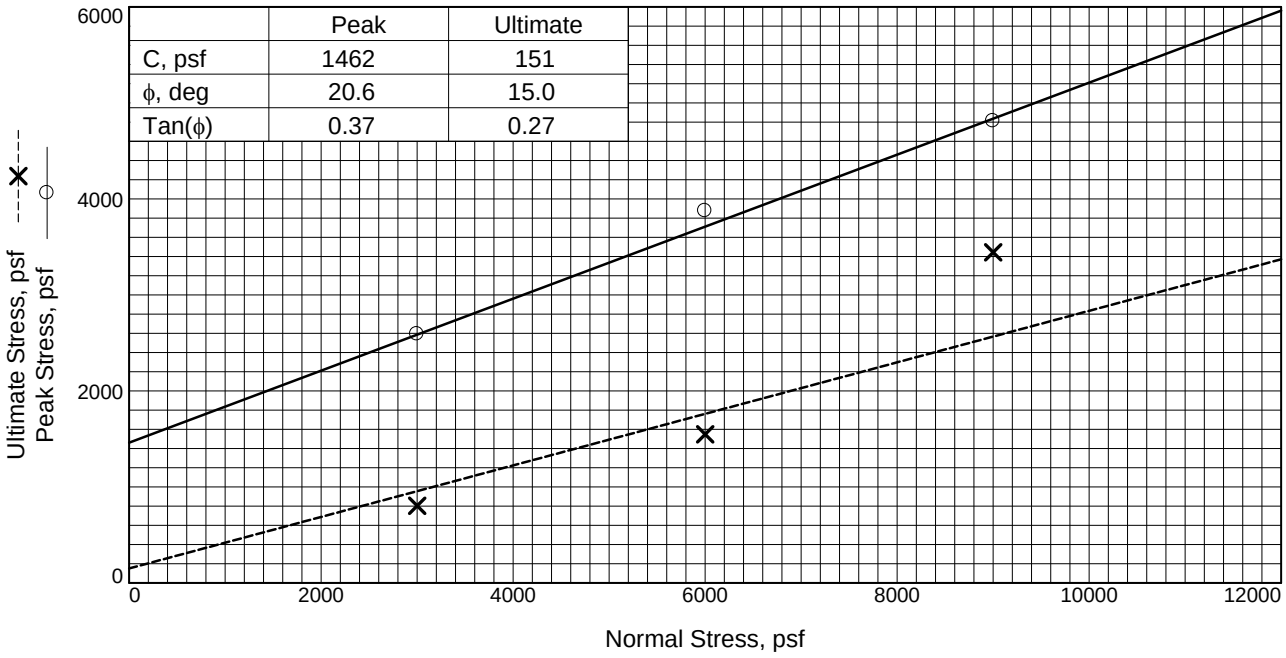
Figure B7.12

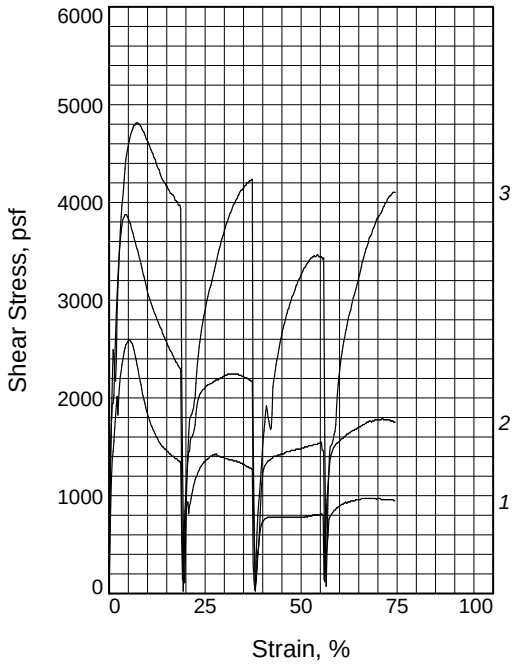
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-19 **Depth:** 50'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	24.5	23.6	24.8
	Dry Density, pcf	98.4	101.2	97.3
	Saturation, %	95.2	98.7	93.8
	Void Ratio	0.6811	0.6346	0.7002
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	25.3	22.9	25.0
	Dry Density, pcf	99.0	102.9	99.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6704	0.6077	0.6627
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.98	0.98
Normal Stress, psf		3000	6000	9000
Peak Stress, psf		2592	3876	4812
Strain, %		5.2	4.1	7.0
Ultimate Stress, psf		804	1548	3444
Strain, %		55.7	55.3	55.3
Strain rate, in./min.		0.005	0.005	0.005

Sample Type: Modified California Drive
Description: sandy lean clay

LL= 46 **PL=** 17 **PI=** 29
Assumed Specific Gravity= 2.65
Remarks: Bedrock (Tcag) Along bedding
% Fines = 87.7

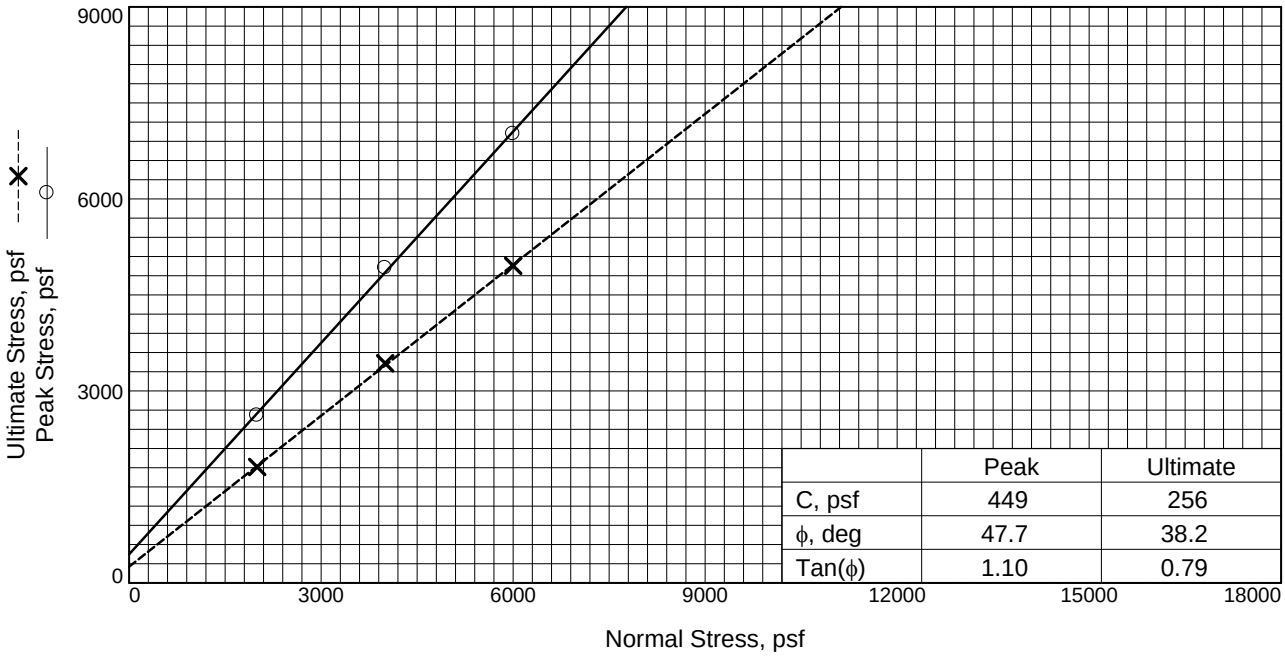
Figure B7.13

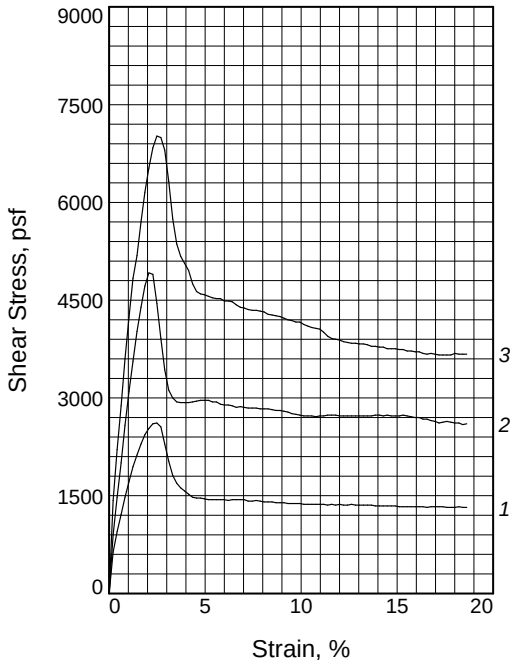
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: HS-44 **Depth:** 25'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	10.4	10.7	10.9
	Dry Density, pcf	120.8	122.3	123.4
	Saturation, %	74.6	80.6	84.7
	Void Ratio	0.3699	0.3525	0.3409
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	13.6	12.7	12.2
	Dry Density, pcf	121.7	123.9	125.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.3593	0.3355	0.3240
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.99
Normal Stress, psf		2000	4000	6000
Peak Stress, psf		2616	4920	7019
Strain, %		2.5	2.1	2.5
Ultimate Stress, psf		1812	3432	4956
Strain, %		3.3	2.9	4.1
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Undisturbed
Description: Silty, clayey sandstone

Specific Gravity= 2.65
Remarks: Bedrock (QTp)
Paso Robles Formation
Cross bedding
% Fines = 41.5

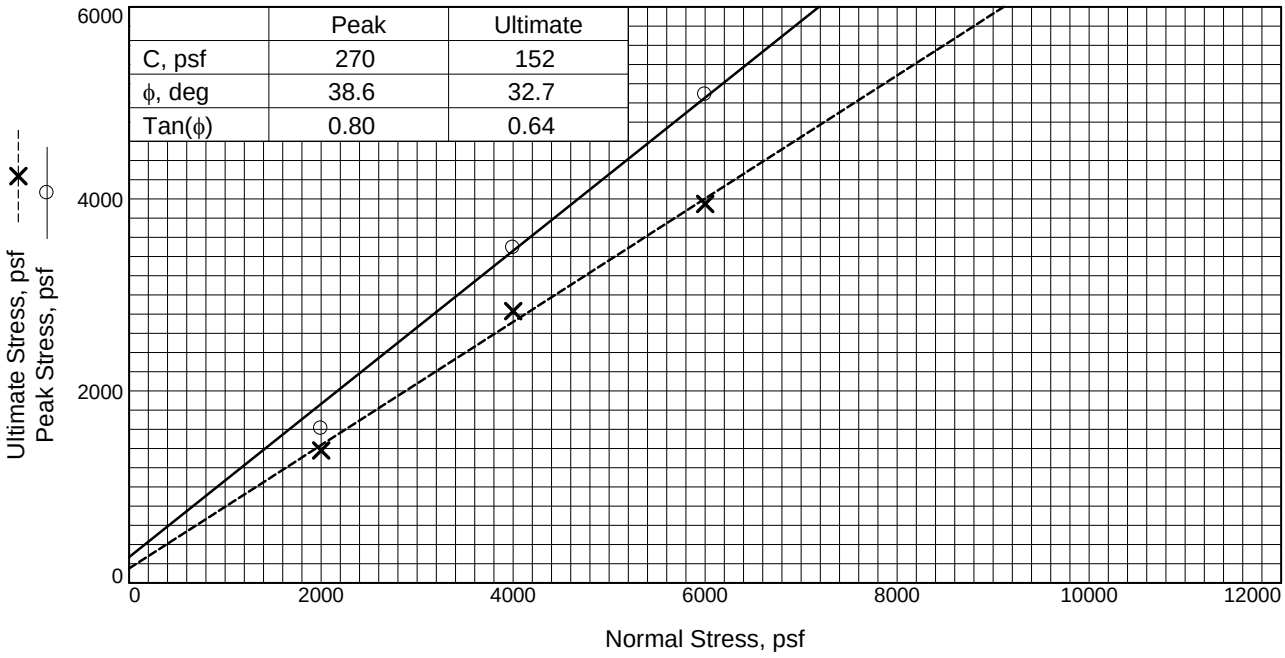
Figure B7.14

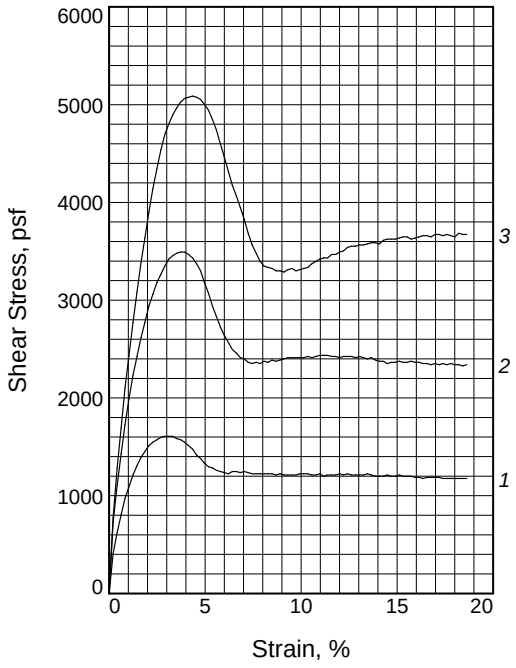
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-1 **Depth:** 40'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	4.3	4.8	5.9
	Dry Density, pcf	99.4	102.9	110.0
	Saturation, %	17.1	20.8	30.8
	Void Ratio	0.6650	0.6080	0.5042
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	24.0	22.1	17.5
	Dry Density, pcf	101.1	104.4	112.9
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6367	0.5848	0.4651
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.98	0.99	0.97
Normal Stress, psf		2000	4000	6000
Peak Stress, psf		1608	3492	5088
Strain, %		2.9	3.7	4.3
Ultimate Stress, psf		1380	2832	3948
Strain, %		4.8	5.6	6.8
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Undisturbed
Description: Sandstone with silt

Specific Gravity= 2.65
Remarks: Bedrock (QTp), cross bedding
Paso Robles Formation
% Fines = 10.3

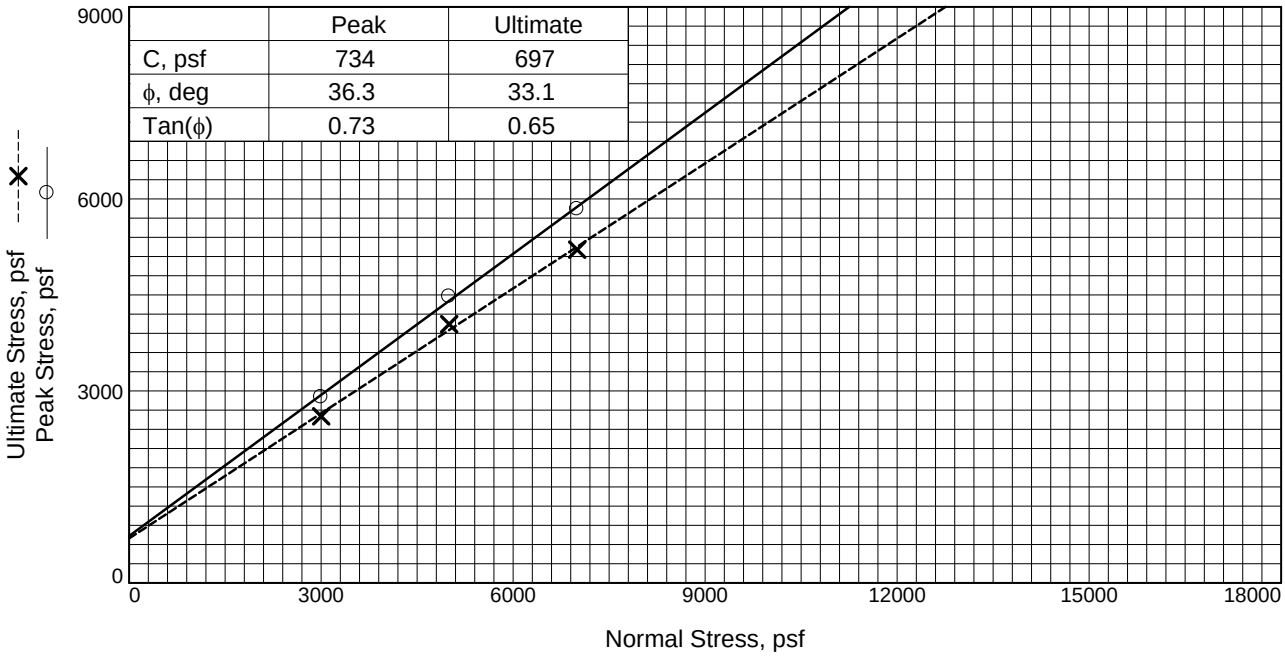
Figure B7.15

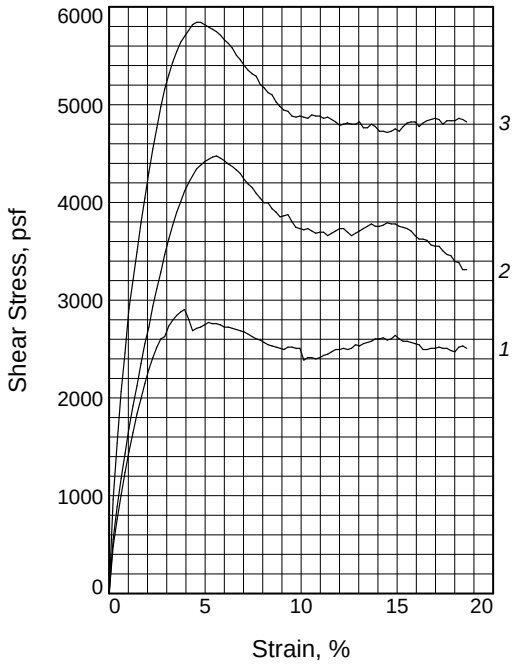
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-2 **Depth:** 40'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	8.1	8.7	7.2
	Dry Density, pcf	97.7	102.1	105.0
	Saturation, %	30.9	37.3	33.0
	Void Ratio	0.6936	0.6205	0.5749
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	23.6	20.4	19.3
	Dry Density, pcf	101.7	107.4	109.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6265	0.5401	0.5103
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.96	0.95	0.96
Normal Stress, psf		3000	5000	7000
Peak Stress, psf		2904	4476	5843
Strain, %		3.9	5.6	4.6
Ultimate Stress, psf		2604	4044	5208
Strain, %		7.7	7.9	7.9
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Undisturbed
Description: Sandstone

Specific Gravity= 2.65
Remarks: Bedrock (QTp)
Paso Robles Formation
Cross bedding

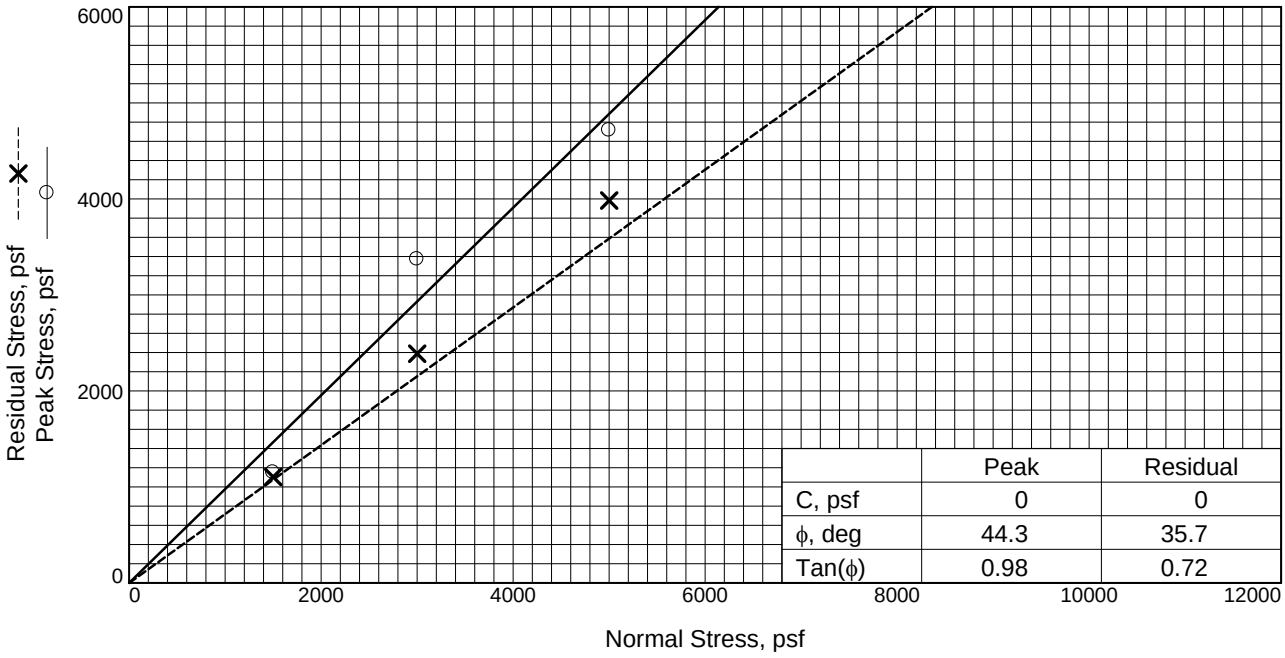
Figure B7.16

Client: Solstra Communities California LLC

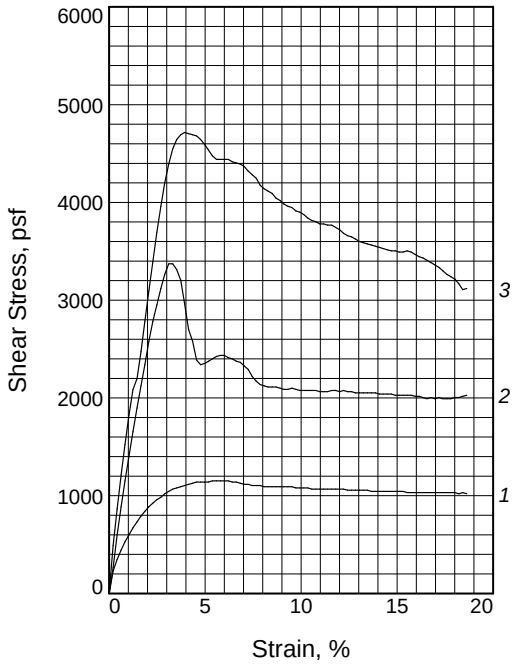
Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-5 **Depth:** 50'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California



	Peak	Residual
C, psf	0	0
ϕ, deg	44.3	35.7
Tan(ϕ)	0.98	0.72



Sample No.		1	2	3
Initial	Water Content, %	5.9	6.2	6.8
	Dry Density, pcf	86.3	96.1	101.1
	Saturation, %	17.1	22.9	28.3
	Void Ratio	0.9166	0.7222	0.6361
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	31.3	25.5	22.1
	Dry Density, pcf	90.4	98.8	104.4
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.8298	0.6750	0.5844
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.95	0.97	0.97
Normal Stress, psf		1500	3000	5000
Peak Stress, psf		1152	3372	4716
Strain, %		5.4	3.1	3.9
Residual Stress, psf		1104	2388	3984
Strain, %		7.9	4.6	9.1
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Silty sandstone

Specific Gravity= 2.65
Remarks: Bedrock (QTp), cross bedding
Paso Robles Formation
% Fines = 34.0

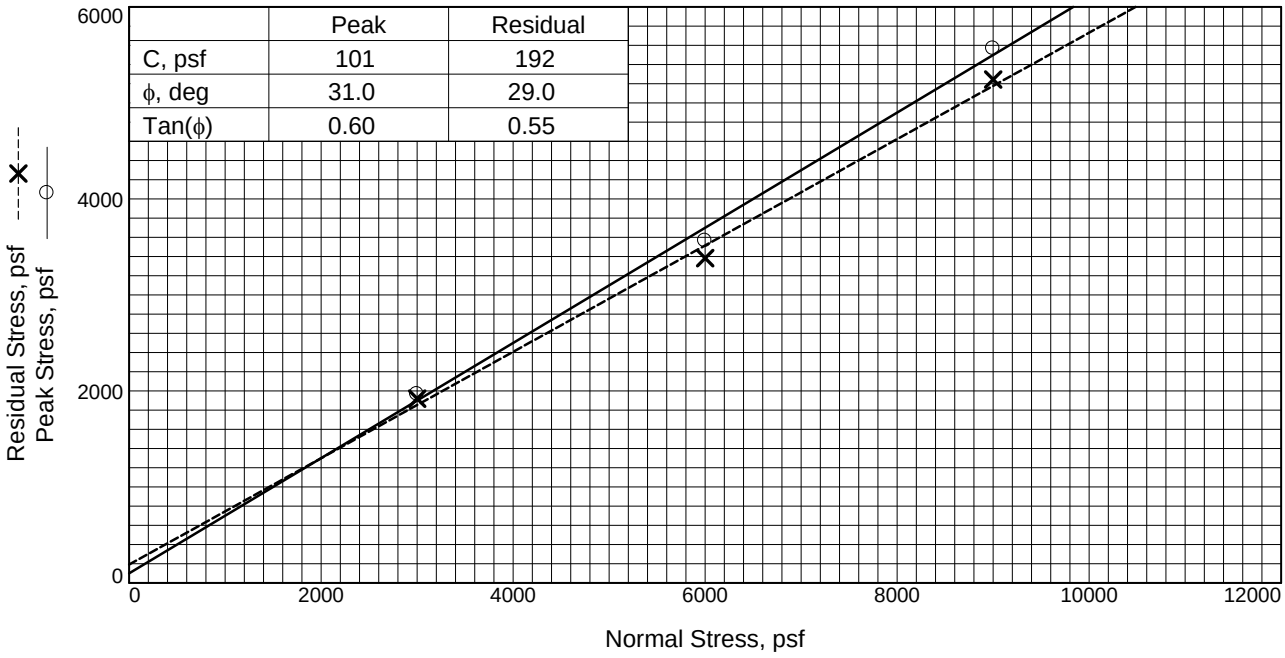
Figure B7.17

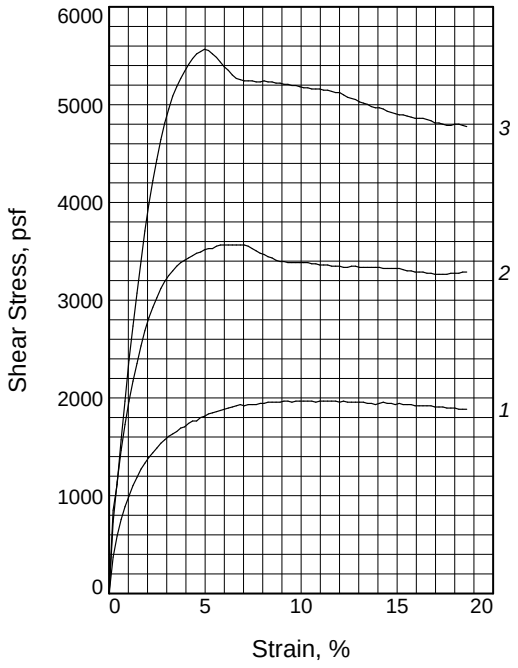
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-13 **Depth:** 5'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	15.8	16.7	16.8
	Dry Density, pcf	91.9	95.3	97.4
	Saturation, %	52.1	60.3	63.7
	Void Ratio	0.8008	0.7358	0.6982
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	25.6	25.3	24.1
	Dry Density, pcf	95.0	99.0	102.0
	Saturation, %	91.6	100.0	102.5
	Void Ratio	0.7410	0.6702	0.6220
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.97	0.96	0.96
Normal Stress, psf		3000	6000	9000
Peak Stress, psf		1968	3564	5567
Strain, %		9.1	5.8	5.0
Residual Stress, psf		1920	3384	5244
Strain, %		16.8	10.3	7.0
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Sandy claystone

Specific Gravity= 2.65
Remarks: Bedrock (QTp), cross bedding
Paso Robles Formation
% Fines = 62.1

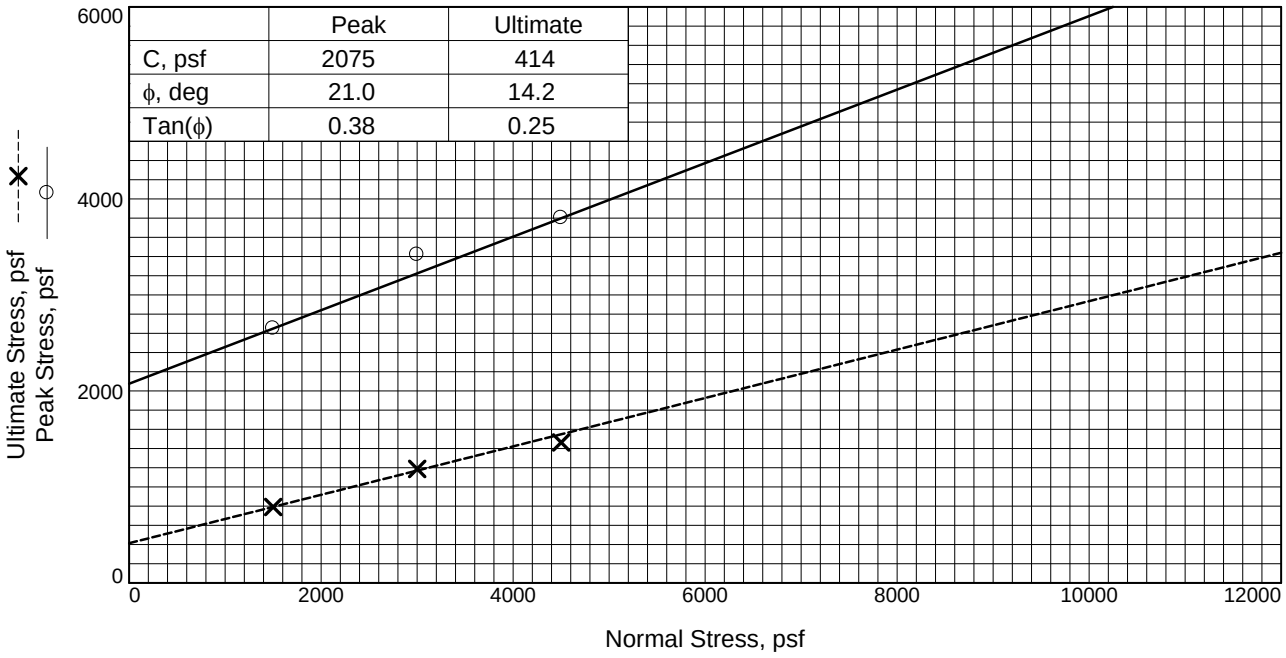
Figure B7.18

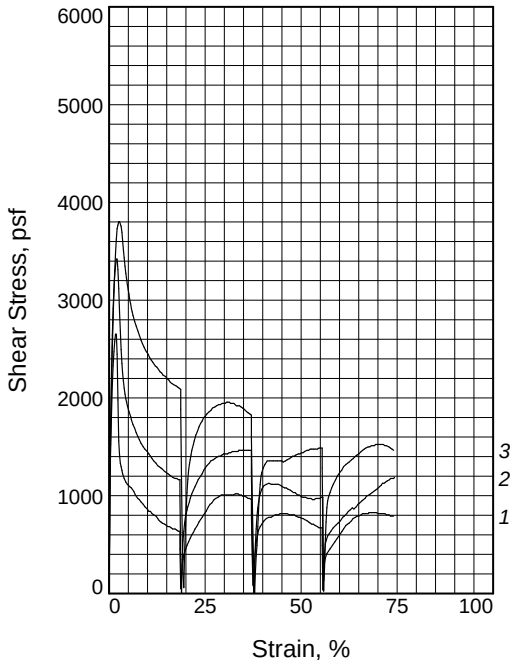
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-13 **Depth:** 55'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	44.5	44.4	42.6
	Dry Density, pcf	74.8	74.8	77.1
	Saturation, %	97.4	97.0	98.6
	Void Ratio	1.2123	1.2118	1.1453
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	45.5	44.9	42.3
	Dry Density, pcf	75.0	75.6	78.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	1.2056	1.1897	1.1197
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	0.99	0.99
Normal Stress, psf		1500	3000	4500
Peak Stress, psf		2652	3420	3804
Strain, %		1.7	1.9	2.5
Ultimate Stress, psf		792	1188	1464
Strain, %		74.1	74.3	74.1
Strain rate, in./min.		0.005	0.005	0.005

Sample Type: Undisturbed
Description: Fat claystone

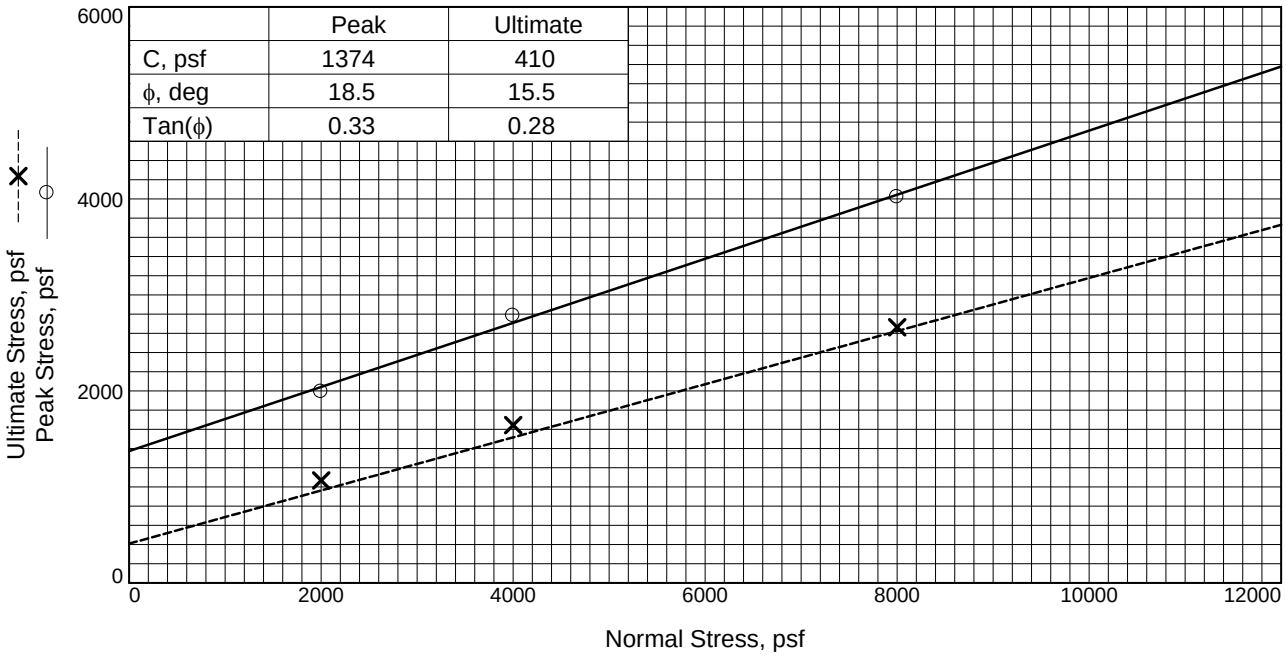
LL= 111 **PL=** 43 **PI=** 68
Specific Gravity= 2.65
Remarks: Bedrock (QTp)
Paso Robles Formation
Along bedding
% Fines = 97.7
Figure B7.19

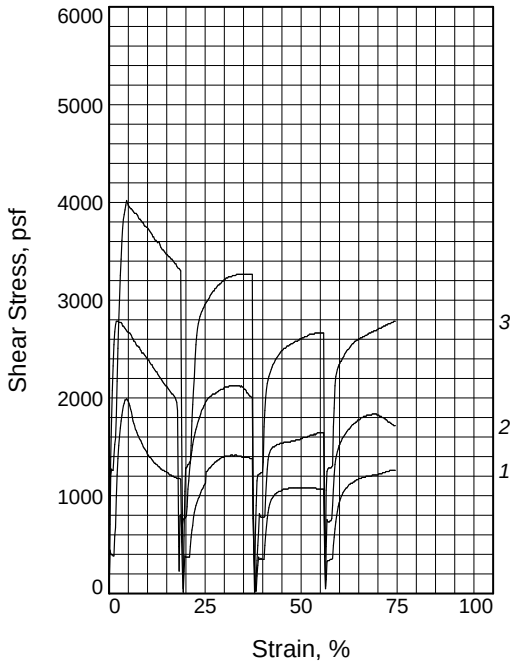
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-2 **Depth:** 30'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	28.3	26.5	30.4
	Dry Density, pcf	91.2	94.2	90.3
	Saturation, %	92.2	93.0	96.9
	Void Ratio	0.8143	0.7565	0.8323
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	30.3	27.8	29.8
	Dry Density, pcf	91.8	95.2	92.4
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.8019	0.7375	0.7907
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		2000	4000	8000
Peak Stress, psf		1992	2784	4020
Strain, %		4.6	1.9	4.6
Ultimate Stress, psf		1068	1644	2664
Strain, %		55.9	55.9	55.9
Strain rate, in./min.		0.005	0.005	0.005

Sample Type: Hand-driven ring
Description: fat clay

LL= 68 **PL=** 32 **PI=** 36
Assumed Specific Gravity= 2.65
Remarks: Bedrock (QTp), Along bedding
Paso Robles Formation
% Fines = 98.3

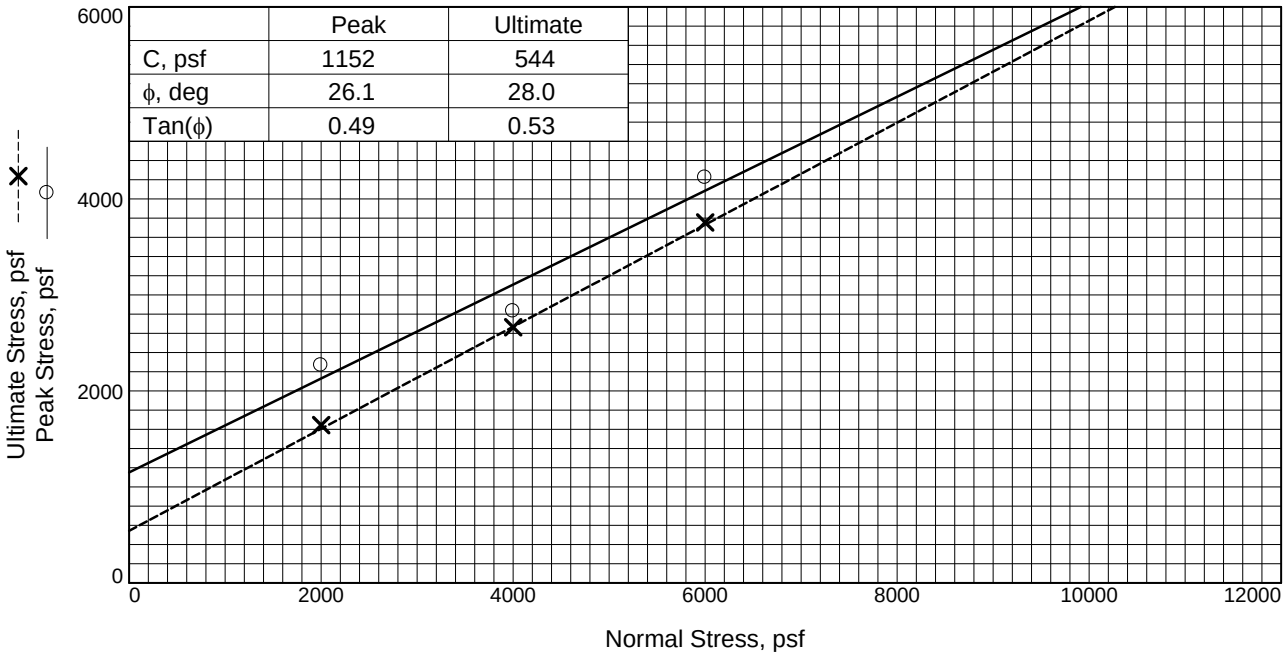
Figure B7.20

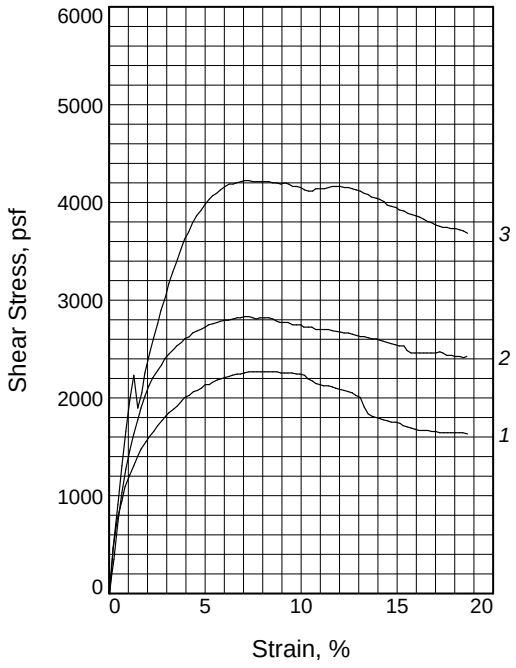
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: GT-205 **Depth:** 3.5'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	15.4	15.4	14.6
	Dry Density, pcf	114.8	115.4	115.0
	Saturation, %	92.3	94.1	88.5
	Void Ratio	0.4416	0.4337	0.4383
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	16.1	15.5	15.5
	Dry Density, pcf	115.9	117.2	117.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4277	0.4120	0.4110
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.98	0.98
Normal Stress, psf		2000	4000	6000
Peak Stress, psf		2268	2832	4224
Strain, %		7.3	7.1	7.0
Ultimate Stress, psf		1644	2664	3756
Strain, %		18.4	12.3	17.2
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Modified California Drive
Description: silty, clayey SAND

Assumed Specific Gravity= 2.65
Remarks: Alluvium (Qa)
% Fines = 31.1

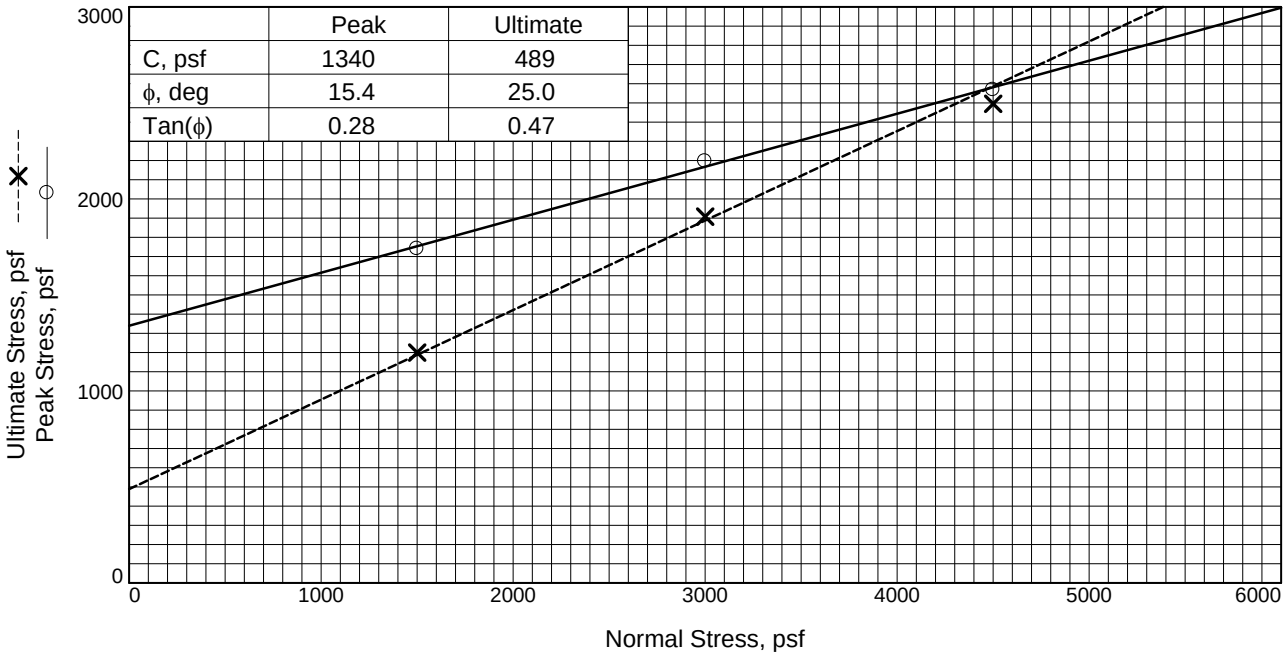
Figure B7.21

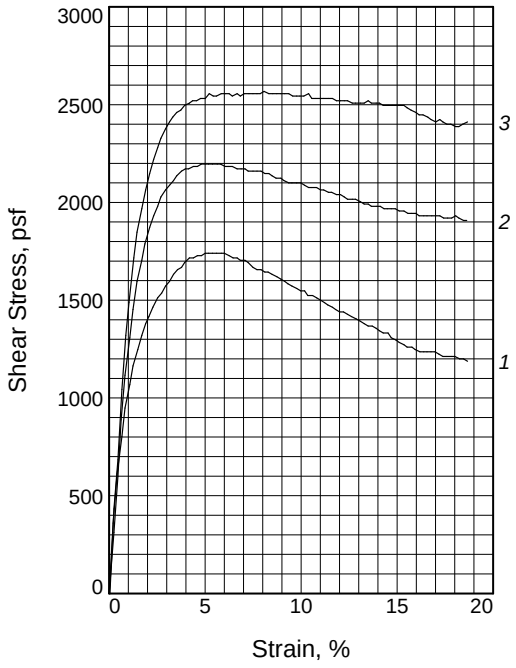
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: HS-40 **Depth:** 5'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	17.4	17.1	17.2
	Dry Density, pcf	110.3	110.6	110.2
	Saturation, %	92.1	91.2	90.6
	Void Ratio	0.5000	0.4960	0.5017
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	18.4	17.8	17.9
	Dry Density, pcf	111.1	112.4	112.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4888	0.4716	0.4742
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.98	0.98
Normal Stress, psf		1500	3000	4500
Peak Stress, psf		1740	2196	2568
Strain, %		5.0	4.8	8.1
Ultimate Stress, psf		1200	1908	2496
Strain, %		18.5	18.6	15.4
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Modified California Drive
Description: clayey sand

Assumed Specific Gravity= 2.65
Remarks: Alluvium (Qa)
% Fines = 47.0

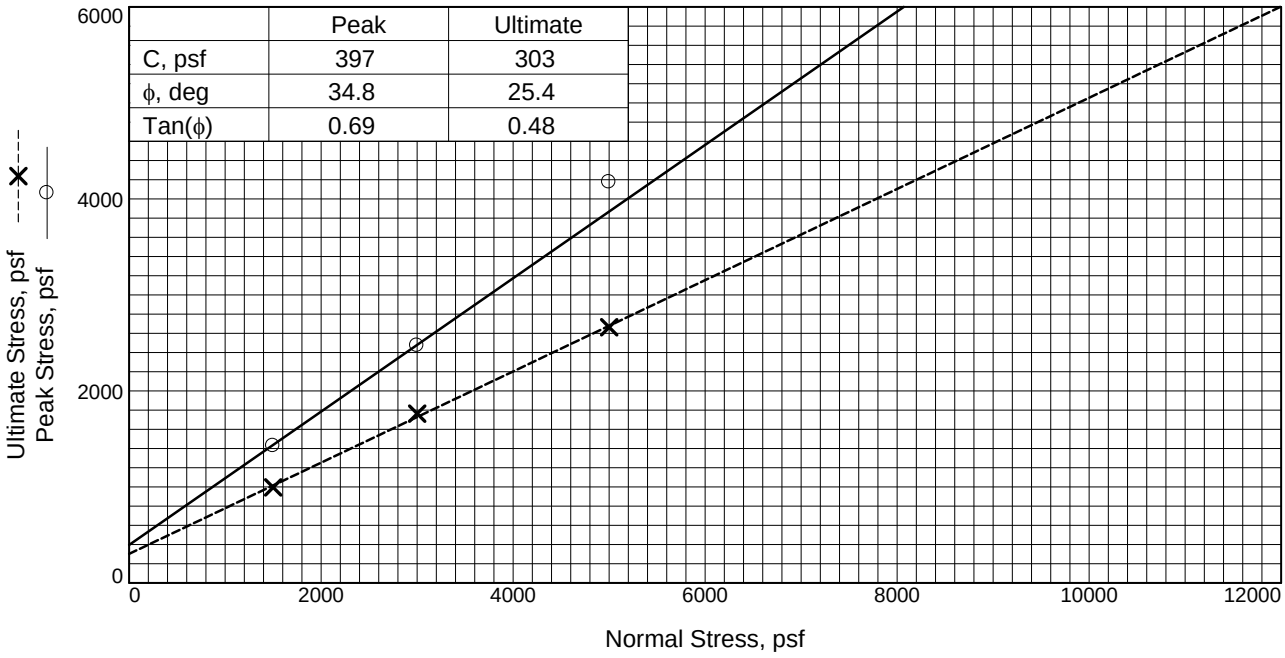
Figure B7.22

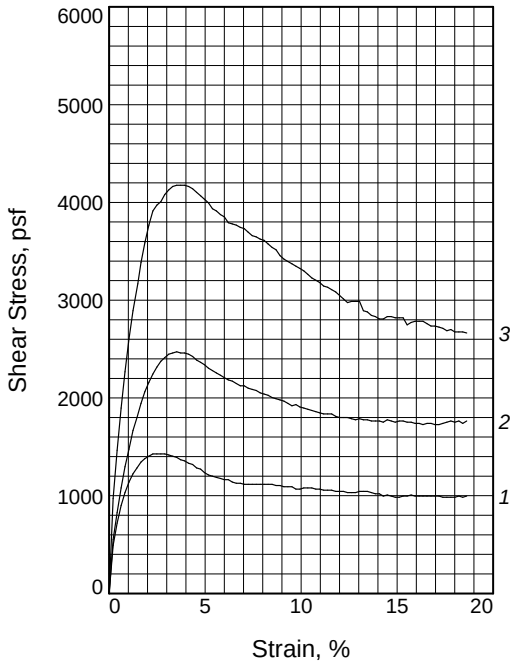
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: HS-47 **Depth:** 15'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	12.5	12.0	18.6
	Dry Density, pcf	103.6	103.0	97.4
	Saturation, %	55.4	52.3	70.5
	Void Ratio	0.5975	0.6061	0.6986
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	23.4	21.4	24.0
	Dry Density, pcf	102.1	105.6	101.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6205	0.5663	0.6351
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.01	0.98	0.96
Normal Stress, psf		1500	3000	5000
Peak Stress, psf		1428	2472	4176
Strain, %		2.3	3.5	3.5
Ultimate Stress, psf		996	1764	2664
Strain, %		18.6	18.6	18.6
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Undisturbed
Description: Sandstone

Specific Gravity= 2.65
Remarks: Landslide (Qls)
QTp derived

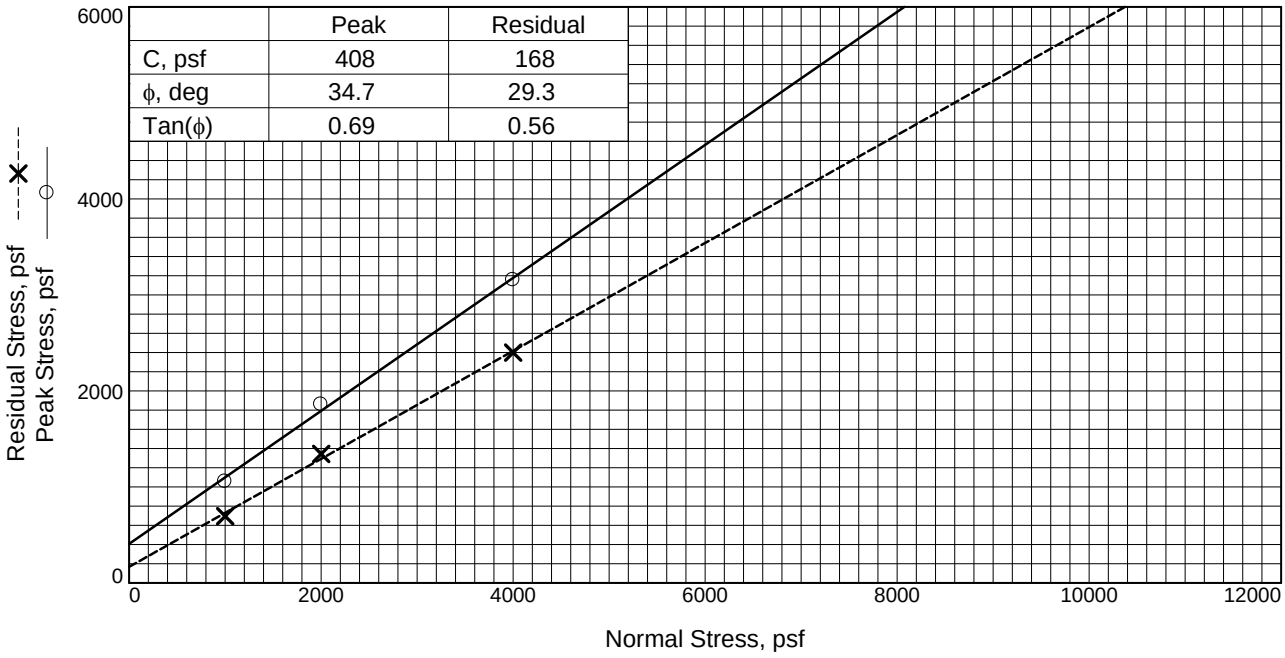
Figure B7.23

Client: Solstra Communities California LLC

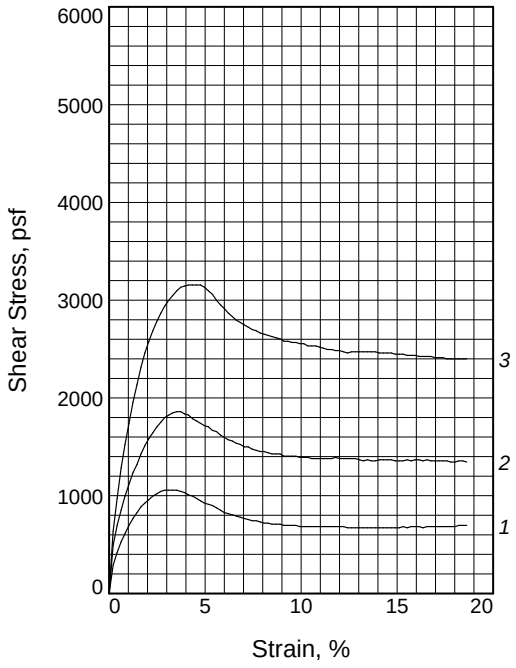
Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-2 **Depth:** 12'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California



	Peak	Residual
C, psf	408	168
ϕ, deg	34.7	29.3
Tan(ϕ)	0.69	0.56



Sample No.		1	2	3
Initial	Water Content, %	15.4	16.4	16.4
	Dry Density, pcf	111.7	109.5	110.0
	Saturation, %	84.7	85.0	86.4
	Void Ratio	0.4815	0.5105	0.5044
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	17.7	17.6	17.6
	Dry Density, pcf	113.0	111.6	113.3
	Saturation, %	101.0	96.6	101.6
	Void Ratio	0.4639	0.4819	0.4598
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.98	0.97
Normal Stress, psf		1000	2000	4000
Peak Stress, psf		1056	1860	3156
Strain, %		2.9	3.5	4.1
Residual Stress, psf		696	1344	2400
Strain, %		18.6	18.6	18.6
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Silty SAND (SM)

Specific Gravity= 2.65
Remarks: Landslide (Qls)
QTp?/Tcag? derived
% Fines = 41.5

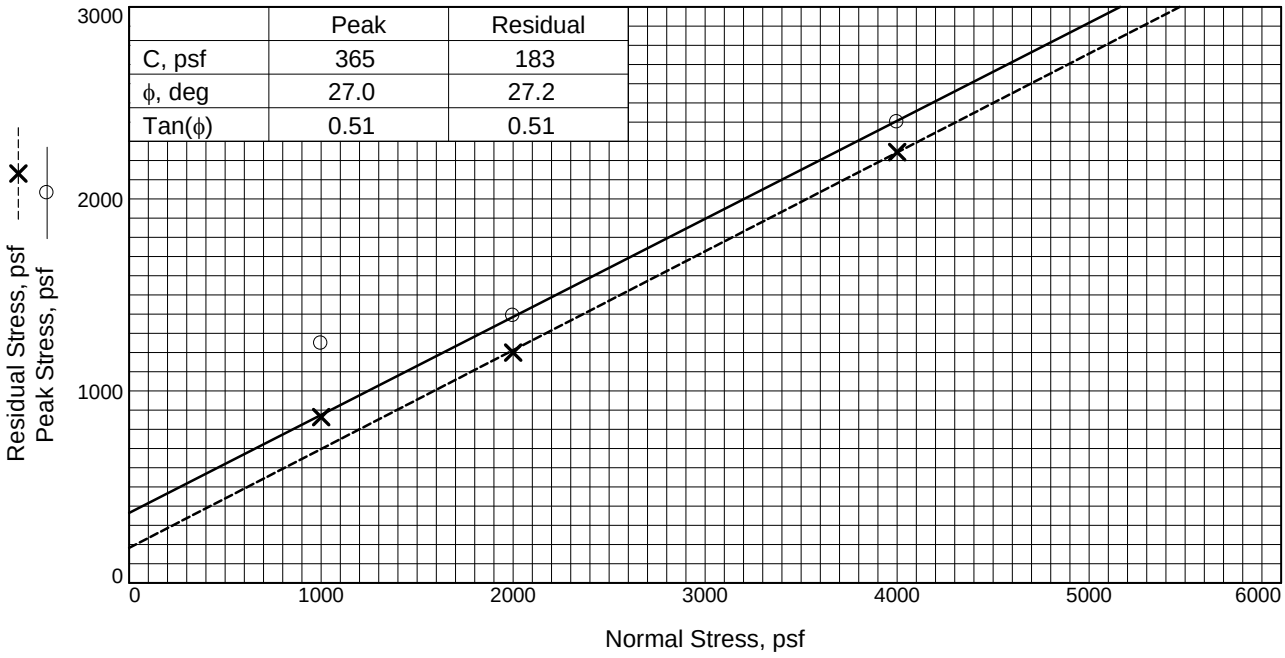
Figure B7.24

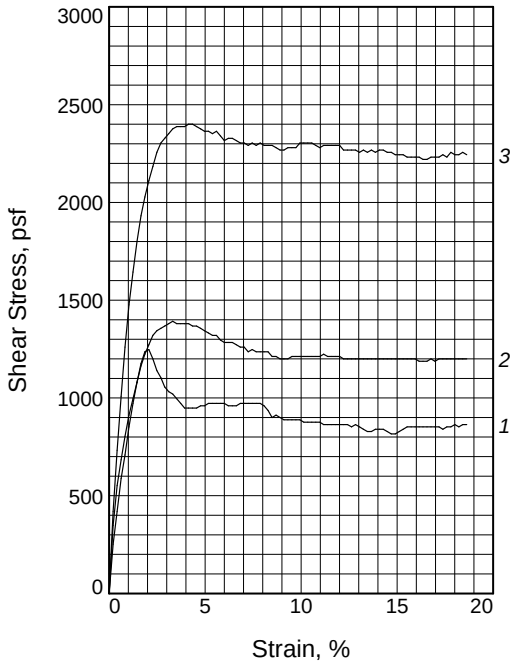
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-8 **Depth:** 5'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	13.4	5.1	4.4
	Dry Density, pcf	103.3	98.3	102.0
	Saturation, %	59.1	19.9	18.6
	Void Ratio	0.6011	0.6823	0.6218
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	20.6	18.3	17.5
	Dry Density, pcf	102.4	96.1	105.0
	Saturation, %	88.9	67.4	80.6
	Void Ratio	0.6150	0.7210	0.5761
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.01	1.02	0.97
Normal Stress, psf		1000	2000	4000
Peak Stress, psf		1248	1392	2400
Strain, %		2.1	3.3	4.1
Residual Stress, psf		864	1200	2244
Strain, %		18.6	18.6	18.6
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Silty SAND (SM)

Specific Gravity= 2.65
Remarks: Landslide (Qls)
Tcac? derived
% Fines = 16.2

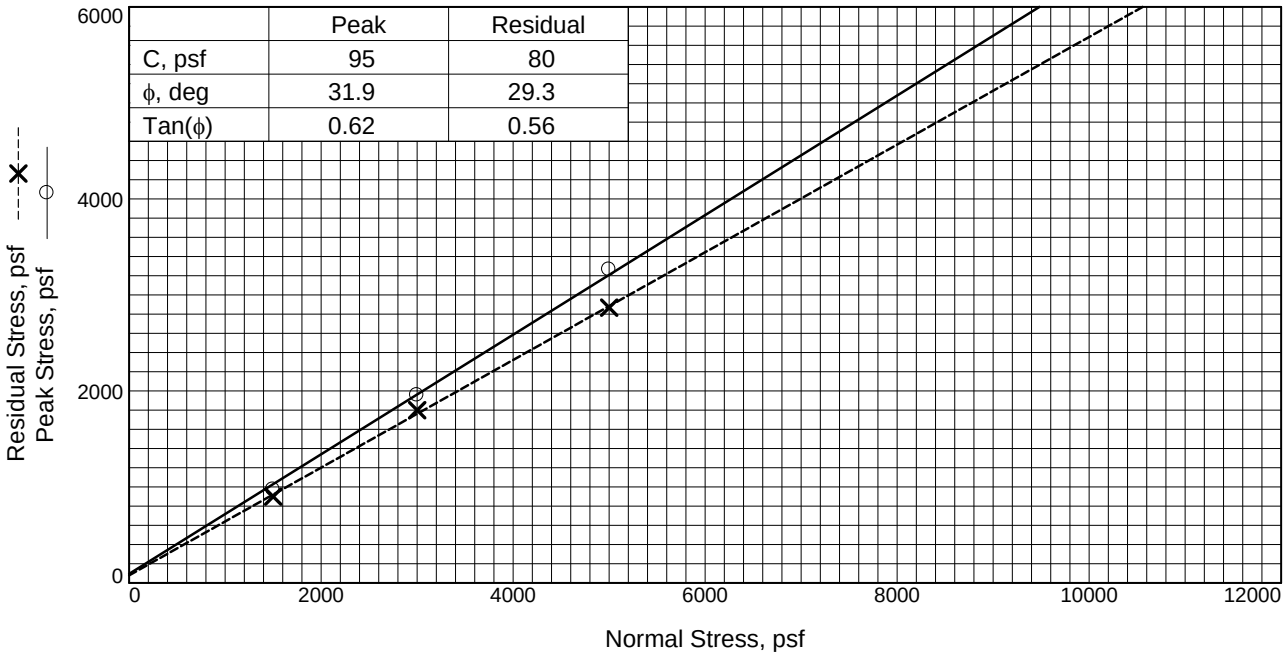
Figure B7.25

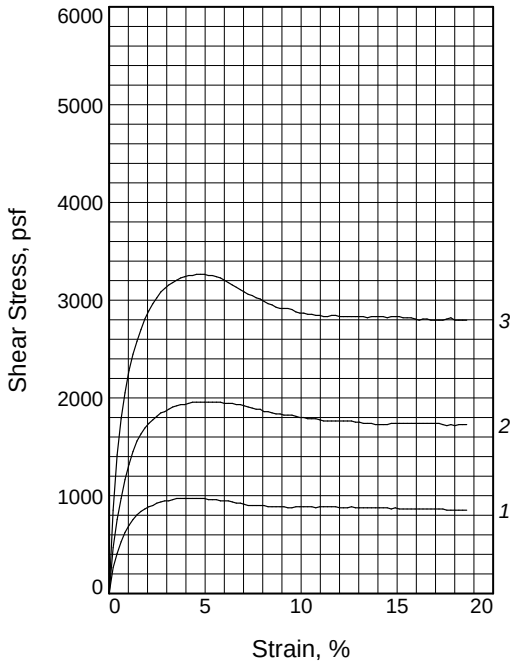
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-11 **Depth:** 5'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	10.4	11.4	11.4
	Dry Density, pcf	108.4	110.7	111.6
	Saturation, %	52.5	61.1	62.6
	Void Ratio	0.5265	0.4939	0.4826
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	15.6	14.8	14.9
	Dry Density, pcf	106.8	112.9	114.1
	Saturation, %	75.2	84.3	87.7
	Void Ratio	0.5484	0.4648	0.4495
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.01	0.98	0.98
Normal Stress, psf		1500	3000	5000
Peak Stress, psf		972	1956	3264
Strain, %		3.5	4.3	4.6
Residual Stress, psf		900	1800	2868
Strain, %		8.1	10.1	10.1
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Undisturbed
Description: Silty SAND

Specific Gravity= 2.65
Remarks: Landslide (Qls)
Tcac? derived
% Fines = 23.2

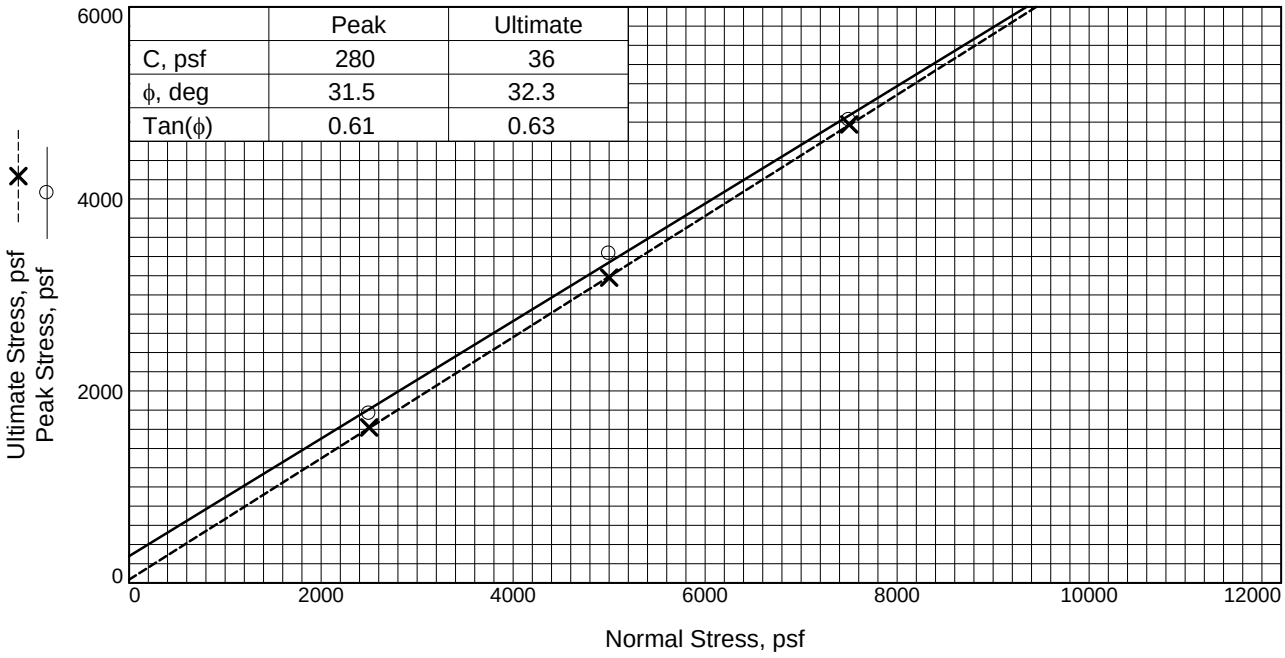
Figure B7.26

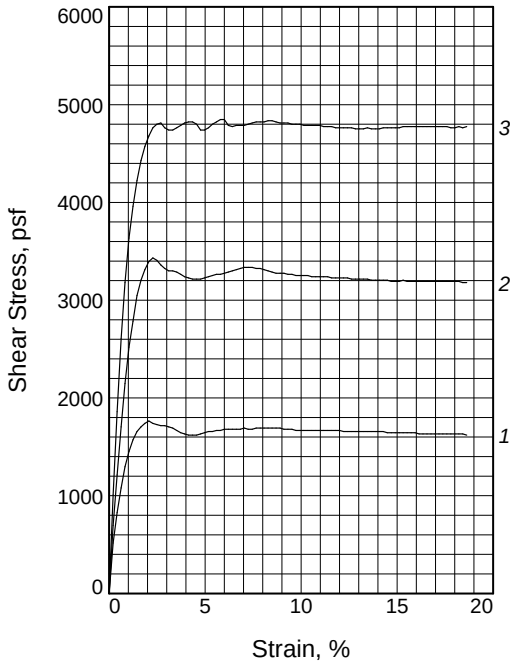
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-11 **Depth:** 15'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	16.5	16.7	16.8
	Dry Density, pcf	100.9	104.7	104.8
	Saturation, %	68.4	76.4	77.0
	Void Ratio	0.6392	0.5806	0.5786
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	23.1	20.7	20.7
	Dry Density, pcf	102.6	106.8	106.8
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6120	0.5497	0.5493
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.98	0.98	0.98
Normal Stress, psf		2500	5000	7500
Peak Stress, psf		1764	3432	4824
Strain, %		2.1	2.3	4.1
Ultimate Stress, psf		1620	3180	4776
Strain, %		18.6	18.6	18.6
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Remold
Description: Pale yellow, silty CLAY

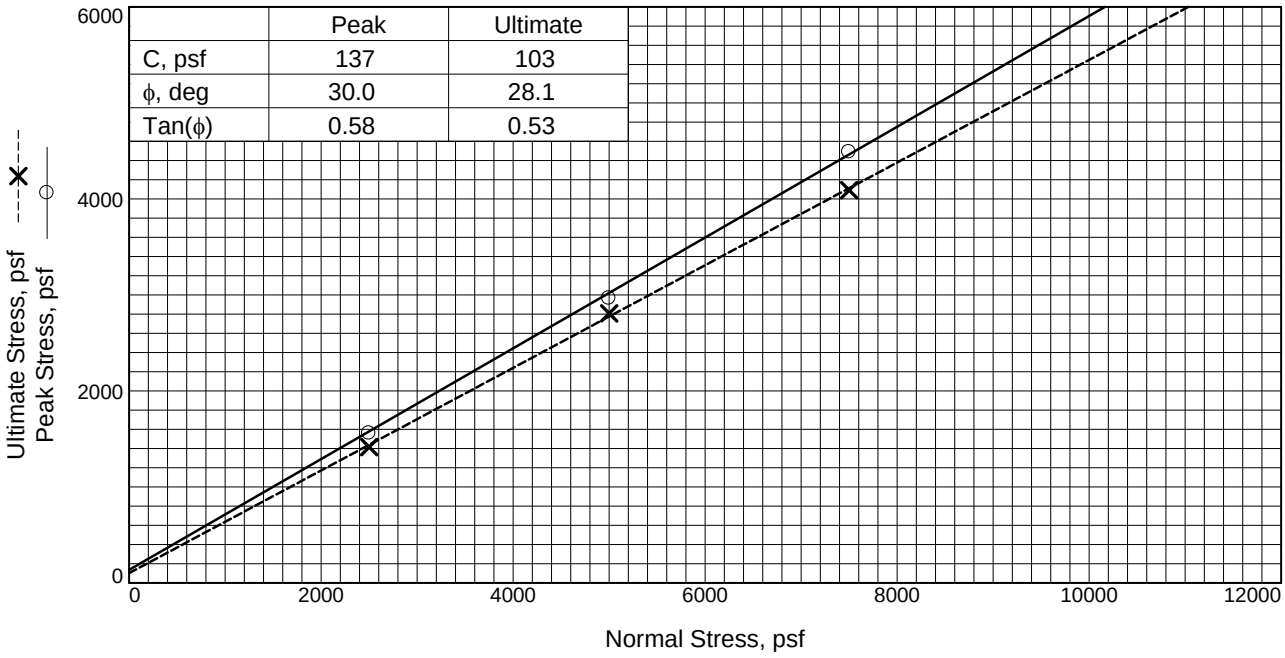
Specific Gravity= 2.65
Remarks: Proposed Compacted Fill
Remolded to about 92% of MDD
Bedrock (Tcac) derived,
% Fines = 92.8
Figure B7.27

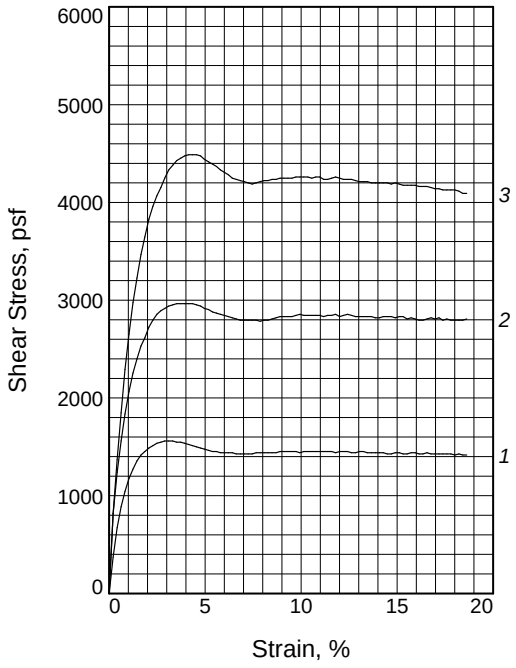
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: GT-2 **Depth:** 3-8'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	14.7	15.3	14.7
	Dry Density, pcf	93.3	93.3	93.6
	Saturation, %	50.3	52.3	50.9
	Void Ratio	0.7739	0.7726	0.7684
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	28.1	28.0	27.3
	Dry Density, pcf	94.9	94.9	95.9
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7437	0.7430	0.7249
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.98	0.98	0.98
Normal Stress, psf		2500	5000	7500
Peak Stress, psf		1560	2964	4488
Strain, %		2.9	3.5	4.1
Ultimate Stress, psf		1416	2808	4092
Strain, %		18.6	18.6	18.6
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Remold
Description: Very light brownish gray, poorly graded SAND with silt

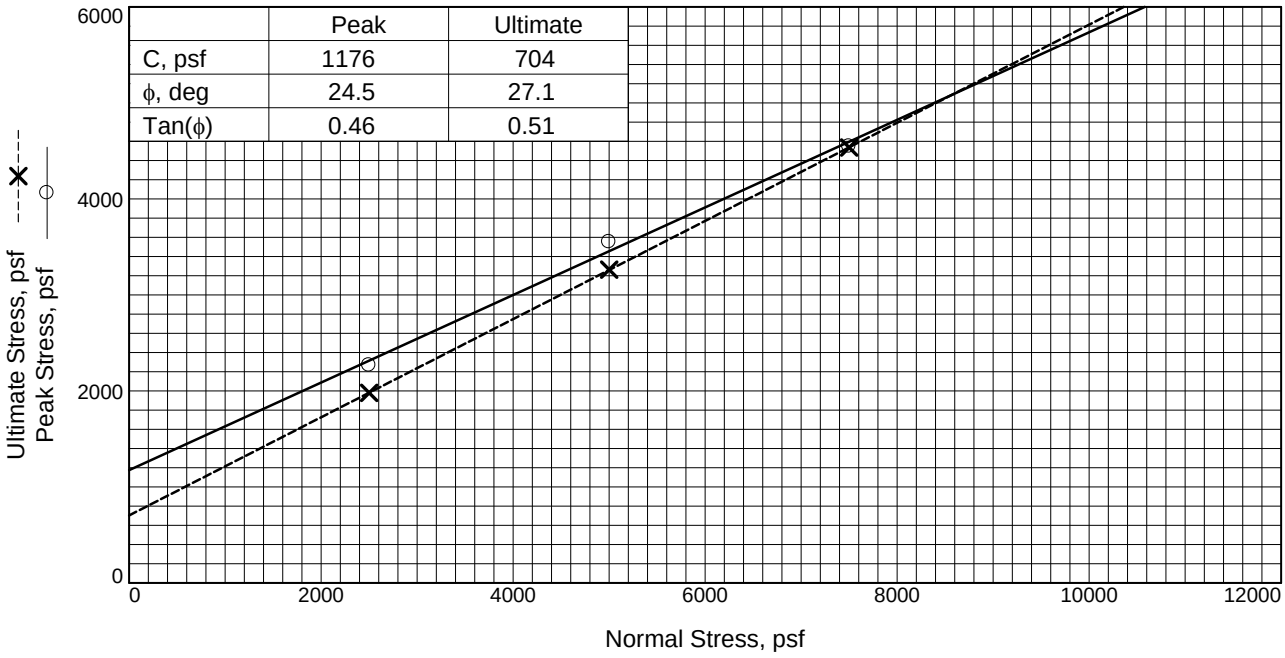
Specific Gravity= 2.65
Remarks: Proposed Compacted Fill
Remolded to about 92% of MDD
Bedrock (Tcag) derived,
% Fines = 5.1
Figure B7.28

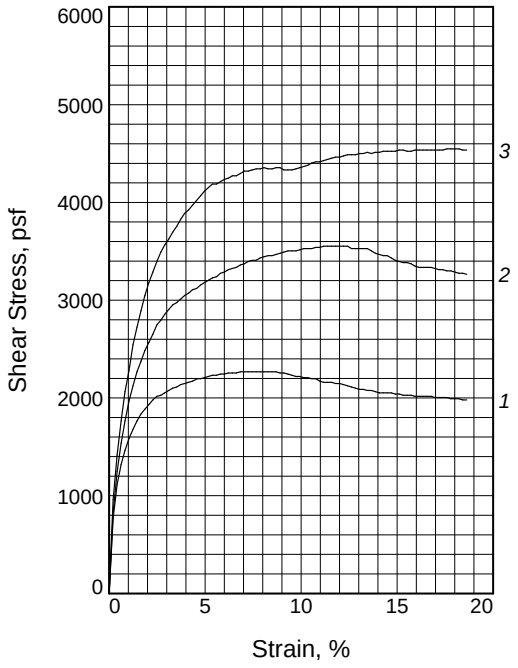
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: GT-4 **Depth:** 3-7'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	15.7	16.1	15.9
	Dry Density, pcf	105.8	105.3	105.5
	Saturation, %	73.6	74.9	74.3
	Void Ratio	0.5641	0.5705	0.5681
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	20.2	20.4	20.2
	Dry Density, pcf	107.8	107.4	107.8
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5349	0.5398	0.5351
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.98	0.98	0.98
Normal Stress, psf		2500	5000	7500
Peak Stress, psf		2268	3552	4548
Strain, %		6.8	11.2	17.6
Ultimate Stress, psf		1980	3264	4536
Strain, %		18.6	18.6	18.6
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Remold

Description: Grayish brown, sandy, lean CLAY (CL)

Specific Gravity= 2.65

Remarks: Proposed Compacted Fill
Remolded to about 92% of MDD
Bedrock (QTp) derived,
% Fines = 69.5

Figure B7.29

Client: Solstra Communities California LLC

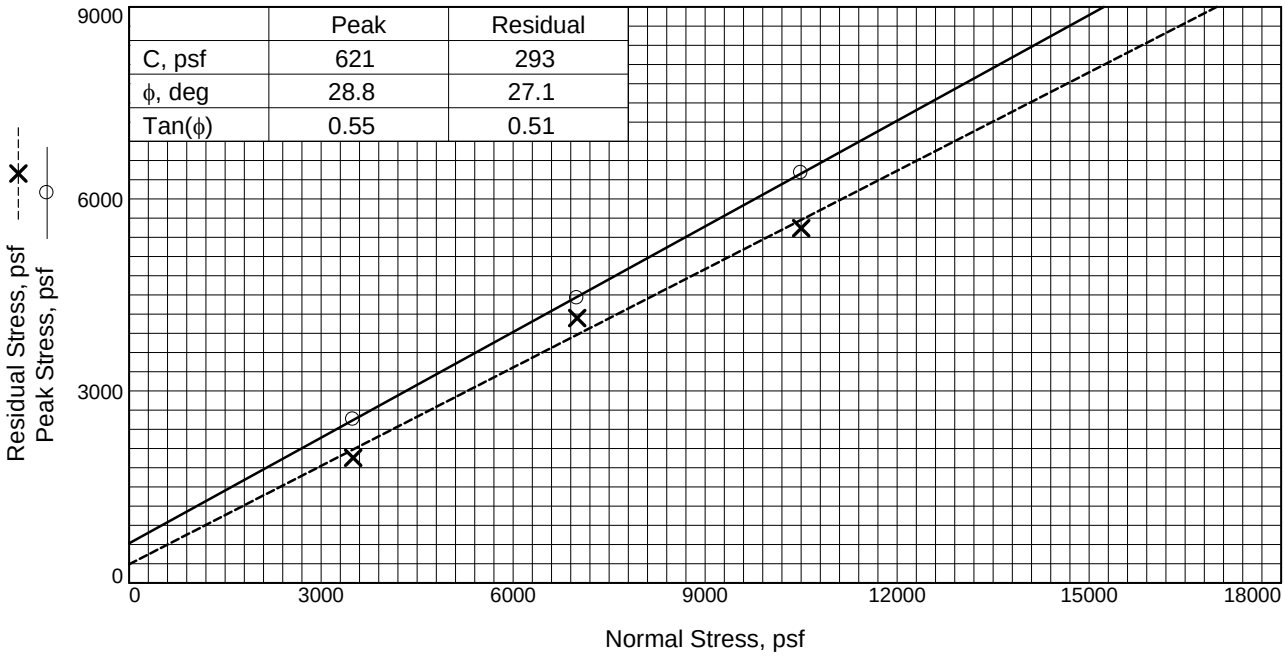
Project: Solomon Hills Specific Plan
Santa Barbara County, CA

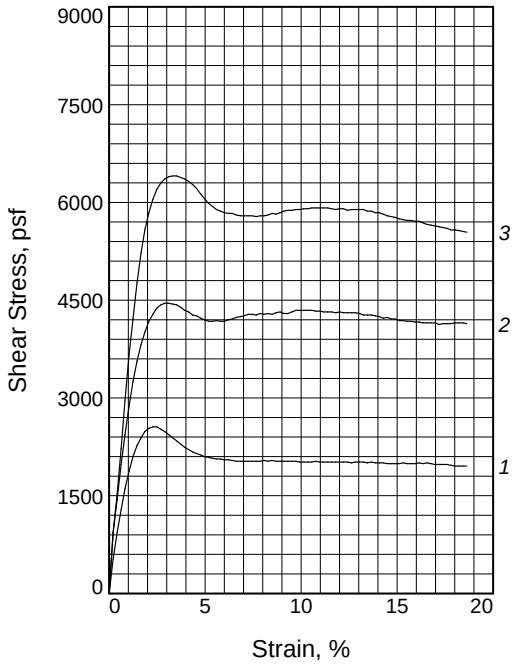
Source of Sample: GT-31 **Depth:** 6-8'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	8.5	7.8	8.6
	Dry Density, pcf	119.8	120.5	119.5
	Saturation, %	59.1	55.2	59.2
	Void Ratio	0.3814	0.3724	0.3839
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	13.2	12.7	12.7
	Dry Density, pcf	117.7	123.0	122.9
	Saturation, %	85.9	97.9	96.7
	Void Ratio	0.4058	0.3445	0.3466
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.02	0.98	0.97
Normal Stress, psf		3500	7000	10500
Peak Stress, psf		2556	4452	6407
Strain, %		2.3	2.9	3.3
Residual Stress, psf		1956	4140	5543
Strain, %		18.6	18.6	18.6
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Remold
Description: Silty SAND

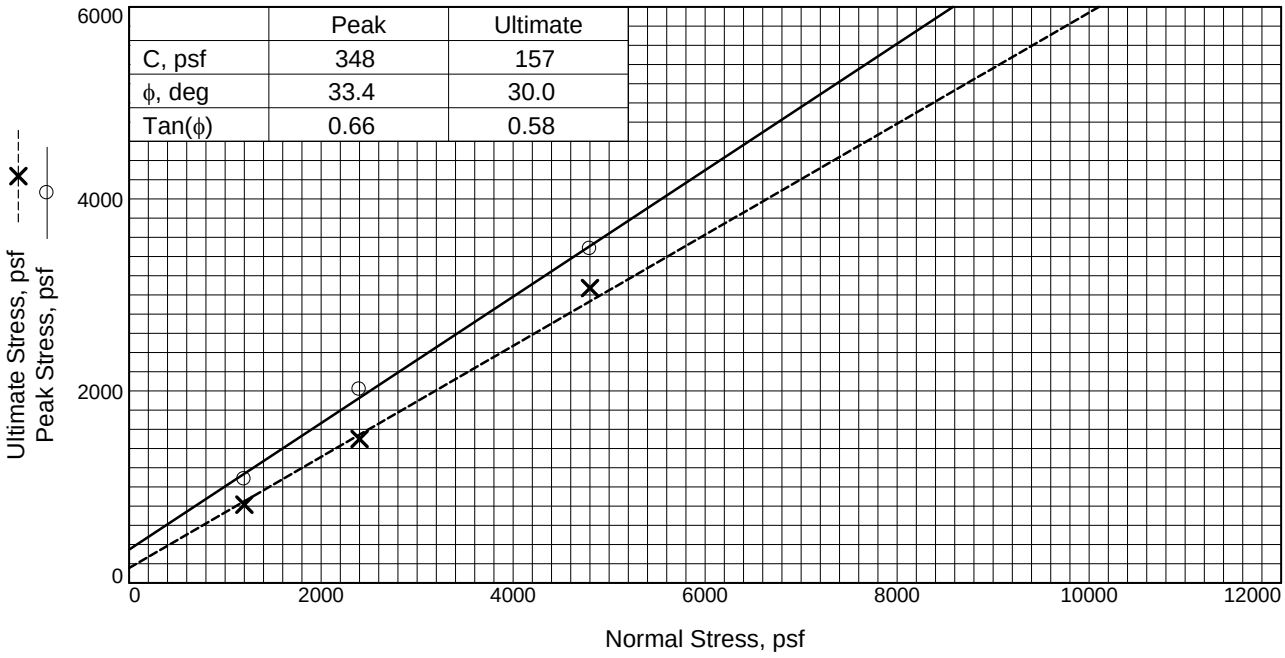
Specific Gravity= 2.65
Remarks: Proposed Compacted Fill
Remolded to about 92% of MDD
Alluvium/soil (Qa) derived,
% Fines = 24.7
Figure B7.30

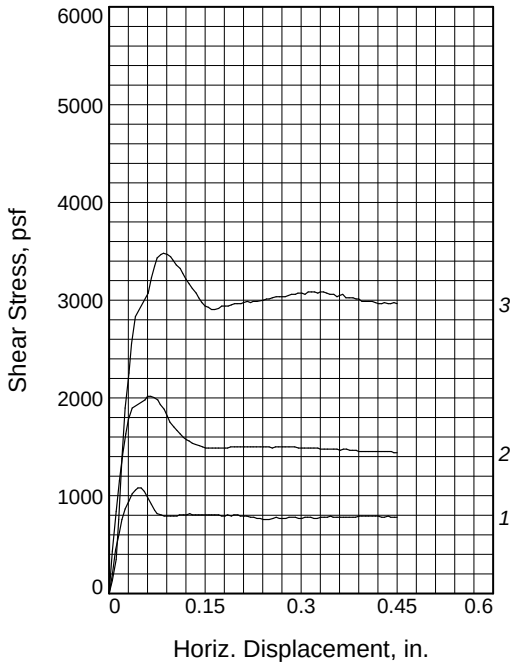
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: HS-17 **Depth:** 0-20'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	8.9	8.9	8.8
	Dry Density, pcf	115.8	115.9	116.0
	Saturation, %	54.8	55.2	54.6
	Void Ratio	0.4282	0.4276	0.4260
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	15.8	15.7	15.2
	Dry Density, pcf	116.6	116.9	118.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4189	0.4151	0.4020
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		1200	2400	4800
Peak Stress, psf		1080	2016	3480
Displacement, in.		0.05	0.06	0.09
Ultimate Stress, psf		816	1500	3072
Displacement, in.		0.08	0.15	0.14
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Remold
Description: silty, fine-grained SAND

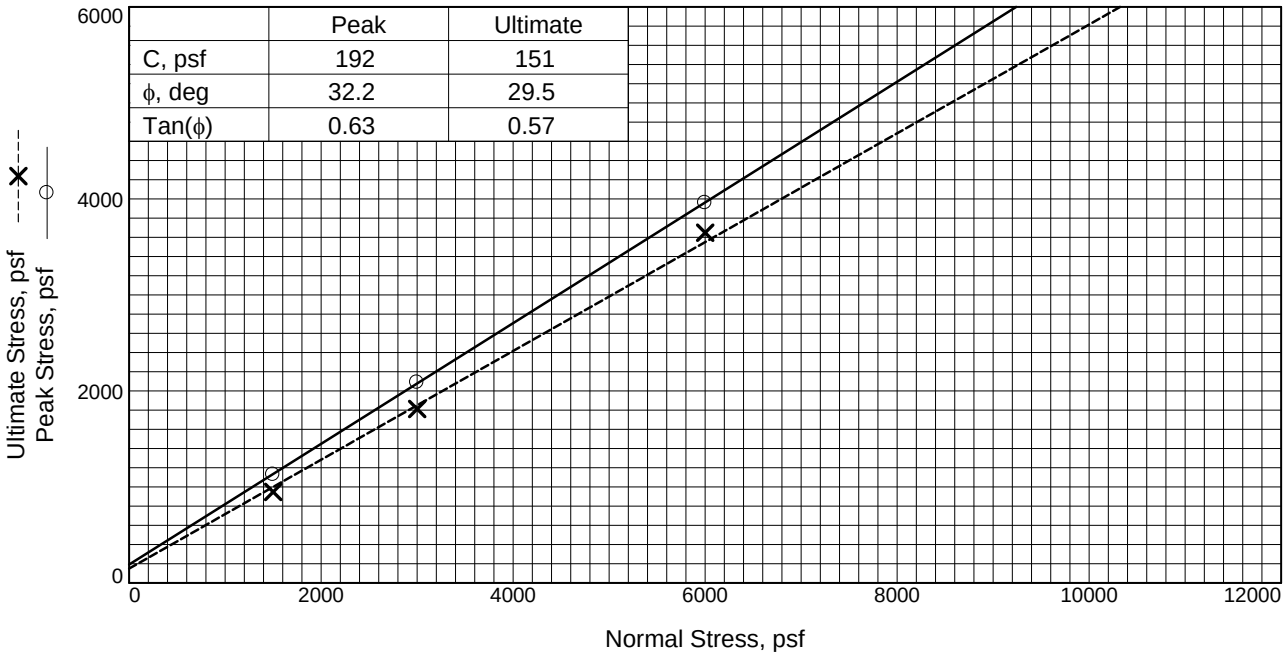
Assumed Specific Gravity= 2.65
Remarks: Proposed Compacted Fill
Remolded to approx. 90% of MDD
Qa derived
% Fines = 24.3
Figure B7.31

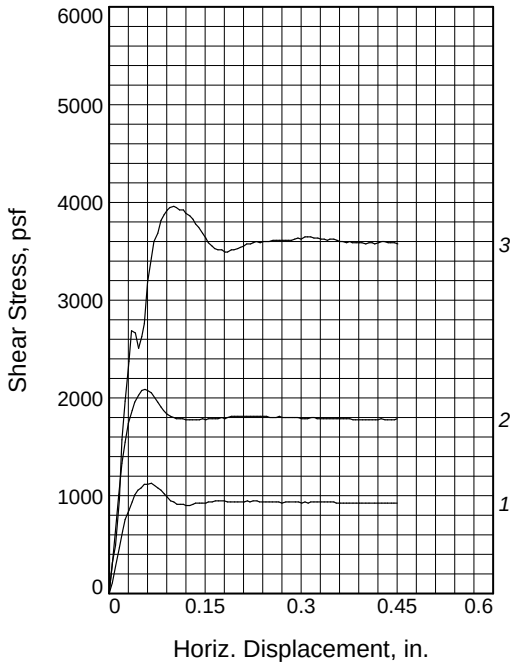
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: HS-39 **Depth:** 10' - 20'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	9.6	9.6	9.8
	Dry Density, pcf	108.1	108.2	107.9
	Saturation, %	48.1	48.2	48.7
	Void Ratio	0.5306	0.5287	0.5334
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	19.5	19.3	19.0
	Dry Density, pcf	109.2	109.5	110.1
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5156	0.5111	0.5023
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		1500	3000	6000
Peak Stress, psf		1128	2088	3960
Displacement, in.		0.07	0.06	0.10
Ultimate Stress, psf		948	1812	3648
Displacement, in.		0.18	0.19	0.32
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Remold
Description: silty, fine-grained SAND

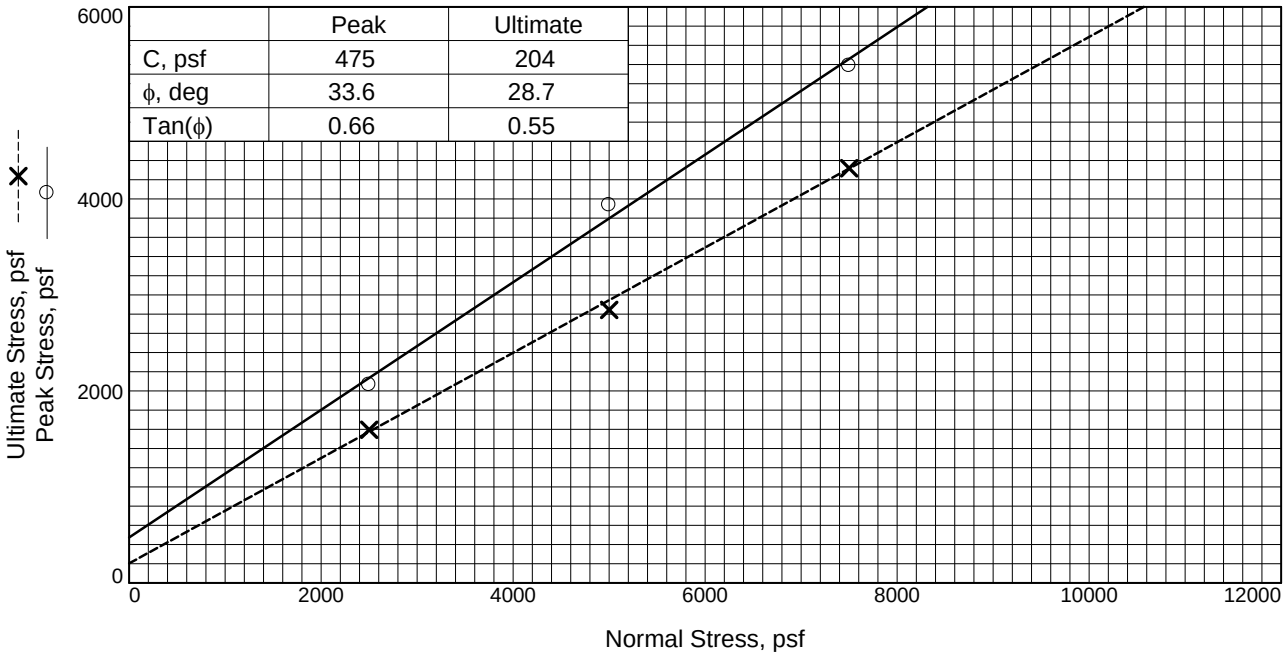
Assumed Specific Gravity= 2.65
Remarks: Proposed Compacted Fill
Remolded to approx. 90% of MDD
Qa/Tcag derived
% Fines = 21.1
Figure B7.32

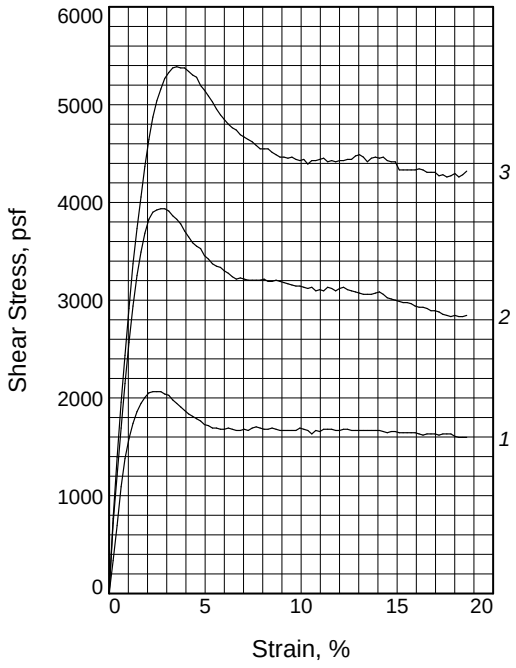
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: HS-49 **Depth:** 10' - 20'

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	10.5	10.8	10.5
	Dry Density, pcf	113.8	113.5	113.6
	Saturation, %	64.0	65.2	63.9
	Void Ratio	0.4267	0.4302	0.4287
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	17.4	15.6	15.1
	Dry Density, pcf	111.8	115.4	116.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4516	0.4065	0.3935
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.02	0.98	0.98
Normal Stress, psf		2500	5000	7500
Peak Stress, psf		2064	3936	5388
Strain, %		2.3	2.7	3.5
Ultimate Stress, psf		1596	2844	4320
Strain, %		18.6	18.6	18.6
Strain rate, in./min.		0.010	0.010	0.010

Sample Type: Remold

Description: Light yellowish brown, poorly graded SAND with clay

Specific Gravity= 2.60

Remarks: Proposed Compacted Fill
Remolded to about 92% of MDD
Bedrock (QTp) derived,
% Fines = 11.3

Figure B7.33

Client: Solstra Communities California LLC

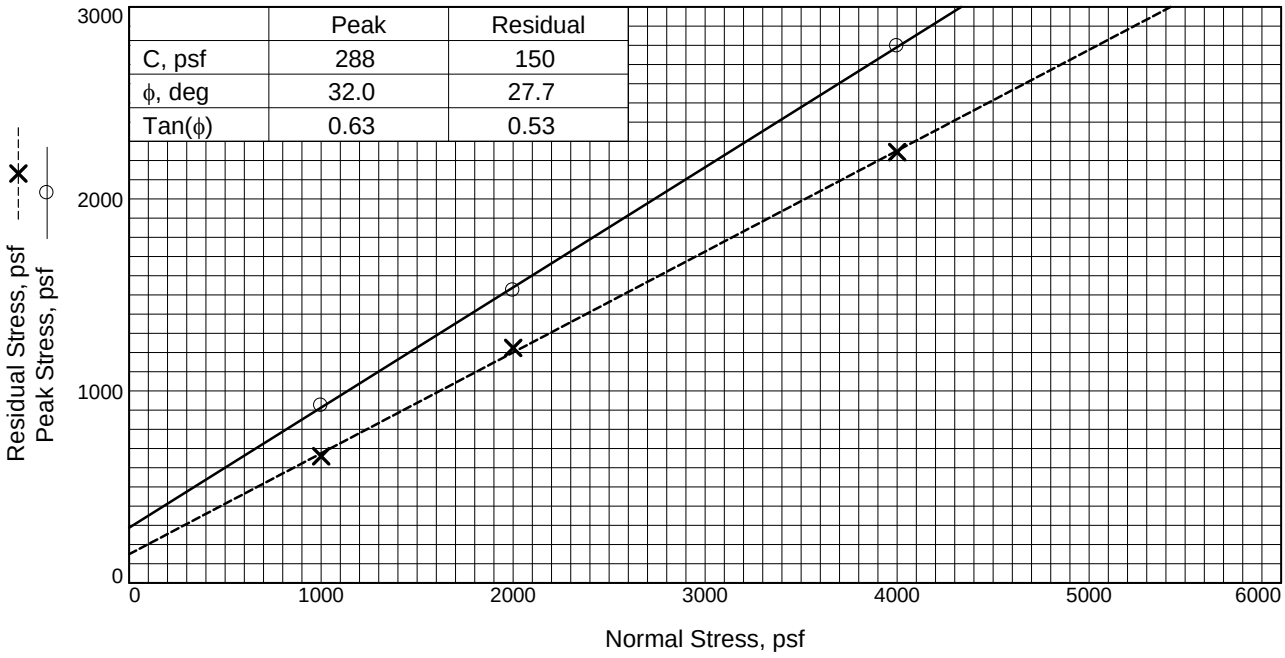
Project: Solomon Hills Specific Plan
Santa Barbara County, CA

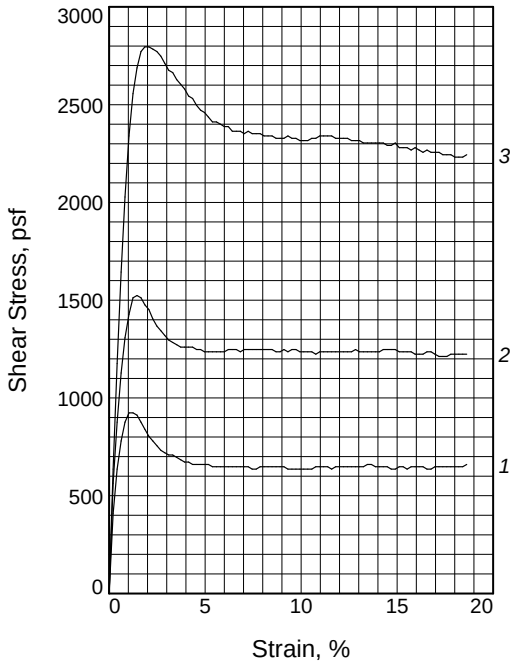
Source of Sample: BA-4 **Depth:** 15-20

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	9.2	9.2	9.3
	Dry Density, pcf	117.3	117.2	117.0
	Saturation, %	59.5	59.5	59.8
	Void Ratio	0.4107	0.4113	0.4143
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	14.8	15.0	14.6
	Dry Density, pcf	118.9	118.4	119.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.3914	0.3969	0.3875
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		1000	2000	4000
Peak Stress, psf		924	1524	2796
Strain, %		1.0	1.4	1.9
Residual Stress, psf		660	1224	2244
Strain, %		18.6	18.6	18.6
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Remold
Description: Clayey SAND

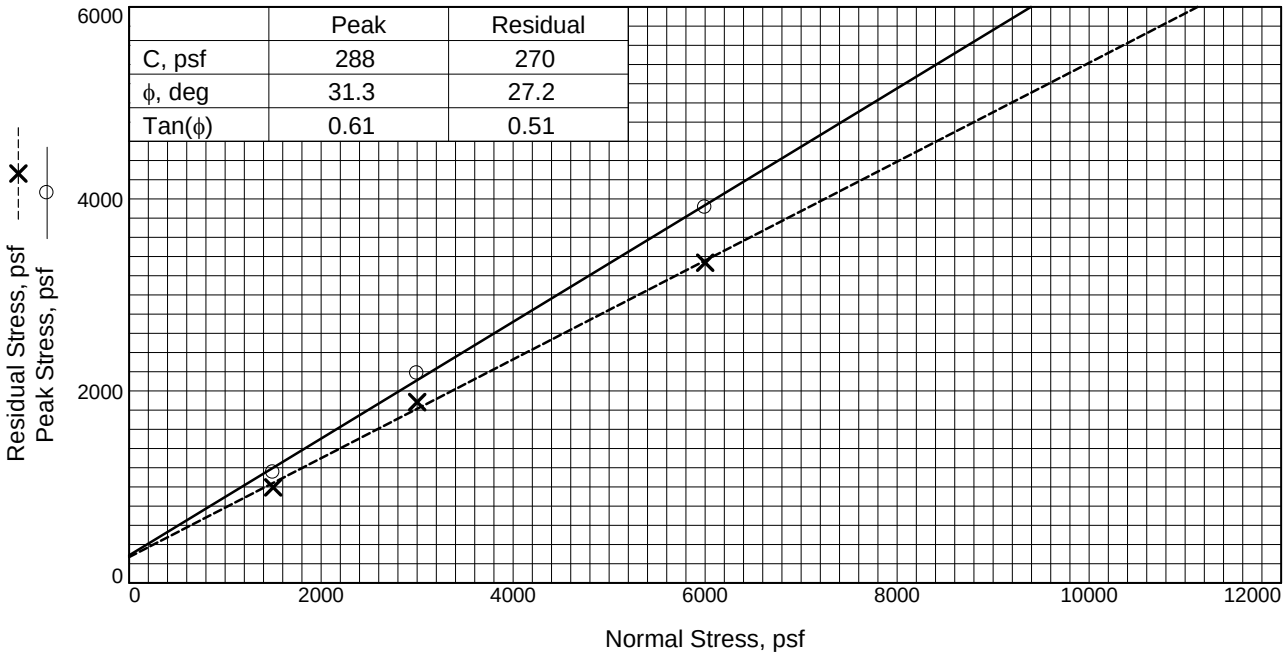
Specific Gravity= 2.65
Remarks: Proposed Compacted Fill
Remolded to about 92% of MDD
Bedrock (Tcag) derived,
% Fines = 23.0
Figure B7.34

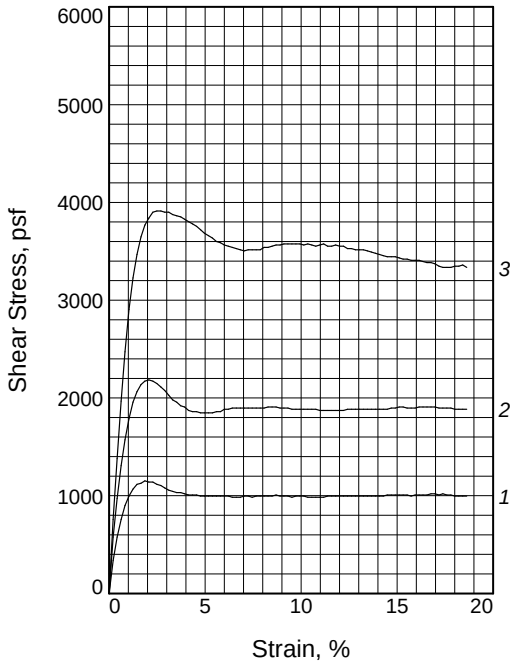
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-19 **Depth:** 10-20

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	9.7	9.8	9.8
	Dry Density, pcf	110.1	110.0	109.9
	Saturation, %	51.2	51.4	51.7
	Void Ratio	0.5019	0.5033	0.5047
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	18.3	18.3	17.9
	Dry Density, pcf	111.4	111.3	112.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4848	0.4863	0.4746
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		1500	3000	6000
Peak Stress, psf		1152	2184	3912
Strain, %		1.9	2.1	2.5
Residual Stress, psf		996	1884	3336
Strain, %		18.6	18.6	18.6
Strain rate, %/min.		0.01	0.01	0.01

Sample Type: Remold
Description: Silty SAND (SM)

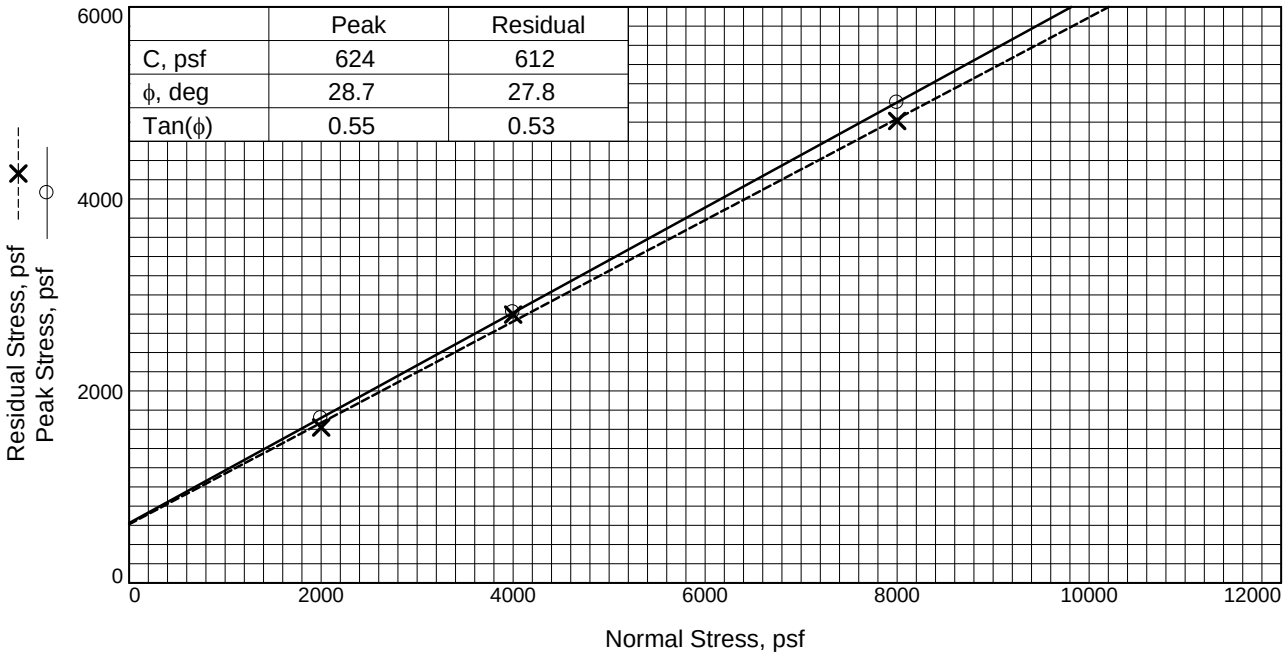
Specific Gravity= 2.65
Remarks: Proposed Compacted Fill
Remolded to about 92% of MDD
Bedrock (Tcag) derived,
% Fines = 14.4
Figure B7.35

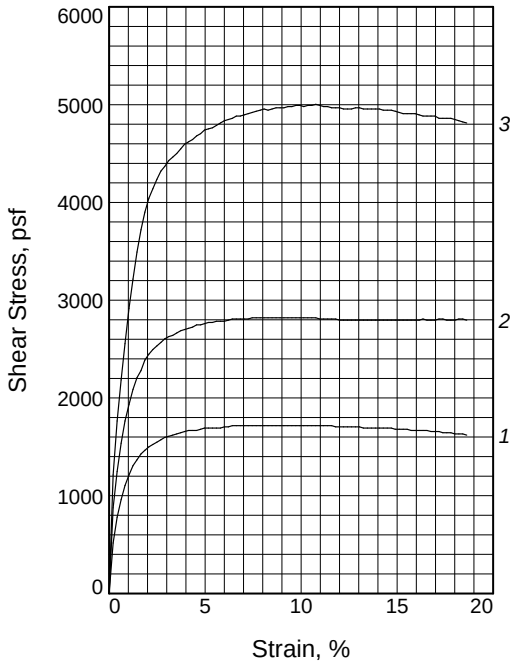
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-20 **Depth:** 10-20

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California





Sample No.		1	2	3
Initial	Water Content, %	11.2	11.1	11.2
	Dry Density, pcf	110.3	110.4	110.3
	Saturation, %	57.4	57.1	57.2
	Void Ratio	0.5276	0.5264	0.5279
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	21.9	20.2	19.5
	Dry Density, pcf	111.3	111.6	112.5
	Saturation, %	114.9	107.2	105.7
	Void Ratio	0.5140	0.5100	0.4988
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		2000	4000	8000
Peak Stress, psf		1716	2820	5004
Strain, %		6.4	7.5	10.8
Residual Stress, psf		1620	2796	4812
Strain, %		18.6	18.6	18.6
Strain rate, %/min.		0.0050	0.0050	0.0050

Sample Type: Remold
Description: Lean CLAY with sand

Specific Gravity= 2.70
Remarks: Proposed Compacted Fill
Remolded to about 92% of MDD
Bedrock (Tcac) derived,
% Fines = 73.4
Figure B7.36

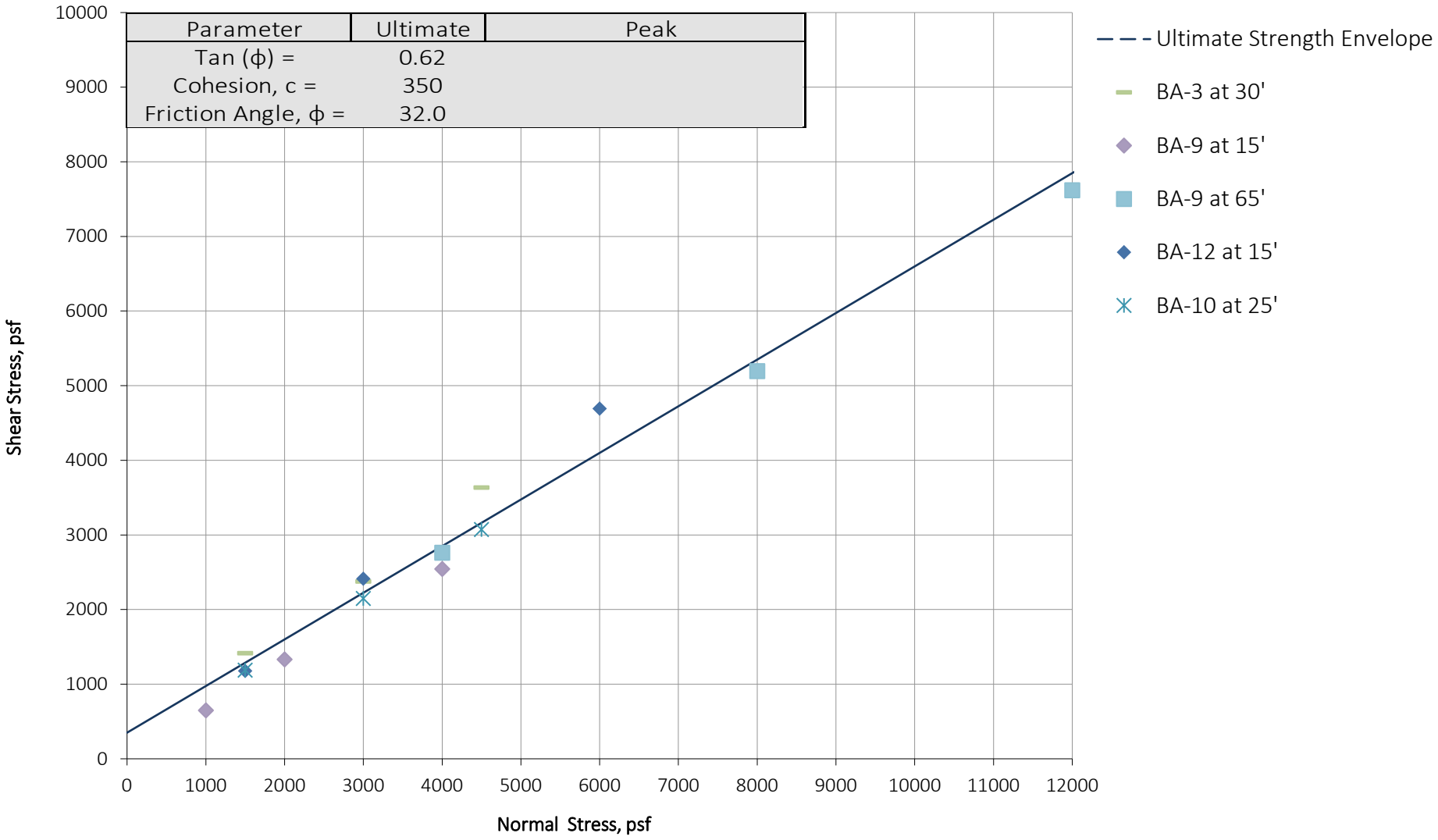
Client: Solstra Communities California LLC

Project: Solomon Hills Specific Plan
Santa Barbara County, CA
Source of Sample: BA-21 **Depth:** 10-20

Proj. No.: 23-2195s-1 **Date Sampled:**

DIRECT SHEAR TEST REPORT
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Valencia, California

Parameter	Ultimate	Peak
Tan (ϕ) =	0.62	
Cohesion, c =	350	
Friction Angle, ϕ =	32.0	

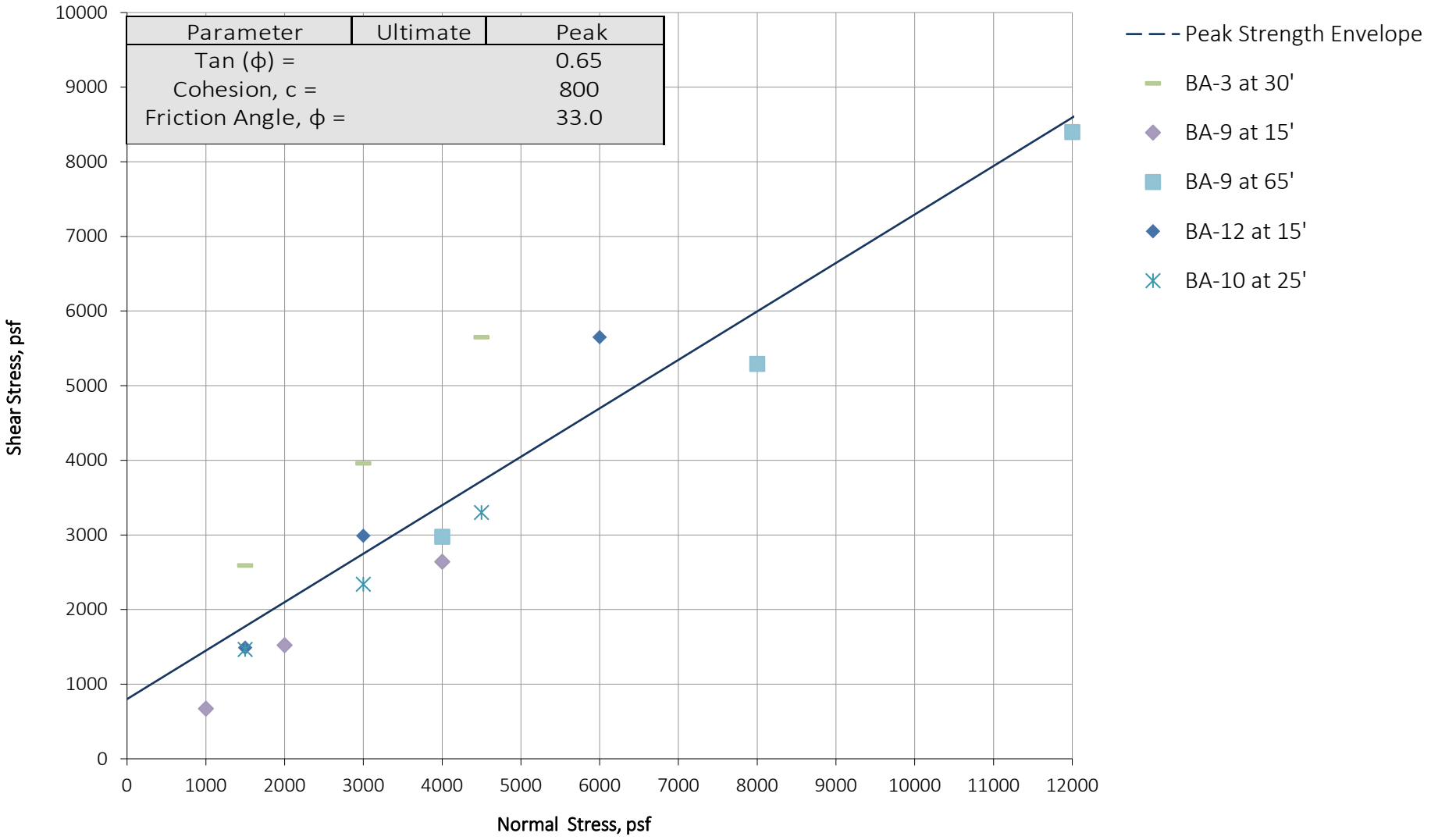


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (Tcac)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.1

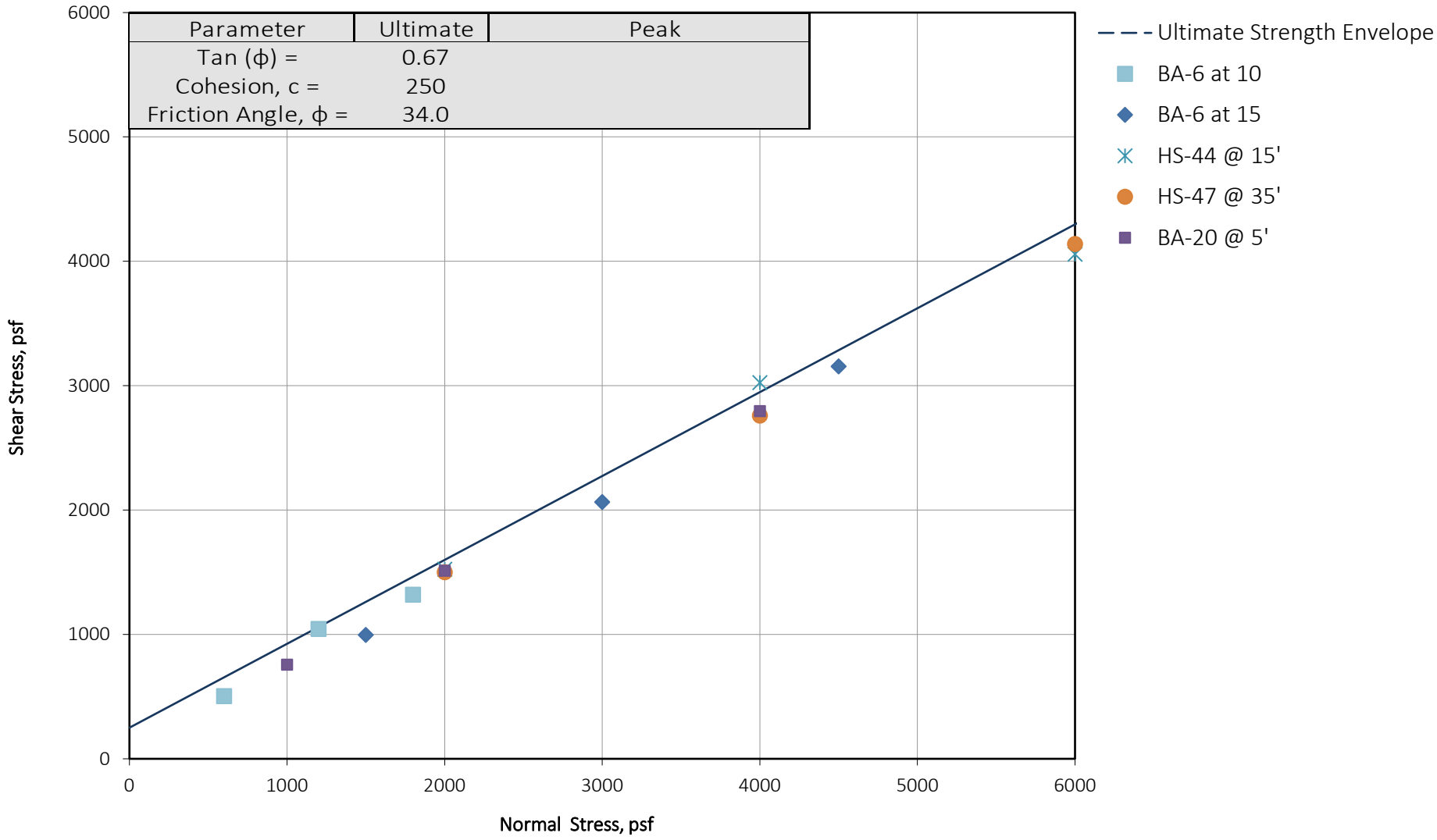


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (Tcac)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.2



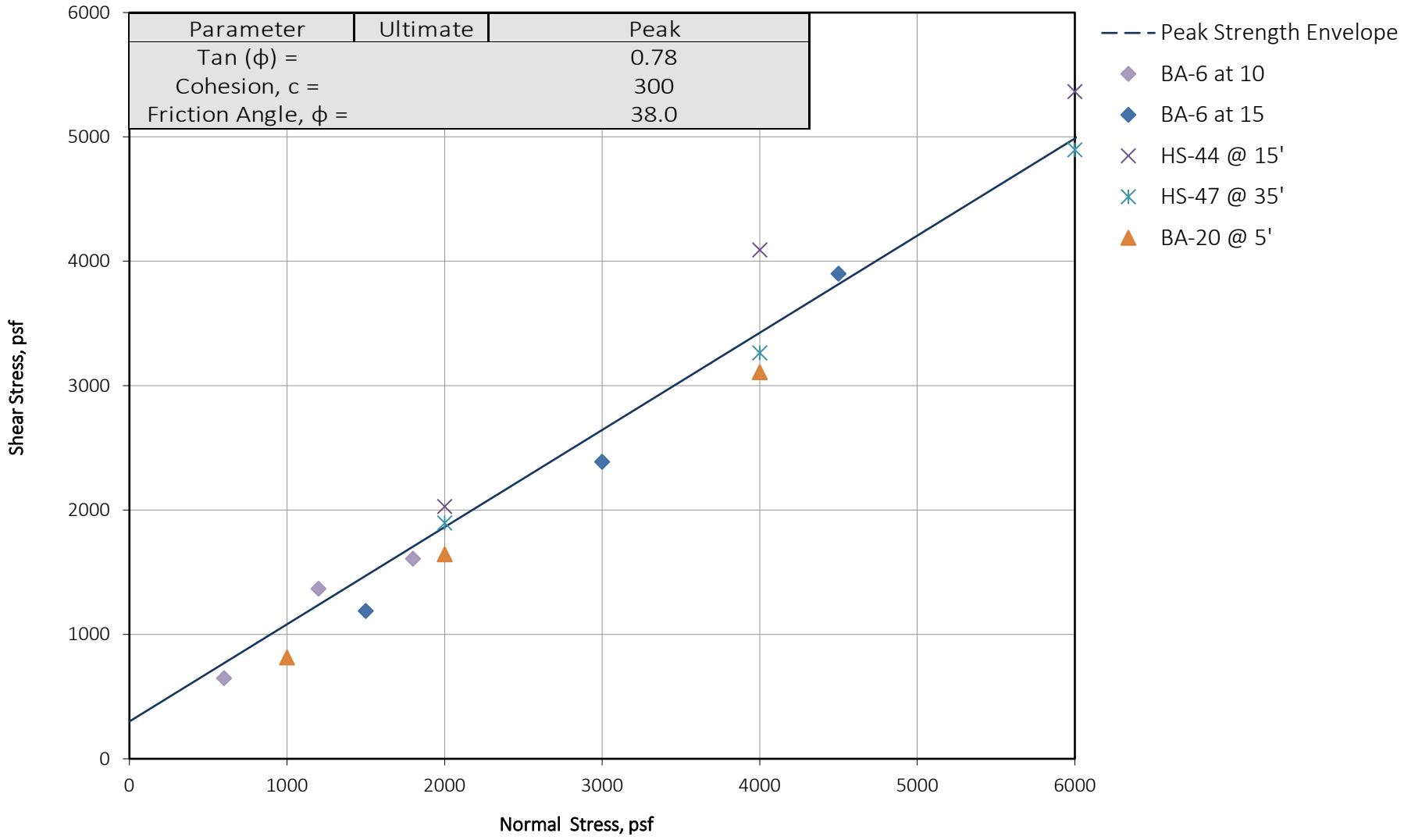
Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (Tcag)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.3

Parameter	Ultimate	Peak
Tan (ϕ) =		0.78
Cohesion, c =		300
Friction Angle, ϕ =		38.0

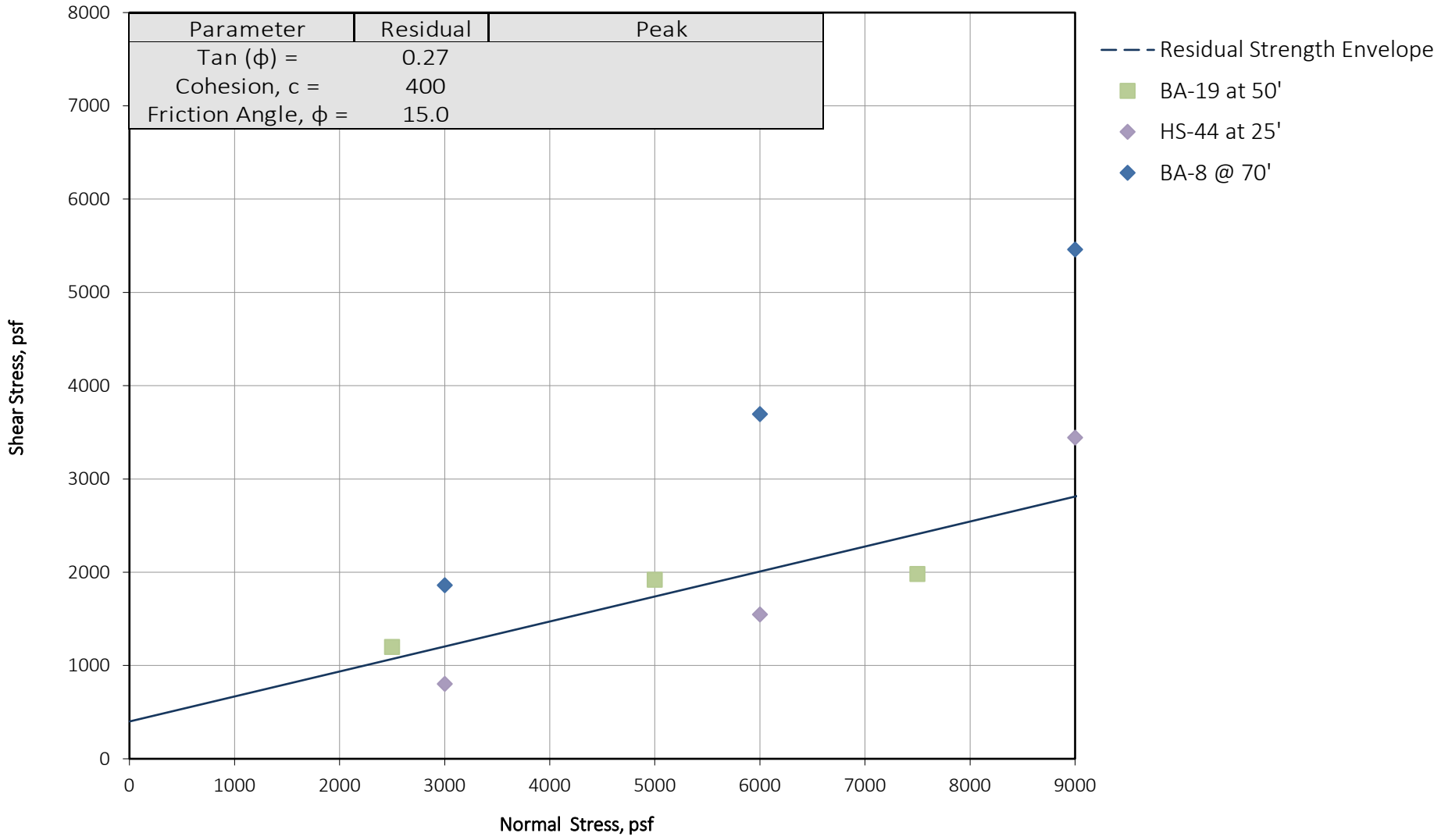


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (Tcag)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.4

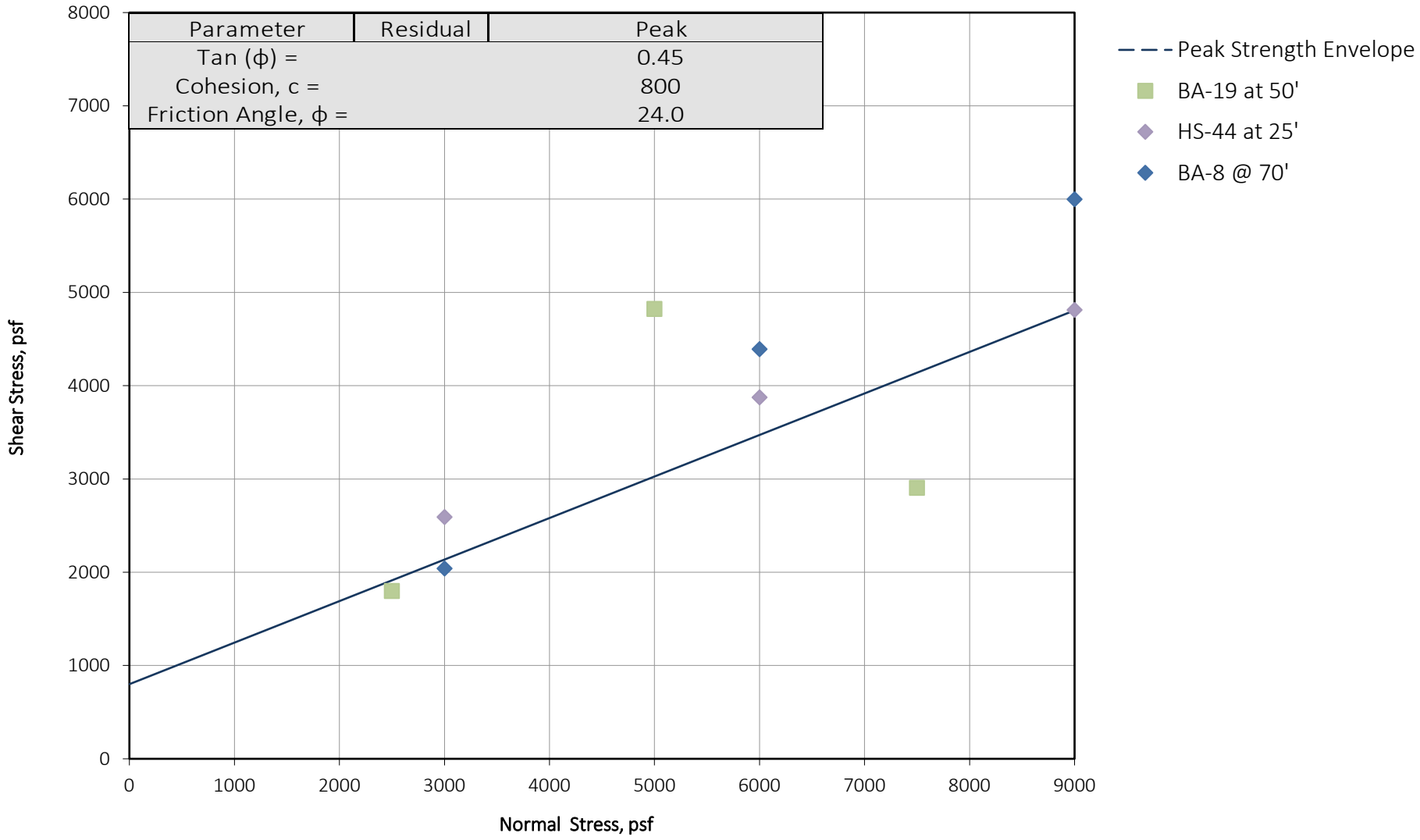


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (Tcac & Tcag along-bedding)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.5

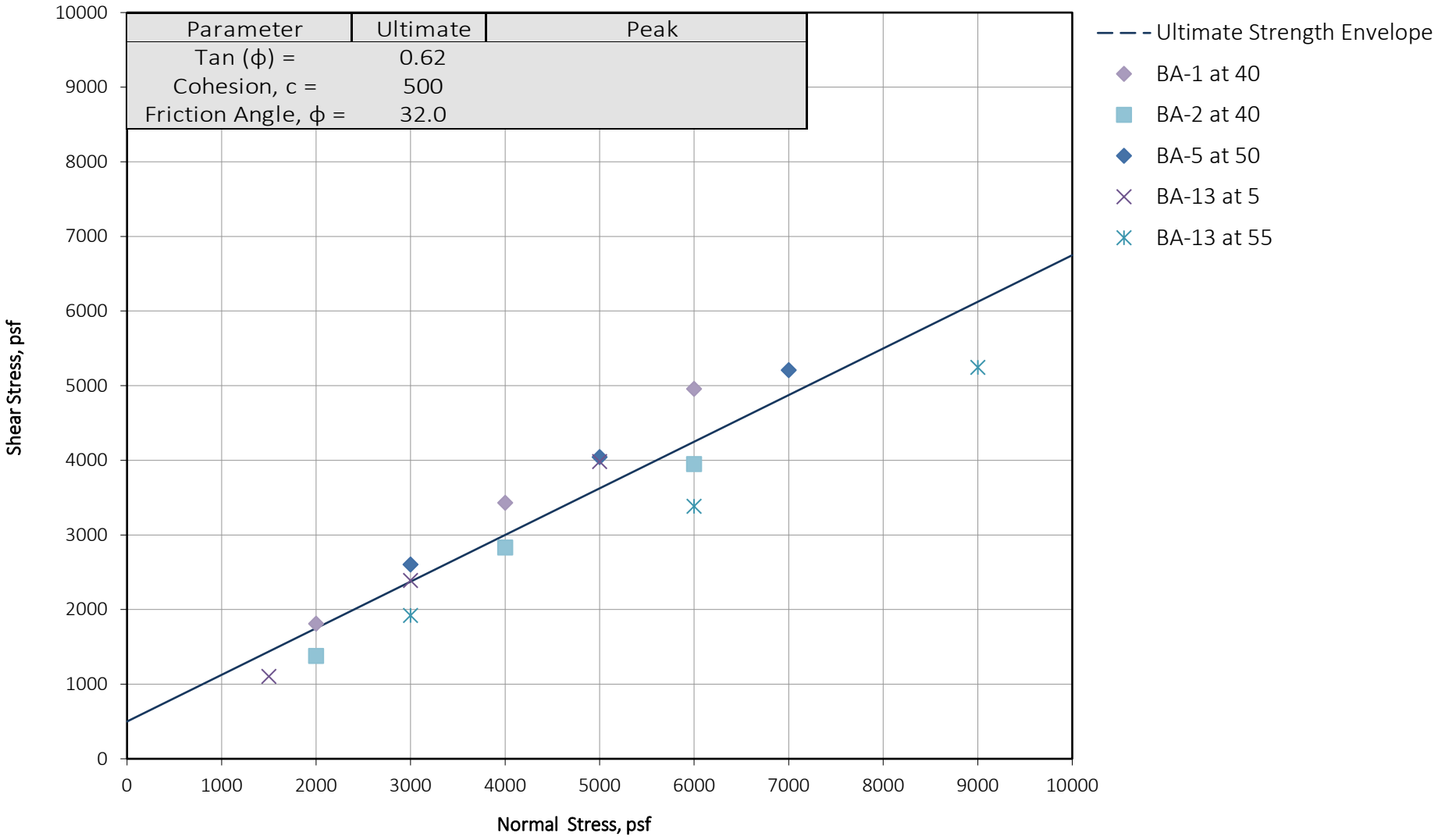


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (Tcac & Tcag along-bedding)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.6

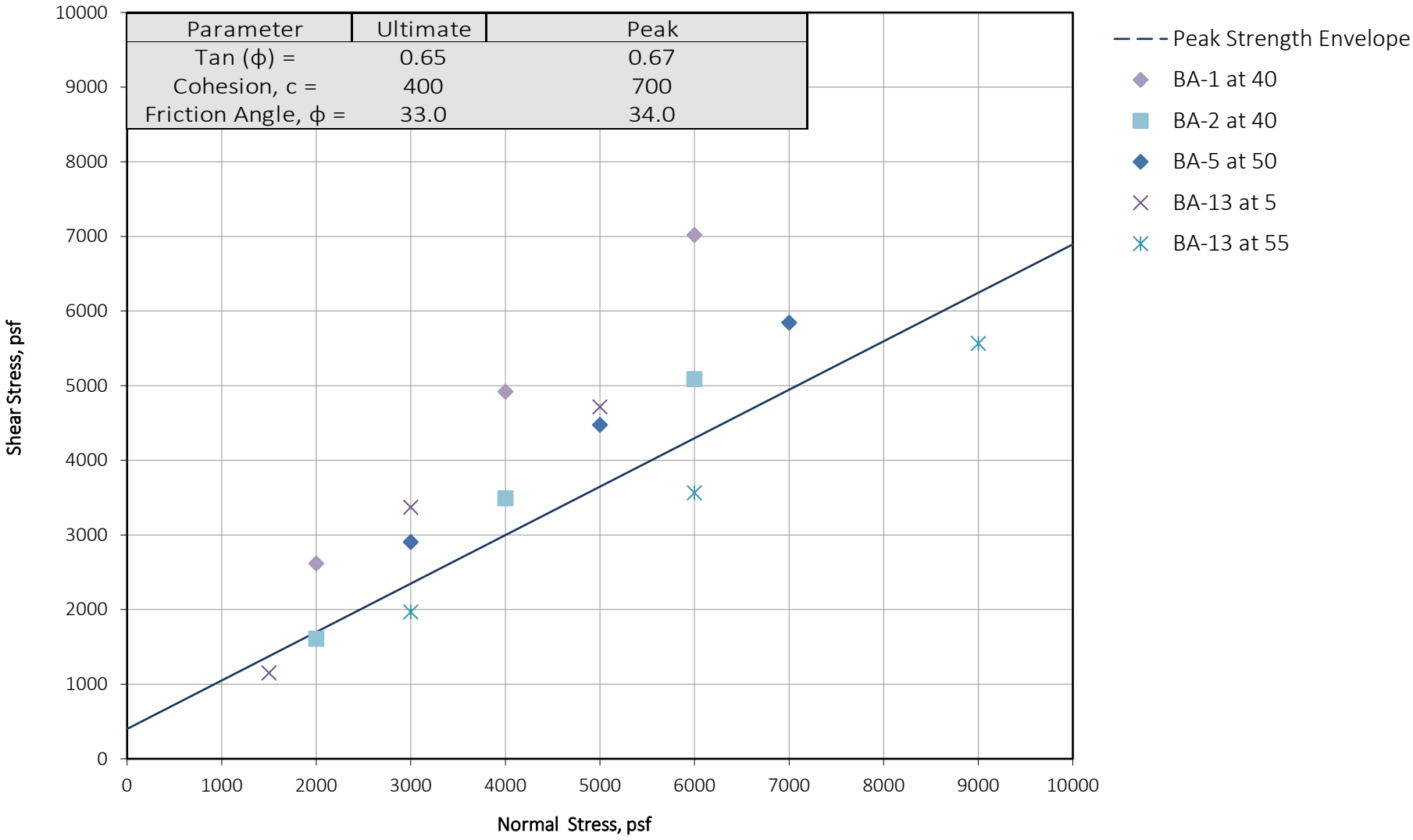


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (QTp)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.7

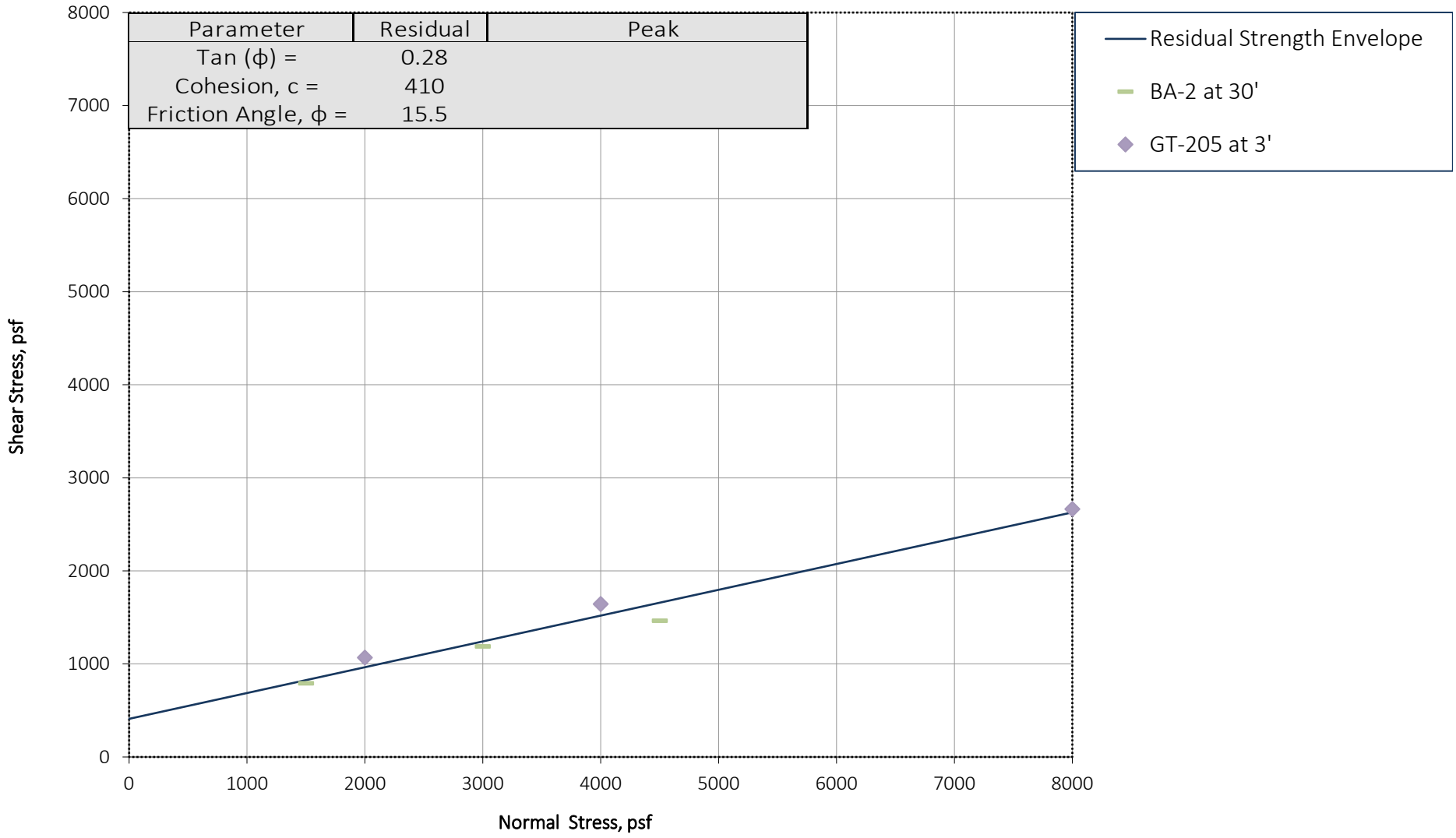


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (QTp)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.8

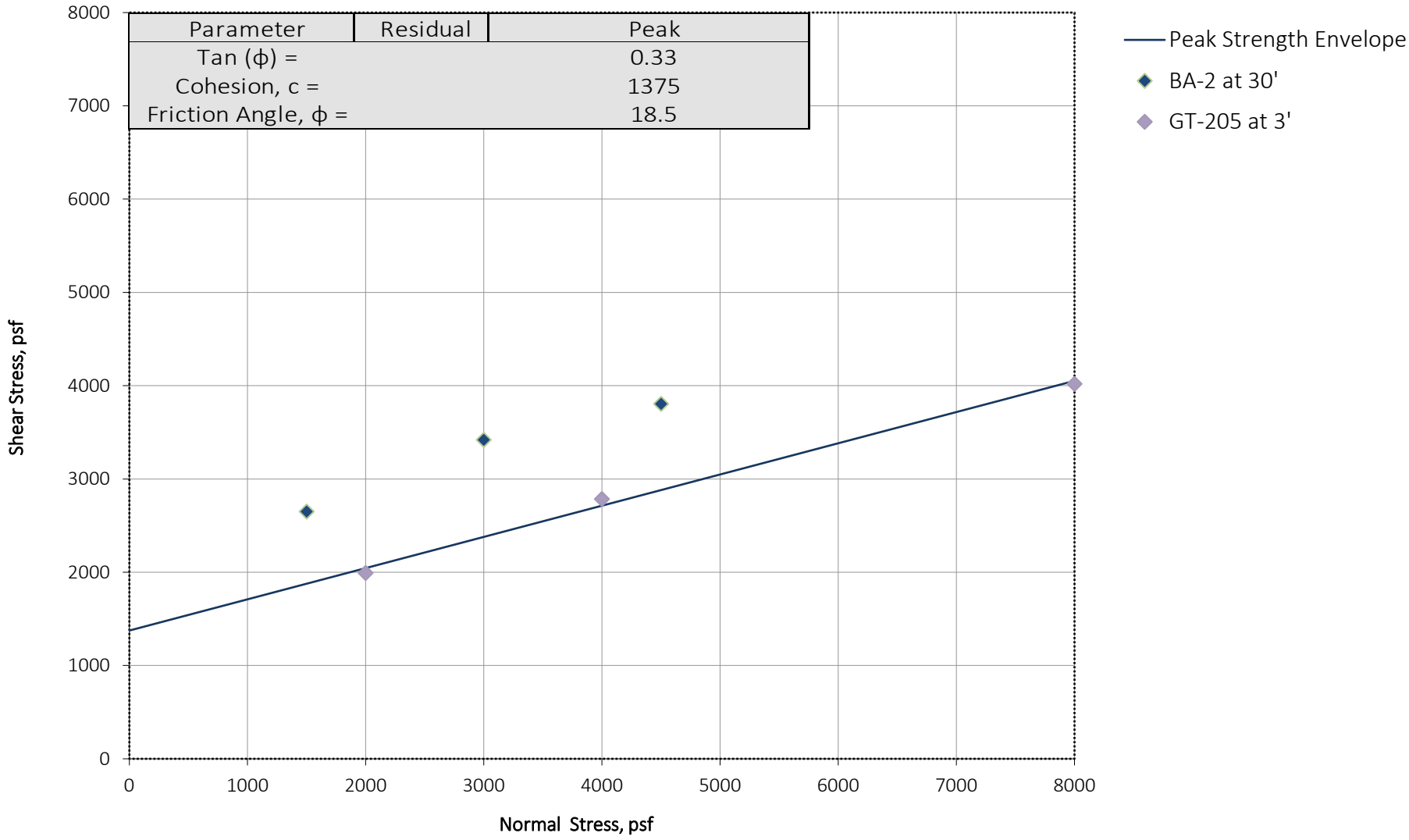


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (QTp along-bedding)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.9

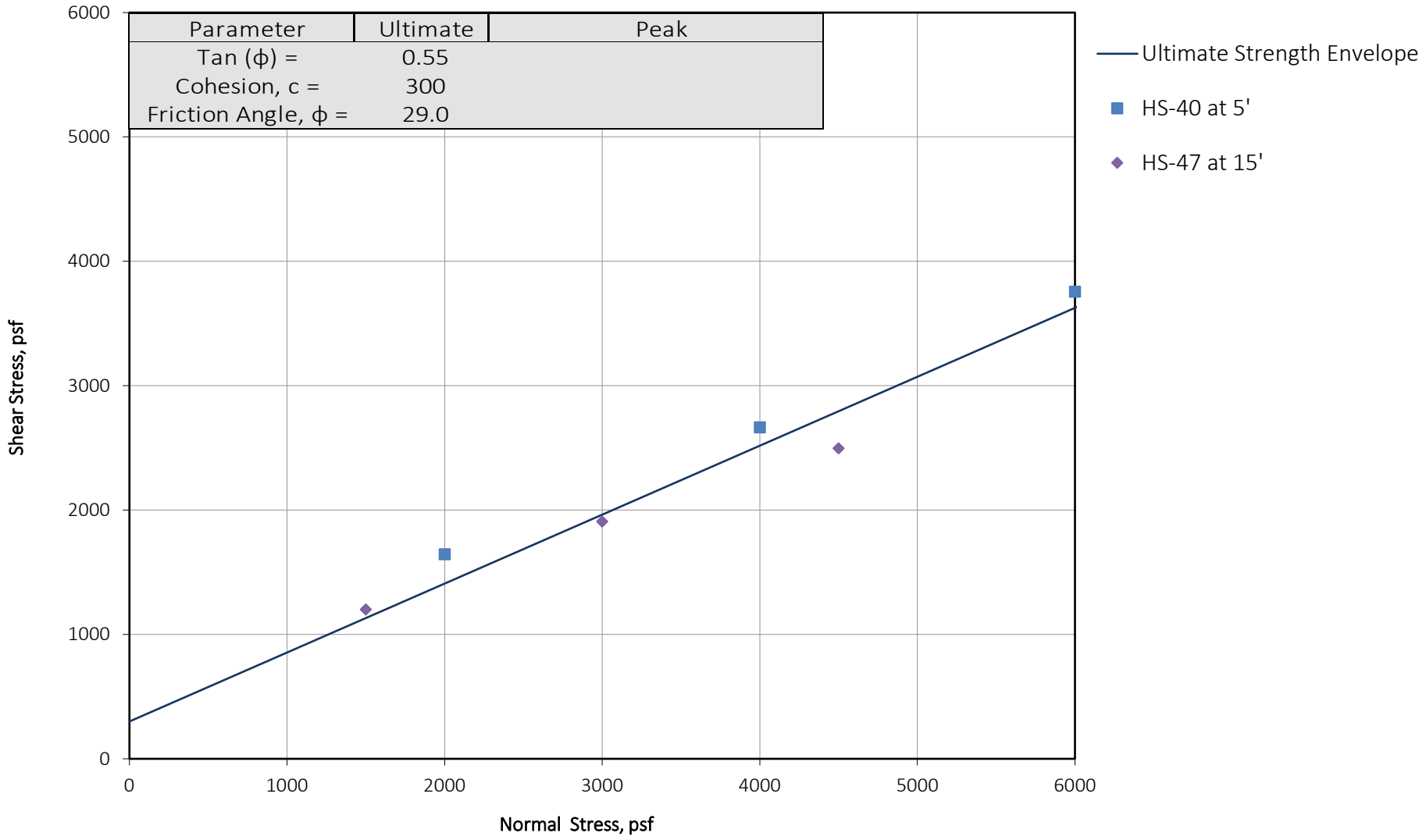


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Bedrock (QTp along-bedding)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.10

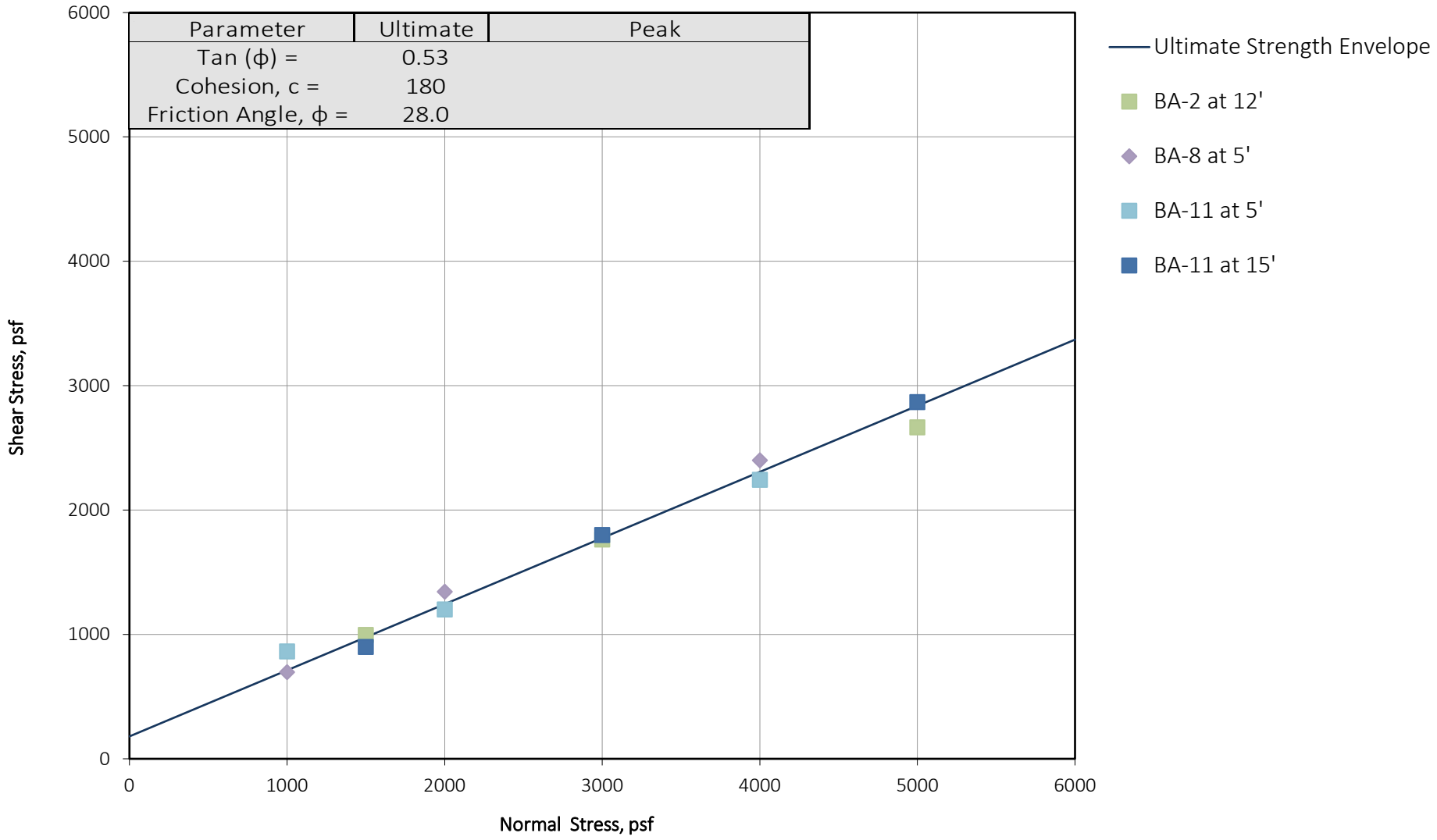


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Alluvium (Qa)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.11

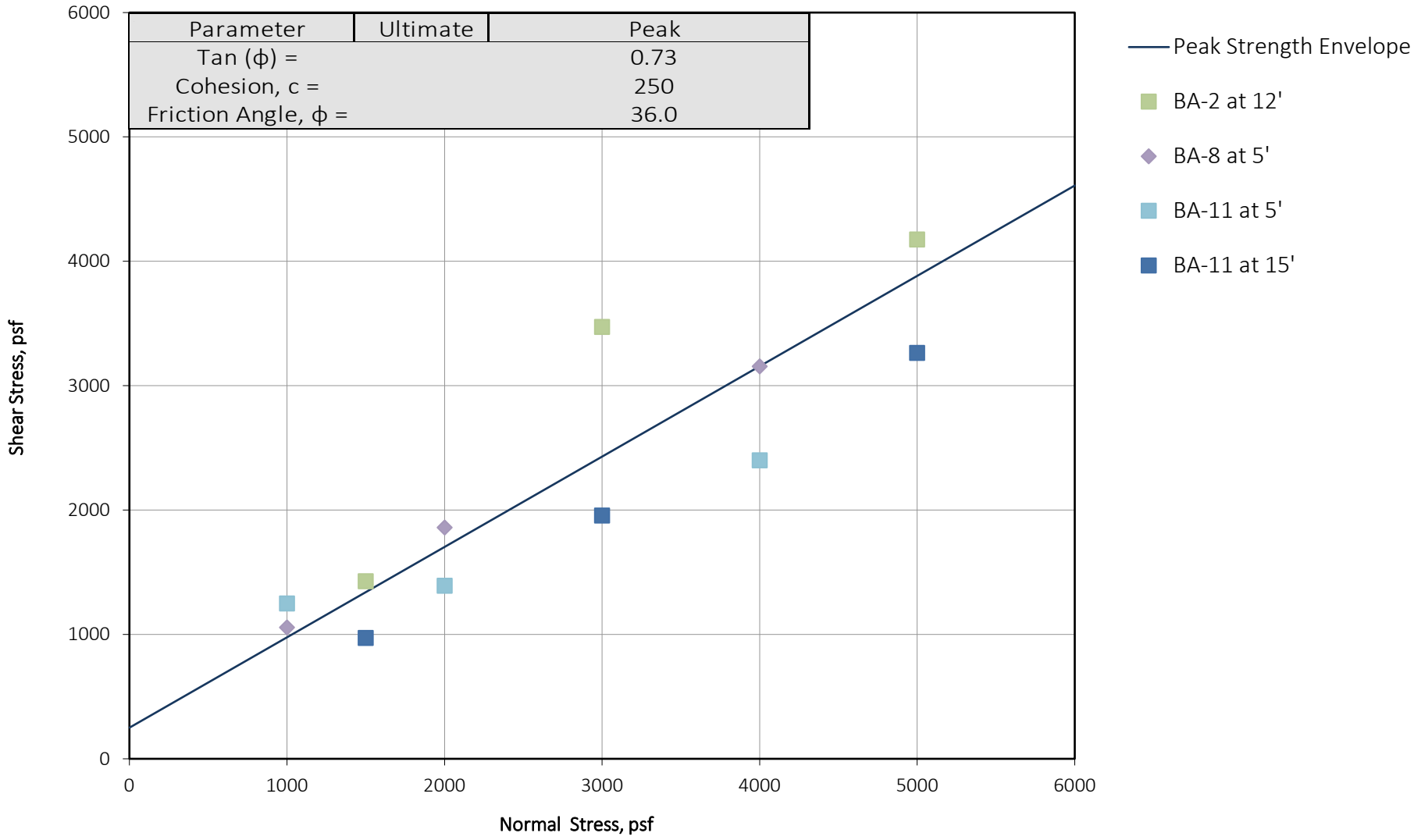


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Landslide (Qls)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.12

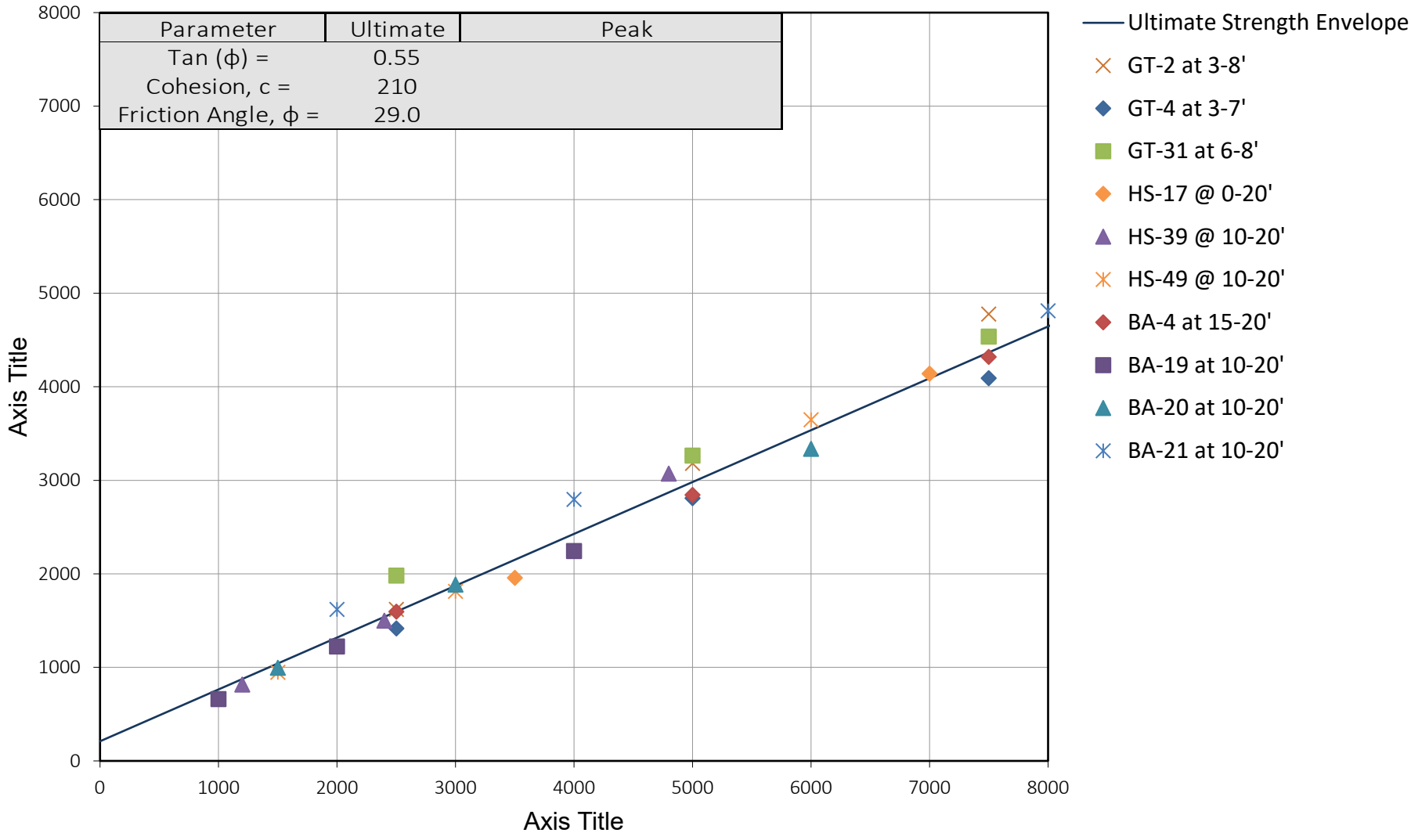


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Landslide (Qls)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.13

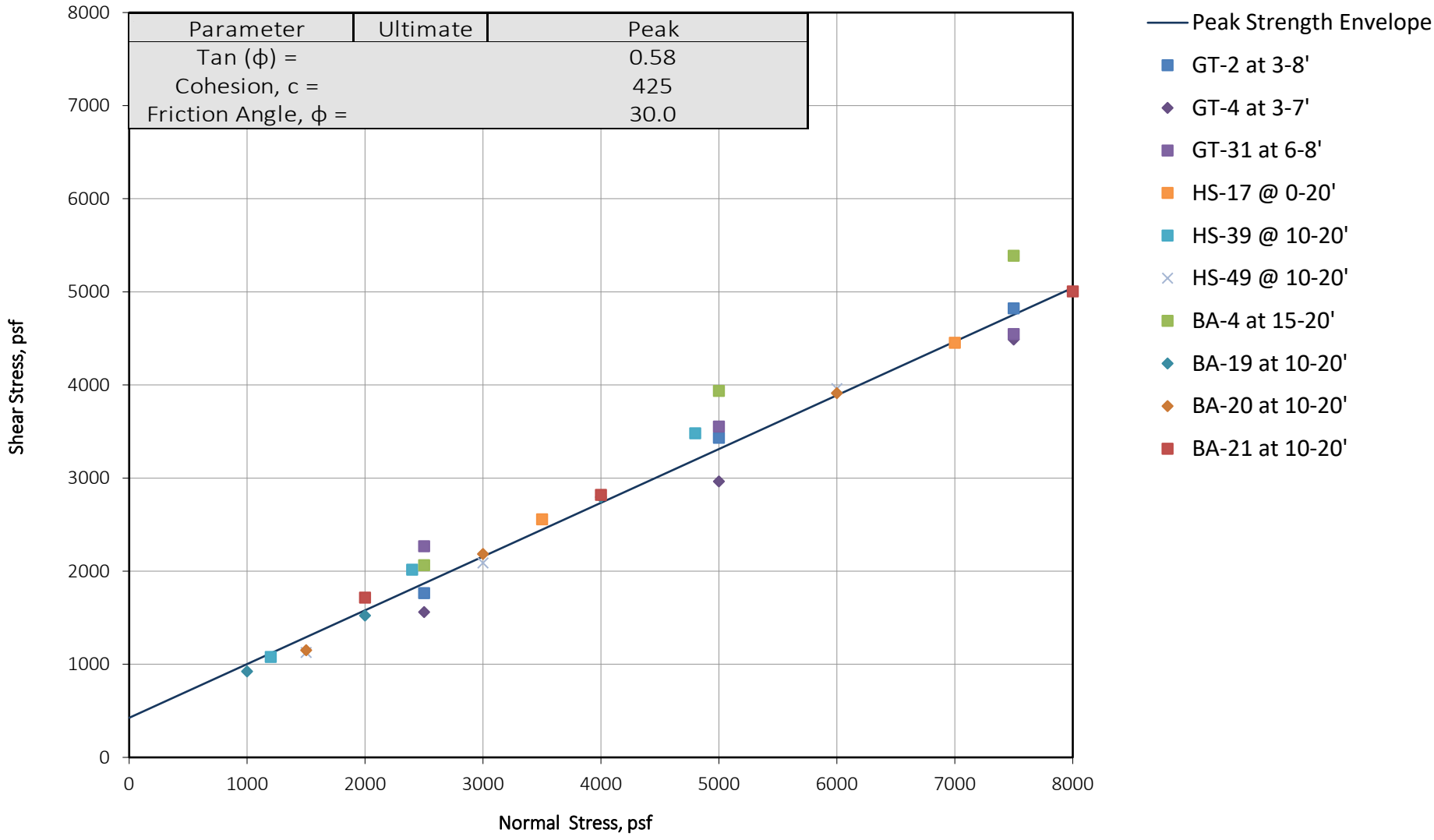


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Fill (All)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.14

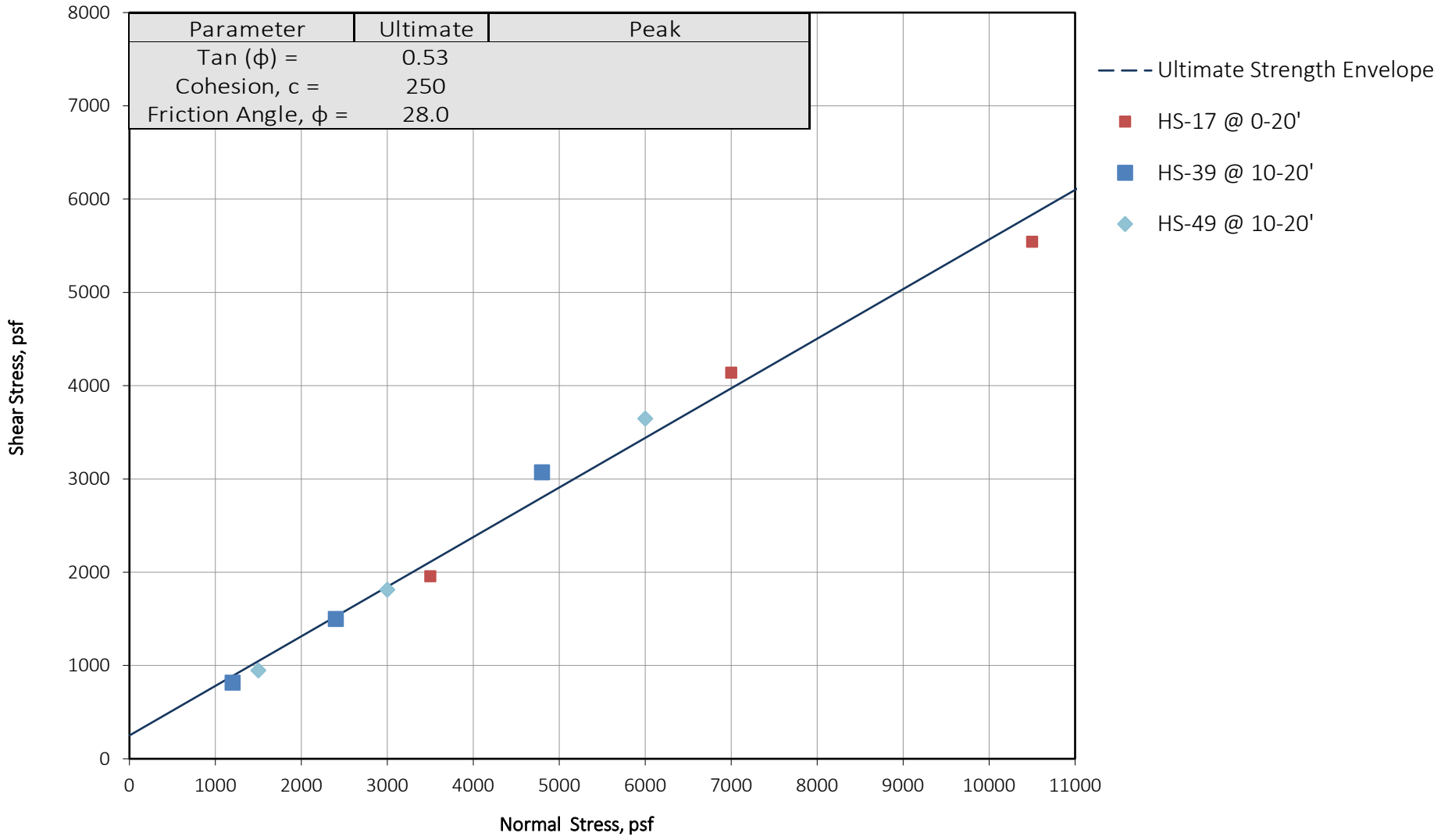


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Fill (All)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.15

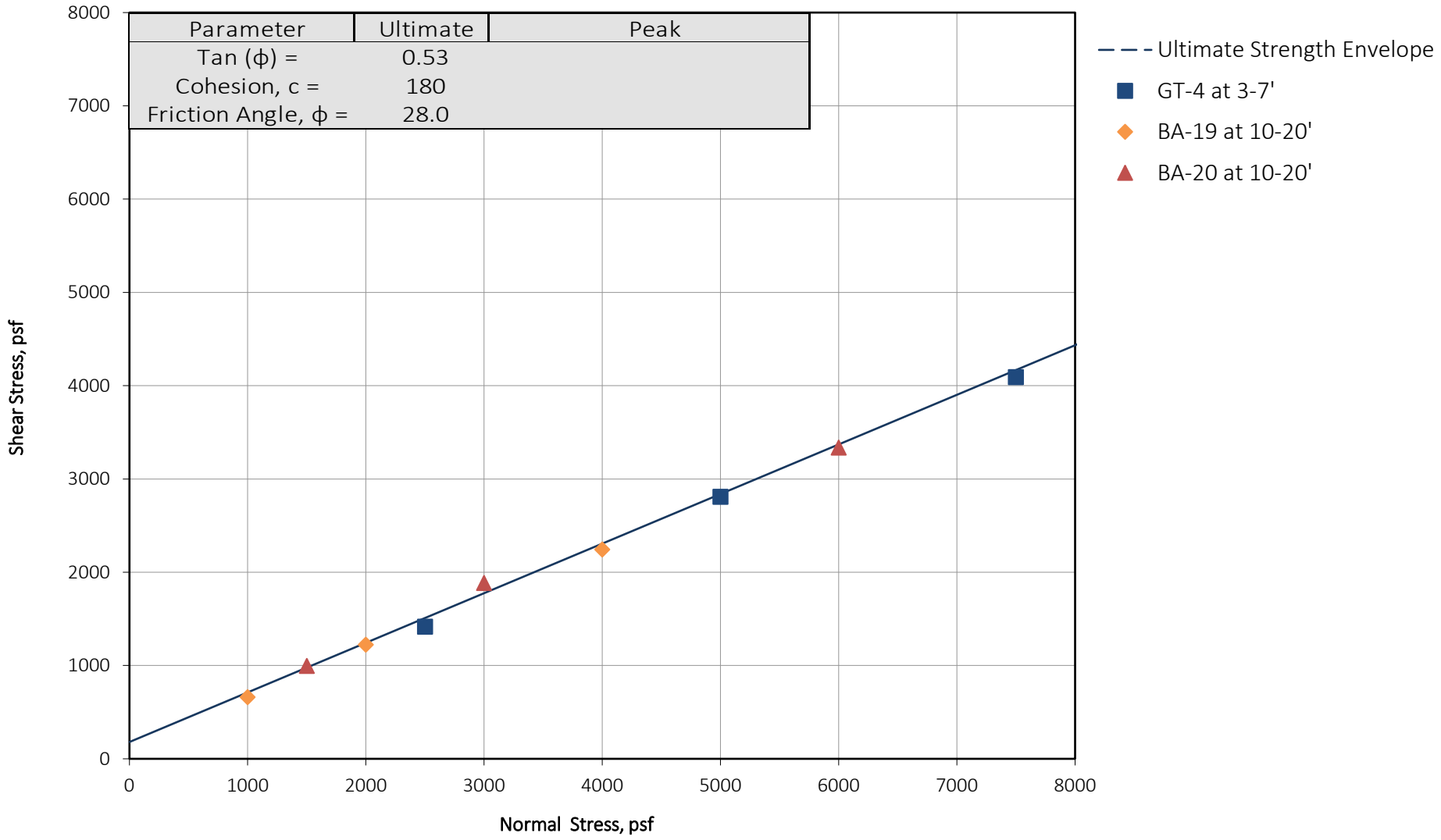


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Fill (Qa derived)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.16

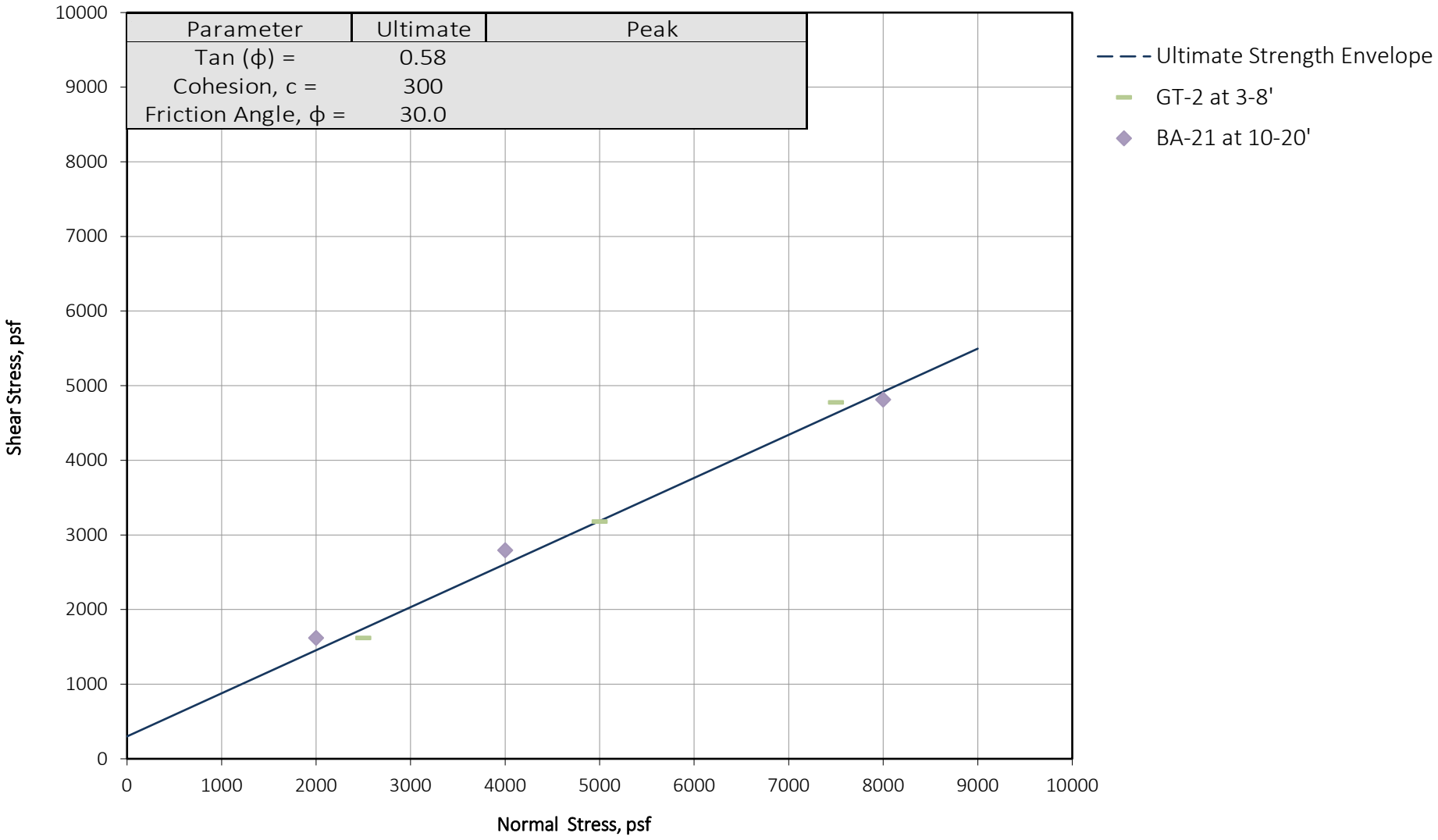


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Fill (Tcag derived)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.17

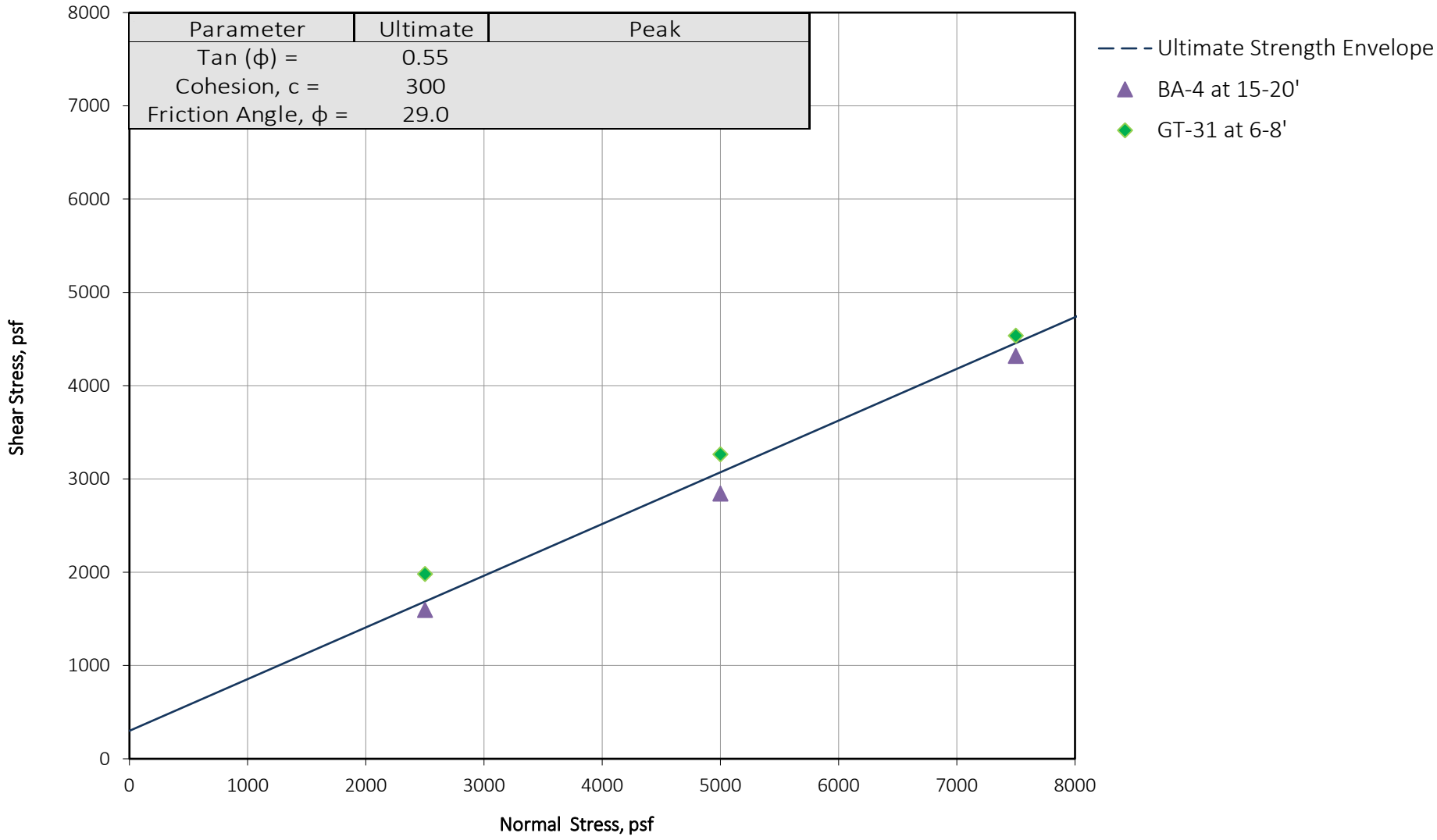


Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Fill (Tcac derived)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.18



Note: x and y scales do not match

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Family Shear Plot - Fill (QTp derived)

Client:	Solstra Communities California LLC	Project No.:	23-2195s-1
Project:	Solomon Hills Specific Plan	Date:	10/20/2023
	Santa Barbara County, CA	Figure No:	B8.19

Appendix C

APPENDIX C

GROUND MOTION AND RESPONSE SPECTRA REFERENCES

Abrahamson, N., Atkinson, G., Boore, D., Bozorgnia, Y., Campbell, K., Chiou, B., Idriss, I.M., Silva, W., Youngs, R., 2008, Comparisons of the NGA ground-motion relations: Earthquake Spectra, v. 24, no.1, p. 45–66.

American Society of Civil Engineers, 2016, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-16), provisions and commentary.

Boore, D.M., Stewart, J.P., Seyhan, E., and Atkinson, G.A., 2014, NGA-West2 equations for predicting PGA, PGV, and 5% damped PSA for shallow crustal earthquakes: Earthquake Spectra, v. 30, no. 3, p. 1057–1085.

Campbell, K.W., and Bozorgnia, Y., 2014, NGA-West2 ground motion model for the average horizontal components of PGA, PGV, and 5% damped linear acceleration response spectra: Earthquake Spectra, v. 30, no. 3, p. 1087–1115.

Chiou, B.S.-J. , and Youngs, R.R., 2014, Update of the Chiou and Youngs NGA model for the average horizontal component of peak ground motion and response spectra: Earthquake Spectra, v. 30, no. 3, p. 1117–1153.

Field, E.H., Biasi, G.P., Bird, P., Dawson, T.E., Felzer, K.R., Jackson, D.D., Johnson, K.M., Jordan, T.H., Madden, C., Michael, A.J., Milner, K.R., Page, M.T., Parsons, T., Powers, P.M., Shaw, B.E., Thatcher, W.R., Weldon, R.J., II, and Zeng, Y., 2013, Uniform California earthquake rupture forecast, version 3 (UCERF3)—The time-independent model: U.S. Geological Survey Open-File Report 2013–1165, 97 p., California Geological Survey Special Report 228, and Southern California Earthquake Center Publication 1792, http://pubs.usgs.gov/of/2013/1165/

Seyhan, E., (2015), Weighted Average of 2014 NGA West-2 GMPEs, Excel file: NGAW2_GMPE_Spreadsheets_v5.7_041515 (2015), Pacific Earthquake Engineering Research Center.

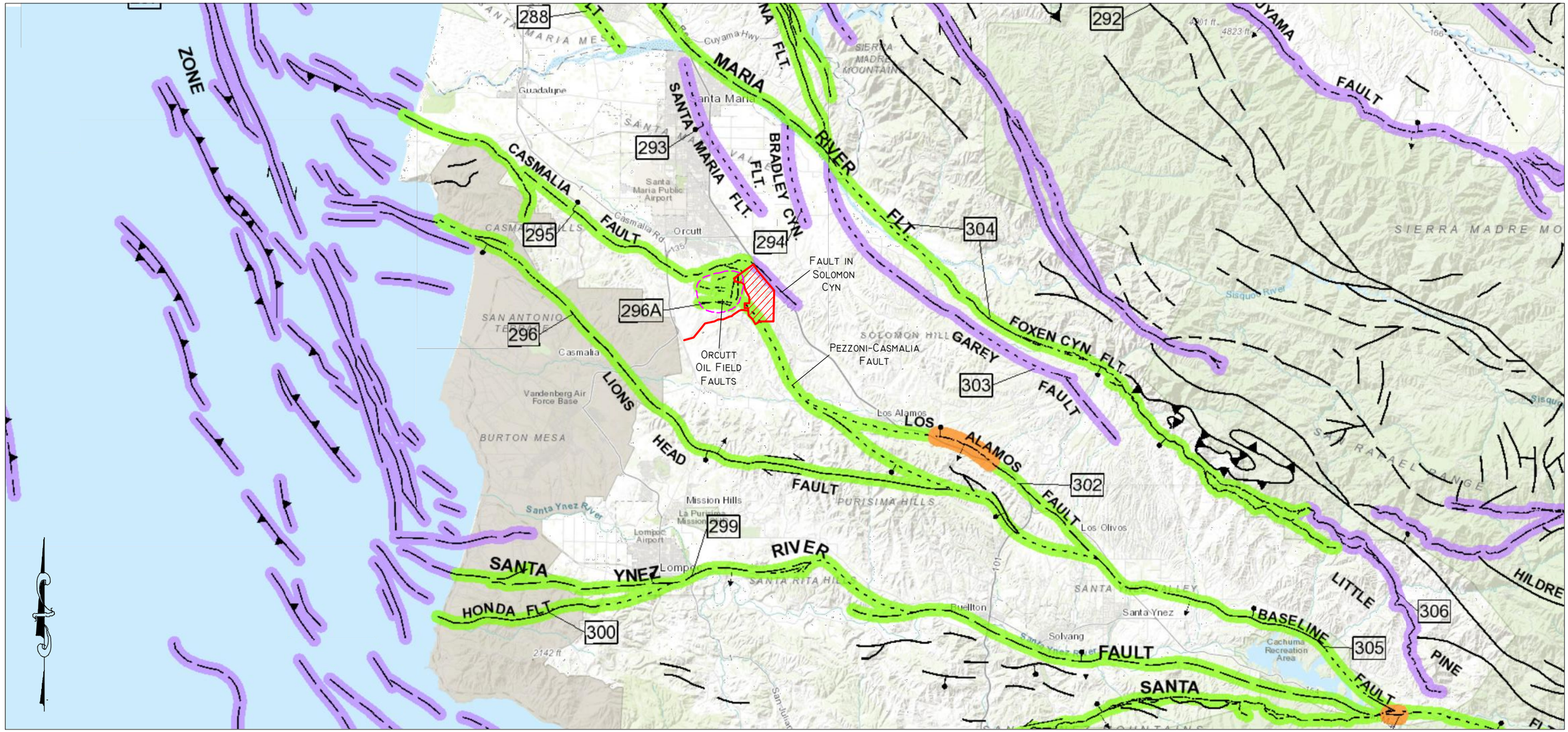
Structural Engineers Association of California (SEAOC), OSHPD Seismic Design Maps web application, https://seismicmaps.org/

U.S. Geological Survey, Beta – Unified Hazard Tool, Interactive Hazard Curve and Deaggregation web applications, https://earthquake.usgs.gov/hazards/interactive/

U.S. Geological Survey, Quaternary Faults and Folds in the U.S., Google Earth .kmz file, https://www.usgs.gov/natural-hazards/earthquake-hazards/google-earth-kml-files

U.S. Geological Survey, Risk-Targeted Ground Motion Calculator, https://earthquake.usgs.gov/designmaps/rtgm/

U.S. Geological Survey, 2008 National Seismic Hazards Map – Source Parameters, https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/query_main.cfm



EXPLANATION

California Geological Survey, Geologic Data Map No. 6

Compilation and Interpretation by: Charles W. Jennings and William A. Bryant

Graphics by: Milind Patel, Ellen Sander, Jim Thompson, Barbara Wanish and Milton Fonseca

SYMBOL EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain. All offshore faults based on seismic reflection profile records are shown as solid lines where well defined, dashed where inferred, queried where uncertain.

FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (age undifferentiated).

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement.

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

OTHER SYMBOLS

Numbers refer to annotations listed in the appendices of the accompanying report.

APPROXIMATE LOCATION OF PROJECT SITE

0 2.75 5.5 11 mi
0 4.25 8.5 17 km

SOURCE; CALIFORNIA GEOLOGIC SURVEY WEB APPLICATION - FAULT ACTIVITY MAP (HTTPS://MAPS.CONSERVATION.CA.GOV/CGS/FAM/APP/)

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.

QUATERNARY FAULT LOCATION MAP

JOB NO.: 23-2195s-1

DATE: 10/20/23

FIGURE: C1

MODIFIED MERCALLI SCALE, ABRIDGED VERSION

	Intensity	Description	Peak acceleration† (%g)	Peak velocity‡ (cm/s)
M§	I	Not felt except by a very few under especially favorable conditions.		
	II	Felt only by a few persons at rest, especially on upper floors of buildings.		
	III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to the passing of a truck. Duration estimated.		0.1 – 1.1
	IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.		1.1 – 3.4
	V	Felt by nearly everyone; many awakened. Some dishes, windows, etc. broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.	0.03	3.4 – 8.1
	VI	Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.	0.03	8.1 – 16
	VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.15	16 – 31
	VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	0.27	31 – 60
	IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.52	60 – 116
	X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed over banks.	1.0	116 – 227
	XI	Few, if any, masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.		227 – 438
	XII	Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air.		438 +

Structures: Masonry A, B, C, and D. Masonry A: Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces. Masonry B: Good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces. Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces. Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.

Peak acceleration from Modified Mercalli intensity (after Wald, Quitoriano, Heaton, and Kanamori, 1999).

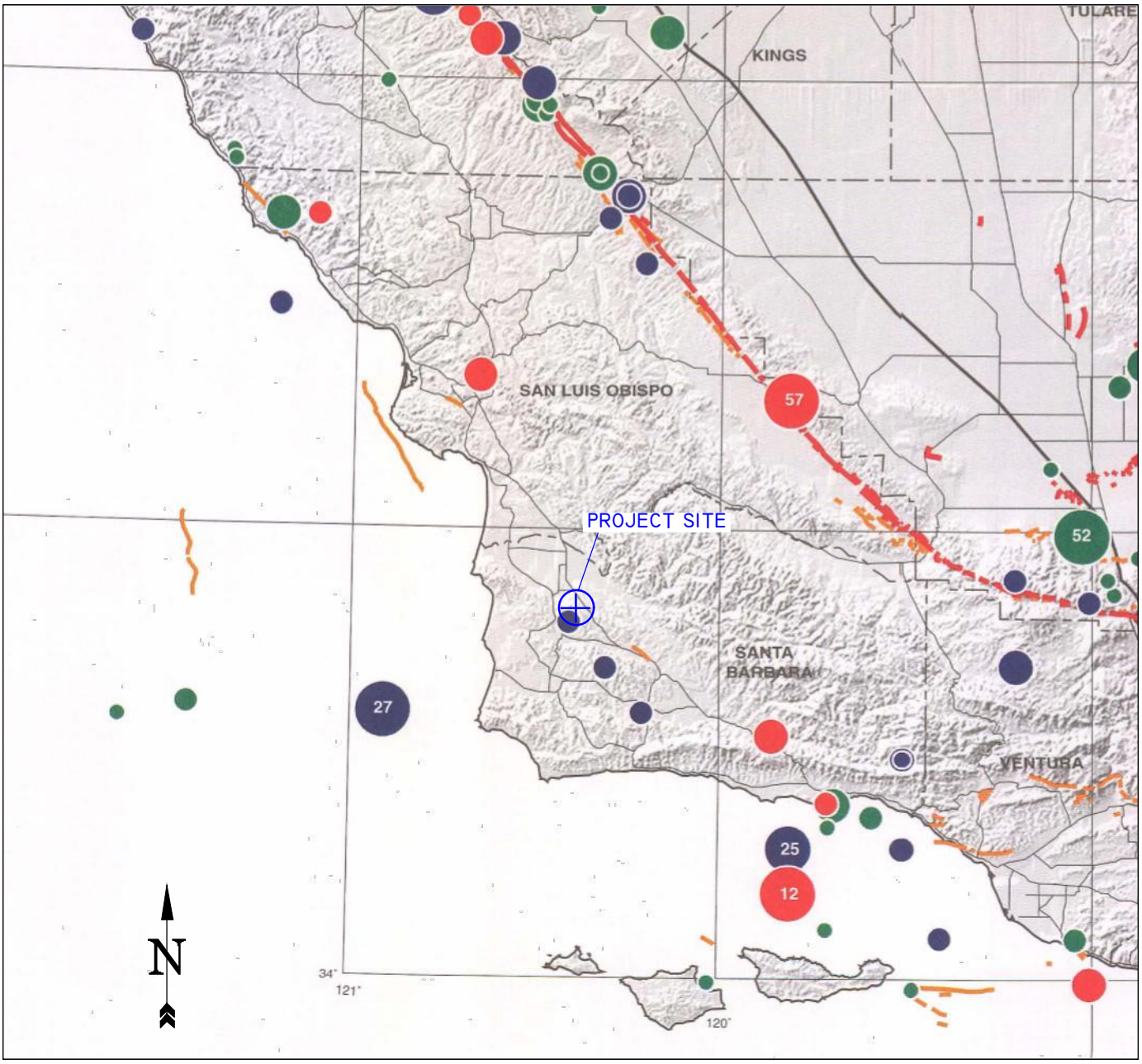
† Peak acceleration from other sources tend to be lower.

‡ Peak velocity from instrumental records of shaking at the given intensity.

§ Magnitude correlation.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geotechnical and Geological Consultants

MODIFIED MERCALLI SCALE



EPICENTER MAP LEGEND

Period: 1800 - 1868 | 1869 - 1931 | 1932 - 1999

Magnitude (M):
- ≥ 7.0
- 6.5 - 6.9
- 6.0 - 6.4
- 5.5 - 5.9
- 5.0 - 5.4

Historical Faulting
Holocene Faulting
Highways (Major)
Highways (Minor)

Lakes

65 — Last two digits of M ≥ 6.5 earthquake year

0 — 15 MI — 30 MI
0 — 20 KM — 48 KM

APPROXIMATE SCALE

SOURCE; CALIFORNIA GEOLOGIC SURVEY, EPICENTERS AND AREAS DAMAGED BY M≥5 CALIFORNIA EARTHQUAKES, 1800-1999 BY T. TOPPOZADA, D. BRANUM, M. PETERSON, C. HALLSTROM, C. CRAMER, M. REICHLE, 2000

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

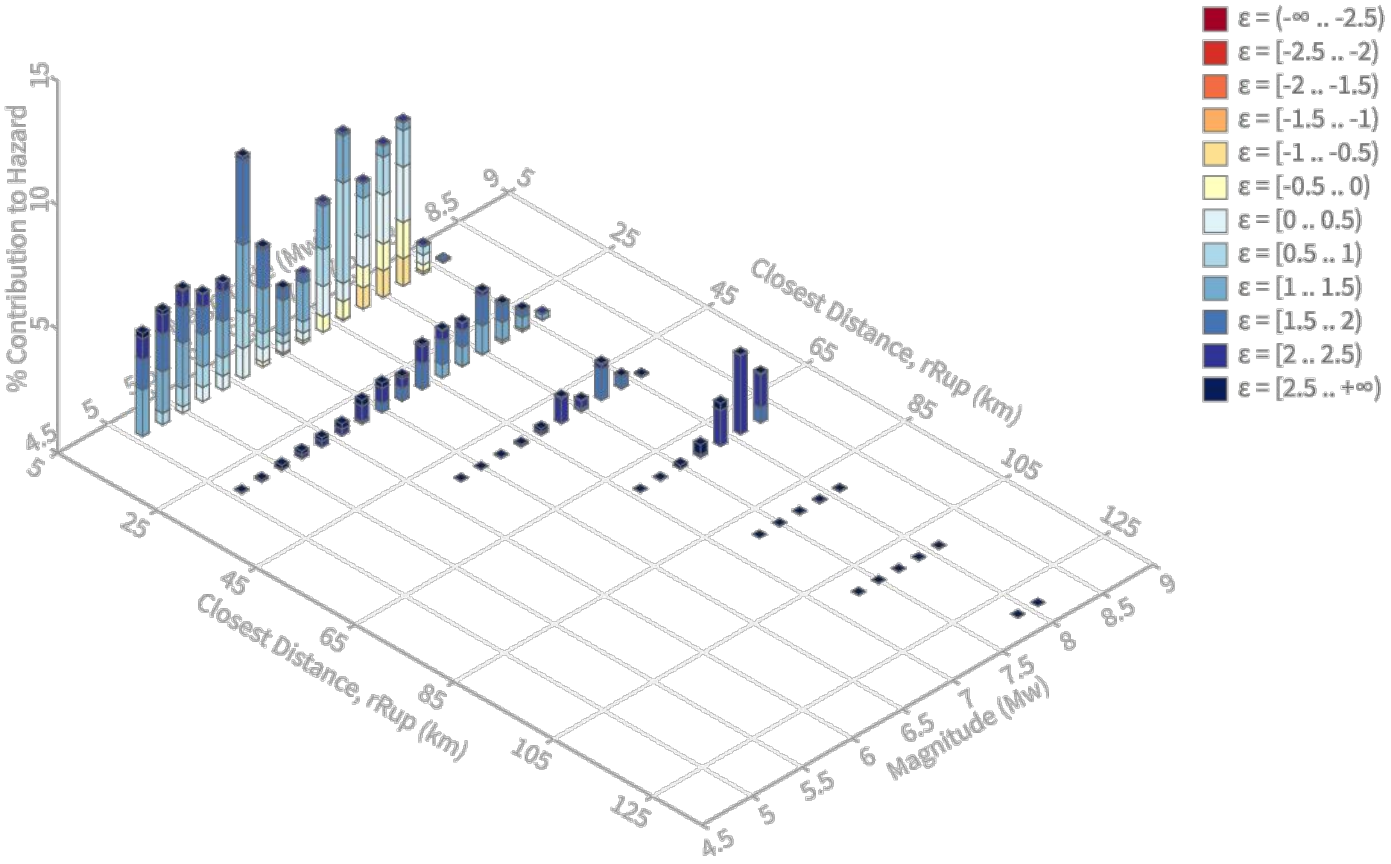
EQ EPICENTER LOCATION MAP

JOB NO.: 23-2195S-1

DATE: 10/20/23

FIGURE: C2

HAZARD CONTRIBUTIONS



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□□d G□□□□□□□□□□C□□s□□□□s

MAGNITUDE-DISTANCE
CONTRIBUTIONS TO HAZARD

JOB NO.: 23-2195s-1

DATE: 10/20/23 | FIGURE: C3

APPENDIX C

Table C1 - USGS Deaggregation of Seismic Hazard

*** Deaggregation of Seismic Hazard at One Period of Spectral Acceleration ***

*** Data from Dynamic: Conterminous U.S. 2014 (update) (4.2.0) ****

PSHA Deaggregation. %contributions.

longitude: 120.380°W

latitude: 34.830°E

imt: Peak Ground Acceleration

vs30 = 259 m/s (Site class D)

return period: 2475 yrs.

#This deaggregation corresponds to: Total

Summary statistics for PSHA PGA deaggregation, r=distance, ε=epsilon:

Deaggregation targets:
Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.51014208 g

Recovered targets:
Return period: 2806.5815 yrs
Exceedance rate: 0.00035630535 yr^{-1}

Totals:
Binned: 100 %
Residual: 0 %
Trace: 0.08 %

Mean (over all sources):
m: 6.74
r: 17.59 km
ε_0: 1.22 σ

Mode (largest m-r bin):
m: 6.11
r: 9.97 km
ε_0: 1.25 σ
Contribution: 8.93 %

Mode (largest m-r-ε_0 bin):
m: 7.13
r: 10.92 km
ε_0: 0.77 σ
Contribution: 4.05 %

Discretization:
r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Deaggregation ContributorsUC33brAvg_FM31:

Percent Contributed: 35.67
Distance (km): 20.347473
Magnitude: 7.1853952
Epsilon (mean values): 1.1288054

Casmalia [6]:
Percent Contributed: 7.76
Distance (km): 1.5666611
Magnitude: 7.3147969
Epsilon (mean values): -0.090398228
Azimuth: 254.77833
Latitude: 34.828031
Longitude: -120.3902

Oceanic - West Huasna [0]:
Percent Contributed: 5.78
Distance (km): 11.729791
Magnitude: 6.5267101
Epsilon (mean values): 1.3233005
Azimuth: 30.964213
Latitude: 34.920686
Longitude: -120.31348

San Andreas (Carrizo) rev [1]:
Percent Contributed: 3.62
Distance (km): 70.472982
Magnitude: 8.0752551
Epsilon (mean values): 2.2476493
Azimuth: 49.031177
Latitude: 35.244541
Longitude: -119.7936

Los Alamos [0]:
Percent Contributed: 3.01
Distance (km): 10.426218
Magnitude: 7.2028011
Epsilon (mean values): 0.77422896
Azimuth: 164.4288
Latitude: 34.740683
Longitude: -120.34912

San Luis Range [3]:
Percent Contributed: 1.9
Distance (km): 11.718547
Magnitude: 7.1503056
Epsilon (mean values): 0.93105331
Azimuth: 46.747628
Latitude: 34.902208
Longitude: -120.28645

Santa Ynez River [4]:
Percent Contributed: 1.72
Distance (km): 20.63704
Magnitude: 7.232165
Epsilon (mean values): 1.475112
Azimuth: 179.44952
Latitude: 34.645139
Longitude: -120.37739

San Luis Range [4]:
Percent Contributed: 1.09
Distance (km): 12.641464
Magnitude: 6.5558295
Epsilon (mean values): 1.369432
Azimuth: 21.473088
Latitude: 34.935718
Longitude: -120.32902

Appendix D

APPENDIX D

EVALUATION OF LIQUEFACTION POTENTIAL AND ASSOCIATED POTENTIAL CONSEQUENCES

1. Introduction

Potential at the Property for seismic soil liquefaction and for associated potential consequences (e.g., earthquake-induced settlements, lateral spread displacements, surface manifestations, and/or loss/reduction of bearing capacity) have been assessed utilizing engineering judgment by Allan E. Seward Engineering Geology, Inc. (AESEGI) using data from Cone Penetration Test (CPT) soundings, Hollow- Stem (HS) augers, and in conjunction with applicable laboratory testing. Liquefaction methods based on the CPT have the advantage of continuous, repeatable measurements, whereas SPT-based data by itself (from HS borings) collects point data typically every 5 ft, which results in an overestimation of seismically induced settlement. Soil Behavior Type (SBT) data and apparent fines content (FC) interpreted from representative CPT soundings were correlated with visual classifications of soils observed in adjacent/applicable hollow-stem auger and with results of geotechnical index tests performed on selected soil samples from the boring, as discussed herein.

The calculation procedures described in the following references were generally used herein, utilizing engineering judgment for the assessment of the liquefaction potential (and its associated potential consequences):

- *Cyclic Liquefaction and its Evaluation Based on the SPT and CPT*, by Robertson P. and Wride, C.E. 1997.
- *Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils*, by Youd and Idriss, 2001
- *Performance-based Earthquake Design using the CPT*, by Robertson, 2009.
- *Interpretation of Cone Penetration Tests – A Unified Approach*, by Robertson, 2009.
- *SPT-Based Probabilistic Assessment of Seismic Soil Liquefaction Potential*, by Cetin, et. al., 2004.
- *Evaluation of Settlements in Sands Due to Earthquake Shaking,* by Tokimatsu and Seed,1987.
- *Estimating Liquefaction-Induced Lateral Displacements using the Standard Penetration Test or Cone Penetration Test,* by Zhang et. al., 2004.
- *Evaluation of Flow Liquefaction and Liquefied Strength using the Cone Penetration Test,* by P.K. Robertson, 2010.

APPENDIX D

- *Evaluation of Flow Liquefaction and Liquefied Strength using the Cone Penetration Test: an update,* by P.K. Robertson, 2022.

Our analyses of liquefaction potential and associated phenomena at the Property were performed in general accordance with the guidelines and requirements contained in the following documents:

- *Special Publication 117A: Guidelines for Evaluating and Mitigating Seismic Hazards in California*, revised and re-adopted by California State Mining and Geology Board, September 11, 2008.
- *Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California,* SCEC, Martin and Lew, 1999

2. Geotechnical Design Criteria, Data and Assumptions

Factors that affect the potential for liquefaction triggering at the Property include estimated ground motion parameters, engineering characteristics of Property's soils, historic high groundwater depth, and proposed grading (i.e., removals and/or raising of grade).

SP117A provides, that Youd (1989), citing data from Japan, suggests that structural mitigation may be acceptable where displacements of less than one foot horizontal and less than four inches vertical are predicted. Therefore, for this paper (i.e., SP117A), large-scale ground displacements are defined as those that exceed 1 to 3 feet horizontally and 4 to 6 inches vertically. For the purposes of our lateral spread potential analysis, removal depths are to the extent necessary to limit the lateral spread ≤ 2 ft (i.e., average of recommended lower and upper bound limits by SP117A).

a. Estimated Ground Motion Parameters

Based on our probabilistic seismic hazard analyses (PSHA) the Peak Ground Acceleration (PGA_M) at the Property, consistent with the maximum considered earthquake (MCE_R) ground motions and generated by a magnitude 6.11 earthquake, is 0.49g. This magnitude-acceleration pair is considered to be equivalent to a magnitude 7.5 earthquake (i.e., the "standard" magnitude used to evaluate liquefaction triggering) and a corresponding PGA of 0.29g. This magnitude-acceleration pair was used in our liquefaction potential analyses.

b. Engineering Characteristics of Property's soils

Engineering characteristics of Property's soils were interpreted from the Cone Penetration Test (CPT) corrected cone resistance (q_t) and friction ratio (R_f) and used

APPENDIX D

herein for assessment of soil liquefaction potential and associated seismic settlements and lateral spread displacements. The interpreted soil characteristics include Soil Behavior Type (SBT) and SBT Index (I_c), apparent fines content (FC), relative density (D_r), and liquefied shear strength ($s_{u,liq}$).

The appended CPT logs include raw q_c and R_f data, as well as interpreted SBT classification, SBT Index (I_c), correction factor for grain size (K_c), and equivalent Standard Penetration Test (SPT) blow count data adjusted to 1.0 ton/ft^2 effective vertical soil pressure ($N1_{60}$). These interpreted data were calculated using the procedures in the referenced article by Youd and Idriss (2001) with updates by Zhang et. al. (2002) and Robertson (2009). The CPT logs are presented in **Appendix A**.

Per the guidelines of SP117A, the accuracy of the CPT interpretations used for the assessment of liquefaction potential should be checked by comparison with data obtained from a correlation boring adjacent to a representative CPT sounding. The visual classifications of soils and results of laboratory testing (measured fines content) on select soil samples from hollow-stem auger borings were used to check the SBT classification and apparent fines content (FC) interpreted from an adjacent applicable CPT. Additionally, boring $N_{1,60}$ values from SPT blow count data were used to check the equivalent SPT $N_{1,60}$ values interpreted from the CPT. The classifications of soils and blow count data obtained from HS borings are generally consistent with data interpreted from the adjacent applicable CPT. However, the apparent fine content interpreted from the CPT is typically less (and more conservative) than the measured fine content from the borings. Therefore, it may be concluded that the data interpreted from the CPT soundings at the Property are a relatively generalized representation of soil conditions at the Property and that data from the CPT soundings at the Property are appropriate for conceptual use in the generalized interpretation of the liquefaction potential at the EIR-level. Further fieldwork, analysis, and evaluations are required as the improvement plans develop, to further assess the liquefaction potential, its consequences, and applicable design features.

c. Groundwater Depth

Based on measurements taken at the CPT sounding and boring locations at the Property during the various phases of subsurface exploration, groundwater was not specifically encountered in the upper 50 ft below the existing ground surface at the explored locations at the specific time of our explorations, with the exception being borings
HS-6, HS-8, and HS-9, where the groundwater was encountered at the depth of 40 ft,

60 ft and 60 ft, respectively, below existing ground surface in the alluvial canyons that drain towards Solomon Canyon. In addition, boring HS-38 at a depth of ~33 ft below existing ground surface in the alluvial canyon that drain south towards Careaga Canyon. As discussed in the Ground Water section of the report, the historic high groundwater depth at the Property for the purposes of our conceptual design is assumed to be 25 ft below the existing ground surface. The encountered (if any), and historic high groundwater depths at the location of each CPT soundings and boring analyzed are shown on the **Analysis of Liquefaction Potential** sheets at the end of this appendix (**Figures D1.1** through **D1.29**).

Effective vertical soil pressure based on measured groundwater depths at the time of the exploration (if encountered) was used in our calculations to adjust CPT tip resistance and friction ratio data to the standard effective vertical soil pressure (i.e., 1 ton/ft^2), and ultimately for calculation of the soils cyclic resistance to earthquake shaking. Effective vertical soil pressure based on the historic high groundwater depth was used to estimate cyclic shear stress that would be induced by the design earthquake shaking.

d. Proposed Grading

The liquefaction potential analyses were performed herein, and corresponding conceptual recommendations for the remedial removals and replacements as shown in **Table D1.**

3. Methods of Analysis

a. Liquefaction Potential

Liquefaction is a phenomenon in which pore water pressure generated by earthquake shaking causes sudden, temporary reduction or loss of shear strength in saturated soils with negligible to low plasticity. Structures founded on liquefied soils may experience subsidence and/or lateral movement.

Analyses to evaluate liquefaction potential typically are performed by a method first proposed by Seed and Idriss (1970) and subsequently revised by Youd and Idriss (2001). In these methods, estimated earthquake-induced cyclic shear stress in the ground is compared with cyclic shear strength (i.e., soil resistance to liquefaction) derived empirically from earthquake case histories.

The Youd and Idriss (2001) methodology with updates by Robertson (2009) was used herein for the evaluation of liquefaction potential. This procedure estimates cyclic shear strength against liquefaction based on in-situ effective vertical soil pressure,

APPENDIX D

cone resistance (q_t) and friction ration (R_f) data normalized to 1 ton/ft^2 vertical effective soil pressure, and fines content data estimated from the normalized q_t and R_f data. The normalized cone resistance ($Q_{t,1N}$) and normalized friction ratio (F_r) values and the interpreted apparent fines content (FC) values are summarized in the **Analysis of Liquefaction Potential** sheets at the end of this appendix, **Figures D1.1** through **D1.23**.

Normalized CPT cone penetration resistance ($Q_{t,1N}$) is used to calculate the Cyclic Resistance Ratio (CRR) for clean sandy soils subjected to magnitude 7.5 earthquakes. Normalization of the tip resistance is performed using the following equations (from Robertson, 2009):

$C_N = (p_a/\sigma'_o)^n, \quad C_N \leq 2.0,$

$Q_{t,1N} = [(q_t - \sigma_o) / p_a] \cdot C_N$

where: n = variable stress exponent ≤ 1

σ'_o = effective vertical soil pressure [tsf]

σ_o = total vertical soil pressure [tsf]

p_a = reference pressure [tsf]

q_t = CPT cone resistance [tsf]

$Q_{t,1N}$ is further corrected for fines content in order to obtain an equivalent clean sand CPT tip resistance value $(Q_{t,1N})_{cs}$ (per Youd and Idriss, 2001, and Robertson, 2009). $(Q_{t,1N})_{cs}$ is used to calculate the Cyclic Resistance Ratio (CRR) against liquefaction (per Youd and Idriss, 2001).

The earthquake-induced cyclic shear stress ratio (CSR or τ_{av}/σ'_v) for each depth in question is calculated by estimation, using the following equation (by Youd and Idriss, 2001):

$\tau_{av}/\sigma'_v = 0.65 \cdot (a_{max}/g) \cdot \sigma_o/\sigma'_v \cdot r_d$

where: a_{max}/g = Peak ground acceleration (PGA_M) at the ground surface divided by the acceleration of gravity

σ_o = Total vertical soil pressure at the depth in question

σ'_v = Effective vertical soil pressure at the depth in question

r_d = Shear stress reduction factor to account for soil deformability at the depth in question

Cyclic Resistance Ratio (CRR) vs. corrected cone-tip resistance $(Q_{t,1N})_{cs}$ curves (based on case histories of clean sands subjected to earthquakes with a magnitude of

about 7.5) are presented by Youd and Idriss (2001). Soils with $(Qt,_{1N})_{cs}$ and CSR values that plot above these curves are potentially liquefiable, and soils with $(Q_{t,1N})_{cs}$ and CSR values that plot below these curves generally are not expected to be liquefiable. In accordance with the applicable guidelines, a soil deposit is considered to be potentially liquefiable if its factor of safety against liquefaction (i.e., CRR divided by CSR) is less than 1.3.

Values of the factor of safety against liquefaction for the soil profiles in each of the CPT logs are calculated at 2-inch intervals using fines content corrected values of tip resistance $(Q_{t,1N})_{cs}$ (per Youd and Idriss, 2001, and updated by Robertson, 2009). A typical spreadsheet with Liquefaction Triggering Analysis calculations is included in **Figure D3.1**.

b. Earthquake-Induced Settlement of Soils

Soils that liquefy as a result of earthquake shaking can potentially densify as earthquake-induced excess pore water pressure in the soil dissipates. Likewise, earthquake shaking can potentially densify predominantly granular, saturated soils (with low liquefaction potential) and unsaturated soils. Soil densification of potentially liquefiable soils and earthquake-induced soil densification that occurs in the absence of liquefaction are both included in our earthquake-induced settlement estimates.

The procedures described in Tokimatsu and Seed (1987) are used herein for the estimation of earthquake-induced densification of sands that occurs as the result of liquefaction and that occurs in the absence of liquefaction. The Tokimatsu and Seed method is discussed below.

One-dimensional volumetric strain of unsaturated sandy soils caused by earthquake shaking is estimated based on $N1_{60}$ values (estimated from the CPT sounding data) and earthquake-induced cyclic shear strain (estimated using the $N1_{60}$ values and the CSR). This one-dimensional shear strain is doubled in order to estimate the volumetric strain produced by multi-directional earthquake shaking. Settlement is calculated by multiplying the volumetric strain value by the thickness of the soil layer. This procedure for estimating earthquake-induced densification was developed based on data from clean to slightly silty sands, therefore the $N1_{60}$ values estimated based on the normalized CPT tip resistance ($q_{c,1N}$) of unsaturated soils were corrected for fines content.

APPENDIX D

The volumetric strain of saturated sands caused by earthquake shaking is evaluated using $N1_{60}$ values (estimated from the CPT sounding data) and earthquake-induced cyclic shear strain (estimated from the $N1_{60}$ values and the CSR). Since the volumetric strain obtained from the analysis method for saturated sands includes the effect of multi-directional earthquake shaking, it is not necessary to double the volumetric strain calculated for saturated sand deposits. Although this procedure for the calculation of volumetric strains strictly applies only to saturated clean sands, the estimated $N1_{60}$ values are corrected for fines content as described in SP 117. Estimated seismically induced-settlement is then calculated by multiplying the thickness of the saturated soil layer by the volumetric strain.

A typical spreadsheet with Cyclic Settlement Analysis calculations is included in **Figure D3.2**.

c. Potential for Lateral Spreading

Regression equations for potential lateral spread displacement associated with the liquefaction of soil beneath a gently sloping site are presented in the referenced article by Zhang, et al (2004). According to these equations, the magnitude of lateral spreading displacement depends on the factor of safety (FS) against liquefaction (evaluated using the CPT-based method described above), thickness of liquefied layers, maximum cyclic shear strains of saturated sands under seismic loading (γ_{max}), relative density (D_r), grain size characteristics and percent fines, and ground surface geometry. The effects of earthquake characteristics on lateral spread displacements, including magnitude, PGA, and site-to-fault distance, are assumed to be quantified by their effects on FS determined in the liquefaction analysis. The effect of fine content on lateral spreading is relatively assumed to be similar to liquefaction triggering. The equivalent clean sand normalized cone resistance, $(Q_{t,1N})_{cs}$ is used to account for fines content when estimating γ_{max}.

In summary, the $(Q_{t,1N})_{cs}$ and FS estimated from the CPT-based evaluation of liquefaction potential were subsequently used to estimate γ_{max} from the regression equations for different values of relative density, Dr, where,

$$D_r = -85 + 76 \log (Q_{t,1N})_{cs} \qquad (Q_{t,1N})_{cs} \leq 200$$

Integrating γ_{max} with depth yields a value defined as the Lateral Displacement Index (LDI) that quantifies the potential for lateral displacement. Based on the analyzed case histories where lateral displacement was observed, empirical correlations were

developed to estimate lateral displacement (LD) based on the calculated LDI, ground slope, and/or free face height and distance to free face.

The database used to develop the lateral spread displacement regression equations is based on case histories in which the liquefiable layers extended laterally for substantial distances without being impeded by boundary effects. It may be inferred that significant lateral spreading has not been observed at narrow sites that are bounded by denser soils or bedrock, or at sites where liquefiable layers are laterally discontinuous. In addition, significant lateral spreading is expected only if a site is underlain by a **laterally continuous**, liquefiable layer of sufficient thickness (say at least 3 ft) that has a relative density that corresponds to an equivalent **$N1_{60}$ blow count ≤ 15**. Soil layers with equivalent $N1_{60}$ blow count < 15 should generally be evaluated for lateral spreading hazard. For the CPT-based analyses included herein, potentially liquefiable soil layers (i.e. safety factor against liquefaction ≤ 1.3) with a corrected CPT cone resistance of $(Q_{t,1N})_{cs} \leq 84$ (equivalent to an $N1_{60}$ blow count of 15 with correction for fines content) were included in the evaluation.

The estimated maximum cyclic shear strains and cumulative lateral displacements at the location of each CPT sounding analyzed are shown on the CPT-Based Evaluation of Liquefaction-Induced Lateral Displacement sheets at the end of this appendix (**Figures D4.1** through **D4.23**). A typical spreadsheet with Lateral Spread Displacement Calculations is included as **Figure D5**.

d. Surface Manifestations and Loss of Bearing Capacity

Surface manifestations of liquefaction, such as sand boils and fissures, do not occur provided there is a sufficient thickness of non-liquefiable soil over potentially liquefiable soil layers with low blow count (i.e., $N1_{60} \leq 10$). Although there is no analytical model available for evaluating the required thickness of this cover, an empirical model for estimation of the cover thickness needed to address surface manifestations of liquefaction was developed by Professor Kenji Ishihara ("Stability Of Natural Deposits During Earthquakes", Proceedings of 11th ICSMFE, 1985) based on a limited number of case histories of vertically continuous liquefied sand deposits subjected to peak horizontal ground acceleration values up to about 0.5g.

4. Results of Analysis

a. Liquefaction Potential Assessment

Results of our liquefaction potential assessment for analyzed CPT sounding and boring locations at the Property are graphically summarized herein on individual

sheets (**Analysis of Liquefaction Potential - Figures D1.1** through **D1.29**). These sheets present plots of depth vs. normalized CPT cone resistance and friction ratio, fines content interpreted from the CPT data, cyclic shear stress induced by earthquake shaking, resistance to liquefaction caused by cyclic shear stress, and cumulative settlement that would be caused by earthquake shaking (before and after recommended removals). The sheets also display groundwater depths at the time of the CPT soundings, (if encountered) and estimated historic high groundwater depths. Based on data from our CPT soundings, HAS boring, lab data, and our analysis, potentially liquefiable soil layers are intermittently and/or continuously present at depths ranging from 25 feet (historic high groundwater level) to 50 feet (maximum depth explored and analyzed).

b. Earthquake-Induced Settlement

The results of the analyses of potential earthquake-induced settlement are presented for CPTs and HSA borings in Table D1. Based on these analyses, the potential earthquake-induced total vertical settlement is summarized as follows by generalized areas: (without any design features, such as removal and recompaction).

Generalized Location	Neighborhood Plan Land Uses	Total Seismic Vertical Settlement (inch)
Solomon Canyon	Areas 19 & 20	~0.7 to ~1.3
Alluvial Canyons draining east towards Solomon Cyn	Areas 17, 18 & 31	~6.3 to ~10.5
	Areas 21 & 22	~0.9 to ~5.1
	Areas 23 through 29	up to ~4.4
Alluvial Canyons draining south towards Careaga Cyn	Areas 1 through 14	up to ~5.7
Alluvial Canyons draining west towards Harris Cyn	Area 15	up to ~3

Table D1 also provides, conceptual recommended removals and recompaction at each analyzed location, to limit the differential vertical settlement to be less than ~1 inch, and total vertical seismic settlement to be less than ~4 inches, for practical design purposes.

In general, total seismic settlements up to 4 inches and differential seismic settlements up to 1 inch (over a horizontal distance of 30 feet) can be reasonably managed using structural methods, such as additional foundation reinforcement or alternate foundation types, including but not limited to structurally tying all footings in two orthogonal directions with reinforced grade beams. Footing tie beams are provided to accommodate differential settlement between columns. Excessive differential

settlement, if not structurally managed, can lead to extensive cracks in the structure and in the worst-case failure of the structure. Ties beams are provided when columns rest on isolated footings, they may not be structurally required in the case of mat or raft foundation.

Calculated seismically-induced settlements in excess of 4-inch vertical and 1-inch differential, would warrant ground improvement, or a combination of ground improvement and structural methods.

Remedial removals are proposed to reduce total seismic settlement generally to less than 2 inches and differential seismic settlement to less than 1 inch, in order to avoid alternate ground improvement methods.

c. Lateral Spreading

As stated above, significant lateral spreading is expected only if a site is underlain by a laterally continuous liquefiable layer that has a relative density that corresponds to a corrected CPT cone resistance of $(Q_{t,1N})_{cs} \leq 84$ (i.e., "Susceptible Layers"). Based on our evaluation of lateral spreading hazard, laterally continuous, potentially liquefiable layers with substantial thicknesses of material with a relative density that corresponds to $N1_{60} \leq 15$ blows/ft were identified in the generalized areas as follows:

i. Solomon Canyon:

Potential lateral spread in this canyon is not expected to exceed 0.4 ft, with the total thickness of susceptible layers up to 1.3 ft. The risk of lateral spreading at the analyzed locations in this canyon is relatively low. The result of our conceptual analysis is shown in Table D2.

ii. Alluvial Canyons, Areas 21 & 22:

Without implementing design features, potential lateral spread ranges up to 4.9 ft, with the total thickness of susceptible layers up to 16.1 ft. The risk of lateral spreading at the analyzed locations in this canyon is moderate to significant. With the recommended removal and recompaction of up to 38 ft below the existing ground surface, the remaining lateral spread is expected to be less than 2 ft, with the remaining thickness of susceptible layers less than 5.6 ft. To avoid significant removal over a large area of the canyon, consideration could be given to designing and constructing shear keys, in an attempt to disconnect potential continuous susceptible layers, hence managing the adverse effects of potential lateral spread to an acceptable level. Further fieldwork and analysis

APPENDIX D

will be required as the design efforts progress. The result of our conceptual analysis is shown in Table D3.

iii. Alluvial Canyons, Areas 23 through 29:

Without implementing design features, potential lateral spread ranges up to 5.1 ft, with the total thickness of susceptible layers up to 15.7 ft. The risk of lateral spreading at the analyzed locations in this canyon is moderate to significant, however, the recommended removal depths in this canyon, are rather driven by limiting differential vertical seismic settlement to be less than 1 inch. With the recommended removal and recompaction of up to 41½ ft below the existing ground surface, the remaining lateral spread is expected to be less than 2 ft, with the remaining thickness of susceptible layers less than 5.6 ft. To avoid significant removal over a large area of the canyon, consideration could be given to constructing shear keys, in an attempt to disconnect potential continuous susceptible layers. Further fieldwork and analysis will be required as the design efforts progress. The result of our conceptual analysis is shown in Table D4.

iv. Alluvial Canyons, Areas 1 through 14

The potential for lateral spread in the in this portion, at the analyzed locations, is low. Given the large subject area and our limited testing, during the grading plan preparation, further confirmatory fieldwork and analysis are recommended in the southern portion. The result of our conceptual analysis is shown in Table D5.

v. Alluvial Canyons (Area 15):

Without implementing design features, potential lateral spread ranges up to 3.3 ft, with the total thickness of susceptible layers up to 7.2 ft. The risk of lateral spreading at the analyzed locations in this canyon is moderate to significant. With the recommended removal and recompaction of up to 30½ ft below the existing ground surface, the remaining lateral spread is expected to be less than 2 ft, with the remaining thickness of susceptible layers less than 3.6 ft. To avoid significant removal over a large area of the canyon, consideration could be given to constructing shear keys, in an attempt to disconnect potential continuous susceptible layers. Further fieldwork and analysis will be required as the design efforts progress. The result of our conceptual analysis is shown in Table D5.

APPENDIX D

d. Surface Manifestations

Based on the currently proposed grading, a cap of non-liquefiable material of at least ~15 ft in thickness will be present over potentially liquefiable soils at the analyzed locations. In addition to the removal and recompaction to manage seismic settlements to an acceptable level, there will be significant additional compacted engineered fill proposed at the Property, which further helps to protect against the potential adverse effect of any surface manifestations from liquefaction. Further, at the detailed design phases, consideration could be given to limiting the allowable bearing capacity to a reasonable maximum value (i.e., not allowing any increase in bearing capacity with depth and/or embedment increase) in an attempt to characterize the residual strength of the potential liquefied soils, should the soils ever get liquified with the potential surface manifestation. To conclude, based upon our analysis at the analyzed locations, the thickness of the cap of non-liquefiable materials above the remaining potentially liquefiable materials will be sufficient to manage the hazard of surface manifestations of liquefaction to an acceptable level.

e. Conclusions and Recommendations

The conceptual findings of our liquefaction analyses are as follows:

- Layers of potentially liquefiable alluvial soils are present at the Property at depths ranging from about 25 ft to 50 ft (i.e., the explored design depth for the purposes of liquefaction analysis). Although some CPTs were deeper than 50 ft below the existing ground surface, the effects of liquefaction are generally considered only in the upper 50 ft of the subsurface profile.
- Without any design features to manage these impacts to an acceptable level, potential liquefaction and earthquake-induced densification of these soils could cause <u>total</u> vertical ground settlement at the Property, which could be significant as discussed earlier (section 4.b above) and in **Table D1**. The corresponding <u>differential</u> vertical seismic ground settlement (between locations of adjacent footing foundations or over a horizontal distance of 30 ft) could be up to half of the total seismic vertical settlement. Since the potential differential settlement exceeds the maximum potential differential settlement reasonably considered to be tolerable by structural practice, removal of in-situ Property's soils and replacement with compacted engineered fill are recommended as shown on the Preliminary Geologic Map and on the Summary of Estimated Theoretically-Calculated Vertical Cyclic Settlements and Removal Depths (**Table D1**).

APPENDIX D

- Following the recommended removals and recompaction, potential liquefaction and earthquake-induced densification of soils would significantly improve, specifically, it is generally expected to cause total ground settlement generally not exceeding 2 inches. However, given the large area of the Property, relative to our inevitably limited number of widely spread CPTs/HSAs, further fieldwork (i.e., subsurface investigation), laboratory testing, and analysis should be done during the design phases of the Project.
- Following the recommended removals and recompaction, the corresponding differential seismic vertical ground settlement over a horizontal distance of 30 ft, is not expected to exceed 1 inch. The cumulative thickness of potentially liquefiable soil layers remaining varies up to 22 ft as shown in **Table D1** for each analyzed location.
- Differential settlement could occur over a horizontal distance of 30 ft or between locations of adjacent columns, whichever distance is smaller. For purposes of design, the earthquake-induced settlement should be added to the static settlement that will be caused by structure loads.
- Potential for lateral spreading (following proposed grading and shear key constructions, where warranted as determined in the detailed design phase) is believed to be manageable for the preliminary design purposes. Following recommended remedial removals, the remaining thickness of soils with potential for lateral spreading and the estimated potential lateral displacements are provided below in **Tables C2 to C5.**
- **SHEAR KEY:** In order to minimize the potential for lateral spreading, shear keys are recommended, where warranted, to be designed at the detailed design phase. The engineered fill shear keys are to be at least 50 feet in width and extended into competent strata in an attempt to intercept laterally continuous layers subjected to potential lateral spread hazard. Cross Sections need to be developed to illustrate existing grade, proposed grade, depth to the competent strata, and recommended removal/recompaction depths. Slope stability analyses (e.g., the 2D limit equilibrium) need to be performed on representative cross-sections in an attempt to identify critical areas where potential failure surfaces along liquefied soil layers subject to lateral spreading yield safety factors less than a reasonable value (e.g., FoS = 1.5). An iterative approach may be necessary to determine the critical locations and widths of remedial shear keys to obtain adequate safety factors. General shear strength parameters need to be

APPENDIX D

substantiated with in-situ and post-earthquake conditions, utilizing engineering judgment. A liquefied shear strength ratio of $s_{u(liq)} / \sigma'_{vo} = ½$ can be applied to the alluvial soils remaining in place to represent the shear strength of liquefied soils during earthquake loading. This value represents a lower-bound CPT-based estimate using the following equation (Robertson, 2010):

$$s_{u(liq)} / \sigma'_{vo} = [0.02199 - 0.0003124\ (Q_{t,1N})_{cs}] / [1 - 0.02676\ (Q_{t,1N})_{cs} + 0.0001783\ [(Q_{t,1N})_{cs}]^2]$$

Results of the slope stability analyses to evaluate the recommended shear keys for minimization of potential lateral spreading hazard should be included in the detailed design phase.

- The cap of non-liquefiable soils (following proposed grading) will be thick enough to protect against surface manifestations of potential liquefaction, such as sand boils, fissures, and loss of bearing capacity.

The following attachments complete this Appendix.

- References - Assessment of Liquefaction Potential and Estimated Cyclic Settlements
- Summary of Estimated Theoretically-Calculated Vertical Cyclic Settlements and Removal Depths — Table D1
- Summary of Lateral Spread Hazard — Tables D2 to D6
- Analysis of Liquefaction Potential Based on q_t and F_R from CPT Data (CPT-1 to CPT-23) — Figures D1.1 through D1.23
- SPT-Based Assessment of Seismic Soil Liquefaction Potential (HS-5, HS-13, HS-38, HS-39, HS-40, HS-48 and HS-49) — Figures D1.24 through D1.29
- Typical Correlation of N1(60) Blow Count and Percent Fines - Boring vs. CPT Interpretation (HS-13 vs. CPT-10). — Figure D2
- Typical Spreadsheet of Liquefaction Triggering Analysis (based on CPT-5) (6 Sheets) — Figure D3.1
- Typical Spreadsheet of Cyclic Settlement Analysis (based on CPT-5) (7 Sheets) — Figure D3.2
- CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements — Figures D4.1 through D4.23
- Typical Spreadsheet of Lateral Spread Displacement Calculations (based on CPT-5) (6 sheets) — Figure D5

APPENDIX D

REFERENCES FOR ASSESSMENT OF LIQUEFACTION POTENTIAL AND ESTIMATED CYCLIC SETTLEMENTS

Bartlett, S.F., and Youd, T.L., "Empirical prediction of liquefaction – induced lateral spread", Journal of Geotechnical Engineering, Vol. 121, No. 4, April 1995.

Boulanger, Ross W. and Idriss, I.M., "Liquefaction Susceptibility Criteria for Silts and Clays", ASCE Journal of Geotechnical and Geoenvironmental Engineering, Vol. 132, No. 11, pp. 1413-1426, November, 2006.

Bray, Jonathan D. and Sancio, Rodolfo B., "Assessment of the Liquefaction Potential of Fine-Grained Soils", ASCE Journal of Geotechnical and Geoenvironmental Engineering, Vol. 132, No. 9, pp. 1165-1177, September, 2006.

California Division of Mines and Geology, Special Publication 117, "Guidelines for Evaluating and Mitigating Seismic Hazards in California", adopted by the State on March 13, 1997.

Douglas, B.J., and Olsen, R.S., "Soil classification using Electric Cone Penetrometer", ASCE Special Technical Publication, ST. Louis, Missouri, October, 1981.

Douglas, B.J., Olsen, R.S., and Martin, G.R., "Evaluation of the Cone Penetrometer Test for use in SPT—Liquefaction Potential Assessment," ASCE Preprint Volume No. 81-544, St. Louis, Missouri, October 1981.

Fear and McRoberts, "Reconsideration of initiation of liquefaction in sandy soils", ASCE Geotechnical Journal, March 1995.

Housner, G.W., Chairman of Committee on Earthquake Engineering, Book, "Liquefaction of soils during earthquakes", p. 110-114, National Academy Press, 1985.

Ishihara, K., "Soil Behaviour in Earthquake Geotechnics", Clarendon Press, Oxford, 1996.

Ishihara, K., "Stability of natural deposits during earthquakes", Proceedings of the Eleventh International Conference on Soil Mechanics and Foundation Engineering, A.A. Balkema Publishers, Rotterdame, Netherlands, 1985

Liao, S.S.C., and Whitman, R.V., "Overburden correction factors for SPT in sand", Journal of Geotechnical Engineering, Vol. 112, No. 3, March 1986.

Olsen, Richard S., "Cyclic Liquefaction Based on the Cone Penetrometer Test" in the *Proceedings of the NCEER Workshop on Evaluating the Liquefaction Resistance of Soils*, edited by Youd, T.L. and Idriss, I.M., Technical Report NCEER-97-0022, pp. 225-276, 1997

Pradel, D., "Procedure to evaluate earthquake-induced settlements in dry sandy soils," Journal of Geotechnical and Geoenvironmental Engineering, ASCE, Vol. 124, No. 4, April 1998.

Proprietary charts for correction of blow-count by sampler type to N-SPT

Robertson, P.K.., "Interpretation of Cone Penetration Tests – A Unified Approach", Vol. 46, Canadian Geotechnical Journal, pp. 1337-1355, 2009.

Robertson, P. K., and Wride, C.F., "Cyclic Liquefaction and its Evaluation Based on the SPT and CPT" in the *Proceedings of the NCEER Workshop on Evaluating the Liquefaction Resistance of Soils*, edited by Youd, T.L. and Idriss, I.M., Technical Report NCEER-97-0022, pp. 41-87, 1997

Robertson, P.K., and Fear, C.E., "Soil liquefaction and its evaluation based on SPT and CPT" Liquefaction Workshop, University of Alberta, January 1996.

Robertson, P.K., and Fear, C.E., "Liquefaction of sands and its evaluation", First International Conference and Earthquake Geotechnical Engineering, 1995.

APPENDIX D

Robertson, P.K., and Campanella, R.G., "Guidelines for Geotechnical Design using the Cone Penetrometer Test and CPT with Pore Pressure Measurement", University of Alberta and University of British Columbia, 4th edition, 1989.

Seed, H.B., "Design problems in soil liquefaction," Report No. UCB/EERC-86/02, February, 1986

Seed, H.B., Tokimatsu, K., Harder, L.F., and Chung, R.M., "The influence of SPT procedures in soil liquefaction resistance evaluations", Earthquake Engineering Research Center Report No. 84/15, University of California, Berkeley, 1984.

Seed, H.B., Idriss, I.M., and Arango, I., "Evaluation of liquefaction potential using field performance data", ASCE Journal of Geotechnical Engineering, Vol. 109, No.3, March 1983.

Seed, H.B. and Idriss, I.M., "Ground motions and soil liquefaction during earthquakes", 1982, Monograph, Earthquake Engineering Research Institute.

Seed, H.B. and Idriss, I.M., "A simplified procedure for evaluating soil liquefaction potential", EERC 70-9, Nov. 1970.

Tokimatsu, K. and Seed, H.B., "Evaluation of settlements in sands due to earthquake shaking", ASCE Journal of Geotechnical Engineering, Vol. 113, No. 8, August, 1987.

University of Southern California (USC), Southern California Earthquake Center, Workshop on "Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California", USC, Los Angeles, California, June 17, 1999.

Youd, T.L. and Idriss, I.M., editors, "Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils", Technical Report NCEER-97-0022, December, 1997.

Youd, T.L., Idriss, I.M., et al "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils", Vol. 127, No. 10, ASCE Journal of Geotechnical and Geoenvironmental Engineering, October 2001.

Youd, T. Leslie, Hanson, Corbett M. and Bartlett, Steven F. "Revised Multilinear Regression Equations for Prediction of Lateral Spread Displacement", Vol. 128, No. 12, ASCE Journal of Geotechnical and Geoenvironmental Engineering, December 2002.

Zhang, G., Robertson, P.K.. and Brachman, R.W.I. "Estimating Liquefaction-Induced Ground Settlements from CPT for Level Ground", Vol. 39, Canadian Geotechnical Journal, pp. 1168-1180, September 2002.

Table D1 – Summary of Estimated Theoretically-Calculated Vertical Seismic Settlements and Corresponding Removal Depths

Analyzed Location		Total Depth (BGS) (feet)	Groundwater Depth (BGS) (feet)		Total Vertical Seismic Settlement Before Removals (inches)	Cumulative Thickness of Potential Liquefiable Layers BEFORE Removals (Ft)	Limit Differential Vertical Seismic Settlement ≤ 1.0 inch *(taken as ½ of the total)*		Limit Total Vertical Seismic Settlement ≤ 4.0 inches	
			Existing GWT	Historical GWT			Removal Depth (ft) (Min. 5')	Total Seismic Settlement (In.)	Removal Depth (ft) (Min 5')	Total Seismic Settlement (In)
Solomon Canyon	CPT-12	50.3	> 50	25	1.33	5.8	5	1.33	--	--
	CPT-13	50	> 50	25	1.15	3.3	5	1.15	--	--
	CPT-14	50.4	> 50	25	1.04	10.5	5	1.04	--	--
	CPT-15	50.4	> 50	25	0.67	4.2	5	0.66	--	--
AREAS 17, 18 & 31	HS-5	70	> 70	25	10.45	12	44	1.96	38	4
	HS-48	51.5	> 50	25	6.34	8	42	1.9	30	4
	HS-49	36.5	> 36	25	7.04	18	41	1.89	32	3.77
AREAS 21 & 22	CPT-1	50.7	> 50	25	1.33	5	5	1.31	--	--
	CPT-2	32.3	> 32	25	0.94	6.5	5	0.93	--	--
	CPT-3	33.9	> 33	25	0.96	5	5	0.95	--	--
	CPT-4	90.4	> 50	25	3.75	23.5	30	1.95	5	3.74
	CPT-5	50.5	> 50	25	5.12	25.4	36	1.89	26.5	3.89

Table D1 – Summary of Estimated Theoretically-Calculated Vertical Seismic Settlements and Corresponding Removal Depths

Analyzed Location		Total Depth (BGS) (feet)	Groundwater Depth (BGS) (feet)		Total Vertical Seismic Settlement Before Removals (inches)	Cumulative Thickness of Potential Liquefiable Layers BEFORE Removals (Ft)	Limit Differential Vertical Seismic Settlement ≤ 1.0 inch *(taken as ½ of the total)*		Limit Total Vertical Seismic Settlement ≤ 4.0 inches	
			Existing GWT	Historical GWT			Removal Depth (ft) (Min. 5')	Total Seismic Settlement (In.)	Removal Depth (ft) (Min 5')	Total Seismic Settlement (In)
AREAS 23 THROUGH 29	CPT-6	82.5	> 50	25	2.76	11.2	36.5	1.94	5	2.75
	CPT-7	50.5	> 50	25	4.46	23.9	41.5	1.94	31	4
	CPT-8	48.7	> 50	25	2.5	14	21.5	1.90	5	2.49
	CPT-9	50.5	> 50	25	3.73	24	31	1.91	5	3.72
	CPT-10	67.9	> 50	25	3.14	16	35	1.99	5	3.13
	CPT-11	38.5	> 50	25	0.05	Negligible	5	0.04	--	--
AERAS 1 THROUGH 14 (Alluvial Canyons drain south towards Careaga canyon)	CPT-17	10	> 50	N/A	N/A	Negligible	--	--	--	--
	CPT-18	35.6	> 50	25	0.01	Negligible	5	0.01	--	--
	CPT-19	40.5	> 50	25	0.01	Negligible	5	0.01	--	--
	HS-38 (South of Fill Slope)	55.8	33	25	4.35	5	23	1.85	5	3.97
	HS-39 (South of Fill Slope)	61.4	> 50	25	5.69	25	41	1.88	30	3.8

Table D1 – Summary of Estimated Theoretically-Calculated Vertical Seismic Settlements and Corresponding Removal Depths

Analyzed Location		Total Depth (BGS) (feet)	Groundwater Depth (BGS) (feet)		Total Vertical Seismic Settlement Before Removals (inches)	Cumulative Thickness of Potential Liquefiable Layers BEFORE Removals (Ft)	Limit Differential Vertical Seismic Settlement ≤ 1.0 inch *(taken as ½ of the total)*		Limit Total Vertical Seismic Settlement ≤ 4.0 inches	
			Existing GWT	Historical GWT			Removal Depth (ft) (Min. 5')	Total Seismic Settlement (In.)	Removal Depth (ft) (Min 5')	Total Seismic Settlement (In)
	HS-40	26.4	> 50	25	0.21	Negligible	5	0.21	--	--
AERA 15 (Alluvial Canyons drain west towards Harris Canyon)	CPT-20	26.4	> 50	25	0.04	Negligible	5	0.04	--	--
	CPT-21	52	> 50	25	2.31	18.7	28	1.98	5	2.31
	CPT-22	45.4	> 50	25	3.01	12.5	30.5	1.9	5	3.01
	CPT-23	48.2	> 50	25	1.05	3.8	5	1.05	--	--

Table D2 – Summary of Lateral Spreading Hazard, Solomon Canyon

Analyzed Location	Total Depth (feet)	Total Lateral Spread Before Removals (FT)	Total Thickness of Susceptible Layers BEFORE Removals (FT)	Limit Lateral Spread ≤ 2 ft, And; Limit Differential Vertical Seismic settlement ≤ 1 inch		
				Removal Depth (Ft)	Remaining Lateral Spread AFTER Removals (FT)	Remaining Thickness of Susceptible Layers AFTER Removals (Ft)
CPT-12	50.3	0.4	1.3	5	0.4	1.3
CPT-13	50	0.1	0.3	5	0.1	0.3
CPT-14	50.4	0.4	1.1	5	0.4	1.1
CPT-15	50.4	Negligible		5	Negligible	

Table D3 – Summary of Lateral Spreading Hazard, Alluvial Canyon – Areas 21 and 22

Analyzed Location	Total Depth (feet)	Total Lateral Spread Before Removals (FT)	Total Thickness of Susceptible Layers BEFORE Removals (FT)	Limit Lateral Spread ≤ 2 ft, And; Limit Differential Vertical Seismic settlement ≤ 1 inch		
				Removal Depth (Ft)	Remaining Lateral Spread AFTER Removals (FT)	Remaining Thickness of Susceptible Layers AFTER Removals (Ft)
CPT-1	50.7	0.7	2.3	5	0.7	2.3
CPT-2	32.3	1.4	4.6	5	1.4	4.6
CPT-3	33.9	0.7	2.1	5	0.7	2.1
CPT-4	90.4	1.7	6.1	38	1.2	4.1
CPT-5	50.5	4.9	16.1	38	1.8	5.6

Table D4 – Summary of Lateral Spreading Hazard, Alluvial Canyon – Area A23 through 29

Analyzed Location	Total Depth (feet)	Total Lateral Spread Before Removals (FT)	Total Thickness of Susceptible Layers BEFORE Removals (FT)	Limit Lateral Spread ≤ 2 ft, and; Limit Differential Vertical Seismic settlement ≤ 1 inch		
				Removal Depth (Ft)	Remaining Lateral Spread (FT)	Remaining Thickness of Susceptible Layers AFTER Removals (Ft)
CPT-6	82.5	1.7	5.1	36.5	1.2	3.6
CPT-7	50.5	5.1	15.7	41.5	1.7	5.4
CPT-8	48.7	3	8.7	28	2	5.6
CPT-9	50.5	2.4	8.2	32.5	1.2	3.9
CPT-10	67.9	1.6	6.1	35	0.8	2.8
CPT-11	38.5	Negligible		5	Negligible	

Table D5 – Summary of Lateral Spreading Hazard, Areas 1 through 14

Analyzed Location	Total Depth (feet)	Total Lateral Spread Before Removals (Ft)	Limit Lateral Spread ≤ 2 ft, and; Limit Differential Vertical Seismic settlement ≤ 1 inch	
			Removal Depth (Ft)	Remaining Lateral Spread (Ft)
CPT-17	10	N/A	5	N/A
CPT-18	35.6	Negligible	5	Negligible
CPT-19	40.5	Negligible	5	Negligible

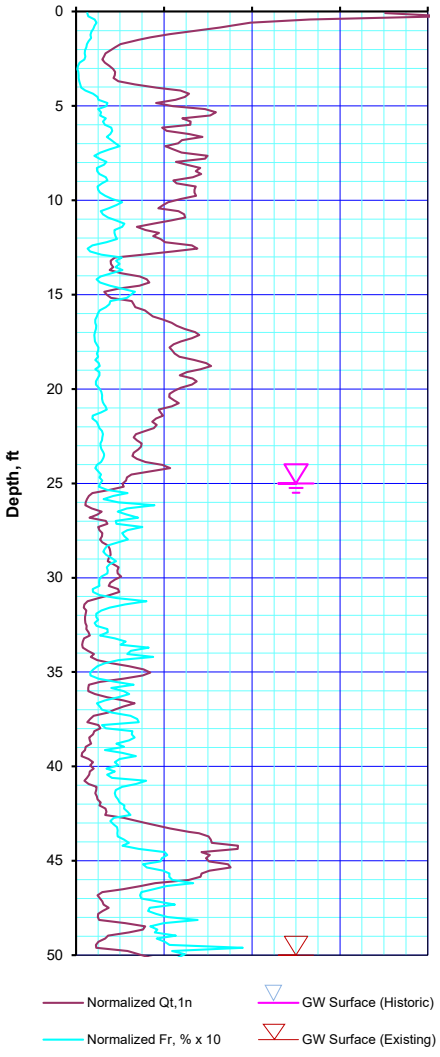
Table D6 – Summary of Lateral Spreading Hazard, Area 15

Analyzed Location	Total Depth (feet)	Total lateral Spread Before Removals (FT)	Total Thickness of Susceptible Layers BEFORE Removals (FT)	Limit Lateral Spread ≤ 2 ft, and; Limit Differential Vertical Seismic settlement ≤ 1 inch		
				Removal Depth (Ft)	Remaining Lateral Spread (FT)	Remaining Thickness of Susceptible Layers AFTER Removals (Ft)
CPT-20	26.4	Negligible		5	Negligible	
CPT-21	52	0.2	0.7	28	0.2	0.7
CPT-22	45.4	3.3	7.2	30.5	1.5	3.6
CPT-23	48.2	2.3	2.5	26	1.4	1.5

Location..... CPT-01
Elevation (MSL)..... 774 ft
Proposed Grade..... 775 ft

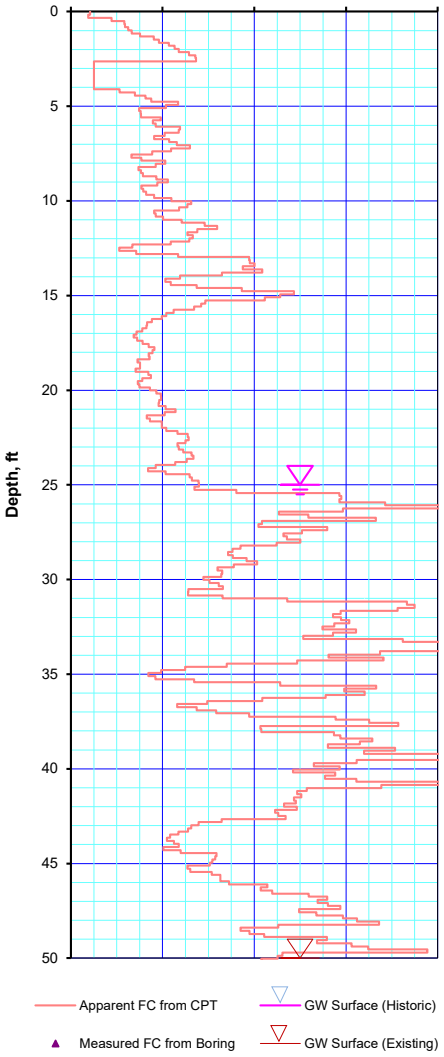
(a)

Normalized Tip Resistance and Friction Ratio



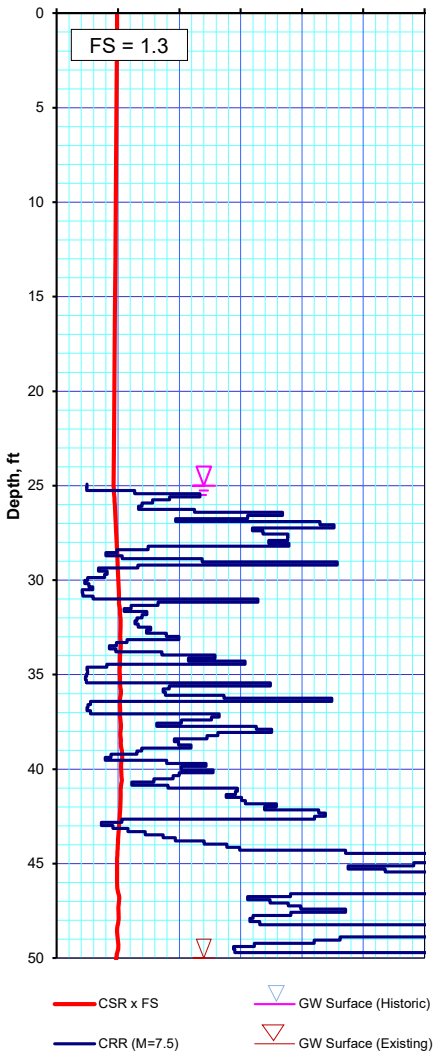
(b)

Fines Content, FC %



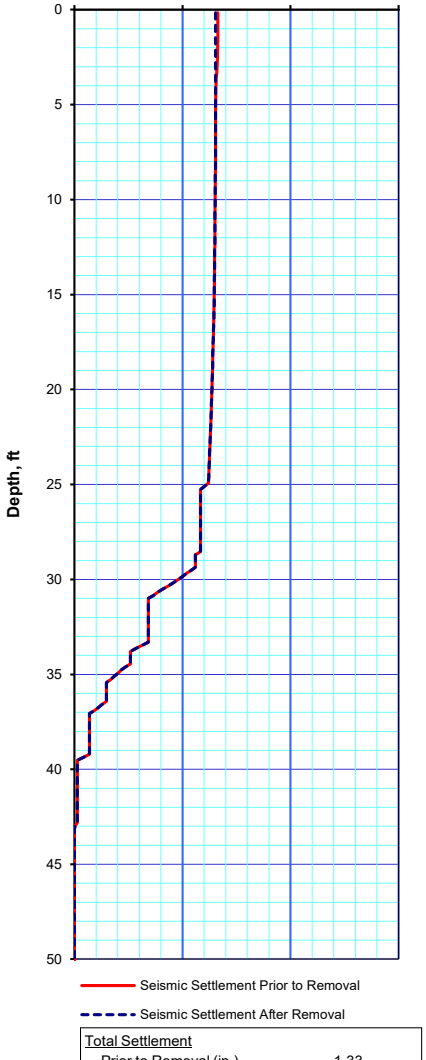
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	1.33
After Removal (in.)	1.31

Removal Depth (ft) = 5.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

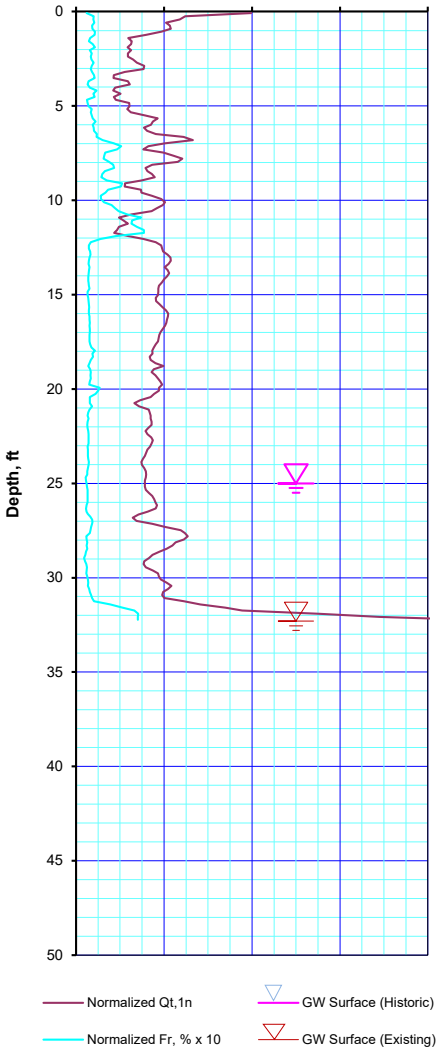
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County, CA	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.1
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-02
Elevation (MSL)..... 809 ft
Proposed Grade..... 810 ft

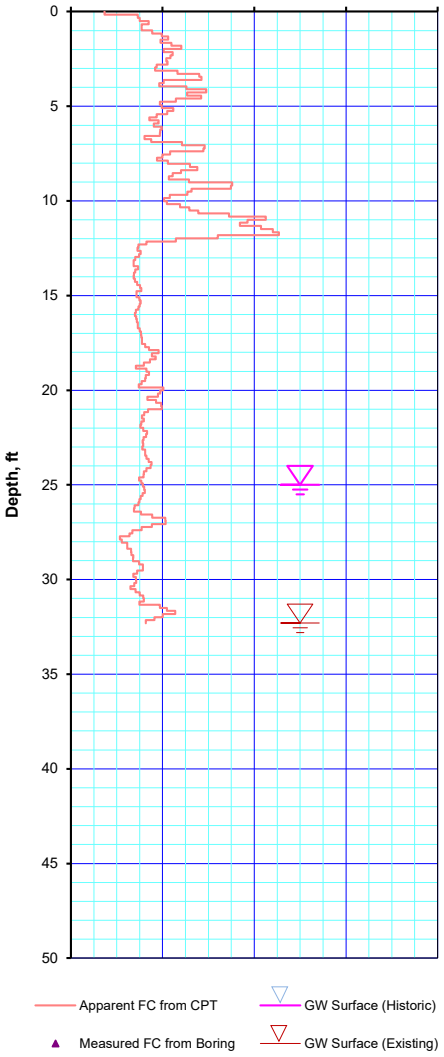
(a)

Normalized Tip Resistance and Friction Ratio



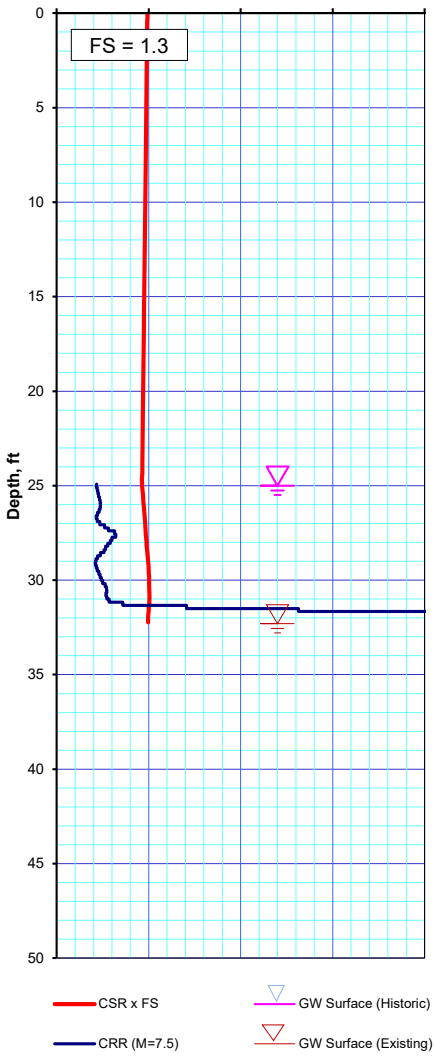
(b)

Fines Content, FC %



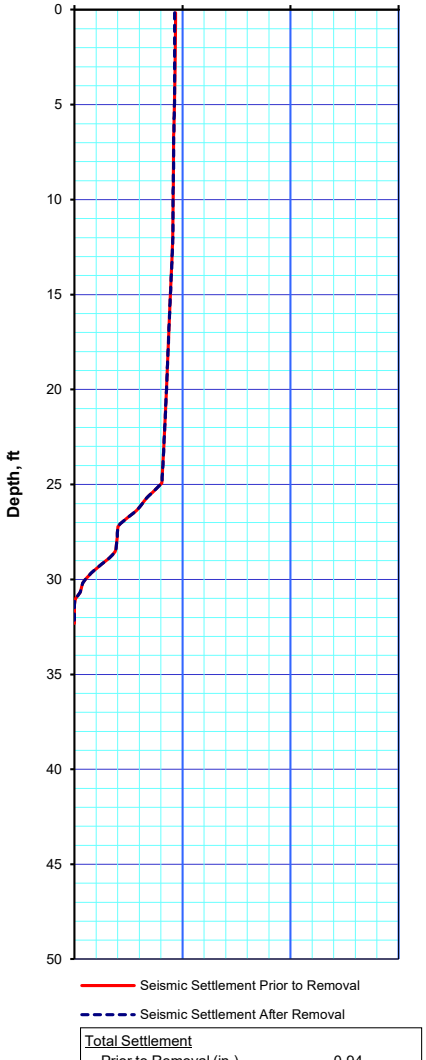
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	0.94
After Removal (in.)	0.93

Removal Depth (ft) = 5.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

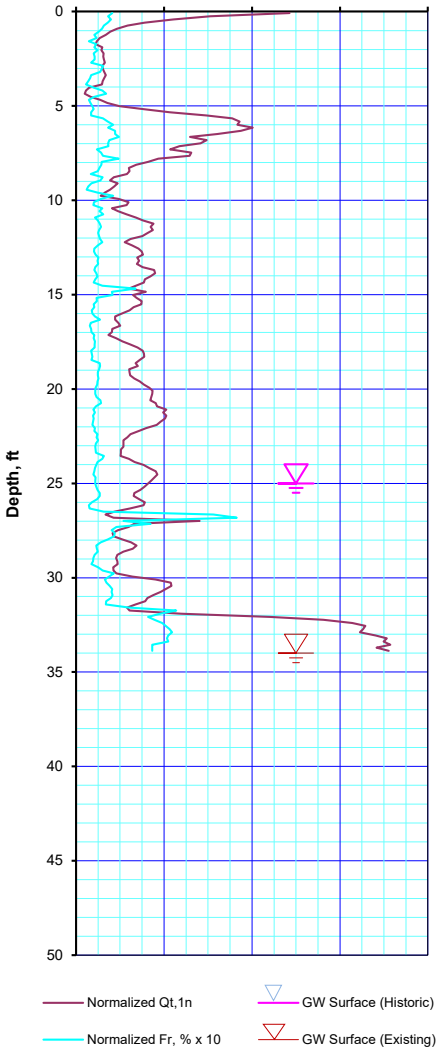
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hill Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.2
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-03
Elevation (MSL)..... 840 ft
Proposed Grade..... 835 ft

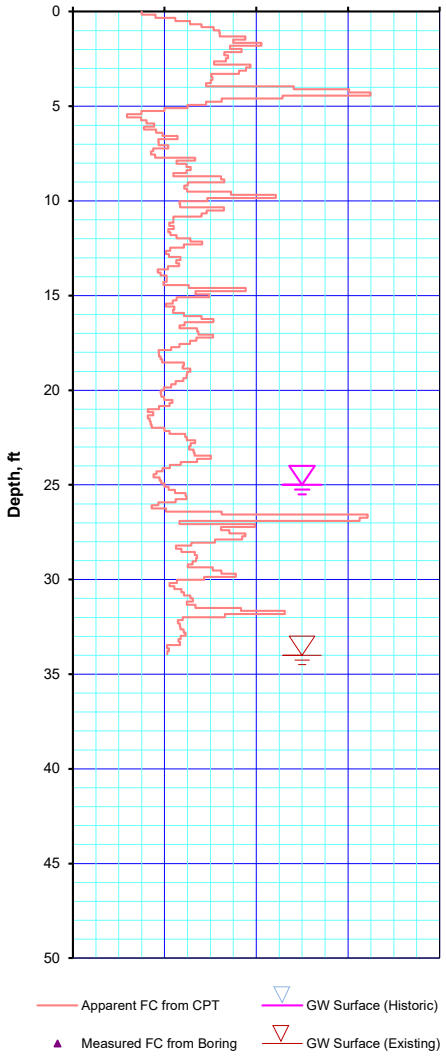
(a)

Normalized Tip Resistance and Friction Ratio



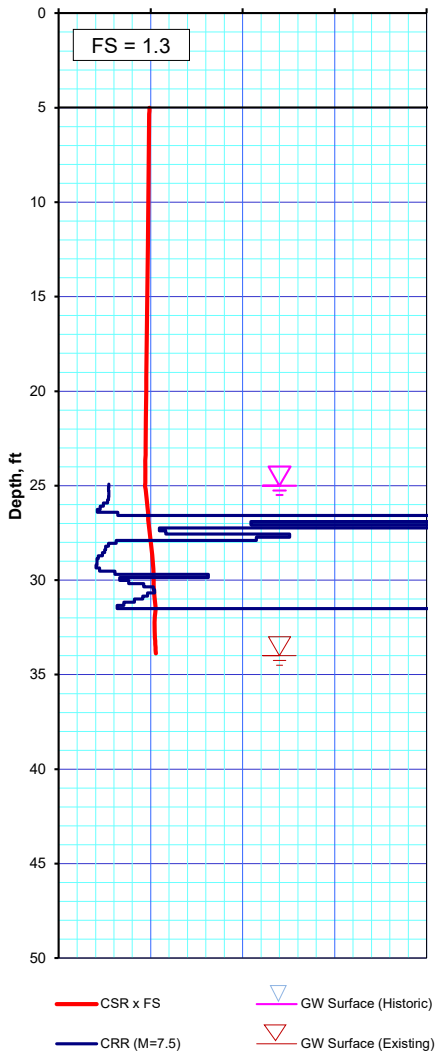
(b)

Fines Content, FC %



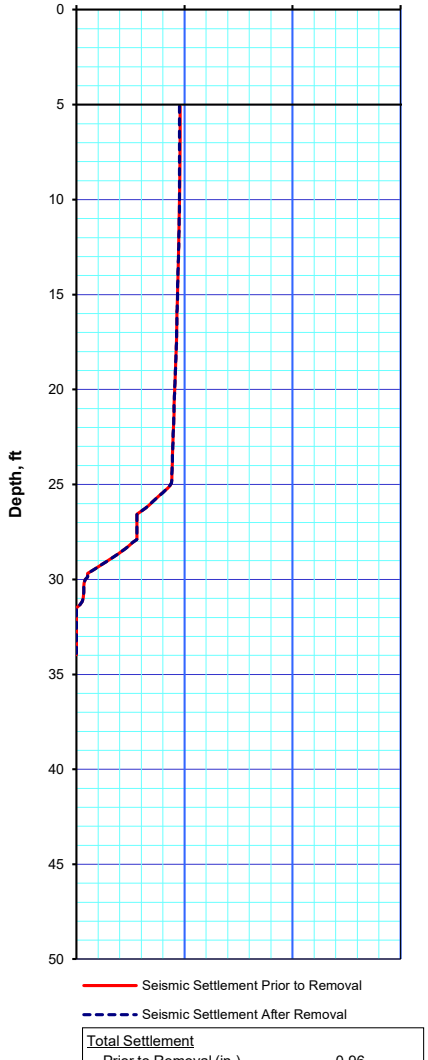
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	0.96
After Removal (in.)	0.95

Removal Depth (ft) = 5.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

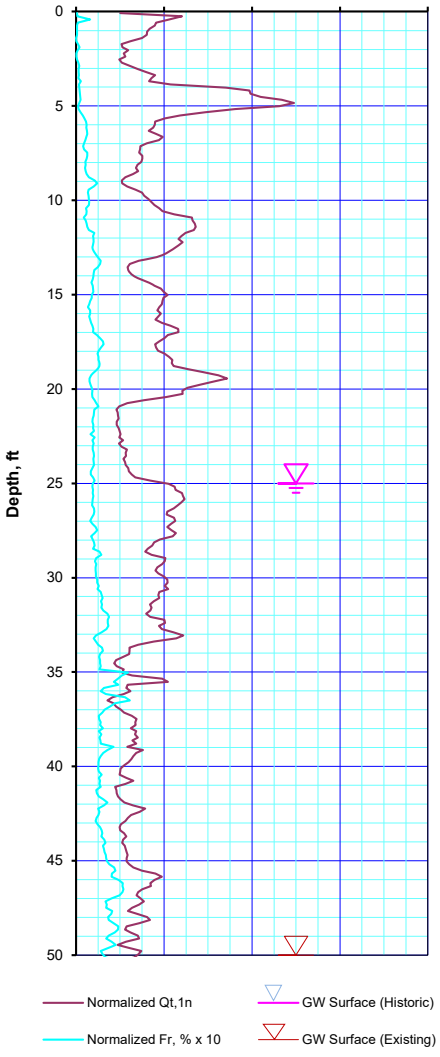
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hill Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.3
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-04
Elevation (MSL)..... 845 ft
Proposed Grade..... 835 ft

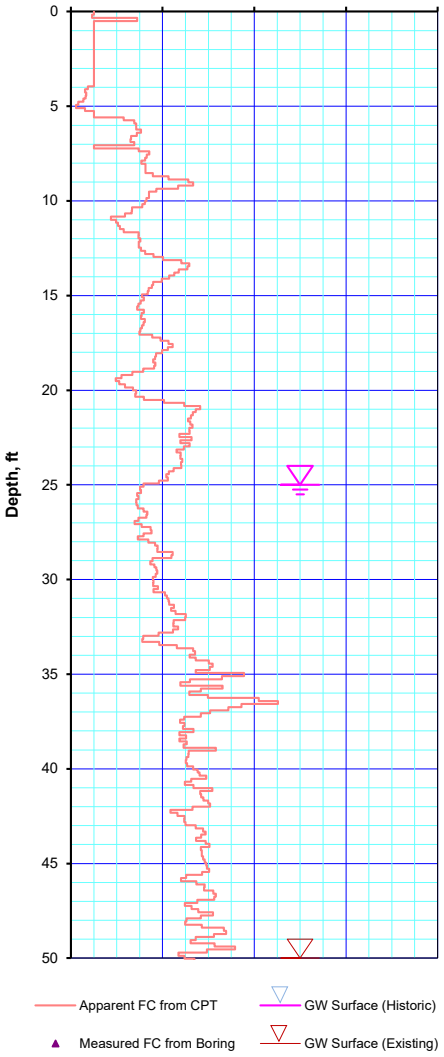
(a)

Normalized Tip Resistance and Friction Ratio



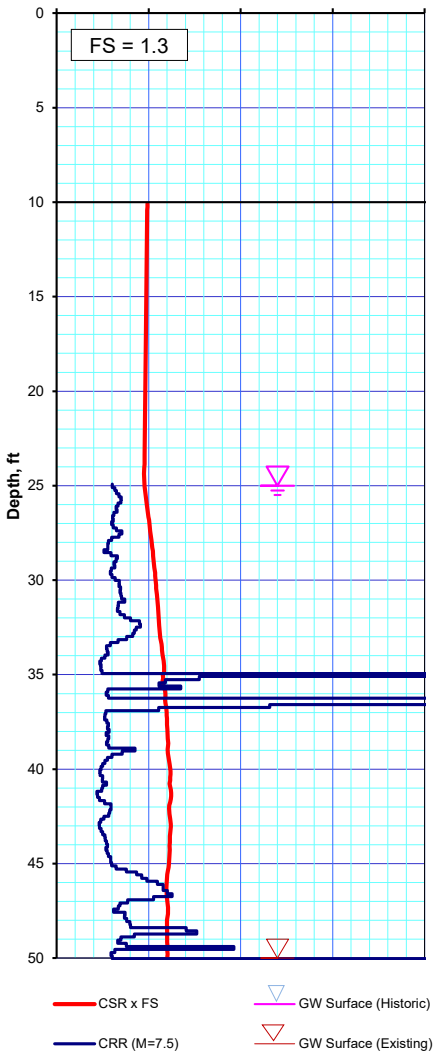
(b)

Fines Content, FC %



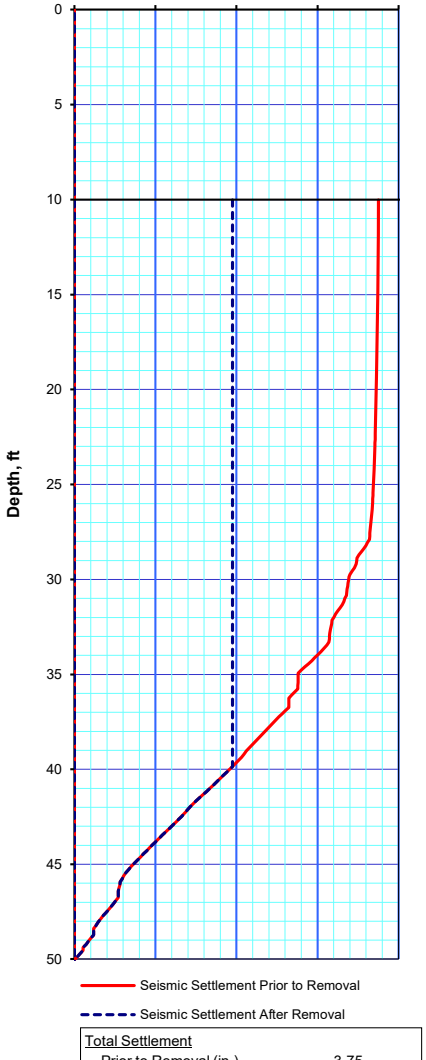
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	3.75
After Removal (in.)	1.95

Removal Depth (ft) = 30.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

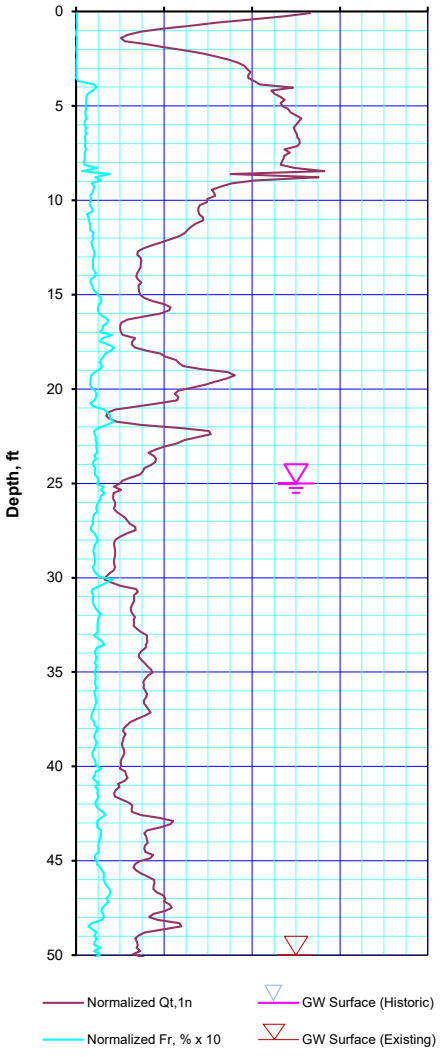
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hill Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.4
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-05
Elevation (MSL)..... 838 ft
Proposed Grade..... 835 ft

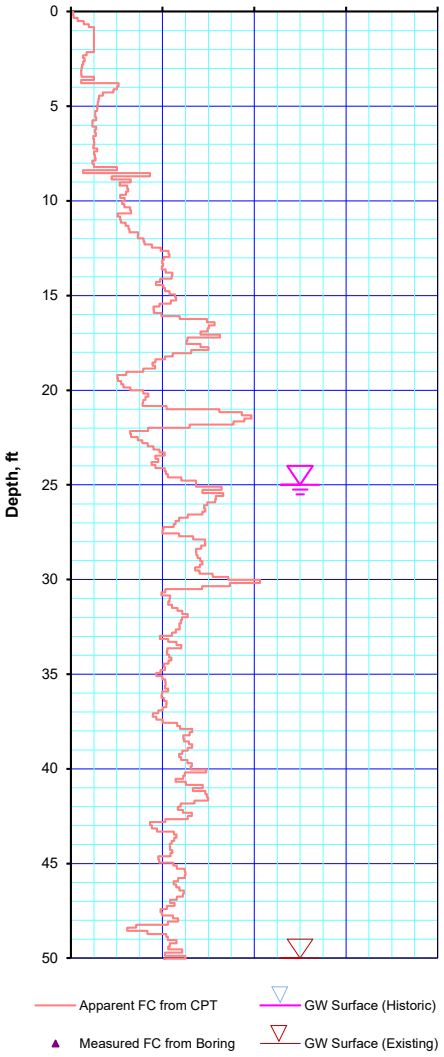
(a)

Normalized Tip Resistance and Friction Ratio



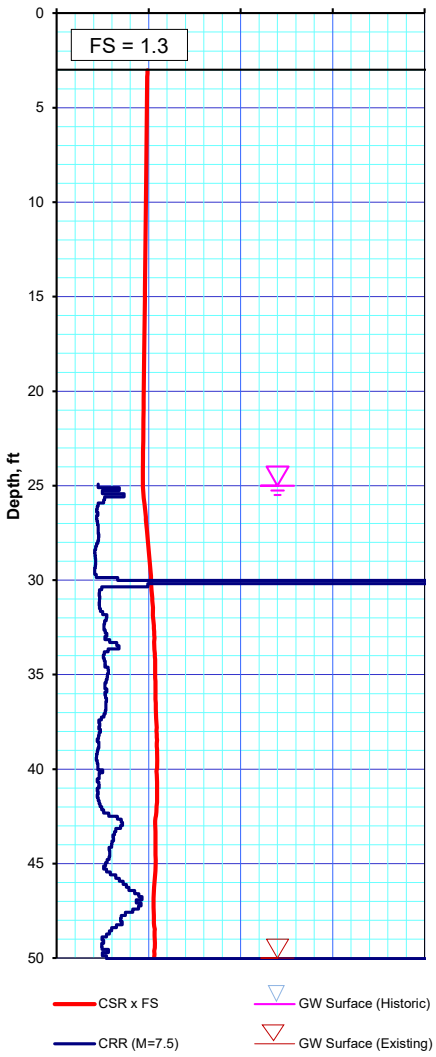
(b)

Fines Content, FC %



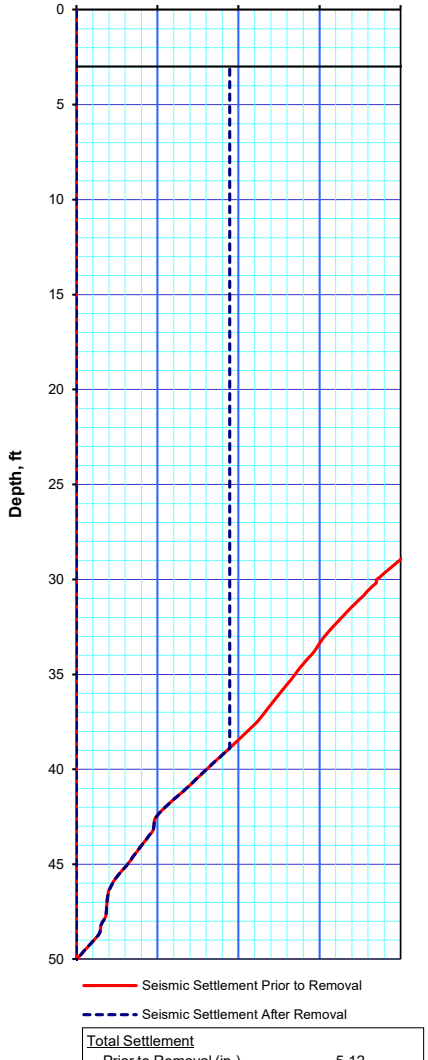
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	5.12
After Removal (in.)	1.89

Version: 5b; 11/13/20

Removal Depth (ft) = 36.0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

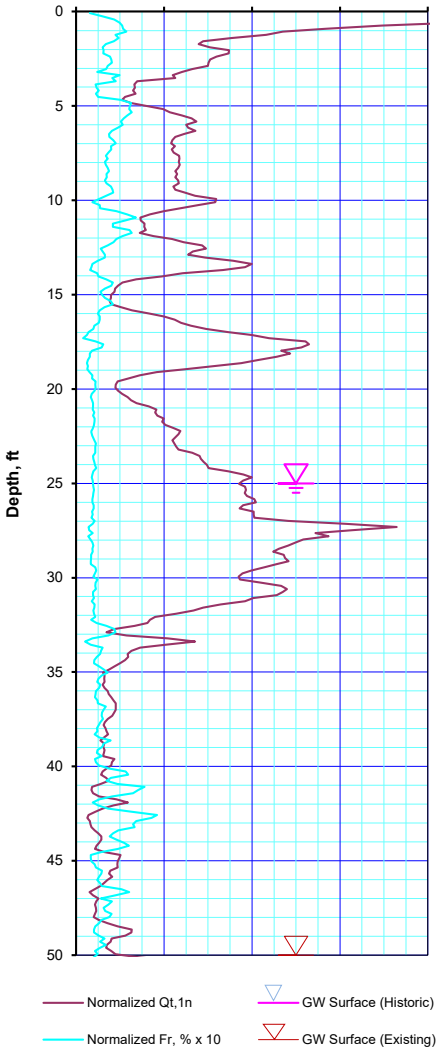
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hill Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.5
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-06
Elevation (MSL)..... 827 ft
Proposed Grade..... 830 ft

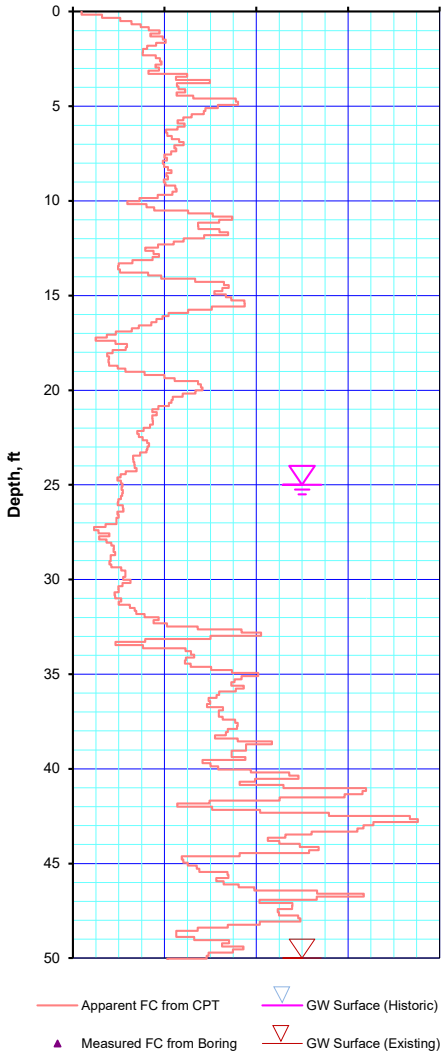
(a)

Normalized Tip Resistance and Friction Ratio



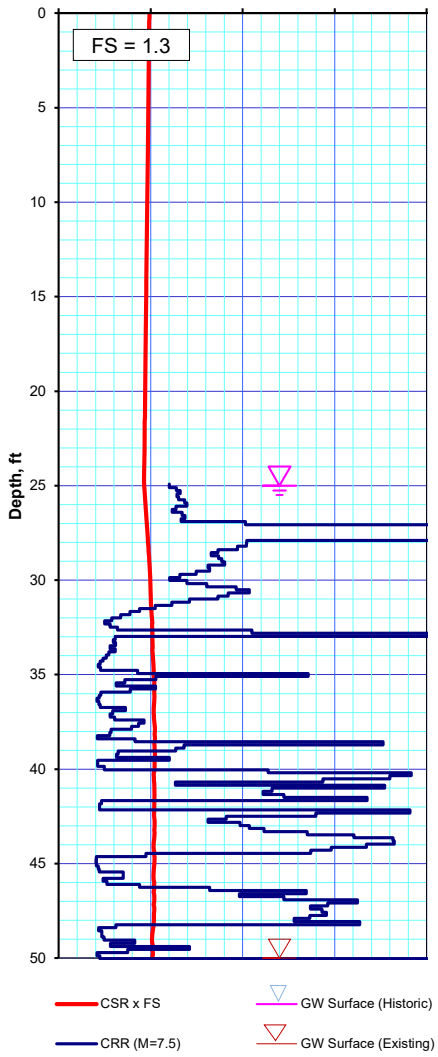
(b)

Fines Content, FC %



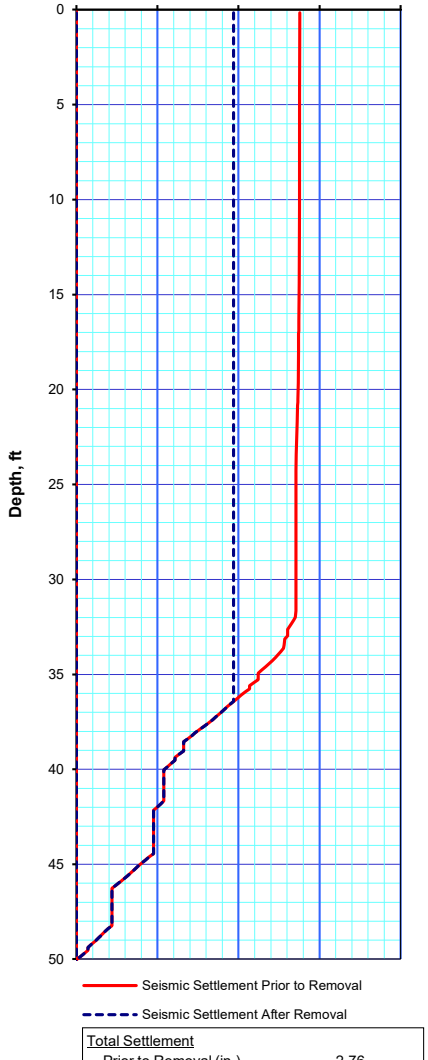
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	2.76
After Removal (in.)	1.94

Removal Depth (ft) = 36.5

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

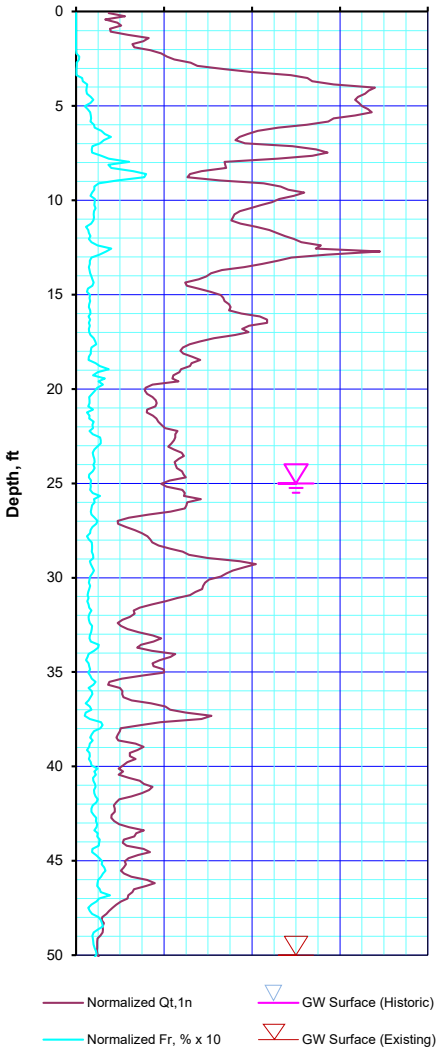
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.6
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-07
Elevation (MSL)..... 863 ft
Proposed Grade..... 885 ft

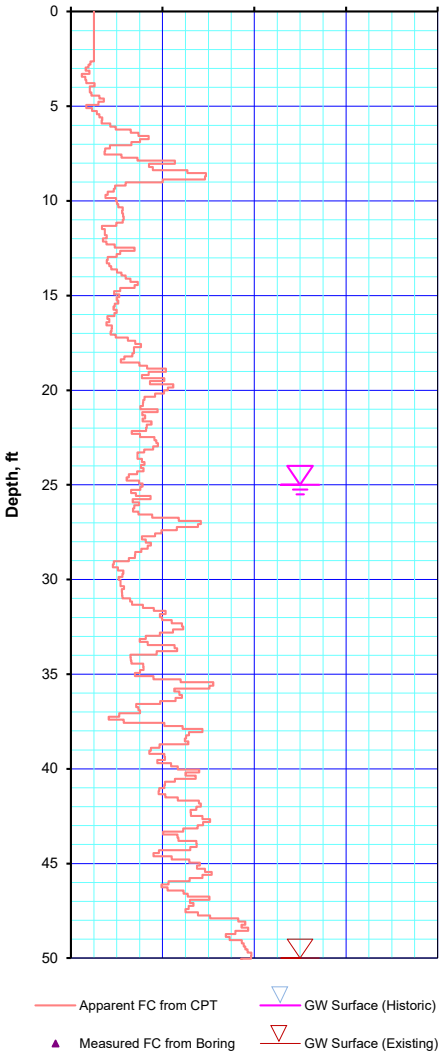
(a)

Normalized Tip Resistance and Friction Ratio



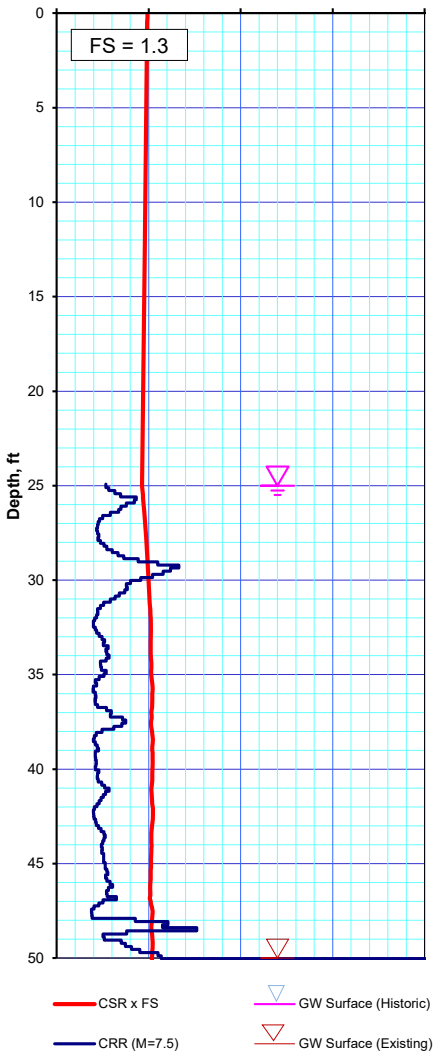
(b)

Fines Content, FC %



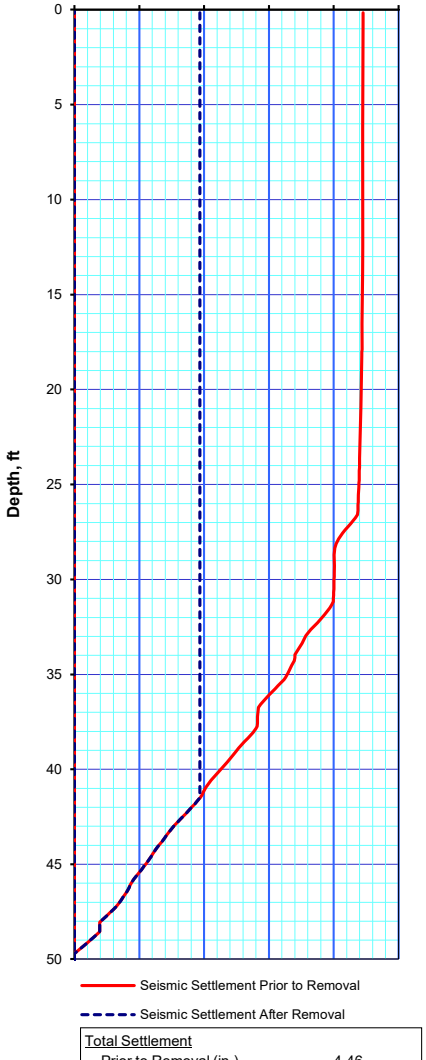
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	4.46
After Removal (in.)	1.94

Removal Depth (ft) = 41.5

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

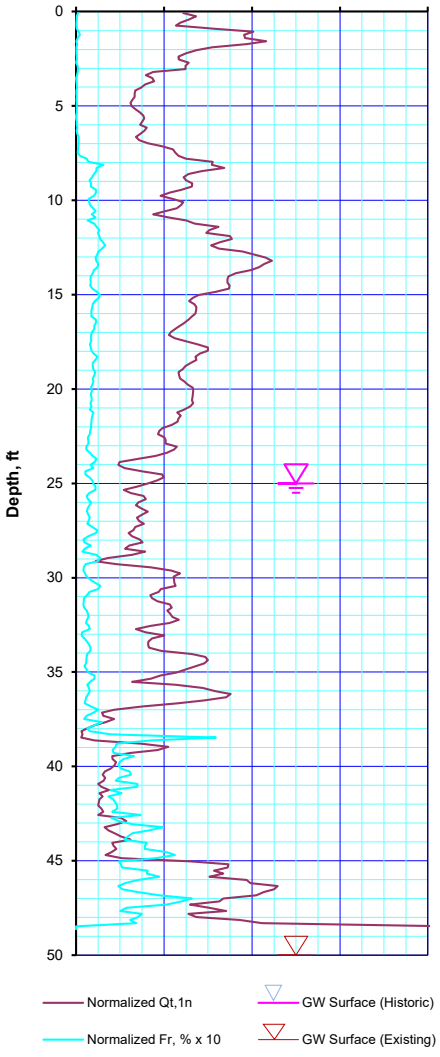
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.7
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-08
Elevation (MSL)..... 891 ft
Proposed Grade..... 885 ft

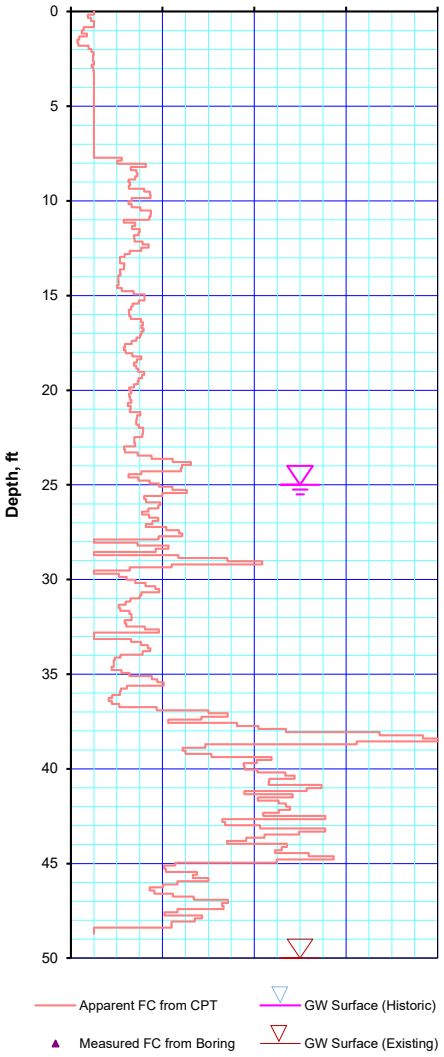
(a)

Normalized Tip Resistance and Friction Ratio



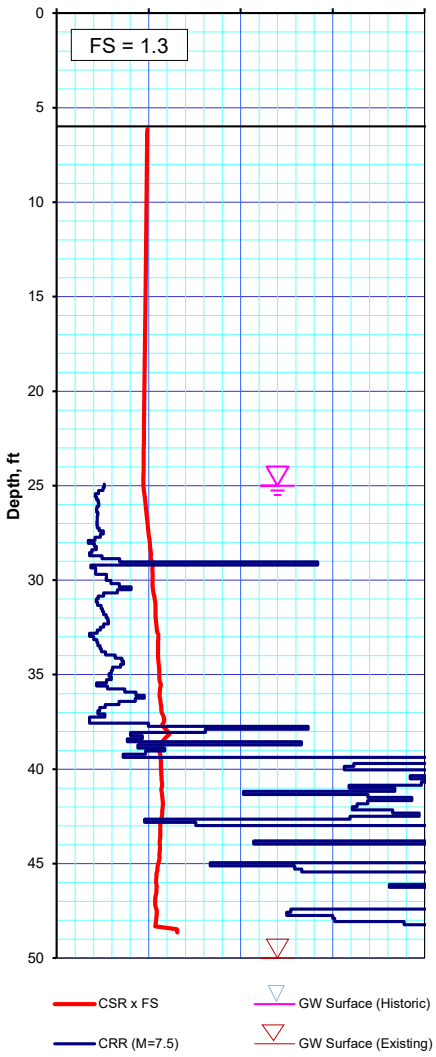
(b)

Fines Content, FC %



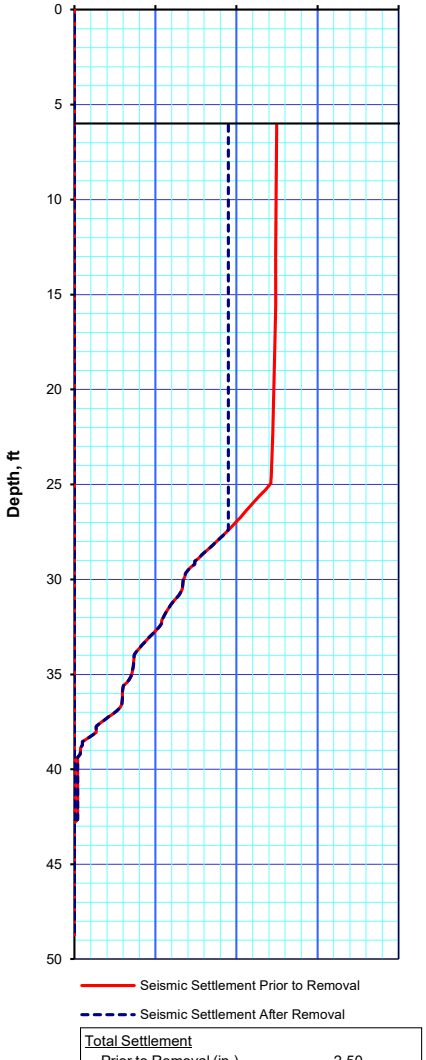
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	2.50
After Removal (in.)	1.90

Version: 5b; 11/13/20

Removal Depth (ft) = 21.5

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

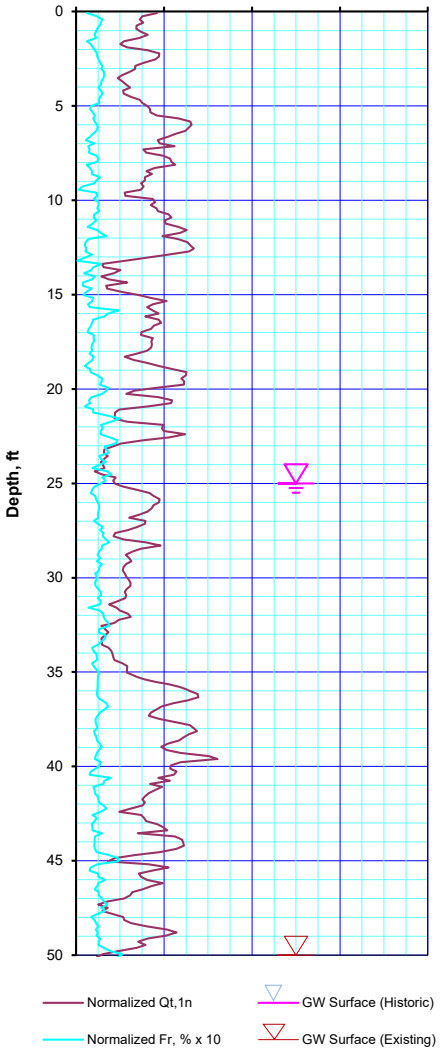
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.8
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-09
Elevation (MSL)..... 938 ft
Proposed Grade..... 935 ft

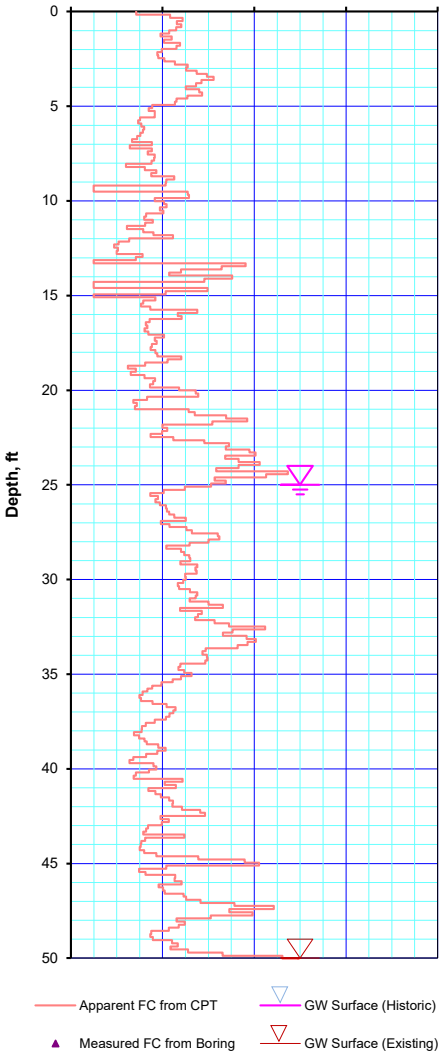
(a)

Normalized Tip Resistance and Friction Ratio



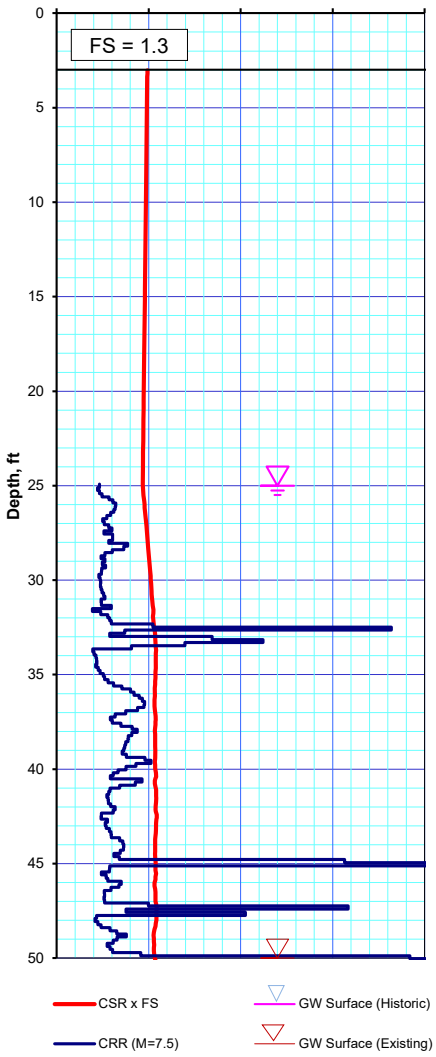
(b)

Fines Content, FC %



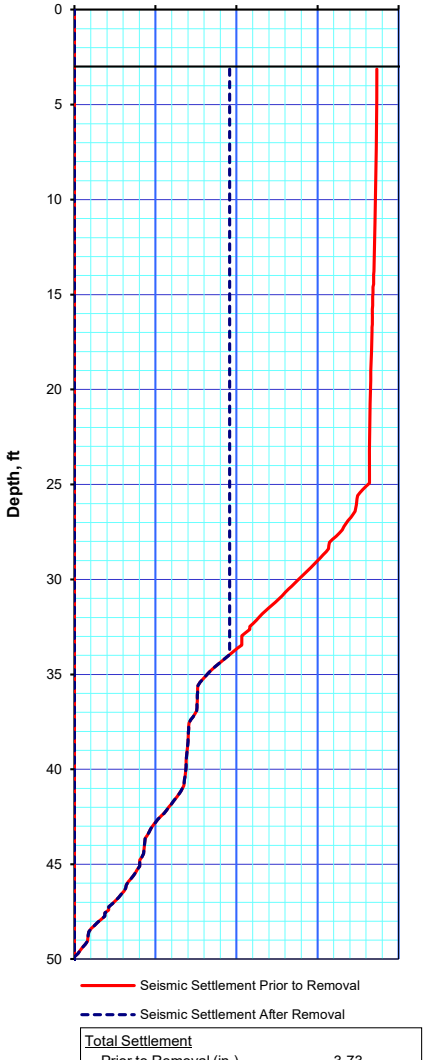
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	3.73
After Removal (in.)	1.91

Removal Depth (ft) = 31.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

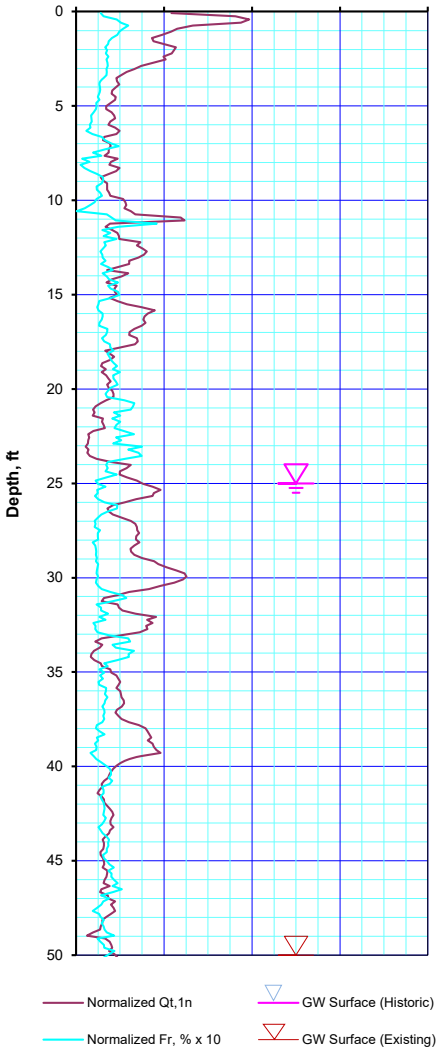
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.9
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-10
Elevation (MSL)..... 897 ft
Proposed Grade..... 905 ft

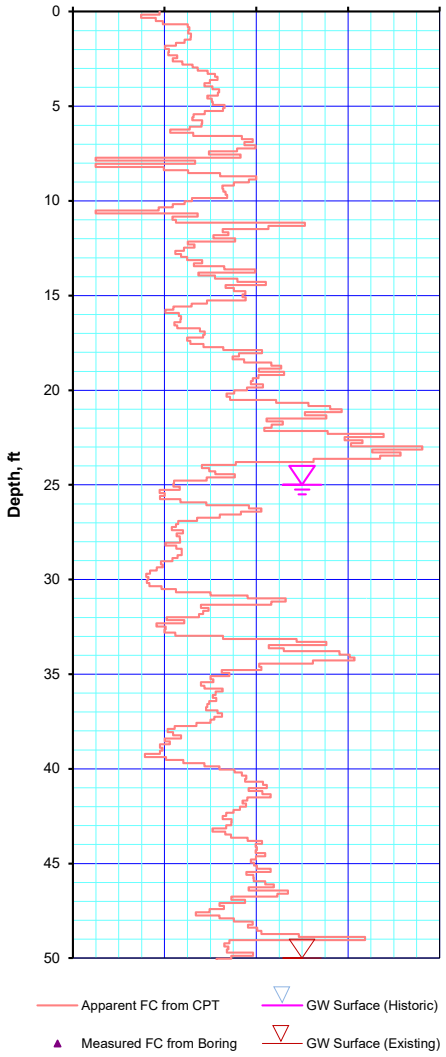
(a)

Normalized Tip Resistance and Friction Ratio



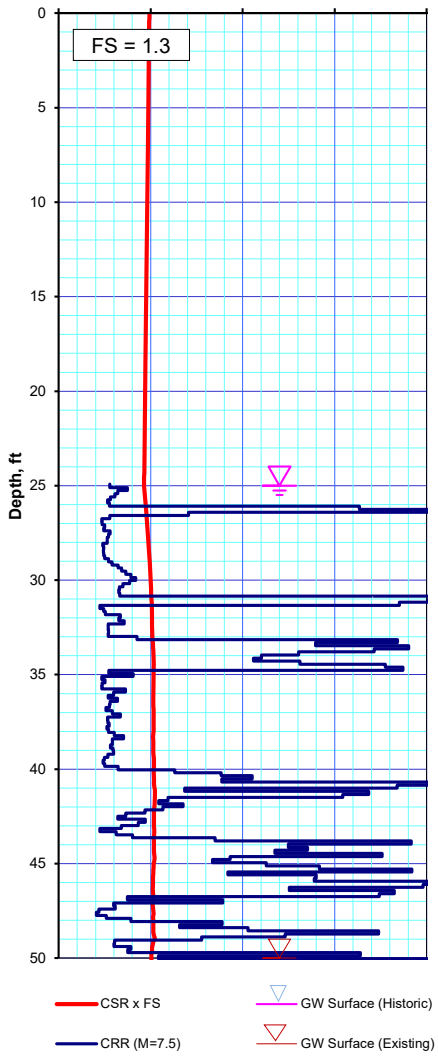
(b)

Fines Content, FC %



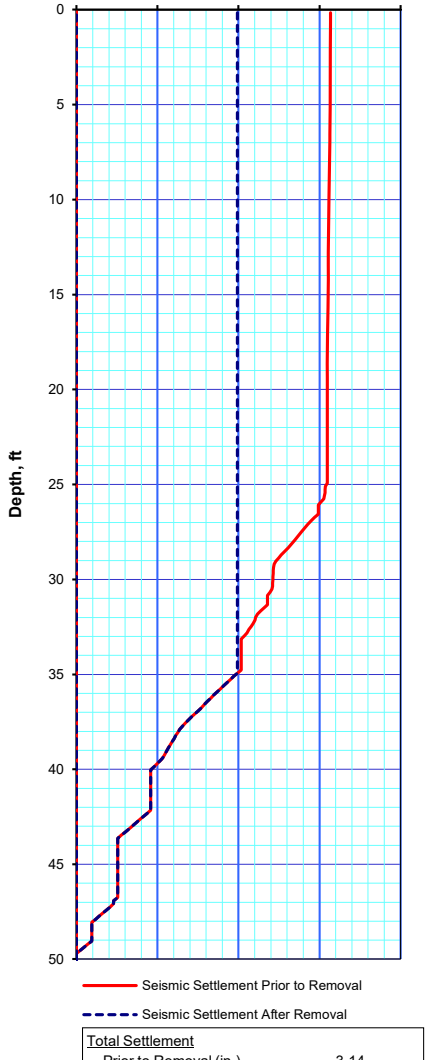
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	3.14
After Removal (in.)	1.99

Removal Depth (ft) = 35.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

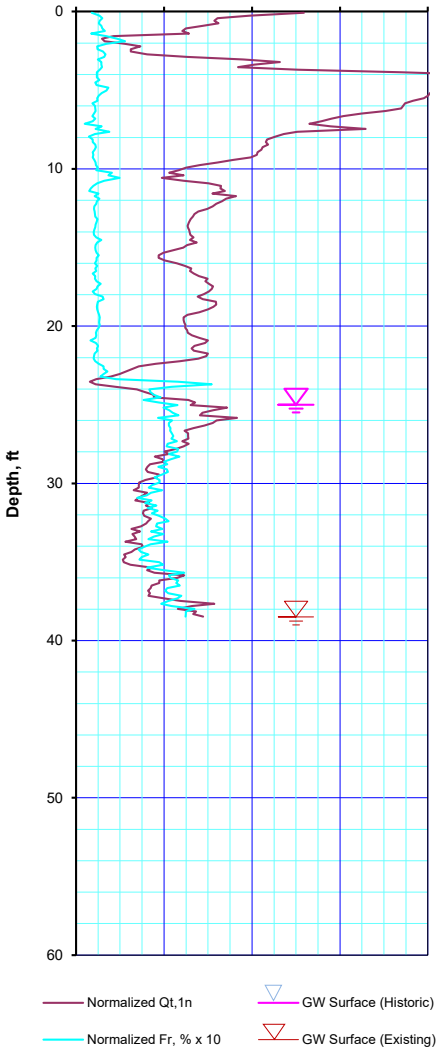
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.10
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-11
Elevation (MSL)..... 882 ft
Proposed Grade..... 905 ft

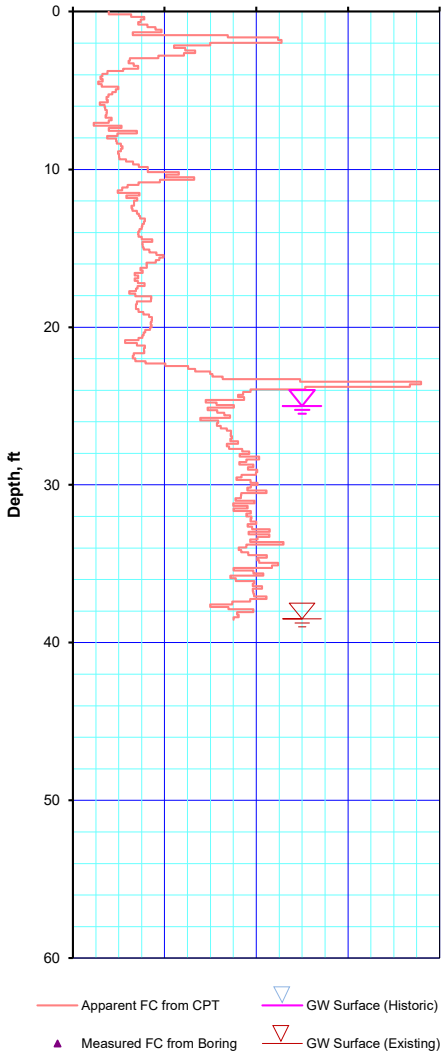
(a)

Normalized Tip Resistance and Friction Ratio



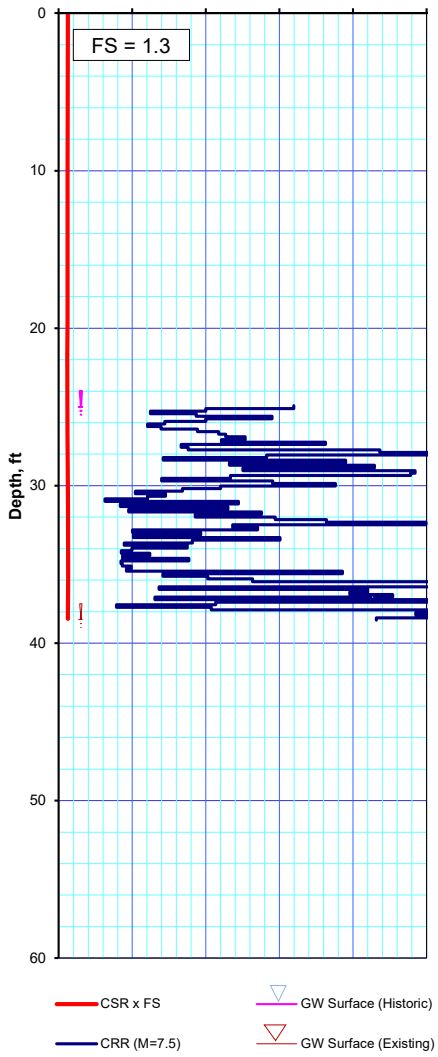
(b)

Fines Content, FC %



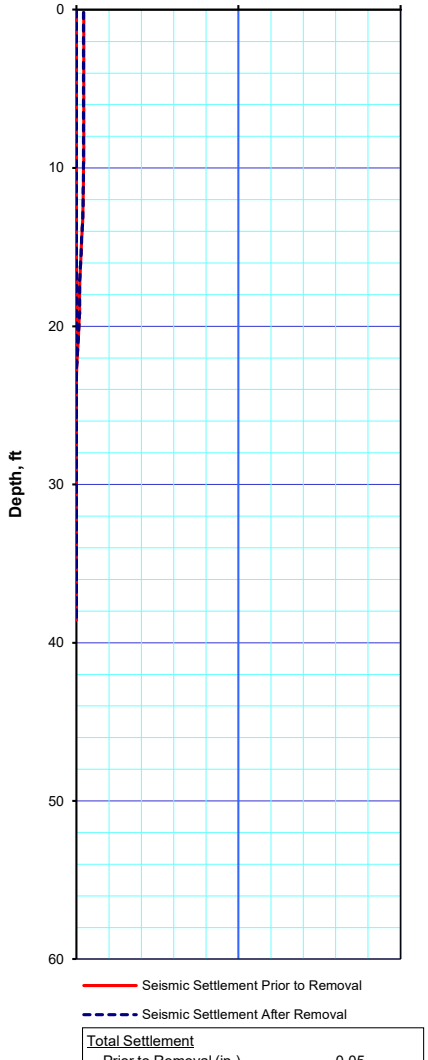
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	0.05
After Removal (in.)	0.04

Removal Depth (ft) = 5.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

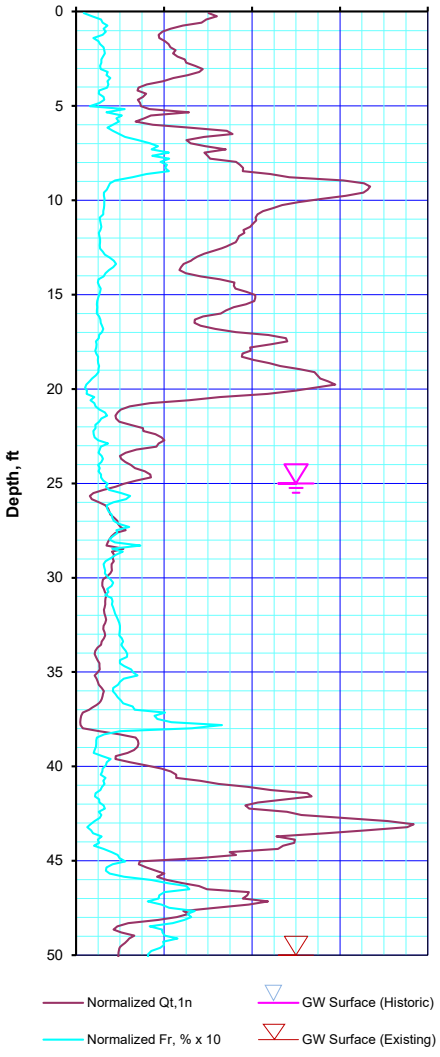
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County, California	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.11
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-12
Elevation (MSL)..... 779 ft
Proposed Grade..... 763 ft

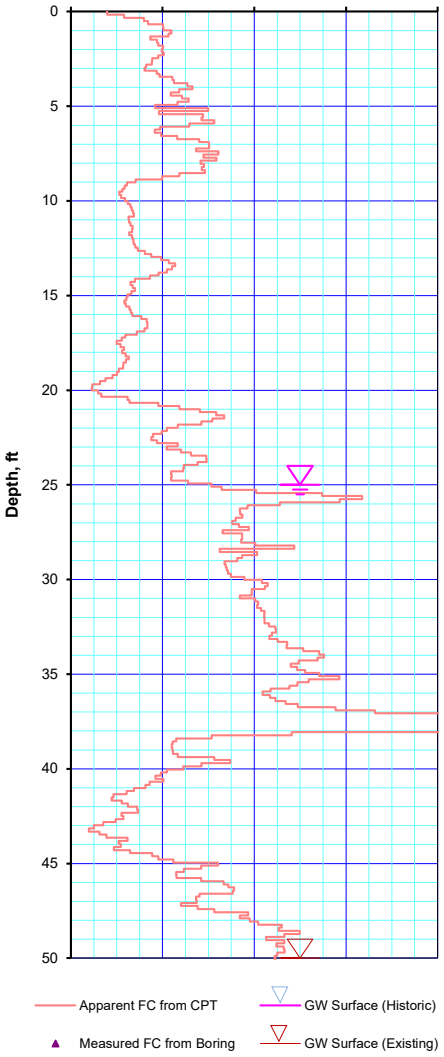
(a)

Normalized Tip Resistance and Friction Ratio



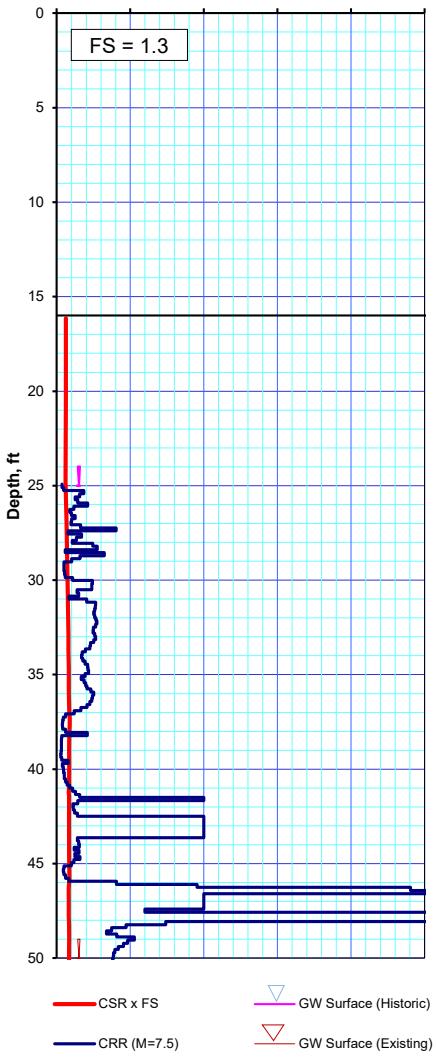
(b)

Fines Content, FC %



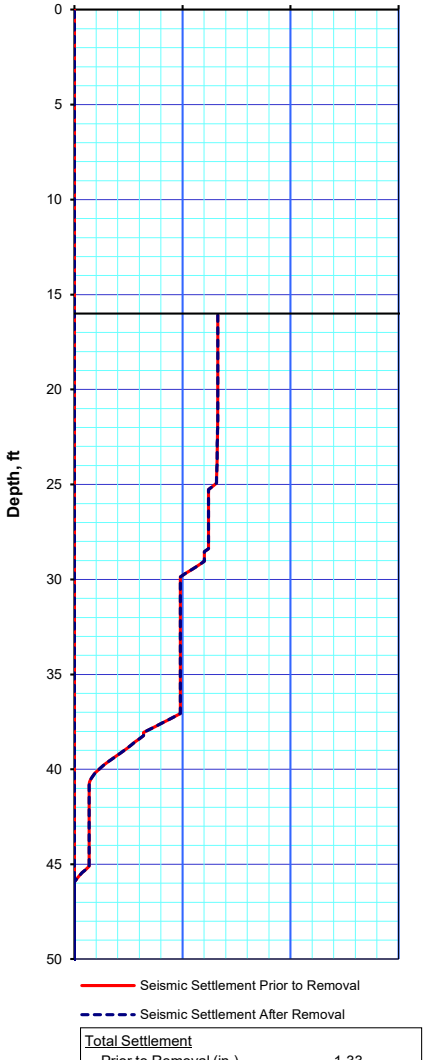
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	1.33
After Removal (in.)	1.33

Removal Depth (ft) = 5.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

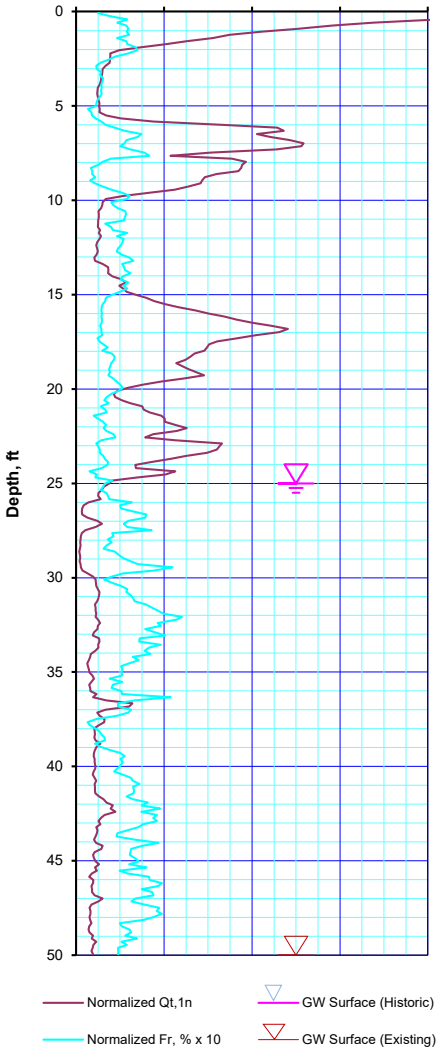
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County, CA	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.12
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-13
Elevation (MSL)..... 757 ft
Proposed Grade..... 756 ft

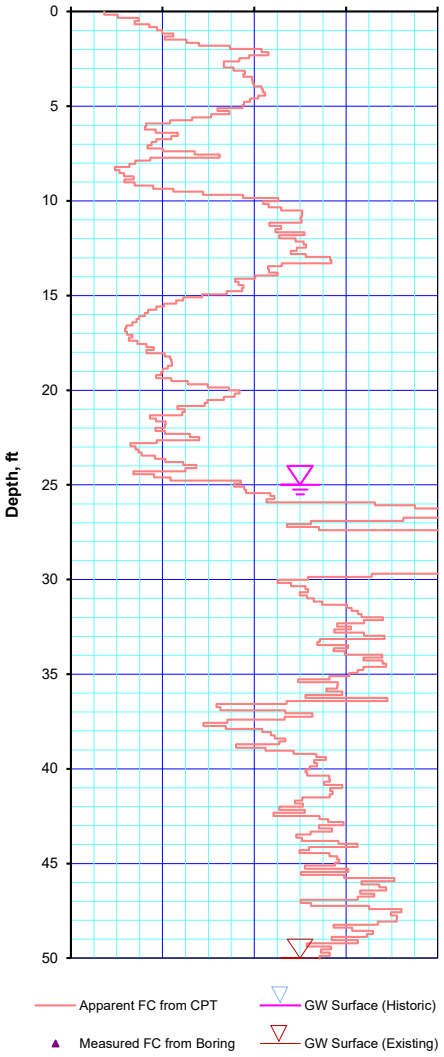
(a)

Normalized Tip Resistance and Friction Ratio



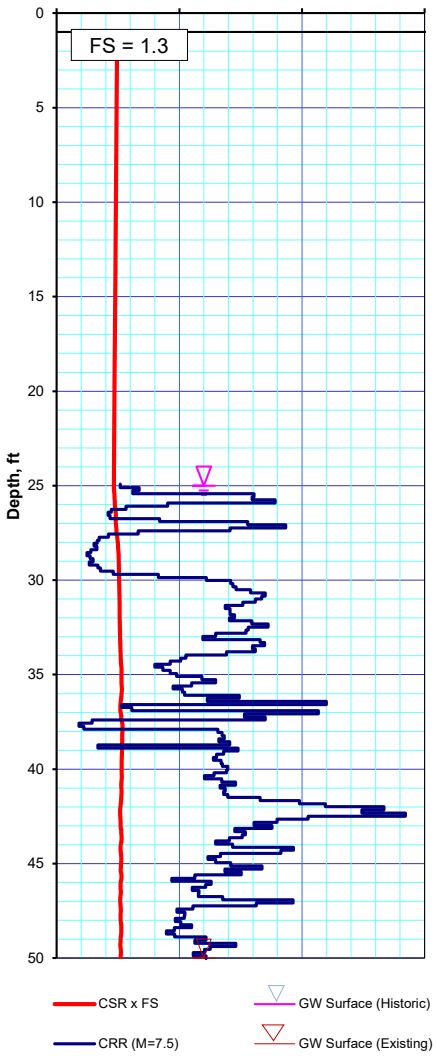
(b)

Fines Content, FC %



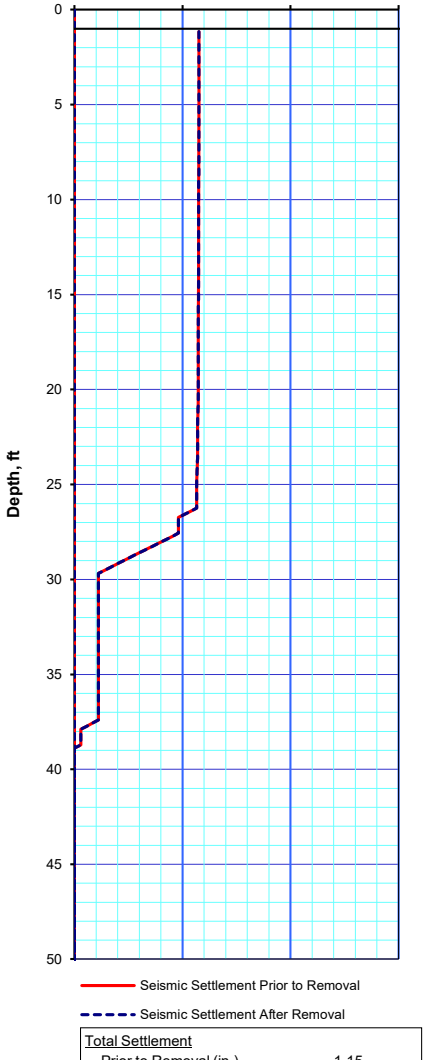
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	1.15
After Removal (in.)	1.15

Version: 5b; 11/13/20

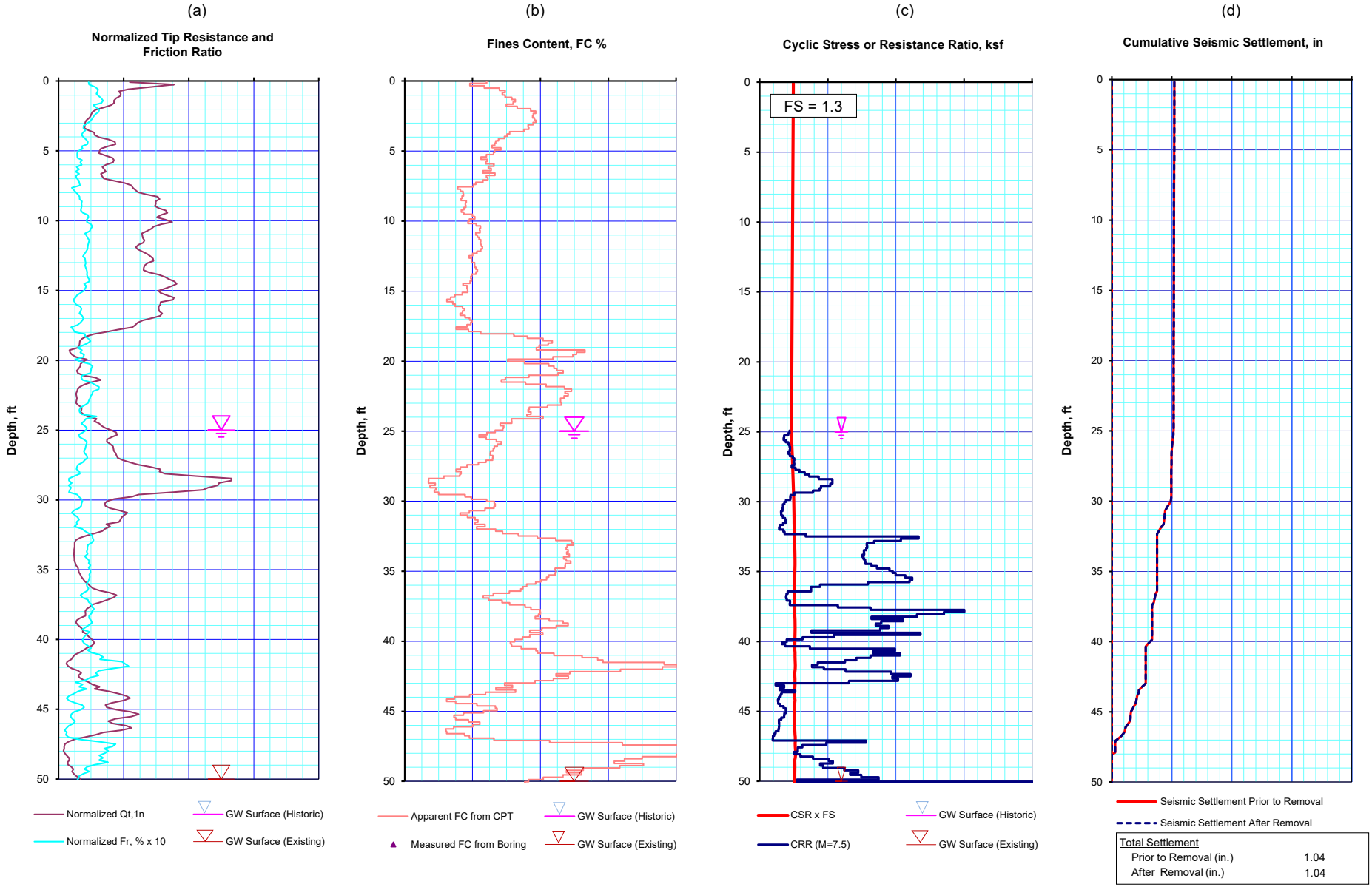
Removal Depth (ft) = 5.0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.13
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-14
Elevation (MSL)..... 750 ft
Proposed Grade..... 750 ft



Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

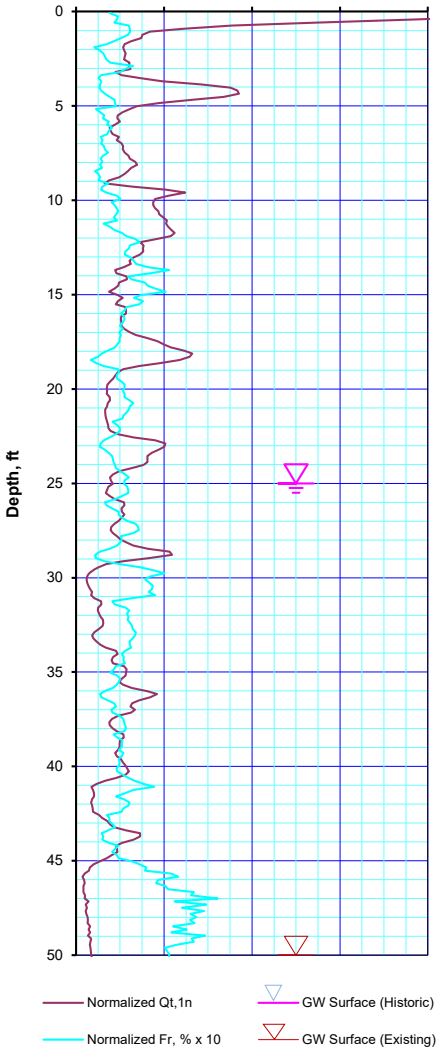
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.14
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-15
Elevation (MSL)..... 725 ft
Proposed Grade..... 725 ft

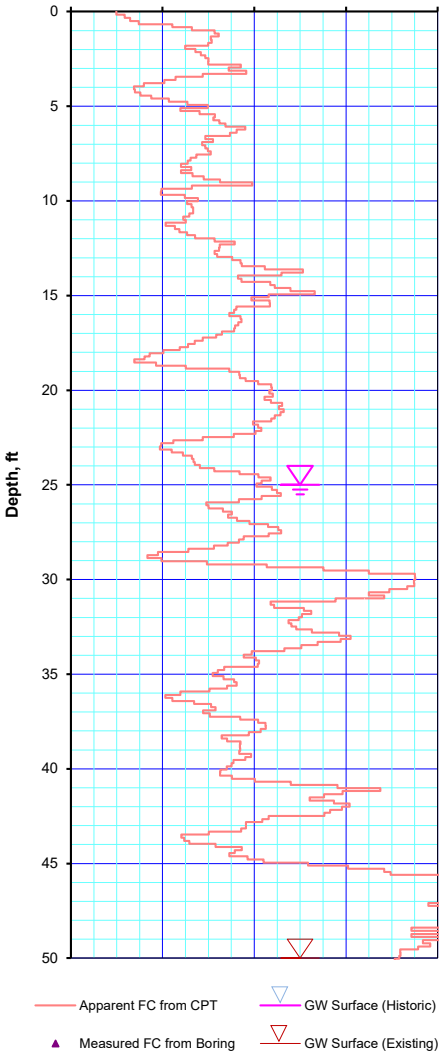
(a)

Normalized Tip Resistance and Friction Ratio



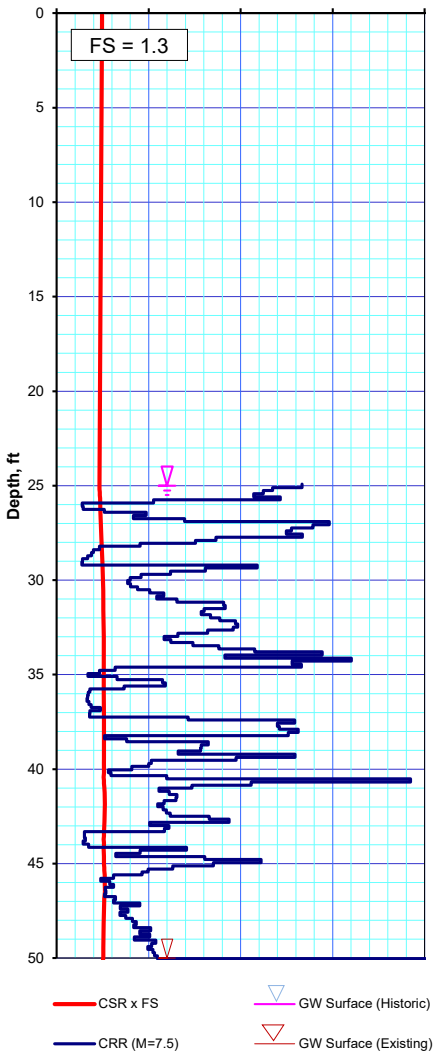
(b)

Fines Content, FC %



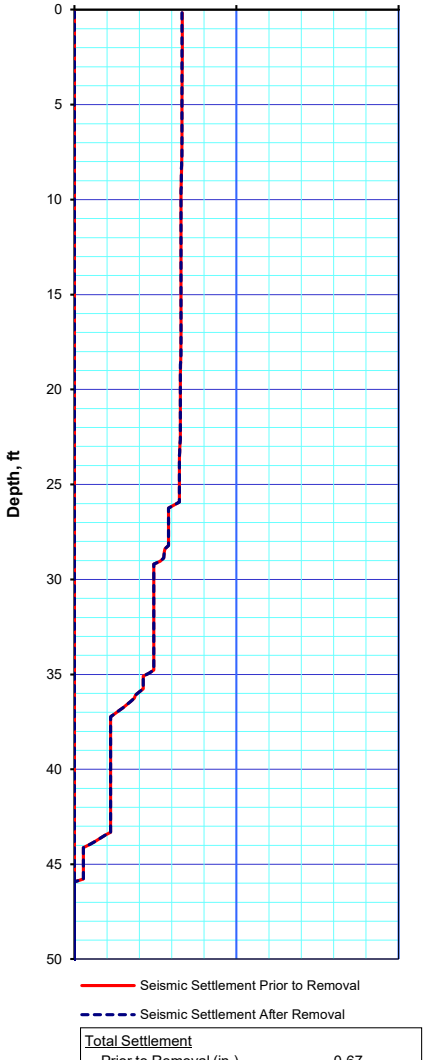
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	0.67
After Removal (in.)	0.66

Removal Depth (ft) = 5.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

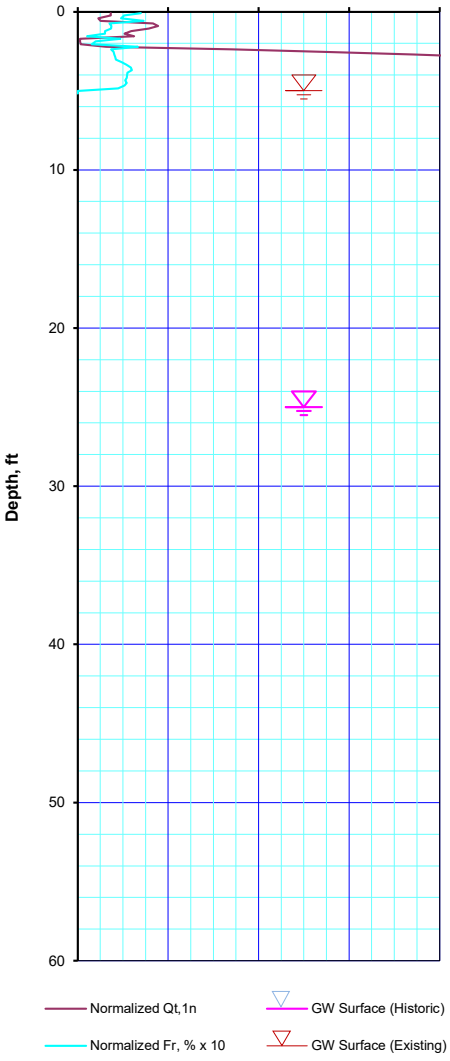
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.15
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-16
Elevation (MSL)..... 1058 ft
Proposed Grade..... 1040 ft

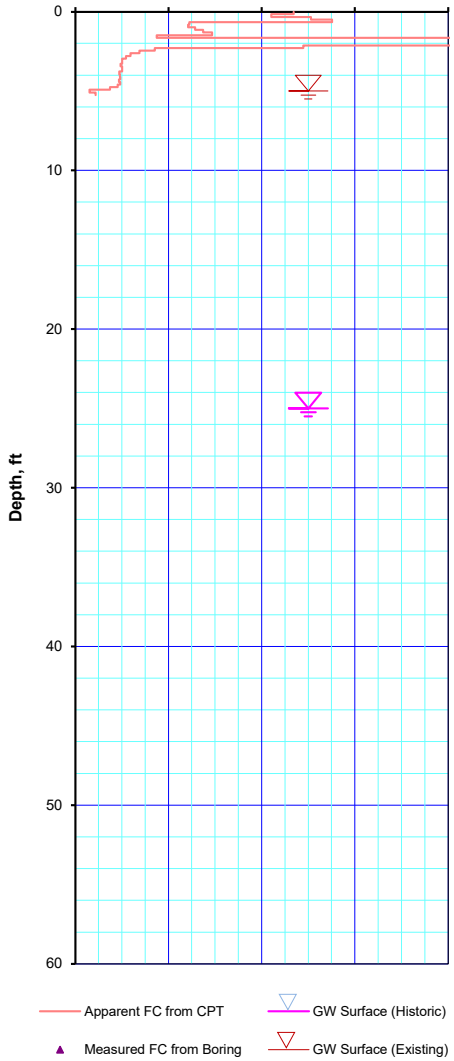
(a)

Normalized Tip Resistance and Friction Ratio



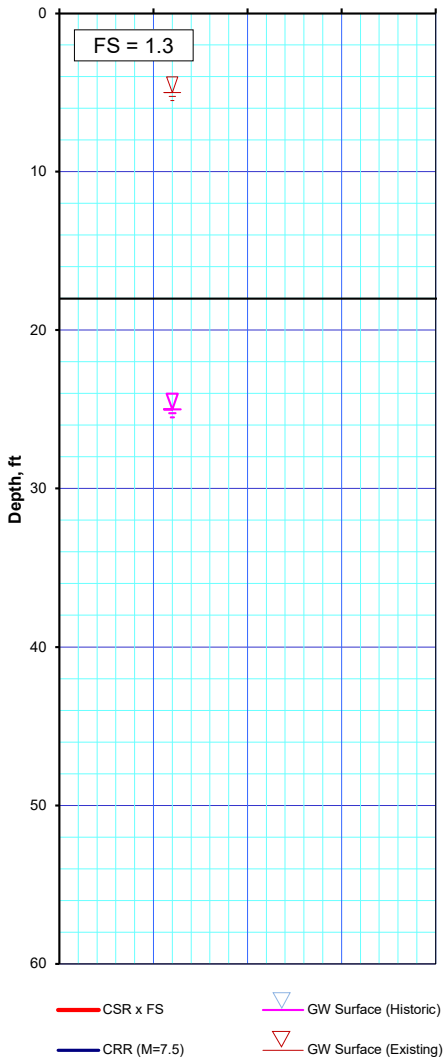
(b)

Fines Content, FC %



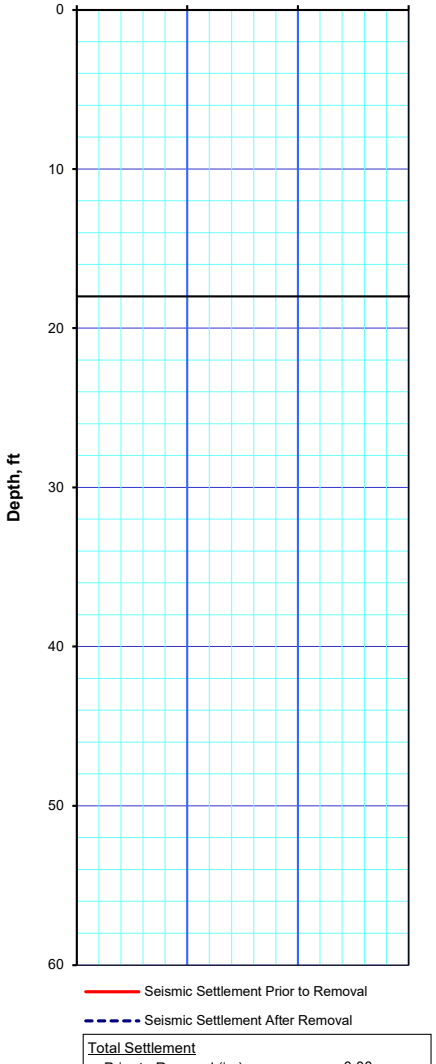
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	0.00
After Removal (in.)	0.00

Version: 5b; 11/13/20

Removal Depth (ft) = 10.0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

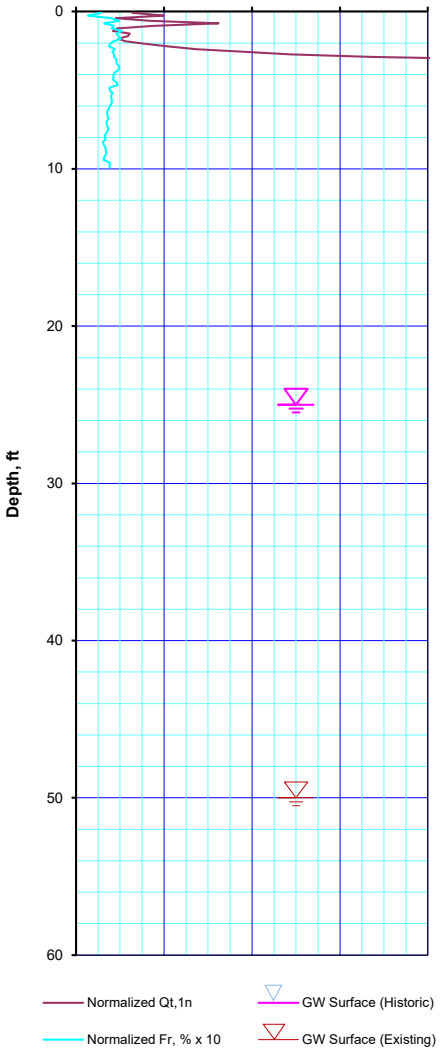
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County, CA	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.16
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-17
Elevation (MSL)..... 1037 ft
Proposed Grade..... 1010 ft

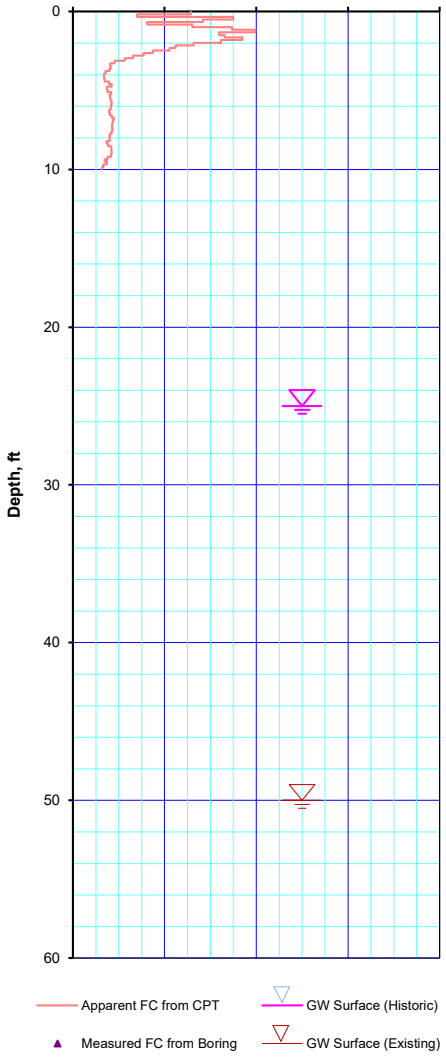
(a)

Normalized Tip Resistance and Friction Ratio



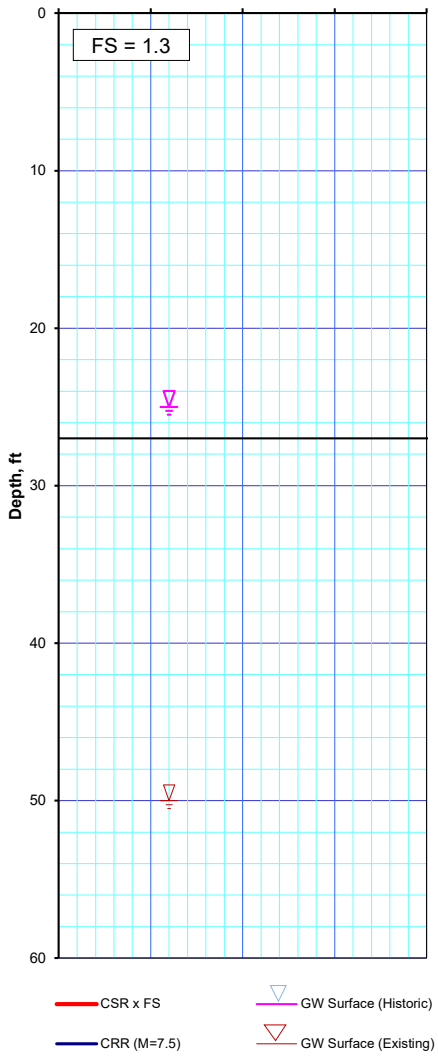
(b)

Fines Content, FC %



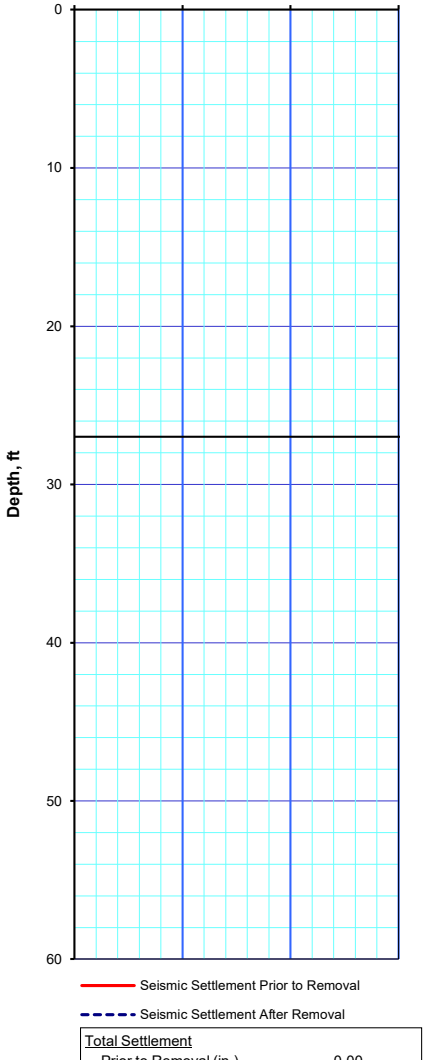
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	0.00
After Removal (in.)	0.00

Version: 5b; 11/13/20

Removal Depth (ft) = 5.0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

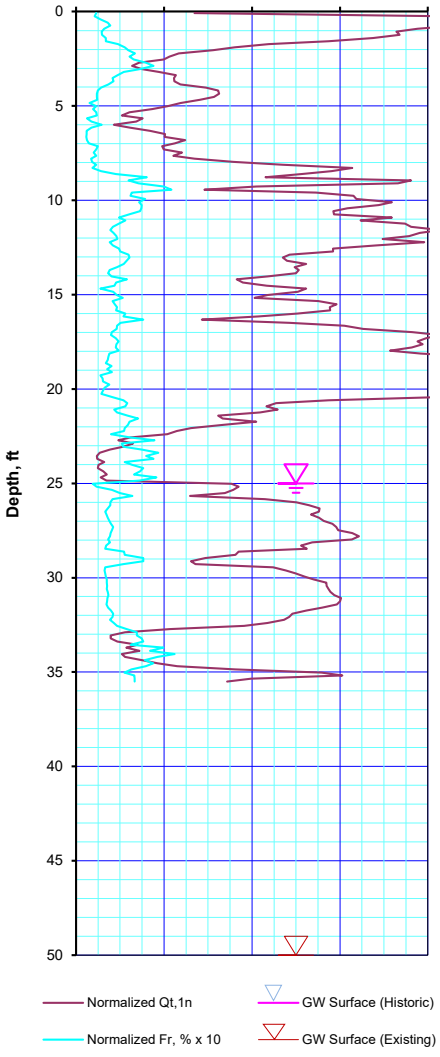
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.17
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-18
Elevation (MSL)..... 985 ft
Proposed Grade..... 1010 ft

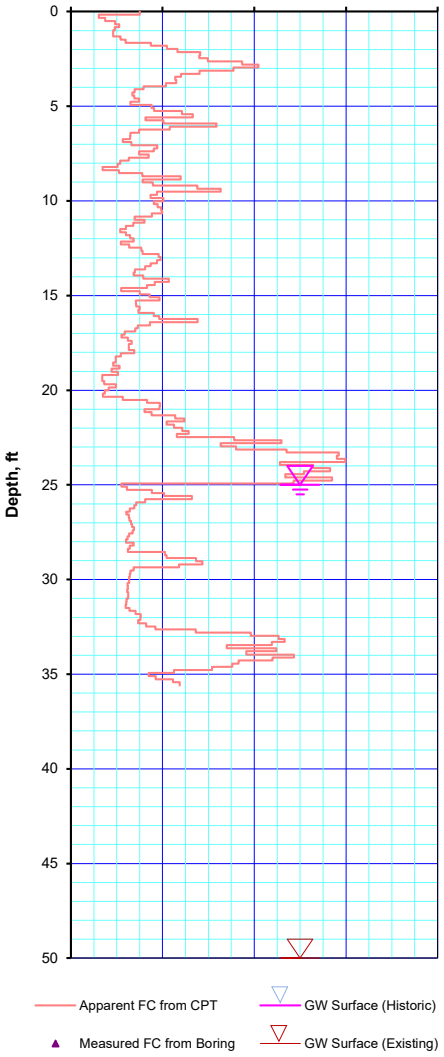
(a)

Normalized Tip Resistance and Friction Ratio



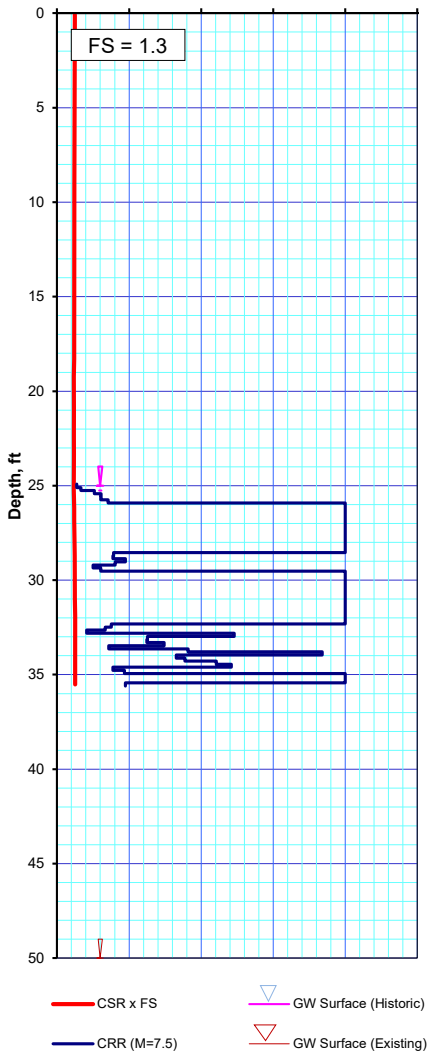
(b)

Fines Content, FC %



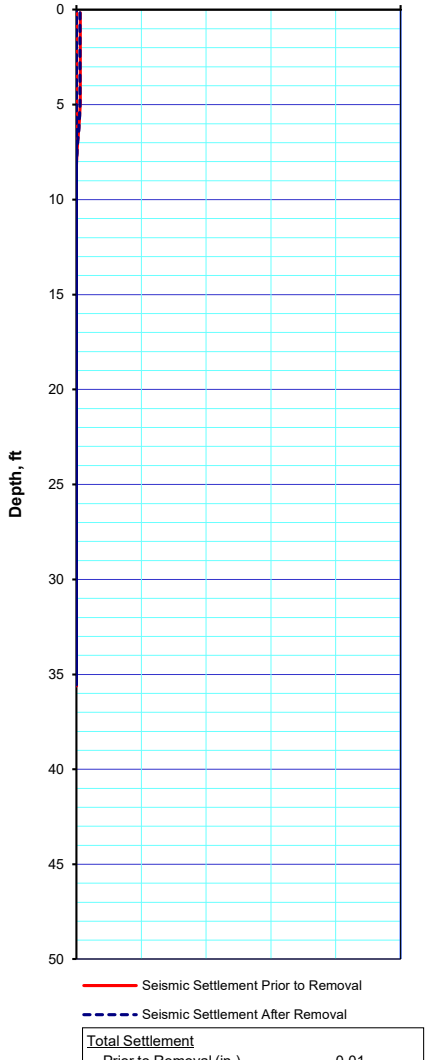
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	0.01
After Removal (in.)	0.01

Version: 5b; 11/13/20

Removal Depth (ft) = 5.0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

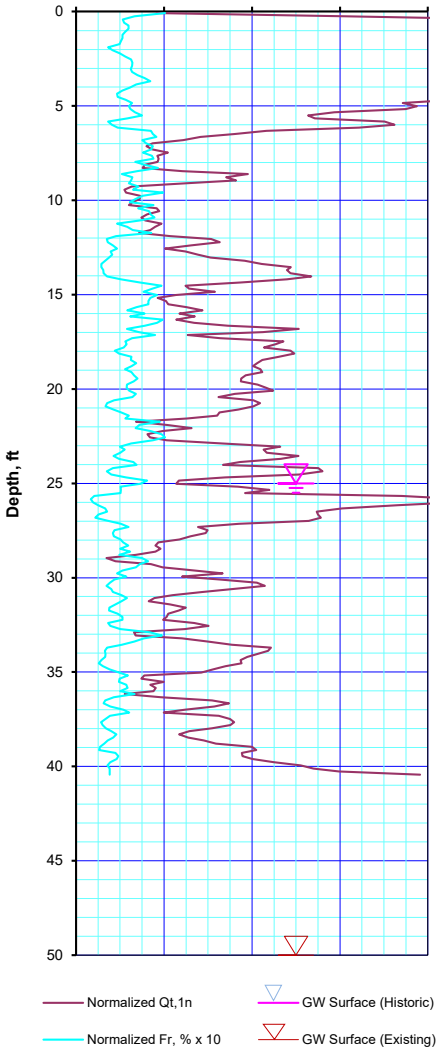
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hill Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.18
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-19
Elevation (MSL)..... 960 ft
Proposed Grade..... 980 ft

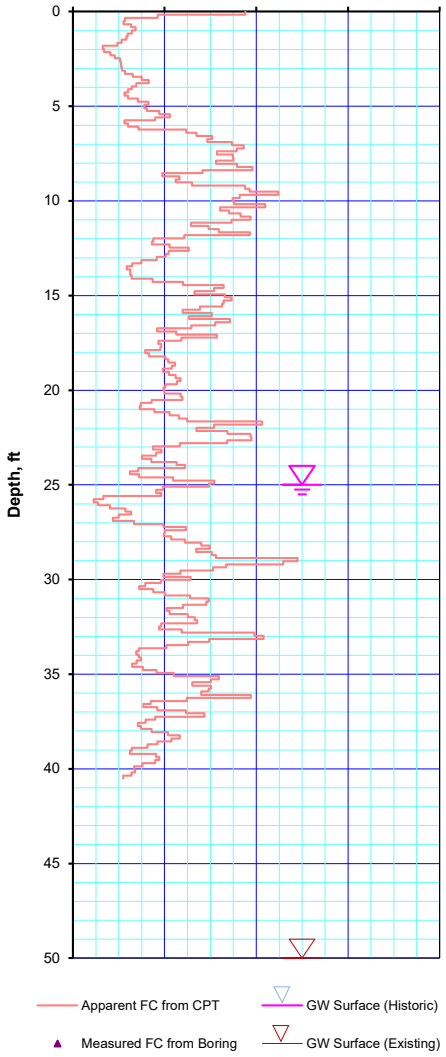
(a)

Normalized Tip Resistance and Friction Ratio



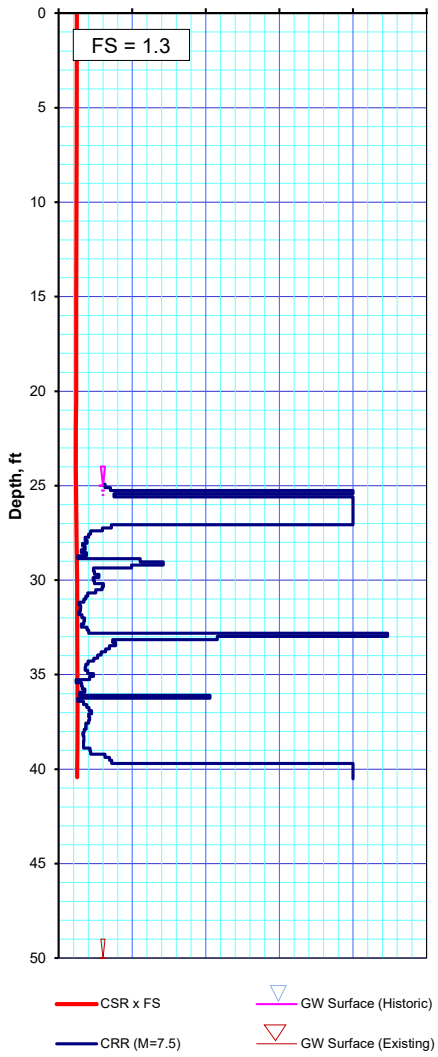
(b)

Fines Content, FC %



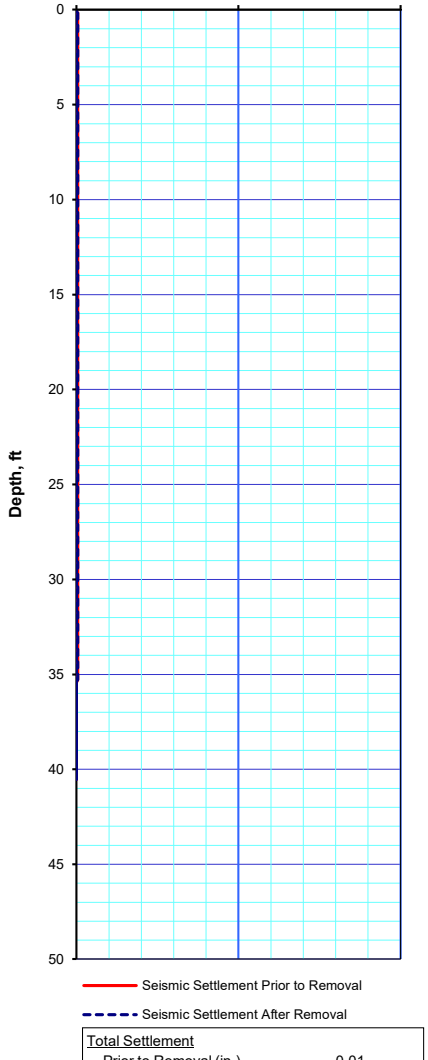
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	0.01
After Removal (in.)	0.01

Version: 5b; 11/13/20

Removal Depth (ft) = 0.0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

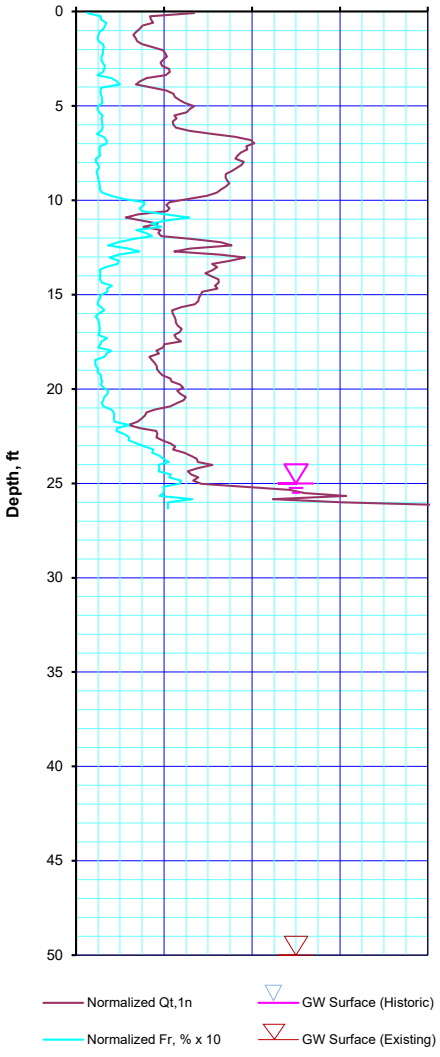
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.19
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-20
Elevation (MSL)..... 991 ft
Proposed Grade..... 1025 ft

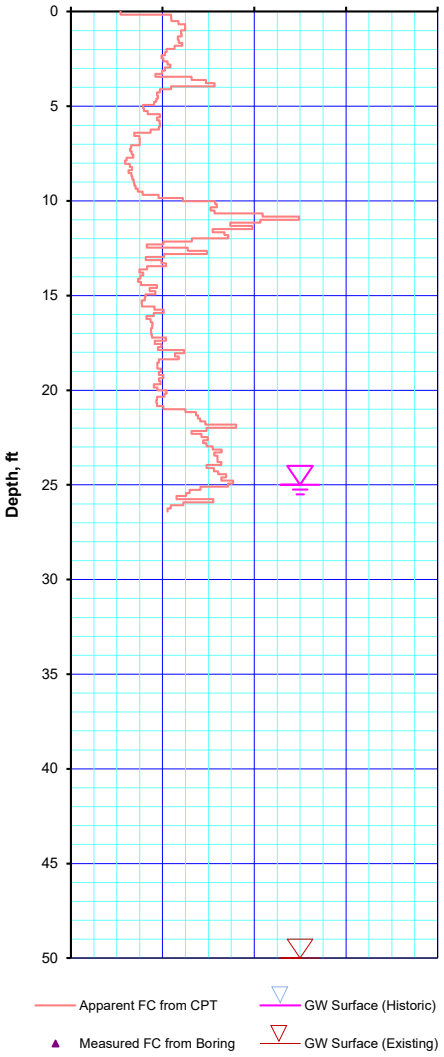
(a)

Normalized Tip Resistance and Friction Ratio



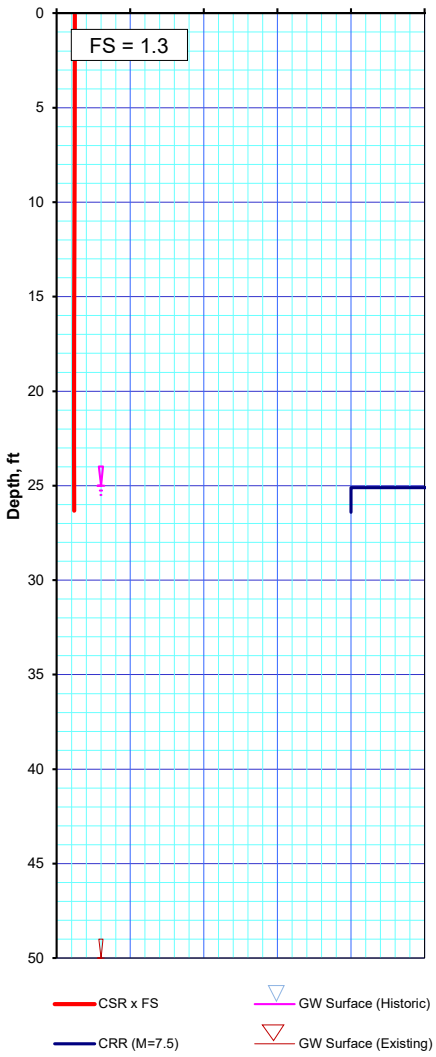
(b)

Fines Content, FC %



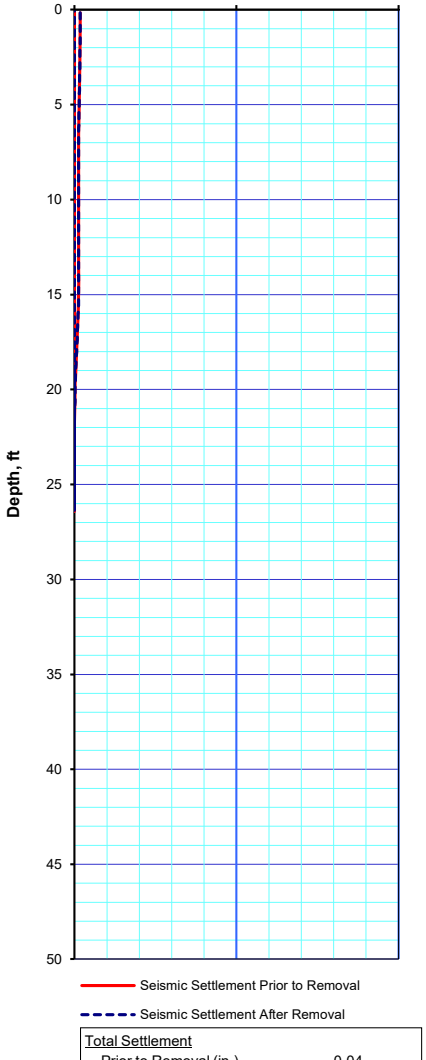
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	0.04
After Removal (in.)	0.04

Version: 5b; 11/13/20

Removal Depth (ft) = 0.0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

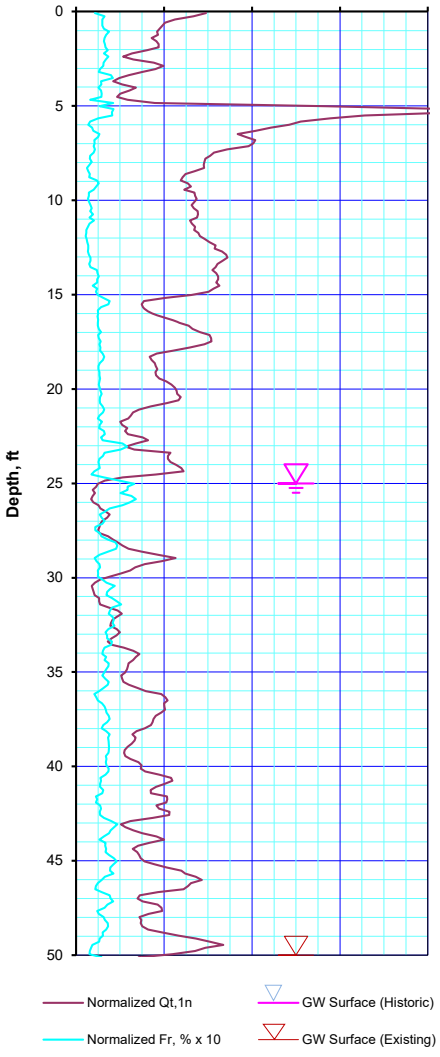
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County, CA	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.20
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-21
Elevation (MSL)..... 951 ft
Proposed Grade..... 1025 ft

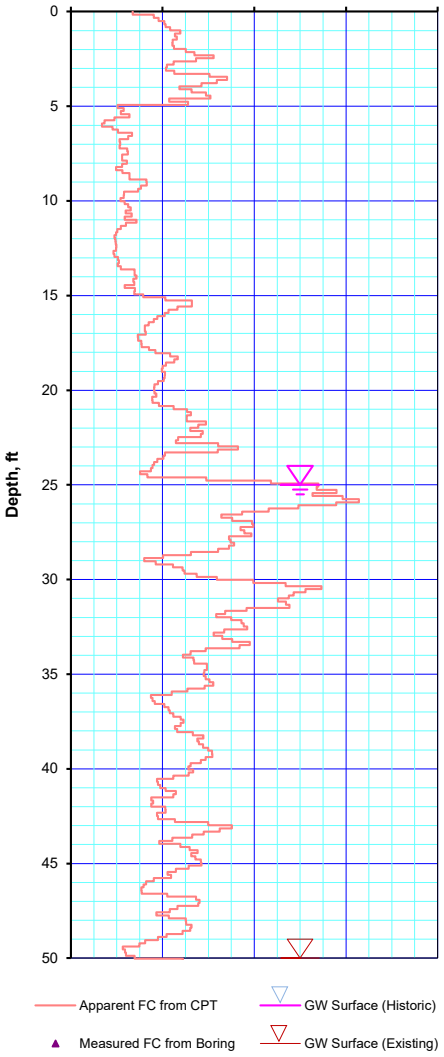
(a)

Normalized Tip Resistance and Friction Ratio



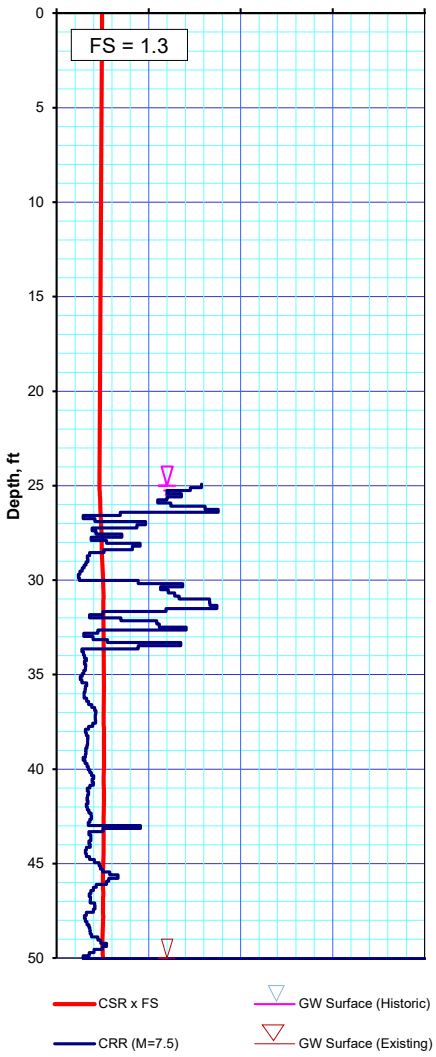
(b)

Fines Content, FC %



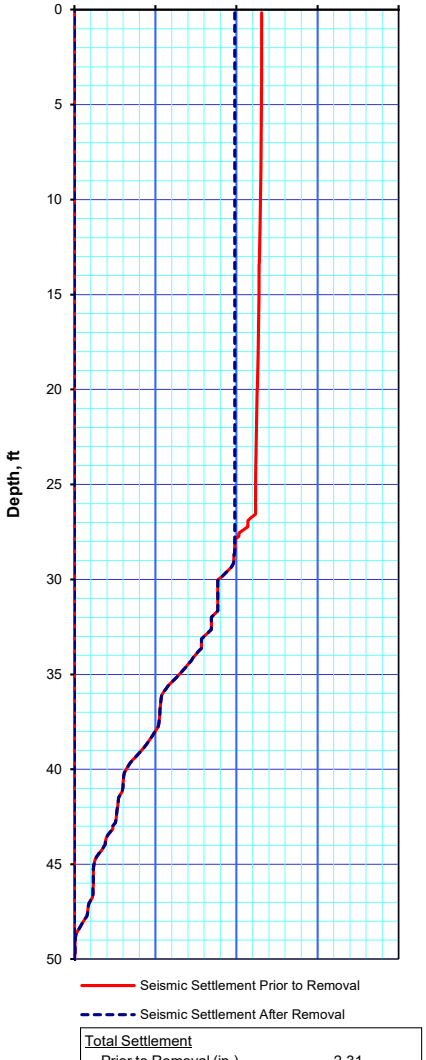
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	2.31
After Removal (in.)	1.98

Removal Depth (ft) = 28.0

Version: 5b; 11/13/20

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

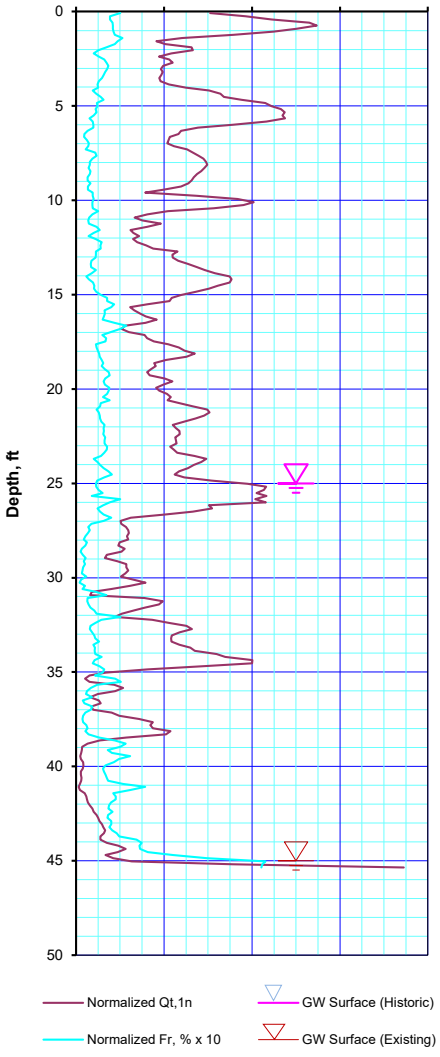
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County, CA	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.21
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-22
Elevation (MSL)..... 912 ft
Proposed Grade..... 945 ft

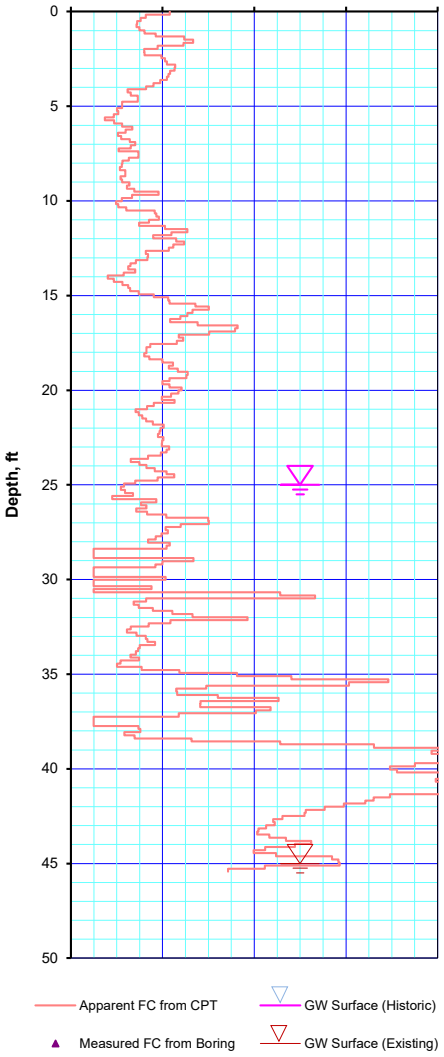
(a)

Normalized Tip Resistance and Friction Ratio



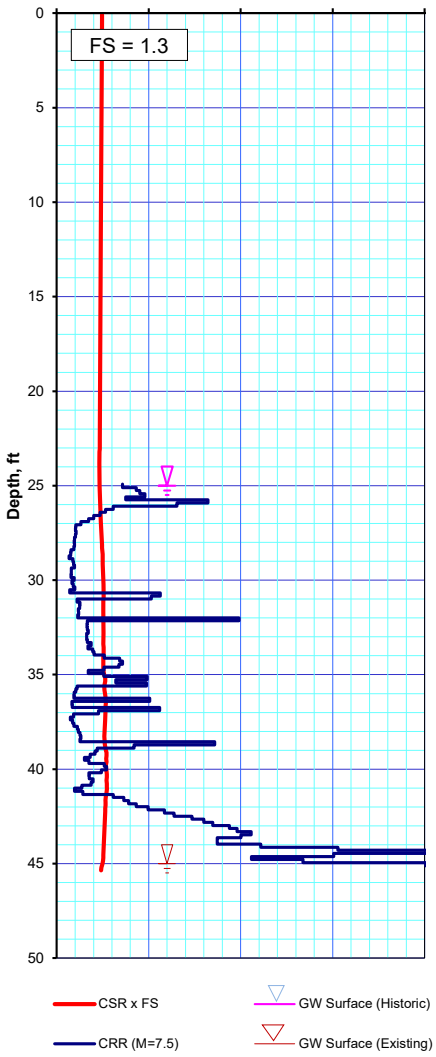
(b)

Fines Content, FC %



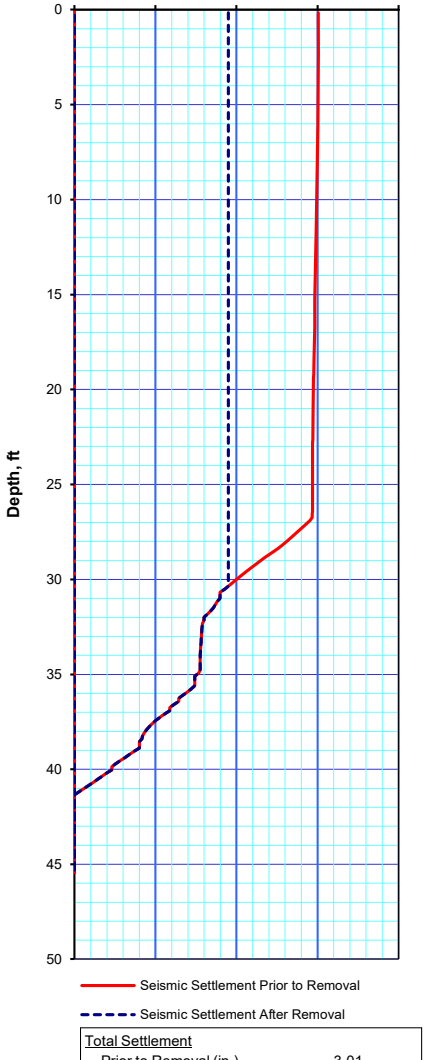
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	3.01
After Removal (in.)	1.90

Version: 5b; 11/13/20

Removal Depth (ft) = 30.5

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

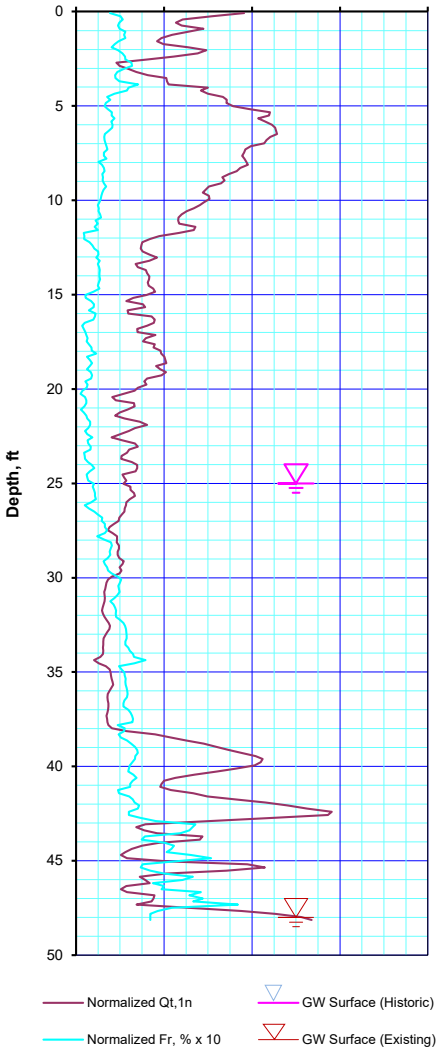
CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County, CA	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.22
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

Location..... CPT-23
Elevation (MSL)..... 937 ft
Proposed Grade..... 1025 ft

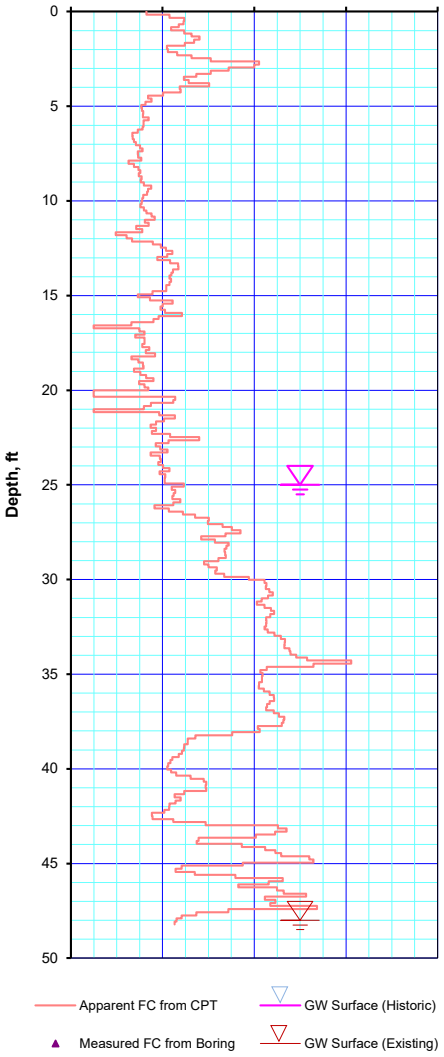
(a)

Normalized Tip Resistance and Friction Ratio



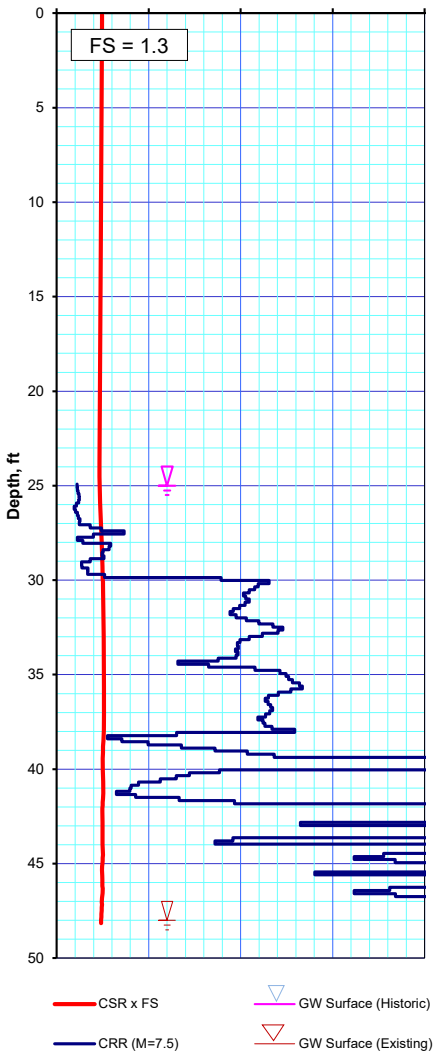
(b)

Fines Content, FC %



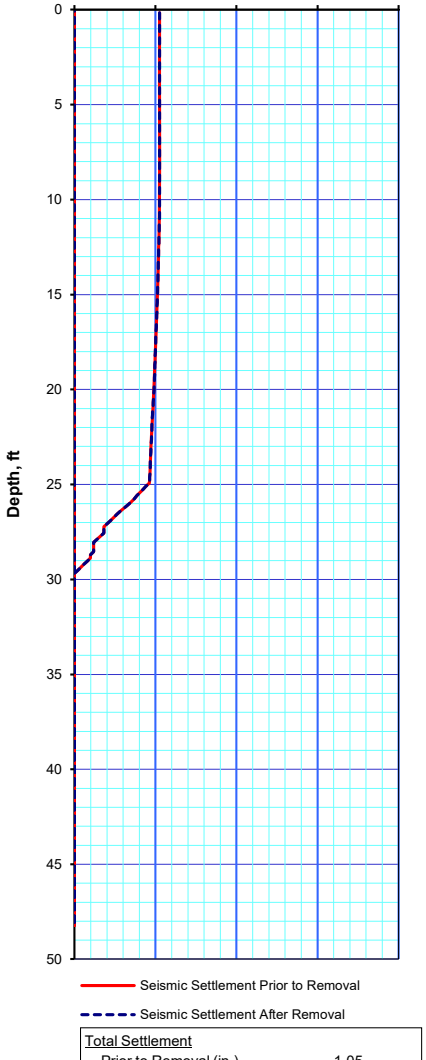
(c)

Cyclic Stress or Resistance Ratio, ksf



(d)

Cumulative Seismic Settlement, in



Total Settlement	
Prior to Removal (in.)	1.05
After Removal (in.)	1.05

Version: 5b; 11/13/20

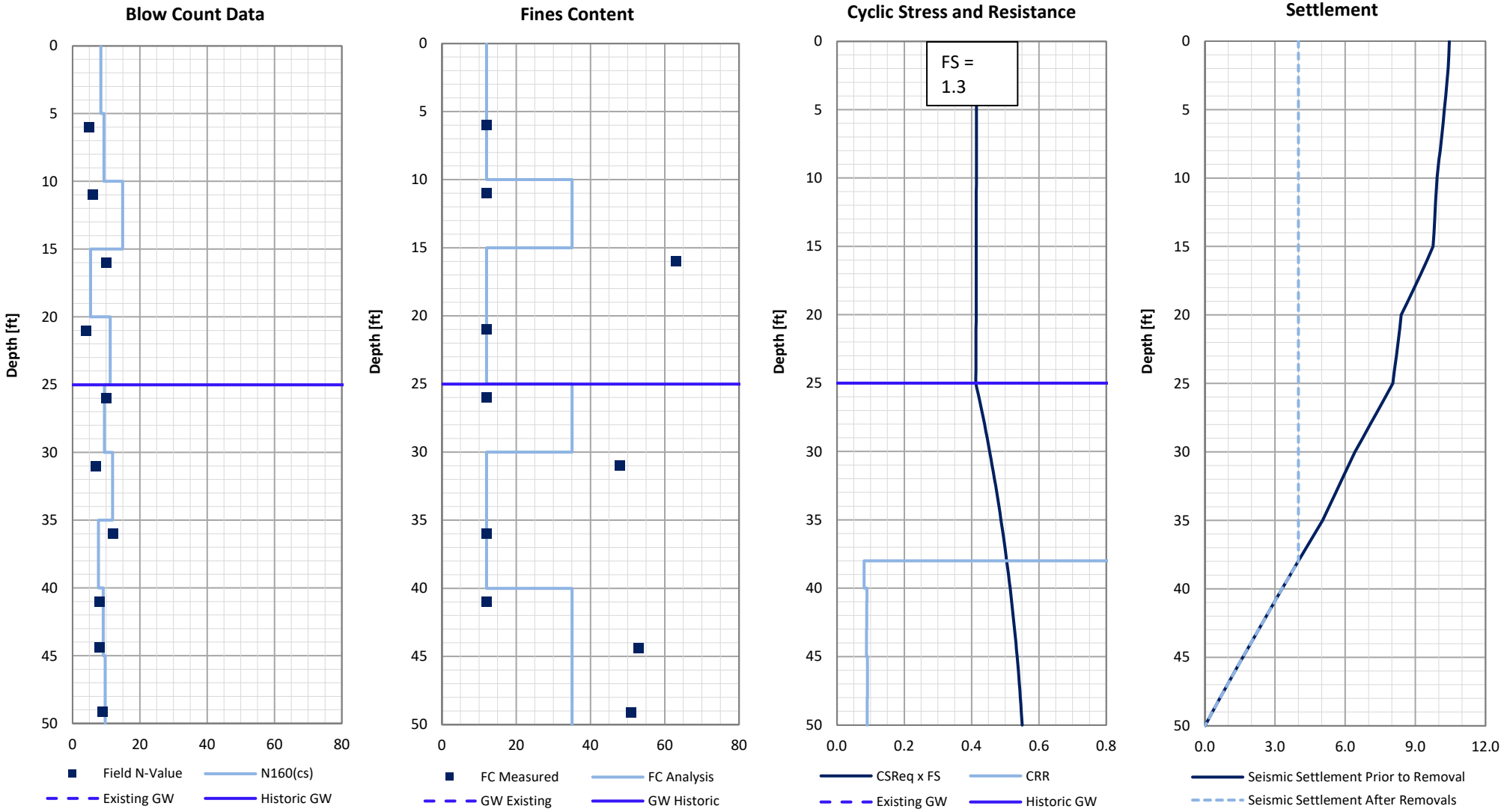
Removal Depth (ft) = 5.0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

CPT-Based Assessment of Seismic Soil Liquefaction Potential

Project:	Solomon Hills Specific Plan	Weighted PGA (M=7.5).....	0.29 g	Project No.:	23-2195s
	Santa Barbara County	Design PGA (M=6.11).....	0.49 g	Figure No.:	D1.23
Client:	Solstra Communities California, LLC	Mag. Weighting Factor.....	0.59	Date:	10/20/2023

SPT-Based Assessment of Seismic Soil Liquefaction Potential



References:

1. Cetin, et al., ASCE Journal of Geotechnical and Environmental Engineering,December 2004, pp. 1314 - 1340
2. Tokimatsu and Seed, ASCE Journal of Geotechnical Engineering,August, 1987

Removal Depth (ft):	38
Total Settlement (in)	
Prior to Removal:	10.45
After Removal:	4.00

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Figure: D1.24

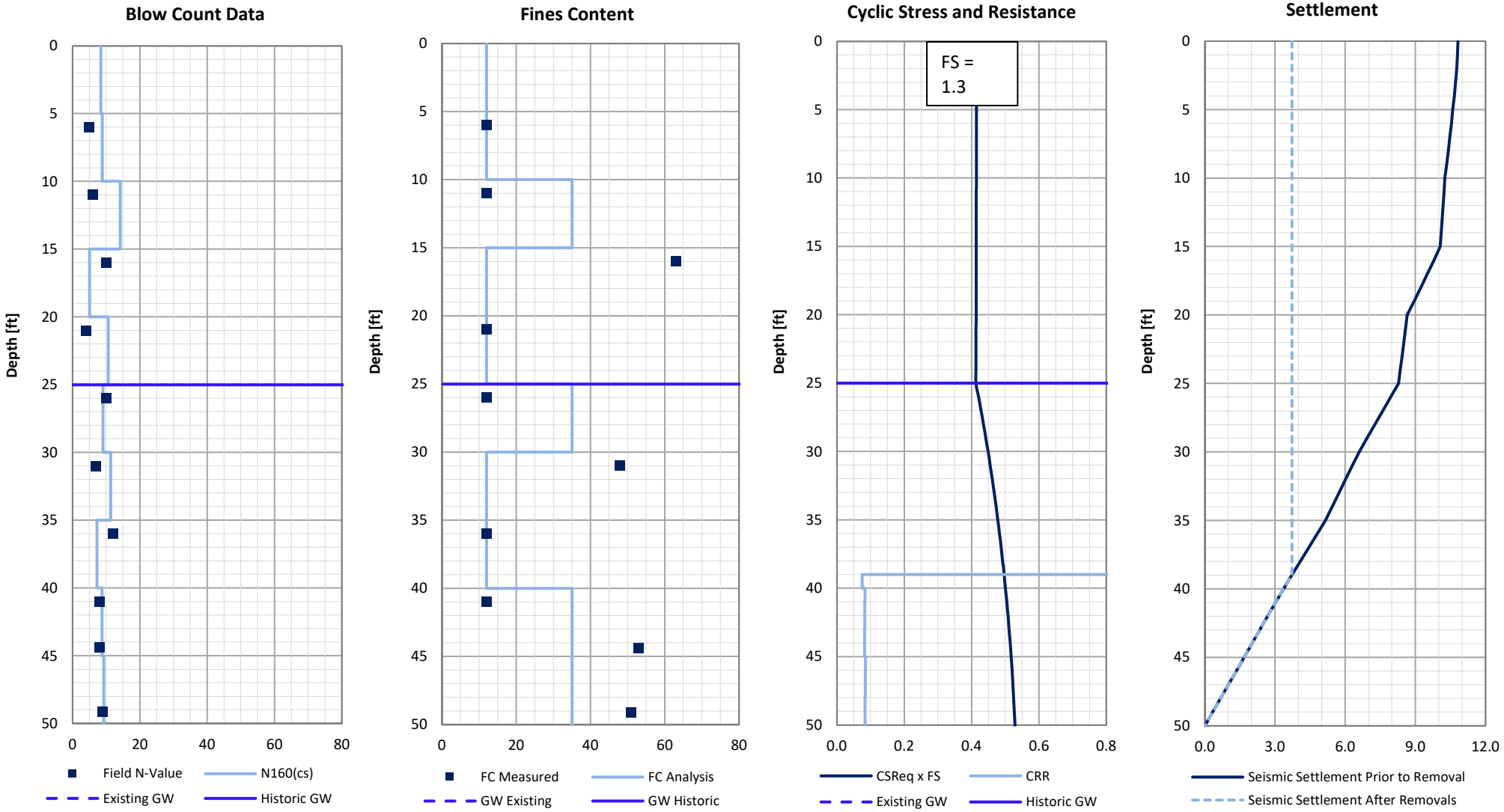
Client:	Solstra Communities California, LLC
Project:	Solomon Hills Specific Plan
Job No.:	23-2195s-1
Date:	10/20/2023

Magnitude, M_w:	6.11
Acceleration, PGA (g):	0.49
Existing GW Elev. (ft):	70
Historic GW Elev. (ft):	25

Location:	**HS-5**
Elevation (MSL):	738

SPT Liq v1a; Feb 2017

SPT-Based Assessment of Seismic Soil Liquefaction Potential



References:

1. Cetin, et al., ASCE Journal of Geotechnical and Environmental Engineering,December 2004, pp. 1314 - 1340

2. Tokimatsu and Seed, ASCE Journal of Geotechnical Engineering,August, 1987

Removal Depth (ft):	39
Total Settlement (in)	
Prior to Removal:	10.82
After Removal:	3.72

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Figure: D1.25

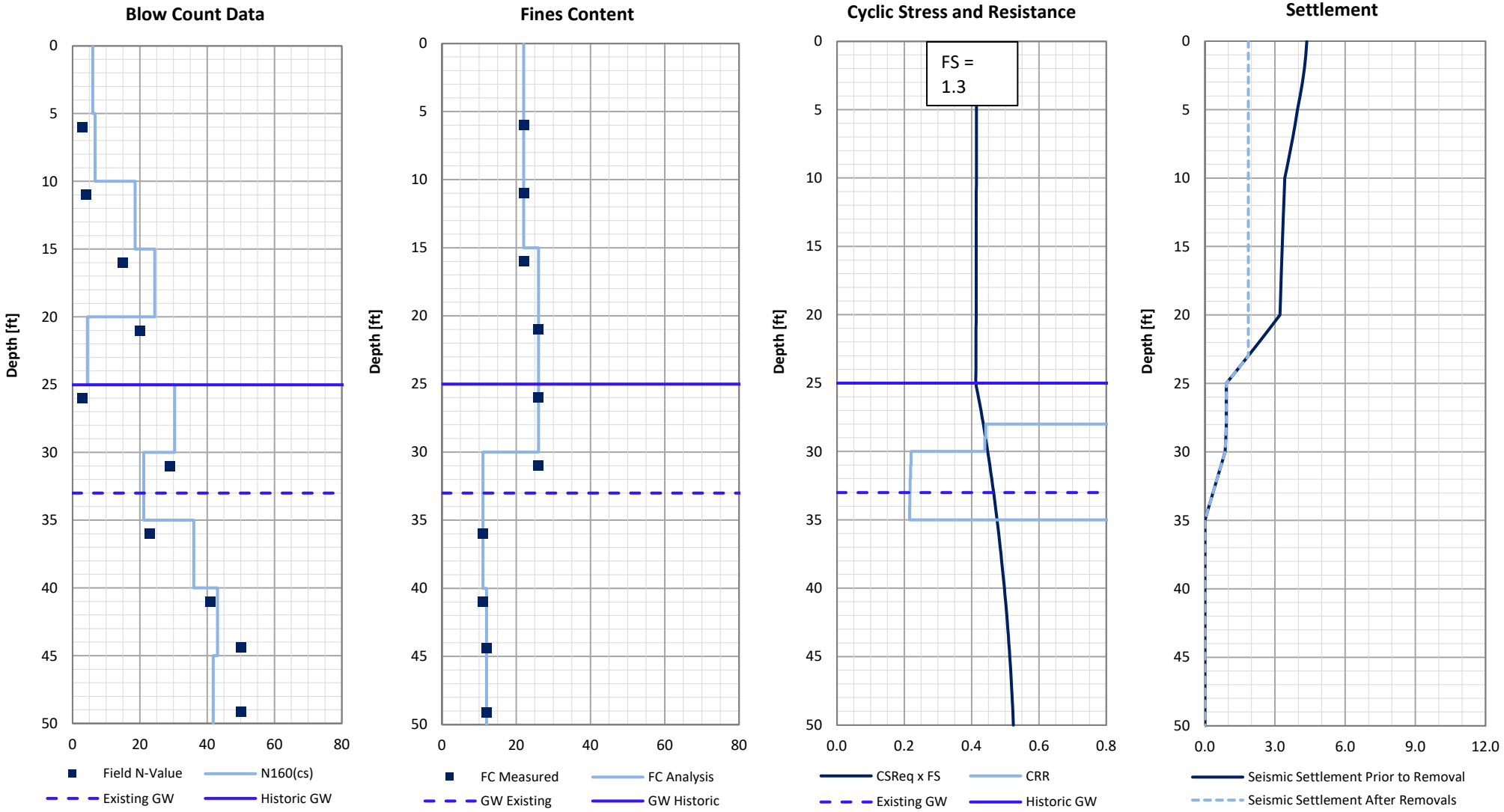
Client:	Solstra Communities California, LLC
Project:	Solomon Hills Specific Plan
Job No.:	23-2195s-1
Date:	10/20/2023

Magnitude, M_w:	6.11
Acceleration, PGA (g):	0.49
Existing GW Elev. (ft):	60
Historic GW Elev. (ft):	25

Location:	**HS-13**
Elevation (MSL):	893

SPT Liq v1a; Feb 2017

SPT-Based Assessment of Seismic Soil Liquefaction Potential



References:

1. Cetin, et al., ASCE Journal of Geotechnical and Environmental Engineering,December 2004, pp. 1314 - 1340

2. Tokimatsu and Seed, ASCE Journal of Geotechnical Engineering,August, 1987

Removal Depth (ft):	23
Total Settlement (in)	
Prior to Removal:	4.35
After Removal:	1.85

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Figure: D1.26

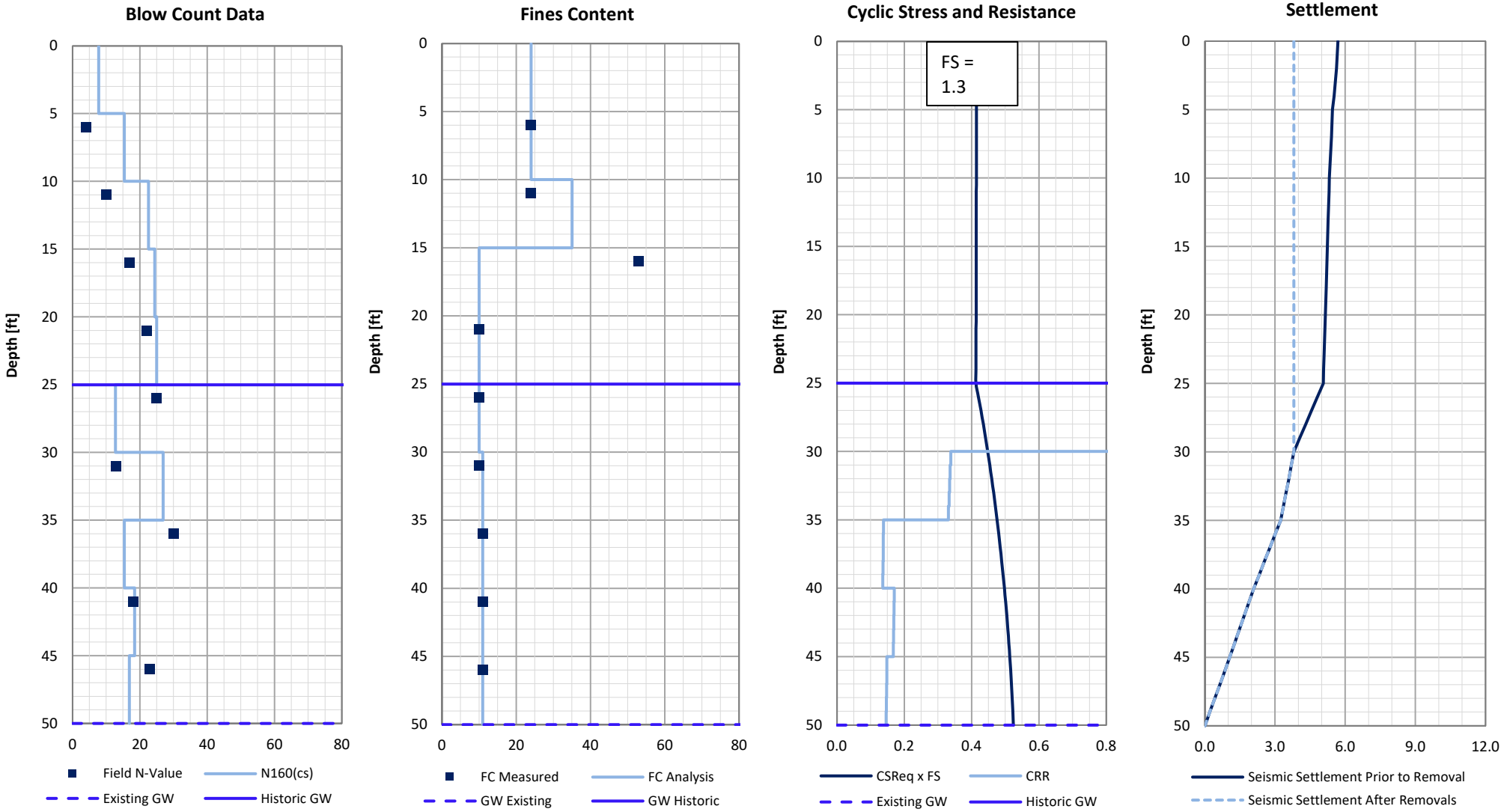
Client:	Solstra Communities California, LLC
Project:	Solomon Hills Specific Plan
Job No.:	23-2195s-1
Date:	10/20/2023

Magnitude, M_w:	6.11
Acceleration, PGA (g):	0.49
Existing GW Elev. (ft):	33
Historic GW Elev. (ft):	25

Location:	**HS-38**
Elevation (MSL):	847

SPT Liq v1a; Feb 2017

SPT-Based Assessment of Seismic Soil Liquefaction Potential



References:

1. Cetin, et al., ASCE Journal of Geotechnical and Environmental Engineering,December 2004, pp. 1314 - 1340
2. Tokimatsu and Seed, ASCE Journal of Geotechnical Engineering,August, 1987

Removal Depth (ft):	30
Total Settlement (in)	
Prior to Removal:	5.69
After Removal:	3.80

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Figure: D1.27

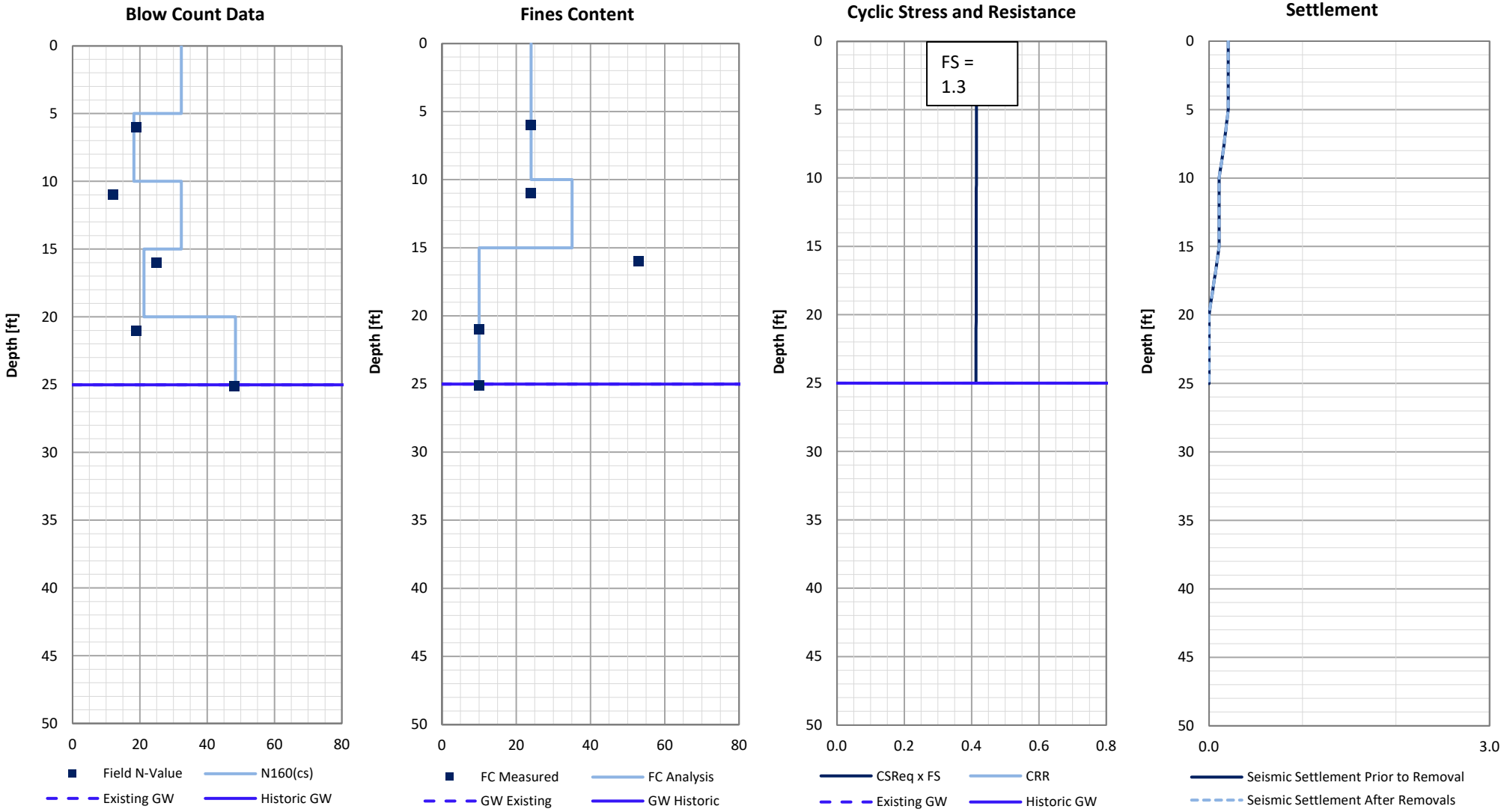
Client:	Solstra Communities California, LLC
Project:	Solomon Hills Specific Plan
Job No.:	23-2195s-1
Date:	10/20/2023

Magnitude, M_w:	6.11
Acceleration, PGA (g):	0.49
Existing GW Elev. (ft):	50
Historic GW Elev. (ft):	25

Location:	**HS-39**
Elevation (MSL):	830

SPT Liq v1a; Feb 2017

SPT-Based Assessment of Seismic Soil Liquefaction Potential



References:

1. Cetin, et al., ASCE Journal of Geotechnical and Environmental Engineering,December 2004, pp. 1314 - 1340

2. Tokimatsu and Seed, ASCE Journal of Geotechnical Engineering,August, 1987

Removal Depth (ft):	0
Total Settlement (in)	
Prior to Removal:	0.21
After Removal:	0.21

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Figure: D1.28

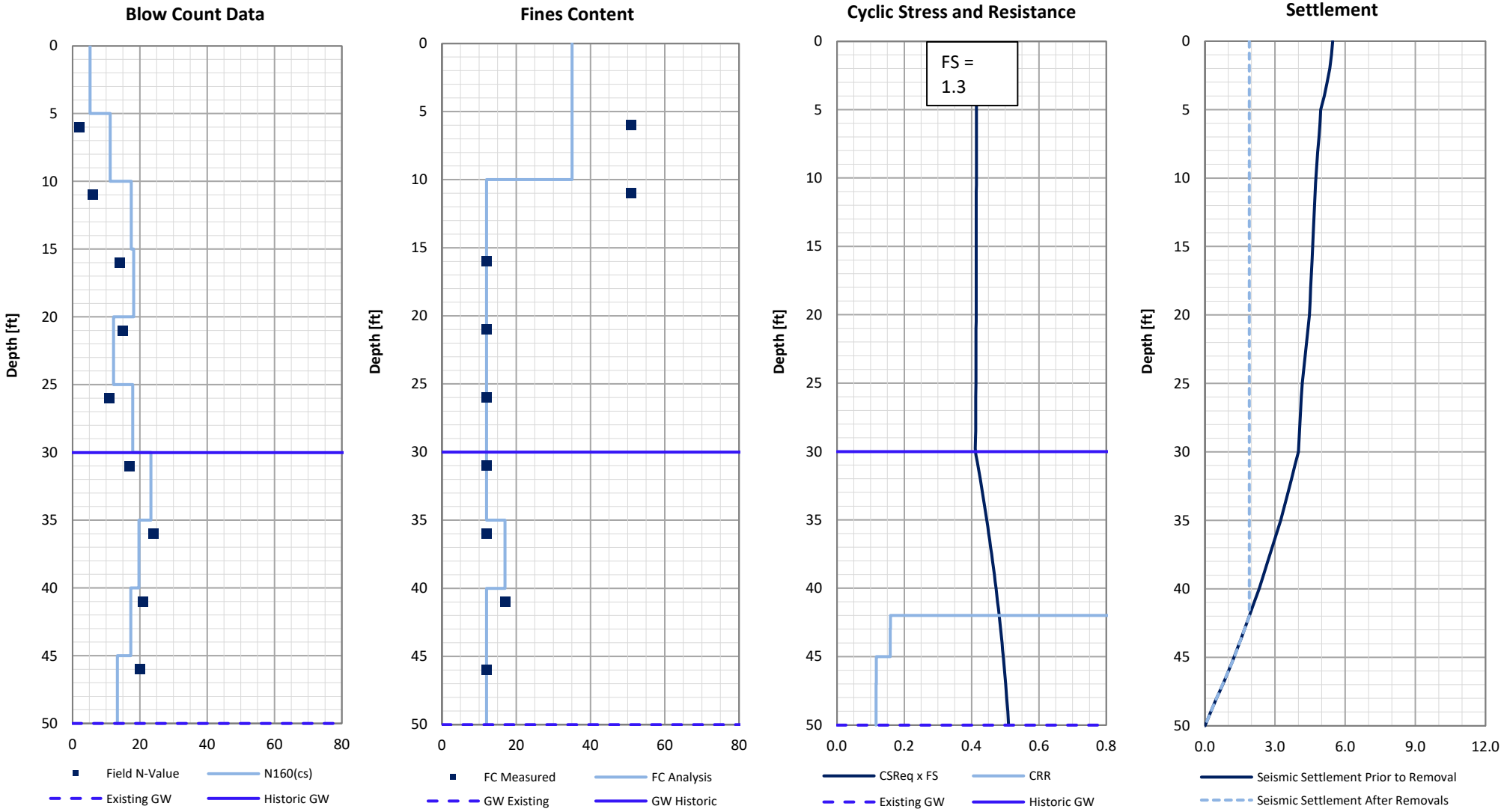
Client:	Solstra Communities California, LLC
Project:	Solomon Hills Specific Plan
Job No.:	23-2195s-1
Date:	10/20/2023

Magnitude, M_w:	6.11
Acceleration, PGA (g):	0.49
Existing GW Elev. (ft):	25
Historic GW Elev. (ft):	25

Location:	**HS-40**
Elevation (MSL):	836

SPT Liq v1a; Feb 2017

SPT-Based Assessment of Seismic Soil Liquefaction Potential



References:

1. Cetin, et al., ASCE Journal of Geotechnical and Environmental Engineering,December 2004, pp. 1314 - 1340

2. Tokimatsu and Seed, ASCE Journal of Geotechnical Engineering,August, 1987

Removal Depth (ft):	42
Total Settlement (in)	
Prior to Removal:	5.46
After Removal:	1.90

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Figure: D1.29

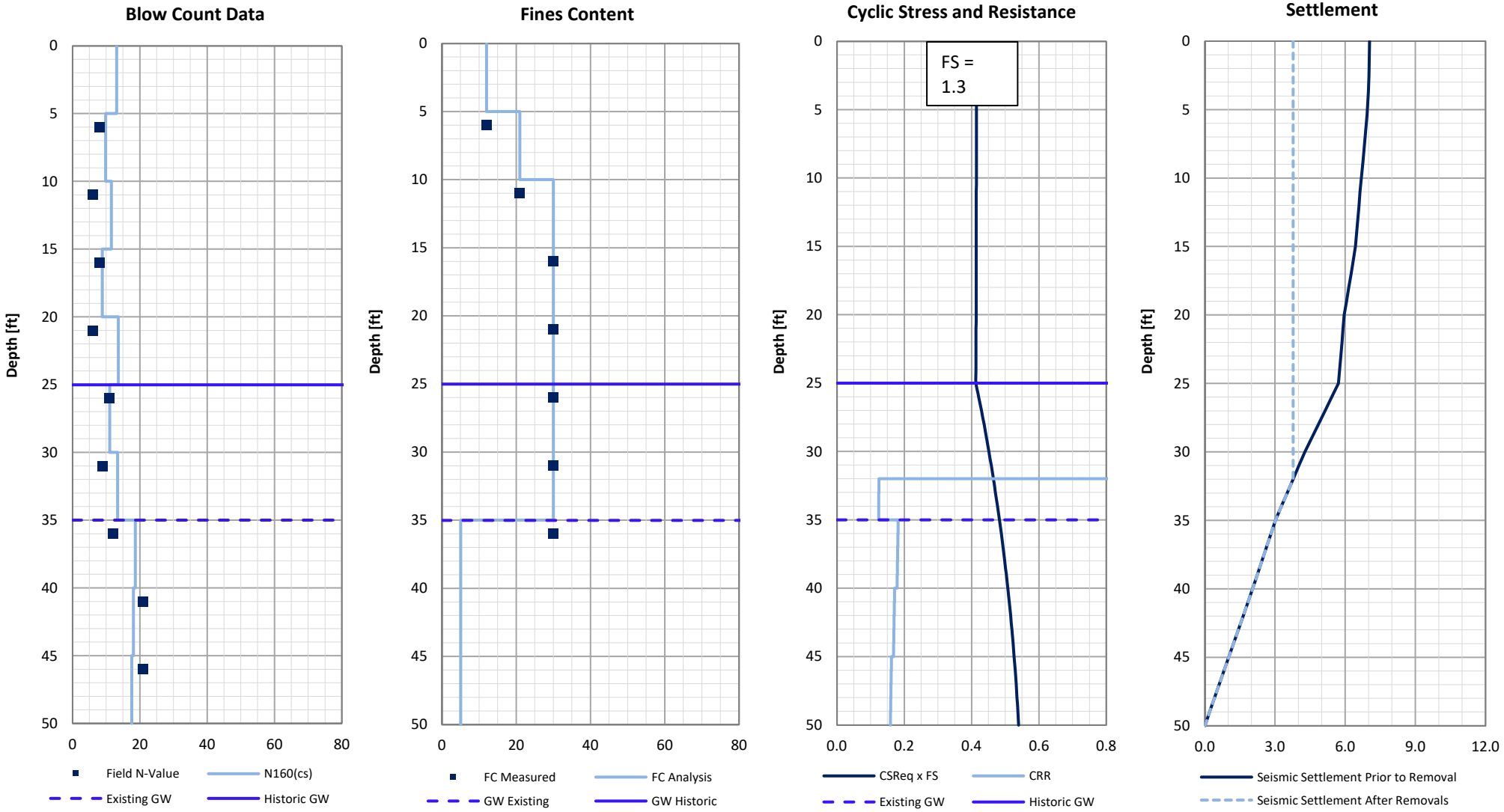
Client:	Solstra Communities California, LLC
Project:	Solomon Hills Specific Plan
Job No.:	23-2195s-1
Date:	10/20/2023

Magnitude, M_w:	6.11
Acceleration, PGA (g):	0.49
Existing GW Elev. (ft):	50
Historic GW Elev. (ft):	30

Location:	**HS-48**
Elevation (MSL):	790

SPT Liq v1a; Feb 2017

SPT-Based Assessment of Seismic Soil Liquefaction Potential



References:

1. Cetin, et al., ASCE Journal of Geotechnical and Environmental Engineering,December 2004, pp. 1314 - 1340

2. Tokimatsu and Seed, ASCE Journal of Geotechnical Engineering,August, 1987

Removal Depth (ft):	32
Total Settlement (in)	
Prior to Removal:	7.04
After Removal:	3.77

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Figure: D1.30

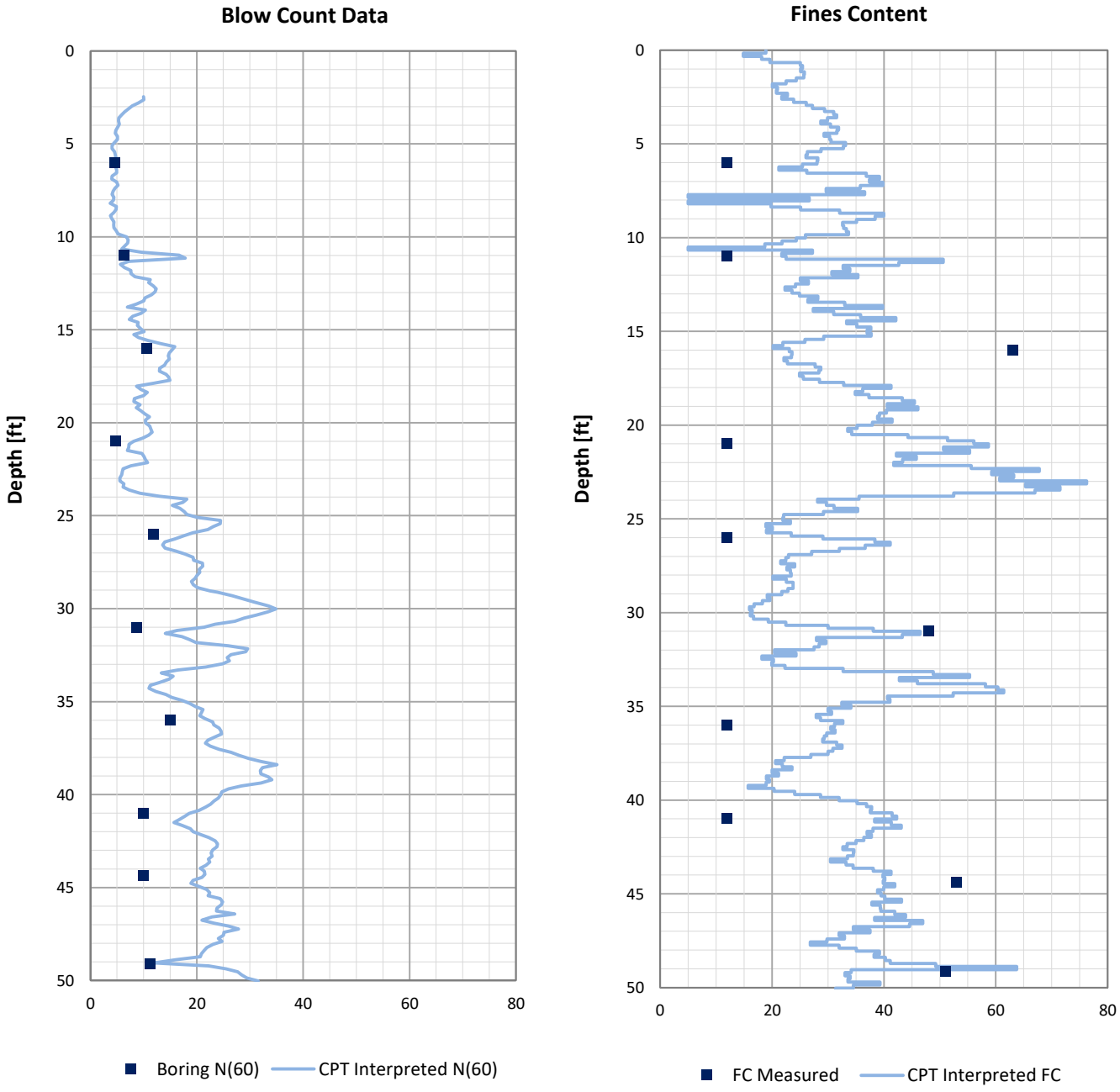
Client:	Solstra Communities California, LLC
Project:	Solomon Hills Specific Plan
Job No.:	23-2195s-1
Date:	10/20/2023

Magnitude, M_w:	6.11
Acceleration, PGA (g):	0.49
Existing GW Elev. (ft):	35
Historic GW Elev. (ft):	25

Location:	**HS-49**
Elevation (MSL):	810

SPT Liq v1a; Feb 2017

Location……. **HS-13**
CPT-10



Correlation of N(60) Blow Count and Percent Fines - Boring vs. CPT Interpretation

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Client:	Solstra Communities California, LLC
Project:	Solomon Hills Specific Plan
Date:	10/20/2023
Proj. No.:	23-2195s-1
Figure:	D2

Seismic Soil Liquefaction Triggering Calculations

Project:	Solomon Hills Specific Plan	Project No.:	23-2195s
	Santa Barbara County	Date:	10/20/23
Client:	Solstra Communities California, LLC	Figure No.:	D3.1

Location	CPT-05	MCE Mean Magnitude =	6.1
Type of Sampler (CPT/SPT/CD)	CPT	Peak Ground Accel. (M = 6.11) =	0.49 g
Ground Surface Elevation	838 ft. above MSL	Approx. Distance From Site =	1.0
Existing Ground Water Depth	50.0 ft. BGS	Basic Earthquake Magnitude =	7.5
Historic Ground Water Depth	25.0 ft. BGS	Magnitude Weighted PGA (M = 7.5) =	0.29 g
		Magnitude Scaling Factor =	1.69

Conditions: CPT Interpretation based on ground water conditions at time of investigation

Evaluation of cyclic stress ratio based on historic high ground water conditions

For sites with excavation, only changes to in-situ stresses are considered

											Robertson and Wride (1998) Procedure (Updated by Zhang et al. 2002 and Robertson 2009)													CSR Calculations				
											Evaluation of Soil Behavior Type Index Through Iterations							Corrections to Tip Resistance				Apparent Fines Content, FC							
Layer No.	Mid-layer Depth	Elevation	Depth of layer below ground surface [ft]		Total Unit Weight., γ	Total Vertical Stress, σ_{vo}	In-Situ Effective Vertical Stress, σ'_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Total Cone Resistance, q_t	Sleeve Friction, f_s	Normalized Friction Ratio, F_r	Normalized Cone Resistance, $Q_{t,1}$	Normalized Behavior Type Index, $(I_C)_1$	n	Δn	Final n	Final I_c	Normalizing Factor, C_N	For Overburden, $q_{t,1N}$	Fines Factor, K_c	for "Clean Sand" $(q_{t,1N})_{CS}$	Estimated	Lab	Cyclic Resistance Ratio, $CRR_{7.5}$	Stress Reduction Factor, r_d	Total Vertical Stress, σ_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Cyclic Stress Ratio, CSR*	Calculated Factor of Safety, FS
	(ft)	(ft. MSL)	Top	Bottom	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[%]	trial 1 (assume n = 1.0)										[%]	[%]	M_W = 7.5		[ksf]	[ksf]	for FS = 1.3	$CRR_{7.5}/CSR^*$
1	0.08	837.9	0.00	0.16	0.094	0.007	0.007	0.007	169.19	0.047	0.028	22574.44	0.94	0.21	0.00	0.35	1.31	2.00	159.83	1.00	159.83	1		0.460	-	-	-	#N/A	#N/A
2	0.25	837.8	0.16	0.33	0.098	0.024	0.024	0.024	150.68	0.085	0.057	6292.58	0.33	-0.02	0.00	0.35	1.32	2.00	142.33	1.00	142.33	1		0.348	-	-	-	#N/A	#N/A
3	0.41	837.6	0.33	0.49	0.095	0.039	0.039	0.039	126.48	0.060	0.048	3253.77	0.11	-0.11	0.00	0.38	1.40	2.00	119.45	1.00	119.45	1		0.239	-	-	-	#N/A	#N/A
4	0.58	837.4	0.49	0.66	0.091	0.053	0.053	0.053	101.31	0.041	0.041	1925.13	0.25	-0.05	0.00	0.42	1.50	2.00	95.66	1.00	95.66	3		0.161	-	-	-	#N/A	#N/A
5	0.74	837.3	0.66	0.82	0.092	0.068	0.068	0.068	83.83	0.049	0.059	1226.38	0.38	0.00	0.00	0.45	1.57	2.00	79.13	1.00	79.13	4		0.126	-	-	-	#N/A	#N/A
6	0.90	837.1	0.82	0.98	0.088	0.079	0.079	0.079	62.46	0.029	0.046	791.28	0.58	0.07	0.00	0.50	1.70	2.00	58.94	1.00	58.94	5		0.099	-	-	-	#N/A	#N/A
7	1.07	836.9	0.98	1.15	0.072	0.077	0.077	0.077	47.03	0.004	0.008	609.67	1.10	0.27	0.00	0.62	2.02	2.00	44.36	1.00	44.36	5		0.087	-	-	-	#N/A	#N/A
8	1.23	836.8	1.15	1.31	0.070	0.086	0.086	0.086	37.36	0.003	0.008	432.47	1.20	0.31	0.00	0.65	2.11	2.00	35.21	1.00	35.21	5		0.079	-	-	-	#N/A	#N/A
9	1.40	836.6	1.31	1.48	0.084	0.117	0.117	0.117	32.41	0.022	0.068	275.61	1.03	0.25	0.00	0.61	1.99	2.00	30.51	1.00	30.51	5		0.075	-	-	-	#N/A	#N/A
10	1.56	836.4	1.48	1.64	0.081	0.126	0.126	0.126	35.14	0.013	0.038	278.67	1.04	0.25	0.00	0.60	1.96	2.00	33.08	1.00	33.08	5		0.078	-	-	-	#N/A	#N/A
11	1.72	836.3	1.64	1.80	0.089	0.153	0.153	0.153	50.41	0.037	0.074	328.45	0.96	0.22	0.00	0.54	1.80	2.00	47.48	1.00	47.48	5		0.090	-	-	-	#N/A	#N/A
12	1.89	836.1	1.80	1.97	0.078	0.148	0.148	0.148	63.87	0.008	0.013	431.75	1.08	0.26	0.00	0.55	1.82	2.00	60.20	1.00	60.20	5		0.100	-	-	-	#N/A	#N/A
13	2.05	836.0	1.97	2.13	0.080	0.164	0.164	0.164	77.89	0.009	0.012	475.06	1.06	0.26	0.00	0.52	1.75	2.00	73.43	1.00	73.43	5		0.117	-	-	-	#N/A	#N/A
14	2.22	835.8	2.13	2.30	0.091	0.202	0.202	0.202	91.42	0.042	0.046	450.72	0.82	0.17	0.00	0.44	1.54	2.00	86.17	1.00	86.17	3		0.140	-	-	-	#N/A	#N/A
15	2.38	835.6	2.30	2.46	0.095	0.226	0.226	0.226	101.50	0.067	0.066	448.15	0.82	0.17	0.00	0.42	1.49	2.00	95.68	1.00	95.68	3		0.161	-	-	-	#N/A	#N/A
16	2.54	835.5	2.46	2.62	0.088	0.224	0.224	0.224	109.87	0.025	0.023	490.08	0.88	0.19	0.00	0.43	1.51	2.00	103.59	1.00	103.59	3		0.183	-	-	-	#N/A	#N/A
17	2.71	835.3	2.62	2.79	0.089	0.240	0.240	0.240	117.07	0.027	0.023	486.91	0.89	0.19	0.00	0.42	1.49	2.00	110.38	1.00	110.38	3		0.205	-	-	-	#N/A	#N/A
18	2.87	835.1	2.79	2.95	0.089	0.256	0.256	0.256	121.78	0.028	0.023	475.27	0.90	0.20	0.00	0.42	1.47	2.00	114.81	1.00	114.81	2		0.221	-	-	-	#N/A	#N/A
19	3.04	835.0	2.95	3.12	0.089	0.271	0.271	0.271	123.94	0.029	0.023	456.50	0.91	0.20	0.00	0.41	1.46	2.00	116.83	1.00	116.83	2		0.228	1.000	0.003	0.003	0.246	1.21
20	3.20	834.8	3.12	3.28	0.089	0.286	0.286	0.286	126.27	0.029	0.023	440.17	0.92	0.21	0.00	0.41	1.45	2.00	119.02	1.00	119.02	2		0.237	1.000	0.018	0.018	0.246	1.25
21	3.36	834.6	3.28	3.44	0.089	0.300	0.300	0.300	124.68	0.029	0.023	414.45	0.95	0.22	0.00	0.41	1.46	2.00	117.51	1.00	117.51	2		0.231	0.999	0.032	0.032	0.246	1.22
22	3.53	834.5	3.44	3.61	0.073	0.256	0.256	0.256	124.53	0.003	0.002	484.67	1.60	0.47	0.00	0.61	1.98	2.00	117.40	1.00	117.40	5		0.230	0.999	0.038	0.038	0.246	1.22
23	3.69	834.3	3.61	3.77	0.104	0.385	0.385	0.385	129.25	0.221	0.171	334.82	1.05	0.26	0.00	0.41	1.46	2.00	121.75	1.00	121.75	2		0.248	0.998	0.072	0.072	0.246	1.31
24	3.86	834.1	3.77	3.94	0.119	0.459	0.459	0.459	133.01	1.656	1.249	288.65	1.66	0.49	0.00	0.59	1.90	2.00	125.23	1.18	148.23	10		0.383	0.998	0.102	0.102	0.246	2.00
25	4.02	834.0	3.94	4.10	0.122	0.489	0.489	0.489	157.19	2.197	1.402	320.55	1.67	0.50	0.00	0.58	1.89	2.00	148.04	1.17	173.09	10		0.562	0.998	0.124	0.124	0.246	2.00
26	4.19	833.8	4.10	4.27	0.119	0.498	0.498	0.498	141.44	1.587	1.126	283.10	1.63	0.48	0.00	0.57	1.85	2.00	133.16	1.14	151.79	9		0.405	0.997	0.141	0.141	0.246	2.00
27	4.35	833.7	4.27	4.43	0.117	0.507	0.507	0.507	143.69	1.141	0.797	282.32	1.52	0.44	0.00	0.53	1.75	2.00	135.27	1.06	143.89	7		0.357	0.997	0.157	0.157	0.245	1.89
28	4.51	833.5	4.43	4.59	0.116	0.523	0.523	0.523	148.13	1.037	0.702	282.25	1.48	0.42	0.00	0.51	1.70	2.00	139.45	1.03	144.17	6		0.359	0.996	0.175	0.175	0.245	1.90
29	4.68	833.3	4.59	4.76	0.116	0.543	0.543	0.543	151.29	1.064	0.706	277.50	1.48	0.43	0.00	0.51	1.70	2.00	142.30	1.03	146.60	6		0.373	0.996	0.195	0.195	0.245	1.98
30	4.84	833.2	4.76	4.92	0.116	0.560	0.560	0.560	151.15	1.003	0.666	268.76	1.47	0.42	0.00	0.51	1.69	1.96	139.37	1.02	142.77	6		0.351	0.996	0.213	0.213	0.245	1.86
31	5.01	833.0	4.92	5.09	0.116	0.581	0.581	0.581	155.97	1.031	0.663	267.54	1.47	0.43	0.00	0.50	1.68	1.92	140.96	1.02	143.93	6		0.357	0.995	0.233	0.233	0.245	1.89
32	5.17	832.8	5.09	5.25	0.117	0.603	0.603	0.603	163.25	1.102	0.678	269.71	1.48	0.43	0.00	0.50	1.68	1.88	144.67	1.02	147.42	6		0.378	0.995	0.253	0.253	0.245	2.00
33	5.33	832.7	5.25	5.41	0.116	0.621	0.621	0.621	169.10	1.059	0.629	271.46	1.45	0.42	0.00	0.50	1.66	1.84	146.15	1.00	146.55	5		0.373	0.995	0.271	0.271	0.245	1.98
34	5.50	832.5	5.41	5.58	0.117	0.643	0.643	0.643	176.82	1.141	0.648	273.80	1.46	0.42	0.00	0.50	1.65	1.80	150.14	1.00	150.43	5		0.397	0.994	0.292	0.292	0.245	2.00
35	5.66	832.3	5.58	5.74	0.118	0.668	0.668	0.668	183.04	1.275	0.699	273.10	1.48	0.43	0.00	0.50	1.67	1.78	153.57	1.01	155.27	6		0.428	0.994	0.314	0.314	0.245	2.00
36	5.83	832.2	5.74	5.91	0.117	0.680	0.680	0.680	186.29	1.074	0.579	272.87	1.43	0.41	0.00	0.48	1.62	1.73	151.79	1.00	151.79	5		0.405	0.993	0.330	0.330	0.245	2.00
37	5.99	832.0	5.91	6.07	0.117	0.699	0.699	0.699	186.84	1.054	0.566	266.41	1.43	0.41	0.00	0.48	1.62	1.71	150.20	1.00	150.20	5		0.395	0.993	0.349	0.349	0.245	2.00
38	6.15	831.9	6.07	6.23	0.118	0.724	0.724	0.724	184.03	1.233	0.673	253.11	1.50	0.44	0.00	0.50	1.67	1.71	148.48	1.01	150.21	6		0.395	0.993	0.371	0.371	0.244	2.00
39	6.32	831.7	6.23	6.40	0.118	0.742	0.742	0.742	188.60	1.193	0.635	253.01	1.48	0.43	0.00	0.50	1.65	1.68	149.29	1.00	149.21	5		0.389	0.992	0.390	0.390	0.244	2.00
40	6.48	831.5	6.40	6.56	0.118	0.766	0.766	0.766	192.04	1.285	0.672	249.81	1.50	0.44	0.00	0.50	1.66	1.67	150.51	1.01	151.74	5		0.405	0.992	0.411	0.411	0.244	2.00
41	6.65	831.4	6.56	6.73	0.118	0.781	0.781	0.781	196.73	1.171	0.598	250.87	1.46	0.43	0.00	0.49	1.63	1.63	150.86	1.00	150.86	5		0.399	0.992	0.428	0.428	0.244	2.00
42	6.81	831.2	6.73	6.89	0.118	0.804	0.804	0.804	200.84	1.256	0.628	248.71	1.48	0.43	0.00	0.49	1.64	1.61	152.42	0.99	151.25	5		0.402	0.991	0.450	0.450	0.244	2.00
43	6.97	831.0	6.89	7.05	0.118	0.825	0.825	0.825	203.09	1.289	0.637	245.25	1.49	0.44	0.00	0.50	1.64	1.60	152.51	1.00	151.76	5		0.405	0.991	0.470	0.470	0.244	2.00
44	7.14	830.9	7.05	7.22	0.118	0.841	0.841	0.841	203.85	1.208	0.595	241.42	1.47	0.43	0.00	0.49	1.63	1.57	150.88	1.00	150.88	5		0.399	0.990	0.487	0.487	0.244	2.00
45	7.30	830.7	7.22	7.38	0.118	0.862	0.862	0.862	190.87	1.266	0.666	220.51	1.54	0.46	0.00	0.51	1.68	1.58	142.05	1.02	144.89	6		0.363	0.990	0.508	0.508	0.244	1.93
46	7.47	830.5	7.38	7.55	0.118	0.879	0.879	0.879	200.50	1.186	0.594	227.23	1.49	0.44	0.00	0.50	1.64	1.55	145.87	0.99	144.79	5		0.362	0.990	0.525	0.525	0.244	1.93
47	7.63	830.4	7.55	7.71	0.118	0.897	0.897	0.897	196.40	1.167	0.597	218.04	1.51	0.45	0.00	0.50	1.65	1.54	141.97	1.00	141.99	5		0.346	0.989	0.544	0.544	0.244	1.85

Seismic Soil Liquefaction Triggering Calculations

Layer No.	Mid-layer Depth	Elevation	Depth of layer below ground surface [ft]		Total Unit Weight., γ	Total Vertical Stress, σ_{vo}	In-Situ Effective Vertical Stress, σ'_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Total Cone Resistance, q_t	Sleeve Friction, f_s	Normalized Friction Ratio, F_r	Normalized Cone Resistance, $Q_{t,1}$	Normalized Behavior Type Index, $(I_C)_1$	n	Δn	Final n	Final I_c	Normalizing Factor, C_N	For Overburden, $q_{t,1N}$	Fines Factor, K_c	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC		Cyclic Resistance Ratio, $CRR_{7.5}$	Stress Reduction Factor, r_d	Total Vertical Stress, σ_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Cyclic Stress Ratio, CSR*	Calculated Factor of Safety, FS
																						Estimated	Lab					
	(ft)	(ft. MSL)	Top	Bottom	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[%]	trial 1 (assume n = 1.0)										[%]	[%]	M_W = 7.5		[ksf]	[ksf]	for FS = 1.3	$CRR_{7.5}/CSR^*$
48	7.79	830.2	7.71	7.87	0.118	0.917	0.917	0.917	197.44	1.207	0.614	214.21	1.52	0.45	0.00	0.50	1.66	1.52	141.52	1.01	142.37	5		0.348	0.989	0.564	0.564	0.244	1.86
49	7.96	830.0	7.87	8.04	0.117	0.928	0.928	0.928	199.32	1.026	0.517	213.87	1.47	0.43	0.00	0.49	1.62	1.50	140.27	1.00	140.27	5		0.337	0.988	0.578	0.578	0.243	1.80
50	8.12	829.9	8.04	8.20	0.117	0.952	0.952	0.952	199.24	1.111	0.560	208.38	1.50	0.45	0.00	0.50	1.64	1.49	139.47	0.99	138.48	5		0.327	0.988	0.600	0.600	0.243	1.75
51	8.29	829.7	8.20	8.37	0.124	1.030	1.030	1.030	206.79	2.897	1.408	199.82	1.80	0.56	0.00	0.59	1.89	1.53	148.98	1.17	174.11	10		0.571	0.988	0.657	0.657	0.243	2.00
52	8.45	829.6	8.37	8.53	0.117	0.990	0.990	0.990	257.80	1.014	0.395	259.43	1.33	0.38	0.00	0.44	1.49	1.40	169.40	1.00	169.40	3		>0.8	0.987	0.638	0.638	0.243	Non Liquefiable
53	8.61	829.4	8.53	8.69	0.124	1.069	1.069	1.069	140.02	3.222	2.318	130.03	2.09	0.67	0.00	0.69	2.15	1.61	105.41	1.54	161.84	17		0.474	0.987	0.696	0.696	0.243	2.00
54	8.78	829.2	8.69	8.86	0.125	1.100	1.100	1.100	241.34	3.167	1.318	218.46	1.75	0.54	0.00	0.57	1.83	1.46	165.33	1.13	186.13	9		>0.8	0.987	0.724	0.724	0.243	Non Liquefiable
55	8.94	829.1	8.86	9.02	0.124	1.107	1.107	1.107	171.89	2.909	1.703	154.22	1.94	0.61	0.00	0.64	2.00	1.51	122.13	1.30	158.57	13		0.451	0.986	0.736	0.736	0.243	2.00
56	9.11	828.9	9.02	9.19	0.119	1.086	1.086	1.086	151.35	1.610	1.071	138.41	1.82	0.57	0.00	0.60	1.91	1.50	106.20	1.19	126.50	11		0.268	0.986	0.728	0.728	0.243	1.44
57	9.27	828.7	9.19	9.35	0.120	1.109	1.109	1.109	140.57	1.739	1.247	125.77	1.90	0.60	0.00	0.63	1.98	1.50	98.95	1.26	124.94	12		0.261	0.985	0.750	0.750	0.243	1.40
58	9.43	828.6	9.35	9.51	0.119	1.118	1.118	1.118	132.07	1.546	1.181	117.08	1.91	0.60	0.00	0.63	1.98	1.50	92.57	1.27	117.57	12		0.231	0.985	0.763	0.763	0.243	1.24
59	9.60	828.4	9.51	9.68	0.119	1.137	1.137	1.137	136.05	1.517	1.124	118.62	1.89	0.60	0.00	0.63	1.96	1.47	93.97	1.25	117.25	12		0.230	0.985	0.782	0.782	0.242	1.23
60	9.76	828.2	9.68	9.84	0.118	1.147	1.147	1.147	139.68	1.316	0.950	120.74	1.83	0.58	0.00	0.61	1.91	1.45	94.87	1.20	113.38	11		0.216	0.984	0.795	0.795	0.242	1.16
61	9.93	828.1	9.84	10.01	0.118	1.167	1.167	1.167	131.90	1.338	1.024	112.06	1.88	0.59	0.00	0.62	1.95	1.45	89.47	1.24	110.67	12		0.206	0.984	0.814	0.814	0.242	1.11
62	10.09	827.9	10.01	10.17	0.117	1.181	1.181	1.181	133.22	1.247	0.944	111.80	1.86	0.59	0.00	0.61	1.93	1.43	89.27	1.21	108.40	11		0.198	0.983	0.830	0.830	0.242	1.07
63	10.25	827.8	10.17	10.33	0.117	1.194	1.194	1.194	126.50	1.179	0.941	104.92	1.88	0.59	0.00	0.62	1.95	1.43	84.48	1.23	104.21	12		0.185	0.983	0.845	0.845	0.242	0.99
64	10.42	827.6	10.33	10.50	0.118	1.224	1.224	1.224	125.42	1.365	1.099	101.43	1.93	0.62	0.00	0.64	2.00	1.42	83.28	1.29	107.35	13		0.195	0.983	0.872	0.872	0.242	1.05
65	10.58	827.4	10.50	10.66	0.118	1.248	1.248	1.248	126.85	1.433	1.141	100.65	1.95	0.62	0.00	0.64	2.01	1.41	83.40	1.30	108.59	13		0.199	0.982	0.894	0.894	0.242	1.07
66	10.75	827.3	10.66	10.83	0.115	1.236	1.236	1.236	130.04	0.955	0.742	104.20	1.82	0.57	0.00	0.60	1.89	1.38	84.02	1.17	98.64	10		0.169	0.982	0.891	0.891	0.242	0.91
67	10.91	827.1	10.83	10.99	0.116	1.270	1.270	1.270	135.50	1.136	0.846	105.69	1.85	0.58	0.00	0.61	1.91	1.37	86.57	1.20	103.52	11		0.183	0.982	0.921	0.921	0.242	0.99
68	11.07	826.9	10.99	11.15	0.117	1.292	1.292	1.292	136.95	1.180	0.870	104.99	1.86	0.59	0.00	0.61	1.92	1.35	86.71	1.20	104.27	11		0.185	0.981	0.942	0.942	0.242	1.00
69	11.24	826.8	11.15	11.32	0.117	1.311	1.311	1.311	129.14	1.201	0.940	97.50	1.90	0.61	0.00	0.63	1.96	1.35	81.61	1.25	101.72	12		0.178	0.981	0.961	0.961	0.242	0.96
70	11.40	826.6	11.32	11.48	0.117	1.330	1.330	1.330	124.76	1.202	0.974	92.84	1.93	0.62	0.00	0.64	1.99	1.35	78.45	1.27	99.92	13		0.173	0.980	0.980	0.980	0.241	0.93
71	11.57	826.4	11.48	11.65	0.116	1.345	1.345	1.345	121.68	1.159	0.963	89.47	1.94	0.62	0.00	0.64	1.99	1.34	76.03	1.28	97.59	13		0.166	0.980	0.996	0.996	0.241	0.90
72	11.73	826.3	11.65	11.81	0.118	1.381	1.381	1.381	119.49	1.415	1.198	85.54	2.01	0.65	0.00	0.67	2.06	1.33	74.21	1.38	102.29	15		0.180	0.980	1.028	1.028	0.241	0.97
73	11.89	826.1	11.81	11.97	0.117	1.388	1.388	1.388	113.96	1.255	1.114	81.12	2.01	0.65	0.00	0.67	2.06	1.33	70.47	1.38	96.91	15		0.165	0.979	1.038	1.038	0.241	0.89
74	12.06	825.9	11.97	12.14	0.116	1.402	1.402	1.402	105.07	1.222	1.179	73.93	2.06	0.67	0.00	0.68	2.10	1.33	64.90	1.45	93.98	16		0.157	0.979	1.053	1.053	0.241	0.85
75	12.22	825.8	12.14	12.30	0.114	1.399	1.399	1.399	94.58	0.984	1.056	66.60	2.06	0.67	0.00	0.69	2.11	1.33	58.49	1.46	85.49	16		0.138	0.979	1.056	1.056	0.241	0.75
76	12.39	825.6	12.30	12.47	0.113	1.404	1.404	1.404	82.99	0.883	1.082	58.10	2.12	0.69	0.00	0.71	2.16	1.34	51.50	1.56	80.53	18		0.129	0.978	1.064	1.064	0.241	0.69
77	12.55	825.5	12.47	12.63	0.113	1.413	1.413	1.413	73.26	0.830	1.155	50.84	2.18	0.71	0.00	0.73	2.22	1.34	45.56	1.70	77.67	20		0.124	0.978	1.075	1.075	0.241	0.67
78	12.72	825.3	12.63	12.80	0.112	1.429	1.429	1.429	67.76	0.826	1.246	46.41	2.23	0.73	0.00	0.75	2.27	1.34	42.03	1.84	77.16	21		0.123	0.977	1.092	1.092	0.241	0.66
79	12.88	825.1	12.80	12.96	0.112	1.449	1.449	1.449	67.80	0.836	1.260	45.80	2.24	0.74	0.00	0.75	2.27	1.33	41.66	1.85	77.21	22		0.123	0.977	1.111	1.111	0.241	0.66
80	13.04	825.0	12.96	13.12	0.113	1.468	1.468	1.468	72.36	0.830	1.171	48.29	2.20	0.72	0.00	0.74	2.24	1.31	43.85	1.75	76.73	20		0.122	0.977	1.130	1.130	0.241	0.66
81	13.21	824.8	13.12	13.29	0.113	1.488	1.488	1.488	74.14	0.832	1.145	48.84	2.19	0.72	0.00	0.73	2.23	1.30	44.45	1.72	76.55	20		0.122	0.976	1.150	1.150	0.240	0.66
82	13.37	824.6	13.29	13.45	0.113	1.508	1.508	1.508	74.34	0.845	1.161	48.30	2.20	0.72	0.00	0.74	2.23	1.28	44.16	1.74	76.72	20		0.122	0.976	1.170	1.170	0.240	0.66
83	13.54	824.5	13.45	13.62	0.113	1.525	1.525	1.525	75.07	0.833	1.133	48.21	2.19	0.72	0.00	0.73	2.23	1.27	44.18	1.72	76.03	20		0.121	0.975	1.187	1.187	0.240	0.65
84	13.70	824.3	13.62	13.78	0.113	1.546	1.546	1.546	73.50	0.856	1.190	46.54	2.22	0.73	0.00	0.74	2.25	1.26	42.93	1.78	76.48	21		0.122	0.975	1.207	1.207	0.240	0.66
85	13.86	824.1	13.78	13.94	0.114	1.574	1.574	1.574	72.13	0.950	1.347	44.82	2.26	0.75	0.00	0.76	2.29	1.25	41.74	1.90	79.44	22		0.127	0.975	1.233	1.233	0.240	0.69
86	14.03	824.0	13.94	14.11	0.113	1.588	1.588	1.588	71.52	0.906	1.295	44.05	2.26	0.75	0.00	0.76	2.28	1.24	41.08	1.89	77.62	22		0.123	0.974	1.248	1.248	0.240	0.67
87	14.19	823.8	14.11	14.27	0.112	1.584	1.584	1.584	73.67	0.727	1.008	45.49	2.19	0.72	0.00	0.73	2.21	1.24	42.09	1.69	71.23	19		0.114	0.974	1.249	1.249	0.240	0.62
88	14.36	823.6	14.27	14.44	0.112	1.609	1.609	1.609	78.97	0.756	0.978	48.07	2.16	0.71	0.00	0.72	2.19	1.22	44.53	1.62	72.34	19		0.115	0.974	1.273	1.273	0.240	0.62
89	14.52	823.5	14.44	14.60	0.113	1.636	1.636	1.636	76.05	0.827	1.112	45.48	2.21	0.73	0.00	0.74	2.23	1.21	42.54	1.74	74.19	20		0.118	0.973	1.298	1.298	0.240	0.64
90	14.68	823.3	14.60	14.76	0.113	1.662	1.662	1.662	77.25	0.881	1.166	45.49	2.22	0.74	0.00	0.74	2.24	1.20	42.76	1.77	75.74	21		0.120	0.973	1.322	1.322	0.240	0.65
91	14.85	823.2	14.76	14.93	0.114	1.696	1.696	1.696	78.68	1.011	1.313	45.40	2.25	0.75	0.00	0.76	2.27	1.18	43.00	1.85	79.61	22		0.127	0.972	1.353	1.353	0.239	0.69
92	15.01	823.0	14.93	15.09	0.116	1.736	1.736	1.736	81.35	1.217	1.528	45.86	2.29	0.76	0.00	0.77	2.31	1.16	43.81	1.95	85.60	23		0.138	0.972	1.389	1.389	0.239	0.75
93	15.18	822.8	15.09	15.26	0.117	1.778	1.778	1.778	87.96	1.455	1.689	48.47	2.30	0.77	0.00	0.77	2.31	1.14	46.58	1.97	91.91	23		0.152	0.972	1.427	1.427	0.239	0.83
94	15.34	822.7	15.26	15.42	0.119	1.819	1.819	1.819	100.13	1.694	1.723	54.04	2.27	0.76	0.00	0.76	2.28	1.12	52.12	1.87	97.53	22		0.166	0.971	1.464	1.464	0.239	0.90
95	15.50	822.5	15.42	15.58	0.120	1.855	1.855	1.855	117.67	1.856	1.603	62.44	2.20	0.73	0.00	0.74	2.21	1.10	60.30	1.68	101.39	19		0.177	0.971	1.496	1.496	0.239	0.96
96	15.67	822.3	15.58	15.75	0.120	1.879	1.879	1.879	126.95	1.881	1.504	66.56	2.16	0.72	0.00	0.72	2.17	1.09	64.39	1.59	102.22	18		0.179	0.970	1.519	1.519	0.239	0.98
97	15.83	822.2	15.75	15.91	0.120	1.896	1.896	1.896	125.91	1.847	1.489	65.40	2.16	0.72	0.00	0.72	2.17	1.08	63.43	1.59	101.03	18		0.176	0.970	1.537	1.537	0.239	0.96
98	16.00	822.0	15.91	16.08	0.119	1.908	1.908	1.908	114.57	1.777	1.577	59.05	2.21	0.74	0.00	0.74	2.22	1.08	57.48	1.71	98.33	20		0.168	0.970	1.550	1.550	0.239	0.92
99	16.16	821.8	16.08	16.24	0.118	1.911	1.911	1.911	92.86	1.660	1.825	47.59	2.33	0.78	0.00	0.78	2.33	1.08	46.55	2.05	95.23	24		0.160	0.969	1.556	1.556	0.239	0.87
100	16.32	821.7	16.24	16.40	0.117	1.904	1.904	1.904	69.49	1.469	2.174	35.50	2.47	0.84	0.00	0.84	2.48	1.09	34.89	2.64	92.24	30		0.153	0.969	1.554	1.554	0.239	0.83
101	16.49	821.5	16.40	16.57	0.115	1.901	1.901	1.901	61.52	1.275	2.138	31.36	2.51	0.85	0.00	0.85	2.51	1.10	30.87	3.10	95.58	31		0.161	0.969	1.555	1.555	0.239	0.88
102	16.65	821.4	16.57	16.73	0.114	1.899	1.899	1.899	60.08	1.084	1.863	30.63	2.48	0.84	0.00	0.84	2.49	1.10	30.11	2.69	80.96	30		0.129	0.968	1.557	1.557	0.238	0.71
103	16.82	821.2	16.73	16.90	0.114	1.917	1.917	1.917	60.63	1.065	1.815	30.64	2.47	0.84	0.00	0.84	2.48	1.09	30.15	2.65	80.00	30		0.128	0.968	1.575	1.575	0.238	0.70

Seismic Soil Liquefaction Triggering Calculations

Layer No.	Mid-layer Depth	Elevation	Depth of layer below ground surface [ft]		Total Unit Weight., γ	Total Vertical Stress, σ_{vo}	In-Situ Effective Vertical Stress, σ'_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Total Cone Resistance, q_t	Sleeve Friction, f_s	Normalized Friction Ratio, F_r	Normalized Cone Resistance, $Q_{t,1}$	Normalized Behavior Type Index, $(I_C)_1$	n	Δn	Final n	Final I_c	Normalizing Factor, C_N	For Overburden, $q_{t,1N}$	Fines Factor, K_c	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC		Cyclic Resistance Ratio, $CRR_{7.5}$	Stress Reduction Factor, r_d	Total Vertical Stress, σ_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Cyclic Stress Ratio, CSR*	Calculated Factor of Safety, FS
																						Estimated	Lab					
	(ft)	(ft. MSL)	Top	Bottom	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[%]	trial 1 (assume n = 1.0)										[%]	[%]	M_W = 7.5		[ksf]	[ksf]	for FS = 1.3	$CRR_{7.5}/CSR^*$
104	16.98	821.0	16.90	17.06	0.113	1.924	1.924	1.924	61.71	0.966	1.616	31.07	2.44	0.82	0.00	0.83	2.45	1.08	30.56	2.49	76.19	28		0.121	0.967	1.584	1.584	0.238	0.66
105	17.14	820.9	17.06	17.22	0.117	2.005	2.005	2.005	66.25	1.564	2.435	32.03	2.54	0.86	0.00	0.87	2.54	1.05	31.80	3.66	116.39	33		0.227	0.967	1.654	1.654	0.238	1.24
106	17.31	820.7	17.22	17.39	0.117	2.028	2.028	2.028	84.67	1.478	1.788	40.75	2.37	0.80	0.00	0.80	2.37	1.04	40.41	2.20	88.89	25		0.145	0.967	1.676	1.676	0.238	0.79
107	17.47	820.5	17.39	17.55	0.116	2.029	2.029	2.029	80.82	1.297	1.646	38.84	2.37	0.80	0.00	0.80	2.37	1.03	38.51	2.18	83.91	25		0.135	0.966	1.680	1.680	0.238	0.74
108	17.64	820.4	17.55	17.72	0.118	2.083	2.083	2.083	81.51	1.701	2.142	38.13	2.44	0.83	0.00	0.83	2.44	1.01	38.02	2.49	94.68	28		0.159	0.966	1.729	1.729	0.238	0.87
109	17.80	820.2	17.72	17.88	0.120	2.141	2.141	2.141	87.58	2.236	2.617	39.90	2.49	0.85	0.00	0.85	2.48	0.99	39.97	2.68	106.95	30		0.194	0.965	1.780	1.780	0.238	1.06
110	17.96	820.0	17.88	18.04	0.121	2.181	2.181	2.181	106.24	2.457	2.361	47.70	2.40	0.81	0.00	0.81	2.40	0.98	47.97	2.28	109.39	26		0.202	0.965	1.817	1.817	0.238	1.10
111	18.13	819.9	18.04	18.21	0.122	2.214	2.214	2.214	128.23	2.541	2.016	56.91	2.29	0.78	0.00	0.78	2.29	0.97	57.49	1.91	109.73	22		0.203	0.965	1.848	1.848	0.238	1.11
112	18.29	819.7	18.21	18.37	0.122	2.235	2.235	2.235	137.23	2.492	1.846	60.40	2.25	0.76	0.00	0.76	2.25	0.96	61.20	1.77	108.59	21		0.199	0.964	1.868	1.868	0.237	1.09
113	18.46	819.5	18.37	18.54	0.123	2.263	2.263	2.263	153.87	2.537	1.674	67.01	2.19	0.74	0.00	0.73	2.18	0.95	68.20	1.61	110.04	18		0.204	0.964	1.895	1.895	0.237	1.12
114	18.62	819.4	18.54	18.70	0.123	2.285	2.285	2.285	159.43	2.547	1.621	68.77	2.17	0.73	0.00	0.73	2.16	0.95	70.21	1.57	110.34	18		0.205	0.964	1.917	1.917	0.237	1.12
115	18.78	819.2	18.70	18.86	0.124	2.327	2.327	2.327	167.57	2.957	1.789	71.00	2.19	0.74	0.00	0.74	2.18	0.93	72.80	1.61	117.18	18		0.230	0.963	1.956	1.956	0.237	1.26
116	18.95	819.1	18.86	19.03	0.125	2.367	2.367	2.367	198.98	3.195	1.625	83.08	2.11	0.71	0.00	0.71	2.10	0.92	85.85	1.44	124.01	16		0.257	0.963	1.992	1.992	0.237	1.41
117	19.11	818.9	19.03	19.19	0.125	2.387	2.387	2.387	239.08	3.001	1.268	99.16	1.98	0.66	0.00	0.66	1.97	0.92	103.34	1.25	129.36	12		0.281	0.962	2.012	2.012	0.237	1.54
118	19.28	818.7	19.19	19.36	0.124	2.385	2.385	2.385	249.12	2.515	1.019	103.47	1.90	0.63	0.00	0.63	1.89	0.93	108.18	1.17	126.83	10		0.270	0.962	2.013	2.013	0.237	1.48
119	19.44	818.6	19.36	19.52	0.123	2.390	2.390	2.390	237.31	2.298	0.978	98.30	1.91	0.63	0.00	0.63	1.89	0.93	102.83	1.18	121.05	10		0.245	0.962	2.021	2.021	0.237	1.34
120	19.60	818.4	19.52	19.68	0.122	2.398	2.398	2.398	221.51	2.170	0.990	91.37	1.94	0.65	0.00	0.64	1.92	0.92	95.58	1.20	115.07	11		0.222	0.961	2.031	2.031	0.237	1.22
121	19.77	818.2	19.68	19.85	0.121	2.400	2.400	2.400	205.12	1.963	0.968	84.47	1.96	0.65	0.00	0.65	1.94	0.92	88.29	1.23	108.20	11		0.198	0.961	2.036	2.036	0.237	1.09
122	19.93	818.1	19.85	20.01	0.121	2.409	2.409	2.409	184.27	1.891	1.040	75.48	2.02	0.68	0.00	0.67	2.00	0.92	78.78	1.29	101.94	13		0.179	0.961	2.047	2.047	0.237	0.98
123	20.10	817.9	20.01	20.18	0.121	2.438	2.438	2.438	165.49	2.081	1.276	66.88	2.11	0.71	0.00	0.71	2.10	0.90	69.70	1.44	100.59	16		0.175	0.960	2.074	2.074	0.236	0.96
124	20.26	817.7	20.18	20.34	0.122	2.466	2.466	2.466	161.57	2.219	1.395	64.51	2.15	0.73	0.00	0.72	2.13	0.90	67.31	1.51	101.77	17		0.178	0.960	2.101	2.101	0.236	0.98
125	20.43	817.6	20.34	20.51	0.122	2.491	2.491	2.491	168.66	2.255	1.357	66.70	2.13	0.72	0.00	0.71	2.11	0.89	69.88	1.47	102.90	16		0.181	0.959	2.125	2.125	0.236	1.00
126	20.59	817.4	20.51	20.67	0.121	2.499	2.499	2.499	166.77	2.081	1.267	65.75	2.12	0.72	0.00	0.71	2.10	0.89	68.99	1.45	99.74	16		0.172	0.959	2.134	2.134	0.236	0.95
127	20.75	817.3	20.67	20.83	0.117	2.434	2.434	2.434	135.60	1.281	0.962	54.71	2.11	0.71	0.00	0.71	2.09	0.91	57.01	1.44	81.82	16		0.131	0.959	2.082	2.082	0.236	0.72
128	20.92	817.1	20.83	21.00	0.116	2.425	2.425	2.425	101.51	1.176	1.187	40.85	2.27	0.77	0.00	0.77	2.25	0.90	42.18	1.80	75.81	21		0.121	0.958	2.077	2.077	0.236	0.66
129	21.08	816.9	21.00	21.16	0.115	2.427	2.427	2.427	65.89	1.214	1.913	26.15	2.54	0.88	0.00	0.87	2.54	0.89	26.60	3.59	95.49	32		0.161	0.958	2.082	2.082	0.236	0.89
130	21.25	816.8	21.16	21.33	0.114	2.423	2.423	2.423	54.33	1.113	2.144	21.43	2.64	0.91	0.00	0.91	2.64	0.88	21.68	6.91	149.75	37		0.392	0.957	2.081	2.081	0.236	2.00
131	21.41	816.6	21.33	21.49	0.114	2.444	2.444	2.444	51.85	1.148	2.325	20.22	2.68	0.93	0.00	0.93	2.68	0.88	20.42	8.98	183.39	39		0.654	0.957	2.101	2.101	0.236	2.00
132	21.57	816.4	21.49	21.65	0.115	2.485	2.485	2.485	57.43	1.286	2.342	22.11	2.65	0.92	0.00	0.92	2.65	0.86	22.40	7.42	166.22	38		0.507	0.957	2.140	2.140	0.236	2.00
133	21.74	816.3	21.65	21.82	0.118	2.571	2.571	2.571	72.65	1.811	2.585	27.25	2.61	0.90	0.00	0.90	2.60	0.84	27.78	5.48	152.26	35		0.408	0.956	2.216	2.216	0.236	2.00
134	21.90	816.1	21.82	21.98	0.121	2.658	2.658	2.658	115.72	2.364	2.091	42.53	2.40	0.83	0.00	0.82	2.39	0.83	44.29	2.25	99.52	26		0.172	0.956	2.294	2.294	0.235	0.95
135	22.07	815.9	21.98	22.15	0.124	2.727	2.727	2.727	185.33	2.728	1.494	66.96	2.16	0.74	0.00	0.73	2.13	0.83	71.75	1.51	108.20	17		0.198	0.956	2.356	2.356	0.235	1.09
136	22.23	815.8	22.15	22.31	0.124	2.764	2.764	2.764	232.46	2.799	1.218	83.11	2.03	0.69	0.00	0.68	2.00	0.83	90.59	1.29	116.87	13		0.228	0.955	2.391	2.391	0.235	1.26
137	22.39	815.6	22.31	22.47	0.125	2.795	2.795	2.795	237.77	2.980	1.268	84.07	2.03	0.69	0.00	0.68	2.01	0.83	91.88	1.30	119.35	13		0.238	0.955	2.421	2.421	0.235	1.32
138	22.56	815.4	22.47	22.64	0.124	2.802	2.802	2.802	214.11	2.847	1.348	75.40	2.09	0.71	0.00	0.70	2.06	0.82	82.00	1.38	112.97	15		0.214	0.954	2.430	2.430	0.235	1.18
139	22.72	815.3	22.64	22.80	0.123	2.797	2.797	2.797	192.55	2.527	1.332	67.84	2.12	0.72	0.00	0.71	2.09	0.82	73.47	1.43	105.26	16		0.188	0.954	2.428	2.428	0.235	1.04
140	22.89	815.1	22.80	22.97	0.123	2.815	2.815	2.815	182.16	2.535	1.413	63.71	2.16	0.74	0.00	0.73	2.13	0.81	68.83	1.50	103.55	17		0.183	0.954	2.446	2.446	0.235	1.01
141	23.05	815.0	22.97	23.13	0.122	2.801	2.801	2.801	159.47	2.163	1.380	55.93	2.19	0.75	0.00	0.74	2.17	0.81	60.11	1.59	95.35	18		0.161	0.953	2.436	2.436	0.235	0.89
142	23.21	814.8	23.13	23.29	0.121	2.802	2.802	2.802	144.64	1.999	1.409	50.63	2.23	0.77	0.00	0.76	2.21	0.81	54.17	1.68	91.19	19		0.151	0.953	2.439	2.439	0.235	0.83
143	23.38	814.6	23.29	23.46	0.120	2.801	2.801	2.801	132.39	1.827	1.410	46.27	2.27	0.78	0.00	0.77	2.24	0.81	49.33	1.77	87.22	20		0.142	0.952	2.442	2.442	0.235	0.79
144	23.54	814.5	23.46	23.62	0.120	2.814	2.814	2.814	141.85	1.711	1.231	49.42	2.21	0.76	0.00	0.75	2.18	0.81	53.09	1.61	85.67	18		0.138	0.952	2.455	2.455	0.234	0.77
145	23.71	814.3	23.62	23.79	0.121	2.862	2.862	2.862	148.00	1.990	1.371	50.72	2.23	0.77	0.00	0.76	2.20	0.80	54.58	1.66	90.53	19		0.149	0.952	2.500	2.500	0.234	0.83
146	23.87	814.1	23.79	23.95	0.119	2.846	2.846	2.846	145.11	1.630	1.145	49.99	2.18	0.75	0.00	0.74	2.16	0.80	54.00	1.56	84.18	18		0.135	0.951	2.488	2.488	0.234	0.75
147	24.03	814.0	23.95	24.11	0.119	2.861	2.861	2.861	139.05	1.613	1.184	47.61	2.21	0.76	0.00	0.75	2.18	0.80	51.34	1.62	83.04	18		0.133	0.951	2.503	2.503	0.234	0.74
148	24.20	813.8	24.11	24.28	0.119	2.875	2.875	2.875	127.48	1.617	1.297	43.33	2.27	0.78	0.00	0.77	2.24	0.79	46.46	1.77	82.02	20		0.131	0.951	2.519	2.519	0.234	0.73
149	24.36	813.6	24.28	24.44	0.119	2.895	2.895	2.895	126.14	1.618	1.313	42.58	2.28	0.79	0.00	0.78	2.25	0.78	45.67	1.79	81.76	21		0.131	0.950	2.538	2.538	0.234	0.73
150	24.53	813.5	24.44	24.61	0.118	2.900	2.900	2.900	120.78	1.514	1.285	40.65	2.29	0.79	0.00	0.78	2.26	0.78	43.56	1.82	79.36	21		0.126	0.950	2.545	2.545	0.234	0.70
151	24.69	813.3	24.61	24.77	0.118	2.907	2.907	2.907	105.93	1.477	1.434	35.44	2.36	0.82	0.00	0.81	2.34	0.77	37.63	2.08	78.17	24		0.124	0.949	2.554	2.554	0.234	0.69
152	24.85	813.2	24.77	24.93	0.117	2.900	2.900	2.900	90.33	1.350	1.544	30.15	2.44	0.85	0.00	0.84	2.42	0.77	31.70	2.39	75.63	27		0.120	0.949	2.550	2.550	0.234	0.67
153	25.02	813.0	24.93	25.10	0.115	2.884	2.884	2.883	84.19	1.141	1.403	28.20	2.44	0.85	0.00	0.84	2.42	0.77	29.62	2.39	70.70	27		0.113	0.949	2.538	2.537	0.234	0.63
154	25.18	812.8	25.10	25.26	0.116	2.931	2.931	2.919	75.45	1.377	1.898	24.75	2.56	0.89	0.00	0.89	2.55	0.75	25.65	3.86	98.94	33		0.170	0.948	2.582	2.570	0.235	0.94
155	25.35	812.7	25.26	25.43	0.117	2.972	2.972	2.951	89.91	1.464	1.684	29.25	2.47	0.86	0.00	0.86	2.45	0.75	30.72	2.53	77.78	29		0.124	0.948	2.620	2.599	0.235	0.68
156	25.51	812.5	25.43	25.59	0.117	2.975	2.975	2.943	76.02	1.416	1.939	24.55	2.57	0.90	0.00	0.89	2.56	0.74	25.45	4.07	103.53	33		0.183	0.948	2.625	2.593	0.236	1.01
157	25.67	812.3	25.59	25.75	0.115	2.962	2.962	2.920	75.01	1.204	1.672	24.32	2.53	0.89	0.00	0.88	2.52	0.74	25.32	3.22	81.41	32		0.130	0.947	2.616	2.574	0.237	0.71
158	25.84	812.2	25.75	25.92	0.115	2.982	2.982	2.930	75.60	1.204	1.658	24.35	2.53	0.89	0.00	0.88	2.52	0.74	25.38	3.15	80.04	31		0.128	0.947	2.635	2.583	0.238	0.70
159	26.00	812.0	25.92	26.08	0.115	2.994	2.994	2.932	78.81	1.147	1.513	25.32	2.50	0.87	0.00	0.87	2.48	0.74	26.53	2.65	70.32	30		0.112	0.946	2.649	2.586	0.239	0.61

Seismic Soil Liquefaction Triggering Calculations

Layer No.	Mid-layer Depth	Elevation	Depth of layer below ground surface [ft]		Total Unit Weight., γ	Total Vertical Stress, σ_{vo}	In-Situ Effective Vertical Stress, σ'_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Total Cone Resistance, q_t	Sleeve Friction, f_s	Normalized Friction Ratio, F_r	Normalized Cone Resistance, $Q_{t,1}$	Normalized Behavior Type Index, $(I_C)_1$	n	Δn	Final n	Final I_c	Normalizing Factor, C_N	For Overburden, $q_{t,1N}$	Fines Factor, K_c	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC		Cyclic Resistance Ratio, $CRR_{7.5}$	Stress Reduction Factor, r_d	Total Vertical Stress, σ_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Cyclic Stress Ratio, CSR*	Calculated Factor of Safety, FS
																						Estimated	Lab					
	(ft)	(ft. MSL)	Top	Bottom	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[%]	trial 1 (assume n = 1.0)										[%]	[%]	M_W = 7.5		[ksf]	[ksf]	for FS = 1.3	$CRR_{7.5}/CSR^*$
160	26.17	811.8	26.08	26.25	0.115	3.002	3.002	2.929	79.06	1.081	1.421	25.33	2.48	0.87	0.00	0.86	2.46	0.74	26.61	2.57	68.47	29		0.110	0.946	2.658	2.585	0.240	0.60
161	26.33	811.7	26.25	26.41	0.114	3.008	3.008	2.925	76.68	1.019	1.383	24.50	2.49	0.87	0.00	0.86	2.47	0.74	25.72	2.60	66.86	29		0.108	0.946	2.665	2.582	0.240	0.58
162	26.49	811.5	26.41	26.57	0.115	3.055	3.055	2.962	82.90	1.155	1.447	26.13	2.47	0.86	0.00	0.86	2.45	0.73	27.54	2.54	69.83	29		0.112	0.945	2.709	2.616	0.241	0.60
163	26.66	811.3	26.57	26.74	0.115	3.064	3.064	2.961	90.54	1.066	1.219	28.55	2.40	0.84	0.00	0.83	2.38	0.74	30.42	2.21	67.22	26		0.108	0.945	2.719	2.616	0.242	0.58
164	26.82	811.2	26.74	26.90	0.115	3.096	3.096	2.982	99.27	1.103	1.147	31.06	2.36	0.82	0.00	0.81	2.33	0.73	33.38	2.03	67.90	24		0.109	0.944	2.750	2.636	0.243	0.58
165	26.99	811.0	26.90	27.07	0.116	3.128	3.128	3.004	104.84	1.156	1.136	32.52	2.34	0.81	0.00	0.80	2.31	0.73	35.11	1.97	69.00	23		0.111	0.944	2.780	2.656	0.243	0.59
166	27.15	810.9	27.07	27.23	0.117	3.164	3.164	3.030	110.37	1.236	1.153	33.89	2.33	0.81	0.00	0.80	2.30	0.73	36.73	1.92	70.68	22		0.113	0.944	2.814	2.680	0.244	0.60
167	27.31	810.7	27.23	27.39	0.117	3.183	3.183	3.039	120.50	1.204	1.026	36.86	2.27	0.79	0.00	0.78	2.23	0.73	40.38	1.74	70.36	20		0.112	0.943	2.833	2.689	0.245	0.60
168	27.48	810.5	27.39	27.56	0.117	3.202	3.202	3.048	121.53	1.200	1.014	36.95	2.26	0.79	0.00	0.78	2.23	0.73	40.56	1.73	70.19	20		0.112	0.943	2.852	2.698	0.246	0.59
169	27.64	810.4	27.56	27.72	0.117	3.230	3.230	3.066	108.33	1.303	1.240	32.54	2.36	0.82	0.00	0.81	2.33	0.71	35.20	2.03	71.57	24		0.114	0.943	2.880	2.715	0.246	0.60
170	27.81	810.2	27.72	27.89	0.116	3.237	3.237	3.062	95.75	1.275	1.378	28.58	2.43	0.85	0.00	0.84	2.41	0.70	30.55	2.32	70.94	27		0.113	0.942	2.888	2.712	0.247	0.60
171	27.97	810.0	27.89	28.05	0.116	3.240	3.240	3.055	85.84	1.222	1.480	25.49	2.49	0.87	0.00	0.87	2.47	0.69	26.98	2.60	70.04	29		0.112	0.942	2.892	2.707	0.248	0.59
172	28.13	809.9	28.05	28.21	0.115	3.237	3.237	3.041	82.59	1.113	1.403	24.52	2.49	0.87	0.00	0.87	2.47	0.69	25.94	2.60	67.48	29		0.109	0.941	2.891	2.696	0.249	0.57
173	28.30	809.7	28.21	28.38	0.114	3.236	3.236	3.031	82.35	1.015	1.284	24.45	2.47	0.87	0.00	0.86	2.45	0.69	25.95	2.50	64.96	28		0.105	0.941	2.893	2.688	0.249	0.55
174	28.46	809.5	28.38	28.54	0.114	3.241	3.241	3.025	83.30	0.943	1.178	24.70	2.45	0.86	0.00	0.85	2.42	0.70	26.34	2.39	62.98	27		0.103	0.941	2.899	2.683	0.250	0.54
175	28.63	809.4	28.54	28.71	0.114	3.268	3.268	3.042	84.68	0.977	1.200	24.91	2.45	0.86	0.00	0.85	2.42	0.69	26.58	2.40	63.68	27		0.104	0.940	2.925	2.699	0.251	0.54
176	28.79	809.2	28.71	28.87	0.114	3.294	3.294	3.058	85.20	1.011	1.234	24.86	2.45	0.86	0.00	0.85	2.43	0.69	26.52	2.43	64.37	28		0.105	0.940	2.951	2.715	0.252	0.54
177	28.96	809.0	28.87	29.04	0.115	3.319	3.319	3.072	84.96	1.041	1.275	24.60	2.47	0.87	0.00	0.86	2.44	0.68	26.21	2.48	64.99	28		0.106	0.939	2.975	2.729	0.252	0.54
178	29.12	808.9	29.04	29.20	0.115	3.342	3.342	3.085	84.44	1.061	1.308	24.27	2.48	0.87	0.00	0.86	2.45	0.67	25.82	2.53	65.37	29		0.106	0.939	2.997	2.740	0.253	0.54
179	29.28	808.7	29.20	29.36	0.115	3.354	3.354	3.087	85.24	1.030	1.258	24.41	2.47	0.87	0.00	0.86	2.44	0.67	26.04	2.48	64.49	28		0.105	0.939	3.011	2.744	0.254	0.54
180	29.45	808.6	29.36	29.53	0.114	3.360	3.360	3.083	86.50	0.965	1.160	24.74	2.44	0.86	0.00	0.85	2.42	0.68	26.52	2.37	62.74	27		0.103	0.938	3.018	2.741	0.254	0.53
181	29.61	808.4	29.53	29.69	0.114	3.380	3.380	3.092	84.23	0.977	1.208	23.92	2.46	0.87	0.00	0.86	2.44	0.67	25.55	2.47	62.99	28		0.103	0.938	3.038	2.750	0.255	0.53
182	29.78	808.2	29.69	29.86	0.114	3.394	3.394	3.096	76.65	0.985	1.345	21.59	2.53	0.89	0.00	0.88	2.51	0.66	22.79	2.92	66.56	31		0.107	0.938	3.052	2.754	0.256	0.55
183	29.94	808.1	29.86	30.02	0.114	3.421	3.421	3.113	70.82	1.053	1.563	19.70	2.59	0.92	0.00	0.91	2.58	0.64	20.53	4.74	97.30	34		0.166	0.937	3.079	2.770	0.256	0.84
184	30.10	807.9	30.02	30.18	0.118	3.547	3.547	3.229	71.68	1.709	2.509	19.21	2.72	0.97	0.00	0.97	2.72	0.61	19.52	Ic>2.7	--	41		1.035	0.937	3.194	2.875	0.256	2.00
185	30.27	807.7	30.18	30.35	0.118	3.586	3.586	3.258	87.79	1.745	2.073	23.48	2.60	0.93	0.00	0.92	2.59	0.62	24.49	4.97	121.64	35		0.247	0.936	3.231	2.902	0.257	1.25
186	30.43	807.6	30.35	30.51	0.119	3.614	3.614	3.275	106.18	1.697	1.655	28.38	2.48	0.88	0.00	0.87	2.45	0.63	30.43	2.53	76.89	29		0.122	0.936	3.257	2.919	0.257	0.62
187	30.60	807.4	30.51	30.68	0.118	3.622	3.622	3.273	136.81	1.483	1.113	36.77	2.29	0.81	0.00	0.79	2.25	0.65	41.13	1.78	73.13	21		0.116	0.936	3.267	2.918	0.258	0.59
188	30.76	807.2	30.68	30.84	0.118	3.635	3.635	3.275	140.05	1.427	1.046	37.53	2.26	0.80	0.00	0.78	2.22	0.66	42.21	1.71	72.28	20		0.115	0.935	3.280	2.921	0.259	0.58
189	30.92	807.1	30.84	31.00	0.119	3.665	3.665	3.295	133.28	1.525	1.176	35.37	2.31	0.82	0.00	0.80	2.28	0.64	39.39	1.86	73.34	22		0.117	0.935	3.309	2.940	0.259	0.59
190	31.09	806.9	31.00	31.17	0.119	3.684	3.684	3.304	134.35	1.519	1.163	35.47	2.31	0.82	0.00	0.80	2.27	0.64	39.57	1.85	73.15	21		0.116	0.935	3.329	2.949	0.260	0.58
191	31.25	806.8	31.17	31.33	0.118	3.697	3.697	3.307	134.51	1.475	1.128	35.38	2.30	0.82	0.00	0.80	2.26	0.64	39.56	1.83	72.26	21		0.115	0.934	3.342	2.952	0.260	0.57
192	31.42	806.6	31.33	31.50	0.118	3.722	3.722	3.322	131.84	1.520	1.187	34.42	2.33	0.82	0.00	0.81	2.29	0.63	38.33	1.90	72.76	22		0.116	0.934	3.367	2.966	0.261	0.58
193	31.58	806.4	31.50	31.66	0.119	3.760	3.760	3.349	130.52	1.651	1.302	33.71	2.36	0.84	0.00	0.82	2.32	0.62	37.33	2.00	74.77	23		0.119	0.933	3.403	2.992	0.261	0.59
194	31.74	806.3	31.66	31.82	0.120	3.810	3.810	3.389	133.00	1.873	1.450	33.91	2.38	0.85	0.00	0.83	2.35	0.61	37.38	2.10	78.33	24		0.125	0.933	3.449	3.029	0.262	0.62
195	31.91	806.1	31.82	31.99	0.122	3.879	3.879	3.449	139.50	2.284	1.684	34.96	2.41	0.86	0.00	0.85	2.38	0.60	38.35	2.21	84.65	25		0.136	0.933	3.515	3.084	0.262	0.68
196	32.07	805.9	31.99	32.15	0.122	3.898	3.898	3.456	145.38	2.234	1.579	36.30	2.38	0.85	0.00	0.84	2.34	0.60	40.14	2.09	83.73	24		0.135	0.932	3.533	3.092	0.262	0.67
197	32.24	805.8	32.15	32.32	0.121	3.901	3.901	3.449	142.62	2.094	1.510	35.56	2.37	0.85	0.00	0.83	2.34	0.60	39.37	2.07	81.43	24		0.130	0.932	3.538	3.086	0.263	0.64
198	32.40	805.6	32.32	32.48	0.121	3.913	3.913	3.452	142.88	2.029	1.460	35.51	2.37	0.84	0.00	0.83	2.33	0.60	39.41	2.04	80.28	24		0.128	0.931	3.551	3.089	0.264	0.63
199	32.56	805.4	32.48	32.64	0.121	3.936	3.936	3.465	143.57	2.056	1.472	35.47	2.37	0.85	0.00	0.83	2.33	0.60	39.38	2.05	80.53	24		0.129	0.931	3.574	3.102	0.264	0.63
200	32.73	805.3	32.64	32.81	0.121	3.973	3.973	3.491	152.27	2.166	1.461	37.32	2.35	0.84	0.00	0.82	2.31	0.60	41.69	1.97	82.18	23		0.132	0.931	3.609	3.127	0.265	0.65
201	32.89	805.1	32.81	32.97	0.122	4.015	4.015	3.523	163.05	2.320	1.459	39.61	2.33	0.83	0.00	0.82	2.29	0.59	44.55	1.90	84.50	22		0.136	0.930	3.649	3.157	0.265	0.67
202	33.06	804.9	32.97	33.14	0.121	4.014	4.014	3.512	173.94	2.079	1.223	42.33	2.26	0.81	0.00	0.79	2.21	0.60	48.49	1.69	81.76	19		0.131	0.929	3.650	3.147	0.265	0.64
203	33.22	804.8	33.14	33.30	0.123	4.088	4.088	3.575	177.75	2.575	1.483	42.48	2.31	0.83	0.00	0.81	2.26	0.59	48.15	1.83	88.10	21		0.144	0.928	3.719	3.206	0.265	0.70
204	33.38	804.6	33.30	33.46	0.125	4.167	4.167	3.644	184.55	3.240	1.796	43.29	2.35	0.84	0.00	0.83	2.31	0.57	48.57	1.98	96.29	23		0.163	0.927	3.792	3.270	0.265	0.80
205	33.55	804.5	33.46	33.63	0.125	4.204	4.204	3.670	183.54	3.464	1.932	42.66	2.38	0.86	0.00	0.84	2.34	0.56	47.57	2.08	98.73	24		0.169	0.925	3.828	3.294	0.265	0.83
206	33.71	804.3	33.63	33.79	0.123	4.137	4.137	3.594	177.10	2.466	1.426	41.80	2.30	0.83	0.00	0.81	2.26	0.58	47.53	1.81	86.14	21		0.139	0.924	3.769	3.226	0.266	0.68
207	33.88	804.1	33.79	33.96	0.121	4.114	4.114	3.560	166.07	2.114	1.305	39.37	2.30	0.82	0.00	0.81	2.26	0.58	44.75	1.81	80.84	21		0.129	0.923	3.750	3.196	0.267	0.63
208	34.04	804.0	33.96	34.12	0.121	4.122	4.122	3.558	160.32	2.035	1.303	37.90	2.31	0.83	0.00	0.81	2.27	0.58	42.94	1.85	79.31	21		0.126	0.921	3.759	3.194	0.267	0.62
209	34.20	803.8	34.12	34.28	0.122	4.157	4.157	3.582	161.83	2.157	1.368	37.93	2.33	0.83	0.00	0.82	2.28	0.58	42.88	1.89	80.88	22		0.129	0.920	3.792	3.218	0.267	0.63
210	34.37	803.6	34.28	34.45	0.122	4.189	4.189	3.604	169.19	2.231	1.352	39.39	2.31	0.83	0.00	0.81	2.27	0.57	44.78	1.83	82.03	21		0.131	0.919	3.823	3.239	0.267	0.64
211	34.53	803.5	34.45	34.61	0.122	4.209	4.209	3.615	176.32	2.203	1.280	40.89	2.28	0.82	0.00	0.80	2.24	0.58	46.87	1.75	81.92	20		0.131	0.917	3.844	3.249	0.267	0.64
212	34.70	803.3	34.61	34.78	0.123	4.267	4.267	3.662	185.34	2.511	1.387	42.44	2.29	0.82	0.00	0.81	2.24	0.57	48.63	1.77	86.06	20		0.139	0.916	3.898	3.293	0.267	0.68
213	34.86	803.1	34.78	34.94	0.123	4.294	4.294	3.678	194.29	2.536	1.335	44.25	2.27	0.81	0.00	0.80	2.22	0.57	51.12	1.70	86.76	20		0.141	0.915	3.924	3.309	0.267	0.68
214	35.02	803.0	34.94	35.10	0.123	4.299	4.299	3.674	196.96	2.390	1.241	44.81	2.24	0.81	0.00	0.79	2.19	0.57	52.15	1.63	85.16	19		0.137	0.913	3.931	3.306	0.267	0.67
215	35.19	802.8	35.10	35.27	0.123	4.322	4.322	3.686	188.48	2.449	1.330	42.61	2.28	0.82	0.00	0.80	2.23	0.56	49.09	1.73	84.97	20		0.137	0.912	3.953	3.318	0.268	0.67

Seismic Soil Liquefaction Triggering Calculations

Layer No.	Mid-layer Depth	Elevation	Depth of layer below ground surface [ft]		Total Unit Weight., γ	Total Vertical Stress, σ_{vo}	In-Situ Effective Vertical Stress, σ'_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Total Cone Resistance, q_t	Sleeve Friction, f_s	Normalized Friction Ratio, F_r	Normalized Cone Resistance, $Q_{t,1}$	Normalized Behavior Type Index, $(I_C)_1$	n	Δn	Final n	Final I_c	Normalizing Factor, C_N	For Overburden, $q_{t,1N}$	Fines Factor, K_c	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC		Cyclic Resistance Ratio, $CRR_{7.5}$	Stress Reduction Factor, r_d	Total Vertical Stress, σ_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Cyclic Stress Ratio, CSR*	Calculated Factor of Safety, FS
																						Estimated	Lab					
	(ft)	(ft. MSL)	Top	Bottom	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[%]	trial 1 (assume n = 1.0)										[%]	[%]	M_W = 7.5		[ksf]	[ksf]	for FS = 1.3	$CRR_{7.5}/CSR^*$
216	35.35	802.7	35.27	35.43	0.123	4.332	4.332	3.687	182.24	2.384	1.340	41.07	2.29	0.83	0.00	0.81	2.25	0.56	47.12	1.77	83.63	21		0.134	0.911	3.965	3.319	0.268	0.65
217	35.52	802.5	35.43	35.60	0.122	4.337	4.337	3.681	177.49	2.264	1.308	39.92	2.30	0.83	0.00	0.81	2.25	0.56	45.77	1.79	81.72	21		0.131	0.909	3.971	3.314	0.268	0.63
218	35.68	802.3	35.60	35.76	0.122	4.361	4.361	3.694	179.94	2.284	1.301	40.26	2.29	0.83	0.00	0.81	2.24	0.56	46.25	1.77	81.94	21		0.131	0.908	3.994	3.328	0.268	0.64
219	35.84	802.2	35.76	35.92	0.123	4.403	4.403	3.727	181.84	2.485	1.400	40.30	2.31	0.83	0.00	0.82	2.26	0.55	46.08	1.83	84.31	21		0.136	0.907	4.035	3.358	0.268	0.66
220	36.01	802.0	35.92	36.09	0.122	4.400	4.400	3.714	184.65	2.264	1.256	40.96	2.28	0.82	0.00	0.80	2.23	0.56	47.33	1.73	81.67	20		0.131	0.905	4.034	3.347	0.269	0.63
221	36.17	801.8	36.09	36.25	0.123	4.432	4.432	3.735	189.49	2.348	1.269	41.75	2.27	0.82	0.00	0.80	2.22	0.55	48.35	1.71	82.82	20		0.133	0.904	4.065	3.368	0.269	0.64
222	36.34	801.7	36.25	36.42	0.123	4.465	4.465	3.758	189.25	2.460	1.332	41.39	2.29	0.83	0.00	0.81	2.24	0.55	47.74	1.76	83.92	20		0.135	0.903	4.096	3.389	0.269	0.65
223	36.50	801.5	36.42	36.58	0.123	4.482	4.482	3.764	185.08	2.448	1.355	40.30	2.30	0.83	0.00	0.81	2.25	0.54	46.30	1.80	83.35	21		0.134	0.901	4.113	3.396	0.269	0.65
224	36.66	801.3	36.58	36.74	0.123	4.501	4.501	3.773	185.66	2.438	1.346	40.25	2.30	0.83	0.00	0.81	2.25	0.54	46.29	1.80	83.10	21		0.133	0.900	4.132	3.405	0.269	0.64
225	36.83	801.2	36.74	36.91	0.123	4.522	4.522	3.784	191.75	2.421	1.293	41.40	2.28	0.83	0.00	0.81	2.23	0.54	47.95	1.73	83.11	20		0.133	0.899	4.154	3.416	0.269	0.64
226	36.99	801.0	36.91	37.07	0.123	4.535	4.535	3.787	197.15	2.340	1.215	42.47	2.26	0.82	0.00	0.80	2.20	0.55	49.60	1.66	82.44	19		0.132	0.897	4.168	3.419	0.269	0.64
227	37.16	800.8	37.07	37.24	0.122	4.531	4.531	3.772	199.89	2.125	1.088	43.12	2.22	0.80	0.00	0.78	2.17	0.55	50.90	1.58	80.19	18		0.128	0.896	4.165	3.406	0.270	0.62
228	37.32	800.7	37.24	37.40	0.121	4.514	4.514	3.745	184.56	1.904	1.058	39.89	2.25	0.81	0.00	0.79	2.19	0.55	46.75	1.63	76.13	19		0.121	0.895	4.151	3.382	0.270	0.58
229	37.49	800.5	37.40	37.57	0.120	4.492	4.492	3.713	165.22	1.695	1.055	35.78	2.28	0.83	0.00	0.81	2.23	0.55	41.40	1.74	71.87	20		0.115	0.893	4.132	3.353	0.271	0.55
230	37.65	800.4	37.57	37.73	0.120	4.533	4.533	3.744	152.97	1.884	1.269	32.74	2.36	0.86	0.00	0.84	2.32	0.53	36.99	1.99	73.70	23		0.117	0.892	4.172	3.383	0.271	0.56
231	37.81	800.2	37.73	37.89	0.120	4.528	4.528	3.729	145.13	1.755	1.248	31.05	2.38	0.86	0.00	0.85	2.33	0.53	34.90	2.05	71.53	24		0.114	0.891	4.169	3.370	0.271	0.55
232	37.98	800.0	37.89	38.06	0.121	4.578	4.578	3.768	139.12	1.983	1.474	29.39	2.44	0.89	0.00	0.87	2.40	0.51	32.41	2.30	74.68	26		0.119	0.889	4.216	3.407	0.271	0.57
233	38.14	799.9	38.06	38.22	0.120	4.572	4.572	3.752	136.91	1.816	1.372	28.95	2.42	0.88	0.00	0.87	2.39	0.51	32.05	2.25	72.07	26		0.115	0.888	4.212	3.392	0.272	0.55
234	38.31	799.7	38.22	38.39	0.120	4.588	4.588	3.758	143.02	1.769	1.278	30.17	2.39	0.87	0.00	0.85	2.35	0.52	33.77	2.11	71.31	24		0.114	0.887	4.229	3.399	0.272	0.54
235	38.47	799.5	38.39	38.55	0.119	4.577	4.577	3.737	136.90	1.608	1.215	28.91	2.40	0.87	0.00	0.86	2.35	0.52	32.32	2.12	68.67	25		0.110	0.885	4.220	3.380	0.272	0.53
236	38.63	799.4	38.55	38.71	0.120	4.632	4.632	3.782	138.83	1.817	1.354	28.97	2.42	0.88	0.00	0.87	2.38	0.51	32.14	2.23	71.74	26		0.114	0.884	4.272	3.422	0.272	0.55
237	38.80	799.2	38.71	38.88	0.120	4.654	4.654	3.793	136.31	1.843	1.400	28.29	2.44	0.89	0.00	0.88	2.40	0.50	31.21	2.31	72.00	26		0.115	0.883	4.294	3.433	0.272	0.55
238	38.96	799.0	38.88	39.04	0.119	4.653	4.653	3.782	137.33	1.710	1.289	28.51	2.41	0.88	0.00	0.87	2.38	0.51	31.71	2.20	69.88	25		0.112	0.881	4.295	3.424	0.272	0.53
239	39.13	798.9	39.04	39.21	0.119	4.659	4.659	3.778	140.44	1.618	1.192	29.14	2.39	0.87	0.00	0.85	2.35	0.51	32.70	2.09	68.42	24		0.110	0.880	4.302	3.421	0.273	0.52
240	39.29	798.7	39.21	39.37	0.119	4.663	4.663	3.771	140.83	1.528	1.122	29.20	2.37	0.86	0.00	0.85	2.33	0.51	32.94	2.03	66.96	24		0.108	0.879	4.307	3.415	0.273	0.51
241	39.45	798.6	39.37	39.53	0.118	4.673	4.673	3.771	137.73	1.494	1.123	28.47	2.38	0.87	0.00	0.85	2.34	0.51	32.02	2.07	66.26	24		0.107	0.877	4.318	3.416	0.273	0.51
242	39.62	798.4	39.53	39.70	0.119	4.719	4.719	3.807	136.34	1.640	1.246	27.89	2.41	0.88	0.00	0.87	2.38	0.50	31.04	2.20	68.36	25		0.110	0.876	4.361	3.449	0.273	0.52
243	39.78	798.2	39.70	39.86	0.119	4.753	4.753	3.831	135.27	1.732	1.327	27.46	2.44	0.89	0.00	0.88	2.40	0.49	30.35	2.29	69.62	26		0.111	0.875	4.395	3.473	0.273	0.53
244	39.95	798.1	39.86	40.03	0.120	4.779	4.779	3.847	137.60	1.759	1.324	27.79	2.43	0.89	0.00	0.87	2.39	0.49	30.77	2.27	69.92	26		0.112	0.873	4.420	3.488	0.273	0.53
245	40.11	797.9	40.03	40.19	0.122	4.888	4.888	3.945	140.12	2.367	1.750	27.67	2.50	0.92	0.00	0.91	2.47	0.47	29.88	2.62	78.40	30		0.125	0.872	4.522	3.580	0.271	0.60
246	40.27	797.7	40.19	40.35	0.121	4.855	4.855	3.902	150.94	1.929	1.320	30.09	2.40	0.88	0.00	0.86	2.36	0.49	33.69	2.14	72.24	25		0.115	0.871	4.493	3.540	0.272	0.55
247	40.44	797.6	40.35	40.52	0.121	4.877	4.877	3.914	153.27	1.939	1.306	30.42	2.39	0.88	0.00	0.86	2.35	0.49	34.15	2.12	72.29	25		0.115	0.869	4.515	3.552	0.272	0.55
248	40.60	797.4	40.52	40.68	0.120	4.858	4.858	3.884	154.38	1.693	1.132	30.78	2.36	0.86	0.00	0.84	2.31	0.50	35.03	1.97	68.83	23		0.110	0.868	4.499	3.525	0.273	0.53
249	40.77	797.2	40.68	40.85	0.121	4.914	4.914	3.930	150.63	1.930	1.325	29.65	2.41	0.88	0.00	0.87	2.37	0.48	33.14	2.17	71.88	25		0.115	0.867	4.552	3.569	0.272	0.55
250	40.93	797.1	40.85	41.01	0.120	4.932	4.932	3.938	134.47	1.988	1.535	26.27	2.49	0.91	0.00	0.90	2.46	0.47	28.52	2.55	72.59	29		0.116	0.865	4.570	3.576	0.272	0.55
251	41.09	796.9	41.01	41.17	0.119	4.908	4.908	3.904	136.39	1.716	1.305	26.79	2.44	0.90	0.00	0.88	2.40	0.48	29.59	2.32	68.50	27		0.110	0.864	4.550	3.546	0.273	0.52
252	41.26	796.7	41.17	41.34	0.120	4.941	4.941	3.927	128.26	1.833	1.486	24.96	2.50	0.92	0.00	0.91	2.47	0.46	27.00	2.60	70.19	29		0.112	0.863	4.582	3.568	0.273	0.53
253	41.42	796.6	41.34	41.50	0.119	4.936	4.936	3.912	123.33	1.711	1.445	23.98	2.50	0.92	0.00	0.91	2.48	0.46	25.88	2.64	68.31	30		0.110	0.861	4.579	3.554	0.273	0.52
254	41.59	796.4	41.50	41.67	0.120	4.983	4.983	3.948	126.77	1.853	1.522	24.44	2.51	0.92	0.00	0.91	2.48	0.46	26.31	2.67	70.30	30		0.112	0.860	4.624	3.589	0.273	0.54
255	41.75	796.3	41.67	41.83	0.121	5.044	5.044	3.999	146.08	2.024	1.435	27.96	2.45	0.90	0.00	0.89	2.41	0.46	30.80	2.35	72.44	27		0.115	0.859	4.682	3.637	0.272	0.55
256	41.91	796.1	41.83	41.99	0.122	5.093	5.093	4.038	166.86	2.131	1.317	31.76	2.38	0.88	0.00	0.86	2.34	0.47	35.89	2.06	73.96	24		0.118	0.857	4.728	3.673	0.272	0.56
257	42.08	795.9	41.99	42.16	0.122	5.153	5.153	4.088	179.43	2.369	1.359	33.82	2.37	0.87	0.00	0.86	2.32	0.47	38.45	2.00	77.05	23		0.123	0.856	4.786	3.720	0.271	0.59
258	42.24	795.8	42.16	42.32	0.123	5.207	5.207	4.132	180.81	2.639	1.503	33.72	2.39	0.88	0.00	0.87	2.35	0.46	37.96	2.11	80.06	24		0.128	0.855	4.838	3.762	0.271	0.61
259	42.41	795.6	42.32	42.49	0.125	5.299	5.299	4.213	187.18	3.285	1.806	34.32	2.43	0.90	0.00	0.89	2.40	0.44	38.00	2.29	87.14	26		0.142	0.853	4.924	3.838	0.270	0.68
260	42.57	795.4	42.49	42.65	0.127	5.418	5.418	4.322	219.14	4.270	1.998	39.45	2.41	0.90	0.00	0.88	2.38	0.44	44.01	2.21	97.08	25		0.165	0.852	5.036	3.940	0.268	0.80
261	42.73	795.3	42.65	42.81	0.128	5.478	5.478	4.371	271.45	4.510	1.696	48.56	2.30	0.86	0.00	0.84	2.25	0.45	56.80	1.78	100.84	21		0.175	0.851	5.093	3.987	0.268	0.85
262	42.90	795.1	42.81	42.98	0.128	5.497	5.497	4.381	306.44	4.308	1.431	54.74	2.21	0.82	0.00	0.80	2.15	0.47	66.40	1.54	101.98	17		0.179	0.849	5.113	3.996	0.268	0.87
263	43.06	794.9	42.98	43.14	0.128	5.508	5.508	4.382	298.09	4.214	1.440	53.11	2.22	0.83	0.00	0.80	2.16	0.46	64.12	1.56	100.30	18		0.174	0.848	5.125	3.998	0.268	0.84
264	43.23	794.8	43.14	43.31	0.127	5.491	5.491	4.353	272.50	3.839	1.438	48.63	2.25	0.84	0.00	0.82	2.19	0.46	57.98	1.64	95.10	19		0.160	0.847	5.110	3.972	0.268	0.78
265	43.39	794.6	43.31	43.47	0.127	5.506	5.506	4.359	238.27	3.949	1.697	42.27	2.35	0.87	0.00	0.86	2.30	0.44	48.52	1.93	93.76	22		0.157	0.845	5.126	3.978	0.268	0.76
266	43.55	794.5	43.47	43.63	0.127	5.511	5.511	4.354	229.61	3.808	1.699	40.66	2.36	0.88	0.00	0.86	2.31	0.44	46.41	1.98	92.02	23		0.152	0.844	5.132	3.974	0.268	0.74
267	43.72	794.3	43.63	43.80	0.127	5.541	5.541	4.373	236.28	3.875	1.680	41.64	2.35	0.88	0.00	0.86	2.30	0.44	47.75	1.94	92.69	23		0.154	0.843	5.160	3.993	0.268	0.75
268	43.88	794.1	43.80	43.96	0.126	5.548	5.548	4.369	237.14	3.704	1.600	41.75	2.33	0.87	0.00	0.85	2.29	0.44	48.16	1.89	91.03	22		0.150	0.841	5.168	3.990	0.268	0.73
269	44.05	794.0	43.96	44.13	0.126	5.566	5.566	4.378	240.34	3.662	1.560	42.18	2.32	0.87	0.00	0.85	2.27	0.44	48.87	1.85	90.63	22		0.149	0.840	5.187	3.999	0.268	0.72
270	44.21	793.8	44.13	44.29	0.126	5.557	5.557	4.358	231.14	3.383	1.500	40.59	2.33	0.87	0.00	0.85	2.28	0.44	46.98	1.86	87.55	22		0.142	0.839	5.180	3.981	0.269	0.69
271	44.37	793.6	44.29	44.45	0.126	5.587	5.587	4.379	230.96	3.491	1.549	40.34	2.34	0.87	0.00	0.85	2.29	0.44	46.48	1.90	88.36	22		0.144	0.837	5.210	4.001	0.269	0.70

Seismic Soil Liquefaction Triggering Calculations

Layer No.	Mid-layer Depth	Elevation	Depth of layer below ground surface [ft]		Total Unit Weight., γ	Total Vertical Stress, σ_{vo}	In-Situ Effective Vertical Stress, σ'_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Total Cone Resistance, q_t	Sleeve Friction, f_s	Normalized Friction Ratio, F_r	Normalized Cone Resistance, $Q_{t,1}$	Normalized Behavior Type Index, $(I_C)_1$	n	Δn	Final n	Final I_c	Normalizing Factor, C_N	For Overburden, $q_{t,1N}$	Fines Factor, K_c	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC		Cyclic Resistance Ratio, $CRR_{7.5}$	Stress Reduction Factor, r_d	Total Vertical Stress, σ_{vo}	H.H. Effective Vertical Stress, σ'_{vo}	Cyclic Stress Ratio, CSR*	Calculated Factor of Safety, FS
																						Estimated	Lab					
	(ft)	(ft. MSL)	Top	Bottom	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[ksf]	[%]	trial 1 (assume n = 1.0)										[%]	[%]	M_W = 7.5		[ksf]	[ksf]	for FS = 1.3	$CRR_{7.5}/CSR^*$
272	44.54	793.5	44.45	44.62	0.126	5.609	5.609	4.390	234.79	3.476	1.517	40.86	2.33	0.87	0.00	0.85	2.28	0.44	47.29	1.87	88.23	22		0.144	0.836	5.231	4.012	0.268	0.70
273	44.70	793.3	44.62	44.78	0.126	5.617	5.617	4.387	253.96	3.256	1.311	44.22	2.26	0.84	0.00	0.82	2.20	0.45	52.63	1.66	87.38	19		0.142	0.835	5.240	4.010	0.269	0.69
274	44.87	793.1	44.78	44.95	0.125	5.614	5.614	4.375	245.32	3.070	1.281	42.70	2.27	0.85	0.00	0.82	2.21	0.45	50.69	1.68	85.01	19		0.137	0.833	5.239	3.999	0.269	0.66
275	45.03	793.0	44.95	45.11	0.125	5.614	5.614	4.364	215.67	3.009	1.433	37.42	2.34	0.88	0.00	0.86	2.29	0.43	43.02	1.92	82.59	22		0.132	0.832	5.240	3.990	0.269	0.64
276	45.20	792.8	45.11	45.28	0.124	5.605	5.605	4.344	203.33	2.802	1.417	35.28	2.36	0.88	0.00	0.86	2.32	0.43	40.26	1.99	79.94	23		0.128	0.831	5.233	3.972	0.269	0.62
277	45.36	792.6	45.28	45.44	0.125	5.672	5.672	4.401	203.54	3.226	1.631	34.89	2.40	0.90	0.00	0.88	2.36	0.42	39.12	2.15	84.07	25		0.135	0.829	5.297	4.026	0.269	0.65
278	45.52	792.5	45.44	45.60	0.126	5.747	5.747	4.467	217.42	3.728	1.761	36.83	2.40	0.90	0.00	0.89	2.36	0.41	41.25	2.16	89.02	25		0.146	0.828	5.369	4.088	0.268	0.71
279	45.69	792.3	45.60	45.77	0.128	5.835	5.835	4.544	237.10	4.423	1.913	39.63	2.40	0.90	0.00	0.89	2.36	0.41	44.42	2.15	95.43	25		0.161	0.827	5.452	4.161	0.267	0.78
280	45.85	792.2	45.77	45.93	0.129	5.893	5.893	4.592	260.34	4.792	1.883	43.17	2.37	0.89	0.00	0.87	2.32	0.41	49.09	2.01	98.90	23		0.170	0.825	5.508	4.207	0.266	0.83
281	46.02	792.0	45.93	46.10	0.129	5.952	5.952	4.640	282.25	5.210	1.886	46.42	2.34	0.88	0.00	0.87	2.30	0.41	53.34	1.93	102.72	22		0.181	0.824	5.564	4.252	0.265	0.89
282	46.18	791.8	46.10	46.26	0.130	5.998	5.998	4.676	286.29	5.573	1.988	46.74	2.36	0.89	0.00	0.87	2.31	0.40	53.38	1.97	105.35	23		0.189	0.823	5.608	4.286	0.265	0.93
283	46.34	791.7	46.26	46.42	0.130	6.038	6.038	4.707	287.23	5.908	2.101	46.57	2.37	0.90	0.00	0.88	2.33	0.40	52.77	2.04	107.62	24		0.196	0.821	5.648	4.316	0.265	0.96
284	46.51	791.5	46.42	46.59	0.131	6.098	6.098	4.756	292.74	6.562	2.289	47.01	2.39	0.91	0.00	0.89	2.36	0.39	52.71	2.13	112.22	25		0.211	0.820	5.704	4.363	0.264	1.04
285	46.67	791.3	46.59	46.75	0.132	6.146	6.146	4.794	305.37	7.002	2.340	48.68	2.39	0.91	0.00	0.89	2.35	0.39	54.69	2.11	115.35	24		0.223	0.819	5.751	4.399	0.264	1.10
286	46.84	791.2	46.75	46.92	0.132	6.191	6.191	4.828	328.47	7.300	2.265	52.06	2.36	0.89	0.00	0.88	2.32	0.39	59.32	1.99	117.81	23		0.232	0.817	5.794	4.432	0.263	1.15
287	47.00	791.0	46.92	47.08	0.132	6.182	6.182	4.809	331.66	6.659	2.046	52.65	2.32	0.88	0.00	0.86	2.28	0.40	60.95	1.86	113.61	22		0.216	0.816	5.788	4.415	0.263	1.07
288	47.16	790.8	47.08	47.24	0.132	6.232	6.232	4.849	333.35	7.217	2.206	52.49	2.35	0.89	0.00	0.87	2.30	0.39	60.10	1.95	117.01	23		0.229	0.815	5.835	4.452	0.263	1.13
289	47.33	790.7	47.24	47.41	0.132	6.240	6.240	4.847	347.58	6.846	2.006	54.70	2.31	0.88	0.00	0.86	2.26	0.40	63.86	1.80	115.16	21		0.222	0.813	5.844	4.451	0.263	1.10
290	47.49	790.5	47.41	47.57	0.131	6.225	6.225	4.821	348.46	6.152	1.798	54.98	2.27	0.86	0.00	0.84	2.22	0.40	65.21	1.70	110.79	20		0.206	0.812	5.832	4.428	0.263	1.02
291	47.66	790.3	47.57	47.74	0.130	6.197	6.197	4.783	324.52	5.460	1.715	51.37	2.28	0.87	0.00	0.84	2.23	0.40	60.68	1.73	104.69	20		0.187	0.811	5.806	4.393	0.264	0.92
292	47.82	790.2	47.74	47.90	0.129	6.188	6.188	4.764	290.04	5.205	1.834	45.87	2.34	0.89	0.00	0.87	2.29	0.39	52.76	1.91	100.89	22		0.176	0.809	5.800	4.376	0.264	0.86
293	47.98	790.0	47.90	48.06	0.129	6.202	6.202	4.768	277.40	5.175	1.908	43.73	2.37	0.90	0.00	0.88	2.32	0.39	49.66	2.01	100.02	23		0.173	0.808	5.814	4.380	0.264	0.85
294	48.15	789.9	48.06	48.23	0.130	6.241	6.241	4.796	305.56	5.269	1.760	47.96	2.31	0.88	0.00	0.86	2.26	0.39	55.85	1.82	101.70	21		0.178	0.807	5.852	4.407	0.264	0.88
295	48.31	789.7	48.23	48.39	0.127	6.149	6.149	4.694	347.66	3.664	1.073	55.54	2.13	0.81	0.00	0.78	2.05	0.44	70.57	1.36	95.89	14		0.162	0.805	5.767	4.312	0.265	0.79
296	48.48	789.5	48.39	48.56	0.125	6.067	6.067	4.602	339.32	2.764	0.830	54.93	2.07	0.78	0.00	0.75	1.98	0.46	71.78	1.26	90.54	12		0.149	0.804	5.692	4.227	0.267	0.73
297	48.64	789.4	48.56	48.72	0.126	6.141	6.141	4.666	299.38	3.350	1.142	47.75	2.20	0.83	0.00	0.81	2.13	0.42	58.73	1.50	87.94	17		0.143	0.803	5.762	4.287	0.266	0.70
298	48.80	789.2	48.72	48.88	0.126	6.143	6.143	4.658	252.27	3.370	1.369	40.07	2.31	0.87	0.00	0.85	2.25	0.40	46.82	1.80	84.13	21		0.135	0.801	5.765	4.280	0.266	0.66
299	48.97	789.0	48.88	49.05	0.124	6.082	6.082	4.586	228.48	2.769	1.245	36.57	2.32	0.88	0.00	0.86	2.26	0.41	42.59	1.82	77.59	21		0.123	0.800	5.709	4.214	0.267	0.60
300	49.13	788.9	49.05	49.21	0.125	6.138	6.138	4.632	223.44	3.082	1.418	35.40	2.36	0.89	0.00	0.88	2.31	0.39	40.37	1.98	80.06	23		0.128	0.799	5.763	4.258	0.266	0.62
301	49.30	788.7	49.21	49.38	0.124	6.118	6.118	4.602	224.86	2.750	1.257	35.75	2.33	0.88	0.00	0.86	2.27	0.40	41.43	1.86	76.97	22		0.122	0.797	5.746	4.230	0.267	0.60
302	49.46	788.5	49.38	49.54	0.124	6.144	6.144	4.618	229.10	2.771	1.243	36.29	2.32	0.88	0.00	0.86	2.27	0.40	42.21	1.83	77.24	21		0.123	0.796	5.771	4.245	0.266	0.60
303	49.62	788.4	49.54	49.70	0.127	6.284	6.284	4.747	236.89	3.812	1.653	36.70	2.39	0.91	0.00	0.89	2.35	0.38	41.25	2.10	86.45	24		0.140	0.795	5.904	4.367	0.265	0.69
304	49.79	788.2	49.70	49.87	0.124	6.194	6.194	4.648	237.97	2.814	1.214	37.42	2.30	0.87	0.00	0.85	2.25	0.40	43.87	1.77	77.84	21		0.124	0.793	5.821	4.275	0.266	0.61
305	49.95	788.1	49.87	50.03	0.126	6.295	6.295	4.738	225.16	3.572	1.632	34.77	2.40	0.91	0.00	0.90	2.36	0.38	38.78	2.16	83.82	25		0.135	0.792	5.917	4.360	0.265	0.66
306	50.12	787.9	50.03	50.20	0.126	6.290	6.283	4.723	254.19	3.195	1.289	39.46	2.30	0.87	0.00	0.85	2.24	0.40	46.33	1.76	81.70	20		0.131	0.791	5.914	4.346	0.265	Non Liquefiable
307	50.28	787.7	50.20	50.36	0.125	6.286	6.269	4.709	241.67	3.038	1.291	37.55	2.32	0.88	0.00	0.86	2.26	0.39	43.71	1.82	79.63	21		0.127	0.789	5.911	4.333	0.265	Non Liquefiable
308	50.44	787.6	50.36	50.52	0.125	6.294	6.267	4.707	235.96	2.966	1.291	36.65	2.32	0.88	0.00	0.86	2.27	0.39	42.48	1.85	78.66	22		0.125	0.788	5.920	4.332	0.265	Non Liquefiable

CYCLIC SETTLEMENT ANALYSIS

Project:	Solomon Hills Specific Plan	Project No.:	23-2195s
	Santa Barbara County	Date:	10/20/23
Client:	Solstra Communities California, LLC	Figure No.:	D3.2

Location	CPT-05	MCE Mean Magnitude =	6.1
Type of Sampler (CPT/SPT/CD)	CPT	Peak Ground Accel. (M = 6.11) =	0.49 g
Ground Surface Elevation	838 ft. above MSL	Approx. Distance From Site =	1.0
Existing Ground Water Depth	50.0 ft. BGS	Basic Earthquake Magnitude =	7.5
Historic Ground Water Depth	25.0 ft. BGS	Magnitude Weighted PGA (M = 7.5) =	0.29 g
		Magnitude Scaling Factor =	1.69

Conditions: CPT Interpretation based on ground water conditions at time of investigation

Evaluation of cyclic stress ratio based on historic high ground water conditions

Vol. Strain Ratio For Dry Sands= 0.637

Layer No.	Depth of layer below ground surface [ft]		Layer Thickness	H.H. Effective Vertical Stress, σ'_{vo}	Cone Tip Resistance, q_t	Cyclic Stress Ratio, CSR	Calculated Factor of Safety, FS	Dry Settlement										Wet Settlement		Cumulative Settlement
								a	b	Low Strain Shear Modulus G_{max}	Induced Cyclic Stress (γ_{eff} x G_{eff})	γ_{eff} x (G_{eff} / G_{max})	Cyclic Shear Strain, γ_{cyc} (γ_{eff} x 100)	Volumetric Strain M = 7.5	Volumetric Strain M = 6.5	Volumetric Strain w/ 3D Effect	Settlement	Volumetric Strain, %	Settlement	
	Top	Bottom	[ft]	[psf]	[ksf]		$CRR_{7.5}$/CSR*			[psf]	M=7.5 [ksf]		[%]	[%]	[%]	[%]	[inches]	[%]	[inches]	[inches]
1	0.00	0.16	0.16	#N/A	169.2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
2	0.16	0.33	0.17	#N/A	150.7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
3	0.33	0.49	0.16	#N/A	126.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
4	0.49	0.66	0.17	#N/A	101.3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
5	0.66	0.82	0.16	#N/A	83.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
6	0.82	0.98	0.16	#N/A	62.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
7	0.98	1.15	0.17	#N/A	47.0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
8	1.15	1.31	0.16	#N/A	37.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
9	1.31	1.48	0.17	#N/A	32.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
10	1.48	1.64	0.16	#N/A	35.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
11	1.64	1.80	0.16	#N/A	50.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
12	1.80	1.97	0.17	#N/A	63.9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
13	1.97	2.13	0.16	#N/A	77.9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
14	2.13	2.30	0.17	#N/A	91.4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
15	2.30	2.46	0.16	#N/A	101.5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
16	2.46	2.62	0.16	#N/A	109.9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
17	2.62	2.79	0.17	#N/A	117.1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
18	2.79	2.95	0.16	#N/A	121.8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.000			0.000
19	2.95	3.12	0.17	3.12	123.9	0.19	1.205	0.586	2.82	82289	0.001	7.19E-06	7.71E-04	0.001	0.001	0.001	0.000			0.000
20	3.12	3.28	0.16	17.89	126.3	0.19	1.251	0.625	2.54	196909	0.003	1.72E-05	1.49E-03	0.002	0.001	0.002	0.000			0.000
21	3.28	3.44	0.16	32.16	124.7	0.19	1.220	0.639	2.46	263999	0.006	2.31E-05	2.15E-03	0.002	0.001	0.003	0.000			0.000
22	3.44	3.61	0.17	38.19	124.5	0.19	1.218	0.643	2.43	321180	0.007	2.25E-05	2.07E-03	0.002	0.001	0.002	0.000			0.000
23	3.61	3.77	0.16	71.97	129.3	0.19	1.310	0.658	2.34	394962	0.014	3.45E-05	3.80E-03	0.004	0.003	0.005	0.000			0.000
24	3.77	3.94	0.17	101.85	133.0	0.19	2.000	0.666	2.29	524524	0.019	3.67E-05	4.07E-03	0.003	0.002	0.004	0.000			0.000
25	3.94	4.10	0.16	124.03	157.2	0.19	2.000	0.671	2.27	612955	0.023	3.82E-05	4.26E-03	0.003	0.002	0.004	0.000			0.000
26	4.10	4.27	0.17	140.97	141.4	0.19	2.000	0.674	2.25	623457	0.027	4.27E-05	5.06E-03	0.004	0.002	0.005	0.000			0.000
27	4.27	4.43	0.16	157.39	143.7	0.19	1.891	0.677	2.23	645172	0.030	4.61E-05	5.68E-03	0.005	0.003	0.006	0.000			0.000
28	4.43	4.59	0.16	175.10	148.1	0.19	1.900	0.680	2.22	687741	0.033	4.81E-05	6.02E-03	0.005	0.003	0.006	0.000			0.000
29	4.59	4.76	0.17	194.64	151.3	0.19	1.977	0.682	2.21	725103	0.037	5.07E-05	6.49E-03	0.005	0.003	0.006	0.000			0.000
30	4.76	4.92	0.16	213.01	151.2	0.19	1.859	0.685	2.19	750564	0.040	5.35E-05	7.06E-03	0.006	0.004	0.007	0.000			0.000
31	4.92	5.09	0.17	232.66	156.0	0.19	1.895	0.687	2.18	784428	0.044	5.59E-05	7.52E-03	0.006	0.004	0.008	0.000			0.000
32	5.09	5.25	0.16	253.12	163.3	0.19	2.000	0.689	2.17	826894	0.048	5.77E-05	7.83E-03	0.006	0.004	0.008	0.000			0.000
33	5.25	5.41	0.16	271.31	169.1	0.19	1.978	0.691	2.16	856081	0.051	5.97E-05	8.22E-03	0.006	0.004	0.008	0.000			0.000
34	5.41	5.58	0.17	292.15	176.8	0.19	2.000	0.693	2.15	897518	0.055	6.13E-05	8.50E-03	0.006	0.004	0.008	0.000			0.000
35	5.58	5.74	0.16	313.84	183.0	0.19	2.000	0.694	2.14	939546	0.059	6.29E-05	8.77E-03	0.006	0.004	0.008	0.000			0.000
36	5.74	5.91	0.17	329.90	186.3	0.19	2.000	0.696	2.14	953738	0.062	6.51E-05	9.25E-03	0.007	0.004	0.009	0.000			0.000
37	5.91	6.07	0.16	348.76	186.8	0.19	2.000	0.697	2.13	970623	0.066	6.76E-05	9.80E-03	0.008	0.005	0.010	0.000			0.000
38	6.07	6.23	0.16	370.94	184.0	0.19	2.000	0.699	2.12	1011324	0.070	6.90E-05	1.00E-02	0.008	0.005	0.010	0.000			0.000
39	6.23	6.40	0.17	389.76	188.6	0.19	2.000	0.700	2.12	1036661	0.073	7.07E-05	1.04E-02	0.008	0.005	0.010	0.000			0.000

CYCLIC SETTLEMENT ANALYSIS

Layer No.	Depth of layer below ground surface [ft]		Layer Thickness	H.H. Effective Vertical Stress, σ'_{vo}	Cone Tip Resistance, q_t	Cyclic Stress Ratio, CSR	Calculated Factor of Safety, FS	Dry Settlement										Wet Settlement		Cumulative Settlement
								a	b	Low Strain Shear Modulus G_{max}	Induced Cyclic Stress (γ_{eff} x G_{eff})	γ_{eff} x (G_{eff} / G_{max})	Cyclic Shear Strain, γ_{cyc} (γ_{eff} x 100)	Volumetric Strain M = 7.5	Volumetric Strain M = 6.5	Volumetric Strain w/ 3D Effect	Settlement	Volumetric Strain, %	Settlement	
	Top	Bottom	[ft]	[psf]	[ksf]		$CRR_{7.5}$/CSR*			[psf]	M=7.5 [ksf]		[%]	[%]	[%]	[%]	[inches]	[%]	[inches]	[inches]
40	6.40	6.56	0.16	411.20	192.0	0.19	2.000	0.701	2.11	1064794	0.077	7.26E-05	1.08E-02	0.008	0.005	0.010	0.000			0.000
41	6.56	6.73	0.17	428.45	196.7	0.19	2.000	0.702	2.10	1086894	0.080	7.40E-05	1.11E-02	0.008	0.005	0.011	0.000			0.000
42	6.73	6.89	0.16	449.98	200.8	0.19	2.000	0.704	2.10	1113866	0.084	7.59E-05	1.14E-02	0.009	0.005	0.011	0.000			0.000
43	6.89	7.05	0.16	469.74	203.1	0.19	2.000	0.705	2.09	1138068	0.088	7.75E-05	1.18E-02	0.009	0.006	0.011	0.000			0.000
44	7.05	7.22	0.17	487.34	203.9	0.19	2.000	0.706	2.09	1159191	0.091	7.89E-05	1.20E-02	0.009	0.006	0.012	0.000			0.000
45	7.22	7.38	0.16	507.56	190.9	0.19	1.935	0.707	2.08	1170926	0.095	8.13E-05	1.26E-02	0.010	0.006	0.012	0.000			0.000
46	7.38	7.55	0.17	525.46	200.5	0.19	1.933	0.708	2.08	1191386	0.099	8.27E-05	1.29E-02	0.010	0.006	0.013	0.000			0.000
47	7.55	7.71	0.16	544.10	196.4	0.19	1.848	0.709	2.07	1199574	0.102	8.50E-05	1.35E-02	0.011	0.007	0.014	0.000			0.000
48	7.71	7.87	0.16	564.12	197.4	0.19	1.860	0.710	2.07	1221445	0.106	8.65E-05	1.38E-02	0.011	0.007	0.014	0.000			0.000
49	7.87	8.04	0.17	577.79	199.3	0.19	1.798	0.710	2.07	1222713	0.108	8.85E-05	1.43E-02	0.012	0.008	0.015	0.000			0.000
50	8.04	8.20	0.16	600.01	199.2	0.19	1.747	0.711	2.06	1246002	0.112	9.01E-05	1.46E-02	0.012	0.008	0.015	0.000			0.000
51	8.20	8.37	0.17	656.88	206.8	0.19	2.000	0.714	2.05	1410602	0.123	8.71E-05	1.34E-02	0.009	0.006	0.011	0.000			0.000
52	8.37	8.53	0.16	638.45	257.8	0.19	Non Liquefiable	0.713	2.05	1326788	0.119	9.00E-05	1.43E-02	0.011	0.007	0.014	0.000			0.000
53	8.53	8.69	0.16	696.30	140.0	0.19	2.000	0.715	2.04	1426377	0.130	9.13E-05	1.43E-02	0.010	0.006	0.013	0.000			0.000
54	8.69	8.86	0.17	723.72	241.3	0.19	Non Liquefiable	0.716	2.04	1518617	0.135	8.91E-05	1.35E-02	0.008	0.005	0.010	0.000			0.000
55	8.86	9.02	0.16	735.80	171.9	0.19	2.000	0.717	2.04	1438604	0.137	9.56E-05	1.54E-02	0.011	0.007	0.014	0.000			0.000
56	9.02	9.19	0.17	727.91	151.4	0.19	1.437	0.716	2.04	1341200	0.136	1.01E-04	1.73E-02	0.015	0.010	0.019	0.000			0.000
57	9.19	9.35	0.16	750.00	140.6	0.19	1.400	0.717	2.03	1344993	0.140	1.04E-04	1.80E-02	0.017	0.011	0.021	0.000			0.000
58	9.35	9.51	0.16	762.63	132.1	0.19	1.239	0.717	2.03	1321921	0.142	1.08E-04	1.91E-02	0.019	0.012	0.024	0.000			0.001
59	9.51	9.68	0.17	781.74	136.1	0.19	1.233	0.718	2.03	1338379	0.146	1.09E-04	1.94E-02	0.019	0.012	0.025	0.001			0.001
60	9.68	9.84	0.16	794.70	139.7	0.19	1.156	0.719	2.03	1349429	0.148	1.10E-04	1.96E-02	0.019	0.012	0.025	0.000			0.002
61	9.84	10.01	0.17	814.00	131.9	0.19	1.106	0.719	2.02	1347255	0.152	1.13E-04	2.04E-02	0.021	0.013	0.027	0.001			0.002
62	10.01	10.17	0.16	829.88	133.2	0.19	1.065	0.720	2.02	1360336	0.155	1.14E-04	2.07E-02	0.021	0.014	0.027	0.001			0.003
63	10.17	10.33	0.16	844.74	126.5	0.19	0.995	0.720	2.02	1353129	0.157	1.16E-04	2.15E-02	0.023	0.015	0.029	0.001			0.003
64	10.33	10.50	0.17	871.74	125.4	0.19	1.048	0.721	2.02	1374581	0.162	1.18E-04	2.19E-02	0.024	0.015	0.030	0.001			0.004
65	10.50	10.66	0.16	894.07	126.8	0.19	1.070	0.722	2.01	1392077	0.166	1.20E-04	2.22E-02	0.024	0.015	0.030	0.001			0.004
66	10.66	10.83	0.17	891.01	130.0	0.19	0.910	0.722	2.01	1369251	0.166	1.21E-04	2.28E-02	0.026	0.016	0.033	0.001			0.005
67	10.83	10.99	0.16	920.79	135.5	0.19	0.985	0.722	2.01	1412726	0.171	1.21E-04	2.26E-02	0.024	0.015	0.031	0.001			0.006
68	10.99	11.15	0.16	941.91	137.0	0.19	0.998	0.723	2.01	1428835	0.175	1.23E-04	2.29E-02	0.025	0.016	0.031	0.001			0.006
69	11.15	11.32	0.17	961.05	129.1	0.19	0.957	0.724	2.00	1422049	0.179	1.26E-04	2.38E-02	0.027	0.017	0.034	0.001			0.007
70	11.32	11.48	0.16	979.63	124.8	0.19	0.930	0.724	2.00	1413640	0.182	1.29E-04	2.48E-02	0.029	0.019	0.037	0.001			0.008
71	11.48	11.65	0.17	996.06	121.7	0.19	0.896	0.725	2.00	1425441	0.185	1.30E-04	2.51E-02	0.030	0.019	0.038	0.001			0.008
72	11.65	11.81	0.16	1027.63	119.5	0.19	0.967	0.725	2.00	1447856	0.191	1.32E-04	2.55E-02	0.030	0.019	0.038	0.001			0.009
73	11.81	11.97	0.16	1037.60	114.0	0.19	0.888	0.726	2.00	1431393	0.192	1.34E-04	2.65E-02	0.033	0.021	0.042	0.001			0.010
74	11.97	12.14	0.17	1053.32	105.1	0.19	0.848	0.726	1.99	1510975	0.195	1.29E-04	2.44E-02	0.026	0.017	0.033	0.001			0.011
75	12.14	12.30	0.16	1055.56	94.6	0.19	0.745	0.726	1.99	1490333	0.196	1.31E-04	2.51E-02	0.028	0.018	0.036	0.001			0.011
76	12.30	12.47	0.17	1064.00	83.0	0.19	0.694	0.726	1.99	1449489	0.197	1.36E-04	2.68E-02	0.033	0.021	0.042	0.001			0.012
77	12.47	12.63	0.16	1075.44	73.3	0.19	0.667	0.727	1.99	1432554	0.199	1.39E-04	2.79E-02	0.036	0.023	0.046	0.001			0.013
78	12.63	12.80	0.17	1091.89	67.8	0.19	0.663	0.727	1.99	1443468	0.202	1.40E-04	2.82E-02	0.037	0.023	0.047	0.001			0.014
79	12.80	12.96	0.16	1111.28	67.8	0.19	0.664	0.727	1.99	1456233	0.206	1.41E-04	2.84E-02	0.037	0.024	0.047	0.001			0.015
80	12.96	13.12	0.16	1130.37	72.4	0.19	0.660	0.728	1.99	1468684	0.209	1.42E-04	2.87E-02	0.037	0.024	0.048	0.001			0.016
81	13.12	13.29	0.17	1149.72	74.1	0.18	0.658	0.728	1.98	1481203	0.213	1.44E-04	2.90E-02	0.038	0.024	0.048	0.001			0.017
82	13.29	13.45	0.16	1169.59	74.3	0.18	0.660	0.729	1.98	1493947	0.216	1.45E-04	2.92E-02	0.038	0.024	0.049	0.001			0.018
83	13.45	13.62	0.17	1187.31	75.1	0.18	0.654	0.729	1.98	1505223	0.219	1.46E-04	2.95E-02	0.038	0.024	0.049	0.001			0.019
84	13.62	13.78	0.16	1207.50	73.5	0.18	0.658	0.730	1.98	1517963	0.223	1.47E-04	2.97E-02	0.039	0.025	0.049	0.001			0.020
85	13.78	13.94	0.16	1233.36	72.1	0.18	0.686	0.730	1.98	1534133	0.228	1.48E-04	3.01E-02	0.039	0.025	0.050	0.001			0.021
86	13.94	14.11	0.17	1247.96	71.5	0.18	0.669	0.731	1.97	1543188	0.230	1.49E-04	3.02E-02	0.039	0.025	0.050	0.001			0.022
87	14.11	14.27	0.16	1249.46	73.7	0.18	0.616	0.731	1.97	1516536	0.231	1.52E-04	3.14E-02	0.043	0.028	0.055	0.001			0.023
88	14.27	14.44	0.17	1273.11	79.0	0.18	0.625	0.731	1.97	1558663	0.235	1.51E-04	3.05E-02	0.040	0.025	0.051	0.001			0.024

CYCLIC SETTLEMENT ANALYSIS

Layer No.	Depth of layer below ground surface [ft]		Layer Thickness	H.H. Effective Vertical Stress, σ'_{vo}	Cone Tip Resistance, q_t	Cyclic Stress Ratio, CSR	Calculated Factor of Safety, FS	Dry Settlement										Wet Settlement		Cumulative Settlement
								a	b	Low Strain Shear Modulus G_{max}	Induced Cyclic Stress (γ_{eff} x G_{eff})	γ_{eff} x (G_{eff} / G_{max})	Cyclic Shear Strain, γ_{cyc} (γ_{eff} x 100)	Volumetric Strain M = 7.5	Volumetric Strain M = 6.5	Volumetric Strain w/ 3D Effect	Settlement	Volumetric Strain, %	Settlement	
	Top	Bottom	[ft]	[psf]	[ksf]		$CRR_{7.5}$/CSR*			[psf]	M=7.5 [ksf]		[%]	[%]	[%]	[%]	[inches]	[%]	[inches]	[inches]
89	14.44	14.60	0.16	1298.09	76.1	0.18	0.640	0.732	1.97	1573876	0.239	1.52E-04	3.09E-02	0.040	0.026	0.051	0.001			0.025
90	14.60	14.76	0.16	1321.98	77.3	0.18	0.653	0.732	1.97	1588294	0.244	1.53E-04	3.12E-02	0.041	0.026	0.052	0.001			0.026
91	14.76	14.93	0.17	1353.05	78.7	0.18	0.689	0.733	1.96	1606851	0.249	1.55E-04	3.15E-02	0.041	0.026	0.052	0.001			0.027
92	14.93	15.09	0.16	1389.20	81.4	0.18	0.751	0.733	1.96	1656250	0.256	1.54E-04	3.09E-02	0.038	0.024	0.049	0.001			0.028
93	15.09	15.26	0.17	1426.54	88.0	0.18	0.827	0.734	1.96	1705884	0.263	1.54E-04	3.04E-02	0.036	0.023	0.046	0.001			0.029
94	15.26	15.42	0.16	1463.50	100.1	0.18	0.904	0.735	1.95	1754843	0.269	1.53E-04	2.98E-02	0.034	0.021	0.043	0.001			0.030
95	15.42	15.58	0.16	1495.75	117.7	0.18	0.962	0.735	1.95	1826280	0.275	1.51E-04	2.85E-02	0.029	0.019	0.038	0.001			0.030
96	15.58	15.75	0.17	1519.05	126.9	0.18	0.975	0.736	1.95	1840452	0.279	1.52E-04	2.87E-02	0.030	0.019	0.038	0.001			0.031
97	15.75	15.91	0.16	1536.89	125.9	0.18	0.957	0.736	1.95	1851223	0.282	1.53E-04	2.89E-02	0.030	0.019	0.038	0.001			0.032
98	15.91	16.08	0.17	1549.97	114.6	0.18	0.917	0.736	1.95	1832896	0.285	1.55E-04	2.98E-02	0.032	0.020	0.041	0.001			0.033
99	16.08	16.24	0.16	1556.38	92.9	0.18	0.873	0.737	1.95	1781825	0.286	1.60E-04	3.17E-02	0.037	0.024	0.048	0.001			0.034
100	16.24	16.40	0.16	1553.98	69.5	0.18	0.833	0.737	1.95	1751726	0.285	1.63E-04	3.27E-02	0.041	0.026	0.052	0.000			0.034
101	16.40	16.57	0.17	1555.19	61.5	0.18	0.879	0.737	1.95	1722703	0.285	1.66E-04	3.38E-02	0.044	0.028	0.056	0.000			0.034
102	16.57	16.73	0.16	1557.23	60.1	0.18	0.705	0.737	1.95	1693040	0.286	1.69E-04	3.50E-02	0.048	0.031	0.061	0.000			0.034
103	16.73	16.90	0.17	1574.65	60.6	0.18	0.696	0.737	1.95	1702485	0.289	1.70E-04	3.52E-02	0.049	0.031	0.062	0.000			0.034
104	16.90	17.06	0.16	1584.07	61.7	0.18	0.661	0.737	1.95	1707571	0.290	1.70E-04	3.53E-02	0.049	0.031	0.062	0.000			0.034
105	17.06	17.22	0.16	1654.47	66.2	0.18	1.237	0.738	1.94	1776840	0.303	1.71E-04	3.48E-02	0.045	0.029	0.058	0.000			0.034
106	17.22	17.39	0.17	1676.37	84.7	0.18	0.794	0.739	1.94	1819405	0.307	1.69E-04	3.39E-02	0.042	0.027	0.054	0.001			0.035
107	17.39	17.55	0.16	1680.27	80.8	0.18	0.737	0.739	1.94	1790637	0.308	1.72E-04	3.51E-02	0.046	0.029	0.058	0.001			0.036
108	17.55	17.72	0.17	1728.79	81.5	0.18	0.869	0.739	1.94	1847632	0.316	1.71E-04	3.44E-02	0.043	0.027	0.054	0.000			0.036
109	17.72	17.88	0.16	1780.45	87.6	0.18	1.059	0.740	1.93	1935560	0.326	1.68E-04	3.28E-02	0.037	0.024	0.047	0.000			0.036
110	17.88	18.04	0.16	1817.06	106.2	0.18	1.103	0.741	1.93	1984547	0.332	1.67E-04	3.22E-02	0.035	0.022	0.044	0.001			0.037
111	18.04	18.21	0.17	1847.76	128.2	0.18	1.110	0.741	1.93	2029836	0.338	1.66E-04	3.16E-02	0.033	0.021	0.042	0.001			0.037
112	18.21	18.37	0.16	1868.29	137.2	0.18	1.090	0.742	1.93	2069045	0.341	1.65E-04	3.09E-02	0.031	0.020	0.039	0.001			0.038
113	18.37	18.54	0.17	1894.80	153.9	0.18	1.117	0.742	1.93	2111088	0.346	1.64E-04	3.04E-02	0.029	0.018	0.037	0.001			0.039
114	18.54	18.70	0.16	1916.81	159.4	0.18	1.123	0.742	1.92	2123318	0.350	1.65E-04	3.05E-02	0.029	0.019	0.037	0.001			0.040
115	18.70	18.86	0.16	1955.59	167.6	0.18	1.259	0.743	1.92	2171838	0.357	1.64E-04	3.01E-02	0.028	0.018	0.035	0.001			0.040
116	18.86	19.03	0.17	1991.78	199.0	0.18	1.411	0.743	1.92	2244681	0.363	1.62E-04	2.90E-02	0.025	0.016	0.032	0.000			0.040
117	19.03	19.19	0.16	2012.22	239.1	0.18	1.543	0.744	1.92	2229928	0.367	1.65E-04	2.98E-02	0.026	0.017	0.034	0.000			0.040
118	19.19	19.36	0.17	2013.39	249.1	0.18	1.480	0.744	1.92	2230580	0.367	1.65E-04	2.98E-02	0.026	0.017	0.034	0.000			0.040
119	19.36	19.52	0.16	2021.00	237.3	0.18	1.345	0.744	1.92	2207862	0.368	1.67E-04	3.05E-02	0.028	0.018	0.036	0.000			0.040
120	19.52	19.68	0.16	2030.94	221.5	0.18	1.217	0.744	1.92	2157226	0.370	1.71E-04	3.21E-02	0.032	0.020	0.041	0.001			0.041
121	19.68	19.85	0.17	2035.70	205.1	0.18	1.087	0.744	1.92	2130563	0.371	1.74E-04	3.30E-02	0.034	0.022	0.043	0.001			0.042
122	19.85	20.01	0.16	2046.68	184.3	0.18	0.981	0.744	1.92	2075232	0.372	1.79E-04	3.49E-02	0.039	0.025	0.050	0.001			0.043
123	20.01	20.18	0.17	2074.12	165.5	0.18	0.960	0.744	1.91	2180041	0.377	1.73E-04	3.24E-02	0.032	0.020	0.041	0.001			0.044
124	20.18	20.34	0.16	2101.25	161.6	0.18	0.979	0.745	1.91	2194251	0.382	1.74E-04	3.26E-02	0.032	0.021	0.041	0.001			0.045
125	20.34	20.51	0.17	2125.17	168.7	0.18	0.998	0.745	1.91	2206702	0.386	1.75E-04	3.27E-02	0.032	0.021	0.041	0.001			0.045
126	20.51	20.67	0.16	2134.49	166.8	0.18	0.948	0.745	1.91	2211539	0.388	1.75E-04	3.28E-02	0.033	0.021	0.041	0.001			0.046
127	20.67	20.83	0.16	2081.94	135.6	0.18	0.721	0.744	1.91	2060823	0.378	1.83E-04	3.61E-02	0.043	0.027	0.054	0.001			0.047
128	20.83	21.00	0.17	2077.44	101.5	0.18	0.664	0.744	1.91	1991052	0.377	1.89E-04	3.85E-02	0.050	0.032	0.064	0.001			0.049
129	21.00	21.16	0.16	2081.69	65.9	0.18	0.887	0.744	1.91	1920546	0.378	1.97E-04	4.14E-02	0.060	0.038	0.077	0.000			0.049
130	21.16	21.33	0.17	2080.55	54.3	0.18	2.000	0.744	1.91	1881611	0.377	2.01E-04	4.31E-02	0.067	0.042	0.085	0.000			0.049
131	21.33	21.49	0.16	2101.46	51.8	0.18	2.000	0.745	1.91	1891044	0.381	2.01E-04	4.32E-02	0.067	0.043	0.085	0.000			0.049
132	21.49	21.65	0.16	2139.78	57.4	0.18	2.000	0.745	1.91	1947161	0.388	1.99E-04	4.19E-02	0.061	0.039	0.078	0.000			0.049
133	21.65	21.82	0.17	2216.44	72.6	0.18	2.000	0.746	1.91	2056583	0.402	1.95E-04	3.96E-02	0.052	0.033	0.066	0.000			0.049
134	21.82	21.98	0.16	2294.26	115.7	0.18	0.948	0.747	1.90	2197165	0.415	1.89E-04	3.66E-02	0.041	0.026	0.053	0.001			0.050
135	21.98	22.15	0.17	2356.14	185.3	0.18	1.093	0.748	1.90	2354107	0.427	1.81E-04	3.34E-02	0.032	0.020	0.041	0.001			0.050
136	22.15	22.31	0.16	2390.78	232.5	0.18	1.263	0.748	1.90	2340546	0.433	1.85E-04	3.44E-02	0.034	0.022	0.043	0.001			0.051
137	22.31	22.47	0.16	2420.64	237.8	0.18	1.316	0.749	1.90	2355117	0.438	1.86E-04	3.46E-02	0.034	0.022	0.044	0.000			0.051

CYCLIC SETTLEMENT ANALYSIS

Layer No.	Depth of layer below ground surface [ft]		Layer Thickness	H.H. Effective Vertical Stress, σ'_{vo}	Cone Tip Resistance, q_t	Cyclic Stress Ratio, CSR	Calculated Factor of Safety, FS	Dry Settlement										Wet Settlement		Cumulative Settlement
								a	b	Low Strain Shear Modulus G_{max}	Induced Cyclic Stress (γ_{eff} x G_{eff})	γ_{eff} x (G_{eff} / G_{max})	Cyclic Shear Strain, γ_{cyc} (γ_{eff} x 100)	Volumetric Strain M = 7.5	Volumetric Strain M = 6.5	Volumetric Strain w/ 3D Effect	Settlement	Volumetric Strain, %	Settlement	
	Top	Bottom	[ft]	[psf]	[ksf]		$CRR_{7.5}$/CSR*			[psf]	M=7.5 [ksf]		[%]	[%]	[%]	[%]	[inches]	[%]	[inches]	[inches]
138	22.47	22.64	0.17	2429.73	214.1	0.18	1.184	0.749	1.90	2327645	0.439	1.89E-04	3.55E-02	0.037	0.023	0.047	0.001			0.052
139	22.64	22.80	0.16	2427.88	192.5	0.18	1.043	0.749	1.90	2389672	0.439	1.84E-04	3.37E-02	0.032	0.020	0.041	0.001			0.053
140	22.80	22.97	0.17	2445.97	182.2	0.18	1.014	0.749	1.90	2367408	0.442	1.87E-04	3.47E-02	0.034	0.022	0.044	0.001			0.054
141	22.97	23.13	0.16	2436.47	159.5	0.18	0.889	0.749	1.90	2298039	0.440	1.91E-04	3.65E-02	0.039	0.025	0.050	0.001			0.055
142	23.13	23.29	0.16	2439.47	144.6	0.18	0.834	0.749	1.90	2265630	0.440	1.94E-04	3.75E-02	0.042	0.027	0.054	0.001			0.056
143	23.29	23.46	0.17	2441.57	132.4	0.18	0.785	0.749	1.90	2231730	0.441	1.97E-04	3.86E-02	0.046	0.029	0.058	0.001			0.057
144	23.46	23.62	0.16	2454.97	141.9	0.18	0.768	0.749	1.90	2237846	0.443	1.98E-04	3.87E-02	0.046	0.029	0.058	0.001			0.058
145	23.62	23.79	0.17	2499.65	148.0	0.18	0.826	0.750	1.89	2293410	0.451	1.97E-04	3.79E-02	0.043	0.027	0.054	0.001			0.059
146	23.79	23.95	0.16	2488.08	145.1	0.18	0.752	0.749	1.89	2252889	0.448	1.99E-04	3.89E-02	0.046	0.029	0.058	0.001			0.060
147	23.95	24.11	0.16	2503.39	139.0	0.18	0.740	0.750	1.89	2259806	0.451	2.00E-04	3.90E-02	0.046	0.029	0.059	0.001			0.062
148	24.11	24.28	0.17	2518.91	127.5	0.18	0.729	0.750	1.89	2230233	0.454	2.03E-04	4.03E-02	0.050	0.032	0.064	0.001			0.063
149	24.28	24.44	0.16	2538.05	126.1	0.18	0.727	0.750	1.89	2238692	0.457	2.04E-04	4.04E-02	0.050	0.032	0.064	0.001			0.064
150	24.44	24.61	0.17	2544.99	120.8	0.18	0.703	0.750	1.89	2203747	0.458	2.08E-04	4.18E-02	0.055	0.035	0.069	0.001			0.066
151	24.61	24.77	0.16	2553.64	105.9	0.18	0.692	0.750	1.89	2207490	0.459	2.08E-04	4.18E-02	0.055	0.035	0.069	0.001			0.067
152	24.77	24.93	0.16	2549.57	90.3	0.18	0.669	0.750	1.89	2166331	0.458	2.12E-04	4.32E-02	0.060	0.038	0.076	0.000			0.067
153	24.93	25.10	0.17	2536.96	84.2	0.18	0.628	0.750	1.89	1938825	0.456	2.35E-04	5.34E-02	0.102	0.065	0.130	0.000	2.10	0.04	0.110
154	25.10	25.26	0.16	2570.30	75.5	0.18	0.943	0.750	1.89	1900144	0.464	2.44E-04	5.70E-02	0.118	0.075	0.150	0.000	2.30	0.04	0.154
155	25.26	25.43	0.17	2598.76	89.9	0.18	0.684	0.751	1.89	2011374	0.471	2.34E-04	5.21E-02	0.092	0.059	0.118	0.000	1.90	0.04	0.193
156	25.43	25.59	0.16	2593.20	76.0	0.18	1.008	0.751	1.89	1908588	0.471	2.47E-04	5.81E-02	0.120	0.076	0.153	0.000	2.30	0.04	0.237
157	25.59	25.75	0.16	2574.23	75.0	0.18	0.714	0.750	1.89	1901597	0.469	2.47E-04	5.83E-02	0.121	0.077	0.153	0.000	2.30	0.04	0.281
158	25.75	25.92	0.17	2583.33	75.6	0.18	0.698	0.750	1.89	1904953	0.473	2.48E-04	5.88E-02	0.122	0.077	0.155	0.000	2.30	0.05	0.328
159	25.92	26.08	0.16	2586.33	78.8	0.18	0.612	0.750	1.89	1906060	0.475	2.49E-04	5.93E-02	0.122	0.078	0.156	0.000	2.30	0.04	0.372
160	26.08	26.25	0.17	2585.14	79.1	0.18	0.596	0.750	1.89	1905621	0.476	2.50E-04	5.97E-02	0.123	0.078	0.157	0.000	2.30	0.05	0.419
161	26.25	26.41	0.16	2581.91	76.7	0.18	0.583	0.750	1.89	1904430	0.477	2.51E-04	6.00E-02	0.124	0.079	0.158	0.000	2.30	0.04	0.463
162	26.41	26.57	0.16	2616.21	82.9	0.19	0.602	0.751	1.89	1917040	0.485	2.53E-04	6.08E-02	0.126	0.080	0.160	0.000	2.30	0.04	0.507
163	26.57	26.74	0.17	2616.17	90.5	0.19	0.582	0.751	1.89	1968861	0.487	2.47E-04	5.80E-02	0.111	0.070	0.141	0.000	2.10	0.04	0.550
164	26.74	26.90	0.16	2636.14	99.3	0.19	0.585	0.751	1.89	1976358	0.492	2.49E-04	5.85E-02	0.112	0.071	0.142	0.000	2.10	0.04	0.590
165	26.90	27.07	0.17	2656.28	104.8	0.19	0.591	0.751	1.89	1983895	0.497	2.51E-04	5.91E-02	0.113	0.072	0.144	0.000	2.10	0.04	0.633
166	27.07	27.23	0.16	2680.06	110.4	0.19	0.601	0.751	1.89	2042595	0.503	2.46E-04	5.68E-02	0.101	0.064	0.128	0.000	1.90	0.04	0.670
167	27.23	27.39	0.16	2689.16	120.5	0.19	0.597	0.752	1.89	2046059	0.506	2.47E-04	5.72E-02	0.101	0.065	0.129	0.000	1.90	0.04	0.706
168	27.39	27.56	0.17	2698.05	121.5	0.19	0.594	0.752	1.88	2049440	0.510	2.49E-04	5.76E-02	0.102	0.065	0.130	0.000	1.90	0.04	0.745
169	27.56	27.72	0.16	2714.98	108.3	0.19	0.602	0.752	1.88	2005698	0.514	2.56E-04	6.11E-02	0.117	0.074	0.148	0.000	2.10	0.04	0.785
170	27.72	27.89	0.17	2712.48	95.8	0.19	0.596	0.752	1.88	2004772	0.515	2.57E-04	6.14E-02	0.117	0.075	0.149	0.000	2.10	0.04	0.828
171	27.89	28.05	0.16	2707.03	85.8	0.19	0.587	0.752	1.88	1950028	0.516	2.65E-04	6.52E-02	0.135	0.086	0.172	0.000	2.30	0.04	0.872
172	28.05	28.21	0.16	2696.03	82.6	0.19	0.568	0.752	1.88	1946062	0.516	2.65E-04	6.55E-02	0.135	0.086	0.172	0.000	2.30	0.04	0.916
173	28.21	28.38	0.17	2687.54	82.4	0.19	0.550	0.752	1.89	1942997	0.516	2.65E-04	6.59E-02	0.136	0.087	0.173	0.000	2.30	0.05	0.963
174	28.38	28.54	0.16	2683.06	83.3	0.19	0.536	0.751	1.89	1941376	0.517	2.66E-04	6.63E-02	0.137	0.087	0.174	0.000	2.30	0.04	1.008
175	28.54	28.71	0.17	2699.25	84.7	0.19	0.539	0.752	1.88	1947226	0.521	2.68E-04	6.68E-02	0.138	0.088	0.176	0.000	2.30	0.05	1.054
176	28.71	28.87	0.16	2714.53	85.2	0.19	0.541	0.752	1.88	1952729	0.525	2.69E-04	6.74E-02	0.139	0.089	0.177	0.000	2.30	0.04	1.099
177	28.87	29.04	0.17	2728.50	85.0	0.19	0.544	0.752	1.88	1957747	0.530	2.70E-04	6.79E-02	0.140	0.089	0.179	0.000	2.30	0.05	1.146
178	29.04	29.20	0.16	2740.31	84.4	0.19	0.545	0.752	1.88	1961980	0.533	2.72E-04	6.84E-02	0.141	0.090	0.180	0.000	2.30	0.04	1.190
179	29.20	29.36	0.16	2743.72	85.2	0.20	0.538	0.752	1.88	1963200	0.535	2.73E-04	6.88E-02	0.142	0.091	0.181	0.000	2.30	0.04	1.234
180	29.36	29.53	0.17	2740.58	86.5	0.20	0.526	0.752	1.88	1962077	0.536	2.73E-04	6.92E-02	0.143	0.091	0.182	0.000	2.30	0.05	1.281
181	29.53	29.69	0.16	2749.84	84.2	0.20	0.526	0.752	1.88	1965386	0.540	2.75E-04	6.97E-02	0.144	0.092	0.183	0.000	2.30	0.04	1.325
182	29.69	29.86	0.17	2753.88	76.7	0.20	0.546	0.752	1.88	1910604	0.542	2.84E-04	7.44E-02	0.168	0.107	0.214	0.000	2.40	0.05	1.374
183	29.86	30.02	0.16	2770.31	70.8	0.20	0.840	0.752	1.88	1916296	0.547	2.85E-04	7.50E-02	0.169	0.108	0.215	0.000	2.40	0.05	1.420
184	30.02	30.18	0.16	2875.46	71.7	0.20	2.000	0.753	1.88	1952324	0.567	2.90E-04	7.60E-02	0.171	0.109	0.218	0.000	0.00	0.00	1.420
185	30.18	30.35	0.17	2902.21	87.8	0.20	1.253	0.754	1.88	2019104	0.573	2.84E-04	7.22E-02	0.149	0.095	0.190	0.000	2.30	0.05	1.467
186	30.35	30.51	0.16	2918.57	106.2	0.20	0.618	0.754	1.88	2131548	0.578	2.71E-04	6.55E-02	0.116	0.074	0.148	0.000	2.00	0.04	1.505

CYCLIC SETTLEMENT ANALYSIS

Layer No.	Depth of layer below ground surface [ft]		Layer Thickness	H.H. Effective Vertical Stress, σ'_{vo}	Cone Tip Resistance, q_t	Cyclic Stress Ratio, CSR	Calculated Factor of Safety, FS	Dry Settlement										Wet Settlement		Cumulative Settlement
								a	b	Low Strain Shear Modulus G_{max}	Induced Cyclic Stress (γ_{eff} x G_{eff})	γ_{eff} x (G_{eff} / G_{max})	Cyclic Shear Strain, γ_{cyc} (γ_{eff} x 100)	Volumetric Strain M = 7.5	Volumetric Strain M = 6.5	Volumetric Strain w/ 3D Effect	Settlement	Volumetric Strain, %	Settlement	
	Top	Bottom	[ft]	[psf]	[ksf]		$CRR_{7.5}/CSR^*$			[psf]	M=7.5 [ksf]		[%]	[%]	[%]	[%]	[inches]	[%]	[inches]	[inches]
187	30.51	30.68	0.17	2917.67	136.8	0.20	0.586	0.754	1.88	2180802	0.579	2.66E-04	6.29E-02	0.104	0.066	0.132	0.000	1.80	0.04	1.542
188	30.68	30.84	0.16	2920.69	140.0	0.20	0.579	0.754	1.88	2181927	0.581	2.66E-04	6.33E-02	0.105	0.067	0.133	0.000	1.80	0.03	1.577
189	30.84	31.00	0.16	2939.81	133.3	0.20	0.585	0.754	1.88	2139292	0.586	2.74E-04	6.67E-02	0.118	0.075	0.150	0.000	2.00	0.04	1.615
190	31.00	31.17	0.17	2948.89	134.3	0.20	0.582	0.754	1.87	2142591	0.589	2.75E-04	6.71E-02	0.119	0.076	0.151	0.000	2.00	0.04	1.656
191	31.17	31.33	0.16	2952.10	134.5	0.20	0.574	0.754	1.87	2143759	0.591	2.76E-04	6.75E-02	0.120	0.076	0.152	0.000	2.00	0.04	1.694
192	31.33	31.50	0.17	2966.25	131.8	0.20	0.577	0.754	1.87	2148887	0.596	2.77E-04	6.79E-02	0.120	0.077	0.153	0.000	2.00	0.04	1.735
193	31.50	31.66	0.16	2992.01	130.5	0.20	0.591	0.754	1.87	2158199	0.602	2.79E-04	6.84E-02	0.121	0.077	0.154	0.000	2.00	0.04	1.773
194	31.66	31.82	0.16	3028.90	133.0	0.20	0.619	0.755	1.87	2171463	0.610	2.81E-04	6.89E-02	0.122	0.078	0.155	0.000	2.00	0.04	1.812
195	31.82	31.99	0.17	3083.79	139.5	0.20	0.677	0.755	1.87	2290777	0.621	2.71E-04	6.35E-02	0.098	0.063	0.125	0.000	1.60	0.03	1.844
196	31.99	32.15	0.16	3091.77	145.4	0.20	0.667	0.755	1.87	2244924	0.624	2.78E-04	6.67E-02	0.110	0.070	0.140	0.000	1.80	0.03	1.879
197	32.15	32.32	0.17	3086.32	142.6	0.20	0.643	0.755	1.87	2242943	0.625	2.78E-04	6.70E-02	0.111	0.070	0.141	0.000	1.80	0.04	1.916
198	32.32	32.48	0.16	3089.34	142.9	0.20	0.632	0.755	1.87	2244040	0.627	2.79E-04	6.73E-02	0.111	0.071	0.142	0.000	1.80	0.03	1.950
199	32.48	32.64	0.16	3101.83	143.6	0.20	0.633	0.755	1.87	2248573	0.630	2.80E-04	6.77E-02	0.112	0.071	0.142	0.000	1.80	0.03	1.985
200	32.64	32.81	0.17	3127.10	152.3	0.20	0.647	0.756	1.87	2257715	0.636	2.82E-04	6.81E-02	0.113	0.072	0.143	0.000	1.80	0.04	2.022
201	32.81	32.97	0.16	3156.82	163.1	0.20	0.668	0.756	1.87	2317746	0.643	2.77E-04	6.56E-02	0.102	0.065	0.130	0.000	1.60	0.03	2.052
202	32.97	33.14	0.17	3147.29	173.9	0.20	0.641	0.756	1.87	2361488	0.643	2.72E-04	6.33E-02	0.092	0.059	0.118	0.000	1.50	0.03	2.083
203	33.14	33.30	0.16	3205.99	177.8	0.20	0.704	0.756	1.87	2383405	0.654	2.74E-04	6.36E-02	0.093	0.059	0.118	0.000	1.50	0.03	2.112
204	33.30	33.46	0.16	3269.56	184.6	0.20	0.801	0.757	1.86	2453217	0.666	2.71E-04	6.16E-02	0.085	0.054	0.108	0.000	1.20	0.02	2.135
205	33.46	33.63	0.17	3294.39	183.5	0.20	0.832	0.757	1.86	2462515	0.671	2.72E-04	6.18E-02	0.085	0.054	0.108	0.000	1.20	0.02	2.159
206	33.63	33.79	0.16	3225.68	177.1	0.20	0.682	0.757	1.86	2390715	0.660	2.76E-04	6.41E-02	0.094	0.060	0.119	0.000	1.50	0.03	2.188
207	33.79	33.96	0.17	3196.04	166.1	0.21	0.630	0.756	1.87	2332097	0.655	2.81E-04	6.69E-02	0.104	0.066	0.132	0.000	1.60	0.03	2.221
208	33.96	34.12	0.16	3194.44	160.3	0.21	0.615	0.756	1.87	2281892	0.656	2.88E-04	7.00E-02	0.116	0.074	0.147	0.000	1.80	0.03	2.255
209	34.12	34.28	0.16	3217.84	161.8	0.21	0.629	0.757	1.87	2290235	0.661	2.89E-04	7.02E-02	0.116	0.074	0.148	0.000	1.80	0.03	2.290
210	34.28	34.45	0.17	3238.70	169.2	0.21	0.639	0.757	1.86	2347612	0.665	2.83E-04	6.75E-02	0.105	0.067	0.133	0.000	1.60	0.03	2.322
211	34.45	34.61	0.16	3248.88	176.3	0.21	0.638	0.757	1.86	2351296	0.668	2.84E-04	6.77E-02	0.105	0.067	0.134	0.000	1.60	0.03	2.353
212	34.61	34.78	0.17	3292.86	185.3	0.21	0.678	0.757	1.86	2415482	0.676	2.80E-04	6.52E-02	0.095	0.061	0.121	0.000	1.50	0.03	2.384
213	34.78	34.94	0.16	3308.81	194.3	0.21	0.685	0.757	1.86	2421324	0.680	2.81E-04	6.54E-02	0.095	0.061	0.122	0.000	1.50	0.03	2.412
214	34.94	35.10	0.16	3305.75	197.0	0.21	0.668	0.757	1.86	2420205	0.680	2.81E-04	6.56E-02	0.096	0.061	0.122	0.000	1.50	0.03	2.441
215	35.10	35.27	0.17	3317.92	188.5	0.21	0.666	0.757	1.86	2424654	0.683	2.82E-04	6.57E-02	0.096	0.061	0.122	0.000	1.50	0.03	2.472
216	35.27	35.43	0.16	3318.89	182.2	0.21	0.652	0.757	1.86	2376496	0.684	2.88E-04	6.86E-02	0.106	0.068	0.135	0.000	1.60	0.03	2.503
217	35.43	35.60	0.17	3314.49	177.5	0.21	0.634	0.757	1.86	2374921	0.684	2.88E-04	6.87E-02	0.107	0.068	0.136	0.000	1.60	0.03	2.535
218	35.60	35.76	0.16	3327.52	179.9	0.21	0.635	0.757	1.86	2379583	0.687	2.89E-04	6.89E-02	0.107	0.068	0.136	0.000	1.60	0.03	2.566
219	35.76	35.92	0.16	3358.16	181.8	0.21	0.658	0.758	1.86	2390514	0.693	2.90E-04	6.91E-02	0.107	0.068	0.136	0.000	1.60	0.03	2.597
220	35.92	36.09	0.17	3346.90	184.7	0.21	0.632	0.758	1.86	2386504	0.692	2.90E-04	6.92E-02	0.107	0.068	0.137	0.000	1.60	0.03	2.629
221	36.09	36.25	0.16	3367.74	189.5	0.21	0.643	0.758	1.86	2442790	0.696	2.85E-04	6.67E-02	0.097	0.062	0.124	0.000	1.50	0.03	2.658
222	36.25	36.42	0.17	3388.94	189.3	0.21	0.653	0.758	1.86	2450469	0.701	2.86E-04	6.68E-02	0.097	0.062	0.124	0.000	1.50	0.03	2.689
223	36.42	36.58	0.16	3395.81	185.1	0.21	0.647	0.758	1.86	2403877	0.702	2.92E-04	6.97E-02	0.108	0.069	0.138	0.000	1.60	0.03	2.719
224	36.58	36.74	0.16	3404.73	185.7	0.21	0.644	0.758	1.86	2407035	0.705	2.93E-04	6.99E-02	0.108	0.069	0.138	0.000	1.60	0.03	2.750
225	36.74	36.91	0.17	3415.64	191.8	0.21	0.644	0.758	1.86	2460101	0.707	2.87E-04	6.73E-02	0.098	0.062	0.125	0.000	1.50	0.03	2.781
226	36.91	37.07	0.16	3419.44	197.2	0.21	0.638	0.758	1.86	2461469	0.709	2.88E-04	6.74E-02	0.098	0.063	0.125	0.000	1.50	0.03	2.810
227	37.07	37.24	0.17	3406.44	199.9	0.21	0.617	0.758	1.86	2456787	0.707	2.88E-04	6.75E-02	0.098	0.063	0.125	0.000	1.50	0.03	2.840
228	37.24	37.40	0.16	3382.09	184.6	0.21	0.582	0.758	1.86	2399018	0.704	2.93E-04	7.04E-02	0.109	0.069	0.139	0.000	1.60	0.03	2.871
229	37.40	37.57	0.17	3353.05	165.2	0.21	0.549	0.758	1.86	2337857	0.699	2.99E-04	7.36E-02	0.122	0.077	0.155	0.000	1.80	0.04	2.908
230	37.57	37.73	0.16	3382.80	153.0	0.21	0.562	0.758	1.86	2294818	0.705	3.07E-04	7.72E-02	0.137	0.087	0.174	0.000	2.00	0.04	2.946
231	37.73	37.89	0.16	3369.59	145.1	0.21	0.546	0.758	1.86	2234450	0.703	3.15E-04	8.14E-02	0.155	0.099	0.198	0.000	2.10	0.04	2.986
232	37.89	38.06	0.17	3406.66	139.1	0.21	0.569	0.758	1.86	2302895	0.710	3.08E-04	7.75E-02	0.137	0.087	0.175	0.000	2.00	0.04	3.027
233	38.06	38.22	0.16	3392.20	136.9	0.21	0.550	0.758	1.86	2298004	0.709	3.08E-04	7.77E-02	0.138	0.088	0.175	0.000	2.00	0.04	3.066
234	38.22	38.39	0.17	3398.78	143.0	0.21	0.544	0.758	1.86	2244106	0.710	3.17E-04	8.18E-02	0.156	0.099	0.199	0.000	2.10	0.04	3.108
235	38.39	38.55	0.16	3379.65	136.9	0.21	0.526	0.758	1.86	2237782	0.708	3.16E-04	8.20E-02	0.156	0.100	0.199	0.000	2.10	0.04	3.149

CYCLIC SETTLEMENT ANALYSIS

Layer No.	Depth of layer below ground surface [ft]		Layer Thickness	H.H. Effective Vertical Stress, σ'_{vo}	Cone Tip Resistance, q_t	Cyclic Stress Ratio, CSR	Calculated Factor of Safety, FS	Dry Settlement										Wet Settlement		Cumulative Settlement
								a	b	Low Strain Shear Modulus G_{max}	Induced Cyclic Stress (γ_{eff} x G_{eff})	γ_{eff} x (G_{eff} / G_{max})	Cyclic Shear Strain, γ_{cyc} (γ_{eff} x 100)	Volumetric Strain M = 7.5	Volumetric Strain M = 6.5	Volumetric Strain w/ 3D Effect	Settlement	Volumetric Strain, %	Settlement	
	Top	Bottom	[ft]	[psf]	[ksf]		$CRR_{7.5}$/CSR*			[psf]	M=7.5 [ksf]		[%]	[%]	[%]	[%]	[inches]	[%]	[inches]	[inches]
236	38.55	38.71	0.16	3421.79	138.8	0.21	0.547	0.758	1.86	2308006	0.715	3.10E-04	7.81E-02	0.138	0.088	0.176	0.000	2.00	0.04	3.187
237	38.71	38.88	0.17	3433.43	136.3	0.21	0.548	0.758	1.86	2255517	0.718	3.18E-04	8.22E-02	0.157	0.100	0.200	0.000	2.10	0.04	3.230
238	38.88	39.04	0.16	3423.86	137.3	0.21	0.534	0.758	1.86	2252371	0.717	3.18E-04	8.24E-02	0.157	0.100	0.200	0.000	2.10	0.04	3.270
239	39.04	39.21	0.17	3420.57	140.4	0.21	0.524	0.758	1.86	2251288	0.717	3.19E-04	8.25E-02	0.157	0.100	0.201	0.000	2.10	0.04	3.313
240	39.21	39.37	0.16	3414.97	140.8	0.21	0.514	0.758	1.86	2249444	0.717	3.19E-04	8.27E-02	0.158	0.100	0.201	0.000	2.10	0.04	3.353
241	39.37	39.53	0.16	3416.04	137.7	0.21	0.510	0.758	1.86	2190564	0.718	3.28E-04	8.75E-02	0.181	0.115	0.230	0.000	2.30	0.04	3.398
242	39.53	39.70	0.17	3449.41	136.3	0.21	0.523	0.758	1.86	2260758	0.724	3.20E-04	8.29E-02	0.158	0.101	0.201	0.000	2.10	0.04	3.440
243	39.70	39.86	0.16	3472.62	135.3	0.21	0.531	0.759	1.86	2268351	0.728	3.21E-04	8.31E-02	0.158	0.101	0.202	0.000	2.10	0.04	3.481
244	39.86	40.03	0.17	3487.79	137.6	0.21	0.533	0.759	1.86	2273301	0.731	3.22E-04	8.32E-02	0.159	0.101	0.202	0.000	2.10	0.04	3.524
245	40.03	40.19	0.16	3579.52	140.1	0.21	0.598	0.759	1.85	2360600	0.747	3.16E-04	7.92E-02	0.140	0.089	0.179	0.000	2.00	0.04	3.562
246	40.19	40.35	0.16	3540.01	150.9	0.21	0.550	0.759	1.85	2290256	0.741	3.24E-04	8.34E-02	0.159	0.101	0.203	0.000	2.10	0.04	3.602
247	40.35	40.52	0.17	3552.35	153.3	0.21	0.550	0.759	1.85	2294246	0.744	3.24E-04	8.35E-02	0.159	0.101	0.203	0.000	2.10	0.04	3.645
248	40.52	40.68	0.16	3525.35	154.4	0.21	0.526	0.759	1.85	2285508	0.740	3.24E-04	8.37E-02	0.160	0.102	0.203	0.000	2.10	0.04	3.685
249	40.68	40.85	0.17	3568.75	150.6	0.21	0.547	0.759	1.85	2357045	0.747	3.17E-04	7.97E-02	0.141	0.090	0.180	0.000	2.00	0.04	3.726
250	40.85	41.01	0.16	3576.05	134.5	0.21	0.552	0.759	1.85	2301885	0.749	3.25E-04	8.38E-02	0.160	0.102	0.204	0.000	2.10	0.04	3.767
251	41.01	41.17	0.16	3545.68	136.4	0.21	0.523	0.759	1.85	2292091	0.745	3.25E-04	8.40E-02	0.160	0.102	0.204	0.000	2.10	0.04	3.807
252	41.17	41.34	0.17	3567.76	128.3	0.21	0.534	0.759	1.85	2238683	0.749	3.34E-04	8.87E-02	0.183	0.117	0.234	0.000	2.30	0.05	3.854
253	41.34	41.50	0.16	3554.23	123.3	0.21	0.522	0.759	1.85	2234432	0.747	3.34E-04	8.89E-02	0.184	0.117	0.234	0.000	2.30	0.04	3.898
254	41.50	41.67	0.17	3588.77	126.8	0.21	0.535	0.760	1.85	2245265	0.753	3.35E-04	8.89E-02	0.184	0.117	0.234	0.000	2.30	0.05	3.945
255	41.67	41.83	0.16	3636.64	146.1	0.21	0.551	0.760	1.85	2321304	0.762	3.28E-04	8.43E-02	0.161	0.102	0.205	0.000	2.10	0.04	3.985
256	41.83	41.99	0.16	3673.23	166.9	0.21	0.563	0.760	1.85	2391301	0.768	3.21E-04	8.03E-02	0.142	0.091	0.181	0.000	2.00	0.04	4.024
257	41.99	42.16	0.17	3720.16	179.4	0.21	0.587	0.761	1.85	2406528	0.776	3.22E-04	8.03E-02	0.142	0.091	0.181	0.000	2.00	0.04	4.064
258	42.16	42.32	0.16	3761.78	180.8	0.21	0.613	0.761	1.85	2419953	0.783	3.24E-04	8.03E-02	0.142	0.091	0.181	0.000	2.00	0.04	4.103
259	42.32	42.49	0.17	3838.30	187.2	0.21	0.682	0.761	1.85	2555702	0.796	3.11E-04	7.35E-02	0.114	0.073	0.145	0.000	1.60	0.03	4.135
260	42.49	42.65	0.16	3939.78	219.1	0.21	0.800	0.762	1.84	2692945	0.813	3.02E-04	6.81E-02	0.094	0.060	0.119	0.000	1.20	0.02	4.158
261	42.65	42.81	0.16	3986.83	271.5	0.21	0.852	0.762	1.84	2805808	0.821	2.93E-04	6.36E-02	0.079	0.050	0.100	0.000	0.30	0.01	4.164
262	42.81	42.98	0.17	3996.09	306.4	0.21	0.868	0.763	1.84	2855123	0.823	2.88E-04	6.17E-02	0.073	0.046	0.093	0.000	0.20	0.00	4.168
263	42.98	43.14	0.16	3997.76	298.1	0.21	0.844	0.763	1.84	2855719	0.823	2.88E-04	6.17E-02	0.073	0.046	0.093	0.000	0.20	0.00	4.172
264	43.14	43.31	0.17	3972.37	272.5	0.21	0.776	0.762	1.84	2753235	0.820	2.98E-04	6.59E-02	0.086	0.055	0.110	0.000	1.00	0.02	4.193
265	43.31	43.47	0.16	3978.16	238.3	0.21	0.759	0.762	1.84	2654959	0.821	3.09E-04	7.09E-02	0.103	0.066	0.132	0.000	1.50	0.03	4.221
266	43.47	43.63	0.16	3974.02	229.6	0.21	0.738	0.762	1.84	2653580	0.820	3.09E-04	7.10E-02	0.104	0.066	0.132	0.000	1.50	0.03	4.250
267	43.63	43.80	0.17	3992.67	236.3	0.21	0.747	0.763	1.84	2659798	0.824	3.10E-04	7.10E-02	0.104	0.066	0.132	0.000	1.50	0.03	4.281
268	43.80	43.96	0.16	3990.15	237.1	0.21	0.727	0.763	1.84	2658959	0.824	3.10E-04	7.11E-02	0.104	0.066	0.132	0.000	1.50	0.03	4.310
269	43.96	44.13	0.17	3998.56	240.3	0.21	0.723	0.763	1.84	2661759	0.825	3.10E-04	7.11E-02	0.104	0.066	0.132	0.000	1.50	0.03	4.340
270	44.13	44.29	0.16	3981.35	231.1	0.21	0.689	0.762	1.84	2656027	0.823	3.10E-04	7.12E-02	0.104	0.066	0.132	0.000	1.50	0.03	4.369
271	44.29	44.45	0.16	4000.90	231.0	0.21	0.698	0.763	1.84	2662538	0.826	3.10E-04	7.12E-02	0.104	0.066	0.132	0.000	1.50	0.03	4.398
272	44.45	44.62	0.17	4011.76	234.8	0.21	0.697	0.763	1.84	2666151	0.828	3.11E-04	7.12E-02	0.104	0.066	0.132	0.000	1.50	0.03	4.428
273	44.62	44.78	0.16	4010.28	254.0	0.21	0.688	0.763	1.84	2716932	0.828	3.05E-04	6.87E-02	0.095	0.060	0.121	0.000	1.20	0.02	4.451
274	44.78	44.95	0.17	3999.13	245.3	0.21	0.663	0.763	1.84	2661948	0.827	3.11E-04	7.14E-02	0.104	0.066	0.133	0.000	1.50	0.03	4.482
275	44.95	45.11	0.16	3990.13	215.7	0.21	0.640	0.763	1.84	2605758	0.826	3.17E-04	7.43E-02	0.115	0.073	0.147	0.000	1.60	0.03	4.513
276	45.11	45.28	0.17	3972.35	203.3	0.21	0.615	0.762	1.84	2544612	0.823	3.24E-04	7.76E-02	0.128	0.082	0.163	0.000	1.80	0.04	4.549
277	45.28	45.44	0.16	4026.30	203.5	0.21	0.654	0.763	1.84	2561832	0.832	3.25E-04	7.76E-02	0.128	0.082	0.163	0.000	1.80	0.03	4.584
278	45.44	45.60	0.16	4088.15	217.4	0.21	0.707	0.763	1.84	2637570	0.842	3.19E-04	7.43E-02	0.115	0.073	0.147	0.000	1.60	0.03	4.615
279	45.60	45.77	0.17	4161.09	237.1	0.21	0.784	0.764	1.84	2715318	0.854	3.14E-04	7.13E-02	0.104	0.066	0.132	0.000	1.50	0.03	4.645
280	45.77	45.93	0.16	4206.75	260.3	0.20	0.830	0.764	1.84	2782689	0.861	3.09E-04	6.87E-02	0.095	0.060	0.121	0.000	1.20	0.02	4.668
281	45.93	46.10	0.17	4252.44	282.2	0.20	0.885	0.764	1.83	2848640	0.868	3.05E-04	6.63E-02	0.087	0.055	0.110	0.000	1.00	0.02	4.689
282	46.10	46.26	0.16	4286.30	286.3	0.20	0.926	0.765	1.83	2859959	0.874	3.06E-04	6.63E-02	0.087	0.055	0.110	0.000	1.00	0.02	4.708
283	46.26	46.42	0.16	4315.95	287.2	0.20	0.962	0.765	1.83	2869833	0.879	3.06E-04	6.63E-02	0.087	0.055	0.110	0.000	1.00	0.02	4.727
284	46.42	46.59	0.17	4362.56	292.7	0.20	1.041	0.765	1.83	2935047	0.886	3.02E-04	6.41E-02	0.080	0.051	0.101	0.000	0.30	0.01	4.733

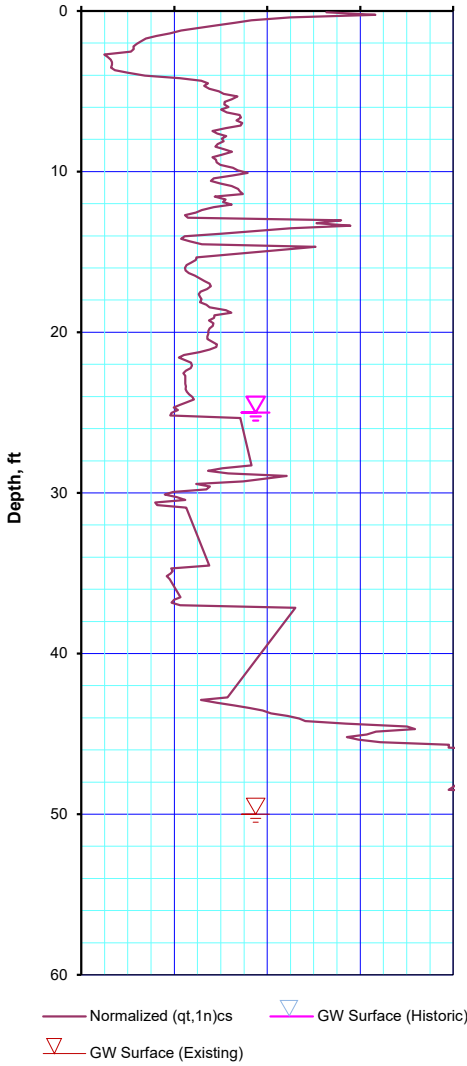
CYCLIC SETTLEMENT ANALYSIS

Layer No.	Depth of layer below ground surface [ft]		Layer Thickness	H.H. Effective Vertical Stress, σ'_{vo}	Cone Tip Resistance, q_t	Cyclic Stress Ratio, CSR	Calculated Factor of Safety, FS	Dry Settlement										Wet Settlement		Cumulative Settlement
								a	b	Low Strain Shear Modulus G_{max}	Induced Cyclic Stress (γ_{eff} x G_{eff})	γ_{eff} x (G_{eff} / G_{max})	Cyclic Shear Strain, γ_{cyc} (γ_{eff} x 100)	Volumetric Strain M = 7.5	Volumetric Strain M = 6.5	Volumetric Strain w/ 3D Effect	Settlement	Volumetric Strain, %	Settlement	
	Top	Bottom	[ft]	[psf]	[ksf]		$CRR_{7.5}$/CSR*			[psf]	M=7.5 [ksf]		[%]	[%]	[%]	[%]	[inches]	[%]	[inches]	[inches]
285	46.59	46.75	0.16	4399.15	305.4	0.20	1.099	0.765	1.83	2947328	0.892	3.03E-04	6.41E-02	0.079	0.051	0.101	0.000	0.30	0.01	4.739
286	46.75	46.92	0.17	4431.75	328.5	0.20	1.146	0.765	1.83	3006731	0.897	2.98E-04	6.21E-02	0.073	0.047	0.093	0.000	0.20	0.00	4.743
287	46.92	47.08	0.16	4414.72	331.7	0.20	1.068	0.765	1.83	3000951	0.895	2.98E-04	6.22E-02	0.073	0.047	0.093	0.000	0.20	0.00	4.747
288	47.08	47.24	0.16	4452.34	333.4	0.20	1.132	0.766	1.83	3013709	0.900	2.99E-04	6.21E-02	0.073	0.047	0.093	0.000	0.20	0.00	4.751
289	47.24	47.41	0.17	4451.25	347.6	0.20	1.098	0.766	1.83	3060431	0.900	2.94E-04	6.04E-02	0.068	0.043	0.087	0.000	0.15	0.00	4.754
290	47.41	47.57	0.16	4428.16	348.5	0.20	1.019	0.765	1.83	3052482	0.897	2.94E-04	6.04E-02	0.068	0.043	0.087	0.000	0.15	0.00	4.757
291	47.57	47.74	0.17	4392.78	324.5	0.20	0.920	0.765	1.83	2993485	0.892	2.98E-04	6.23E-02	0.074	0.047	0.094	0.000	0.20	0.00	4.761
292	47.74	47.90	0.16	4375.97	290.0	0.20	0.864	0.765	1.83	2889719	0.889	3.08E-04	6.64E-02	0.087	0.055	0.110	0.000	1.00	0.02	4.780
293	47.90	48.06	0.16	4379.88	277.4	0.20	0.852	0.765	1.83	2839373	0.890	3.13E-04	6.87E-02	0.095	0.060	0.121	0.000	1.20	0.02	4.803
294	48.06	48.23	0.17	4407.50	305.6	0.20	0.877	0.765	1.83	2900112	0.894	3.08E-04	6.64E-02	0.087	0.055	0.110	0.000	1.00	0.02	4.823
295	48.23	48.39	0.16	4312.39	347.7	0.20	0.794	0.765	1.83	2965967	0.880	2.97E-04	6.24E-02	0.074	0.047	0.094	0.000	0.20	0.00	4.827
296	48.39	48.56	0.17	4226.70	339.3	0.21	0.727	0.764	1.83	2936349	0.867	2.95E-04	6.26E-02	0.074	0.047	0.094	0.000	0.20	0.00	4.831
297	48.56	48.72	0.16	4287.28	299.4	0.20	0.701	0.765	1.83	2860288	0.876	3.06E-04	6.66E-02	0.087	0.055	0.111	0.000	1.00	0.02	4.851
298	48.72	48.88	0.16	4280.35	252.3	0.20	0.662	0.764	1.83	2698858	0.875	3.24E-04	7.45E-02	0.115	0.073	0.147	0.000	1.60	0.03	4.881
299	48.88	49.05	0.17	4213.71	228.5	0.21	0.601	0.764	1.84	2620778	0.865	3.30E-04	7.78E-02	0.129	0.082	0.164	0.000	1.80	0.04	4.918
300	49.05	49.21	0.16	4257.54	223.4	0.20	0.624	0.764	1.83	2634374	0.872	3.31E-04	7.77E-02	0.129	0.082	0.164	0.000	1.80	0.03	4.953
301	49.21	49.38	0.17	4229.96	224.9	0.21	0.597	0.764	1.83	2625827	0.868	3.30E-04	7.78E-02	0.129	0.082	0.164	0.000	1.80	0.04	4.989
302	49.38	49.54	0.16	4244.86	229.1	0.20	0.599	0.764	1.83	2630447	0.870	3.31E-04	7.78E-02	0.129	0.082	0.164	0.000	1.80	0.03	5.024
303	49.54	49.70	0.16	4367.34	236.9	0.20	0.688	0.765	1.83	2726147	0.889	3.26E-04	7.43E-02	0.115	0.073	0.147	0.000	1.60	0.03	5.055
304	49.70	49.87	0.17	4274.54	238.0	0.20	0.605	0.764	1.83	2639628	0.875	3.31E-04	7.77E-02	0.129	0.082	0.164	0.000	1.80	0.04	5.091
305	49.87	50.03	0.16	4360.38	225.2	0.20	0.662	0.765	1.83	2723975	0.888	3.26E-04	7.43E-02	0.115	0.073	0.147	0.000	1.60	0.03	5.122
306	50.03	50.20	0.17	4346.35	254.2	0.20	Non Liquefiable	0.765	1.83	2719587	0.886	3.26E-04	7.44E-02	0.115	0.073	0.147	0.000	0.00	0.00	5.122
307	50.20	50.36	0.16	4333.46	241.7	0.20	Non Liquefiable	0.765	1.83	2715551	0.884	3.25E-04	7.44E-02	0.115	0.073	0.147	0.000	0.00	0.00	5.122
308	50.36	50.52	0.16	4332.40	236.0	0.20	Non Liquefiable	0.765	1.83	2657433	0.884	3.33E-04	7.76E-02	0.128	0.082	0.163	0.000	0.00	0.00	5.122

Location..... **CPT-01**
Elevation (MSL)..... 774 ft

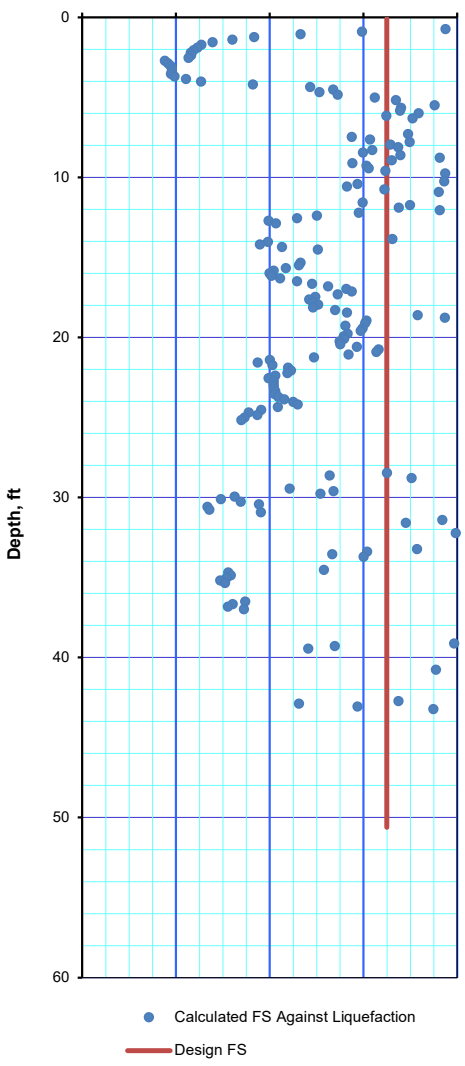
(a)

Normalized "Clean Sand" Tip Resistance



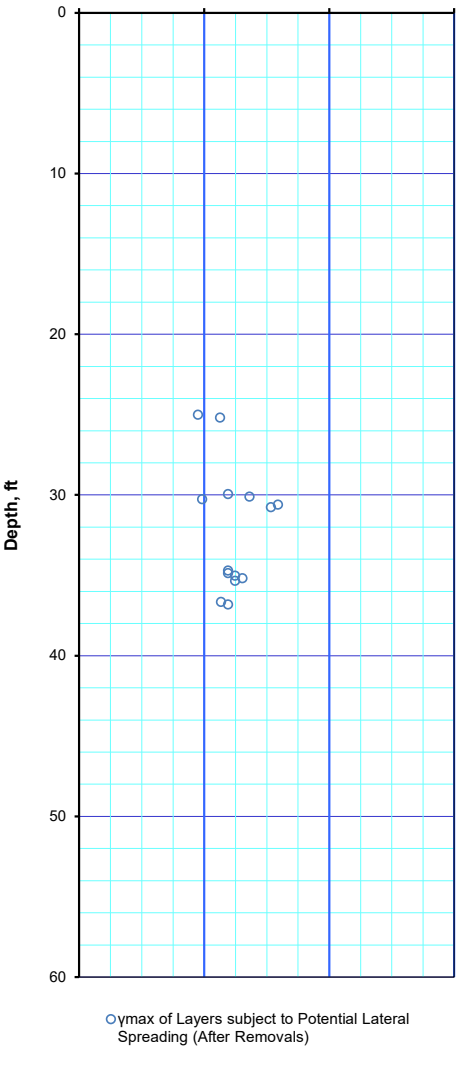
(b)

Factor of Safety



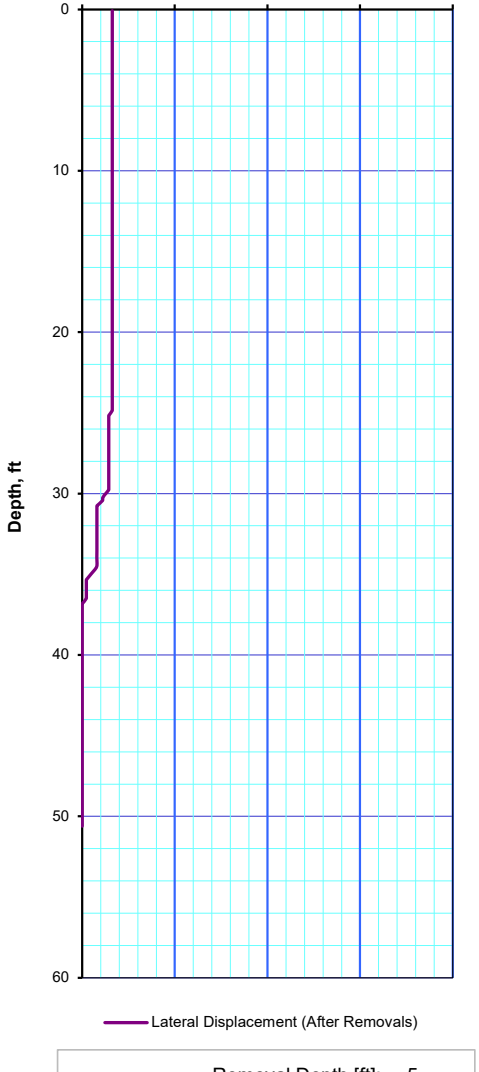
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	0.7

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

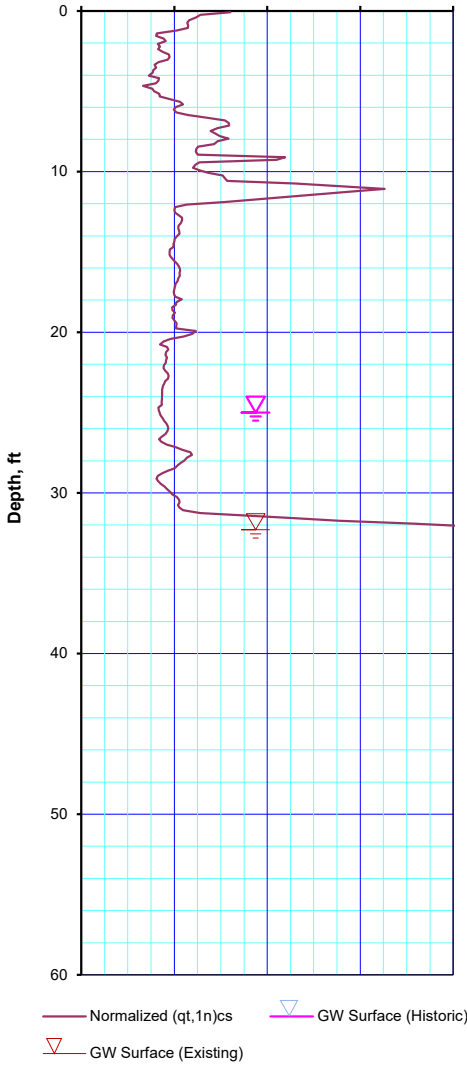
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County, CA	Dist.to Free Face [ft]:	0	Figure No.:	D4.1
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-02**
Elevation (MSL)..... 809 ft

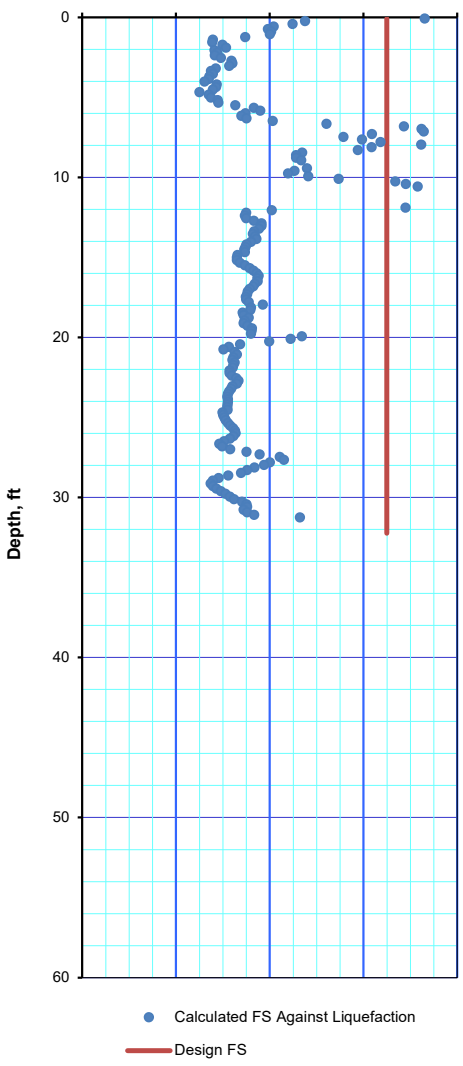
(a)

Normalized "Clean Sand" Tip Resistance



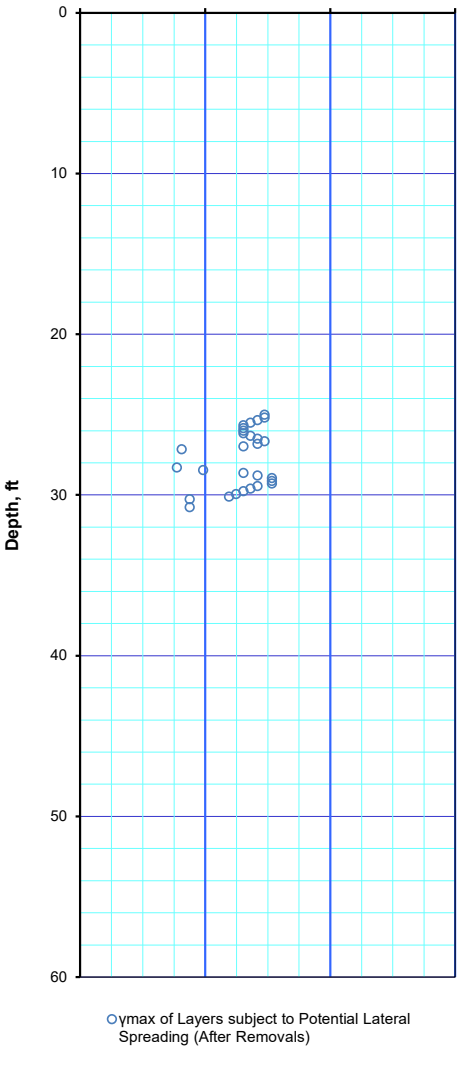
(b)

Factor of Safety



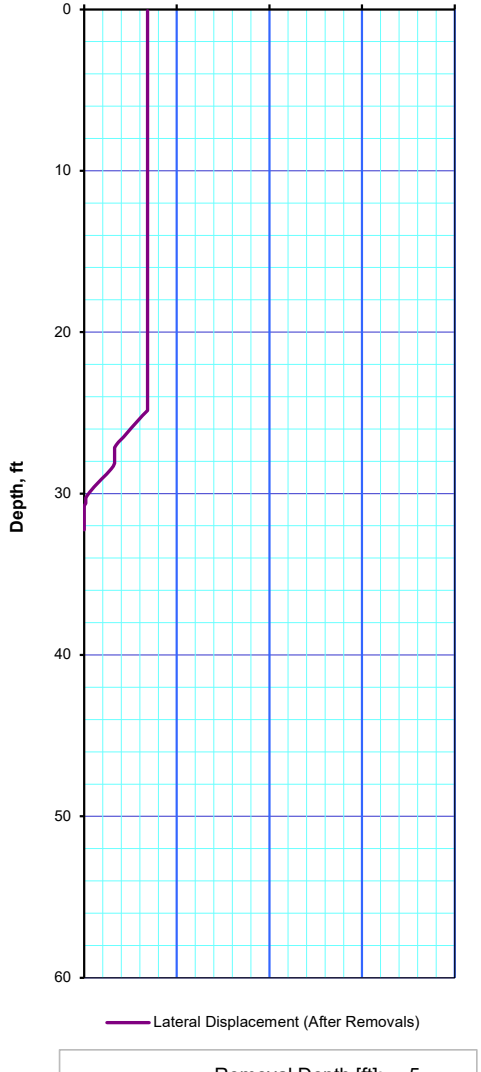
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	1.4

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

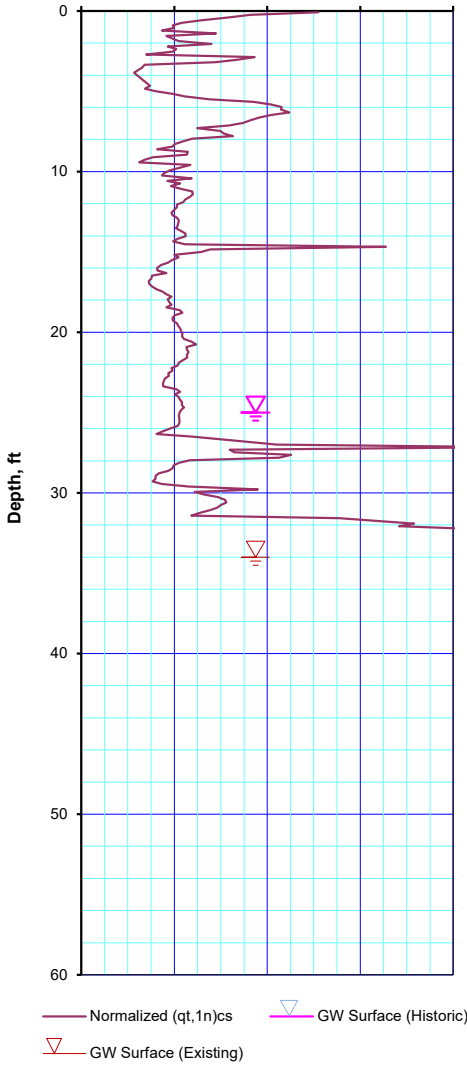
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hill Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.2
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-03**
Elevation (MSL)..... 840 ft

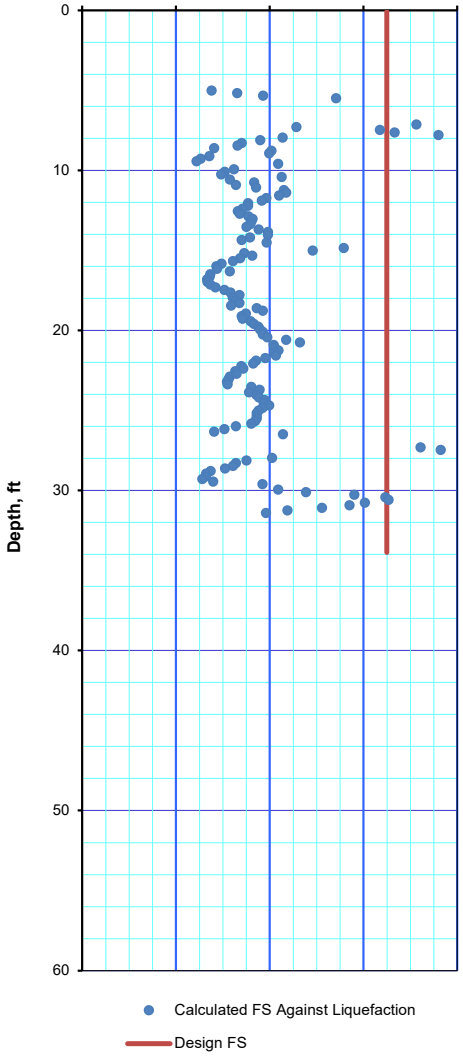
(a)

Normalized "Clean Sand" Tip Resistance



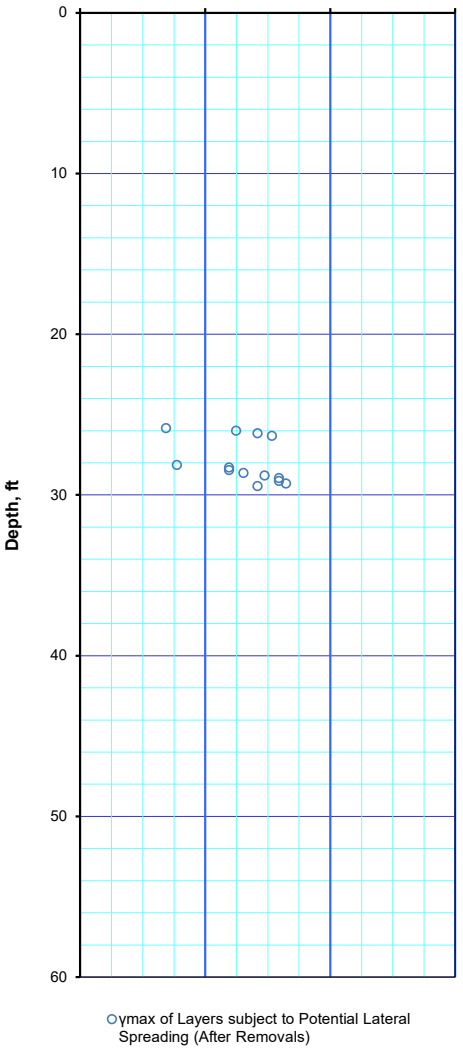
(b)

Factor of Safety



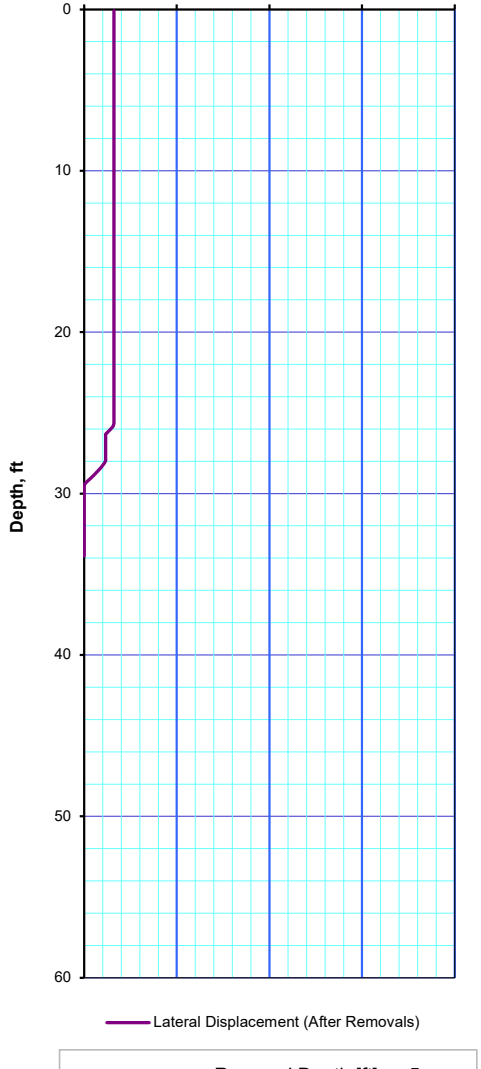
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	0.7

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

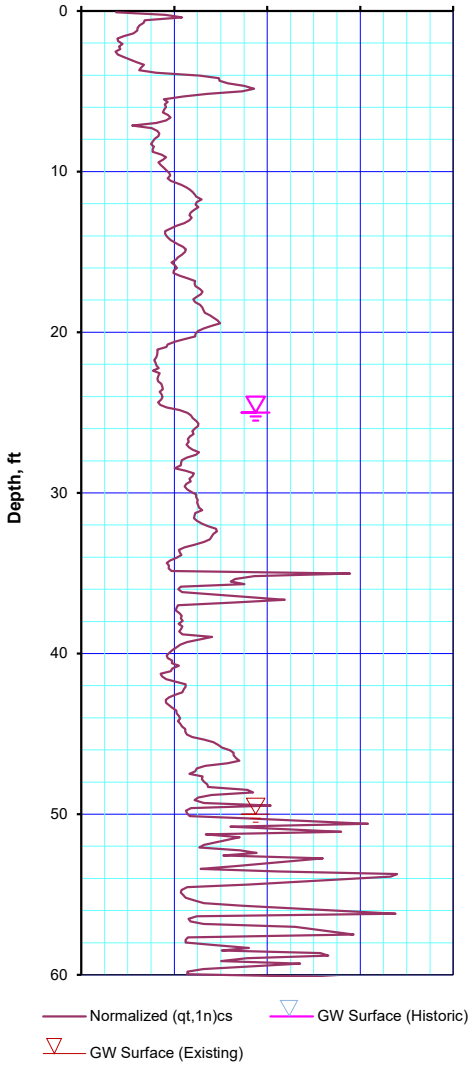
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hill Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.3
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-04**
Elevation (MSL)..... 845 ft

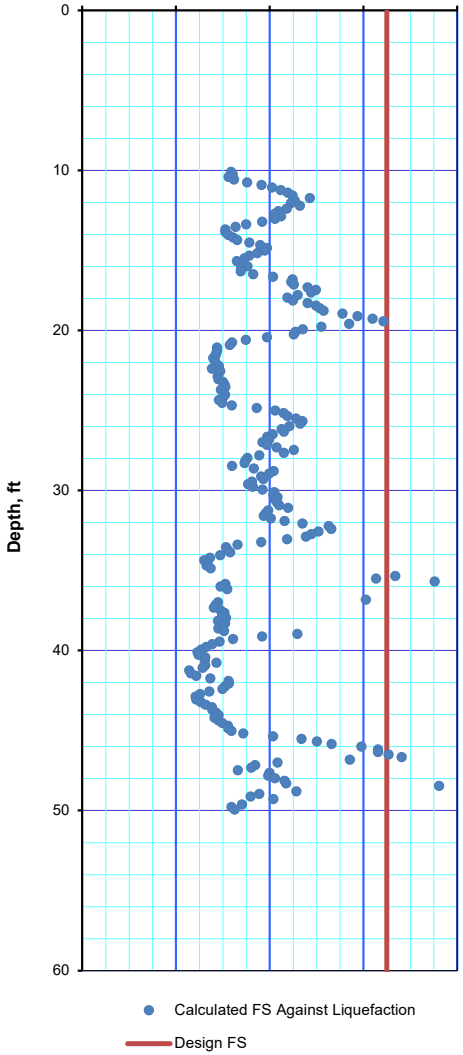
(a)

Normalized "Clean Sand" Tip Resistance



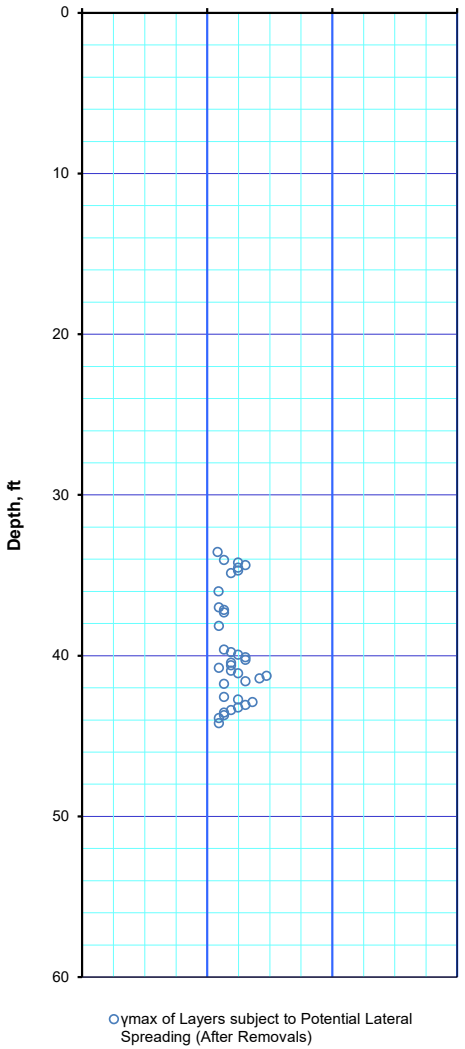
(b)

Factor of Safety



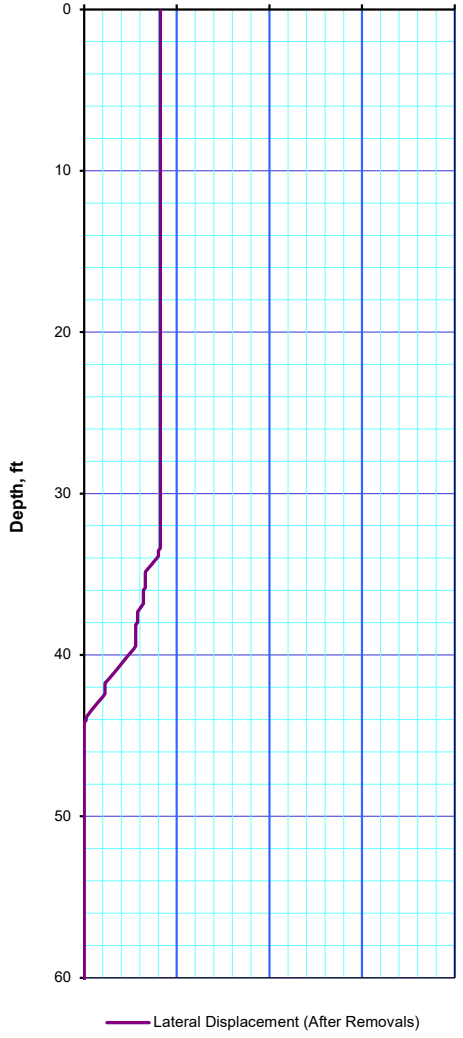
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	30
Estimated Lateral Disp. [ft]:	1.7

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

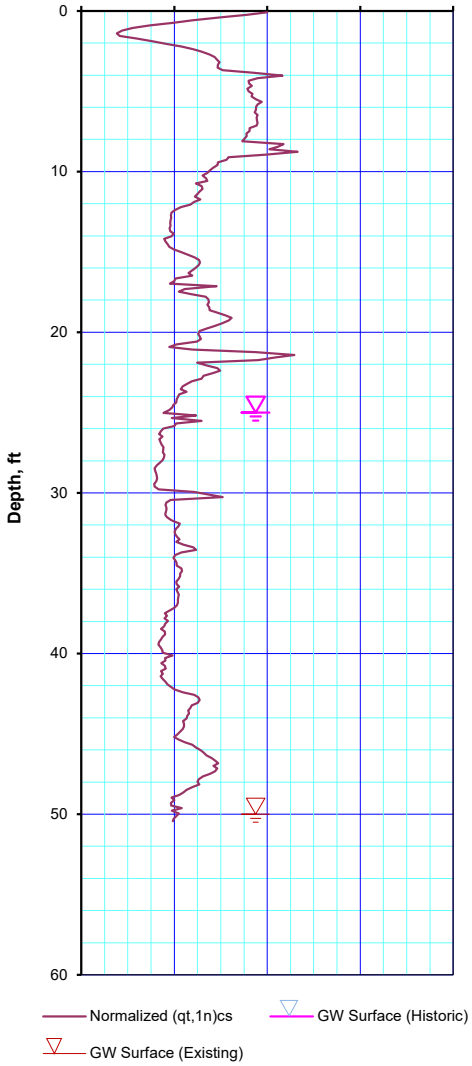
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hill Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.4
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-05**
Elevation (MSL)..... 838 ft

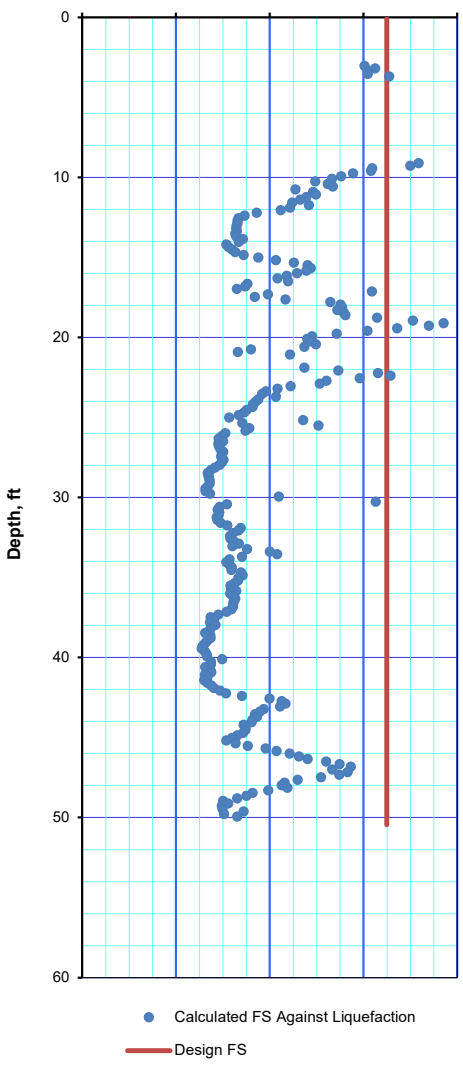
(a)

Normalized "Clean Sand" Tip Resistance



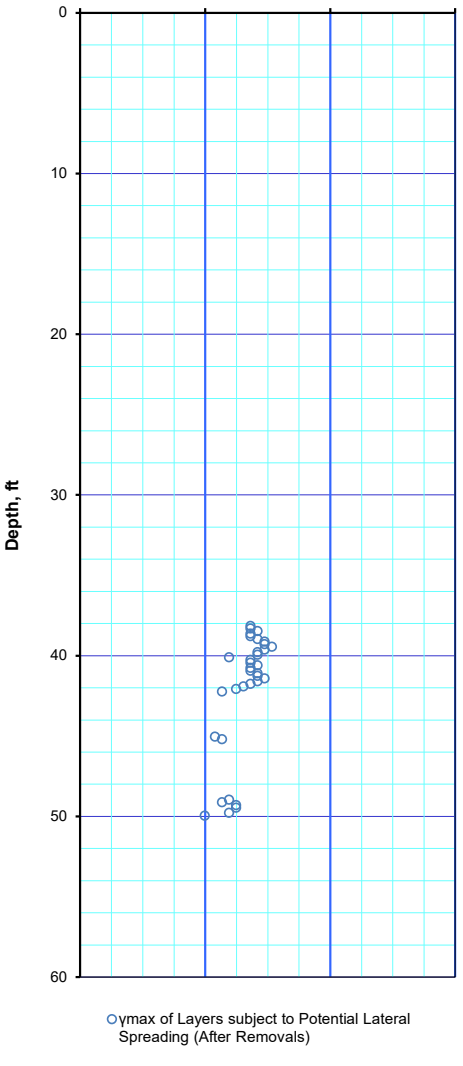
(b)

Factor of Safety



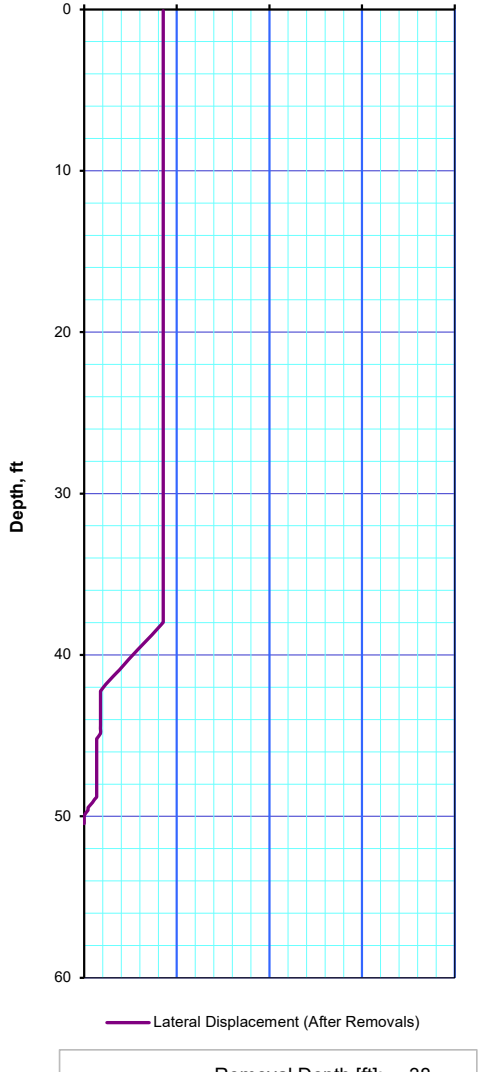
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	38
Estimated Lateral Disp. [ft]:	1.8

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

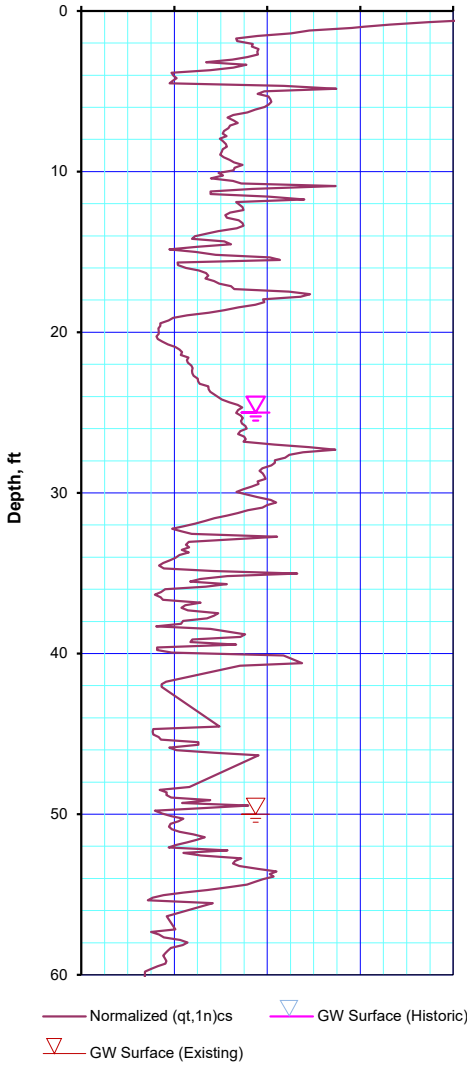
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.5
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-06**
Elevation (MSL)..... 827 ft

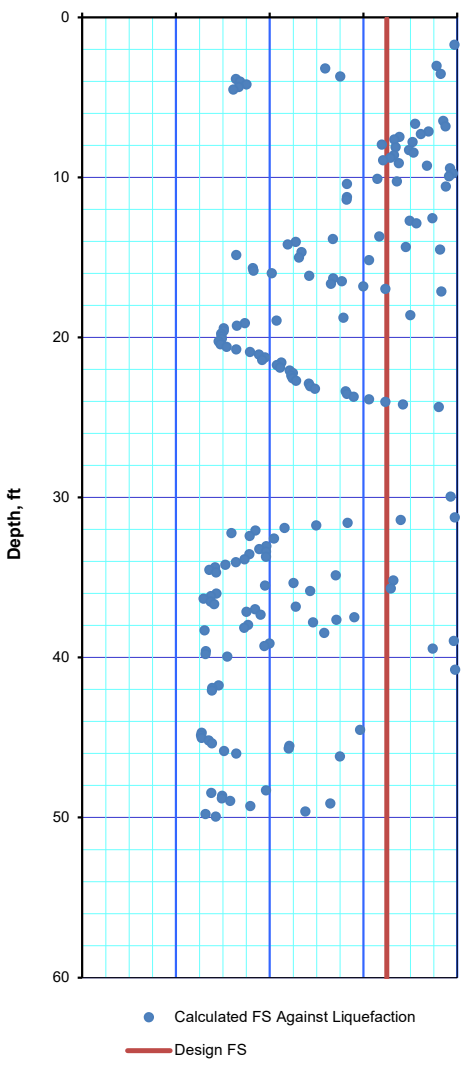
(a)

Normalized "Clean Sand" Tip Resistance



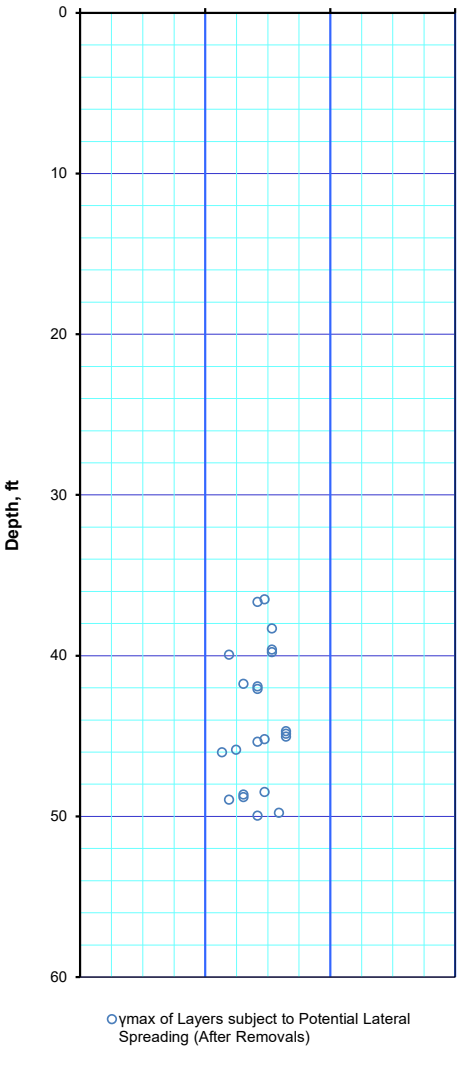
(b)

Factor of Safety



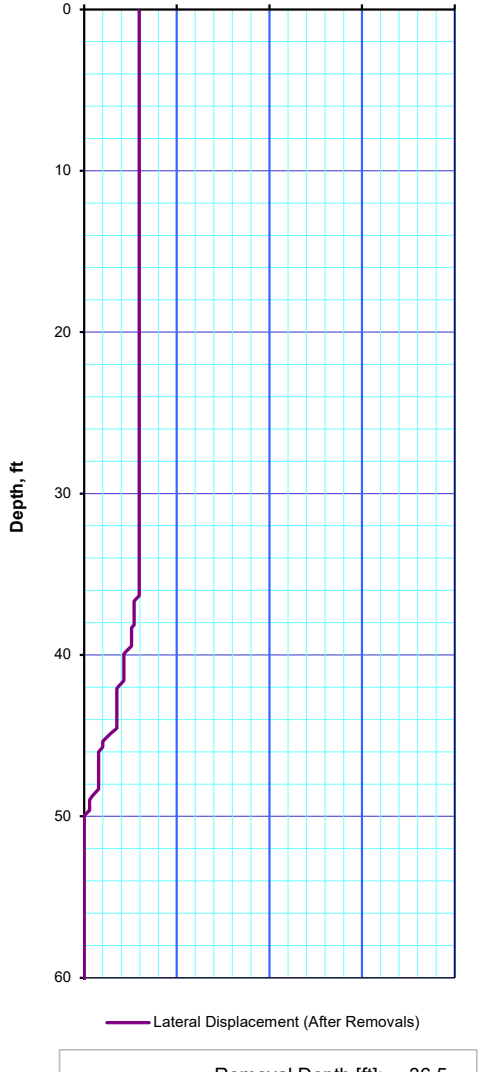
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	36.5
Estimated Lateral Disp. [ft]:	1.2

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

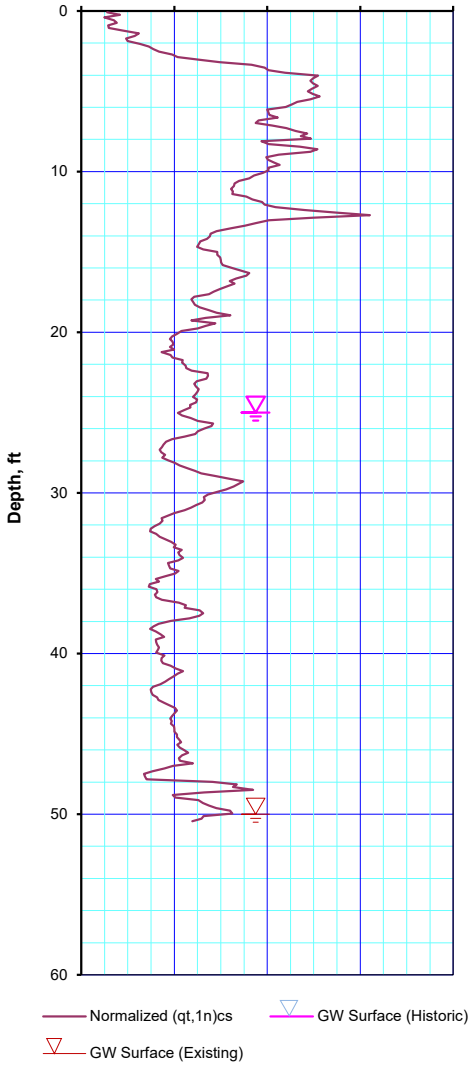
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.6
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-07**
Elevation (MSL)..... 863 ft

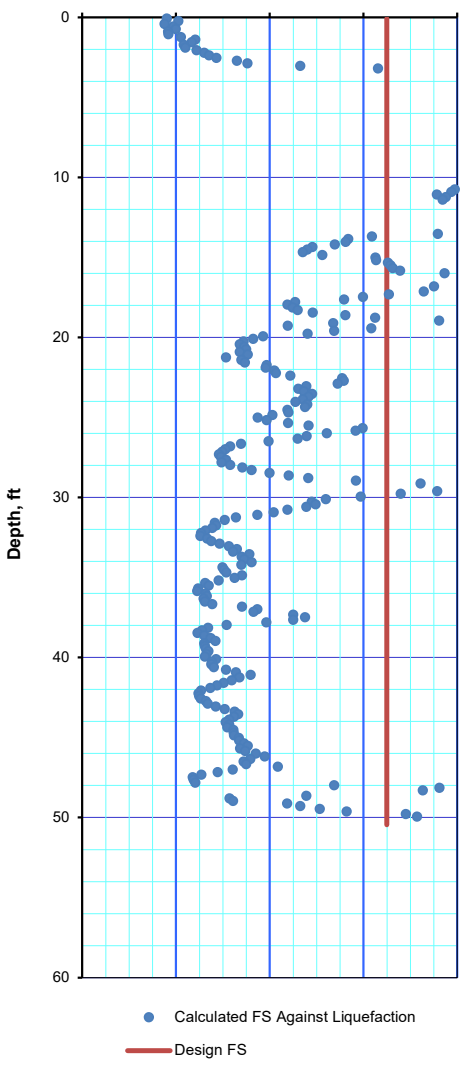
(a)

Normalized "Clean Sand" Tip Resistance



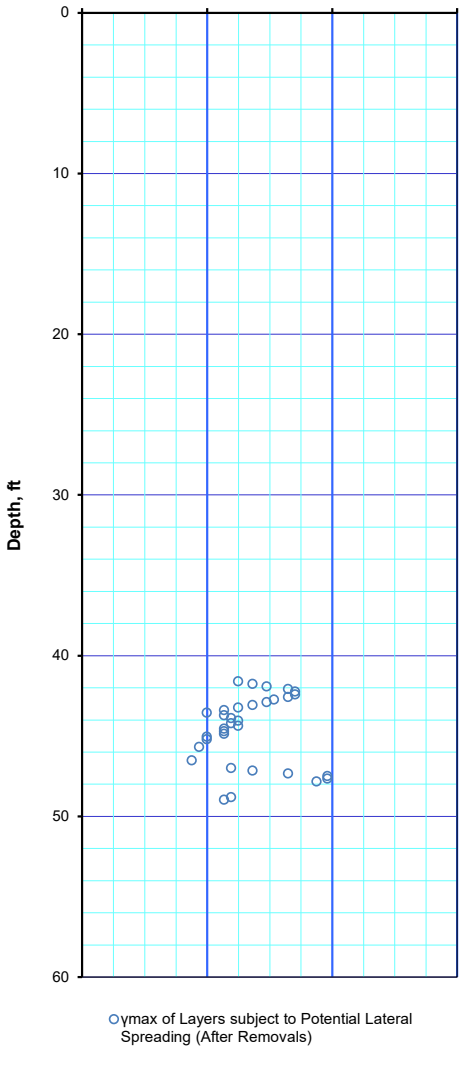
(b)

Factor of Safety



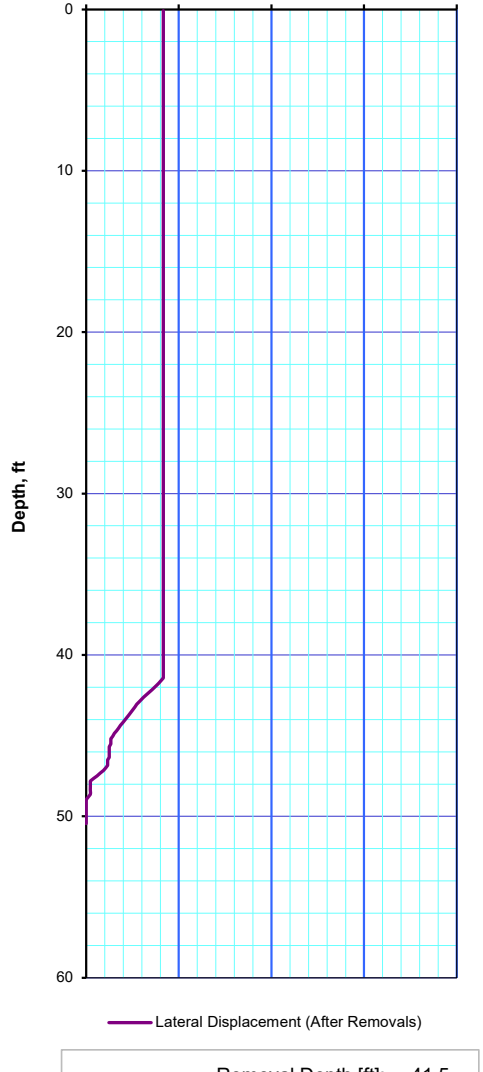
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	41.5
Estimated Lateral Disp. [ft]:	1.7

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

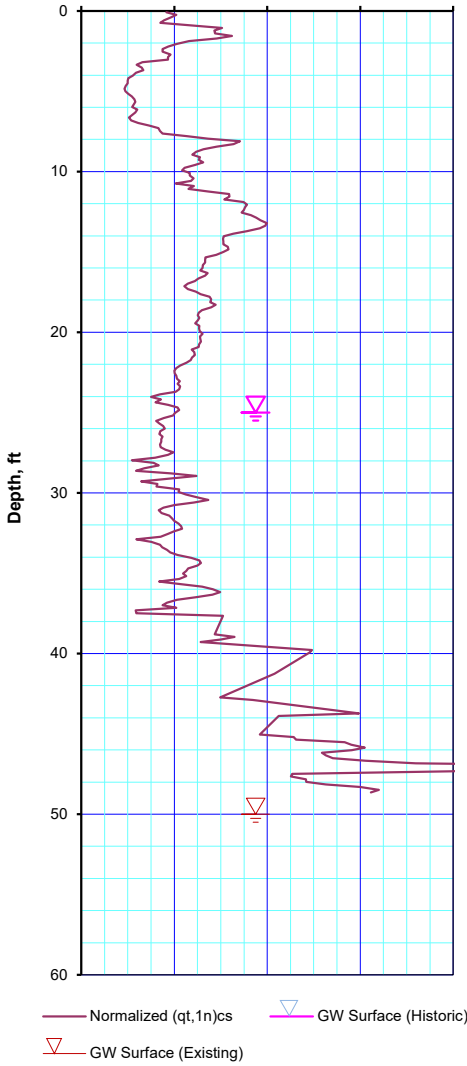
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.7
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-08**
Elevation (MSL)..... 891 ft

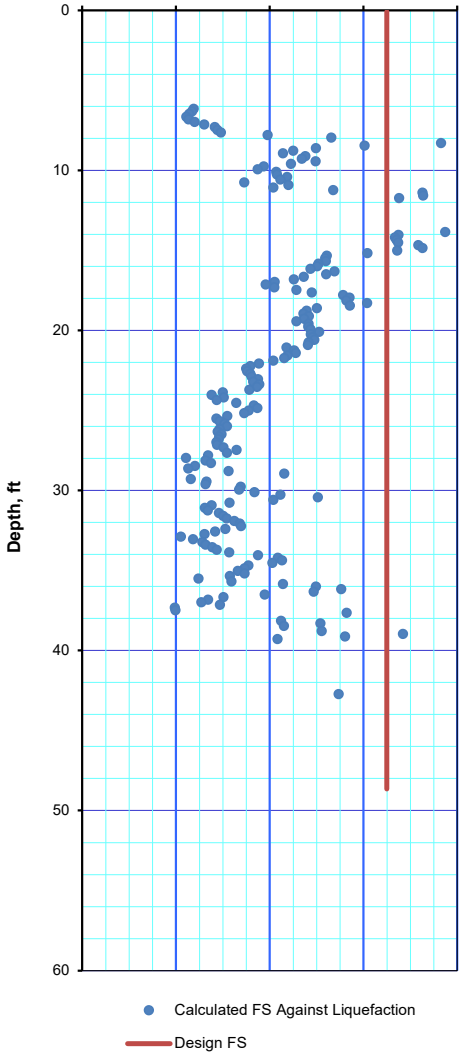
(a)

Normalized "Clean Sand" Tip Resistance



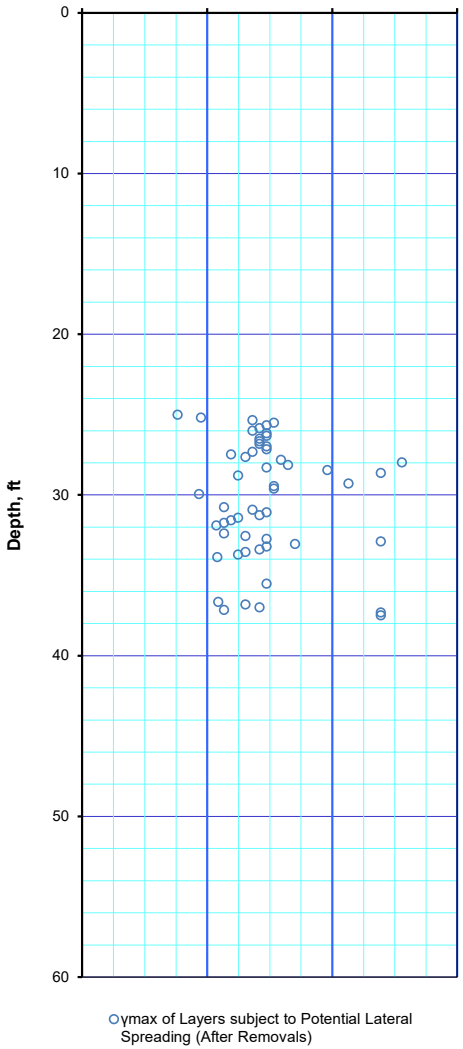
(b)

Factor of Safety



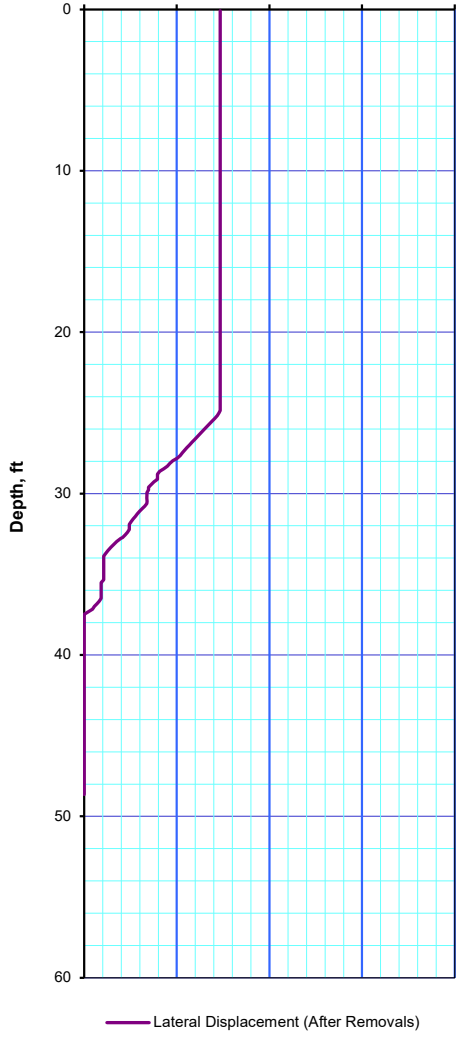
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	21.5
Estimated Lateral Disp. [ft]:	3.1

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

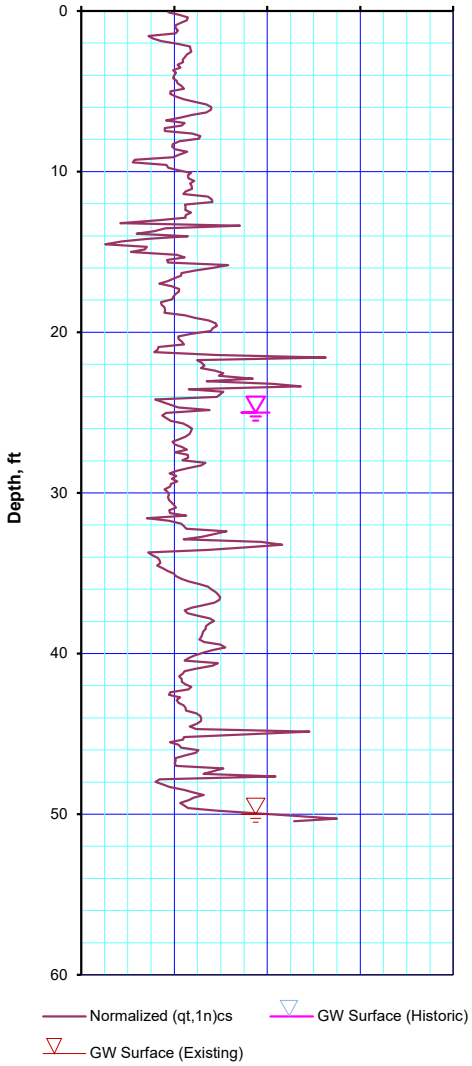
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.8
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-09**
Elevation (MSL)..... 938 ft

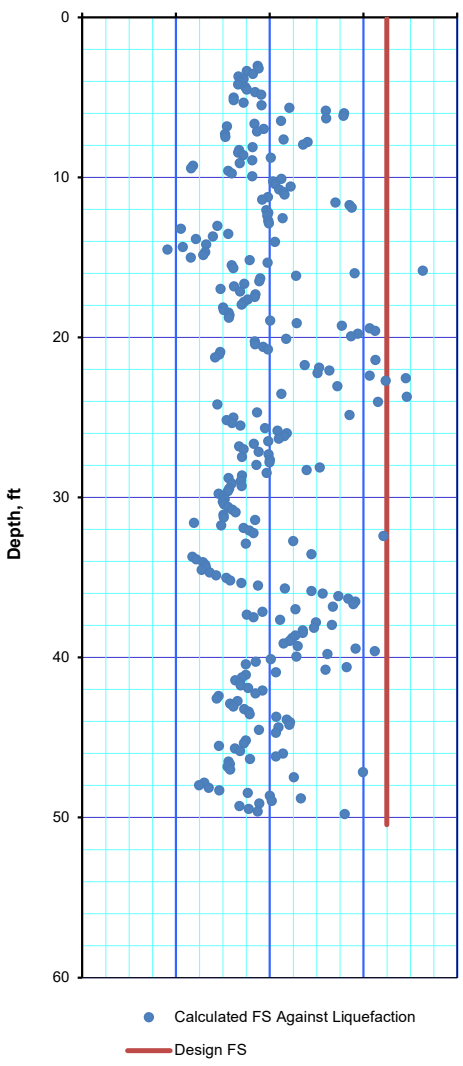
(a)

Normalized "Clean Sand" Tip Resistance



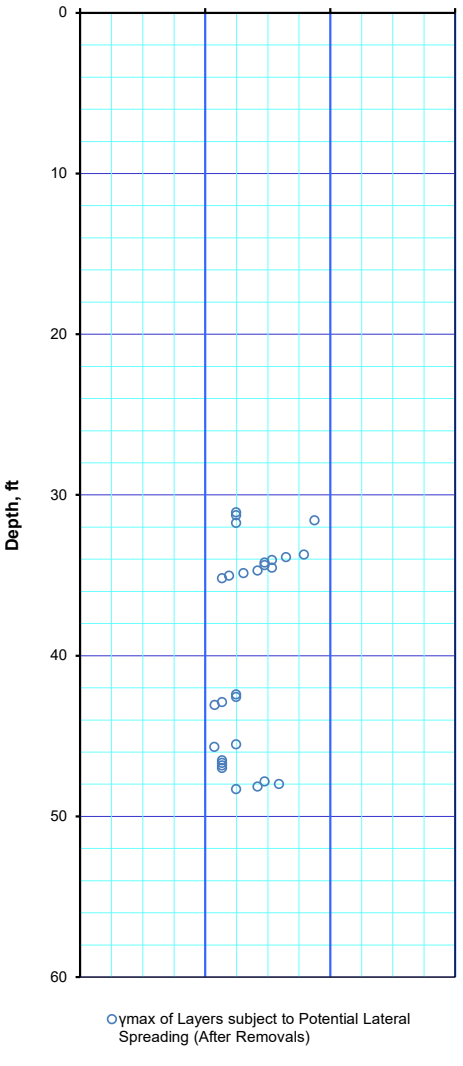
(b)

Factor of Safety



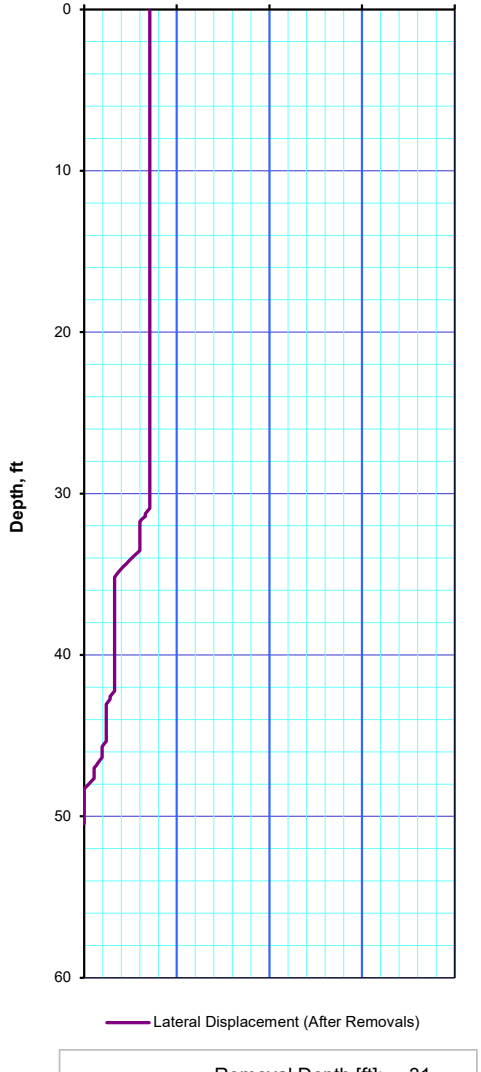
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	31
Estimated Lateral Disp. [ft]:	1.5

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

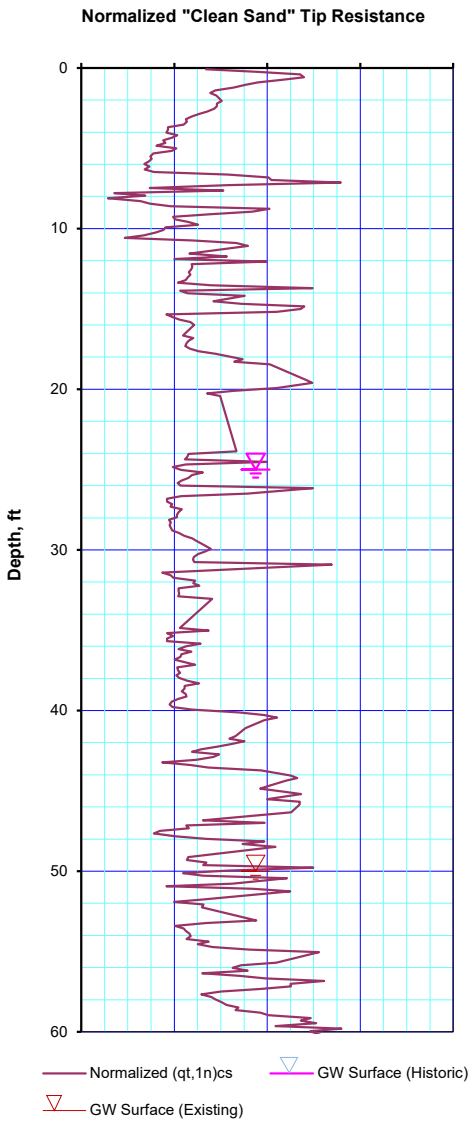
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

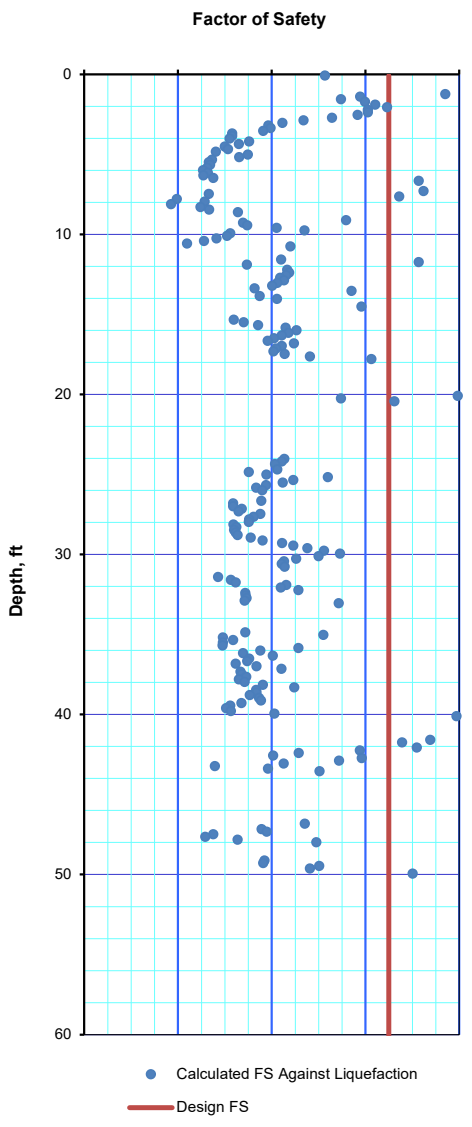
Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.9
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-10**
Elevation (MSL)..... 897 ft

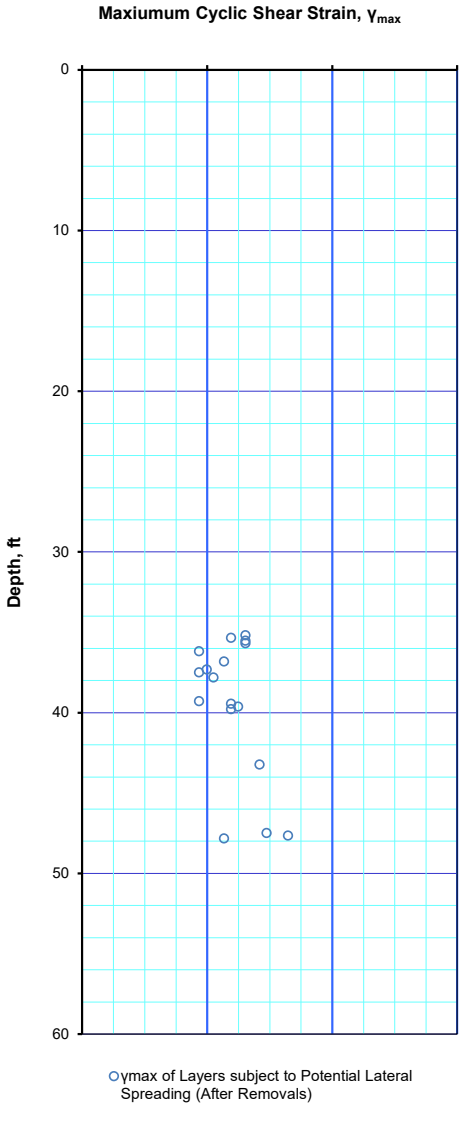
(a)



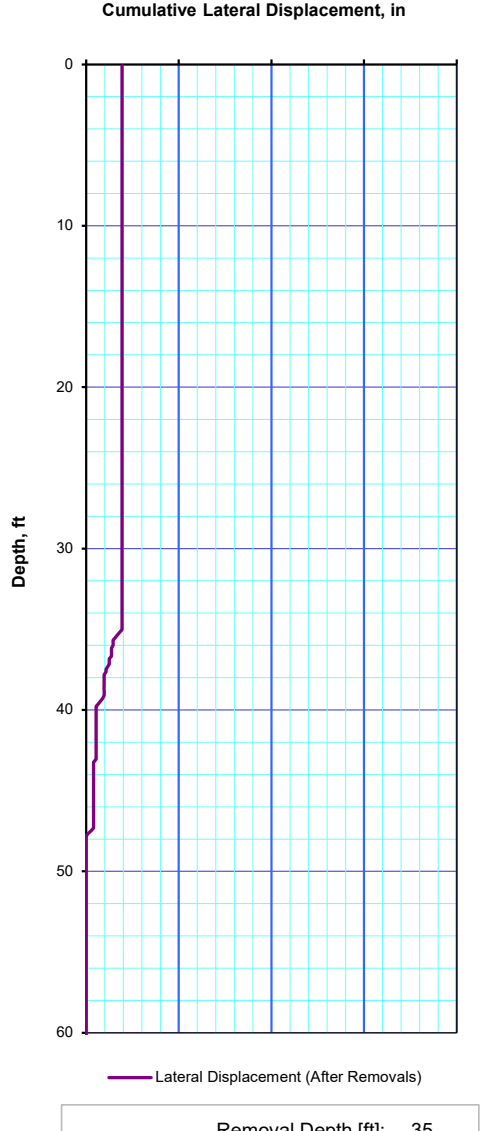
(b)



(c)



(d)



Removal Depth [ft]:	35
Estimated Lateral Disp. [ft]:	0.8

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

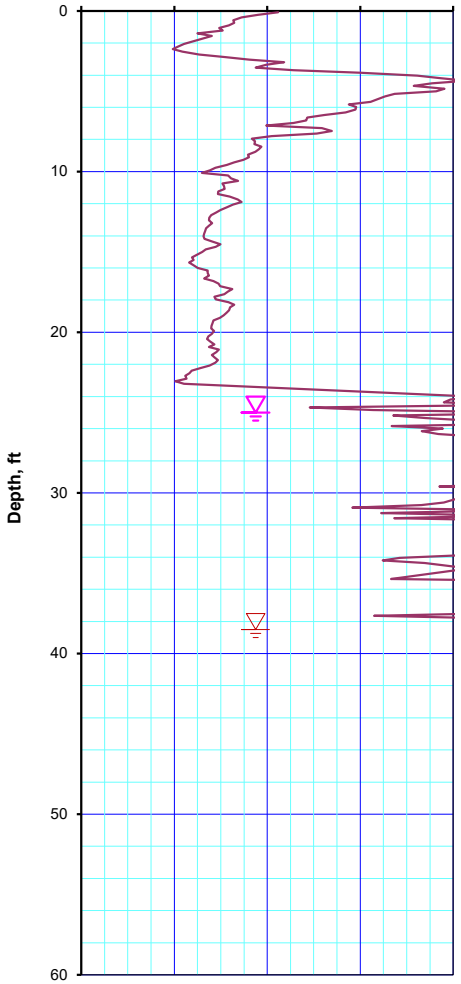
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.10
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-11**
Elevation (MSL)..... 882 ft

(a)

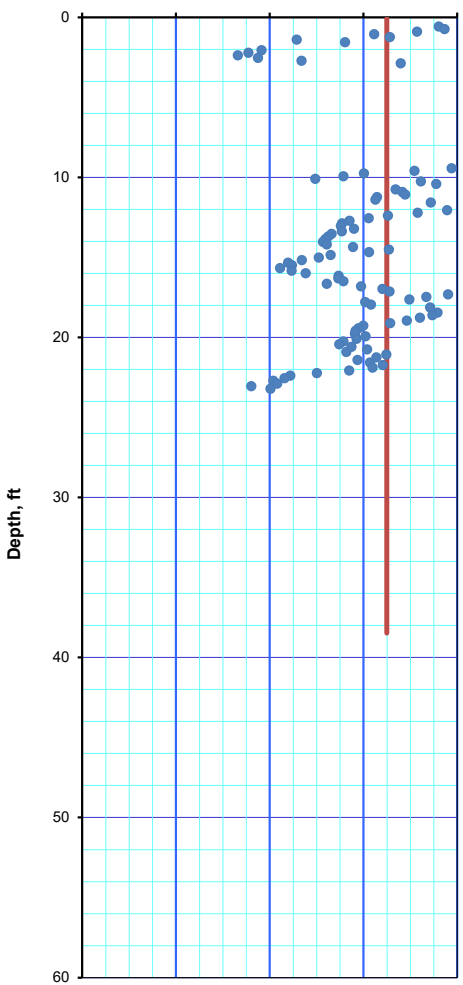
Normalized "Clean Sand" Tip Resistance



Normalized (qt,1n)cs
GW Surface (Historic)
GW Surface (Existing)

(b)

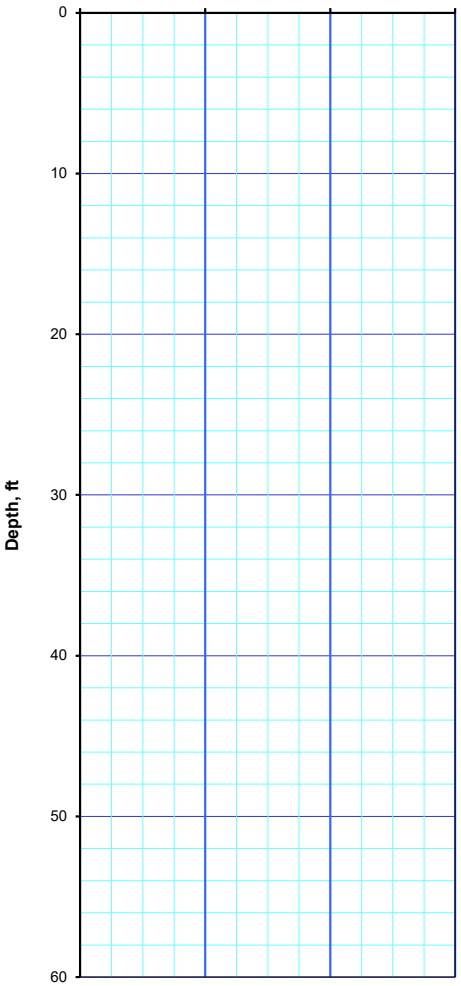
Factor of Safety



Calculated FS Against Liquefaction
Design FS

(c)

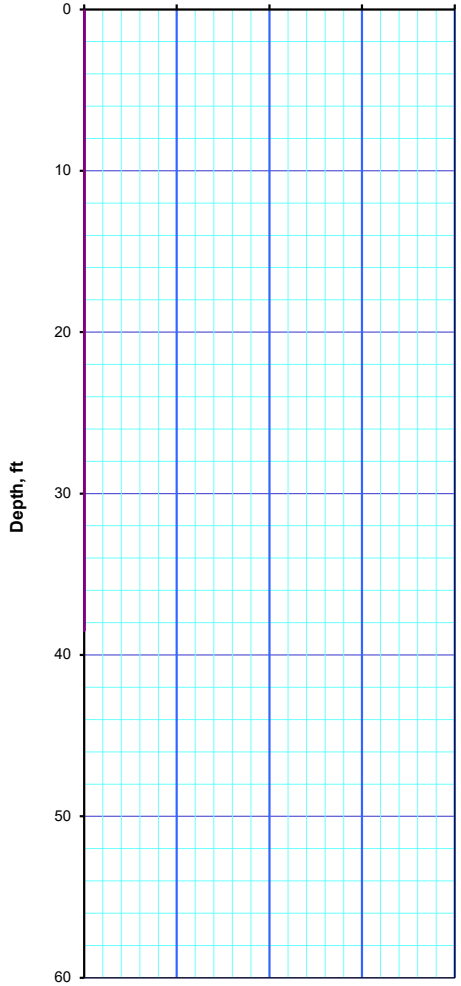
Maxiumum Cyclic Shear Strain, γ_{max}



γmax of Layers subject to Potential Lateral Spreading (After Removals)

(d)

Cumulative Lateral Displacement, in



Lateral Displacement (After Removals)

Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	0.0

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

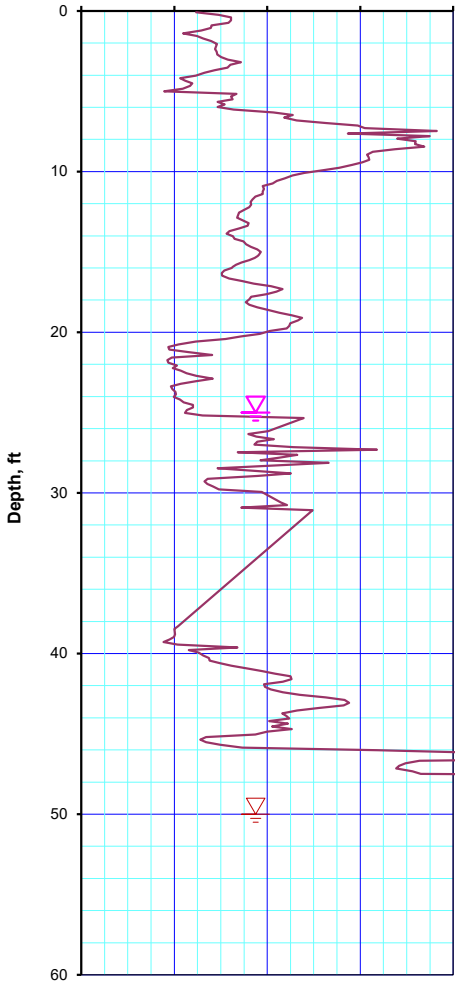
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County, California	Dist.to Free Face [ft]:	0	Figure No.:	D4.11
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-12**
Elevation (MSL)..... 779 ft

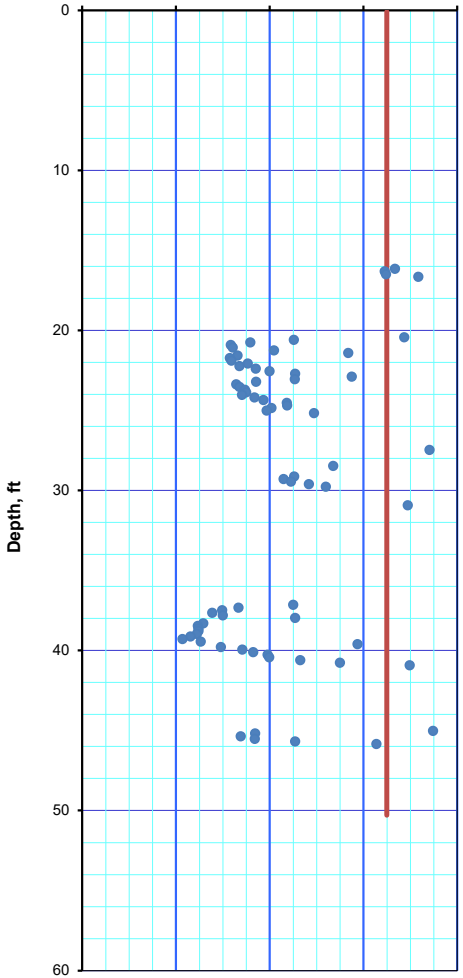
(a)

Normalized "Clean Sand" Tip Resistance



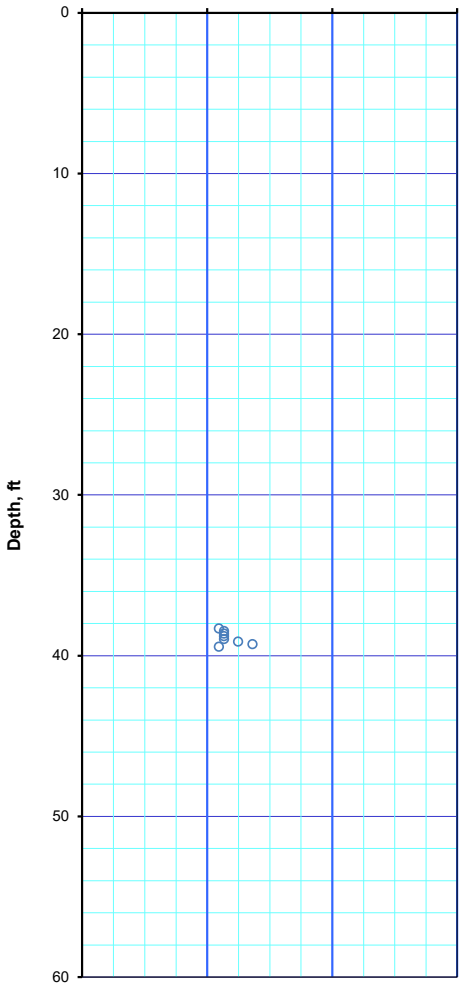
(b)

Factor of Safety



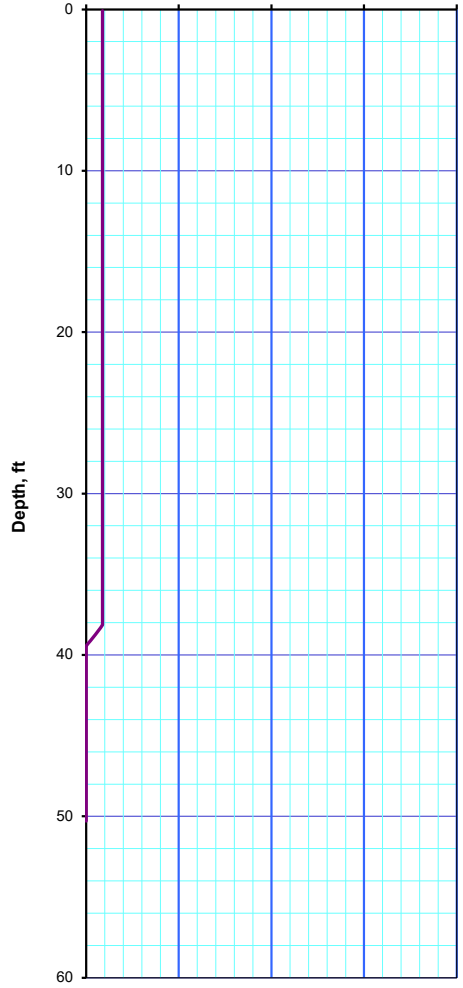
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	0.4

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

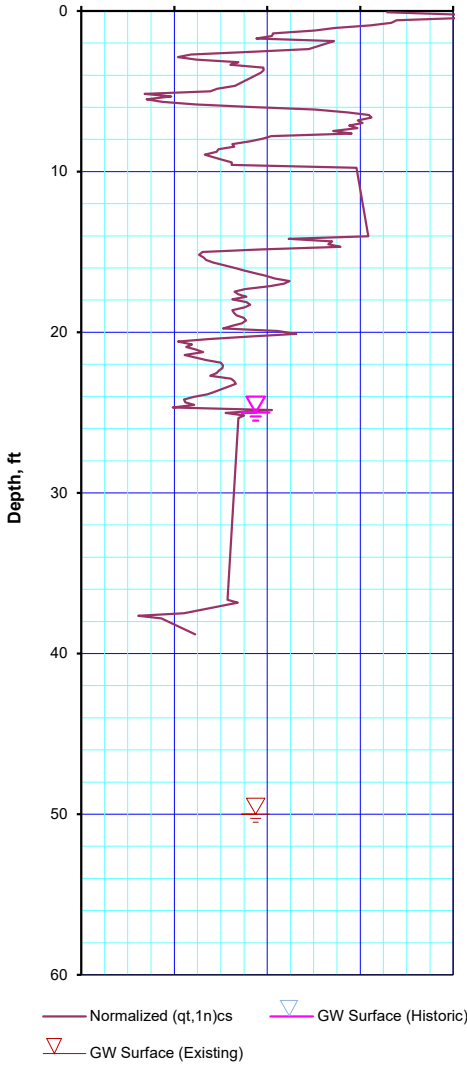
ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

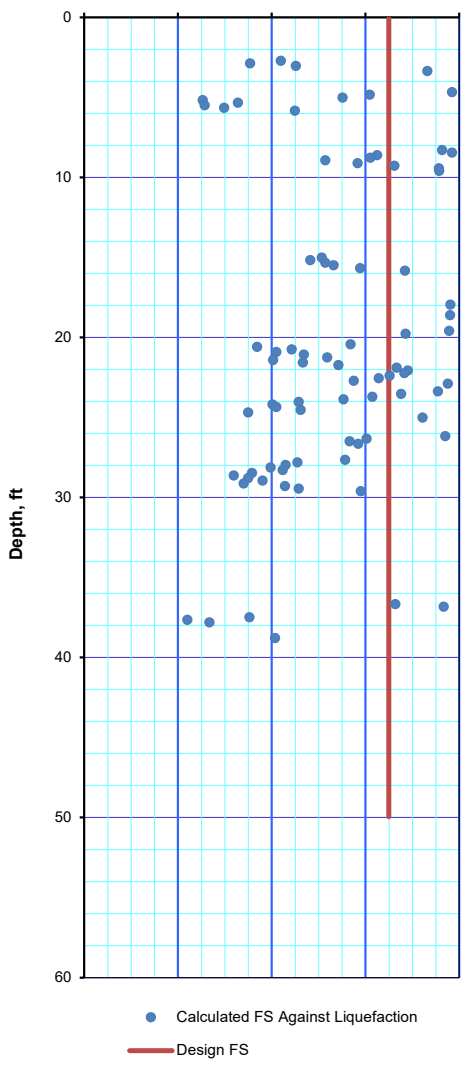
Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County, CA	Dist.to Free Face [ft]:	0	Figure No.:	D4.12
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-13**
Elevation (MSL)..... 757 ft

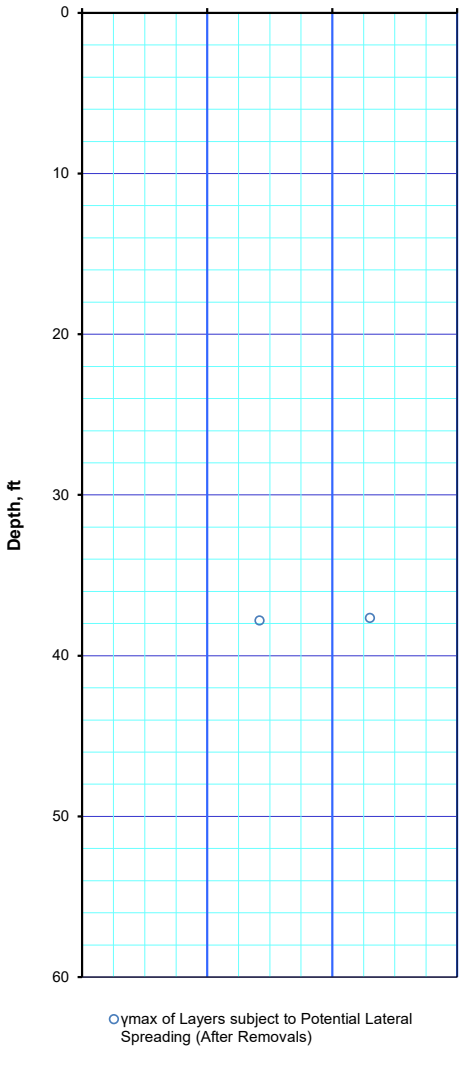
(a)



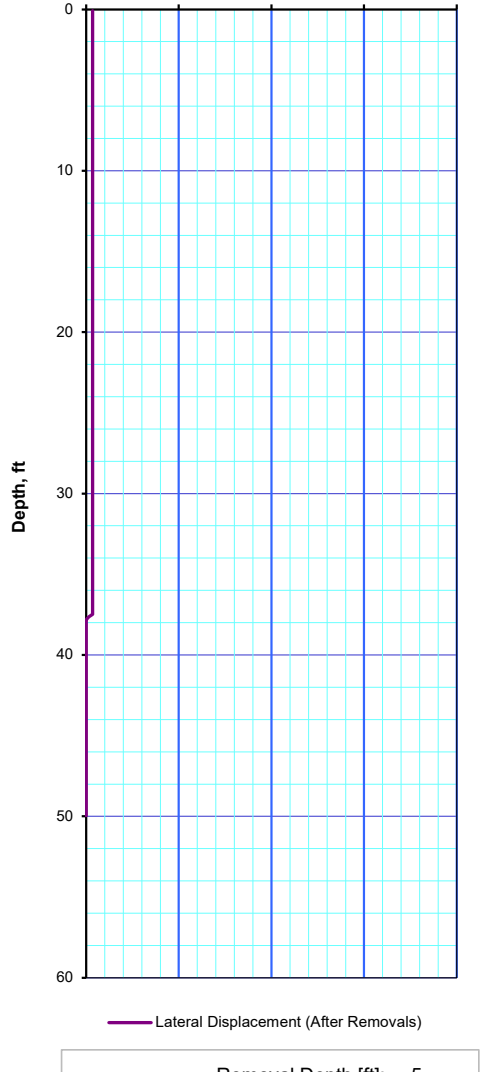
(b)



(c)



(d)



Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	0.1

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

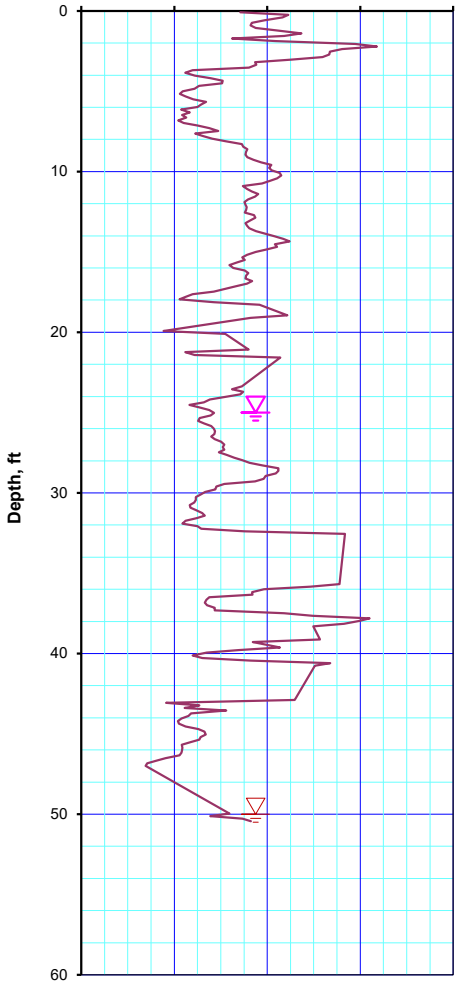
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.13
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-14**
Elevation (MSL)..... 750 ft

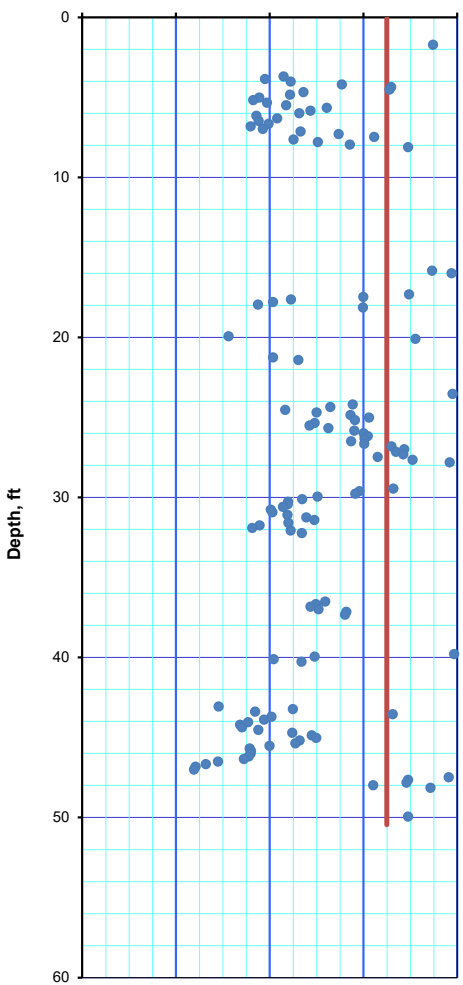
(a)

Normalized "Clean Sand" Tip Resistance



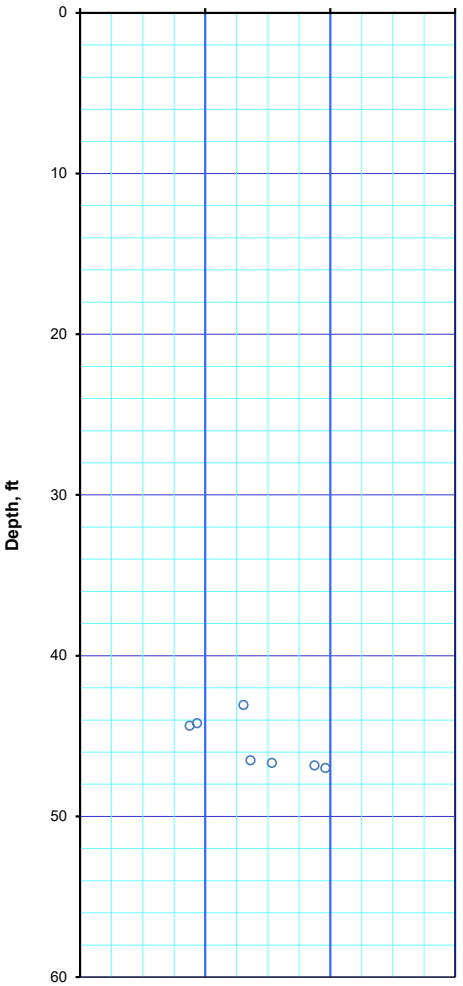
(b)

Factor of Safety



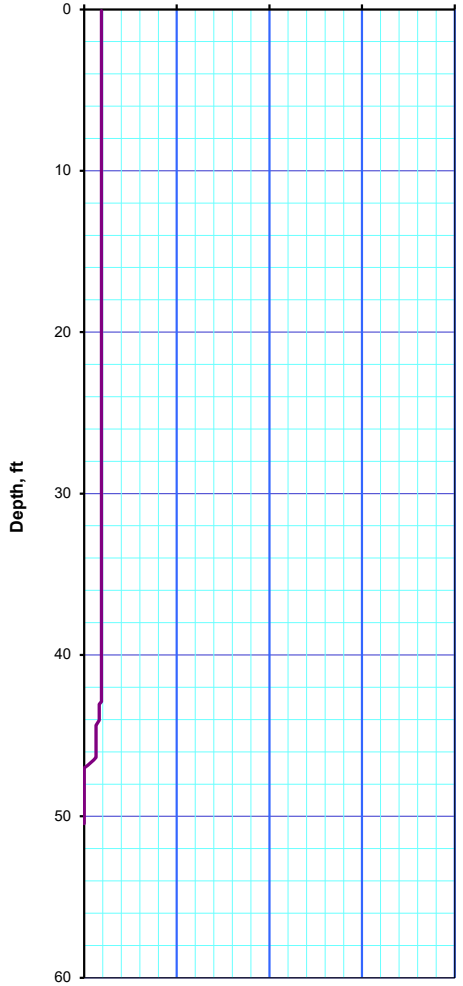
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	0.4

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

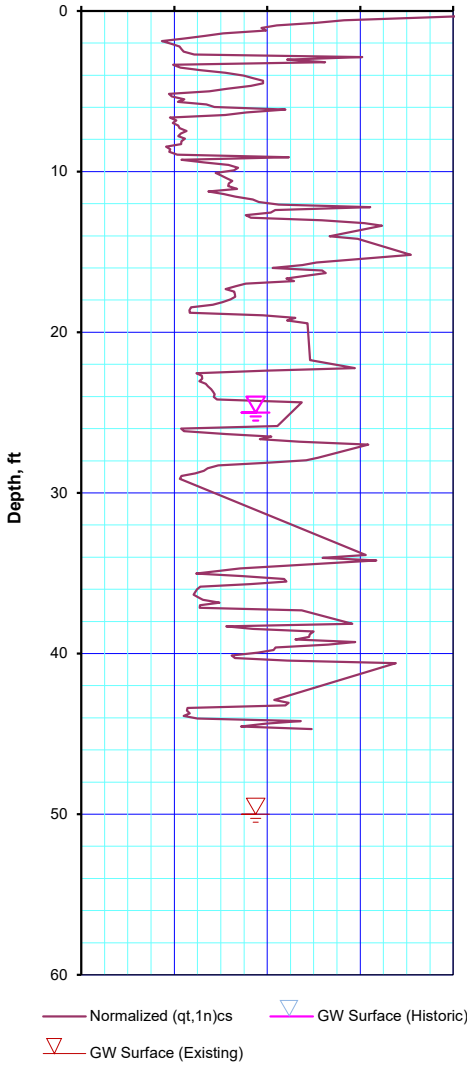
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.14
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-15**
Elevation (MSL)..... 725 ft

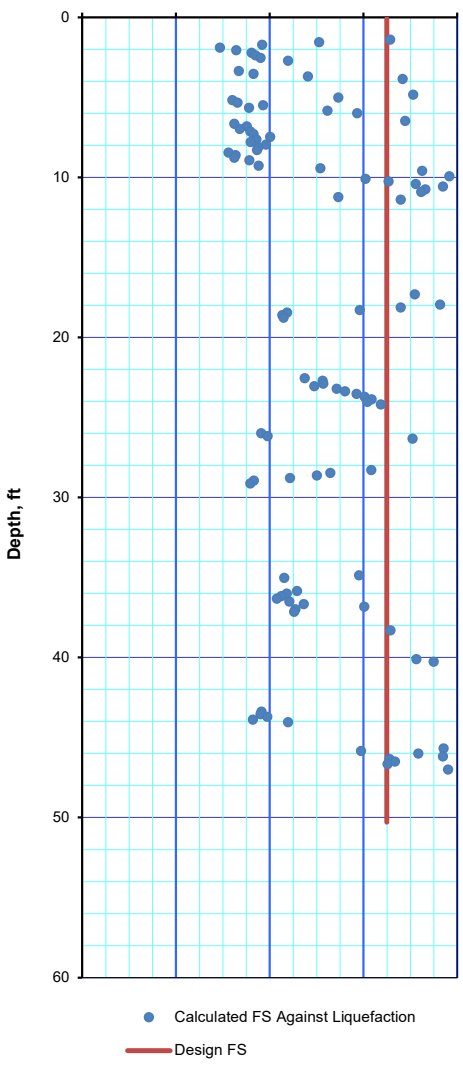
(a)

Normalized "Clean Sand" Tip Resistance



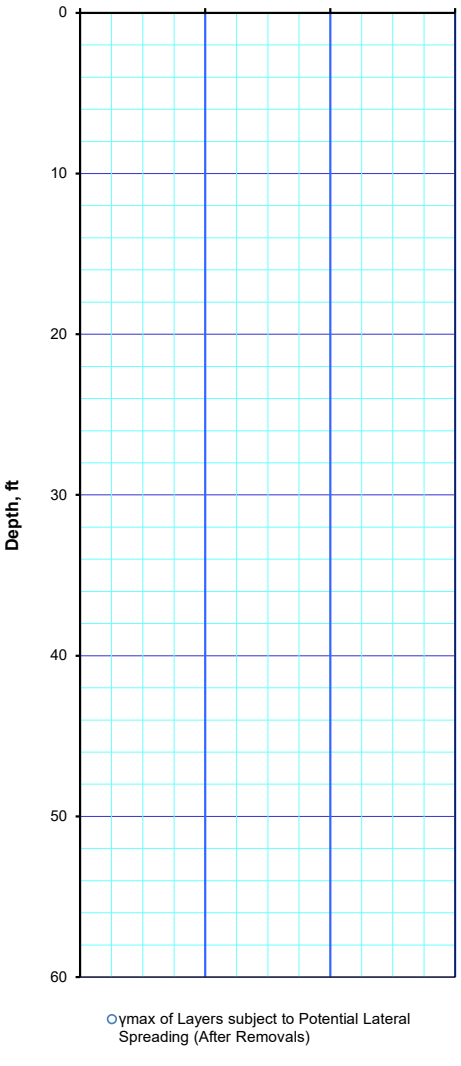
(b)

Factor of Safety



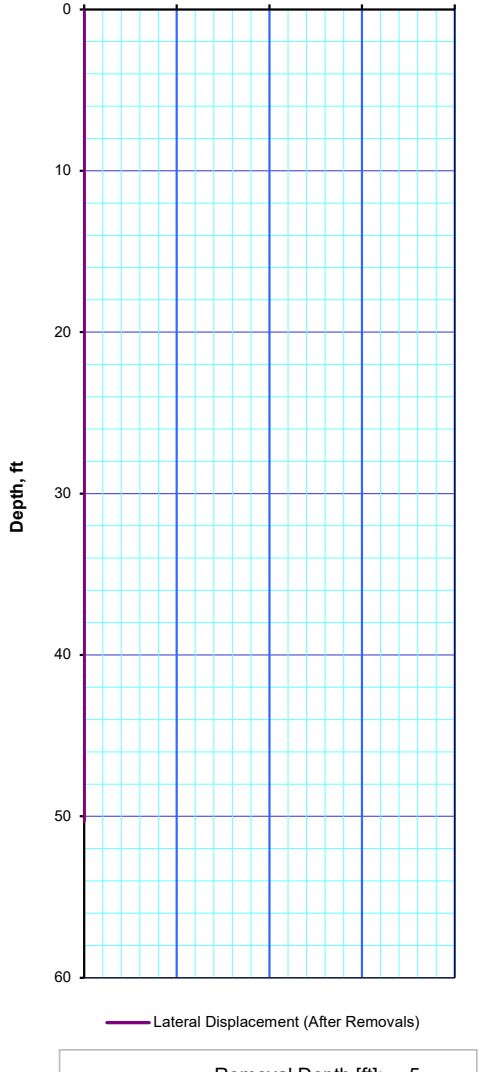
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	0.0

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

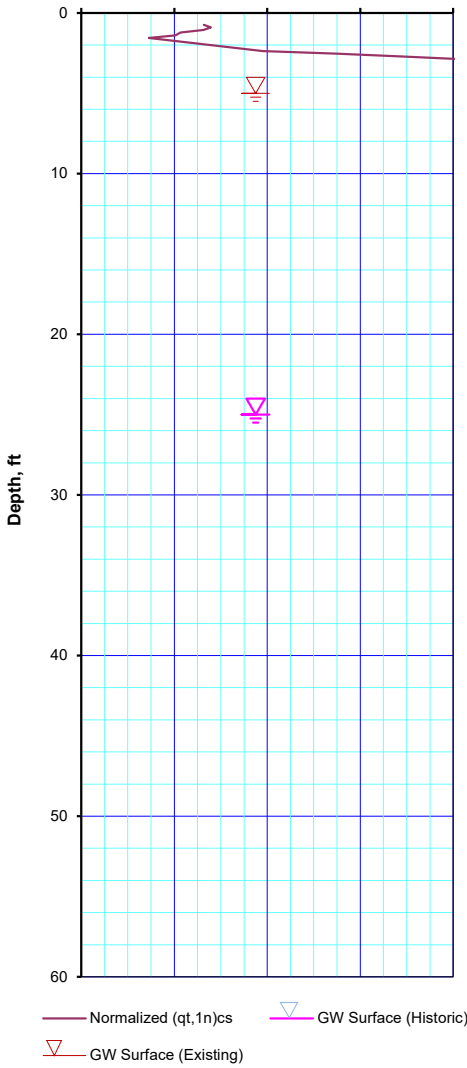
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	2.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.15
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-16**
Elevation (MSL)..... 1058 ft

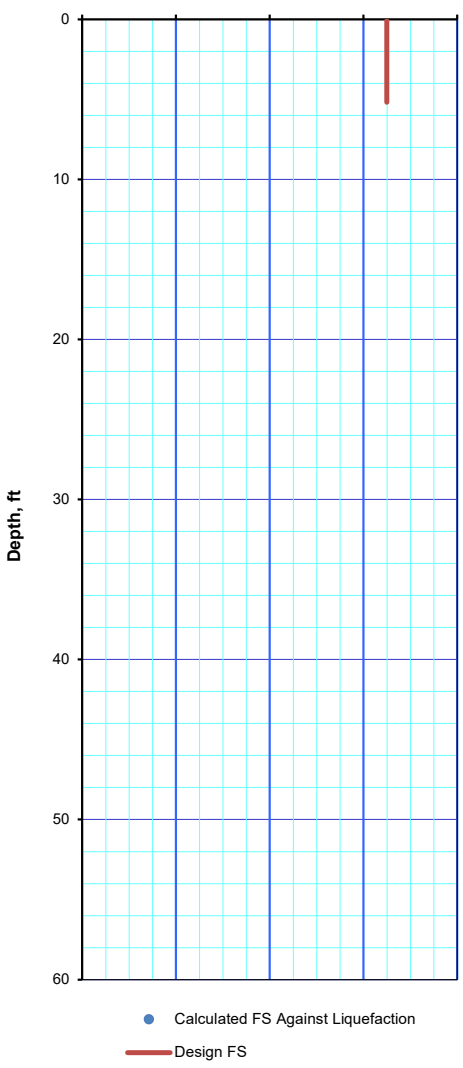
(a)

Normalized "Clean Sand" Tip Resistance



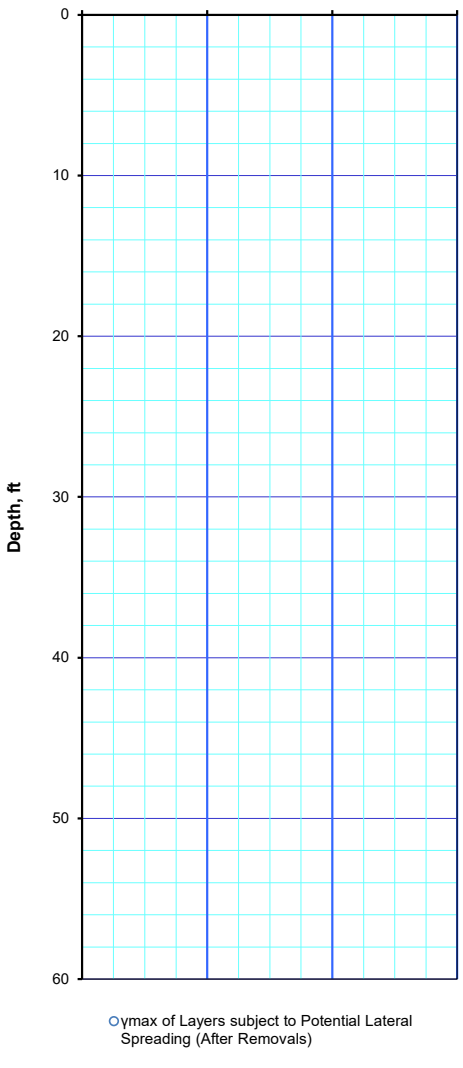
(b)

Factor of Safety



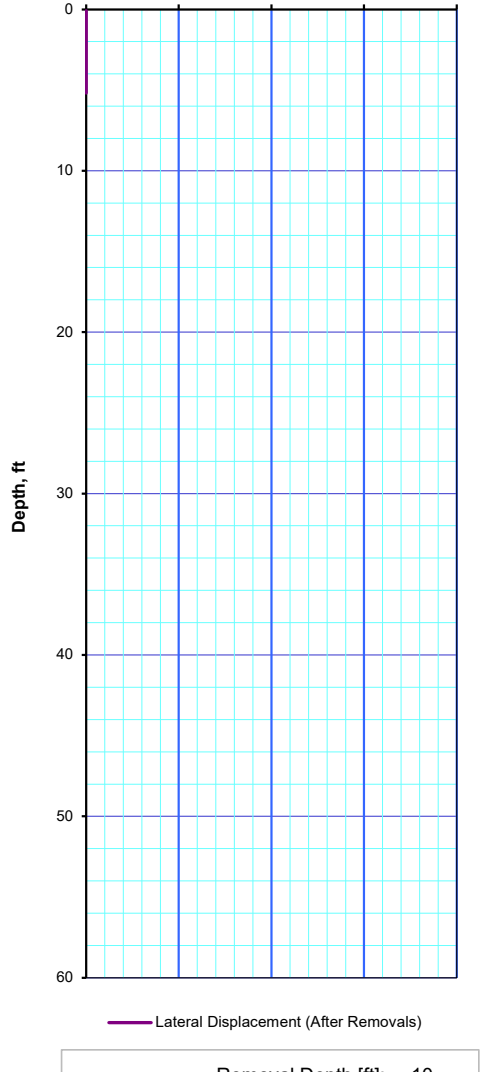
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	10
Estimated Lateral Disp. [ft]:	0.0

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

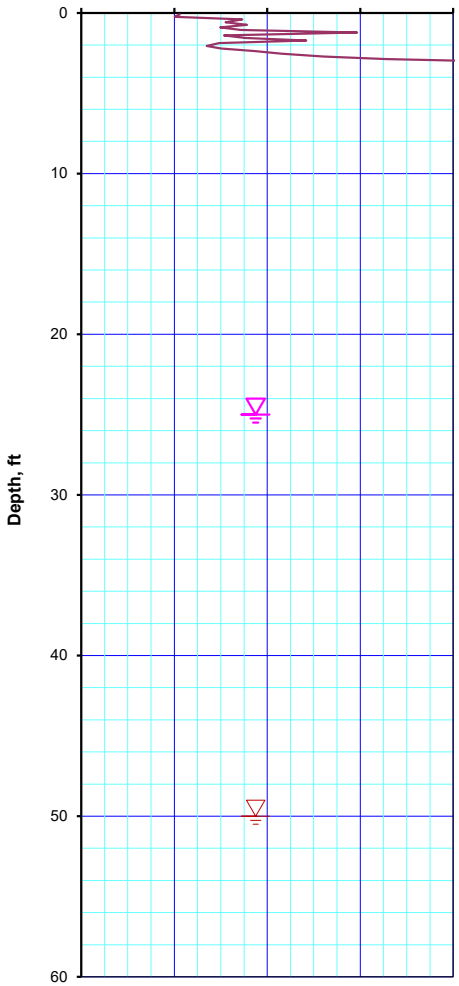
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	3.3	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.16
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-17**
Elevation (MSL)..... 1037 ft

(a)

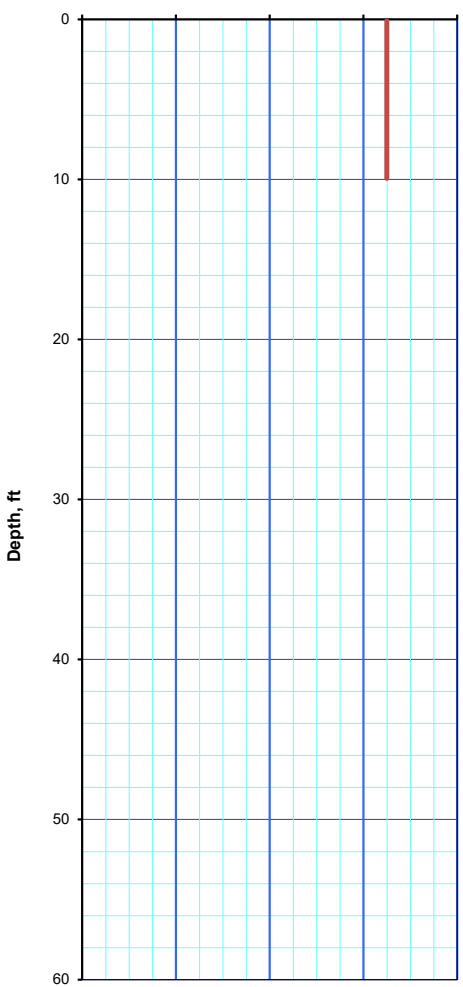
Normalized "Clean Sand" Tip Resistance



Normalized (qt,1n)cs
GW Surface (Historic)
GW Surface (Existing)

(b)

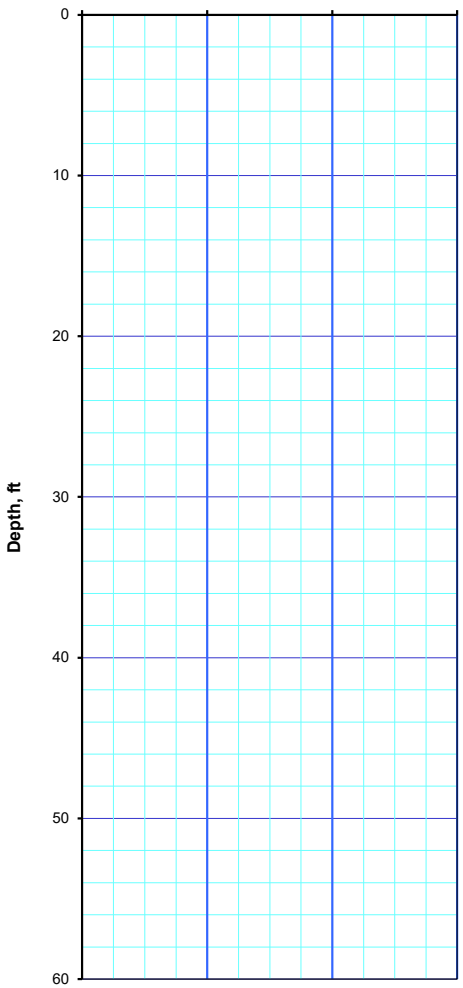
Factor of Safety



Calculated FS Against Liquefaction
Design FS

(c)

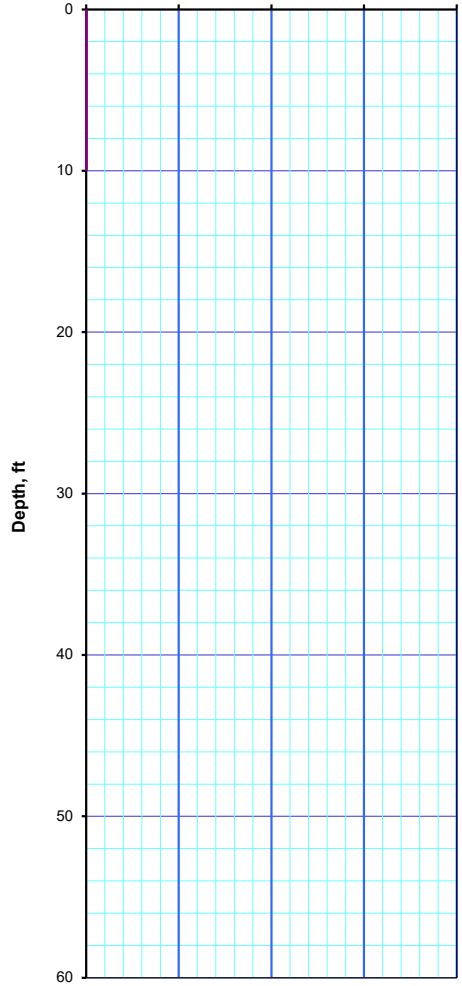
Maxiumum Cyclic Shear Strain, γ_{max}



γmax of Layers subject to Potential Lateral Spreading (After Removals)

(d)

Cumulative Lateral Displacement, in



Lateral Displacement (After Removals)

Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	0.0

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

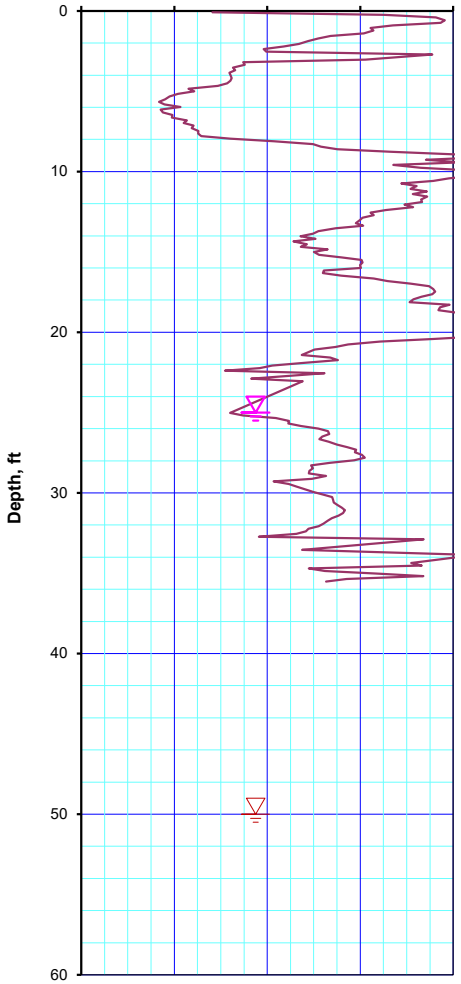
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	3.3	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.17
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	6/8/2018

Location..... **CPT-18**
Elevation (MSL)..... 985 ft

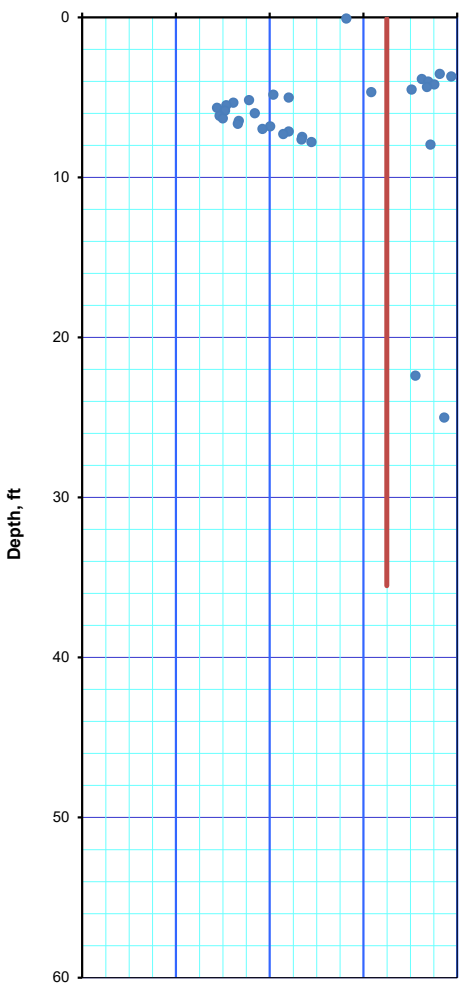
(a)

Normalized "Clean Sand" Tip Resistance



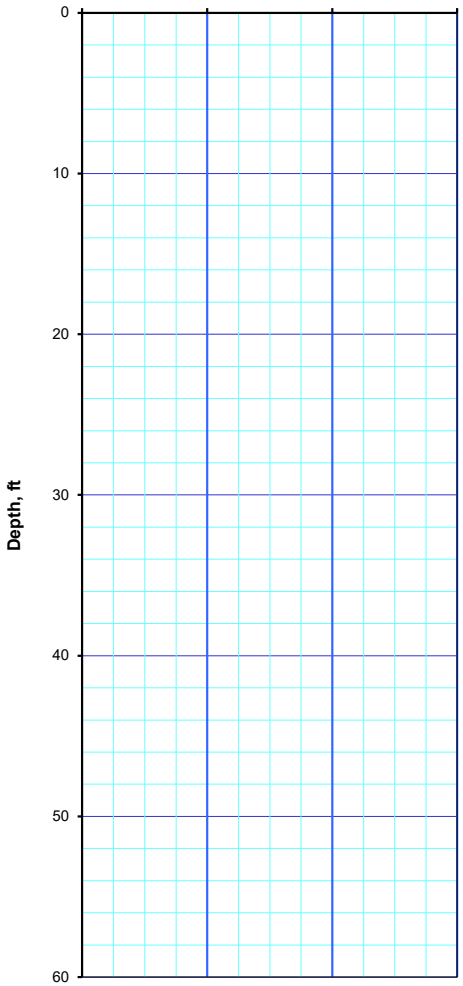
(b)

Factor of Safety



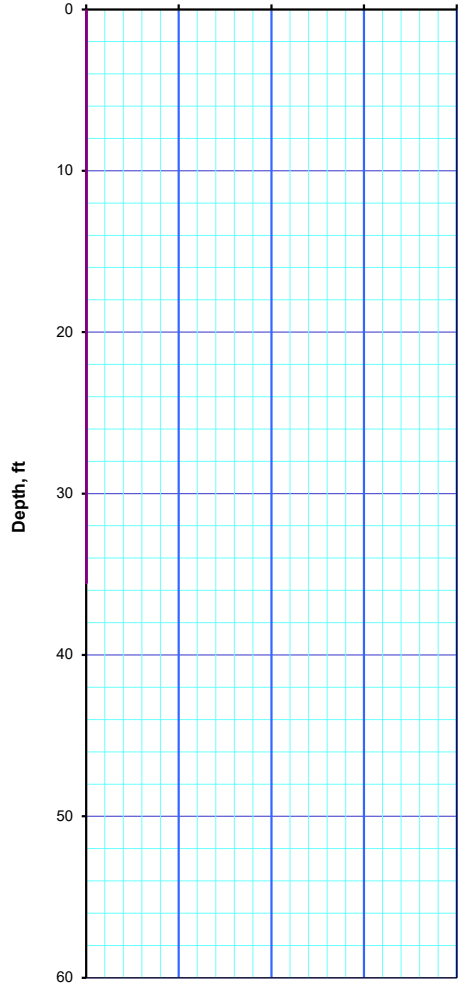
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	0.0

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

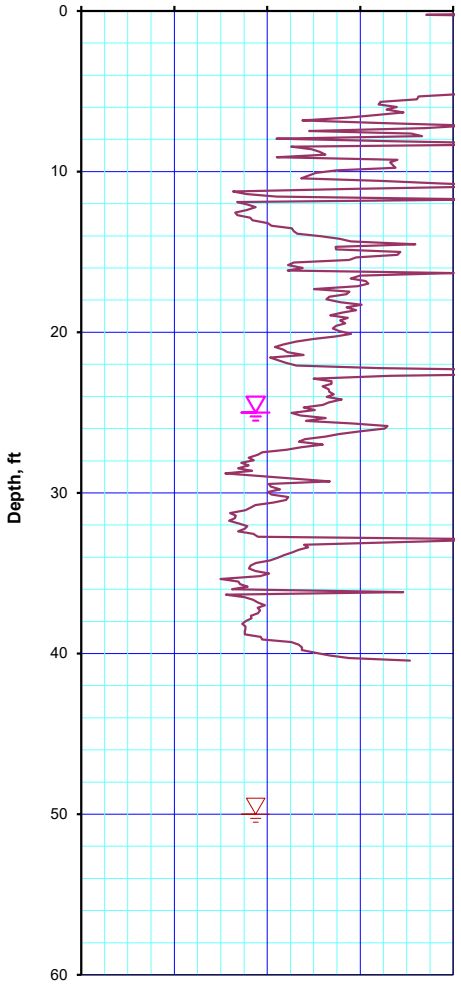
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hill Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.18
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	6/8/2018

Location..... **CPT-19**
Elevation (MSL)..... 960 ft

(a)

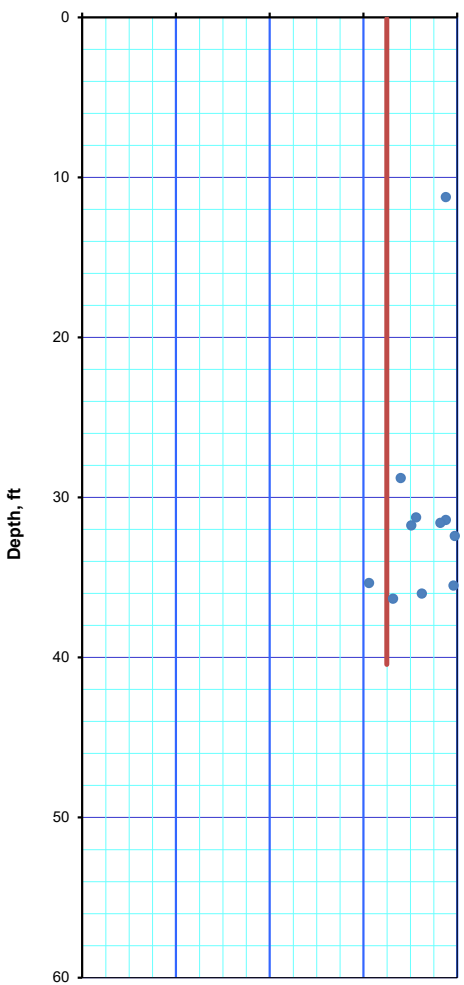
Normalized "Clean Sand" Tip Resistance



Normalized (qt,1n)cs
GW Surface (Historic)
GW Surface (Existing)

(b)

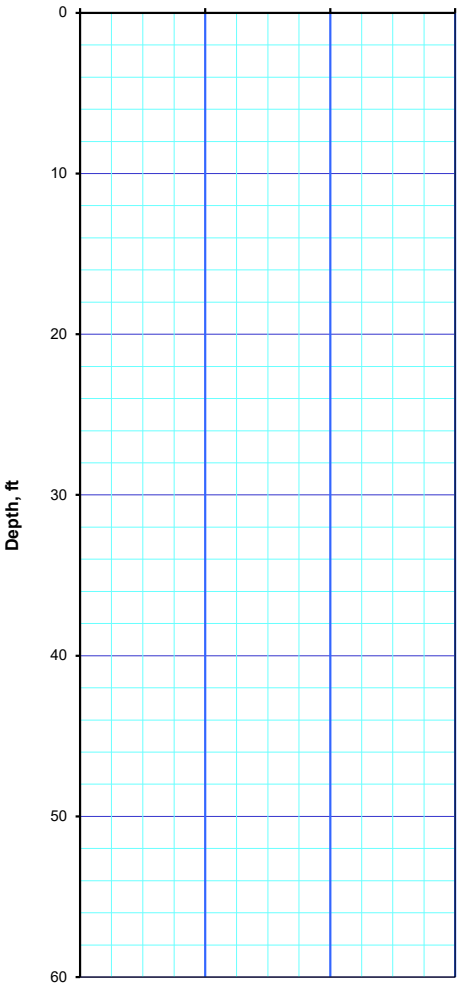
Factor of Safety



Calculated FS Against Liquefaction
Design FS

(c)

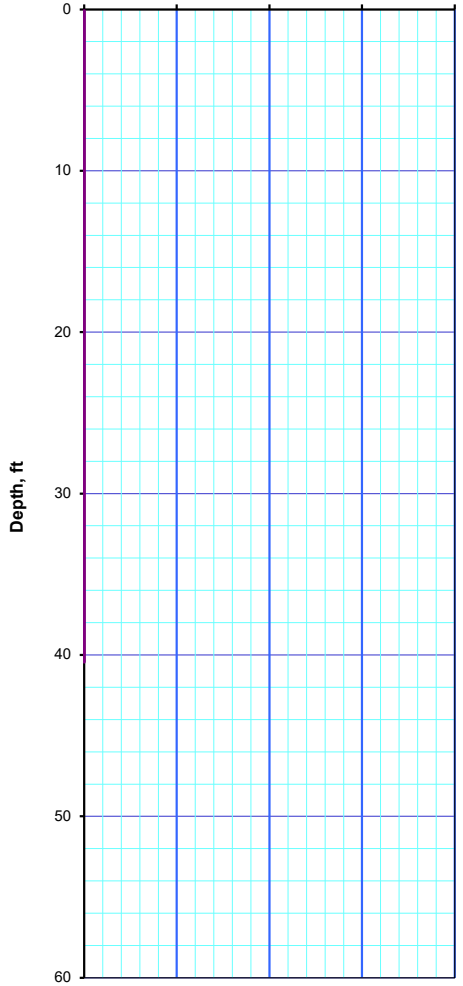
Maxiumum Cyclic Shear Strain, γ_{max}



γmax of Layers subject to Potential Lateral Spreading (After Removals)

(d)

Cumulative Lateral Displacement, in



Lateral Displacement (After Removals)

Removal Depth [ft]:	0
Estimated Lateral Disp. [ft]:	0.0

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

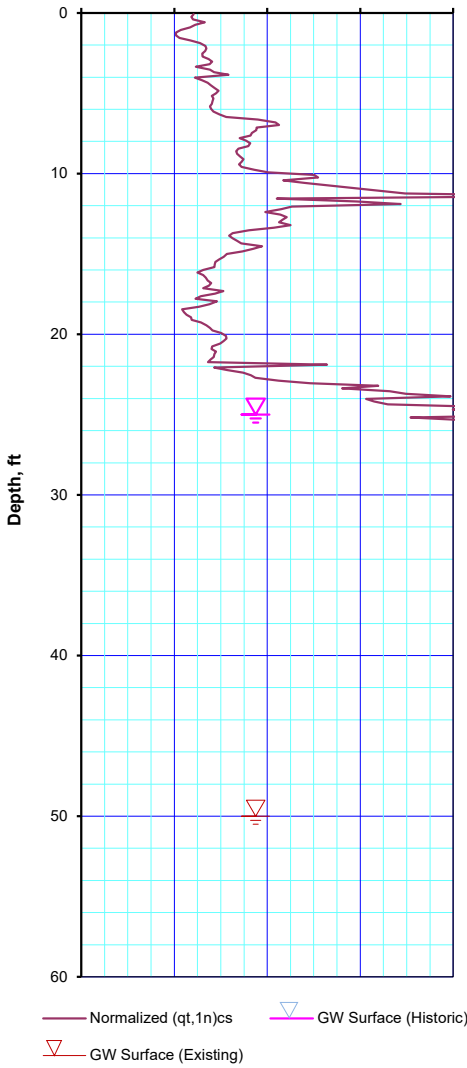
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.19
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	6/8/2018

Location..... **CPT-20**
Elevation (MSL)..... 991 ft

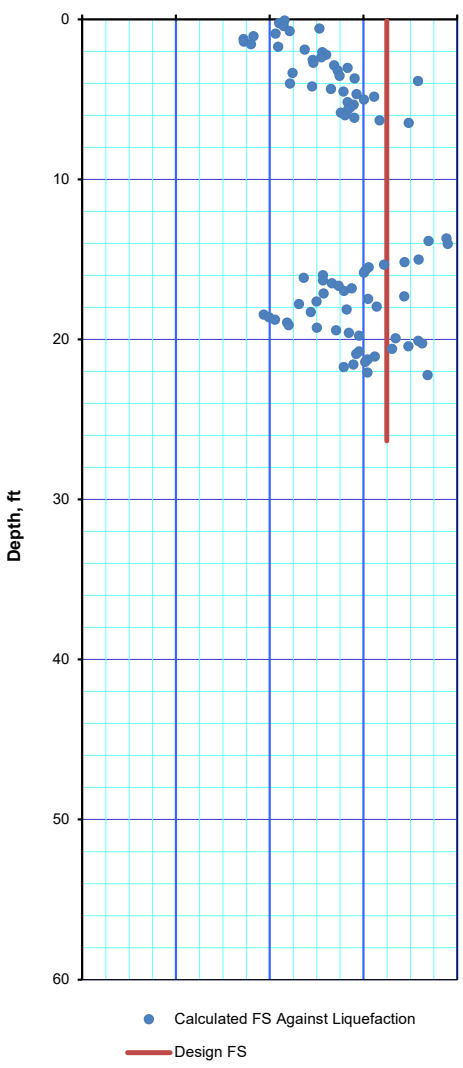
(a)

Normalized "Clean Sand" Tip Resistance



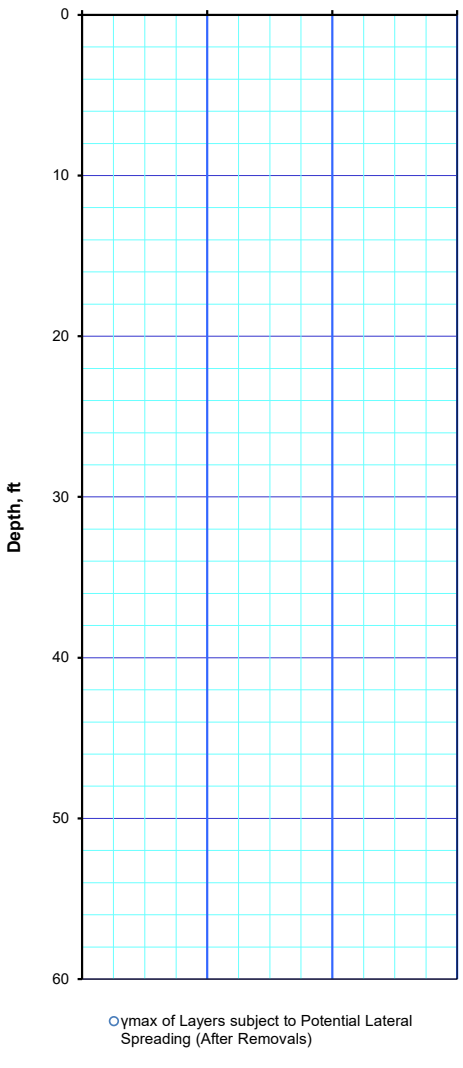
(b)

Factor of Safety



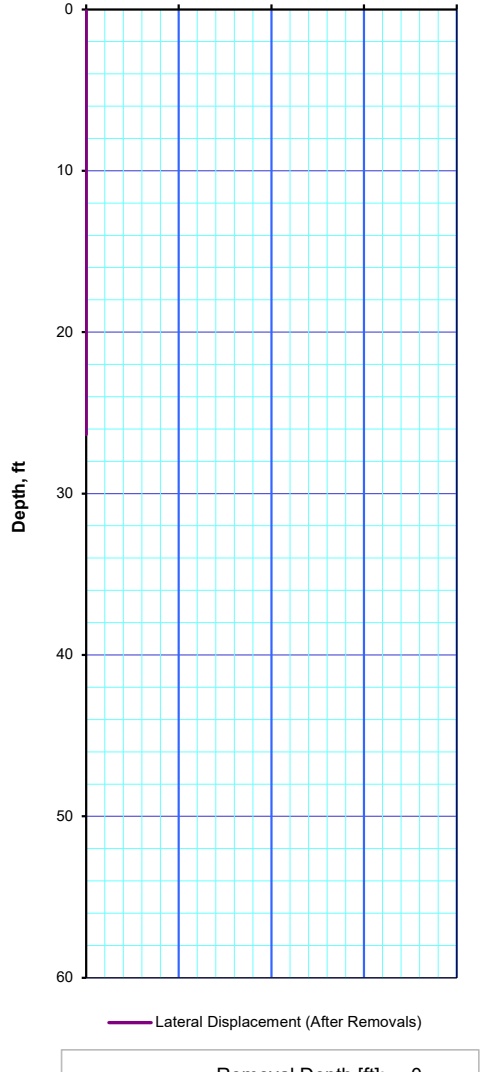
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	0
Estimated Lateral Disp. [ft]:	0.0

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

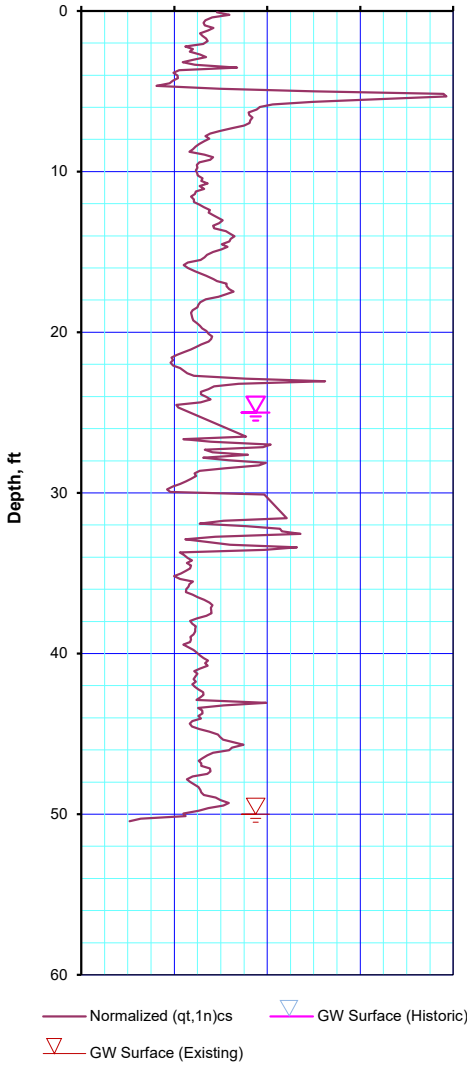
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County, CA	Dist.to Free Face [ft]:	0	Figure No.:	D4.20
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	6/8/2018

Location..... **CPT-21**
Elevation (MSL)..... 951 ft

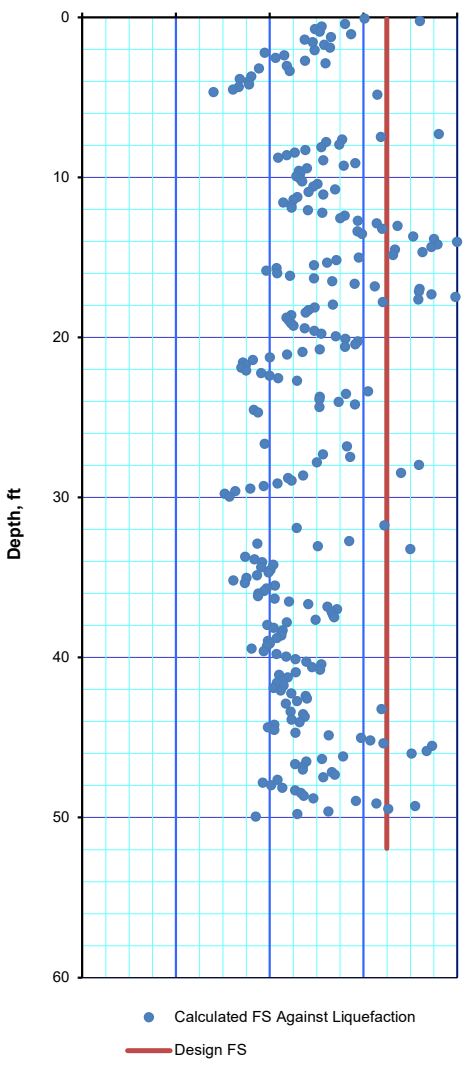
(a)

Normalized "Clean Sand" Tip Resistance



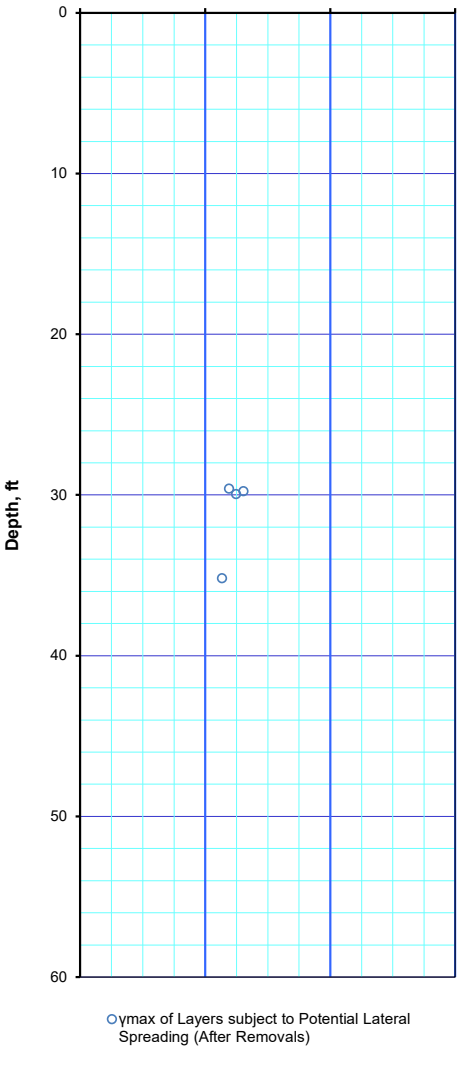
(b)

Factor of Safety



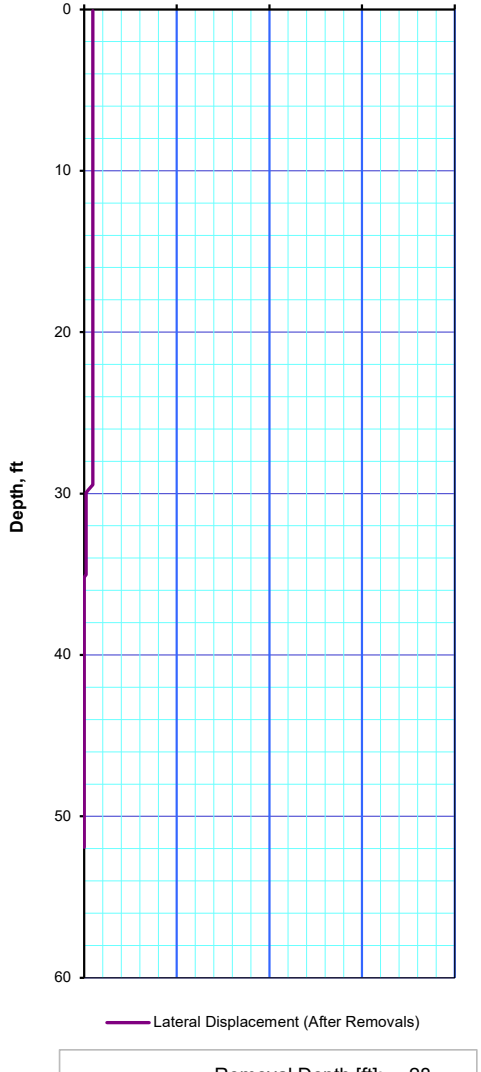
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	28
Estimated Lateral Disp. [ft]:	0.2

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

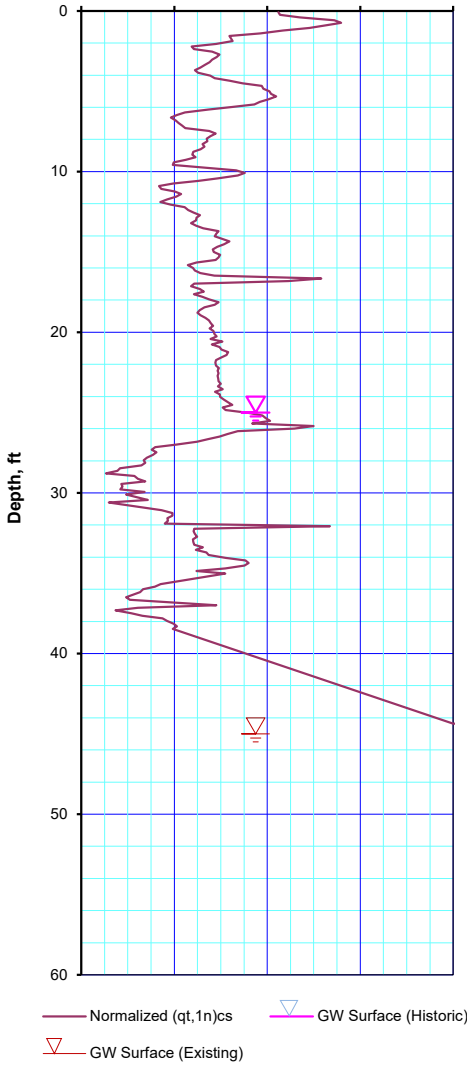
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County, CA	Dist.to Free Face [ft]:	0	Figure No.:	D4.21
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-22**
Elevation (MSL)..... 912 ft

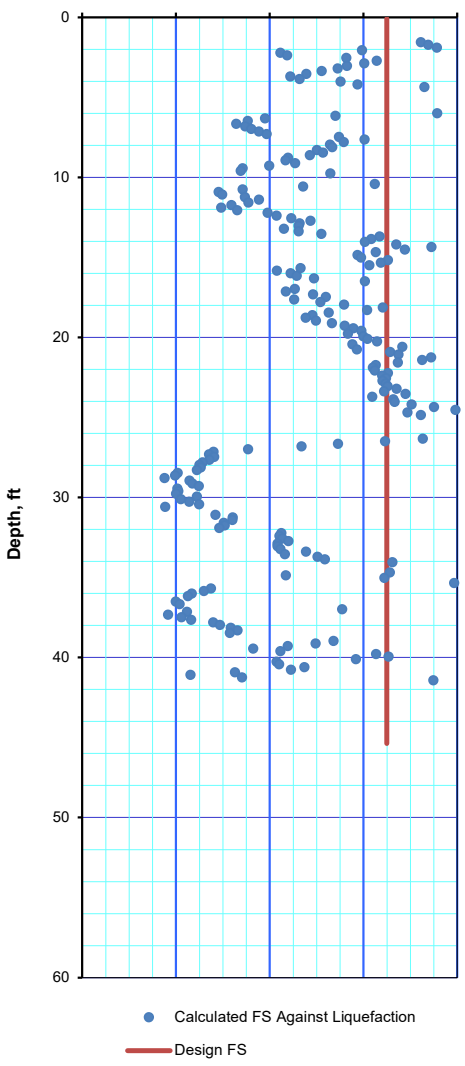
(a)

Normalized "Clean Sand" Tip Resistance



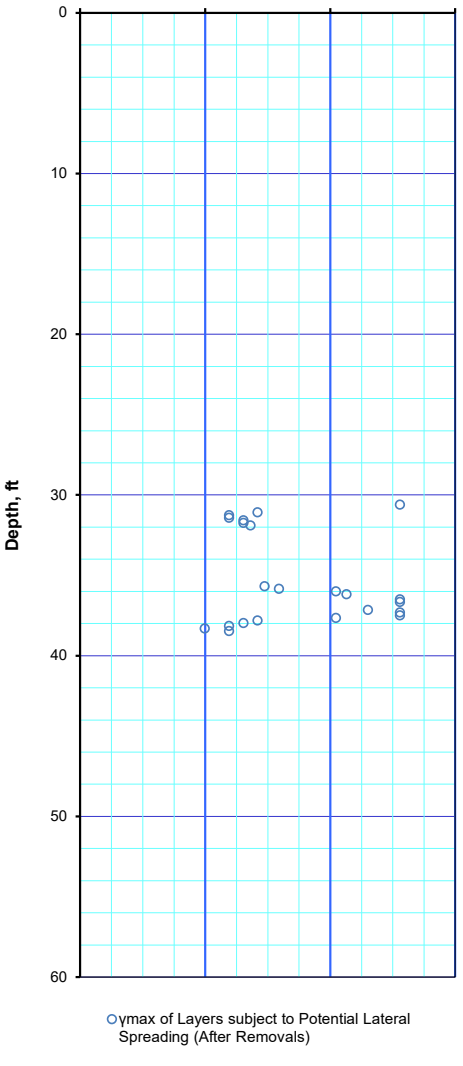
(b)

Factor of Safety



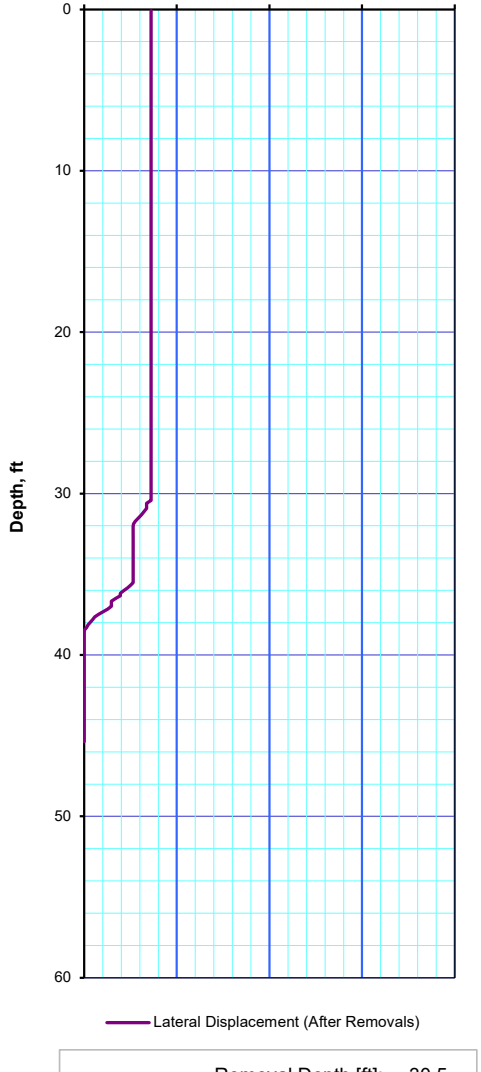
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	30.5
Estimated Lateral Disp. [ft]:	1.5

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

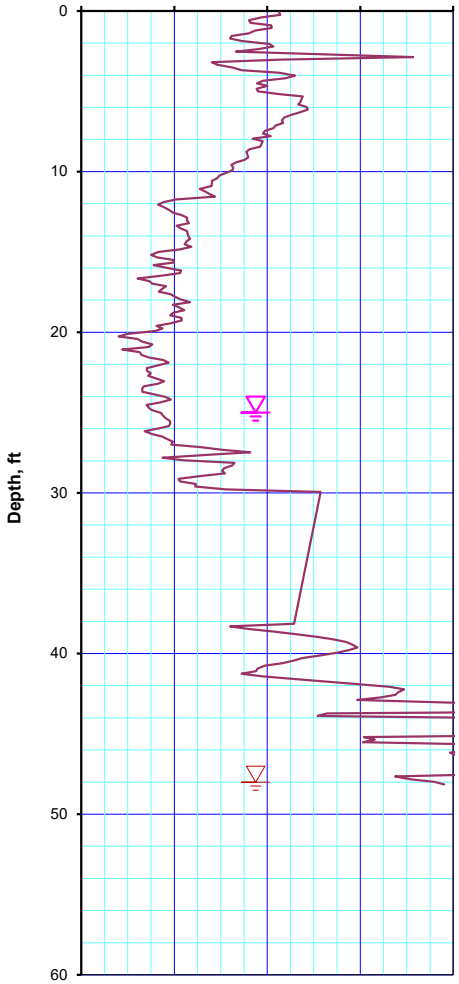
CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	1.0	Project No.:	23-2195s
	Santa Barbara County, CA	Dist.to Free Face [ft]:	0	Figure No.:	D4.22
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Location..... **CPT-23**
Elevation (MSL)..... 937 ft

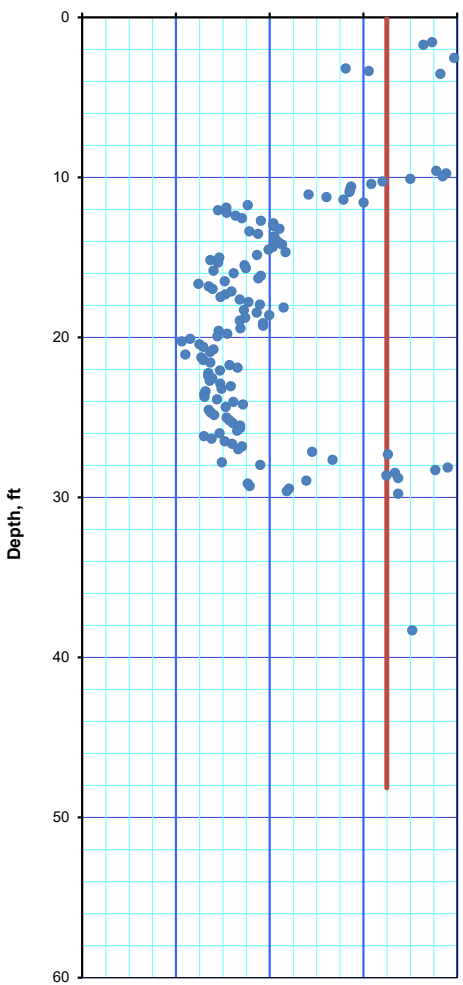
(a)

Normalized "Clean Sand" Tip Resistance



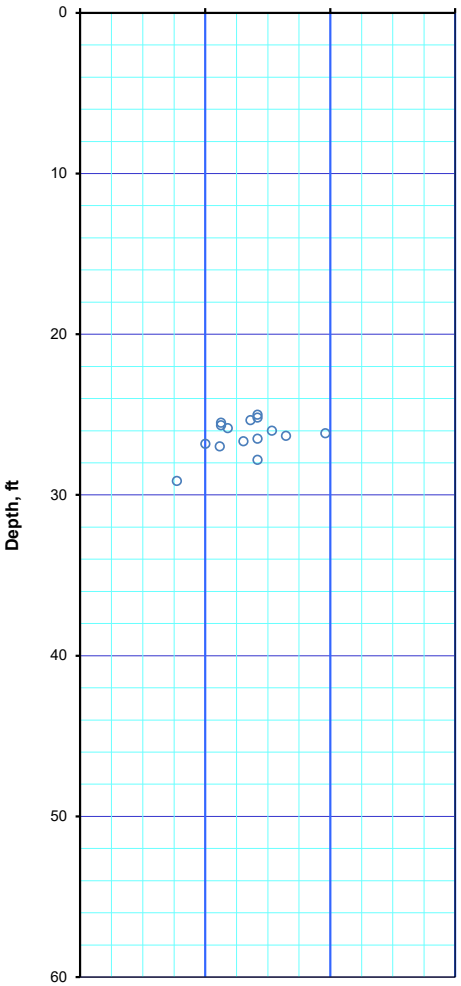
(b)

Factor of Safety



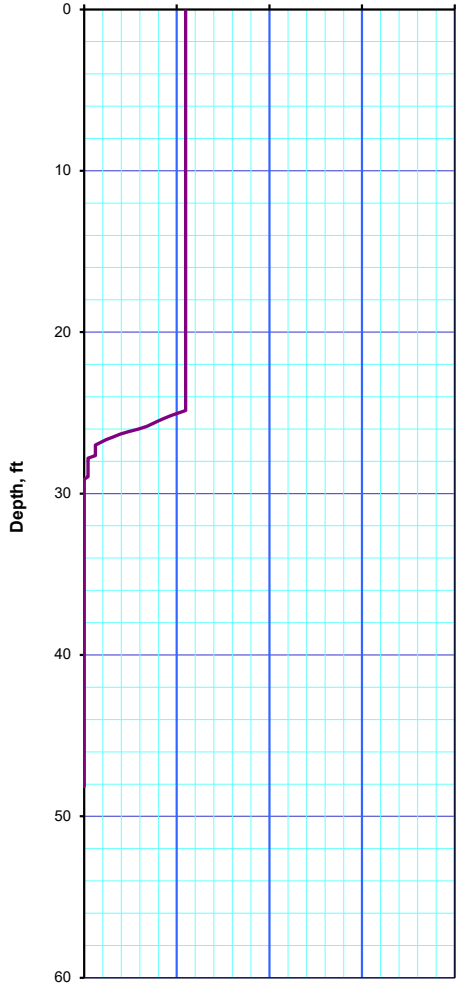
(c)

Maxiumum Cyclic Shear Strain, γ_{max}



(d)

Cumulative Lateral Displacement, in



Removal Depth [ft]:	5
Estimated Lateral Disp. [ft]:	2.3

Version v1a; 1/23/18
Reference: Zhang et. al. 2004

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

CPT-Based Evaluation of Liquefaction-Induced Lateral Displacements

Project:	Solomon Hills Specific Plan	Ground Slope [%]:	3.3	Project No.:	23-2195s
	Santa Barbara County	Dist.to Free Face [ft]:	0	Figure No.:	D4.23
Client:	Solstra Communities California, I	Free Face Height [ft]:	0	Date:	10/20/2023

Estimation of Liquefaction-Induced Lateral Spread Displacements using the CPT

Project:	Solomon Hills Specific Plan	Project No.:	23-2195s
	Santa Barbara County	Date:	10/20/23
Client:	Solstra Communities California, LLC	Figure No.:	D5

Location	CPT-05		MCE Mean Magnitude =	6.79	
Ground Surface Elevation	838	ft. above MSL	Peak Ground Accel. (M = 6.79) =	0.49	g
Existing Ground Water Depth	50.0	ft. BGS	Approx. Distance From Site (miles) =	1.0	
Historic Ground Water Depth	25.0	ft. BGS	Basic Earthquake Magnitude =	7.5	
Removal Depth	38	ft.	Magnitude Weighted PGA (M = 7.5) =	0.29	g
Design Safety Factor	1.3		Magnitude Scaling Factor =	1.69	

Options:

SS	Free Face Condition [FF] or Gently Sloping Surface [SS]
84	$q_{t,1N}$ cut-off value [tsf]
4	I_c cut-off value

(Range is 0.2% to 3.5%) Ground Slope, S =	1.0	[%]
Distance to Free Face, L =	0	[ft]
Free Face Height, H =	0	[ft]
(Range is 4 < L/H < 40) L/H =		
Thickness of Susceptible Layers, T =	5.6	[ft]

Procedure by Zhang et. al., 2004

Mid-layer Depth	Elevation	For Overburden, $q_{t,1N}$	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC	Calculated Factor of Safety, FS	Relative Density, D_r	Max Cyclic Shear Strain, γ_{max}	Lateral Displacement Index, LDI	Lateral Displ.	Cumulative Lateral Displ.
[ft]	[ft. MSL]			[%]	$CRR_{7.5}/CSR^*$		[%]	[in]	[in]	21.4
0.08	837.9	159.83	159.83	1	#N/A	#N/A	#N/A	#N/A	0.00	21.4
0.25	837.8	142.33	142.33	1	#N/A	#N/A	#N/A	#N/A	0.00	21.4
0.41	837.6	119.45	119.45	1	#N/A	#N/A	#N/A	#N/A	0.00	21.4
0.58	837.4	95.66	95.66	3	#N/A	#N/A	#N/A	#N/A	0.00	21.4
0.74	837.3	79.13	79.13	4	#N/A	#N/A	#N/A	#N/A	0.00	21.4
0.90	837.1	58.94	58.94	5	#N/A	#N/A	#N/A	#N/A	0.00	21.4
1.07	836.9	44.36	44.36	5	#N/A	#N/A	#N/A	#N/A	0.00	21.4
1.23	836.8	35.21	35.21	5	#N/A	#N/A	#N/A	#N/A	0.00	21.4
1.40	836.6	30.51	30.51	5	#N/A	#N/A	#N/A	#N/A	0.00	21.4
1.56	836.4	33.08	33.08	5	#N/A	#N/A	#N/A	#N/A	0.00	21.4
1.72	836.3	47.48	47.48	5	#N/A	#N/A	#N/A	#N/A	0.00	21.4
1.89	836.1	60.20	60.20	5	#N/A	#N/A	#N/A	#N/A	0.00	21.4
2.05	836.0	73.43	73.43	5	#N/A	#N/A	#N/A	#N/A	0.00	21.4
2.22	835.8	86.17	86.17	3	#N/A	#N/A	#N/A	#N/A	0.00	21.4
2.38	835.6	95.68	95.68	3	#N/A	#N/A	#N/A	#N/A	0.00	21.4
2.54	835.5	103.59	103.59	3	#N/A	#N/A	#N/A	#N/A	0.00	21.4
2.71	835.3	110.38	110.38	3	#N/A	#N/A	#N/A	#N/A	0.00	21.4
2.87	835.1	114.81	114.81	2	#N/A	#N/A	#N/A	#N/A	0.00	21.4
3.04	835.0	116.83	116.83	2	1.21	72	#N/A	#N/A	0.00	21.4
3.20	834.8	119.02	119.02	2	1.25	73	#N/A	#N/A	0.00	21.4
3.36	834.6	117.51	117.51	2	1.22	72	#N/A	#N/A	0.00	21.4
3.53	834.5	117.40	117.40	5	1.22	72	#N/A	#N/A	0.00	21.4
3.69	834.3	121.75	121.75	2	1.31	73	#N/A	#N/A	0.00	21.4
3.86	834.1	125.23	148.23	10	2.00	80	#N/A	#N/A	0.00	21.4
4.02	834.0	148.04	173.09	10	2.00	85	#N/A	#N/A	0.00	21.4
4.19	833.8	133.16	151.79	9	2.00	81	#N/A	#N/A	0.00	21.4
4.35	833.7	135.27	143.89	7	1.89	79	#N/A	#N/A	0.00	21.4
4.51	833.5	139.45	144.17	6	1.90	79	#N/A	#N/A	0.00	21.4
4.68	833.3	142.30	146.60	6	1.98	80	#N/A	#N/A	0.00	21.4
4.84	833.2	139.37	142.77	6	1.86	79	#N/A	#N/A	0.00	21.4
5.01	833.0	140.96	143.93	6	1.89	79	#N/A	#N/A	0.00	21.4
5.17	832.8	144.67	147.42	6	2.00	80	#N/A	#N/A	0.00	21.4

Procedure by Zhang et. al., 2004										
Mid-layer Depth	Elevation	For Overburden, $q_{t,1N}$	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC	Calculated Factor of Safety, FS	Relative Density, D_r	Max Cyclic Shear Strain, γ_{max}	Lateral Displacement Index, LDI	Lateral Displ.	Cumulative Lateral Displ.
[ft]	[ft. MSL]			[%]	$CRR_{7.5}/CSR^*$		[%]	[in]	[in]	21.4
5.33	832.7	146.15	146.55	5	1.98	80	#N/A	#N/A	0.00	21.4
5.50	832.5	150.14	150.43	5	2.00	80	#N/A	#N/A	0.00	21.4
5.66	832.3	153.57	155.27	6	2.00	82	#N/A	#N/A	0.00	21.4
5.83	832.2	151.79	151.79	5	2.00	81	#N/A	#N/A	0.00	21.4
5.99	832.0	150.20	150.20	5	2.00	80	#N/A	#N/A	0.00	21.4
6.15	831.9	148.48	150.21	6	2.00	80	#N/A	#N/A	0.00	21.4
6.32	831.7	149.29	149.21	5	2.00	80	#N/A	#N/A	0.00	21.4
6.48	831.5	150.51	151.74	5	2.00	81	#N/A	#N/A	0.00	21.4
6.65	831.4	150.86	150.86	5	2.00	81	#N/A	#N/A	0.00	21.4
6.81	831.2	152.42	151.25	5	2.00	81	#N/A	#N/A	0.00	21.4
6.97	831.0	152.51	151.76	5	2.00	81	#N/A	#N/A	0.00	21.4
7.14	830.9	150.88	150.88	5	2.00	81	#N/A	#N/A	0.00	21.4
7.30	830.7	142.05	144.89	6	1.93	79	#N/A	#N/A	0.00	21.4
7.47	830.5	145.87	144.79	5	1.93	79	#N/A	#N/A	0.00	21.4
7.63	830.4	141.97	141.99	5	1.85	79	#N/A	#N/A	0.00	21.4
7.79	830.2	141.52	142.37	5	1.86	79	#N/A	#N/A	0.00	21.4
7.96	830.0	140.27	140.27	5	1.80	78	#N/A	#N/A	0.00	21.4
8.12	829.9	139.47	138.48	5	1.75	78	#N/A	#N/A	0.00	21.4
8.29	829.7	148.98	174.11	10	2.00	85	#N/A	#N/A	0.00	21.4
8.45	829.6	169.40	169.40	3	2.00	84	#N/A	#N/A	0.00	21.4
8.61	829.4	105.41	161.84	17	2.00	83	#N/A	#N/A	0.00	21.4
8.78	829.2	165.33	186.13	9	2.00	88	#N/A	#N/A	0.00	21.4
8.94	829.1	122.13	158.57	13	2.00	82	#N/A	#N/A	0.00	21.4
9.11	828.9	106.20	126.50	11	1.44	75	#N/A	#N/A	0.00	21.4
9.27	828.7	98.95	124.94	12	1.40	74	#N/A	#N/A	0.00	21.4
9.43	828.6	92.57	117.57	12	1.24	72	#N/A	#N/A	0.00	21.4
9.60	828.4	93.97	117.25	12	1.23	72	#N/A	#N/A	0.00	21.4
9.76	828.2	94.87	113.38	11	1.16	71	#N/A	#N/A	0.00	21.4
9.93	828.1	89.47	110.67	12	1.11	70	#N/A	#N/A	0.00	21.4
10.09	827.9	89.27	108.40	11	1.07	70	#N/A	#N/A	0.00	21.4
10.25	827.8	84.48	104.21	12	0.99	68	#N/A	#N/A	0.00	21.4
10.42	827.6	83.28	107.35	13	1.05	69	#N/A	#N/A	0.00	21.4
10.58	827.4	83.40	108.59	13	1.07	70	#N/A	#N/A	0.00	21.4
10.75	827.3	84.02	98.64	10	0.91	67	#N/A	#N/A	0.00	21.4
10.91	827.1	86.57	103.52	11	0.99	68	#N/A	#N/A	0.00	21.4
11.07	826.9	86.71	104.27	11	1.00	68	#N/A	#N/A	0.00	21.4
11.24	826.8	81.61	101.72	12	0.96	68	#N/A	#N/A	0.00	21.4
11.40	826.6	78.45	99.92	13	0.93	67	#N/A	#N/A	0.00	21.4
11.57	826.4	76.03	97.59	13	0.90	66	#N/A	#N/A	0.00	21.4
11.73	826.3	74.21	102.29	15	0.97	68	#N/A	#N/A	0.00	21.4
11.89	826.1	70.47	96.91	15	0.89	66	#N/A	#N/A	0.00	21.4
12.06	825.9	64.90	93.98	16	0.85	65	#N/A	#N/A	0.00	21.4
12.22	825.8	58.49	85.49	16	0.75	62	#N/A	#N/A	0.00	21.4
12.39	825.6	51.50	80.53	18	0.69	60	#N/A	#N/A	0.00	21.4
12.55	825.5	45.56	77.67	20	0.67	59	#N/A	#N/A	0.00	21.4
12.72	825.3	42.03	77.16	21	0.66	58	#N/A	#N/A	0.00	21.4
12.88	825.1	41.66	77.21	22	0.66	58	#N/A	#N/A	0.00	21.4
13.04	825.0	43.85	76.73	20	0.66	58	#N/A	#N/A	0.00	21.4
13.21	824.8	44.45	76.55	20	0.66	58	#N/A	#N/A	0.00	21.4
13.37	824.6	44.16	76.72	20	0.66	58	#N/A	#N/A	0.00	21.4

Procedure by Zhang et. al., 2004										
Mid-layer Depth	Elevation	For Overburden, $q_{t,1N}$	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC	Calculated Factor of Safety, FS	Relative Density, D_r	Max Cyclic Shear Strain, γ_{max}	Lateral Displacement Index, LDI	Lateral Displ.	Cumulative Lateral Displ.
[ft]	[ft. MSL]			[%]	$CRR_{7.5}/CSR^*$		[%]	[in]	[in]	21.4
13.54	824.5	44.18	76.03	20	0.65	58	#N/A	#N/A	0.00	21.4
13.70	824.3	42.93	76.48	21	0.66	58	#N/A	#N/A	0.00	21.4
13.86	824.1	41.74	79.44	22	0.69	59	#N/A	#N/A	0.00	21.4
14.03	824.0	41.08	77.62	22	0.67	59	#N/A	#N/A	0.00	21.4
14.19	823.8	42.09	71.23	19	0.62	56	#N/A	#N/A	0.00	21.4
14.36	823.6	44.53	72.34	19	0.62	56	#N/A	#N/A	0.00	21.4
14.52	823.5	42.54	74.19	20	0.64	57	#N/A	#N/A	0.00	21.4
14.68	823.3	42.76	75.74	21	0.65	58	#N/A	#N/A	0.00	21.4
14.85	823.2	43.00	79.61	22	0.69	59	#N/A	#N/A	0.00	21.4
15.01	823.0	43.81	85.60	23	0.75	62	#N/A	#N/A	0.00	21.4
15.18	822.8	46.58	91.91	23	0.83	64	#N/A	#N/A	0.00	21.4
15.34	822.7	52.12	97.53	22	0.90	66	#N/A	#N/A	0.00	21.4
15.50	822.5	60.30	101.39	19	0.96	67	#N/A	#N/A	0.00	21.4
15.67	822.3	64.39	102.22	18	0.98	68	#N/A	#N/A	0.00	21.4
15.83	822.2	63.43	101.03	18	0.96	67	#N/A	#N/A	0.00	21.4
16.00	822.0	57.48	98.33	20	0.92	66	#N/A	#N/A	0.00	21.4
16.16	821.8	46.55	95.23	24	0.87	65	#N/A	#N/A	0.00	21.4
16.32	821.7	34.89	92.24	30	0.83	64	#N/A	#N/A	0.00	21.4
16.49	821.5	30.87	95.58	31	0.88	66	#N/A	#N/A	0.00	21.4
16.65	821.4	30.11	80.96	30	0.71	60	#N/A	#N/A	0.00	21.4
16.82	821.2	30.15	80.00	30	0.70	60	#N/A	#N/A	0.00	21.4
16.98	821.0	30.56	76.19	28	0.66	58	#N/A	#N/A	0.00	21.4
17.14	820.9	31.80	116.39	33	1.24	72	#N/A	#N/A	0.00	21.4
17.31	820.7	40.41	88.89	25	0.79	63	#N/A	#N/A	0.00	21.4
17.47	820.5	38.51	83.91	25	0.74	61	#N/A	#N/A	0.00	21.4
17.64	820.4	38.02	94.68	28	0.87	65	#N/A	#N/A	0.00	21.4
17.80	820.2	39.97	106.95	30	1.06	69	#N/A	#N/A	0.00	21.4
17.96	820.0	47.97	109.39	26	1.10	70	#N/A	#N/A	0.00	21.4
18.13	819.9	57.49	109.73	22	1.11	70	#N/A	#N/A	0.00	21.4
18.29	819.7	61.20	108.59	21	1.09	70	#N/A	#N/A	0.00	21.4
18.46	819.5	68.20	110.04	18	1.12	70	#N/A	#N/A	0.00	21.4
18.62	819.4	70.21	110.34	18	1.12	70	#N/A	#N/A	0.00	21.4
18.78	819.2	72.80	117.18	18	1.26	72	#N/A	#N/A	0.00	21.4
18.95	819.1	85.85	124.01	16	1.41	74	#N/A	#N/A	0.00	21.4
19.11	818.9	103.34	129.36	12	1.54	75	#N/A	#N/A	0.00	21.4
19.28	818.7	108.18	126.83	10	1.48	75	#N/A	#N/A	0.00	21.4
19.44	818.6	102.83	121.05	10	1.34	73	#N/A	#N/A	0.00	21.4
19.60	818.4	95.58	115.07	11	1.22	72	#N/A	#N/A	0.00	21.4
19.77	818.2	88.29	108.20	11	1.09	70	#N/A	#N/A	0.00	21.4
19.93	818.1	78.78	101.94	13	0.98	68	#N/A	#N/A	0.00	21.4
20.10	817.9	69.70	100.59	16	0.96	67	#N/A	#N/A	0.00	21.4
20.26	817.7	67.31	101.77	17	0.98	68	#N/A	#N/A	0.00	21.4
20.43	817.6	69.88	102.90	16	1.00	68	#N/A	#N/A	0.00	21.4
20.59	817.4	68.99	99.74	16	0.95	67	#N/A	#N/A	0.00	21.4
20.75	817.3	57.01	81.82	16	0.72	60	#N/A	#N/A	0.00	21.4
20.92	817.1	42.18	75.81	21	0.66	58	#N/A	#N/A	0.00	21.4
21.08	816.9	26.60	95.49	32	0.89	65	#N/A	#N/A	0.00	21.4
21.25	816.8	21.68	149.75	37	2.00	80	#N/A	#N/A	0.00	21.4
21.41	816.6	20.42	183.39	39	2.00	87	#N/A	#N/A	0.00	21.4
21.57	816.4	22.40	166.22	38	2.00	84	#N/A	#N/A	0.00	21.4

Procedure by Zhang et. al., 2004										
Mid-layer Depth	Elevation	For Overburden, $q_{t,1N}$	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC	Calculated Factor of Safety, FS	Relative Density, D_r	Max Cyclic Shear Strain, γ_{max}	Lateral Displacement Index, LDI	Lateral Displ.	Cumulative Lateral Displ.
[ft]	[ft. MSL]			[%]	$CRR_{7.5}/CSR^*$		[%]	[in]	[in]	21.4
21.74	816.3	27.78	152.26	35	2.00	81	#N/A	#N/A	0.00	21.4
21.90	816.1	44.29	99.52	26	0.95	67	#N/A	#N/A	0.00	21.4
22.07	815.9	71.75	108.20	17	1.09	70	#N/A	#N/A	0.00	21.4
22.23	815.8	90.59	116.87	13	1.26	72	#N/A	#N/A	0.00	21.4
22.39	815.6	91.88	119.35	13	1.32	73	#N/A	#N/A	0.00	21.4
22.56	815.4	82.00	112.97	15	1.18	71	#N/A	#N/A	0.00	21.4
22.72	815.3	73.47	105.26	16	1.04	69	#N/A	#N/A	0.00	21.4
22.89	815.1	68.83	103.55	17	1.01	68	#N/A	#N/A	0.00	21.4
23.05	815.0	60.11	95.35	18	0.89	65	#N/A	#N/A	0.00	21.4
23.21	814.8	54.17	91.19	19	0.83	64	#N/A	#N/A	0.00	21.4
23.38	814.6	49.33	87.22	20	0.79	62	#N/A	#N/A	0.00	21.4
23.54	814.5	53.09	85.67	18	0.77	62	#N/A	#N/A	0.00	21.4
23.71	814.3	54.58	90.53	19	0.83	64	#N/A	#N/A	0.00	21.4
23.87	814.1	54.00	84.18	18	0.75	61	#N/A	#N/A	0.00	21.4
24.03	814.0	51.34	83.04	18	0.74	61	#N/A	#N/A	0.00	21.4
24.20	813.8	46.46	82.02	20	0.73	60	#N/A	#N/A	0.00	21.4
24.36	813.6	45.67	81.76	21	0.73	60	#N/A	#N/A	0.00	21.4
24.53	813.5	43.56	79.36	21	0.70	59	#N/A	#N/A	0.00	21.4
24.69	813.3	37.63	78.17	24	0.69	59	#N/A	#N/A	0.00	21.4
24.85	813.2	31.70	75.63	27	0.67	58	#N/A	#N/A	0.00	21.4
25.02	813.0	29.62	70.70	27	0.63	56	#N/A	#N/A	0.00	21.4
25.18	812.8	25.65	98.94	33	0.94	67	#N/A	#N/A	0.00	21.4
25.35	812.7	30.72	77.78	29	0.68	59	#N/A	#N/A	0.00	21.4
25.51	812.5	25.45	103.53	33	1.01	68	#N/A	#N/A	0.00	21.4
25.67	812.3	25.32	81.41	32	0.71	60	#N/A	#N/A	0.00	21.4
25.84	812.2	25.38	80.04	31	0.70	60	#N/A	#N/A	0.00	21.4
26.00	812.0	26.53	70.32	30	0.61	55	#N/A	#N/A	0.00	21.4
26.17	811.8	26.61	68.47	29	0.60	55	#N/A	#N/A	0.00	21.4
26.33	811.7	25.72	66.86	29	0.58	54	#N/A	#N/A	0.00	21.4
26.49	811.5	27.54	69.83	29	0.60	55	#N/A	#N/A	0.00	21.4
26.66	811.3	30.42	67.22	26	0.58	54	#N/A	#N/A	0.00	21.4
26.82	811.2	33.38	67.90	24	0.58	54	#N/A	#N/A	0.00	21.4
26.99	811.0	35.11	69.00	23	0.59	55	#N/A	#N/A	0.00	21.4
27.15	810.9	36.73	70.68	22	0.60	56	#N/A	#N/A	0.00	21.4
27.31	810.7	40.38	70.36	20	0.60	55	#N/A	#N/A	0.00	21.4
27.48	810.5	40.56	70.19	20	0.59	55	#N/A	#N/A	0.00	21.4
27.64	810.4	35.20	71.57	24	0.60	56	#N/A	#N/A	0.00	21.4
27.81	810.2	30.55	70.94	27	0.60	56	#N/A	#N/A	0.00	21.4
27.97	810.0	26.98	70.04	29	0.59	55	#N/A	#N/A	0.00	21.4
28.13	809.9	25.94	67.48	29	0.57	54	#N/A	#N/A	0.00	21.4
28.30	809.7	25.95	64.96	28	0.55	53	#N/A	#N/A	0.00	21.4
28.46	809.5	26.34	62.98	27	0.54	52	#N/A	#N/A	0.00	21.4
28.63	809.4	26.58	63.68	27	0.54	52	#N/A	#N/A	0.00	21.4
28.79	809.2	26.52	64.37	28	0.54	52	#N/A	#N/A	0.00	21.4
28.96	809.0	26.21	64.99	28	0.54	53	#N/A	#N/A	0.00	21.4
29.12	808.9	25.82	65.37	29	0.54	53	#N/A	#N/A	0.00	21.4
29.28	808.7	26.04	64.49	28	0.54	53	#N/A	#N/A	0.00	21.4
29.45	808.6	26.52	62.74	27	0.53	52	#N/A	#N/A	0.00	21.4
29.61	808.4	25.55	62.99	28	0.53	52	#N/A	#N/A	0.00	21.4
29.78	808.2	22.79	66.56	31	0.55	54	#N/A	#N/A	0.00	21.4

Procedure by Zhang et. al., 2004										
Mid-layer Depth	Elevation	For Overburden, $q_{t,1N}$	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC	Calculated Factor of Safety, FS	Relative Density, D_r	Max Cyclic Shear Strain, γ_{max}	Lateral Displacement Index, LDI	Lateral Displ.	Cumulative Lateral Displ.
[ft]	[ft. MSL]			[%]	$CRR_{7.5}/CSR^*$		[%]	[in]	[in]	21.4
29.94	808.1	20.53	97.30	34	0.84	66	#N/A	#N/A	0.00	21.4
30.10	807.9	19.52	#N/A	41	2.00	#N/A	#N/A	#N/A	0.00	21.4
30.27	807.7	24.49	121.64	35	1.25	73	#N/A	#N/A	0.00	21.4
30.43	807.6	30.43	76.89	29	0.62	58	#N/A	#N/A	0.00	21.4
30.60	807.4	41.13	73.13	21	0.59	57	#N/A	#N/A	0.00	21.4
30.76	807.2	42.21	72.28	20	0.58	56	#N/A	#N/A	0.00	21.4
30.92	807.1	39.39	73.34	22	0.59	57	#N/A	#N/A	0.00	21.4
31.09	806.9	39.57	73.15	21	0.58	57	#N/A	#N/A	0.00	21.4
31.25	806.8	39.56	72.26	21	0.57	56	#N/A	#N/A	0.00	21.4
31.42	806.6	38.33	72.76	22	0.58	57	#N/A	#N/A	0.00	21.4
31.58	806.4	37.33	74.77	23	0.59	57	#N/A	#N/A	0.00	21.4
31.74	806.3	37.38	78.33	24	0.62	59	#N/A	#N/A	0.00	21.4
31.91	806.1	38.35	84.65	25	0.68	61	#N/A	#N/A	0.00	21.4
32.07	805.9	40.14	83.73	24	0.67	61	#N/A	#N/A	0.00	21.4
32.24	805.8	39.37	81.43	24	0.64	60	#N/A	#N/A	0.00	21.4
32.40	805.6	39.41	80.28	24	0.63	60	#N/A	#N/A	0.00	21.4
32.56	805.4	39.38	80.53	24	0.63	60	#N/A	#N/A	0.00	21.4
32.73	805.3	41.69	82.18	23	0.65	61	#N/A	#N/A	0.00	21.4
32.89	805.1	44.55	84.50	22	0.67	61	#N/A	#N/A	0.00	21.4
33.06	804.9	48.49	81.76	19	0.64	60	#N/A	#N/A	0.00	21.4
33.22	804.8	48.15	88.10	21	0.70	63	#N/A	#N/A	0.00	21.4
33.38	804.6	48.57	96.29	23	0.80	66	#N/A	#N/A	0.00	21.4
33.55	804.5	47.57	98.73	24	0.83	67	#N/A	#N/A	0.00	21.4
33.71	804.3	47.53	86.14	21	0.68	62	#N/A	#N/A	0.00	21.4
33.88	804.1	44.75	80.84	21	0.63	60	#N/A	#N/A	0.00	21.4
34.04	804.0	42.94	79.31	21	0.62	59	#N/A	#N/A	0.00	21.4
34.20	803.8	42.88	80.88	22	0.63	60	#N/A	#N/A	0.00	21.4
34.37	803.6	44.78	82.03	21	0.64	60	#N/A	#N/A	0.00	21.4
34.53	803.5	46.87	81.92	20	0.64	60	#N/A	#N/A	0.00	21.4
34.70	803.3	48.63	86.06	20	0.68	62	#N/A	#N/A	0.00	21.4
34.86	803.1	51.12	86.76	20	0.68	62	#N/A	#N/A	0.00	21.4
35.02	803.0	52.15	85.16	19	0.67	62	#N/A	#N/A	0.00	21.4
35.19	802.8	49.09	84.97	20	0.67	62	#N/A	#N/A	0.00	21.4
35.35	802.7	47.12	83.63	21	0.65	61	#N/A	#N/A	0.00	21.4
35.52	802.5	45.77	81.72	21	0.63	60	#N/A	#N/A	0.00	21.4
35.68	802.3	46.25	81.94	21	0.64	60	#N/A	#N/A	0.00	21.4
35.84	802.2	46.08	84.31	21	0.66	61	#N/A	#N/A	0.00	21.4
36.01	802.0	47.33	81.67	20	0.63	60	#N/A	#N/A	0.00	21.4
36.17	801.8	48.35	82.82	20	0.64	61	#N/A	#N/A	0.00	21.4
36.34	801.7	47.74	83.92	20	0.65	61	#N/A	#N/A	0.00	21.4
36.50	801.5	46.30	83.35	21	0.65	61	#N/A	#N/A	0.00	21.4
36.66	801.3	46.29	83.10	21	0.64	61	#N/A	#N/A	0.00	21.4
36.83	801.2	47.95	83.11	20	0.64	61	#N/A	#N/A	0.00	21.4
36.99	801.0	49.60	82.44	19	0.64	61	#N/A	#N/A	0.00	21.4
37.16	800.8	50.90	80.19	18	0.62	60	#N/A	#N/A	0.00	21.4
37.32	800.7	46.75	76.13	19	0.58	58	#N/A	#N/A	0.00	21.4
37.49	800.5	41.40	71.87	20	0.55	56	#N/A	#N/A	0.00	21.4
37.65	800.4	36.99	73.70	23	0.56	57	#N/A	#N/A	0.00	21.4
37.81	800.2	34.90	71.53	24	0.55	56	#N/A	#N/A	0.00	21.4
37.98	800.0	32.41	74.68	26	0.57	57	#N/A	#N/A	0.00	21.4

Procedure by Zhang et. al., 2004										
Mid-layer Depth	Elevation	For Overburden, $q_{t,1N}$	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC	Calculated Factor of Safety, FS	Relative Density, D_r	Max Cyclic Shear Strain, γ_{max}	Lateral Displacement Index, LDI	Lateral Displ.	Cumulative Lateral Displ.
[ft]	[ft. MSL]			[%]	$CRR_{7.5}/CSR^*$		[%]	[in]	[in]	21.4
38.14	799.9	32.05	72.07	26	0.55	56	27.26	0.54	0.65	20.7
38.31	799.7	33.77	71.31	24	0.54	56	27.26	0.54	0.65	20.1
38.47	799.5	32.32	68.67	25	0.53	55	28.40	0.56	0.67	19.4
38.63	799.4	32.14	71.74	26	0.55	56	27.26	0.52	0.63	18.8
38.80	799.2	31.21	72.00	26	0.55	56	27.26	0.54	0.65	18.1
38.96	799.0	31.71	69.88	25	0.53	55	28.40	0.56	0.67	17.4
39.13	798.9	32.70	68.42	24	0.52	54	29.54	0.58	0.70	16.7
39.29	798.7	32.94	66.96	24	0.51	54	29.54	0.58	0.70	16.0
39.45	798.6	32.02	66.26	24	0.51	53	30.68	0.59	0.71	15.3
39.62	798.4	31.04	68.36	25	0.52	54	29.54	0.58	0.70	14.6
39.78	798.2	30.35	69.62	26	0.53	55	28.40	0.56	0.67	14.0
39.95	798.1	30.77	69.92	26	0.53	55	28.40	0.56	0.67	13.3
40.11	797.9	29.88	78.40	30	0.60	59	23.84	0.47	0.57	12.7
40.27	797.7	33.69	72.24	25	0.55	56	27.26	0.52	0.63	12.1
40.44	797.6	34.15	72.29	25	0.55	56	27.26	0.54	0.65	11.4
40.60	797.4	35.03	68.83	23	0.53	55	28.40	0.56	0.67	10.8
40.77	797.2	33.14	71.88	25	0.55	56	27.26	0.54	0.65	10.1
40.93	797.1	28.52	72.59	29	0.55	56	27.26	0.54	0.65	9.5
41.09	796.9	29.59	68.50	27	0.52	55	28.40	0.55	0.65	8.8
41.26	796.7	27.00	70.19	29	0.53	55	28.40	0.56	0.67	8.1
41.42	796.6	25.88	68.31	30	0.52	54	29.54	0.58	0.70	7.4
41.59	796.4	26.31	70.30	30	0.54	55	28.40	0.56	0.67	6.8
41.75	796.3	30.80	72.44	27	0.55	56	27.26	0.54	0.65	6.1
41.91	796.1	35.89	73.96	24	0.56	57	26.12	0.50	0.60	5.5
42.08	795.9	38.45	77.05	23	0.59	58	24.98	0.49	0.59	4.9
42.24	795.8	37.96	80.06	24	0.61	60	22.70	0.45	0.54	4.4
42.41	795.6	38.00	87.14	26	0.68	62	#N/A	#N/A	0.00	4.4
42.57	795.4	44.01	97.08	25	0.80	66	#N/A	#N/A	0.00	4.4
42.73	795.3	56.80	100.84	21	0.85	67	#N/A	#N/A	0.00	4.4
42.90	795.1	66.40	101.98	17	0.87	68	#N/A	#N/A	0.00	4.4
43.06	794.9	64.12	100.30	18	0.84	67	#N/A	#N/A	0.00	4.4
43.23	794.8	57.98	95.10	19	0.78	65	#N/A	#N/A	0.00	4.4
43.39	794.6	48.52	93.76	22	0.76	65	#N/A	#N/A	0.00	4.4
43.55	794.5	46.41	92.02	23	0.74	64	#N/A	#N/A	0.00	4.4
43.72	794.3	47.75	92.69	23	0.75	64	#N/A	#N/A	0.00	4.4
43.88	794.1	48.16	91.03	22	0.73	64	#N/A	#N/A	0.00	4.4
44.05	794.0	48.87	90.63	22	0.72	64	#N/A	#N/A	0.00	4.4
44.21	793.8	46.98	87.55	22	0.69	63	#N/A	#N/A	0.00	4.4
44.37	793.6	46.48	88.36	22	0.70	63	#N/A	#N/A	0.00	4.4
44.54	793.5	47.29	88.23	22	0.70	63	#N/A	#N/A	0.00	4.4
44.70	793.3	52.63	87.38	19	0.69	63	#N/A	#N/A	0.00	4.4
44.87	793.1	50.69	85.01	19	0.66	62	#N/A	#N/A	0.00	4.4
45.03	793.0	43.02	82.59	22	0.64	61	21.59	0.43	0.51	3.9
45.20	792.8	40.26	79.94	23	0.62	60	22.70	0.45	0.54	3.3
45.36	792.6	39.12	84.07	25	0.65	61	#N/A	#N/A	0.00	3.3
45.52	792.5	41.25	89.02	25	0.71	63	#N/A	#N/A	0.00	3.3
45.69	792.3	44.42	95.43	25	0.78	65	#N/A	#N/A	0.00	3.3
45.85	792.2	49.09	98.90	23	0.83	67	#N/A	#N/A	0.00	3.3
46.02	792.0	53.34	102.72	22	0.89	68	#N/A	#N/A	0.00	3.3
46.18	791.8	53.38	105.35	23	0.93	69	#N/A	#N/A	0.00	3.3

Procedure by Zhang et. al., 2004										
Mid-layer Depth	Elevation	For Overburden, $q_{t,1N}$	for "Clean Sand" $(q_{t,1N})_{CS}$	Apparent Fines Content, FC	Calculated Factor of Safety, FS	Relative Density, D_r	Max Cyclic Shear Strain, γ_{max}	Lateral Displacement Index, LDI	Lateral Displ.	Cumulative Lateral Displ.
[ft]	[ft. MSL]			[%]	$CRR_{7.5}/CSR^*$		[%]	[in]	[in]	21.4
46.34	791.7	52.77	107.62	24	0.96	69	#N/A	#N/A	0.00	3.3
46.51	791.5	52.71	112.22	25	1.04	71	#N/A	#N/A	0.00	3.3
46.67	791.3	54.69	115.35	24	1.10	72	#N/A	#N/A	0.00	3.3
46.84	791.2	59.32	117.81	23	1.15	72	#N/A	#N/A	0.00	3.3
47.00	791.0	60.95	113.61	22	1.07	71	#N/A	#N/A	0.00	3.3
47.16	790.8	60.10	117.01	23	1.13	72	#N/A	#N/A	0.00	3.3
47.33	790.7	63.86	115.16	21	1.10	72	#N/A	#N/A	0.00	3.3
47.49	790.5	65.21	110.79	20	1.02	70	#N/A	#N/A	0.00	3.3
47.66	790.3	60.68	104.69	20	0.92	69	#N/A	#N/A	0.00	3.3
47.82	790.2	52.76	100.89	22	0.86	67	#N/A	#N/A	0.00	3.3
47.98	790.0	49.66	100.02	23	0.85	67	#N/A	#N/A	0.00	3.3
48.15	789.9	55.85	101.70	21	0.88	68	#N/A	#N/A	0.00	3.3
48.31	789.7	70.57	95.89	14	0.79	66	#N/A	#N/A	0.00	3.3
48.48	789.5	71.78	90.54	12	0.73	64	#N/A	#N/A	0.00	3.3
48.64	789.4	58.73	87.94	17	0.70	63	#N/A	#N/A	0.00	3.3
48.80	789.2	46.82	84.13	21	0.66	61	#N/A	#N/A	0.00	3.3
48.97	789.0	42.59	77.59	21	0.60	59	23.84	0.47	0.57	2.8
49.13	788.9	40.37	80.06	23	0.62	60	22.70	0.45	0.54	2.2
49.30	788.7	41.43	76.97	22	0.60	58	24.98	0.49	0.59	1.6
49.46	788.5	42.21	77.24	21	0.60	58	24.98	0.49	0.59	1.0
49.62	788.4	41.25	86.45	24	0.69	62	#N/A	#N/A	0.00	1.0
49.79	788.2	43.87	77.84	21	0.61	59	23.84	0.47	0.57	0.5
49.95	788.1	38.78	83.82	25	0.66	61	19.94	0.39	0.47	0.0
50.12	787.9	46.33	81.70	20	2.00	60	#N/A	#N/A	0.00	0.0
50.28	787.7	43.71	79.63	21	2.00	59	#N/A	#N/A	0.00	0.0
50.44	787.6	42.48	78.66	22	2.00	59	#N/A	#N/A	0.00	0.0

Appendix E

APPENDIX E

SLOPE STABILITY ANALYSES

General

Limit equilibrium analyses were performed to evaluate the stability of selected proposed cut and fill slopes, critical natural slopes proposed to remain adjacent to the proposed development, that may potentially impact the feasibility of the proposed development. The stability analyses utilized representative cross-sections that were constructed to illustrate the critical structural geometries and maximum heights for each analyzed slope. The analyses included the evaluation of gross slope stability, under static and pseudo-static loading conditions, and surficial slope stability. Based on the results, the need for stabilization measures was explored, as needed, and the design of appropriate design features was performed in a step-by-step fashion to achieve minimum safety factor requirements. Management of natural slopes that did not meet the minimum required safety factors for gross stability included remedial grading or a post-failure analysis to determine preliminary building/road set back lines.

The analyzed cross-sections, calculation procedures and methods, slope conditions, and calculated factors of safety are summarized in **Table E1** along with the recommended project design features, as applicable. Slope stability diagrams graphically illustrating the results of our analyses for selected cross-sections analyzed, are attached for review. Critical failure surfaces (factor of safety 1.5 or less), and for post-failure analysis were plotted on the respective cross sections in **Appendix H**.

Geometry and Groundwater

Analyses included across bedding (anti-dip to neutral) and potential adverse bedding with dips toward the slope face, depending on geologic data obtained near each cross-section listed in **Table E1**. In general, adverse bedding conditions with anisotropic shear strengths were modeled where the dip direction of the bedding was no more than 45 degrees off of the cross-section trend (or associated trend directly downslope). Except where subsurface data indicates otherwise, it has been conservatively assumed for the purposes of stability analysis that weak bedding planes may occur anywhere in the proposed cut slopes.

Where the bedding dip direction was greater than 45 degrees off of the cross-section trend (i.e., extreme bedding component), the bedding was considered to be generally neutral to the slope, and across bedding shear strengths were used in our assessment. The need for remedial stability fills on the slopes with extreme, daylighted bedding components, should be reviewed at the grading plan stage and during grading operations.

A review of groundwater data in the vicinity and trench and boring log data indicates that the proposed cut-slopes in bedrock are generally above historic high groundwater levels. The

general practice is that groundwater is usually modeled in the slope stability source where a potential for future groundwater exists directly up the gradient (up-dip) of the slope being analyzed. In general, a static water table is modeled where existing groundwater is actually encountered and an assumed pore water pressure coefficient (e.g., r_u of 0.10) is utilized where a future source of groundwater seepage could potentially exist, directly above and directly up-dip of the slope. The foregoing situations were not applicable to our analysis at the Specific Plan stage and therefore seepage is not assumed at this time.

Shear Strength Parameters

Shear strength parameters for bedrock (Tcac, Tcag, and QTp), alluvium (Qa), landslide (Qls), and proposed compacted engineered fill (Cef) are based on the results of direct shear tests performed on representative samples collected at the Property. Shear strength parameters developed for this report were generally based on family shear plots, utilizing engineering judgment, and are presented in Appendix B, along with direct shear test reports. A summary of design shear strength values used in our slope stability analyses is presented in the following table.

Summary of Design Shear Strength Parameters

Geologic Unit	Moist Unit Weight, pcf	Ultimate Shear Strength[2]		Peak Shear Strength	
		Phi, degrees	Cohesion, psf	Phi, degrees	Cohesion, psf
Tcac – Careaga Formation Cebada member (fine-grained)	130	32	350	33	800
Tcag – Careaga Formation Graciosa member	130	34	250	38	300
Tcac & Tcag – Careaga Formation Cebada & Graciosa members Along bedding	130	15	400	24	400
QTp – Paso Robles Formation Cross bedding	135	32	500	34	700
QTp – Paso Robles Formation Along bedding	135	15.5	410	18.5	1375
Qa – Alluvium	125	29	300	--	--
Qls - Landslide	130	28	180	36	250
Compacted Engineered Fill (Cef) (general)	130	29	210	30	425
FILL – Qa derived	125	28	250	--	--

[2] Ultimate shear strengths were utilized for along bedding of fine-grained bedrock (i.e., weak bedding planes)

APPENDIX E

Geologic Unit	Moist Unit Weight, pcf	Ultimate Shear Strength[2]		Peak Shear Strength	
		Phi, degrees	Cohesion, psf	Phi, degrees	Cohesion, psf
FILL – Tcag derived	110	28	180	--	--
FILL – Tcac derived	120	30	300	--	--
FILL – QTp derived	135	29	300	--	--

In our analyses, ultimate shear strengths were utilized for static analysis and peak shear strength for pseudo-static gross slope stability.

Natural Slopes

Where steep natural slopes are proposed to remain uphill of the proposed development, analyses were completed to evaluate the stability of the slope and to develop appropriate setbacks for future buildings and roads. While it is premature to conclusively determine building setbacks for the purposes of this study, a general conceptual discussion is provided to assist the client and its design team during the detailed design phase. Selected critical natural slopes were analyzed for this project as shown in Table E1.

In general, development is not currently proposed at or near the top of descending natural slope at this time. If future development may be proposed at or near the top of any slopes, then additional analysis is required.

Where development (building pads, roads, etc.) is proposed at or near the toe of an ascending natural slope, the stability of the slope should be analyzed. If the slope meets or exceeds the minimum factor of safety (e.g., generally F.S. = 1.5), standard building code setbacks apply. If the slope does not meet the minimum county requirements, additional analyses should be completed to determine an appropriate building setback at the toe of the slope. For the steep natural slopes that do not meet the minimum requirements, a stable post-failure geometry should be reasonably predicted based on the pre-failure critical surface. The post-failure geometry is to be modeled on applicable cross sections assuming bulking of the failure mass by approximately 20 percent and a runout of the failure mass that yielded a stable condition (i.e., where potential failure surfaces meet or exceed minimum requirements). A Restricted Use Area (RUA), wherein structures and roadways are prohibited, should delineated on the map to encompass areas where the calculated safety factor is less than 1.5 surfaces. Standard building code setbacks should then be applied from the RUA line. Our post-failure analysis in this specific plan study followed the preceding rationale (e.g., Sections 3-3', 6-6', 7-7', 8-8' and 15-15').

APPENDIX E

Fill Slopes Analyzed

The currently identified highest fill slope (145 ft) at a gradient of 3.1:1 (Section 13-13') was analyzed to be grossly stable. The highest fill slope (125 ft) at a gradient of 3:1 (Section 14-14') and schematic fill slopes of 105 ft high at a gradient of 2.5:1 (H:V), derived from general fill (i.e., derived from a reasonable combination of Qa, Tcag, Tcac, and QTp), Qa, Tcag, Tcac, and QTp, were also analyzed to be grossly stable.

Cut Slopes Analyzed

Selected tall (greater than 200 ft) cut-slopes at gradients ranging from 3.6:1 to 3.8:1 and a 105-ft high schematic bedrock (Tcag, Tcac, and QTp) cut-slope of at a gradient of 2.5:1 (H:V) within were analyzed for this project as shown in Table E1. The cut-slopes analyzed are grossly stable.

Methods of Analysis

The slope stability analyses performed for this study used the 2D limit equilibrium software, Slide, by RocScience (9/11/2023 ver. 9.029). This software utilizes robust search methods to locate critical circular and non-circular slip surfaces and computes associated minimum factors of safety. The analyses used Spencer's complete equilibrium procedure to evaluate critical potential failure surfaces under static and pseudo-static loading conditions. In general, various search methods were employed for each cross-section analyzed to determine either the critical circular failure surfaces (i.e., Grid Search, Slope Search, and/or Auto Refine) or critical non-circular failure surfaces (Cuckoo Search, Block Search, and/or Path Search). Critical non-circular slip surfaces were further optimized using the Surface Altering optimization option to assess potential surfaces with lower safety factors. Global and local minimum factors of safety were based on the results that each search method produced.

Analysis for seismic slope stability was performed using the pseudo-static procedure. In this procedure, the seismic loading is introduced into the conventional limit equilibrium analysis as a static horizontal force equal to the soil weight multiplied by a seismic coefficient, *k*. The seismic coefficient is an empirical value which in no way models actual seismic forces. However, the pseudo-static procedure does provide some indication of slope stability or instability during seismic loading.

A pseudo-static slope stability analysis may require estimates of PGA and magnitude for the selection of an appropriate seismic coefficient. Therefore, it is up to the consultant to decide on an appropriate seismic coefficient for the Property, given the geology, subsurface profile, engineering characteristics of subsurface material, nature of the proposed development, and consequences of the failure during the design seismic event. The selection of a seismic

coefficient has relied heavily on engineering judgment and local code requirements because there is no simple method for determining an appropriate value. In accordance with the SP117A, a pseudo-static coefficient of $k = 0.10$ for magnitude 6.5 earthquakes is recommended for the Property (Mw=6.11).

Surficial Stability Evaluation

Surficial slope stability analyses of cut slopes within bedrock (Tcac, Tcag and QTp) and alluvium (Qa) materials, were carried out using the "Infinite Slope" method, which substantiates 2:1 (H:V) cut slopes, (or flatter), within the foregoing materials are surficially stable. Landslide (Qls) material, are surficially stable at a slope gradient of 2.25:1 (H:V), or flatter.

The surficial slope stability of various fill materials was also carried out using the "Infinite Slope" method. Fill materials derived from bedrock (Tcac and QTp) and alluvium (Qa), and general fill materials (i.e., derived from a reasonable combination of Qa, Tcag, Tcac, and QTp), are surficially stable at a slope gradient of 2:1 (H:V), or flatter. Fill materials derived from bedrock (Tcag) material, are surficially stable at a slope gradient of 2.25:1 (H:V), or flatter. Surficial stability analysis results are provided in Figures E1 through E10.

CONCLUSION

The analyzed cut slopes, proposed grades, remedial grades, and compacted engineered fill slopes appear to be consistent with the industry-practice requirements for gross stability under static & pseudo-static loading conditions and for surficial stability, as applicable, provided our recommendations are followed and incorporated into design and constructions of the project. The results of the stability analyses are summarized in Table E1.

The following attachments complete this Appendix.

Slope Stability Analyses Results Table E1
Slope Stability Diagrams and Data Sheets
Surficial Stability Analysis Results Figures E1 through E10

TABLE E1 – SUMMARY OF SLOPE STABILITY ANALYSES RESULTS

Cross Section	File Name	Slope Designation	Analyzed Failure Surface	Method	Factor of Safety		Comments	Run No.
					Static	Pseudo static (Coeff = 0.10)		
2-2′	SP24S1A	Natural Slope	Non-Circular	Cuckoo	1.62	1.30	Min FS (Planer)	1 2
	SP24S1B	Natural Slope	Circular	Auto Refine	1.82	1.43	Min FS (Circular)	3 4
3-3′	SPHS1A	Natural Slope	Circular	Auto Refine	1.34	--	Bedding dip direction >45° off cross-section trend (i.e., extreme bedding component). Min FS (Circular) <1.5. The critical surface is used as the failure plane to model a potential post-failure geometry.	5
	SPHS1B	Natural Failed Slope	Circular	Auto Refine	1.54	1.34	Min FS on post-failure geometry >1.5. Post-failure geometry does not encroach into pad. Therefore, building setback line not required.	6 7
5-5′	SP1S1D	Natural Slope	Non-Circular	Cuckoo	1.49	1.55	Remedial cut for the top of the natural slope. Min FS (planar) <1.5.	8 9
	SP1S1E	Natural Slope	Non-Circular	Cuckoo	1.53	1.58	Proposed revision to remedial cut as shown on Cross-Section 5-5′. Min FS (planar) >1.5.	10 11
6-6′	SP7S1A	Natural Slope	Non-Circular	Cuckoo	0.99	--	Min FS (planar) <1.5. The critical surface is used as the failure plane to model a potential post-failure geometry.	12
	SP7S1C	Natural Failed Slope	Non-Circular	Cuckoo	1.58	1.48	Min FS (planer) on post-failure geometry >1.5. Preliminary setback line for roads applies at the toe of post-failure.	13 14
7-7′	SPIS1A_PFD	Natural Slope	Non-Circular	Cuckoo	1.09	--	Min FS (planar) <1.5. The critical surface is used as the failure plane to model a potential post-failure geometry.	15
	SPIS1A_PFF	Natural Failed Slope	Non-Circular	Cuckoo	1.50	1.53	Min FS (planar) on post-failure geometry =1.5. Preliminary setback line for roads applies at the toe of post-failure.	16 17

TABLE E1 – SUMMARY OF SLOPE STABILITY ANALYSES RESULTS

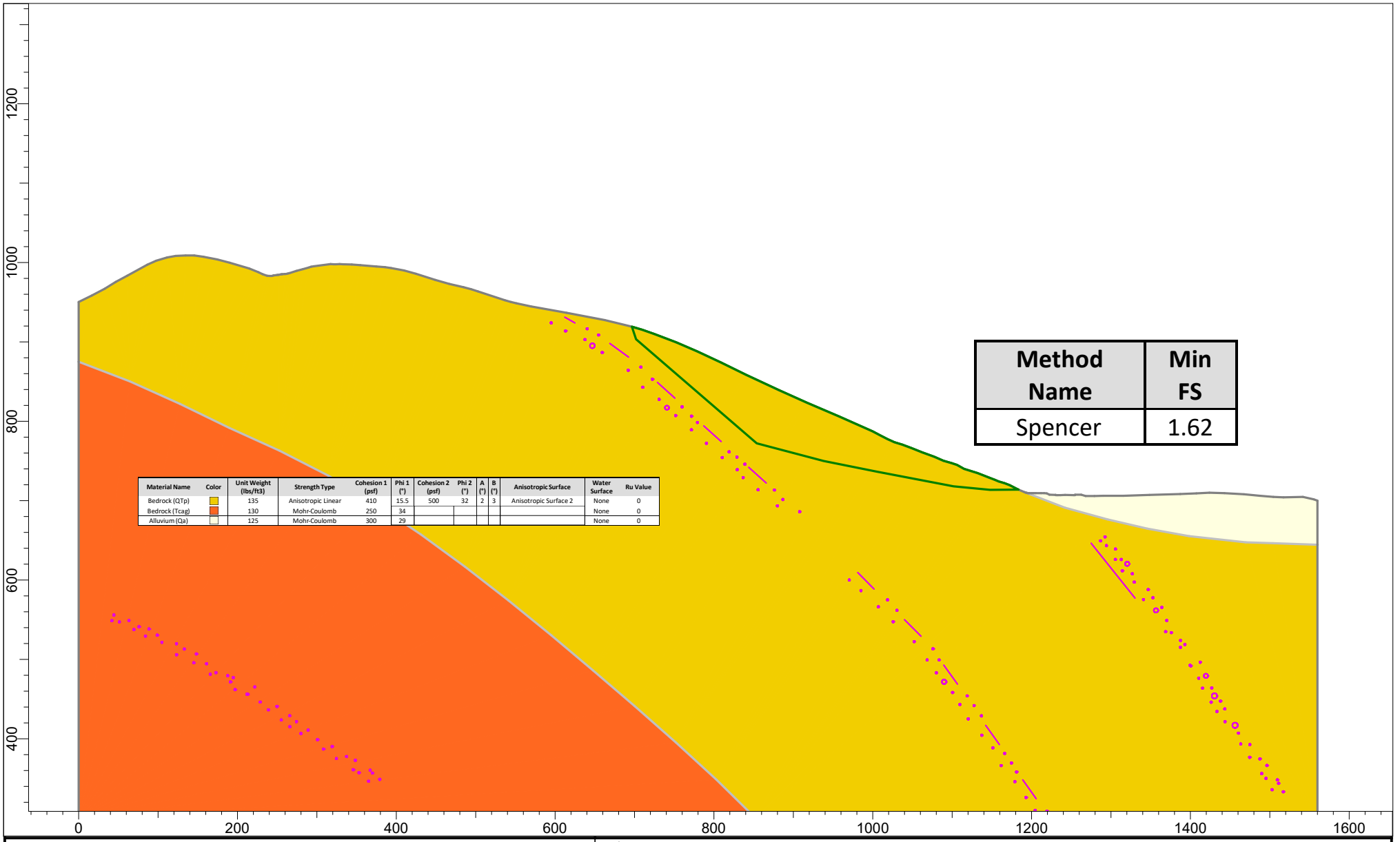
Cross Section	File Name	Slope Designation	Analyzed Failure Surface	Method	Factor of Safety		Comments	Run No.
					Static	Pseudo static (Coeff = 0.10)		
8-8′	SPJS1A	Natural Slope	Circular	Auto Refine	1.48	1.40	Bedding dip direction >45° off cross-section trend (i.e., extreme bedding component). Min FS (circular) <1.5. The critical surface is used as the failure plane to model a potential post-failure geometry.	18 19
	SPJS1B	Natural Failed Slope	Circular	Auto Refine	1.52	1.15	Min FS (circular) on post-failure geometry >1.5. Post-failure geometry encroaches into pad. Therefore, preliminary Building Setback Line applies at the toe of post-failure. Building code setbacks should be measured from the preliminary Building Setback Line.	20 21
9-9′	SPAS1D	Cut Slope (CS-6)	Non-Circular	Cuckoo	1.72	1.70	Min FS (planar)	22 23
10-10′	SPKS1A	Cut Slope (CS-5)	Non-Circular	Cuckoo	1.75	1.72	Min FS (planar)	24 25
11-11′	SPMS1A	Cut Slope (CS-4)	Non-Circular	Cuckoo	1.57	1.59	Min FS (planer)	26 27
12-12′	SPLS1A	Cut Slope (CS-3)	Non-Circular	Cuckoo	1.71	1.72	Min FS (planar)	28 29
13-13′ 145′ FILL SLOPE (3.1:1)	SPCS1E	Fill Slope	Non-Circular	Cuckoo	1.5	1.42	Min FS (planar) for Highest Fill Slope, 145′ @ 3.1:1 (H:V)	30 31

TABLE E1 – SUMMARY OF SLOPE STABILITY ANALYSES RESULTS

Cross Section		File Name	Slope Designation	Analyzed Failure Surface	Method	Factor of Safety		Comments	Run No.
						Static	Pseudo static (Coeff = 0.10)		
14-14′ MAXIMUM HEIGHT 3:1 FILL SLOPE	Fill (General)	SP_FILL	Fill Slope	Circular	Auto Refine	1.97	1.47	Min FS - 2nd Highest Fill Slope, 125′ @ 3:1 (H:V).	32 33
	FILL (Qa derived)	SP_FILL	Fill Slope	Circular	Auto Refine	1.94	1.45	Min FS - 2nd Highest Fill Slope, 125′ @ 3:1 (H:V).	34 35
	FILL (Tcag derived)	SP_FILL	Fill Slope	Circular	Auto Refine	1.90	1.42	Min FS - 2nd Highest Fill Slope, 125′ @ 3:1 (H:V).	36 37
	FILL (Tcac Derived)	SP_FILL	Fill Slope	Circular	Auto Refine	2.15	1.61	Min FS - 2nd Highest Fill Slope, 125′ @ 3:1 (H:V).	38 39
	FILL (QTp derived)	SP_FILL	Fill Slope	Circular	Auto Refine	2.04	1.53	Min FS - 2nd Highest Fill Slope, 125′ @ 3:1 (H:V).	40 41
15-15′		SPGS1A	Cut/Natural Slope	Circular	Auto Refine	1.32	--	Bedding Dip Direction >45° off cross-section trend (i.e., extreme bedding component). Min FS (Circular) <1.5. The critical surface is used as the failure plane to model a potential post-failure geometry.	42
		SPGS1B	Natural Failed Slope	Circular	Auto Refine	1.55	1.45	Min FS on post-failure geometry >1.5. Post-failure geometry does not encroach into pad. Therefore, building setback line not required.	43 44

TABLE E1 – SUMMARY OF SLOPE STABILITY ANALYSES RESULTS

Cross Section		File Name	Slope Designation	Analyzed Failure Surface	Method	Factor of Safety		Comments	Run No.
						Static	Pseudo static (Coeff = 0.10)		
Schematic 105' MAXIMUM HEIGHT 2.5:1 FILL SLOPE	Fill (General)	SP_FILL-H-105	Fill Slope	Circular	Auto Refine	1.72	1.33	Min FS (Circular), Highest Fill Slope, 105' @ 2.5:1 (H:V).	45 46
	FILL (Qa derived)	SP_FILL-H-105	Fill Slope	Circular	Auto Refine	1.72	1.33	Min FS (Circular), Highest Fill Slope, 105' @ 2.5:1 (H:V).	47 48
	FILL (Tcag derived)	SP_FILL-H-105	Fill Slope	Circular	Auto Refine	1.67	1.29	Min FS (Circular), Highest Fill Slope, 105' @ 2.5:1 (H:V).	49 50
	FILL (Tcac Derived)	SP_FILL-H-105	Fill Slope	Circular	Auto Refine	1.91	1.48	Min FS (Circular), Highest Fill Slope, 105' @ 2.5:1 (H:V).	51 52
	FILL (QTp derived)	SP_FILL-H-105	Fill Slope	Circular	Auto Refine	1.81	1.4	Min FS (Circular), Highest Fill Slope, 105' @ 2.5:1 (H:V).	53 54
Schematic 105' MAXIMUM HEIGHT 2.5:1 CUT SLOPE Favorable Geology	Tcag	SP_CUT-H-105	Cut Slope	Circular	Auto Refine	2.09	1.62	Min FS (Circular)	55 56
	Tcac	SP_CUT-H-105	Cut Slope	Circular	Auto Refine	2.07	1.6	Min FS (Circular)	57 58
	QTp	SP_CUT-H-105	Cut Slope	Circular	Auto Refine	2.13	1.65	Min FS (Circular)	59 60



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 2	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	250	34						None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0

Method Name	Min FS
Spencer	1.62

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 2-2'; static; Non-Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, CA	File Name	SP24s1a.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 1

Table of Contents

Project Summary 3
Currently Open Scenarios 3
General Settings 3
Analysis Options 3
All Open Scenarios 3
Groundwater Analysis 4
All Open Scenarios 4
Random Numbers 4
All Open Scenarios 4
Surface Options 4
All Open Scenarios 4
Seismic Loading 4
All Open Scenarios 4
Materials 5
Materials In Use 5
Global Minimums 5
Non-Circular Search (Cuckoo) - Master Scenario 6
Method: spencer 6
Non-Circular Search (Cuckoo) - Min FS, No Ru 6
Method: spencer 6
Global Minimum Coordinates 6
Non-Circular Search (Cuckoo) - Master Scenario 6
Method: spencer 6
Non-Circular Search (Cuckoo) - Min FS, No Ru 6
Method: spencer 6
Global Minimum Support Data 7
All Open Scenarios 7
Valid and Invalid Surfaces 7
Non-Circular Search (Cuckoo) - Master Scenario 7
Method: spencer 7
Non-Circular Search (Cuckoo) - Min FS, No Ru 7
Method: spencer 7
Error Code Descriptions 7
Slice Data 8
Non-Circular Search (Cuckoo) - Master Scenario 8
Global Minimum Query (spencer) - Safety Factor: 1.62305 8
Non-Circular Search (Cuckoo) - Min FS, No Ru 9
Global Minimum Query (spencer) - Safety Factor: 1.62211 9
Interslice Data 11
Non-Circular Search (Cuckoo) - Master Scenario 11
Global Minimum Query (spencer) - Safety Factor: 1.62305 11
Non-Circular Search (Cuckoo) - Min FS, No Ru 12

Global Minimum Query (spencer) - Safety Factor: 1.62211 12
Entity Information 13
Non-Circular Search (Cuckoo) 13
Shared Entities 13

Slide2 Analysis Information

SP24s1a

Project Summary

File Name:	SP24s1a.slmd
Slide2 Modeler Version:	9.029
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 2-2'; static; Non-Circular
Author:	M. Neely
Date Created:	10/20/2023

Comments

Solstra Communities California, LLC
Santa Barbara County, CA
23-2195s-1

Currently Open Scenarios

Group Name	Scenario Name	Global Minimum	Compute Time
Non-Circular Search (Cuckoo)	Master Scenario	Spencer: 1.623050	00h:00m:06.853s
	Min FS, No Ru	Spencer: 1.622110	00h:00m:07.154s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

All Open Scenarios

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

All Open Scenarios

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

All Open Scenarios

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

All Open Scenarios

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

All Open Scenarios

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Assigned per scenario
Water Surface	Assigned per scenario
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	Assigned per scenario
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	Assigned per scenario
Ru Value	0

Materials In Use

Material	Non-Circular Search (Cuckoo)	Min FS, No Ru
Bedrock (QTp)	✓	✓
Bedrock (Tcag)	✓	✓
Alluvium (Qa)	✓	✓

Global Minimums

Non-Circular Search (Cuckoo) - Master Scenario

Method: spencer

FS	1.623050
Axis Location:	1098.189, 1247.121
Left Slip Surface Endpoint:	707.357, 915.874
Right Slip Surface Endpoint:	1128.687, 735.707
Resisting Moment:	7.2144e+08 lb-ft
Driving Moment:	4.44497e+08 lb-ft
Resisting Horizontal Force:	1.31937e+06 lb
Driving Horizontal Force:	812894 lb
Total Slice Area:	17464.7 ft2
Surface Horizontal Width:	421.331 ft
Surface Average Height:	41.4512 ft

Non-Circular Search (Cuckoo) - Min FS, No Ru

Method: spencer

FS	1.622110
Axis Location:	1145.424, 1303.376
Left Slip Surface Endpoint:	696.646, 919.038
Right Slip Surface Endpoint:	1183.627, 713.750
Resisting Moment:	1.04317e+09 lb-ft
Driving Moment:	6.43093e+08 lb-ft
Resisting Horizontal Force:	1.66135e+06 lb
Driving Horizontal Force:	1.02419e+06 lb
Total Slice Area:	22250.8 ft2
Surface Horizontal Width:	486.982 ft
Surface Average Height:	45.6913 ft

Global Minimum Coordinates

Non-Circular Search (Cuckoo) - Master Scenario

Method: spencer

X	Y
707.357	901.533
839.987	787.112
898.499	770.183
937.093	760.05
995.142	748.349
1066.21	740.794
1128.69	735.707

Non-Circular Search (Cuckoo) - Min FS, No Ru

Method: spencer

X	Y
696.646	919.038
701.82	903.34
853.852	771.972
938.119	749.901
1004.39	736.598
1101.54	718.027
1147.82	713.437
1183.63	713.75

Global Minimum Support Data

All Open Scenarios

No Supports Present

Valid and Invalid Surfaces

Non-Circular Search (Cuckoo) - Master Scenario

Method: spencer

Number of Valid Surfaces:	19604
Number of Invalid Surfaces:	5448

Error Codes
Error Code -106 reported for 3 surfaces
Error Code -108 reported for 121 surfaces
Error Code -111 reported for 1297 surfaces
Error Code -112 reported for 211 surfaces
Error Code -121 reported for 763 surfaces
Error Code -124 reported for 22 surfaces
Error Code -145 reported for 17 surfaces
Error Code -1000 reported for 3014 surfaces

Non-Circular Search (Cuckoo) - Min FS, No Ru

Method: spencer

Number of Valid Surfaces:	19530
Number of Invalid Surfaces:	5521

Error Codes
Error Code -108 reported for 116 surfaces
Error Code -111 reported for 829 surfaces
Error Code -112 reported for 210 surfaces
Error Code -121 reported for 1262 surfaces
Error Code -124 reported for 4 surfaces
Error Code -145 reported for 12 surfaces
Error Code -1000 reported for 3088 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Non-Circular Search (Cuckoo) - Master Scenario

Global Minimum Query (spencer) - Safety Factor: 1.62305

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	8.2894	18567.4	-40.7845	Bedrock (QTp)	410	15.5	508.7	825.645	1498.77	0	1498.77	1937.63	1937.63
2	8.2894	23400.2	-40.7845	Bedrock (QTp)	410	15.5	579.183	940.043	1911.27	0	1911.27	2410.93	2410.93
3	8.2894	28058.6	-40.7845	Bedrock (QTp)	410	15.5	647.123	1050.31	2308.89	0	2308.89	2867.17	2867.17
4	8.2894	32490.2	-40.7845	Bedrock (QTp)	410	15.5	711.756	1155.22	2687.16	0	2687.16	3301.19	3301.19
5	8.2894	36919.9	-40.7845	Bedrock (QTp)	410	15.5	776.36	1260.07	3065.26	0	3065.26	3735.03	3735.03
6	8.2894	41278.3	-40.7845	Bedrock (QTp)	410	15.5	839.924	1363.24	3437.27	0	3437.27	4161.87	4161.87
7	8.2894	45269.3	-40.7845	Bedrock (QTp)	410	15.5	898.13	1457.71	3777.92	0	3777.92	4552.74	4552.74
8	8.2894	49208.2	-40.7845	Bedrock (QTp)	410	15.5	955.577	1550.95	4114.12	0	4114.12	4938.5	4938.5
9	8.2894	53130.9	-40.7845	Bedrock (QTp)	410	15.5	1012.78	1643.8	4448.94	0	4448.94	5322.68	5322.68
10	8.2894	56890.7	-40.7845	Bedrock (QTp)	410	15.5	1067.62	1732.8	4769.87	0	4769.87	5690.91	5690.91
11	8.2894	60608.3	-40.7845	Bedrock (QTp)	410	15.5	1121.84	1820.8	5087.19	0	5087.19	6055.01	6055.01
12	8.2894	64326	-40.7845	Bedrock (QTp)	410	15.5	1176.06	1908.8	5404.5	0	5404.5	6419.09	6419.09
13	8.2894	67975.4	-40.7845	Bedrock (QTp)	410	15.5	1229.28	1995.19	5716.01	0	5716.01	6776.52	6776.52
14	8.2894	71434.3	-40.7845	Bedrock (QTp)	410	15.5	1279.73	2077.06	6011.24	0	6011.24	7115.27	7115.27
15	8.2894	74881.8	-40.7845	Bedrock (QTp)	410	15.5	1330.01	2158.67	6305.51	0	6305.51	7452.92	7452.92
16	8.2894	78329.4	-40.7845	Bedrock (QTp)	410	15.5	1380.29	2240.28	6599.78	0	6599.78	7790.56	7790.56
17	8.35879	79886.9	-16.1363	Bedrock (QTp)	500	32	3742.79	6074.73	8921.44	0	8921.44	10004.3	10004.3
18	8.35879	78232.9	-16.1363	Bedrock (QTp)	500	32	3671.89	5959.66	8737.29	0	8737.29	9799.65	9799.65
19	8.35879	76579.1	-16.1363	Bedrock (QTp)	500	32	3601	5844.61	8553.16	0	8553.16	9595.01	9595.01

20	8.35879	74925.3	-16.1363	Bedrock (QTp)	500	32	3530.12	5729.56	8369.04	0	8369.04	9390.39	9390.39
21	8.35879	73271.6	-16.1363	Bedrock (QTp)	500	32	3459.23	5614.51	8184.93	0	8184.93	9185.76	9185.76
22	8.35879	71701.7	-16.1363	Bedrock (QTp)	500	32	3391.95	5505.3	8010.16	0	8010.16	8991.52	8991.52
23	8.35879	70202.2	-16.1363	Bedrock (QTp)	500	32	3327.67	5400.98	7843.2	0	7843.2	8805.97	8805.97
24	7.71889	63388.5	-14.7108	Bedrock (QTp)	500	32	3321.64	5391.19	7827.53	0	7827.53	8699.62	8699.62
25	7.71889	61894.4	-14.7108	Bedrock (QTp)	500	32	3250.93	5276.42	7643.87	0	7643.87	8497.4	8497.4
26	7.71889	60423.8	-14.7108	Bedrock (QTp)	500	32	3181.34	5163.47	7463.12	0	7463.12	8298.37	8298.37
27	7.71889	59064.6	-14.7108	Bedrock (QTp)	500	32	3117.01	5059.07	7296.04	0	7296.04	8114.4	8114.4
28	7.71889	57719.6	-14.7108	Bedrock (QTp)	500	32	3053.36	4955.76	7130.71	0	7130.71	7932.36	7932.36
29	8.29266	60228.4	-11.3966	Bedrock (QTp)	500	32	3106.42	5041.87	7268.51	0	7268.51	7894.68	7894.68
30	8.29266	58109.9	-11.3966	Bedrock (QTp)	500	32	3008.75	4883.35	7014.83	0	7014.83	7621.31	7621.31
31	8.29266	55974.1	-11.3966	Bedrock (QTp)	500	32	2910.28	4723.53	6759.05	0	6759.05	7345.69	7345.69
32	8.29266	53743	-11.3966	Bedrock (QTp)	500	32	2807.41	4556.57	6491.87	0	6491.87	7057.77	7057.77
33	8.29266	51497.3	-11.3966	Bedrock (QTp)	500	32	2703.88	4388.54	6222.96	0	6222.96	6767.99	6767.99
34	8.29266	49249.1	-11.3966	Bedrock (QTp)	500	32	2600.23	4220.3	5953.73	0	5953.73	6477.87	6477.87
35	8.29266	46936.7	-11.3966	Bedrock (QTp)	500	32	2493.62	4047.27	5676.82	0	5676.82	6179.47	6179.47
36	8.88378	47093.8	-6.06817	Bedrock (QTp)	500	32	2529.43	4105.39	5769.83	0	5769.83	6038.72	6038.72
37	8.88378	42717.3	-6.06817	Bedrock (QTp)	500	32	2326.29	3775.68	5242.17	0	5242.17	5489.47	5489.47
38	8.88378	38372.8	-6.06817	Bedrock (QTp)	500	32	2124.62	3448.37	4718.39	0	4718.39	4944.25	4944.25
39	8.88378	34759.8	-6.06817	Bedrock (QTp)	500	32	1956.92	3176.18	4282.77	0	4282.77	4490.81	4490.81
40	8.88378	32266.9	-6.06817	Bedrock (QTp)	500	32	1841.21	2988.37	3982.23	0	3982.23	4177.96	4177.96
41	8.88378	29587.7	-6.06817	Bedrock (QTp)	500	32	1716.85	2786.53	3659.2	0	3659.2	3841.71	3841.71
42	8.88378	26625.5	-6.06817	Bedrock (QTp)	500	32	1579.35	2563.36	3302.08	0	3302.08	3469.97	3469.97
43	8.88378	23585.8	-6.06817	Bedrock (QTp)	500	32	1438.26	2334.36	2935.59	0	2935.59	3088.49	3088.49
44	8.92508	20690.8	-4.65524	Bedrock (QTp)	500	32	1323.42	2147.98	2637.31	0	2637.31	2745.07	2745.07
45	8.92508	17423.3	-4.65524	Bedrock (QTp)	500	32	1169.29	1897.82	2236.98	0	2236.98	2332.19	2332.19
46	8.92508	13877.8	-4.65524	Bedrock (QTp)	500	32	1002.05	1626.37	1802.58	0	1802.58	1884.17	1884.17
47	8.92508	11282.9	-4.65524	Bedrock (QTp)	500	32	879.648	1427.71	1484.65	0	1484.65	1556.28	1556.28
48	8.92508	8414.71	-4.65524	Bedrock (QTp)	500	32	744.354	1208.12	1133.24	0	1133.24	1193.85	1193.85
49	8.92508	3999.59	-4.65524	Bedrock (QTp)	500	32	536.092	870.104	592.29	0	592.29	635.943	635.943
50	8.92508	1235.54	-4.65524	Bedrock (QTp)	500	32	406.583	659.905	255.902	0	255.902	289.009	289.009

Non-Circular Search (Cuckoo) - Min FS, No Ru

Global Minimum Query (spencer) - Safety Factor: 1.62211

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.17377	4948.55	-71.7594	Bedrock (QTp)	500	32	329.697	534.805	55.6993	0	55.6993	1056.09	1056.09

2	10.1355	23316.1	-40.8295	Bedrock (QTp)	410	15.5	516.467	837.767	1542.48	0	1542.48	1988.75	1988.75
3	10.1355	30738.6	-40.8295	Bedrock (QTp)	410	15.5	604.99	981.361	2060.26	0	2060.26	2583.02	2583.02
4	10.1355	37798.7	-40.8295	Bedrock (QTp)	410	15.5	689.191	1117.94	2552.76	0	2552.76	3148.27	3148.27
5	10.1355	44460.3	-40.8295	Bedrock (QTp)	410	15.5	768.639	1246.82	3017.47	0	3017.47	3681.63	3681.63
6	10.1355	51101.7	-40.8295	Bedrock (QTp)	410	15.5	847.847	1375.3	3480.76	0	3480.76	4213.37	4213.37
7	10.1355	57385.5	-40.8295	Bedrock (QTp)	410	15.5	922.786	1496.86	3919.11	0	3919.11	4716.47	4716.47
8	10.1355	63293.2	-40.8295	Bedrock (QTp)	410	15.5	993.243	1611.15	4331.22	0	4331.22	5189.46	5189.46
9	10.1355	69173.6	-40.8295	Bedrock (QTp)	410	15.5	1063.38	1724.92	4741.43	0	4741.43	5660.28	5660.28
10	10.1355	74808.9	-40.8295	Bedrock (QTp)	410	15.5	1130.58	1833.93	5134.54	0	5134.54	6111.45	6111.45
11	10.1355	80385.9	-40.8295	Bedrock (QTp)	410	15.5	1197.1	1941.82	5523.59	0	5523.59	6557.97	6557.97
12	10.1355	85930.1	-40.8295	Bedrock (QTp)	410	15.5	1263.22	2049.08	5910.34	0	5910.34	7001.86	7001.86
13	10.1355	91175.2	-40.8295	Bedrock (QTp)	410	15.5	1325.77	2150.55	6276.23	0	6276.23	7421.8	7421.8
14	10.1355	96348.4	-40.8295	Bedrock (QTp)	410	15.5	1387.47	2250.63	6637.1	0	6637.1	7835.98	7835.98
15	10.1355	101542	-40.8295	Bedrock (QTp)	410	15.5	1449.41	2351.11	6999.42	0	6999.42	8251.83	8251.83
16	10.1355	107001	-40.8295	Bedrock (QTp)	410	15.5	1514.52	2456.71	7380.21	0	7380.21	8688.87	8688.87
17	10.5334	112561	-14.6771	Bedrock (QTp)	500	32	4228.49	6859.07	10176.6	0	10176.6	11284.1	11284.1
18	10.5334	109524	-14.6771	Bedrock (QTp)	500	32	4123.09	6688.1	9903.04	0	9903.04	10983	10983
19	10.5334	106506	-14.6771	Bedrock (QTp)	500	32	4018.32	6518.15	9631.01	0	9631.01	10683.5	10683.5
20	10.5334	103668	-14.6771	Bedrock (QTp)	500	32	3919.81	6358.36	9375.33	0	9375.33	10402	10402
21	10.5334	100876	-14.6771	Bedrock (QTp)	500	32	3822.92	6201.19	9123.81	0	9123.81	10125.1	10125.1
22	10.5334	98084	-14.6771	Bedrock (QTp)	500	32	3726.02	6044.01	8872.27	0	8872.27	9848.18	9848.18
23	10.5334	95424.3	-14.6771	Bedrock (QTp)	500	32	3633.71	5894.27	8632.64	0	8632.64	9584.37	9584.37
24	10.5334	92910.2	-14.6771	Bedrock (QTp)	500	32	3546.44	5752.72	8406.12	0	8406.12	9335	9335
25	9.46762	80994.1	-11.3502	Bedrock (QTp)	500	32	3602.91	5844.31	8552.68	0	8552.68	9275.89	9275.89
26	9.46762	78222.6	-11.3502	Bedrock (QTp)	500	32	3490.9	5662.62	8261.91	0	8261.91	8962.64	8962.64
27	9.46762	75378.1	-11.3502	Bedrock (QTp)	500	32	3375.94	5476.14	7963.5	0	7963.5	8641.15	8641.15
28	9.46762	72441.2	-11.3502	Bedrock (QTp)	500	32	3257.25	5283.61	7655.37	0	7655.37	8309.2	8309.2
29	9.46762	69503.7	-11.3502	Bedrock (QTp)	500	32	3138.52	5091.03	7347.19	0	7347.19	7977.18	7977.18
30	9.46762	66497.9	-11.3502	Bedrock (QTp)	500	32	3017.05	4893.99	7031.85	0	7031.85	7637.47	7637.47
31	9.46762	63336.6	-11.3502	Bedrock (QTp)	500	32	2889.29	4686.74	6700.19	0	6700.19	7280.16	7280.16
32	9.71461	60948	-10.822	Bedrock (QTp)	500	32	2749.05	4459.26	6336.14	0	6336.14	6861.65	6861.65
33	9.71461	56922.8	-10.822	Bedrock (QTp)	500	32	2589.34	4200.2	5921.57	0	5921.57	6416.54	6416.54
34	9.71461	53990.5	-10.822	Bedrock (QTp)	500	32	2473.01	4011.49	5619.55	0	5619.55	6092.28	6092.28
35	9.71461	52175.7	-10.822	Bedrock (QTp)	500	32	2401	3894.68	5432.63	0	5432.63	5891.6	5891.6
36	9.71461	49870.3	-10.822	Bedrock (QTp)	500	32	2309.53	3746.31	5195.18	0	5195.18	5636.67	5636.67
37	9.71461	47320.3	-10.822	Bedrock (QTp)	500	32	2208.36	3582.2	4932.55	0	4932.55	5354.69	5354.69
38	9.71461	44902.3	-10.822	Bedrock (QTp)	500	32	2112.42	3426.57	4683.5	0	4683.5	5087.3	5087.3

39	9.71461	42539.6	-10.822	Bedrock (QTp)	500	32	2018.68	3274.52	4440.16	0	4440.16	4826.04	4826.04
40	9.71461	39717.7	-10.822	Bedrock (QTp)	500	32	1906.71	3092.9	4149.5	0	4149.5	4513.99	4513.99
41	9.71461	37893.8	-10.822	Bedrock (QTp)	500	32	1834.35	2975.52	3961.66	0	3961.66	4312.31	4312.31
42	9.25644	33765.7	-5.664	Bedrock (QTp)	500	32	1857.03	3012.31	4020.54	0	4020.54	4204.72	4204.72
43	9.25644	29270.2	-5.664	Bedrock (QTp)	500	32	1655.63	2685.62	3497.73	0	3497.73	3661.94	3661.94
44	9.25644	26518.7	-5.664	Bedrock (QTp)	500	32	1532.37	2485.68	3177.74	0	3177.74	3329.72	3329.72
45	9.25644	23850.4	-5.664	Bedrock (QTp)	500	32	1412.83	2291.77	2867.43	0	2867.43	3007.55	3007.55
46	9.25644	20562.1	-5.664	Bedrock (QTp)	500	32	1265.52	2052.81	2485.01	0	2485.01	2610.52	2610.52
47	8.9516	15902.4	0.50107	Bedrock (QTp)	500	32	1171.48	1900.27	2240.91	0	2240.91	2230.66	2230.66
48	8.9516	11830.4	0.50107	Bedrock (QTp)	500	32	964.448	1564.44	1703.46	0	1703.46	1695.03	1695.03
49	8.9516	7901.65	0.50107	Bedrock (QTp)	500	32	764.703	1240.43	1184.94	0	1184.94	1178.25	1178.25
50	8.9516	2642.04	0.50107	Bedrock (QTp)	500	32	475.83	771.848	435.047	0	435.047	430.886	430.886

Interslice Data

Non-Circular Search (Cuckoo) - Master Scenario

Global Minimum Query (spencer) - Safety Factor: 1.62305

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	707.357	901.533	0	0	0
2	715.646	894.381	6503.13	2504.2	21.0605
3	723.935	887.23	15372.2	5919.47	21.0605
4	732.225	880.079	26521.9	10212.9	21.0604
5	740.514	872.928	39841	15341.8	21.0605
6	748.804	865.776	55328.8	21305.8	21.0605
7	757.093	858.625	72950.3	28091.4	21.0605
8	765.382	851.474	92525.6	35629.4	21.0605
9	773.672	844.322	114029	43909.9	21.0605
10	781.961	837.171	137453	52930	21.0606
11	790.251	830.02	162718	62658.8	21.0605
12	798.54	822.868	189803	73088.4	21.0605
13	806.829	815.717	218707	84218.9	21.0605
14	815.119	808.566	249399	96037.4	21.0605
15	823.408	801.414	281783	108508	21.0605
16	831.698	794.263	315855	121628	21.0605
17	839.987	787.112	351616	135399	21.0605
18	848.346	784.693	341919	131665	21.0605
19	856.705	782.275	332370	127988	21.0605
20	865.063	779.857	322968	124367	21.0605
21	873.422	777.438	313712	120803	21.0605
22	881.781	775.02	304604	117296	21.0605
23	890.14	772.601	295635	113842	21.0605
24	898.499	770.183	286799	110440	21.0606
25	906.217	768.156	277034	106679	21.0605
26	913.936	766.13	267442	102985	21.0604
27	921.655	764.103	258021	99357.5	21.0605
28	929.374	762.077	248757	95790.3	21.0605
29	937.093	760.05	239649	92283.2	21.0605
30	945.386	758.379	226050	87046.3	21.0605
31	953.678	756.707	212836	81957.9	21.0605
32	961.971	755.035	200010	77019.1	21.0605
33	970.264	753.364	187591	72236.7	21.0605
34	978.556	751.692	175580	67611.7	21.0605
35	986.849	750.021	163979	63144.3	21.0605
36	995.142	748.349	152798	58838.8	21.0605
37	1004.03	747.405	135786	52287.8	21.0605
38	1012.91	746.46	120079	46239.6	21.0605
39	1021.79	745.516	105669	40690.4	21.0604
40	1030.68	744.571	92335.9	35556.3	21.0605
41	1039.56	743.627	79746.8	30708.6	21.0605
42	1048.44	742.683	67957	26168.6	21.0605
43	1057.33	741.738	57050.9	21969	21.0606
44	1066.21	740.794	47051.7	18118.5	21.0605
45	1075.14	740.067	37161.8	14310.1	21.0605
46	1084.06	739.34	28355.9	10919.2	21.0605
47	1092.99	738.614	20726.4	7981.25	21.0605
48	1101.91	737.887	13957.8	5374.82	21.0605
49	1110.84	737.16	8140.81	3134.83	21.0605
50	1119.76	736.433	3788.64	1458.92	21.0606
51	1128.69	735.707	0	0	0

Non-Circular Search (Cuckoo) - Min FS, No Ru

Global Minimum Query (spencer) - Safety Factor: 1.62211

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	696.646	919.038	0	0	0
2	701.82	903.34	-836.557	-318.757	20.8586
3	711.955	894.582	7421.69	2827.92	20.8586
4	722.091	885.824	19314.6	7359.55	20.8586
5	732.226	877.066	34664.9	13208.5	20.8585
6	742.362	868.308	53277.2	20300.4	20.8585
7	752.497	859.55	75141.7	28631.6	20.8586
8	762.633	850.793	100083	38135.2	20.8586
9	772.768	842.035	127918	48741.2	20.8586
10	782.904	833.277	158632	60444.3	20.8586
11	793.039	824.519	192106	73199	20.8586
12	803.175	815.761	228311	86994.2	20.8585
13	813.31	807.003	267230	101824	20.8586
14	823.446	798.245	308718	117632	20.8585
15	833.581	789.488	352740	134406	20.8586
16	843.717	780.73	399304	152149	20.8586
17	853.852	771.972	448542	170910	20.8586
18	864.386	769.213	431943	164585	20.8585
19	874.919	766.454	415702	158397	20.8586
20	885.452	763.695	399818	152345	20.8586
21	895.986	760.936	384269	146420	20.8586
22	906.519	758.177	369050	140621	20.8586
23	917.052	755.419	354161	134948	20.8586
24	927.586	752.66	339586	129394	20.8586
25	938.119	749.901	325308	123954	20.8586
26	947.587	748	307347	117110	20.8586
27	957.054	746.1	289898	110461	20.8585
28	966.522	744.199	272973	104012	20.8585
29	975.99	742.299	256589	97769.4	20.8586
30	985.457	740.399	240748	91733.1	20.8585
31	994.925	738.498	225460	85908.1	20.8586
32	1004.39	736.598	210756	80305.2	20.8585
33	1014.11	734.741	195735	74581.8	20.8586
34	1023.82	732.884	181500	69157.9	20.8586
35	1033.54	731.027	167839	63952.4	20.8586
36	1043.25	729.17	154532	58881.9	20.8585
37	1052.97	727.313	141675	53983	20.8585
38	1062.68	725.456	129316	49273.9	20.8586
39	1072.39	723.599	117430	44744.8	20.8585
40	1082.11	721.742	106005	40391.6	20.8586
41	1091.82	719.884	95131.5	36248.4	20.8586
42	1101.54	718.027	84614.2	32240.9	20.8585
43	1110.8	717.109	71063.5	27077.7	20.8586
44	1120.05	716.191	58902.7	22444	20.8586
45	1129.31	715.273	47592.6	18134.4	20.8585
46	1138.56	714.355	37107.5	14139.2	20.8585
47	1147.82	713.437	27639.1	10531.4	20.8585
48	1156.77	713.516	16945.1	6456.68	20.8586
49	1165.72	713.594	8152.17	3106.26	20.8586
50	1174.68	713.672	1193.3	454.687	20.8585
51	1183.63	713.75	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

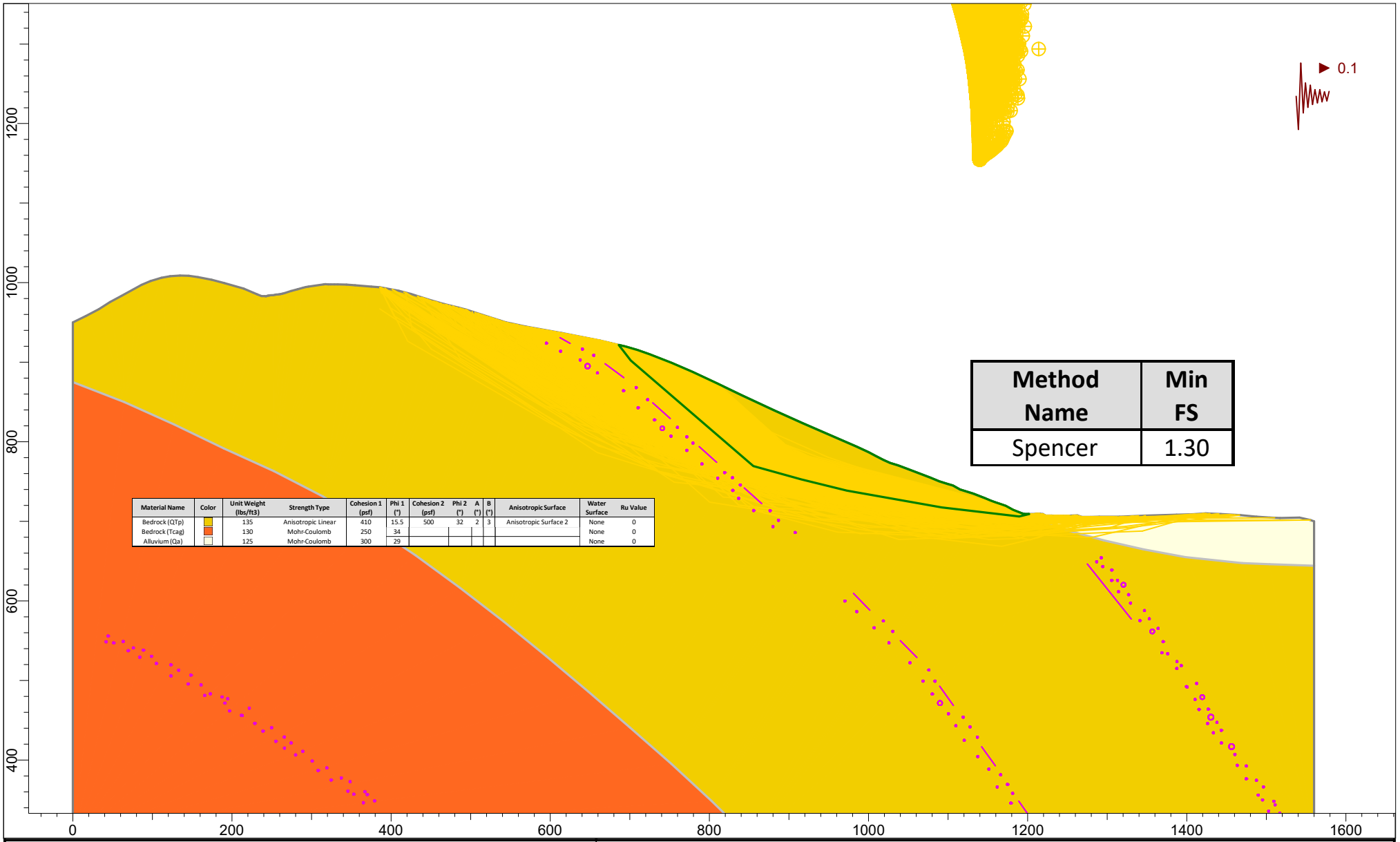
Shared Entities

Type	Coordinates (x,y)
	0, 300 852.446, 300 1560, 300 1560, 644.315

1560, 700
1555.39, 701.596
1541.64, 704.63
1517.29, 704.105
1504.54, 704.659
1487.87, 705.882
1467.43, 707.876
1442.73, 709.196
1423.79, 709.968
1407.59, 708.959
1387.12, 708.334
1348.31, 707.17
1315.67, 705.9
1290.11, 705.913
1279.09, 705.626
1268.07, 705.626
1262.62, 707.428
1254.64, 707.252
1254.6, 706.761
1253.1, 706.848
1242.3, 707.03
1236.42, 706.899
1233.43, 706.833
1231.99, 706.799
1230.55, 706.709
1230.51, 707.209
1230.05, 707.208
1222.53, 707.341
1219.07, 709.06
1215.76, 709.328
1212.08, 709.351
1205.18, 709.241
1202.74, 709.203
1200.29, 709.209
1197.85, 709.22
1196.53, 709.23
1195.86, 709.244
1195.41, 709.273
1195.19, 709.32
1194.91, 709.425
1194.6, 709.542
1194.24, 709.66
1193.39, 709.868
1192.99, 709.974
1192.34, 710.181
1192.12, 710.252
1190.88, 710.709
1181.62, 714.59
1172.41, 719.377
1166.13, 721.75
1158.73, 724.15
1153.22, 726.203
1146.24, 729.181
1132.03, 734.665
1115.12, 739.93
1105.99, 744.935
1099.47, 747.003
1088.86, 750.237
1077.56, 755.052

External Boundary	1062.1, 760.779 1048.42, 766.173 1037.27, 770.347 1027.34, 773.464 1018.48, 777.352 1009.01, 782.253 999.948, 787.05 984.915, 793.87 957.637, 805.966 917.314, 823.296 881.404, 839.394 840.308, 858.49 809.229, 873.751 778.791, 887.812 752.625, 899.275 724.773, 910.003 709.789, 915.155 694.4, 919.702 662.572, 927.297 614.564, 936.584 569.359, 944.722 551.294, 948.574 544.307, 950.132 536.668, 952.52 502.857, 963.408 494.08, 966.141 484.836, 968.651 466.57, 972.951 449.093, 977.99 424.731, 985.802 409.743, 989.824 393.259, 992.887 385.739, 994.146 375.049, 994.942 354.643, 996.661 343.852, 997.393 333.047, 997.753 328.667, 997.846 324.174, 997.72 321.225, 997.766 317.361, 997.93 315.302, 997.688 296.215, 995.141 292.882, 994.488 289.343, 993.514 282.608, 991.648 274.11, 989.322 265.66, 986.671 263.293, 986.007 260.877, 985.553 259.142, 985.305 256.353, 985.144 255.646, 985.104 254.298, 984.807 251.723, 984.26 250.608, 984.246 248.844, 984.047 246.945, 983.806 245.743, 983.737

	244.889, 983.506 243.435, 982.949 242.689, 982.875 241.156, 982.944 237.271, 983.198 231.631, 985.157 226.3, 987.639 214.637, 992.497 190.294, 999.521 174.435, 1003.69 157.107, 1007.02 145.433, 1008.69 134.747, 1008.79 122.274, 1008.2 111.392, 1006.26 97.4038, 1002.09 86.4637, 997.205 61.1904, 983.244 46.7959, 975.514 32.7471, 966.797 16.51, 958.155 0, 950.025 0, 875
Material Boundary	1192.34, 710.181 1241.97, 690.921 1295.59, 676.18 1345.72, 664.72 1398.24, 655.103 1469.81, 647.385 1504.27, 646.148 1560, 644.315
Material Boundary	0, 875 64.4726, 850.068 127.469, 821.742 189.75, 791.684 252.654, 763.039 314.118, 731.456 373.471, 695.906 430.905, 657.347 486.711, 616.539 541.258, 574.079 594.894, 530.509 647.829, 486.087 700.222, 440.964 752.142, 395.211 803.114, 348.422 852.446, 300



Method Name	Min FS
Spencer	1.30

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 2	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	250	34						None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 2-2'; Pseudo-static; Non-Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, CA	File Name	SP24s1a_s.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 2

Table of Contents

Project Summary 3
Currently Open Scenarios 3
General Settings 3
Analysis Options 3
All Open Scenarios 3
Groundwater Analysis 4
All Open Scenarios 4
Random Numbers 4
All Open Scenarios 4
Surface Options 4
All Open Scenarios 4
Seismic Loading 4
Non-Circular Search (Cuckoo) - Master Scenario 4
Non-Circular Search (Cuckoo) - Min FS, No Ru 5
Materials 5
Materials In Use 5
Global Minimums 6
Non-Circular Search (Cuckoo) - Master Scenario 6
Method: spencer 6
Non-Circular Search (Cuckoo) - Min FS, No Ru 6
Method: spencer 6
Global Minimum Coordinates 6
Non-Circular Search (Cuckoo) - Master Scenario 6
Method: spencer 6
Non-Circular Search (Cuckoo) - Min FS, No Ru 7
Method: spencer 7
Global Minimum Support Data 7
All Open Scenarios 7
Valid and Invalid Surfaces 7
Non-Circular Search (Cuckoo) - Master Scenario 7
Method: spencer 7
Non-Circular Search (Cuckoo) - Min FS, No Ru 7
Method: spencer 7
Error Code Descriptions 8
Slice Data 8
Non-Circular Search (Cuckoo) - Master Scenario 8
Global Minimum Query (spencer) - Safety Factor: 1.62305 8
Non-Circular Search (Cuckoo) - Min FS, No Ru 10
Global Minimum Query (spencer) - Safety Factor: 1.303 10
Interslice Data 11
Non-Circular Search (Cuckoo) - Master Scenario 11
Global Minimum Query (spencer) - Safety Factor: 1.62305 11

Non-Circular Search (Cuckoo) - Min FS, No Ru 12
Global Minimum Query (spencer) - Safety Factor: 1.303 12
Entity Information 13
Non-Circular Search (Cuckoo) 13
Shared Entities 13

Slide2 Analysis Information

SP24s1a_s

Project Summary

File Name:	SP24s1a_s.slmd
Slide2 Modeler Version:	9.029
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 2-2'; Pseudo-static; Non-Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, CA 23-2195s-1

Currently Open Scenarios

Group Name	Scenario Name	Global Minimum	Compute Time
Non-Circular Search (Cuckoo)	Master Scenario	Spencer: 1.623050	00h:00m:06.905s
	Min FS, No Ru	Spencer: 1.303000	00h:00m:08.179s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

All Open Scenarios

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

All Open Scenarios

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

All Open Scenarios

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

All Open Scenarios

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

- **Non-Circular Search (Cuckoo) - Master Scenario**

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Non-Circular Search (Cuckoo) - Min FS, No Ru

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Assigned per scenario
Water Surface	Assigned per scenario
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	Assigned per scenario
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	Assigned per scenario
Ru Value	0

Materials In Use

Material	Non-Circular Search (Cuckoo)	Min FS, No Ru
Bedrock (QTp)	✓	✓
Bedrock (Tcag)	✓	✓
Alluvium (Qa)	✓	✓

Global Minimums

Non-Circular Search (Cuckoo) - Master Scenario

Method: spencer

FS	1.623050
Axis Location:	1098.189, 1247.121
Left Slip Surface Endpoint:	707.357, 915.874
Right Slip Surface Endpoint:	1128.687, 735.707
Resisting Moment:	7.2144e+08 lb-ft
Driving Moment:	4.44497e+08 lb-ft
Resisting Horizontal Force:	1.31937e+06 lb
Driving Horizontal Force:	812894 lb
Total Slice Area:	17464.7 ft2
Surface Horizontal Width:	421.331 ft
Surface Average Height:	41.4512 ft

Non-Circular Search (Cuckoo) - Min FS, No Ru

Method: spencer

FS	1.303000
Axis Location:	1156.499, 1331.449
Left Slip Surface Endpoint:	686.001, 921.706
Right Slip Surface Endpoint:	1201.994, 709.205
Resisting Moment:	1.15995e+09 lb-ft
Driving Moment:	8.90216e+08 lb-ft
Resisting Horizontal Force:	1.75282e+06 lb
Driving Horizontal Force:	1.34522e+06 lb
Total Slice Area:	23684.8 ft2
Surface Horizontal Width:	515.993 ft
Surface Average Height:	45.9013 ft

Global Minimum Coordinates

Non-Circular Search (Cuckoo) - Master Scenario

Method: spencer

X	Y
707.357	901.533
839.987	787.112
898.499	770.183
937.093	760.05
995.142	748.349
1066.21	740.794
1128.69	735.707

Non-Circular Search (Cuckoo) - Min FS, No Ru

Method: spencer

X	Y
686.001	921.706
701.2	902.197
855.162	769.319
915.253	752.74
972.895	738.491
1091.95	717.501
1189.52	706.054
1201.99	709.205

Global Minimum Support Data

All Open Scenarios

No Supports Present

Valid and Invalid Surfaces

Non-Circular Search (Cuckoo) - Master Scenario

Method: spencer

Number of Valid Surfaces:	19604
Number of Invalid Surfaces:	5448

Error Codes
Error Code -106 reported for 3 surfaces
Error Code -108 reported for 121 surfaces
Error Code -111 reported for 1297 surfaces
Error Code -112 reported for 211 surfaces
Error Code -121 reported for 763 surfaces
Error Code -124 reported for 22 surfaces
Error Code -145 reported for 17 surfaces
Error Code -1000 reported for 3014 surfaces

Non-Circular Search (Cuckoo) - Min FS, No Ru

Method: spencer

Number of Valid Surfaces:	19927
Number of Invalid Surfaces:	5124

Error Codes

Error Code -108 reported for 106 surfaces
Error Code -109 reported for 1 surface
Error Code -111 reported for 1001 surfaces
Error Code -112 reported for 139 surfaces
Error Code -121 reported for 1042 surfaces
Error Code -145 reported for 13 surfaces
Error Code -1000 reported for 2822 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-109 = Soiltype for slice base not located. This error should occur very rarely, if at all. It may occur if a very low number of slices is combined with certain soil geometries, such that the midpoint of a slice base is actually outside the soil region,even though the slip surface is wholly within the soil region.
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Non-Circular Search (Cuckoo) - Master Scenario

Global Minimum Query (spencer) - Safety Factor: 1.62305

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	8.2894	18567.4	-40.7845	Bedrock (QTp)	410	15.5	508.7	825.645	1498.77	0	1498.77	1937.63	1937.63
2	8.2894	23400.2	-40.7845	Bedrock (QTp)	410	15.5	579.183	940.043	1911.27	0	1911.27	2410.93	2410.93
3	8.2894	28058.6	-40.7845	Bedrock (QTp)	410	15.5	647.123	1050.31	2308.89	0	2308.89	2867.17	2867.17
4	8.2894	32490.2	-40.7845	Bedrock (QTp)	410	15.5	711.756	1155.22	2687.16	0	2687.16	3301.19	3301.19
5	8.2894	36919.9	-40.7845	Bedrock (QTp)	410	15.5	776.36	1260.07	3065.26	0	3065.26	3735.03	3735.03
6	8.2894	41278.3	-40.7845	Bedrock (QTp)	410	15.5	839.924	1363.24	3437.27	0	3437.27	4161.87	4161.87
7	8.2894	45269.3	-40.7845	Bedrock (QTp)	410	15.5	898.13	1457.71	3777.92	0	3777.92	4552.74	4552.74
8	8.2894	49208.2	-40.7845	Bedrock (QTp)	410	15.5	955.577	1550.95	4114.12	0	4114.12	4938.5	4938.5

9	8.2894	53130.9	-40.7845	Bedrock (QTp)	410	15.5	1012.78	1643.8	4448.94	0	4448.94	5322.68	5322.68
10	8.2894	56890.7	-40.7845	Bedrock (QTp)	410	15.5	1067.62	1732.8	4769.87	0	4769.87	5690.91	5690.91
11	8.2894	60608.3	-40.7845	Bedrock (QTp)	410	15.5	1121.84	1820.8	5087.19	0	5087.19	6055.01	6055.01
12	8.2894	64326	-40.7845	Bedrock (QTp)	410	15.5	1176.06	1908.8	5404.5	0	5404.5	6419.09	6419.09
13	8.2894	67975.4	-40.7845	Bedrock (QTp)	410	15.5	1229.28	1995.19	5716.01	0	5716.01	6776.52	6776.52
14	8.2894	71434.3	-40.7845	Bedrock (QTp)	410	15.5	1279.73	2077.06	6011.24	0	6011.24	7115.27	7115.27
15	8.2894	74881.8	-40.7845	Bedrock (QTp)	410	15.5	1330.01	2158.67	6305.51	0	6305.51	7452.92	7452.92
16	8.2894	78329.4	-40.7845	Bedrock (QTp)	410	15.5	1380.29	2240.28	6599.78	0	6599.78	7790.56	7790.56
17	8.35879	79886.9	-16.1363	Bedrock (QTp)	500	32	3742.79	6074.73	8921.44	0	8921.44	10004.3	10004.3
18	8.35879	78232.9	-16.1363	Bedrock (QTp)	500	32	3671.89	5959.66	8737.29	0	8737.29	9799.65	9799.65
19	8.35879	76579.1	-16.1363	Bedrock (QTp)	500	32	3601	5844.61	8553.16	0	8553.16	9595.01	9595.01
20	8.35879	74925.3	-16.1363	Bedrock (QTp)	500	32	3530.12	5729.56	8369.04	0	8369.04	9390.39	9390.39
21	8.35879	73271.6	-16.1363	Bedrock (QTp)	500	32	3459.23	5614.51	8184.93	0	8184.93	9185.76	9185.76
22	8.35879	71701.7	-16.1363	Bedrock (QTp)	500	32	3391.95	5505.3	8010.16	0	8010.16	8991.52	8991.52
23	8.35879	70202.2	-16.1363	Bedrock (QTp)	500	32	3327.67	5400.98	7843.2	0	7843.2	8805.97	8805.97
24	7.71889	63388.5	-14.7108	Bedrock (QTp)	500	32	3321.64	5391.19	7827.53	0	7827.53	8699.62	8699.62
25	7.71889	61894.4	-14.7108	Bedrock (QTp)	500	32	3250.93	5276.42	7643.87	0	7643.87	8497.4	8497.4
26	7.71889	60423.8	-14.7108	Bedrock (QTp)	500	32	3181.34	5163.47	7463.12	0	7463.12	8298.37	8298.37
27	7.71889	59064.6	-14.7108	Bedrock (QTp)	500	32	3117.01	5059.07	7296.04	0	7296.04	8114.4	8114.4
28	7.71889	57719.6	-14.7108	Bedrock (QTp)	500	32	3053.36	4955.76	7130.71	0	7130.71	7932.36	7932.36
29	8.29266	60228.4	-11.3966	Bedrock (QTp)	500	32	3106.42	5041.87	7268.51	0	7268.51	7894.68	7894.68
30	8.29266	58109.9	-11.3966	Bedrock (QTp)	500	32	3008.75	4883.35	7014.83	0	7014.83	7621.31	7621.31
31	8.29266	55974.1	-11.3966	Bedrock (QTp)	500	32	2910.28	4723.53	6759.05	0	6759.05	7345.69	7345.69
32	8.29266	53743	-11.3966	Bedrock (QTp)	500	32	2807.41	4556.57	6491.87	0	6491.87	7057.77	7057.77
33	8.29266	51497.3	-11.3966	Bedrock (QTp)	500	32	2703.88	4388.54	6222.96	0	6222.96	6767.99	6767.99
34	8.29266	49249.1	-11.3966	Bedrock (QTp)	500	32	2600.23	4220.3	5953.73	0	5953.73	6477.87	6477.87
35	8.29266	46936.7	-11.3966	Bedrock (QTp)	500	32	2493.62	4047.27	5676.82	0	5676.82	6179.47	6179.47
36	8.88378	47093.8	-6.06817	Bedrock (QTp)	500	32	2529.43	4105.39	5769.83	0	5769.83	6038.72	6038.72
37	8.88378	42717.3	-6.06817	Bedrock (QTp)	500	32	2326.29	3775.68	5242.17	0	5242.17	5489.47	5489.47
38	8.88378	38372.8	-6.06817	Bedrock (QTp)	500	32	2124.62	3448.37	4718.39	0	4718.39	4944.25	4944.25
39	8.88378	34759.8	-6.06817	Bedrock (QTp)	500	32	1956.92	3176.18	4282.77	0	4282.77	4490.81	4490.81
40	8.88378	32266.9	-6.06817	Bedrock (QTp)	500	32	1841.21	2988.37	3982.23	0	3982.23	4177.96	4177.96
41	8.88378	29587.7	-6.06817	Bedrock (QTp)	500	32	1716.85	2786.53	3659.2	0	3659.2	3841.71	3841.71
42	8.88378	26625.5	-6.06817	Bedrock (QTp)	500	32	1579.35	2563.36	3302.08	0	3302.08	3469.97	3469.97
43	8.88378	23585.8	-6.06817	Bedrock (QTp)	500	32	1438.26	2334.36	2935.59	0	2935.59	3088.49	3088.49
44	8.92508	20690.8	-4.65524	Bedrock (QTp)	500	32	1323.42	2147.98	2637.31	0	2637.31	2745.07	2745.07
45	8.92508	17423.3	-4.65524	Bedrock (QTp)	500	32	1169.29	1897.82	2236.98	0	2236.98	2332.19	2332.19

46	8.92508	13877.8	-4.65524	Bedrock (QTp)	500	32	1002.05	1626.37	1802.58	0	1802.58	1884.17	1884.17
47	8.92508	11282.9	-4.65524	Bedrock (QTp)	500	32	879.648	1427.71	1484.65	0	1484.65	1556.28	1556.28
48	8.92508	8414.71	-4.65524	Bedrock (QTp)	500	32	744.354	1208.12	1133.24	0	1133.24	1193.85	1193.85
49	8.92508	3999.59	-4.65524	Bedrock (QTp)	500	32	536.092	870.104	592.29	0	592.29	635.943	635.943
50	8.92508	1235.54	-4.65524	Bedrock (QTp)	500	32	406.583	659.905	255.902	0	255.902	289.009	289.009

Non-Circular Search (Cuckoo) - Min FS, No Ru

Global Minimum Query (spencer) - Safety Factor: 1.303

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	15.1987	16116.5	-52.0796	Bedrock (QTp)	500	32	551.235	718.259	349.287	0	349.287	1056.86	1056.86
2	10.2642	25499.1	-40.7959	Bedrock (QTp)	410	15.5	634.814	827.163	1504.24	0	1504.24	2052.12	2052.12
3	10.2642	33124.8	-40.7959	Bedrock (QTp)	410	15.5	735.889	958.864	1979.14	0	1979.14	2614.25	2614.25
4	10.2642	40364.2	-40.7959	Bedrock (QTp)	410	15.5	831.846	1083.89	2429.99	0	2429.99	3147.91	3147.91
5	10.2642	47186.7	-40.7959	Bedrock (QTp)	410	15.5	922.275	1201.72	2854.86	0	2854.86	3650.83	3650.83
6	10.2642	53983.2	-40.7959	Bedrock (QTp)	410	15.5	1012.36	1319.11	3278.13	0	3278.13	4151.85	4151.85
7	10.2642	60411.1	-40.7959	Bedrock (QTp)	410	15.5	1097.56	1430.12	3678.43	0	3678.43	4625.68	4625.68
8	10.2642	66455.2	-40.7959	Bedrock (QTp)	410	15.5	1177.67	1534.5	4054.83	0	4054.83	5071.22	5071.22
9	10.2642	72466.2	-40.7959	Bedrock (QTp)	410	15.5	1257.34	1638.32	4429.18	0	4429.18	5514.33	5514.33
10	10.2642	78224.1	-40.7959	Bedrock (QTp)	410	15.5	1333.66	1737.76	4787.76	0	4787.76	5938.77	5938.77
11	10.2642	83928.9	-40.7959	Bedrock (QTp)	410	15.5	1409.28	1836.29	5143.03	0	5143.03	6359.31	6359.31
12	10.2642	89587	-40.7959	Bedrock (QTp)	410	15.5	1484.27	1934.01	5495.4	0	5495.4	6776.4	6776.4
13	10.2642	94934.8	-40.7959	Bedrock (QTp)	410	15.5	1555.16	2026.37	5828.44	0	5828.44	7170.62	7170.62
14	10.2642	100226	-40.7959	Bedrock (QTp)	410	15.5	1625.28	2117.74	6157.92	0	6157.92	7560.62	7560.62
15	10.2642	105554	-40.7959	Bedrock (QTp)	410	15.5	1695.91	2209.77	6489.75	0	6489.75	7953.4	7953.4
16	10.2642	111163	-40.7959	Bedrock (QTp)	410	15.5	1770.25	2306.63	6839.05	0	6839.05	8366.86	8366.86
17	10.0151	109951	-15.4243	Bedrock (QTp)	500	32	5260.61	6854.58	10169.4	0	10169.4	11620.8	11620.8
18	10.0151	107395	-15.4243	Bedrock (QTp)	500	32	5148.07	6707.93	9934.77	0	9934.77	11355.1	11355.1
19	10.0151	104856	-15.4243	Bedrock (QTp)	500	32	5036.22	6562.19	9701.55	0	9701.55	11091.1	11091.1
20	10.0151	102479	-15.4243	Bedrock (QTp)	500	32	4931.54	6425.8	9483.27	0	9483.27	10843.9	10843.9
21	10.0151	100144	-15.4243	Bedrock (QTp)	500	32	4828.74	6291.85	9268.9	0	9268.9	10601.2	10601.2
22	10.0151	97809.7	-15.4243	Bedrock (QTp)	500	32	4725.95	6157.91	9054.54	0	9054.54	10358.4	10358.4
23	9.60712	91524.3	-13.8855	Bedrock (QTp)	500	32	4740.41	6176.75	9084.7	0	9084.7	10256.6	10256.6
24	9.60712	89244.3	-13.8855	Bedrock (QTp)	500	32	4632.91	6036.68	8860.53	0	8860.53	10005.8	10005.8
25	9.60712	86969.7	-13.8855	Bedrock (QTp)	500	32	4525.66	5896.93	8636.89	0	8636.89	9755.67	9755.67
26	9.60712	84695	-13.8855	Bedrock (QTp)	500	32	4418.4	5757.18	8413.25	0	8413.25	9505.51	9505.51
27	9.60712	82390.9	-13.8855	Bedrock (QTp)	500	32	4309.76	5615.62	8186.71	0	8186.71	9252.11	9252.11

28	9.60712	79959.9	-13.8855	Bedrock (QTp)	500	32	4195.14	5466.27	7947.7	0	7947.7	8984.77	8984.77
29	10.8231	86590.8	-9.99869	Bedrock (QTp)	500	32	4326.1	5636.91	8220.78	0	8220.78	8983.48	8983.48
30	10.8231	82302.3	-9.99869	Bedrock (QTp)	500	32	4133.73	5386.25	7819.63	0	7819.63	8548.42	8548.42
31	10.8231	77767.6	-9.99869	Bedrock (QTp)	500	32	3930.31	5121.2	7395.46	0	7395.46	8088.38	8088.38
32	10.8231	72375.3	-9.99869	Bedrock (QTp)	500	32	3688.42	4806.01	6891.06	0	6891.06	7541.34	7541.34
33	10.8231	67353.8	-9.99869	Bedrock (QTp)	500	32	3463.17	4512.51	6421.36	0	6421.36	7031.93	7031.93
34	10.8231	64102.5	-9.99869	Bedrock (QTp)	500	32	3317.32	4322.47	6117.23	0	6117.23	6702.08	6702.08
35	10.8231	61397.9	-9.99869	Bedrock (QTp)	500	32	3195.99	4164.38	5864.24	0	5864.24	6427.71	6427.71
36	10.8231	58102.3	-9.99869	Bedrock (QTp)	500	32	3048.17	3971.76	5555.97	0	5555.97	6093.38	6093.38
37	10.8231	54764.9	-9.99869	Bedrock (QTp)	500	32	2898.45	3776.68	5243.78	0	5243.78	5754.79	5754.79
38	10.8231	51635.2	-9.99869	Bedrock (QTp)	500	32	2758.06	3593.75	4951.04	0	4951.04	5437.29	5437.29
39	10.8231	47959.9	-9.99869	Bedrock (QTp)	500	32	2593.19	3378.93	4607.25	0	4607.25	5064.44	5064.44
40	10.841	45035	-6.69129	Bedrock (QTp)	500	32	2602.66	3391.26	4626.99	0	4626.99	4932.33	4932.33
41	10.841	40998.4	-6.69129	Bedrock (QTp)	500	32	2410.41	3140.76	4226.09	0	4226.09	4508.88	4508.88
42	10.841	35721.9	-6.69129	Bedrock (QTp)	500	32	2159.09	2813.3	3702.05	0	3702.05	3955.35	3955.35
43	10.841	32555.7	-6.69129	Bedrock (QTp)	500	32	2008.3	2616.81	3387.6	0	3387.6	3623.21	3623.21
44	10.841	28579.9	-6.69129	Bedrock (QTp)	500	32	1818.93	2370.07	2992.75	0	2992.75	3206.14	3206.14
45	10.841	24052.9	-6.69129	Bedrock (QTp)	500	32	1603.32	2089.13	2543.14	0	2543.14	2731.24	2731.24
46	10.841	20080.7	-6.69129	Bedrock (QTp)	500	32	1414.14	1842.62	2148.64	0	2148.64	2314.54	2314.54
47	10.841	15862.7	-6.69129	Bedrock (QTp)	500	32	1213.25	1580.86	1729.73	0	1729.73	1872.07	1872.07
48	10.841	10102.6	-6.69129	Bedrock (QTp)	500	32	938.9	1223.39	1157.67	0	1157.67	1267.82	1267.82
49	8.15388	3116.62	14.1722	Bedrock (QTp)	500	32	956.262	1246.01	1193.86	0	1193.86	952.386	952.386
50	4.322	298.516	14.1722	Alluvium (Qa)	300	29	393.241	512.393	383.167	0	383.167	283.865	283.865

Interslice Data

Non-Circular Search (Cuckoo) - Master Scenario

Global Minimum Query (spencer) - Safety Factor: 1.62305

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	707.357	901.533	0	0	0
2	715.646	894.381	6503.13	2504.2	21.0605
3	723.935	887.23	15372.2	5919.47	21.0605
4	732.225	880.079	26521.9	10212.9	21.0604
5	740.514	872.928	39841	15341.8	21.0605
6	748.804	865.776	55328.8	21305.8	21.0605
7	757.093	858.625	72950.3	28091.4	21.0605
8	765.382	851.474	92525.6	35629.4	21.0605
9	773.672	844.322	114029	43909.9	21.0605
10	781.961	837.171	137453	52930	21.0606
11	790.251	830.02	162718	62658.8	21.0605
12	798.54	822.868	189803	73088.4	21.0605
13	806.829	815.717	218707	84218.9	21.0605
14	815.119	808.566	249399	96037.4	21.0605
15	823.408	801.414	281783	108508	21.0605
16	831.698	794.263	315855	121628	21.0605
17	839.987	787.112	351616	135399	21.0605
18	848.346	784.693	341919	131665	21.0605
19	856.705	782.275	332370	127988	21.0605
20	865.063	779.857	322968	124367	21.0605
21	873.422	777.438	313712	120803	21.0605
22	881.781	775.02	304604	117296	21.0605
23	890.14	772.601	295635	113842	21.0605
24	898.499	770.183	286799	110440	21.0606
25	906.217	768.156	277034	106679	21.0605
26	913.936	766.13	267442	102985	21.0604
27	921.655	764.103	258021	99357.5	21.0605
28	929.374	762.077	248757	95790.3	21.0605
29	937.093	760.05	239649	92283.2	21.0605
30	945.386	758.379	226050	87046.3	21.0605
31	953.678	756.707	212836	81957.9	21.0605
32	961.971	755.035	200010	77019.1	21.0605
33	970.264	753.364	187591	72236.7	21.0605
34	978.556	751.692	175580	67611.7	21.0605
35	986.849	750.021	163979	63144.3	21.0605
36	995.142	748.349	152798	58838.8	21.0605
37	1004.03	747.405	135786	52287.8	21.0605
38	1012.91	746.46	120079	46239.6	21.0605
39	1021.79	745.516	105669	40690.4	21.0604
40	1030.68	744.571	92335.9	35556.3	21.0605
41	1039.56	743.627	79746.8	30708.6	21.0605
42	1048.44	742.683	67957	26168.6	21.0605
43	1057.33	741.738	57050.9	21969	21.0606
44	1066.21	740.794	47051.7	18118.5	21.0605
45	1075.14	740.067	37161.8	14310.1	21.0605
46	1084.06	739.34	28355.9	10919.2	21.0605
47	1092.99	738.614	20726.4	7981.25	21.0605
48	1101.91	737.887	13957.8	5374.82	21.0605
49	1110.84	737.16	8140.81	3134.83	21.0605
50	1119.76	736.433	3788.64	1458.92	21.0606
51	1128.69	735.707	0	0	0

Non-Circular Search (Cuckoo) - Min FS, No Ru

Global Minimum Query (spencer) - Safety Factor: 1.303

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	686.001	921.706	0	0	0
2	701.2	902.197	52.4667	24.8356	25.331
3	711.464	893.338	9415.38	4456.86	25.331
4	721.728	884.48	22710.9	10750.4	25.3309
5	731.992	875.621	39739.8	18811.2	25.331
6	742.256	866.763	60287	28537.4	25.331
7	752.52	857.904	84339.2	39922.7	25.3309
8	762.785	849.046	111706	52877.2	25.331
9	773.049	840.187	142190	67307.1	25.331
10	783.313	831.329	175774	83204.3	25.331
11	793.577	822.47	212327	100507	25.331
12	803.841	813.612	251823	119203	25.331
13	814.105	804.753	294236	139279	25.3309
14	824.37	795.895	339407	160661	25.3309
15	834.634	787.036	387306	183335	25.331
16	844.898	778.178	437953	207309	25.331
17	855.162	769.319	491493	232653	25.331
18	865.177	766.556	477931	226233	25.331
19	875.192	763.793	464592	219919	25.331
20	885.207	761.03	451474	213709	25.3309
21	895.222	758.267	438563	207598	25.331
22	905.238	755.504	425855	201582	25.3309
23	915.253	752.74	413350	195663	25.331
24	924.86	750.365	398561	188662	25.3309
25	934.467	747.99	384044	181791	25.331
26	944.074	745.616	369798	175047	25.3309
27	953.681	743.241	355823	168432	25.331
28	963.288	740.866	342123	161947	25.331
29	972.895	738.491	328713	155600	25.3311
30	983.718	736.583	306262	144972	25.331
31	994.542	734.674	284698	134764	25.3309
32	1005.36	732.766	264071	125001	25.3311
33	1016.19	730.858	244559	115764	25.3309
34	1027.01	728.95	226086	107020	25.331
35	1037.83	727.042	208284	98593.3	25.331
36	1048.66	725.134	191042	90431.5	25.331
37	1059.48	723.225	174481	82592.3	25.331
38	1070.3	721.317	158610	75079.7	25.331
39	1081.13	719.409	143387	67873.4	25.3309
40	1091.95	717.501	128923	61026.7	25.3309
41	1102.79	716.229	111111	52595.4	25.331
42	1113.63	714.957	94468.8	44717.7	25.331
43	1124.47	713.685	79355.5	37563.6	25.3309
44	1135.31	712.414	65159.5	30843.8	25.3309
45	1146.15	711.142	52115.4	24669.3	25.331
46	1157	709.87	40383.1	19115.7	25.331
47	1167.84	708.598	29801.6	14106.9	25.331
48	1178.68	707.326	20442.2	9676.5	25.331
49	1189.52	706.054	12751.7	6036.16	25.3311
50	1197.67	708.113	2812.18	1331.17	25.3309
51	1201.99	709.205	0	0	0

Discharge Sections

Entity Information

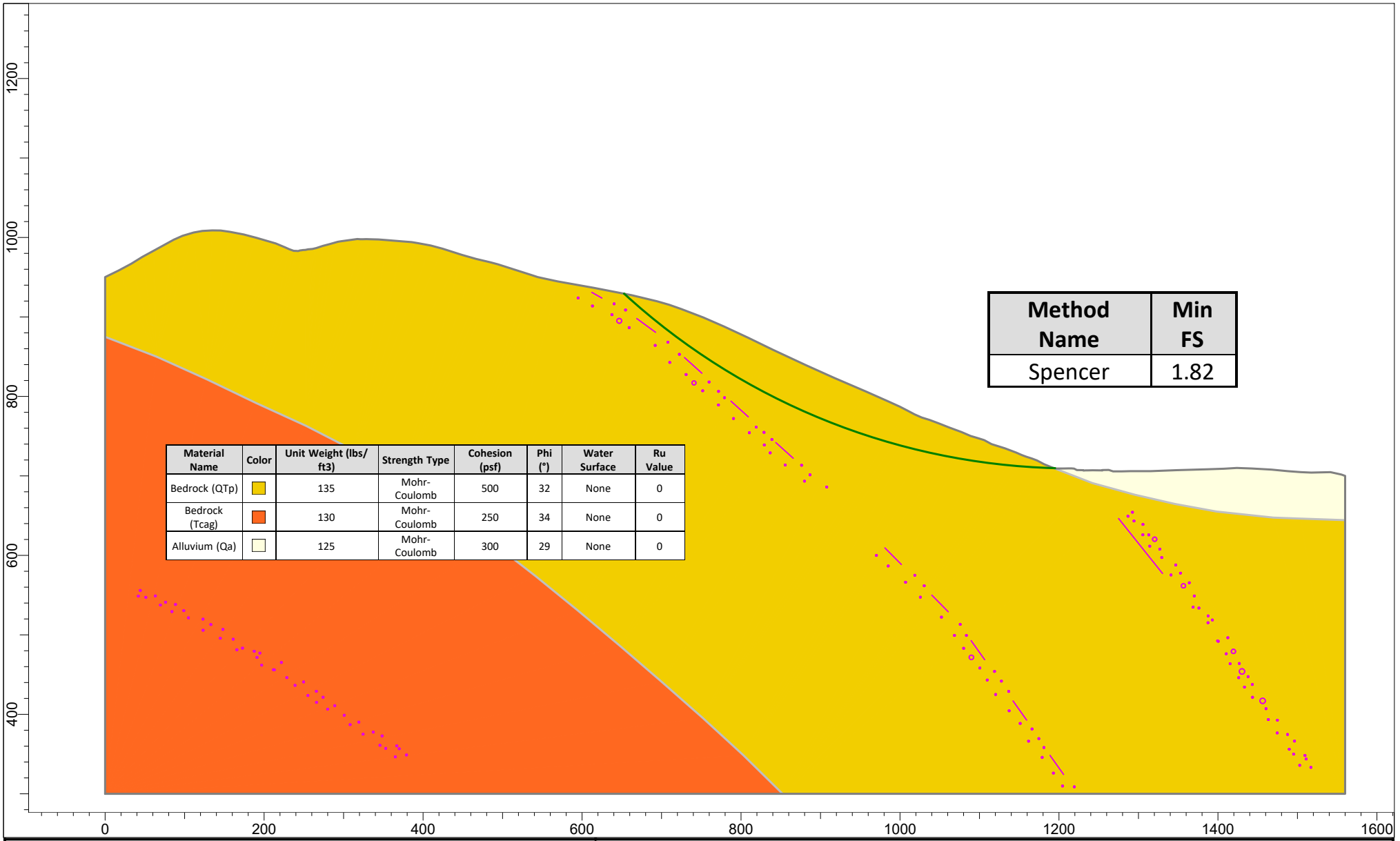
Non-Circular Search (Cuckoo)

Shared Entities

Type	Coordinates (x,y)
	0, 300 852.446, 300 1560, 300 1560, 644.315 1560, 700 1555.39, 701.596 1541.64, 704.63 1517.29, 704.105 1504.54, 704.659 1487.87, 705.882 1467.43, 707.876 1442.73, 709.196 1423.79, 709.968 1407.59, 708.959 1387.12, 708.334 1348.31, 707.17 1315.67, 705.9 1290.11, 705.913 1279.09, 705.626 1268.07, 705.626 1262.62, 707.428 1254.64, 707.252 1254.6, 706.761 1253.1, 706.848 1242.3, 707.03 1236.42, 706.899 1233.43, 706.833 1231.99, 706.799 1230.55, 706.709 1230.51, 707.209 1230.05, 707.208 1222.53, 707.341 1219.07, 709.06 1215.76, 709.328 1212.08, 709.351 1205.18, 709.241 1202.74, 709.203 1200.29, 709.209 1197.85, 709.22 1196.53, 709.23 1195.86, 709.244 1195.41, 709.273 1195.19, 709.32 1194.91, 709.425 1194.6, 709.542 1194.24, 709.66 1193.39, 709.868 1192.99, 709.974 1192.34, 710.181 1192.12, 710.252 1190.88, 710.709 1181.62, 714.59 1172.41, 719.377 1166.13, 721.75 1158.73, 724.15 1153.22, 726.203 1146.24, 729.181 1132.03, 734.665

External Boundary	1115.12, 739.93 1105.99, 744.935 1099.47, 747.003 1088.86, 750.237 1077.56, 755.052 1062.1, 760.779 1048.42, 766.173 1037.27, 770.347 1027.34, 773.464 1018.48, 777.352 1009.01, 782.253 999.948, 787.05 984.915, 793.87 957.637, 805.966 917.314, 823.296 881.404, 839.394 840.308, 858.49 809.229, 873.751 778.791, 887.812 752.625, 899.275 724.773, 910.003 709.789, 915.155 694.4, 919.702 662.572, 927.297 614.564, 936.584 569.359, 944.722 551.294, 948.574 544.307, 950.132 536.668, 952.52 502.857, 963.408 494.08, 966.141 484.836, 968.651 466.57, 972.951 449.093, 977.99 424.731, 985.802 409.743, 989.824 393.259, 992.887 385.739, 994.146 375.049, 994.942 354.643, 996.661 343.852, 997.393 333.047, 997.753 328.667, 997.846 324.174, 997.72 321.225, 997.766 317.361, 997.93 315.302, 997.688 296.215, 995.141 292.882, 994.488 289.343, 993.514 282.608, 991.648 274.11, 989.322 265.66, 986.671 263.293, 986.007 260.877, 985.553 259.142, 985.305 256.353, 985.144 255.646, 985.104 254.298, 984.807

	251.723, 984.26 250.608, 984.246 248.844, 984.047 246.945, 983.806 245.743, 983.737 244.889, 983.506 243.435, 982.949 242.689, 982.875 241.156, 982.944 237.271, 983.198 231.631, 985.157 226.3, 987.639 214.637, 992.497 190.294, 999.521 174.435, 1003.69 157.107, 1007.02 145.433, 1008.69 134.747, 1008.79 122.274, 1008.2 111.392, 1006.26 97.4038, 1002.09 86.4637, 997.205 61.1904, 983.244 46.7959, 975.514 32.7471, 966.797 16.51, 958.155 0, 950.025 0, 875
Material Boundary	1192.34, 710.181 1241.97, 690.921 1295.59, 676.18 1345.72, 664.72 1398.24, 655.103 1469.81, 647.385 1504.27, 646.148 1560, 644.315
Material Boundary	0, 875 64.4726, 850.068 127.469, 821.742 189.75, 791.684 252.654, 763.039 314.118, 731.456 373.471, 695.906 430.905, 657.347 486.711, 616.539 541.258, 574.079 594.894, 530.509 647.829, 486.087 700.222, 440.964 752.142, 395.211 803.114, 348.422 852.446, 300



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Bedrock (QTp)		135	Mohr-Coulomb	500	32	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	250	34	None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29	None	0

Method Name	Min FS
Spencer	1.82

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 2-2'; Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SP24s1b.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 3

Table of Contents

Project Summary 2
Currently Open Scenarios 2
General Settings 2
Analysis Options 2
All Open Scenarios 2
Groundwater Analysis 3
All Open Scenarios 3
Random Numbers 3
All Open Scenarios 3
Surface Options 3
All Open Scenarios 3
Seismic Loading 3
All Open Scenarios 4
Materials 4
Materials In Use 4
Global Minimums 4
Circular Search (Auto Refine) - Master Scenario 4
Method: spencer 4
Circular Search (Auto Refine) - Min FS, No Ru 5
Method: spencer 5
Global Minimum Support Data 5
All Open Scenarios 5
Valid and Invalid Surfaces 5
Circular Search (Auto Refine) - Master Scenario 5
Method: spencer 5
Circular Search (Auto Refine) - Min FS, No Ru 5
Method: spencer 5
Slice Data 6
Circular Search (Auto Refine) - Master Scenario 6
Global Minimum Query (spencer) - Safety Factor: 1.8228 6
Circular Search (Auto Refine) - Min FS, No Ru 7
Global Minimum Query (spencer) - Safety Factor: 1.82279 7
Interslice Data 9
Circular Search (Auto Refine) - Master Scenario 9
Global Minimum Query (spencer) - Safety Factor: 1.8228 9
Circular Search (Auto Refine) - Min FS, No Ru 9
Global Minimum Query (spencer) - Safety Factor: 1.82279 9
Entity Information 10
Circular Search (Auto Refine) 10
Shared Entities 10

Slide2 Analysis Information

SP24s1b

Project Summary

File Name:	SP24s1b.slmd
Slide2 Modeler Version:	9.029
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 2-2'; Static; Circular
Author:	M. Neely
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

Currently Open Scenarios

Group Name	Scenario Name	Global Minimum	Compute Time
Circular Search (Auto Refine)	Master Scenario	Spencer: 1.822800	00h:00m:02.765s
	Min FS, No Ru	Spencer: 1.822790	00h:00m:01.505s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

All Open Scenarios

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

All Open Scenarios

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

All Open Scenarios

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

All Open Scenarios

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

All Open Scenarios

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (QTp)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	500 psf
Phi	32 °
Water Surface	Assigned per scenario
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	Assigned per scenario
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	Assigned per scenario
Ru Value	0

Materials In Use

Material	Circular Search (Auto Refine)	Min FS, No Ru
Bedrock (QTp)	✓	✓
Bedrock (Tcag)	✓	✓
Alluvium (Qa)	✓	✓

Global Minimums

Circular Search (Auto Refine) - Master Scenario

Method: spencer

FS	1.822800
Center:	1219.873, 1549.063
Radius:	840.081
Left Slip Surface Endpoint:	652.891, 929.170
Right Slip Surface Endpoint:	1195.125, 709.346
Resisting Moment:	1.71925e+09 lb-ft
Driving Moment:	9.43191e+08 lb-ft
Resisting Horizontal Force:	1.87372e+06 lb
Driving Horizontal Force:	1.02794e+06 lb
Total Slice Area:	22056.5 ft2
Surface Horizontal Width:	542.234 ft
Surface Average Height:	40.677 ft

Circular Search (Auto Refine) - Min FS, No Ru

Method: spencer

FS	1.822790
Center:	1219.909, 1549.252
Radius:	840.295
Left Slip Surface Endpoint:	652.797, 929.188
Right Slip Surface Endpoint:	1195.194, 709.320
Resisting Moment:	1.72091e+09 lb-ft
Driving Moment:	9.44107e+08 lb-ft
Resisting Horizontal Force:	1.87508e+06 lb
Driving Horizontal Force:	1.02868e+06 lb
Total Slice Area:	22073.5 ft2
Surface Horizontal Width:	542.397 ft
Surface Average Height:	40.6962 ft

Global Minimum Support Data

All Open Scenarios

No Supports Present

Valid and Invalid Surfaces

Circular Search (Auto Refine) - Master Scenario

Method: spencer

Number of Valid Surfaces:	12035
Number of Invalid Surfaces:	0

Circular Search (Auto Refine) - Min FS, No Ru

Method: spencer

Number of Valid Surfaces:	7370
Number of Invalid Surfaces:	0

Slice Data

Circular Search (Auto Refine) - Master Scenario

Global Minimum Query (spencer) - Safety Factor: 1.8228

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	11.0521	5807.78	-41.9408	Bedrock (QTp)	500	32	359.906	656.037	249.712	0	249.712	573.1	573.1
2	11.0521	16718	-40.9352	Bedrock (QTp)	500	32	590.668	1076.67	922.863	0	922.863	1435.15	1435.15
3	11.0521	26838.8	-39.9447	Bedrock (QTp)	500	32	811.071	1478.42	1565.8	0	1565.8	2245.04	2245.04
4	11.0521	36449.9	-38.9683	Bedrock (QTp)	500	32	1026.32	1870.77	2193.69	0	2193.69	3023.85	3023.85
5	11.0521	44957.3	-38.0052	Bedrock (QTp)	500	32	1222.98	2229.25	2767.38	0	2767.38	3723.06	3723.06
6	11.0521	52464.1	-37.0546	Bedrock (QTp)	500	32	1402.33	2556.16	3290.55	0	3290.55	4349.38	4349.38
7	11.0521	58960.8	-36.1158	Bedrock (QTp)	500	32	1563.24	2849.48	3759.96	0	3759.96	4900.56	4900.56
8	11.0521	64525.3	-35.1881	Bedrock (QTp)	500	32	1706.61	3110.81	4178.17	0	4178.17	5381.52	5381.52
9	11.0521	69605.5	-34.2708	Bedrock (QTp)	500	32	1841.86	3357.35	4572.71	0	4572.71	5827.77	5827.77
10	11.0521	73885.5	-33.3635	Bedrock (QTp)	500	32	1961.28	3575.03	4921.08	0	4921.08	6212.52	6212.52
11	11.0521	77336.3	-32.4655	Bedrock (QTp)	500	32	2063.54	3761.42	5219.36	0	5219.36	6532.23	6532.23
12	11.0521	80352.7	-31.5764	Bedrock (QTp)	500	32	2157.29	3932.3	5492.82	0	5492.82	6818.77	6818.77
13	11.0521	82727.8	-30.6957	Bedrock (QTp)	500	32	2237.23	4078.02	5726.02	0	5726.02	7054.17	7054.17
14	11.0521	84731.4	-29.823	Bedrock (QTp)	500	32	2309.39	4209.55	5936.52	0	5936.52	7260.35	7260.35
15	11.0521	86227.4	-28.9578	Bedrock (QTp)	500	32	2370.14	4320.29	6113.74	0	6113.74	7425.25	7425.25
16	11.0521	87099.6	-28.0998	Bedrock (QTp)	500	32	2416.22	4404.29	6248.18	0	6248.18	7538.31	7538.31
17	11.0521	87651.1	-27.2486	Bedrock (QTp)	500	32	2454.72	4474.47	6360.49	0	6360.49	7624.68	7624.68
18	11.0521	88129	-26.4039	Bedrock (QTp)	500	32	2491.64	4541.77	6468.19	0	6468.19	7705.26	7705.26
19	11.0521	88504.5	-25.5653	Bedrock (QTp)	500	32	2526.21	4604.78	6569.03	0	6569.03	7777.5	7777.5
20	11.0521	88584.5	-24.7325	Bedrock (QTp)	500	32	2553.37	4654.28	6648.24	0	6648.24	7824.42	7824.42
21	11.0521	88389	-23.9053	Bedrock (QTp)	500	32	2573.42	4690.83	6706.73	0	6706.73	7847.4	7847.4
22	11.0521	88103.4	-23.0834	Bedrock (QTp)	500	32	2591.04	4722.95	6758.13	0	6758.13	7862.41	7862.41
23	11.0521	87600.7	-22.2664	Bedrock (QTp)	500	32	2602.79	4744.36	6792.4	0	6792.4	7858.09	7858.09
24	11.0521	86825.1	-21.4542	Bedrock (QTp)	500	32	2607	4752.04	6804.69	0	6804.69	7829.21	7829.21
25	11.0521	85954.4	-20.6465	Bedrock (QTp)	500	32	2608.31	4754.42	6808.49	0	6808.49	7791.3	7791.3
26	11.0521	84949.7	-19.843	Bedrock (QTp)	500	32	2605.56	4749.42	6800.49	0	6800.49	7740.76	7740.76
27	11.0521	83684.4	-19.0436	Bedrock (QTp)	500	32	2595.17	4730.47	6770.16	0	6770.16	7665.96	7665.96
28	11.0521	82141.5	-18.2481	Bedrock (QTp)	500	32	2576.44	4696.33	6715.53	0	6715.53	7565.01	7565.01
29	11.0521	80177.2	-17.4561	Bedrock (QTp)	500	32	2545.08	4639.18	6624.06	0	6624.06	7424.38	7424.38
30	11.0521	77925.7	-16.6676	Bedrock (QTp)	500	32	2504.59	4565.37	6505.94	0	6505.94	7255.81	7255.81

31	11.0521	75350.2	-15.8823	Bedrock (QTp)	500	32	2453.66	4472.53	6357.38	0	6357.38	7055.51	7055.51
32	11.0521	72217.4	-15.1001	Bedrock (QTp)	500	32	2385.22	4347.78	6157.73	0	6157.73	6801.32	6801.32
33	11.0521	67977.6	-14.3207	Bedrock (QTp)	500	32	2282.63	4160.78	5858.48	0	5858.48	6441.2	6441.2
34	11.0521	64094.2	-13.5441	Bedrock (QTp)	500	32	2188.38	3988.97	5583.52	0	5583.52	6110.68	6110.68
35	11.0521	61946.5	-12.77	Bedrock (QTp)	500	32	2144.06	3908.2	5454.25	0	5454.25	5940.19	5940.19
36	11.0521	59688.2	-11.9982	Bedrock (QTp)	500	32	2095.34	3819.39	5312.14	0	5312.14	5757.45	5757.45
37	11.0521	56678.9	-11.2286	Bedrock (QTp)	500	32	2022.53	3686.66	5099.72	0	5099.72	5501.24	5501.24
38	11.0521	53523.7	-10.4611	Bedrock (QTp)	500	32	1943.61	3542.81	4869.5	0	4869.5	5228.37	5228.37
39	11.0521	50193	-9.6955	Bedrock (QTp)	500	32	1857.5	3385.86	4618.34	0	4618.34	4935.7	4935.7
40	11.0521	46259.1	-8.93162	Bedrock (QTp)	500	32	1750.58	3190.96	4306.44	0	4306.44	4581.56	4581.56
41	11.0521	43477.1	-8.16934	Bedrock (QTp)	500	32	1678.04	3058.73	4094.83	0	4094.83	4335.72	4335.72
42	11.0521	38661.4	-7.40852	Bedrock (QTp)	500	32	1538.66	2804.67	3688.25	0	3688.25	3888.31	3888.31
43	11.0521	34241.1	-6.64901	Bedrock (QTp)	500	32	1409.23	2568.74	3310.68	0	3310.68	3474.95	3474.95
44	11.0521	30662.5	-5.89066	Bedrock (QTp)	500	32	1304.69	2378.19	3005.73	0	3005.73	3140.34	3140.34
45	11.0521	25920.3	-5.13336	Bedrock (QTp)	500	32	1159.5	2113.54	2582.2	0	2582.2	2686.36	2686.36
46	11.0521	20654.3	-4.37695	Bedrock (QTp)	500	32	993.817	1811.53	2098.89	0	2098.89	2174.96	2174.96
47	11.0521	16051.7	-3.6213	Bedrock (QTp)	500	32	847.114	1544.12	1670.95	0	1670.95	1724.56	1724.56
48	11.0521	9707.98	-2.86629	Bedrock (QTp)	500	32	638.02	1162.98	1060.99	0	1060.99	1092.94	1092.94
49	11.0521	2995.48	-2.11177	Bedrock (QTp)	500	32	411.898	750.807	401.374	0	401.374	416.562	416.562
50	0.681478	9.94784	-1.71137	Alluvium (Qa)	300	29	461.515	841.25	976.441	0	976.441	990.23	990.23

Circular Search (Auto Refine) - Min FS, No Ru

Global Minimum Query (spencer) - Safety Factor: 1.82279

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	11.0553	5811.54	-41.9394	Bedrock (QTp)	500	32	359.954	656.121	249.846	0	249.846	573.261	573.261
2	11.0553	16732.8	-40.9337	Bedrock (QTp)	500	32	590.887	1077.06	923.495	0	923.495	1435.95	1435.95
3	11.0553	26858.8	-39.9432	Bedrock (QTp)	500	32	811.349	1478.92	1566.6	0	1566.6	2246.03	2246.03
4	11.0553	36476.5	-38.9668	Bedrock (QTp)	500	32	1026.68	1871.43	2194.75	0	2194.75	3025.16	3025.16
5	11.0553	44993.4	-38.0038	Bedrock (QTp)	500	32	1223.51	2230.21	2768.92	0	2768.92	3724.96	3724.96
6	11.0553	52508.6	-37.0531	Bedrock (QTp)	500	32	1403.01	2557.39	3292.51	0	3292.51	4351.8	4351.8
7	11.0553	59011.4	-36.1143	Bedrock (QTp)	500	32	1564.04	2850.91	3762.24	0	3762.24	4903.35	4903.35
8	11.0553	64580.8	-35.1866	Bedrock (QTp)	500	32	1707.49	3112.39	4180.7	0	4180.7	5384.6	5384.6
9	11.0553	69663.3	-34.2693	Bedrock (QTp)	500	32	1842.77	3358.99	4575.33	0	4575.33	5830.94	5830.94
10	11.0553	73950.1	-33.362	Bedrock (QTp)	500	32	1962.34	3576.93	4924.12	0	4924.12	6216.17	6216.17
11	11.0553	77402.4	-32.464	Bedrock (QTp)	500	32	2064.62	3763.36	5222.47	0	5222.47	6535.95	6535.95
12	11.0553	80421.2	-31.5748	Bedrock (QTp)	500	32	2158.41	3934.33	5496.07	0	5496.07	6822.63	6822.63

13	11.0553	82797.8	-30.6941	Bedrock (QTp)	500	32	2238.39	4080.11	5729.37	0	5729.37	7058.12	7058.12
14	11.0553	84801.9	-29.8214	Bedrock (QTp)	500	32	2310.56	4211.66	5939.9	0	5939.9	7264.32	7264.32
15	11.0553	86300	-28.9562	Bedrock (QTp)	500	32	2371.36	4322.5	6117.28	0	6117.28	7429.38	7429.38
16	11.0553	87172.4	-28.0981	Bedrock (QTp)	500	32	2417.46	4406.53	6251.75	0	6251.75	7542.46	7542.46
17	11.0553	87723.5	-27.2469	Bedrock (QTp)	500	32	2455.97	4476.71	6364.06	0	6364.06	7628.8	7628.8
18	11.0553	88199.6	-26.4022	Bedrock (QTp)	500	32	2492.85	4543.94	6471.66	0	6471.66	7709.24	7709.24
19	11.0553	88574.8	-25.5636	Bedrock (QTp)	500	32	2527.42	4606.95	6572.5	0	6572.5	7781.46	7781.46
20	11.0553	88654.2	-24.7308	Bedrock (QTp)	500	32	2554.57	4656.45	6651.71	0	6651.71	7828.35	7828.35
21	11.0553	88457.8	-23.9036	Bedrock (QTp)	500	32	2574.61	4692.97	6710.16	0	6710.16	7851.26	7851.26
22	11.0553	88171	-23.0816	Bedrock (QTp)	500	32	2592.21	4725.06	6761.5	0	6761.5	7866.19	7866.19
23	11.0553	87667.4	-22.2646	Bedrock (QTp)	500	32	2603.95	4746.46	6795.75	0	6795.75	7861.83	7861.83
24	11.0553	86890.7	-21.4524	Bedrock (QTp)	500	32	2608.16	4754.12	6808.01	0	6808.01	7832.89	7832.89
25	11.0553	86018.4	-20.6446	Bedrock (QTp)	500	32	2609.43	4756.45	6811.74	0	6811.74	7794.88	7794.88
26	11.0553	85012.6	-19.8412	Bedrock (QTp)	500	32	2606.68	4751.43	6803.7	0	6803.7	7744.28	7744.28
27	11.0553	83745.9	-19.0417	Bedrock (QTp)	500	32	2596.26	4732.44	6773.32	0	6773.32	7669.4	7669.4
28	11.0553	82201.6	-18.2462	Bedrock (QTp)	500	32	2577.52	4698.27	6718.63	0	6718.63	7568.38	7568.38
29	11.0553	80235.5	-17.4542	Bedrock (QTp)	500	32	2546.14	4641.07	6627.1	0	6627.1	7427.66	7427.66
30	11.0553	77982.1	-16.6657	Bedrock (QTp)	500	32	2505.62	4567.21	6508.9	0	6508.9	7258.99	7258.99
31	11.0553	75404.5	-15.8804	Bedrock (QTp)	500	32	2454.65	4474.32	6360.25	0	6360.25	7058.56	7058.56
32	11.0553	72268.6	-15.0981	Bedrock (QTp)	500	32	2386.16	4349.47	6160.44	0	6160.44	6804.19	6804.19
33	11.0553	68025.5	-14.3187	Bedrock (QTp)	500	32	2283.52	4162.38	5861.03	0	5861.03	6443.89	6443.89
34	11.0553	64141.2	-13.5421	Bedrock (QTp)	500	32	2189.26	3990.57	5586.08	0	5586.08	6113.38	6113.38
35	11.0553	61993.8	-12.7679	Bedrock (QTp)	500	32	2145	3909.88	5456.95	0	5456.95	5943.02	5943.02
36	11.0553	59732.2	-11.9961	Bedrock (QTp)	500	32	2096.2	3820.94	5314.61	0	5314.61	5760.02	5760.02
37	11.0553	56719.9	-11.2265	Bedrock (QTp)	500	32	2023.33	3688.1	5102.03	0	5102.03	5503.63	5503.63
38	11.0553	53563.3	-10.459	Bedrock (QTp)	500	32	1944.39	3544.22	4871.77	0	4871.77	5230.7	5230.7
39	11.0553	50228.5	-9.69335	Bedrock (QTp)	500	32	1858.21	3387.12	4620.35	0	4620.35	4937.76	4937.76
40	11.0553	46294	-8.92945	Bedrock (QTp)	500	32	1751.3	3192.26	4308.51	0	4308.51	4583.67	4583.67
41	11.0553	43511.9	-8.16715	Bedrock (QTp)	500	32	1678.79	3060.08	4096.98	0	4096.98	4337.91	4337.91
42	11.0553	38681.8	-7.4063	Bedrock (QTp)	500	32	1538.99	2805.26	3689.19	0	3689.19	3889.24	3889.24
43	11.0553	34270.3	-6.64676	Bedrock (QTp)	500	32	1409.89	2569.93	3312.58	0	3312.58	3476.88	3476.88
44	11.0553	30685.6	-5.88839	Bedrock (QTp)	500	32	1305.19	2379.08	3007.16	0	3007.16	3141.77	3141.77
45	11.0553	25937.1	-5.13106	Bedrock (QTp)	500	32	1159.83	2114.13	2583.15	0	2583.15	2687.3	2687.3
46	11.0553	20669.4	-4.37463	Bedrock (QTp)	500	32	994.146	1812.12	2099.83	0	2099.83	2175.88	2175.88
47	11.0553	16065	-3.61896	Bedrock (QTp)	500	32	847.426	1544.68	1671.83	0	1671.83	1725.43	1725.43
48	11.0553	9704.14	-2.86391	Bedrock (QTp)	500	32	637.807	1162.59	1060.36	0	1060.36	1092.27	1092.27
49	11.0553	2997.79	-2.10937	Bedrock (QTp)	500	32	411.954	750.906	401.533	0	401.533	416.706	416.706

50	0.686256	10.0666	-1.7088	Alluvium (Qa)	300	29	459.756	838.039	970.647	0	970.647	984.363	984.363

Interslice Data

Circular Search (Auto Refine) - Master Scenario

Global Minimum Query (spencer) - Safety Factor: 1.8228

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	652.891	929.17	0	0	0
2	663.943	919.239	-1497.31	-554.408	20.318
3	674.995	909.654	821.662	304.236	20.318
4	686.047	900.398	6351.45	2351.74	20.318
5	697.099	891.458	14621.1	5413.75	20.3181
6	708.151	882.822	25007.1	9259.34	20.318
7	719.203	874.477	36970	13688.8	20.318
8	730.255	866.413	50015.8	18519.3	20.318
9	741.307	858.62	63717.3	23592.5	20.318
10	752.36	851.089	77801	28807.3	20.318
11	763.412	843.812	91940.7	34042.8	20.318
12	774.464	836.78	105838	39188.6	20.3181
13	785.516	829.987	119312	44177.6	20.3181
14	796.568	823.426	132159	48934.4	20.318
15	807.62	817.09	144250	53411.3	20.318
16	818.672	810.975	155449	57557.7	20.3179
17	829.724	805.073	165620	61323.9	20.318
18	840.776	799.382	174697	64685	20.3181
19	851.828	793.894	182656	67631.8	20.318
20	862.88	788.607	189471	70155.2	20.318
21	873.933	783.516	195101	72240	20.3181
22	884.985	778.617	199519	73875.7	20.318
23	896.037	773.907	202720	75060.9	20.318
24	907.089	769.382	204695	75792.3	20.3181
25	918.141	765.039	205442	76068.7	20.318
26	929.193	760.874	204972	75894.9	20.3181
27	940.245	756.886	203303	75276.7	20.318
28	951.297	753.071	200453	74221.5	20.318
29	962.349	749.427	196454	72740.7	20.318
30	973.401	745.951	191351	70851.2	20.318
31	984.454	742.642	185202	68574.5	20.318
32	995.506	739.498	178079	65937.2	20.318
33	1006.56	736.516	170085	62977	20.318
34	1017.61	733.694	161390	59757.6	20.318
35	1028.66	731.032	152073	56307.7	20.318
36	1039.71	728.527	142042	52593.7	20.318
37	1050.77	726.178	131365	48640.3	20.318
38	1061.82	723.984	120204	44508	20.3181
39	1072.87	721.943	108664	40234.7	20.3179
40	1083.92	720.055	96858	35863.5	20.318
41	1094.97	718.318	84993.5	31470.4	20.318
42	1106.03	716.732	72947.2	27010.1	20.318
43	1117.08	715.294	61244.7	22677	20.318
44	1128.13	714.006	49937.4	18490.3	20.3181
45	1139.18	712.866	38947.4	14421	20.318
46	1150.24	711.873	28698.2	10626.1	20.3181
47	1161.29	711.027	19491.6	7217.15	20.3181
48	1172.34	710.328	11299.4	4183.82	20.318
49	1183.39	709.774	4836.12	1790.66	20.318
50	1194.44	709.367	448.05	165.899	20.318
51	1195.12	709.346	0	0	0

Circular Search (Auto Refine) - Min FS, No Ru

Global Minimum Query (spencer) - Safety Factor: 1.82279

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	652.797	929.188	0	0	0
2	663.853	919.255	-1497.07	-554.276	20.3166
3	674.908	909.667	825.774	305.736	20.3167
4	685.963	900.409	6360.75	2355.01	20.3166
5	697.019	891.467	14637.2	5419.31	20.3167
6	708.074	882.829	25032.3	9268	20.3167
7	719.129	874.482	37006.1	13701.2	20.3167
8	730.185	866.416	50063.7	18535.7	20.3167
9	741.24	858.621	63777.4	23613.1	20.3167
10	752.295	851.088	77872.9	28831.8	20.3167
11	763.35	843.809	92025.1	34071.5	20.3166
12	774.406	836.776	105934	39221.4	20.3168
13	785.461	829.981	119420	44214.2	20.3166
14	796.516	823.419	132277	48974.5	20.3167
15	807.572	817.082	144378	53454.7	20.3166
16	818.627	810.965	155585	57604	20.3166
17	829.682	805.062	165764	61372.9	20.3167
18	840.738	799.369	174848	64736.1	20.3167
19	851.793	793.881	182813	67684.8	20.3166
20	862.848	788.593	189632	70209.6	20.3166
21	873.904	783.5	195266	72295.5	20.3166
22	884.959	778.601	199686	73931.9	20.3166
23	896.014	773.889	202888	75117.5	20.3166
24	907.07	769.363	204863	75848.8	20.3166
25	918.125	765.019	205609	76124.9	20.3166
26	929.18	760.854	205138	75950.5	20.3166
27	940.236	756.865	203465	75331.3	20.3167
28	951.291	753.049	200612	74274.8	20.3166
29	962.346	749.404	196608	72792.4	20.3166
30	973.402	745.928	191500	70901.2	20.3166
31	984.457	742.619	185345	68622.4	20.3166
32	995.512	739.474	178216	65982.8	20.3166
33	1006.57	736.491	170214	63020.2	20.3166
34	1017.62	733.669	161511	59798.2	20.3167
35	1028.68	731.006	152186	56345.6	20.3167
36	1039.73	728.501	142147	52628.6	20.3166
37	1050.79	726.152	131461	48672.2	20.3166
38	1061.84	723.958	120291	44536.7	20.3166
39	1072.9	721.917	108741	40260.3	20.3166
40	1083.95	720.029	96925.7	35885.9	20.3166
41	1095.01	718.292	85051.4	31489.6	20.3167
42	1106.07	716.705	72995.1	27025.8	20.3166
43	1117.12	715.268	61285.2	22690.3	20.3166
44	1128.18	713.98	49968.3	18500.4	20.3167
45	1139.23	712.839	38970	14428.3	20.3166
46	1150.29	711.847	28713.9	10631.1	20.3167
47	1161.34	711.001	19500.9	7220.03	20.3166
48	1172.4	710.302	11302.7	4184.72	20.3166
49	1183.45	709.749	4839.02	1791.61	20.3167
50	1194.51	709.342	448.919	166.208	20.3166
51	1195.19	709.321	0	0	0

Entity Information

Circular Search (Auto Refine)

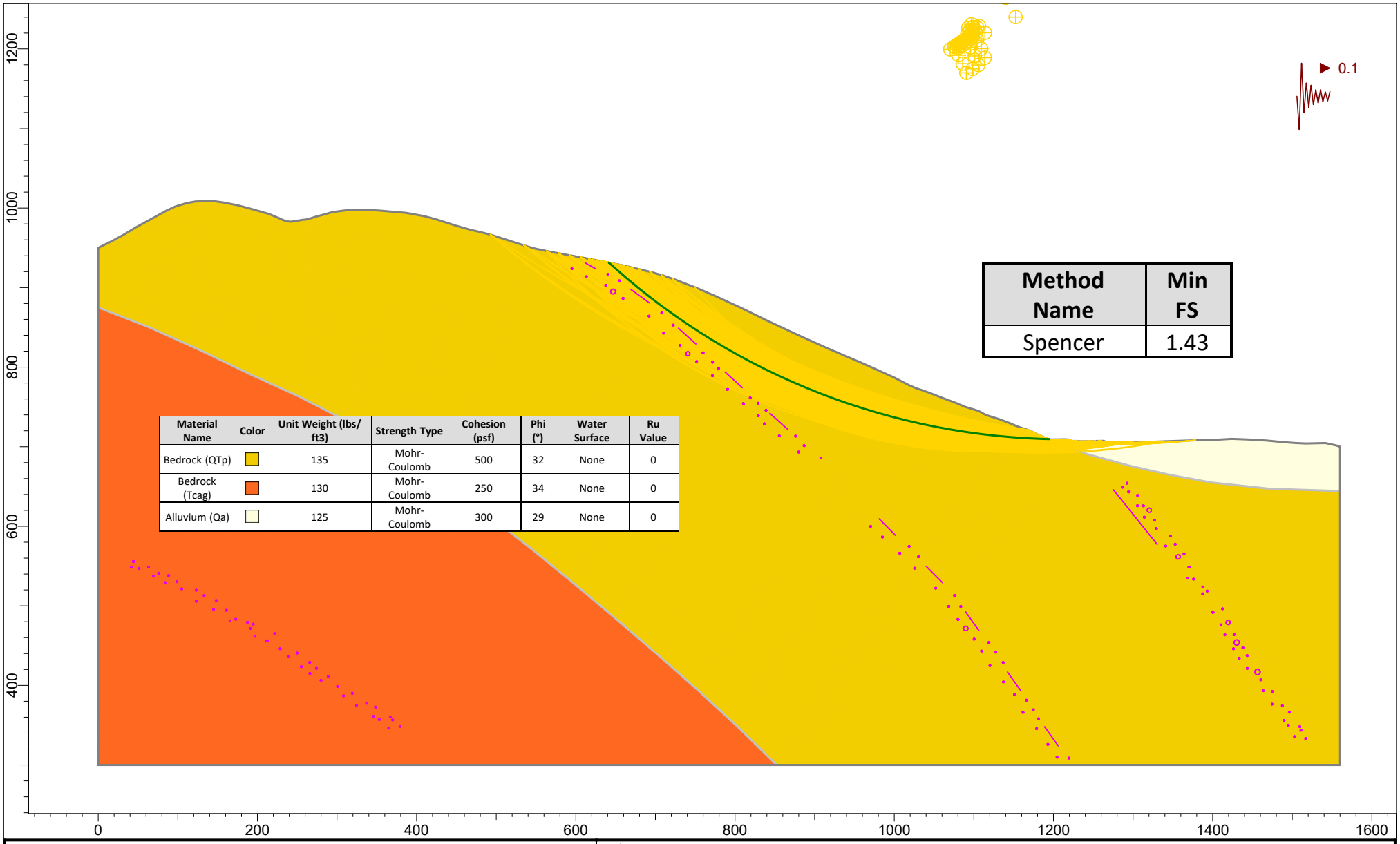
Shared Entities

Type	Coordinates (x,y)
	0, 300 852.446, 300 1560, 300 1560, 644.315

1560, 700
1555.39, 701.596
1541.64, 704.63
1517.29, 704.105
1504.54, 704.659
1487.87, 705.882
1467.43, 707.876
1442.73, 709.196
1423.79, 709.968
1407.59, 708.959
1387.12, 708.334
1348.31, 707.17
1315.67, 705.9
1290.11, 705.913
1279.09, 705.626
1268.07, 705.626
1262.62, 707.428
1254.64, 707.252
1254.6, 706.761
1253.1, 706.848
1242.3, 707.03
1236.42, 706.899
1233.43, 706.833
1231.99, 706.799
1230.55, 706.709
1230.51, 707.209
1230.05, 707.208
1222.53, 707.341
1219.07, 709.06
1215.76, 709.328
1212.08, 709.351
1205.18, 709.241
1202.74, 709.203
1200.29, 709.209
1197.85, 709.22
1196.53, 709.23
1195.86, 709.244
1195.41, 709.273
1195.19, 709.32
1194.91, 709.425
1194.6, 709.542
1194.24, 709.66
1193.39, 709.868
1192.99, 709.974
1192.34, 710.181
1192.12, 710.252
1190.88, 710.709
1181.62, 714.59
1172.41, 719.377
1166.13, 721.75
1158.73, 724.15
1153.22, 726.203
1146.24, 729.181
1132.03, 734.665
1115.12, 739.93
1105.99, 744.935
1099.47, 747.003
1088.86, 750.237
1077.56, 755.052

External Boundary	1062.1, 760.779 1048.42, 766.173 1037.27, 770.347 1027.34, 773.464 1018.48, 777.352 1009.01, 782.253 999.948, 787.05 984.915, 793.87 957.637, 805.966 917.314, 823.296 881.404, 839.394 840.308, 858.49 809.229, 873.751 778.791, 887.812 752.625, 899.275 724.773, 910.003 709.789, 915.155 694.4, 919.702 662.572, 927.297 614.564, 936.584 569.359, 944.722 551.294, 948.574 544.307, 950.132 536.668, 952.52 502.857, 963.408 494.08, 966.141 484.836, 968.651 466.57, 972.951 449.093, 977.99 424.731, 985.802 409.743, 989.824 393.259, 992.887 385.739, 994.146 375.049, 994.942 354.643, 996.661 343.852, 997.393 333.047, 997.753 328.667, 997.846 324.174, 997.72 321.225, 997.766 317.361, 997.93 315.302, 997.688 296.215, 995.141 292.882, 994.488 289.343, 993.514 282.608, 991.648 274.11, 989.322 265.66, 986.671 263.293, 986.007 260.877, 985.553 259.142, 985.305 256.353, 985.144 255.646, 985.104 254.298, 984.807 251.723, 984.26 250.608, 984.246 248.844, 984.047 246.945, 983.806 245.743, 983.737

	244.889, 983.506 243.435, 982.949 242.689, 982.875 241.156, 982.944 237.271, 983.198 231.631, 985.157 226.3, 987.639 214.637, 992.497 190.294, 999.521 174.435, 1003.69 157.107, 1007.02 145.433, 1008.69 134.747, 1008.79 122.274, 1008.2 111.392, 1006.26 97.4038, 1002.09 86.4637, 997.205 61.1904, 983.244 46.7959, 975.514 32.7471, 966.797 16.51, 958.155 0, 950.025 0, 875
Material Boundary	1192.34, 710.181 1241.97, 690.921 1295.59, 676.18 1345.72, 664.72 1398.24, 655.103 1469.81, 647.385 1504.27, 646.148 1560, 644.315
Material Boundary	0, 875 64.4726, 850.068 127.469, 821.742 189.75, 791.684 252.654, 763.039 314.118, 731.456 373.471, 695.906 430.905, 657.347 486.711, 616.539 541.258, 574.079 594.894, 530.509 647.829, 486.087 700.222, 440.964 752.142, 395.211 803.114, 348.422 852.446, 300



Method Name	Min FS
Spencer	1.43

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Bedrock (QTp)		135	Mohr-Coulomb	500	32	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	250	34	None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 2-2'; Pseudo-Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SP24s1b_s.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 4

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.42835 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.42835 6
Entity Information 7
    Circular Search (Auto Refine) 7
        Shared Entities 7

Slide2 Analysis Information

SP24s1b_s

Project Summary

File Name:	SP24s1b_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:01.509s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 2-2'; Pseudo-Static; Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Bedrock (QTp)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	500 psf
Phi	32 °
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.428350
Center:	1216.219, 1562.835
Radius:	853.769
Left Slip Surface Endpoint:	641.636, 931.347
Right Slip Surface Endpoint:	1195.184, 709.324
Resisting Moment:	1.79711e+09 lb-ft
Driving Moment:	1.25818e+09 lb-ft
Resisting Horizontal Force:	1.93359e+06 lb
Driving Horizontal Force:	1.35373e+06 lb
Total Slice Area:	23577.9 ft2
Surface Horizontal Width:	553.547 ft
Surface Average Height:	42.5942 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	6932
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.42835

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	11.2831	6018.55	-41.7909	Bedrock (QTp)	500	32	446.875	638.294	221.317	0	221.317	620.741	620.741
2	11.2831	17779.8	-40.7831	Bedrock (QTp)	500	32	728.37	1040.37	864.768	0	864.768	1493.1	1493.1
3	11.2831	28533.1	-39.7903	Bedrock (QTp)	500	32	995.004	1421.21	1474.25	0	1474.25	2302.97	2302.97
4	11.2831	38501.3	-38.8117	Bedrock (QTp)	500	32	1250.93	1786.77	2059.27	0	2059.27	3065.46	3065.46
5	11.2831	47937.8	-37.8464	Bedrock (QTp)	500	32	1501.46	2144.61	2631.93	0	2631.93	3798.53	3798.53
6	11.2831	56210.3	-36.8935	Bedrock (QTp)	500	32	1730.07	2471.14	3154.49	0	3154.49	4453.15	4453.15
7	11.2831	63432.6	-35.9524	Bedrock (QTp)	500	32	1938.27	2768.53	3630.42	0	3630.42	5036.2	5036.2
8	11.2831	69637.1	-35.0224	Bedrock (QTp)	500	32	2125.7	3036.25	4058.86	0	4058.86	5548.53	5548.53
9	11.2831	74906.1	-34.1029	Bedrock (QTp)	500	32	2293.35	3275.71	4442.07	0	4442.07	5994.95	5994.95
10	11.2831	79714.6	-33.1932	Bedrock (QTp)	500	32	2452.8	3503.45	4806.52	0	4806.52	6411.17	6411.17
11	11.2831	83556.3	-32.2929	Bedrock (QTp)	500	32	2589.84	3699.2	5119.79	0	5119.79	6756.57	6756.57
12	11.2831	86703.6	-31.4014	Bedrock (QTp)	500	32	2710.86	3872.06	5396.42	0	5396.42	7051.23	7051.23
13	11.2831	89339.4	-30.5184	Bedrock (QTp)	500	32	2820.16	4028.18	5646.26	0	5646.26	7308.68	7308.68
14	11.2831	91360.9	-29.6433	Bedrock (QTp)	500	32	2914.28	4162.61	5861.41	0	5861.41	7519.86	7519.86
15	11.2831	93026.1	-28.7757	Bedrock (QTp)	500	32	2999.91	4284.92	6057.13	0	6057.13	7704.69	7704.69
16	11.2831	94041	-27.9153	Bedrock (QTp)	500	32	3068.13	4382.37	6213.08	0	6213.08	7838.63	7838.63
17	11.2831	94544.4	-27.0617	Bedrock (QTp)	500	32	3122.3	4459.74	6336.9	0	6336.9	7932.03	7932.03
18	11.2831	94760.9	-26.2145	Bedrock (QTp)	500	32	3168.52	4525.75	6442.56	0	6442.56	8002.66	8002.66
19	11.2831	94997.9	-25.3735	Bedrock (QTp)	500	32	3215.75	4593.21	6550.52	0	6550.52	8075.64	8075.64
20	11.2831	95010.7	-24.5383	Bedrock (QTp)	500	32	3256.56	4651.51	6643.8	0	6643.8	8130.53	8130.53
21	11.2831	94721.7	-23.7086	Bedrock (QTp)	500	32	3288.3	4696.85	6716.37	0	6716.37	8160.42	8160.42
22	11.2831	94215.7	-22.8841	Bedrock (QTp)	500	32	3313.31	4732.56	6773.51	0	6773.51	8172.02	8172.02
23	11.2831	93612.4	-22.0647	Bedrock (QTp)	500	32	3335.11	4763.71	6823.36	0	6823.36	8175.22	8175.22
24	11.2831	92732.6	-21.2499	Bedrock (QTp)	500	32	3347.86	4781.92	6852.51	0	6852.51	8154.42	8154.42
25	11.2831	91623.3	-20.4397	Bedrock (QTp)	500	32	3352.76	4788.92	6863.71	0	6863.71	8113.24	8113.24
26	11.2831	90475.6	-19.6336	Bedrock (QTp)	500	32	3355.85	4793.33	6870.76	0	6870.76	8067.95	8067.95
27	11.2831	89085.8	-18.8317	Bedrock (QTp)	500	32	3350.27	4785.36	6858.01	0	6858.01	8000.6	8000.6
28	11.2831	87428	-18.0335	Bedrock (QTp)	500	32	3334.84	4763.32	6822.74	0	6822.74	7908.45	7908.45
29	11.2831	85389.8	-17.2389	Bedrock (QTp)	500	32	3305.36	4721.21	6755.35	0	6755.35	7780.99	7780.99
30	11.2831	82971.5	-16.4477	Bedrock (QTp)	500	32	3261.34	4658.33	6654.73	0	6654.73	7617.54	7617.54
31	11.2831	80266.7	-15.6598	Bedrock (QTp)	500	32	3205.55	4578.65	6527.21	0	6527.21	7425.82	7425.82

32	11.2831	77138.7	-14.8748	Bedrock (QTp)	500	32	3132.73	4474.63	6360.74	0	6360.74	7192.82	7192.82
33	11.2831	72873.4	-14.0928	Bedrock (QTp)	500	32	3016.45	4308.54	6094.93	0	6094.93	6852.2	6852.2
34	11.2831	68380.3	-13.3134	Bedrock (QTp)	500	32	2888.38	4125.62	5802.21	0	5802.21	6485.71	6485.71
35	11.2831	65390.6	-12.5364	Bedrock (QTp)	500	32	2812.36	4017.04	5628.44	0	5628.44	6253.8	6253.8
36	11.2831	63203.4	-11.7619	Bedrock (QTp)	500	32	2764.15	3948.18	5518.23	0	5518.23	6093.77	6093.77
37	11.2831	60076.4	-10.9895	Bedrock (QTp)	500	32	2678.59	3825.96	5322.65	0	5322.65	5842.8	5842.8
38	11.2831	56630.6	-10.2191	Bedrock (QTp)	500	32	2578.18	3682.54	5093.13	0	5093.13	5557.91	5557.91
39	11.2831	53164.6	-9.45057	Bedrock (QTp)	500	32	2474.06	3533.82	4855.13	0	4855.13	5266.95	5266.95
40	11.2831	48913.8	-8.68377	Bedrock (QTp)	500	32	2335.88	3336.46	4539.29	0	4539.29	4896.06	4896.06
41	11.2831	45742.2	-7.91852	Bedrock (QTp)	500	32	2237.08	3195.34	4313.44	0	4313.44	4624.6	4624.6
42	11.2831	41182.3	-7.1547	Bedrock (QTp)	500	32	2079.06	2969.62	3952.21	0	3952.21	4213.19	4213.19
43	11.2831	36031.6	-6.39216	Bedrock (QTp)	500	32	1892.3	2702.86	3525.31	0	3525.31	3737.3	3737.3
44	11.2831	32307.1	-5.63075	Bedrock (QTp)	500	32	1759.83	2513.66	3222.52	0	3222.52	3396.03	3396.03
45	11.2831	27361.6	-4.87033	Bedrock (QTp)	500	32	1572.03	2245.41	2793.24	0	2793.24	2927.19	2927.19
46	11.2831	21777.2	-4.11078	Bedrock (QTp)	500	32	1351.62	1930.59	2289.43	0	2289.43	2386.57	2386.57
47	11.2831	16862.7	-3.35195	Bedrock (QTp)	500	32	1154.15	1648.53	1838.04	0	1838.04	1905.63	1905.63
48	11.2831	10267.8	-2.5937	Bedrock (QTp)	500	32	877.148	1252.88	1204.85	0	1204.85	1244.58	1244.58
49	11.2831	3165.5	-1.83591	Bedrock (QTp)	500	32	569.698	813.728	502.07	0	502.07	520.331	520.331
50	0.674821	9.92975	-1.43447	Alluvium (Qa)	300	29	409.441	584.825	513.839	0	513.839	524.092	524.092

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.42835

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	641.636	931.347	0	0	0
2	652.919	921.262	-2214.03	-1034.83	25.0512
3	664.203	911.528	-246.451	-115.19	25.0512
4	675.486	902.131	5221.63	2440.56	25.0511
5	686.769	893.055	13630.5	6370.79	25.051
6	698.052	884.288	24537.2	11468.5	25.051
7	709.335	875.819	37332.8	17449.1	25.0511
8	720.618	867.635	51490.3	24066.3	25.0511
9	731.901	859.728	66536	31098.5	25.0511
10	743.184	852.088	82058.7	38353.7	25.0511
11	754.468	844.707	97803.1	45712.5	25.0511
12	765.751	837.576	113413	53008.4	25.051
13	777.034	830.688	128630	60120.9	25.0511
14	788.317	824.037	143262	66959.6	25.051
15	799.6	817.616	157114	73434.2	25.0511
16	810.883	811.419	170064	79487	25.0511
17	822.166	805.441	181953	85043.5	25.051
18	833.449	799.677	192666	90050.8	25.0511
19	844.732	794.122	202142	94480.1	25.0511
20	856.016	788.77	210371	98325.8	25.051
21	867.299	783.619	217309	101569	25.0511
22	878.582	778.664	222916	104189	25.051
23	889.865	773.902	227169	106177	25.051
24	901.148	769.328	230064	107530	25.051
25	912.431	764.94	231587	108242	25.051
26	923.714	760.735	231739	108313	25.051
27	934.997	756.71	230535	107751	25.0512
28	946.28	752.862	227989	106561	25.0512
29	957.564	749.189	224124	104754	25.0511
30	968.847	745.688	218977	102349	25.0512
31	980.13	742.357	212602	99368.6	25.051
32	991.413	739.194	205064	95845.6	25.0511
33	1002.7	736.197	196453	91821	25.0511
34	1013.98	733.364	186932	87370.6	25.051
35	1025.26	730.694	176634	82557.8	25.0511
36	1036.55	728.185	165527	77366.1	25.051
37	1047.83	725.836	153587	71785.8	25.0512
38	1059.11	723.645	141000	65902.6	25.0511
39	1070.39	721.611	127900	59779.6	25.0511
40	1081.68	719.733	114388	53464.3	25.0511
41	1092.96	718.009	100716	47074	25.0511
42	1104.24	716.44	86789.7	40564.9	25.0511
43	1115.53	715.024	73020.7	34129.4	25.0511
44	1126.81	713.76	59704.7	27905.6	25.0511
45	1138.09	712.647	46641.3	21799.8	25.051
46	1149.38	711.686	34305.3	16034.1	25.0511
47	1160.66	710.875	23071.7	10783.6	25.0512
48	1171.94	710.214	12935.4	6045.93	25.0511
49	1183.23	709.703	4669.8	2182.63	25.051
50	1194.51	709.341	-1267.34	-592.348	25.0511
51	1195.18	709.324	0	0	0

Entity Information

Circular Search (Auto Refine)

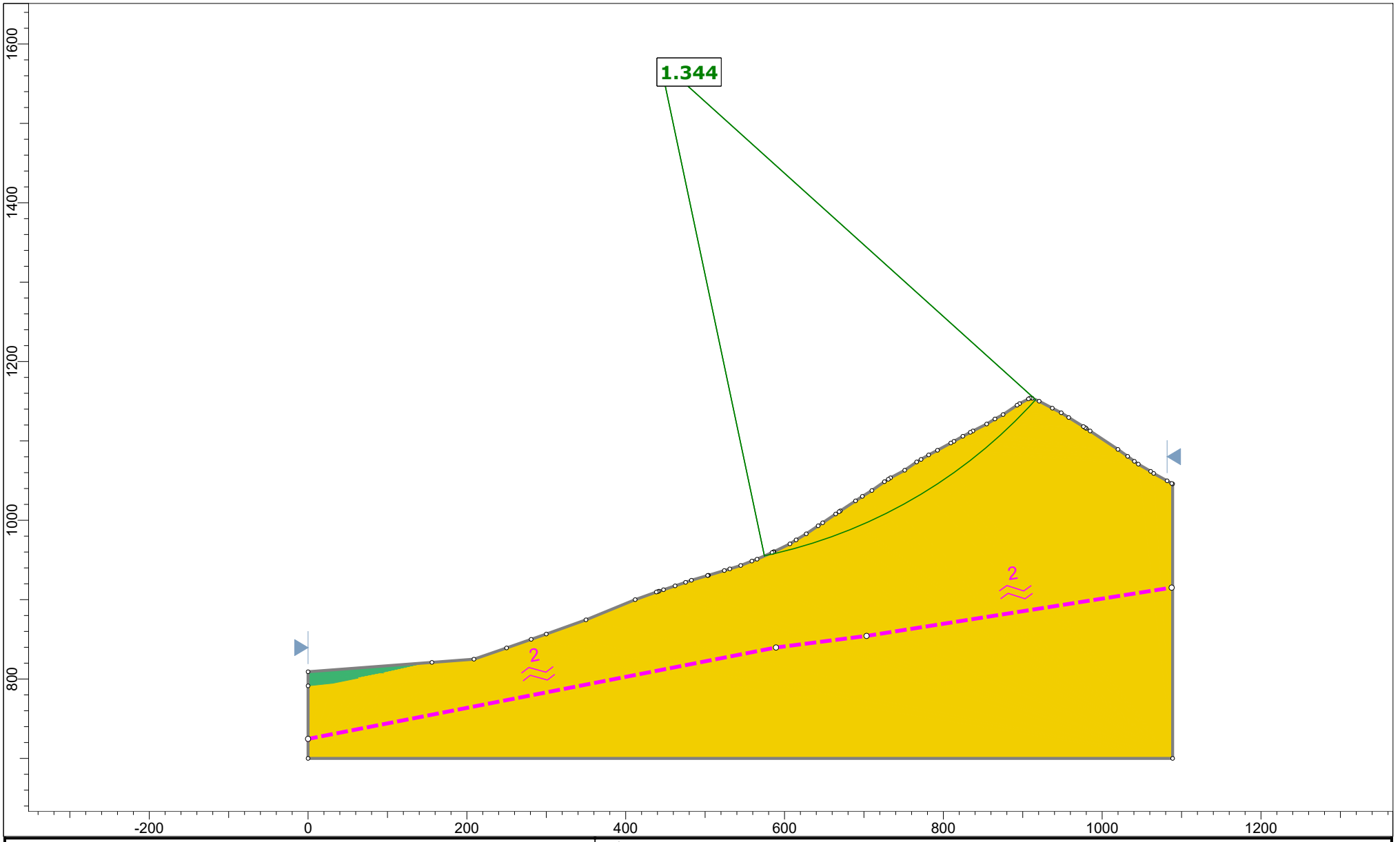
Shared Entities

Type	Coordinates (x,y)
	0, 300 852.446, 300 1560, 300 1560, 644.315

1560, 700
1555.39, 701.596
1541.64, 704.63
1517.29, 704.105
1504.54, 704.659
1487.87, 705.882
1467.43, 707.876
1442.73, 709.196
1423.79, 709.968
1407.59, 708.959
1387.12, 708.334
1348.31, 707.17
1315.67, 705.9
1290.11, 705.913
1279.09, 705.626
1268.07, 705.626
1262.62, 707.428
1254.64, 707.252
1254.6, 706.761
1253.1, 706.848
1242.3, 707.03
1236.42, 706.899
1233.43, 706.833
1231.99, 706.799
1230.55, 706.709
1230.51, 707.209
1230.05, 707.208
1222.53, 707.341
1219.07, 709.06
1215.76, 709.328
1212.08, 709.351
1205.18, 709.241
1202.74, 709.203
1200.29, 709.209
1197.85, 709.22
1196.53, 709.23
1195.86, 709.244
1195.41, 709.273
1195.19, 709.32
1194.91, 709.425
1194.6, 709.542
1194.24, 709.66
1193.39, 709.868
1192.99, 709.974
1192.34, 710.181
1192.12, 710.252
1190.88, 710.709
1181.62, 714.59
1172.41, 719.377
1166.13, 721.75
1158.73, 724.15
1153.22, 726.203
1146.24, 729.181
1132.03, 734.665
1115.12, 739.93
1105.99, 744.935
1099.47, 747.003
1088.86, 750.237
1077.56, 755.052

External Boundary	1062.1, 760.779 1048.42, 766.173 1037.27, 770.347 1027.34, 773.464 1018.48, 777.352 1009.01, 782.253 999.948, 787.05 984.915, 793.87 957.637, 805.966 917.314, 823.296 881.404, 839.394 840.308, 858.49 809.229, 873.751 778.791, 887.812 752.625, 899.275 724.773, 910.003 709.789, 915.155 694.4, 919.702 662.572, 927.297 614.564, 936.584 569.359, 944.722 551.294, 948.574 544.307, 950.132 536.668, 952.52 502.857, 963.408 494.08, 966.141 484.836, 968.651 466.57, 972.951 449.093, 977.99 424.731, 985.802 409.743, 989.824 393.259, 992.887 385.739, 994.146 375.049, 994.942 354.643, 996.661 343.852, 997.393 333.047, 997.753 328.667, 997.846 324.174, 997.72 321.225, 997.766 317.361, 997.93 315.302, 997.688 296.215, 995.141 292.882, 994.488 289.343, 993.514 282.608, 991.648 274.11, 989.322 265.66, 986.671 263.293, 986.007 260.877, 985.553 259.142, 985.305 256.353, 985.144 255.646, 985.104 254.298, 984.807 251.723, 984.26 250.608, 984.246 248.844, 984.047 246.945, 983.806 245.743, 983.737

	244.889, 983.506 243.435, 982.949 242.689, 982.875 241.156, 982.944 237.271, 983.198 231.631, 985.157 226.3, 987.639 214.637, 992.497 190.294, 999.521 174.435, 1003.69 157.107, 1007.02 145.433, 1008.69 134.747, 1008.79 122.274, 1008.2 111.392, 1006.26 97.4038, 1002.09 86.4637, 997.205 61.1904, 983.244 46.7959, 975.514 32.7471, 966.797 16.51, 958.155 0, 950.025 0, 875
Material Boundary	1192.34, 710.181 1241.97, 690.921 1295.59, 676.18 1345.72, 664.72 1398.24, 655.103 1469.81, 647.385 1504.27, 646.148 1560, 644.315
Material Boundary	0, 875 64.4726, 850.068 127.469, 821.742 189.75, 791.684 252.654, 763.039 314.118, 731.456 373.471, 695.906 430.905, 657.347 486.711, 616.539 541.258, 574.079 594.894, 530.509 647.829, 486.087 700.222, 440.964 752.142, 395.211 803.114, 348.422 852.446, 300



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 3-3'; Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPHS1A.slmd
		Scale	1:2000
Project No.: 23-2195s-1	Date: 10/13/2023	Run Number	Run No. 5

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.34383 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.34383 6
Entity Information 6
    Group 1 6
        Shared Entities 6

Slide2 Analysis Information

SPHS1A

Project Summary

File Name:	SPHS1A.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:03.209s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 3-3'; Static; Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Water Surface	None
Ru Value	0

Qa	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.343830
Center:	443.231, 1578.711
Radius:	637.306
Left Slip Surface Endpoint:	574.752, 955.123
Right Slip Surface Endpoint:	916.480, 1151.868
Resisting Moment:	5.32544e+08 lb-ft
Driving Moment:	3.96287e+08 lb-ft
Resisting Horizontal Force:	720376 lb
Driving Horizontal Force:	536060 lb
Total Slice Area:	9591.32 ft2
Surface Horizontal Width:	341.727 ft
Surface Average Height:	28.0672 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 11180
Number of Invalid Surfaces: 0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.34383

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	6.83455	672.576	12.2241	Tcag	250	34	261.878	351.92	151.103	0	151.103	207.839	207.839
2	6.83455	2013.31	12.8536	Tcag	250	34	360.081	483.887	346.751	0	346.751	428.914	428.914
3	6.83455	3524.46	13.4847	Tcag	250	34	468.622	629.748	562.999	0	562.999	675.373	675.373
4	6.83455	5001.12	14.1174	Tcag	250	34	572.163	768.89	769.287	0	769.287	913.189	913.189
5	6.83455	6450.31	14.7519	Tcag	250	34	671.345	902.173	966.886	0	966.886	1143.66	1143.66
6	6.83455	8492.08	15.3882	Tcag	250	34	810.514	1089.19	1244.15	0	1244.15	1467.23	1467.23
7	6.83455	10521.2	16.0265	Tcag	250	34	945.588	1270.71	1513.26	0	1513.26	1784.88	1784.88
8	6.83455	12404.8	16.6669	Tcag	250	34	1067.38	1434.38	1755.92	0	1755.92	2075.48	2075.48
9	6.83455	14530.8	17.3094	Tcag	250	34	1203.03	1616.67	2026.18	0	2026.18	2401.1	2401.1
10	6.83455	16696.9	17.9541	Tcag	250	34	1338.24	1798.37	2295.56	0	2295.56	2729.19	2729.19
11	6.83455	18768.8	18.6012	Tcag	250	34	1463.9	1967.23	2545.9	0	2545.9	3038.59	3038.59
12	6.83455	20784.4	19.2508	Tcag	250	34	1582.79	2127	2782.77	0	2782.77	3335.53	3335.53
13	6.83455	22736.3	19.903	Tcag	250	34	1694.59	2277.24	3005.51	0	3005.51	3619.05	3619.05
14	6.83455	24575.8	20.5578	Tcag	250	34	1796.31	2413.94	3208.17	0	3208.17	3881.85	3881.85
15	6.83455	26261.6	21.2155	Tcag	250	34	1885.58	2533.9	3386.01	0	3386.01	4117.97	4117.97
16	6.83455	27868.7	21.8761	Tcag	250	34	1967.52	2644.01	3549.28	0	3549.28	4339.26	4339.26
17	6.83455	29394.7	22.5398	Tcag	250	34	2042.19	2744.36	3698.03	0	3698.03	4545.6	4545.6
18	6.83455	30851.9	23.2067	Tcag	250	34	2110.54	2836.21	3834.22	0	3834.22	4739.09	4739.09
19	6.83455	32101.7	23.877	Tcag	250	34	2164.22	2908.34	3941.15	0	3941.15	4899.16	4899.16
20	6.83455	33118.8	24.5507	Tcag	250	34	2202.12	2959.28	4016.68	0	4016.68	5022.6	5022.6
21	6.83455	34400.7	25.2281	Tcag	250	34	2254.68	3029.9	4121.37	0	4121.37	5183.69	5183.69
22	6.83455	35767.7	25.9093	Tcag	250	34	2310.63	3105.1	4232.86	0	4232.86	5355.3	5355.3
23	6.83455	36886.8	26.5944	Tcag	250	34	2350.28	3158.38	4311.85	0	4311.85	5488.5	5488.5
24	6.83455	37491.6	27.2837	Tcag	250	34	2358.69	3169.68	4328.6	0	4328.6	5545.16	5545.16
25	6.83455	37566.8	27.9772	Tcag	250	34	2336.04	3139.24	4283.46	0	4283.46	5524.37	5524.37
26	6.83455	37540.1	28.6753	Tcag	250	34	2307.64	3101.07	4226.89	0	4226.89	5488.99	5488.99
27	6.83455	38039.9	29.378	Tcag	250	34	2308.85	3102.7	4229.3	0	4229.3	5529.1	5529.1
28	6.83455	38797.7	30.0857	Tcag	250	34	2323.74	3122.71	4258.96	0	4258.96	5605.21	5605.21
29	6.83455	39128.3	30.7984	Tcag	250	34	2314.37	3110.12	4240.31	0	4240.31	5619.86	5619.86
30	6.83455	39011.7	31.5164	Tcag	250	34	2280.53	3064.64	4172.88	0	4172.88	5571.28	5571.28
31	6.83455	38722.6	32.24	Tcag	250	34	2237.72	3007.12	4087.59	0	4087.59	5498.95	5498.95
32	6.83455	38079.1	32.9695	Tcag	250	34	2176.73	2925.15	3966.07	0	3966.07	5378.01	5378.01
33	6.83455	37370.3	33.705	Tcag	250	34	2113.25	2839.85	3839.62	0	3839.62	5249.25	5249.25
34	6.83455	36587	34.4468	Tcag	250	34	2046.94	2750.74	3707.5	0	3707.5	5111.52	5111.52
35	6.83455	35628.7	35.1953	Tcag	250	34	1972.84	2651.16	3559.87	0	3559.87	4951.31	4951.31
36	6.83455	34595.1	35.9508	Tcag	250	34	1896.27	2548.27	3407.32	0	3407.32	4782.56	4782.56
37	6.83455	33582.1	36.7136	Tcag	250	34	1822.09	2448.58	3259.53	0	3259.53	4618.34	4618.34
38	6.83455	32300.4	37.484	Tcag	250	34	1736.19	2333.15	3088.41	0	3088.41	4419.87	4419.87
39	6.83455	30731.4	38.2624	Tcag	250	34	1638.23	2201.5	2893.22	0	2893.22	4185.28	4185.28
40	6.83455	28907.7	39.0493	Tcag	250	34	1530.31	2056.47	2678.21	0	2678.21	3919.6	3919.6
41	6.83455	26942.6	39.8451	Tcag	250	34	1418.2	1905.82	2454.86	0	2454.86	3638.35	3638.35
42	6.83455	25198.6	40.6501	Tcag	250	34	1318.82	1772.27	2256.86	0	2256.86	3389.23	3389.23
43	6.83455	23561.2	41.4651	Tcag	250	34	1226.55	1648.27	2073.02	0	2073.02	3156.84	3156.84
44	6.83455	21461.7	42.2904	Tcag	250	34	1115.86	1499.52	1852.48	0	1852.48	2867.49	2867.49
45	6.83455	19573	43.1266	Tcag	250	34	1017.18	1366.92	1655.9	0	1655.9	2608.65	2608.65
46	6.83455	17905.2	43.9745	Tcag	250	34	930.534	1250.48	1483.28	0	1483.28	2381.09	2381.09
47	6.83455	16035.9	44.8346	Tcag	250	34	837.556	1125.53	1298.03	0	1298.03	2130.77	2130.77
48	6.83455	13470.9	45.7078	Tcag	250	34	718.077	964.973	1059.99	0	1059.99	1796.03	1796.03
49	6.83455	10331.8	46.5949	Tcag	250	34	578.572	777.502	782.054	0	782.054	1393.77	1393.77
50	6.83455	4484.67	47.4967	Tcag	250	34	348.14	467.841	322.963	0	322.963	702.847	702.847

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.34383

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	574.752	955.123	0	0	0
2	581.587	956.604	1565.28	757.319	25.8188
3	588.421	958.164	3484.4	1685.84	25.8189
4	595.256	959.802	5763.07	2788.31	25.8188
5	602.09	961.521	8349.44	4039.66	25.8188
6	608.925	963.321	11195.7	5416.74	25.8188
7	615.759	965.202	14392.4	6963.38	25.8188
8	622.594	967.165	17881.3	8651.4	25.8188
9	629.429	969.211	21580.2	10441	25.8188
10	636.263	971.341	25483	12329.3	25.8188
11	643.098	973.556	29541.4	14292.8	25.8188
12	649.932	975.856	33685.8	16298	25.8188
13	656.767	978.243	37856.5	18315.9	25.8188
14	663.601	980.718	41996	20318.7	25.8188
15	670.436	983.281	46044.3	22277.3	25.8188
16	677.27	985.934	49942.2	24163.3	25.8189
17	684.105	988.678	53643.5	25954	25.8188
18	690.939	991.515	57105	27628.8	25.8188
19	697.774	994.445	60288	29168.8	25.8188
20	704.609	997.47	63149.3	30553.2	25.8189
21	711.443	1000.59	65653	31764.5	25.8188
22	718.278	1003.81	67784.1	32795.6	25.8188
23	725.112	1007.13	69515.9	33633.5	25.8188
24	731.947	1010.55	70818.1	34263.5	25.8188
25	738.781	1014.08	71672.6	34676.9	25.8188
26	745.616	1017.71	72080	34874	25.8188
27	752.45	1021.45	72044.5	34856.9	25.8188
28	759.285	1025.3	71544.6	34615	25.8188
29	766.12	1029.25	70555.5	34136.5	25.8188
30	772.954	1033.33	69091.3	33428	25.8188
31	779.789	1037.52	67182.5	32504.5	25.8188
32	786.623	1041.83	64849.3	31375.7	25.8188
33	793.458	1046.26	62137	30063.4	25.8188
34	800.292	1050.82	59069.1	28579.1	25.8189
35	807.127	1055.51	55672.2	26935.6	25.8189
36	813.961	1060.33	51989.6	25153.8	25.8188
37	820.796	1065.29	48055.1	23250.2	25.8188
38	827.63	1070.38	43889.4	21234.7	25.8188
39	834.465	1075.63	39562.9	19141.5	25.8188
40	841.3	1081.02	35159	17010.8	25.8189
41	848.134	1086.56	30764.6	14884.7	25.8189
42	854.969	1092.26	26451.9	12798.1	25.8189
43	861.803	1098.13	22217.4	10749.3	25.8188
44	868.638	1104.17	18077	8746.1	25.8188
45	875.472	1110.39	14183.3	6862.22	25.8188
46	882.307	1116.79	10531.7	5095.49	25.8188
47	889.141	1123.38	7107.65	3438.85	25.8188
48	895.976	1130.18	4008.99	1939.65	25.8189
49	902.81	1137.18	1488.71	720.272	25.8188
50	909.645	1144.41	-209.954	-101.581	25.8189
51	916.48	1151.87	0	0	0

Entity Information

Group 1

Shared Entities

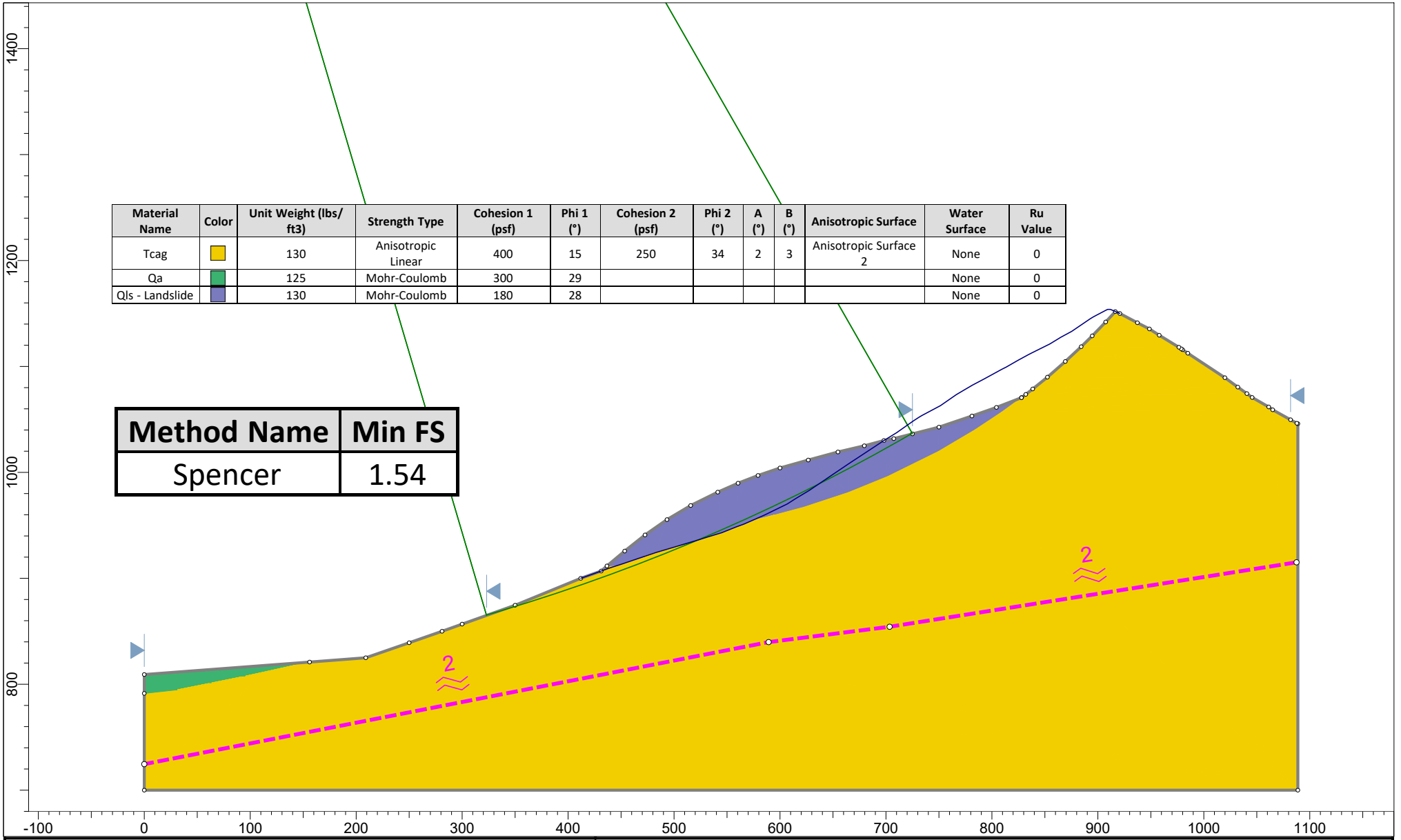
Type	Coordinates (x,y)

External Boundary	0, 700 1088.74, 700 1088.74, 1045.96 1087.76, 1046.44 1081.88, 1049.75 1064.97, 1059.13 1061.23, 1061.8 1045.57, 1070.78 1040.57, 1074.4 1032.09, 1080.61 1019.92, 1089.42 984.878, 1112.56 979.895, 1115.89 978.61, 1116.77 976.432, 1118.13 957.955, 1129.48 948.6, 1135.46 937.301, 1141.32 920.769, 1150.04 911.832, 1153.85 909.205, 1153.92 907.271, 1153.01 895.993, 1147.05 892.938, 1145.12 875.338, 1133.22 865.107, 1127.66 854.684, 1121.3 837.276, 1112.61 834.03, 1110.97 824.687, 1105.92 813.375, 1099.46 809.445, 1097.49 792.721, 1088.33 781.614, 1082.43 772.067, 1076.79 766.434, 1073.54 751.413, 1063.08 733.594, 1053.59 730.758, 1051.78 725.952, 1048.72 710.104, 1037.57 698.12, 1030.2 689.45, 1024.45 670.289, 1011.81 668.796, 1010.84 664.497, 1007.99 648.141, 996.916 642.458, 993.115 627.487, 983.016 614.627, 975.293 606.833, 970.279 586.796, 960.485 586.178, 960.134 584.401, 959.351 565.524, 951.08 558.965, 948.695 544.87, 943.074 531.134, 938.859 524.216, 936.672

	504.306, 930.82 503.561, 930.598 503.303, 930.519 482.907, 924.446 475.472, 921.926 462.253, 917.412 447.64, 912.515 442, 910.795 440.516, 910.261 438.632, 909.583 412, 900 350, 874.643 300, 856.786 281, 850 250, 839.236 209, 825 156.051, 821.012 4.66784e-06, 809.259 3.90459e-06, 791.394
Material Boundary	3.90459e-06, 791.394 15.2016, 792.328 31.3719, 794.833 47.4695, 798.048 63.5228, 801.292 79.5403, 804.483 95.5238, 807.747 111.477, 811.185 127.419, 814.746 143.374, 818.3 156.051, 821.012
Material Boundary	3.90459e-06, 791.394 31.3719, 794.833 63.5228, 801.292 95.5238, 807.747 127.419, 814.746 156.051, 821.012

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Tcag		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 2	None	0
Qa		125	Mohr-Coulomb	300	29						None	0
Qls - Landslide		130	Mohr-Coulomb	180	28						None	0

Method Name	Min FS
Spencer	1.54



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 3-3'; Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPHS1B.slmd
		Scale	1:1500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 6

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.54149 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.54149 6
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SPHS1B

Project Summary

File Name:	SPHS1B.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:01.605s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 3-3'; Static; Circular
Author:	M Neely
Date Created:	10/20/2020
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Water Surface	None
Ru Value	0

Qa	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Qls - Landslide	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.541490
Center:	-206.452, 2664.243
Radius:	1875.523
Left Slip Surface Endpoint:	323.032, 865.011
Right Slip Surface Endpoint:	725.077, 1036.410
Resisting Moment:	1.17789e+09 lb-ft
Driving Moment:	7.64119e+08 lb-ft
Resisting Horizontal Force:	575863 lb
Driving Horizontal Force:	373574 lb
Total Slice Area:	7721.31 ft2
Surface Horizontal Width:	402.046 ft
Surface Average Height:	19.205 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	5377
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.54149

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	7.99144	250.906	16.5256	Tcag	250	34	173.952	268.145	26.9008	0	26.9008	78.5122	78.5122
2	7.99144	732.604	16.7804	Tcag	250	34	197.725	304.791	81.231	0	81.231	140.854	140.854
3	7.99144	1173.99	17.0356	Tcag	250	34	219.332	338.099	130.612	0	130.612	197.818	197.818
4	7.99144	1659.07	17.2911	Tcag	250	34	242.973	374.541	184.64	0	184.64	260.276	260.276
5	7.99144	2419.55	17.547	Tcag	250	34	280.122	431.805	269.536	0	269.536	358.111	358.111
6	7.99144	3169.43	17.8032	Tcag	250	34	316.505	487.889	352.684	0	352.684	454.322	454.322
7	7.99144	3878.32	18.0598	Tcag	250	34	350.631	540.494	430.675	0	430.675	545.006	545.006
8	7.99144	4546.05	18.3168	Tcag	250	34	382.512	589.638	503.534	0	503.534	630.161	630.161
9	7.99144	5172.43	18.5741	Tcag	250	34	412.158	635.338	571.287	0	571.287	709.786	709.786
10	7.99144	5757.28	18.8319	Tcag	250	34	439.582	677.611	633.959	0	633.959	783.878	783.878
11	7.99144	6300.4	19.09	Tcag	250	34	464.793	716.474	691.576	0	691.576	852.434	852.434
12	7.99144	6648.21	19.3485	Tcag	250	34	480.364	740.476	727.161	0	727.161	895.84	895.84
13	7.99144	6702.83	19.6075	Tcag	250	34	481.655	742.467	730.113	0	730.113	901.694	901.694
14	7.99144	7173.47	19.8669	Tcag	250	34	502.976	775.332	778.838	0	778.838	960.583	960.583
15	7.99144	10719.5	20.1267	Tcag	250	34	671.845	1035.64	1164.76	0	1164.76	1410.98	1410.98
16	7.99144	14642.7	20.3869	Tcag	250	34	857.657	1322.07	1589.4	0	1589.4	1908.14	1908.14
17	7.99144	18417.3	20.6476	Tcag	250	34	1035.15	1595.68	1995.06	0	1995.06	2385.13	2385.13
18	7.99144	21843.2	20.9087	Tcag	250	34	1194.9	1841.93	2360.13	0	2360.13	2816.63	2816.63
19	7.99144	25175.3	21.1703	Tcag	250	34	1349.14	2079.68	2712.62	0	2712.62	3235.11	3235.11
20	7.99144	27952.2	21.4323	Tcag	250	34	1476.11	2275.41	3002.8	0	3002.8	3582.24	3582.24
21	7.99144	30496.8	21.6948	Tcag	250	34	1591.29	2452.96	3266.02	0	3266.02	3899.1	3899.1
22	7.99144	32795.2	21.9578	Tcag	250	34	1694.13	2611.48	3501.03	0	3501.03	4184.05	4184.05
23	7.99144	34431.3	22.2213	Tcag	250	34	1765.28	2721.16	3663.64	0	3663.64	4384.81	4384.81
24	7.99144	35979.9	22.4852	Tcag	250	34	1831.84	2823.77	3815.77	0	3815.77	4573.99	4573.99
25	7.99144	37131.4	22.7497	Tcag	250	34	1879.49	2897.21	3924.65	0	3924.65	4712.77	4712.77
26	8.09039	38177.9	23.0163	Qls - Landslide	180	28	1504.01	2318.42	4021.79	0	4021.79	4660.71	4660.71
27	8.09039	38716.1	23.2851	Qls - Landslide	180	28	1519.26	2341.92	4065.99	0	4065.99	4719.82	4719.82
28	8.09039	39096.4	23.5545	Qls - Landslide	180	28	1528.66	2356.42	4093.25	0	4093.25	4759.66	4759.66
29	8.09039	39136.1	23.8244	Qls - Landslide	180	28	1525.68	2351.82	4084.6	0	4084.6	4758.28	4758.28
30	8.09039	39083.1	24.0948	Qls - Landslide	180	28	1519.34	2342.05	4066.23	0	4066.23	4745.7	4745.7
31	8.09039	38637.4	24.3659	Qls - Landslide	180	28	1498.91	2310.56	4007	0	4007	4685.86	4685.86
32	8.09039	38043.2	24.6375	Qls - Landslide	180	28	1473.26	2271.02	3932.63	0	3932.63	4608.31	4608.31

33	8.09039	37210.4	24.9097	Qls - Landslide	180	28	1439.22	2218.54	3833.93	0	3833.93	4502.29	4502.29
34	8.09039	36156.9	25.1825	Qls - Landslide	180	28	1397.5	2154.23	3712.98	0	3712.98	4370.07	4370.07
35	8.09039	34996.2	25.4559	Qls - Landslide	180	28	1352.2	2084.4	3581.66	0	3581.66	4225.35	4225.35
36	8.09039	33378.1	25.73	Qls - Landslide	180	28	1290.97	1990.02	3404.15	0	3404.15	4026.28	4026.28
37	8.09039	31630.5	26.0046	Qls - Landslide	180	28	1225.52	1889.13	3214.4	0	3214.4	3812.25	3812.25
38	8.09039	29831.5	26.28	Qls - Landslide	180	28	1158.65	1786.04	3020.53	0	3020.53	3592.66	3592.66
39	8.09039	27942.4	26.5559	Qls - Landslide	180	28	1089	1678.68	2818.62	0	2818.62	3362.9	3362.9
40	8.09039	25980.1	26.8326	Qls - Landslide	180	28	1017.21	1568.02	2610.48	0	2610.48	3125.04	3125.04
41	8.09039	23966.1	27.1099	Qls - Landslide	180	28	944.041	1455.23	2398.36	0	2398.36	2881.66	2881.66
42	8.09039	21825.4	27.3879	Qls - Landslide	180	28	866.914	1336.34	2174.75	0	2174.75	2623.89	2623.89
43	8.09039	19414.6	27.6666	Qls - Landslide	180	28	780.894	1203.74	1925.38	0	1925.38	2334.78	2334.78
44	8.09039	16936.9	27.946	Qls - Landslide	180	28	693.1	1068.41	1670.85	0	1670.85	2038.54	2038.54
45	8.09039	14461.4	28.2262	Qls - Landslide	180	28	605.919	934.018	1418.1	0	1418.1	1743.35	1743.35
46	8.09039	12137	28.5071	Qls - Landslide	180	28	524.461	808.452	1181.94	0	1181.94	1466.79	1466.79
47	8.09039	9738.21	28.7887	Qls - Landslide	180	28	440.97	679.751	939.894	0	939.894	1182.21	1182.21
48	8.09039	6777.72	29.0711	Qls - Landslide	180	28	338.871	522.366	643.897	0	643.897	832.287	832.287
49	8.09039	3988.03	29.3543	Qls - Landslide	180	28	243.222	374.925	366.601	0	366.601	503.394	503.394
50	8.09039	1338.62	29.6382	Qls - Landslide	180	28	153.479	236.587	106.424	0	106.424	193.748	193.748

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.54149

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	323.032	865.011	0	0	0
2	331.023	867.382	1326.35	376.962	15.8657
3	339.014	869.792	2710.71	770.413	15.8657
4	347.006	872.241	4143.67	1177.68	15.8658
5	354.997	874.728	5626.06	1598.99	15.8658
6	362.989	877.255	7183.55	2041.64	15.8657
7	370.98	879.822	8807.8	2503.27	15.8657
8	378.972	882.427	10487.6	2980.69	15.8657
9	386.963	885.073	12212.3	3470.88	15.8658
10	394.955	887.758	13971.9	3970.98	15.8658
11	402.946	890.484	15757	4478.31	15.8657
12	410.937	893.25	17558.7	4990.37	15.8657
13	418.929	896.056	19357	5501.46	15.8657
14	426.92	898.903	21127.6	6004.69	15.8657
15	434.912	901.79	22898.1	6507.89	15.8657
16	442.903	904.719	24855.9	7064.33	15.8658
17	450.895	907.689	26989.5	7670.7	15.8657
18	458.886	910.7	29254.1	8314.32	15.8657
19	466.878	913.753	31597.5	8980.36	15.8657
20	474.869	916.848	33983.8	9658.58	15.8657
21	482.86	919.985	36360.3	10334	15.8657
22	490.852	923.164	38693.3	10997.1	15.8658
23	498.843	926.386	40951.8	11639	15.8658
24	506.835	929.651	43098.3	12249	15.8657
25	514.826	932.959	45115.8	12822.4	15.8657
26	522.818	936.31	46984	13353.4	15.8658
27	530.908	939.747	45329.7	12883.2	15.8657
28	538.998	943.228	43464.2	12353	15.8657
29	547.089	946.755	41395	11764.9	15.8657
30	555.179	950.328	39146.6	11125.9	15.8657
31	563.27	953.946	36726.6	10438.1	15.8657
32	571.36	957.61	34171.1	9711.81	15.8657
33	579.45	961.321	31498.5	8952.22	15.8657
34	587.541	965.078	28737.9	8167.63	15.8657
35	595.631	968.882	25919.9	7366.73	15.8658
36	603.722	972.733	23065.8	6555.56	15.8657
37	611.812	976.632	20238	5751.87	15.8658
38	619.902	980.579	17466.5	4964.18	15.8658
39	627.993	984.574	14773.5	4198.78	15.8657
40	636.083	988.617	12186.6	3463.57	15.8658
41	644.173	992.71	9732.81	2766.17	15.8657
42	652.264	996.851	7436.91	2113.65	15.8657
43	660.354	1001.04	5335.12	1516.3	15.8657
44	668.445	1005.28	3486.32	990.85	15.8657
45	676.535	1009.58	1922.55	546.41	15.8657
46	684.625	1013.92	666.17	189.333	15.8657
47	692.716	1018.31	-284.21	-80.7757	15.8658
48	700.806	1022.76	-895.024	-254.376	15.8658
49	708.897	1027.26	-1049.48	-298.273	15.8657
50	716.987	1031.81	-749.814	-213.105	15.8657
51	725.077	1036.41	0	0	0

Entity Information

Group 1

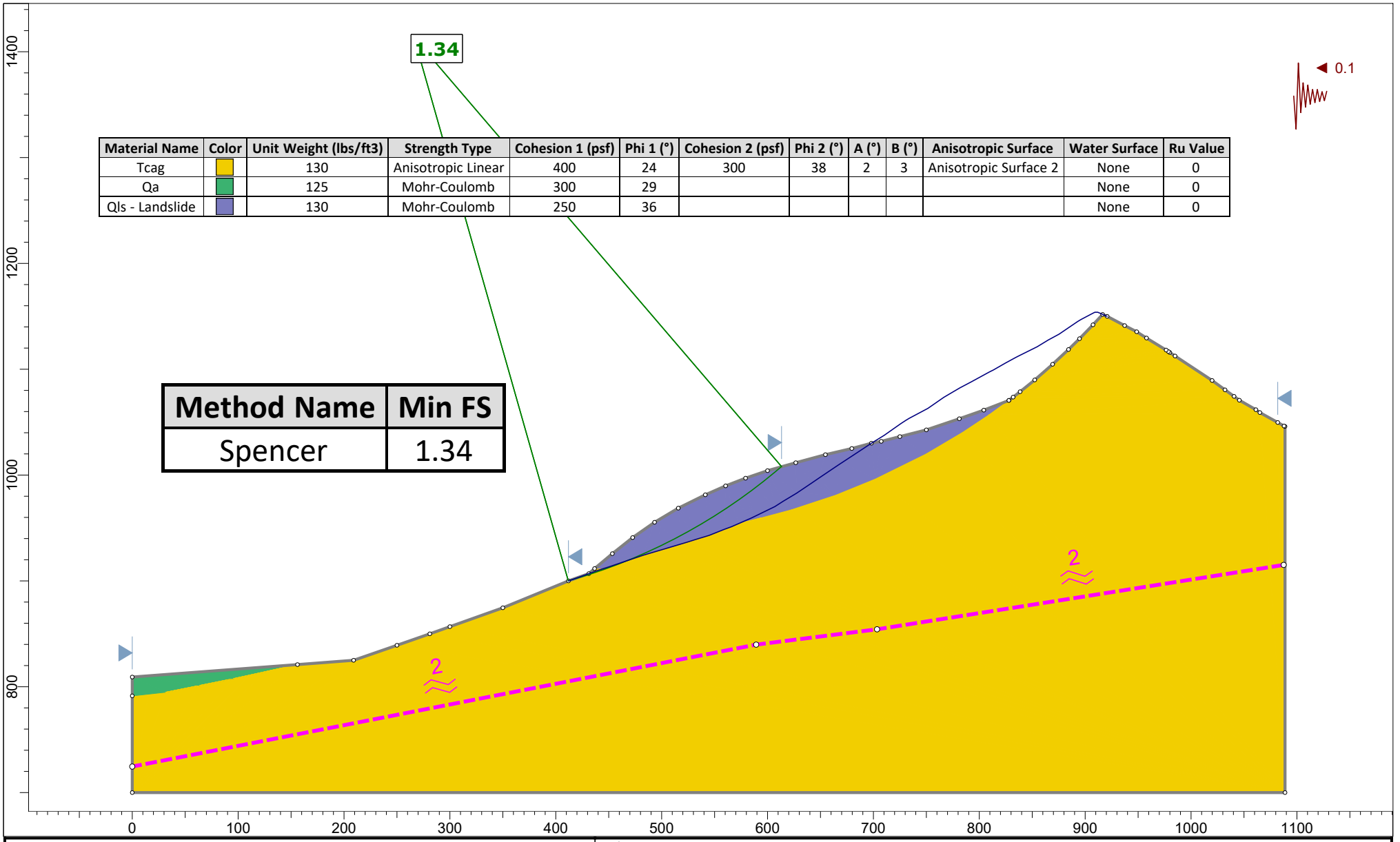
Shared Entities

Type	Coordinates (x,y)

External Boundary	431.2, 906.909 412, 900 350, 874.643 300, 856.786 281, 850 250, 839.236 209, 825 156.051, 821.012 4.66784e-06, 809.259 3.90459e-06, 791.394 0, 700 1088.74, 700 1088.74, 1045.96 1087.76, 1046.44 1081.88, 1049.75 1064.97, 1059.13 1061.23, 1061.8 1045.57, 1070.78 1040.57, 1074.4 1032.09, 1080.61 1019.92, 1089.42 984.878, 1112.56 979.895, 1115.89 978.61, 1116.77 976.432, 1118.13 957.955, 1129.48 948.6, 1135.46 937.301, 1141.32 920.769, 1150.04 916.48, 1151.87 907.426, 1142.04 894.653, 1128.89 884.267, 1118.71 869.212, 1104.69 852.377, 1090 838.571, 1078.85 831.918, 1073.7 827.994, 1070.66 827.885, 1070.58 804.307, 1061.36 781.089, 1053.28 750, 1042.75 724.959, 1036.38 707.386, 1031.91 698.12, 1030.2 679.532, 1025.2 654.706, 1019.33 626.706, 1011.71 600, 1004.25 579.243, 997.118 560.432, 989.858 541.211, 981.37 515.699, 968.848 493.374, 955.503 472.625, 940.944 453.445, 925.802 436.658, 911.688

Material Boundary	3.90459e-06, 791.394 15.2016, 792.328 31.3719, 794.833 47.4695, 798.048 63.5228, 801.292 79.5403, 804.483 95.5238, 807.747 111.477, 811.185 127.419, 814.746 143.374, 818.3 156.051, 821.012
Material Boundary	3.90459e-06, 791.394 31.3719, 794.833 63.5228, 801.292 95.5238, 807.747 127.419, 814.746 156.051, 821.012
Material Boundary	431.2, 906.909 438.632, 909.583 440.516, 910.261 442, 910.795 447.64, 912.515 462.253, 917.412 475.472, 921.926 482.907, 924.446 482.987, 924.469 503.303, 930.519 503.561, 930.598 504.306, 930.82 518.957, 935.126 524.216, 936.672 531.134, 938.859 544.87, 943.074 558.965, 948.695 565.524, 951.08 572.982, 954.348 584.401, 959.351 586.178, 960.134 586.796, 960.485 606.833, 970.279 614.627, 975.293 627.487, 983.016 642.458, 993.115 648.141, 996.916 664.497, 1007.99 668.796, 1010.84 670.289, 1011.81 689.45, 1024.45 698.12, 1030.2

Material Boundary	462.253, 917.412 472.387, 920.873 482.907, 924.446 482.987, 924.469 504.306, 930.82 518.956, 935.126 518.957, 935.126 531.134, 938.859 544.87, 943.074 558.965, 948.695 572.982, 954.348 572.983, 954.348 594.249, 959.592 622.588, 967.194 664.538, 981.064 701.67, 996.158 749.565, 1019.86 784.09, 1040.22 809.115, 1056.93 827.885, 1070.58
Material Boundary	436.658, 911.688 447.64, 912.515
Material Boundary	431.2, 906.909 431.2, 906.909
Material Boundary	827.994, 1070.66 828.004, 1070.67



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Tcag		130	Anisotropic Linear	400	24	300	38	2	3	Anisotropic Surface 2	None	0
Qa		125	Mohr-Coulomb	300	29						None	0
Qls - Landslide		130	Mohr-Coulomb	250	36						None	0

Method Name	Min FS
Spencer	1.34

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 3-3'; Pseudo-Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPHS1B_s.slmd
		Scale	1:1500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 7

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.34272 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.34272 6
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SPHS1B_s

Project Summary

File Name:	SPHS1B_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:01.329s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 3-3'; Pseudo-Static; Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	300 psf
Phi 2	38 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Water Surface	None
Ru Value	0

Qa	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Qls - Landslide	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	36 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.342720
Center:	266.167, 1413.518
Radius:	533.835
Left Slip Surface Endpoint:	411.914, 899.965
Right Slip Surface Endpoint:	613.309, 1007.967
Resisting Moment:	1.73043e+08 lb-ft
Driving Moment:	1.28875e+08 lb-ft
Resisting Horizontal Force:	285342 lb
Driving Horizontal Force:	212510 lb
Total Slice Area:	3302.96 ft2
Surface Horizontal Width:	201.394 ft
Surface Average Height:	16.4005 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	5263
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.34272

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	4.07474	79.622	16.0716	Tcag	300	38	267.784	359.559	76.2318	0	76.2318	153.38	153.38
2	4.07474	225.163	16.5273	Tcag	300	38	285.669	383.573	106.969	0	106.969	191.736	191.736
3	4.07474	351.981	16.984	Tcag	300	38	300.736	403.804	132.863	0	132.863	224.716	224.716
4	4.07474	459.964	17.4419	Tcag	300	38	313.046	420.333	154.019	0	154.019	252.373	252.373
5	4.07474	588.674	17.9009	Tcag	300	38	327.782	440.119	179.345	0	179.345	285.221	285.221
6	4.07474	1472.87	18.3611	Tcag	300	38	438.844	589.244	370.216	0	370.216	515.868	515.868
7	4.07474	2604.46	18.8225	Tcag	300	38	579.119	777.594	611.293	0	611.293	808.695	808.695
8	4.07474	3673.92	19.2852	Tcag	300	38	708.905	951.861	834.345	0	834.345	1082.39	1082.39
9	4.07474	4723.59	19.7492	Tcag	300	38	833.726	1119.46	1048.86	0	1048.86	1348.19	1348.19
10	4.07474	5753.49	20.2145	Tcag	300	38	953.687	1280.53	1255.03	0	1255.03	1606.19	1606.19
11	4.07474	6727.32	20.6813	Tcag	300	38	1064.46	1429.27	1445.4	0	1445.4	1847.23	1847.23
12	4.07474	7608.48	21.1495	Tcag	300	38	1161.86	1560.05	1612.79	0	1612.79	2062.26	2062.26
13	4.07474	8467.29	21.6192	Tcag	300	38	1254.62	1684.61	1772.22	0	1772.22	2269.45	2269.45
14	4.07474	9305.58	22.0904	Tcag	300	38	1343.09	1803.4	1924.26	0	1924.26	2469.38	2469.38
15	4.00966	9954.56	22.5594	Qls - Landslide	250	36	1297.17	1741.73	2053.19	0	2053.19	2592.07	2592.07
16	4.00966	10619.5	23.0262	Qls - Landslide	250	36	1359.03	1824.8	2167.53	0	2167.53	2745.14	2745.14
17	4.00966	11187.6	23.4946	Qls - Landslide	250	36	1409.18	1892.14	2260.21	0	2260.21	2872.78	2872.78
18	4.00966	11735.4	23.9647	Qls - Landslide	250	36	1456.1	1955.14	2346.92	0	2346.92	2994.14	2994.14
19	4.00966	12262.6	24.4365	Qls - Landslide	250	36	1499.84	2013.87	2427.76	0	2427.76	3109.27	3109.27
20	4.00966	12769	24.9101	Qls - Landslide	250	36	1540.46	2068.4	2502.81	0	2502.81	3218.2	3218.2
21	4.00966	13164.2	25.3856	Qls - Landslide	250	36	1568.53	2106.1	2554.71	0	2554.71	3299.02	3299.02
22	4.00966	13411.9	25.8629	Qls - Landslide	250	36	1580.68	2122.41	2577.15	0	2577.15	3343.42	3343.42
23	4.00966	13637.1	26.3421	Qls - Landslide	250	36	1590.13	2135.1	2594.61	0	2594.61	3381.96	3381.96
24	4.00966	13840.6	26.8233	Qls - Landslide	250	36	1597.02	2144.35	2607.35	0	2607.35	3414.87	3414.87
25	4.00966	14021.9	27.3066	Qls - Landslide	250	36	1601.38	2150.21	2615.41	0	2615.41	3442.18	3442.18
26	4.00966	14167.7	27.792	Qls - Landslide	250	36	1601.93	2150.94	2616.43	0	2616.43	3460.75	3460.75
27	4.00966	14128.7	28.2796	Qls - Landslide	250	36	1584.02	2126.89	2583.32	0	2583.32	3435.5	3435.5

28	4.00966	14018.6	28.7694	Qls - Landslide	250	36	1559.29	2093.69	2537.61	0	2537.61	3393.76	3393.76
29	4.00966	13885.2	29.2615	Qls - Landslide	250	36	1532.57	2057.81	2488.24	0	2488.24	3346.92	3346.92
30	4.00966	13728.1	29.756	Qls - Landslide	250	36	1503.89	2019.3	2435.24	0	2435.24	3294.99	3294.99
31	4.00966	13547	30.253	Qls - Landslide	250	36	1473.26	1978.18	2378.65	0	2378.65	3237.93	3237.93
32	4.00966	13341.6	30.7525	Qls - Landslide	250	36	1440.74	1934.51	2318.52	0	2318.52	3175.75	3175.75
33	4.00966	13061.9	31.2546	Qls - Landslide	250	36	1401.7	1882.09	2246.39	0	2246.39	3097.11	3097.11
34	4.00966	12703.7	31.7594	Qls - Landslide	250	36	1355.96	1820.68	2161.85	0	2161.85	3001.25	3001.25
35	4.00966	12319.9	32.2669	Qls - Landslide	250	36	1308.57	1757.04	2074.26	0	2074.26	2900.45	2900.45
36	4.00966	11910.1	32.7773	Qls - Landslide	250	36	1259.55	1691.22	1983.67	0	1983.67	2794.69	2794.69
37	4.00966	11471.9	33.2906	Qls - Landslide	250	36	1208.74	1623	1889.78	0	1889.78	2683.49	2683.49
38	4.00966	10931	33.807	Qls - Landslide	250	36	1149.62	1543.62	1780.51	0	1780.51	2550.32	2550.32
39	4.00966	10324.3	34.3265	Qls - Landslide	250	36	1085.7	1457.79	1662.38	0	1662.38	2403.73	2403.73
40	4.00966	9689.74	34.8493	Qls - Landslide	250	36	1020.44	1370.17	1541.78	0	1541.78	2252.31	2252.31
41	4.00966	9026.76	35.3754	Qls - Landslide	250	36	953.885	1280.8	1418.77	0	1418.77	2096.04	2096.04
42	4.00966	8323.9	35.905	Qls - Landslide	250	36	885.098	1188.44	1291.65	0	1291.65	1932.47	1932.47
43	4.00966	7524.91	36.4381	Qls - Landslide	250	36	809.441	1086.85	1151.83	0	1151.83	1749.43	1749.43
44	4.00966	6684.49	36.9749	Qls - Landslide	250	36	731.73	982.509	1008.21	0	1008.21	1559.11	1559.11
45	4.00966	5813.27	37.5155	Qls - Landslide	250	36	652.948	876.727	862.616	0	862.616	1363.92	1363.92
46	4.00966	4910.59	38.0601	Qls - Landslide	250	36	573.117	769.535	715.079	0	715.079	1163.82	1163.82
47	4.00966	3968.93	38.6087	Qls - Landslide	250	36	491.703	660.22	564.62	0	564.62	957.265	957.265
48	4.00966	2898.44	39.1616	Qls - Landslide	250	36	401.61	539.25	398.118	0	398.118	725.215	725.215
49	4.00966	1763.26	39.7189	Qls - Landslide	250	36	308.253	413.897	225.585	0	225.585	481.673	481.673
50	4.00966	593.573	40.2807	Qls - Landslide	250	36	213.42	286.564	50.3258	0	50.3258	231.196	231.196

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.34272

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	411.914	899.965	0	0	0
2	415.989	901.139	994.578	554.492	29.1403
3	420.064	902.348	2007.69	1119.32	29.1404
4	424.139	903.593	3033.55	1691.25	29.1403
5	428.213	904.873	4066.99	2267.4	29.1402
6	432.288	906.189	5108.77	2848.22	29.1404
7	436.363	907.541	6250.42	3484.7	29.1403
8	440.438	908.93	7502.59	4182.8	29.1403
9	444.512	910.356	8836.55	4926.5	29.1403
10	448.587	911.819	10229.8	5703.24	29.1402
11	452.662	913.319	11660.5	6500.92	29.1404
12	456.737	914.858	13105.4	7306.45	29.1403
13	460.811	916.434	14540.3	8106.43	29.1403
14	464.886	918.049	15948.1	8891.27	29.1402
15	468.961	919.703	17312.4	9651.9	29.1403
16	472.97	921.368	18102.3	10092.3	29.1403
17	476.98	923.072	18800.2	10481.4	29.1403
18	480.99	924.815	19396.8	10814	29.1403
19	484.999	926.598	19883.6	11085.4	29.1403
20	489.009	928.42	20252.8	11291.2	29.1402
21	493.019	930.282	20497.1	11427.5	29.1404
22	497.028	932.184	20614.3	11492.8	29.1404
23	501.038	934.128	20606.8	11488.6	29.1403
24	505.048	936.114	20472.9	11413.9	29.1402
25	509.057	938.141	20211.1	11268	29.1403
26	513.067	940.211	19820.9	11050.4	29.1402
27	517.077	942.325	19303.1	10761.8	29.1404
28	521.086	944.482	18674.2	10411.1	29.1402
29	525.096	946.683	17942.9	10003.4	29.1402
30	529.106	948.93	17114.4	9541.53	29.1403
31	533.115	951.222	16194.3	9028.58	29.1404
32	537.125	953.561	15188.9	8468.03	29.1403
33	541.135	955.946	14104.9	7863.68	29.1403
34	545.144	958.38	12956.9	7223.65	29.1403
35	549.154	960.862	11761.8	6557.37	29.1403
36	553.164	963.394	10529.8	5870.53	29.1404
37	557.173	965.976	9271.81	5169.17	29.1403
38	561.183	968.609	7999.56	4459.87	29.1403
39	565.193	971.293	6739.19	3757.19	29.1403
40	569.202	974.031	5512.08	3073.07	29.1403
41	573.212	976.823	4333.53	2416.01	29.1403
42	577.222	979.67	3219.56	1794.95	29.1403
43	581.231	982.573	2189.27	1220.55	29.1403
44	585.241	985.534	1275.23	710.959	29.1403
45	589.251	988.552	499.609	278.539	29.1403
46	593.26	991.631	-117.018	-65.2391	29.1403
47	597.27	994.77	-553.184	-308.408	29.1403
48	601.28	997.972	-784.759	-437.515	29.1403
49	605.289	1001.24	-763.128	-425.455	29.1403
50	609.299	1004.57	-453.915	-253.064	29.1403
51	613.309	1007.97	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)

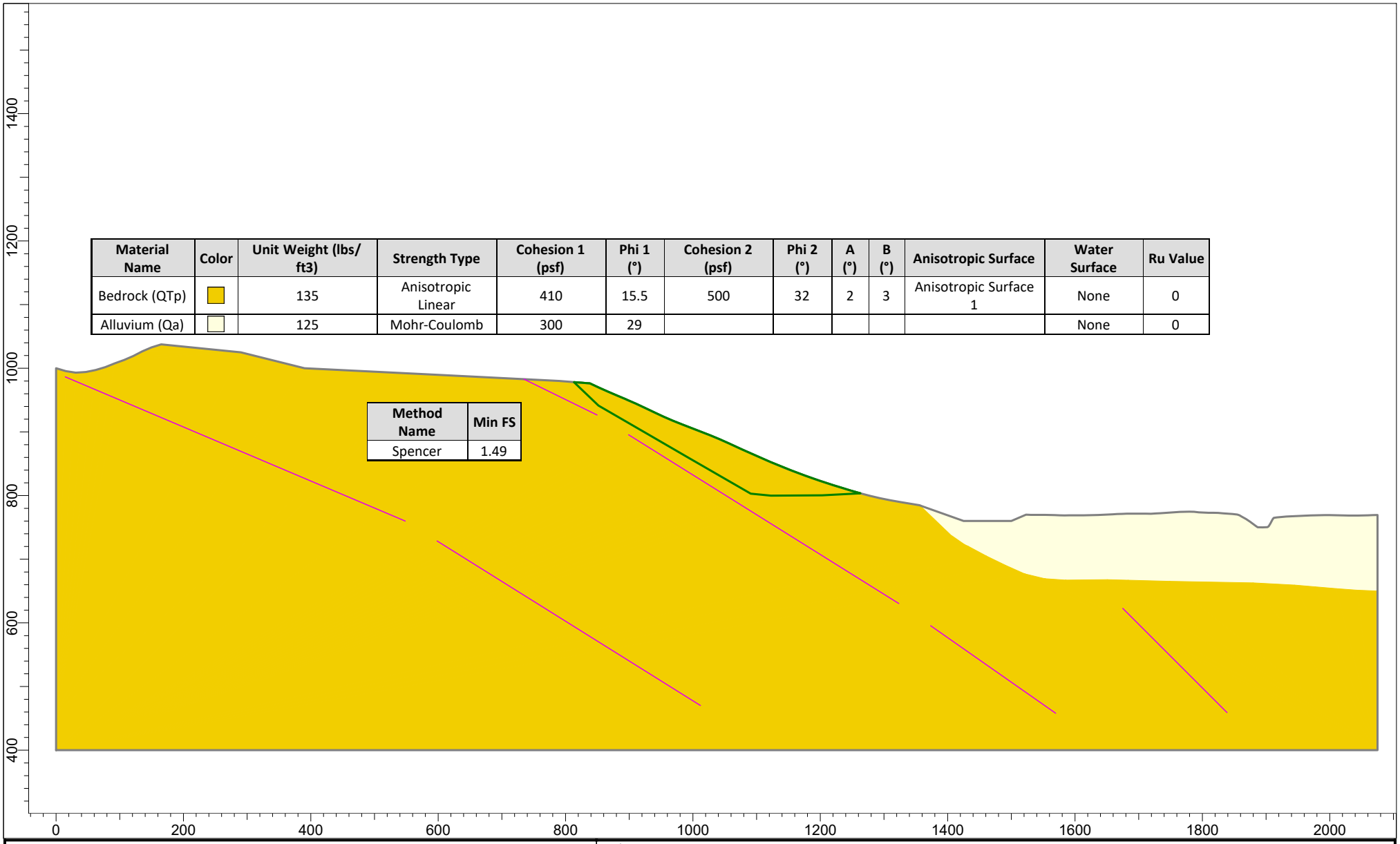
External Boundary	431.2, 906.909 412, 900 350, 874.643 300, 856.786 281, 850 250, 839.236 209, 825 156.051, 821.012 4.66784e-06, 809.259 3.90459e-06, 791.394 0, 700 1088.74, 700 1088.74, 1045.96 1087.76, 1046.44 1081.88, 1049.75 1064.97, 1059.13 1061.23, 1061.8 1045.57, 1070.78 1040.57, 1074.4 1032.09, 1080.61 1019.92, 1089.42 984.878, 1112.56 979.895, 1115.89 978.61, 1116.77 976.432, 1118.13 957.955, 1129.48 948.6, 1135.46 937.301, 1141.32 920.769, 1150.04 916.48, 1151.87 907.426, 1142.04 894.653, 1128.89 884.267, 1118.71 869.212, 1104.69 852.377, 1090 838.571, 1078.85 831.918, 1073.7 827.994, 1070.66 827.885, 1070.58 804.307, 1061.36 781.089, 1053.28 750, 1042.75 724.959, 1036.38 707.386, 1031.91 698.12, 1030.2 679.532, 1025.2 654.706, 1019.33 626.706, 1011.71 600, 1004.25 579.243, 997.118 560.432, 989.858 541.211, 981.37 515.699, 968.848 493.374, 955.503 472.625, 940.944 453.445, 925.802 436.658, 911.688

Material Boundary	3.90459e-06, 791.394 15.2016, 792.328 31.3719, 794.833 47.4695, 798.048 63.5228, 801.292 79.5403, 804.483 95.5238, 807.747 111.477, 811.185 127.419, 814.746 143.374, 818.3 156.051, 821.012
Material Boundary	3.90459e-06, 791.394 31.3719, 794.833 63.5228, 801.292 95.5238, 807.747 127.419, 814.746 156.051, 821.012
Material Boundary	431.2, 906.909 438.632, 909.583 440.516, 910.261 442, 910.795 447.64, 912.515 462.253, 917.412 475.472, 921.926 482.907, 924.446 482.987, 924.469 503.303, 930.519 503.561, 930.598 504.306, 930.82 518.957, 935.126 524.216, 936.672 531.134, 938.859 544.87, 943.074 558.965, 948.695 565.524, 951.08 572.982, 954.348 584.401, 959.351 586.178, 960.134 586.796, 960.485 606.833, 970.279 614.627, 975.293 627.487, 983.016 642.458, 993.115 648.141, 996.916 664.497, 1007.99 668.796, 1010.84 670.289, 1011.81 689.45, 1024.45 698.12, 1030.2

Material Boundary	462.253, 917.412 472.387, 920.873 482.907, 924.446 482.987, 924.469 504.306, 930.82 518.956, 935.126 518.957, 935.126 531.134, 938.859 544.87, 943.074 558.965, 948.695 572.982, 954.348 572.983, 954.348 594.249, 959.592 622.588, 967.194 664.538, 981.064 701.67, 996.158 749.565, 1019.86 784.09, 1040.22 809.115, 1056.93 827.885, 1070.58
Material Boundary	436.658, 911.688 447.64, 912.515
Material Boundary	431.2, 906.909 431.2, 906.909
Material Boundary	827.994, 1070.66 828.004, 1070.67

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 1	None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0

Method Name	Min FS
Spencer	1.49



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 5-5'; Static; Non-circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SP1S1D.slmd
		Scale	1:2500
Project No.:	23-2195s	Date: 10/13/2023	Run Number: Run No. 8

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.48795 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.48795 7
Entity Information 7
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SP1S1D

Project Summary

File Name:	SP1S1D.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:06.152s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 5-5'; Static; Non-circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.487950
Axis Location:	1212.756, 1340.591
Left Slip Surface Endpoint:	813.148, 978.128
Right Slip Surface Endpoint:	1262.961, 803.427
Resisting Moment:	6.34001e+08 lb-ft
Driving Moment:	4.26091e+08 lb-ft
Resisting Horizontal Force:	1.09981e+06 lb
Driving Horizontal Force:	739148 lb
Total Slice Area:	16947 ft2
Surface Horizontal Width:	449.814 ft
Surface Average Height:	37.6757 ft

Global Minimum Coordinates

Method: spencer

X	Y
813.148	978.128
851.678	941.312
929.334	896.3
990.626	860.791
1090.71	802.847
1122.48	799.766
1202.94	800.25
1262.96	803.427

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	23115
Number of Invalid Surfaces:	1936

Error Codes

Error Code -108 reported for 127 surfaces
Error Code -111 reported for 576 surfaces
Error Code -112 reported for 218 surfaces
Error Code -121 reported for 264 surfaces
Error Code -124 reported for 1 surface
Error Code -145 reported for 24 surfaces
Error Code -1000 reported for 726 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.48795

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	9.63258	5478.06	-43.6967	Bedrock (QTp)	500	32	431.314	641.773	226.885	0	226.885	639.009	639.009
2	9.63258	16434.2	-43.6967	Bedrock (QTp)	500	32	730.756	1087.33	939.92	0	939.92	1638.17	1638.17
3	9.63258	26989.9	-43.6967	Bedrock (QTp)	500	32	1019.25	1516.6	1626.91	0	1626.91	2600.82	2600.82
4	9.63258	33985.5	-43.6967	Bedrock (QTp)	500	32	1210.45	1801.09	2082.18	0	2082.18	3238.78	3238.78
5	9.707	38206.3	-30.0981	Bedrock (QTp)	410	15.5	853.377	1269.78	3100.27	0	3100.27	3594.92	3594.92
6	9.707	39977	-30.0981	Bedrock (QTp)	410	15.5	880.608	1310.3	3246.37	0	3246.37	3756.8	3756.8
7	9.707	41852.8	-30.0981	Bedrock (QTp)	410	15.5	909.453	1353.22	3401.14	0	3401.14	3928.3	3928.3
8	9.707	43751	-30.0981	Bedrock (QTp)	410	15.5	938.644	1396.66	3557.77	0	3557.77	4101.84	4101.84
9	9.707	45635.9	-30.0981	Bedrock (QTp)	410	15.5	967.627	1439.78	3713.28	0	3713.28	4274.15	4274.15
10	9.707	47418.6	-30.0981	Bedrock (QTp)	410	15.5	995.047	1480.58	3860.38	0	3860.38	4437.14	4437.14
11	9.707	49072.7	-30.0981	Bedrock (QTp)	410	15.5	1020.48	1518.42	3996.85	0	3996.85	4588.36	4588.36
12	9.707	50565	-30.0981	Bedrock (QTp)	410	15.5	1043.43	1552.57	4119.98	0	4119.98	4724.79	4724.79

13	8.75607	46726.7	-30.0852	Bedrock (QTp)	410	15.5	1062.56	1581.03	4222.61	0	4222.61	4838.18	4838.18
14	8.75607	47791.2	-30.0852	Bedrock (QTp)	410	15.5	1080.71	1608.04	4319.98	0	4319.98	4946.08	4946.08
15	8.75607	48930.8	-30.0852	Bedrock (QTp)	410	15.5	1100.14	1636.95	4424.24	0	4424.24	5061.59	5061.59
16	8.75607	50325.8	-30.0852	Bedrock (QTp)	410	15.5	1123.92	1672.34	4551.86	0	4551.86	5202.98	5202.98
17	8.75607	51882.1	-30.0852	Bedrock (QTp)	410	15.5	1150.46	1711.83	4694.23	0	4694.23	5360.73	5360.73
18	8.75607	53675	-30.0852	Bedrock (QTp)	410	15.5	1181.03	1757.31	4858.24	0	4858.24	5542.45	5542.45
19	8.75607	55571.1	-30.0852	Bedrock (QTp)	410	15.5	1213.36	1805.42	5031.71	0	5031.71	5734.65	5734.65
20	9.0983	59864.9	-30.0694	Bedrock (QTp)	410	15.5	1248.34	1857.47	5219.41	0	5219.41	5942.16	5942.16
21	9.0983	62049.9	-30.0694	Bedrock (QTp)	410	15.5	1284.2	1910.83	5411.82	0	5411.82	6155.33	6155.33
22	9.0983	64219.4	-30.0694	Bedrock (QTp)	410	15.5	1319.81	1963.81	5602.86	0	5602.86	6366.98	6366.98
23	9.0983	66294.3	-30.0694	Bedrock (QTp)	410	15.5	1353.86	2014.48	5785.56	0	5785.56	6569.4	6569.4
24	9.0983	68224.4	-30.0694	Bedrock (QTp)	410	15.5	1385.54	2061.61	5955.52	0	5955.52	6757.7	6757.7
25	9.0983	70002.8	-30.0694	Bedrock (QTp)	410	15.5	1414.72	2105.04	6112.1	0	6112.1	6931.18	6931.18
26	9.0983	71603.9	-30.0694	Bedrock (QTp)	410	15.5	1441	2144.14	6253.1	0	6253.1	7087.39	7087.39
27	9.0983	73115.3	-30.0694	Bedrock (QTp)	410	15.5	1465.81	2181.05	6386.19	0	6386.19	7234.84	7234.84
28	9.0983	74531.9	-30.0694	Bedrock (QTp)	410	15.5	1489.06	2215.64	6510.92	0	6510.92	7373.03	7373.03
29	9.0983	75915.7	-30.0694	Bedrock (QTp)	410	15.5	1511.76	2249.43	6632.77	0	6632.77	7508.03	7508.03
30	9.0983	77294	-30.0694	Bedrock (QTp)	410	15.5	1534.39	2283.09	6754.13	0	6754.13	7642.49	7642.49
31	7.9431	66577.4	-5.53871	Bedrock (QTp)	500	32	4185.79	6228.25	9167.11	0	9167.11	9573.01	9573.01
32	7.9431	63577.9	-5.53871	Bedrock (QTp)	500	32	4014.15	5972.86	8758.4	0	8758.4	9147.65	9147.65
33	7.9431	60622.2	-5.53871	Bedrock (QTp)	500	32	3845.03	5721.21	8355.68	0	8355.68	8728.54	8728.54
34	7.9431	57736.4	-5.53871	Bedrock (QTp)	500	32	3679.9	5475.51	7962.47	0	7962.47	8319.31	8319.31
35	8.93947	61042	0.34442	Bedrock (QTp)	500	32	3791.07	5640.92	8227.18	0	8227.18	8204.39	8204.39
36	8.93947	56497.4	0.34442	Bedrock (QTp)	500	32	3538.36	5264.91	7625.45	0	7625.45	7604.18	7604.18
37	8.93947	52054.2	0.34442	Bedrock (QTp)	500	32	3291.31	4897.3	7037.16	0	7037.16	7017.37	7017.37
38	8.93947	47774.6	0.34442	Bedrock (QTp)	500	32	3053.35	4543.23	6470.52	0	6470.52	6452.17	6452.17
39	8.93947	43619.3	0.34442	Bedrock (QTp)	500	32	2822.3	4199.44	5920.33	0	5920.33	5903.37	5903.37
40	8.93947	39569	0.34442	Bedrock (QTp)	500	32	2597.08	3864.33	5384.06	0	5384.06	5368.45	5368.45
41	8.93947	35648.3	0.34442	Bedrock (QTp)	500	32	2379.07	3539.94	4864.93	0	4864.93	4850.63	4850.63
42	8.93947	31798.3	0.34442	Bedrock (QTp)	500	32	2165.01	3221.42	4355.18	0	4355.18	4342.16	4342.16
43	8.93947	28051.3	0.34442	Bedrock (QTp)	500	32	1956.66	2911.41	3859.06	0	3859.06	3847.3	3847.3
44	8.57511	23228.6	3.0298	Bedrock (QTp)	500	32	1813.41	2698.27	3517.96	0	3517.96	3421.97	3421.97
45	8.57511	19451.1	3.0298	Bedrock (QTp)	500	32	1584.79	2358.09	2973.57	0	2973.57	2889.69	2889.69
46	8.57511	15761.1	3.0298	Bedrock (QTp)	500	32	1361.47	2025.8	2441.79	0	2441.79	2369.72	2369.72
47	8.57511	12118.9	3.0298	Bedrock (QTp)	500	32	1141.05	1697.82	1916.91	0	1916.91	1856.51	1856.51
48	8.57511	8568.06	3.0298	Bedrock (QTp)	500	32	926.145	1378.06	1405.19	0	1405.19	1356.17	1356.17
49	8.57511	5076.87	3.0298	Bedrock (QTp)	500	32	714.855	1063.67	902.058	0	902.058	864.222	864.222

50	8.57511	1690.97	3.0298	Bedrock (QTp)	500	32	514.198	765.101	424.25	0	424.25	397.033	397.033

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.48795

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	813.148	978.128	0	0	0
2	822.78	968.924	-2079.24	-746.288	19.7443
3	832.413	959.72	-488.961	-175.5	19.7443
4	842.045	950.516	4636.74	1664.24	19.7443
5	851.678	941.312	12105.4	4344.93	19.7443
6	861.385	935.686	21239.9	7623.52	19.7443
7	871.092	930.059	30931.3	11102	19.7443
8	880.799	924.433	41212.6	14792.2	19.7443
9	890.506	918.806	52090.9	18696.7	19.7443
10	900.213	913.18	63562	22813.9	19.7443
11	909.92	907.553	75593.8	27132.4	19.7443
12	919.627	901.927	88145.8	31637.6	19.7443
13	929.334	896.3	101167	36311.3	19.7443
14	938.09	891.227	113255	40649.8	19.7442
15	946.846	886.155	125677	45108.3	19.7442
16	955.602	881.082	138457	49695.5	19.7443
17	964.358	876.009	151676	54440	19.7442
18	973.114	870.937	165383	59360	19.7443
19	981.87	865.864	179655	64482.3	19.7442
20	990.626	860.791	194522	69818.6	19.7443
21	999.725	855.524	210623	75597.6	19.7443
22	1008.82	850.256	227410	81622.9	19.7443
23	1017.92	844.988	244879	87892.8	19.7442
24	1027.02	839.721	262999	94396.6	19.7443
25	1036.12	834.453	281725	101118	19.7443
26	1045.22	829.186	301010	108040	19.7443
27	1054.31	823.918	320798	115142	19.7443
28	1063.41	818.65	341060	122415	19.7443
29	1072.51	813.383	361768	129847	19.7443
30	1081.61	808.115	382909	137435	19.7443
31	1090.71	802.847	404484	145179	19.7443
32	1098.65	802.077	378194	135743	19.7443
33	1106.59	801.307	352957	126685	19.7443
34	1114.54	800.537	328757	117999	19.7443
35	1122.48	799.766	305570	109677	19.7444
36	1131.42	799.82	271134	97316.3	19.7442
37	1140.36	799.874	238995	85781	19.7443
38	1149.3	799.928	209103	75052.2	19.7443
39	1158.24	799.981	181376	65100.2	19.7443
40	1167.18	800.035	155750	55902.5	19.7443
41	1176.12	800.089	132173	47439.9	19.7442
42	1185.06	800.143	110578	39689	19.7442
43	1194	800.196	90930.1	32637	19.7443
44	1202.94	800.25	73177.2	26265	19.7442
45	1211.51	800.704	55982.3	20093.4	19.7443
46	1220.09	801.158	41000.9	14716.2	19.7443
47	1228.66	801.612	28181.8	10115.1	19.7442
48	1237.24	802.066	17497	6280.08	19.7442
49	1245.81	802.52	8892.89	3191.87	19.7443
50	1254.39	802.973	2334.58	837.937	19.7443
51	1262.96	803.427	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

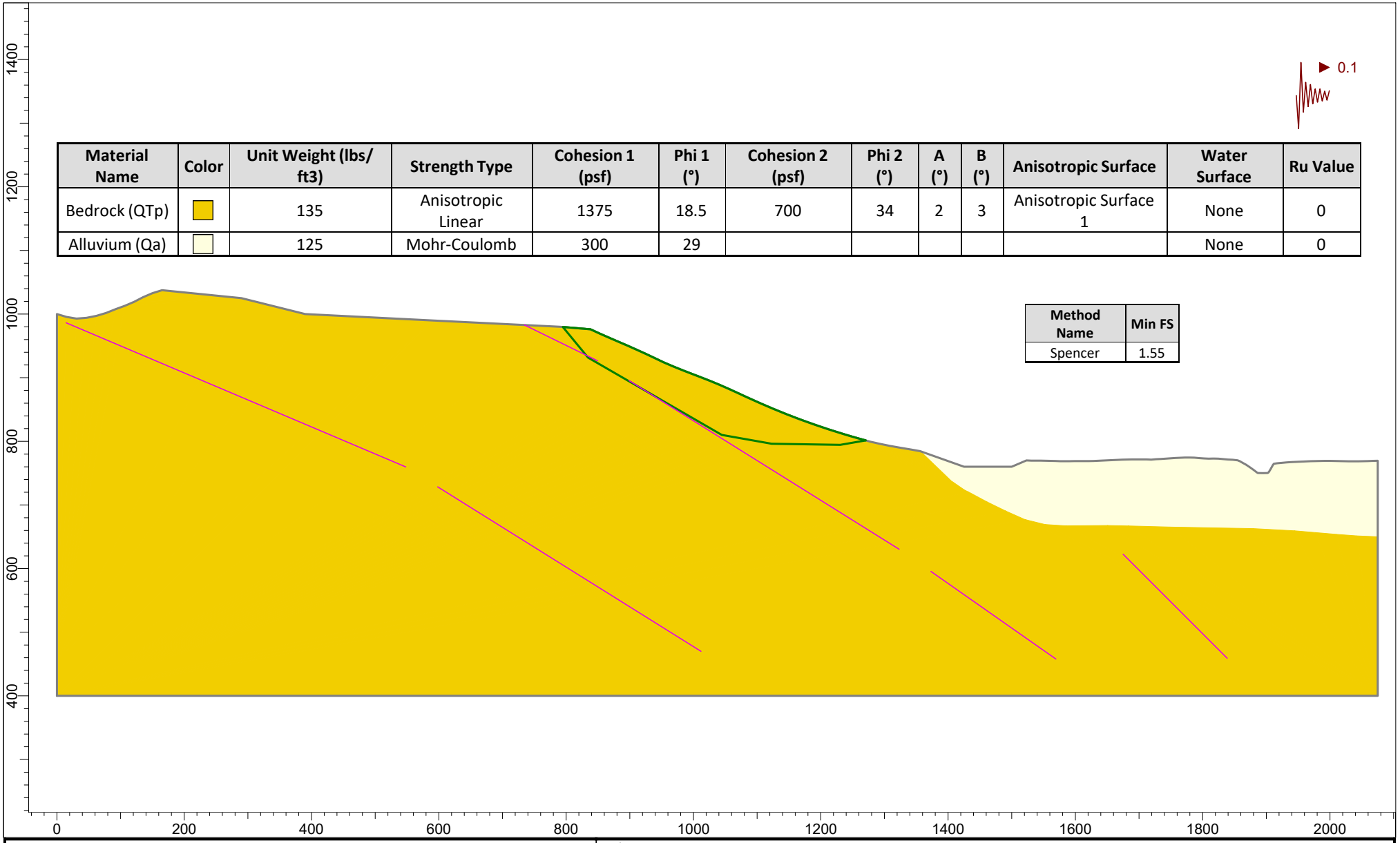
Shared Entities

Type	Coordinates (x,y)
	0, 400 2075, 400 2075, 650 2075, 769.431 2067.46, 769.191 2059.92, 768.929 2052.38, 768.694 2044.84, 768.54 2037.3, 768.512 2029.75, 768.601 2022.2, 768.761 2014.66, 768.948 2007.12, 769.117 1999.59, 769.224 1992.07, 769.228 1984.55, 769.122 1977.04, 768.928 1969.51, 768.668 1961.97, 768.363 1954.4, 768.035 1946.79, 767.706 1939.17, 767.354 1931.61, 766.891 1924.18, 766.22 1916.66, 765.501 1911.85, 764.818 1910.23, 762.613 1906.61, 756.019 1904.17, 752.108 1903.17, 750.93 1901.96, 750.244 1894.38, 750.021 1886.65, 750.182 1884.63, 751.432 1880.64, 754.46 1874.56, 758.924 1868.27, 763.108 1861.67, 766.747 1858.33, 768.798 1854.82, 770.14 1847.18, 770.955 1839.67, 771.428 1832.15, 772.001 1824.62, 772.648 1817.06, 772.914 1809.51, 772.81 1801.9, 773.154 1794.23, 773.584 1786.9, 774.372 1779.37, 774.531 1771.85, 774.483 1764.32, 774.202 1756.79, 773.753 1749.27, 773.212

External Boundary	1741.74, 772.658 1734.2, 772.168 1726.67, 771.819 1719.13, 771.23 1711.59, 771.548 1704.04, 771.535 1696.5, 771.54 1688.95, 771.514 1681.41, 771.409 1673.87, 771.192 1666.34, 770.883 1658.8, 770.515 1651.27, 770.123 1643.73, 769.741 1636.2, 769.403 1628.66, 769.145 1621.12, 768.996 1613.58, 768.945 1606.04, 768.935 1598.5, 768.912 1590.95, 768.82 1583.41, 768.687 1575.87, 768.817 1568.33, 769.144 1560.79, 769.344 1553.25, 769.491 1545.71, 769.574 1538.17, 769.569 1530.62, 769.618 1523.09, 769.872 1500, 760 1425, 760 1358.97, 783.533 1355.99, 784.592 1340.4, 787.304 1324.78, 789.861 1309.19, 792.618 1293.67, 795.751 1278.27, 799.373 1262.96, 803.427 1247.74, 807.807 1232.59, 812.405 1217.49, 817.172 1202.46, 822.107 1187.47, 827.214 1172.55, 832.504 1157.71, 838.007 1142.96, 843.755 1128.32, 849.774 1113.78, 856.028 1099.31, 862.452 1084.89, 868.984 1070.48, 875.558 1056.06, 882.083 1041.57, 888.452 1026.97, 894.556 1012.24, 900.359 997.458, 906.016 982.687, 911.712

	968.006, 917.635 953.486, 923.94 939.163, 930.675 924.894, 937.53 910.515, 944.147 896.032, 950.538 894.344, 951.265 881.493, 956.796 866.953, 963.054 852.472, 969.445 838.111, 976.11 790, 980 590, 990 390, 1000 290, 1025 165.066, 1037.52 149.94, 1032.77 135.41, 1026.55 121.321, 1019.29 106.836, 1012.97 91.9272, 1007.63 77.2456, 1001.72 62.0853, 997.15 46.5553, 994.078 30.7511, 992.925 15.1827, 995.473 0, 1000 0, 457.856
Material Boundary	1358.97, 783.533 1405.42, 738.845 1432.22, 720.215 1461.04, 704.79 1490.63, 690.419 1520.6, 677.065 1552.23, 669.33 1584.89, 667.203 1650.32, 667.764 1683.01, 667.015 1748.39, 665.186 1879.2, 662.762 1944.52, 659.328 1977.13, 656.606 2009.72, 653.733 2042.34, 651.325 2075, 650

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	1375	18.5	700	34	2	3	Anisotropic Surface 1	None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0



Method Name	Min FS
Spencer	1.55

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 5-5'; Pseudo-Static; Non-circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SP1S1D_s.slmd
		Scale	1:2500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 9

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.55258 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.55258 7
Entity Information 7
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SP1S1D_s

Project Summary

File Name:	SP1S1D_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:07.563s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 5-5'; Pseudo-Static; Non-circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	1375 psf
Phi 1	18.5 °
A	2 °
Cohesion 2	700 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.552580
Axis Location:	1211.013, 1366.406
Left Slip Surface Endpoint:	794.813, 979.611
Right Slip Surface Endpoint:	1270.729, 801.369
Resisting Moment:	1.17549e+09 lb-ft
Driving Moment:	7.57118e+08 lb-ft
Resisting Horizontal Force:	1.90304e+06 lb
Driving Horizontal Force:	1.22573e+06 lb
Total Slice Area:	23075.5 ft2
Surface Horizontal Width:	475.916 ft
Surface Average Height:	48.4866 ft

Global Minimum Coordinates

Method: spencer

X	Y
794.813	979.611
834.39	931.587
944.225	868.047
971.18	852.463
1044.46	810.128
1122.82	796.252
1230.51	794.407
1270.73	801.369

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	22822
Number of Invalid Surfaces:	2229

Error Codes

Error Code -108 reported for 126 surfaces
Error Code -111 reported for 822 surfaces
Error Code -112 reported for 168 surfaces
Error Code -121 reported for 335 surfaces
Error Code -124 reported for 1 surface
Error Code -145 reported for 14 surfaces
Error Code -1000 reported for 763 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.55258

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	9.89416	7484	-50.508	Bedrock (QTp)	700	34	533.446	828.217	190.09	0	190.09	837.396	837.396
2	9.89416	22452	-50.508	Bedrock (QTp)	700	34	872.825	1355.13	971.269	0	971.269	2030.39	2030.39
3	9.89416	37420	-50.508	Bedrock (QTp)	700	34	1212.2	1882.04	1752.45	0	1752.45	3223.39	3223.39
4	9.89416	52388	-50.508	Bedrock (QTp)	700	34	1551.59	2408.96	2533.63	0	2533.63	4416.39	4416.39
5	9.15292	57437.7	-30.0496	Bedrock (QTp)	700	34	2412.04	3744.89	4514.24	0	4514.24	5909.62	5909.62
6	9.15292	59089.9	-30.0496	Bedrock (QTp)	1375	18.5	1901.27	2951.87	4712.78	0	4712.78	5812.67	5812.67
7	9.15292	60518.6	-30.0496	Bedrock (QTp)	1375	18.5	1926.41	2990.91	4829.45	0	4829.45	5943.89	5943.89
8	9.15292	62081.9	-30.0496	Bedrock (QTp)	1375	18.5	1953.93	3033.63	4957.12	0	4957.12	6087.48	6087.48
9	9.15292	63737.9	-30.0496	Bedrock (QTp)	1375	18.5	1983.07	3078.88	5092.36	0	5092.36	6239.58	6239.58
10	9.15292	65412.9	-30.0496	Bedrock (QTp)	1375	18.5	2012.55	3124.65	5229.15	0	5229.15	6393.42	6393.42
11	9.15292	67083	-30.0496	Bedrock (QTp)	1375	18.5	2041.94	3170.28	5365.54	0	5365.54	6546.81	6546.81
12	9.15292	68668.4	-30.0496	Bedrock (QTp)	1375	18.5	2069.85	3213.6	5495.01	0	5495.01	6692.43	6692.43

13	9.15292	70170.7	-30.0496	Bedrock (QTp)	1375	18.5	2096.29	3254.66	5617.7	0	5617.7	6830.41	6830.41
14	9.15292	71517.6	-30.0496	Bedrock (QTp)	1375	18.5	2119.99	3291.46	5727.7	0	5727.7	6954.13	6954.13
15	9.15292	72716.9	-30.0496	Bedrock (QTp)	1375	18.5	2141.1	3324.23	5825.64	0	5825.64	7064.28	7064.28
16	9.15292	73843.9	-30.0496	Bedrock (QTp)	1375	18.5	2160.94	3355.03	5917.68	0	5917.68	7167.79	7167.79
17	8.98496	73666.7	-30.0335	Bedrock (QTp)	1375	18.5	2182.35	3388.28	6017.05	0	6017.05	7278.73	7278.73
18	8.98496	75027.3	-30.0335	Bedrock (QTp)	1375	18.5	2206.75	3426.15	6130.25	0	6130.25	7406.04	7406.04
19	8.98496	76616.6	-30.0335	Bedrock (QTp)	1375	18.5	2235.25	3470.4	6262.5	0	6262.5	7554.76	7554.76
20	9.16003	79995.4	-30.016	Bedrock (QTp)	1375	18.5	2268.76	3522.43	6418.01	0	6418.01	7728.72	7728.72
21	9.16003	82025.2	-30.016	Bedrock (QTp)	1375	18.5	2304.47	3577.88	6583.71	0	6583.71	7915.05	7915.05
22	9.16003	84194.4	-30.016	Bedrock (QTp)	1375	18.5	2342.64	3637.13	6760.79	0	6760.79	8114.18	8114.18
23	9.16003	86391.7	-30.016	Bedrock (QTp)	1375	18.5	2381.29	3697.15	6940.16	0	6940.16	8315.89	8315.89
24	9.16003	88584.7	-30.016	Bedrock (QTp)	1375	18.5	2419.88	3757.05	7119.18	0	7119.18	8517.2	8517.2
25	9.16003	90679.8	-30.016	Bedrock (QTp)	1375	18.5	2456.73	3814.27	7290.21	0	7290.21	8709.52	8709.52
26	9.16003	92647.1	-30.016	Bedrock (QTp)	1375	18.5	2491.34	3868.01	7450.81	0	7450.81	8890.11	8890.11
27	9.16003	94444.1	-30.016	Bedrock (QTp)	1375	18.5	2522.96	3917.09	7597.51	0	7597.51	9055.08	9055.08
28	9.79564	100195	-10.0406	Bedrock (QTp)	700	34	4913.49	7628.59	10272	0	10272	11142	11142
29	9.79564	96740	-10.0406	Bedrock (QTp)	700	34	4761.4	7392.45	9921.96	0	9921.96	10765	10765
30	9.79564	93173.7	-10.0406	Bedrock (QTp)	700	34	4604.41	7148.72	9560.62	0	9560.62	10375.9	10375.9
31	9.79564	89567	-10.0406	Bedrock (QTp)	700	34	4445.65	6902.23	9195.18	0	9195.18	9982.32	9982.32
32	9.79564	85966.4	-10.0406	Bedrock (QTp)	700	34	4287.15	6656.15	8830.36	0	8830.36	9589.44	9589.44
33	9.79564	82402.6	-10.0406	Bedrock (QTp)	700	34	4130.28	6412.59	8469.27	0	8469.27	9200.57	9200.57
34	9.79564	78924	-10.0406	Bedrock (QTp)	700	34	3977.15	6174.85	8116.8	0	8116.8	8820.99	8820.99
35	9.79564	75542.8	-10.0406	Bedrock (QTp)	700	34	3828.32	5943.78	7774.22	0	7774.22	8452.06	8452.06
36	9.78938	71208.6	-0.981977	Bedrock (QTp)	700	34	4203.64	6526.48	8638.11	0	8638.11	8710.17	8710.17
37	9.78938	66071.8	-0.981977	Bedrock (QTp)	700	34	3939.95	6117.09	8031.17	0	8031.17	8098.7	8098.7
38	9.78938	61096.8	-0.981977	Bedrock (QTp)	700	34	3684.58	5720.6	7443.34	0	7443.34	7506.5	7506.5
39	9.78938	56298.7	-0.981977	Bedrock (QTp)	700	34	3438.28	5338.2	6876.41	0	6876.41	6935.35	6935.35
40	9.78938	51685.3	-0.981977	Bedrock (QTp)	700	34	3201.46	4970.52	6331.31	0	6331.31	6386.18	6386.18
41	9.78938	47200	-0.981977	Bedrock (QTp)	700	34	2971.22	4613.05	5801.34	0	5801.34	5852.27	5852.27
42	9.78938	42848.9	-0.981977	Bedrock (QTp)	700	34	2747.86	4266.28	5287.23	0	5287.23	5334.33	5334.33
43	9.78938	38629	-0.981977	Bedrock (QTp)	700	34	2531.25	3929.97	4788.63	0	4788.63	4832.02	4832.02
44	9.78938	34502.8	-0.981977	Bedrock (QTp)	700	34	2319.44	3601.12	4301.09	0	4301.09	4340.85	4340.85
45	9.78938	30486.1	-0.981977	Bedrock (QTp)	700	34	2113.26	3281	3826.49	0	3826.49	3862.72	3862.72
46	9.78938	26586.5	-0.981977	Bedrock (QTp)	700	34	1913.09	2970.22	3365.74	0	3365.74	3398.53	3398.53
47	10.0552	22040.5	9.82109	Bedrock (QTp)	700	34	1981.73	3076.79	3523.74	0	3523.74	3180.68	3180.68
48	10.0552	15540.5	9.82109	Bedrock (QTp)	700	34	1581.1	2454.79	2601.59	0	2601.59	2327.88	2327.88
49	10.0552	9195.27	9.82109	Bedrock (QTp)	700	34	1190.02	1847.6	1701.4	0	1701.4	1495.39	1495.39

50	10.0552	2997.64	9.82109	Bedrock (QTp)	700	34	816.807	1268.16	842.329	0	842.329	700.933	700.933

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.55258

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	794.813	979.611	0	0	0
2	804.707	967.605	-2264.34	-982.174	23.4491
3	814.601	955.599	2978.32	1291.87	23.4492
4	824.495	943.593	15728	6822.13	23.4491
5	834.39	931.587	35984.6	15608.6	23.4492
6	843.543	926.292	43483.1	18861.1	23.4491
7	852.695	920.997	56888.2	24675.7	23.4492
8	861.848	915.702	70823.1	30720.1	23.4492
9	871.001	910.407	85337.7	37015.9	23.4492
10	880.154	905.112	100466	43578	23.4492
11	889.307	899.817	116216	50409.6	23.4492
12	898.46	894.522	132585	57509.8	23.4492
13	907.613	889.227	149542	64865	23.4492
14	916.766	883.932	167056	72461.8	23.4492
15	925.919	878.637	185070	80275.3	23.4491
16	935.072	873.342	203528	88281.7	23.4491
17	944.225	868.047	222404	96469.3	23.4491
18	953.21	862.852	241355	104689	23.449
19	962.195	857.658	260810	113128	23.4491
20	971.18	852.463	280853	121822	23.4491
21	980.34	847.171	301968	130981	23.4492
22	989.5	841.879	323834	140466	23.4492
23	998.66	836.587	346504	150299	23.4492
24	1007.82	831.295	369988	160485	23.4491
25	1016.98	826.004	394283	171023	23.4491
26	1026.14	820.712	419355	181898	23.4491
27	1035.3	815.42	445155	193089	23.4491
28	1044.46	810.128	471620	204569	23.4492
29	1054.26	808.393	451170	195698	23.4491
30	1064.05	806.659	431262	187063	23.4491
31	1073.85	804.924	411913	178670	23.4491
32	1083.64	803.19	393130	170523	23.4491
33	1093.44	801.456	374912	162621	23.4492
34	1103.23	799.721	357252	154961	23.4492
35	1113.03	797.987	340138	147538	23.4492
36	1122.82	796.252	323555	140344	23.4491
37	1132.61	796.085	290842	126155	23.4492
38	1142.4	795.917	260103	112822	23.4492
39	1152.19	795.749	231276	100318	23.4492
40	1161.98	795.581	204293	88613.6	23.4491
41	1171.77	795.413	179083	77678.5	23.4491
42	1181.56	795.246	155596	67491.1	23.4492
43	1191.35	795.078	133782	58029	23.4492
44	1201.14	794.91	113589	49270.3	23.4492
45	1210.93	794.742	94982.5	41199.4	23.4492
46	1220.72	794.574	77919.2	33798.1	23.4492
47	1230.51	794.407	62354.5	27046.8	23.4492
48	1240.56	796.147	38434.4	16671.2	23.4491
49	1250.62	797.888	19510.6	8462.87	23.4492
50	1260.67	799.629	5464.25	2370.16	23.4492
51	1270.73	801.369	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

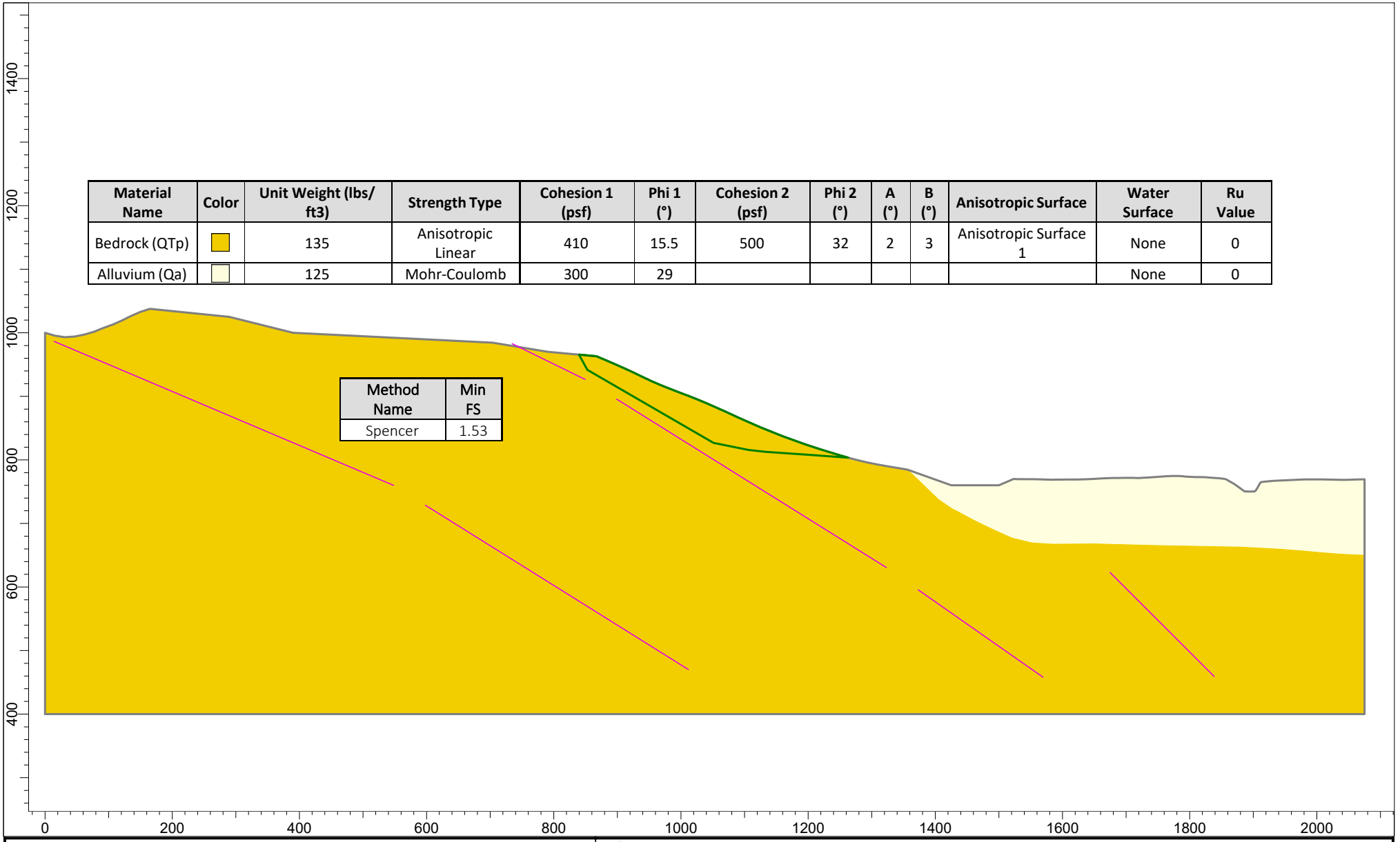
Shared Entities

Type	Coordinates (x,y)
	0, 400 2075, 400 2075, 650 2075, 769.431 2067.46, 769.191 2059.92, 768.929 2052.38, 768.694 2044.84, 768.54 2037.3, 768.512 2029.75, 768.601 2022.2, 768.761 2014.66, 768.948 2007.12, 769.117 1999.59, 769.224 1992.07, 769.228 1984.55, 769.122 1977.04, 768.928 1969.51, 768.668 1961.97, 768.363 1954.4, 768.035 1946.79, 767.706 1939.17, 767.354 1931.61, 766.891 1924.18, 766.22 1916.66, 765.501 1911.85, 764.818 1910.23, 762.613 1906.61, 756.019 1904.17, 752.108 1903.17, 750.93 1901.96, 750.244 1894.38, 750.021 1886.65, 750.182 1884.63, 751.432 1880.64, 754.46 1874.56, 758.924 1868.27, 763.108 1861.67, 766.747 1858.33, 768.798 1854.82, 770.14 1847.18, 770.955 1839.67, 771.428 1832.15, 772.001 1824.62, 772.648 1817.06, 772.914 1809.51, 772.81 1801.9, 773.154 1794.23, 773.584 1786.9, 774.372 1779.37, 774.531 1771.85, 774.483 1764.32, 774.202 1756.79, 773.753 1749.27, 773.212

External Boundary	1741.74, 772.658 1734.2, 772.168 1726.67, 771.819 1719.13, 771.23 1711.59, 771.548 1704.04, 771.535 1696.5, 771.54 1688.95, 771.514 1681.41, 771.409 1673.87, 771.192 1666.34, 770.883 1658.8, 770.515 1651.27, 770.123 1643.73, 769.741 1636.2, 769.403 1628.66, 769.145 1621.12, 768.996 1613.58, 768.945 1606.04, 768.935 1598.5, 768.912 1590.95, 768.82 1583.41, 768.687 1575.87, 768.817 1568.33, 769.144 1560.79, 769.344 1553.25, 769.491 1545.71, 769.574 1538.17, 769.569 1530.62, 769.618 1523.09, 769.872 1500, 760 1425, 760 1358.97, 783.533 1355.99, 784.592 1340.4, 787.304 1324.78, 789.861 1309.19, 792.618 1293.67, 795.751 1278.27, 799.373 1262.96, 803.427 1247.74, 807.807 1232.59, 812.405 1217.49, 817.172 1202.46, 822.107 1187.47, 827.214 1172.55, 832.504 1157.71, 838.007 1142.96, 843.755 1128.32, 849.774 1113.78, 856.028 1099.31, 862.452 1084.89, 868.984 1070.48, 875.558 1056.06, 882.083 1041.57, 888.452 1026.97, 894.556 1012.24, 900.359 997.458, 906.016 982.687, 911.712

	968.006, 917.635 953.486, 923.94 939.163, 930.675 924.894, 937.53 910.515, 944.147 896.032, 950.538 894.344, 951.265 881.493, 956.796 866.953, 963.054 852.472, 969.445 838.111, 976.11 790, 980 590, 990 390, 1000 290, 1025 165.066, 1037.52 149.94, 1032.77 135.41, 1026.55 121.321, 1019.29 106.836, 1012.97 91.9272, 1007.63 77.2456, 1001.72 62.0853, 997.15 46.5553, 994.078 30.7511, 992.925 15.1827, 995.473 0, 1000 0, 457.856
Material Boundary	1358.97, 783.533 1405.42, 738.845 1432.22, 720.215 1461.04, 704.79 1490.63, 690.419 1520.6, 677.065 1552.23, 669.33 1584.89, 667.203 1650.32, 667.764 1683.01, 667.015 1748.39, 665.186 1879.2, 662.762 1944.52, 659.328 1977.13, 656.606 2009.72, 653.733 2042.34, 651.325 2075, 650

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 1	None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0



Method Name	Min FS
Spencer	1.53

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 5-5'; Static; Non-circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SP1S1E.slmd
		Scale	1:2500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 10

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.52936 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.52936 7
Entity Information 7
    Non-Circular Search (Cuckoo) 7
        Shared Entities 7

Slide2 Analysis Information

SP1S1E

Project Summary

File Name:	SP1S1E.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:06.154s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 5-5'; Static; Non-circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.529360
Axis Location:	1213.380, 1307.728
Left Slip Surface Endpoint:	839.688, 965.483
Right Slip Surface Endpoint:	1262.961, 803.427
Resisting Moment:	5.21894e+08 lb-ft
Driving Moment:	3.4125e+08 lb-ft
Resisting Horizontal Force:	977106 lb
Driving Horizontal Force:	638898 lb
Total Slice Area:	14337.9 ft2
Surface Horizontal Width:	423.273 ft
Surface Average Height:	33.8739 ft

Global Minimum Coordinates

Method: spencer

X	Y
839.688	965.483
852.932	941.582
980.779	867.526
1051.32	826.687
1106.27	815.619
1133.05	812.647
1208.4	807.297
1262.96	803.427

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	23023
Number of Invalid Surfaces:	2028

Error Codes

Error Code -108 reported for 138 surfaces
Error Code -111 reported for 617 surfaces
Error Code -112 reported for 242 surfaces
Error Code -121 reported for 266 surfaces
Error Code -145 reported for 34 surfaces
Error Code -1000 reported for 731 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.52936

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	6.62222	5072.69	-61.0071	Bedrock (QTp)	500	32	377.453	577.261	123.644	0	123.644	804.786	804.786
2	6.62222	15218.1	-61.0071	Bedrock (QTp)	500	32	662.323	1012.93	820.86	0	820.86	2016.07	2016.07
3	8.52311	28509.7	-30.0819	Bedrock (QTp)	410	15.5	746.049	1140.98	2635.83	0	2635.83	3067.98	3067.98
4	8.52311	33097	-30.0819	Bedrock (QTp)	410	15.5	824.438	1260.86	3068.11	0	3068.11	3545.67	3545.67
5	8.52311	35279.5	-30.0819	Bedrock (QTp)	410	15.5	861.734	1317.9	3273.79	0	3273.79	3772.96	3772.96
6	8.52311	36757.4	-30.0819	Bedrock (QTp)	410	15.5	886.99	1356.53	3413.06	0	3413.06	3926.86	3926.86
7	8.52311	38218.1	-30.0819	Bedrock (QTp)	410	15.5	911.95	1394.7	3550.72	0	3550.72	4078.97	4078.97
8	8.52311	39630.3	-30.0819	Bedrock (QTp)	410	15.5	936.084	1431.61	3683.8	0	3683.8	4226.03	4226.03
9	8.52311	40978.6	-30.0819	Bedrock (QTp)	410	15.5	959.12	1466.84	3810.86	0	3810.86	4366.44	4366.44
10	8.52311	42199	-30.0819	Bedrock (QTp)	410	15.5	979.979	1498.74	3925.86	0	3925.86	4493.53	4493.53
11	8.52311	43335.5	-30.0819	Bedrock (QTp)	410	15.5	999.398	1528.44	4032.96	0	4032.96	4611.87	4611.87
12	8.52311	44324.2	-30.0819	Bedrock (QTp)	410	15.5	1016.29	1554.28	4126.13	0	4126.13	4714.83	4714.83
13	8.52311	45332.5	-30.0819	Bedrock (QTp)	410	15.5	1033.52	1580.63	4221.16	0	4221.16	4819.84	4819.84
14	8.52311	46408.5	-30.0819	Bedrock (QTp)	410	15.5	1051.91	1608.75	4322.55	0	4322.55	4931.88	4931.88

15	8.52311	47718.7	-30.0819	Bedrock (QTp)	410	15.5	1074.3	1642.99	4446.03	0	4446.03	5068.33	5068.33
16	8.52311	49178.7	-30.0819	Bedrock (QTp)	410	15.5	1099.25	1681.15	4583.62	0	4583.62	5220.37	5220.37
17	8.52311	50864.9	-30.0819	Bedrock (QTp)	410	15.5	1128.07	1725.22	4742.52	0	4742.52	5395.97	5395.97
18	8.81819	54496.2	-30.0668	Bedrock (QTp)	410	15.5	1159.1	1772.68	4913.66	0	4913.66	5584.67	5584.67
19	8.81819	56520.6	-30.0668	Bedrock (QTp)	410	15.5	1192.54	1823.83	5098.08	0	5098.08	5788.46	5788.46
20	8.81819	58568.7	-30.0668	Bedrock (QTp)	410	15.5	1226.38	1875.57	5284.67	0	5284.67	5994.63	5994.63
21	8.81819	60618.5	-30.0668	Bedrock (QTp)	410	15.5	1260.23	1927.35	5471.39	0	5471.39	6200.95	6200.95
22	8.81819	62577.9	-30.0668	Bedrock (QTp)	410	15.5	1292.6	1976.85	5649.89	0	5649.89	6398.19	6398.19
23	8.81819	64444.6	-30.0668	Bedrock (QTp)	410	15.5	1323.44	2024.01	5819.94	0	5819.94	6586.09	6586.09
24	8.81819	66138.4	-30.0668	Bedrock (QTp)	410	15.5	1351.42	2066.81	5974.24	0	5974.24	6756.59	6756.59
25	8.81819	67691.3	-30.0668	Bedrock (QTp)	410	15.5	1377.07	2106.04	6115.71	0	6115.71	6912.9	6912.9
26	7.84905	59904.6	-11.3895	Bedrock (QTp)	500	32	3439.88	5260.82	7618.91	0	7618.91	8311.86	8311.86
27	7.84905	57837.2	-11.3895	Bedrock (QTp)	500	32	3333.16	5097.6	7357.69	0	7357.69	8029.14	8029.14
28	7.84905	55745.2	-11.3895	Bedrock (QTp)	500	32	3225.16	4932.43	7093.38	0	7093.38	7743.07	7743.07
29	7.84905	53628.4	-11.3895	Bedrock (QTp)	500	32	3115.89	4765.31	6825.91	0	6825.91	7453.59	7453.59
30	7.84905	51516	-11.3895	Bedrock (QTp)	500	32	3006.83	4598.53	6559.01	0	6559.01	7164.73	7164.73
31	7.84905	49424	-11.3895	Bedrock (QTp)	500	32	2898.83	4433.35	6294.67	0	6294.67	6878.63	6878.63
32	7.84905	47361.9	-11.3895	Bedrock (QTp)	500	32	2792.37	4270.54	6034.13	0	6034.13	6596.64	6596.64
33	8.9286	50937.6	-6.3296	Bedrock (QTp)	500	32	2842.37	4347	6156.48	0	6156.48	6471.77	6471.77
34	8.9286	47449.7	-6.3296	Bedrock (QTp)	500	32	2672.49	4087.2	5740.72	0	5740.72	6037.17	6037.17
35	8.9286	44043.4	-6.3296	Bedrock (QTp)	500	32	2506.6	3833.49	5334.69	0	5334.69	5612.74	5612.74
36	8.37165	38150.5	-4.06206	Bedrock (QTp)	500	32	2415.77	3694.58	5112.39	0	5112.39	5283.95	5283.95
37	8.37165	34999.3	-4.06206	Bedrock (QTp)	500	32	2246.66	3435.95	4698.51	0	4698.51	4858.05	4858.05
38	8.37165	31980	-4.06206	Bedrock (QTp)	500	32	2084.63	3188.15	4301.94	0	4301.94	4449.98	4449.98
39	8.37165	29063.9	-4.06206	Bedrock (QTp)	500	32	1928.13	2948.81	3918.92	0	3918.92	4055.84	4055.84
40	8.37165	26234.5	-4.06206	Bedrock (QTp)	500	32	1776.29	2716.59	3547.3	0	3547.3	3673.44	3673.44
41	8.37165	23512.9	-4.06206	Bedrock (QTp)	500	32	1630.24	2493.23	3189.83	0	3189.83	3305.6	3305.6
42	8.37165	20847	-4.06206	Bedrock (QTp)	500	32	1487.18	2274.43	2839.68	0	2839.68	2945.3	2945.3
43	8.37165	18278.1	-4.06206	Bedrock (QTp)	500	32	1349.32	2063.59	2502.27	0	2502.27	2598.09	2598.09
44	8.37165	15755.5	-4.06206	Bedrock (QTp)	500	32	1213.95	1856.56	2170.94	0	2170.94	2257.15	2257.15
45	9.09377	14351.6	-4.05664	Bedrock (QTp)	500	32	1077.52	1647.91	1837.04	0	1837.04	1913.46	1913.46
46	9.09377	11548.8	-4.05664	Bedrock (QTp)	500	32	939.042	1436.13	1498.12	0	1498.12	1564.72	1564.72
47	9.09377	8823.2	-4.05664	Bedrock (QTp)	500	32	804.377	1230.18	1168.54	0	1168.54	1225.58	1225.58
48	9.09377	6196.98	-4.05664	Bedrock (QTp)	500	32	674.623	1031.74	850.966	0	850.966	898.81	898.81
49	9.09377	3640.49	-4.05664	Bedrock (QTp)	500	32	548.314	838.57	541.827	0	541.827	580.713	580.713
50	9.09377	1210.38	-4.05664	Bedrock (QTp)	500	32	429.406	656.717	250.799	0	250.799	281.253	281.253

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.52936

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	839.688	965.483	0	0	0
2	846.31	953.533	-1015.58	-360.776	19.5571
3	852.932	941.582	4419.18	1569.88	19.5572
4	861.456	936.645	11090.1	3939.68	19.5572
5	869.979	931.708	19228.9	6830.92	19.5572
6	878.502	926.771	28066.1	9970.25	19.5572
7	887.025	921.834	37376.2	13277.6	19.5572
8	895.548	916.897	47153.6	16751	19.5572
9	904.071	911.96	57383	20384.9	19.5572
10	912.594	907.023	68043.8	24172	19.5572
11	921.117	902.086	79095.1	28097.9	19.5572
12	929.64	897.149	90510.1	32153	19.5572
13	938.164	892.211	102241	36320.4	19.5572
14	946.687	887.274	114295	40602.5	19.5572
15	955.21	882.337	126694	45006.9	19.5571
16	963.733	877.4	139511	49560.2	19.5572
17	972.256	872.463	152796	54279.5	19.5572
18	980.779	867.526	166620	59190.5	19.5572
19	989.597	862.421	181509	64479.7	19.5572
20	998.415	857.316	197045	69998.8	19.5572
21	1007.23	852.211	213236	75750.5	19.5572
22	1016.05	847.106	230083	81735.1	19.5572
23	1024.87	842.001	247556	87942.3	19.5572
24	1033.69	836.897	265626	94361.5	19.5572
25	1042.51	831.792	284237	100973	19.5572
26	1051.32	826.687	303345	107761	19.5572
27	1059.17	825.106	288462	102474	19.5572
28	1067.02	823.524	274000	97336.4	19.5572
29	1074.87	821.943	259966	92351	19.5572
30	1082.72	820.362	246365	87519.3	19.5572
31	1090.57	818.781	233196	82841	19.5572
32	1098.42	817.2	220454	78314.6	19.5572
33	1106.27	815.619	208134	73937.9	19.5572
34	1115.2	814.628	188918	67111.6	19.5572
35	1124.13	813.638	170803	60676.5	19.5572
36	1133.05	812.647	153764	54623.3	19.5571
37	1141.43	812.053	136631	48537.1	19.5572
38	1149.8	811.458	120664	42865.1	19.5573
39	1158.17	810.864	105815	37590	19.5572
40	1166.54	810.269	92044.7	32698.1	19.5572
41	1174.91	809.675	79321.3	28178.2	19.5571
42	1183.28	809.08	67604.9	24016.1	19.5572
43	1191.66	808.486	56874.9	20204.4	19.5572
44	1200.03	807.891	47095.5	16730.3	19.5572
45	1208.4	807.297	38249.6	13587.9	19.5572
46	1217.49	806.652	29660.8	10536.8	19.5572
47	1226.59	806.007	22109.5	7854.22	19.5572
48	1235.68	805.362	15567.1	5530.08	19.5571
49	1244.77	804.717	9996.77	3551.27	19.5572
50	1253.87	804.072	5372.76	1908.63	19.5572
51	1262.96	803.427	0	0	0

Entity Information

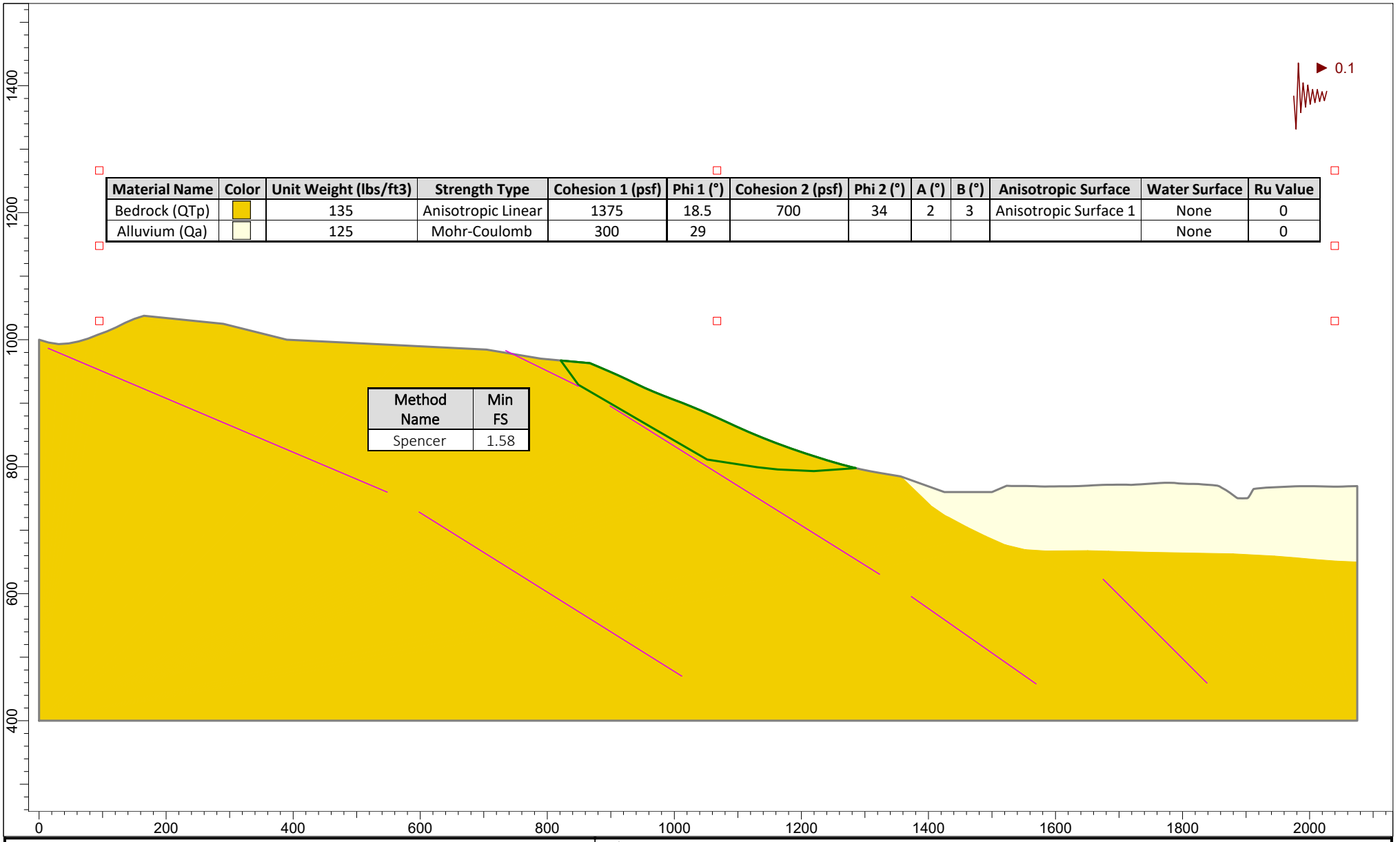
Non-Circular Search (Cuckoo)

Shared Entities

Type	Coordinates (x,y)
	0, 400 2075, 400 2075, 650 2075, 769.431 2067.46, 769.191 2059.92, 768.929 2052.38, 768.694 2044.84, 768.54 2037.3, 768.512 2029.75, 768.601 2022.2, 768.761 2014.66, 768.948 2007.12, 769.117 1999.59, 769.224 1992.07, 769.228 1984.55, 769.122 1977.04, 768.928 1969.51, 768.668 1961.97, 768.363 1954.4, 768.035 1946.79, 767.706 1939.17, 767.354 1931.61, 766.891 1924.18, 766.22 1916.66, 765.501 1911.85, 764.818 1910.23, 762.613 1906.61, 756.019 1904.17, 752.108 1903.17, 750.93 1901.96, 750.244 1894.38, 750.021 1886.65, 750.182 1884.63, 751.432 1880.64, 754.46 1874.56, 758.924 1868.27, 763.108 1861.67, 766.747 1858.33, 768.798 1854.82, 770.14 1847.18, 770.955 1839.67, 771.428 1832.15, 772.001 1824.62, 772.648 1817.06, 772.914 1809.51, 772.81 1801.9, 773.154 1794.23, 773.584 1786.9, 774.372 1779.37, 774.531 1771.85, 774.483 1764.32, 774.202 1756.79, 773.753 1749.27, 773.212 1741.74, 772.658 1734.2, 772.168 1726.67, 771.819 1719.13, 771.23

External Boundary	1711.59, 771.548 1704.04, 771.535 1696.5, 771.54 1688.95, 771.514 1681.41, 771.409 1673.87, 771.192 1666.34, 770.883 1658.8, 770.515 1651.27, 770.123 1643.73, 769.741 1636.2, 769.403 1628.66, 769.145 1621.12, 768.996 1613.58, 768.945 1606.04, 768.935 1598.5, 768.912 1590.95, 768.82 1583.41, 768.687 1575.87, 768.817 1568.33, 769.144 1560.79, 769.344 1553.25, 769.491 1545.71, 769.574 1538.17, 769.569 1530.62, 769.618 1523.09, 769.872 1500, 760 1425, 760 1358.97, 783.533 1355.99, 784.592 1340.4, 787.304 1324.78, 789.861 1309.19, 792.618 1293.67, 795.751 1278.27, 799.373 1262.96, 803.427 1247.74, 807.807 1232.59, 812.405 1217.49, 817.172 1202.46, 822.107 1187.47, 827.214 1172.55, 832.504 1157.71, 838.007 1142.96, 843.755 1128.32, 849.774 1113.78, 856.028 1099.31, 862.452 1084.89, 868.984 1070.48, 875.558 1056.06, 882.083 1041.57, 888.452 1026.97, 894.556 1012.24, 900.359 997.458, 906.016 982.687, 911.712 968.006, 917.635 953.486, 923.94 939.163, 930.675 924.894, 937.53

	910.515, 944.147 896.032, 950.538 894.344, 951.265 881.493, 956.796 867, 963 790, 970 704.281, 984.286 590, 990 390, 1000 290, 1025 165.066, 1037.52 149.94, 1032.77 135.41, 1026.55 121.321, 1019.29 106.836, 1012.97 91.9272, 1007.63 77.2456, 1001.72 62.0853, 997.15 46.5553, 994.078 30.7511, 992.925 15.1827, 995.473 0, 1000 0, 457.856
Material Boundary	1358.97, 783.533 1405.42, 738.845 1432.22, 720.215 1461.04, 704.79 1490.63, 690.419 1520.6, 677.065 1552.23, 669.33 1584.89, 667.203 1650.32, 667.764 1683.01, 667.015 1748.39, 665.186 1879.2, 662.762 1944.52, 659.328 1977.13, 656.606 2009.72, 653.733 2042.34, 651.325 2075, 650



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	1375	18.5	700	34	2	3	Anisotropic Surface 1	None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0

Method Name	Min FS
Spencer	1.58

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 5-5'; Pseudo-Static; Non-circular		
Client	Solstra Communities California, LLC	*Drawn By*	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	*File Name*	SP1S1E_s.slmd
		Scale	1:2500
Project No.:	23-2195s-1	*Date:* 10/13/2023	*Run Number* Run No. 11

Slide2 Analysis Information

SP1S1E_s

Project Summary

File Name:	SP1S1E_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:07.668s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 5-5'; Pseudo-Static; Non-circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	1375 psf
Phi 1	18.5 °
A	2 °
Cohesion 2	700 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.580950
Axis Location:	1222.857, 1346.880
Left Slip Surface Endpoint:	821.107, 967.172
Right Slip Surface Endpoint:	1285.573, 797.655
Resisting Moment:	1.03765e+09 lb-ft
Driving Moment:	6.56345e+08 lb-ft
Resisting Horizontal Force:	1.74158e+06 lb
Driving Horizontal Force:	1.10161e+06 lb
Total Slice Area:	20757.7 ft2
Surface Horizontal Width:	464.467 ft
Surface Average Height:	44.6915 ft

Global Minimum Coordinates

Method: spencer

X	Y
821.107	967.172
848.874	928.876
971.84	857.454
1051.59	811.167
1130.75	799.116
1162.6	795.61
1219.53	792.948
1285.57	797.655

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	22591
Number of Invalid Surfaces:	2460

Error Codes

Error Code -108 reported for 126 surfaces
Error Code -111 reported for 793 surfaces
Error Code -112 reported for 213 surfaces
Error Code -121 reported for 405 surfaces
Error Code -124 reported for 2 surfaces
Error Code -145 reported for 23 surfaces
Error Code -1000 reported for 898 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.58095

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	9.25588	7449.77	-54.0551	Bedrock (QTp)	700	34	513.148	811.262	164.953	0	164.953	872.671	872.671
2	9.25588	22349.3	-54.0551	Bedrock (QTp)	700	34	846.697	1338.59	946.745	0	946.745	2114.48	2114.48
3	9.25588	37248.9	-54.0551	Bedrock (QTp)	700	34	1180.25	1865.91	1728.53	0	1728.53	3356.29	3356.29
4	9.4589	48637.8	-30.1491	Bedrock (QTp)	1375	18.5	1659.98	2624.34	3733.88	0	3733.88	4698.04	4698.04
5	9.4589	54541	-30.1491	Bedrock (QTp)	1375	18.5	1758.85	2780.66	4201.06	0	4201.06	5222.65	5222.65
6	9.4589	58095.7	-30.1491	Bedrock (QTp)	1375	18.5	1818.39	2874.79	4482.39	0	4482.39	5538.55	5538.55
7	9.4589	59936.6	-30.1491	Bedrock (QTp)	1375	18.5	1849.22	2923.53	4628.08	0	4628.08	5702.15	5702.15
8	9.4589	61755.7	-30.1491	Bedrock (QTp)	1375	18.5	1879.69	2971.7	4772.05	0	4772.05	5863.82	5863.82
9	9.4589	63504.9	-30.1491	Bedrock (QTp)	1375	18.5	1908.99	3018.02	4910.48	0	4910.48	6019.27	6019.27
10	9.4589	65164.2	-30.1491	Bedrock (QTp)	1375	18.5	1936.78	3061.96	5041.8	0	5041.8	6166.73	6166.73
11	9.4589	66651.3	-30.1491	Bedrock (QTp)	1375	18.5	1961.69	3101.34	5159.48	0	5159.48	6298.88	6298.88
12	9.4589	67994.7	-30.1491	Bedrock (QTp)	1375	18.5	1984.19	3136.91	5265.8	0	5265.8	6418.27	6418.27

13	9.4589	69220.3	-30.1491	Bedrock (QTp)	1375	18.5	2004.73	3169.37	5362.8	0	5362.8	6527.19	6527.19
14	9.4589	70538.1	-30.1491	Bedrock (QTp)	1375	18.5	2026.79	3204.26	5467.09	0	5467.09	6644.3	6644.3
15	9.4589	72066.4	-30.1491	Bedrock (QTp)	1375	18.5	2052.39	3244.73	5588.04	0	5588.04	6780.12	6780.12
16	9.4589	73867.1	-30.1491	Bedrock (QTp)	1375	18.5	2082.56	3292.42	5730.55	0	5730.55	6940.15	6940.15
17	8.8607	71075.5	-30.1323	Bedrock (QTp)	1375	18.5	2116.46	3346.02	5890.75	0	5890.75	7119.22	7119.22
18	8.8607	73008.1	-30.1323	Bedrock (QTp)	1375	18.5	2151.02	3400.66	6054.06	0	6054.06	7302.59	7302.59
19	8.8607	75068	-30.1323	Bedrock (QTp)	1375	18.5	2187.86	3458.9	6228.12	0	6228.12	7498.03	7498.03
20	8.8607	77152.1	-30.1323	Bedrock (QTp)	1375	18.5	2225.14	3517.83	6404.23	0	6404.23	7695.77	7695.77
21	8.8607	79237.4	-30.1323	Bedrock (QTp)	1375	18.5	2262.42	3576.78	6580.44	0	6580.44	7893.63	7893.63
22	8.8607	81231.4	-30.1323	Bedrock (QTp)	1375	18.5	2298.09	3633.16	6748.93	0	6748.93	8082.81	8082.81
23	8.8607	83129.1	-30.1323	Bedrock (QTp)	1375	18.5	2332.02	3686.81	6909.29	0	6909.29	8262.87	8262.87
24	8.8607	84853.9	-30.1323	Bedrock (QTp)	1375	18.5	2362.87	3735.58	7055.02	0	7055.02	8426.51	8426.51
25	8.8607	86433.1	-30.1323	Bedrock (QTp)	1375	18.5	2391.11	3780.23	7188.47	0	7188.47	8576.35	8576.35
26	8.7961	85027.7	-8.65548	Bedrock (QTp)	700	34	4669.11	7381.63	9905.92	0	9905.92	10616.7	10616.7
27	8.7961	81910.2	-8.65548	Bedrock (QTp)	700	34	4516.17	7139.84	9547.45	0	9547.45	10234.9	10234.9
28	8.7961	78760.2	-8.65548	Bedrock (QTp)	700	34	4361.64	6895.53	9185.25	0	9185.25	9849.2	9849.2
29	8.7961	75585	-8.65548	Bedrock (QTp)	700	34	4205.86	6649.26	8820.14	0	8820.14	9460.39	9460.39
30	8.7961	72433.6	-8.65548	Bedrock (QTp)	700	34	4051.26	6404.84	8457.78	0	8457.78	9074.49	9074.49
31	8.7961	69308.7	-8.65548	Bedrock (QTp)	700	34	3897.96	6162.48	8098.46	0	8098.46	8691.83	8691.83
32	8.7961	66252.6	-8.65548	Bedrock (QTp)	700	34	3748.04	5925.46	7747.06	0	7747.06	8317.61	8317.61
33	8.7961	63267.8	-8.65548	Bedrock (QTp)	700	34	3601.6	5693.95	7403.83	0	7403.83	7952.09	7952.09
34	8.7961	60372.7	-8.65548	Bedrock (QTp)	700	34	3459.58	5469.42	7070.95	0	7070.95	7597.59	7597.59
35	10.6176	68888.6	-6.28161	Bedrock (QTp)	700	34	3418.07	5403.8	6973.67	0	6973.67	7349.92	7349.92
36	10.6176	64423.3	-6.28161	Bedrock (QTp)	700	34	3229.47	5105.63	6531.62	0	6531.62	6887.1	6887.1
37	10.6176	60193.3	-6.28161	Bedrock (QTp)	700	34	3050.81	4823.18	6112.87	0	6112.87	6448.69	6448.69
38	9.4884	50012.7	-2.67708	Bedrock (QTp)	700	34	3036.53	4800.61	6079.4	0	6079.4	6221.38	6221.38
39	9.4884	46164.7	-2.67708	Bedrock (QTp)	700	34	2843.37	4495.23	5626.66	0	5626.66	5759.6	5759.6
40	9.4884	42436.3	-2.67708	Bedrock (QTp)	700	34	2656.21	4199.34	5187.98	0	5187.98	5312.18	5312.18
41	9.4884	38830.2	-2.67708	Bedrock (QTp)	700	34	2475.19	3913.15	4763.7	0	4763.7	4879.44	4879.44
42	9.4884	35305.3	-2.67708	Bedrock (QTp)	700	34	2298.25	3633.42	4348.97	0	4348.97	4456.44	4456.44
43	9.4884	31885.4	-2.67708	Bedrock (QTp)	700	34	2126.58	3362.01	3946.6	0	3946.6	4046.03	4046.03
44	9.43413	27706.2	4.07686	Bedrock (QTp)	700	34	2142.73	3387.55	3984.45	0	3984.45	3831.73	3831.73
45	9.43413	23083.7	4.07686	Bedrock (QTp)	700	34	1879.43	2971.28	3367.32	0	3367.32	3233.36	3233.36
46	9.43413	18570	4.07686	Bedrock (QTp)	700	34	1622.32	2564.81	2764.7	0	2764.7	2649.07	2649.07
47	9.43413	14163.5	4.07686	Bedrock (QTp)	700	34	1371.33	2168	2176.4	0	2176.4	2078.66	2078.66
48	9.43413	9871.22	4.07686	Bedrock (QTp)	700	34	1126.83	1781.46	1603.33	0	1603.33	1523.02	1523.02
49	9.43413	5781.57	4.07686	Bedrock (QTp)	700	34	893.88	1413.18	1057.33	0	1057.33	993.62	993.62

50	9.43413	1849.5	4.07686	Bedrock (QTp)	700	34	676.234	1069.09	547.202	0	547.202	499.004	499.004

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.58095

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	821.107	967.172	0	0	0
2	830.362	954.407	-1903.36	-816.241	23.2117
3	839.618	941.641	4573	1961.1	23.2117
4	848.874	928.876	19429.1	8332.02	23.2117
5	858.333	923.382	29090.6	12475.3	23.2117
6	867.792	917.888	40973	17571	23.2118
7	877.251	912.394	54192.8	23240.2	23.2117
8	886.71	906.9	68105.2	29206.4	23.2117
9	896.169	901.406	82701.9	35466.1	23.2117
10	905.628	895.912	97956.8	42008.1	23.2117
11	915.086	890.418	113836	48817.7	23.2117
12	924.545	884.924	130274	55867.2	23.2118
13	934.004	879.43	147218	63133.5	23.2118
14	943.463	873.936	164623	70597.6	23.2118
15	952.922	868.442	182524	78274.2	23.2118
16	962.381	862.948	201000	86197.4	23.2117
17	971.84	857.454	220153	94411.2	23.2118
18	980.701	852.311	238787	102402	23.2117
19	989.561	847.168	258147	110704	23.2116
20	998.422	842.025	278281	119339	23.2118
21	1007.28	836.882	299199	128309	23.2117
22	1016.14	831.739	320901	137616	23.2117
23	1025	826.596	343353	147245	23.2118
24	1033.86	821.453	366518	157179	23.2118
25	1042.73	816.31	390332	167391	23.2117
26	1051.59	811.167	414740	177858	23.2117
27	1060.38	809.828	395399	169564	23.2117
28	1069.18	808.489	376612	161508	23.2118
29	1077.97	807.15	358387	153692	23.2118
30	1086.77	805.811	340726	146118	23.2117
31	1095.57	804.472	323626	138785	23.2118
32	1104.36	803.133	307082	131690	23.2117
33	1113.16	801.794	291082	124829	23.2118
34	1121.95	800.455	275614	118195	23.2117
35	1130.75	799.116	260660	111782	23.2117
36	1141.37	797.947	239374	102654	23.2118
37	1151.99	796.778	219129	93972.1	23.2118
38	1162.6	795.61	199871	85713.2	23.2117
39	1172.09	795.166	178731	76647.4	23.2117
40	1181.58	794.722	158840	68117.3	23.2117
41	1191.07	794.279	140159	60106	23.2117
42	1200.56	793.835	122648	52596.6	23.2117
43	1210.05	793.391	106281	45577.8	23.2117
44	1219.53	792.948	91023.9	39035	23.2118
45	1228.97	793.62	70881.9	30397.2	23.2117
46	1238.4	794.293	53178.9	22805.4	23.2117
47	1247.84	794.965	37857.6	16235	23.2118
48	1257.27	795.637	24861.3	10661.6	23.2117
49	1266.71	796.31	14129.8	6059.48	23.2118
50	1276.14	796.982	5556.28	2382.77	23.2117
51	1285.57	797.655	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

Shared Entities

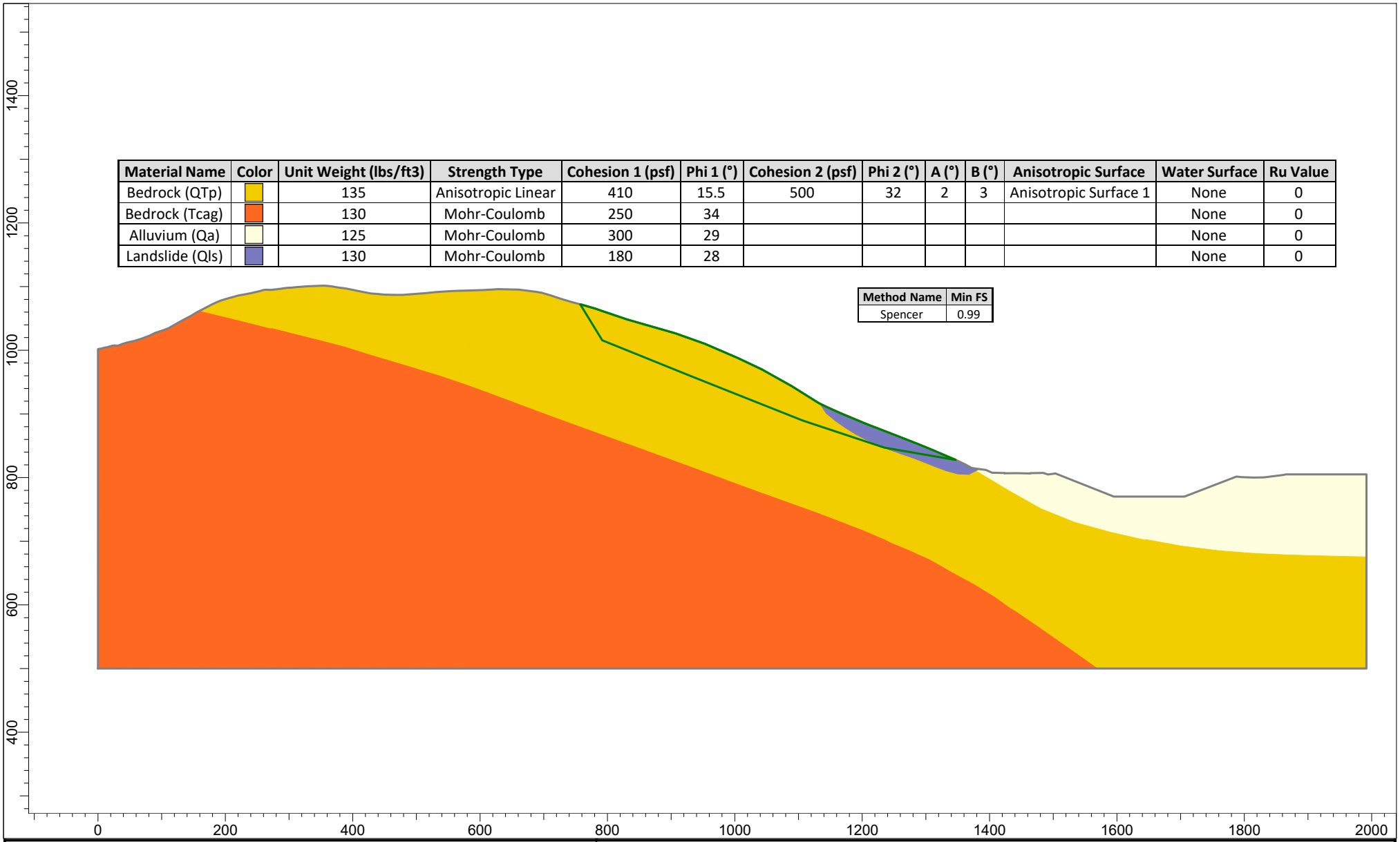
Type	Coordinates (x,y)
	0, 400 2075, 400 2075, 650 2075, 769.431 2067.46, 769.191 2059.92, 768.929 2052.38, 768.694 2044.84, 768.54 2037.3, 768.512 2029.75, 768.601 2022.2, 768.761 2014.66, 768.948 2007.12, 769.117 1999.59, 769.224 1992.07, 769.228 1984.55, 769.122 1977.04, 768.928 1969.51, 768.668 1961.97, 768.363 1954.4, 768.035 1946.79, 767.706 1939.17, 767.354 1931.61, 766.891 1924.18, 766.22 1916.66, 765.501 1911.85, 764.818 1910.23, 762.613 1906.61, 756.019 1904.17, 752.108 1903.17, 750.93 1901.96, 750.244 1894.38, 750.021 1886.65, 750.182 1884.63, 751.432 1880.64, 754.46 1874.56, 758.924 1868.27, 763.108 1861.67, 766.747 1858.33, 768.798 1854.82, 770.14 1847.18, 770.955 1839.67, 771.428 1832.15, 772.001 1824.62, 772.648 1817.06, 772.914 1809.51, 772.81 1801.9, 773.154 1794.23, 773.584 1786.9, 774.372 1779.37, 774.531 1771.85, 774.483 1764.32, 774.202 1756.79, 773.753 1749.27, 773.212

External Boundary	1741.74, 772.658 1734.2, 772.168 1726.67, 771.819 1719.13, 771.23 1711.59, 771.548 1704.04, 771.535 1696.5, 771.54 1688.95, 771.514 1681.41, 771.409 1673.87, 771.192 1666.34, 770.883 1658.8, 770.515 1651.27, 770.123 1643.73, 769.741 1636.2, 769.403 1628.66, 769.145 1621.12, 768.996 1613.58, 768.945 1606.04, 768.935 1598.5, 768.912 1590.95, 768.82 1583.41, 768.687 1575.87, 768.817 1568.33, 769.144 1560.79, 769.344 1553.25, 769.491 1545.71, 769.574 1538.17, 769.569 1530.62, 769.618 1523.09, 769.872 1500, 760 1425, 760 1358.97, 783.533 1355.99, 784.592 1340.4, 787.304 1324.78, 789.861 1309.19, 792.618 1293.67, 795.751 1278.27, 799.373 1262.96, 803.427 1247.74, 807.807 1232.59, 812.405 1217.49, 817.172 1202.46, 822.107 1187.47, 827.214 1172.55, 832.504 1157.71, 838.007 1142.96, 843.755 1128.32, 849.774 1113.78, 856.028 1099.31, 862.452 1084.89, 868.984 1070.48, 875.558 1056.06, 882.083 1041.57, 888.452 1026.97, 894.556 1012.24, 900.359 997.458, 906.016 982.687, 911.712

	968.006, 917.635 953.486, 923.94 939.163, 930.675 924.894, 937.53 910.515, 944.147 896.032, 950.538 894.344, 951.265 881.493, 956.796 867, 963 790, 970 704.281, 984.286 590, 990 390, 1000 290, 1025 165.066, 1037.52 149.94, 1032.77 135.41, 1026.55 121.321, 1019.29 106.836, 1012.97 91.9272, 1007.63 77.2456, 1001.72 62.0853, 997.15 46.5553, 994.078 30.7511, 992.925 15.1827, 995.473 0, 1000 0, 457.856
Material Boundary	1358.97, 783.533 1405.42, 738.845 1432.22, 720.215 1461.04, 704.79 1490.63, 690.419 1520.6, 677.065 1552.23, 669.33 1584.89, 667.203 1650.32, 667.764 1683.01, 667.015 1748.39, 665.186 1879.2, 662.762 1944.52, 659.328 1977.13, 656.606 2009.72, 653.733 2042.34, 651.325 2075, 650

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 1	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	250	34						None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0
Landslide (Qls)		130	Mohr-Coulomb	180	28						None	0

Method Name	Min FS
Spencer	0.99



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 6-6'; Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SP7S1A.slmd
		Scale	1:2500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 12

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 0.986254 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 0.986254 7
Entity Information 8
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SP7S1A

Project Summary

File Name:	SP7S1A.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:06.10s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 6-6'; Static; Circular
Author:	M. Neely
Date Created:	09/12/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Landslide (Qls)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	0.986254
Axis Location:	1296.356, 1539.365
Left Slip Surface Endpoint:	757.260, 1072.048
Right Slip Surface Endpoint:	1346.752, 827.698
Resisting Moment:	7.66287e+08 lb-ft
Driving Moment:	7.76967e+08 lb-ft
Resisting Horizontal Force:	1.03275e+06 lb
Driving Horizontal Force:	1.04714e+06 lb
Total Slice Area:	23303.1 ft2
Surface Horizontal Width:	589.493 ft
Surface Average Height:	39.5307 ft

Global Minimum Coordinates

Method: spencer

X	Y
757.26	1072.05
791.853	1015.56
929.3	959.972
990.011	935.861
1107.24	889.317
1234.7	846.981
1329.93	830.561
1346.75	827.698

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	19074
Number of Invalid Surfaces:	5977

Error Codes

Error Code -108 reported for 137 surfaces
Error Code -111 reported for 396 surfaces
Error Code -112 reported for 255 surfaces
Error Code -121 reported for 1992 surfaces
Error Code -124 reported for 1 surface
Error Code -145 reported for 24 surfaces
Error Code -1000 reported for 3172 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 0.986254

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	11.5311	12118.3	-58.5176	Bedrock (QTp)	500	32	605.562	597.238	155.613	0	155.613	1144.48	1144.48
2	11.5311	36301.6	-58.5176	Bedrock (QTp)	500	32	1181.59	1165.35	1064.78	0	1064.78	2994.29	2994.29
3	11.5311	59928.1	-58.5176	Bedrock (QTp)	500	32	1744.36	1720.38	1953.02	0	1953.02	4801.51	4801.51
4	12.4952	78012.7	-22.0192	Bedrock (QTp)	410	15.5	1932.04	1905.48	5392.54	0	5392.54	6173.89	6173.89
5	12.4952	79438.7	-22.0192	Bedrock (QTp)	410	15.5	1960	1933.06	5491.97	0	5491.97	6284.62	6284.62
6	12.4952	80864.7	-22.0192	Bedrock (QTp)	410	15.5	1987.96	1960.63	5591.39	0	5591.39	6395.35	6395.35
7	12.4952	82665.6	-22.0192	Bedrock (QTp)	410	15.5	2023.26	1995.45	5716.96	0	5716.96	6535.2	6535.2
8	12.4952	85114.6	-22.0192	Bedrock (QTp)	410	15.5	2071.27	2042.8	5887.7	0	5887.7	6725.35	6725.35
9	12.4952	87574.9	-22.0192	Bedrock (QTp)	410	15.5	2119.5	2090.37	6059.24	0	6059.24	6916.4	6916.4
10	12.4952	90035.2	-22.0192	Bedrock (QTp)	410	15.5	2167.75	2137.95	6230.77	0	6230.77	7107.45	7107.45
11	12.4952	92495.6	-22.0192	Bedrock (QTp)	410	15.5	2215.98	2185.52	6402.32	0	6402.32	7298.5	7298.5
12	12.4952	94955.9	-22.0192	Bedrock (QTp)	410	15.5	2264.21	2233.09	6573.85	0	6573.85	7489.54	7489.54
13	12.4952	96951.2	-22.0192	Bedrock (QTp)	410	15.5	2303.33	2271.67	6712.96	0	6712.96	7644.47	7644.47
14	12.4952	98040.3	-22.0192	Bedrock (QTp)	410	15.5	2324.69	2292.73	6788.9	0	6788.9	7729.04	7729.04
15	12.1422	96219.4	-21.6599	Bedrock (QTp)	410	15.5	2351.4	2319.08	6883.93	0	6883.93	7817.76	7817.76
16	12.1422	97079.4	-21.6599	Bedrock (QTp)	410	15.5	2368.82	2336.26	6945.86	0	6945.86	7886.6	7886.6
17	12.1422	97105.4	-21.6599	Bedrock (QTp)	410	15.5	2369.35	2336.78	6947.73	0	6947.73	7888.69	7888.69
18	12.1422	96426.1	-21.6599	Bedrock (QTp)	410	15.5	2355.59	2323.21	6898.81	0	6898.81	7834.31	7834.31
19	12.1422	95746.7	-21.6599	Bedrock (QTp)	410	15.5	2341.83	2309.64	6849.9	0	6849.9	7779.92	7779.92
20	11.7227	91793.2	-21.6552	Bedrock (QTp)	410	15.5	2328.4	2296.39	6802.11	0	6802.11	7726.58	7726.58
21	11.7227	90934.8	-21.6552	Bedrock (QTp)	410	15.5	2310.39	2278.63	6738.08	0	6738.08	7655.41	7655.41
22	11.7227	89505.6	-21.6552	Bedrock (QTp)	410	15.5	2280.42	2249.07	6631.49	0	6631.49	7536.92	7536.92
23	11.7227	88048.1	-21.6552	Bedrock (QTp)	410	15.5	2249.86	2218.93	6522.78	0	6522.78	7416.07	7416.07
24	11.7227	86379.4	-21.6552	Bedrock (QTp)	410	15.5	2214.86	2184.41	6398.33	0	6398.33	7277.72	7277.72
25	11.7227	83551.2	-21.6552	Bedrock (QTp)	410	15.5	2155.55	2125.92	6187.39	0	6187.39	7043.24	7043.24
26	11.7227	80546.6	-21.6552	Bedrock (QTp)	410	15.5	2092.53	2063.77	5963.3	0	5963.3	6794.12	6794.12
27	11.7227	77542	-21.6552	Bedrock (QTp)	410	15.5	2029.52	2001.62	5739.2	0	5739.2	6545.01	6545.01
28	11.7227	74378.2	-21.6552	Bedrock (QTp)	410	15.5	1963.17	1936.18	5503.24	0	5503.24	6282.7	6282.7
29	11.7227	70251.6	-21.6552	Bedrock (QTp)	410	15.5	1876.63	1850.83	5195.47	0	5195.47	5940.57	5940.57
30	11.5876	64639.3	-18.3733	Bedrock (QTp)	410	15.5	1826.03	1800.93	5015.53	0	5015.53	5622.02	5622.02
31	11.5876	59272.7	-18.3733	Bedrock (QTp)	410	15.5	1708.44	1684.96	4597.37	0	4597.37	5164.81	5164.81
32	11.5876	54737.4	-18.3733	Bedrock (QTp)	410	15.5	1609.08	1586.96	4243.99	0	4243.99	4778.43	4778.43
33	11.5876	51581.5	-18.3733	Bedrock (QTp)	410	15.5	1539.94	1518.77	3998.08	0	3998.08	4509.55	4509.55
34	11.5876	49446.4	-18.3733	Bedrock (QTp)	410	15.5	1493.15	1472.63	3831.73	0	3831.73	4327.66	4327.66
35	11.5876	47623.9	-18.3733	Bedrock (QTp)	410	15.5	1453.23	1433.25	3689.71	0	3689.71	4172.38	4172.38

36	11.5876	45848.9	-18.3733	Bedrock (QTp)	410	15.5	1414.34	1394.89	3551.41	0	3551.41	4021.16	4021.16
37	11.5876	44112.7	-18.3733	Bedrock (QTp)	410	15.5	1376.29	1357.38	3416.13	0	3416.13	3873.25	3873.25
38	11.5876	42419	-18.3733	Bedrock (QTp)	410	15.5	1339.19	1320.78	3284.15	0	3284.15	3728.95	3728.95
39	11.5876	41091.3	-18.3733	Bedrock (QTp)	410	15.5	1310.1	1292.09	3180.71	0	3180.71	3615.84	3615.84
40	11.5876	40028.8	-18.3733	Bedrock (QTp)	410	15.5	1286.82	1269.13	3097.91	0	3097.91	3525.31	3525.31
41	1.02068	3463.72	-9.78316	Bedrock (QTp)	500	32	2726.86	2689.38	3503.74	0	3503.74	3973.92	3973.92
42	11.7763	37830.4	-9.78316	Landslide (Qls)	180	28	1937.91	1911.27	3256.05	0	3256.05	3590.2	3590.2
43	11.7763	33918.7	-9.78316	Landslide (Qls)	180	28	1757.45	1733.29	2921.31	0	2921.31	3224.34	3224.34
44	11.7763	30007	-9.78316	Landslide (Qls)	180	28	1576.98	1555.3	2586.57	0	2586.57	2858.48	2858.48
45	11.7763	26095.3	-9.78316	Landslide (Qls)	180	28	1396.52	1377.32	2251.82	0	2251.82	2492.62	2492.62
46	11.7763	22033.1	-9.78316	Landslide (Qls)	180	28	1209.11	1192.49	1904.21	0	1904.21	2112.69	2112.69
47	11.7763	17617.7	-9.78316	Landslide (Qls)	180	28	1005.4	991.583	1526.37	0	1526.37	1699.73	1699.73
48	11.7763	13187.6	-9.78316	Landslide (Qls)	180	28	801.022	790.011	1147.27	0	1147.27	1285.38	1285.38
49	11.7763	8747.98	-9.78316	Landslide (Qls)	180	28	596.201	588.006	767.347	0	767.347	870.149	870.149
50	16.8193	4643.67	-9.66107	Landslide (Qls)	180	28	347.751	342.971	306.504	0	306.504	365.703	365.703

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 0.986254

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	757.26	1072.05	0	0	0
2	768.791	1053.22	-4058.54	-1121.53	15.4475
3	780.322	1034.39	2354.67	650.688	15.4476
4	791.853	1015.56	18998.5	5250.03	15.4476
5	804.348	1010.5	22086.6	6103.41	15.4476
6	816.844	1005.45	25327.6	6999	15.4475
7	829.339	1000.4	28721.3	7936.82	15.4476
8	841.834	995.345	32308	8927.96	15.4476
9	854.329	990.291	36157	9991.61	15.4476
10	866.824	985.238	40269.7	11128.1	15.4476
11	879.319	980.185	44646	12337.5	15.4476
12	891.815	975.131	49285.9	13619.6	15.4475
13	904.31	970.078	54189.4	14974.7	15.4476
14	916.805	965.025	59306.7	16388.8	15.4476
15	929.3	959.972	64540.7	17835.1	15.4475
16	941.442	955.15	69160.3	19111.7	15.4476
17	953.585	950.327	73866.9	20412.3	15.4475
18	965.727	945.505	78576.1	21713.7	15.4476
19	977.869	940.683	83216.6	22996	15.4476
20	990.011	935.861	87788.4	24259.4	15.4476
21	1001.73	931.207	92129.9	25459.1	15.4476
22	1013.46	926.552	96384.7	26634.9	15.4476
23	1025.18	921.898	100495	27770.7	15.4476
24	1036.9	917.243	104458	28865.8	15.4475
25	1048.62	912.589	108252	29914.3	15.4476
26	1060.35	907.935	111760	30883.8	15.4476
27	1072.07	903.28	114965	31769.4	15.4476
28	1083.79	898.626	117866	32571	15.4476
29	1095.52	893.971	120447	33284.3	15.4476
30	1107.24	889.317	122611	33882.3	15.4476
31	1118.83	885.468	120737	33364.4	15.4476
32	1130.41	881.619	118617	32778.6	15.4476
33	1142	877.771	116290	32135.4	15.4475
34	1153.59	873.922	113818	31452.3	15.4475
35	1165.18	870.073	111248	30742.2	15.4476
36	1176.76	866.225	108595	30009	15.4475
37	1188.35	862.376	105860	29253.4	15.4476
38	1199.94	858.527	103046	28475.8	15.4476
39	1211.53	854.679	100155	27676.8	15.4476
40	1223.11	850.83	97202.7	26860.9	15.4476
41	1234.7	846.981	94201.8	26031.7	15.4476
42	1235.72	846.805	92032.8	25432.3	15.4476
43	1247.5	844.775	75803.5	20947.5	15.4476
44	1259.28	842.744	61021.6	16862.7	15.4476
45	1271.05	840.714	47687	13177.8	15.4476
46	1282.83	838.683	35799.7	9892.88	15.4476
47	1294.6	836.652	25415.4	7023.28	15.4476
48	1306.38	834.622	16664.8	4605.14	15.4476
49	1318.16	832.591	9553.29	2639.95	15.4476
50	1329.93	830.561	4084.42	1128.68	15.4475
51	1346.75	827.698	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

Shared Entities

Type	Coordinates (x,y)
	0, 500 1569.16, 500 1991.92, 500 1991.92, 675.302

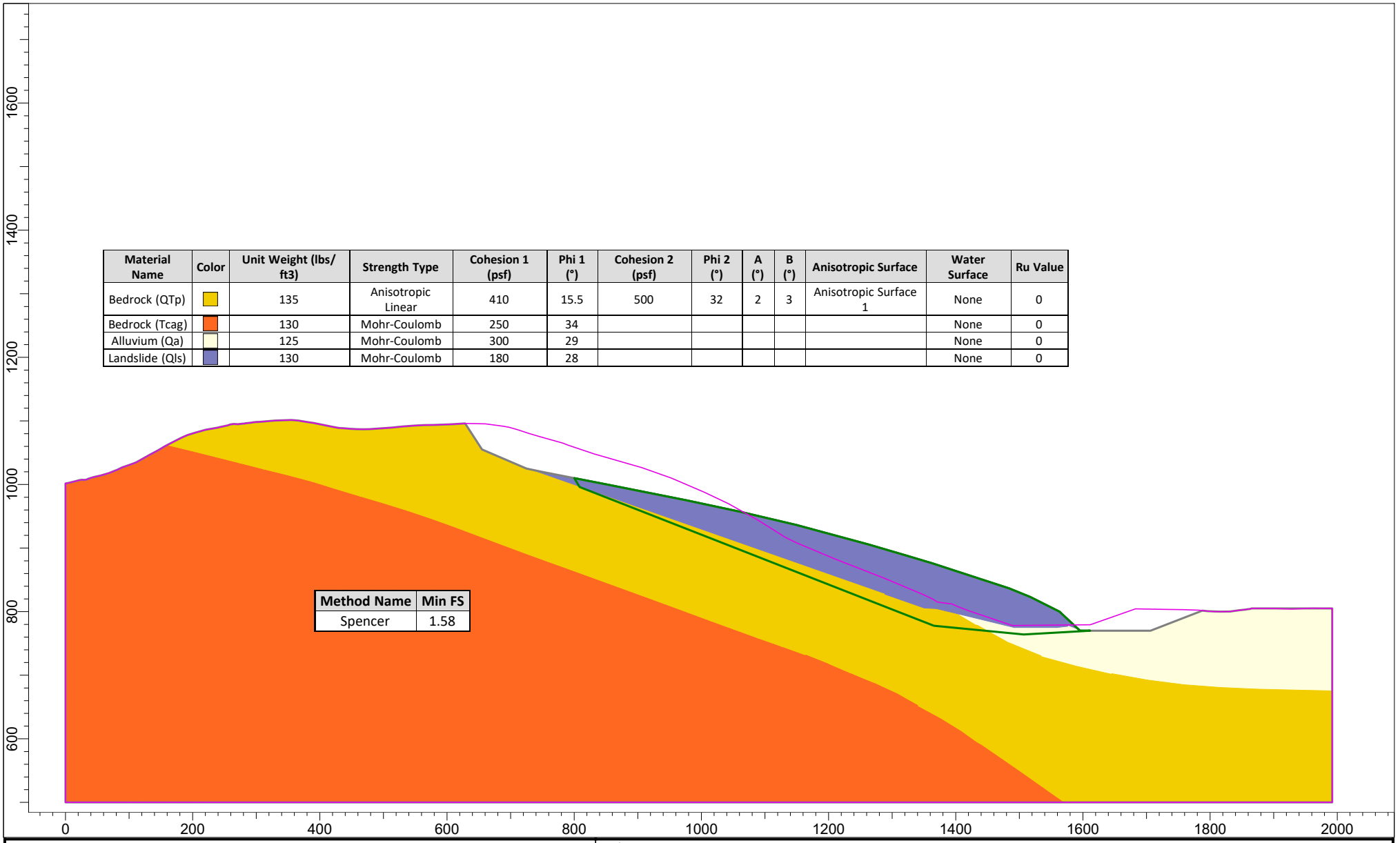
	1991.92, 804.969 1865.35, 805 1861.9, 804.054 1860.11, 803.963 1856.31, 803.351 1845.04, 802.052 1831.44, 800.238 1815.4, 800 1796.27, 800.631 1787.73, 801.554 1706.13, 770 1595.19, 770 1503.53, 806.286 1491.69, 804.729 1484.42, 807.149 1463.89, 806.871 1463.53, 806.373 1443.67, 806.941 1425.28, 806.687 1423.8, 806.609 1423.76, 807.109 1403.8, 807.61 1394.3, 811.911 1386.31, 813.008 1371.65, 815 1362.2, 820.5 1348.49, 826.965 1324.31, 837.186 1285.63, 853.359 1210.95, 882.442 1150.19, 908.079 1133.56, 916.06 1131.92, 916.848 1089.68, 943.384 1042.5, 969.756 1004.81, 987.68 953.061, 1010 906.6, 1026.44 831.195, 1048.13 790.971, 1061.68 781.836, 1065.04 759.016, 1071.56 744.187, 1075.64 729.439, 1080 709.851, 1086.47 697.667, 1090 688.053, 1091.69 660.49, 1095.25 628.401, 1095.94 605.985, 1094.59 578.266, 1093.65 564.392, 1093.41 550.55, 1092.66 531.51, 1091.36 512.538, 1089.44 477.725, 1086.99 467.877, 1086.9 458.034, 1087.05
External Boundary	448.23, 1087.45

438.401, 1088.42
429.726, 1088.97
421.051, 1090.52
403.043, 1094.16
390.252, 1096.74
377.314, 1098.58
366.335, 1100.52
355.224, 1101.41
329.049, 1100.46
311.187, 1098.99
302.379, 1098.28
301.402, 1098.27
300.986, 1098.16
300.696, 1098.3
300.298, 1098.31
299.473, 1098.22
297.151, 1097.95
295.961, 1097.89
293.329, 1097.49
284.873, 1096.31
283.07, 1096.31
281.705, 1095.84
278.708, 1095.6
276.645, 1095.5
275.84, 1095.13
274.43, 1095.25
272.04, 1094.73
264.019, 1095.09
259.325, 1094.52
254.762, 1092.98
249.262, 1091.73
241.892, 1090.05
240.213, 1089.56
238.477, 1089.26
234.466, 1088.56
219.767, 1085.93
212.637, 1083.81
205.443, 1081.92
192.468, 1077.89
186.188, 1075.31
180.043, 1072.42
160.094, 1062.15
155.925, 1060
145.359, 1053.59
133.352, 1047.3
115.409, 1037.21
111.332, 1034.91
103.801, 1031.96
89.2358, 1026.93
81.7114, 1023.28
68.638, 1018.14
56.6371, 1014.45
44.3537, 1011.69
36.359, 1009.18
32.6645, 1007.43
28.9084, 1007.15
26.0111, 1007.54
21.5459, 1006.87
15.8788, 1005.18

	10.824, 1004.04 5.44227, 1002.71 0, 1001.61
Material Boundary	1380.74, 810.286 1431.3, 780.004 1481.33, 751.909 1534.3, 730.403 1589.53, 715.249 1645.41, 702.498 1701.78, 692.343 1758.52, 685.09 1815.53, 680.684 1872.71, 678.227 1929.97, 676.703 1991.92, 675.302
Material Boundary	1133.56, 916.06 1143.63, 900.759 1158.6, 888.627 1173.94, 877.823 1189.59, 868.196 1205.61, 859.633
Material Boundary	1205.61, 859.633 1242.58, 843.884 1260.48, 837.465 1278.49, 831.112 1296.38, 824.42 1314.05, 817.265 1331.87, 810.62 1350.29, 805.723 1369.36, 804.728 1380.74, 810.286 1386.31, 813.008

Material Boundary	160.094, 1062.15 198.203, 1052.89 236.185, 1043.42 274.134, 1033.82 312.072, 1024.19 350.048, 1014.71 387.902, 1004.79 425.254, 993.063 462.754, 981.845 500.278, 970.678 537.661, 959.078 574.752, 946.608 611.57, 933.329 648.243, 919.618 684.901, 905.858 721.623, 892.287 758.398, 878.872 795.206, 865.557 832.026, 852.281 868.837, 838.986 905.618, 825.612 942.36, 812.133 979.085, 798.603 1015.82, 785.088 1052.58, 771.656 1089.41, 758.374 1126.32, 745.308 1163.19, 732.132 1199.42, 717.362 1235.43, 702.008 1271.69, 687.243 1307.29, 671.035 1341.31, 651.637 1375.69, 632.957 1409.02, 612.541 1440.74, 589.52 1473.01, 567.402 1505.15, 545.082 1537.15, 522.544 1569.16, 500

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 1	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	250	34						None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0
Landslide (Qls)		130	Mohr-Coulomb	180	28						None	0



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 6-6'; Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SP7S1C.slmd
		Scale	1:2500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 13

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.5837 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.5837 7
Entity Information 8
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SP7S1C

Project Summary

File Name:	SP7S1C.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:05.716s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 6-6'; Static; Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Landslide (Qls)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.583700
Axis Location:	1445.649, 1701.250
Left Slip Surface Endpoint:	800.045, 1009.971
Right Slip Surface Endpoint:	1611.310, 770.000
Resisting Moment:	2.48171e+09 lb-ft
Driving Moment:	1.56703e+09 lb-ft
Resisting Horizontal Force:	2.62269e+06 lb
Driving Horizontal Force:	1.65605e+06 lb
Total Slice Area:	48606.9 ft2
Surface Horizontal Width:	811.265 ft
Surface Average Height:	59.9149 ft

Global Minimum Coordinates

Method: spencer

X	Y
800.045	1009.97
808.448	996.01
1028.37	909.847
1149.19	862.531
1310.02	799.577
1365.62	777.829
1506.66	764
1611.31	770

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	17911
Number of Invalid Surfaces:	7140

Error Codes

Error Code -108 reported for 155 surfaces
Error Code -111 reported for 275 surfaces
Error Code -112 reported for 267 surfaces
Error Code -121 reported for 3353 surfaces
Error Code -124 reported for 7 surfaces
Error Code -145 reported for 15 surfaces
Error Code -1000 reported for 3068 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.5837

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	8.40274	6734.28	-58.9576	Landslide (Qls)	180	28	225.437	357.025	332.935	0	332.935	707.497	707.497
2	6.65717	11240	-21.3944	Landslide (Qls)	180	28	604.001	956.556	1460.49	0	1460.49	1697.13	1697.13
3	16.4052	32586.8	-21.3944	Bedrock (QTp)	410	15.5	561.952	889.963	1730.69	0	1730.69	1950.85	1950.85
4	16.4052	39557.2	-21.3944	Bedrock (QTp)	410	15.5	627.624	993.968	2105.72	0	2105.72	2351.61	2351.61
5	16.4052	46455.6	-21.3944	Bedrock (QTp)	410	15.5	692.618	1096.9	2476.88	0	2476.88	2748.23	2748.23
6	16.4052	53237.3	-21.3944	Bedrock (QTp)	410	15.5	756.512	1198.09	2841.75	0	2841.75	3138.14	3138.14
7	16.4052	60017.4	-21.3944	Bedrock (QTp)	410	15.5	820.391	1299.25	3206.54	0	3206.54	3527.96	3527.96
8	16.4052	66797.4	-21.3944	Bedrock (QTp)	410	15.5	884.27	1400.42	3571.33	0	3571.33	3917.77	3917.77
9	16.4052	73577.5	-21.3944	Bedrock (QTp)	410	15.5	948.147	1501.58	3936.12	0	3936.12	4307.59	4307.59
10	16.4052	80357.6	-21.3944	Bedrock (QTp)	410	15.5	1012.03	1602.75	4300.91	0	4300.91	4697.4	4697.4
11	16.4052	87137.6	-21.3944	Bedrock (QTp)	410	15.5	1075.9	1703.91	4665.7	0	4665.7	5087.22	5087.22
12	16.4052	93915.7	-21.3944	Bedrock (QTp)	410	15.5	1139.77	1805.05	5030.38	0	5030.38	5476.92	5476.92
13	16.4052	100431	-21.3944	Bedrock (QTp)	410	15.5	1201.15	1902.26	5380.91	0	5380.91	5851.5	5851.5
14	16.4052	106761	-21.3944	Bedrock (QTp)	410	15.5	1260.79	1996.71	5721.52	0	5721.52	6215.47	6215.47
15	16.4052	113091	-21.3944	Bedrock (QTp)	410	15.5	1320.43	2091.16	6062.05	0	6062.05	6579.37	6579.37
16	15.1026	109705	-21.3868	Bedrock (QTp)	410	15.5	1377.75	2181.95	6389.44	0	6389.44	6929.01	6929.01
17	15.1026	115065	-21.3868	Bedrock (QTp)	410	15.5	1432.61	2268.83	6702.7	0	6702.7	7263.76	7263.76
18	15.1026	120172	-21.3868	Bedrock (QTp)	410	15.5	1484.88	2351.61	7001.23	0	7001.23	7582.76	7582.76
19	15.1026	124877	-21.3868	Bedrock (QTp)	410	15.5	1533.03	2427.86	7276.15	0	7276.15	7876.53	7876.53
20	15.1026	129576	-21.3868	Bedrock (QTp)	410	15.5	1581.13	2504.03	7550.82	0	7550.82	8170.04	8170.04
21	15.1026	134275	-21.3868	Bedrock (QTp)	410	15.5	1629.22	2580.2	7825.49	0	7825.49	8463.55	8463.55
22	15.1026	138975	-21.3868	Bedrock (QTp)	410	15.5	1677.33	2656.38	8100.16	0	8100.16	8757.06	8757.06
23	15.1026	143674	-21.3868	Bedrock (QTp)	410	15.5	1725.42	2732.55	8374.83	0	8374.83	9050.56	9050.56
24	16.0826	157613	-21.3773	Bedrock (QTp)	410	15.5	1769.91	2803	8628.9	0	8628.9	9321.71	9321.71
25	16.0826	161722	-21.3773	Bedrock (QTp)	410	15.5	1809.4	2865.55	8854.43	0	8854.43	9562.7	9562.7
26	16.0826	165829	-21.3773	Bedrock (QTp)	410	15.5	1848.89	2928.08	9079.89	0	9079.89	9803.62	9803.62
27	16.0826	169937	-21.3773	Bedrock (QTp)	410	15.5	1888.37	2990.61	9305.36	0	9305.36	10044.5	10044.5
28	16.0826	174045	-21.3773	Bedrock (QTp)	410	15.5	1927.85	3053.14	9530.83	0	9530.83	10285.5	10285.5
29	16.0826	178153	-21.3773	Bedrock (QTp)	410	15.5	1967.34	3115.67	9756.35	0	9756.35	10526.4	10526.4
30	16.0826	182260	-21.3773	Bedrock (QTp)	410	15.5	2006.82	3178.2	9981.82	0	9981.82	10767.4	10767.4
31	16.0826	186021	-21.3773	Bedrock (QTp)	410	15.5	2042.97	3235.45	10188.2	0	10188.2	10987.9	10987.9
32	16.0826	189385	-21.3773	Bedrock (QTp)	410	15.5	2075.3	3286.65	10372.8	0	10372.8	11185.2	11185.2
33	16.0826	192747	-21.3773	Bedrock (QTp)	410	15.5	2107.62	3337.83	10557.4	0	10557.4	11382.4	11382.4
34	18.5336	226273	-21.3627	Bedrock (QTp)	410	15.5	2142.47	3393.03	10756.5	0	10756.5	11594.5	11594.5
35	18.5336	230511	-21.3627	Bedrock (QTp)	410	15.5	2177.82	3449.02	10958.4	0	10958.4	11810.2	11810.2

36	18.5336	234737	-21.3627	Bedrock (QTp)	410	15.5	2213.08	3504.85	11159.7	0	11159.7	12025.3	12025.3
37	16.853	211102	-5.59973	Bedrock (QTp)	500	32	5538.62	8771.52	13237.2	0	13237.2	13780.2	13780.2
38	16.853	202514	-5.59973	Bedrock (QTp)	500	32	5327.22	8436.72	12701.4	0	12701.4	13223.7	13223.7
39	16.853	193659	-5.59973	Bedrock (QTp)	500	32	5109.21	8091.45	12148.9	0	12148.9	12649.8	12649.8
40	16.853	184093	-5.59973	Bedrock (QTp)	500	32	4873.7	7718.48	11552	0	11552	12029.9	12029.9
41	16.853	174550	-5.59973	Bedrock (QTp)	500	32	4638.76	7346.41	10956.6	0	10956.6	11411.4	11411.4
42	18.9253	185519	-5.59973	Alluvium (Qa)	300	29	3778.17	5983.49	10253.3	0	10253.3	10623.7	10623.7
43	18.9253	175125	-5.59973	Alluvium (Qa)	300	29	3577.88	5666.29	9681.02	0	9681.02	10031.8	10031.8
44	18.9253	161991	-5.59973	Alluvium (Qa)	300	29	3324.77	5265.44	8957.9	0	8957.9	9283.88	9283.88
45	17.4416	133022	3.28116	Alluvium (Qa)	300	29	3319.84	5257.63	8943.78	0	8943.78	8753.46	8753.46
46	17.4416	111702	3.28116	Alluvium (Qa)	300	29	2822.47	4469.94	7522.74	0	7522.74	7360.93	7360.93
47	17.4416	89727.5	3.28116	Alluvium (Qa)	300	29	2309.81	3658.04	6058.08	0	6058.08	5925.66	5925.66
48	17.4416	62628.7	3.28116	Alluvium (Qa)	300	29	1677.62	2656.84	4251.84	0	4251.84	4155.67	4155.67
49	17.4416	24175.8	3.28116	Alluvium (Qa)	300	29	780.536	1236.13	1688.83	0	1688.83	1644.08	1644.08
50	17.4416	1193.95	3.28116	Alluvium (Qa)	300	29	266.794	422.522	221.036	0	221.036	205.741	205.741

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.5837

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	800.045	1009.97	0	0	0
2	808.448	996.01	2749.89	814.648	16.5018
3	815.105	993.402	2529.75	749.433	16.5018
4	831.51	986.975	4415.19	1307.99	16.5018
5	847.915	980.547	7631.43	2260.79	16.5018
6	864.321	974.12	12164.7	3603.77	16.5018
7	880.726	967.693	17992.8	5330.32	16.5018
8	897.131	961.266	25115.3	7440.35	16.5018
9	913.536	954.838	33532.3	9933.86	16.5018
10	929.941	948.411	43243.7	12810.9	16.5019
11	946.346	941.984	54249.6	16071.3	16.5018
12	962.752	935.556	66550	19715.3	16.5018
13	979.157	929.129	80144.5	23742.6	16.5018
14	995.562	922.702	94982.8	28138.4	16.5018
15	1011.97	916.275	111030	32892.3	16.5018
16	1028.37	909.847	128285	38004.2	16.5018
17	1043.47	903.933	145225	43022.6	16.5018
18	1058.58	898.018	163188	48344	16.5018
19	1073.68	892.104	182125	53954.1	16.5018
20	1088.78	886.189	201960	59830.2	16.5018
21	1103.89	880.274	222691	65971.8	16.5018
22	1118.99	874.36	244319	72379.1	16.5018
23	1134.09	868.445	266844	79051.9	16.5018
24	1149.19	862.531	290265	85990.4	16.5018
25	1165.28	856.235	316063	93633	16.5018
26	1181.36	849.94	342644	101508	16.5019
27	1197.44	843.644	370008	109614	16.5018
28	1213.52	837.349	398156	117953	16.5018
29	1229.61	831.054	427086	126523	16.5018
30	1245.69	824.758	456800	135326	16.5018
31	1261.77	818.463	487297	144361	16.5018
32	1277.85	812.168	518510	153608	16.5019
33	1293.94	805.872	550365	163044	16.5018
34	1310.02	799.577	582861	172671	16.5018
35	1328.55	792.328	621048	183984	16.5018
36	1347.09	785.078	660042	195536	16.5018
37	1365.62	777.829	699840	207326	16.5018
38	1382.47	776.177	628176	186096	16.5018
39	1399.33	774.524	559196	165660	16.5018
40	1416.18	772.872	492985	146046	16.5018
41	1433.03	771.22	429765	127317	16.5018
42	1449.88	769.567	369529	109472	16.5018
43	1468.81	767.712	316902	93881.5	16.5018
44	1487.74	765.856	267012	79101.6	16.5018
45	1506.66	764	220580	65346.3	16.5018
46	1524.1	765	153613	45507.4	16.5018
47	1541.54	766	96759.4	28664.8	16.5018
48	1558.99	767	50330.9	14910.4	16.5018
49	1576.43	768	16758.1	4964.55	16.5018
50	1593.87	769	1427.19	422.801	16.5018
51	1611.31	770	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

Shared Entities

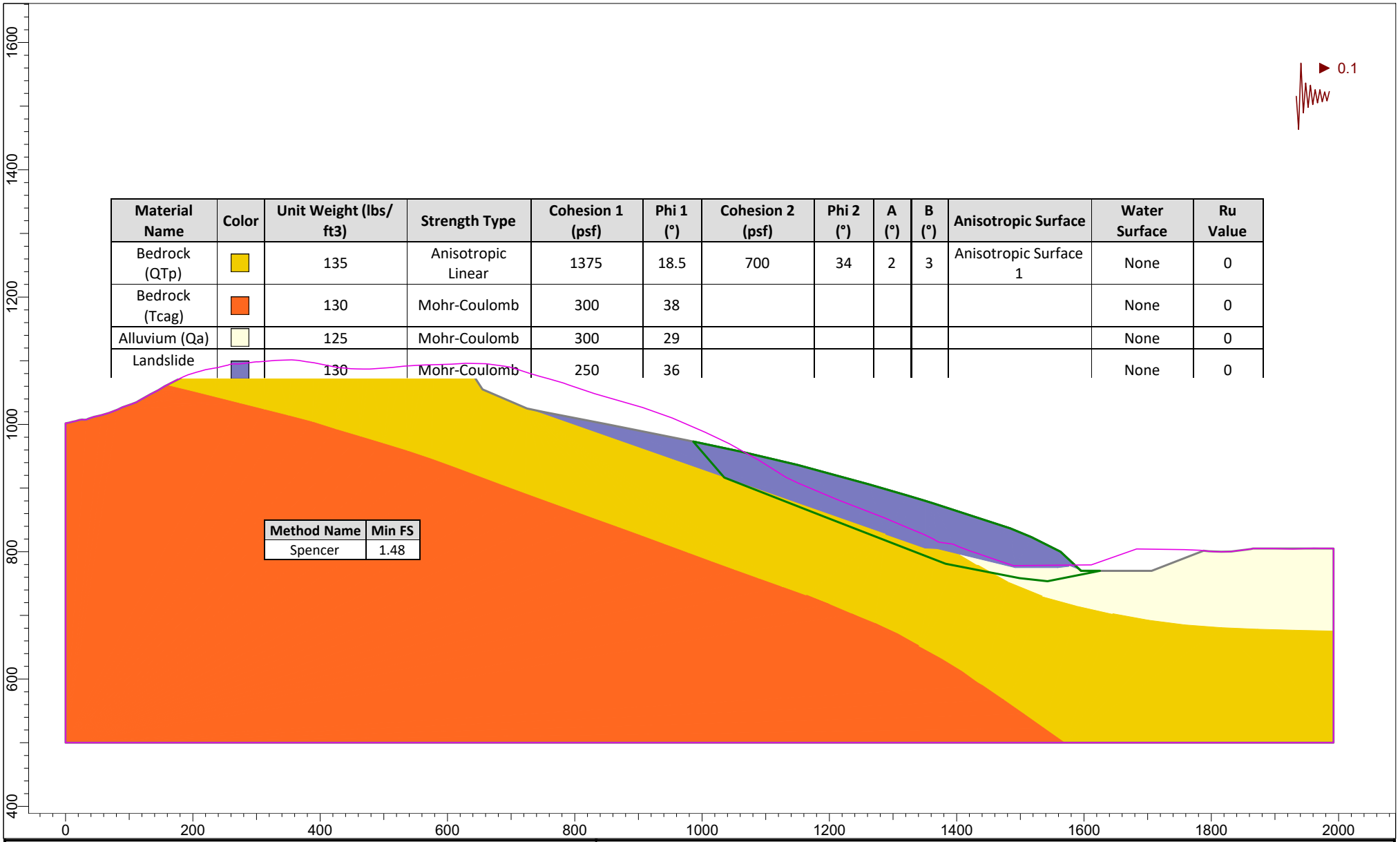
Type	Coordinates (x,y)
	1484.11, 836.541 1363.4, 875.799 1350, 879.907 1322.75, 888.062

External Boundary	1262.34, 905.763 1150, 936.189 1085.7, 951.281 1060.47, 957.204 977.625, 974.803 850.05, 1000.26 750.584, 1019.57 725, 1025 655, 1055 628.401, 1095.94 605.985, 1094.59 578.266, 1093.65 564.392, 1093.41 550.55, 1092.66 531.51, 1091.36 512.538, 1089.44 477.725, 1086.99 467.877, 1086.9 458.034, 1087.05 448.23, 1087.45 438.401, 1088.42 429.726, 1088.97 421.051, 1090.52 403.043, 1094.16 390.252, 1096.74 377.314, 1098.58 366.335, 1100.52 355.224, 1101.41 329.049, 1100.46 311.187, 1098.99 302.379, 1098.28 301.402, 1098.27 300.986, 1098.16 300.696, 1098.3 300.298, 1098.31 299.473, 1098.22 297.151, 1097.95 295.961, 1097.89 293.329, 1097.49 284.873, 1096.31 283.07, 1096.31 281.705, 1095.84 278.708, 1095.6 276.645, 1095.5 275.84, 1095.13 274.43, 1095.25 272.04, 1094.73 264.019, 1095.09 259.325, 1094.52 254.762, 1092.98 249.262, 1091.73 241.892, 1090.05 240.213, 1089.56 238.477, 1089.26 234.466, 1088.56 219.767, 1085.93 212.637, 1083.81 205.443, 1081.92 192.468, 1077.89

	186.188, 1075.31 180.043, 1072.42 160.094, 1062.15 155.925, 1060 145.359, 1053.59 133.352, 1047.3 115.409, 1037.21 111.332, 1034.91 103.801, 1031.96 89.2358, 1026.93 81.7114, 1023.28 68.638, 1018.14 56.6371, 1014.45 44.3537, 1011.69 36.359, 1009.18 32.6645, 1007.43 28.9084, 1007.15 26.0111, 1007.54 21.5459, 1006.87 15.8788, 1005.18 10.824, 1004.04 5.44227, 1002.71 0, 1001.61 0, 500 1569.16, 500 1991.92, 500 1991.92, 675.302 1991.92, 804.969 1865.35, 805 1861.9, 804.054 1860.11, 803.963 1856.31, 803.351 1845.04, 802.052 1831.44, 800.238 1815.4, 800 1796.27, 800.631 1787.73, 801.554 1706.13, 770 1595.19, 770 1563.05, 800 1517.26, 822.92
Material Boundary	1404.06, 796.317 1431.3, 780.004 1481.33, 751.909 1534.3, 730.403 1589.53, 715.249 1645.41, 702.498 1701.78, 692.343 1758.52, 685.09 1815.53, 680.684 1872.71, 678.227 1929.97, 676.703 1991.92, 675.302

Material Boundary	160.094, 1062.15 198.203, 1052.89 236.185, 1043.42 274.134, 1033.82 312.072, 1024.19 350.048, 1014.71 387.902, 1004.79 425.254, 993.063 462.754, 981.845 500.278, 970.678 537.661, 959.078 574.752, 946.608 611.57, 933.329 648.243, 919.618 684.901, 905.858 721.623, 892.287 758.398, 878.872 795.206, 865.557 832.026, 852.281 868.837, 838.986 905.618, 825.612 942.36, 812.133 979.085, 798.603 1015.82, 785.088 1052.58, 771.656 1089.41, 758.374 1126.32, 745.308 1163.19, 732.132 1199.42, 717.362 1235.43, 702.008 1271.69, 687.243 1307.29, 671.035 1341.31, 651.637 1375.69, 632.957 1409.02, 612.541 1440.74, 589.52 1473.01, 567.402 1505.15, 545.082 1537.15, 522.544 1569.16, 500
Material Boundary	725, 1025 1287.43, 827.766 1350.29, 805.723
Material Boundary	1369.36, 804.728 1404.06, 796.317 1492, 775
Material Boundary	1350.29, 805.723 1369.36, 804.728
Material Boundary	1558.85, 775 1577.22, 777.112 1595.19, 770
Material Boundary	1492, 775 1558.85, 775

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	1375	18.5	700	34	2	3	Anisotropic Surface 1	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	300	38						None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0
Landslide		130	Mohr-Coulomb	250	36						None	0



Method Name	Min FS
Spencer	1.48

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 6-6'; Pseudo-Static; Non-Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SP7S1C_s.slmd
		Scale	1:2500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 14

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.48414 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.48414 7
Entity Information 8
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SP7S1C_s

Project Summary

File Name:	SP7S1C_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:06.751s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 6-6'; Pseudo-Static; Non-Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	1375 psf
Phi 1	18.5 °
A	2 °
Cohesion 2	700 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	300 psf
Phi	38 °
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Landslide (Qls)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	36 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.484140
Axis Location:	1508.515, 1510.487
Left Slip Surface Endpoint:	986.005, 973.023
Right Slip Surface Endpoint:	1624.980, 770.000
Resisting Moment:	2.12088e+09 lb-ft
Driving Moment:	1.42903e+09 lb-ft
Resisting Horizontal Force:	2.73529e+06 lb
Driving Horizontal Force:	1.84302e+06 lb
Total Slice Area:	39770.3 ft2
Surface Horizontal Width:	638.975 ft
Surface Average Height:	62.2407 ft

Global Minimum Coordinates

Method: spencer

X	Y
986.005	973.023
1034.81	916.423
1189.63	855.895
1303.3	811.734
1382.61	780.942
1498.57	758.396
1542.74	753.544
1624.98	770

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	18799
Number of Invalid Surfaces:	6252

Error Codes

Error Code -108 reported for 89 surfaces
Error Code -111 reported for 570 surfaces
Error Code -112 reported for 151 surfaces
Error Code -121 reported for 1818 surfaces
Error Code -145 reported for 13 surfaces
Error Code -1000 reported for 3611 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.48414

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	12.2019	9166.78	-49.2278	Landslide (Qls)	250	36	326.199	484.125	322.245	0	322.245	700.521	700.521
2	12.2019	27500.3	-49.2278	Landslide (Qls)	250	36	708.303	1051.22	1102.79	0	1102.79	1924.17	1924.17
3	12.2019	45833.9	-49.2278	Landslide (Qls)	250	36	1090.41	1618.32	1883.33	0	1883.33	3147.82	3147.82
4	12.2019	64167.5	-49.2278	Landslide (Qls)	250	36	1472.51	2185.41	2663.87	0	2663.87	4371.46	4371.46
5	1.69882	10243.5	-21.3533	Landslide (Qls)	250	36	2629.35	3902.33	5027	0	5027	6054.96	6054.96
6	12.7601	79098.1	-21.3533	Bedrock (QTp)	1375	18.5	2089.03	3100.42	5156.75	0	5156.75	5973.47	5973.47
7	12.7601	82906	-21.3533	Bedrock (QTp)	1375	18.5	2144.82	3183.22	5404.2	0	5404.2	6242.73	6242.73
8	12.7601	86427.4	-21.3533	Bedrock (QTp)	1375	18.5	2196.42	3259.79	5633.03	0	5633.03	6491.73	6491.73
9	12.7601	89767.2	-21.3533	Bedrock (QTp)	1375	18.5	2245.34	3332.4	5850.05	0	5850.05	6727.88	6727.88
10	12.7601	93107	-21.3533	Bedrock (QTp)	1375	18.5	2294.27	3405.02	6067.08	0	6067.08	6964.04	6964.04
11	12.7601	96446.8	-21.3533	Bedrock (QTp)	1375	18.5	2343.2	3477.63	6284.11	0	6284.11	7200.2	7200.2
12	12.7601	99786.6	-21.3533	Bedrock (QTp)	1375	18.5	2392.13	3550.25	6501.14	0	6501.14	7436.36	7436.36
13	12.7601	103126	-21.3533	Bedrock (QTp)	1375	18.5	2441.06	3622.87	6718.17	0	6718.17	7672.51	7672.51
14	12.7601	106462	-21.3533	Bedrock (QTp)	1375	18.5	2489.92	3695.39	6934.92	0	6934.92	7908.36	7908.36
15	12.7601	109343	-21.3533	Bedrock (QTp)	1375	18.5	2532.13	3758.03	7122.12	0	7122.12	8112.07	8112.07
16	12.7601	111918	-21.3533	Bedrock (QTp)	1375	18.5	2569.85	3814.02	7289.46	0	7289.46	8294.16	8294.16
17	12.7601	114493	-21.3533	Bedrock (QTp)	1375	18.5	2607.58	3870.01	7456.8	0	7456.8	8476.24	8476.24
18	12.6297	115832	-21.2315	Bedrock (QTp)	1375	18.5	2647.49	3929.24	7633.86	0	7633.86	8662.43	8662.43
19	12.6297	118302	-21.2315	Bedrock (QTp)	1375	18.5	2684.1	3983.58	7796.23	0	7796.23	8839.02	8839.02
20	12.6297	120772	-21.2315	Bedrock (QTp)	1375	18.5	2720.71	4037.91	7958.6	0	7958.6	9015.61	9015.61
21	12.6297	123242	-21.2315	Bedrock (QTp)	1375	18.5	2757.32	4092.25	8120.97	0	8120.97	9192.21	9192.21
22	12.6297	125712	-21.2315	Bedrock (QTp)	1367.75	18.688	2809.5	4169.69	8283.71	0	8283.71	9375.22	9375.22
23	12.6297	128169	-21.2315	Bedrock (QTp)	1367.75	18.688	2846.31	4224.32	8445.19	0	8445.19	9551	9551
24	12.6297	130311	-21.2315	Bedrock (QTp)	1367.75	18.688	2878.41	4271.96	8586.08	0	8586.08	9704.36	9704.36
25	12.6297	132322	-21.2315	Bedrock (QTp)	1367.75	18.688	2908.53	4316.67	8718.27	0	8718.27	9848.25	9848.25
26	12.6297	134332	-21.2315	Bedrock (QTp)	1367.75	18.688	2938.66	4361.39	8850.45	0	8850.45	9992.14	9992.14
27	13.2185	142746	-21.2186	Bedrock (QTp)	1359.05	18.9128	2990.55	4438.39	8987.42	0	8987.42	10148.5	10148.5
28	13.2185	144922	-21.2186	Bedrock (QTp)	1359.05	18.9128	3022.11	4485.24	9124.17	0	9124.17	10297.5	10297.5
29	13.2185	146992	-21.2186	Bedrock (QTp)	1359.05	18.9128	3052.13	4529.79	9254.21	0	9254.21	10439.2	10439.2
30	13.2185	149053	-21.2186	Bedrock (QTp)	1359.05	18.9128	3082.03	4574.17	9383.76	0	9383.76	10580.4	10580.4
31	13.2185	151143	-21.2186	Bedrock (QTp)	1359.05	18.9128	3112.34	4619.15	9515	0	9515	10723.4	10723.4
32	13.2185	152847	-21.2186	Bedrock (QTp)	700	34	4860.71	7213.98	9657.39	0	9657.39	11544.6	11544.6
33	11.9867	138072	-11.0032	Bedrock (QTp)	700	34	5634.98	8363.1	11361	0	11361	12456.7	12456.7
34	11.9867	135583	-11.0032	Bedrock (QTp)	700	34	5542.75	8226.22	11158.1	0	11158.1	12235.8	12235.8
35	11.9867	132752	-11.0032	Bedrock (QTp)	700	34	5437.88	8070.58	10927.3	0	10927.3	11984.7	11984.7
36	11.9867	129762	-11.0032	Bedrock (QTp)	700	34	5327.1	7906.16	10683.5	0	10683.5	11719.3	11719.3
37	11.9867	126796	-11.0032	Bedrock (QTp)	700	34	5217.19	7743.04	10441.7	0	10441.7	11456.1	11456.1

38	11.9867	123860	-11.0032	Bedrock (QTp)	700	34	5108.4	7581.58	10202.3	0	10202.3	11195.6	11195.6
39	14.678	148066	-11.0032	Alluvium (Qa)	300	29	3835.4	5692.27	9727.87	0	9727.87	10473.6	10473.6
40	14.678	144454	-11.0032	Alluvium (Qa)	300	29	3747.17	5561.32	9491.66	0	9491.66	10220.3	10220.3
41	14.678	139653	-11.0032	Alluvium (Qa)	300	29	3629.89	5387.26	9177.68	0	9177.68	9883.47	9883.47
42	14.725	132693	-6.26821	Alluvium (Qa)	300	29	3687.86	5473.3	9332.88	0	9332.88	9737.95	9737.95
43	14.725	123415	-6.26821	Alluvium (Qa)	300	29	3445.84	5114.11	8684.89	0	8684.89	9063.38	9063.38
44	14.725	112375	-6.26821	Alluvium (Qa)	300	29	3157.87	4686.72	7913.84	0	7913.84	8260.7	8260.7
45	13.7066	90959.9	11.3155	Alluvium (Qa)	300	29	3707.8	5502.9	9386.28	0	9386.28	8644.34	8644.34
46	13.7066	72579.6	11.3155	Alluvium (Qa)	300	29	3012.84	4471.48	7525.53	0	7525.53	6922.66	6922.66
47	13.7066	46258.9	11.3155	Alluvium (Qa)	300	29	2017.65	2994.47	4860.96	0	4860.96	4457.22	4457.22
48	13.7066	19406.8	11.3155	Alluvium (Qa)	300	29	1002.37	1487.65	2142.57	0	2142.57	1942	1942
49	13.7066	7048.68	11.3155	Alluvium (Qa)	300	29	535.1	794.163	891.498	0	891.498	784.424	784.424
50	13.7066	2349.56	11.3155	Alluvium (Qa)	300	29	371.444	551.275	453.312	0	453.312	378.986	378.986

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.48414

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	986.005	973.023	0	0	0
2	998.206	958.873	1493.07	614.878	22.3829
3	1010.41	944.723	11198.1	4611.6	22.3828
4	1022.61	930.573	29115	11990.2	22.3829
5	1034.81	916.423	55243.8	22750.6	22.3829
6	1036.51	915.759	55136.6	22706.4	22.3829
7	1049.27	910.77	62094.5	25571.8	22.3829
8	1062.03	905.781	69955.2	28809	22.3829
9	1074.79	900.793	78650.7	32390	22.3829
10	1087.55	895.804	88138.1	36297.1	22.3829
11	1100.31	890.816	98417.4	40530.3	22.3829
12	1113.07	885.827	109488	45089.7	22.383
13	1125.83	880.838	121351	49975	22.3829
14	1138.59	875.85	134006	55186.5	22.3829
15	1151.35	870.861	147452	60723.7	22.3828
16	1164.11	865.872	161580	66542.2	22.3829
17	1176.87	860.884	176319	72612	22.3829
18	1189.63	855.895	191669	78933.4	22.3829
19	1202.26	850.988	207246	85348.4	22.3829
20	1214.89	846.082	223405	92002.8	22.3829
21	1227.52	841.175	240144	98896.4	22.3829
22	1240.15	836.268	257465	106029	22.3828
23	1252.78	831.361	275171	113321	22.3829
24	1265.41	826.455	293450	120849	22.3829
25	1278.04	821.548	312229	128583	22.383
26	1290.67	816.641	331477	136509	22.3829
27	1303.3	811.734	351193	144629	22.3829
28	1316.52	806.602	372031	153210	22.3829
29	1329.74	801.47	393370	161998	22.3829
30	1342.96	796.338	415186	170982	22.3829
31	1356.17	791.206	437478	180163	22.3829
32	1369.39	786.074	460251	189541	22.3829
33	1382.61	780.942	460797	189766	22.3829
34	1394.6	778.611	433485	178518	22.3829
35	1406.58	776.281	406559	167429	22.3828
36	1418.57	773.95	380069	156520	22.3828
37	1430.56	771.619	354041	145802	22.383
38	1442.54	769.289	328471	135271	22.3829
39	1454.53	766.958	303355	124928	22.3829
40	1469.21	764.104	289585	119257	22.3829
41	1483.89	761.25	276076	113694	22.3829
42	1498.57	758.396	262913	108273	22.3829
43	1513.29	756.779	236931	97573.2	22.3829
44	1528.02	755.161	212540	87528.4	22.3829
45	1542.74	753.544	190041	78263	22.3829
46	1556.45	756.287	122533	50461.6	22.3829
47	1570.15	759.029	67822.7	27930.8	22.3829
48	1583.86	761.772	31439.9	12947.6	22.3829
49	1597.57	764.515	13754.5	5664.38	22.3829
50	1611.27	767.257	4674.15	1924.91	22.3829
51	1624.98	770	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

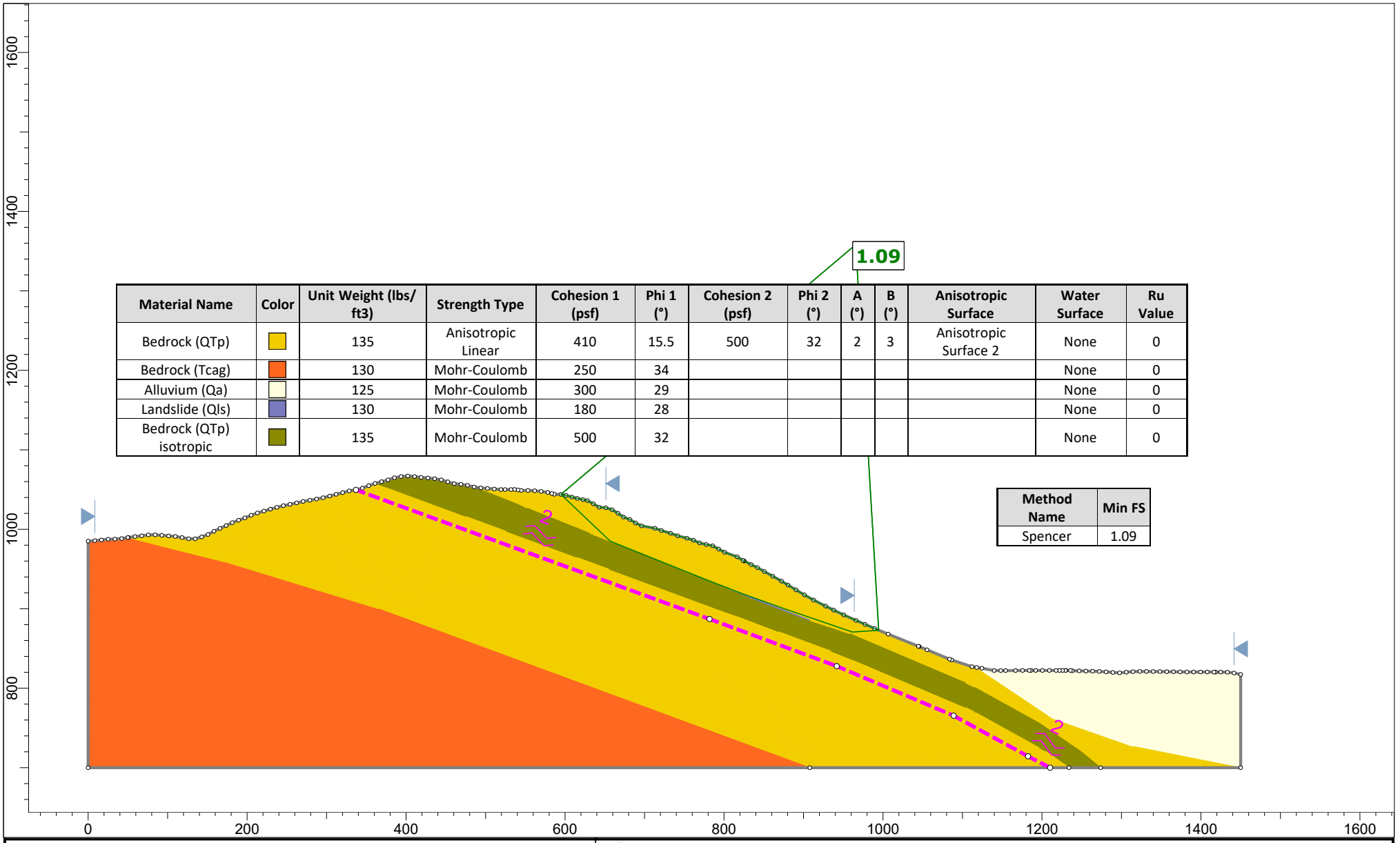
Shared Entities

Type	Coordinates (x,y)
	1484.11, 836.541 1363.4, 875.799 1350, 879.907 1322.75, 888.062

External Boundary	1262.34, 905.763 1150, 936.189 1085.7, 951.281 1060.47, 957.204 977.625, 974.803 850.05, 1000.26 750.584, 1019.57 725, 1025 655, 1055 628.401, 1095.94 605.985, 1094.59 578.266, 1093.65 564.392, 1093.41 550.55, 1092.66 531.51, 1091.36 512.538, 1089.44 477.725, 1086.99 467.877, 1086.9 458.034, 1087.05 448.23, 1087.45 438.401, 1088.42 429.726, 1088.97 421.051, 1090.52 403.043, 1094.16 390.252, 1096.74 377.314, 1098.58 366.335, 1100.52 355.224, 1101.41 329.049, 1100.46 311.187, 1098.99 302.379, 1098.28 301.402, 1098.27 300.986, 1098.16 300.696, 1098.3 300.298, 1098.31 299.473, 1098.22 297.151, 1097.95 295.961, 1097.89 293.329, 1097.49 284.873, 1096.31 283.07, 1096.31 281.705, 1095.84 278.708, 1095.6 276.645, 1095.5 275.84, 1095.13 274.43, 1095.25 272.04, 1094.73 264.019, 1095.09 259.325, 1094.52 254.762, 1092.98 249.262, 1091.73 241.892, 1090.05 240.213, 1089.56 238.477, 1089.26 234.466, 1088.56 219.767, 1085.93 212.637, 1083.81 205.443, 1081.92 192.468, 1077.89

	186.188, 1075.31 180.043, 1072.42 160.094, 1062.15 155.925, 1060 145.359, 1053.59 133.352, 1047.3 115.409, 1037.21 111.332, 1034.91 103.801, 1031.96 89.2358, 1026.93 81.7114, 1023.28 68.638, 1018.14 56.6371, 1014.45 44.3537, 1011.69 36.359, 1009.18 32.6645, 1007.43 28.9084, 1007.15 26.0111, 1007.54 21.5459, 1006.87 15.8788, 1005.18 10.824, 1004.04 5.44227, 1002.71 0, 1001.61 0, 500 1569.16, 500 1991.92, 500 1991.92, 675.302 1991.92, 804.969 1865.35, 805 1861.9, 804.054 1860.11, 803.963 1856.31, 803.351 1845.04, 802.052 1831.44, 800.238 1815.4, 800 1796.27, 800.631 1787.73, 801.554 1706.13, 770 1595.19, 770 1563.05, 800 1517.26, 822.92
Material Boundary	1404.06, 796.317 1431.3, 780.004 1481.33, 751.909 1534.3, 730.403 1589.53, 715.249 1645.41, 702.498 1701.78, 692.343 1758.52, 685.09 1815.53, 680.684 1872.71, 678.227 1929.97, 676.703 1991.92, 675.302

Material Boundary	160.094, 1062.15 198.203, 1052.89 236.185, 1043.42 274.134, 1033.82 312.072, 1024.19 350.048, 1014.71 387.902, 1004.79 425.254, 993.063 462.754, 981.845 500.278, 970.678 537.661, 959.078 574.752, 946.608 611.57, 933.329 648.243, 919.618 684.901, 905.858 721.623, 892.287 758.398, 878.872 795.206, 865.557 832.026, 852.281 868.837, 838.986 905.618, 825.612 942.36, 812.133 979.085, 798.603 1015.82, 785.088 1052.58, 771.656 1089.41, 758.374 1126.32, 745.308 1163.19, 732.132 1199.42, 717.362 1235.43, 702.008 1271.69, 687.243 1307.29, 671.035 1341.31, 651.637 1375.69, 632.957 1409.02, 612.541 1440.74, 589.52 1473.01, 567.402 1505.15, 545.082 1537.15, 522.544 1569.16, 500
Material Boundary	725, 1025 1287.43, 827.766 1350.29, 805.723
Material Boundary	1369.36, 804.728 1404.06, 796.317 1492, 775
Material Boundary	1350.29, 805.723 1369.36, 804.728
Material Boundary	1558.85, 775 1577.22, 777.112 1595.19, 770
Material Boundary	1492, 775 1558.85, 775



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 2	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	250	34						None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0
Landslide (Qls)		130	Mohr-Coulomb	180	28						None	0
Bedrock (QTp) isotropic		135	Mohr-Coulomb	500	32						None	0

Method Name	Min FS
Spencer	1.09

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 7-7'; Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPIs1a_PFd.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 15

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 5
    Method: spencer 5
Global Minimum Coordinates 5
    Method: spencer 5
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 6
Slice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.08936 6
Interslice Data 8
    Global Minimum Query (spencer) - Safety Factor: 1.08936 8
Entity Information 8
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SPIs1a_PFd

Project Summary

File Name:	SPIs1a_PFd.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:06.316s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 7-7'; Static; Circular
Author:	M Neely
Company:	Allan E Seward Engineering Geology, Inc.
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Landslide (Qls)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Bedrock (QTp) isotropic	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	500 psf
Phi	32 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.089360
Axis Location:	965.699, 1358.186
Left Slip Surface Endpoint:	594.909, 1043.953
Right Slip Surface Endpoint:	994.611, 873.014
Resisting Moment:	3.20312e+08 lb-ft
Driving Moment:	2.94037e+08 lb-ft
Resisting Horizontal Force:	619618 lb
Driving Horizontal Force:	568791 lb
Total Slice Area:	12329.1 ft2
Surface Horizontal Width:	399.703 ft
Surface Average Height:	30.8458 ft

Global Minimum Coordinates

Method: spencer

X	Y
594.909	1043.95
656.699	985.189
662.851	982.676
779.938	935.729
822.267	919.286
875.601	900.167
961.495	870.696
994.611	873.014

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	23554
Number of Invalid Surfaces:	1497

Error Codes

Error Code -108 reported for 91 surfaces
Error Code -111 reported for 267 surfaces
Error Code -112 reported for 195 surfaces
Error Code -121 reported for 355 surfaces
Error Code -124 reported for 7 surfaces
Error Code -145 reported for 31 surfaces
Error Code -1000 reported for 551 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.08936

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	7.7237	2992.03	-43.5625	Bedrock (QTp)	500	32	486.61	530.093	48.1596	0	48.1596	510.946	510.946
2	7.7237	8636.92	-43.5625	Bedrock (QTp)	500	32	740.016	806.144	489.934	0	489.934	1193.72	1193.72
3	7.7237	14243.2	-43.5625	Bedrock (QTp)	500	32	991.691	1080.31	928.687	0	928.687	1871.83	1871.83
4	7.7237	20076.6	-43.5625	Bedrock (QTp)	500	32	1253.56	1365.58	1385.21	0	1385.21	2577.4	2577.4
5	7.7237	25334.7	-43.5625	Bedrock (QTp)	500	32	1489.6	1622.71	1796.72	0	1796.72	3213.39	3213.39
6	7.7237	28622.2	-43.5625	Bedrock (QTp)	500	32	1637.18	1783.48	2054	0	2054	3611.02	3611.02
7	7.7237	32885	-43.5625	Bedrock (QTp)	500	32	1828.54	1991.94	2387.6	0	2387.6	4126.62	4126.62
8	7.7237	39365.6	-43.5625	Bedrock (QTp)	500	32	2119.46	2308.86	2894.78	0	2894.78	4910.48	4910.48
9	6.15229	33407.2	-22.2169	Bedrock (QTp)	424.286	18.3916	1812.42	1974.38	4662.02	0	4662.02	5402.27	5402.27
10	8.36339	43796.5	-21.8488	Bedrock (QTp)	410	15.5	1531.88	1668.77	4538.99	0	4538.99	5153.21	5153.21
11	8.36339	41987.8	-21.8488	Bedrock (QTp)	410	15.5	1483.76	1616.35	4349.95	0	4349.95	4944.88	4944.88
12	8.36339	41498.4	-21.8488	Bedrock (QTp)	410	15.5	1470.74	1602.16	4298.8	0	4298.8	4888.5	4888.5
13	8.36339	40058.1	-21.8488	Bedrock (QTp)	410	15.5	1432.41	1560.41	4148.26	0	4148.26	4722.6	4722.6
14	8.36339	40700.9	-21.8488	Bedrock (QTp)	410	15.5	1449.52	1579.05	4215.45	0	4215.45	4796.65	4796.65

15	8.36339	42786.5	-21.8488	Bedrock (QTp)	410	15.5	1505.01	1639.5	4433.43	0	4433.43	5036.88	5036.88
16	8.36339	44052.3	-21.8488	Bedrock (QTp)	410	15.5	1538.69	1676.19	4565.74	0	4565.74	5182.69	5182.69
17	8.36339	44785.7	-21.8488	Bedrock (QTp)	410	15.5	1558.21	1697.45	4642.39	0	4642.39	5267.17	5267.17
18	8.36339	45663.7	-21.8488	Bedrock (QTp)	410	15.5	1581.57	1722.9	4734.15	0	4734.15	5368.3	5368.3
19	8.36339	46218.5	-21.8488	Bedrock (QTp)	410	15.5	1596.33	1738.98	4792.14	0	4792.14	5432.2	5432.2
20	8.36339	47432.3	-21.8488	Bedrock (QTp)	410	15.5	1628.63	1774.16	4919.01	0	4919.01	5572.02	5572.02
21	8.36339	48483.6	-21.8488	Bedrock (QTp)	410	15.5	1656.6	1804.63	5028.89	0	5028.89	5693.12	5693.12
22	8.36339	48565.2	-21.8488	Bedrock (QTp)	410	15.5	1658.77	1807	5037.41	0	5037.41	5702.51	5702.51
23	8.36339	49589.3	-21.8488	Bedrock (QTp)	410	15.5	1686.02	1836.68	5144.45	0	5144.45	5820.48	5820.48
24	8.46583	51776.3	-21.2279	Bedrock (QTp)	410	15.5	1736.64	1891.83	5343.3	0	5343.3	6017.87	6017.87
25	8.46583	51088.4	-21.2279	Bedrock (QTp)	410	15.5	1718.45	1872.01	5271.85	0	5271.85	5939.36	5939.36
26	8.46583	49946.8	-21.2279	Bedrock (QTp)	410	15.5	1688.27	1839.13	5153.26	0	5153.26	5809.05	5809.05
27	8.46583	49944.6	-21.2279	Bedrock (QTp)	410	15.5	1688.21	1839.07	5153.04	0	5153.04	5808.8	5808.8
28	8.46583	49606.9	-21.2279	Bedrock (QTp)	410	15.5	1679.28	1829.34	5117.98	0	5117.98	5770.27	5770.27
29	7.61908	43078.9	-19.7222	Bedrock (QTp)	410	15.5	1653.97	1801.77	5018.57	0	5018.57	5611.51	5611.51
30	7.61908	41882.2	-19.7222	Bedrock (QTp)	410	15.5	1618.31	1762.92	4878.47	0	4878.47	5458.61	5458.61
31	7.61908	40826.4	-19.7222	Bedrock (QTp)	410	15.5	1586.84	1728.64	4754.86	0	4754.86	5323.72	5323.72
32	7.61908	39301.1	-19.7222	Bedrock (QTp)	410	15.5	1541.37	1679.11	4576.28	0	4576.28	5128.84	5128.84
33	7.61908	37691.5	-19.7222	Bedrock (QTp)	410	15.5	1493.4	1626.85	4387.83	0	4387.83	4923.19	4923.19
34	7.61908	36096.8	-19.7222	Bedrock (QTp)	410	15.5	1445.88	1575.08	4201.13	0	4201.13	4719.46	4719.46
35	7.61908	34478.9	-19.7222	Bedrock (QTp)	410	15.5	1397.66	1522.55	4011.71	0	4011.71	4512.76	4512.76
36	7.80858	33358.1	-18.9372	Bedrock (QTp)	410	15.5	1348.65	1469.17	3819.26	0	3819.26	4281.98	4281.98
37	7.80858	31212.4	-18.9372	Bedrock (QTp)	410	15.5	1285.79	1400.69	3572.31	0	3572.31	4013.47	4013.47
38	7.80858	29102.6	-18.9372	Bedrock (QTp)	410	15.5	1223.98	1333.35	3329.49	0	3329.49	3749.44	3749.44
39	7.80858	27085.6	-18.9372	Bedrock (QTp)	410	15.5	1164.88	1268.98	3097.37	0	3097.37	3497.04	3497.04
40	7.80858	25241.6	-18.9372	Bedrock (QTp)	410	15.5	1110.85	1210.12	2885.13	0	2885.13	3266.26	3266.26
41	7.80858	23769.5	-18.9372	Bedrock (QTp)	410	15.5	1067.72	1163.13	2715.72	0	2715.72	3082.06	3082.06
42	7.80858	22449.4	-18.9372	Bedrock (QTp)	410	15.5	1029.05	1121	2563.79	0	2563.79	2916.85	2916.85
43	7.80858	21234.4	-18.9372	Bedrock (QTp)	410	15.5	993.448	1082.22	2423.95	0	2423.95	2764.8	2764.8
44	7.80858	20072.7	-18.9372	Bedrock (QTp)	410	15.5	959.41	1045.14	2290.26	0	2290.26	2619.43	2619.43
45	7.80858	18948.9	-18.9372	Bedrock (QTp)	410	15.5	926.485	1009.28	2160.92	0	2160.92	2478.8	2478.8
46	7.80858	18020.6	-18.9372	Bedrock (QTp)	410	15.5	899.288	979.648	2054.09	0	2054.09	2362.63	2362.63
47	8.27901	16253.1	4.0033	Bedrock (QTp)	500	32	2018.15	2198.49	2718.16	0	2718.16	2576.92	2576.92
48	8.27901	11592.3	4.0033	Bedrock (QTp)	500	32	1604.68	1748.07	1997.33	0	1997.33	1885.03	1885.03
49	8.27901	6924.29	4.0033	Bedrock (QTp)	500	32	1190.57	1296.96	1275.41	0	1275.41	1192.09	1192.09
50	8.27901	2265.44	4.0033	Bedrock (QTp)	500	32	791.563	862.297	579.798	0	579.798	524.4	524.4

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.08936

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	594.909	1043.95	0	0	0
2	602.633	1036.61	-3417	-974.223	15.9134
3	610.356	1029.26	-5552.59	-1583.1	15.9134
4	618.08	1021.92	-6415.52	-1829.13	15.9134
5	625.804	1014.57	-5954.25	-1697.62	15.9134
6	633.527	1007.23	-4299.36	-1225.79	15.9134
7	641.251	999.88	-1898.19	-541.195	15.9134
8	648.975	992.534	1470.64	419.295	15.9134
9	656.699	985.189	6310.62	1799.22	15.9134
10	662.851	982.676	6838.31	1949.67	15.9134
11	671.214	979.323	9205.49	2624.58	15.9134
12	679.578	975.969	11342.6	3233.88	15.9133
13	687.941	972.616	13417.4	3825.43	15.9134
14	696.304	969.262	15308.9	4364.73	15.9134
15	704.668	965.909	17282.3	4927.35	15.9134
16	713.031	962.556	19520.9	5565.62	15.9134
17	721.395	959.202	21920.7	6249.81	15.9134
18	729.758	955.849	24413.7	6960.61	15.9134
19	738.121	952.495	27018.5	7703.25	15.9134
20	746.485	949.142	29693.8	8466.01	15.9134
21	754.848	945.789	32523.6	9272.81	15.9134
22	763.212	942.435	35487.1	10117.7	15.9133
23	771.575	939.082	38461	10965.6	15.9134
24	779.938	935.729	41565.2	11850.7	15.9134
25	788.404	932.44	44385.9	12654.9	15.9134
26	796.87	929.152	47126.1	13436.1	15.9134
27	805.336	925.863	49732.7	14179.3	15.9134
28	813.802	922.575	52339.1	14922.4	15.9134
29	822.267	919.286	54906.1	15654.3	15.9134
30	829.887	916.555	55970.5	15957.8	15.9134
31	837.506	913.824	56924.8	16229.9	15.9134
32	845.125	911.092	57782.1	16474.3	15.9134
33	852.744	908.361	58499.1	16678.7	15.9134
34	860.363	905.63	59068.2	16841	15.9134
35	867.982	902.898	59490.6	16961.4	15.9134
36	875.601	900.167	59764.2	17039.4	15.9134
37	883.41	897.488	59430.9	16944.4	15.9134
38	891.218	894.809	58928.4	16801.1	15.9134
39	899.027	892.13	58259.7	16610.5	15.9135
40	906.835	889.45	57432.1	16374.5	15.9134
41	914.644	886.771	56459.1	16097.1	15.9134
42	922.453	884.092	55370.1	15786.6	15.9134
43	930.261	881.413	54177.1	15446.4	15.9133
44	938.07	878.734	52888.3	15079	15.9134
45	945.878	876.055	51508	14685.5	15.9134
46	953.687	873.376	50039.1	14266.7	15.9134
47	961.495	870.696	48497.1	13827	15.9134
48	969.774	871.276	30159	8598.65	15.9134
49	978.053	871.855	15673	4468.54	15.9134
50	986.332	872.435	5044.93	1438.36	15.9134
51	994.611	873.014	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

Shared Entities

Type	Coordinates (x,y)
	485.719, 1053.23 477.448, 1055.3 469.088, 1056.53 460.619, 1057.39 452.503, 1059.75 444.399, 1062.3 436.042, 1063.72 427.582, 1064.59 419.125, 1065.28 410.72, 1066.38 402.261, 1067.09 393.794, 1066.49 385.445, 1064.9 377.358, 1062.32 369.232, 1059.9 361.04, 1057.67 353.03, 1054.86 345.072, 1051.91 336.936, 1049.65 328.52, 1048.4 320.318, 1046.2 312.091, 1044.11 303.912, 1041.84 295.668, 1039.83 287.371, 1038.03 279.013, 1036.54 270.654, 1035.05 262.352, 1033.3 254.068, 1031.44 245.741, 1029.75 237.504, 1027.72 229.383, 1025.26 221.228, 1022.91 213.038, 1020.66 205.116, 1017.65 197.276, 1014.39 189.329, 1011.41 181.419, 1008.34 173.742, 1004.71 166.054, 1001.12 158.384, 997.484 150.834, 993.542 142.992, 990.477 134.815, 988.153 126.526, 988.044 118.185, 989.639 109.794, 991.025 101.335, 991.662 92.8442, 992.351 84.3596, 993.047 75.9034, 992.974 67.4792, 991.916 59.0572, 990.856 50.6494, 989.717 50.0147, 989.617 42.2637, 988.39 33.8066, 987.732 25.323, 987.519

External Boundary	16.8784, 986.627 8.43798, 985.747 0, 984.987 0, 700 907.994, 700 1234.09, 700 1273.93, 700 1450, 700 1450, 817.358 1441.73, 819.243 1433.36, 820.215 1424.88, 820.304 1418.3, 820.321 1416.4, 820.325 1407.91, 820.394 1399.42, 820.415 1390.93, 820.45 1382.44, 820.497 1373.96, 820.637 1365.47, 820.796 1356.98, 820.876 1348.5, 820.955 1340.01, 821.047 1331.52, 821.135 1323.04, 821.129 1314.55, 820.826 1306.09, 820.241 1297.64, 819.37 1289.19, 819.954 1280.72, 820.645 1272.26, 821.177 1263.75, 821.383 1255.26, 821.566 1246.85, 821.789 1238.27, 822.002 1235.84, 822.435 1230.04, 822.426 1229.71, 822.425 1225.83, 822.419 1222.14, 822.413 1217.86, 822.406 1209.31, 822.393 1200.59, 822.379 1192.12, 822.366 1186.25, 822.357 1184.05, 822.354 1175.54, 822.34 1166.76, 822.326 1154.28, 822.302 1148.2, 822.302 1139.87, 822.302 1124.49, 825.158 1118, 826.158 1111.93, 827.092 1086.46, 835.654 1083.79, 836.552 1055.45, 848.325 1045.41, 852.493 1044.6, 852.832

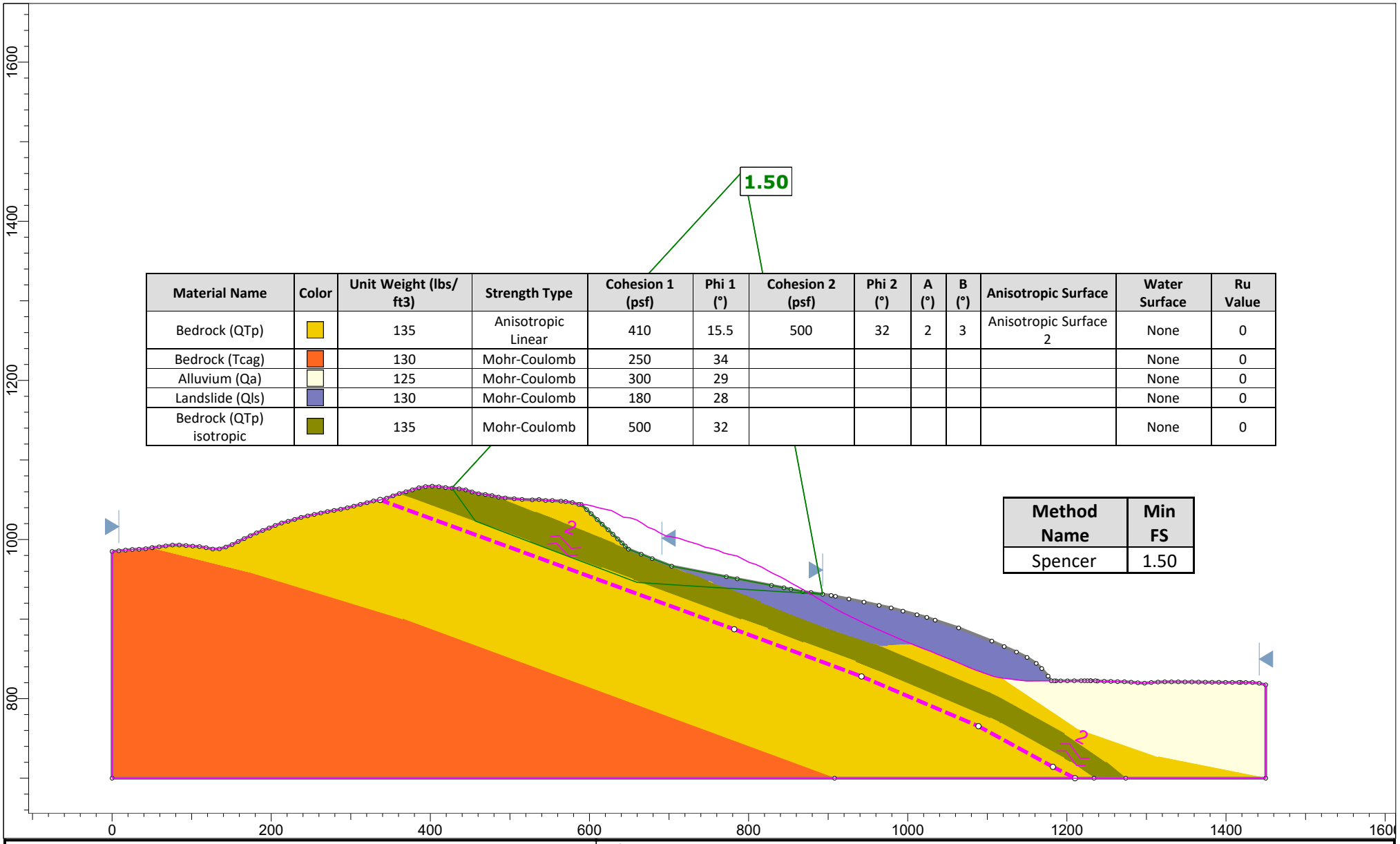
1006.53, 868.049
989.534, 875.129
977.488, 880.398
966.177, 885.269
950.696, 892.232
937.99, 898.356
927.773, 903.327
912.62, 910.97
901.083, 917.527
890.607, 923.765
880.424, 929.923
872.337, 934.774
861.337, 940.95
850.683, 946.941
841.941, 951.908
834.149, 955.653
825.332, 960.168
825.091, 960.291
823.924, 960.889
816.654, 965.281
800.762, 971.199
793.272, 975.143
785.802, 979.185
777.49, 980.9
769.277, 982.865
761.496, 986.343
753.428, 988.754
741.64, 991.855
732.685, 995.108
721.122, 998.498
713.121, 1001.36
696.329, 1004.38
688.811, 1008.01
681.525, 1012.47
673.541, 1015.42
666.522, 1020.19
659.336, 1024.58
651.356, 1027.19
642.84, 1027.83
635.551, 1032.08
628.069, 1036.18
622.711, 1037.32
615.427, 1038.93
608.776, 1040.6
601.26, 1042.62
595.086, 1043.95
586.576, 1044.06
583.336, 1045.02
578.416, 1046.48
570.07, 1047.63
561.796, 1048.45
553.328, 1048.93
544.878, 1048.98
541.065, 1049.55
536.494, 1050.23
532.111, 1050.04
524.566, 1050.04
519.53, 1050.04
511.061, 1050.78

	502.587, 1051.39 494.127, 1052.13
Material Boundary	50.0147, 989.617 172.255, 959.139 364.865, 900.252 907.994, 700
Material Boundary	551.99, 1026.79 574.254, 1017.87 593.42, 1010.18 615.105, 1001.49 631.017, 995.113 649, 987.904 664.987, 981.496 687.116, 972.625 700, 967.461 715.461, 961.264 735.669, 953.164 761.945, 942.654 782.829, 934.322 805.712, 925.193 806.659, 924.815 830.374, 915.353 850, 907.523 872.1, 899.033 893.477, 890.82 907.747, 885.802 915.529, 883.066 930.255, 878.089 946.668, 872.542 957.264, 868.961 958.74, 868.463 965.369, 866.222 974.419, 866.222 974.419, 866.624 978.936, 866.624 981.931, 866.624 981.931, 866.957 985.757, 866.957 989.084, 866.957 989.084, 867.275 992.577, 867.275 995.488, 867.559 998.152, 867.677 1001.06, 867.677 1003.8, 867.928 1006.53, 868.049 1027.25, 859.759 1055.45, 848.325
Material Boundary	796.163, 966.767 825.091, 960.291
Material Boundary	695.747, 989.488 730.641, 981.121 758.962, 974.917 763.263, 973.974

Material Boundary	551.99, 1026.79 600.116, 1013.15 650, 1000 700, 987.718 730.641, 981.121 750, 976.952 758.962, 974.917 776.625, 970.904 800, 965.594 825.332, 960.168
Material Boundary	1148.2, 822.302 1149.8, 822.167 1154.28, 822.302
Material Boundary	1087.78, 835.112 1105.12, 828.862 1111.93, 827.092
Material Boundary	1027.25, 859.759 1045.41, 852.493
Material Boundary	998.152, 867.677 1003.8, 867.928
Material Boundary	965.369, 866.222 974.419, 866.624 981.931, 866.957 989.084, 867.275 995.488, 867.559
Material Boundary	893.477, 890.82 900, 888.314 909.965, 884.946 915.529, 883.066
Material Boundary	735.669, 953.164 750, 947.42 761.945, 942.654
Material Boundary	1118, 826.158 1214, 762 1314, 727 1450, 700
Material Boundary	1418.3, 820.321 1433.36, 820.215 1450, 817.358
Material Boundary	1348.5, 820.955 1373.96, 820.637
Material Boundary	377.985, 1052.14 402.082, 1043.25 434.135, 1031.43 475.02, 1016.35 481.516, 1013.96
Material Boundary	495.018, 1008.98 526.51, 997.365 569.504, 981.508 614.826, 964.794 636.29, 956.878
Material Boundary	655.558, 949.772 789.783, 900.27 796.457, 897.809

Material Boundary	835.412, 883.442 867.686, 871.54 935.044, 846.698 940.893, 844.541
Material Boundary	956.414, 838.45 961.928, 836.109 1103.47, 776.027
Material Boundary	1115.63, 770.065 1197.05, 724.931
Material Boundary	1203.93, 721.115 1234.09, 700
Material Boundary	428.612, 1064.47 481.516, 1044.96
Material Boundary	495.018, 1039.98 511.667, 1033.84 636.29, 987.878
Material Boundary	655.558, 980.772 755.064, 944.075 793.143, 930.031 796.457, 928.809
Material Boundary	835.412, 914.442 940.893, 875.541
Material Boundary	956.414, 869.45 958.74, 868.463 1103.47, 807.027
Material Boundary	1115.63, 801.065 1197.05, 755.931
Material Boundary	1203.93, 752.115 1248.96, 720.59
Material Boundary	377.985, 1052.14 361.04, 1057.67 393.794, 1066.49 427.582, 1064.59
Material Boundary	481.516, 1013.96 495.018, 1008.98
Material Boundary	636.29, 956.878 655.558, 949.772
Material Boundary	789.783, 900.27 824.514, 888.082 867.686, 871.54
Material Boundary	935.044, 846.698 961.928, 836.109
Material Boundary	1103.47, 776.027 1115.63, 770.065
Material Boundary	1197.05, 724.931 1203.93, 721.115
Material Boundary	1197.05, 755.931 1248.96, 720.59 1273.93, 700
Material Boundary	965.369, 866.222 1103.47, 807.027 1115.63, 801.065

Material Boundary	793.143, 930.031 806.659, 924.815 907.747, 885.802 909.965, 884.946
Material Boundary	636.29, 987.878 655.558, 980.772
Material Boundary	481.516, 1044.96 495.018, 1039.98
Material Boundary	485.719, 1053.23 551.99, 1026.79 588.01, 1016.94 612.207, 1010.33 650, 1000 670.369, 995.32 695.747, 989.488 763.263, 973.974 776.625, 970.904 796.163, 966.767 823.924, 960.889
Material Boundary	1086.46, 835.654 1087.78, 835.112 1111.93, 827.092



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 2	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	250	34						None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0
Landslide (Qls)		130	Mohr-Coulomb	180	28						None	0
Bedrock (QTp) isotropic		135	Mohr-Coulomb	500	32						None	0

Method Name	Min FS
Spencer	1.50

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 7-7'; Static; Non-Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPIs1a_PFf.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 16

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 5
    Method: spencer 5
Global Minimum Coordinates 5
    Method: spencer 5
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 6
Slice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.5048 6
Interslice Data 8
    Global Minimum Query (spencer) - Safety Factor: 1.5048 8
Entity Information 9
    Non-Circular Search (Cuckoo) 9
        Shared Entities 9

Slide2 Analysis Information

SPIs1a_PFf

Project Summary

File Name:	SPIs1a_PFf.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:07.357s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 7-7'; Static; Non-Circular
Author:	M Neely
Company:	Allan E Seward Engineering Geology, Inc.
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Landslide (Qls)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Bedrock (QTp) isotropic	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	500 psf
Phi	32 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.504800
Axis Location:	793.494, 1463.986
Left Slip Surface Endpoint:	426.985, 1064.634
Right Slip Surface Endpoint:	893.071, 931.168
Resisting Moment:	4.80625e+08 lb-ft
Driving Moment:	3.19394e+08 lb-ft
Resisting Horizontal Force:	850814 lb
Driving Horizontal Force:	565398 lb
Total Slice Area:	14651.1 ft2
Surface Horizontal Width:	466.085 ft
Surface Average Height:	31.4343 ft

Global Minimum Coordinates

Method: spencer

X	Y
426.985	1064.63
456.61	1023.09
506.249	1004.15
659.961	946.003
718.772	942.242
804.343	936.805
845.614	934.183
893.071	931.168

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	23602
Number of Invalid Surfaces:	1449

Error Codes

Error Code -108 reported for 104 surfaces
Error Code -111 reported for 229 surfaces
Error Code -112 reported for 207 surfaces
Error Code -121 reported for 200 surfaces
Error Code -124 reported for 16 surfaces
Error Code -145 reported for 27 surfaces
Error Code -1000 reported for 666 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.5048

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	9.87507	8567.91	-54.5043	Bedrock (QTp) isotropic	500	32	441.792	664.808	263.748	0	263.748	883.215	883.215
2	9.87507	25109.3	-54.5043	Bedrock (QTp) isotropic	500	32	820.702	1234.99	1176.23	0	1176.23	2327	2327
3	9.87507	40010.5	-54.5043	Bedrock (QTp) isotropic	500	32	1162.04	1748.64	1998.24	0	1998.24	3627.61	3627.61
4	9.92764	48583	-20.8917	Bedrock (QTp)	410	15.5	1070.77	1611.3	4331.74	0	4331.74	4740.46	4740.46
5	9.92764	51933.7	-20.8917	Bedrock (QTp)	410	15.5	1126.2	1694.71	4632.53	0	4632.53	5062.4	5062.4
6	9.92764	54518.4	-20.8917	Bedrock (QTp)	410	15.5	1168.97	1759.06	4864.56	0	4864.56	5310.75	5310.75
7	9.92764	57191.8	-20.8917	Bedrock (QTp)	410	15.5	1213.19	1825.61	5104.54	0	5104.54	5567.61	5567.61
8	9.92764	60968.9	-20.8917	Bedrock (QTp)	410	15.5	1275.68	1919.64	5443.6	0	5443.6	5930.52	5930.52
9	9.60703	62793	-20.72	Bedrock (QTp)	410	15.5	1342.14	2019.65	5804.19	0	5804.19	6311.88	6311.88
10	9.60703	66775.3	-20.72	Bedrock (QTp)	410	15.5	1410.31	2122.23	6174.11	0	6174.11	6707.58	6707.58
11	9.60703	71241.9	-20.72	Bedrock (QTp)	410	15.5	1486.77	2237.29	6589.02	0	6589.02	7151.41	7151.41
12	9.60703	75582.6	-20.72	Bedrock (QTp)	410	15.5	1561.08	2349.11	6992.21	0	6992.21	7582.72	7582.72

13	9.60703	79316	-20.72	Bedrock (QTp)	410	15.5	1624.99	2445.29	7339.01	0	7339.01	7953.69	7953.69
14	9.60703	83509.7	-20.72	Bedrock (QTp)	410	15.5	1696.78	2553.32	7728.56	0	7728.56	8370.4	8370.4
15	9.60703	87171.3	-20.72	Bedrock (QTp)	410	15.5	1759.46	2647.64	8068.68	0	8068.68	8734.23	8734.23
16	9.60703	90038.5	-20.72	Bedrock (QTp)	410	15.5	1808.55	2721.5	8335.01	0	8335.01	9019.13	9019.13
17	9.60703	91464.8	-20.72	Bedrock (QTp)	410	15.5	1832.97	2758.25	8467.5	0	8467.5	9160.85	9160.85
18	9.60703	86899	-20.72	Bedrock (QTp)	410	15.5	1754.8	2640.63	8043.39	0	8043.39	8707.17	8707.17
19	9.60703	79820.6	-20.72	Bedrock (QTp)	410	15.5	1633.63	2458.29	7385.88	0	7385.88	8003.83	8003.83
20	9.60703	72742.3	-20.72	Bedrock (QTp)	410	15.5	1512.45	2275.94	6728.37	0	6728.37	7300.49	7300.49
21	9.60703	65663.9	-20.72	Bedrock (QTp)	410	15.5	1391.28	2093.6	6070.87	0	6070.87	6597.14	6597.14
22	9.60703	58585.5	-20.72	Bedrock (QTp)	410	15.5	1270.11	1911.26	5413.36	0	5413.36	5893.8	5893.8
23	9.60703	51574.7	-20.72	Bedrock (QTp)	410	15.5	1150.09	1730.65	4762.12	0	4762.12	5197.16	5197.16
24	9.60703	48785.3	-20.72	Bedrock (QTp)	410	15.5	1102.34	1658.8	4503.03	0	4503.03	4920.01	4920.01
25	7.03539	34497.8	-3.6594	Bedrock (QTp)	500	32	2539.87	3821.99	5316.3	0	5316.3	5478.74	5478.74
26	8.62921	39239.2	-3.6594	Bedrock (QTp) isotropic	500	32	2381.61	3583.85	4935.19	0	4935.19	5087.51	5087.51
27	8.62921	35880.1	-3.6594	Bedrock (QTp) isotropic	500	32	2208.67	3323.61	4518.71	0	4518.71	4659.97	4659.97
28	8.62921	32624.1	-3.6594	Bedrock (QTp) isotropic	500	32	2041.04	3071.35	4115.02	0	4115.02	4245.55	4245.55
29	8.62921	29377.9	-3.6594	Bedrock (QTp) isotropic	500	32	1873.91	2819.86	3712.56	0	3712.56	3832.4	3832.4
30	8.62921	26705.7	-3.6594	Bedrock (QTp) isotropic	500	32	1736.33	2612.83	3381.23	0	3381.23	3492.28	3492.28
31	8.62921	25269.5	-3.6594	Bedrock (QTp) isotropic	500	32	1662.39	2501.57	3203.18	0	3203.18	3309.5	3309.5
32	8.76328	24234.8	-3.63542	Bedrock (QTp) isotropic	500	32	1590.47	2393.34	3029.98	0	3029.98	3131.03	3131.03
33	8.76328	22799.4	-3.63542	Bedrock (QTp) isotropic	500	32	1517.68	2283.8	2854.68	0	2854.68	2951.11	2951.11
34	8.76328	21364.6	-3.63542	Bedrock (QTp) isotropic	500	32	1444.92	2174.31	2679.46	0	2679.46	2771.26	2771.26
35	8.76328	19929.4	-3.63542	Bedrock (QTp) isotropic	500	32	1372.14	2064.79	2504.19	0	2504.19	2591.37	2591.37
36	8.76328	18490.7	-3.63542	Bedrock (QTp) isotropic	500	32	1299.18	1955	2328.5	0	2328.5	2411.04	2411.04
37	8.76328	17051.4	-3.63542	Bedrock (QTp) isotropic	500	32	1226.19	1845.17	2152.72	0	2152.72	2230.62	2230.62
38	8.24778	14806.1	-3.63542	Landslide (Qls)	180	28	798.618	1201.76	1921.64	0	1921.64	1972.38	1972.38
39	8.24778	13682	-3.63542	Landslide (Qls)	180	28	747.735	1125.19	1777.65	0	1777.65	1825.15	1825.15
40	8.24778	12558.9	-3.63542	Landslide (Qls)	180	28	696.901	1048.7	1633.78	0	1633.78	1678.06	1678.06
41	8.24778	11436.1	-3.63542	Landslide (Qls)	180	28	646.084	972.227	1489.97	0	1489.97	1531.02	1531.02
42	10.3179	12725.7	-3.63537	Landslide (Qls)	180	28	588.89	886.161	1328.09	0	1328.09	1365.51	1365.51
43	10.3179	10968.6	-3.63537	Landslide (Qls)	180	28	525.316	790.496	1148.18	0	1148.18	1181.55	1181.55

44	10.3179	9211.49	-3.63537	Landslide (Qls)	180	28	461.744	694.832	968.263	0	968.263	997.599	997.599
45	10.3179	7452.37	-3.63537	Landslide (Qls)	180	28	398.098	599.058	788.133	0	788.133	813.426	813.426
46	9.49126	5148.75	-3.63537	Landslide (Qls)	180	28	330.977	498.054	598.172	0	598.172	619.2	619.2
47	9.49126	3411.8	-3.63537	Landslide (Qls)	180	28	262.659	395.25	404.828	0	404.828	421.516	421.516
48	9.49126	1921.21	-3.63537	Landslide (Qls)	180	28	204.032	307.028	238.905	0	238.905	251.868	251.868
49	9.49126	1319.94	-3.63537	Landslide (Qls)	180	28	180.384	271.441	171.976	0	171.976	183.437	183.437
50	9.49126	456.573	-3.63537	Landslide (Qls)	180	28	146.716	220.779	76.6939	0	76.6939	86.0154	86.0154

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.5048

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	426.985	1064.63	0	0	0
2	436.86	1050.79	-715.889	-187.572	14.6822
3	446.735	1036.94	7456.8	1953.78	14.6822
4	456.61	1023.09	23636.7	6193.12	14.6822
5	466.538	1019.31	29408.4	7705.38	14.6822
6	476.466	1015.52	35768.9	9371.91	14.6822
7	486.393	1011.73	42583.6	11157.5	14.6823
8	496.321	1007.94	49868	13066.1	14.6822
9	506.249	1004.15	57816.3	15148.6	14.6822
10	515.856	1000.51	65999.7	17292.8	14.6822
11	525.463	996.88	74871.7	19617.4	14.6822
12	535.07	993.246	84516	22144.3	14.6822
13	544.677	989.612	94910.8	24867.9	14.6822
14	554.284	985.978	105951	27760.6	14.6822
15	563.891	982.344	117717	30843.3	14.6822
16	573.498	978.71	130115	34091.9	14.6822
17	583.105	975.076	143010	37470.4	14.6822
18	592.712	971.442	156151	40913.5	14.6822
19	602.319	967.808	168502	44149.8	14.6822
20	611.926	964.174	179630	47065.4	14.6822
21	621.533	960.539	189534	49660.3	14.6822
22	631.14	956.905	198213	51934.5	14.6822
23	640.747	953.271	205669	53888.1	14.6822
24	650.354	949.637	211913	55524	14.6822
25	659.961	946.003	217674	57033.6	14.6822
26	666.997	945.553	202176	52972.9	14.6822
27	675.626	945.002	184324	48295.4	14.6822
28	684.255	944.45	167737	43949.2	14.6822
29	692.884	943.898	152374	39924.1	14.6822
30	701.513	943.346	138234	36219	14.6822
31	710.143	942.794	125099	32777.6	14.6822
32	718.772	942.242	112505	29477.7	14.6822
33	727.535	941.685	100237	26263.5	14.6823
34	736.298	941.129	88511.2	23191.1	14.6822
35	745.062	940.572	77325.9	20260.4	14.6822
36	753.825	940.015	66681.6	17471.5	14.6822
37	762.588	939.458	56579.5	14824.6	14.6822
38	771.352	938.901	47020	12319.9	14.6823
39	779.599	938.377	41432.4	10855.8	14.6822
40	787.847	937.853	36189.5	9482.13	14.6822
41	796.095	937.329	31291	8198.64	14.6822
42	804.343	936.805	26736.7	7005.36	14.6822
43	814.661	936.15	21524	5639.58	14.6822
44	824.978	935.494	16850.1	4414.95	14.6822
45	835.296	934.839	12715	3331.49	14.6822
46	845.614	934.183	9119.24	2389.36	14.6822
47	855.106	933.58	6334.85	1659.82	14.6823
48	864.597	932.977	4083.06	1069.81	14.6821
49	874.088	932.374	2288.31	599.567	14.6822
50	883.579	931.771	677.921	177.624	14.6822
51	893.071	931.168	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

Shared Entities

Type	Coordinates (x,y)
	485.719, 1053.23 477.448, 1055.3 469.088, 1056.53 460.619, 1057.39

452.503, 1059.75
444.399, 1062.3
436.042, 1063.72
427.582, 1064.59
419.125, 1065.28
410.72, 1066.38
402.261, 1067.09
393.794, 1066.49
385.445, 1064.9
377.358, 1062.32
369.232, 1059.9
361.04, 1057.67
353.03, 1054.86
345.072, 1051.91
336.936, 1049.65
328.52, 1048.4
320.318, 1046.2
312.091, 1044.11
303.912, 1041.84
295.668, 1039.83
287.371, 1038.03
279.013, 1036.54
270.654, 1035.05
262.352, 1033.3
254.068, 1031.44
245.741, 1029.75
237.504, 1027.72
229.383, 1025.26
221.228, 1022.91
213.038, 1020.66
205.116, 1017.65
197.276, 1014.39
189.329, 1011.41
181.419, 1008.34
173.742, 1004.71
166.054, 1001.12
158.384, 997.484
150.834, 993.542
142.992, 990.477
134.815, 988.153
126.526, 988.044
118.185, 989.639
109.794, 991.025
101.335, 991.662
92.8442, 992.351
84.3596, 993.047
75.9034, 992.974
67.4792, 991.916
59.0572, 990.856
50.6494, 989.717
50.0147, 989.617
42.2637, 988.39
33.8066, 987.732
25.323, 987.519
16.8784, 986.627
8.43798, 985.747
0, 984.987
0, 700
907.994, 700

External Boundary	1234.09, 700 1273.93, 700 1450, 700 1450, 817.358 1441.73, 819.243 1433.36, 820.215 1424.88, 820.304 1418.3, 820.321 1416.4, 820.325 1407.91, 820.394 1399.42, 820.415 1390.93, 820.45 1382.44, 820.497 1373.96, 820.637 1365.47, 820.796 1356.98, 820.876 1348.5, 820.955 1340.01, 821.047 1331.52, 821.135 1323.04, 821.129 1314.55, 820.826 1306.09, 820.241 1297.64, 819.37 1289.19, 819.954 1280.72, 820.645 1272.26, 821.177 1263.75, 821.383 1255.26, 821.566 1246.85, 821.789 1238.27, 822.002 1235.84, 822.435 1230.04, 822.426 1229.71, 822.425 1225.83, 822.419 1222.14, 822.413 1217.86, 822.406 1209.31, 822.393 1200.59, 822.379 1192.12, 822.366 1186.25, 822.357 1184.05, 822.354 1180.32, 822.348 1176.34, 828.259 1168.5, 837.799 1161.49, 844.239 1150, 851.829 1136.63, 858.559 1121.14, 865.433 1105.67, 872.302 1063.93, 888.872 1034.46, 898.606 1024, 902.059 1011.67, 905.314 993.977, 909.987 979.067, 913.924 963.965, 917.229 944.92, 921.398 926.038, 925.183 909.185, 928.562

	903.658, 929.67 893.071, 931.168 878.412, 933.242 868.253, 934.264 853.134, 937.467 844.409, 939.315 828.642, 942.319 785.634, 950.512 772.034, 953.102 703.349, 966.461 678.861, 975.935 664.987, 981.496 649, 987.904 644.896, 991.788 640.803, 995.662 635.515, 1000.67 629.35, 1006.5 623.39, 1012.14 615.952, 1019.18 609.694, 1025.1 601.979, 1032.4 596.454, 1037.63 589.704, 1044.02 586.576, 1044.06 578.416, 1046.48 570.07, 1047.63 564.133, 1048.22 553.328, 1048.93 544.878, 1048.98 536.494, 1050.23 528.012, 1049.87 515.281, 1050.41 505.307, 1051.2 494.127, 1052.13
Material Boundary	50.0147, 989.617 172.255, 959.139 364.865, 900.252 907.994, 700

Material Boundary	678.861, 975.935 687.116, 972.625 700, 967.461 715.461, 961.264 721.543, 958.826 735.669, 953.164 755.531, 945.22 761.945, 942.654 769.872, 939.492 782.829, 934.322 805.712, 925.193 806.659, 924.815 815.009, 921.484 830.374, 915.353 842.606, 910.473 850, 907.523 867.494, 900.802 872.1, 899.033 893.477, 890.82 894.384, 890.501 907.747, 885.802 915.529, 883.066 926.772, 879.266 930.255, 878.089 946.668, 872.542 957.264, 868.961 958.74, 868.463 964.18, 866.624 965.369, 866.222 974.419, 866.222 974.419, 866.624 978.936, 866.624 981.931, 866.624 981.931, 866.957 985.757, 866.957 989.084, 866.957 989.084, 867.275 992.577, 867.275 995.488, 867.559 998.152, 867.677 1001.06, 867.677 1003.8, 867.928 1006.53, 868.049 1027.25, 859.759 1055.45, 848.325
Material Boundary	1148.2, 822.302 1149.8, 822.167 1154.28, 822.302
Material Boundary	1087.78, 835.112 1100.13, 830.659 1105.12, 828.862 1111.93, 827.092
Material Boundary	1027.25, 859.759 1045.41, 852.493
Material Boundary	998.152, 867.677 1003.8, 867.928

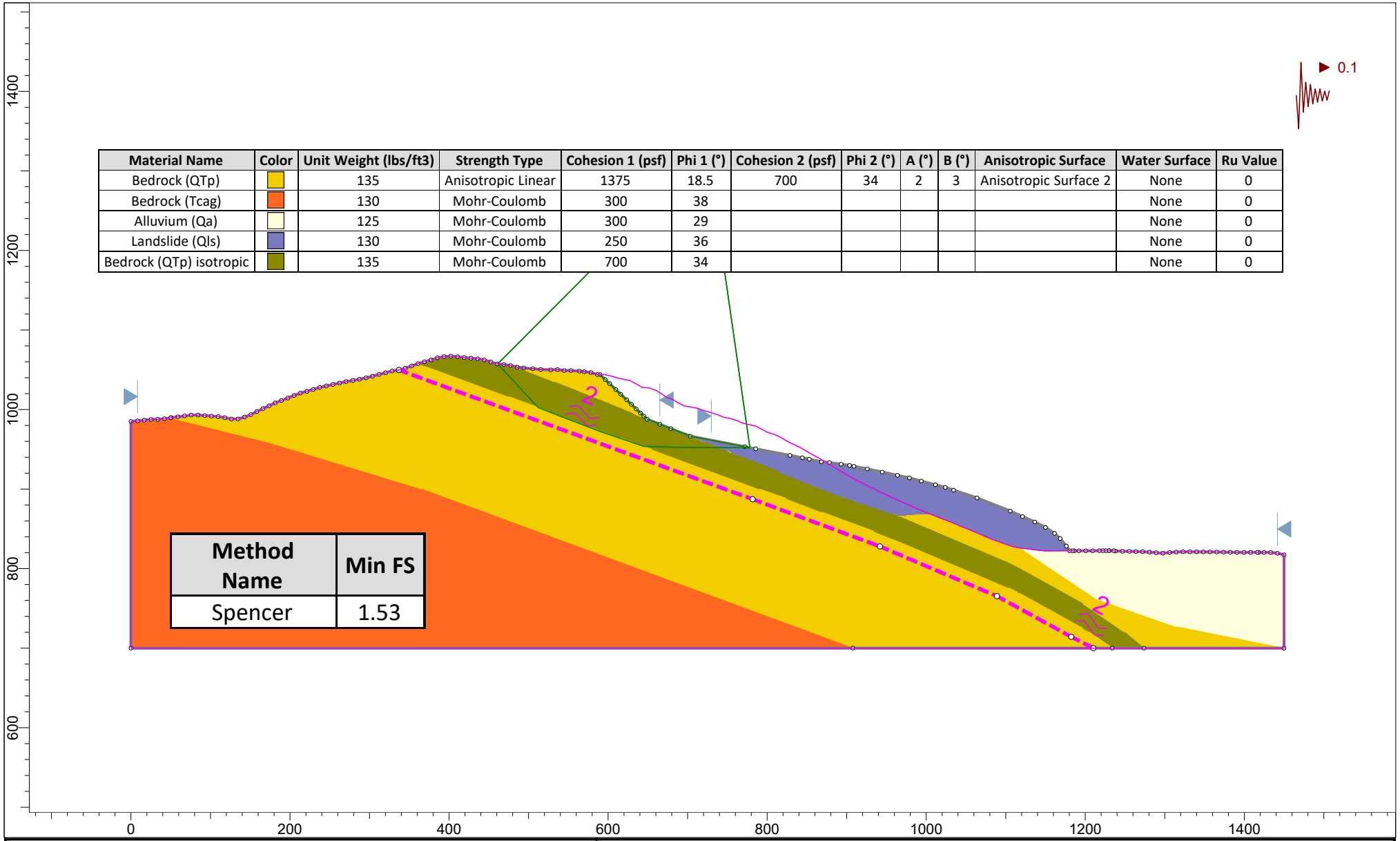
Material Boundary	965.369, 866.222 974.419, 866.624 981.931, 866.957 989.084, 867.275 995.488, 867.559
Material Boundary	893.477, 890.82 900, 888.314 900.791, 888.046 909.965, 884.946 915.529, 883.066
Material Boundary	735.669, 953.164 743.589, 949.99 750, 947.42 761.945, 942.654
Material Boundary	1118, 826.158 1118.4, 825.89 1214, 762 1314, 727 1450, 700
Material Boundary	1418.3, 820.321 1433.36, 820.215 1450, 817.358
Material Boundary	1348.5, 820.955 1373.96, 820.637
Material Boundary	377.985, 1052.14 402.082, 1043.25 434.135, 1031.43 475.02, 1016.35 481.516, 1013.96
Material Boundary	495.018, 1008.98 526.51, 997.365 569.504, 981.508 614.826, 964.794 636.29, 956.878
Material Boundary	655.558, 949.772 789.783, 900.27 796.457, 897.809
Material Boundary	835.412, 883.442 867.686, 871.54 935.044, 846.698 940.893, 844.541
Material Boundary	956.414, 838.45 961.928, 836.109 1103.47, 776.027
Material Boundary	1115.63, 770.065 1197.05, 724.931
Material Boundary	1203.93, 721.115 1234.09, 700
Material Boundary	428.612, 1064.47 481.516, 1044.96
Material Boundary	495.018, 1039.98 511.667, 1033.84 636.29, 987.878

Material Boundary	655.558, 980.772 755.064, 944.075 793.143, 930.031 796.457, 928.809
Material Boundary	835.412, 914.442 940.893, 875.541
Material Boundary	956.414, 869.45 958.74, 868.463 1103.47, 807.027
Material Boundary	1115.63, 801.065 1197.05, 755.931
Material Boundary	1203.93, 752.115 1248.96, 720.59
Material Boundary	377.985, 1052.14 361.04, 1057.67 393.794, 1066.49 427.582, 1064.59
Material Boundary	481.516, 1013.96 495.018, 1008.98
Material Boundary	636.29, 956.878 655.558, 949.772
Material Boundary	789.783, 900.27 824.514, 888.082 867.686, 871.54
Material Boundary	935.044, 846.698 961.928, 836.109
Material Boundary	1103.47, 776.027 1115.63, 770.065
Material Boundary	1197.05, 724.931 1203.93, 721.115
Material Boundary	1197.05, 755.931 1248.96, 720.59 1273.93, 700
Material Boundary	965.369, 866.222 1103.47, 807.027 1115.63, 801.065
Material Boundary	793.143, 930.031 802.814, 926.299 806.659, 924.815 907.747, 885.802 909.965, 884.946
Material Boundary	636.29, 987.878 655.558, 980.772
Material Boundary	481.516, 1044.96 495.018, 1039.98
Material Boundary	1086.46, 835.654 1087.78, 835.112 1107.11, 828.691 1111.93, 827.092

Material Boundary	868.253, 934.264 875.883, 932.647 880.424, 929.923 890.607, 923.765 901.083, 917.527 912.62, 910.97 927.773, 903.327 937.99, 898.356 950.696, 892.232 966.177, 885.269 977.488, 880.398 989.534, 875.129 1006.53, 868.049 1043.1, 853.429 1044.6, 852.832 1045.41, 852.493 1055.45, 848.325 1069.59, 842.449 1079.44, 838.36 1083.79, 836.552 1085.91, 835.839 1086.46, 835.654 1107.48, 828.588 1111.93, 827.092 1113.82, 826.801 1118, 826.158 1124.49, 825.158 1136.07, 823.009 1139.87, 822.302 1148.2, 822.302 1154.28, 822.302 1166.76, 822.326 1175.54, 822.34 1180.32, 822.348
Material Boundary	703.349, 966.461 750.088, 957.147 785.634, 950.512
Material Boundary	893.071, 931.168 909.185, 928.562
Material Boundary	963.965, 917.229 993.977, 909.987
Material Boundary	1011.67, 905.314 1034.46, 898.606

Material Boundary	1006.53, 868.049 1021, 862.388 1043.1, 853.429 1045.41, 852.493 1060.32, 846.435 1069.59, 842.449 1075.92, 839.73 1079.44, 838.36 1085.91, 835.839 1087.78, 835.112 1099.76, 830.763 1100.13, 830.659 1107.11, 828.691 1107.48, 828.588 1113.82, 826.801 1116.05, 826.172 1118.4, 825.89 1124.49, 825.158 1130.26, 823.009 1136.07, 823.009 1141.36, 823.009 1158.14, 822.313 1166.76, 822.326
Material Boundary	964.18, 866.624 974.419, 866.624
Material Boundary	842.606, 910.473 867.494, 900.802 894.384, 890.501 900.791, 888.046
Material Boundary	743.589, 949.99 755.531, 945.22 769.872, 939.492 796.457, 928.809 802.814, 926.299 815.009, 921.484
Material Boundary	703.349, 966.461 721.543, 958.826
Material Boundary	545.996, 1029.18 563.809, 1022.05
Material Boundary	485.719, 1053.23 491.355, 1050.98 497.541, 1048.51 501.812, 1046.81 510.418, 1043.38 521.226, 1039.06 533.564, 1034.14 545.996, 1029.18 551.99, 1026.79 563.809, 1022.05 574.254, 1017.87 582.256, 1014.66 593.42, 1010.18 600.702, 1007.26 615.105, 1001.49 631.017, 995.113 635.244, 993.418 649, 987.904

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	1375	18.5	700	34	2	3	Anisotropic Surface 2	None	0
Bedrock (Tcag)		130	Mohr-Coulomb	300	38						None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0
Landslide (Qls)		130	Mohr-Coulomb	250	36						None	0
Bedrock (QTp) isotropic		135	Mohr-Coulomb	700	34						None	0



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 7-7'; Pseud-Static; Non-Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPIs1a_PFf_s.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 17

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 5
    Method: spencer 5
Global Minimum Coordinates 5
    Method: spencer 5
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 6
Slice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.53493 6
Interslice Data 8
    Global Minimum Query (spencer) - Safety Factor: 1.53493 8
Entity Information 9
    Non-Circular Search (Cuckoo) 9
        Shared Entities 9

Slide2 Analysis Information

SPIs1a_PFf_s

Project Summary

File Name:	SPIs1a_PFf_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:08.767s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 7-7'; Pseud-Static; Non-Circular
Author:	M. Neely
Company:	Allan E Seward Engineering Geology, Inc.
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Left to Right

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	1375 psf
Phi 1	18.5 °
A	2 °
Cohesion 2	700 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	300 psf
Phi	38 °
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Landslide (Qls)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	36 °
Water Surface	None
Ru Value	0

Bedrock (QTp) isotropic	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	700 psf
Phi	34 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.534930
Axis Location:	725.171, 1321.848
Left Slip Surface Endpoint:	461.115, 1057.344
Right Slip Surface Endpoint:	778.341, 951.901
Resisting Moment:	3.52088e+08 lb-ft
Driving Moment:	2.29383e+08 lb-ft
Resisting Horizontal Force:	870161 lb
Driving Horizontal Force:	566905 lb
Total Slice Area:	10967.4 ft2
Surface Horizontal Width:	317.226 ft
Surface Average Height:	34.5729 ft

Global Minimum Coordinates

Method: spencer

X	Y
461.115	1057.34
512.086	1002.5
540.358	991.42
590.864	972.09
644.64	953.766
688.445	952.453
754.698	952.044
778.341	951.901

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	23565
Number of Invalid Surfaces:	1486

Error Codes
Error Code -108 reported for 64 surfaces
Error Code -111 reported for 549 surfaces
Error Code -112 reported for 133 surfaces
Error Code -121 reported for 153 surfaces
Error Code -124 reported for 5 surfaces
Error Code -145 reported for 23 surfaces
Error Code -1000 reported for 559 surfaces

Error Code Descriptions

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-111 = Safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-121 = Concave failure surface, only convex surfaces have been defined as being allowed.

-124 = A slice has a width less than the minimum acceptable value.

-145 = Slip mass has invalid boundary slices.

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.53493

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	6.33914	2642.13	-47.0955	Bedrock (QTp) isotropic	700	34	481.765	739.475	58.5242	0	58.5242	576.883	576.883
2	6.33914	7857.95	-47.0955	Bedrock (QTp) isotropic	700	34	680.414	1044.39	510.577	0	510.577	1242.67	1242.67
3	6.33914	12852.3	-47.0955	Bedrock (QTp) isotropic	700	34	870.628	1336.35	943.433	0	943.433	1880.19	1880.19
4	6.33914	17429.8	-47.0955	Bedrock (QTp) isotropic	700	34	1044.97	1603.95	1340.17	0	1340.17	2464.51	2464.51
5	6.33914	22307.1	-47.0955	Bedrock (QTp) isotropic	700	34	1230.73	1889.08	1762.87	0	1762.87	3087.09	3087.09
6	6.33914	27516	-47.0955	Bedrock (QTp) isotropic	700	34	1429.11	2193.58	2214.32	0	2214.32	3751.98	3751.98
7	6.33914	32893.9	-47.0955	Bedrock (QTp) isotropic	700	34	1633.93	2507.97	2680.43	0	2680.43	4438.47	4438.47
8	6.33914	38291.9	-47.0955	Bedrock (QTp) isotropic	700	34	1839.52	2823.53	3148.27	0	3148.27	5127.52	5127.52
9	0.257831	1671.96	-47.0955	Bedrock (QTp)	700	34	1946.75	2988.13	3392.29	0	3392.29	5486.92	5486.92
10	7.0679	47048.9	-21.404	Bedrock (QTp)	1375	18.5	2100.14	3223.57	5524.8	0	5524.8	6348	6348

11	7.0679	49378.4	-21.404	Bedrock (QTp)	1375	18.5	2159.53	3314.72	5797.21	0	5797.21	6643.69	6643.69
12	7.0679	51893.7	-21.404	Bedrock (QTp)	1375	18.5	2223.64	3413.13	6091.34	0	6091.34	6962.95	6962.95
13	7.0679	54613.6	-21.404	Bedrock (QTp)	1375	18.5	2292.98	3519.56	6409.42	0	6409.42	7308.21	7308.21
14	7.21518	57613.6	-20.9423	Bedrock (QTp)	1375	18.5	2348.47	3604.74	6663.99	0	6663.99	7562.78	7562.78
15	7.21518	60056.8	-20.9423	Bedrock (QTp)	1375	18.5	2409.8	3698.87	6945.31	0	6945.31	7867.56	7867.56
16	7.21518	62416.5	-20.9423	Bedrock (QTp)	1375	18.5	2469.02	3789.78	7217	0	7217	8161.92	8161.92
17	7.21518	64582.7	-20.9423	Bedrock (QTp)	1375	18.5	2523.39	3873.23	7466.44	0	7466.44	8432.16	8432.16
18	7.21518	66481.3	-20.9423	Bedrock (QTp)	1375	18.5	2571.05	3946.38	7685.05	0	7685.05	8669.02	8669.02
19	7.21518	67915.3	-20.9423	Bedrock (QTp)	1375	18.5	2607.04	4001.63	7850.16	0	7850.16	8847.91	8847.91
20	7.21518	68828.2	-20.9423	Bedrock (QTp)	1375	18.5	2629.96	4036.8	7955.27	0	7955.27	8961.78	8961.78
21	6.72192	62429.4	-18.8171	Bedrock (QTp)	1375	18.5	2631.87	4039.73	7964.05	0	7964.05	8860.89	8860.89
22	6.72192	58735.3	-18.8171	Bedrock (QTp)	1375	18.5	2529.97	3883.33	7496.6	0	7496.6	8358.71	8358.71
23	6.72192	55041.2	-18.8171	Bedrock (QTp)	1375	18.5	2428.07	3726.92	7029.15	0	7029.15	7856.54	7856.54
24	6.72192	51347.2	-18.8171	Bedrock (QTp)	1375	18.5	2326.17	3570.51	6561.7	0	6561.7	7354.36	7354.36
25	6.72192	47653.1	-18.8171	Bedrock (QTp)	1375	18.5	2224.28	3414.11	6094.24	0	6094.24	6852.19	6852.19
26	6.72192	43959	-18.8171	Bedrock (QTp)	1375	18.5	2122.38	3257.7	5626.79	0	5626.79	6350.01	6350.01
27	6.72192	40264.9	-18.8171	Bedrock (QTp)	1375	18.5	2020.48	3101.29	5159.34	0	5159.34	5847.84	5847.84
28	6.72192	36570.8	-18.8171	Bedrock (QTp)	1375	18.5	1918.58	2944.88	4691.89	0	4691.89	5345.66	5345.66
29	0.0965015	497.926	-1.71674	Bedrock (QTp)	700	34	3132.94	4808.84	6091.61	0	6091.61	6185.51	6185.51
30	6.24409	29913.5	-1.71674	Bedrock (QTp) isotropic	700	34	2948.12	4525.16	5671.04	0	5671.04	5759.4	5759.4
31	6.24409	27291.9	-1.71674	Bedrock (QTp) isotropic	700	34	2737.89	4202.47	5192.63	0	5192.63	5274.69	5274.69
32	6.24409	25339.9	-1.71674	Bedrock (QTp) isotropic	700	34	2581.34	3962.18	4836.39	0	4836.39	4913.75	4913.75
33	6.24409	23387.8	-1.71674	Bedrock (QTp) isotropic	700	34	2424.8	3721.9	4480.15	0	4480.15	4552.82	4552.82
34	6.24409	21435.7	-1.71674	Bedrock (QTp) isotropic	700	34	2268.26	3481.62	4123.92	0	4123.92	4191.9	4191.9
35	6.24409	19494.2	-1.71674	Bedrock (QTp) isotropic	700	34	2112.56	3242.63	3769.6	0	3769.6	3832.92	3832.92
36	6.24409	17607.7	-1.71674	Bedrock (QTp) isotropic	700	34	1961.28	3010.42	3425.33	0	3425.33	3484.12	3484.12
37	7.10995	17680.8	-0.353257	Bedrock (QTp) isotropic	700	34	1833.48	2814.26	3134.52	0	3134.52	3145.82	3145.82
38	7.10995	15082.6	-0.353257	Bedrock (QTp) isotropic	700	34	1645.95	2526.42	2707.77	0	2707.77	2717.92	2717.92
39	7.10995	12997.9	-0.353257	Bedrock (QTp) isotropic	700	34	1495.48	2295.46	2365.36	0	2365.36	2374.58	2374.58
40	7.10995	11651.2	-0.353257	Bedrock (QTp) isotropic	700	34	1398.28	2146.26	2144.17	0	2144.17	2152.79	2152.79
41	7.10995	10310.6	-0.353257	Bedrock (QTp) isotropic	700	34	1301.51	1997.73	1923.97	0	1923.97	1932	1932

42	7.10995	8973.43	-0.353257	Bedrock (QTp) isotropic	700	34	1205	1849.59	1704.34	0	1704.34	1711.77	1711.77
43	7.10995	7637.31	-0.353257	Bedrock (QTp) isotropic	700	34	1108.57	1701.57	1484.89	0	1484.89	1491.73	1491.73
44	8.24196	7248.21	-0.353257	Landslide (Qls)	250	36	696.978	1069.81	1128.37	0	1128.37	1132.67	1132.67
45	8.24196	5586.11	-0.353257	Landslide (Qls)	250	36	583.58	895.755	888.807	0	888.807	892.405	892.405
46	5.87197	2963.79	-0.348066	Landslide (Qls)	250	36	486.326	746.476	683.341	0	683.341	686.295	686.295
47	5.87197	2117.9	-0.348066	Landslide (Qls)	250	36	405.314	622.128	512.19	0	512.19	514.652	514.652
48	5.87197	1272.03	-0.348066	Landslide (Qls)	250	36	324.303	497.783	341.045	0	341.045	343.015	343.015
49	5.87197	436.295	-0.348066	Landslide (Qls)	250	36	244.265	374.929	171.949	0	171.949	173.433	173.433
50	0.154876	0.298593	-0.348066	Bedrock (QTp)	700	34	861.099	1321.73	921.748	0	921.748	926.979	926.979

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.53493

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	461.115	1057.34	0	0	0
2	467.455	1050.52	-2393.5	-1009.08	22.8599
3	473.794	1043.7	-2442.58	-1029.78	22.8601
4	480.133	1036.88	-246.809	-104.053	22.86
5	486.472	1030.06	4006.47	1689.11	22.8601
6	492.811	1023.24	10452	4406.51	22.86
7	499.15	1016.42	19238.8	8110.98	22.86
8	505.489	1009.6	30442.9	12834.6	22.8601
9	511.829	1002.78	44073.3	18581.1	22.8601
10	512.086	1002.5	44679.1	18836.5	22.8601
11	519.154	999.731	49832.5	21009.1	22.86
12	526.222	996.961	55553.4	23421	22.86
13	533.29	994.19	61887.2	26091.3	22.86
14	540.358	991.42	68883.6	29040.9	22.86
15	547.573	988.658	76085.5	32077.3	22.8601
16	554.788	985.897	83865.8	35357.4	22.86
17	562.003	983.136	92204.5	38872.9	22.86
18	569.219	980.374	101056	42604.6	22.86
19	576.434	977.613	110357	46525.8	22.86
20	583.649	974.852	119997	50590	22.86
21	590.864	972.09	129853	54745.4	22.8601
22	597.586	969.8	136630	57602.5	22.86
23	604.308	967.509	142653	60141.6	22.86
24	611.03	965.219	147921	62362.6	22.86
25	617.752	962.928	152434	64265.4	22.86
26	624.474	960.638	156193	65850.2	22.86
27	631.196	958.347	159197	67116.8	22.8601
28	637.918	956.056	161447	68065.3	22.8601
29	644.64	953.766	162943	68695.8	22.86
30	644.736	953.763	162707	68596.6	22.8601
31	650.98	953.576	148334	62536.9	22.8601
32	657.224	953.389	134923	56883	22.8601
33	663.468	953.202	122229	51531.1	22.86
34	669.712	953.014	110251	46481.3	22.8601
35	675.956	952.827	98989.7	41733.5	22.86
36	682.201	952.64	88441	37286.3	22.8601
37	688.445	952.453	78584.8	33130.9	22.86
38	695.555	952.409	67441.9	28433.2	22.8601
39	702.665	952.365	57355.1	24180.6	22.86
40	709.775	952.321	48115.7	20285.3	22.86
41	716.884	952.278	39423.7	16620.8	22.86
42	723.994	952.234	31276.6	13186	22.86
43	731.104	952.19	23673	9980.41	22.86
44	738.214	952.146	16612.5	7003.73	22.86
45	746.456	952.095	11644.7	4909.35	22.8601
46	754.698	952.044	7434.06	3134.16	22.86
47	760.57	952.009	4896.4	2064.3	22.8601
48	766.442	951.973	2744.21	1156.94	22.86
49	772.314	951.937	977.467	412.095	22.86
50	778.186	951.902	-408.448	-172.199	22.86
51	778.341	951.901	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

Shared Entities

Type	Coordinates (x,y)
	485.719, 1053.23 477.448, 1055.3 469.088, 1056.53 460.619, 1057.39

452.503, 1059.75
444.399, 1062.3
436.042, 1063.72
427.582, 1064.59
419.125, 1065.28
410.72, 1066.38
402.261, 1067.09
393.794, 1066.49
385.445, 1064.9
377.358, 1062.32
369.232, 1059.9
361.04, 1057.67
353.03, 1054.86
345.072, 1051.91
336.936, 1049.65
328.52, 1048.4
320.318, 1046.2
312.091, 1044.11
303.912, 1041.84
295.668, 1039.83
287.371, 1038.03
279.013, 1036.54
270.654, 1035.05
262.352, 1033.3
254.068, 1031.44
245.741, 1029.75
237.504, 1027.72
229.383, 1025.26
221.228, 1022.91
213.038, 1020.66
205.116, 1017.65
197.276, 1014.39
189.329, 1011.41
181.419, 1008.34
173.742, 1004.71
166.054, 1001.12
158.384, 997.484
150.834, 993.542
142.992, 990.477
134.815, 988.153
126.526, 988.044
118.185, 989.639
109.794, 991.025
101.335, 991.662
92.8442, 992.351
84.3596, 993.047
75.9034, 992.974
67.4792, 991.916
59.0572, 990.856
50.6494, 989.717
50.0147, 989.617
42.2637, 988.39
33.8066, 987.732
25.323, 987.519
16.8784, 986.627
8.43798, 985.747
0, 984.987
0, 700
907.994, 700

External Boundary	1234.09, 700 1273.93, 700 1450, 700 1450, 817.358 1441.73, 819.243 1433.36, 820.215 1424.88, 820.304 1418.3, 820.321 1416.4, 820.325 1407.91, 820.394 1399.42, 820.415 1390.93, 820.45 1382.44, 820.497 1373.96, 820.637 1365.47, 820.796 1356.98, 820.876 1348.5, 820.955 1340.01, 821.047 1331.52, 821.135 1323.04, 821.129 1314.55, 820.826 1306.09, 820.241 1297.64, 819.37 1289.19, 819.954 1280.72, 820.645 1272.26, 821.177 1263.75, 821.383 1255.26, 821.566 1246.85, 821.789 1238.27, 822.002 1235.84, 822.435 1230.04, 822.426 1229.71, 822.425 1225.83, 822.419 1222.14, 822.413 1217.86, 822.406 1209.31, 822.393 1200.59, 822.379 1192.12, 822.366 1186.25, 822.357 1184.05, 822.354 1180.32, 822.348 1176.34, 828.259 1168.5, 837.799 1161.49, 844.239 1150, 851.829 1136.63, 858.559 1121.14, 865.433 1105.67, 872.302 1063.93, 888.872 1034.46, 898.606 1024, 902.059 1011.67, 905.314 993.977, 909.987 979.067, 913.924 963.965, 917.229 944.92, 921.398 926.038, 925.183 909.185, 928.562

	903.658, 929.67 893.071, 931.168 878.412, 933.242 868.253, 934.264 853.134, 937.467 844.409, 939.315 828.642, 942.319 785.634, 950.512 772.034, 953.102 703.349, 966.461 678.861, 975.935 664.987, 981.496 649, 987.904 644.896, 991.788 640.803, 995.662 635.515, 1000.67 629.35, 1006.5 623.39, 1012.14 615.952, 1019.18 609.694, 1025.1 601.979, 1032.4 596.454, 1037.63 589.704, 1044.02 586.576, 1044.06 578.416, 1046.48 570.07, 1047.63 564.133, 1048.22 553.328, 1048.93 544.878, 1048.98 536.494, 1050.23 528.012, 1049.87 515.281, 1050.41 505.307, 1051.2 494.127, 1052.13
Material Boundary	50.0147, 989.617 172.255, 959.139 364.865, 900.252 907.994, 700

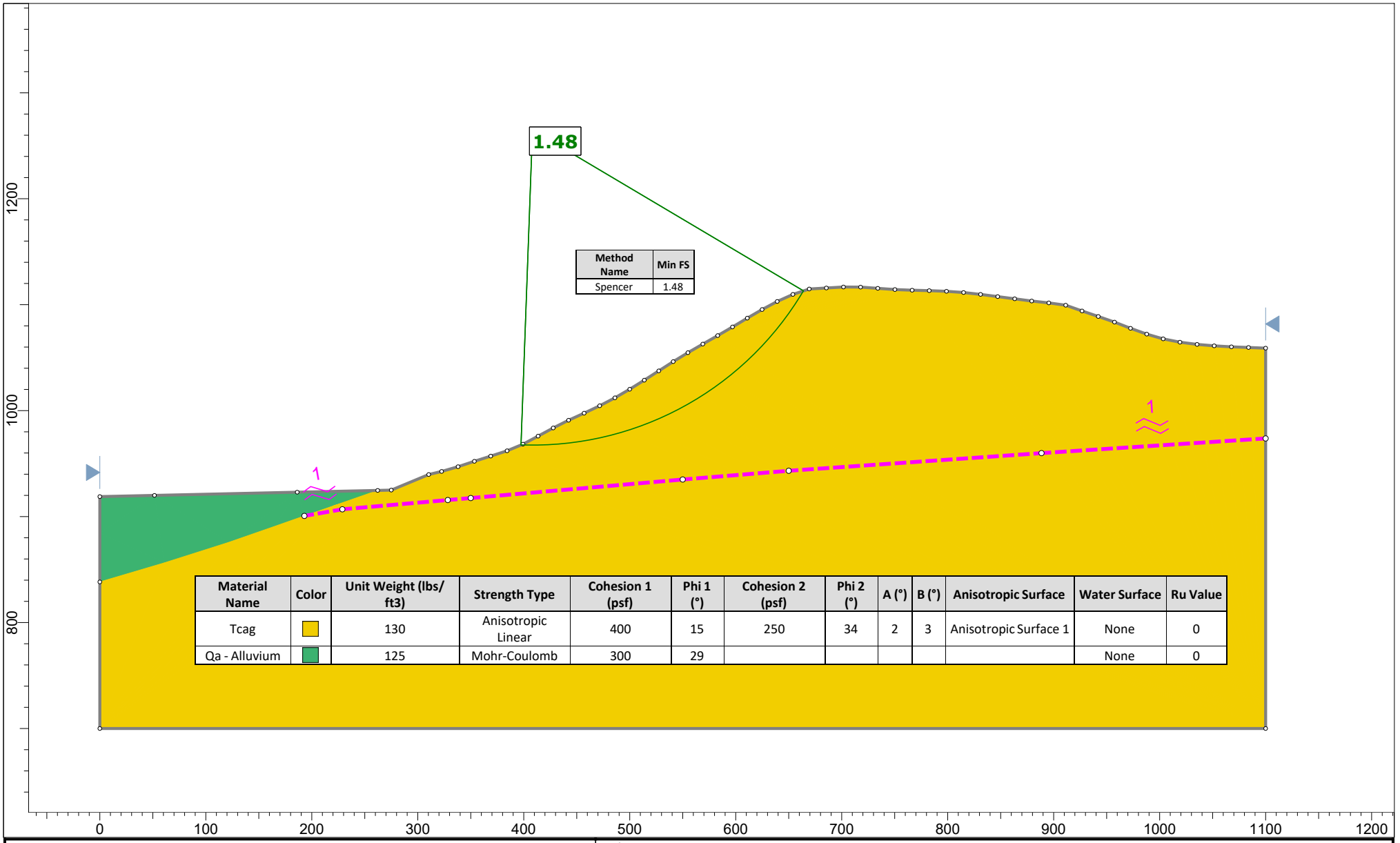
Material Boundary	678.861, 975.935 687.116, 972.625 700, 967.461 715.461, 961.264 721.543, 958.826 735.669, 953.164 755.531, 945.22 761.945, 942.654 769.872, 939.492 782.829, 934.322 805.712, 925.193 806.659, 924.815 815.009, 921.484 830.374, 915.353 842.606, 910.473 850, 907.523 867.494, 900.802 872.1, 899.033 893.477, 890.82 894.384, 890.501 907.747, 885.802 915.529, 883.066 926.772, 879.266 930.255, 878.089 946.668, 872.542 957.264, 868.961 958.74, 868.463 964.18, 866.624 965.369, 866.222 974.419, 866.222 974.419, 866.624 978.936, 866.624 981.931, 866.624 981.931, 866.957 985.757, 866.957 989.084, 866.957 989.084, 867.275 992.577, 867.275 995.488, 867.559 998.152, 867.677 1001.06, 867.677 1003.8, 867.928 1006.53, 868.049 1027.25, 859.759 1055.45, 848.325
Material Boundary	1148.2, 822.302 1149.8, 822.167 1154.28, 822.302
Material Boundary	1087.78, 835.112 1100.13, 830.659 1105.12, 828.862 1111.93, 827.092
Material Boundary	1027.25, 859.759 1045.41, 852.493
Material Boundary	998.152, 867.677 1003.8, 867.928

Material Boundary	965.369, 866.222 974.419, 866.624 981.931, 866.957 989.084, 867.275 995.488, 867.559
Material Boundary	893.477, 890.82 900, 888.314 900.791, 888.046 909.965, 884.946 915.529, 883.066
Material Boundary	735.669, 953.164 743.589, 949.99 750, 947.42 761.945, 942.654
Material Boundary	1118, 826.158 1118.4, 825.89 1214, 762 1314, 727 1450, 700
Material Boundary	1418.3, 820.321 1433.36, 820.215 1450, 817.358
Material Boundary	1348.5, 820.955 1373.96, 820.637
Material Boundary	377.985, 1052.14 402.082, 1043.25 434.135, 1031.43 475.02, 1016.35 481.516, 1013.96
Material Boundary	495.018, 1008.98 526.51, 997.365 569.504, 981.508 614.826, 964.794 636.29, 956.878
Material Boundary	655.558, 949.772 789.783, 900.27 796.457, 897.809
Material Boundary	835.412, 883.442 867.686, 871.54 935.044, 846.698 940.893, 844.541
Material Boundary	956.414, 838.45 961.928, 836.109 1103.47, 776.027
Material Boundary	1115.63, 770.065 1197.05, 724.931
Material Boundary	1203.93, 721.115 1234.09, 700
Material Boundary	428.612, 1064.47 481.516, 1044.96
Material Boundary	495.018, 1039.98 511.667, 1033.84 636.29, 987.878

Material Boundary	655.558, 980.772 755.064, 944.075 793.143, 930.031 796.457, 928.809
Material Boundary	835.412, 914.442 940.893, 875.541
Material Boundary	956.414, 869.45 958.74, 868.463 1103.47, 807.027
Material Boundary	1115.63, 801.065 1197.05, 755.931
Material Boundary	1203.93, 752.115 1248.96, 720.59
Material Boundary	377.985, 1052.14 361.04, 1057.67 393.794, 1066.49 427.582, 1064.59
Material Boundary	481.516, 1013.96 495.018, 1008.98
Material Boundary	636.29, 956.878 655.558, 949.772
Material Boundary	789.783, 900.27 824.514, 888.082 867.686, 871.54
Material Boundary	935.044, 846.698 961.928, 836.109
Material Boundary	1103.47, 776.027 1115.63, 770.065
Material Boundary	1197.05, 724.931 1203.93, 721.115
Material Boundary	1197.05, 755.931 1248.96, 720.59 1273.93, 700
Material Boundary	965.369, 866.222 1103.47, 807.027 1115.63, 801.065
Material Boundary	793.143, 930.031 802.814, 926.299 806.659, 924.815 907.747, 885.802 909.965, 884.946
Material Boundary	636.29, 987.878 655.558, 980.772
Material Boundary	481.516, 1044.96 495.018, 1039.98
Material Boundary	1086.46, 835.654 1087.78, 835.112 1107.11, 828.691 1111.93, 827.092

Material Boundary	868.253, 934.264 875.883, 932.647 880.424, 929.923 890.607, 923.765 901.083, 917.527 912.62, 910.97 927.773, 903.327 937.99, 898.356 950.696, 892.232 966.177, 885.269 977.488, 880.398 989.534, 875.129 1006.53, 868.049 1043.1, 853.429 1044.6, 852.832 1045.41, 852.493 1055.45, 848.325 1069.59, 842.449 1079.44, 838.36 1083.79, 836.552 1085.91, 835.839 1086.46, 835.654 1107.48, 828.588 1111.93, 827.092 1113.82, 826.801 1118, 826.158 1124.49, 825.158 1136.07, 823.009 1139.87, 822.302 1148.2, 822.302 1154.28, 822.302 1166.76, 822.326 1175.54, 822.34 1180.32, 822.348
Material Boundary	703.349, 966.461 750.088, 957.147 785.634, 950.512
Material Boundary	893.071, 931.168 909.185, 928.562
Material Boundary	963.965, 917.229 993.977, 909.987
Material Boundary	1011.67, 905.314 1034.46, 898.606

Material Boundary	1006.53, 868.049 1021, 862.388 1043.1, 853.429 1045.41, 852.493 1060.32, 846.435 1069.59, 842.449 1075.92, 839.73 1079.44, 838.36 1085.91, 835.839 1087.78, 835.112 1099.76, 830.763 1100.13, 830.659 1107.11, 828.691 1107.48, 828.588 1113.82, 826.801 1116.05, 826.172 1118.4, 825.89 1124.49, 825.158 1130.26, 823.009 1136.07, 823.009 1141.36, 823.009 1158.14, 822.313 1166.76, 822.326
Material Boundary	964.18, 866.624 974.419, 866.624
Material Boundary	842.606, 910.473 867.494, 900.802 894.384, 890.501 900.791, 888.046
Material Boundary	743.589, 949.99 755.531, 945.22 769.872, 939.492 796.457, 928.809 802.814, 926.299 815.009, 921.484
Material Boundary	703.349, 966.461 721.543, 958.826
Material Boundary	545.996, 1029.18 563.809, 1022.05
Material Boundary	485.719, 1053.23 491.355, 1050.98 497.541, 1048.51 501.812, 1046.81 510.418, 1043.38 521.226, 1039.06 533.564, 1034.14 545.996, 1029.18 551.99, 1026.79 563.809, 1022.05 574.254, 1017.87 582.256, 1014.66 593.42, 1010.18 600.702, 1007.26 615.105, 1001.49 631.017, 995.113 635.244, 993.418 649, 987.904



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Tcag		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 1	None	0
Qa - Alluvium		125	Mohr-Coulomb	300	29						None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 8-8', Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPJS1A.slmd
		Scale	1:1500
Project No.:	23-2195s-01	Date: 10/13/2023	Run Number: Run No. 18

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.47785 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.47785 6
Entity Information 6
    Circular Search - Auto Refine 6
        Shared Entities 6

Slide2 Analysis Information

SPJS1A

Project Summary

File Name:	SPJS1A.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.301s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 8-8', Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-01

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.477850
Center:	408.165, 1264.821
Radius:	297.461
Left Slip Surface Endpoint:	397.359, 967.557
Right Slip Surface Endpoint:	663.953, 1112.982
Resisting Moment:	2.21985e+08 lb-ft
Driving Moment:	1.50208e+08 lb-ft
Resisting Horizontal Force:	645971 lb
Driving Horizontal Force:	437101 lb
Total Slice Area:	8579.79 ft2
Surface Horizontal Width:	266.594 ft
Surface Average Height:	32.1829 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 13261
Number of Invalid Surfaces: 0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.47785

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.33189	908.891	-1.56809	Tcag	250	34	327.21	483.567	346.279	0	346.279	337.321	337.321
2	5.33189	2904.89	-0.540855	Tcag	250	34	545.873	806.718	825.369	0	825.369	820.216	820.216
3	5.33189	4859.9	0.486207	Tcag	250	34	750.896	1109.71	1274.57	0	1274.57	1280.95	1280.95
4	5.33189	6779.85	1.51343	Tcag	250	34	943.668	1394.6	1696.93	0	1696.93	1721.87	1721.87
5	5.33189	8669.62	2.54113	Tcag	331.17	24.4421	829.6	1226.02	1968.85	0	1968.85	2005.66	2005.66
6	5.33189	10485.6	3.56966	Tcag	400	15	669.477	989.386	2199.61	0	2199.61	2241.38	2241.38
7	5.33189	12116.2	4.59933	Tcag	400	15	720.971	1065.49	2483.63	0	2483.63	2541.63	2541.63
8	5.33189	13638.2	5.6305	Tcag	400	15	767.303	1133.96	2739.18	0	2739.18	2814.83	2814.83
9	5.33189	15064.4	6.6635	Tcag	400	15	809.091	1195.72	2969.64	0	2969.64	3064.17	3064.17
10	5.33189	16296.3	7.69869	Tcag	295.197	28.899	1460.34	2158.16	3374.87	0	3374.87	3572.28	3572.28
11	5.33189	17445.1	8.73641	Tcag	250	34	1830.73	2705.55	3640.5	0	3640.5	3921.83	3921.83
12	5.33189	18543.6	9.77703	Tcag	250	34	1898.54	2805.75	3789.06	0	3789.06	4116.21	4116.21
13	5.33189	19609.1	10.8209	Tcag	250	34	1960.37	2897.13	3924.54	0	3924.54	4299.24	4299.24
14	5.33189	20606	11.8684	Tcag	250	34	2013.36	2975.44	4040.63	0	4040.63	4463.75	4463.75
15	5.33189	21650.7	12.92	Tcag	250	34	2068	3056.19	4160.35	0	4160.35	4634.75	4634.75
16	5.33189	22716.2	13.976	Tcag	250	34	2121.8	3135.7	4278.23	0	4278.23	4806.31	4806.31
17	5.33189	23722.7	15.0369	Tcag	250	34	2168.08	3204.09	4379.6	0	4379.6	4962.04	4962.04
18	5.33189	24796.6	16.1031	Tcag	250	34	2217.48	3277.11	4487.88	0	4487.88	5128.06	5128.06
19	5.33189	25833	17.1751	Tcag	250	34	2261.35	3341.93	4583.97	0	4583.97	5282.9	5282.9
20	5.33189	26836.9	18.2533	Tcag	250	34	2300.24	3399.41	4669.19	0	4669.19	5427.84	5427.84
21	5.33189	27871.2	19.3382	Tcag	250	34	2339.21	3457	4754.58	0	4754.58	5575.51	5575.51
22	5.33189	28832.6	20.4304	Tcag	250	34	2370.31	3502.96	4822.72	0	4822.72	5705.67	5705.67
23	5.33189	29762.4	21.5304	Tcag	250	34	2396.93	3542.31	4881.05	0	4881.05	5826.7	5826.7
24	5.33189	30636.7	22.6389	Tcag	250	34	2417.48	3572.67	4926.06	0	4926.06	5934.28	5934.28
25	5.33189	31423.5	23.7563	Tcag	250	34	2429.88	3591	4953.22	0	4953.22	6022.72	6022.72
26	5.33189	32111.3	24.8834	Tcag	250	34	2433.67	3596.6	4961.55	0	4961.55	6090.36	6090.36
27	5.33189	32708.9	26.0209	Tcag	250	34	2429.85	3590.96	4953.18	0	4953.18	6139.39	6139.39
28	5.33189	33157.9	27.1695	Tcag	250	34	2414.82	3568.74	4920.23	0	4920.23	6159.65	6159.65
29	5.33189	33465.1	28.3301	Tcag	250	34	2389.56	3531.41	4864.9	0	4864.9	6153.16	6153.16
30	5.33189	33664.1	29.5035	Tcag	250	34	2356.8	3483	4793.13	0	4793.13	6126.73	6126.73
31	5.33189	33683	30.6907	Tcag	250	34	2312.34	3417.29	4695.7	0	4695.7	6068.15	6068.15
32	5.33189	33581.9	31.8927	Tcag	250	34	2260.56	3340.77	4582.26	0	4582.26	5988.94	5988.94
33	5.33189	33358.9	33.1106	Tcag	250	34	2201.78	3253.9	4453.47	0	4453.47	5889.37	5889.37
34	5.33189	32997.8	34.3456	Tcag	250	34	2135.43	3155.85	4308.1	0	4308.1	5767.29	5767.29
35	5.33189	32518.7	35.5991	Tcag	250	34	2063.17	3049.06	4149.77	0	4149.77	5626.81	5626.81
36	5.33189	31934.5	36.8725	Tcag	250	34	1986.12	2935.19	3980.95	0	3980.95	5470.69	5470.69
37	5.33189	31229.9	38.1676	Tcag	250	34	1903.77	2813.49	3800.53	0	3800.53	5296.91	5296.91
38	5.33189	30400.3	39.4861	Tcag	250	34	1816.29	2684.2	3608.85	0	3608.85	5105.34	5105.34
39	5.33189	29482.7	40.8301	Tcag	250	34	1726.05	2550.85	3411.15	0	3411.15	4902.62	4902.62
40	5.33189	28419.4	42.202	Tcag	250	34	1630.36	2409.43	3201.49	0	3201.49	4679.91	4679.91
41	5.33189	27177.2	43.6044	Tcag	250	34	1528.04	2258.21	2977.29	0	2977.29	4432.64	4432.64
42	5.33189	25740.9	45.0403	Tcag	250	34	1419	2097.07	2738.39	0	2738.39	4159.39	4159.39
43	5.33189	24105.1	46.5132	Tcag	250	34	1303.75	1926.74	2485.86	0	2485.86	3860.36	3860.36
44	5.33189	22115	48.0272	Tcag	250	34	1175.82	1737.68	2205.57	0	2205.57	3512.69	3512.69
45	5.33189	19855.2	49.5872	Tcag	250	34	1040.53	1537.75	1909.18	0	1909.18	3131.24	3131.24
46	5.33189	17286.5	51.1988	Tcag	250	34	897.364	1326.17	1595.48	0	1595.48	2711.53	2711.53
47	5.33189	14219.4	52.869	Tcag	250	34	739.693	1093.16	1250.03	0	1250.03	2226.98	2226.98
48	5.33189	10830	54.6064	Tcag	250	34	577.126	852.905	893.842	0	893.842	1706.13	1706.13
49	5.33189	6934.65	56.4215	Tcag	250	34	404.195	597.34	514.952	0	514.952	1123.81	1123.81
50	5.33189	2383.27	58.328	Tcag	250	34	214.55	317.072	99.4386	0	99.4386	447.204	447.204

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.47785

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	397.359	967.557	0	0	0
2	402.691	967.411	1791.16	926.583	27.3529
3	408.023	967.36	4736.51	2450.24	27.3529
4	413.355	967.405	8673.29	4486.77	27.3529
5	418.687	967.546	13454.1	6959.94	27.353
6	424.018	967.783	17401.4	9001.88	27.3529
7	429.35	968.116	20231.1	10465.7	27.3529
8	434.682	968.545	23001	11898.6	27.3529
9	440.014	969.07	25642.9	13265.3	27.3529
10	445.346	969.693	28097.1	14534.8	27.3528
11	450.678	970.414	33432.9	17295.1	27.3529
12	456.01	971.233	40188.7	20790	27.353
13	461.342	972.152	46806.8	24213.6	27.353
14	466.674	973.171	53235.6	27539.2	27.3529
15	472.005	974.292	59418.1	30737.5	27.3529
16	477.337	975.515	65330.3	33795.9	27.3529
17	482.669	976.842	70940.1	36697.9	27.3529
18	488.001	978.274	76200.1	39419	27.3529
19	493.333	979.813	81088.1	41947.6	27.3529
20	498.665	981.461	85563.3	44262.6	27.3529
21	503.997	983.22	89588.6	46345	27.3529
22	509.329	985.091	93135.5	48179.8	27.3529
23	514.661	987.077	96166	49747.5	27.3529
24	519.992	989.181	98649.1	51032	27.3529
25	525.324	991.405	100555	52017.9	27.3529
26	530.656	993.751	101857	52691.4	27.3529
27	535.988	996.224	102532	53040.9	27.353
28	541.32	998.827	102565	53057.9	27.353
29	546.652	1001.56	101946	52737.7	27.353
30	551.984	1004.44	100673	52079.2	27.353
31	557.316	1007.46	98749.4	51083.9	27.3529
32	562.648	1010.62	96189.7	49759.8	27.3529
33	567.979	1013.94	93011.6	48115.7	27.3529
34	573.311	1017.42	89238.5	46163.9	27.3529
35	578.643	1021.06	84902.1	43920.6	27.3529
36	583.975	1024.88	80037.1	41403.9	27.3529
37	589.307	1028.88	74681.3	38633.3	27.3529
38	594.639	1033.07	68881	35632.7	27.3529
39	599.971	1037.46	62688.8	32429.5	27.3529
40	605.303	1042.07	56154.6	29049.3	27.3529
41	610.635	1046.9	49348.3	25528.3	27.3529
42	615.966	1051.98	42357.3	21911.8	27.3529
43	621.298	1057.32	35284.4	18252.9	27.3529
44	626.63	1062.94	28246.2	14612	27.3529
45	631.962	1068.87	21427.9	11084.8	27.3528
46	637.294	1075.13	15007.6	7763.55	27.3529
47	642.626	1081.76	9201.11	4759.82	27.3529
48	647.958	1088.8	4333.12	2241.56	27.3529
49	653.29	1096.31	695.368	359.72	27.3529
50	658.622	1104.34	-1290.41	-667.542	27.353
51	663.953	1112.98	0	0	0

Entity Information

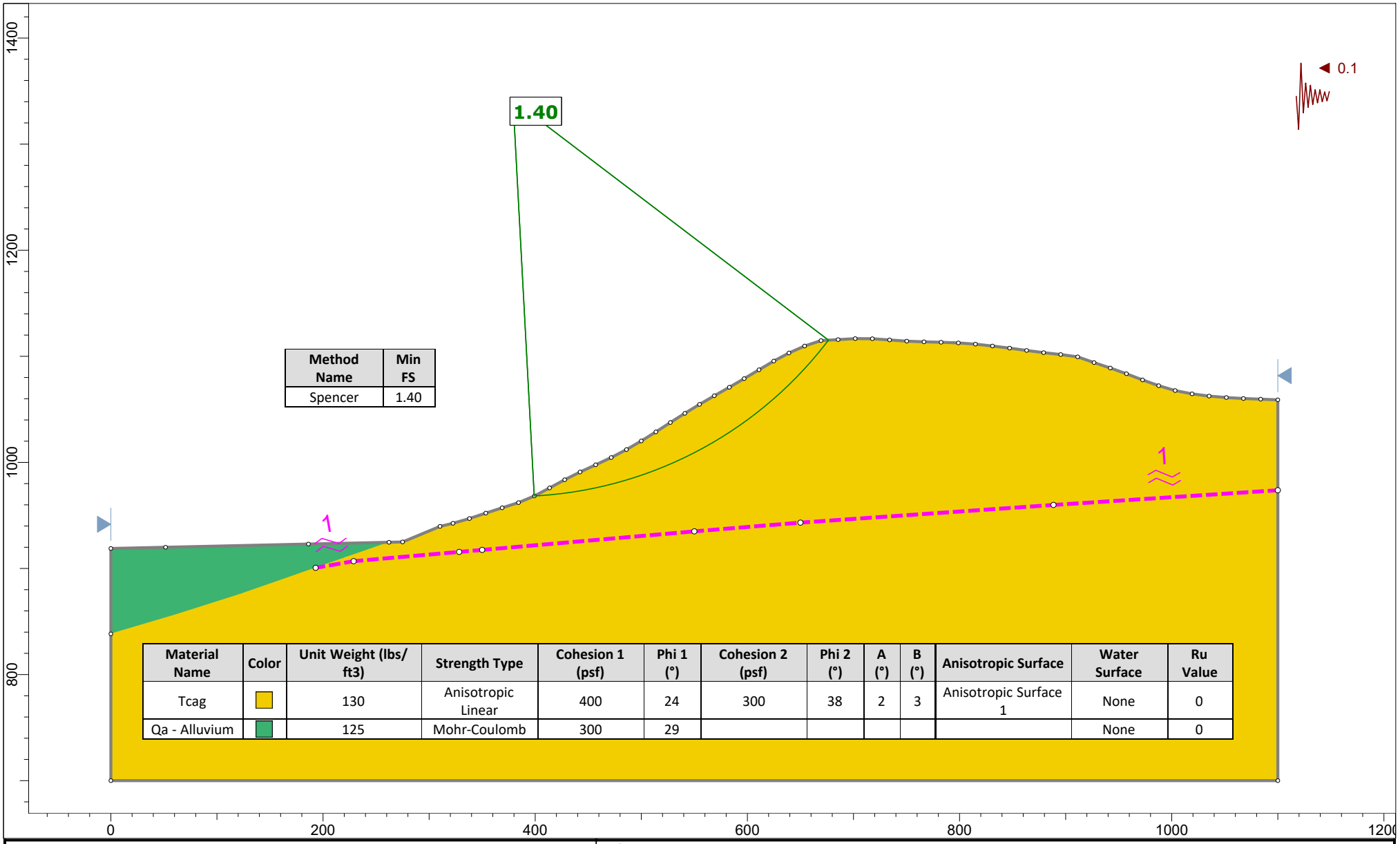
Circular Search - Auto Refine

Shared Entities

Type	Coordinates (x,y)

External Boundary	-3.638e-12, 700 1100, 700 1100, 1059 1083.83, 1059.54 1067.65, 1060.21 1051.45, 1061.15 1035.25, 1062.5 1019.14, 1064.57 1003.27, 1067.73 987.756, 1072.24 972.503, 1077.73 957.331, 1083.5 942.067, 1088.9 926.727, 1094.1 911.388, 1099.46 895.363, 1101.64 879.255, 1103.44 863.199, 1105.51 847.148, 1107.66 831.065, 1109.7 814.95, 1111.42 798.804, 1112.61 782.631, 1113.22 766.437, 1113.62 750.233, 1114.27 734.027, 1115.44 717.837, 1116.53 701.682, 1116.7 685.528, 1115.7 669.331, 1114.76 653.968, 1109.67 639.188, 1103.07 624.891, 1095.47 610.927, 1087.25 597.013, 1078.94 582.978, 1070.83 568.901, 1062.81 554.896, 1054.68 541.07, 1046.26 527.414, 1037.55 513.782, 1028.79 500.019, 1020.24 485.992, 1012.11 471.657, 1004.55 456.998, 997.655 442.254, 990.943 427.774, 983.683 413.556, 975.91 399.236, 968.341 384.286, 962.09 368.861, 957.139 353.444, 952.166 338.055, 947.093 322.475, 942.608 310.288, 939.676 274.984, 925 262.148, 924.714 186.229, 923.024 51.5523, 920.027

	4.27228e-05, 918.879 2.70039e-05, 838.348
Material Boundary	2.70039e-05, 838.348 60.8781, 856.375 121.451, 875.601 164.296, 890.557 193.02, 900.583 221.006, 910.353 262.148, 924.714
Material Boundary	2.70039e-05, 838.348 4.27228e-05, 884.507 4.27228e-05, 918.879



Method Name	Min FS
Spencer	1.40

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Tcag		130	Anisotropic Linear	400	24	300	38	2	3	Anisotropic Surface 1	None	0
Qa - Alluvium		125	Mohr-Coulomb	300	29						None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 8-8', Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPJS1A_s.slmd
		Scale	1:1500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 19

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.40481 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.40481 6
Entity Information 6
    Circular Search - Auto Refine 6
        Shared Entities 6

Slide2 Analysis Information

SPJS1A_s

Project Summary

File Name:	SPJS1A_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.520s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 8-8', Pseudo-Static, Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	300 psf
Phi 2	38 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.404810
Center:	379.075, 1341.405
Radius:	373.677
Left Slip Surface Endpoint:	399.046, 968.262
Right Slip Surface Endpoint:	676.489, 1115.176
Resisting Moment:	2.95481e+08 lb-ft
Driving Moment:	2.10335e+08 lb-ft
Resisting Horizontal Force:	692211 lb
Driving Horizontal Force:	492744 lb
Total Slice Area:	7973.09 ft2
Surface Horizontal Width:	277.444 ft
Surface Average Height:	28.7377 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 12632
Number of Invalid Surfaces: 0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.40481

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.54888	920.779	3.48975	Tcag	400	24	402.133	564.921	370.419	0	370.419	394.943	394.943
2	5.54888	2761.95	4.34258	Tcag	400	24	511.945	719.186	716.905	0	716.905	755.781	755.781
3	5.54888	4548.84	5.19637	Tcag	400	24	614.96	863.902	1041.94	0	1041.94	1097.87	1097.87
4	5.54888	6329.32	6.05132	Tcag	400	24	714.302	1003.46	1355.39	0	1355.39	1431.11	1431.11
5	5.54888	8063.16	6.90763	Tcag	400	24	807.741	1134.72	1650.21	0	1650.21	1748.07	1748.07
6	5.54888	9674.74	7.7655	Tcag	323.45	35.0872	1268.42	1781.89	2076.15	0	2076.15	2249.12	2249.12
7	5.54888	11107.9	8.62511	Tcag	300	38	1532.76	2153.23	2372.02	0	2372.02	2604.51	2604.51
8	5.54888	12472.4	9.48669	Tcag	300	38	1654.67	2324.49	2591.22	0	2591.22	2867.72	2867.72
9	5.54888	13651.8	10.3504	Tcag	300	38	1751.18	2460.08	2764.78	0	2764.78	3084.62	3084.62
10	5.54888	14711.7	11.2166	Tcag	300	38	1830.7	2571.78	2907.74	0	2907.74	3270.78	3270.78
11	5.54888	15717.9	12.0853	Tcag	300	38	1900.95	2670.47	3034.06	0	3034.06	3441.08	3441.08
12	5.54888	16705.3	12.9569	Tcag	300	38	1965.98	2761.83	3151	0	3151	3603.32	3603.32
13	5.54888	17634.5	13.8315	Tcag	300	38	2022.05	2840.6	3251.82	0	3251.82	3749.66	3749.66
14	5.54888	18594.3	14.7095	Tcag	300	38	2078.32	2919.65	3353	0	3353	3898.6	3898.6
15	5.54888	19620.7	15.5909	Tcag	300	38	2138.14	3003.68	3460.55	0	3460.55	4057.17	4057.17
16	5.54888	20592.9	16.4762	Tcag	300	38	2189.83	3076.3	3553.51	0	3553.51	4201.18	4201.18
17	5.54888	21647.4	17.3656	Tcag	300	38	2246.4	3155.76	3655.21	0	3655.21	4357.7	4357.7
18	5.54888	22680.1	18.2593	Tcag	300	38	2298.02	3228.28	3748.02	0	3748.02	4506.21	4506.21
19	5.54888	23697.9	19.1576	Tcag	300	38	2345.51	3295	3833.43	0	3833.43	4648.28	4648.28
20	5.54888	24756.5	20.0608	Tcag	300	38	2393.87	3362.93	3920.37	0	3920.37	4794.54	4794.54
21	5.54888	25751	20.9693	Tcag	300	38	2433.98	3419.28	3992.51	0	3992.51	4925.33	4925.33
22	5.54888	26732.2	21.8833	Tcag	300	38	2470.49	3470.57	4058.15	0	4058.15	5050.44	5050.44
23	5.54888	27658	22.8032	Tcag	300	38	2500.05	3512.1	4111.3	0	4111.3	5162.39	5162.39
24	5.54888	28501	23.7294	Tcag	300	38	2520.78	3541.22	4148.57	0	4148.57	5256.65	5256.65
25	5.54888	29255.2	24.6622	Tcag	300	38	2532.61	3557.84	4169.85	0	4169.85	5332.7	5332.7
26	5.54888	29920.6	25.602	Tcag	300	38	2536.01	3562.61	4175.95	0	4175.95	5391.11	5391.11
27	5.54888	30420.7	26.5493	Tcag	300	38	2525.59	3547.98	4157.23	0	4157.23	5419.16	5419.16
28	5.54888	30817.5	27.5045	Tcag	300	38	2506.72	3521.47	4123.29	0	4123.29	5428.45	5428.45
29	5.54888	31081.1	28.468	Tcag	300	38	2477.67	3480.65	4071.06	0	4071.06	5414.53	5414.53
30	5.54888	31190.5	29.4404	Tcag	300	38	2437.51	3424.24	3998.84	0	3998.84	5374.58	5374.58
31	5.54888	31206.1	30.4222	Tcag	300	38	2391.11	3359.05	3915.4	0	3915.4	5319.5	5319.5
32	5.54888	31097.6	31.414	Tcag	300	38	2336.74	3282.68	3817.65	0	3817.65	5244.79	5244.79
33	5.54888	30885.4	32.4164	Tcag	300	38	2276.28	3197.74	3708.94	0	3708.94	5154.43	5154.43
34	5.54888	30585.2	33.4301	Tcag	300	38	2211.15	3106.24	3591.82	0	3591.82	5051.47	5051.47
35	5.54888	30201.6	34.4558	Tcag	300	38	2141.93	3009.01	3467.37	0	3467.37	4937.05	4937.05
36	5.54888	29716.5	35.4942	Tcag	300	38	2067.81	2904.88	3334.1	0	3334.1	4808.73	4808.73
37	5.54888	29179.8	36.5462	Tcag	300	38	1992.19	2798.65	3198.13	0	3198.13	4674.76	4674.76
38	5.54888	28547	37.6128	Tcag	300	38	1912.57	2686.8	3054.96	0	3054.96	4528.52	4528.52
39	5.54888	27781.9	38.6949	Tcag	300	38	1827.17	2566.82	2901.41	0	2901.41	4364.98	4364.98
40	5.54888	26867	39.7936	Tcag	300	38	1735.44	2437.97	2736.48	0	2736.48	4182.07	4182.07
41	5.54888	25810.1	40.9102	Tcag	300	38	1638.39	2301.63	2561.96	0	2561.96	3981.69	3981.69
42	5.54888	24454.6	42.0459	Tcag	300	38	1527.96	2146.49	2363.4	0	2363.4	3741.4	3741.4
43	5.54888	22898	43.2024	Tcag	300	38	1410.48	1981.45	2152.16	0	2152.16	3476.8	3476.8
44	5.54888	21099.4	44.3812	Tcag	300	38	1284.56	1804.56	1925.75	0	1925.75	3182.85	3182.85
45	5.54888	18900.6	45.5843	Tcag	300	38	1143.11	1605.85	1671.41	0	1671.41	2838.08	2838.08
46	5.54888	16514.2	46.8138	Tcag	300	38	998.149	1402.21	1410.76	0	1410.76	2474.19	2474.19
47	5.54888	13684.6	48.072	Tcag	300	38	838.135	1177.42	1123.05	0	1123.05	2056.25	2056.25
48	5.54888	10450	49.3619	Tcag	300	38	666.6	936.446	814.614	0	814.614	1591.3	1591.3
49	5.54888	6953.67	50.6865	Tcag	300	38	491.662	690.692	500.063	0	500.063	1100.47	1100.47
50	5.54888	2450.52	52.0498	Tcag	300	38	299.885	421.282	155.234	0	155.234	539.758	539.758

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.40481

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	399.046	968.262	0	0	0
2	404.594	968.6	2015.38	1292.58	32.6744
3	410.143	969.022	4279.62	2744.78	32.6745
4	415.692	969.526	6713.43	4305.73	32.6745
5	421.241	970.114	9249.29	5932.13	32.6745
6	426.79	970.787	11818.5	7579.94	32.6746
7	432.339	971.543	16322.8	10468.8	32.6745
8	437.888	972.385	21726	13934.2	32.6745
9	443.437	973.312	27263.4	17485.7	32.6746
10	448.985	974.326	32819.5	21049.1	32.6745
11	454.534	975.426	38313.4	24572.7	32.6745
12	460.083	976.614	43691.7	28022.1	32.6745
13	465.632	977.891	48914.3	31371.7	32.6745
14	471.181	979.257	53935.5	34592.1	32.6745
15	476.73	980.714	58731.4	37668	32.6745
16	482.279	982.262	63283.1	40587.3	32.6745
17	487.828	983.903	67550.8	43324.4	32.6745
18	493.376	985.638	71516.2	45867.6	32.6745
19	498.925	987.469	75146	48195.7	32.6745
20	504.474	989.397	78409.6	50288.8	32.6745
21	510.023	991.423	81281.8	52130.9	32.6745
22	515.572	993.55	83730.7	53701.6	32.6745
23	521.121	995.779	85730	54983.8	32.6745
24	526.67	998.111	87254.2	55961.4	32.6745
25	532.219	1000.55	88281.3	56620.2	32.6745
26	537.767	1003.1	88794.1	56949	32.6745
27	543.316	1005.76	88779.8	56939.9	32.6745
28	548.865	1008.53	88234.8	56590.3	32.6745
29	554.414	1011.42	87158.7	55900.2	32.6745
30	559.963	1014.43	85558.7	54874	32.6745
31	565.512	1017.56	83450.1	53521.6	32.6745
32	571.061	1020.82	80847.9	51852.6	32.6745
33	576.61	1024.21	77774.9	49881.8	32.6745
34	582.158	1027.73	74256.1	47624.9	32.6745
35	587.707	1031.39	70317.9	45099.1	32.6745
36	593.256	1035.2	65989.1	42322.8	32.6745
37	598.805	1039.16	61305.3	39318.8	32.6745
38	604.354	1043.27	56295.2	36105.5	32.6745
39	609.903	1047.55	50999.3	32709	32.6746
40	615.452	1051.99	45470.5	29163	32.6745
41	621.001	1056.61	39771.4	25507.8	32.6745
42	626.549	1061.42	33968.6	21786.1	32.6745
43	632.098	1066.43	28179.9	18073.5	32.6745
44	637.647	1071.64	22506.3	14434.6	32.6744
45	643.196	1077.07	17071.3	10948.9	32.6746
46	648.745	1082.73	12062.7	7736.51	32.6744
47	654.294	1088.64	7613.2	4882.8	32.6745
48	659.843	1094.82	3959.92	2539.73	32.6744
49	665.392	1101.29	1349.43	865.474	32.6746
50	670.94	1108.06	-4.53787	-2.91041	32.6745
51	676.489	1115.18	0	0	0

Entity Information

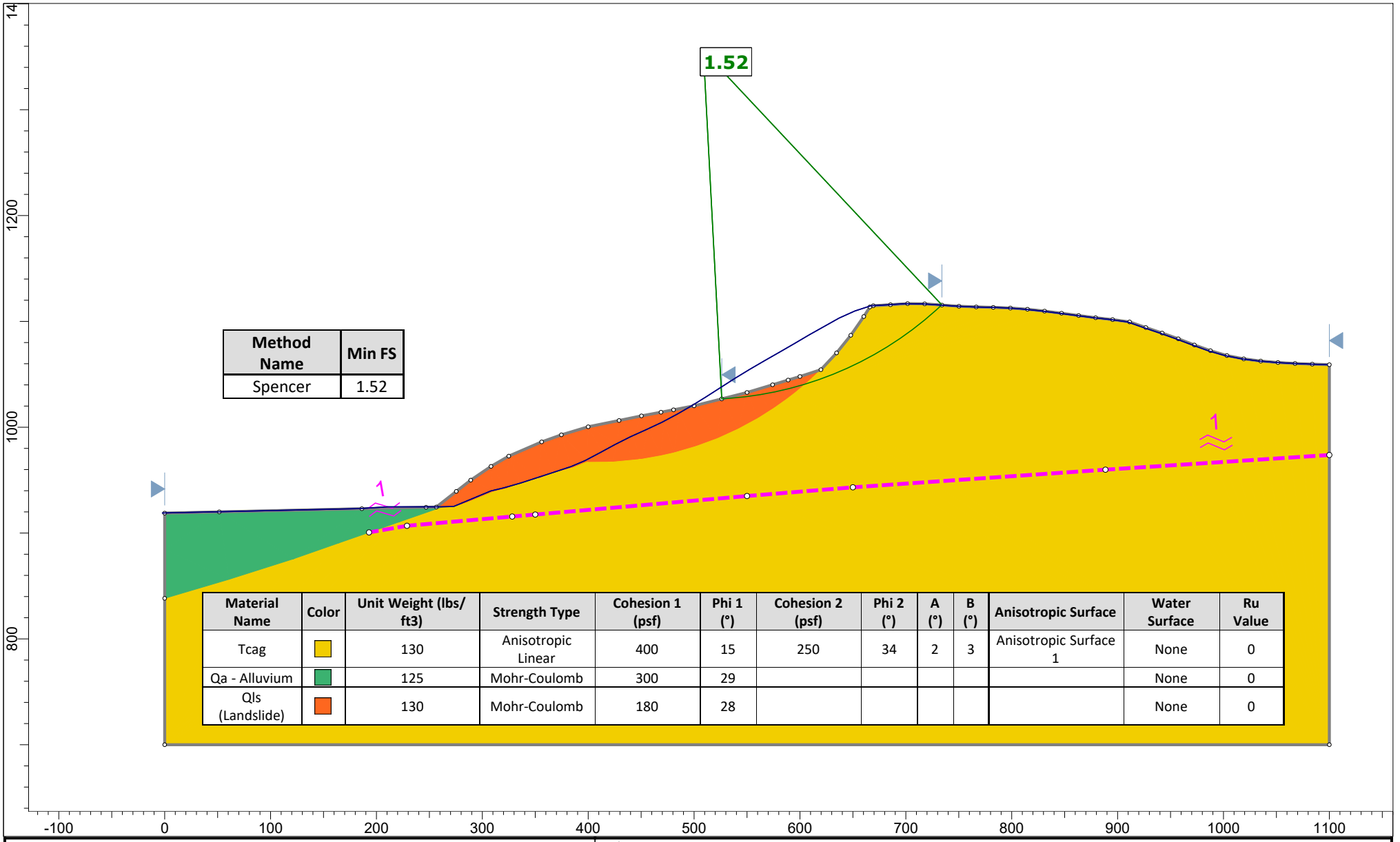
Circular Search - Auto Refine

Shared Entities

Type	Coordinates (x,y)

External Boundary	-3.638e-12, 700 1100, 700 1100, 1059 1083.83, 1059.54 1067.65, 1060.21 1051.45, 1061.15 1035.25, 1062.5 1019.14, 1064.57 1003.27, 1067.73 987.756, 1072.24 972.503, 1077.73 957.331, 1083.5 942.067, 1088.9 926.727, 1094.1 911.388, 1099.46 895.363, 1101.64 879.255, 1103.44 863.199, 1105.51 847.148, 1107.66 831.065, 1109.7 814.95, 1111.42 798.804, 1112.61 782.631, 1113.22 766.437, 1113.62 750.233, 1114.27 734.027, 1115.44 717.837, 1116.53 701.682, 1116.7 685.528, 1115.7 669.331, 1114.76 653.968, 1109.67 639.188, 1103.07 624.891, 1095.47 610.927, 1087.25 597.013, 1078.94 582.978, 1070.83 568.901, 1062.81 554.896, 1054.68 541.07, 1046.26 527.414, 1037.55 513.782, 1028.79 500.019, 1020.24 485.992, 1012.11 471.657, 1004.55 456.998, 997.655 442.254, 990.943 427.774, 983.683 413.556, 975.91 399.236, 968.341 384.286, 962.09 368.861, 957.139 353.444, 952.166 338.055, 947.093 322.475, 942.608 310.288, 939.676 274.984, 925 262.148, 924.714 186.229, 923.024 51.5523, 920.027

	4.27228e-05, 918.879 2.70039e-05, 838.348
Material Boundary	2.70039e-05, 838.348 60.8781, 856.375 121.451, 875.601 164.296, 890.557 193.02, 900.583 221.006, 910.353 262.148, 924.714
Material Boundary	2.70039e-05, 838.348 4.27228e-05, 884.507 4.27228e-05, 918.879



Method Name	Min FS
Spencer	1.52

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Tcag		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 1	None	0
Qa - Alluvium		125	Mohr-Coulomb	300	29						None	0
Qls (Landslide)		130	Mohr-Coulomb	180	28						None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 8-8', Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPJS1B.slmd
		Scale	1:1500
Project No.:	23-2195s	Date: 10/13/2023	Run Number: Run No. 20

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.52269 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.52269 6
Entity Information 7
    Circular Search - Auto Refine 7
        Shared Entities 7

Slide2 Analysis Information

SPJS1B

Project Summary

File Name:	SPJS1B.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:01.561s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 8-8', Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Qls (Landslide)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.522690
Center:	508.767, 1355.720
Radius:	329.437
Left Slip Surface Endpoint:	526.126, 1026.740
Right Slip Surface Endpoint:	734.135, 1115.432
Resisting Moment:	1.09151e+08 lb-ft
Driving Moment:	7.1683e+07 lb-ft
Resisting Horizontal Force:	292547 lb
Driving Horizontal Force:	192125 lb
Total Slice Area:	3655.09 ft2
Surface Horizontal Width:	208.009 ft
Surface Average Height:	17.5717 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	4315
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.52269

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	4.15744	217.853	3.38252	Qls (Landslide)	180	28	152.884	232.794	99.292	0	99.292	108.328	108.328
2	4.15744	639.487	4.10715	Qls (Landslide)	180	28	190.5	290.072	207.015	0	207.015	220.694	220.694
3	4.15744	1032.54	4.83244	Qls (Landslide)	180	28	224.78	342.271	305.189	0	305.189	324.192	324.192
4	4.15744	1396.94	5.5585	Qls (Landslide)	180	28	255.812	389.523	394.055	0	394.055	418.951	418.951
5	4.15744	1732.57	6.28546	Qls (Landslide)	180	28	283.676	431.951	473.851	0	473.851	505.096	505.096
6	4.15744	2042.98	7.01344	Qls (Landslide)	180	28	308.771	470.163	545.717	0	545.717	583.703	583.703
7	4.15744	2400.81	7.74256	Qls (Landslide)	180	28	337.486	513.887	627.951	0	627.951	673.837	673.837
8	4.15744	2759.96	8.47295	Qls (Landslide)	180	28	365.744	556.914	708.873	0	708.873	763.358	763.358
9	4.15744	3089.81	9.20472	Qls (Landslide)	180	28	390.936	595.275	781.02	0	781.02	844.371	844.371
10	4.15744	3390.17	9.93801	Qls (Landslide)	180	28	413.132	629.072	844.582	0	844.582	916.968	916.968
11	4.15744	3660.86	10.673	Qls (Landslide)	180	28	432.393	658.401	899.741	0	899.741	981.231	981.231
12	4.15744	3901.66	11.4097	Qls (Landslide)	180	28	448.781	683.354	946.672	0	946.672	1037.24	1037.24
13	4.15744	4112.36	12.1483	Qls (Landslide)	180	28	462.353	704.02	985.537	0	985.537	1085.07	1085.07
14	4.15744	4292.7	12.889	Qls (Landslide)	180	28	473.164	720.482	1016.5	0	1016.5	1124.77	1124.77

15	4.15744	4442.42	13.6319	Qls (Landslide)	180	28	481.267	732.82	1039.7	0	1039.7	1156.42	1156.42
16	4.15744	4561.24	14.3771	Qls (Landslide)	180	28	486.712	741.112	1055.3	0	1055.3	1180.06	1180.06
17	4.15744	4648.87	15.1249	Qls (Landslide)	180	28	489.547	745.428	1063.42	0	1063.42	1195.73	1195.73
18	4.15744	4706.28	15.8752	Qls (Landslide)	180	28	489.92	745.996	1064.49	0	1064.49	1203.81	1203.81
19	4.15744	4765.1	16.6284	Qls (Landslide)	180	28	490.348	746.648	1065.71	0	1065.71	1212.15	1212.15
20	4.16187	4811.35	17.385	Tcag	250	34	639.168	973.254	1072.27	0	1072.27	1272.39	1272.39
21	4.16187	4819.82	18.1451	Tcag	250	34	633.815	965.104	1060.19	0	1060.19	1267.9	1267.9
22	4.16187	4795.13	18.9085	Tcag	250	34	625.326	952.177	1041.02	0	1041.02	1255.22	1255.22
23	4.16187	4929.8	19.6754	Tcag	250	34	632.002	962.343	1056.09	0	1056.09	1282.08	1282.08
24	4.16187	6289.75	20.446	Tcag	250	34	753.011	1146.6	1329.27	0	1329.27	1610	1610
25	4.16187	7842.91	21.2205	Tcag	250	34	889.098	1353.82	1636.48	0	1636.48	1981.71	1981.71
26	4.16187	9360.96	21.9991	Tcag	250	34	1018.81	1551.33	1929.3	0	1929.3	2340.91	2340.91
27	4.16187	11004.1	22.782	Tcag	250	34	1156.76	1761.39	2240.72	0	2240.72	2726.55	2726.55
28	4.16187	12825.1	23.5694	Tcag	250	34	1307.3	1990.62	2580.57	0	2580.57	3150.88	3150.88
29	4.16187	14610.3	24.3616	Tcag	250	34	1451.02	2209.46	2905.03	0	2905.03	3562.07	3562.07
30	4.16187	16460	25.1587	Tcag	250	34	1596.84	2431.49	3234.18	0	3234.18	3984.19	3984.19
31	4.16187	18593.8	25.9611	Tcag	250	34	1763.48	2685.24	3610.39	0	3610.39	4469.02	4469.02
32	4.16187	20711.9	26.769	Tcag	250	34	1924.55	2930.5	3974.01	0	3974.01	4944.87	4944.87
33	4.16187	22894.8	27.5827	Tcag	250	34	2086.87	3177.66	4340.43	0	4340.43	5430.62	5430.62
34	4.16187	25129.7	28.4025	Tcag	250	34	2249.18	3424.81	4706.85	0	4706.85	5923.11	5923.11
35	4.16187	25126.1	29.2287	Tcag	250	34	2222.77	3384.59	4647.21	0	4647.21	5890.93	5890.93
36	4.16187	24031.3	30.0615	Tcag	250	34	2107.63	3209.26	4387.28	0	4387.28	5607.14	5607.14
37	4.16187	22835.9	30.9015	Tcag	250	34	1986.6	3024.97	4114.07	0	4114.07	5303.1	5303.1
38	4.16187	21595.5	31.7489	Tcag	250	34	1864.37	2838.86	3838.13	0	3838.13	4991.79	4991.79
39	4.16187	20311.1	32.6041	Tcag	250	34	1741.14	2651.22	3559.97	0	3559.97	4673.65	4673.65
40	4.16187	18986.2	33.4676	Tcag	250	34	1617.32	2462.67	3280.41	0	3280.41	4349.58	4349.58
41	4.16187	17612.7	34.3398	Tcag	250	34	1492.39	2272.45	2998.41	0	2998.41	4017.97	4017.97
42	4.16187	16188.7	35.2211	Tcag	250	34	1366.36	2080.55	2713.9	0	2713.9	3678.52	3678.52
43	4.16187	14660.3	36.1121	Tcag	250	34	1235.39	1881.11	2418.22	0	2418.22	3319.48	3319.48
44	4.16187	12969.3	37.0134	Tcag	250	34	1095.53	1668.15	2102.49	0	2102.49	2928.44	2928.44
45	4.16187	11219.1	37.9255	Tcag	250	34	954.764	1453.81	1784.72	0	1784.72	2528.67	2528.67
46	4.16187	9410.84	38.849	Tcag	250	34	813.391	1238.54	1465.57	0	1465.57	2120.7	2120.7
47	4.16187	7488.88	39.7847	Tcag	250	34	667.709	1016.71	1136.7	0	1136.7	1692.71	1692.71
48	4.16187	5430.65	40.7333	Tcag	250	34	516.556	786.555	795.475	0	795.475	1240.31	1240.31
49	4.16187	3306.53	41.6956	Tcag	250	34	365.206	556.095	453.805	0	453.805	779.141	779.141
50	4.16187	1114.02	42.6726	Tcag	250	34	218.214	332.272	121.973	0	121.973	323.142	323.142

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.52269

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	526.126	1026.74	0	0	0
2	530.283	1026.99	611.313	234.9	21.0195
3	534.441	1027.28	1341.64	515.531	21.0195
4	538.598	1027.64	2169.04	833.465	21.0195
5	542.755	1028.04	3073.31	1180.93	21.0194
6	546.913	1028.5	4035.89	1550.81	21.0195
7	551.07	1029.01	5040.69	1936.91	21.0195
8	555.228	1029.58	6089.05	2339.75	21.0195
9	559.385	1030.19	7170.84	2755.43	21.0195
10	563.543	1030.87	8270.23	3177.88	21.0195
11	567.7	1031.6	9372.87	3601.58	21.0196
12	571.857	1032.38	10465.9	4021.56	21.0195
13	576.015	1033.22	11537.7	4433.41	21.0195
14	580.172	1034.11	12578.2	4833.24	21.0195
15	584.33	1035.07	13578.6	5217.67	21.0196
16	588.487	1036.07	14531.5	5583.82	21.0196
17	592.645	1037.14	15430.7	5929.35	21.0196
18	596.802	1038.26	16271.4	6252.37	21.0195
19	600.96	1039.45	17050	6551.54	21.0195
20	605.117	1040.69	17765.7	6826.56	21.0195
21	609.279	1041.99	19029	7312.01	21.0196
22	613.441	1043.35	20221.3	7770.15	21.0196
23	617.603	1044.78	21340.2	8200.08	21.0195
24	621.764	1046.27	22399.3	8607.05	21.0195
25	625.926	1047.82	23471.3	9018.97	21.0195
26	630.088	1049.44	24527.7	9424.89	21.0195
27	634.25	1051.12	25524.5	9807.94	21.0196
28	638.412	1052.87	26423	10153.2	21.0196
29	642.574	1054.68	27179.3	10443.8	21.0196
30	646.736	1056.57	27744.7	10661	21.0194
31	650.898	1058.52	28069.5	10785.9	21.0196
32	655.059	1060.55	28094.1	10795.3	21.0195
33	659.221	1062.65	27761.8	10667.6	21.0195
34	663.383	1064.82	27011.7	10379.4	21.0196
35	667.545	1067.07	25781.1	9906.54	21.0196
36	671.707	1069.4	24211.5	9303.39	21.0195
37	675.869	1071.81	22416.4	8613.64	21.0196
38	680.031	1074.3	20437.7	7853.31	21.0196
39	684.193	1076.87	18313.8	7037.19	21.0196
40	688.354	1079.54	16084.7	6180.62	21.0195
41	692.516	1082.29	13791.4	5299.44	21.0196
42	696.678	1085.13	11478.3	4410.62	21.0196
43	700.84	1088.07	9192.02	3532.08	21.0195
44	705.002	1091.11	6992.11	2686.76	21.0196
45	709.164	1094.24	4955.29	1904.1	21.0196
46	713.326	1097.49	3141.89	1207.29	21.0196
47	717.487	1100.84	1614.94	620.551	21.0196
48	721.649	1104.3	454.92	174.805	21.0195
49	725.811	1107.89	-245.848	-94.4684	21.0195
50	729.973	1111.6	-408.142	-156.831	21.0196
51	734.135	1115.43	0	0	0

Entity Information

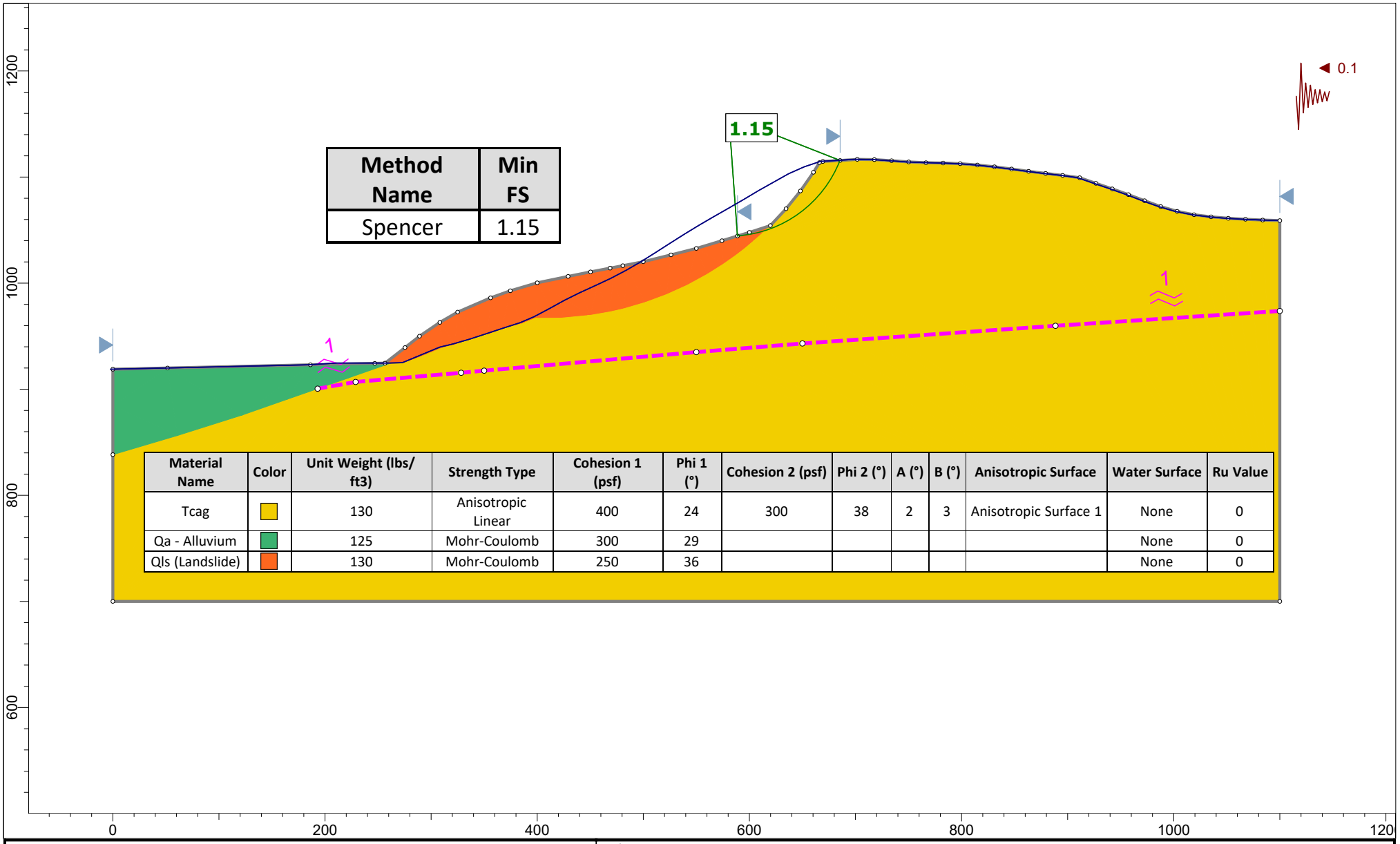
Circular Search - Auto Refine

Shared Entities

Type	Coordinates (x,y)

External Boundary	246.873, 924.374 186.229, 923.024 51.5523, 920.027 4.27228e-05, 918.879 2.70039e-05, 838.348 -3.638e-12, 700 1100, 700 1100, 1059 1083.83, 1059.54 1067.65, 1060.21 1051.45, 1061.15 1035.25, 1062.5 1019.14, 1064.57 1003.27, 1067.73 987.756, 1072.24 972.503, 1077.73 957.331, 1083.5 942.067, 1088.9 926.727, 1094.1 911.388, 1099.46 895.363, 1101.64 879.255, 1103.44 863.199, 1105.51 847.148, 1107.66 831.065, 1109.7 814.95, 1111.42 798.804, 1112.61 782.631, 1113.22 766.437, 1113.62 750.233, 1114.27 734.027, 1115.44 717.837, 1116.53 701.682, 1116.7 685.528, 1115.7 669.331, 1114.76 666.042, 1113.67 660.378, 1104.53 648.085, 1086.87 634.563, 1070.14 619.77, 1054.31 600, 1047.9 588.864, 1044.53 574.177, 1040.09 550, 1032.78 526.173, 1026.75 500.019, 1020.24 480.686, 1016.45 468.753, 1014.19 450.296, 1010.68 429.195, 1006.35 400, 1000.37 374.682, 992.813 356.046, 986.161 324.967, 972.732 308.237, 963.026 289.041, 950 275.412, 939.328 256.592, 924.591

Material Boundary	2.70039e-05, 838.348 60.8781, 856.375 121.451, 875.601 164.296, 890.557 193.02, 900.583 221.006, 910.353 262.148, 924.714
Material Boundary	2.70039e-05, 838.348 4.27228e-05, 884.507 4.27228e-05, 918.879
Material Boundary	246.873, 924.374 262.148, 924.714 274.984, 925 310.288, 939.676 322.475, 942.608 338.055, 947.093 353.444, 952.166 368.861, 957.139 384.286, 962.09 399.236, 968.341 413.556, 975.91 427.774, 983.683 442.254, 990.943 456.998, 997.655 471.657, 1004.55 485.992, 1012.11 499.751, 1020.08 500.019, 1020.24
Material Boundary	256.592, 924.591 262.148, 924.714 274.984, 925 310.288, 939.676
Material Boundary	322.475, 942.608 336.306, 947.26 353.444, 952.166 366.659, 957.198 384.286, 962.09 396.257, 966.904 400, 966.904 422.711, 967.113 450, 969.7 468.675, 972.985 481.14, 975.819 501.798, 981.826 521.974, 989.293 541.564, 998.181 560.469, 1008.45 575.685, 1018.11 587.331, 1026.32 595.84, 1032.9 604.107, 1039.78 612.124, 1046.96 619.77, 1054.31
Material Boundary	480.686, 1016.45 499.751, 1020.08 500.002, 1020.13 526.173, 1026.75



Method Name	Min FS
Spencer	1.15

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Tcag		130	Anisotropic Linear	400	24	300	38	2	3	Anisotropic Surface 1	None	0
Qa - Alluvium		125	Mohr-Coulomb	300	29						None	0
Qls (Landslide)		130	Mohr-Coulomb	250	36						None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 8-8', Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPJS1B_s.slmd
		Scale	1:1500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 21

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.14858 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.14858 6
Entity Information 7
    Circular Search - Auto Refine 7
        Shared Entities 7

Slide2 Analysis Information

SPJS1B_s

Project Summary

File Name:	SPJS1B_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:01.435s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 8-8', Pseudo-Static, Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	300 psf
Phi 2	38 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Qls (Landslide)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	36 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.148580
Center:	580.681, 1156.970
Radius:	112.751
Left Slip Surface Endpoint:	588.794, 1044.511
Right Slip Surface Endpoint:	685.609, 1115.704
Resisting Moment:	1.44925e+07 lb-ft
Driving Moment:	1.26177e+07 lb-ft
Resisting Horizontal Force:	98580.1 lb
Driving Horizontal Force:	85827.8 lb
Total Slice Area:	1212.04 ft2
Surface Horizontal Width:	96.8153 ft
Surface Average Height:	12.5191 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 5219
Number of Invalid Surfaces: 0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.14858

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.99719	57.3568	4.63548	Qls (Landslide)	250	36	392.976	451.364	277.154	0	277.154	309.017	309.017
2	1.99719	167.421	5.65454	Qls (Landslide)	250	36	432.922	497.246	340.304	0	340.304	383.169	383.169
3	1.99719	268.164	6.67539	Qls (Landslide)	250	36	465.86	535.078	392.376	0	392.376	446.899	446.899
4	1.99719	359.53	7.69838	Qls (Landslide)	250	36	492.424	565.588	434.37	0	434.37	500.934	500.934
5	1.99719	441.456	8.72384	Qls (Landslide)	250	36	513.176	589.424	467.176	0	467.176	545.922	545.922
6	1.99719	514.727	9.75213	Qls (Landslide)	250	36	528.953	607.545	492.119	0	492.119	583.03	583.03
7	1.99719	586.765	10.7836	Qls (Landslide)	250	36	543.001	623.68	514.325	0	514.325	617.747	617.747
8	1.99719	651.226	11.8186	Qls (Landslide)	250	36	553.14	635.325	530.355	0	530.355	646.099	646.099
9	1.99719	705.89	12.8576	Qls (Landslide)	250	36	558.923	641.968	539.497	0	539.497	667.072	667.072
10	1.99719	750.64	13.9008	Qls (Landslide)	250	36	560.697	644.005	542.303	0	542.303	681.07	681.07
11	1.99719	785.345	14.9488	Qls (Landslide)	250	36	558.766	641.788	539.25	0	539.25	688.436	688.436
12	1.99719	809.863	16.002	Qls (Landslide)	250	36	553.413	635.639	530.785	0	530.785	689.494	689.494
13	1.99719	824.036	17.0607	Qls (Landslide)	250	36	544.887	625.846	517.308	0	517.308	684.528	684.528
14	1.91491	793.731	18.1034	Tcag	300	38	622.951	715.509	531.826	0	531.826	735.478	735.478
15	1.91491	787.665	19.1303	Tcag	300	38	606.64	696.774	507.848	0	507.848	718.275	718.275
16	1.91491	798.016	20.1636	Tcag	300	38	596.333	684.936	492.696	0	492.696	711.674	711.674

17	1.91491	1060.43	21.2038	Tcag	300	38	666.217	765.203	595.433	0	595.433	853.892	853.892
18	1.91491	1380.66	22.2514	Tcag	300	38	749.478	860.835	717.834	0	717.834	1024.47	1024.47
19	1.91491	1690.67	23.3068	Tcag	300	38	824.455	946.952	828.059	0	828.059	1183.24	1183.24
20	1.91491	1990.23	24.3708	Tcag	300	38	891.593	1024.07	926.761	0	926.761	1330.66	1330.66
21	1.91491	2279.07	25.4437	Tcag	300	38	951.302	1092.65	1014.54	0	1014.54	1467.14	1467.14
22	1.91491	2556.91	26.5263	Tcag	300	38	1003.95	1153.12	1091.94	0	1091.94	1593.07	1593.07
23	1.91491	2823.44	27.6192	Tcag	300	38	1049.88	1205.87	1159.46	0	1159.46	1708.77	1708.77
24	1.91491	3095.54	28.7232	Tcag	300	38	1093.83	1256.35	1224.08	0	1224.08	1823.51	1823.51
25	1.91491	3413.35	29.8389	Tcag	300	38	1145.86	1316.11	1300.57	0	1300.57	1957.84	1957.84
26	1.91491	3723.42	30.9673	Tcag	300	38	1192.06	1369.18	1368.48	0	1368.48	2083.82	2083.82
27	1.91491	4020.64	32.1091	Tcag	300	38	1231.49	1414.47	1426.46	0	1426.46	2199.25	2199.25
28	1.91491	4304.52	33.2654	Tcag	300	38	1264.41	1452.28	1474.86	0	1474.86	2304.33	2304.33
29	1.91491	4574.55	34.4373	Tcag	300	38	1291.04	1482.86	1514	0	1514	2399.22	2399.22
30	1.91491	4830.14	35.6258	Tcag	300	38	1311.56	1506.43	1544.17	0	1544.17	2484.04	2484.04
31	1.91491	5087.47	36.8323	Tcag	300	38	1329.68	1527.24	1570.79	0	1570.79	2566.68	2566.68
32	1.91491	5399.29	38.0581	Tcag	300	38	1356.04	1557.52	1609.55	0	1609.55	2671.22	2671.22
33	1.91491	5702.26	39.3048	Tcag	300	38	1377.16	1581.78	1640.6	0	1640.6	2767.99	2767.99
34	1.91491	5987.74	40.5742	Tcag	300	38	1391.55	1598.31	1661.76	0	1661.76	2853.37	2853.37
35	1.91491	6254.72	41.8681	Tcag	300	38	1399.31	1607.22	1673.17	0	1673.17	2927.29	2927.29
36	1.91491	6502.07	43.1888	Tcag	300	38	1400.52	1608.61	1674.94	0	1674.94	2989.6	2989.6
37	1.91491	6729.82	44.5388	Tcag	300	38	1395.44	1602.78	1667.48	0	1667.48	3040.64	3040.64
38	1.91491	6990.01	45.9208	Tcag	300	38	1392.92	1599.88	1663.77	0	1663.77	3102.19	3102.19
39	1.91491	7254.93	47.3382	Tcag	300	38	1387.77	1593.96	1656.2	0	1656.2	3162.12	3162.12
40	1.91491	7479.18	48.7948	Tcag	300	38	1372.79	1576.76	1634.18	0	1634.18	3202.02	3202.02
41	1.91491	7264.7	50.295	Tcag	300	38	1290.37	1482.09	1513	0	1513	3066.98	3066.98
42	1.91491	6815.8	51.8442	Tcag	300	38	1177.23	1352.14	1346.68	0	1346.68	2845.04	2845.04
43	1.91491	6234.69	53.4488	Tcag	300	38	1051.45	1207.67	1161.76	0	1161.76	2580.05	2580.05
44	1.91491	5598.87	55.1165	Tcag	300	38	925.426	1062.93	976.5	0	976.5	2303.88	2303.88
45	1.91491	4919.52	56.8573	Tcag	300	38	801.726	920.846	794.648	0	794.648	2022.49	2022.49
46	1.91491	4190.28	58.6833	Tcag	300	38	680.787	781.938	616.852	0	616.852	1735.82	1735.82
47	1.91491	3402.89	60.6109	Tcag	300	38	563.277	646.969	444.1	0	444.1	1444.2	1444.2
48	1.91491	2546.21	62.662	Tcag	300	38	450.224	517.118	277.899	0	277.899	1148.77	1148.77
49	1.91491	1604.67	64.8671	Tcag	300	38	343.239	394.238	120.619	0	120.619	852.264	852.264
50	1.91491	555.15	67.2722	Tcag	300	38	253.77	291.475	-10.9118	0	-10.9118	594.918	594.918

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.14858

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	588.794	1044.51	0	0	0
2	590.791	1044.67	735.689	581.367	38.317
3	592.789	1044.87	1517.89	1199.49	38.317
4	594.786	1045.1	2331.49	1842.43	38.3171
5	596.783	1045.37	3163.56	2499.96	38.3171
6	598.78	1045.68	4003.06	3163.35	38.317
7	600.777	1046.02	4841.04	3825.56	38.317
8	602.774	1046.4	5673.21	4483.17	38.317
9	604.772	1046.82	6493.22	5131.17	38.317
10	606.769	1047.28	7295.05	5764.8	38.317
11	608.766	1047.77	8073.83	6380.22	38.317
12	610.763	1048.31	8825.78	6974.44	38.317
13	612.76	1048.88	9548.11	7545.25	38.317
14	614.758	1049.49	10238.9	8091.13	38.317
15	616.673	1050.12	11021.7	8709.74	38.317
16	618.587	1050.78	11769.4	9300.61	38.3171
17	620.502	1051.48	12487.2	9867.84	38.3171
18	622.417	1052.23	13217	10444.5	38.3169
19	624.332	1053.01	13954.3	11027.2	38.3171
20	626.247	1053.84	14683.9	11603.7	38.3169
21	628.162	1054.7	15391.4	12162.8	38.317
22	630.077	1055.61	16064.2	12694.5	38.317
23	631.992	1056.57	16690.9	13189.7	38.317
24	633.907	1057.57	17261	13640.2	38.3169
25	635.822	1058.62	17765.4	14038.8	38.3169
26	637.737	1059.72	18193.8	14377.4	38.3171
27	639.652	1060.87	18535.9	14647.7	38.317
28	641.566	1062.07	18782.3	14842.4	38.317
29	643.481	1063.33	18924.8	14955.1	38.3171
30	645.396	1064.64	18956.3	14980	38.3172
31	647.311	1066.01	18870.5	14912.2	38.3172
32	649.226	1067.45	18659.9	14745.7	38.317
33	651.141	1068.95	18308.4	14467.9	38.317
34	653.056	1070.51	17808.4	14072.8	38.317
35	654.971	1072.15	17154.3	13555.9	38.317
36	656.886	1073.87	16341.9	12913.9	38.3169
37	658.801	1075.67	15367.8	12144.1	38.3169
38	660.716	1077.55	14229.8	11244.9	38.3171
39	662.63	1079.53	12913	10204.3	38.317
40	664.545	1081.61	11408.4	9015.34	38.3171
41	666.46	1083.79	9720.25	7681.28	38.317
42	668.375	1086.1	7980.14	6306.18	38.317
43	670.29	1088.54	6274.79	4958.56	38.317
44	672.205	1091.12	4667.63	3688.52	38.317
45	674.12	1093.87	3201.03	2529.57	38.3171
46	676.035	1096.8	1916.72	1514.66	38.317
47	677.95	1099.95	862.267	681.393	38.317
48	679.865	1103.35	92.6921	73.2485	38.317
49	681.78	1107.05	-327.537	-258.831	38.317
50	683.695	1111.13	-321.853	-254.34	38.3171
51	685.609	1115.7	0	0	0

Entity Information

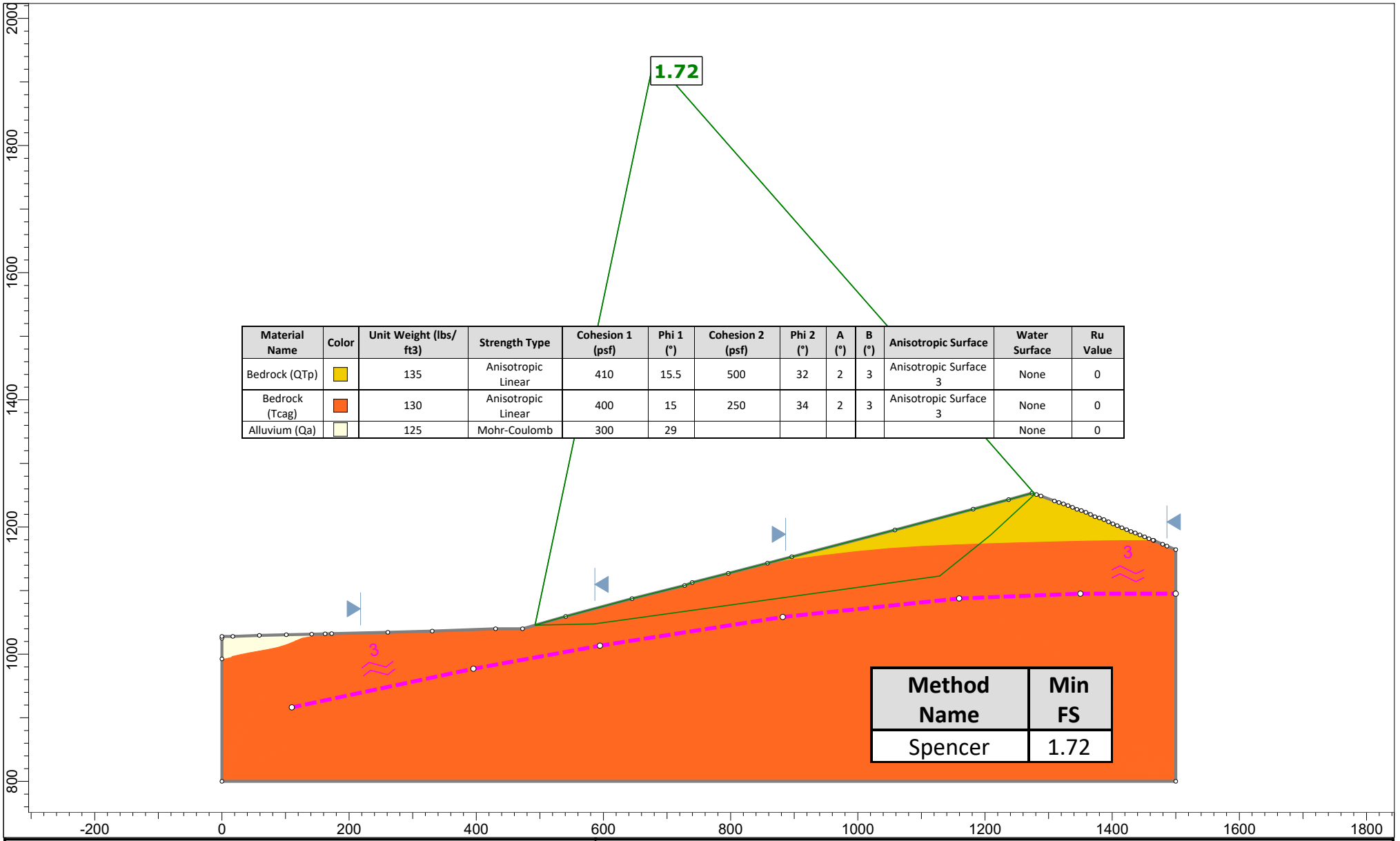
Circular Search - Auto Refine

Shared Entities

Type	Coordinates (x,y)

External Boundary	246.873, 924.374 186.229, 923.024 51.5523, 920.027 4.27228e-05, 918.879 2.70039e-05, 838.348 -3.638e-12, 700 1100, 700 1100, 1059 1083.83, 1059.54 1067.65, 1060.21 1051.45, 1061.15 1035.25, 1062.5 1019.14, 1064.57 1003.27, 1067.73 987.756, 1072.24 972.503, 1077.73 957.331, 1083.5 942.067, 1088.9 926.727, 1094.1 911.388, 1099.46 895.363, 1101.64 879.255, 1103.44 863.199, 1105.51 847.148, 1107.66 831.065, 1109.7 814.95, 1111.42 798.804, 1112.61 782.631, 1113.22 766.437, 1113.62 750.233, 1114.27 734.027, 1115.44 717.837, 1116.53 701.682, 1116.7 685.528, 1115.7 669.331, 1114.76 666.042, 1113.67 660.378, 1104.53 648.085, 1086.87 634.563, 1070.14 619.77, 1054.31 600, 1047.9 588.864, 1044.53 574.177, 1040.09 550, 1032.78 526.173, 1026.75 500.019, 1020.24 480.686, 1016.45 468.753, 1014.19 450.296, 1010.68 429.195, 1006.35 400, 1000.37 374.682, 992.813 356.046, 986.161 324.967, 972.732 308.237, 963.026 289.041, 950 275.412, 939.328 256.592, 924.591

Material Boundary	2.70039e-05, 838.348 60.8781, 856.375 121.451, 875.601 164.296, 890.557 193.02, 900.583 221.006, 910.353 262.148, 924.714
Material Boundary	2.70039e-05, 838.348 4.27228e-05, 884.507 4.27228e-05, 918.879
Material Boundary	246.873, 924.374 262.148, 924.714 274.984, 925 310.288, 939.676 322.475, 942.608 338.055, 947.093 353.444, 952.166 368.861, 957.139 384.286, 962.09 399.236, 968.341 413.556, 975.91 427.774, 983.683 442.254, 990.943 456.998, 997.655 471.657, 1004.55 485.992, 1012.11 499.751, 1020.08 500.019, 1020.24
Material Boundary	256.592, 924.591 262.148, 924.714 274.984, 925 310.288, 939.676
Material Boundary	322.475, 942.608 336.306, 947.26 353.444, 952.166 366.659, 957.198 384.286, 962.09 396.257, 966.904 400, 966.904 422.711, 967.113 450, 969.7 468.675, 972.985 481.14, 975.819 501.798, 981.826 521.974, 989.293 541.564, 998.181 560.469, 1008.45 575.685, 1018.11 587.331, 1026.32 595.84, 1032.9 604.107, 1039.78 612.124, 1046.96 619.77, 1054.31
Material Boundary	480.686, 1016.45 499.751, 1020.08 500.002, 1020.13 526.173, 1026.75



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 3	None	0
Bedrock (Tcag)		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 3	None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 9-9'; Static; Non-circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPAS1d.slmd
		Scale	1:2500
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 22

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.71709 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.71709 7
Entity Information 8
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SPAS1d

Project Summary

File Name:	SPAS1d.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:04.923s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 9-9'; Static; Non-circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 3
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 3
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.717090
Axis Location:	679.266, 1934.896
Left Slip Surface Endpoint:	492.317, 1045.599
Right Slip Surface Endpoint:	1278.534, 1251.759
Resisting Moment:	1.8495e+09 lb-ft
Driving Moment:	1.07711e+09 lb-ft
Resisting Horizontal Force:	1.93166e+06 lb
Driving Horizontal Force:	1.12496e+06 lb
Total Slice Area:	39686.1 ft2
Surface Horizontal Width:	786.217 ft
Surface Average Height:	50.4772 ft

Global Minimum Coordinates

Method: spencer

X	Y
492.317	1045.6
584.885	1047.56
638.109	1054.92
840.51	1082.95
1009.7	1106.43
1128.59	1122.97
1209.26	1187.74
1278.53	1251.76

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	21518
Number of Invalid Surfaces:	3533

Error Codes

Error Code -108 reported for 133 surfaces
Error Code -111 reported for 304 surfaces
Error Code -112 reported for 301 surfaces
Error Code -121 reported for 92 surfaces
Error Code -124 reported for 1 surface
Error Code -145 reported for 26 surfaces
Error Code -1000 reported for 2676 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.71709

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	15.428	4089.47	1.21061	Bedrock (Tcag)	250	34	271.099	465.502	319.495	0	319.495	325.224	325.224
2	15.428	12268.4	1.21061	Bedrock (Tcag)	250	34	496.544	852.611	893.407	0	893.407	903.9	903.9
3	15.428	20447.3	1.21061	Bedrock (Tcag)	250	34	721.989	1239.72	1467.32	0	1467.32	1482.58	1482.58
4	15.428	28410.7	1.21061	Bedrock (Tcag)	250	34	941.494	1616.63	2026.11	0	2026.11	2046.01	2046.01
5	15.428	36026.6	1.21061	Bedrock (Tcag)	250	34	1151.42	1977.09	2560.51	0	2560.51	2584.84	2584.84
6	15.428	43637.7	1.21061	Bedrock (Tcag)	250	34	1361.21	2337.32	3094.58	0	3094.58	3123.35	3123.35
7	17.7412	57190.9	7.87638	Bedrock (Tcag)	400	15	730.523	1254.37	3188.57	0	3188.57	3289.63	3289.63
8	17.7412	62459.6	7.87638	Bedrock (Tcag)	400	15	776.064	1332.57	3480.41	0	3480.41	3587.77	3587.77
9	17.7412	67728.2	7.87638	Bedrock (Tcag)	400	15	821.605	1410.77	3772.24	0	3772.24	3885.9	3885.9
10	15.5693	63692.2	7.88588	Bedrock (Tcag)	400	15	863.467	1482.65	4040.53	0	4040.53	4160.13	4160.13
11	15.5693	67269.5	7.88588	Bedrock (Tcag)	400	15	898.701	1543.15	4266.3	0	4266.3	4390.78	4390.78
12	15.5693	70796.2	7.88588	Bedrock (Tcag)	400	15	933.434	1602.79	4488.89	0	4488.89	4618.18	4618.18
13	15.5693	74323	7.88588	Bedrock (Tcag)	400	15	968.173	1662.44	4711.48	0	4711.48	4845.58	4845.58
14	15.5693	77849.7	7.88588	Bedrock (Tcag)	400	15	1002.91	1722.08	4934.06	0	4934.06	5072.98	5072.98
15	15.5693	81528	7.88588	Bedrock (Tcag)	400	15	1039.13	1784.28	5166.22	0	5166.22	5310.15	5310.15
16	15.5693	87917.7	7.88588	Bedrock (Tcag)	400	15	1102.06	1892.34	5569.5	0	5569.5	5722.14	5722.14
17	15.5693	92102.3	7.88588	Bedrock (Tcag)	400	15	1143.28	1963.11	5833.6	0	5833.6	5991.96	5991.96
18	15.5693	95662.9	7.88588	Bedrock (Tcag)	400	15	1178.34	2023.32	6058.32	0	6058.32	6221.54	6221.54
19	15.5693	99223.4	7.88588	Bedrock (Tcag)	400	15	1213.41	2083.54	6283.04	0	6283.04	6451.11	6451.11
20	15.5693	102885	7.88588	Bedrock (Tcag)	400	15	1249.47	2145.46	6514.13	0	6514.13	6687.2	6687.2
21	15.5693	106731	7.88588	Bedrock (Tcag)	400	15	1287.35	2210.5	6756.91	0	6756.91	6935.22	6935.22
22	15.5693	110581	7.88588	Bedrock (Tcag)	400	15	1325.27	2275.61	6999.88	0	6999.88	7183.45	7183.45
23	15.3807	113017	7.89976	Bedrock (Tcag)	400	15	1362.81	2340.06	7240.39	0	7240.39	7429.49	7429.49
24	15.3807	116816	7.89976	Bedrock (Tcag)	400	15	1400.67	2405.07	7483.04	0	7483.04	7677.4	7677.4
25	15.3807	120696	7.89976	Bedrock (Tcag)	400	15	1439.35	2471.49	7730.92	0	7730.92	7930.64	7930.64
26	15.3807	124580	7.89976	Bedrock (Tcag)	400	15	1478.07	2537.98	7979.05	0	7979.05	8184.14	8184.14
27	15.3807	128477	7.89976	Bedrock (Tcag)	400	15	1516.92	2604.68	8227.95	0	8227.95	8438.44	8438.44
28	15.3807	132375	7.89976	Bedrock (Tcag)	400	15	1555.77	2671.4	8476.99	0	8476.99	8692.86	8692.86
29	15.3807	136274	7.89976	Bedrock (Tcag)	400	15	1594.64	2738.14	8726.09	0	8726.09	8947.35	8947.35
30	15.3807	140188	7.89976	Bedrock (Tcag)	400	15	1633.66	2805.14	8976.09	0	8976.09	9202.77	9202.77
31	15.3807	144108	7.89976	Bedrock (Tcag)	400	15	1672.74	2872.24	9226.54	0	9226.54	9458.64	9458.64
32	15.3807	148028	7.89976	Bedrock (Tcag)	400	15	1711.81	2939.34	9476.99	0	9476.99	9714.51	9714.51
33	15.3807	151959	7.89976	Bedrock (Tcag)	400	15	1751	3006.62	9728.02	0	9728.02	9970.98	9970.98
34	14.8615	150573	7.92234	Bedrock (Tcag)	400	15	1789.37	3072.51	9973.92	0	9973.92	10222.9	10222.9
35	14.8615	154246	7.92234	Bedrock (Tcag)	400	15	1827.26	3137.57	10216.8	0	10216.8	10471.1	10471.1

36	14.8615	157922	7.92234	Bedrock (Tcag)	400	15	1865.18	3202.68	10459.8	0	10459.8	10719.3	10719.3
37	14.8615	161668	7.92234	Bedrock (Tcag)	400	15	1903.82	3269.03	10707.4	0	10707.4	10972.3	10972.3
38	14.8615	165549	7.92234	Bedrock (Tcag)	400	15	1943.85	3337.76	10963.9	0	10963.9	11234.4	11234.4
39	14.8615	169436	7.92234	Bedrock (Tcag)	400	15	1983.95	3406.62	11220.9	0	11220.9	11496.9	11496.9
40	14.8615	173335	7.92234	Bedrock (Tcag)	400	15	2024.17	3475.68	11478.6	0	11478.6	11760.3	11760.3
41	14.8615	177250	7.92234	Bedrock (Tcag)	400	15	2064.55	3545.02	11737.4	0	11737.4	12024.7	12024.7
42	15.6499	180320	38.7589	Bedrock (Tcag)	250	34	3334.19	5725.11	8117.16	0	8117.16	10794	10794
43	15.6499	163531	38.7589	Bedrock (Tcag)	250	34	3035.14	5211.61	7355.9	0	7355.9	9792.63	9792.63
44	15.6499	146748	38.7589	Bedrock (Tcag)	250	34	2736.2	4698.3	6594.89	0	6594.89	8791.62	8791.62
45	15.6499	129974	38.7589	Bedrock (Tcag)	250	34	2437.4	4185.24	5834.24	0	5834.24	7791.08	7791.08
46	18.0749	128644	38.7589	Bedrock (QTp)	500	32	2107.47	3618.72	4991.01	0	4991.01	6682.98	6682.98
47	17.3175	98667.3	42.7431	Bedrock (QTp)	500	32	1657.08	2845.36	3753.36	0	3753.36	5284.78	5284.78
48	17.3175	72125.8	42.7431	Bedrock (QTp)	500	32	1276.06	2191.11	2706.34	0	2706.34	3885.63	3885.63
49	17.3175	45843.5	42.7431	Bedrock (QTp)	500	32	898.759	1543.25	1669.55	0	1669.55	2500.15	2500.15
50	17.3175	18759	42.7431	Bedrock (QTp)	500	32	516.632	887.104	619.497	0	619.497	1096.95	1096.95

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.71709

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	492.317	1045.6	0	0	0
2	507.745	1045.92	4076.31	934.309	12.9095
3	523.173	1046.25	11442	2622.55	12.9094
4	538.601	1046.58	22097	5064.73	12.9095
5	554.029	1046.9	35954.7	8240.97	12.9095
6	569.457	1047.23	52875.3	12119.2	12.9094
7	584.885	1047.56	72856.8	16699.1	12.9095
8	602.627	1050.01	77985	17874.5	12.9095
9	620.368	1052.46	83204.5	19070.8	12.9094
10	638.109	1054.92	88515.2	20288.1	12.9095
11	653.678	1057.07	93238.8	21370.7	12.9094
12	669.248	1059.23	98023.8	22467.5	12.9095
13	684.817	1061.39	102869	23578.1	12.9095
14	700.386	1063.54	107775	24702.6	12.9095
15	715.956	1065.7	112742	25840.9	12.9094
16	731.525	1067.86	117772	26993.7	12.9094
17	747.094	1070.01	122911	28171.7	12.9094
18	762.664	1072.17	128122	29366.1	12.9095
19	778.233	1074.33	133394	30574.5	12.9095
20	793.802	1076.48	138727	31796.9	12.9095
21	809.372	1078.64	144123	33033.7	12.9095
22	824.941	1080.8	149586	34285.7	12.9094
23	840.51	1082.95	155114	35552.7	12.9094
24	855.891	1085.09	160612	36813	12.9095
25	871.272	1087.22	166174	38087.9	12.9095
26	886.652	1089.36	171803	39377.9	12.9094
27	902.033	1091.49	177496	40683	12.9095
28	917.414	1093.62	183256	42003.1	12.9095
29	932.794	1095.76	189082	43338.4	12.9095
30	948.175	1097.89	194974	44688.8	12.9094
31	963.556	1100.03	200931	46054.3	12.9095
32	978.936	1102.16	206956	47435.1	12.9094
33	994.317	1104.29	213046	48831.1	12.9095
34	1009.7	1106.43	219203	50242.3	12.9095
35	1024.56	1108.5	225155	51606.6	12.9095
36	1039.42	1110.56	231169	52984.8	12.9094
37	1054.28	1112.63	237242	54377	12.9095
38	1069.14	1114.7	243378	55783.3	12.9095
39	1084.01	1116.77	249578	57204.3	12.9094
40	1098.87	1118.84	255842	58640.1	12.9095
41	1113.73	1120.91	262170	60090.6	12.9095
42	1128.59	1122.97	268563	61555.9	12.9095
43	1144.24	1135.54	218730	50133.9	12.9095
44	1159.89	1148.1	173785	39832.2	12.9094
45	1175.54	1160.67	133724	30650.2	12.9095
46	1191.19	1173.23	98547.3	22587.5	12.9095
47	1209.26	1187.74	64195.4	14713.9	12.9095
48	1226.58	1203.75	32808.3	7519.79	12.9094
49	1243.9	1219.75	11582.7	2654.81	12.9095
50	1261.22	1235.75	419.509	96.1532	12.9094
51	1278.53	1251.76	0	0	0

Entity Information

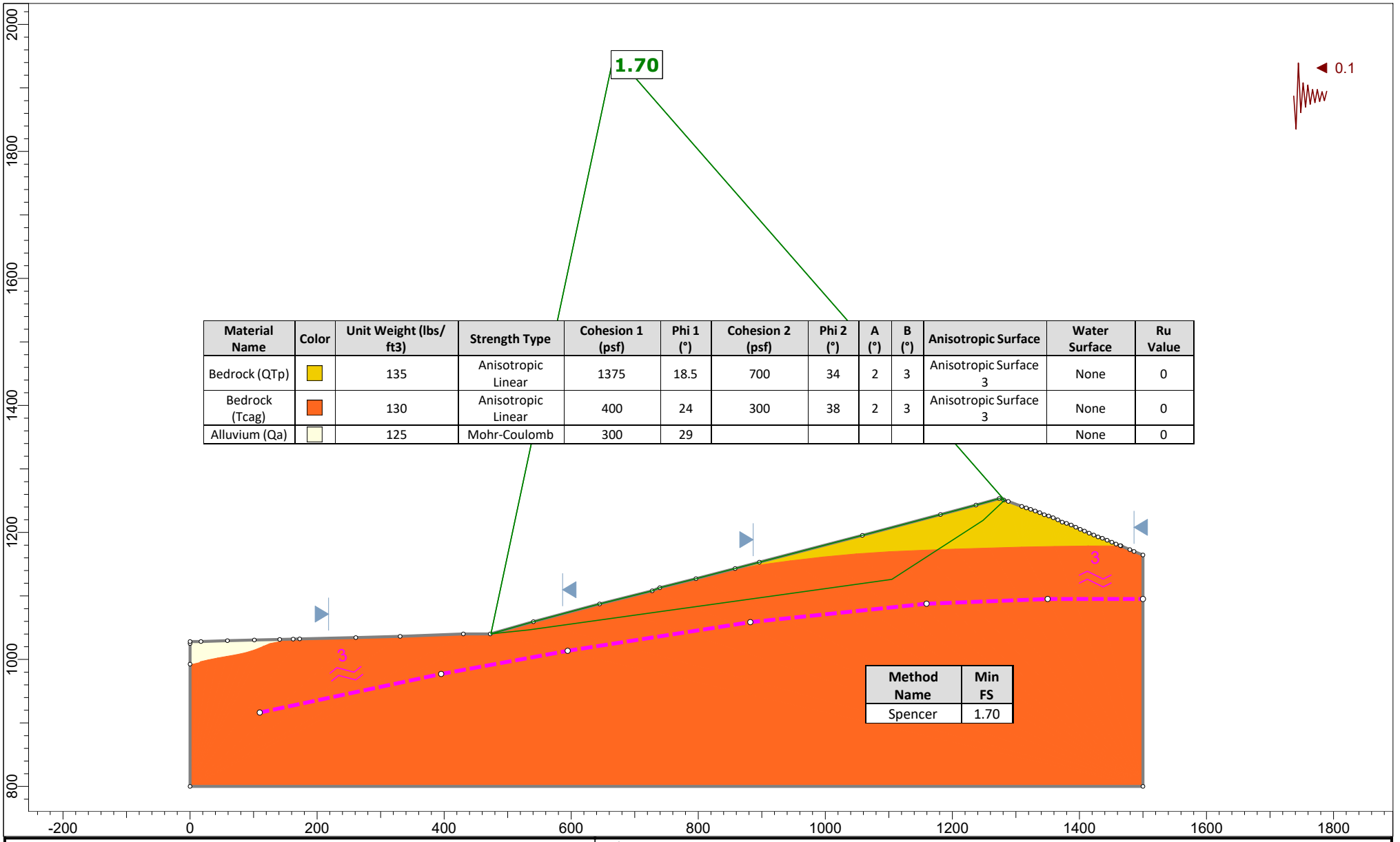
Non-Circular Search (Cuckoo)

Shared Entities

Type	Coordinates (x,y)

External Boundary	0, 1025 0, 992.582 0, 800 1500, 800 1500, 1164.41 1486.06, 1170.01 1479.39, 1172.89 1465.52, 1178.76 1464.48, 1179.21 1457.77, 1181.62 1451.03, 1184.59 1443.63, 1187.57 1436.26, 1190.69 1429.49, 1192.85 1422.68, 1195.83 1415.35, 1198.82 1408.05, 1202.13 1401.2, 1204.84 1394.32, 1208.21 1387.06, 1211.62 1379.84, 1214.27 1372.92, 1216.11 1365.96, 1219.74 1358.78, 1223.1 1351.63, 1225.8 1344.63, 1227.79 1337.61, 1230.97 1330.49, 1233.62 1323.41, 1236.27 1316.35, 1238.48 1309.25, 1240.98 1288.07, 1248.78 1280.89, 1250.99 1273.92, 1253.27 1237.16, 1243.1 1181.38, 1228.16 1058.41, 1195.34 896.258, 1153.07 858.024, 1143.1 796.344, 1127.03 739.544, 1112.74 727.587, 1107.95 644.938, 1087.25 540.586, 1059.38 472.703, 1040 430.345, 1040 330.79, 1036.24 261.029, 1034.39 172.657, 1032.23 162.373, 1031.98 141.16, 1031.47 101.243, 1030.5 58.9525, 1029.47 17.224, 1028.04 0, 1028.04

Material Boundary	0, 992.582 14.4596, 995.971 28.9589, 999.228 43.5373, 1002.22 58.2276, 1004.85 72.94, 1007.4 87.48, 1010.52 101.65, 1014.87 115.41, 1020.52 125.744, 1025
Material Boundary	858.024, 1143.1 892.683, 1148.28 944.428, 1155.26 996.294, 1161.29 1048.27, 1166.16 1100.34, 1169.66 1152.48, 1171.86 1204.64, 1173.71 1256.81, 1175.39 1308.98, 1176.82 1361.15, 1177.91 1413.34, 1178.59 1465.52, 1178.76
Material Boundary	125.744, 1025 162.373, 1031.98



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (QTp)		135	Anisotropic Linear	1375	18.5	700	34	2	3	Anisotropic Surface 3	None	0
Bedrock (Tcag)		130	Anisotropic Linear	400	24	300	38	2	3	Anisotropic Surface 3	None	0
Alluvium (Qa)		125	Mohr-Coulomb	300	29						None	0

Method Name	Min FS
Spencer	1.70

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 9-9'; Pseudo-Static; Non-circular		
Client	Solstra Communities California, LLC	*Drawn By*	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	*File Name*	SPAS1d_s.slmd
		Scale	1:2500
Project No.:	23-2195s-1	*Date:* 10/13/2023	*Run Number* Run No. 23

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.70484 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.70484 7
Entity Information 8
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SPAS1d_s

Project Summary

File Name:	SPAS1d_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:04.790s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 9-9'; Pseudo-Static; Non-circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Bedrock (QTp)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	1375 psf
Phi 1	18.5 °
A	2 °
Cohesion 2	700 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 3
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	300 psf
Phi 2	38 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 3
Water Surface	None
Ru Value	0

Alluvium (Qa)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.704840
Axis Location:	667.629, 1953.941
Left Slip Surface Endpoint:	473.682, 1040.279
Right Slip Surface Endpoint:	1282.189, 1250.586
Resisting Moment:	2.35849e+09 lb-ft
Driving Moment:	1.38341e+09 lb-ft
Resisting Horizontal Force:	2.47814e+06 lb
Driving Horizontal Force:	1.45359e+06 lb
Total Slice Area:	35255.8 ft2
Surface Horizontal Width:	808.508 ft
Surface Average Height:	43.606 ft

Global Minimum Coordinates

Method: spencer

X	Y
473.682	1040.28
532.341	1046.32
646.009	1062.11
743.184	1075.63
924.203	1100.85
1104.84	1126.06
1248.4	1218.86
1282.19	1250.59

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	20249
Number of Invalid Surfaces:	4802

Error Codes
Error Code -108 reported for 109 surfaces
Error Code -111 reported for 546 surfaces
Error Code -112 reported for 346 surfaces
Error Code -121 reported for 151 surfaces
Error Code -145 reported for 37 surfaces
Error Code -1000 reported for 3613 surfaces

Error Code Descriptions

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-111 = Safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-121 = Concave failure surface, only convex surfaces have been defined as being allowed.

-145 = Slip mass has invalid boundary slices.

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.70484

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	14.6647	2551.03	5.87827	Bedrock (Tcag)	300	38	284.051	484.261	235.843	0	235.843	265.088	265.088
2	14.6647	7653.08	5.87827	Bedrock (Tcag)	300	38	452.025	770.63	602.379	0	602.379	648.918	648.918
3	14.6647	12755.1	5.87827	Bedrock (Tcag)	300	38	620	1057	968.918	0	968.918	1032.75	1032.75
4	14.6647	17857.2	5.87827	Bedrock (Tcag)	300	38	787.974	1343.37	1335.45	0	1335.45	1416.58	1416.58
5	16.2383	25032.8	7.91116	Bedrock (Tcag)	354.083	30.9442	764.533	1303.41	1583.43	0	1583.43	1689.67	1689.67
6	16.2383	29506.5	7.91116	Bedrock (Tcag)	354.083	30.9442	860.81	1467.54	1857.2	0	1857.2	1976.82	1976.82
7	16.2383	33899.1	7.91116	Bedrock (Tcag)	354.083	30.9442	955.341	1628.7	2126.02	0	2126.02	2258.77	2258.77
8	16.2383	38291.8	7.91116	Bedrock (Tcag)	400	24	848.08	1445.84	2349	0	2349	2466.84	2466.84
9	16.2383	42684.4	7.91116	Bedrock (Tcag)	400	24	916.737	1562.89	2611.9	0	2611.9	2739.29	2739.29
10	16.2383	47077	7.91116	Bedrock (Tcag)	400	24	985.395	1679.94	2874.8	0	2874.8	3011.73	3011.73
11	16.2383	51468.4	7.91116	Bedrock (Tcag)	400	24	1054.03	1796.96	3137.63	0	3137.63	3284.1	3284.1
12	16.1959	55386	7.92	Bedrock (Tcag)	400	24	1117.44	1905.05	3380.4	0	3380.4	3535.85	3535.85
13	16.1959	59181.6	7.92	Bedrock (Tcag)	400	24	1176.91	2006.45	3608.14	0	3608.14	3771.87	3771.87
14	16.1959	62977.2	7.92	Bedrock (Tcag)	400	24	1236.39	2107.84	3835.88	0	3835.88	4007.88	4007.88
15	16.1959	66772.8	7.92	Bedrock (Tcag)	400	24	1295.86	2209.24	4063.62	0	4063.62	4243.9	4243.9
16	16.1959	70568.4	7.92	Bedrock (Tcag)	400	24	1355.34	2310.64	4291.36	0	4291.36	4479.91	4479.91
17	16.1959	76613.2	7.92	Bedrock (Tcag)	400	24	1450.06	2472.12	4654.06	0	4654.06	4855.79	4855.79
18	15.0849	76223.5	7.93043	Bedrock (Tcag)	400	24	1531.75	2611.39	4966.87	0	4966.87	5180.24	5180.24
19	15.0849	79542.5	7.93043	Bedrock (Tcag)	400	24	1587.58	2706.57	5180.65	0	5180.65	5401.81	5401.81
20	15.0849	82861.5	7.93043	Bedrock (Tcag)	400	24	1643.42	2801.76	5394.44	0	5394.44	5623.37	5623.37
21	15.0849	86211.3	7.93043	Bedrock (Tcag)	400	24	1699.76	2897.82	5610.2	0	5610.2	5846.98	5846.98
22	15.0849	89764.5	7.93043	Bedrock (Tcag)	400	24	1759.53	2999.72	5839.08	0	5839.08	6084.19	6084.19
23	15.0849	93355	7.93043	Bedrock (Tcag)	400	24	1819.93	3102.69	6070.35	0	6070.35	6323.87	6323.87
24	15.0849	96945.5	7.93043	Bedrock (Tcag)	400	24	1880.33	3205.66	6301.62	0	6301.62	6563.56	6563.56
25	15.0849	100546	7.93043	Bedrock (Tcag)	400	24	1940.89	3308.91	6533.51	0	6533.51	6803.88	6803.88
26	15.0849	104239	7.93043	Bedrock (Tcag)	400	24	2003.02	3414.83	6771.38	0	6771.38	7050.41	7050.41
27	15.0849	107956	7.93043	Bedrock (Tcag)	400	24	2065.55	3521.43	7010.83	0	7010.83	7298.57	7298.57
28	15.0849	111683	7.93043	Bedrock (Tcag)	400	24	2128.24	3628.31	7250.88	0	7250.88	7547.35	7547.35
29	15.0849	115417	7.93043	Bedrock (Tcag)	400	24	2191.04	3735.38	7491.38	0	7491.38	7796.6	7796.6
30	16.4212	129880	7.94611	Bedrock (Tcag)	400	24	2256.17	3846.41	7740.78	0	7740.78	8055.7	8055.7
31	16.4212	134302	7.94611	Bedrock (Tcag)	400	24	2324.49	3962.89	8002.35	0	8002.35	8326.81	8326.81
32	16.4212	138741	7.94611	Bedrock (Tcag)	400	24	2393.08	4079.81	8265.01	0	8265.01	8599.04	8599.04
33	16.4212	143181	7.94611	Bedrock (Tcag)	400	24	2461.67	4196.75	8527.67	0	8527.67	8871.27	8871.27
34	16.4212	147626	7.94611	Bedrock (Tcag)	400	24	2530.35	4313.84	8790.63	0	8790.63	9143.82	9143.82
35	16.4212	152094	7.94611	Bedrock (Tcag)	400	24	2599.38	4431.53	9054.98	0	9054.98	9417.81	9417.81
36	16.4212	156564	7.94611	Bedrock (Tcag)	400	24	2668.44	4549.27	9319.39	0	9319.39	9691.85	9691.85
37	16.4212	161038	7.94611	Bedrock (Tcag)	400	24	2737.56	4667.11	9584.1	0	9584.1	9966.21	9966.21

38	16.4212	165615	7.94611	Bedrock (Tcag)	400	24	2808.29	4787.68	9854.9	0	9854.9	10246.9	10246.9
39	16.4212	170344	7.94611	Bedrock (Tcag)	400	24	2881.34	4912.22	10134.6	0	10134.6	10536.8	10536.8
40	16.4212	175076	7.94611	Bedrock (Tcag)	400	24	2954.46	5036.88	10414.6	0	10414.6	10827	10827
41	18.0501	187199	32.8778	Bedrock (Tcag)	300	38	3502.72	5971.57	7259.3	0	7259.3	9523.38	9523.38
42	18.0501	171491	32.8778	Bedrock (Tcag)	300	38	3222.25	5493.42	6647.27	0	6647.27	8730.07	8730.07
43	18.0501	155784	32.8778	Bedrock (Tcag)	300	38	2941.8	5015.29	6035.3	0	6035.3	7936.81	7936.81
44	18.0501	140085	32.8778	Bedrock (Tcag)	300	38	2661.49	4537.41	5423.64	0	5423.64	7143.97	7143.97
45	17.8413	122566	32.8778	Bedrock (QTp)	700	34	2313.96	3944.93	4810.82	0	4810.82	6306.52	6306.52
46	17.8413	106302	32.8778	Bedrock (QTp)	700	34	2057.11	3507.04	4161.61	0	4161.61	5491.28	5491.28
47	17.8413	90039.3	32.8778	Bedrock (QTp)	700	34	1800.28	3069.19	3512.46	0	3512.46	4676.13	4676.13
48	17.8413	73850.5	32.8778	Bedrock (QTp)	700	34	1544.61	2633.32	2866.27	0	2866.27	3864.68	3864.68
49	16.8937	49620.5	43.1979	Bedrock (QTp)	700	34	1062.76	1811.83	1648.35	0	1648.35	2646.27	2646.27
50	16.8937	21313.3	43.1979	Bedrock (QTp)	700	34	661.031	1126.95	632.981	0	632.981	1253.69	1253.69

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.70484

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	473.682	1040.28	0	0	0
2	488.346	1041.79	3552.12	1353.56	20.8597
3	503.011	1043.3	8502.62	3239.98	20.8597
4	517.676	1044.81	14851.5	5659.26	20.8597
5	532.341	1046.32	22598.7	8611.41	20.8597
6	548.579	1048.58	28930.7	11024.2	20.8596
7	564.817	1050.83	35760	13626.6	20.8597
8	581.056	1053.09	43077.7	16415.1	20.8597
9	597.294	1055.34	47712.2	18181	20.8596
10	613.532	1057.6	52428.4	19978.2	20.8597
11	629.771	1059.86	57226.5	21806.6	20.8597
12	646.009	1062.11	62106.4	23666.1	20.8597
13	662.205	1064.37	67039.6	25545.9	20.8597
14	678.401	1066.62	72042.9	27452.4	20.8597
15	694.597	1068.87	77116.2	29385.7	20.8597
16	710.793	1071.13	82259.6	31345.6	20.8597
17	726.988	1073.38	87473.1	33332.2	20.8597
18	743.184	1075.63	92798.1	35361.3	20.8597
19	758.269	1077.73	97832.6	37279.8	20.8597
20	773.354	1079.84	102928	39221.3	20.8596
21	788.439	1081.94	108083	41185.9	20.8597
22	803.524	1084.04	113300	43173.9	20.8598
23	818.609	1086.14	118582	45186.6	20.8597
24	833.694	1088.24	123930	47224.2	20.8596
25	848.779	1090.34	129343	49286.9	20.8596
26	863.864	1092.44	134821	51374.6	20.8597
27	878.949	1094.55	140368	53488	20.8596
28	894.033	1096.65	145982	55627.3	20.8596
29	909.118	1098.75	151664	57792.5	20.8596
30	924.203	1100.85	157414	59983.7	20.8597
31	940.624	1103.14	163713	62383.9	20.8597
32	957.046	1105.43	170091	64814.4	20.8597
33	973.467	1107.73	176549	67275.3	20.8597
34	989.888	1110.02	183087	69766.6	20.8597
35	1006.31	1112.31	189705	72288.3	20.8597
36	1022.73	1114.6	196403	74840.6	20.8597
37	1039.15	1116.89	203181	77423.6	20.8597
38	1055.57	1119.19	210040	80037.1	20.8597
39	1071.99	1121.48	216981	82682.1	20.8597
40	1088.42	1123.77	224007	85359.4	20.8597
41	1104.84	1126.06	231118	88069.1	20.8597
42	1122.89	1137.73	190893	72741.2	20.8597
43	1140.94	1149.4	154320	58804.8	20.8597
44	1158.99	1161.06	121398	46259.7	20.8598
45	1177.04	1172.73	92125.9	35105.2	20.8597
46	1194.88	1184.26	65652	25017.1	20.8597
47	1212.72	1195.8	43711.1	16656.4	20.8597
48	1230.56	1207.33	26302.9	10022.9	20.8597
49	1248.4	1218.86	13406.6	5108.69	20.8597
50	1265.3	1234.72	241.033	91.8474	20.8597
51	1282.19	1250.59	0	0	0

Entity Information

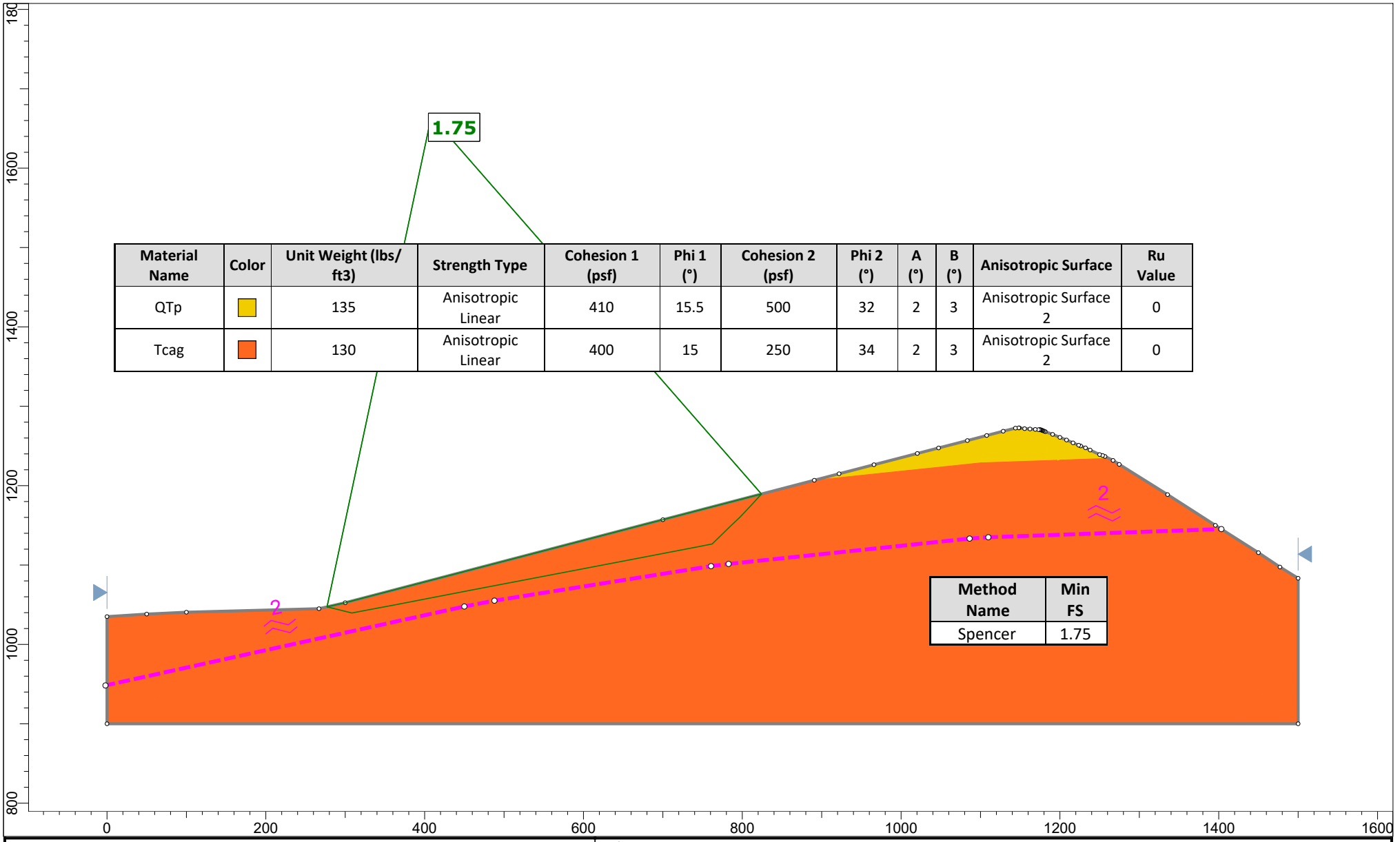
Non-Circular Search (Cuckoo)

Shared Entities

Type	Coordinates (x,y)

External Boundary	0, 1025 0, 992.582 0, 800 1500, 800 1500, 1164.41 1486.06, 1170.01 1479.39, 1172.89 1465.52, 1178.76 1464.48, 1179.21 1457.77, 1181.62 1451.03, 1184.59 1443.63, 1187.57 1436.26, 1190.69 1429.49, 1192.85 1422.68, 1195.83 1415.35, 1198.82 1408.05, 1202.13 1401.2, 1204.84 1394.32, 1208.21 1387.06, 1211.62 1379.84, 1214.27 1372.92, 1216.11 1365.96, 1219.74 1358.78, 1223.1 1351.63, 1225.8 1344.63, 1227.79 1337.61, 1230.97 1330.49, 1233.62 1323.41, 1236.27 1316.35, 1238.48 1309.25, 1240.98 1288.07, 1248.78 1280.89, 1250.99 1273.92, 1253.27 1237.16, 1243.1 1181.38, 1228.16 1058.41, 1195.34 896.258, 1153.07 858.024, 1143.1 796.344, 1127.03 739.544, 1112.74 727.587, 1107.95 644.938, 1087.25 540.586, 1059.38 472.703, 1040 430.345, 1040 330.79, 1036.24 261.029, 1034.39 172.657, 1032.23 162.373, 1031.98 141.16, 1031.47 101.243, 1030.5 58.9525, 1029.47 17.224, 1028.04 0, 1028.04

Material Boundary	0, 992.582 14.4596, 995.971 28.9589, 999.228 43.5373, 1002.22 58.2276, 1004.85 72.94, 1007.4 87.48, 1010.52 101.65, 1014.87 115.41, 1020.52 125.744, 1025
Material Boundary	858.024, 1143.1 892.683, 1148.28 944.428, 1155.26 996.294, 1161.29 1048.27, 1166.16 1100.34, 1169.66 1152.48, 1171.86 1204.64, 1173.71 1256.81, 1175.39 1308.98, 1176.82 1361.15, 1177.91 1413.34, 1178.59 1465.52, 1178.76
Material Boundary	125.744, 1025 162.373, 1031.98



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Ru Value
QTp		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 2	0
Tcag		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 2	0

Method Name	Min FS
Spencer	1.75

SLIDEINTERPRET 9.029

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

Analysis Description	Cross Section 10-10', Static, Non-Circular		
Client	Solstra Communities California, LLC	*Drawn By*	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	*File Name*	SPKS1A.slmd
		Scale	1:2000
Project No.:	23-2195s	*Date:* 10/13/2023	*Run Number* Run No. 24

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 6
Slice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.75357 6
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.75357 7
Entity Information 8
    Non-Circular Search (Cuckoo) - Min FS, no Ru* 8
        Shared Entities 8

Slide2 Analysis Information

SPKS1A

Project Summary

File Name:	SPKS1A.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:06.342s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 10-10', Static, Non-Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Ru Coefficient
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

QTp	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Ru Value	0

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Ru Value	0

Global Minimums

Method: spencer

FS	1.753570
Axis Location:	408.525, 1665.347
Left Slip Surface Endpoint:	277.169, 1047.292
Right Slip Surface Endpoint:	824.156, 1189.429
Resisting Moment:	5.07998e+08 lb-ft
Driving Moment:	2.90549e+08 lb-ft
Resisting Horizontal Force:	790078 lb
Driving Horizontal Force:	451884 lb
Total Slice Area:	15803.6 ft2
Surface Horizontal Width:	546.987 ft
Surface Average Height:	28.8922 ft

Global Minimum Coordinates

Method: spencer

X	Y
277.169	1047.29
292.79	1043.44
308.411	1039.58
335.233	1044.65
362.056	1049.7
388.878	1054.76
416.392	1060.33
437.606	1064.24
458.761	1068.25
473.198	1071.05
487.688	1073.86
514.122	1079.01
534.38	1082.87
554.638	1086.72
574.896	1090.59
595.154	1094.45
615.412	1098.32
635.67	1102.18
656.11	1106.08
676.55	1109.98
698.004	1114.07
719.457	1118.17
740.824	1122.34
762.081	1126.48
773.38	1137.48
785.204	1149
797.029	1160.09
810.592	1174.58
824.156	1189.43

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	21926
Number of Invalid Surfaces:	3133

Error Codes

Error Code -106 reported for 6 surfaces
Error Code -108 reported for 78 surfaces
Error Code -111 reported for 286 surfaces
Error Code -112 reported for 290 surfaces
Error Code -121 reported for 558 surfaces
Error Code -1000 reported for 1915 surfaces

Error Code Descriptions

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-111 = Safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-121 = Concave failure surface, only convex surfaces have been defined as being allowed.

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.75357

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	15.6207	7502.62	-13.865	Tcag	250	34	410.629	720.067	696.903	0	696.903	595.548	595.548
2	15.6207	22669.9	-13.865	Tcag	250	34	889.3	1559.45	1941.33	0	1941.33	1721.83	1721.83
3	8.94086	17897.2	10.7126	Tcag	400	15	523.636	918.233	1934.07	0	1934.07	2033.13	2033.13
4	8.94086	18648.3	10.7126	Tcag	400	15	536.023	939.954	2015.13	0	2015.13	2116.54	2116.54
5	8.94086	19399.3	10.7126	Tcag	400	15	548.41	961.676	2096.2	0	2096.2	2199.95	2199.95
6	13.4113	30518.1	10.661	Tcag	400	15	564.153	989.281	2199.23	0	2199.23	2305.43	2305.43
7	13.4113	32229.8	10.661	Tcag	400	15	582.979	1022.29	2322.44	0	2322.44	2432.18	2432.18
8	13.4113	33939.6	10.6697	Tcag	400	15	601.76	1055.23	2445.34	0	2445.34	2558.72	2558.72
9	13.4113	35647.6	10.6697	Tcag	400	15	620.544	1088.17	2568.28	0	2568.28	2685.19	2685.19
10	9.17116	25284.2	11.4409	Tcag	400	15	632.73	1109.54	2648.03	0	2648.03	2776.08	2776.08
11	9.17116	25930.1	11.4409	Tcag	400	15	643.069	1127.67	2715.69	0	2715.69	2845.83	2845.83
12	9.17116	26576	11.4409	Tcag	400	15	653.408	1145.8	2783.36	0	2783.36	2915.59	2915.59
13	10.6069	31672.6	10.4555	Tcag	400	15	669.637	1174.26	2889.56	0	2889.56	3013.14	3013.14
14	10.6069	32797.6	10.4555	Tcag	400	15	685.302	1201.72	2992.08	0	2992.08	3118.54	3118.54
15	10.5776	33792.4	10.7207	Tcag	400	15	699.524	1226.66	3085.16	0	3085.16	3217.6	3217.6
16	10.5776	34841.5	10.7207	Tcag	400	15	714.149	1252.31	3180.86	0	3180.86	3316.07	3316.07
17	14.4371	49183.3	10.9818	Tcag	400	15	729.819	1279.79	3283.41	0	3283.41	3425.04	3425.04
18	14.49	51197.9	10.99	Tcag	400	15	748.424	1312.41	3405.17	0	3405.17	3550.52	3550.52
19	8.81138	32027.6	11.026	Tcag	400	15	763.223	1338.37	3502.02	0	3502.02	3650.74	3650.74
20	8.81138	32699.9	11.026	Tcag	400	15	774.451	1358.05	3575.51	0	3575.51	3726.41	3726.41
21	8.81138	33372.1	11.026	Tcag	400	15	785.679	1377.74	3648.99	0	3648.99	3802.08	3802.08
22	10.129	39223.5	10.7713	Tcag	400	15	799.244	1401.53	3737.77	0	3737.77	3889.81	3889.81
23	10.129	40173.3	10.7713	Tcag	400	15	813.067	1425.77	3828.23	0	3828.23	3982.9	3982.9
24	10.129	41123.1	10.7713	Tcag	400	15	826.89	1450.01	3918.69	0	3918.69	4075.99	4075.99
25	10.129	42072.8	10.7713	Tcag	400	15	840.714	1474.25	4009.14	0	4009.14	4169.07	4169.07
26	10.129	43018.1	10.8088	Tcag	400	15	854.297	1498.07	4098.07	0	4098.07	4261.17	4261.17
27	10.129	43958.8	10.8088	Tcag	400	15	867.984	1522.07	4187.64	0	4187.64	4353.36	4353.36
28	10.129	44899.5	10.8088	Tcag	400	15	881.676	1546.08	4277.21	0	4277.21	4445.54	4445.54
29	10.129	45840.2	10.8088	Tcag	400	15	895.362	1570.08	4366.78	0	4366.78	4537.73	4537.73
30	10.129	46783.2	10.7901	Tcag	400	15	909.168	1594.29	4457.16	0	4457.16	4630.43	4630.43
31	10.129	47728.4	10.7901	Tcag	400	15	922.923	1618.41	4547.18	0	4547.18	4723.07	4723.07
32	10.129	48673.6	10.7901	Tcag	400	15	936.678	1642.53	4637.2	0	4637.2	4815.71	4815.71
33	10.129	49618.9	10.7901	Tcag	400	15	950.433	1666.65	4727.21	0	4727.21	4908.34	4908.34
34	10.2201	51021.6	10.8034	Tcag	400	15	964.159	1690.72	4817.03	0	4817.03	5001.01	5001.01
35	10.2201	51980.6	10.8034	Tcag	400	15	977.988	1714.97	4907.53	0	4907.53	5094.15	5094.15
36	10.2201	52939.7	10.8034	Tcag	400	15	991.817	1739.22	4998.04	0	4998.04	5187.3	5187.3
37	10.2201	53898.7	10.8034	Tcag	400	15	1005.65	1763.47	5088.55	0	5088.55	5280.45	5280.45
38	10.7267	57601	10.8119	Tcag	400	15	1019.76	1788.22	5180.9	0	5180.9	5375.65	5375.65
39	10.7267	58655.2	10.8119	Tcag	400	15	1034.24	1813.61	5275.68	0	5275.68	5473.2	5473.2
40	10.7267	59706.6	10.8119	Tcag	400	15	1048.69	1838.95	5370.22	0	5370.22	5570.49	5570.49
41	10.7267	60752.7	10.8119	Tcag	400	15	1063.06	1864.15	5464.27	0	5464.27	5667.29	5667.29
42	10.6835	61517.9	11.0343	Tcag	400	15	1075.69	1886.29	5546.92	0	5546.92	5756.68	5756.68
43	10.6835	62495.7	11.0343	Tcag	400	15	1089.16	1909.91	5635.07	0	5635.07	5847.46	5847.46
44	10.6287	63146.4	11.0254	Tcag	400	15	1102.66	1933.59	5723.44	0	5723.44	5938.29	5938.29
45	10.6287	64116.5	11.0254	Tcag	400	15	1116.09	1957.15	5811.36	0	5811.36	6028.82	6028.82
46	11.2987	62756.5	44.2453	Tcag	250	34	1544.97	2709.21	3645.93	0	3645.93	5150.72	5150.72
47	11.8242	53007.5	44.2293	Tcag	250	34	1269.2	2225.63	2928.99	0	2928.99	4164.5	4164.5
48	11.8243	40372.7	43.1879	Tcag	250	34	1006.85	1765.59	2246.96	0	2246.96	3192.06	3192.06
49	13.5638	29592.3	46.8883	Tcag	250	34	653.797	1146.48	1329.08	0	1329.08	2027.46	2027.46
50	13.5637	9969.21	47.5849	Tcag	250	34	294.076	515.683	393.892	0	393.892	715.776	715.776

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.75357

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	277.169	1047.29	0	0	0
2	292.79	1043.44	9123.18	1824.64	11.31
3	308.411	1039.58	30547	6109.41	11.31
4	317.352	1041.27	31973.5	6394.69	11.3099
5	326.292	1042.96	33373.9	6674.77	11.3099
6	335.233	1044.65	34748.3	6949.66	11.3099
7	348.645	1047.18	36787.9	7357.58	11.3099
8	362.056	1049.7	38769.8	7753.96	11.3099
9	375.467	1052.23	40689	8137.8	11.3099
10	388.878	1054.76	42550.3	8510.06	11.3099
11	398.05	1056.61	43458.1	8691.63	11.3099
12	407.221	1058.47	44335.5	8867.11	11.3099
13	416.392	1060.33	45182.5	9036.5	11.3099
14	426.999	1062.28	46653.6	9330.73	11.3099
15	437.606	1064.24	48090.8	9618.16	11.3099
16	448.183	1066.24	49337	9867.4	11.3099
17	458.761	1068.25	50546.7	10109.3	11.3099
18	473.198	1071.05	51920.6	10384.1	11.3099
19	487.688	1073.86	53220.3	10644.1	11.31
20	496.5	1075.58	53955.7	10791.1	11.3099
21	505.311	1077.29	54664.1	10932.8	11.3099
22	514.122	1079.01	55345.7	11069.1	11.3099
23	524.251	1080.94	56266.4	11253.3	11.31
24	534.38	1082.87	57153.3	11430.7	11.31
25	544.509	1084.79	58006.3	11601.3	11.31
26	554.638	1086.72	58825.6	11765.1	11.3099
27	564.767	1088.65	59583.3	11916.7	11.31
28	574.896	1090.59	60307	12061.4	11.3099
29	585.025	1092.52	60996.6	12199.3	11.3099
30	595.154	1094.45	61652	12330.4	11.3099
31	605.283	1096.39	62288.4	12457.7	11.31
32	615.412	1098.32	62890.7	12578.1	11.3099
33	625.541	1100.25	63459.2	12691.8	11.3099
34	635.67	1102.18	63993.6	12798.7	11.3099
35	645.89	1104.13	64486.8	12897.4	11.31
36	656.11	1106.08	64945.3	12989.1	11.31
37	666.33	1108.03	65369.2	13073.8	11.3099
38	676.55	1109.98	65758.3	13151.7	11.31
39	687.277	1112.03	66121	13224.2	11.3099
40	698.004	1114.07	66445.5	13289.1	11.3099
41	708.73	1116.12	66731.8	13346.4	11.31
42	719.457	1118.17	66980.1	13396	11.3099
43	730.141	1120.25	66955.5	13391.1	11.3099
44	740.824	1122.34	66891.7	13378.3	11.3099
45	751.453	1124.41	66798.9	13359.8	11.3099
46	762.081	1126.48	66667.3	13333.5	11.31
47	773.38	1137.48	44059.9	8811.99	11.3099
48	785.204	1149	25404.7	5080.94	11.3099
49	797.029	1160.09	12411.6	2482.32	11.3099
50	810.592	1174.58	2053.23	410.645	11.3099
51	824.156	1189.43	0	0	0

Entity Information

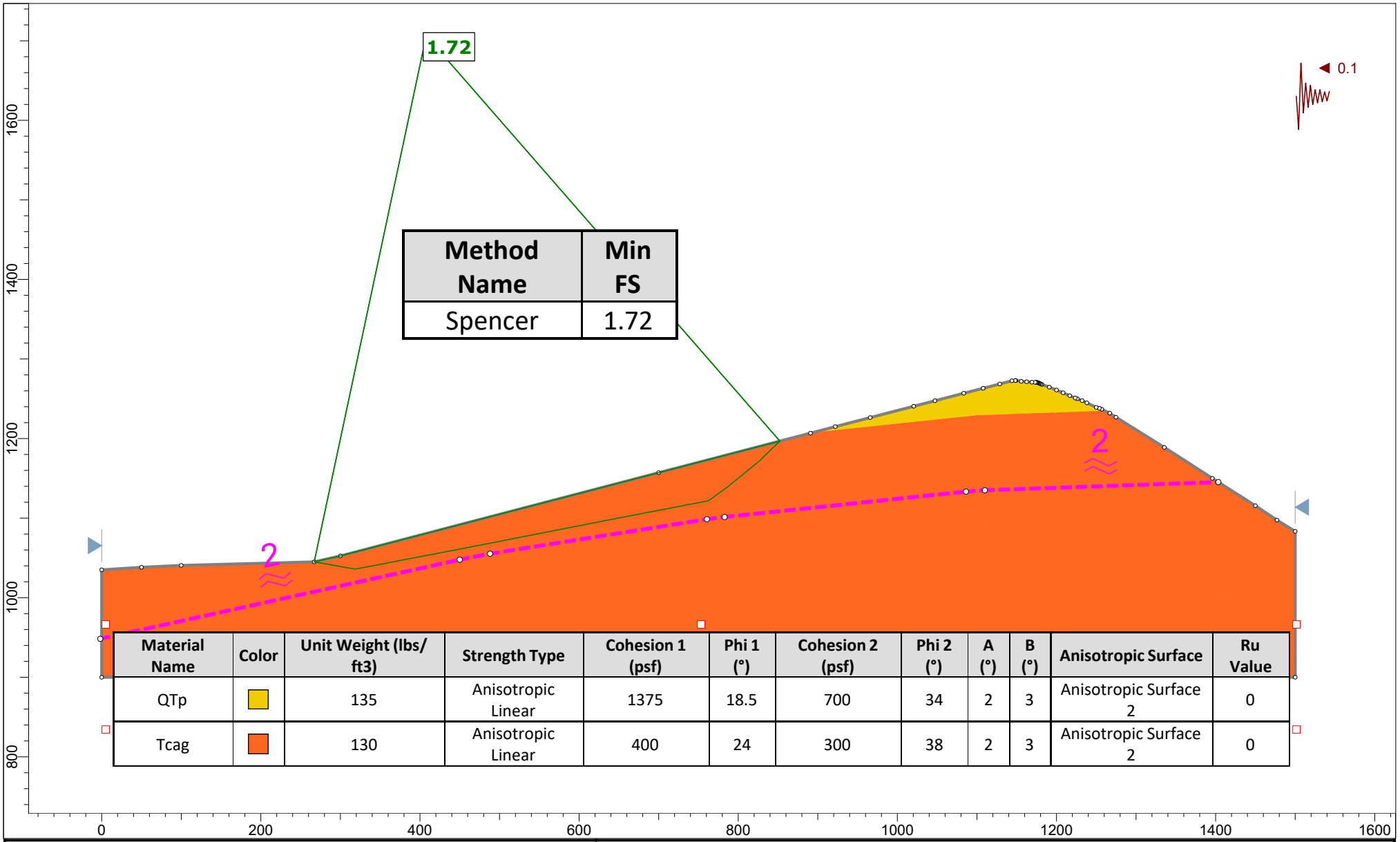
Non-Circular Search (Cuckoo) - Min FS, no Ru*

Shared Entities

Type	Coordinates (x,y)

External Boundary	3.4106e-12, 900 1500, 900 1500, 1083.31 1477.04, 1097.46 1450, 1115.47 1395.9, 1150 1335.53, 1188.78 1274.68, 1226.8 1266.93, 1231.84 1256.83, 1236.75 1253.76, 1237.98 1250, 1239.14 1238.14, 1244.81 1232.2, 1247.6 1226.08, 1250 1223.62, 1250.93 1216.57, 1253.82 1208.31, 1257.4 1200, 1260.85 1190.86, 1264.49 1181.68, 1268 1180.19, 1268.58 1178.67, 1269.22 1178.11, 1269.47 1177.16, 1269.89 1176.49, 1270.16 1175.71, 1270.38 1175, 1270.5 1174.29, 1270.56 1172.96, 1270.59 1169.06, 1270.8 1162.42, 1271.3 1155.57, 1271.83 1148.77, 1272.8 1148.28, 1272.79 1144, 1272.52 1128.66, 1268.55 1107.87, 1263.15 1083.47, 1256.83 1047.21, 1247.42 1020.46, 1240.49 965.843, 1226.33 921.956, 1214.94 890.716, 1206.79 700, 1157.04 300, 1052.46 267.019, 1045 100, 1040.52 50, 1038.1 4.27229e-05, 1034.97
Material Boundary	890.716, 1206.79 984.343, 1216.61 1054.09, 1223.92 1100, 1228.73 1196.79, 1232.12 1261.65, 1234.39
Material Boundary	1256.83, 1236.75 1261.65, 1234.39

Material Boundary	1226.08, 1250 1238.14, 1244.81
Material Boundary	1174.29, 1270.56 1176.49, 1270.16 1178.11, 1269.47
Material Boundary	1144, 1272.52 1148.77, 1272.8



Method Name	Min FS
Spencer	1.72

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Ru Value
QTp		135	Anisotropic Linear	1375	18.5	700	34	2	3	Anisotropic Surface 2	0
Tcag		130	Anisotropic Linear	400	24	300	38	2	3	Anisotropic Surface 2	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 10-10', Pseudo-Static, Non-Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPKS1A_s.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 25

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 6
Slice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.72454 6
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.72454 7
Entity Information 8
    Non-Circular Search (Cuckoo) - Min FS, no Ru* 8
        Shared Entities 8

Slide2 Analysis Information

SPKS1A_s

Project Summary

File Name:	SPKS1A_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:06.761s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 10-10', Pseudo-Static, Non-Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Ru Coefficient
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

QTp	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	1375 psf
Phi 1	18.5 °
A	2 °
Cohesion 2	700 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Ru Value	0

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	300 psf
Phi 2	38 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Ru Value	0

Global Minimums

Method: spencer

FS	1.724540
Axis Location:	407.890, 1706.196
Left Slip Surface Endpoint:	267.019, 1044.996
Right Slip Surface Endpoint:	852.328, 1196.779
Resisting Moment:	9.28463e+08 lb-ft
Driving Moment:	5.38383e+08 lb-ft
Resisting Horizontal Force:	1.35396e+06 lb
Driving Horizontal Force:	785116 lb
Total Slice Area:	19303.5 ft2
Surface Horizontal Width:	585.308 ft
Surface Average Height:	32.9801 ft

Global Minimum Coordinates

Method: spencer

X	Y
267.019	1045
291.692	1040.57
318.412	1035.97
344.854	1040.84
360.82	1044.01
376.786	1046.99
401.775	1051.67
419.811	1055.21
438.321	1058.61
459.085	1062.74
485.459	1068.14
511.834	1073.25
540.37	1078.77
568.906	1084.29
595.655	1089.47
622.405	1094.66
649.154	1099.85
675.904	1105.04
700.118	1109.75
721.137	1113.81
742.156	1117.88
762.527	1121.8
785.178	1138.11
798.958	1149.31
812.739	1160.51
826.52	1171.71
839.424	1184.24
852.328	1196.78

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	22327
Number of Invalid Surfaces:	2733

Error Codes

Error Code -106 reported for 3 surfaces
Error Code -108 reported for 86 surfaces
Error Code -111 reported for 294 surfaces
Error Code -112 reported for 288 surfaces
Error Code -121 reported for 593 surfaces
Error Code -124 reported for 1 surface
Error Code -1000 reported for 1468 surfaces

Error Code Descriptions

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-111 = Safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-121 = Concave failure surface, only convex surfaces have been defined as being allowed.

-124 = A slice has a width less than the minimum acceptable value.

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.72454

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	12.3364	4012.3	-10.1699	Tcag	300	38	433.178	747.032	572.175	0	572.175	494.469	494.469
2	12.3364	12036.9	-10.1699	Tcag	300	38	836.507	1442.59	1462.45	0	1462.45	1312.39	1312.39
3	13.3596	22059	-9.76212	Tcag	300	38	1245.72	2148.29	2365.7	0	2365.7	2151.38	2151.38
4	13.3596	31959.1	-9.76212	Tcag	300	38	1701.47	2934.25	3371.69	0	3371.69	3078.95	3078.95
5	13.2215	37486.7	10.4218	Tcag	400	24	932.666	1608.42	2714.16	0	2714.16	2885.7	2885.7
6	13.2215	39248.4	10.4218	Tcag	400	24	965.179	1664.49	2840.09	0	2840.09	3017.61	3017.61
7	15.9655	49497.1	11.2395	Tcag	400	24	989.934	1707.18	2935.97	0	2935.97	3132.69	3132.69
8	15.9655	51778.2	10.5649	Tcag	400	24	1030.83	1777.7	3094.37	0	3094.37	3286.63	3286.63
9	12.4946	42245.1	10.6113	Tcag	400	24	1063.98	1834.88	3222.79	0	3222.79	3422.13	3422.13
10	12.4946	43749	10.6113	Tcag	400	24	1093.29	1885.43	3336.32	0	3336.32	3541.15	3541.15
11	9.01842	32465.1	11.1013	Tcag	400	24	1112.22	1918.06	3409.61	0	3409.61	3627.84	3627.84
12	9.01842	33154.8	11.1013	Tcag	400	24	1130.74	1950.01	3481.38	0	3481.38	3703.25	3703.25
13	9.25489	34809.2	10.4268	Tcag	400	24	1158.52	1997.92	3588.99	0	3588.99	3802.18	3802.18
14	9.25489	35671.4	10.4268	Tcag	400	24	1181.25	2037.12	3677.04	0	3677.04	3894.41	3894.41
15	10.3817	40937.8	11.2374	Tcag	400	24	1193.9	2058.92	3725.99	0	3725.99	3963.2	3963.2
16	10.3817	41817.3	11.2374	Tcag	400	24	1214.39	2094.26	3805.37	0	3805.37	4046.65	4046.65
17	13.1874	54319.5	11.565	Tcag	400	24	1232.64	2125.74	3876.07	0	3876.07	4128.31	4128.31
18	13.1874	55604.1	11.565	Tcag	400	24	1256.13	2166.24	3967.03	0	3967.03	4224.07	4224.07
19	13.1874	57012.1	10.9626	Tcag	400	24	1289.14	2223.17	4094.91	0	4094.91	4344.62	4344.62
20	13.1874	58543.8	10.9626	Tcag	400	24	1317.31	2271.76	4204.05	0	4204.05	4459.22	4459.22
21	14.2679	65068.2	10.9519	Tcag	400	24	1346.83	2322.66	4318.37	0	4318.37	4578.99	4578.99
22	14.2679	66866.3	10.9519	Tcag	400	24	1377.41	2375.4	4436.81	0	4436.81	4703.35	4703.35
23	9.51196	45576.5	10.9519	Tcag	400	24	1402.89	2419.34	4535.51	0	4535.51	4806.98	4806.98
24	9.51196	46375.6	10.9519	Tcag	400	24	1423.28	2454.5	4614.47	0	4614.47	4889.89	4889.89
25	9.51196	47174.7	10.9519	Tcag	400	24	1443.66	2489.65	4693.44	0	4693.44	4972.8	4972.8
26	13.3747	67683.7	10.9525	Tcag	400	24	1468.18	2531.93	4788.39	0	4788.39	5072.51	5072.51
27	13.3747	69263.5	10.9525	Tcag	400	24	1496.83	2581.35	4899.4	0	4899.4	5189.07	5189.07
28	13.3747	70836.7	10.9842	Tcag	400	24	1524.91	2629.77	5008.15	0	5008.15	5304.13	5304.13
29	13.3747	72403.1	10.9842	Tcag	400	24	1553.32	2678.76	5118.18	0	5118.18	5419.67	5419.67
30	8.91648	49139	10.9842	Tcag	400	24	1576.99	2719.59	5209.88	0	5209.88	5515.96	5515.96
31	8.91648	49835.1	10.9842	Tcag	400	24	1595.93	2752.25	5283.24	0	5283.24	5593	5593
32	8.91648	50531.3	10.9842	Tcag	400	24	1614.87	2784.91	5356.59	0	5356.59	5670.03	5670.03
33	8.91648	51227.5	10.9842	Tcag	400	24	1633.81	2817.57	5429.95	0	5429.95	5747.06	5747.06
34	8.91648	51923.7	10.9842	Tcag	400	24	1652.75	2850.23	5503.31	0	5503.31	5824.1	5824.1
35	8.91648	52619.8	10.9842	Tcag	400	24	1671.69	2882.89	5576.67	0	5576.67	5901.13	5901.13
36	12.1072	72562.2	10.9942	Tcag	400	24	1693.81	2921.05	5662.37	0	5662.37	5991.44	5991.44
37	12.1072	73842.2	10.9942	Tcag	400	24	1719.46	2965.27	5761.7	0	5761.7	6095.75	6095.75
38	10.5095	65137.3	10.9536	Tcag	400	24	1744.12	3007.81	5857.24	0	5857.24	6194.8	6194.8
39	10.5095	66104.4	10.9536	Tcag	400	24	1766.45	3046.32	5943.74	0	5943.74	6285.61	6285.61
40	10.5095	67071.6	10.9536	Tcag	400	24	1788.78	3084.83	6030.22	0	6030.22	6376.42	6376.42
41	10.5095	68038.8	10.9536	Tcag	400	24	1811.11	3123.34	6116.72	0	6116.72	6467.24	6467.24
42	10.1852	66869.8	10.8896	Tcag	400	24	1834.43	3163.54	6207.01	0	6207.01	6559.91	6559.91
43	10.1852	67793.8	10.8896	Tcag	400	24	1856.45	3201.53	6292.33	0	6292.33	6649.48	6649.48
44	11.3256	72070.8	35.7522	Tcag	300	38	2120.22	3656.4	4296.01	0	4296.01	5822.47	5822.47
45	11.3256	64416	35.7522	Tcag	300	38	1911.23	3296	3834.7	0	3834.7	5210.71	5210.71
46	13.7805	66909.6	39.1025	Tcag	300	38	1576.2	2718.22	3095.18	0	3095.18	4376.24	4376.24
47	13.7805	53285.8	39.1025	Tcag	300	38	1285.55	2216.98	2453.62	0	2453.62	3498.45	3498.45
48	13.7805	39662.1	39.1025	Tcag	300	38	994.897	1715.74	1812.07	0	1812.07	2620.67	2620.67
49	12.9041	23070.7	44.1691	Tcag	300	38	627.803	1082.67	1001.77	0	1001.77	1611.63	1611.63
50	12.9041	7690.25	44.1691	Tcag	300	38	304.57	525.243	288.298	0	288.298	584.16	584.16

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.72454

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	267.019	1045	0	0	0
2	279.356	1042.78	6208.87	2087.73	18.5852
3	291.692	1040.57	18561.1	6241.16	18.5852
4	305.052	1038.27	38435.1	12923.8	18.5852
5	318.412	1035.97	65720	22098.3	18.5852
6	331.633	1038.4	67702.3	22764.8	18.5851
7	344.854	1040.84	69632.1	23413.7	18.5851
8	360.82	1044.01	71172.2	23931.6	18.5852
9	376.786	1046.99	73237.9	24626.2	18.5852
10	389.28	1049.33	74763.3	25139.1	18.5852
11	401.775	1051.67	76238.8	25635.2	18.5852
12	410.793	1053.44	76989.2	25887.6	18.5852
13	419.811	1055.21	77710.8	26130.2	18.5852
14	429.066	1056.91	78839.7	26509.8	18.5852
15	438.321	1058.61	79942.7	26880.7	18.5852
16	448.703	1060.68	80558.1	27087.6	18.5852
17	459.085	1062.74	81134.5	27281.4	18.5852
18	472.272	1065.44	81498	27403.6	18.5852
19	485.459	1068.14	81797.3	27504.3	18.5852
20	498.647	1070.69	82636.3	27786.4	18.5852
21	511.834	1073.25	83414.9	28048.2	18.5852
22	526.102	1076.01	84201.7	28312.7	18.5851
23	540.37	1078.77	84918	28553.6	18.5852
24	549.882	1080.61	85356.3	28701	18.5852
25	559.394	1082.45	85763.3	28837.8	18.5852
26	568.906	1084.29	86138.9	28964.1	18.5852
27	582.281	1086.88	86613.3	29123.7	18.5852
28	595.655	1089.47	87025.8	29262.4	18.5852
29	609.03	1092.06	87336.5	29366.8	18.5852
30	622.405	1094.66	87584.9	29450.4	18.5852
31	631.321	1096.39	87715.9	29494.4	18.5852
32	640.238	1098.12	87819.2	29529.1	18.5852
33	649.154	1099.85	87894.7	29554.5	18.5852
34	658.071	1101.58	87942.6	29570.6	18.5852
35	666.987	1103.31	87962.8	29577.4	18.5852
36	675.904	1105.04	87955.2	29574.9	18.5852
37	688.011	1107.39	87887.7	29552.2	18.5852
38	700.118	1109.75	87769	29512.3	18.5852
39	710.628	1111.78	87671.6	29479.5	18.5852
40	721.137	1113.81	87536.2	29434	18.5852
41	731.647	1115.85	87362.8	29375.7	18.5852
42	742.156	1117.88	87151.4	29304.6	18.5852
43	752.342	1119.84	86986.2	29249	18.5852
44	762.527	1121.8	86785.7	29181.6	18.5852
45	773.852	1129.95	68562.2	23054	18.5852
46	785.178	1138.11	52498.6	17652.6	18.5852
47	798.958	1149.31	32862.2	11049.9	18.5852
48	812.739	1160.51	17768.3	5974.57	18.5852
49	826.52	1171.71	7216.99	2426.71	18.5852
50	839.424	1184.24	453.758	152.576	18.5852
51	852.328	1196.78	0	0	0

Entity Information

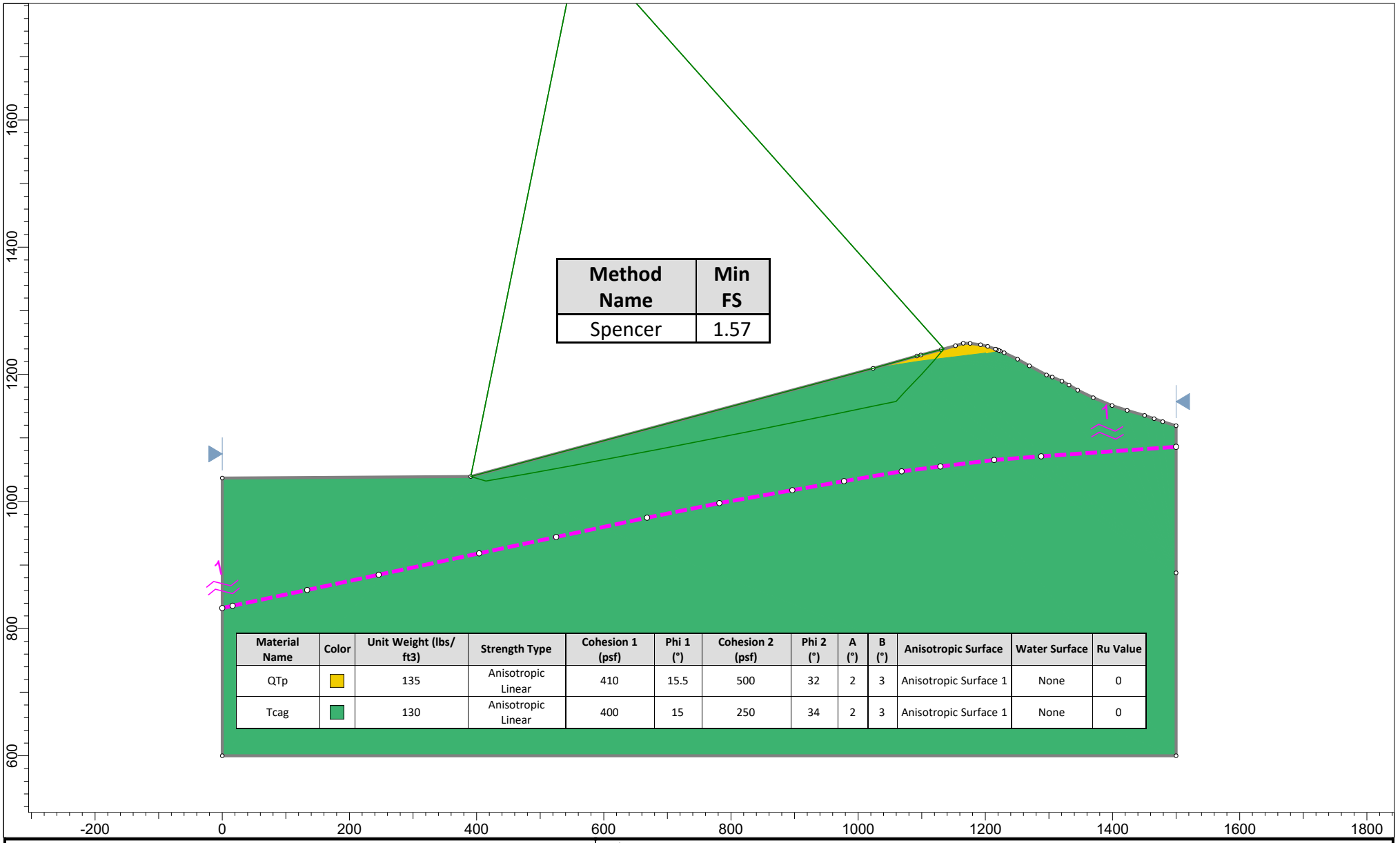
Non-Circular Search (Cuckoo) - Min FS, no Ru*

Shared Entities

Type	Coordinates (x,y)

External Boundary	3.4106e-12, 900 1500, 900 1500, 1083.31 1477.04, 1097.46 1450, 1115.47 1395.9, 1150 1335.53, 1188.78 1274.68, 1226.8 1266.93, 1231.84 1256.83, 1236.75 1253.76, 1237.98 1250, 1239.14 1238.14, 1244.81 1232.2, 1247.6 1226.08, 1250 1223.62, 1250.93 1216.57, 1253.82 1208.31, 1257.4 1200, 1260.85 1190.86, 1264.49 1181.68, 1268 1180.19, 1268.58 1178.67, 1269.22 1178.11, 1269.47 1177.16, 1269.89 1176.49, 1270.16 1175.71, 1270.38 1175, 1270.5 1174.29, 1270.56 1172.96, 1270.59 1169.06, 1270.8 1162.42, 1271.3 1155.57, 1271.83 1148.77, 1272.8 1148.28, 1272.79 1144, 1272.52 1128.66, 1268.55 1107.87, 1263.15 1083.47, 1256.83 1047.21, 1247.42 1020.46, 1240.49 965.843, 1226.33 921.956, 1214.94 890.716, 1206.79 700, 1157.04 300, 1052.46 267.019, 1045 100, 1040.52 50, 1038.1 4.27229e-05, 1034.97
Material Boundary	890.716, 1206.79 984.343, 1216.61 1054.09, 1223.92 1100, 1228.73 1196.79, 1232.12 1261.65, 1234.39
Material Boundary	1256.83, 1236.75 1261.65, 1234.39

Material Boundary	1226.08, 1250 1238.14, 1244.81
Material Boundary	1174.29, 1270.56 1176.49, 1270.16 1178.11, 1269.47
Material Boundary	1144, 1272.52 1148.77, 1272.8



Method Name	Min FS
Spencer	1.57

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
QTp		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 1	None	0
Tcag		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 1	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 11-11', Static, Non-Circular		
Client	Solstra Communities California, LLC		Drawn By: M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California		File Name: SPMS1A.slmd
			Scale: 1:2500
Project No.: 23-2195s-1	Date: 10/13/2023		Run Number: Run No. 26

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 5
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 6
Slice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.56734 6
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.56734 7
Entity Information 8
    Non-Circular Search (Cuckoo), Min FS, no Ru 8
        Shared Entities 8

Slide2 Analysis Information

SPMS1A

Project Summary

File Name:	SPMS1A.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:07.466s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 11-11', Static, Non-Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

QTp	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.567340
Axis Location:	562.110, 1883.926
Left Slip Surface Endpoint:	390.827, 1039.341
Right Slip Surface Endpoint:	1135.009, 1240.149
Resisting Moment:	1.13544e+09 lb-ft
Driving Moment:	7.24474e+08 lb-ft
Resisting Horizontal Force:	1.29136e+06 lb
Driving Horizontal Force:	823964 lb
Total Slice Area:	28073.8 ft2
Surface Horizontal Width:	744.181 ft
Surface Average Height:	37.7244 ft

Global Minimum Coordinates

Method: spencer

X	Y
390.827	1039.34
414.718	1032.1
448.579	1038.08
482.441	1044.05
499.957	1047.19
517.473	1050.32
547.657	1055.91
577.841	1061.5
607.967	1067.18
638.093	1072.86
672.282	1079.41
706.47	1085.96
738.845	1092.37
771.219	1098.79
803.593	1105.23
835.967	1111.58
868.342	1117.9
900.716	1124.55
934.496	1131.58
966.907	1138.27
999.317	1144.94
1030.71	1151.37
1059.64	1157.35
1074.22	1173.27
1086.66	1186.42
1099.8	1199.85
1117.4	1219.42
1135.01	1240.15

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	20503
Number of Invalid Surfaces:	4558

Error Codes

Error Code -106 reported for 4 surfaces
Error Code -108 reported for 144 surfaces
Error Code -111 reported for 601 surfaces
Error Code -112 reported for 527 surfaces
Error Code -121 reported for 444 surfaces
Error Code -1000 reported for 2838 surfaces

Error Code Descriptions

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-111 = Safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-121 = Concave failure surface, only convex surfaces have been defined as being allowed.

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.56734

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	11.9451	5303.03	-16.8569	Tcag	250	34	484.94	760.066	756.204	0	756.204	609.266	609.266
2	11.9451	15909.1	-16.8569	Tcag	250	34	1030.92	1615.8	2024.88	0	2024.88	1712.51	1712.51
3	16.9309	31785.7	10.0087	Tcag	400	15	568.98	891.785	1835.37	0	1835.37	1935.78	1935.78
4	16.9309	35225.3	10.0087	Tcag	400	15	602.649	944.556	2032.31	0	2032.31	2138.67	2138.67
5	11.2872	25394.4	10.0087	Tcag	400	15	630.707	988.532	2196.43	0	2196.43	2307.74	2307.74
6	11.2872	26923.1	10.0087	Tcag	400	15	653.152	1023.71	2327.72	0	2327.72	2442.99	2442.99
7	11.2872	28451.9	10.0087	Tcag	400	15	675.598	1058.89	2459.02	0	2459.02	2578.25	2578.25
8	17.5162	47134.9	10.1346	Tcag	400	15	703.31	1102.33	2621.11	0	2621.11	2746.83	2746.83
9	17.5162	50726	10.1346	Tcag	400	15	737.257	1155.53	2819.68	0	2819.68	2951.47	2951.47
10	15.0918	46489.8	10.4918	Tcag	400	15	766.228	1200.94	2989.15	0	2989.15	3131.04	3131.04
11	15.0918	48964.9	10.4918	Tcag	400	15	793.315	1243.39	3147.59	0	3147.59	3294.51	3294.51
12	15.0918	51440.1	10.4918	Tcag	400	15	820.402	1285.85	3306.03	0	3306.03	3457.96	3457.96
13	15.0918	53915.2	10.4918	Tcag	400	15	847.489	1328.3	3464.48	0	3464.48	3621.42	3621.42
14	15.063	56228.8	10.6848	Tcag	400	15	872.985	1368.26	3613.61	0	3613.61	3778.33	3778.33
15	15.063	58591.7	10.6848	Tcag	400	15	898.854	1408.81	3764.94	0	3764.94	3934.54	3934.54
16	15.063	60954.5	10.6848	Tcag	400	15	924.726	1449.36	3916.28	0	3916.28	4090.75	4090.75
17	15.063	63317.3	10.6848	Tcag	400	15	950.598	1489.91	4067.61	0	4067.61	4246.97	4246.97
18	11.3963	49450.6	10.8413	Tcag	400	15	972.055	1523.54	4193.11	0	4193.11	4379.26	4379.26
19	11.3963	50755.3	10.8413	Tcag	400	15	990.915	1553.1	4303.44	0	4303.44	4493.2	4493.2
20	11.3963	52060.1	10.8413	Tcag	400	15	1009.77	1582.66	4413.77	0	4413.77	4607.15	4607.15
21	17.0945	80536.5	10.8413	Tcag	400	15	1033.36	1619.62	4551.68	0	4551.68	4749.57	4749.57
22	17.0945	83472.2	10.8413	Tcag	400	15	1061.65	1663.96	4717.17	0	4717.17	4920.48	4920.48
23	16.1871	81634.3	11.2088	Tcag	400	15	1085.57	1701.45	4857.09	0	4857.09	5072.21	5072.21
24	16.1871	84039.8	11.2088	Tcag	400	15	1109.98	1739.72	4999.92	0	4999.92	5219.88	5219.88
25	16.1871	86447.6	11.2014	Tcag	400	15	1134.48	1778.11	5143.2	0	5143.2	5367.86	5367.86
26	16.1871	88857.6	11.2014	Tcag	400	15	1158.94	1816.46	5286.3	0	5286.3	5515.81	5515.81
27	16.1871	91249.4	11.261	Tcag	400	15	1182.78	1853.82	5425.74	0	5425.74	5661.25	5661.25
28	16.1871	93622.6	11.261	Tcag	400	15	1206.87	1891.57	5566.6	0	5566.6	5806.9	5806.9
29	16.1871	96049.6	11.087	Tcag	400	15	1232.84	1932.28	5718.54	0	5718.54	5960.13	5960.13
30	16.1871	98530.3	11.087	Tcag	400	15	1258.04	1971.78	5865.97	0	5865.97	6112.49	6112.49
31	16.1871	101020	11.0573	Tcag	400	15	1283.58	2011.81	6015.35	0	6015.35	6266.18	6266.18
32	16.1871	103519	11.0573	Tcag	400	15	1308.98	2051.61	6163.91	0	6163.91	6419.7	6419.7
33	16.1872	105851	11.5985	Tcag	400	15	1328.1	2081.58	6275.74	0	6275.74	6548.32	6548.32
34	16.1872	108016	11.5985	Tcag	400	15	1350.01	2115.92	6403.91	0	6403.91	6680.99	6680.99
35	16.8898	114960	11.7536	Tcag	400	15	1370.53	2148.08	6523.93	0	6523.93	6809.09	6809.09
36	16.8898	117211	11.7536	Tcag	400	15	1392.35	2182.28	6651.57	0	6651.57	6941.27	6941.27
37	16.2055	114606	11.6642	Tcag	400	15	1414.82	2217.5	6782.97	0	6782.97	7075.04	7075.04
38	16.2055	116735	11.6642	Tcag	400	15	1436.33	2251.21	6908.85	0	6908.85	7205.37	7205.37
39	16.2054	118874	11.6279	Tcag	400	15	1458.29	2285.64	7037.3	0	7037.3	7337.38	7337.38
40	16.2054	121026	11.6279	Tcag	400	15	1480.04	2319.72	7164.53	0	7164.53	7469.09	7469.09
41	15.6976	119296	11.5879	Tcag	400	15	1501.95	2354.07	7292.71	0	7292.71	7600.69	7600.69
42	15.6976	121392	11.5879	Tcag	400	15	1523.84	2388.37	7420.71	0	7420.71	7733.17	7733.17
43	14.4615	114037	11.6671	Tcag	400	15	1548.02	2426.27	7562.14	0	7562.14	7881.79	7881.79
44	14.4615	116207	11.6671	Tcag	400	15	1572.59	2464.78	7705.84	0	7705.84	8030.57	8030.57
45	14.5855	107158	47.5147	Tcag	250	34	2067.13	3239.9	4432.71	0	4432.71	6689.76	6689.76
46	12.4375	74130.3	46.5859	Tcag	250	34	1724	2702.09	3635.38	0	3635.38	5457.56	5457.56
47	13.139	61819	45.6242	Tcag	250	34	1406.62	2204.65	2897.89	0	2897.89	4335.5	4335.5
48	17.6049	54674.3	48.0302	Tcag	250	34	937.844	1469.92	1808.61	0	1808.61	2851.3	2851.3
49	3.85218	7388.16	49.6597	Tcag	250	34	611.388	958.253	1050.03	0	1050.03	1769.93	1769.93
50	13.754	11630.4	49.6597	QTp	500	32	454.861	712.922	340.746	0	340.746	876.336	876.336

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.56734

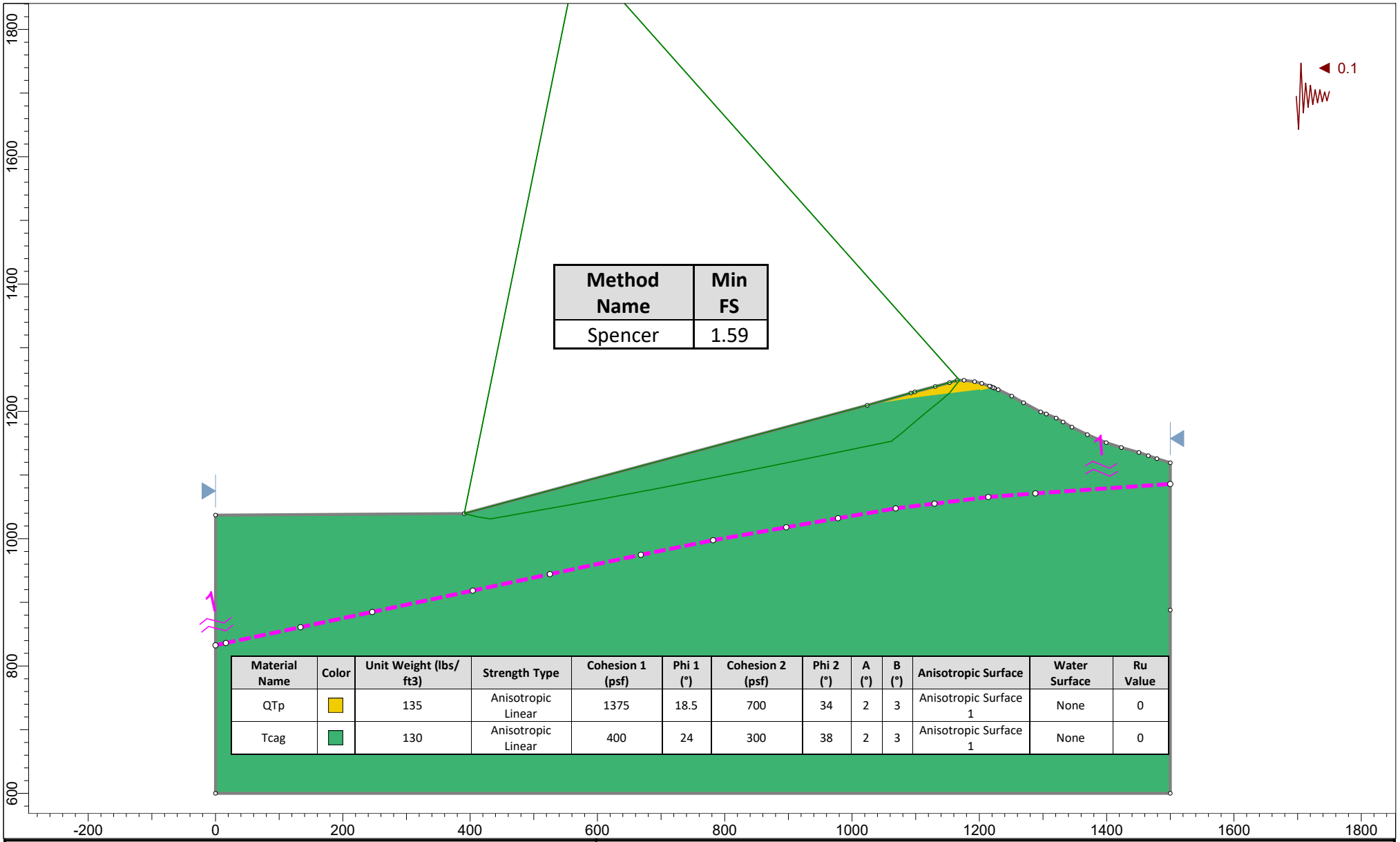
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	390.827	1039.34	0	0	0
2	402.773	1035.72	8530	2038.91	13.4431
3	414.718	1032.1	28174	6734.4	13.4431
4	431.648	1035.09	32323.9	7726.33	13.4431
5	448.579	1038.08	36455.3	8713.87	13.4431
6	459.867	1040.07	39199.4	9369.79	13.4431
7	471.154	1042.06	41935.4	10023.8	13.4431
8	482.441	1044.05	44663.1	10675.8	13.4431
9	499.957	1047.19	48776.4	11659	13.4431
10	517.473	1050.32	52862.7	12635.7	13.4431
11	532.565	1053.11	56073	13403	13.443
12	547.657	1055.91	59249.3	14162.3	13.4431
13	562.749	1058.7	62391.5	14913.4	13.4431
14	577.841	1061.5	65499.8	15656.3	13.4431
15	592.904	1064.34	68380.3	16344.9	13.4431
16	607.967	1067.18	71220.5	17023.7	13.4431
17	623.03	1070.02	74020.3	17693	13.4431
18	638.093	1072.86	76779.7	18352.6	13.4431
19	649.489	1075.05	78707	18813.2	13.4431
20	660.885	1077.23	80608.4	19267.7	13.4431
21	672.282	1079.41	82484	19716	13.4431
22	689.376	1082.69	85248.9	20376.9	13.4431
23	706.47	1085.96	87955.8	21024	13.4431
24	722.658	1089.17	89948.9	21500.4	13.4431
25	738.845	1092.37	91879.2	21961.8	13.4431
26	755.032	1095.58	93757.7	22410.8	13.4431
27	771.219	1098.79	95573.4	22844.8	13.4431
28	787.406	1102.01	97233.1	23241.5	13.4431
29	803.593	1105.23	98828.6	23622.9	13.4431
30	819.78	1108.4	100647	24057.5	13.4431
31	835.967	1111.58	102406	24477.9	13.4431
32	852.154	1114.74	104157	24896.4	13.443
33	868.342	1117.9	105848	25300.8	13.4431
34	884.529	1121.22	106498	25456.1	13.4431
35	900.716	1124.55	107076	25594.3	13.4431
36	917.606	1128.06	107299	25647.6	13.4431
37	934.496	1131.58	107443	25681.9	13.4431
38	950.701	1134.92	107680	25738.6	13.4431
39	966.907	1138.27	107845	25778	13.4431
40	983.112	1141.6	108011	25817.7	13.4431
41	999.317	1144.94	108106	25840.4	13.4431
42	1015.02	1148.15	108211	25865.4	13.443
43	1030.71	1151.37	108247	25874.1	13.4431
44	1045.17	1154.36	108053	25827.8	13.4431
45	1059.64	1157.35	107786	25763.9	13.4431
46	1074.22	1173.27	67344.7	16097.3	13.4431
47	1086.66	1186.42	40998.3	9799.78	13.4431
48	1099.8	1199.85	20566.9	4916.09	13.4431
49	1117.4	1219.42	1678.81	401.284	13.4431
50	1121.25	1223.95	-728.641	-174.166	13.4431
51	1135.01	1240.15	0	0	0

Entity Information

Non-Circular Search (Cuckoo), Min FS, no Ru

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 1036.94 0, 600 1500, 600 1500, 887.809 1500, 1119.16 1479.07, 1125.65 1465.46, 1130.34 1450.66, 1135.38 1423.13, 1143.22 1399.38, 1150.84 1369.78, 1163.33 1345.39, 1175.11 1331.63, 1183.25 1320.64, 1189.3 1305.25, 1195.72 1296.28, 1199.06 1269.41, 1213.41 1250.85, 1223.87 1229.71, 1233.89 1223.59, 1236.53 1221.17, 1237.57 1217.9, 1238.98 1216.02, 1239.64 1203.73, 1243.93 1192.61, 1246.63 1176.06, 1248.65 1165.3, 1248.9 1153.2, 1245 1130.73, 1239.01 1098.6, 1230.44 1092.48, 1228.81 1023.76, 1209.46 390.827, 1039.34
Material Boundary	1023.76, 1209.46 1065.25, 1215.97 1095.56, 1220.66 1122.73, 1224.14 1146.34, 1227.04 1173, 1230.32 1201.57, 1233.82 1223.59, 1236.53
Material Boundary	1216.02, 1239.64 1221.17, 1237.57



Method Name	Min FS
Spencer	1.59

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
QTp		135	Anisotropic Linear	1375	18.5	700	34	2	3	Anisotropic Surface 1	None	0
Tcag		130	Anisotropic Linear	400	24	300	38	2	3	Anisotropic Surface 1	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 11-11', Pseudo-Static, Non-Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPMS1A_s.slmd
		Scale	1:2500
Project No.:	23-2195s	Date: 10/13/2023	Run Number: Run No. 27

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 5
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 6
Slice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.59331 6
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.59331 7
Entity Information 8
    Non-Circular Search (Cuckoo), Min FS, no Ru 8
        Shared Entities 8

Slide2 Analysis Information

SPMS1A_s

Project Summary

File Name:	SPMS1A_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:08.502s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 11-11', Pseudo-Static, Non-Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

QTp	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	1375 psf
Phi 1	18.5 °
A	2 °
Cohesion 2	700 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	300 psf
Phi 2	38 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.593310
Axis Location:	570.355, 1922.098
Left Slip Surface Endpoint:	390.827, 1039.341
Right Slip Surface Endpoint:	1168.843, 1248.822
Resisting Moment:	1.98346e+09 lb-ft
Driving Moment:	1.24487e+09 lb-ft
Resisting Horizontal Force:	2.17288e+06 lb
Driving Horizontal Force:	1.36375e+06 lb
Total Slice Area:	32731.8 ft2
Surface Horizontal Width:	778.016 ft
Surface Average Height:	42.0709 ft

Global Minimum Coordinates

Method: spencer

X	Y
390.827	1039.34
411.107	1034.23
431.991	1031.01
465.447	1036.94
503.36	1043.63
541.702	1050.64
577.934	1057.27
605.68	1062.3
633.659	1067.39
661.639	1072.47
701.018	1079.82
740.398	1087.43
779.836	1095.3
811.98	1101.81
843.822	1108.33
875.664	1114.85
907.507	1121.36
939.349	1127.89
971.191	1134.41
999.733	1140.12
1028.27	1146.02
1061.59	1152.88
1078.25	1165.95
1094.57	1179.93
1118.36	1199.87
1138.05	1215.69
1153.45	1229.09
1168.84	1248.82

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	21427
Number of Invalid Surfaces:	3634

Error Codes

Error Code -106 reported for 6 surfaces
Error Code -108 reported for 111 surfaces
Error Code -111 reported for 693 surfaces
Error Code -112 reported for 450 surfaces
Error Code -121 reported for 463 surfaces
Error Code -124 reported for 1 surface
Error Code -1000 reported for 1910 surfaces

Error Code Descriptions

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-111 = Safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-121 = Concave failure surface, only convex surfaces have been defined as being allowed.

-124 = A slice has a width less than the minimum acceptable value.

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.59331

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	20.2796	13922.9	-14.1466	Tcag	300	38	814.101	1297.12	1276.25	0	1276.25	1071.06	1071.06
2	20.8837	40669.3	-8.77192	Tcag	300	38	1587.13	2528.79	2852.72	0	2852.72	2607.81	2607.81
3	16.7281	43849.2	10.0501	Tcag	400	24	960.974	1531.13	2540.56	0	2540.56	2710.87	2710.87
4	16.7281	47179.8	10.0501	Tcag	400	24	1013.93	1615.51	2730.09	0	2730.09	2909.78	2909.78
5	18.9566	57506.5	10.0127	Tcag	400	24	1071.03	1706.49	2934.43	0	2934.43	3123.53	3123.53
6	18.9566	61815	10.0127	Tcag	400	24	1131.52	1802.86	3150.87	0	3150.87	3350.65	3350.65
7	19.171	66747.6	10.3577	Tcag	400	24	1186.17	1889.94	3346.47	0	3346.47	3563.27	3563.27
8	19.171	70857.2	10.3577	Tcag	400	24	1243	1980.48	3549.81	0	3549.81	3776.99	3776.99
9	18.1157	70728.2	10.3709	Tcag	400	24	1298	2068.12	3746.66	0	3746.66	3984.21	3984.21
10	18.1157	74387.6	10.3709	Tcag	400	24	1351.54	2153.42	3938.25	0	3938.25	4185.59	4185.59
11	13.8729	59458.9	10.2853	Tcag	400	24	1400.4	2231.27	4113.1	0	4113.1	4367.22	4367.22
12	13.8729	61643.5	10.2853	Tcag	400	24	1442.17	2297.83	4262.59	0	4262.59	4524.3	4524.3
13	13.9899	64373.8	10.295	Tcag	400	24	1483.94	2364.37	4412.04	0	4412.04	4681.58	4681.58
14	13.9899	66591	10.295	Tcag	400	24	1525.97	2431.35	4562.48	0	4562.48	4839.66	4839.66
15	13.9899	68808.1	10.295	Tcag	400	24	1568.01	2498.33	4712.92	0	4712.92	4997.74	4997.74
16	13.9899	71025.3	10.295	Tcag	400	24	1610.05	2565.31	4863.36	0	4863.36	5155.81	5155.81
17	13.1264	68600.9	10.5755	Tcag	400	24	1644.85	2620.76	4987.91	0	4987.91	5295	5295
18	13.1264	70439.4	10.5755	Tcag	400	24	1681.89	2679.77	5120.44	0	5120.44	5434.45	5434.45
19	13.1264	72278	10.5755	Tcag	400	24	1718.92	2738.77	5252.97	0	5252.97	5573.9	5573.9
20	19.6896	111698	10.9407	Tcag	400	24	1756.28	2798.3	5386.68	0	5386.68	5726.18	5726.18
21	19.6896	115502	10.9407	Tcag	400	24	1807.16	2879.36	5568.74	0	5568.74	5918.07	5918.07
22	13.146	79164	11.2853	Tcag	400	24	1841.52	2934.12	5691.73	0	5691.73	6059.21	6059.21
23	13.146	80719.4	11.2853	Tcag	400	24	1872.56	2983.57	5802.78	0	5802.78	6176.46	6176.46
24	13.146	82274.8	11.2853	Tcag	400	24	1903.59	3033.01	5913.84	0	5913.84	6293.7	6293.7
25	16.0722	102654	11.4413	Tcag	400	24	1934.14	3081.68	6023.15	0	6023.15	6414.6	6414.6
26	16.0722	104884	11.4413	Tcag	400	24	1970.46	3139.55	6153.11	0	6153.11	6551.91	6551.91
27	15.9211	106055	11.5796	Tcag	400	24	2003.03	3191.44	6269.68	0	6269.68	6680.1	6680.1
28	15.9211	108160	11.5796	Tcag	400	24	2037.59	3246.51	6393.36	0	6393.36	6810.86	6810.86
29	15.9211	110271	11.5598	Tcag	400	24	2072.69	3302.43	6518.97	0	6518.97	6942.92	6942.92
30	15.9211	112388	11.5598	Tcag	400	24	2107.46	3357.83	6643.4	0	6643.4	7074.46	7074.46
31	15.9211	114503	11.5668	Tcag	400	24	2142.03	3412.92	6767.1	0	6767.1	7205.5	7205.5
32	15.9211	116616	11.5668	Tcag	400	24	2176.73	3468.2	6891.28	0	6891.28	7336.78	7336.78
33	15.9211	118724	11.5799	Tcag	400	24	2211.05	3522.89	7014.14	0	7014.14	7467.19	7467.19
34	15.9211	120829	11.5799	Tcag	400	24	2245.61	3577.96	7137.82	0	7137.82	7597.95	7597.95
35	15.9211	122938	11.5688	Tcag	400	24	2280.5	3633.55	7262.64	0	7262.64	7729.47	7729.47
36	15.9211	125049	11.5688	Tcag	400	24	2315.18	3688.8	7386.76	0	7386.76	7860.68	7860.68
37	14.2708	113941	11.3242	Tcag	400	24	2355.25	3752.64	7530.15	0	7530.15	8001.81	8001.81
38	14.2708	115755	11.3242	Tcag	400	24	2388.57	3805.74	7649.43	0	7649.43	8127.77	8127.77
39	14.2708	117486	11.6709	Tcag	400	24	2411.46	3842.21	7731.34	0	7731.34	8229.46	8229.46
40	14.2708	119157	11.6709	Tcag	400	24	2442.04	3890.92	7840.73	0	7840.73	8345.16	8345.16
41	16.6568	141633	11.6393	Tcag	400	24	2482.91	3956.05	7987.02	0	7987.02	8498.46	8498.46
42	16.6568	144529	11.6393	Tcag	400	24	2528.35	4028.44	8149.6	0	8149.6	8670.41	8670.41
43	16.6604	137025	38.1085	Tcag	300	38	2770.2	4413.78	5265.39	0	5265.39	7438.16	7438.16
44	16.3193	115541	40.5873	Tcag	300	38	2314.9	3688.35	4336.89	0	4336.89	6320.11	6320.11
45	11.8981	71782.7	39.9683	Tcag	300	38	2015.77	3211.75	3726.87	0	3726.87	5416.41	5416.41
46	11.8981	61363.3	39.9683	Tcag	300	38	1746.35	2782.47	3177.41	0	3177.41	4641.13	4641.13
47	19.6878	79535.9	38.7727	Tcag	300	38	1428.6	2276.2	2529.42	0	2529.42	3676.92	3676.92
48	13.8215	39012.4	41.0464	Tcag	300	38	1011.2	1611.16	1678.21	0	1678.21	2558.67	2558.67
49	1.57323	3493.97	41.0464	QTp	700	34	969.714	1545.05	1252.85	0	1252.85	2097.19	2097.19
50	15.3972	17597.7	52.0329	QTp	700	34	598.7	953.914	376.443	0	376.443	1143.65	1143.65

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.59331

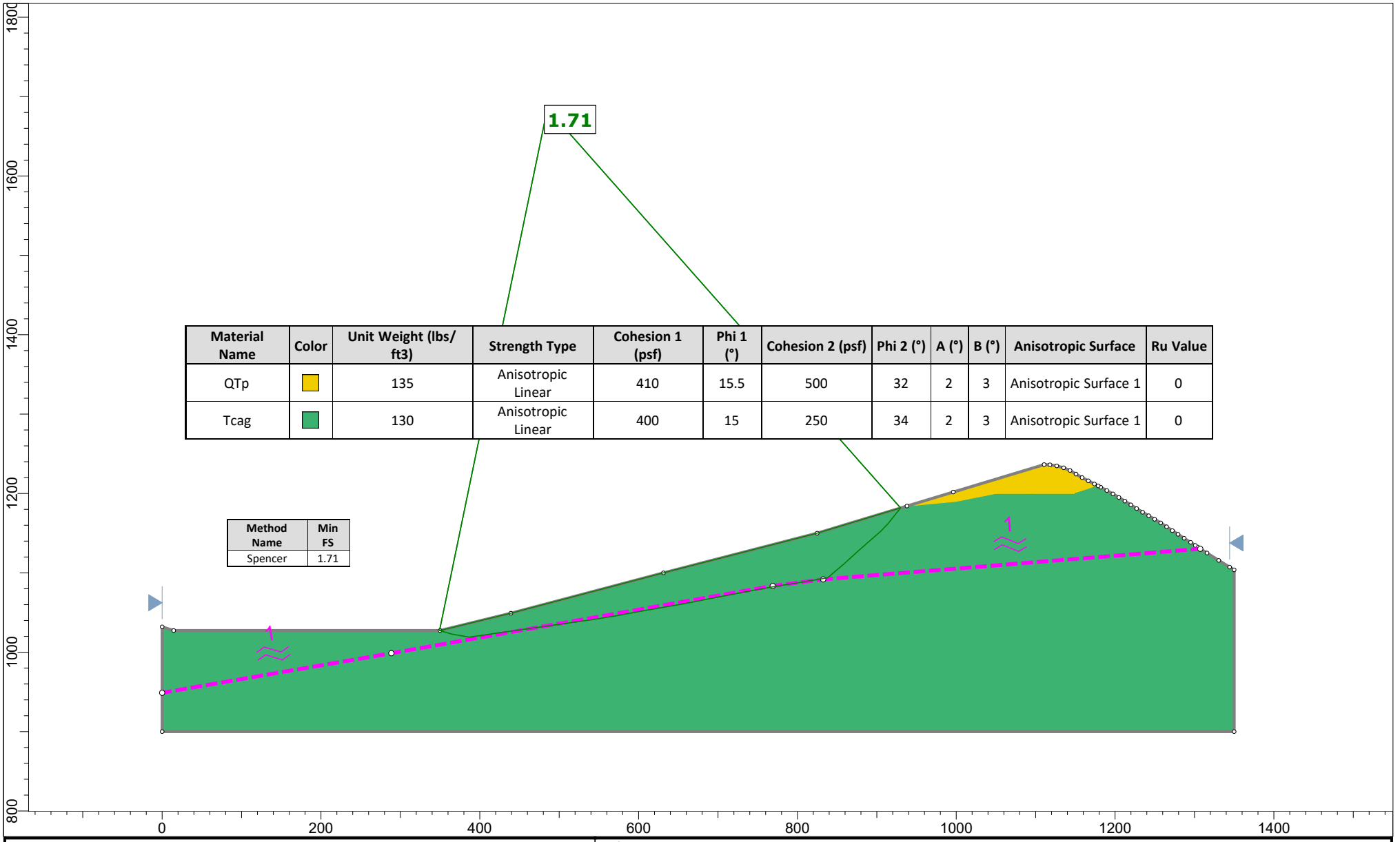
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	390.827	1039.34	0	0	0
2	411.107	1034.23	21640.9	7798.87	19.818
3	431.991	1031.01	59912	21590.9	19.818
4	448.719	1033.97	64070.5	23089.5	19.818
5	465.447	1036.94	68219.9	24584.9	19.818
6	484.404	1040.28	72951.3	26289.9	19.8179
7	503.36	1043.63	77673.9	27991.9	19.818
8	522.531	1047.13	82013.7	29555.8	19.818
9	541.702	1050.64	86319.3	31107.5	19.818
10	559.818	1053.95	90339.4	32556.2	19.818
11	577.934	1057.27	94328.3	33993.7	19.818
12	591.807	1059.79	97455.5	35120.7	19.818
13	605.68	1062.3	100567	36242.1	19.818
14	619.669	1064.85	103678	37363.3	19.8181
15	633.659	1067.39	106774	38478.8	19.818
16	647.649	1069.93	109853	39588.5	19.818
17	661.639	1072.47	112917	40692.5	19.8179
18	674.766	1074.92	115424	41595.9	19.8179
19	687.892	1077.37	117908	42491.3	19.818
20	701.018	1079.82	120370	43378.5	19.818
21	720.708	1083.63	123278	44426.7	19.8181
22	740.398	1087.43	126115	45449	19.818
23	753.544	1090.06	127476	45939.5	19.818
24	766.69	1092.68	128799	46416.1	19.818
25	779.836	1095.3	130082	46878.5	19.818
26	795.908	1098.56	131310	47321.2	19.818
27	811.98	1101.81	132477	47741.6	19.818
28	827.901	1105.07	133309	48041.4	19.818
29	843.822	1108.33	134077	48318.2	19.818
30	859.743	1111.59	134820	48586.2	19.8181
31	875.664	1114.85	135501	48831.3	19.8179
32	891.586	1118.1	136103	49048.4	19.818
33	907.507	1121.36	136642	49242.7	19.818
34	923.428	1124.63	137090	49404	19.818
35	939.349	1127.89	137474	49542.4	19.818
36	955.27	1131.15	137819	49666.6	19.8179
37	971.191	1134.41	138100	49767.9	19.8179
38	985.462	1137.26	138797	50019.1	19.8179
39	999.733	1140.12	139447	50253.6	19.818
40	1014	1143.07	139322	50208.4	19.818
41	1028.27	1146.02	139144	50144.1	19.8179
42	1044.93	1149.45	138934	50068.5	19.818
43	1061.59	1152.88	138633	49960.2	19.818
44	1078.25	1165.95	102278	36858.7	19.818
45	1094.57	1179.93	67867.6	24457.9	19.818
46	1106.47	1189.9	47507	17120.4	19.818
47	1118.36	1199.87	30462.2	10977.9	19.818
48	1138.05	1215.69	10634.5	3832.44	19.818
49	1151.87	1227.72	513.243	184.961	19.818
50	1153.45	1229.09	-26.7462	-9.63871	19.818
51	1168.84	1248.82	0	0	0

Entity Information

Non-Circular Search (Cuckoo), Min FS, no Ru

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 1036.94 0, 600 1500, 600 1500, 887.809 1500, 1119.16 1479.07, 1125.65 1465.46, 1130.34 1450.66, 1135.38 1423.13, 1143.22 1399.38, 1150.84 1369.78, 1163.33 1345.39, 1175.11 1331.63, 1183.25 1320.64, 1189.3 1305.25, 1195.72 1296.28, 1199.06 1269.41, 1213.41 1250.85, 1223.87 1229.71, 1233.89 1223.59, 1236.53 1221.17, 1237.57 1217.9, 1238.98 1216.02, 1239.64 1203.73, 1243.93 1192.61, 1246.63 1176.06, 1248.65 1165.3, 1248.9 1153.2, 1245 1130.73, 1239.01 1098.6, 1230.44 1092.48, 1228.81 1023.76, 1209.46 390.827, 1039.34
Material Boundary	1023.76, 1209.46 1065.25, 1215.97 1095.56, 1220.66 1122.73, 1224.14 1146.34, 1227.04 1173, 1230.32 1201.57, 1233.82 1223.59, 1236.53
Material Boundary	1216.02, 1239.64 1221.17, 1237.57



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Ru Value
QTp		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 1	0
Tcag		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 1	0

Method Name	Min FS
Spencer	1.71

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 12-12', Static, Non-Circular		
Client	Solstra Communities California, LLC		Drawn By: M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California		File Name: SPLS1A.slmd
			Scale: 1:2000
Project No.: 23-2195s-1	Date: 10/13/2023		Run Number: Run No. 28

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 6
Slice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.70694 6
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.70694 7
Entity Information 8
    Non-Circular Search (Cuckoo) - Min FS, no Ru 8
        Shared Entities 8

Slide2 Analysis Information

SPLS1A

Project Summary

File Name:	SPLS1A.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:10.91s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 12-12', Static, Non-Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Ru Coefficient
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

QTp	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Ru Value	0

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Ru Value	0

Global Minimums

Method: spencer

FS	1.706940
Axis Location:	485.137, 1685.163
Left Slip Surface Endpoint:	349.249, 1027.341
Right Slip Surface Endpoint:	929.861, 1181.759
Resisting Moment:	7.355e+08 lb-ft
Driving Moment:	4.30888e+08 lb-ft
Resisting Horizontal Force:	1.04403e+06 lb
Driving Horizontal Force:	611641 lb
Total Slice Area:	21471.3 ft2
Surface Horizontal Width:	580.613 ft
Surface Average Height:	36.9805 ft

Global Minimum Coordinates

Method: spencer

X	Y
349.249	1027.34
364.55	1022.93
386.757	1018.98
404.527	1021.57
422.577	1024.26
438.998	1026.57
455.418	1028.88
485.709	1033.13
513.376	1037.1
541.884	1041.14
570.497	1045.65
599.698	1051.1
623.714	1055.25
647.73	1059.42
663.041	1062.21
678.351	1065.01
693.662	1068.24
708.972	1071.47
724.283	1074.37
739.594	1077.28
754.904	1079.87
770.215	1082.46
792.846	1086.23
815.703	1090.03
837.979	1093.73
858.718	1111.4
874.268	1125.59
886.421	1136.26
904.675	1152.25
914.508	1162.37
929.861	1181.76

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	22067
Number of Invalid Surfaces:	3002

Error Codes

Error Code -106 reported for 2 surfaces
Error Code -108 reported for 84 surfaces
Error Code -109 reported for 1 surface
Error Code -111 reported for 232 surfaces
Error Code -112 reported for 265 surfaces
Error Code -121 reported for 321 surfaces
Error Code -124 reported for 1 surface
Error Code -1000 reported for 2096 surfaces

Error Code Descriptions

The following errors were encountered during the computation:

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-109 = Soiltype for slice base not located. This error should occur very rarely, if at all. It may occur if a very low number of slices is combined with certain soil geometries, such that the midpoint of a slice base is actually outside the soil region,even though the slip surface is wholly within the soil region.

-111 = Safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-121 = Concave failure surface, only convex surfaces have been defined as being allowed.

-124 = A slice has a width less than the minimum acceptable value.

-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.70694

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	15.3011	7752.02	-16.093	Tcag	250	34	460.887	786.706	795.7	0	795.7	662.733	662.733
2	11.1036	14884.4	-10.0751	Tcag	250	34	837.575	1429.69	1748.97	0	1748.97	1600.15	1600.15
3	11.1036	21647.7	-10.0751	Tcag	250	34	1138.34	1943.08	2510.09	0	2510.09	2307.83	2307.83
4	8.88505	20533.9	8.29451	Tcag	400	15	592.778	1011.84	2283.4	0	2283.4	2369.82	2369.82
5	8.88505	21544.8	8.29451	Tcag	400	15	610.283	1041.72	2394.92	0	2394.92	2483.89	2483.89
6	9.02479	22901.7	8.47344	Tcag	400	15	627.052	1070.34	2501.74	0	2501.74	2595.16	2595.16
7	9.02479	23911	8.47344	Tcag	400	15	644.235	1099.67	2611.21	0	2611.21	2707.19	2707.19
8	8.21043	22667	8.00086	Tcag	400	15	662.992	1131.69	2730.69	0	2730.69	2823.87	2823.87
9	8.21043	23576.1	8.00086	Tcag	400	15	680.06	1160.82	2839.43	0	2839.43	2935.02	2935.02
10	8.21043	24571.3	8.00086	Tcag	400	15	698.744	1192.71	2958.45	0	2958.45	3056.66	3056.66
11	8.21043	25660.7	8.00086	Tcag	400	15	719.197	1227.63	3088.74	0	3088.74	3189.83	3189.83
12	10.0969	33050.4	8.00007	Tcag	400	15	742.006	1266.56	3234.05	0	3234.05	3338.33	3338.33
13	10.0969	34698.2	8.00007	Tcag	400	15	767.163	1309.5	3394.3	0	3394.3	3502.12	3502.12
14	10.0969	36346	8.00007	Tcag	400	15	792.32	1352.44	3554.56	0	3554.56	3665.91	3665.91
15	13.8335	52435.7	8.1649	Tcag	400	15	820.972	1401.35	3737.08	0	3737.08	3854.87	3854.87
16	13.8335	55455.8	8.1649	Tcag	400	15	854.588	1458.73	3951.23	0	3951.23	4073.84	4073.84
17	9.50265	39854.3	8.06629	Tcag	400	15	883.599	1508.25	4136.05	0	4136.05	4261.28	4261.28
18	9.50265	41300.1	8.06629	Tcag	400	15	907.038	1548.26	4285.38	0	4285.38	4413.93	4413.93
19	9.50265	42745.8	8.06629	Tcag	400	15	930.484	1588.28	4434.71	0	4434.71	4566.58	4566.58
20	9.5377	44264.3	8.94595	Tcag	400	15	947.69	1617.65	4544.33	0	4544.33	4693.51	4693.51
21	9.5377	45535.1	8.94595	Tcag	400	15	968.101	1652.49	4674.35	0	4674.35	4826.74	4826.74
22	9.5377	46805.9	8.94595	Tcag	400	15	988.506	1687.32	4804.36	0	4804.36	4959.97	4959.97
23	14.6005	73709.2	10.5676	Tcag	400	15	1000.7	1708.14	4882.04	0	4882.04	5068.73	5068.73
24	14.6005	75879.5	10.5676	Tcag	400	15	1023.23	1746.59	5025.53	0	5025.53	5216.42	5216.42
25	12.0079	64160	9.81203	Tcag	400	15	1049.95	1792.2	5195.76	0	5195.76	5377.35	5377.35
26	12.0079	65883.1	9.81203	Tcag	400	15	1071.81	1829.51	5334.99	0	5334.99	5520.35	5520.35
27	12.0079	67591.5	9.84715	Tcag	400	15	1093.25	1866.11	5471.61	0	5471.61	5661.37	5661.37
28	12.0079	69203.7	9.84715	Tcag	400	15	1113.69	1901.01	5601.83	0	5601.83	5795.15	5795.15
29	15.3107	90403.7	10.3498	Tcag	400	15	1131.89	1932.06	5717.71	0	5717.71	5924.43	5924.43
30	15.3107	92709.4	10.3498	Tcag	400	15	1154.73	1971.06	5863.29	0	5863.29	6074.18	6074.18
31	15.3106	94582.3	11.9134	Tcag	400	15	1162.55	1984.41	5913.1	0	5913.1	6158.37	6158.37
32	15.3106	96024.1	11.9134	Tcag	400	15	1176.7	2008.55	6003.19	0	6003.19	6251.45	6251.45
33	15.3107	97791.2	10.7401	Tcag	400	15	1202.33	2052.3	6166.47	0	6166.47	6394.52	6394.52
34	15.3107	99882.2	10.7401	Tcag	400	15	1223	2087.58	6298.15	0	6298.15	6530.12	6530.12
35	15.3108	102284	9.60967	Tcag	400	15	1255.13	2142.44	6502.88	0	6502.88	6715.39	6715.39
36	15.3108	104996	9.60967	Tcag	400	15	1282.14	2188.54	6674.95	0	6674.95	6892.03	6892.03
37	11.3154	79364	9.44707	Tcag	400	15	1307.23	2231.36	6834.72	0	6834.72	7052.23	7052.23
38	11.3154	80893.7	9.44707	Tcag	400	15	1327.86	2266.58	6966.18	0	6966.18	7187.12	7187.12
39	11.4284	83254.8	9.44282	Tcag	400	15	1348.65	2302.06	7098.58	0	7098.58	7322.89	7322.89
40	11.4284	84816.5	9.44282	Tcag	400	15	1369.51	2337.67	7231.47	0	7231.47	7459.25	7459.25
41	11.1379	84176	9.4343	Tcag	400	15	1390.35	2373.25	7364.26	0	7364.26	7595.29	7595.29
42	11.1379	86134.2	9.4343	Tcag	400	15	1417.2	2419.07	7535.26	0	7535.26	7770.75	7770.75
43	10.3698	77374.4	40.4323	Tcag	250	34	2168.86	3702.11	5117.96	0	5117.96	6965.91	6965.91
44	10.3698	69690.3	40.4323	Tcag	250	34	1965.51	3355.01	4603.37	0	4603.37	6278.06	6278.06
45	15.55	89153	42.3802	Tcag	250	34	1652.89	2821.39	3812.24	0	3812.24	5320.5	5320.5
46	12.1531	56660.6	41.2699	Tcag	250	34	1386	2365.82	3136.83	0	3136.83	4353.17	4353.17
47	9.1269	35297.8	41.2224	Tcag	250	34	1170.97	1998.78	2592.68	0	2592.68	3618.59	3618.59
48	9.1269	29084.5	41.2224	Tcag	250	34	986.086	1683.19	2124.79	0	2124.79	2988.72	2988.72
49	9.83265	23416.1	45.8374	Tcag	250	34	723.456	1234.9	1460.17	0	1460.17	2205.09	2205.09
50	15.3535	14713.5	51.6206	Tcag	250	34	334.477	570.932	475.802	0	475.802	898.119	898.119

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.70694

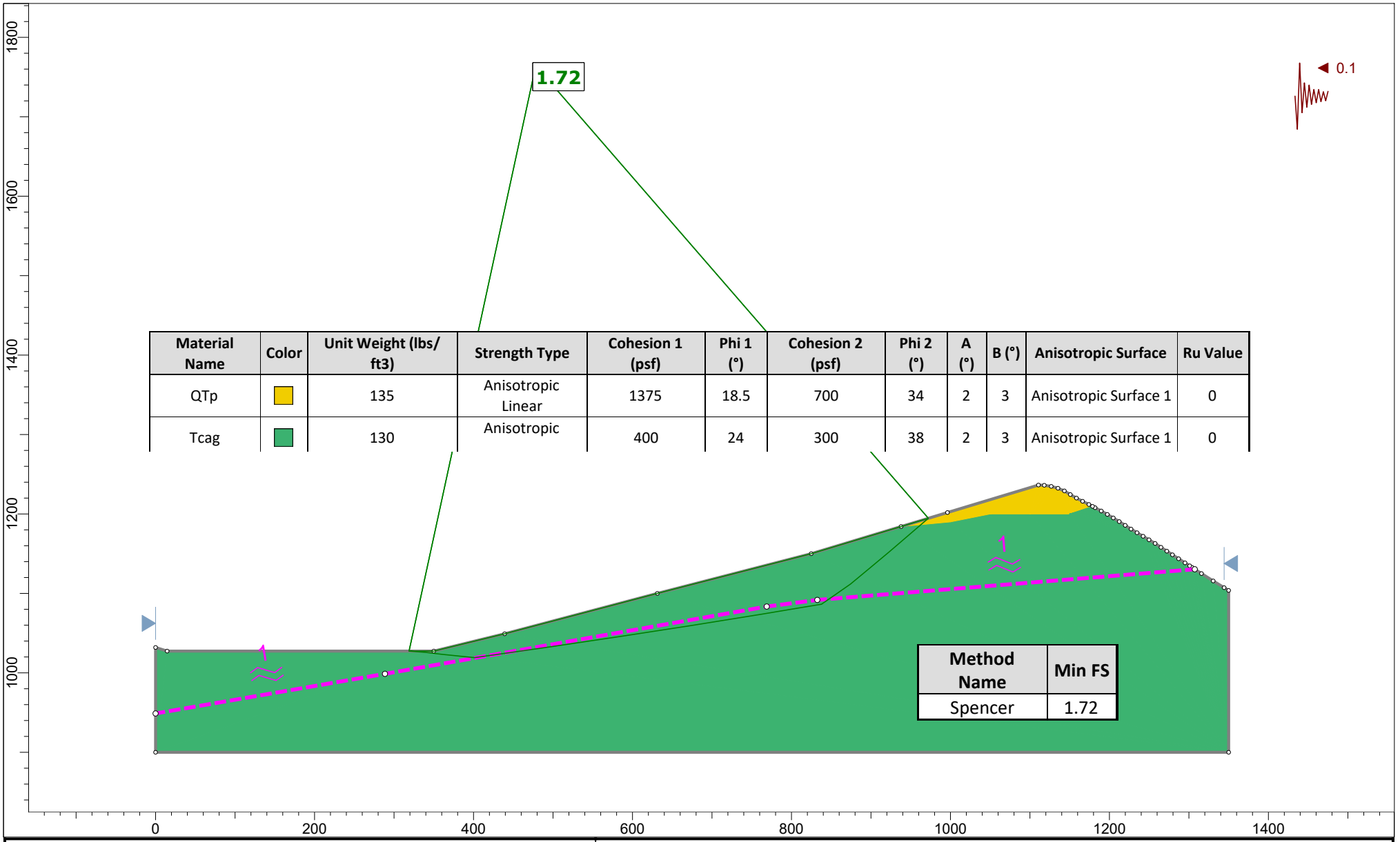
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	349.249	1027.34	0	0	0
2	364.55	1022.93	10564.6	2388.74	12.7408
3	375.653	1020.95	23315.3	5271.75	12.7407
4	386.757	1018.98	40907.1	9249.39	12.7408
5	395.642	1020.28	43216.3	9771.51	12.7407
6	404.527	1021.57	45536.5	10296.1	12.7407
7	413.552	1022.92	47832	10815.2	12.7408
8	422.577	1024.26	50135.4	11336	12.7408
9	430.787	1025.41	52427.5	11854.2	12.7407
10	438.998	1026.57	54734.4	12375.8	12.7407
11	447.208	1027.72	57057.3	12901.1	12.7408
12	455.418	1028.88	59397.7	13430.3	12.7408
13	465.515	1030.3	62300.5	14086.6	12.7408
14	475.612	1031.71	65229.8	14748.9	12.7407
15	485.709	1033.13	68185.8	15417.3	12.7407
16	499.543	1035.12	72125.4	16308.1	12.7408
17	513.376	1037.1	76105.1	17207.9	12.7407
18	522.879	1038.45	78931.5	17847	12.7408
19	532.381	1039.8	81779.7	18491	12.7408
20	541.884	1041.14	84649.4	19139.9	12.7408
21	551.422	1042.64	86865.4	19640.9	12.7408
22	560.96	1044.15	89080.8	20141.8	12.7407
23	570.497	1045.65	91295.7	20642.6	12.7407
24	585.098	1048.37	92608.5	20939.5	12.7408
25	599.698	1051.1	93859.4	21222.3	12.7408
26	611.706	1053.17	95677	21633.3	12.7408
27	623.714	1055.25	97467.9	22038.2	12.7408
28	635.722	1057.33	99191.1	22427.8	12.7407
29	647.73	1059.42	100888	22811.6	12.7408
30	663.041	1062.21	102231	23115.1	12.7407
31	678.351	1065.01	103516	23405.7	12.7407
32	693.662	1068.24	102215	23111.5	12.7407
33	708.972	1071.47	100839	22800.5	12.7408
34	724.283	1074.37	101340	22913.7	12.7407
35	739.594	1077.28	101775	23012	12.7407
36	754.904	1079.87	104134	23545.6	12.7408
37	770.215	1082.46	106462	24071.8	12.7407
38	781.531	1084.35	108385	24506.7	12.7408
39	792.846	1086.23	110295	24938.5	12.7408
40	804.275	1088.13	112215	25372.7	12.7408
41	815.703	1090.03	114121	25803.7	12.7408
42	826.841	1091.88	115978	26223.5	12.7408
43	837.979	1093.73	117817	26639.3	12.7408
44	848.349	1102.57	95088.1	21500.1	12.7407
45	858.718	1111.4	74797.1	16912.2	12.7408
46	874.268	1125.59	46406.9	10492.9	12.7407
47	886.421	1136.26	29795.5	6736.97	12.7407
48	895.548	1144.25	19751.1	4465.86	12.7407
49	904.675	1152.25	11760.6	2659.16	12.7408
50	914.508	1162.37	4090.89	924.979	12.7407
51	929.861	1181.76	0	0	0

Entity Information

Non-Circular Search (Cuckoo) - Min FS, no Ru

Shared Entities

Type	Coordinates (x,y)
External Boundary	1344.24, 1107.23 1330.5, 1115.74 1315.82, 1124.97 1307.4, 1130.35 1303.88, 1132.71 1301.01, 1134.66 1295.1, 1138.48 1287, 1143.66 1279.32, 1148.57 1272.16, 1153.24 1264.88, 1158.07 1257.46, 1162.89 1249.9, 1167.5 1242.29, 1171.89 1234.72, 1176.37 1227.23, 1180.97 1219.81, 1185.69 1212.39, 1190.4 1204.9, 1195.01 1197.31, 1199.45 1189.64, 1203.75 1181.9, 1207.92 1178.71, 1209.57 1174.09, 1211.96 1166.24, 1215.94 1158.47, 1220.05 1150.88, 1224.48 1143.35, 1229.02 1135.22, 1232.37 1126.74, 1234.75 1118.07, 1236.12 1110.68, 1236.43 996.264, 1201.84 937.906, 1184.19 824.824, 1150 631.244, 1100 439.187, 1049.13 350, 1027.34 14.5154, 1027.34 0, 1031.93 0, 900 1350, 900 1350, 1103.76
Material Boundary	937.906, 1184.19 1000, 1190 1050, 1200 1100, 1200 1150, 1200 1178.71, 1209.57



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Ru Value
QTp		135	Anisotropic Linear	1375	18.5	700	34	2	3	Anisotropic Surface 1	0
Tcag		130	Anisotropic	400	24	300	38	2	3	Anisotropic Surface 1	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 12-12', Pseudo-Static, Non-Circular		
Client	Solstra Communities California, LLC	Drawn By	M. Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPLS1A_s.slmd
		Scale	1:2000
Project No.:	23-2195s	Date: 10/13/2023	Run Number: Run No. 29

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 6
Slice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.72381 6
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.72381 7
Entity Information 8
    Non-Circular Search (Cuckoo) - Min FS, no Ru 8
        Shared Entities 8

Slide2 Analysis Information

SPLS1A_s

Project Summary

File Name:	SPLS1A_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:10.503s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 12-12', Pseudo-Static, Non-Circular
Author:	M. Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Ru Coefficient
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Cuckoo Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Nests:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

QTp	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	1375 psf
Phi 1	18.5 °
A	2 °
Cohesion 2	700 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Ru Value	0

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	300 psf
Phi 2	38 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 1
Ru Value	0

Global Minimums

Method: spencer

FS	1.723810
Axis Location:	478.286, 1764.282
Left Slip Surface Endpoint:	318.826, 1027.341
Right Slip Surface Endpoint:	972.163, 1194.550
Resisting Moment:	1.37096e+09 lb-ft
Driving Moment:	7.95307e+08 lb-ft
Resisting Horizontal Force:	1.75022e+06 lb
Driving Horizontal Force:	1.01532e+06 lb
Total Slice Area:	25085.2 ft2
Surface Horizontal Width:	653.337 ft
Surface Average Height:	38.3955 ft

Global Minimum Coordinates

Method: spencer

X	Y
318.826	1027.34
339.458	1025.9
360.09	1023.26
380.722	1021.22
401.354	1019.18
424.759	1022.52
448.164	1025.85
471.569	1029.17
494.974	1032.5
518.484	1036.01
541.995	1039.52
565.506	1043.03
589.017	1046.53
612.528	1050.03
636.038	1053.54
658.756	1057.01
681.474	1060.49
704.192	1064.39
726.909	1068.01
754.619	1072.81
782.328	1077.32
810.038	1081.83
837.747	1086.34
855.987	1099.07
874.228	1111.81
898.712	1132.12
923.195	1152.43
947.679	1173.49
972.163	1194.55

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	22269
Number of Invalid Surfaces:	2808

Error Codes

Error Code -106 reported for 6 surfaces
Error Code -108 reported for 82 surfaces
Error Code -111 reported for 256 surfaces
Error Code -112 reported for 288 surfaces
Error Code -121 reported for 318 surfaces
Error Code -124 reported for 1 surface
Error Code -145 reported for 3 surfaces
Error Code -1000 reported for 1854 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-124 = A slice has a width less than the minimum acceptable value.
-145 = Slip mass has invalid boundary slices.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.72381

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	10.316	484.454	-4.00621	Tcag	300	38	241.044	415.514	147.852	0	147.852	130.97	130.97
2	10.316	1453.36	-4.00621	Tcag	300	38	293.089	505.23	262.682	0	262.682	242.156	242.156
3	10.316	2820.84	-7.27474	Tcag	300	38	384.476	662.763	464.315	0	464.315	415.235	415.235
4	10.316	6203.58	-7.27474	Tcag	300	38	577.343	995.23	889.854	0	889.854	816.154	816.154
5	10.316	11149.2	-5.64508	Tcag	300	38	835.939	1441	1460.4	0	1460.4	1377.78	1377.78
6	10.316	15896.4	-5.64508	Tcag	300	38	1098.53	1893.66	2039.79	0	2039.79	1931.21	1931.21
7	10.316	20643.6	-5.64508	Tcag	300	38	1361.13	2346.33	2619.18	0	2619.18	2484.63	2484.63
8	10.316	25390.8	-5.64508	Tcag	300	38	1623.72	2798.99	3198.57	0	3198.57	3038.07	3038.07
9	11.7024	32402.8	8.10525	Tcag	400	24	936.6	1614.52	2727.87	0	2727.87	2861.25	2861.25
10	11.7024	34216.6	8.10525	Tcag	400	24	975.374	1681.36	2877.99	0	2877.99	3016.9	3016.9
11	11.7024	36030.4	8.10525	Tcag	400	24	1014.15	1748.2	3028.1	0	3028.1	3172.53	3172.53
12	11.7024	37952	8.10525	Tcag	400	24	1055.23	1819.01	3187.14	0	3187.14	3337.42	3337.42
13	11.7024	40126.2	8.08016	Tcag	400	24	1101.96	1899.57	3368.09	0	3368.09	3524.53	3524.53
14	11.7024	42314.3	8.08016	Tcag	400	24	1148.75	1980.22	3549.24	0	3549.24	3712.32	3712.32
15	11.7024	44502.5	8.08016	Tcag	400	24	1195.53	2060.87	3730.38	0	3730.38	3900.11	3900.11
16	11.7024	46690.6	8.08016	Tcag	400	24	1242.32	2141.53	3911.53	0	3911.53	4087.9	4087.9
17	11.7554	49037.6	8.50065	Tcag	400	24	1282.6	2210.96	4067.48	0	4067.48	4259.18	4259.18
18	11.7554	51110.9	8.50065	Tcag	400	24	1326.54	2286.7	4237.59	0	4237.59	4435.86	4435.86
19	11.7554	53184.3	8.50065	Tcag	400	24	1370.47	2362.43	4407.69	0	4407.69	4612.52	4612.52
20	11.7554	55257.6	8.50065	Tcag	400	24	1414.41	2438.17	4577.8	0	4577.8	4789.2	4789.2
21	11.7554	57334.9	8.47572	Tcag	400	24	1458.78	2514.66	4749.59	0	4749.59	4966.98	4966.98
22	11.7554	59416.3	8.47572	Tcag	400	24	1502.89	2590.7	4920.4	0	4920.4	5144.36	5144.36
23	23.5108	125077	8.47572	Tcag	400	24	1569.07	2704.78	5176.6	0	5176.6	5410.42	5410.42
24	11.7554	65660.3	8.47572	Tcag	400	24	1635.24	2818.85	5432.81	0	5432.81	5676.49	5676.49
25	11.7554	67741.6	8.47572	Tcag	400	24	1679.36	2894.89	5603.62	0	5603.62	5853.88	5853.88
26	23.5108	141717	8.47572	Tcag	400	24	1745.43	3008.79	5859.43	0	5859.43	6119.53	6119.53
27	11.3589	71321	8.69777	Tcag	400	24	1804.03	3109.81	6086.34	0	6086.34	6362.32	6362.32
28	11.3589	73087.4	8.69777	Tcag	400	24	1842.69	3176.45	6236	0	6236	6517.9	6517.9
29	11.3589	74853.8	8.69777	Tcag	400	24	1881.34	3243.08	6385.67	0	6385.67	6673.48	6673.48
30	11.3589	76620.2	8.69777	Tcag	400	24	1920	3309.72	6535.33	0	6535.33	6829.06	6829.06
31	11.3589	78228.2	9.75183	Tcag	400	24	1934.88	3335.36	6592.93	0	6592.93	6925.47	6925.47
32	11.3589	79677.8	9.75183	Tcag	400	24	1966.25	3389.44	6714.4	0	6714.4	7052.32	7052.32
33	11.3589	81235	9.03676	Tcag	400	24	2014.19	3472.08	6900	0	6900	7220.34	7220.34
34	11.3589	82899.7	9.03676	Tcag	400	24	2050.49	3534.65	7040.53	0	7040.53	7366.65	7366.65
35	13.8547	103191	9.83103	Tcag	400	24	2071.17	3570.31	7120.67	0	7120.67	7479.57	7479.57
36	13.8547	105312	9.83103	Tcag	400	24	2108.78	3635.13	7266.24	0	7266.24	7631.67	7631.67
37	27.7094	217512	9.24526	Tcag	400	24	2182.54	3762.28	7551.8	0	7551.8	7907.06	7907.06
38	13.8547	112331	9.24526	Tcag	400	24	2246.31	3872.21	7798.72	0	7798.72	8164.36	8164.36
39	13.8547	114715	9.24526	Tcag	400	24	2288.83	3945.5	7963.35	0	7963.35	8335.92	8335.92
40	13.8547	117098	9.24526	Tcag	400	24	2331.34	4018.79	8127.92	0	8127.92	8507.4	8507.4
41	13.8547	119960	9.24526	Tcag	400	24	2382.39	4106.79	8325.61	0	8325.61	8713.4	8713.4
42	18.2404	151664	34.9207	Tcag	300	38	2754.33	4747.94	5693.09	0	5693.09	7616.01	7616.01
43	18.2404	134545	34.9207	Tcag	300	38	2460.81	4241.97	5045.51	0	5045.51	6763.51	6763.51
44	12.2419	79419.3	39.6757	Tcag	300	38	2036.72	3510.92	4109.79	0	4109.79	5799.25	5799.25
45	12.2419	69149.5	39.6757	Tcag	300	38	1792.54	3090	3571.03	0	3571.03	5057.95	5057.95
46	12.2419	58879.6	39.6757	Tcag	300	38	1548.36	2669.07	3032.27	0	3032.27	4316.63	4316.63
47	12.2419	48609.8	39.6757	Tcag	300	38	1304.17	2248.14	2493.51	0	2493.51	3575.32	3575.32
48	24.4838	65262.1	40.7034	Tcag	300	38	910.686	1569.85	1625.34	0	1625.34	2408.75	2408.75
49	15.1533	18855	40.7034	Tcag	300	38	503.609	868.127	727.17	0	727.17	1160.39	1160.39
50	9.33052	3278.33	40.7034	QTp	700	34	439.643	757.861	85.7819	0	85.7819	463.98	463.98

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.72381

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	318.826	1027.34	0	0	0
2	329.142	1026.62	2544.98	866.644	18.8053
3	339.458	1025.9	5612.92	1911.38	18.8054
4	349.774	1024.58	9908.52	3374.16	18.8053
5	360.09	1023.26	16415.9	5590.11	18.8053
6	370.406	1022.24	25413.6	8654.12	18.8053
7	380.722	1021.22	37236.3	12680.1	18.8053
8	391.038	1020.2	51884	17668.1	18.8053
9	401.354	1019.18	69356.7	23618.1	18.8053
10	413.056	1020.85	72530.7	24699	18.8053
11	424.759	1022.52	75726.9	25787.4	18.8053
12	436.461	1024.18	78945.2	26883.3	18.8053
13	448.164	1025.85	82187	27987.3	18.8053
14	459.866	1027.51	85474.4	29106.7	18.8053
15	471.569	1029.17	88789.5	30235.6	18.8053
16	483.271	1030.83	92132.4	31374	18.8053
17	494.974	1032.5	95503	32521.8	18.8053
18	506.729	1034.25	98530.2	33552.6	18.8053
19	518.484	1036.01	101568	34587	18.8053
20	530.24	1037.77	104615	35624.8	18.8054
21	541.995	1039.52	107673	36666.1	18.8054
22	553.751	1041.27	110768	37720	18.8053
23	565.506	1043.03	113874	38777.8	18.8054
24	589.017	1046.53	120120	40904.7	18.8053
25	600.772	1048.28	123260	41973.9	18.8053
26	612.528	1050.03	126411	43047	18.8054
27	636.038	1053.54	132747	45204.6	18.8054
28	647.397	1055.27	135531	46152.5	18.8053
29	658.756	1057.01	138317	47101.1	18.8053
30	670.115	1058.75	141105	48050.6	18.8053
31	681.474	1060.49	143895	49000.9	18.8054
32	692.833	1062.44	145180	49438.3	18.8053
33	704.192	1064.39	146439	49867	18.8053
34	715.551	1066.2	148729	50646.9	18.8053
35	726.909	1068.01	151011	51424.1	18.8054
36	740.764	1070.41	152292	51860.3	18.8054
37	754.619	1072.81	153532	52282.6	18.8054
38	782.328	1077.32	158196	53870.8	18.8054
39	796.183	1079.57	160497	54654.4	18.8054
40	810.038	1081.83	162778	55431	18.8053
41	823.892	1084.08	165038	56200.6	18.8053
42	837.747	1086.34	167273	56961.9	18.8054
43	855.987	1099.07	129848	44217.5	18.8054
44	874.228	1111.81	97028.4	33041.2	18.8053
45	886.47	1121.96	72286.2	24615.7	18.8053
46	898.712	1132.12	51052.7	17385.1	18.8054
47	910.954	1142.27	33327.9	11349.2	18.8053
48	923.195	1152.43	19111.7	6508.13	18.8053
49	947.679	1173.49	649.85	221.294	18.8053
50	962.833	1186.52	-3083.29	-1049.96	18.8054
51	972.163	1194.55	0	0	0

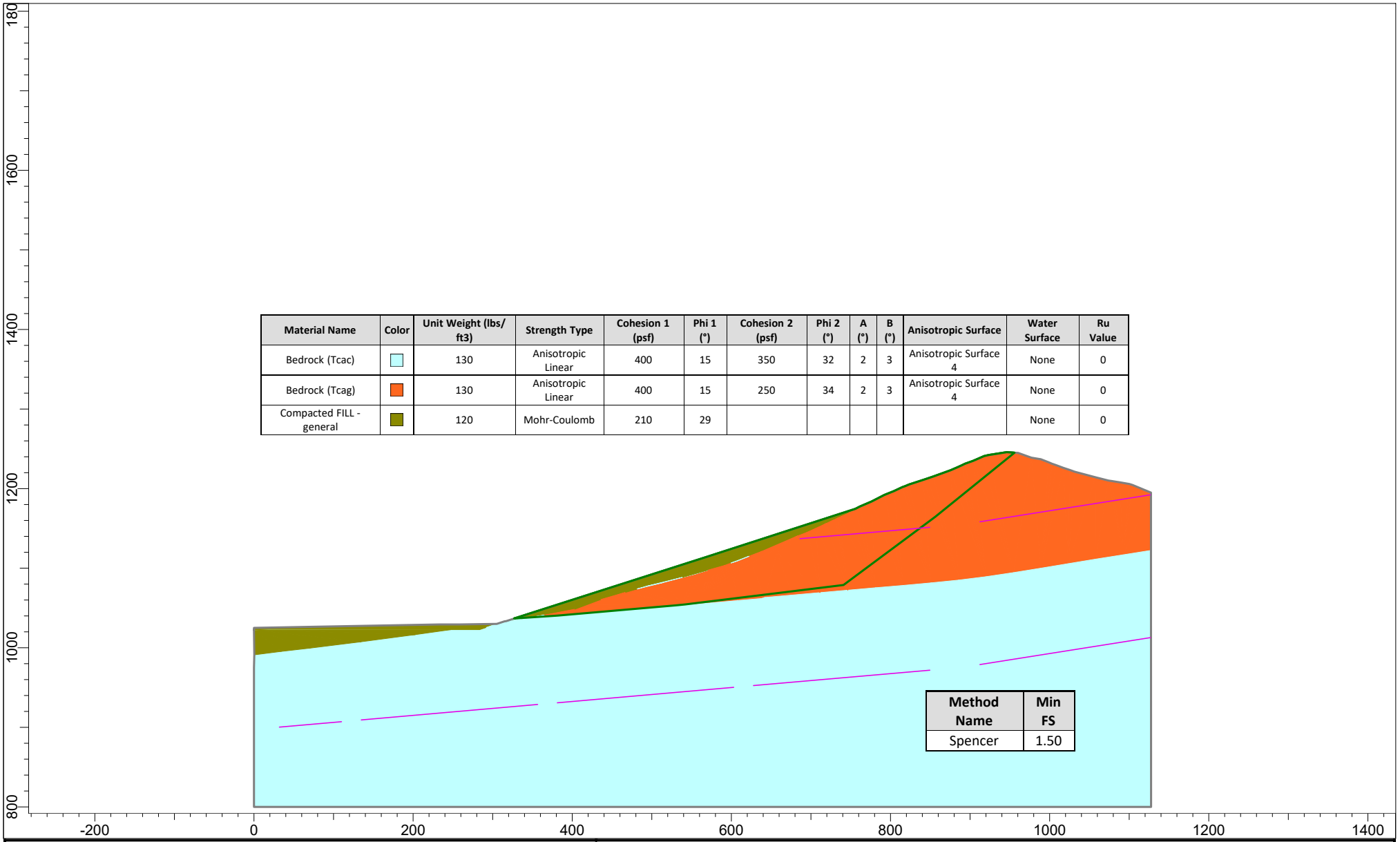
Entity Information

Non-Circular Search (Cuckoo) - Min FS, no Ru

Shared Entities

Type	Coordinates (x,y)
External Boundary	1344.24, 1107.23 1330.5, 1115.74 1315.82, 1124.97 1307.4, 1130.35 1303.88, 1132.71 1301.01, 1134.66 1295.1, 1138.48 1287, 1143.66 1279.32, 1148.57 1272.16, 1153.24 1264.88, 1158.07 1257.46, 1162.89 1249.9, 1167.5 1242.29, 1171.89 1234.72, 1176.37 1227.23, 1180.97 1219.81, 1185.69 1212.39, 1190.4 1204.9, 1195.01 1197.31, 1199.45 1189.64, 1203.75 1181.9, 1207.92 1178.71, 1209.57 1174.09, 1211.96 1166.24, 1215.94 1158.47, 1220.05 1150.88, 1224.48 1143.35, 1229.02 1135.22, 1232.37 1126.74, 1234.75 1118.07, 1236.12 1110.68, 1236.43 996.264, 1201.84 937.906, 1184.19 824.824, 1150 631.244, 1100 439.187, 1049.13 350, 1027.34 14.5154, 1027.34 0, 1031.93 0, 900 1350, 900 1350, 1103.76
Material Boundary	937.906, 1184.19 1000, 1190 1050, 1200 1100, 1200 1150, 1200 1178.71, 1209.57

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (Tcac)		130	Anisotropic Linear	400	15	350	32	2	3	Anisotropic Surface 4	None	0
Bedrock (Tcag)		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 4	None	0
Compacted FILL - general		120	Mohr-Coulomb	210	29						None	0



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 13-13'; Static; Non-circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPCS1E.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/16/2023	Run Number: Run No. 30

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.50269 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.50269 7
Entity Information 8
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SPCS1E

Project Summary

File Name:	SPCS1E.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:03.596s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 13-13'; Static; Non-circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Particle Swarm Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Particles:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Bedrock (Tcac)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	350 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 4
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 4
Water Surface	None
Ru Value	0

Compacted FILL - general	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	120 lbs/ft3
Cohesion	210 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.502690
Axis Location:	432.880, 1769.779
Left Slip Surface Endpoint:	326.896, 1036.705
Right Slip Surface Endpoint:	955.750, 1245.147
Resisting Moment:	1.29141e+09 lb-ft
Driving Moment:	8.59403e+08 lb-ft
Resisting Horizontal Force:	1.57398e+06 lb
Driving Horizontal Force:	1.04745e+06 lb
Total Slice Area:	30929.7 ft2
Surface Horizontal Width:	628.854 ft
Surface Average Height:	49.1842 ft

Global Minimum Coordinates

Method: spencer

X	Y
326.896	1036.7
381.367	1040.33
530.464	1053.25
541.755	1054.44
740.845	1078.86
751.372	1086.67
856.181	1164.53
955.75	1245.15

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	25004
Number of Invalid Surfaces:	47

Error Codes

Error Code -106 reported for 1 surface
Error Code -111 reported for 32 surfaces
Error Code -112 reported for 2 surfaces
Error Code -121 reported for 3 surfaces
Error Code -1000 reported for 9 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-121 = Concave failure surface, only convex surfaces have been defined as being allowed.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.50269

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	19.0689	5534.54	3.81076	Compacted FILL - general	210	29	268.372	403.28	348.686	0	348.686	366.562	366.562
2	0.370097	216.981	3.81076	Bedrock (Tcac)	400	15	385.174	578.797	667.281	0	667.281	692.937	692.937
3	11.6771	9051.88	3.81076	Bedrock (Tcag)	400	15	419.653	630.608	860.636	0	860.636	888.589	888.589
4	11.6771	13332.4	3.81076	Bedrock (Tcag)	400	15	486.561	731.151	1235.87	0	1235.87	1268.28	1268.28
5	11.6771	17648.3	3.81076	Bedrock (Tcag)	400	15	554.022	832.523	1614.2	0	1614.2	1651.1	1651.1
6	14.258	27146.4	4.95306	Bedrock (Tcag)	400	15	621.124	933.357	1990.52	0	1990.52	2044.35	2044.35
7	14.258	33100.5	4.95306	Bedrock (Tcag)	400	15	696.584	1046.75	2413.7	0	2413.7	2474.07	2474.07
8	14.258	39322.4	4.95306	Bedrock (Tcag)	400	15	775.437	1165.24	2855.92	0	2855.92	2923.13	2923.13
9	14.258	45592.5	4.95306	Bedrock (Tcag)	400	15	854.901	1284.65	3301.56	0	3301.56	3375.65	3375.65
10	14.258	51749.3	4.95306	Bedrock (Tcag)	400	15	932.927	1401.9	3739.15	0	3739.15	3820	3820
11	14.258	57851.2	4.95306	Bedrock (Tcag)	400	15	1010.26	1518.11	4172.85	0	4172.85	4260.4	4260.4
12	14.258	63953.1	4.95306	Bedrock (Tcag)	400	15	1087.6	1634.32	4606.54	0	4606.54	4700.79	4700.79
13	12.3228	60188.2	4.95306	Bedrock (Tcac)	400	15	1159.67	1742.63	5010.77	0	5010.77	5111.27	5111.27
14	12.3228	64707.2	4.95306	Bedrock (Tcac)	400	15	1225.94	1842.21	5382.4	0	5382.4	5488.65	5488.65
15	12.3228	69199.5	4.95306	Bedrock (Tcac)	400	15	1291.82	1941.2	5751.84	0	5751.84	5863.79	5863.79
16	12.3228	73691.9	4.95306	Bedrock (Tcac)	400	15	1357.69	2040.19	6121.27	0	6121.27	6238.93	6238.93
17	9.28153	58369.3	5.98788	Bedrock (Tcac)	400	15	1402.26	2107.16	6371.21	0	6371.21	6518.29	6518.29
18	2.00946	12947.4	5.98788	Bedrock (Tcag)	400	15	1429.92	2148.72	6526.3	0	6526.3	6676.28	6676.28
19	13.2727	88110.3	6.99402	Bedrock (Tcag)	400	15	1453.59	2184.3	6659.11	0	6659.11	6837.43	6837.43
20	13.2727	92558.7	6.99402	Bedrock (Tcag)	400	15	1513.09	2273.7	6992.75	0	6992.75	7178.38	7178.38
21	13.2727	97037.2	6.99402	Bedrock (Tcag)	400	15	1572.99	2363.71	7328.65	0	7328.65	7521.62	7521.62
22	13.2727	101560	6.99402	Bedrock (Tcag)	400	15	1633.48	2454.61	7667.92	0	7667.92	7868.32	7868.32
23	13.2727	106202	6.99402	Bedrock (Tcag)	400	15	1695.56	2547.9	8016.03	0	8016.03	8224.04	8224.04
24	13.2727	110893	6.99402	Bedrock (Tcag)	400	15	1758.29	2642.17	8367.88	0	8367.88	8583.59	8583.59
25	13.2727	115584	6.99402	Bedrock (Tcag)	400	15	1821.03	2736.44	8719.73	0	8719.73	8943.13	8943.13
26	13.2727	120298	6.99402	Bedrock (Tcag)	400	15	1884.07	2831.18	9073.3	0	9073.3	9304.44	9304.44
27	13.2727	125076	6.99402	Bedrock (Tcag)	400	15	1947.98	2927.21	9431.66	0	9431.66	9670.63	9670.63
28	13.2727	129857	6.99402	Bedrock (Tcag)	400	15	2011.93	3023.3	9790.31	0	9790.31	10037.1	10037.1
29	13.2727	134639	6.99402	Bedrock (Tcag)	400	15	2075.88	3119.4	10149	0	10149	10403.6	10403.6
30	13.2727	139421	6.99402	Bedrock (Tcag)	400	15	2139.84	3215.51	10507.6	0	10507.6	10770.1	10770.1
31	13.2727	144204	6.99402	Bedrock (Tcag)	400	15	2203.8	3311.63	10866.3	0	10866.3	11136.7	11136.7
32	13.2727	149035	6.99402	Bedrock (Tcag)	400	15	2268.41	3408.72	11228.7	0	11228.7	11507	11507
33	13.2727	153996	6.99402	Bedrock (Tcag)	400	15	2334.75	3508.41	11600.8	0	11600.8	11887.2	11887.2
34	10.5274	121116	36.5461	Bedrock (Tcag)	250	34	3768.9	5663.49	8025.84	0	8025.84	10819.4	10819.4
35	13.1011	143380	36.6093	Bedrock (Tcag)	250	34	3588.99	5393.14	7625.01	0	7625.01	10291.3	10291.3
36	13.1011	136795	36.6093	Bedrock (Tcag)	250	34	3430.78	5155.4	7272.52	0	7272.52	9821.31	9821.31

37	13.1011	130902	36.6093	Bedrock (Tcag)	250	34	3289.18	4942.62	6957.1	0	6957.1	9400.69	9400.69
38	13.1011	124796	36.6093	Bedrock (Tcag)	250	34	3142.44	4722.11	6630.15	0	6630.15	8964.73	8964.73
39	13.1011	117930	36.6093	Bedrock (Tcag)	250	34	2977.47	4474.22	6262.65	0	6262.65	8474.67	8474.67
40	13.1011	110513	36.6093	Bedrock (Tcag)	250	34	2799.23	4206.38	5865.58	0	5865.58	7945.17	7945.17
41	13.1011	101439	36.6093	Bedrock (Tcag)	250	34	2581.22	3878.77	5379.87	0	5379.87	7297.5	7297.5
42	13.1011	92207.4	36.6093	Bedrock (Tcag)	250	34	2359.39	3545.43	4885.67	0	4885.67	6638.5	6638.5
43	12.4461	78921.5	38.996	Bedrock (Tcag)	250	34	2068.85	3108.84	4238.41	0	4238.41	5913.49	5913.49
44	12.4461	70034.2	38.996	Bedrock (Tcag)	250	34	1851.77	2782.64	3754.79	0	3754.79	5254.11	5254.11
45	12.4461	62360.2	38.996	Bedrock (Tcag)	250	34	1664.32	2500.96	3337.19	0	3337.19	4684.74	4684.74
46	12.4461	54387.5	38.996	Bedrock (Tcag)	250	34	1469.58	2208.33	2903.34	0	2903.34	4093.22	4093.22
47	12.4461	46371.3	38.996	Bedrock (Tcag)	250	34	1273.78	1914.09	2467.12	0	2467.12	3498.46	3498.46
48	12.4461	36273.7	38.996	Bedrock (Tcag)	250	34	1027.14	1543.47	1917.64	0	1917.64	2749.28	2749.28
49	12.4461	23156.2	38.996	Bedrock (Tcag)	250	34	706.726	1061.99	1203.82	0	1203.82	1776.03	1776.03
50	12.4461	8650.65	38.996	Bedrock (Tcag)	250	34	368.938	554.4	451.292	0	451.292	750.009	750.009

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.50269

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	326.896	1036.7	0	0	0
2	345.965	1037.97	4672.49	1466.84	17.4287
3	346.335	1038	4798.54	1506.4	17.4286
4	358.012	1038.78	9027.38	2833.97	17.4287
5	369.689	1039.55	13745.3	4315.07	17.4287
6	381.367	1040.33	18956.4	5951	17.4287
7	395.625	1041.57	25349.1	7957.85	17.4287
8	409.883	1042.8	32294.3	10138.2	17.4287
9	424.141	1044.04	39816.9	12499.7	17.4286
10	438.399	1045.28	47921.3	15044	17.4287
11	452.657	1046.51	56597.2	17767.5	17.4286
12	466.915	1047.75	65839.2	20668.9	17.4286
13	481.173	1048.98	75647.5	23748	17.4286
14	493.495	1050.05	84580.7	26552.4	17.4286
15	505.818	1051.12	93933.2	29488.5	17.4287
16	518.141	1052.19	103703	32555.4	17.4286
17	530.464	1053.25	113889	35753.2	17.4286
18	539.745	1054.23	120696	37890.1	17.4286
19	541.755	1054.44	122192	38359.9	17.4287
20	555.027	1056.07	130635	41010.1	17.4286
21	568.3	1057.69	139323	43737.6	17.4286
22	581.573	1059.32	148258	46542.8	17.4287
23	594.845	1060.95	157444	49426.5	17.4287
24	608.118	1062.58	166887	52390.9	17.4287
25	621.391	1064.21	176589	55436.7	17.4287
26	634.663	1065.84	186551	58563.9	17.4286
27	647.936	1067.46	196773	61773	17.4287
28	661.209	1069.09	207260	65065	17.4286
29	674.481	1070.72	218011	68440.1	17.4286
30	687.754	1072.35	229026	71898.2	17.4287
31	701.027	1073.98	240306	75439.3	17.4286
32	714.3	1075.61	251851	79063.5	17.4286
33	727.572	1077.23	263663	82771.6	17.4286
34	740.845	1078.86	275749	86565.8	17.4286
35	751.372	1086.67	252783	79356.2	17.4286
36	764.473	1096.4	225568	70812.7	17.4287
37	777.575	1106.13	199712	62695.7	17.4287
38	790.676	1115.86	175072	54960.4	17.4287
39	803.777	1125.6	151692	47620.8	17.4287
40	816.878	1135.33	129729	40725.9	17.4287
41	829.979	1145.06	109297	34311.6	17.4286
42	843.08	1154.8	90736.8	28485	17.4286
43	856.181	1164.53	74081.8	23256.5	17.4286
44	868.627	1174.61	57108.8	17928.2	17.4287
45	881.073	1184.68	42308.6	13281.9	17.4286
46	893.519	1194.76	29384.6	9224.71	17.4286
47	905.966	1204.84	18409.9	5779.42	17.4286
48	918.412	1214.92	9395.11	2949.41	17.4287
49	930.858	1224.99	2849.07	894.408	17.4286
50	943.304	1235.07	-489.858	-153.781	17.4286
51	955.75	1245.15	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

Shared Entities

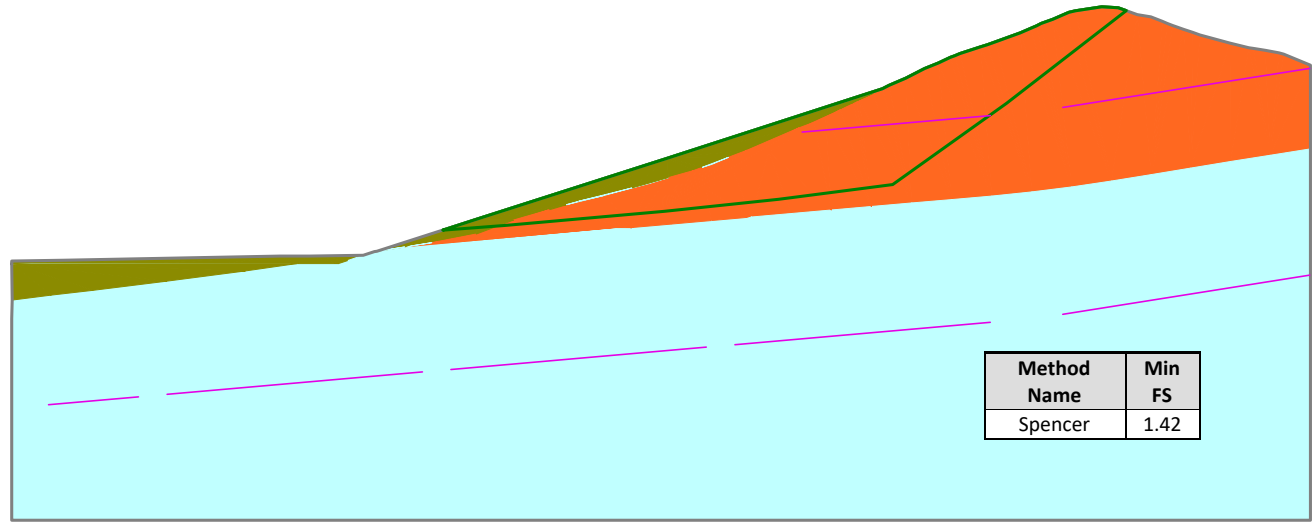
Type	Coordinates (x,y)

External Boundary	0, 1022.42 0.415446, 991.113 0, 975 0, 800 1127.38, 800 1127.32, 1122.33 1127.31, 1195 1104.09, 1204.53 1100.14, 1205.73 1088.08, 1207.86 1077.78, 1209.54 1073.9, 1210.15 1057.48, 1214.21 1031.34, 1221.21 1025.16, 1223.47 1017.15, 1226.11 1007.79, 1229.48 1002.97, 1231.23 998.85, 1233.03 988.783, 1236.92 977.004, 1238.87 960.412, 1244.86 946.232, 1245.73 923.269, 1242.25 917.856, 1240.95 915.438, 1239.97 903.67, 1234.82 893.613, 1231.18 889.485, 1229.2 884.654, 1227.08 875.299, 1222.99 853.871, 1215.27 846.928, 1212.83 840.995, 1210.94 823.087, 1205.12 818.557, 1203.17 814.686, 1201.77 804.372, 1196.93 792.304, 1192.01 776.001, 1183.73 761.521, 1177.46 755.768, 1174.51 569.277, 1114.25 402.406, 1060.89 316.885, 1033.5 314.811, 1033.18 305.111, 1029.95 258.279, 1029.23 232.847, 1029.23 44.994, 1025.74 0, 1025

Material Boundary	537.628, 1054.04 572.4, 1057.08 607.173, 1060.12 641.946, 1063.16 676.718, 1066.2 711.489, 1069.26 746.259, 1072.33 781.032, 1075.36 815.81, 1078.34 850.579, 1081.43 885.303, 1085.01 919.94, 1089.31 954.471, 1094.37 988.933, 1099.93 1023.37, 1105.69 1057.81, 1111.36 1092.29, 1116.8 1127.32, 1122.33
Material Boundary	0, 975 303.882, 975 304.158, 975 304.428, 975 304.704, 975 304.974, 975 305.236, 975 305.492, 975 305.742, 975 305.985, 975 321.113, 975 322.491, 975 323.171, 975 328.948, 975 331.161, 975 335.406, 975 338.233, 975 341.863, 975 345.022, 975 348.32, 975 351.686, 975 354.777, 975 358.285, 975 361.234, 975 364.846, 975 367.691, 975 371.381, 975 374.149, 975 376.537, 975 378.62, 975 380.453, 975 382.077, 975 383.527, 975 537.628, 1054.04 602.747, 1087.44 626.745, 1101.73 657.106, 1119.8 696.748, 1143.39 706.527, 1149.03 717.84, 1155.55

Material Boundary	329.243, 1035.37 329.732, 1035.41 537.628, 1054.04
Material Boundary	599.504, 1106.44 607.604, 1108.94 622.014, 1115
Material Boundary	364.621, 1040.93 336.25, 1036.38 329.732, 1035.41 314.811, 1033.18 537.628, 1054.04 706.527, 1149.03 719.259, 1156.19
Material Boundary	481.417, 1073.84 515.253, 1082.18 554.176, 1092.45 569.821, 1097.28
Material Boundary	403.254, 1048.4 422.903, 1054.37 465.923, 1069.33
Material Boundary	0, 1022.42 247.283, 1022.75 202.722, 1016.43 134.398, 1007.52 70.6001, 999.521 34.2124, 995.365 0.415446, 991.113
Material Boundary	316.885, 1033.5 341.12, 1037.21 364.621, 1040.93 403.254, 1048.4 435.549, 1060.51 465.923, 1069.33 481.417, 1073.84 492.291, 1077 538.377, 1088.4 569.821, 1097.28 591.589, 1103.43 599.504, 1106.44 622.014, 1115 638.387, 1121.22 683.14, 1140.55 717.84, 1155.55 719.259, 1156.19 730.737, 1162.7 733.444, 1163.95 735.758, 1165.24 747.63, 1170.34 755.768, 1174.51
Material Boundary	0, 1022.42 40.581, 1022.75 122.788, 1022.75 184.055, 1022.75 247.283, 1022.75 283.545, 1022.75 291.975, 1025.57 305.111, 1029.95

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
Bedrock (Tcac)		130	Anisotropic Linear	400	24	350	32	2	3	Anisotropic Surface 4	None	0
Bedrock (Tcag)		130	Anisotropic Linear	400	24	250	34	2	3	Anisotropic Surface 4	None	0
Compacted FILL - general		120	Mohr-Coulomb	210	29						None	0



Method Name	Min FS
Spencer	1.42

SLIDEINTERPRET 9.029

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

Analysis Description	Cross-Section 13-13'; Pseudo-Static; Non-circular		
Client	Solstra Communities California, LLC	*Drawn By*	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	*File Name*	SPCS1E_s.slmd
		Scale	1:2000
Project No.: 23-2195s-1	*Date:* 10/16/2023	*Run Number*	Run No. 31

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 2
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Global Minimum Coordinates 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
        Error Code Descriptions 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.42378 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.42378 7
Entity Information 8
    Non-Circular Search (Cuckoo) 8
        Shared Entities 8

Slide2 Analysis Information

SPCS1E_s

Project Summary

File Name:	SPCS1E_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:03.577s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 13-13'; Pseudo-Static; Non-circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Search Method:	Particle Swarm Search
Initial # of Surface Vertices:	8
Maximum Iterations:	500
Number of Particles:	50
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined
Convex Surfaces Only:	Enabled

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Bedrock (Tcac)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	350 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 4
Water Surface	None
Ru Value	0

Bedrock (Tcag)	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 4
Water Surface	None
Ru Value	0

Compacted FILL - general	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	120 lbs/ft3
Cohesion	210 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.423780
Axis Location:	480.227, 1740.389
Left Slip Surface Endpoint:	374.089, 1051.820
Right Slip Surface Endpoint:	967.400, 1242.337
Resisting Moment:	1.37268e+09 lb-ft
Driving Moment:	9.64106e+08 lb-ft
Resisting Horizontal Force:	1.84176e+06 lb
Driving Horizontal Force:	1.29357e+06 lb
Total Slice Area:	28378.9 ft2
Surface Horizontal Width:	593.311 ft
Surface Average Height:	47.8314 ft

Global Minimum Coordinates

Method: spencer

X	Y
374.089	1051.82
429.076	1055.95
566.915	1068.17
665.713	1078.65
764.683	1091.32
863.56	1161.93
873.459	1169.56
967.4	1242.34

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	25027
Number of Invalid Surfaces:	24

Error Codes

Error Code -111 reported for 12 surfaces
Error Code -112 reported for 7 surfaces
Error Code -1000 reported for 5 surfaces

Error Code Descriptions

The following errors were encountered during the computation:
-111 = Safety factor equation did not converge
-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.
-1000 = No valid slip surface is generated

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.42378

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	11.9685	2107.71	4.29199	Compacted FILL - general	210	29	241.825	344.306	242.295	0	242.295	260.444	260.444
2	11.9685	6323.12	4.29199	Compacted FILL - general	210	29	387.879	552.255	617.444	0	617.444	646.554	646.554
3	11.9685	10536.9	4.29199	Compacted FILL - general	210	29	533.875	760.121	992.441	0	992.441	1032.51	1032.51

4	11.9685	14744.5	4.29199	Compacted FILL - general	210	29	679.659	967.685	1366.9	0	1366.9	1417.91	1417.91
5	7.11251	10831	4.29199	Bedrock (Tcag)	400	24	806.148	1147.78	1679.53	0	1679.53	1740.04	1740.04
6	11.4866	20821.9	5.06962	Bedrock (Tcag)	400	24	892.285	1270.42	1954.99	0	1954.99	2034.14	2034.14
7	11.4866	24764.8	5.06962	Bedrock (Tcag)	400	24	1002.31	1427.07	2306.83	0	2306.83	2395.75	2395.75
8	11.4866	28690	5.06962	Bedrock (Tcag)	400	24	1111.84	1583.02	2657.1	0	2657.1	2755.74	2755.74
9	11.4866	32615.2	5.06962	Bedrock (Tcag)	400	24	1221.38	1738.97	3007.37	0	3007.37	3115.72	3115.72
10	11.4866	36540.4	5.06962	Bedrock (Tcag)	400	24	1330.9	1894.91	3357.64	0	3357.64	3475.7	3475.7
11	11.4866	40458.5	5.06962	Bedrock (Tcag)	400	24	1440.24	2050.58	3707.27	0	3707.27	3835.04	3835.04
12	11.4866	44334	5.06962	Bedrock (Tcag)	400	24	1548.39	2204.56	4053.1	0	4053.1	4190.46	4190.46
13	11.4866	48202.2	5.06962	Bedrock (Tcag)	400	24	1656.32	2358.24	4398.29	0	4398.29	4545.22	4545.22
14	11.4866	52070.4	5.06962	Bedrock (Tcag)	400	24	1764.27	2511.93	4743.47	0	4743.47	4899.99	4899.99
15	11.4866	55944.1	5.06962	Bedrock (Tcag)	400	24	1872.36	2665.83	5089.13	0	5089.13	5255.24	5255.24
16	11.4866	59852.3	5.06962	Bedrock (Tcag)	400	24	1981.42	2821.1	5437.89	0	5437.89	5613.66	5613.66
17	11.4866	63766.7	5.06962	Bedrock (Tcag)	400	24	2090.65	2976.62	5787.19	0	5787.19	5972.66	5972.66
18	12.3498	72772.9	6.05245	Bedrock (Tcag)	400	24	2173.14	3094.08	6051	0	6051	6281.42	6281.42
19	12.3498	77013.7	6.05245	Bedrock (Tcag)	400	24	2281.76	3248.72	6398.33	0	6398.33	6640.27	6640.27
20	12.3498	81330.6	6.05245	Bedrock (Tcag)	400	24	2392.32	3406.14	6751.9	0	6751.9	7005.56	7005.56
21	12.3498	85721.7	6.05245	Bedrock (Tcag)	400	24	2504.79	3566.27	7111.56	0	7111.56	7377.14	7377.14
22	12.3498	90112.9	6.05245	Bedrock (Tcag)	400	24	2617.26	3726.4	7471.21	0	7471.21	7748.72	7748.72
23	12.3498	94505.8	6.05245	Bedrock (Tcag)	400	24	2729.77	3886.59	7831	0	7831	8120.44	8120.44
24	12.3498	98951.2	6.05245	Bedrock (Tcag)	400	24	2843.62	4048.69	8195.12	0	8195.12	8496.63	8496.63
25	12.3498	103421	6.05245	Bedrock (Tcag)	400	24	2958.1	4211.69	8561.17	0	8561.17	8874.82	8874.82
26	12.3712	107864	7.29413	Bedrock (Tcag)	400	24	3019.17	4298.63	8756.46	0	8756.46	9142.91	9142.91
27	12.3712	111912	7.29413	Bedrock (Tcag)	400	24	3120.97	4443.57	9081.99	0	9081.99	9481.47	9481.47
28	12.3712	115961	7.29413	Bedrock (Tcag)	400	24	3222.79	4588.54	9407.6	0	9407.6	9820.11	9820.11
29	12.3712	120010	7.29413	Bedrock (Tcag)	400	24	3324.6	4733.5	9733.2	0	9733.2	10158.7	10158.7
30	12.3712	124108	7.29413	Bedrock (Tcag)	400	24	3427.64	4880.21	10062.7	0	10062.7	10501.5	10501.5
31	12.3712	128318	7.29413	Bedrock (Tcag)	400	24	3533.5	5030.92	10401.2	0	10401.2	10853.5	10853.5
32	12.3712	132403	7.29413	Bedrock (Tcag)	400	24	3636.23	5177.19	10729.7	0	10729.7	11195.2	11195.2
33	12.3712	137402	7.29413	Bedrock (Tcag)	400	24	3761.92	5356.15	11131.7	0	11131.7	11613.2	11613.2
34	12.3596	137826	35.5316	Bedrock (Tcag)	250	34	3679.5	5238.8	7396.22	0	7396.22	10023.9	10023.9
35	12.3596	133105	35.5316	Bedrock (Tcag)	250	34	3558.9	5067.09	7141.61	0	7141.61	9683.11	9683.11
36	12.3596	128422	35.5316	Bedrock (Tcag)	250	34	3439.22	4896.69	6889.03	0	6889.03	9345.07	9345.07
37	12.3596	122775	35.5316	Bedrock (Tcag)	250	34	3294.95	4691.28	6584.44	0	6584.44	8937.45	8937.45
38	12.3596	117115	35.5316	Bedrock (Tcag)	250	34	3150.33	4485.38	6279.21	0	6279.21	8528.94	8528.94
39	12.3596	109855	35.5316	Bedrock (Tcag)	250	34	2964.84	4221.28	5887.67	0	5887.67	8004.94	8004.94

40	12.3596	102122	35.5316	Bedrock (Tcag)	250	34	2767.26	3939.97	5470.6	0	5470.6	7446.78	7446.78
41	12.3596	94836.1	35.5316	Bedrock (Tcag)	250	34	2581.09	3674.91	5077.64	0	5077.64	6920.86	6920.86
42	9.89923	70519	37.6443	Bedrock (Tcag)	250	34	2328.83	3315.74	4545.15	0	4545.15	6341.47	6341.47
43	11.7426	77317.1	37.7637	Bedrock (Tcag)	250	34	2160.17	3075.61	4189.15	0	4189.15	5862.56	5862.56
44	11.7426	71331.4	37.7637	Bedrock (Tcag)	250	34	2004.95	2854.61	3861.49	0	3861.49	5414.66	5414.66
45	11.7426	64549.8	37.7637	Bedrock (Tcag)	250	34	1829.08	2604.21	3490.27	0	3490.27	4907.19	4907.19
46	11.7426	58168.2	37.7637	Bedrock (Tcag)	250	34	1663.59	2368.59	3140.94	0	3140.94	4429.67	4429.67
47	11.7426	49123.6	37.7637	Bedrock (Tcag)	250	34	1429.04	2034.64	2645.84	0	2645.84	3752.87	3752.87
48	11.7426	38000.5	37.7637	Bedrock (Tcag)	250	34	1140.59	1623.95	2036.97	0	2036.97	2920.54	2920.54
49	11.7426	25602.3	37.7637	Bedrock (Tcag)	250	34	819.07	1166.18	1358.29	0	1358.29	1992.79	1992.79
50	11.7426	9739.92	37.7637	Bedrock (Tcag)	250	34	433.831	617.68	545.108	0	545.108	881.182	881.182

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.42378

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	374.089	1051.82	0	0	0
2	386.058	1052.72	2464.68	1020.56	22.4932
3	398.026	1053.62	5918.17	2450.55	22.4931
4	409.995	1054.51	10360.1	4289.83	22.4931
5	421.963	1055.41	15789	6537.78	22.4931
6	429.076	1055.95	19540.7	8091.28	22.4931
7	440.562	1056.97	25711.5	10646.4	22.4931
8	452.049	1057.98	32392.7	13412.9	22.4931
9	463.536	1059	39582.1	16389.9	22.4932
10	475.022	1060.02	47279.8	19577.3	22.4931
11	486.509	1061.04	55485.5	22975.1	22.4932
12	497.996	1062.06	64198.6	26582.9	22.4931
13	509.482	1063.08	73413.4	30398.5	22.4931
14	520.969	1064.1	83129	34421.5	22.4931
15	532.455	1065.12	93345.5	38651.8	22.4931
16	543.942	1066.14	104063	43089.8	22.4932
17	555.429	1067.16	115287	47737.3	22.4932
18	566.915	1068.17	127018	52594.7	22.4931
19	579.265	1069.48	138644	57408.7	22.4931
20	591.615	1070.79	150732	62414	22.4931
21	603.965	1072.1	163290	67614	22.4931
22	616.314	1073.41	176327	73012	22.4931
23	628.664	1074.72	189841	78608.1	22.4931
24	641.014	1076.03	203835	84402.3	22.4931
25	653.364	1077.34	218312	90397	22.4931
26	665.713	1078.65	233276	96593.3	22.4931
27	678.085	1080.23	245959	101845	22.4931
28	690.456	1081.82	258981	107237	22.4931
29	702.827	1083.4	272341	112769	22.4931
30	715.198	1084.98	286040	118441	22.4931
31	727.569	1086.57	300082	124256	22.4931
32	739.941	1088.15	314475	130216	22.4932
33	752.312	1089.73	329211	136317	22.4931
34	764.683	1091.32	344364	142592	22.4931
35	777.043	1100.14	310758	128677	22.4932
36	789.402	1108.97	278382	115270	22.493
37	801.762	1117.8	247225	102369	22.4931
38	814.122	1126.62	217539	90076.9	22.4931
39	826.481	1135.45	189326	78394.7	22.4931
40	838.841	1144.28	163003	67495.1	22.4931
41	851.2	1153.1	138694	57429.3	22.4931
42	863.56	1161.93	116281	48149	22.4932
43	873.459	1169.56	97568.5	40400.5	22.4931
44	885.202	1178.66	77085.4	31919	22.4931
45	896.944	1187.76	58359.5	24165.1	22.4931
46	908.687	1196.85	41624.3	17235.5	22.4931
47	920.43	1205.95	26762.5	11081.6	22.4931
48	932.172	1215.05	14555.7	6027.14	22.4932
49	943.915	1224.14	5614.21	2324.69	22.4931
50	955.657	1233.24	312.247	129.293	22.4931
51	967.4	1242.34	0	0	0

Entity Information

Non-Circular Search (Cuckoo)

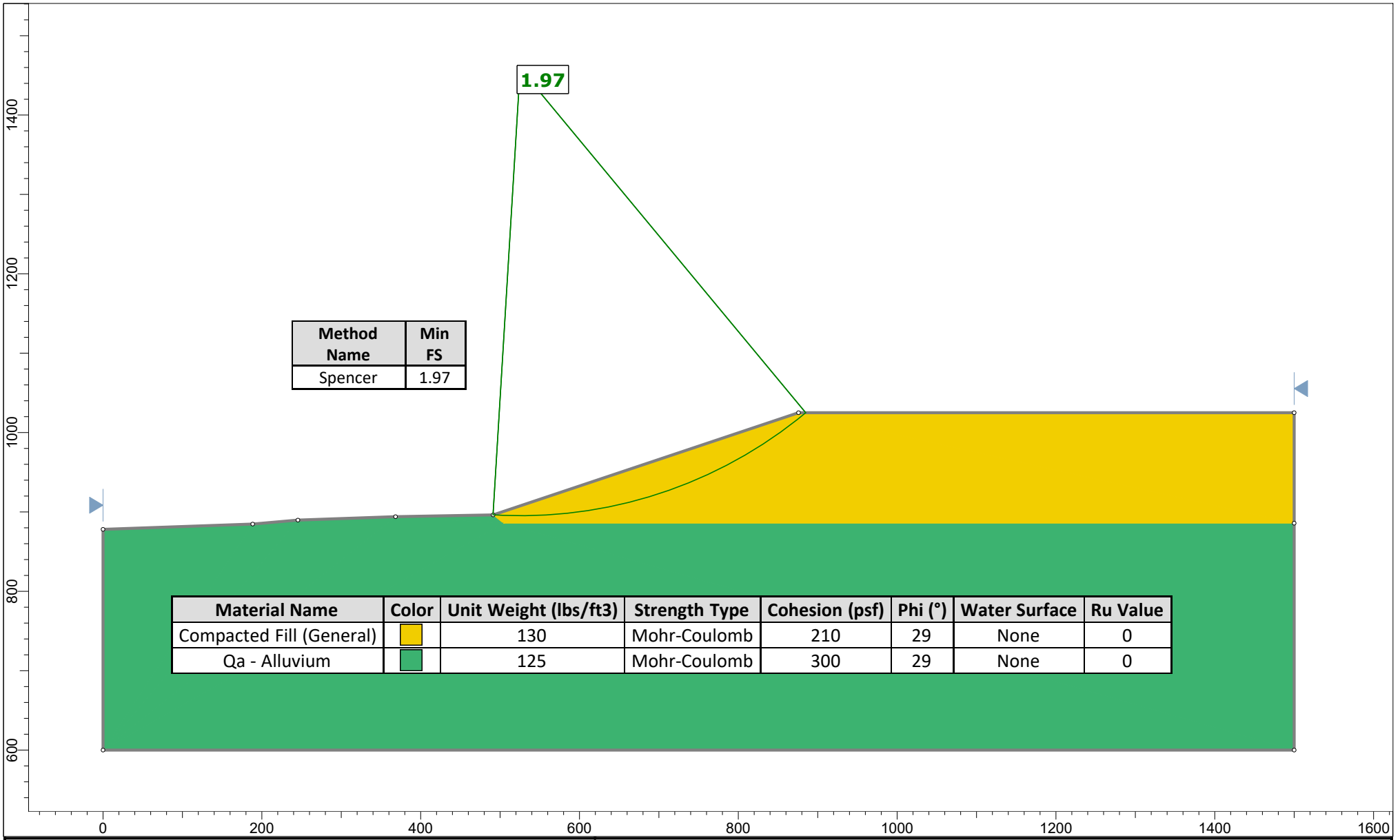
Shared Entities

Type	Coordinates (x,y)

External Boundary	0, 1022.42 0.415446, 991.113 0, 975 0, 800 1127.38, 800 1127.32, 1122.33 1127.31, 1195 1104.09, 1204.53 1100.14, 1205.73 1088.08, 1207.86 1077.78, 1209.54 1073.9, 1210.15 1057.48, 1214.21 1031.34, 1221.21 1025.16, 1223.47 1017.15, 1226.11 1007.79, 1229.48 1002.97, 1231.23 998.85, 1233.03 988.783, 1236.92 977.004, 1238.87 960.412, 1244.86 946.232, 1245.73 923.269, 1242.25 917.856, 1240.95 915.438, 1239.97 903.67, 1234.82 893.613, 1231.18 889.485, 1229.2 884.654, 1227.08 875.299, 1222.99 853.871, 1215.27 846.928, 1212.83 840.995, 1210.94 823.087, 1205.12 818.557, 1203.17 814.686, 1201.77 804.372, 1196.93 792.304, 1192.01 776.001, 1183.73 761.521, 1177.46 755.768, 1174.51 569.277, 1114.25 402.406, 1060.89 316.885, 1033.5 314.811, 1033.18 305.111, 1029.95 258.279, 1029.23 232.847, 1029.23 44.994, 1025.74 0, 1025

Material Boundary	537.628, 1054.04 572.4, 1057.08 607.173, 1060.12 641.946, 1063.16 676.718, 1066.2 711.489, 1069.26 746.259, 1072.33 781.032, 1075.36 815.81, 1078.34 850.579, 1081.43 885.303, 1085.01 919.94, 1089.31 954.471, 1094.37 988.933, 1099.93 1023.37, 1105.69 1057.81, 1111.36 1092.29, 1116.8 1127.32, 1122.33
Material Boundary	0, 975 303.882, 975 304.158, 975 304.428, 975 304.704, 975 304.974, 975 305.236, 975 305.492, 975 305.742, 975 305.985, 975 321.113, 975 322.491, 975 323.171, 975 328.948, 975 331.161, 975 335.406, 975 338.233, 975 341.863, 975 345.022, 975 348.32, 975 351.686, 975 354.777, 975 358.285, 975 361.234, 975 364.846, 975 367.691, 975 371.381, 975 374.149, 975 376.537, 975 378.62, 975 380.453, 975 382.077, 975 383.527, 975 537.628, 1054.04 602.747, 1087.44 626.745, 1101.73 657.106, 1119.8 696.748, 1143.39 706.527, 1149.03 717.84, 1155.55

Material Boundary	329.243, 1035.37 329.732, 1035.41 537.628, 1054.04
Material Boundary	599.504, 1106.44 607.604, 1108.94 622.014, 1115
Material Boundary	364.621, 1040.93 336.25, 1036.38 329.732, 1035.41 314.811, 1033.18 537.628, 1054.04 706.527, 1149.03 719.259, 1156.19
Material Boundary	481.417, 1073.84 515.253, 1082.18 554.176, 1092.45 569.821, 1097.28
Material Boundary	403.254, 1048.4 422.903, 1054.37 465.923, 1069.33
Material Boundary	0, 1022.42 247.283, 1022.75 202.722, 1016.43 134.398, 1007.52 70.6001, 999.521 34.2124, 995.365 0.415446, 991.113
Material Boundary	316.885, 1033.5 341.12, 1037.21 364.621, 1040.93 403.254, 1048.4 435.549, 1060.51 465.923, 1069.33 481.417, 1073.84 492.291, 1077 538.377, 1088.4 569.821, 1097.28 591.589, 1103.43 599.504, 1106.44 622.014, 1115 638.387, 1121.22 683.14, 1140.55 717.84, 1155.55 719.259, 1156.19 730.737, 1162.7 733.444, 1163.95 735.758, 1165.24 747.63, 1170.34 755.768, 1174.51
Material Boundary	0, 1022.42 40.581, 1022.75 122.788, 1022.75 184.055, 1022.75 247.283, 1022.75 283.545, 1022.75 291.975, 1025.57 305.111, 1029.95



Method Name	Min FS
Spencer	1.97

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Compacted Fill (General)		130	Mohr-Coulomb	210	29	None	0
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 14-14', Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill.slmd
		Scale	1:2000
Project No.: 23-2195s-1	Date: 10/13/2023	Run Number	Run No. 32

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.96728 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.96728 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.105s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Compacted Fill (General)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	210 psf
Phi	29 °
Water Surface	None
Ru Value	0

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.967280
Center:	525.237, 1458.651
Radius:	563.407
Left Slip Surface Endpoint:	491.202, 896.273
Right Slip Surface Endpoint:	884.923, 1025.000
Resisting Moment:	5.04328e+08 lb-ft
Driving Moment:	2.56358e+08 lb-ft
Resisting Horizontal Force:	840892 lb
Driving Horizontal Force:	427438 lb
Total Slice Area:	11553.8 ft2
Surface Horizontal Width:	393.721 ft
Surface Average Height:	29.3451 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	13045
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.96728

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	7.87443	1555.26	-3.06234	Compacted Fill (General)	210	29	182.45	358.931	268.678	0	268.678	258.917	258.917
2	7.87443	4628.18	-2.26066	Compacted Fill (General)	210	29	305.025	600.069	703.704	0	703.704	691.662	691.662
3	7.87443	7588.18	-1.45942	Compacted Fill (General)	210	29	420.842	827.914	1114.75	0	1114.75	1104.02	1104.02
4	7.87443	10435.4	-0.65846	Compacted Fill (General)	210	29	530.09	1042.84	1502.47	0	1502.47	1496.38	1496.38
5	7.87443	13169.9	0.142366	Compacted Fill (General)	210	29	632.945	1245.18	1867.52	0	1867.52	1869.09	1869.09
6	7.87443	15791.7	0.943219	Compacted Fill (General)	210	29	729.581	1435.29	2210.48	0	2210.48	2222.49	2222.49
7	7.87443	18300.9	1.74426	Compacted Fill (General)	210	29	820.148	1613.46	2531.9	0	2531.9	2556.87	2556.87
8	7.87443	20697.1	2.54564	Compacted Fill (General)	210	29	904.792	1779.98	2832.33	0	2832.33	2872.56	2872.56
9	7.87443	22980.4	3.34751	Compacted Fill (General)	210	29	983.663	1935.14	3112.23	0	3112.23	3169.76	3169.76
10	7.87443	25150.4	4.15005	Compacted Fill (General)	210	29	1056.88	2079.18	3372.09	0	3372.09	3448.78	3448.78
11	7.87443	27206.9	4.9534	Compacted Fill (General)	210	29	1124.58	2212.36	3612.35	0	3612.35	3709.81	3709.81
12	7.87443	29149.4	5.75773	Compacted Fill (General)	210	29	1186.87	2334.9	3833.41	0	3833.41	3953.09	3953.09
13	7.87443	30977.5	6.5632	Compacted Fill (General)	210	29	1243.85	2447.01	4035.67	0	4035.67	4178.78	4178.78
14	7.87443	32690.7	7.36998	Compacted Fill (General)	210	29	1295.65	2548.9	4219.5	0	4219.5	4387.08	4387.08
15	7.87443	34288.3	8.17822	Compacted Fill (General)	210	29	1342.35	2640.77	4385.24	0	4385.24	4578.15	4578.15
16	7.87443	35769.8	8.98811	Compacted Fill (General)	210	29	1384.04	2722.8	4533.21	0	4533.21	4752.13	4752.13
17	7.87443	37134.3	9.79982	Compacted Fill (General)	210	29	1420.82	2795.15	4663.73	0	4663.73	4909.14	4909.14
18	7.87443	38381.1	10.6135	Compacted Fill (General)	210	29	1452.76	2857.98	4777.09	0	4777.09	5049.32	5049.32
19	7.87443	39509.2	11.4294	Compacted Fill (General)	210	29	1479.94	2911.46	4873.56	0	4873.56	5172.76	5172.76
20	7.87443	40517.7	12.2476	Compacted Fill (General)	210	29	1502.44	2955.72	4953.4	0	4953.4	5279.54	5279.54
21	7.87443	41405.4	13.0684	Compacted Fill (General)	210	29	1520.32	2990.89	5016.85	0	5016.85	5369.76	5369.76
22	7.87443	42171.2	13.8919	Compacted Fill (General)	210	29	1533.65	3017.11	5064.16	0	5064.16	5443.47	5443.47
23	7.87443	42813.9	14.7183	Compacted Fill (General)	210	29	1542.48	3034.49	5095.52	0	5095.52	5500.71	5500.71
24	7.87443	43332	15.5479	Compacted Fill (General)	210	29	1546.88	3043.15	5111.15	0	5111.15	5541.53	5541.53
25	7.87443	43724.1	16.3809	Compacted Fill (General)	210	29	1546.91	3043.2	5111.22	0	5111.22	5565.94	5565.94

26	7.87443	43988.5	17.2174	Compacted Fill (General)	210	29	1542.6	3034.72	5095.93	0	5095.93	5573.96	5573.96
27	7.87443	44123.7	18.0577	Compacted Fill (General)	210	29	1534.01	3017.82	5065.43	0	5065.43	5565.57	5565.57
28	7.87443	44127.8	18.9021	Compacted Fill (General)	210	29	1521.17	2992.57	5019.9	0	5019.9	5540.78	5540.78
29	7.87443	43998.8	19.7507	Compacted Fill (General)	210	29	1504.14	2959.07	4959.46	0	4959.46	5499.52	5499.52
30	7.87443	43734.6	20.6039	Compacted Fill (General)	210	29	1482.96	2917.39	4884.26	0	4884.26	5441.78	5441.78
31	7.87443	43333	21.4619	Compacted Fill (General)	210	29	1457.65	2867.6	4794.43	0	4794.43	5367.49	5367.49
32	7.87443	42791.6	22.325	Compacted Fill (General)	210	29	1428.25	2809.76	4690.09	0	4690.09	5276.58	5276.58
33	7.87443	42107.9	23.1934	Compacted Fill (General)	210	29	1394.78	2743.93	4571.33	0	4571.33	5168.94	5168.94
34	7.87443	41279	24.0676	Compacted Fill (General)	210	29	1357.3	2670.18	4438.27	0	4438.27	5044.5	5044.5
35	7.87443	40302.1	24.9477	Compacted Fill (General)	210	29	1315.8	2588.55	4291.01	0	4291.01	4903.12	4903.12
36	7.87443	39174	25.8342	Compacted Fill (General)	210	29	1270.33	2499.09	4129.62	0	4129.62	4744.66	4744.66
37	7.87443	37891.4	26.7273	Compacted Fill (General)	210	29	1220.9	2401.85	3954.2	0	3954.2	4568.98	4568.98
38	7.87443	36450.6	27.6275	Compacted Fill (General)	210	29	1167.53	2296.86	3764.8	0	3764.8	4375.88	4375.88
39	7.87443	34847.7	28.5352	Compacted Fill (General)	210	29	1110.25	2184.17	3561.5	0	3561.5	4165.2	4165.2
40	7.87443	33078.6	29.4508	Compacted Fill (General)	210	29	1049.06	2063.8	3344.34	0	3344.34	3936.68	3936.68
41	7.87443	31138.8	30.3747	Compacted Fill (General)	210	29	983.993	1935.79	3113.41	0	3113.41	3690.13	3690.13
42	7.87443	29023.5	31.3075	Compacted Fill (General)	210	29	915.055	1800.17	2868.74	0	2868.74	3425.26	3425.26
43	7.87443	26727.5	32.2496	Compacted Fill (General)	210	29	842.259	1656.96	2610.38	0	2610.38	3141.8	3141.8
44	7.87443	24245.1	33.2015	Compacted Fill (General)	210	29	765.615	1506.18	2338.36	0	2338.36	2839.4	2839.4
45	7.87443	21570.4	34.1639	Compacted Fill (General)	210	29	685.139	1347.86	2052.74	0	2052.74	2517.73	2517.73
46	7.87443	18696.6	35.1375	Compacted Fill (General)	210	29	600.836	1182.01	1753.56	0	1753.56	2176.42	2176.42
47	7.87443	15616.8	36.1228	Compacted Fill (General)	210	29	512.721	1008.67	1440.83	0	1440.83	1815.03	1815.03
48	7.87443	12323	37.1206	Compacted Fill (General)	210	29	420.803	827.838	1114.61	0	1114.61	1433.1	1433.1
49	7.87443	8772.95	38.1318	Compacted Fill (General)	210	29	324.212	637.815	771.798	0	771.798	1026.3	1026.3
50	7.87443	3282.13	39.1572	Compacted Fill (General)	210	29	184.609	363.177	276.339	0	276.339	426.673	426.673

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.96728

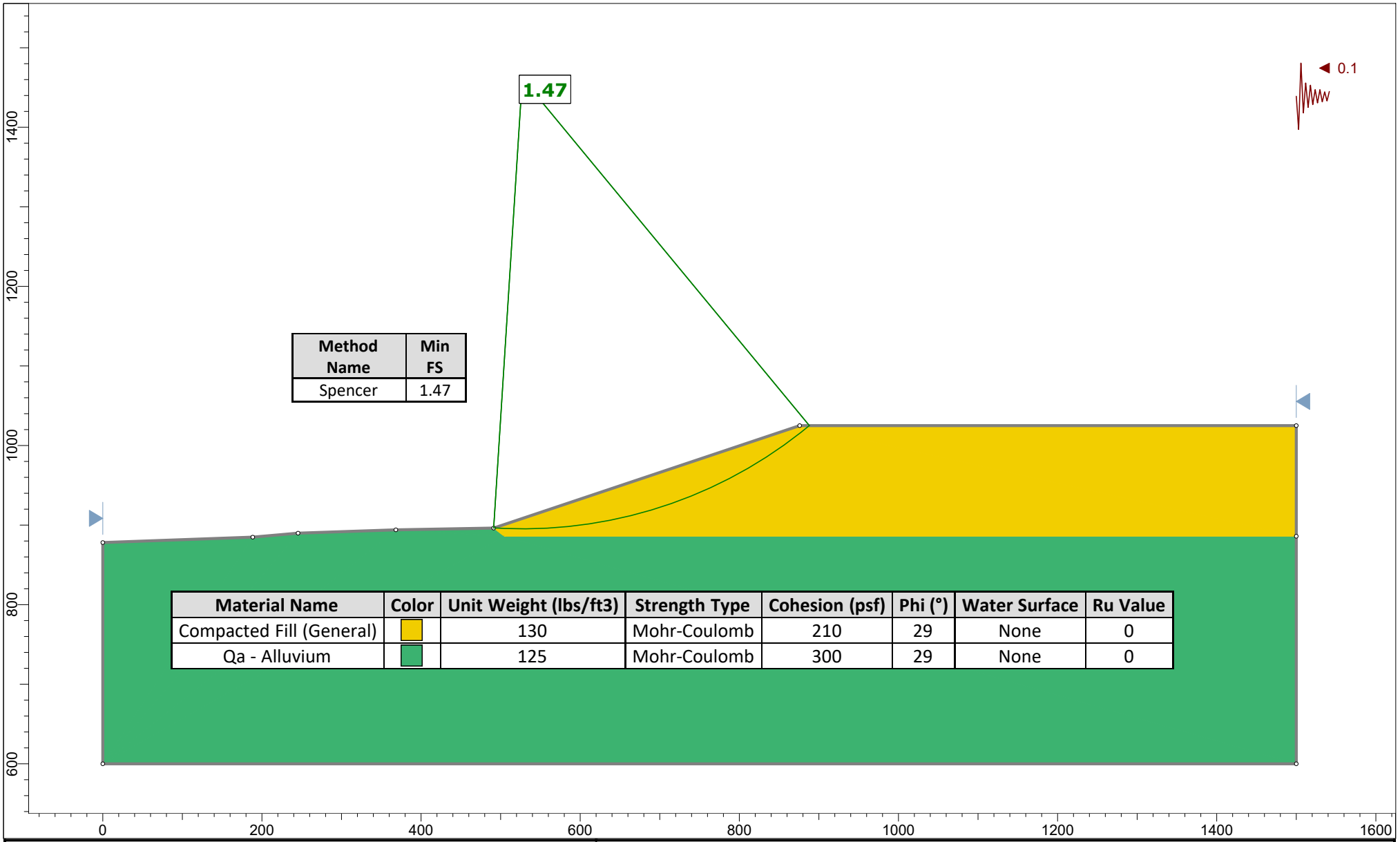
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.202	896.273	0	0	0
2	499.076	895.852	1549.56	487.935	17.4785
3	506.95	895.541	4169.67	1312.97	17.4785
4	514.825	895.34	7706.45	2426.66	17.4785
5	522.699	895.25	12015.6	3783.56	17.4786
6	530.574	895.269	16962.1	5341.13	17.4785
7	538.448	895.399	22419.3	7059.52	17.4785
8	546.323	895.639	28268.9	8901.48	17.4785
9	554.197	895.989	34400.4	10832.2	17.4785
10	562.071	896.449	40711	12819.3	17.4785
11	569.946	897.021	47104.8	14832.7	17.4785
12	577.82	897.703	53492.9	16844.2	17.4785
13	585.695	898.497	59793	18828	17.4785
14	593.569	899.403	65929.3	20760.2	17.4785
15	601.444	900.422	71831.9	22618.9	17.4785
16	609.318	901.553	77437.1	24383.9	17.4785
17	617.192	902.799	82687	26037	17.4785
18	625.067	904.159	87529.4	27561.8	17.4785
19	632.941	905.635	91917.5	28943.6	17.4785
20	640.816	907.226	95810	30169.3	17.4785
21	648.69	908.936	99171.1	31227.6	17.4785
22	656.565	910.764	101970	32109	17.4785
23	664.439	912.711	104181	32805.2	17.4785
24	672.313	914.78	105784	33310.1	17.4786
25	680.188	916.971	106765	33618.8	17.4785
26	688.062	919.285	107112	33728.1	17.4785
27	695.937	921.725	106821	33636.6	17.4786
28	703.811	924.293	105894	33344.4	17.4784
29	711.686	926.989	104334	32853.3	17.4785
30	719.56	929.816	102153	32166.7	17.4786
31	727.434	932.777	99368.9	31289.9	17.4785
32	735.309	935.873	96001.9	30229.7	17.4785
33	743.183	939.106	92080.4	28994.9	17.4785
34	751.058	942.48	87637.8	27595.9	17.4785
35	758.932	945.997	82713.6	26045.4	17.4785
36	766.807	949.66	77353.8	24357.7	17.4785
37	774.681	953.473	71610.7	22549.2	17.4785
38	782.555	957.438	65543.5	20638.8	17.4785
39	790.43	961.559	59218.6	18647.1	17.4785
40	798.304	965.841	52709.9	16597.6	17.4785
41	806.179	970.287	46099.1	14516	17.4785
42	814.053	974.903	39476.6	12430.7	17.4786
43	821.928	979.692	32941.8	10372.9	17.4785
44	829.802	984.66	26603.4	8377.05	17.4785
45	837.676	989.813	20580.8	6480.62	17.4785
46	845.551	995.157	15004.4	4724.67	17.4785
47	853.425	1000.7	10016.4	3154.04	17.4786
48	861.3	1006.45	5772.56	1817.7	17.4785
49	869.174	1012.41	2442.51	769.113	17.4785
50	877.049	1018.59	224.116	70.5711	17.4785
51	884.923	1025	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959



Method Name	Min FS
Spencer	1.47

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Compacted Fill (General)		130	Mohr-Coulomb	210	29	None	0
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 14-14', Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 33

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.47426 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.47426 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.287s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Compacted Fill (General)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	210 psf
Phi	29 °
Water Surface	None
Ru Value	0

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.474260
Center:	527.155, 1461.579
Radius:	566.447
Left Slip Surface Endpoint:	491.231, 896.273
Right Slip Surface Endpoint:	888.071, 1025.000
Resisting Moment:	5.09187e+08 lb-ft
Driving Moment:	3.45384e+08 lb-ft
Resisting Horizontal Force:	846014 lb
Driving Horizontal Force:	573856 lb
Total Slice Area:	11937.1 ft2
Surface Horizontal Width:	396.84 ft
Surface Average Height:	30.0805 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12589
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.47426

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	7.93679	1602.18	-3.23767	Compacted Fill (General)	210	29	264.064	389.299	323.464	0	323.464	308.526	308.526
2	7.93679	4748.69	-2.43025	Compacted Fill (General)	210	29	437.351	644.769	784.345	0	784.345	765.783	765.783
3	7.93679	7779.88	-1.62692	Compacted Fill (General)	210	29	599.765	884.209	1216.31	0	1216.31	1199.27	1199.27
4	7.93679	10696.2	-0.823908	Compacted Fill (General)	210	29	751.726	1108.24	1620.47	0	1620.47	1609.66	1609.66
5	7.93679	13497.7	-0.0210572	Compacted Fill (General)	210	29	893.628	1317.44	1997.87	0	1997.87	1997.54	1997.54
6	7.93679	16184.4	0.781789	Compacted Fill (General)	210	29	1025.83	1512.34	2349.48	0	2349.48	2363.48	2363.48
7	7.93679	18756.4	1.58479	Compacted Fill (General)	210	29	1148.68	1693.45	2676.22	0	2676.22	2708	2708
8	7.93679	21213.5	2.3881	Compacted Fill (General)	210	29	1262.49	1861.24	2978.92	0	2978.92	3031.57	3031.57
9	7.93679	23555.5	3.19188	Compacted Fill (General)	210	29	1367.57	2016.16	3258.4	0	3258.4	3334.66	3334.66
10	7.93679	25782.2	3.99629	Compacted Fill (General)	210	29	1464.21	2158.62	3515.4	0	3515.4	3617.69	3617.69
11	7.93679	27893.3	4.8015	Compacted Fill (General)	210	29	1552.65	2289.01	3750.63	0	3750.63	3881.05	3881.05
12	7.93679	29888.5	5.60765	Compacted Fill (General)	210	29	1633.16	2407.7	3964.76	0	3964.76	4125.11	4125.11
13	7.93679	31767.2	6.41492	Compacted Fill (General)	210	29	1705.97	2515.05	4158.42	0	4158.42	4350.23	4350.23
14	7.93679	33529	7.22347	Compacted Fill (General)	210	29	1771.31	2611.37	4332.19	0	4332.19	4556.7	4556.7
15	7.93679	35173.3	8.03347	Compacted Fill (General)	210	29	1829.38	2696.98	4486.63	0	4486.63	4744.83	4744.83
16	7.93679	36699.4	8.84508	Compacted Fill (General)	210	29	1880.37	2772.16	4622.27	0	4622.27	4914.88	4914.88
17	7.93679	38106.5	9.6585	Compacted Fill (General)	210	29	1924.49	2837.2	4739.6	0	4739.6	5067.12	5067.12
18	7.93679	39393.8	10.4739	Compacted Fill (General)	210	29	1961.9	2892.35	4839.08	0	4839.08	5201.78	5201.78
19	7.93679	40560.5	11.2914	Compacted Fill (General)	210	29	1992.76	2937.85	4921.18	0	4921.18	5319.06	5319.06
20	7.93679	41605.4	12.1113	Compacted Fill (General)	210	29	2017.25	2973.95	4986.29	0	4986.29	5419.17	5419.17
21	7.93679	42527.6	12.9337	Compacted Fill (General)	210	29	2035.5	3000.85	5034.83	0	5034.83	5502.28	5502.28
22	7.93679	43325.8	13.7588	Compacted Fill (General)	210	29	2047.66	3018.78	5067.16	0	5067.16	5568.55	5568.55
23	7.93679	43998.8	14.5868	Compacted Fill (General)	210	29	2053.86	3027.92	5083.66	0	5083.66	5618.14	5618.14
24	7.93679	44545.2	15.418	Compacted Fill (General)	210	29	2054.22	3028.46	5084.64	0	5084.64	5651.16	5651.16
25	7.93679	44963.4	16.2525	Compacted Fill (General)	210	29	2048.89	3020.59	5070.43	0	5070.43	5667.72	5667.72

26	7.93679	45252	17.0906	Compacted Fill (General)	210	29	2037.94	3004.46	5041.34	0	5041.34	5667.93	5667.93
27	7.93679	45409.2	17.9324	Compacted Fill (General)	210	29	2021.52	2980.25	4997.66	0	4997.66	5651.85	5651.85
28	7.93679	45433.1	18.7783	Compacted Fill (General)	210	29	1999.72	2948.1	4939.66	0	4939.66	5619.57	5619.57
29	7.93679	45321.8	19.6284	Compacted Fill (General)	210	29	1972.62	2908.15	4867.6	0	4867.6	5571.12	5571.12
30	7.93679	45073.1	20.4831	Compacted Fill (General)	210	29	1940.34	2860.56	4781.74	0	4781.74	5506.55	5506.55
31	7.93679	44684.8	21.3426	Compacted Fill (General)	210	29	1902.95	2805.44	4682.29	0	4682.29	5425.85	5425.85
32	7.93679	44154.5	22.2071	Compacted Fill (General)	210	29	1860.54	2742.92	4569.51	0	4569.51	5329.06	5329.06
33	7.93679	43479.6	23.077	Compacted Fill (General)	210	29	1813.19	2673.12	4443.59	0	4443.59	5216.12	5216.12
34	7.93679	42657.2	23.9525	Compacted Fill (General)	210	29	1760.99	2596.16	4304.75	0	4304.75	5087.05	5087.05
35	7.93679	41684.5	24.834	Compacted Fill (General)	210	29	1704.01	2512.15	4153.18	0	4153.18	4941.77	4941.77
36	7.93679	40558.2	25.7219	Compacted Fill (General)	210	29	1642.3	2421.18	3989.06	0	3989.06	4780.22	4780.22
37	7.93679	39275	26.6165	Compacted Fill (General)	210	29	1575.94	2323.35	3812.59	0	3812.59	4602.33	4602.33
38	7.93679	37831.2	27.5181	Compacted Fill (General)	210	29	1505.01	2218.77	3623.93	0	3623.93	4407.99	4407.99
39	7.93679	36222.8	28.4271	Compacted Fill (General)	210	29	1429.55	2107.53	3423.24	0	3423.24	4197.07	4197.07
40	7.93679	34445.6	29.344	Compacted Fill (General)	210	29	1349.63	1989.71	3210.69	0	3210.69	3969.43	3969.43
41	7.93679	32495.1	30.2693	Compacted Fill (General)	210	29	1265.31	1865.4	2986.42	0	2986.42	3724.9	3724.9
42	7.93679	30366.5	31.2034	Compacted Fill (General)	210	29	1176.64	1734.68	2750.6	0	2750.6	3463.3	3463.3
43	7.93679	28054.4	32.1467	Compacted Fill (General)	210	29	1083.69	1597.64	2503.36	0	2503.36	3184.39	3184.39
44	7.93679	25553.2	33.1	Compacted Fill (General)	210	29	986.495	1454.35	2244.85	0	2244.85	2887.94	2887.94
45	7.93679	22856.7	34.0637	Compacted Fill (General)	210	29	885.115	1304.89	1975.22	0	1975.22	2573.67	2573.67
46	7.93679	19958.2	35.0385	Compacted Fill (General)	210	29	779.602	1149.34	1694.6	0	1694.6	2241.27	2241.27
47	7.93679	16850.6	36.0251	Compacted Fill (General)	210	29	670.012	987.772	1403.14	0	1403.14	1890.38	1890.38
48	7.93679	13526	37.0242	Compacted Fill (General)	210	29	556.396	820.273	1100.96	0	1100.96	1520.61	1520.61
49	7.93679	9567.11	38.0366	Compacted Fill (General)	210	29	426.103	628.186	754.428	0	754.428	1087.77	1087.77
50	7.93679	3323.17	39.0632	Compacted Fill (General)	210	29	233.055	343.583	240.99	0	240.99	430.14	430.14

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.47426

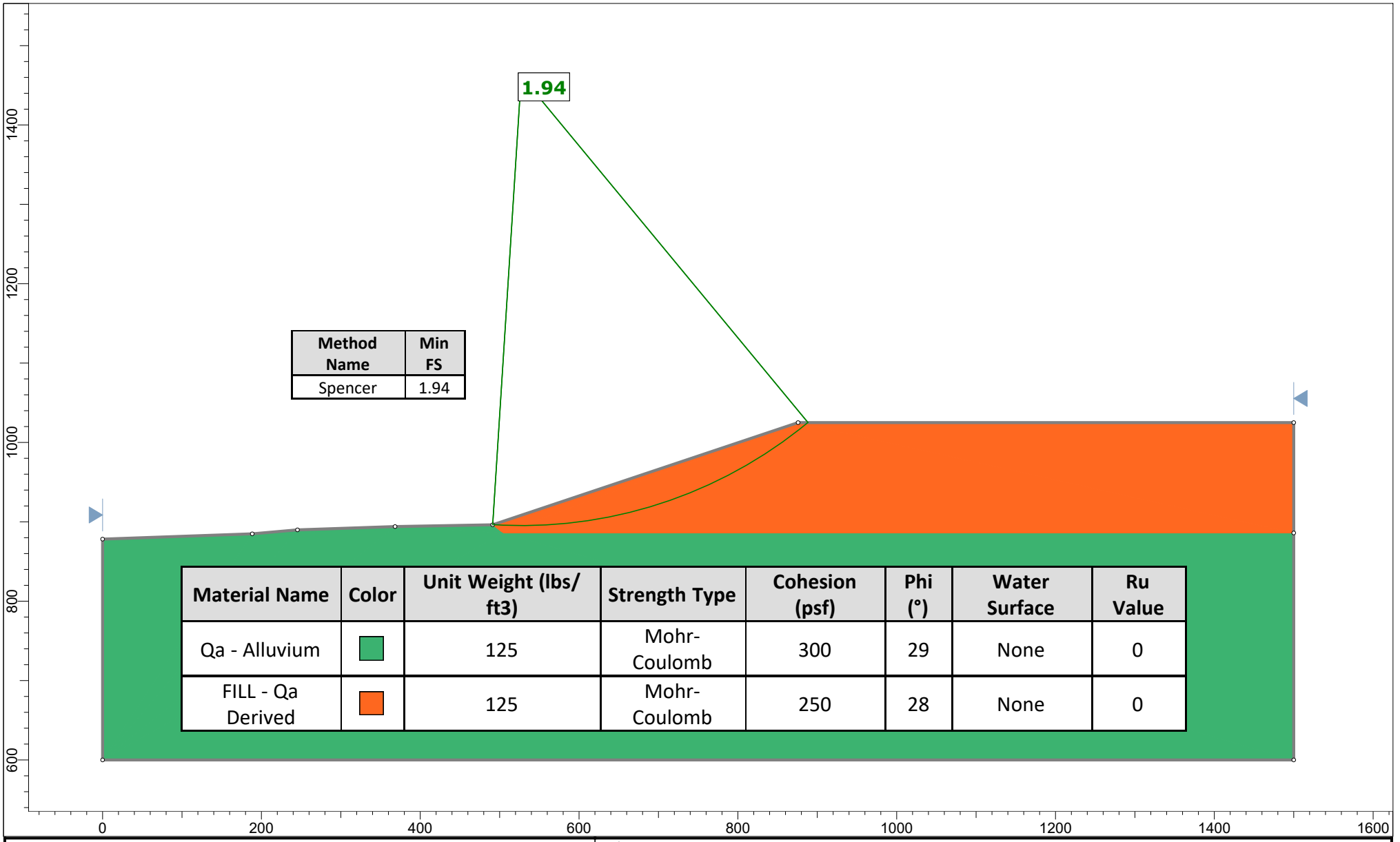
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.231	896.273	0	0	0
2	499.168	895.824	2082.83	866.982	22.5996
3	507.104	895.488	5346.63	2225.55	22.5997
4	515.041	895.262	9607.57	3999.18	22.5997
5	522.978	895.148	14694.9	6116.79	22.5996
6	530.915	895.145	20450.2	8512.46	22.5997
7	538.852	895.253	26726.9	11125.1	22.5996
8	546.788	895.473	33389.1	13898.3	22.5996
9	554.725	895.804	40311.4	16779.7	22.5996
10	562.662	896.247	47378.1	19721.3	22.5997
11	570.599	896.801	54482.8	22678.6	22.5996
12	578.536	897.468	61527.8	25611.1	22.5996
13	586.472	898.247	68423.7	28481.5	22.5996
14	594.409	899.139	75089	31256	22.5997
15	602.346	900.145	81450.1	33903.8	22.5996
16	610.283	901.266	87440.1	36397.2	22.5997
17	618.22	902.501	92999.7	38711.4	22.5997
18	626.156	903.851	98075.9	40824.4	22.5997
19	634.093	905.319	102622	42716.8	22.5997
20	642.03	906.903	106599	44372.1	22.5996
21	649.967	908.606	109972	45776.1	22.5996
22	657.904	910.429	112713	46917.1	22.5997
23	665.84	912.372	114800	47785.8	22.5996
24	673.777	914.438	116217	48375.5	22.5996
25	681.714	916.627	116952	48681.7	22.5997
26	689.651	918.941	117001	48702.1	22.5997
27	697.588	921.381	116364	48436.9	22.5997
28	705.524	923.949	115046	47888.4	22.5997
29	713.461	926.648	113060	47061.4	22.5996
30	721.398	929.478	110420	45962.8	22.5997
31	729.335	932.443	107151	44601.9	22.5997
32	737.272	935.544	103279	42990.3	22.5997
33	745.208	938.784	98839.1	41142	22.5996
34	753.145	942.166	93869.5	39073.4	22.5996
35	761.082	945.692	88416	36803.4	22.5997
36	769.019	949.365	82529.9	34353.3	22.5997
37	776.955	953.188	76269.1	31747.2	22.5996
38	784.892	957.166	69697.6	29011.8	22.5996
39	792.829	961.3	62886.6	26176.7	22.5996
40	800.766	965.597	55914	23274.4	22.5997
41	808.703	970.059	48865.5	20340.4	22.5997
42	816.639	974.691	41834.5	17413.7	22.5996
43	824.576	979.498	34922.5	14536.6	22.5997
44	832.513	984.486	28240	11755	22.5997
45	840.45	989.66	21907	9118.85	22.5997
46	848.387	995.026	16053.3	6682.25	22.5997
47	856.323	1000.59	10819.8	4503.79	22.5997
48	864.26	1006.36	6359.05	2646.97	22.5996
49	872.197	1012.35	2836.23	1180.59	22.5997
50	880.134	1018.56	580.329	241.563	22.5996
51	888.071	1025	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959



Method Name	Min FS
Spencer	1.94

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Qa Derived		125	Mohr-Coulomb	250	28	None	0

SLIDEINTERPRET 9.029

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

Analysis Description	Cross-Section 14-14', Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number: Run No. 34

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.94079 4
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.94079 6
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.84s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Qa Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	250 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.940790
Center:	527.265, 1461.787
Radius:	566.663
Left Slip Surface Endpoint:	491.202, 896.273
Right Slip Surface Endpoint:	888.269, 1025.000
Resisting Moment:	4.96881e+08 lb-ft
Driving Moment:	2.5602e+08 lb-ft
Resisting Horizontal Force:	823634 lb
Driving Horizontal Force:	424381 lb
Total Slice Area:	11961.2 ft2
Surface Horizontal Width:	397.067 ft
Surface Average Height:	30.124 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12729
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.94079

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	7.94134	1533.77	-3.24671	FILL - Qa Derived	250	28	203.39	394.738	272.213	0	272.213	260.675	260.675

2	7.94134	4564.2	-2.44274	FILL - Qa Derived	250	28	319.56	620.198	696.241	0	696.241	682.609	682.609
3	7.94134	7483.85	-1.63925	FILL - Qa Derived	250	28	429.379	833.335	1097.09	0	1097.09	1084.81	1084.81
4	7.94134	10292.9	-0.836077	FILL - Qa Derived	250	28	533.025	1034.49	1475.41	0	1475.41	1467.63	1467.63
5	7.94134	12991.4	-0.0330711	FILL - Qa Derived	250	28	630.661	1223.98	1831.79	0	1831.79	1831.43	1831.43
6	7.94134	15579.4	0.769928	FILL - Qa Derived	250	28	722.443	1402.11	2166.81	0	2166.81	2176.51	2176.51
7	7.94134	18056.9	1.57308	FILL - Qa Derived	250	28	808.521	1569.17	2480.99	0	2480.99	2503.19	2503.19
8	7.94134	20423.8	2.37654	FILL - Qa Derived	250	28	889.025	1725.41	2774.84	0	2774.84	2811.73	2811.73
9	7.94134	22679.9	3.18047	FILL - Qa Derived	250	28	964.087	1871.09	3048.84	0	3048.84	3102.41	3102.41
10	7.94134	24825	3.98502	FILL - Qa Derived	250	28	1033.83	2006.45	3303.4	0	3303.4	3375.42	3375.42
11	7.94134	26858.8	4.79036	FILL - Qa Derived	250	28	1098.37	2131.71	3538.98	0	3538.98	3631.03	3631.03
12	7.94134	28781	5.59666	FILL - Qa Derived	250	28	1157.82	2247.08	3755.96	0	3755.96	3869.41	3869.41
13	7.94134	30591	6.40406	FILL - Qa Derived	250	28	1212.26	2352.75	3954.71	0	3954.71	4090.77	4090.77
14	7.94134	32288.5	7.21275	FILL - Qa Derived	250	28	1261.82	2448.92	4135.58	0	4135.58	4295.27	4295.27
15	7.94134	33872.8	8.02288	FILL - Qa Derived	250	28	1306.56	2535.76	4298.89	0	4298.89	4483.05	4483.05
16	7.94134	35343.4	8.83464	FILL - Qa Derived	250	28	1346.58	2613.43	4444.98	0	4444.98	4654.27	4654.27
17	7.94134	36699.4	9.64818	FILL - Qa Derived	250	28	1381.96	2682.1	4574.11	0	4574.11	4809.04	4809.04
18	7.94134	37940.1	10.4637	FILL - Qa Derived	250	28	1412.78	2741.9	4686.58	0	4686.58	4947.49	4947.49
19	7.94134	39064.6	11.2814	FILL - Qa Derived	250	28	1439.09	2792.98	4782.64	0	4782.64	5069.71	5069.71
20	7.94134	40071.9	12.1014	FILL - Qa Derived	250	28	1460.99	2835.47	4862.55	0	4862.55	5175.8	5175.8
21	7.94134	40961.1	12.9239	FILL - Qa Derived	250	28	1478.51	2869.48	4926.53	0	4926.53	5265.8	5265.8
22	7.94134	41730.9	13.7491	FILL - Qa Derived	250	28	1491.73	2895.14	4974.79	0	4974.79	5339.79	5339.79
23	7.94134	42380.2	14.5773	FILL - Qa Derived	250	28	1500.71	2912.56	5007.54	0	5007.54	5397.81	5397.81
24	7.94134	42907.5	15.4086	FILL - Qa Derived	250	28	1505.48	2921.83	5024.98	0	5024.98	5439.9	5439.9
25	7.94134	43311.6	16.2432	FILL - Qa Derived	250	28	1506.11	2923.05	5027.28	0	5027.28	5466.08	5466.08
26	7.94134	43590.7	17.0814	FILL - Qa Derived	250	28	1502.64	2916.31	5014.61	0	5014.61	5476.34	5476.34
27	7.94134	43743.4	17.9233	FILL - Qa Derived	250	28	1495.11	2901.7	4987.13	0	4987.13	5470.71	5470.71
28	7.94134	43767.8	18.7693	FILL - Qa Derived	250	28	1483.57	2879.29	4944.98	0	4944.98	5449.15	5449.15
29	7.94134	43662	19.6196	FILL - Qa Derived	250	28	1468.04	2849.16	4888.31	0	4888.31	5411.62	5411.62
30	7.94134	43424	20.4744	FILL - Qa Derived	250	28	1448.57	2811.37	4817.24	0	4817.24	5358.09	5358.09
31	7.94134	43051.6	21.3339	FILL - Qa Derived	250	28	1425.18	2765.98	4731.88	0	4731.88	5288.51	5288.51
32	7.94134	42542.4	22.1986	FILL - Qa Derived	250	28	1397.92	2713.07	4632.35	0	4632.35	5202.79	5202.79
33	7.94134	41894.1	23.0686	FILL - Qa Derived	250	28	1366.79	2652.66	4518.76	0	4518.76	5100.86	5100.86
34	7.94134	41103.8	23.9442	FILL - Qa Derived	250	28	1331.84	2584.83	4391.18	0	4391.18	4982.6	4982.6
35	7.94134	40168.8	24.8259	FILL - Qa Derived	250	28	1293.09	2509.61	4249.71	0	4249.71	4847.91	4847.91
36	7.94134	39086	25.7139	FILL - Qa Derived	250	28	1250.55	2427.05	4094.43	0	4094.43	4696.65	4696.65
37	7.94134	37852.1	26.6085	FILL - Qa Derived	250	28	1204.24	2337.18	3925.41	0	3925.41	4528.67	4528.67
38	7.94134	36463.5	27.5102	FILL - Qa Derived	250	28	1154.18	2240.03	3742.71	0	3742.71	4343.8	4343.8

39	7.94134	34916.6	28.4194	FILL - Qa Derived	250	28	1100.4	2135.64	3546.38	0	3546.38	4141.85	4141.85
40	7.94134	33207.2	29.3364	FILL - Qa Derived	250	28	1042.89	2024.04	3336.49	0	3336.49	3922.61	3922.61
41	7.94134	31331	30.2618	FILL - Qa Derived	250	28	981.688	1905.25	3113.08	0	3113.08	3685.85	3685.85
42	7.94134	29283.2	31.196	FILL - Qa Derived	250	28	916.786	1779.29	2876.18	0	2876.18	3431.32	3431.32
43	7.94134	27058.9	32.1395	FILL - Qa Derived	250	28	848.201	1646.18	2625.83	0	2625.83	3158.72	3158.72
44	7.94134	24652.5	33.0928	FILL - Qa Derived	250	28	775.942	1505.94	2362.09	0	2362.09	2867.78	2867.78
45	7.94134	22058.2	34.0566	FILL - Qa Derived	250	28	700.019	1358.59	2084.96	0	2084.96	2558.13	2558.13
46	7.94134	19269.5	35.0315	FILL - Qa Derived	250	28	620.437	1204.14	1794.47	0	1794.47	2229.42	2229.42
47	7.94134	16279.4	36.0182	FILL - Qa Derived	250	28	537.202	1042.6	1490.65	0	1490.65	1881.22	1881.22
48	7.94134	13080.5	37.0174	FILL - Qa Derived	250	28	450.322	873.981	1173.54	0	1173.54	1513.09	1513.09
49	7.94134	9235.51	38.0299	FILL - Qa Derived	250	28	349.008	677.352	803.732	0	803.732	1076.7	1076.7
50	7.94134	3198.27	39.0567	FILL - Qa Derived	250	28	200.104	388.36	260.216	0	260.216	422.586	422.586

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.94079

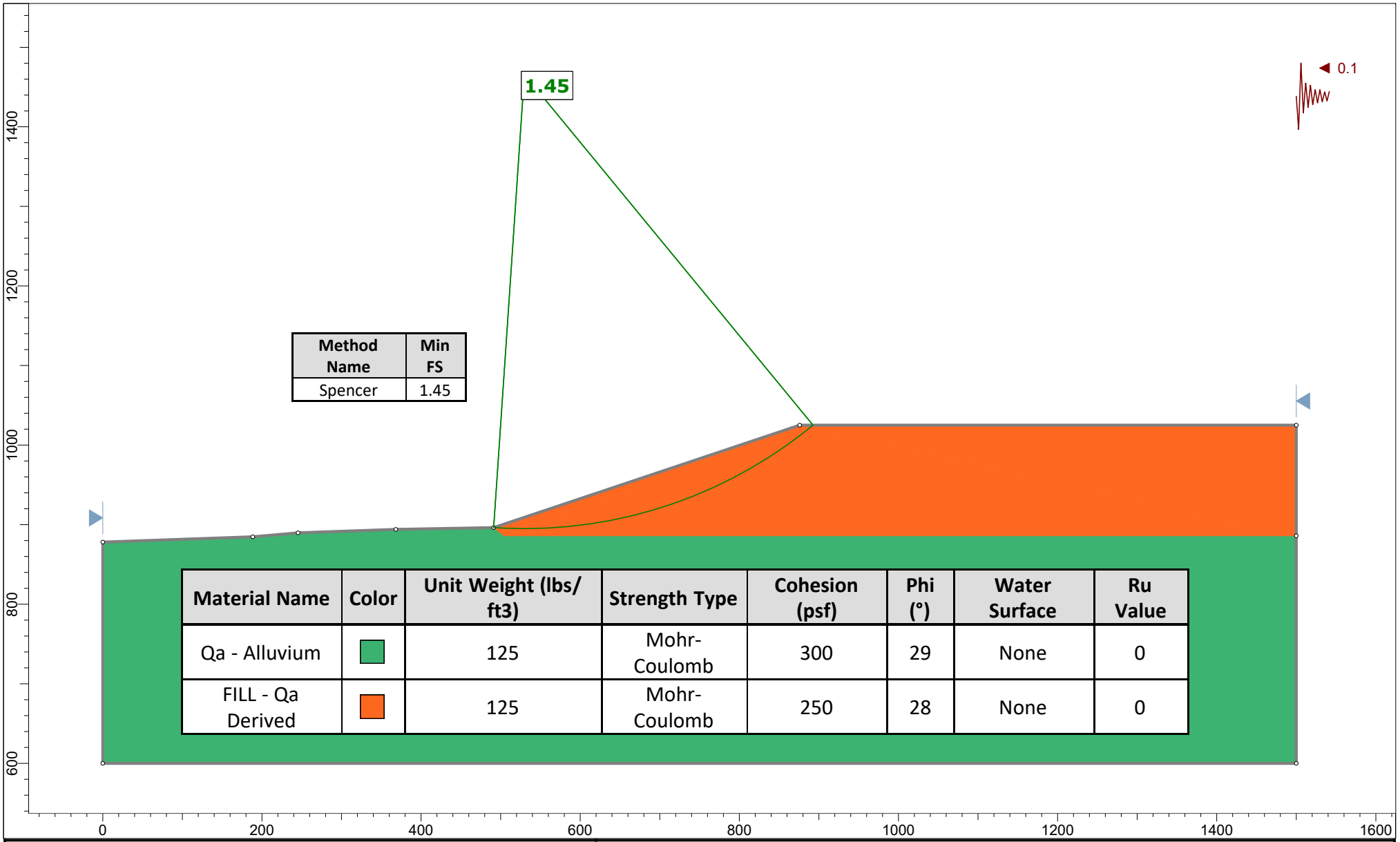
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.202	896.273	0	0	0
2	499.143	895.822	1737.46	541.008	17.2955
3	507.084	895.484	4510.48	1404.47	17.2955
4	515.026	895.256	8168.89	2543.63	17.2956
5	522.967	895.14	12571.9	3914.62	17.2955
6	530.908	895.136	17587.4	5476.36	17.2955
7	538.85	895.243	23092.1	7190.4	17.2955
8	546.791	895.461	28970.3	9020.75	17.2955
9	554.732	895.79	35114.2	10933.8	17.2955
10	562.674	896.232	41423.2	12898.4	17.2956
11	570.615	896.785	47803.9	14885.2	17.2956
12	578.556	897.45	54169.2	16867.2	17.2955
13	586.498	898.228	60438.9	18819.5	17.2956
14	594.439	899.12	66538.8	20718.8	17.2955
15	602.38	900.125	72400.8	22544.1	17.2955
16	610.322	901.244	77962.4	24275.9	17.2955
17	618.263	902.478	83167.3	25896.6	17.2955
18	626.204	903.828	87964.2	27390.2	17.2955
19	634.146	905.295	92307.4	28742.7	17.2956
20	642.087	906.879	96156.8	29941.3	17.2955
21	650.028	908.582	99477	30975.1	17.2955
22	657.97	910.404	102238	31834.9	17.2956
23	665.911	912.347	104415	32512.8	17.2956
24	673.852	914.413	105989	33002.7	17.2955
25	681.794	916.601	106943	33300	17.2956
26	689.735	918.915	107270	33401.6	17.2955
27	697.677	921.355	106963	33306.2	17.2956
28	705.618	923.924	106024	33013.7	17.2955
29	713.559	926.622	104458	32526.1	17.2955
30	721.501	929.453	102275	31846.5	17.2956
31	729.442	932.418	99492.9	30980	17.2955
32	737.383	935.52	96131.7	29933.5	17.2956
33	745.325	938.761	92219.1	28715.1	17.2955
34	753.266	942.143	87787.8	27335.3	17.2955
35	761.207	945.669	82876.8	25806.1	17.2955
36	769.149	949.343	77530.8	24141.5	17.2955
37	777.09	953.167	71801.4	22357.5	17.2955
38	785.031	957.145	65746.4	20472.1	17.2955
39	792.973	961.281	59431.1	18505.6	17.2955
40	800.914	965.579	52927.8	16480.6	17.2955
41	808.855	970.042	46316.8	14422.1	17.2955
42	816.797	974.675	39686.7	12357.6	17.2955
43	824.738	979.484	33134.9	10317.5	17.2955
44	832.679	984.473	26768.4	8335.13	17.2955
45	840.621	989.648	20704.1	6446.84	17.2955
46	848.562	995.016	15070.1	4692.51	17.2955
47	856.503	1000.58	10006	3115.68	17.2956
48	864.445	1006.36	5664.76	1763.89	17.2955
49	872.386	1012.35	2212.96	689.069	17.2955
50	880.327	1018.56	-8.17288	-2.54487	17.2955
51	888.269	1025	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959



Method Name	Min FS
Spencer	1.45

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Qa Derived		125	Mohr-Coulomb	250	28	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 14-14', Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number: Run No. 35

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.45473 4
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.45473 6
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.374s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Qa Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	250 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.454730
Center:	529.863, 1465.850
Radius:	570.889
Left Slip Surface Endpoint:	491.185, 896.273
Right Slip Surface Endpoint:	892.583, 1025.000
Resisting Moment:	5.07786e+08 lb-ft
Driving Moment:	3.49058e+08 lb-ft
Resisting Horizontal Force:	837091 lb
Driving Horizontal Force:	575426 lb
Total Slice Area:	12489.2 ft2
Surface Horizontal Width:	401.398 ft
Surface Average Height:	31.1143 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12711
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.45473

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	8.02795	1578.83	-3.48118	FILL - Qa Derived	250	28	293.83	427.444	333.724	0	333.724	315.849	315.849

2	8.02795	4708.55	-2.67428	FILL - Qa Derived	250	28	458.81	667.445	785.099	0	785.099	763.668	763.668
3	8.02795	7724.64	-1.86792	FILL - Qa Derived	250	28	613.534	892.527	1208.42	0	1208.42	1188.41	1188.41
4	8.02795	10627.3	-1.06192	FILL - Qa Derived	250	28	758.392	1103.26	1604.74	0	1604.74	1590.68	1590.68
5	8.02795	13416.5	-0.256141	FILL - Qa Derived	250	28	893.747	1300.16	1975.07	0	1975.07	1971.07	1971.07
6	8.02795	16092.5	0.549593	FILL - Qa Derived	250	28	1019.95	1483.75	2320.33	0	2320.33	2330.12	2330.12
7	8.02795	18655.1	1.35544	FILL - Qa Derived	250	28	1137.3	1654.47	2641.43	0	2641.43	2668.34	2668.34
8	8.02795	21104.3	2.16155	FILL - Qa Derived	250	28	1246.13	1812.78	2939.15	0	2939.15	2986.19	2986.19
9	8.02795	23440	2.96809	FILL - Qa Derived	250	28	1346.69	1959.07	3214.29	0	3214.29	3284.11	3284.11
10	8.02795	25662	3.77521	FILL - Qa Derived	250	28	1439.26	2093.73	3467.55	0	3467.55	3562.52	3562.52
11	8.02795	27769.9	4.58309	FILL - Qa Derived	250	28	1524.08	2217.13	3699.64	0	3699.64	3821.81	3821.81
12	8.02795	29763.4	5.39189	FILL - Qa Derived	250	28	1601.4	2329.61	3911.18	0	3911.18	4062.33	4062.33
13	8.02795	31642.1	6.20176	FILL - Qa Derived	250	28	1671.43	2431.48	4102.76	0	4102.76	4284.39	4284.39
14	8.02795	33405.5	7.01288	FILL - Qa Derived	250	28	1734.38	2523.05	4274.99	0	4274.99	4488.34	4488.34
15	8.02795	35053	7.82541	FILL - Qa Derived	250	28	1790.44	2604.6	4428.35	0	4428.35	4674.42	4674.42
16	8.02795	36583.9	8.63954	FILL - Qa Derived	250	28	1839.79	2676.4	4563.4	0	4563.4	4842.94	4842.94
17	8.02795	37997.7	9.45542	FILL - Qa Derived	250	28	1882.62	2738.71	4680.59	0	4680.59	4994.13	4994.13
18	8.02795	39293.3	10.2732	FILL - Qa Derived	250	28	1919.09	2791.76	4780.36	0	4780.36	5128.2	5128.2
19	8.02795	40470.1	11.0932	FILL - Qa Derived	250	28	1949.36	2835.79	4863.16	0	4863.16	5245.37	5245.37
20	8.02795	41526.9	11.9154	FILL - Qa Derived	250	28	1973.56	2871	4929.38	0	4929.38	5345.83	5345.83
21	8.02795	42462.8	12.7402	FILL - Qa Derived	250	28	1991.85	2897.6	4979.4	0	4979.4	5429.75	5429.75
22	8.02795	43276.6	13.5676	FILL - Qa Derived	250	28	2004.34	2915.77	5013.59	0	5013.59	5497.29	5497.29
23	8.02795	43967.1	14.398	FILL - Qa Derived	250	28	2011.17	2925.71	5032.29	0	5032.29	5548.6	5548.6
24	8.02795	44532.8	15.2314	FILL - Qa Derived	250	28	2012.46	2927.59	5035.81	0	5035.81	5583.77	5583.77
25	8.02795	44972.5	16.0682	FILL - Qa Derived	250	28	2008.32	2921.56	5024.48	0	5024.48	5602.95	5602.95
26	8.02795	45284.4	16.9085	FILL - Qa Derived	250	28	1998.85	2907.79	4998.58	0	4998.58	5606.2	5606.2
27	8.02795	45467	17.7525	FILL - Qa Derived	250	28	1984.16	2886.42	4958.38	0	4958.38	5593.62	5593.62
28	8.02795	45518.4	18.6006	FILL - Qa Derived	250	28	1964.34	2857.59	4904.16	0	4904.16	5565.25	5565.25
29	8.02795	45436.7	19.4529	FILL - Qa Derived	250	28	1939.49	2821.43	4836.15	0	4836.15	5521.16	5521.16
30	8.02795	45219.8	20.3097	FILL - Qa Derived	250	28	1909.68	2778.07	4754.6	0	4754.6	5461.38	5461.38
31	8.02795	44865.6	21.1713	FILL - Qa Derived	250	28	1875.01	2727.63	4659.74	0	4659.74	5385.93	5385.93
32	8.02795	44371.6	22.0379	FILL - Qa Derived	250	28	1835.54	2670.22	4551.77	0	4551.77	5294.79	5294.79
33	8.02795	43735.3	22.9099	FILL - Qa Derived	250	28	1791.36	2605.95	4430.91	0	4430.91	5187.97	5187.97
34	8.02795	42954.1	23.7875	FILL - Qa Derived	250	28	1742.54	2534.93	4297.33	0	4297.33	5065.43	5065.43
35	8.02795	42025	24.6711	FILL - Qa Derived	250	28	1689.15	2457.25	4151.24	0	4151.24	4927.13	4927.13
36	8.02795	40944.8	25.5609	FILL - Qa Derived	250	28	1631.24	2373.02	3992.81	0	3992.81	4773	4773
37	8.02795	39710.3	26.4575	FILL - Qa Derived	250	28	1568.89	2282.31	3822.22	0	3822.22	4602.98	4602.98
38	8.02795	38317.9	27.3611	FILL - Qa Derived	250	28	1502.14	2185.21	3639.61	0	3639.61	4416.95	4416.95

39	8.02795	36763.7	28.2721	FILL - Qa Derived	250	28	1431.07	2081.82	3445.15	0	3445.15	4214.8	4214.8
40	8.02795	35043.6	29.191	FILL - Qa Derived	250	28	1355.72	1972.2	3238.99	0	3238.99	3996.39	3996.39
41	8.02795	33153.2	30.1182	FILL - Qa Derived	250	28	1276.13	1856.43	3021.26	0	3021.26	3761.55	3761.55
42	8.02795	31087.7	31.0542	FILL - Qa Derived	250	28	1192.39	1734.6	2792.12	0	2792.12	3510.12	3510.12
43	8.02795	28841.9	31.9995	FILL - Qa Derived	250	28	1104.51	1606.76	2551.69	0	2551.69	3241.85	3241.85
44	8.02795	26410.3	32.9546	FILL - Qa Derived	250	28	1012.56	1473	2300.12	0	2300.12	2956.55	2956.55
45	8.02795	23786.8	33.9202	FILL - Qa Derived	250	28	916.576	1333.37	2037.52	0	2037.52	2653.9	2653.9
46	8.02795	20965	34.8968	FILL - Qa Derived	250	28	816.61	1187.95	1764.03	0	1764.03	2333.64	2333.64
47	8.02795	17937.7	35.8853	FILL - Qa Derived	250	28	712.71	1036.8	1479.76	0	1479.76	1995.4	1995.4
48	8.02795	14686.2	36.8862	FILL - Qa Derived	250	28	604.584	879.506	1183.93	0	1183.93	1637.64	1637.64
49	8.02795	9642.83	37.9004	FILL - Qa Derived	250	28	445.426	647.975	748.482	0	748.482	1095.24	1095.24
50	8.02795	3253.53	38.9288	FILL - Qa Derived	250	28	255.301	371.394	228.31	0	228.31	434.523	434.523

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.45473

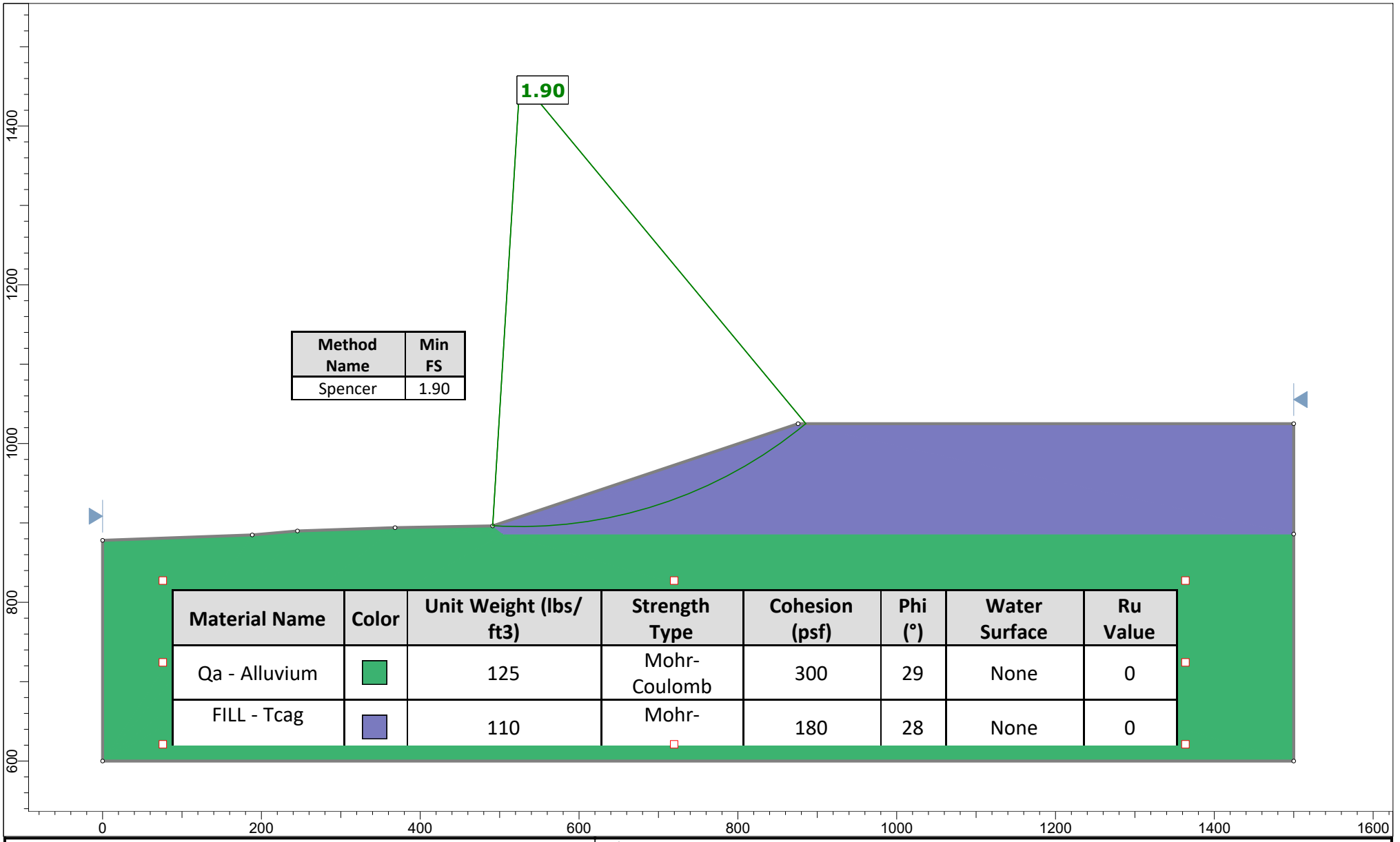
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.185	896.273	0	0	0
2	499.213	895.784	2366.09	979.086	22.4797
3	507.241	895.409	5876.29	2431.6	22.4797
4	515.269	895.147	10350.1	4282.86	22.4797
5	523.297	894.999	15620	6463.55	22.4798
6	531.325	894.963	21530.8	8909.41	22.4797
7	539.353	895.04	27938.4	11560.9	22.4798
8	547.381	895.23	34709.6	14362.8	22.4797
9	555.409	895.533	41721.6	17264.3	22.4797
10	563.437	895.949	48860.6	20218.5	22.4798
11	571.465	896.479	56022.3	23182	22.4797
12	579.493	897.122	63110.9	26115.2	22.4797
13	587.521	897.88	70038.7	28981.9	22.4797
14	595.549	898.752	76725.7	31749	22.4797
15	603.576	899.74	83099.6	34386.5	22.4797
16	611.604	900.843	89095	36867.4	22.4797
17	619.632	902.063	94653.5	39167.5	22.4797
18	627.66	903.4	99723.1	41265.3	22.4797
19	635.688	904.855	104258	43142	22.4798
20	643.716	906.429	108220	44781.4	22.4798
21	651.744	908.123	111575	46169.7	22.4798
22	659.772	909.938	114296	47295.4	22.4796
23	667.8	911.875	116360	48149.7	22.4797
24	675.828	913.936	117753	48725.9	22.4797
25	683.856	916.122	118462	49019.6	22.4798
26	691.884	918.435	118484	49028.6	22.4797
27	699.912	920.875	117819	48753.2	22.4796
28	707.94	923.445	116471	48195.7	22.4798
29	715.968	926.147	114454	47360.7	22.4796
30	723.996	928.982	111782	46255.1	22.4796
31	732.024	931.954	108478	44887.9	22.4796
32	740.052	935.063	104569	43270.5	22.4797
33	748.08	938.312	100089	41416.8	22.4798
34	756.108	941.705	95076.7	39342.6	22.4797
35	764.136	945.244	89576.3	37066.5	22.4797
36	772.164	948.931	83638.7	34609.6	22.4797
37	780.191	952.771	77320.7	31995.2	22.4797
38	788.219	956.766	70685.7	29249.7	22.4797
39	796.247	960.921	63803.7	26401.9	22.4797
40	804.275	965.238	56751.7	23483.8	22.4797
41	812.303	969.723	49613.9	20530.2	22.4797
42	820.331	974.38	42482.5	17579.2	22.4797
43	828.359	979.214	35457.7	14672.3	22.4796
44	836.387	984.23	28648.4	11854.7	22.4798
45	844.415	989.435	22172.8	9175.07	22.4797
46	852.443	994.834	16159.1	6686.62	22.4797
47	860.471	1000.43	10746.3	4446.79	22.4796
48	868.499	1006.24	6084.68	2517.83	22.4797
49	876.527	1012.27	2341.42	968.878	22.4797
50	884.555	1018.52	278.477	115.233	22.4796
51	892.583	1025	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959



Method Name	Min FS
Spencer	1.90

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Tcag		110	Mohr-	180	28	None	0

SLIDEINTERPRET 9.029

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

Analysis Description	Cross-Section 14-14', Static, Circular		
Client	Solstra Communities California, LLC	*Drawn By*	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	*File Name*	SP_Fill.slmd
		Scale	1:2000
Project No.:	23-2195s-1	*Date:* 10/13/2023	*Run Number* Run No. 36

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.89753 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.89753 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.237s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Tcag Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	110 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.897530
Center:	525.629, 1459.256
Radius:	564.034
Left Slip Surface Endpoint:	491.202, 896.273
Right Slip Surface Endpoint:	885.569, 1025.000
Resisting Moment:	4.14679e+08 lb-ft
Driving Moment:	2.18536e+08 lb-ft
Resisting Horizontal Force:	690631 lb
Driving Horizontal Force:	363964 lb
Total Slice Area:	11632.3 ft2
Surface Horizontal Width:	394.367 ft
Surface Average Height:	29.4961 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12269
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.89753

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	7.88734	1322.47	-3.09814	FILL - Tcag Derived	180	28	159.234	302.151	229.732	0	229.732	221.114	221.114
2	7.88734	3935.43	-2.29601	FILL - Tcag Derived	180	28	262.649	498.384	598.794	0	598.794	588.264	588.264
3	7.88734	6452.46	-1.49434	FILL - Tcag Derived	180	28	360.373	683.819	947.545	0	947.545	938.144	938.144
4	7.88734	8873.7	-0.692951	FILL - Tcag Derived	180	28	452.564	858.754	1276.55	0	1276.55	1271.07	1271.07
5	7.88734	11199.2	0.108298	FILL - Tcag Derived	180	28	539.371	1023.47	1586.34	0	1586.34	1587.36	1587.36
6	7.88734	13429	0.909568	FILL - Tcag Derived	180	28	620.935	1178.24	1877.42	0	1877.42	1887.28	1887.28
7	7.88734	15563.1	1.71102	FILL - Tcag Derived	180	28	697.391	1323.32	2150.26	0	2150.26	2171.09	2171.09
8	7.88734	17601.3	2.5128	FILL - Tcag Derived	180	28	768.852	1458.92	2405.3	0	2405.3	2439.04	2439.04
9	7.88734	19543.6	3.31507	FILL - Tcag Derived	180	28	835.449	1585.29	2642.98	0	2642.98	2691.37	2691.37
10	7.88734	21389.6	4.118	FILL - Tcag Derived	180	28	897.288	1702.63	2863.66	0	2863.66	2928.26	2928.26
11	7.88734	23139.2	4.92174	FILL - Tcag Derived	180	28	954.472	1811.14	3067.72	0	3067.72	3149.91	3149.91
12	7.88734	24792.1	5.72645	FILL - Tcag Derived	180	28	1007.09	1910.99	3255.52	0	3255.52	3356.51	3356.51
13	7.88734	26347.8	6.5323	FILL - Tcag Derived	180	28	1055.25	2002.37	3427.38	0	3427.38	3548.22	3548.22
14	7.88734	27805.9	7.33944	FILL - Tcag Derived	180	28	1099.03	2085.45	3583.63	0	3583.63	3725.19	3725.19
15	7.88734	29165.8	8.14806	FILL - Tcag Derived	180	28	1138.52	2160.37	3724.54	0	3724.54	3887.55	3887.55
16	7.88734	30427.2	8.95831	FILL - Tcag Derived	180	28	1173.78	2227.29	3850.39	0	3850.39	4035.43	4035.43
17	7.88734	31589.2	9.77037	FILL - Tcag Derived	180	28	1204.9	2286.34	3961.45	0	3961.45	4168.94	4168.94
18	7.88734	32651.3	10.5844	FILL - Tcag Derived	180	28	1231.95	2337.66	4057.96	0	4057.96	4288.16	4288.16
19	7.88734	33612.5	11.4006	FILL - Tcag Derived	180	28	1254.98	2381.36	4140.16	0	4140.16	4393.22	4393.22
20	7.88734	34472.2	12.2192	FILL - Tcag Derived	180	28	1274.06	2417.56	4208.25	0	4208.25	4484.16	4484.16
21	7.88734	35229.4	13.0403	FILL - Tcag Derived	180	28	1289.24	2446.38	4262.45	0	4262.45	4561.05	4561.05
22	7.88734	35883	13.8642	FILL - Tcag Derived	180	28	1300.59	2467.91	4302.94	0	4302.94	4623.94	4623.94
23	7.88734	36432.1	14.6909	FILL - Tcag Derived	180	28	1308.15	2482.26	4329.92	0	4329.92	4672.89	4672.89
24	7.88734	36875.4	15.5209	FILL - Tcag Derived	180	28	1311.97	2489.51	4343.55	0	4343.55	4707.91	4707.91
25	7.88734	37211.7	16.3541	FILL - Tcag Derived	180	28	1312.1	2489.74	4344	0	4344	4729.02	4729.02

26	7.88734	37439.7	17.191	FILL - Tcag Derived	180	28	1308.57	2483.05	4331.39	0	4331.39	4736.24	4736.24
27	7.88734	37557.9	18.0316	FILL - Tcag Derived	180	28	1301.42	2469.49	4305.91	0	4305.91	4729.57	4729.57
28	7.88734	37564.8	18.8763	FILL - Tcag Derived	180	28	1290.7	2449.15	4267.65	0	4267.65	4708.96	4708.96
29	7.88734	37458.7	19.7253	FILL - Tcag Derived	180	28	1276.44	2422.09	4216.77	0	4216.77	4674.43	4674.43
30	7.88734	37237.9	20.5788	FILL - Tcag Derived	180	28	1258.67	2388.37	4153.35	0	4153.35	4625.92	4625.92
31	7.88734	36900.4	21.4371	FILL - Tcag Derived	180	28	1237.42	2348.05	4077.5	0	4077.5	4563.37	4563.37
32	7.88734	36444.3	22.3004	FILL - Tcag Derived	180	28	1212.72	2301.17	3989.35	0	3989.35	4486.73	4486.73
33	7.88734	35867.2	23.1692	FILL - Tcag Derived	180	28	1184.59	2247.8	3888.97	0	3888.97	4395.93	4395.93
34	7.88734	35167	24.0436	FILL - Tcag Derived	180	28	1153.06	2187.97	3776.44	0	3776.44	4290.87	4290.87
35	7.88734	34341.1	24.924	FILL - Tcag Derived	180	28	1118.15	2121.73	3651.86	0	3651.86	4171.46	4171.46
36	7.88734	33386.9	25.8108	FILL - Tcag Derived	180	28	1079.88	2049.11	3515.28	0	3515.28	4037.57	4037.57
37	7.88734	32301.5	26.7042	FILL - Tcag Derived	180	28	1038.27	1970.15	3366.78	0	3366.78	3889.07	3889.07
38	7.88734	31081.8	27.6048	FILL - Tcag Derived	180	28	993.333	1884.88	3206.41	0	3206.41	3725.82	3725.82
39	7.88734	29724.5	28.5127	FILL - Tcag Derived	180	28	945.092	1793.34	3034.25	0	3034.25	3547.66	3547.66
40	7.88734	28226.2	29.4286	FILL - Tcag Derived	180	28	893.551	1695.54	2850.31	0	2850.31	3354.39	3354.39
41	7.88734	26582.9	30.3528	FILL - Tcag Derived	180	28	838.727	1591.51	2654.67	0	2654.67	3145.82	3145.82
42	7.88734	24790.7	31.2858	FILL - Tcag Derived	180	28	780.636	1481.28	2447.36	0	2447.36	2921.73	2921.73
43	7.88734	22845.1	32.2282	FILL - Tcag Derived	180	28	719.288	1364.87	2228.41	0	2228.41	2681.87	2681.87
44	7.88734	20741.3	33.1804	FILL - Tcag Derived	180	28	654.688	1242.29	1997.87	0	1997.87	2425.96	2425.96
45	7.88734	18474.3	34.1431	FILL - Tcag Derived	180	28	586.846	1113.56	1755.76	0	1755.76	2153.73	2153.73
46	7.88734	16038.3	35.1169	FILL - Tcag Derived	180	28	515.772	978.692	1502.13	0	1502.13	1864.84	1864.84
47	7.88734	13427.4	36.1025	FILL - Tcag Derived	180	28	441.474	837.71	1236.97	0	1236.97	1558.93	1558.93
48	7.88734	10635	37.1006	FILL - Tcag Derived	180	28	363.959	690.624	960.344	0	960.344	1235.61	1235.61
49	7.88734	7588.65	38.112	FILL - Tcag Derived	180	28	281.555	534.26	666.267	0	666.267	887.13	887.13
50	7.88734	2784.37	39.1377	FILL - Tcag Derived	180	28	160.188	303.962	233.138	0	233.138	363.494	363.494

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.89753

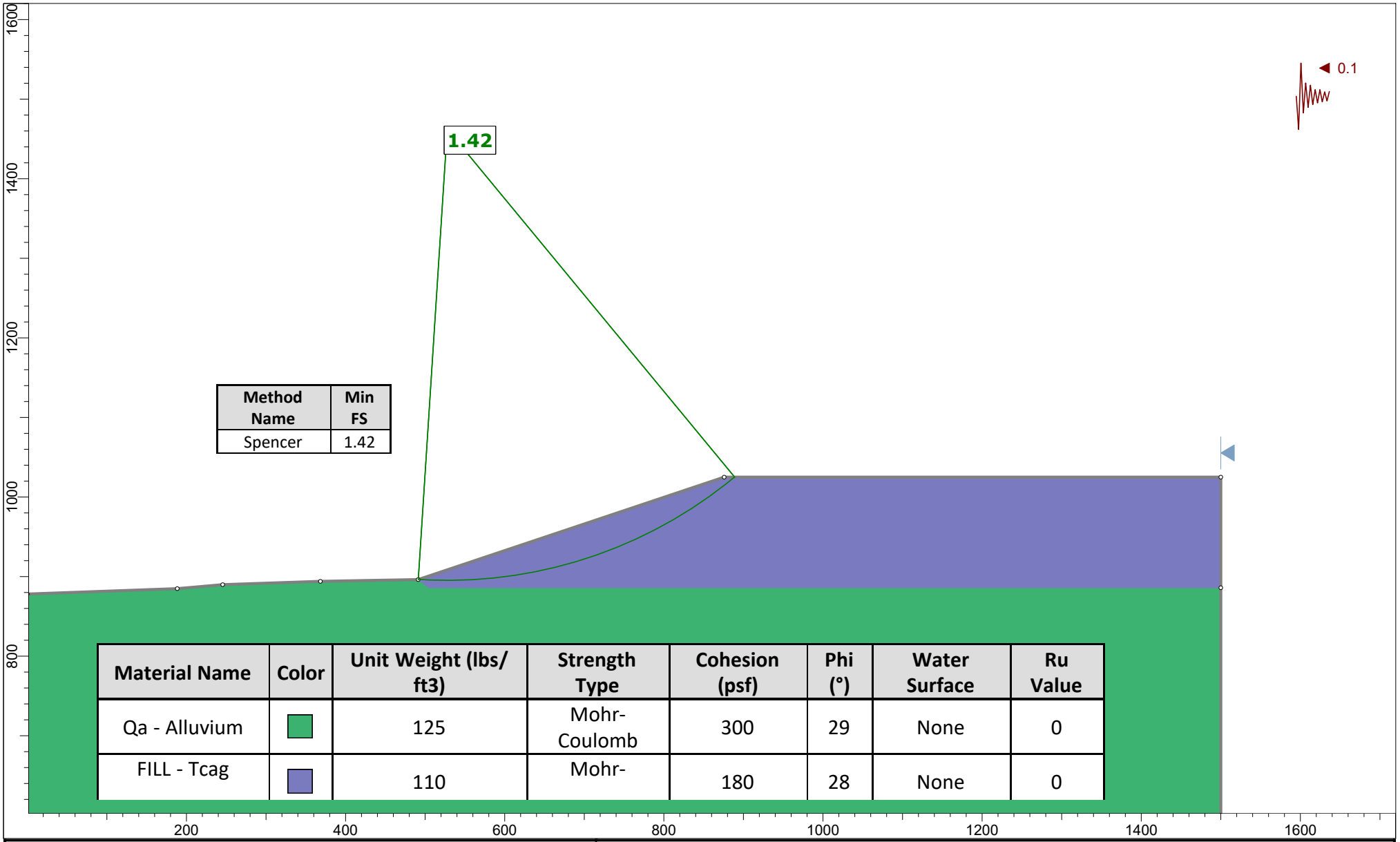
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.202	896.273	0	0	0
2	499.089	895.846	1353.7	425.304	17.4416
3	506.976	895.53	3614.16	1135.49	17.4416
4	514.864	895.324	6650.82	2089.55	17.4416
5	522.751	895.229	10341.3	3249.01	17.4416
6	530.638	895.243	14570.8	4577.83	17.4416
7	538.526	895.369	19232	6042.3	17.4416
8	546.413	895.604	24224.6	7610.86	17.4416
9	554.3	895.95	29454.8	9254.08	17.4416
10	562.188	896.407	34835.2	10944.5	17.4416
11	570.075	896.975	40284.5	12656.6	17.4417
12	577.962	897.654	45727.3	14366.6	17.4417
13	585.85	898.445	51093.8	16052.6	17.4416
14	593.737	899.348	56319.4	17694.4	17.4416
15	601.624	900.364	61345.1	19273.4	17.4417
16	609.512	901.494	66116.8	20772.5	17.4416
17	617.399	902.737	70585.2	22176.4	17.4416
18	625.286	904.095	74706	23471.1	17.4417
19	633.174	905.569	78439.5	24644.1	17.4417
20	641.061	907.159	81750.8	25684.4	17.4416
21	648.948	908.868	84609.3	26582.5	17.4416
22	656.836	910.694	86989	27330.1	17.4416
23	664.723	912.641	88868.3	27920.6	17.4417
24	672.61	914.709	90229.9	28348.4	17.4417
25	680.498	916.899	91061	28609.5	17.4417
26	688.385	919.214	91353.2	28701.3	17.4416
27	696.272	921.654	91102.5	28622.5	17.4416
28	704.16	924.222	90309	28373.2	17.4416
29	712.047	926.918	88977.8	27955	17.4416
30	719.935	929.746	87118.1	27370.7	17.4416
31	727.822	932.708	84743.9	26624.8	17.4417
32	735.709	935.805	81873.9	25723.1	17.4416
33	743.597	939.04	78531.5	24673	17.4417
34	751.484	942.415	74745.3	23483.4	17.4416
35	759.371	945.934	70548.9	22165	17.4416
36	767.259	949.599	65981.2	20729.9	17.4416
37	775.146	953.414	61086.7	19192.2	17.4417
38	783.033	957.381	55915.7	17567.5	17.4416
39	790.921	961.506	50524.5	15873.8	17.4417
40	798.808	965.79	44976	14130.5	17.4416
41	806.695	970.24	39339.6	12359.7	17.4417
42	814.583	974.859	33692.1	10585.4	17.4417
43	822.47	979.652	28117.8	8834.02	17.4416
44	830.357	984.624	22709.2	7134.76	17.4416
45	838.245	989.781	17567.7	5519.41	17.4416
46	846.132	995.13	12804	4022.75	17.4416
47	854.019	1000.68	8539.13	2682.82	17.4417
48	861.907	1006.43	4905.18	1541.11	17.4417
49	869.794	1012.39	2046.44	642.947	17.4416
50	877.681	1018.58	144.335	45.347	17.4416
51	885.569	1025	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959



Method Name	Min FS
Spencer	1.42

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Tcag		110	Mohr-	180	28	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 14-14', Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill.slmd
		Scale	1:2000
Project No.: 23-2195s-1	Date: 10/13/2023	Run Number	Run No. 37

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.42209 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.42209 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.474s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Tcag Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	110 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.422090
Center:	527.718, 1462.329
Radius:	567.213
Left Slip Surface Endpoint:	491.275, 896.288
Right Slip Surface Endpoint:	888.929, 1025.000
Resisting Moment:	4.19489e+08 lb-ft
Driving Moment:	2.9498e+08 lb-ft
Resisting Horizontal Force:	696026 lb
Driving Horizontal Force:	489437 lb
Total Slice Area:	12039.4 ft2
Surface Horizontal Width:	397.654 ft
Surface Average Height:	30.276 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	11981
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.42209

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	7.95308	1363.92	-3.28135	FILL - Tcag Derived	180	28	230.474	327.755	277.887	0	277.887	264.674	264.674
2	7.95308	4042.79	-2.47694	FILL - Tcag Derived	180	28	376.767	535.796	669.155	0	669.155	652.857	652.857
3	7.95308	6623.82	-1.67303	FILL - Tcag Derived	180	28	513.899	730.81	1035.92	0	1035.92	1020.91	1020.91
4	7.95308	9107.16	-0.86944	FILL - Tcag Derived	180	28	642.22	913.295	1379.13	0	1379.13	1369.38	1369.38
5	7.95308	11492.9	-0.0660244	FILL - Tcag Derived	180	28	762.061	1083.72	1699.66	0	1699.66	1698.78	1698.78
6	7.95308	13781.1	0.737378	FILL - Tcag Derived	180	28	873.728	1242.52	1998.31	0	1998.31	2009.55	2009.55
7	7.95308	15971.6	1.54093	FILL - Tcag Derived	180	28	977.512	1390.11	2275.88	0	2275.88	2302.18	2302.18
8	7.95308	18064.5	2.34478	FILL - Tcag Derived	180	28	1073.67	1526.86	2533.08	0	2533.08	2577.05	2577.05
9	7.95308	20059.6	3.14909	FILL - Tcag Derived	180	28	1162.48	1653.15	2770.58	0	2770.58	2834.54	2834.54
10	7.95308	21956.7	3.95402	FILL - Tcag Derived	180	28	1244.15	1769.3	2989.04	0	2989.04	3075.04	3075.04
11	7.95308	23755.5	4.75974	FILL - Tcag Derived	180	28	1318.93	1875.64	3189.03	0	3189.03	3298.85	3298.85
12	7.95308	25455.7	5.5664	FILL - Tcag Derived	180	28	1387.01	1972.46	3371.13	0	3371.13	3506.31	3506.31
13	7.95308	27057	6.37418	FILL - Tcag Derived	180	28	1448.61	2060.05	3535.86	0	3535.86	3697.69	3697.69
14	7.95308	28558.9	7.18322	FILL - Tcag Derived	180	28	1503.89	2138.67	3683.72	0	3683.72	3873.26	3873.26
15	7.95308	29960.8	7.99371	FILL - Tcag Derived	180	28	1553.05	2208.58	3815.2	0	3815.2	4033.29	4033.29
16	7.95308	31262.3	8.80581	FILL - Tcag Derived	180	28	1596.24	2270	3930.72	0	3930.72	4178	4178
17	7.95308	32462.7	9.6197	FILL - Tcag Derived	180	28	1633.62	2323.16	4030.71	0	4030.71	4307.59	4307.59
18	7.95308	33561.3	10.4356	FILL - Tcag Derived	180	28	1665.35	2368.28	4115.56	0	4115.56	4422.28	4422.28
19	7.95308	34557.3	11.2536	FILL - Tcag Derived	180	28	1691.56	2405.55	4185.65	0	4185.65	4522.23	4522.23
20	7.95308	35449.9	12.0739	FILL - Tcag Derived	180	28	1712.38	2435.16	4241.34	0	4241.34	4607.63	4607.63
21	7.95308	36238.1	12.8967	FILL - Tcag Derived	180	28	1727.94	2457.29	4282.96	0	4282.96	4678.61	4678.61
22	7.95308	36921	13.7223	FILL - Tcag Derived	180	28	1738.36	2472.11	4310.83	0	4310.83	4735.31	4735.31
23	7.95308	37497.5	14.5508	FILL - Tcag Derived	180	28	1743.76	2479.78	4325.26	0	4325.26	4777.87	4777.87
24	7.95308	37966.4	15.3824	FILL - Tcag Derived	180	28	1744.23	2480.45	4326.51	0	4326.51	4806.37	4806.37
25	7.95308	38326.4	16.2173	FILL - Tcag Derived	180	28	1739.88	2474.26	4314.87	0	4314.87	4820.93	4820.93

26	7.95308	38576.2	17.0558	FILL - Tcag Derived	180	28	1730.8	2461.36	4290.6	0	4290.6	4821.61	4821.61
27	7.95308	38714.4	17.8981	FILL - Tcag Derived	180	28	1717.09	2441.86	4253.94	0	4253.94	4808.48	4808.48
28	7.95308	38739.3	18.7444	FILL - Tcag Derived	180	28	1698.84	2415.91	4205.13	0	4205.13	4781.63	4781.63
29	7.95308	38649.3	19.595	FILL - Tcag Derived	180	28	1676.12	2383.6	4144.37	0	4144.37	4741.05	4741.05
30	7.95308	38442.6	20.45	FILL - Tcag Derived	180	28	1649.02	2345.06	4071.89	0	4071.89	4686.8	4686.8
31	7.95308	38117.2	21.3099	FILL - Tcag Derived	180	28	1617.61	2300.39	3987.88	0	3987.88	4618.88	4618.88
32	7.95308	37671.2	22.1748	FILL - Tcag Derived	180	28	1581.97	2249.7	3892.53	0	3892.53	4537.31	4537.31
33	7.95308	37102.4	23.0451	FILL - Tcag Derived	180	28	1542.15	2193.07	3786.03	0	3786.03	4442.07	4442.07
34	7.95308	36408.2	23.9211	FILL - Tcag Derived	180	28	1498.22	2130.6	3668.54	0	3668.54	4333.12	4333.12
35	7.95308	35586.4	24.803	FILL - Tcag Derived	180	28	1450.25	2062.38	3540.25	0	3540.25	4210.45	4210.45
36	7.95308	34634	25.6913	FILL - Tcag Derived	180	28	1398.29	1988.5	3401.29	0	3401.29	4073.98	4073.98
37	7.95308	33548.4	26.5862	FILL - Tcag Derived	180	28	1342.4	1909.02	3251.82	0	3251.82	3923.64	3923.64
38	7.95308	32326.2	27.4882	FILL - Tcag Derived	180	28	1282.65	1824.04	3091.99	0	3091.99	3759.36	3759.36
39	7.95308	30964.3	28.3976	FILL - Tcag Derived	180	28	1219.06	1733.62	2921.95	0	2921.95	3581.03	3581.03
40	7.95308	29459	29.3149	FILL - Tcag Derived	180	28	1151.71	1637.84	2741.8	0	2741.8	3388.51	3388.51
41	7.95308	27806.5	30.2406	FILL - Tcag Derived	180	28	1080.64	1536.77	2551.71	0	2551.71	3181.69	3181.69
42	7.95308	26002.6	31.175	FILL - Tcag Derived	180	28	1005.89	1430.47	2351.78	0	2351.78	2960.37	2960.37
43	7.95308	24042.9	32.1188	FILL - Tcag Derived	180	28	927.508	1319	2142.15	0	2142.15	2724.4	2724.4
44	7.95308	21922.6	33.0724	FILL - Tcag Derived	180	28	845.544	1202.44	1922.93	0	1922.93	2473.56	2473.56
45	7.95308	19636.3	34.0365	FILL - Tcag Derived	180	28	760.038	1080.84	1694.24	0	1694.24	2207.6	2207.6
46	7.95308	17178.6	35.0116	FILL - Tcag Derived	180	28	671.036	954.273	1456.2	0	1456.2	1926.26	1926.26
47	7.95308	14543.2	35.9986	FILL - Tcag Derived	180	28	578.579	822.792	1208.92	0	1208.92	1629.26	1629.26
48	7.95308	11723.4	36.998	FILL - Tcag Derived	180	28	482.715	686.464	952.519	0	952.519	1316.25	1316.25
49	7.95308	8218.83	38.0108	FILL - Tcag Derived	180	28	368.25	523.684	646.375	0	646.375	934.195	934.195
50	7.95308	2820.9	39.0378	FILL - Tcag Derived	180	28	202.584	288.092	203.292	0	203.292	367.562	367.562

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.42209

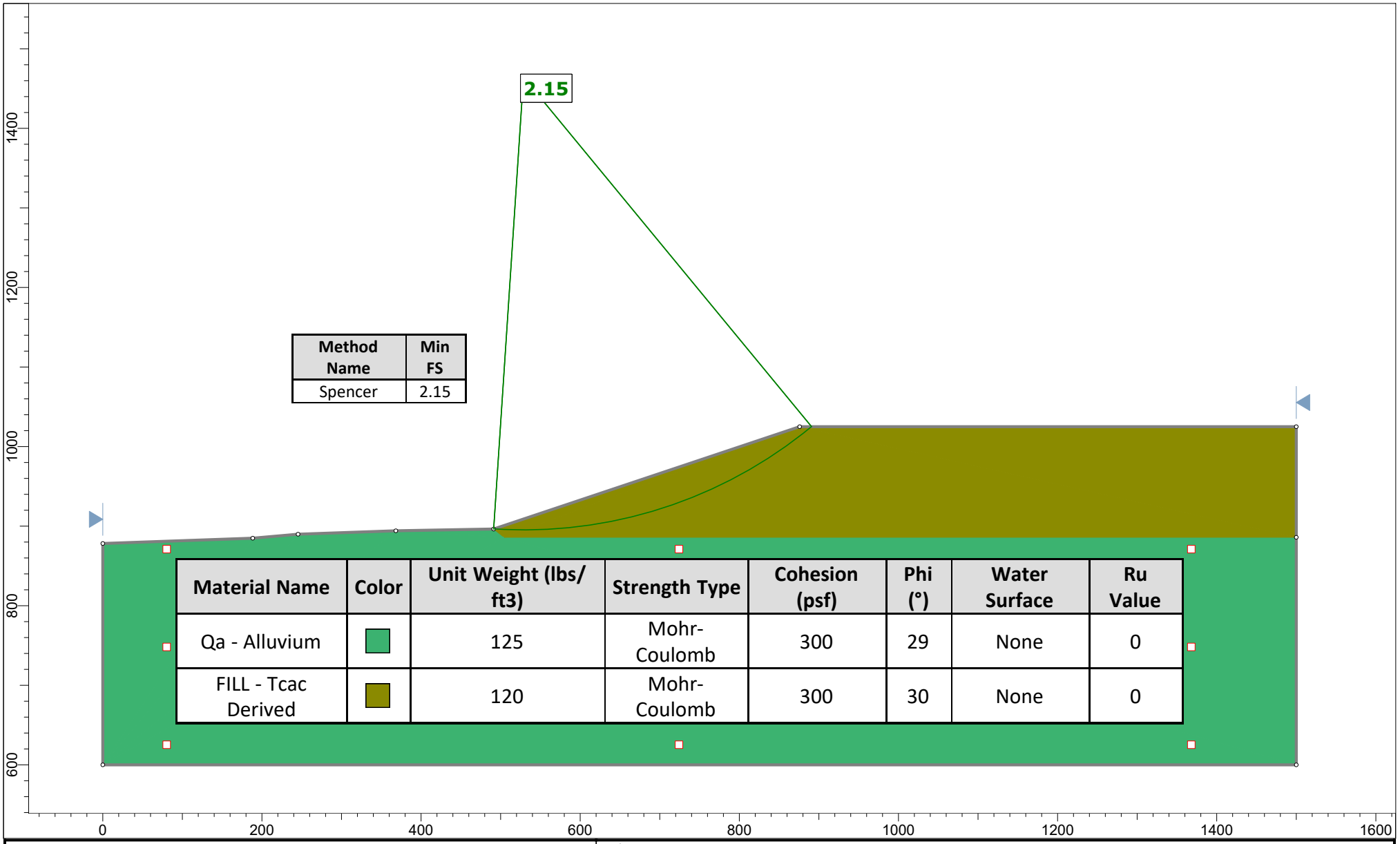
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.275	896.288	0	0	0
2	499.228	895.832	1825.02	758.818	22.5769
3	507.181	895.488	4650.23	1933.5	22.5769
4	515.134	895.256	8319.41	3459.09	22.5768
5	523.087	895.135	12687.6	5275.31	22.5768
6	531.041	895.126	17620.3	7326.26	22.5768
7	538.994	895.228	22993	9560.16	22.5768
8	546.947	895.442	28690.5	11929.1	22.5768
9	554.9	895.768	34606.2	14388.7	22.5768
10	562.853	896.206	40641.9	16898.3	22.5768
11	570.806	896.755	46707.3	19420.2	22.5768
12	578.759	897.418	52719.3	21919.9	22.5768
13	586.712	898.193	58602.2	24365.9	22.5768
14	594.665	899.081	64286.8	26729.5	22.5768
15	602.618	900.083	69710.4	28984.6	22.5769
16	610.571	901.2	74816.5	31107.6	22.5768
17	618.524	902.432	79554.5	33077.6	22.5768
18	626.477	903.78	83879.6	34875.9	22.5768
19	634.431	905.245	87752.2	36486.1	22.5768
20	642.384	906.827	91138.6	37894.1	22.5768
21	650.337	908.529	94009.7	39087.9	22.5768
22	658.29	910.35	96342	40057.6	22.5768
23	666.243	912.292	98116.5	40795.4	22.5768
24	674.196	914.356	99319.2	41295.5	22.5768
25	682.149	916.544	99941.2	41554.1	22.5768
26	690.102	918.857	99977.8	41569.3	22.5768
27	698.055	921.297	99429.3	41341.3	22.5769
28	706.008	923.866	98300.7	40872	22.5768
29	713.961	926.565	96601.6	40165.5	22.5768
30	721.914	929.396	94346.1	39227.7	22.5768
31	729.867	932.361	91553.3	38066.5	22.5768
32	737.821	935.464	88246.9	36691.8	22.5768
33	745.774	938.705	84455.4	35115.3	22.5768
34	753.727	942.089	80212.3	33351.1	22.5768
35	761.68	945.616	75556.1	31415.1	22.5768
36	769.633	949.292	70530.7	29325.6	22.5768
37	777.586	953.118	65184.9	27102.9	22.5768
38	785.539	957.098	59573.5	24769.8	22.5768
39	793.492	961.236	53756.7	22351.2	22.5768
40	801.445	965.536	47801	19875	22.5769
41	809.398	970.002	41779.1	17371.1	22.5768
42	817.351	974.638	35770.4	14872.8	22.5768
43	825.304	979.45	29861.2	12415.8	22.5767
44	833.257	984.442	24145.5	10039.3	22.5767
45	841.211	989.621	18725.2	7785.68	22.5769
46	849.164	994.993	13710.8	5700.77	22.5769
47	857.117	1000.56	9222.04	3834.39	22.5768
48	865.07	1006.34	5388.48	2240.45	22.5768
49	873.023	1012.33	2350.7	977.387	22.5768
50	880.976	1018.55	442.395	183.941	22.5768
51	888.929	1025	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959



Method Name	Min FS
Spencer	2.15

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Tcac Derived		120	Mohr-Coulomb	300	30	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 14-14', Static, Circular		
Client	Solstra Communities California, LLC		Drawn By: M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California		File Name: SP_Fill.slmd
			Scale: 1:2000
Project No.: 23-2195s-1	Date: 10/13/2023		Run Number: Run No. 38

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 2.14578 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 2.14578 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:01.999s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Tcac Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	120 lbs/ft3
Cohesion	300 psf
Phi	30 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	2.145780
Center:	528.808, 1464.182
Radius:	569.153
Left Slip Surface Endpoint:	491.202, 896.273
Right Slip Surface Endpoint:	890.822, 1025.000
Resisting Moment:	5.42332e+08 lb-ft
Driving Moment:	2.52744e+08 lb-ft
Resisting Horizontal Force:	895033 lb
Driving Horizontal Force:	417114 lb
Total Slice Area:	12273.4 ft2
Surface Horizontal Width:	399.62 ft
Surface Average Height:	30.7126 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12022
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.14578

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	7.99241	1500.79	-3.38554	FILL - Tcac Derived	300	30	212.555	456.097	270.368	0	270.368	257.794	257.794
2	7.99241	4466.04	-2.57983	FILL - Tcac Derived	300	30	323.278	693.683	681.879	0	681.879	667.313	667.313
3	7.99241	7323.33	-1.77464	FILL - Tcac Derived	300	30	427.983	918.357	1071.03	0	1071.03	1057.77	1057.77
4	7.99241	10072.8	-0.969801	FILL - Tcac Derived	300	30	526.836	1130.47	1438.42	0	1438.42	1429.5	1429.5
5	7.99241	12714.6	-0.165152	FILL - Tcac Derived	300	30	619.994	1330.37	1784.65	0	1784.65	1782.86	1782.86
6	7.99241	15248.7	0.639466	FILL - Tcac Derived	300	30	707.603	1518.36	2110.26	0	2110.26	2118.16	2118.16
7	7.99241	17675.1	1.44421	FILL - Tcac Derived	300	30	789.797	1694.73	2415.74	0	2415.74	2435.65	2435.65
8	7.99241	19993.8	2.24924	FILL - Tcac Derived	300	30	866.706	1859.76	2701.58	0	2701.58	2735.62	2735.62
9	7.99241	22204.6	3.05471	FILL - Tcac Derived	300	30	938.456	2013.72	2968.25	0	2968.25	3018.33	3018.33
10	7.99241	24307.2	3.86079	FILL - Tcac Derived	300	30	1005.16	2156.85	3216.16	0	3216.16	3283.99	3283.99
11	7.99241	26301.5	4.66763	FILL - Tcac Derived	300	30	1066.92	2289.38	3445.72	0	3445.72	3532.83	3532.83
12	7.99241	28187	5.47541	FILL - Tcac Derived	300	30	1123.85	2411.54	3657.29	0	3657.29	3765.01	3765.01
13	7.99241	29963.4	6.28427	FILL - Tcac Derived	300	30	1176.03	2523.51	3851.23	0	3851.23	3980.74	3980.74
14	7.99241	31630.2	7.0944	FILL - Tcac Derived	300	30	1223.57	2625.51	4027.9	0	4027.9	4180.18	4180.18
15	7.99241	33186.8	7.90596	FILL - Tcac Derived	300	30	1266.54	2717.71	4187.6	0	4187.6	4363.48	4363.48
16	7.99241	34632.6	8.71911	FILL - Tcac Derived	300	30	1305.02	2800.29	4330.63	0	4330.63	4530.77	4530.77
17	7.99241	35966.9	9.53404	FILL - Tcac Derived	300	30	1339.09	2873.4	4457.26	0	4457.26	4682.17	4682.17
18	7.99241	37189	10.3509	FILL - Tcac Derived	300	30	1368.83	2937.2	4567.77	0	4567.77	4817.78	4817.78
19	7.99241	38298	11.1699	FILL - Tcac Derived	300	30	1394.29	2991.83	4662.39	0	4662.39	4937.7	4937.7
20	7.99241	39293	11.9913	FILL - Tcac Derived	300	30	1415.54	3037.43	4741.37	0	4741.37	5042.03	5042.03
21	7.99241	40172.9	12.8151	FILL - Tcac Derived	300	30	1432.64	3074.13	4804.93	0	4804.93	5130.82	5130.82
22	7.99241	40936.8	13.6417	FILL - Tcac Derived	300	30	1445.65	3102.04	4853.27	0	4853.27	5204.12	5204.12
23	7.99241	41583.3	14.4711	FILL - Tcac Derived	300	30	1454.61	3121.27	4886.59	0	4886.59	5261.99	5261.99
24	7.99241	42111.2	15.3037	FILL - Tcac Derived	300	30	1459.58	3131.94	4905.06	0	4905.06	5304.46	5304.46
25	7.99241	42519.1	16.1396	FILL - Tcac Derived	300	30	1460.61	3134.14	4908.88	0	4908.88	5331.55	5331.55

26	7.99241	42805.6	16.979	FILL - Tcac Derived	300	30	1457.73	3127.96	4898.18	0	4898.18	5343.27	5343.27
27	7.99241	42969	17.8222	FILL - Tcac Derived	300	30	1450.99	3113.5	4873.11	0	4873.11	5339.59	5339.59
28	7.99241	43007.7	18.6694	FILL - Tcac Derived	300	30	1440.42	3090.82	4833.84	0	4833.84	5320.54	5320.54
29	7.99241	42919.7	19.5209	FILL - Tcac Derived	300	30	1426.05	3060	4780.46	0	4780.46	5286.04	5286.04
30	7.99241	42703.1	20.3769	FILL - Tcac Derived	300	30	1407.94	3021.12	4713.11	0	4713.11	5236.07	5236.07
31	7.99241	42355.8	21.2376	FILL - Tcac Derived	300	30	1386.08	2974.23	4631.91	0	4631.91	5170.59	5170.59
32	7.99241	41875.6	22.1034	FILL - Tcac Derived	300	30	1360.54	2919.41	4536.95	0	4536.95	5089.5	5089.5
33	7.99241	41260	22.9746	FILL - Tcac Derived	300	30	1331.31	2856.69	4428.31	0	4428.31	4992.72	4992.72
34	7.99241	40506.4	23.8514	FILL - Tcac Derived	300	30	1298.43	2786.14	4306.11	0	4306.11	4880.18	4880.18
35	7.99241	39612.1	24.7342	FILL - Tcac Derived	300	30	1261.91	2707.79	4170.41	0	4170.41	4751.74	4751.74
36	7.99241	38574.1	25.6233	FILL - Tcac Derived	300	30	1221.79	2621.69	4021.28	0	4021.28	4607.28	4607.28
37	7.99241	37389.2	26.5191	FILL - Tcac Derived	300	30	1178.07	2527.88	3858.79	0	3858.79	4446.64	4446.64
38	7.99241	36053.9	27.4219	FILL - Tcac Derived	300	30	1130.77	2426.38	3683	0	3683	4269.69	4269.69
39	7.99241	34564.8	28.3322	FILL - Tcac Derived	300	30	1079.91	2317.24	3493.96	0	3493.96	4076.21	4076.21
40	7.99241	32917.7	29.2503	FILL - Tcac Derived	300	30	1025.49	2200.47	3291.72	0	3291.72	3866.02	3866.02
41	7.99241	31108.4	30.1768	FILL - Tcac Derived	300	30	967.527	2076.1	3076.3	0	3076.3	3638.89	3638.89
42	7.99241	29132.5	31.112	FILL - Tcac Derived	300	30	906.039	1944.16	2847.76	0	2847.76	3394.58	3394.58
43	7.99241	26985	32.0566	FILL - Tcac Derived	300	30	841.023	1804.65	2606.12	0	2606.12	3132.81	3132.81
44	7.99241	24660.6	33.011	FILL - Tcac Derived	300	30	772.488	1657.59	2351.42	0	2351.42	2853.29	2853.29
45	7.99241	22153.6	33.9758	FILL - Tcac Derived	300	30	700.445	1503	2083.66	0	2083.66	2555.69	2555.69
46	7.99241	19457.7	34.9518	FILL - Tcac Derived	300	30	624.896	1340.89	1802.88	0	1802.88	2239.65	2239.65
47	7.99241	16566.2	35.9395	FILL - Tcac Derived	300	30	545.847	1171.27	1509.08	0	1509.08	1904.78	1904.78
48	7.99241	13471.8	36.9397	FILL - Tcac Derived	300	30	463.301	994.142	1202.29	0	1202.29	1550.65	1550.65
49	7.99241	9173.92	37.9532	FILL - Tcac Derived	300	30	352.795	757.021	791.583	0	791.583	1066.75	1066.75
50	7.99241	3101.56	38.981	FILL - Tcac Derived	300	30	205.797	441.595	245.25	0	245.25	411.788	411.788

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.14578

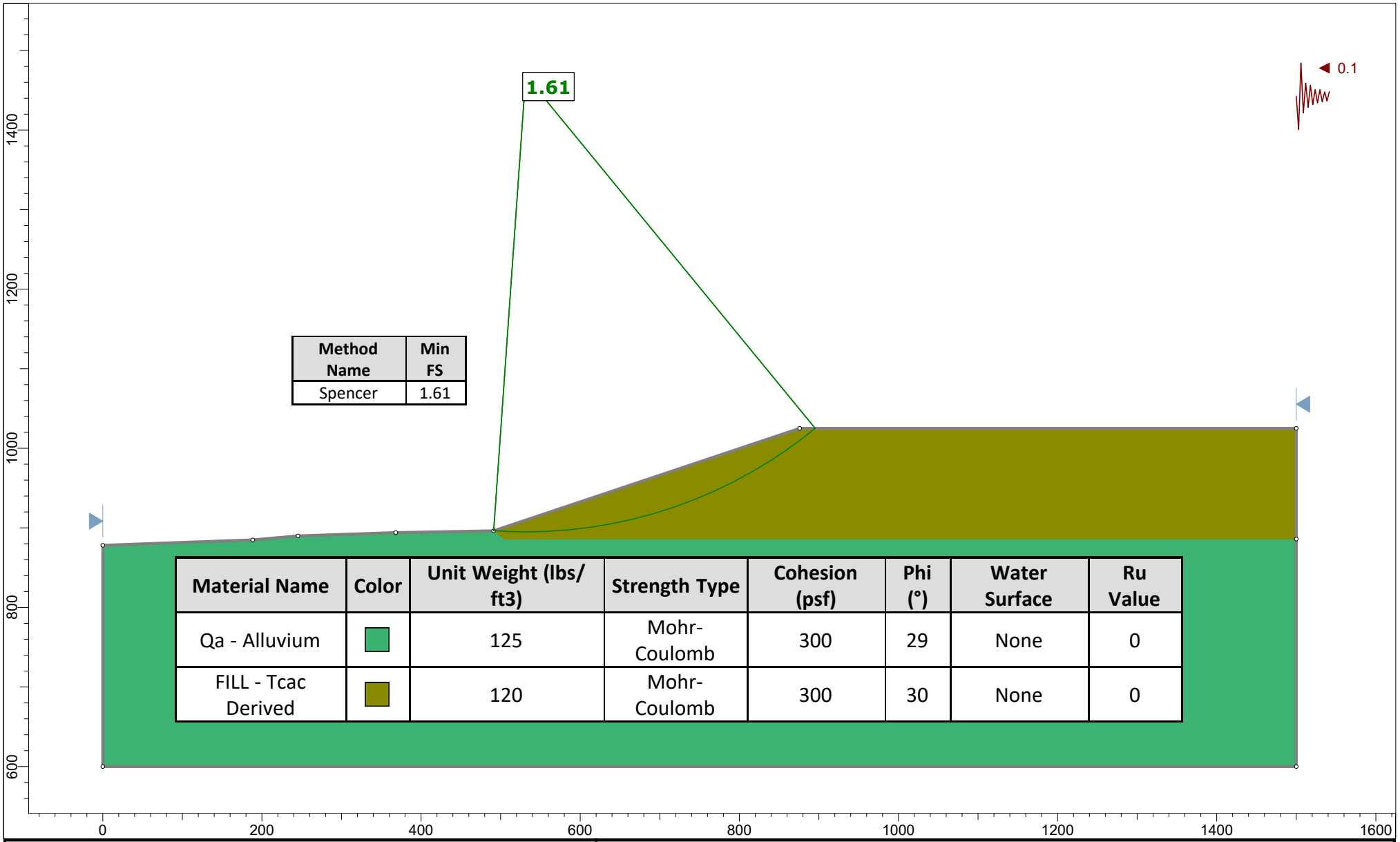
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.202	896.273	0	0	0
2	499.194	895.8	1826.45	564.398	17.1719
3	507.186	895.44	4655.44	1438.6	17.1719
4	515.179	895.192	8340.83	2577.44	17.1719
5	523.171	895.057	12745.6	3938.57	17.1719
6	531.164	895.034	17741.3	5482.32	17.1719
7	539.156	895.123	23207.8	7171.54	17.1719
8	547.148	895.325	29032.6	8971.48	17.1719
9	555.141	895.639	35110.7	10849.7	17.1719
10	563.133	896.065	41344.2	12776	17.172
11	571.126	896.604	47642.1	14722.1	17.1719
12	579.118	897.257	53919.8	16662	17.1719
13	587.111	898.023	60099	18571.5	17.1719
14	595.103	898.903	66107.5	20428.2	17.1719
15	603.095	899.898	71878.9	22211.6	17.1719
16	611.088	901.008	77352.5	23903	17.1719
17	619.08	902.234	82473.3	25485.4	17.1719
18	627.073	903.576	87191.2	26943.3	17.1719
19	635.065	905.036	91462	28263.1	17.1719
20	643.057	906.614	95246.2	29432.4	17.1719
21	651.05	908.312	98509.5	30440.9	17.1719
22	659.042	910.13	101223	31279.3	17.1719
23	667.035	912.069	103361	31940.2	17.172
24	675.027	914.132	104906	32417.6	17.172
25	683.019	916.319	105843	32707	17.1719
26	691.012	918.632	106162	32805.4	17.1718
27	699.004	921.072	105858	32711.6	17.1719
28	706.997	923.642	104932	32425.4	17.1719
29	714.989	926.342	103389	31948.6	17.1719
30	722.981	929.176	101239	31284.4	17.1719
31	730.974	932.144	98498.8	30437.6	17.1719
32	738.966	935.251	95188.5	29414.6	17.1719
33	746.959	938.496	91334.4	28223.6	17.1719
34	754.951	941.885	86968.5	26874.5	17.1719
35	762.943	945.419	82128.4	25378.9	17.1719
36	770.936	949.1	76857.9	23750.2	17.1719
37	778.928	952.934	71206.8	22003.9	17.1719
38	786.921	956.922	65231.6	20157.5	17.1719
39	794.913	961.069	58995.5	18230.5	17.1719
40	802.906	965.378	52569.1	16244.6	17.1719
41	810.898	969.854	46030.4	14224.1	17.172
42	818.89	974.501	39465.6	12195.4	17.1719
43	826.883	979.325	32969.6	10188.1	17.1719
44	834.875	984.33	26646.4	8234.11	17.1719
45	842.868	989.523	20609.9	6368.75	17.1719
46	850.86	994.909	14984.7	4630.49	17.1719
47	858.852	1000.49	9907.06	3061.43	17.1719
48	866.845	1006.29	5525.63	1707.5	17.1719
49	874.837	1012.3	2002.84	618.906	17.1719
50	882.83	1018.53	-112.456	-34.7504	17.1718
51	890.822	1025	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959



Method Name	Min FS
Spencer	1.61

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Tcac Derived		120	Mohr-Coulomb	300	30	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 14-14', Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 39

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.60844 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.60844 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.244s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Tcac Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	120 lbs/ft3
Cohesion	300 psf
Phi	30 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.608440
Center:	531.566, 1468.480
Radius:	573.629
Left Slip Surface Endpoint:	491.202, 896.273
Right Slip Surface Endpoint:	895.400, 1025.000
Resisting Moment:	5.55333e+08 lb-ft
Driving Moment:	3.45262e+08 lb-ft
Resisting Horizontal Force:	911118 lb
Driving Horizontal Force:	566461 lb
Total Slice Area:	12835.7 ft2
Surface Horizontal Width:	404.199 ft
Surface Average Height:	31.7558 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12349
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.60844

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	8.08397	1552.3	-3.63047	FILL - Tcac Derived	300	30	307.249	494.192	336.351	0	336.351	316.856	316.856
2	8.08397	4619.31	-2.82171	FILL - Tcac Derived	300	30	464.493	747.109	774.415	0	774.415	751.521	751.521
3	8.08397	7575.39	-2.01352	FILL - Tcac Derived	300	30	612.014	984.388	1185.39	0	1185.39	1163.88	1163.88
4	8.08397	10420.7	-1.20572	FILL - Tcac Derived	300	30	750.181	1206.62	1570.32	0	1570.32	1554.53	1554.53
5	8.08397	13155.5	-0.398161	FILL - Tcac Derived	300	30	879.336	1414.36	1930.13	0	1930.13	1924.02	1924.02
6	8.08397	15779.7	0.409318	FILL - Tcac Derived	300	30	999.807	1608.13	2265.75	0	2265.75	2272.89	2272.89
7	8.08397	18293.4	1.21688	FILL - Tcac Derived	300	30	1111.89	1788.41	2578	0	2578	2601.62	2601.62
8	8.08397	20696.4	2.02468	FILL - Tcac Derived	300	30	1215.87	1955.66	2867.69	0	2867.69	2910.67	2910.67
9	8.08397	22988.8	2.83288	FILL - Tcac Derived	300	30	1312.02	2110.31	3135.55	0	3135.55	3200.47	3200.47
10	8.08397	25170.2	3.64165	FILL - Tcac Derived	300	30	1400.58	2252.75	3382.26	0	3382.26	3471.4	3471.4
11	8.08397	27240.4	4.45115	FILL - Tcac Derived	300	30	1481.78	2383.36	3608.49	0	3608.49	3723.84	3723.84
12	8.08397	29199	5.26154	FILL - Tcac Derived	300	30	1555.86	2502.51	3814.86	0	3814.86	3958.14	3958.14
13	8.08397	31045.7	6.07298	FILL - Tcac Derived	300	30	1623.01	2610.51	4001.93	0	4001.93	4174.61	4174.61
14	8.08397	32780	6.88566	FILL - Tcac Derived	300	30	1683.43	2707.7	4170.25	0	4170.25	4373.54	4373.54
15	8.08397	34401.4	7.69972	FILL - Tcac Derived	300	30	1737.3	2794.35	4320.34	0	4320.34	4555.23	4555.23
16	8.08397	35909.1	8.51535	FILL - Tcac Derived	300	30	1784.82	2870.77	4452.7	0	4452.7	4719.93	4719.93
17	8.08397	37302.6	9.33273	FILL - Tcac Derived	300	30	1826.11	2937.19	4567.75	0	4567.75	4867.86	4867.86
18	8.08397	38581.1	10.152	FILL - Tcac Derived	300	30	1861.36	2993.89	4665.95	0	4665.95	4999.26	4999.26
19	8.08397	39743.7	10.9734	FILL - Tcac Derived	300	30	1890.71	3041.09	4747.71	0	4747.71	5114.32	5114.32
20	8.08397	40789.4	11.7971	FILL - Tcac Derived	300	30	1914.29	3079.02	4813.4	0	4813.4	5213.21	5213.21
21	8.08397	41717.3	12.6233	FILL - Tcac Derived	300	30	1932.23	3107.88	4863.39	0	4863.39	5296.12	5296.12
22	8.08397	42526.3	13.4521	FILL - Tcac Derived	300	30	1944.67	3127.89	4898.04	0	4898.04	5363.2	5363.2
23	8.08397	43215.1	14.2839	FILL - Tcac Derived	300	30	1951.72	3139.22	4917.67	0	4917.67	5414.57	5414.57
24	8.08397	43782.4	15.1187	FILL - Tcac Derived	300	30	1953.48	3142.05	4922.57	0	4922.57	5450.35	5450.35
25	8.08397	44226.9	15.9568	FILL - Tcac Derived	300	30	1950.06	3136.56	4913.07	0	4913.07	5470.65	5470.65

26	8.08397	44547	16.7984	FILL - Tcac Derived	300	30	1941.58	3122.91	4889.43	0	4889.43	5475.57	5475.57
27	8.08397	44741.2	17.6438	FILL - Tcac Derived	300	30	1928.11	3101.25	4851.92	0	4851.92	5465.17	5465.17
28	8.08397	44807.6	18.4932	FILL - Tcac Derived	300	30	1909.76	3071.73	4800.77	0	4800.77	5439.52	5439.52
29	8.08397	44744.4	19.3468	FILL - Tcac Derived	300	30	1886.6	3034.48	4736.25	0	4736.25	5398.66	5398.66
30	8.08397	44549.6	20.2049	FILL - Tcac Derived	300	30	1858.71	2989.63	4658.57	0	4658.57	5342.63	5342.63
31	8.08397	44221	21.0677	FILL - Tcac Derived	300	30	1826.19	2937.31	4567.94	0	4567.94	5271.43	5271.43
32	8.08397	43756.5	21.9356	FILL - Tcac Derived	300	30	1789.08	2877.63	4464.59	0	4464.59	5185.08	5185.08
33	8.08397	43153.4	22.8088	FILL - Tcac Derived	300	30	1747.48	2810.71	4348.68	0	4348.68	5083.57	5083.57
34	8.08397	42409.2	23.6877	FILL - Tcac Derived	300	30	1701.44	2736.66	4220.42	0	4220.42	4966.87	4966.87
35	8.08397	41521	24.5725	FILL - Tcac Derived	300	30	1651.03	2655.58	4079.99	0	4079.99	4834.93	4834.93
36	8.08397	40485.9	25.4636	FILL - Tcac Derived	300	30	1596.3	2567.56	3927.53	0	3927.53	4687.68	4687.68
37	8.08397	39300.6	26.3614	FILL - Tcac Derived	300	30	1537.33	2472.7	3763.23	0	3763.23	4525.07	4525.07
38	8.08397	37961.6	27.2661	FILL - Tcac Derived	300	30	1474.15	2371.08	3587.22	0	3587.22	4346.98	4346.98
39	8.08397	36465.1	28.1784	FILL - Tcac Derived	300	30	1406.82	2262.79	3399.66	0	3399.66	4153.31	4153.31
40	8.08397	34807.3	29.0984	FILL - Tcac Derived	300	30	1335.41	2147.92	3200.69	0	3200.69	3943.92	3943.92
41	8.08397	32983.7	30.0268	FILL - Tcac Derived	300	30	1259.94	2026.54	2990.45	0	2990.45	3718.66	3718.66
42	8.08397	30989.8	30.9639	FILL - Tcac Derived	300	30	1180.47	1898.72	2769.06	0	2769.06	3477.35	3477.35
43	8.08397	28820.5	31.9103	FILL - Tcac Derived	300	30	1097.05	1764.54	2536.65	0	2536.65	3219.78	3219.78
44	8.08397	26470.5	32.8666	FILL - Tcac Derived	300	30	1009.72	1624.07	2293.35	0	2293.35	2945.73	2945.73
45	8.08397	23933.9	33.8333	FILL - Tcac Derived	300	30	918.517	1477.38	2039.28	0	2039.28	2654.94	2654.94
46	8.08397	21204.3	34.8111	FILL - Tcac Derived	300	30	823.487	1324.53	1774.54	0	1774.54	2347.12	2347.12
47	8.08397	18275	35.8006	FILL - Tcac Derived	300	30	724.678	1165.6	1499.27	0	1499.27	2021.93	2021.93
48	8.08397	14901.8	36.8026	FILL - Tcac Derived	300	30	615.064	989.294	1193.89	0	1193.89	1654.06	1654.06
49	8.08397	9359.3	37.8179	FILL - Tcac Derived	300	30	444.482	714.923	718.668	0	718.668	1063.67	1063.67
50	8.08397	3157.94	38.8474	FILL - Tcac Derived	300	30	264.362	425.21	216.87	0	216.87	429.782	429.782

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.60844

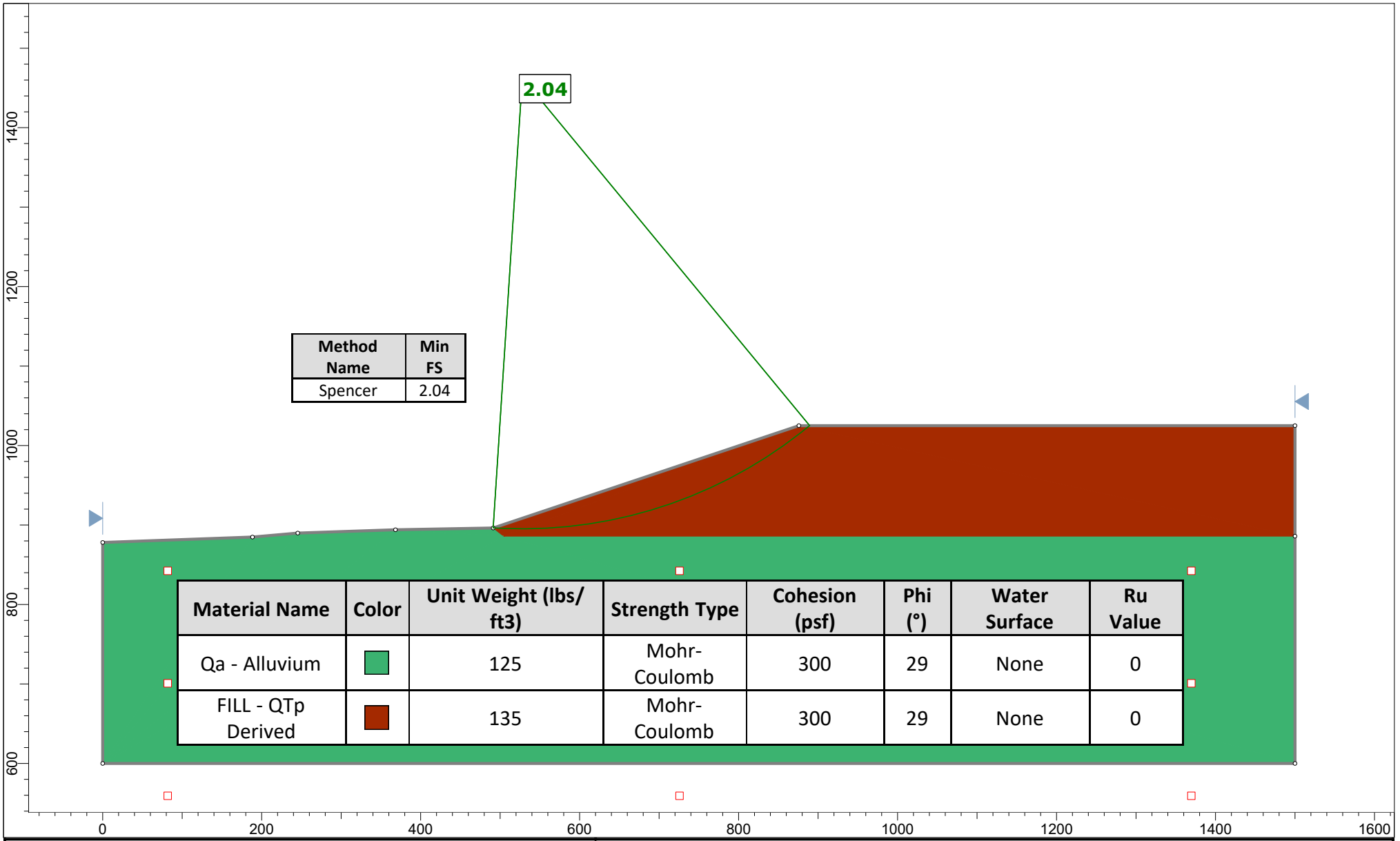
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.202	896.273	0	0	0
2	499.286	895.76	2503.3	1032.15	22.4071
3	507.37	895.362	6108.22	2518.52	22.4072
4	515.454	895.077	10639.5	4386.84	22.4072
5	523.538	894.907	15934.4	6570.03	22.4072
6	531.621	894.851	21842.2	9005.9	22.4072
7	539.705	894.909	28223	11636.8	22.4071
8	547.789	895.08	34947.5	14409.4	22.4071
9	555.873	895.366	41896.2	17274.5	22.4072
10	563.957	895.766	48958.8	20186.5	22.4071
11	572.041	896.281	56033.9	23103.7	22.4072
12	580.125	896.91	63028.5	25987.7	22.4072
13	588.209	897.655	69857.4	28803.4	22.4072
14	596.293	898.515	76442.9	31518.7	22.4072
15	604.377	899.491	82714.8	34104.7	22.4072
16	612.461	900.584	88609.5	36535.2	22.4072
17	620.545	901.794	94070.4	38786.8	22.4072
18	628.629	903.123	99047.1	40838.8	22.4072
19	636.713	904.57	103495	42672.9	22.4073
20	644.797	906.138	107377	44273.4	22.4072
21	652.881	907.826	110660	45627	22.4072
22	660.965	909.637	113318	46722.7	22.4071
23	669.049	911.57	115329	47551.9	22.4071
24	677.133	913.628	116677	48108	22.4072
25	685.217	915.812	117354	48387	22.4072
26	693.301	918.124	117353	48386.7	22.4072
27	701.385	920.564	116676	48107.4	22.4071
28	709.469	923.135	115327	47551.3	22.4072
29	717.553	925.839	113318	46723	22.4072
30	725.637	928.678	110665	45629.2	22.4072
31	733.721	931.653	107390	44278.6	22.4071
32	741.805	934.767	103519	42682.4	22.4071
33	749.889	938.022	99083.9	40853.9	22.4071
34	757.973	941.422	94123.7	38808.7	22.4071
35	766.057	944.969	88681.4	36564.8	22.4072
36	774.141	948.665	82806.7	34142.6	22.4072
37	782.225	952.515	76554.8	31564.8	22.4072
38	790.309	956.521	69987.6	28857.1	22.4072
39	798.393	960.687	63173.3	26047.4	22.4072
40	806.477	965.018	56186.9	23166.8	22.4072
41	814.561	969.517	49110.6	20249.1	22.4072
42	822.645	974.189	42034.3	17331.4	22.4071
43	830.728	979.04	35055.6	14454	22.4072
44	838.812	984.074	28280.8	11660.7	22.4073
45	846.896	989.297	21825.2	8998.89	22.4072
46	854.98	994.715	15813.7	6520.27	22.4072
47	863.064	1000.34	10381.9	4280.63	22.4072
48	871.148	1006.17	5676.48	2340.51	22.4072
49	879.232	1012.21	1942.04	800.735	22.4072
50	887.316	1018.49	93.1245	38.3968	22.4072
51	895.4	1025	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959



Method Name	Min FS
Spencer	2.04

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - QTp Derived		135	Mohr-Coulomb	300	29	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 14-14', Static, Circular		
Client	Solstra Communities California, LLC	*Drawn By*	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	*File Name*	SP_Fill.slmd
		Scale	1:2000
Project No.:	23-2195s-1	*Date:* 10/13/2023	*Run Number* Run No. 40

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 2.03939 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 2.03939 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.84s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - QTp Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	2.039390
Center:	527.984, 1462.902
Radius:	567.821
Left Slip Surface Endpoint:	491.202, 896.273
Right Slip Surface Endpoint:	889.457, 1025.000
Resisting Moment:	5.71337e+08 lb-ft
Driving Moment:	2.80151e+08 lb-ft
Resisting Horizontal Force:	945118 lb
Driving Horizontal Force:	463431 lb
Total Slice Area:	12106.4 ft2
Surface Horizontal Width:	398.256 ft
Surface Average Height:	30.3986 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12480
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.03939

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	7.96511	1671.29	-3.31154	FILL - QTp Derived	300	29	228.253	465.496	298.564	0	298.564	285.356	285.356
2	7.96511	4973.44	-2.50676	FILL - QTp Derived	300	29	353.368	720.655	758.882	0	758.882	743.412	743.412
3	7.96511	8155.09	-1.70247	FILL - QTp Derived	300	29	471.662	961.903	1194.1	0	1194.1	1180.09	1180.09
4	7.96511	11216.4	-0.898522	FILL - QTp Derived	300	29	583.324	1189.63	1604.93	0	1604.93	1595.78	1595.78
5	7.96511	14157.6	-0.0947493	FILL - QTp Derived	300	29	688.529	1404.18	1992	0	1992	1990.86	1990.86
6	7.96511	16978.6	0.709005	FILL - QTp Derived	300	29	787.446	1605.91	2355.92	0	2355.92	2365.66	2365.66
7	7.96511	19679.3	1.5129	FILL - QTp Derived	300	29	880.229	1795.13	2697.29	0	2697.29	2720.54	2720.54
8	7.96511	22259.9	2.31709	FILL - QTp Derived	300	29	967.024	1972.14	3016.62	0	3016.62	3055.75	3055.75
9	7.96511	24719.9	3.12174	FILL - QTp Derived	300	29	1047.98	2137.23	3314.45	0	3314.45	3371.6	3371.6
10	7.96511	27059.3	3.92701	FILL - QTp Derived	300	29	1123.21	2290.66	3591.23	0	3591.23	3668.34	3668.34
11	7.96511	29277.6	4.73305	FILL - QTp Derived	300	29	1192.85	2432.68	3847.45	0	3847.45	3946.21	3946.21
12	7.96511	31374.6	5.54003	FILL - QTp Derived	300	29	1257	2563.52	4083.5	0	4083.5	4205.42	4205.42
13	7.96511	33349.7	6.34812	FILL - QTp Derived	300	29	1315.8	2683.42	4299.8	0	4299.8	4446.19	4446.19
14	7.96511	35202.4	7.15748	FILL - QTp Derived	300	29	1369.32	2792.58	4496.73	0	4496.73	4668.69	4668.69
15	7.96511	36932.1	7.96828	FILL - QTp Derived	300	29	1417.67	2891.19	4674.64	0	4674.64	4873.08	4873.08
16	7.96511	38538.1	8.78069	FILL - QTp Derived	300	29	1460.95	2979.45	4833.87	0	4833.87	5059.53	5059.53
17	7.96511	40019.6	9.59488	FILL - QTp Derived	300	29	1499.24	3057.53	4974.72	0	4974.72	5228.16	5228.16
18	7.96511	41375.7	10.411	FILL - QTp Derived	300	29	1532.62	3125.6	5097.51	0	5097.51	5379.1	5379.1
19	7.96511	42605.6	11.2293	FILL - QTp Derived	300	29	1561.15	3183.8	5202.51	0	5202.51	5512.46	5512.46
20	7.96511	43708.1	12.0499	FILL - QTp Derived	300	29	1584.93	3232.29	5289.99	0	5289.99	5628.32	5628.32
21	7.96511	44682.2	12.8731	FILL - QTp Derived	300	29	1604.01	3271.21	5360.21	0	5360.21	5726.78	5726.78
22	7.96511	45526.5	13.6989	FILL - QTp Derived	300	29	1618.46	3300.68	5413.37	0	5413.37	5807.88	5807.88
23	7.96511	46239.9	14.5277	FILL - QTp Derived	300	29	1628.34	3320.83	5449.71	0	5449.71	5871.67	5871.67
24	7.96511	46820.7	15.3596	FILL - QTp Derived	300	29	1633.7	3331.76	5469.44	0	5469.44	5918.2	5918.2
25	7.96511	47267.6	16.1948	FILL - QTp Derived	300	29	1634.61	3333.6	5472.76	0	5472.76	5947.5	5947.5

26	7.96511	47578.7	17.0336	FILL - QTp Derived	300	29	1631.09	3326.43	5459.83	0	5459.83	5959.55	5959.55
27	7.96511	47752.4	17.8761	FILL - QTp Derived	300	29	1623.21	3310.36	5430.83	0	5430.83	5954.37	5954.37
28	7.96511	47786.7	18.7227	FILL - QTp Derived	300	29	1611.01	3285.47	5385.92	0	5385.92	5931.93	5931.93
29	7.96511	47679.5	19.5735	FILL - QTp Derived	300	29	1594.51	3251.83	5325.25	0	5325.25	5892.2	5892.2
30	7.96511	47428.7	20.4288	FILL - QTp Derived	300	29	1573.77	3209.54	5248.95	0	5248.95	5835.13	5835.13
31	7.96511	47031.8	21.289	FILL - QTp Derived	300	29	1548.82	3158.65	5157.13	0	5157.13	5760.65	5760.65
32	7.96511	46486.4	22.1541	FILL - QTp Derived	300	29	1519.68	3099.23	5049.95	0	5049.95	5668.7	5668.7
33	7.96511	45789.7	23.0247	FILL - QTp Derived	300	29	1486.4	3031.35	4927.48	0	4927.48	5559.17	5559.17
34	7.96511	44938.9	23.9009	FILL - QTp Derived	300	29	1448.99	2955.05	4789.83	0	4789.83	5431.96	5431.96
35	7.96511	43930.8	24.7831	FILL - QTp Derived	300	29	1407.47	2870.39	4637.09	0	4637.09	5286.93	5286.93
36	7.96511	42762.1	25.6716	FILL - QTp Derived	300	29	1361.88	2777.41	4469.36	0	4469.36	5123.96	5123.96
37	7.96511	41429.3	26.5667	FILL - QTp Derived	300	29	1312.23	2676.15	4286.69	0	4286.69	4942.86	4942.86
38	7.96511	39928.5	27.469	FILL - QTp Derived	300	29	1258.54	2566.66	4089.17	0	4089.17	4743.46	4743.46
39	7.96511	38255.6	28.3787	FILL - QTp Derived	300	29	1200.83	2448.97	3876.84	0	3876.84	4525.56	4525.56
40	7.96511	36406.3	29.2962	FILL - QTp Derived	300	29	1139.12	2323.1	3649.77	0	3649.77	4288.91	4288.91
41	7.96511	34375.7	30.2221	FILL - QTp Derived	300	29	1073.4	2189.08	3408	0	3408	4033.29	4033.29
42	7.96511	32158.9	31.1568	FILL - QTp Derived	300	29	1003.7	2046.94	3151.57	0	3151.57	3758.4	3758.4
43	7.96511	29750.3	32.1007	FILL - QTp Derived	300	29	930.033	1896.7	2880.52	0	2880.52	3463.95	3463.95
44	7.96511	27143.9	33.0546	FILL - QTp Derived	300	29	852.397	1738.37	2594.9	0	2594.9	3149.6	3149.6
45	7.96511	24333.4	34.0189	FILL - QTp Derived	300	29	770.809	1571.98	2294.71	0	2294.71	2815	2815
46	7.96511	21311.8	34.9943	FILL - QTp Derived	300	29	685.269	1397.53	1980	0	1980	2459.73	2459.73
47	7.96511	18071.5	35.9815	FILL - QTp Derived	300	29	595.787	1215.04	1650.78	0	1650.78	2083.35	2083.35
48	7.96511	14604.3	36.9811	FILL - QTp Derived	300	29	502.369	1024.53	1307.08	0	1307.08	1685.38	1685.38
49	7.96511	10169.3	37.9941	FILL - QTp Derived	300	29	386.761	788.757	881.742	0	881.742	1183.85	1183.85
50	7.96511	3470.46	39.0213	FILL - QTp Derived	300	29	222.896	454.571	278.854	0	278.854	459.489	459.489

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.03939

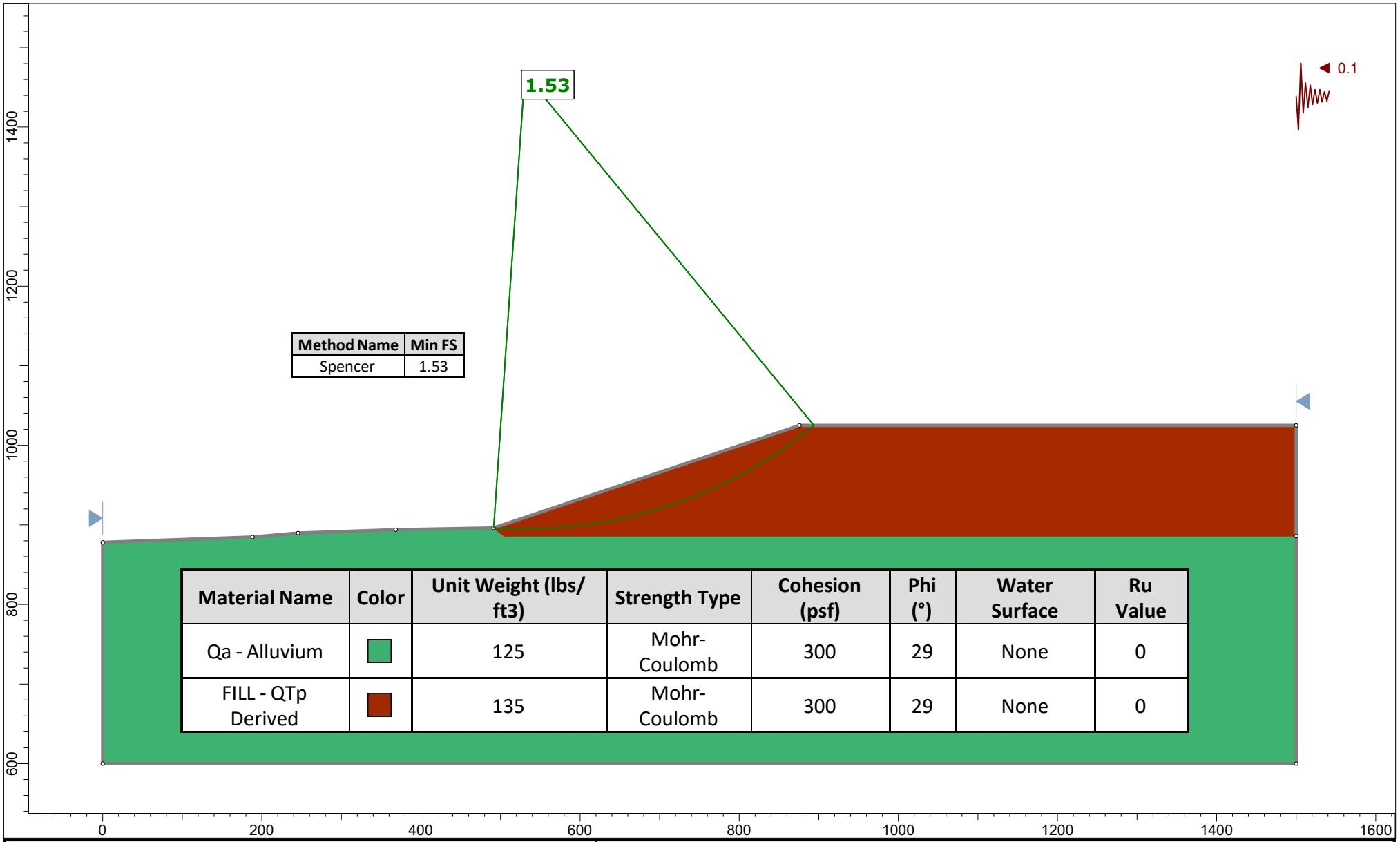
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.202	896.273	0	0	0
2	499.167	895.812	1955.32	606.803	17.2409
3	507.132	895.463	5034.04	1562.24	17.241
4	515.097	895.227	9072.88	2815.63	17.2409
5	523.062	895.102	13918.7	4319.46	17.2409
6	531.027	895.088	19428.2	6029.23	17.2409
7	538.992	895.187	25466.9	7903.25	17.2409
8	546.957	895.397	31909.3	9902.54	17.2409
9	554.923	895.72	38638.1	11990.7	17.2409
10	562.888	896.154	45543.9	14133.8	17.2409
11	570.853	896.701	52525.1	16300.3	17.2409
12	578.818	897.36	59487.2	18460.9	17.2409
13	586.783	898.133	66342.7	20588.4	17.2409
14	594.748	899.019	73011	22657.8	17.2409
15	602.713	900.019	79418.1	24646.2	17.2409
16	610.678	901.134	85496	26532.4	17.2409
17	618.643	902.365	91183.3	28297.3	17.2409
18	626.609	903.711	96424.4	29923.8	17.2409
19	634.574	905.174	101170	31396.4	17.2408
20	642.539	906.756	105375	32701.5	17.2409
21	650.504	908.456	109002	33827.1	17.2409
22	658.469	910.276	112019	34763.3	17.2409
23	666.434	912.218	114397	35501.4	17.2409
24	674.399	914.282	116117	36035	17.2409
25	682.364	916.47	117160	36358.8	17.2409
26	690.329	918.783	117517	36469.7	17.241
27	698.295	921.223	117183	36366	17.241
28	706.26	923.792	116158	36047.9	17.2409
29	714.225	926.492	114448	35517.2	17.2409
30	722.19	929.324	112064	34777.5	17.241
31	730.155	932.291	109025	33834.2	17.2409
32	738.12	935.395	105353	32694.7	17.2409
33	746.085	938.638	101078	31368	17.2409
34	754.05	942.023	96235.4	29865.2	17.2409
35	762.015	945.552	90867.4	28199.3	17.2409
36	769.981	949.23	85022.9	26385.5	17.2409
37	777.946	953.059	78757.5	24441.2	17.2409
38	785.911	957.041	72134.4	22385.8	17.2409
39	793.876	961.182	65224.2	20241.3	17.2409
40	801.841	965.485	58105.5	18032.2	17.241
41	809.806	969.954	50865.8	15785.4	17.2409
42	817.771	974.594	43601.1	13530.9	17.2409
43	825.736	979.41	36417.5	11301.6	17.2409
44	833.702	984.406	29431	9133.44	17.2409
45	841.667	989.59	22768.8	7065.93	17.2409
46	849.632	994.966	16570	5142.24	17.2409
47	857.597	1000.54	10986.7	3409.54	17.2409
48	865.562	1006.33	6184.74	1919.34	17.2409
49	873.527	1012.32	2345.51	727.893	17.2409
50	881.492	1018.55	-60.4072	-18.7464	17.2409
51	889.457	1025	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - QTp Derived		135	Mohr-Coulomb	300	29	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross-Section 14-14', Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/13/2023	Run Number: Run No. 41

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.52868 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.52868 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill

Project Summary

File Name:	SP_Fill.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.334s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross-Section 14-14', Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - QTp Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.528680
Center:	530.625, 1466.915
Radius:	571.992
Left Slip Surface Endpoint:	491.250, 896.280
Right Slip Surface Endpoint:	893.786, 1025.000
Resisting Moment:	5.83629e+08 lb-ft
Driving Moment:	3.81786e+08 lb-ft
Resisting Horizontal Force:	960262 lb
Driving Horizontal Force:	628163 lb
Total Slice Area:	12636 ft2
Surface Horizontal Width:	402.536 ft
Surface Average Height:	31.3909 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12632
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.52868

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	8.05072	1735.33	-3.54327	FILL - QTp Derived	300	29	330.465	505.175	370.146	0	370.146	349.683	349.683
2	8.05072	5144.12	-2.7356	FILL - QTp Derived	300	29	507.994	776.561	859.738	0	859.738	835.466	835.466
3	8.05072	8429.32	-1.92848	FILL - QTp Derived	300	29	674.512	1031.11	1318.96	0	1318.96	1296.25	1296.25
4	8.05072	11591.1	-1.12173	FILL - QTp Derived	300	29	830.437	1269.47	1748.97	0	1748.97	1732.71	1732.71
5	8.05072	14629.7	-0.31521	FILL - QTp Derived	300	29	976.162	1492.24	2150.84	0	2150.84	2145.47	2145.47
6	8.05072	17545.1	0.49125	FILL - QTp Derived	300	29	1112.04	1699.96	2525.61	0	2525.61	2535.14	2535.14
7	8.05072	20337.4	1.29781	FILL - QTp Derived	300	29	1238.44	1893.18	2874.17	0	2874.17	2902.23	2902.23
8	8.05072	23006.3	2.10462	FILL - QTp Derived	300	29	1355.67	2072.38	3197.46	0	3197.46	3247.28	3247.28
9	8.05072	25551.9	2.91185	FILL - QTp Derived	300	29	1464.02	2238.02	3496.27	0	3496.27	3570.74	3570.74
10	8.05072	27973.8	3.71966	FILL - QTp Derived	300	29	1563.79	2390.53	3771.41	0	3771.41	3873.08	3873.08
11	8.05072	30271.7	4.52821	FILL - QTp Derived	300	29	1655.24	2530.33	4023.61	0	4023.61	4154.7	4154.7
12	8.05072	32445.3	5.33767	FILL - QTp Derived	300	29	1738.62	2657.79	4253.56	0	4253.56	4416	4416
13	8.05072	34494.1	6.1482	FILL - QTp Derived	300	29	1814.16	2773.27	4461.9	0	4461.9	4657.32	4657.32
14	8.05072	36417.6	6.95996	FILL - QTp Derived	300	29	1882.09	2877.12	4649.25	0	4649.25	4879.01	4879.01
15	8.05072	38215.2	7.77313	FILL - QTp Derived	300	29	1942.63	2969.66	4816.19	0	4816.19	5081.37	5081.37
16	8.05072	39886.2	8.58788	FILL - QTp Derived	300	29	1995.96	3051.19	4963.27	0	4963.27	5264.7	5264.7
17	8.05072	41429.7	9.40439	FILL - QTp Derived	300	29	2042.28	3121.99	5091	0	5091	5429.26	5429.26
18	8.05072	42845	10.2228	FILL - QTp Derived	300	29	2081.75	3182.33	5199.86	0	5199.86	5575.28	5575.28
19	8.05072	44131	11.0434	FILL - QTp Derived	300	29	2114.55	3232.47	5290.31	0	5290.31	5703	5703
20	8.05072	45286.7	11.8662	FILL - QTp Derived	300	29	2140.83	3272.65	5362.79	0	5362.79	5812.62	5812.62
21	8.05072	46311.1	12.6916	FILL - QTp Derived	300	29	2160.75	3303.09	5417.72	0	5417.72	5904.33	5904.33
22	8.05072	47202.7	13.5196	FILL - QTp Derived	300	29	2174.44	3324.02	5455.47	0	5455.47	5978.29	5978.29
23	8.05072	47960.4	14.3505	FILL - QTp Derived	300	29	2182.04	3335.64	5476.43	0	5476.43	6034.67	6034.67
24	8.05072	48582.6	15.1845	FILL - QTp Derived	300	29	2183.67	3338.13	5480.94	0	5480.94	6073.6	6073.6
25	8.05072	49067.8	16.0218	FILL - QTp Derived	300	29	2179.46	3331.7	5469.33	0	5469.33	6095.18	6095.18

26	8.05072	49414.2	16.8627	FILL - QTp Derived	300	29	2169.52	3316.5	5441.91	0	5441.91	6099.52	6099.52
27	8.05072	49620.1	17.7073	FILL - QTp Derived	300	29	2153.96	3292.71	5398.98	0	5398.98	6086.7	6086.7
28	8.05072	49683.6	18.5559	FILL - QTp Derived	300	29	2132.87	3260.48	5340.84	0	5340.84	6056.81	6056.81
29	8.05072	49602.4	19.4088	FILL - QTp Derived	300	29	2106.37	3219.96	5267.74	0	5267.74	6009.87	6009.87
30	8.05072	49374.4	20.2661	FILL - QTp Derived	300	29	2074.53	3171.29	5179.94	0	5179.94	5945.93	5945.93
31	8.05072	48997.3	21.1282	FILL - QTp Derived	300	29	2037.45	3114.61	5077.68	0	5077.68	5865.02	5865.02
32	8.05072	48468.3	21.9954	FILL - QTp Derived	300	29	1995.21	3050.04	4961.21	0	4961.21	5767.14	5767.14
33	8.05072	47784.8	22.8678	FILL - QTp Derived	300	29	1947.9	2977.71	4830.72	0	4830.72	5652.26	5652.26
34	8.05072	46943.8	23.746	FILL - QTp Derived	300	29	1895.58	2897.74	4686.45	0	4686.45	5520.37	5520.37
35	8.05072	45942.3	24.6301	FILL - QTp Derived	300	29	1838.34	2810.23	4528.57	0	4528.57	5371.39	5371.39
36	8.05072	44776.7	25.5205	FILL - QTp Derived	300	29	1776.23	2715.29	4357.29	0	4357.29	5205.29	5205.29
37	8.05072	43443.4	26.4175	FILL - QTp Derived	300	29	1709.33	2613.02	4172.79	0	4172.79	5021.96	5021.96
38	8.05072	41938.7	27.3216	FILL - QTp Derived	300	29	1637.69	2503.51	3975.24	0	3975.24	4821.3	4821.3
39	8.05072	40258.3	28.2331	FILL - QTp Derived	300	29	1561.39	2386.87	3764.8	0	3764.8	4603.18	4603.18
40	8.05072	38397.7	29.1525	FILL - QTp Derived	300	29	1480.47	2263.17	3541.65	0	3541.65	4367.44	4367.44
41	8.05072	36352.2	30.0802	FILL - QTp Derived	300	29	1395	2132.51	3305.92	0	3305.92	4113.93	4113.93
42	8.05072	34116.6	31.0166	FILL - QTp Derived	300	29	1305.02	1994.96	3057.79	0	3057.79	3842.44	3842.44
43	8.05072	31685.2	31.9624	FILL - QTp Derived	300	29	1210.59	1850.61	2797.37	0	2797.37	3552.73	3552.73
44	8.05072	29052	32.918	FILL - QTp Derived	300	29	1111.76	1699.53	2524.82	0	2524.82	3244.54	3244.54
45	8.05072	26210.5	33.8841	FILL - QTp Derived	300	29	1008.58	1541.8	2240.27	0	2240.27	2917.6	2917.6
46	8.05072	23153.7	34.8612	FILL - QTp Derived	300	29	901.104	1377.5	1943.86	0	1943.86	2571.57	2571.57
47	8.05072	19873.8	35.8501	FILL - QTp Derived	300	29	789.374	1206.7	1635.73	0	1635.73	2206.09	2206.09
48	8.05072	16282.3	36.8514	FILL - QTp Derived	300	29	671.014	1025.77	1309.32	0	1309.32	1812.24	1812.24
49	8.05072	10460.7	37.8661	FILL - QTp Derived	300	29	489.326	748.023	808.254	0	808.254	1188.72	1188.72
50	8.05072	3529.5	38.8949	FILL - QTp Derived	300	29	285.227	436.021	245.388	0	245.388	475.495	475.495

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.52868

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.25	896.28	0	0	0
2	499.301	895.781	2673.86	1104.79	22.4495
3	507.352	895.397	6583.57	2720.21	22.4495
4	515.402	895.126	11533.4	4765.38	22.4495
5	523.453	894.968	17341.6	7165.23	22.4495
6	531.504	894.924	23839.7	9850.15	22.4496
7	539.554	894.993	30871.7	12755.6	22.4495
8	547.605	895.175	38293.1	15822	22.4495
9	555.656	895.471	45970.4	18994.1	22.4495
10	563.707	895.88	53780.5	22221.1	22.4495
11	571.757	896.404	61610.1	25456.2	22.4495
12	579.808	897.041	69355.4	28656.4	22.4495
13	587.859	897.794	76921.1	31782.4	22.4495
14	595.909	898.661	84220.7	34798.5	22.4495
15	603.96	899.644	91175.5	37672.1	22.4495
16	612.011	900.743	97714.8	40374	22.4495
17	620.062	901.958	103775	42878	22.4496
18	628.112	903.292	109300	45160.9	22.4496
19	636.163	904.744	114241	47202.3	22.4495
20	644.214	906.315	118555	48984.6	22.4495
21	652.265	908.006	122205	50492.9	22.4495
22	660.315	909.82	125162	51714.9	22.4496
23	668.366	911.755	127403	52640.8	22.4496
24	676.417	913.815	128911	53263.5	22.4495
25	684.467	916	129672	53578.3	22.4496
26	692.518	918.312	129684	53582.9	22.4495
27	700.569	920.752	128944	53277.5	22.4496
28	708.62	923.322	127461	52664.6	22.4495
29	716.67	926.025	125246	51749.3	22.4495
30	724.721	928.861	122317	50539	22.4495
31	732.772	931.834	118698	49043.7	22.4495
32	740.822	934.945	114419	47275.7	22.4495
33	748.873	938.197	109515	45249.8	22.4496
34	756.924	941.593	104031	42983.6	22.4495
35	764.975	945.134	98012.7	40497.1	22.4495
36	773.025	948.825	91516.7	37813.1	22.4496
37	781.076	952.669	84604.5	34957.1	22.4496
38	789.127	956.668	77344.9	31957.5	22.4495
39	797.177	960.827	69814	28845.9	22.4495
40	805.228	965.15	62095.4	25656.7	22.4495
41	813.279	969.641	54281	22427.9	22.4495
42	821.33	974.304	46470.7	19200.9	22.4496
43	829.38	979.144	38773.5	16020.5	22.4495
44	837.431	984.168	31307.9	12935.9	22.4496
45	845.482	989.38	24202.3	9999.95	22.4495
46	853.533	994.786	17596.1	7270.39	22.4495
47	861.583	1000.39	11640.3	4809.57	22.4496
48	869.634	1006.21	6498.54	2685.08	22.4495
49	877.685	1012.25	2376.93	982.104	22.4495
50	885.735	1018.51	214.433	88.6	22.4496
51	893.786	1025	0	0	0

Entity Information

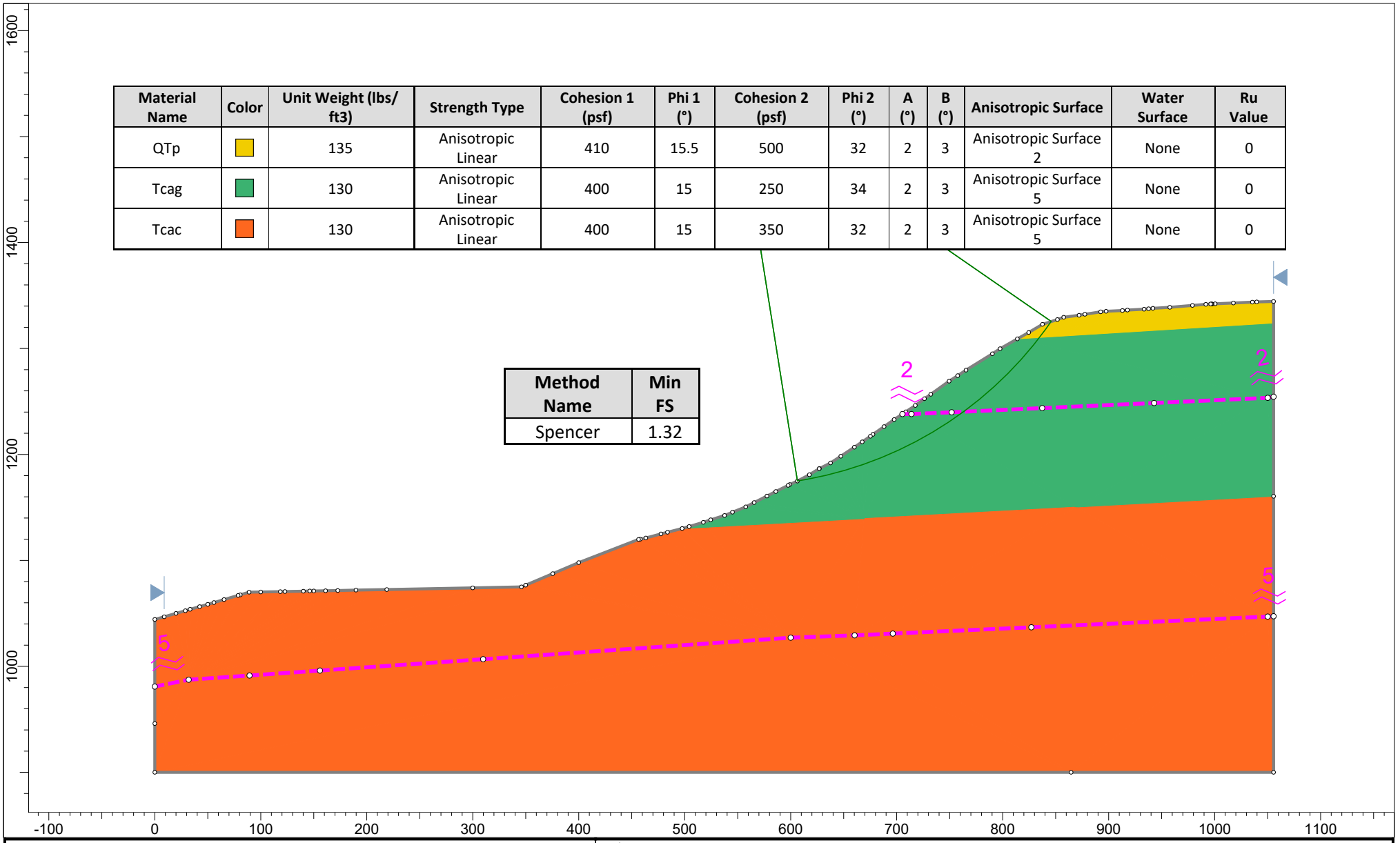
Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	0, 600 1500, 600 1500, 885.959 1500, 1025 875.8, 1025 491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
QTp		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 2	None	0
Tcag		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 5	None	0
Tcac		130	Anisotropic Linear	400	15	350	32	2	3	Anisotropic Surface 5	None	0

Method Name	Min FS
Spencer	1.32



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 15-15'; Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPGS1A.slmd
		Scale	1:1500
Project No.:	23-2195s	Date: 10/13/2023	Run Number: Run No. 42

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 5
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.317 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.317 6
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SPGS1A

Project Summary

File Name:	SPGS1A.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.736s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 15-15'; Static; Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

QTp	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Water Surface	None
Ru Value	0

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 5
Water Surface	None
Ru Value	0

Tcac	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	350 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 5
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.317000
Center:	549.910, 1530.476
Radius:	360.038
Left Slip Surface Endpoint:	606.360, 1174.891
Right Slip Surface Endpoint:	845.894, 1325.486
Resisting Moment:	1.89234e+08 lb-ft
Driving Moment:	1.43686e+08 lb-ft
Resisting Horizontal Force:	441650 lb
Driving Horizontal Force:	335345 lb
Total Slice Area:	5877.14 ft2
Surface Horizontal Width:	239.534 ft
Surface Average Height:	24.5357 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	11980
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.317

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	4.76004	540.797	9.40446	Tcag	250	34	300.814	396.172	216.709	0	216.709	266.533	266.533
2	4.76004	1606.39	10.1732	Tcag	250	34	425.155	559.929	459.488	0	459.488	535.78	535.78
3	4.76004	2679.69	10.9438	Tcag	250	34	546.347	719.539	696.12	0	696.12	801.763	801.763
4	4.76004	3886.52	11.7163	Tcag	250	34	679.039	894.294	955.206	0	955.206	1096.03	1096.03
5	4.76004	4989.49	12.4911	Tcag	250	34	795.553	1047.74	1182.7	0	1182.7	1358.94	1358.94
6	4.76004	5822.92	13.2682	Tcag	250	34	878.002	1156.33	1343.69	0	1343.69	1550.72	1550.72
7	4.76004	6639.11	14.0477	Tcag	250	34	955.771	1258.75	1495.54	0	1495.54	1734.69	1734.69
8	4.76004	7724.49	14.83	Tcag	250	34	1060.14	1396.21	1699.32	0	1699.32	1980.02	1980.02
9	4.76004	8838.64	15.6151	Tcag	250	34	1164.09	1533.1	1902.28	0	1902.28	2227.63	2227.63
10	4.76004	9956.14	16.4032	Tcag	250	34	1264.87	1665.84	2099.07	0	2099.07	2471.42	2471.42
11	4.76004	11040.9	17.1944	Tcag	250	34	1358.82	1789.57	2282.5	0	2282.5	2702.98	2702.98
12	4.76004	12080.9	17.9891	Tcag	250	34	1444.97	1903.02	2450.7	0	2450.7	2919.89	2919.89
13	4.76004	13076.6	18.7874	Tcag	250	34	1523.63	2006.62	2604.29	0	2604.29	3122.6	3122.6
14	4.76004	14078.6	19.5895	Tcag	250	34	1600.05	2107.27	2753.51	0	2753.51	3322.94	3322.94
15	4.76004	15063.8	20.3956	Tcag	250	34	1672.06	2202.1	2894.11	0	2894.11	3515.8	3515.8
16	4.76004	16002.1	21.206	Tcag	250	34	1736.87	2287.46	3020.66	0	3020.66	3694.55	3694.55
17	4.76004	16891.7	22.0208	Tcag	250	34	1794.6	2363.49	3133.37	0	3133.37	3859.2	3859.2
18	4.76004	17738.4	22.8404	Tcag	250	34	1846.02	2431.21	3233.76	0	3233.76	4011.29	4011.29
19	4.76004	18547.1	23.6649	Tcag	250	34	1891.8	2491.5	3323.16	0	3323.16	4152.22	4152.22
20	4.76004	19265.6	24.4946	Tcag	250	34	1927.47	2538.48	3392.82	0	3392.82	4271	4271
21	4.76004	19857.7	25.3299	Tcag	250	34	1950.25	2568.48	3437.29	0	3437.29	4360.42	4360.42
22	4.76004	20396.3	26.1709	Tcag	250	34	1967.02	2590.56	3470.02	0	3470.02	4436.67	4436.67
23	4.76004	20886.7	27.0181	Tcag	250	34	1978.44	2605.61	3492.34	0	3492.34	4501.19	4501.19
24	4.76004	21359.8	27.8717	Tcag	250	34	1987.36	2617.35	3509.73	0	3509.73	4560.73	4560.73
25	4.76004	21915.9	28.7321	Tcag	250	34	2002.09	2636.75	3538.5	0	3538.5	4636.07	4636.07
26	4.76004	22409.2	29.5997	Tcag	250	34	2010.46	2647.77	3554.84	0	3554.84	4696.93	4696.93
27	4.76004	22807	30.4747	Tcag	250	34	2010.12	2647.33	3554.19	0	3554.19	4737.05	4737.05
28	4.76004	23145.9	31.3577	Tcag	250	34	2004.33	2639.7	3542.88	0	3542.88	4764.3	4764.3
29	4.76004	23422.5	32.2491	Tcag	250	34	1993.04	2624.84	3520.86	0	3520.86	4778.33	4778.33
30	4.76004	23634.8	33.1493	Tcag	250	34	1976.36	2602.86	3488.25	0	3488.25	4779.05	4779.05
31	4.76004	23682.6	34.0589	Tcag	250	34	1947.03	2564.24	3431	0	3431	4747.21	4747.21
32	4.76004	23537	34.9783	Tcag	250	34	1903.61	2507.05	3346.21	0	3346.21	4678.06	4678.06
33	4.76004	23390.3	35.9082	Tcag	250	34	1860.62	2450.43	3262.28	0	3262.28	4609.55	4609.55
34	4.76004	23174.4	36.8492	Tcag	250	34	1813.25	2388.05	3169.79	0	3169.79	4528.7	4528.7
35	4.76004	22759.4	37.8018	Tcag	250	34	1752.76	2308.38	3051.67	0	3051.67	4411.34	4411.34
36	4.76004	22250.7	38.767	Tcag	250	34	1687.04	2221.83	2923.35	0	2923.35	4278.17	4278.17
37	4.76004	21659.7	39.7453	Tcag	250	34	1617.2	2129.85	2786.99	0	2786.99	4131.78	4131.78
38	4.76004	20983	40.7378	Tcag	250	34	1543.3	2032.53	2642.71	0	2642.71	3971.93	3971.93
39	4.76004	20225.7	41.7453	Tcag	250	34	1465.98	1930.7	2491.74	0	2491.74	3799.96	3799.96
40	4.76004	19485.5	42.7689	Tcag	250	34	1391.66	1832.81	2346.61	0	2346.61	3633.9	3633.9
41	4.76004	18580.8	43.8097	Tcag	250	34	1309.07	1724.05	2185.36	0	2185.36	3441.14	3441.14
42	4.76004	17378.2	44.869	Tcag	250	34	1210.84	1594.67	1993.56	0	1993.56	3198.87	3198.87
43	4.76004	16060.8	45.9481	Tcag	250	34	1108.88	1460.39	1794.48	0	1794.48	2940.68	2940.68
44	4.76004	14632	47.0487	Tcag	250	34	1003.81	1322.02	1589.34	0	1589.34	2667.63	2667.63
45	4.76004	13122.2	48.1726	Tcag	250	34	897.805	1182.41	1382.35	0	1382.35	2385.53	2385.53
46	4.76004	11492.2	49.3216	Tcag	250	34	789.03	1039.15	1169.97	0	1169.97	2088	2088
47	4.76004	9761.36	50.4981	Tcag	250	34	679.027	894.279	955.182	0	955.182	1778.85	1778.85
48	4.76004	7900.99	51.7047	Tcag	250	34	566.742	746.399	735.943	0	735.943	1453.68	1453.68
49	5.5259	6387.04	53.0473	QTp	500	32	571.259	752.348	403.842	0	403.842	1163.23	1163.23
50	5.5259	2227.35	54.5366	QTp	500	32	425.244	560.046	96.0942	0	96.0942	693.072	693.072

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.317

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	606.36	1174.89	0	0	0
2	611.12	1175.68	1259.87	748.268	30.7071
3	615.88	1176.53	2889.51	1716.15	30.7071
4	620.64	1177.45	4847.33	2878.94	30.707
5	625.4	1178.44	7134.01	4237.05	30.707
6	630.16	1179.5	9670.65	5743.62	30.707
7	634.92	1180.62	12338.4	7328.05	30.707
8	639.68	1181.81	15103	8970.02	30.7071
9	644.44	1183.07	18003.6	10692.7	30.7069
10	649.201	1184.4	21009.4	12478	30.7071
11	653.961	1185.8	24084.1	14304.1	30.707
12	658.721	1187.27	27184.8	16145.7	30.7071
13	663.481	1188.82	30269.5	17977.7	30.707
14	668.241	1190.44	33299	19777.1	30.7071
15	673.001	1192.13	36244.8	21526.6	30.707
16	677.761	1193.9	39075.3	23207.7	30.707
17	682.521	1195.75	41757.4	24800.7	30.7071
18	687.281	1197.67	44260.5	26287.3	30.707
19	692.041	1199.68	46557.2	27651.4	30.7071
20	696.801	1201.77	48622.7	28878.1	30.707
21	701.561	1203.93	50432	29952.7	30.707
22	706.321	1206.19	51963.2	30862.1	30.707
23	711.081	1208.53	53201.6	31597.6	30.707
24	715.841	1210.95	54134.6	32151.8	30.7071
25	720.601	1213.47	54751.8	32518.3	30.707
26	725.361	1216.08	55040.3	32689.7	30.7071
27	730.121	1218.78	54990	32659.8	30.707
28	734.881	1221.59	54595	32425.2	30.707
29	739.641	1224.49	53851.1	31983.4	30.707
30	744.401	1227.49	52756.3	31333.2	30.7071
31	749.161	1230.6	51311.7	30475.2	30.7071
32	753.921	1233.82	49531.8	29418.1	30.7071
33	758.682	1237.15	47441.7	28176.7	30.707
34	763.442	1240.59	45047	26754.4	30.707
35	768.202	1244.16	42363.4	25160.6	30.7071
36	772.962	1247.85	39431.5	23419.3	30.7071
37	777.722	1251.68	36280.4	21547.7	30.707
38	782.482	1255.63	32940.5	19564.1	30.707
39	787.242	1259.73	29446.3	17488.8	30.707
40	792.002	1263.98	25834.4	15343.6	30.707
41	796.762	1268.38	22121.1	13138.2	30.707
42	801.522	1272.95	18368.3	10909.4	30.7072
43	806.282	1277.69	14681.2	8719.49	30.707
44	811.042	1282.61	11125.9	6607.94	30.7071
45	815.802	1287.72	7773.6	4616.91	30.707
46	820.562	1293.04	4691.42	2786.34	30.707
47	825.322	1298.58	1964.59	1166.81	30.7069
48	830.082	1304.35	-321.062	-190.686	30.707
49	834.842	1310.38	-2062	-1224.67	30.7071
50	840.368	1317.73	-1874.35	-1113.22	30.7071
51	845.894	1325.49	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
	1055.63, 900 1055.63, 1160.56 1055.63, 1254.53 1055.63, 1344.41

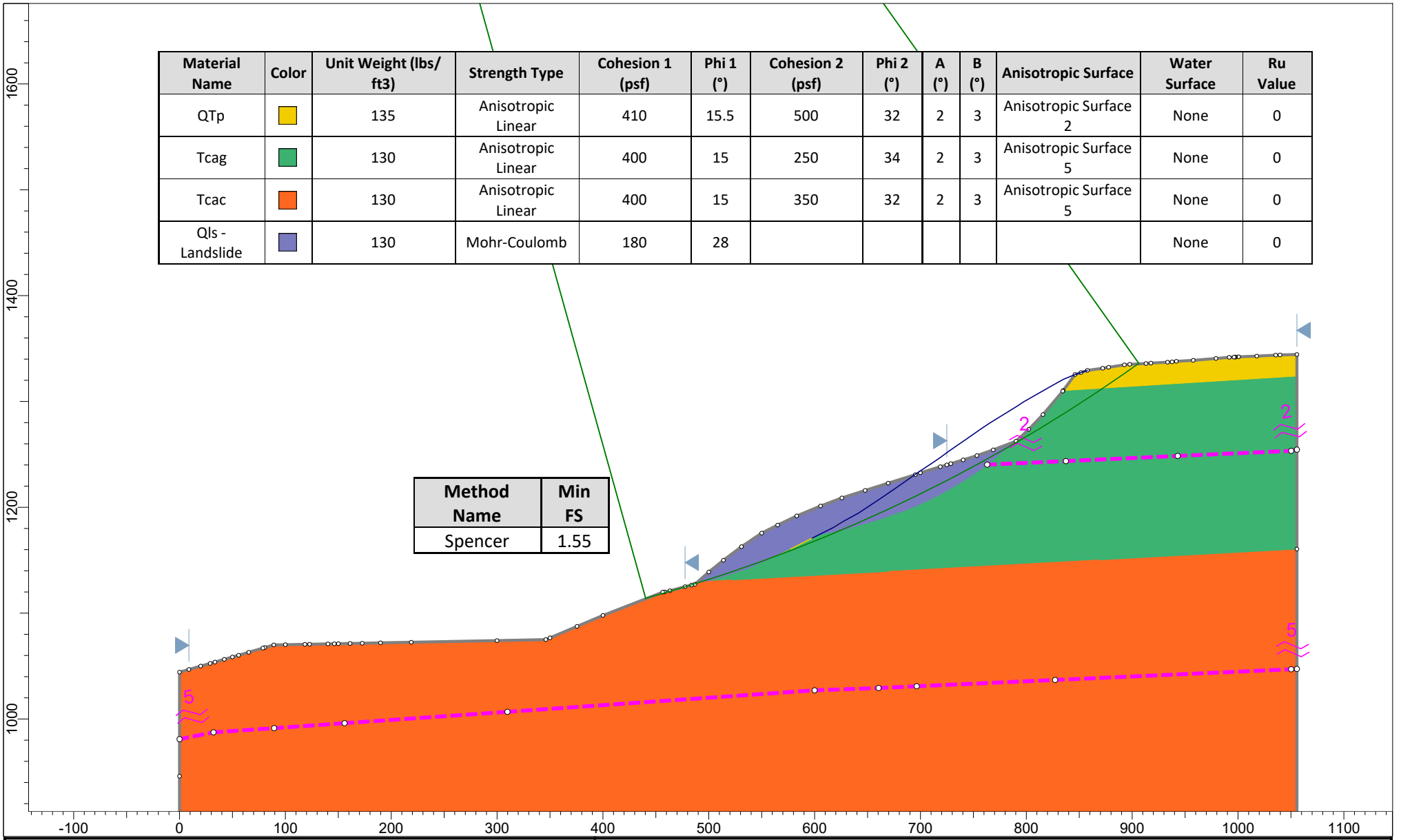
External Boundary	1039.67, 1343.98 1035.64, 1343.8 1017.7, 1342.89 1000.5, 1342.23 997.692, 1341.99 996.981, 1341.97 996.242, 1341.96 991.701, 1341.7 979.127, 1340.65 957.683, 1338.85 941.737, 1337.9 937.678, 1337.48 933.443, 1337.14 917.674, 1336.26 913.003, 1335.89 897.669, 1335.14 892.563, 1334.59 877.665, 1332.3 872.124, 1331.37 857.66, 1329.46 851.684, 1327.36 837.656, 1322.82 824.548, 1315.12 813.922, 1309.09 797.646, 1299.85 790.365, 1294.99 765.449, 1279.61 757.637, 1274.37 749.486, 1269.15 732.198, 1256.82 726.274, 1252.6 717.628, 1246.27 708.606, 1240.25 697.624, 1232.94 688.167, 1226.28 677.619, 1218.92 675.203, 1217.24 667.512, 1211.87 660.091, 1206.89 647.287, 1198.31 637.61, 1192.04 627.144, 1186.73 626.848, 1186.58 617.606, 1180.9 606.408, 1174.91 599.129, 1171.56 597.601, 1170.86 585.968, 1165.05 577.597, 1160.75 565.529, 1154.59 557.592, 1150.55 545.089, 1145.49 537.588, 1142.4 524.649, 1138.32 517.583, 1135.96 504.21, 1132 497.579, 1130.07 483.77, 1126.59 477.574, 1125.04

	463.33, 1121.18 458.073, 1120.02 456.476, 1119.85 400, 1097.88 375.5, 1087.5 350, 1076.69 346, 1075 300, 1074.11 218.904, 1072.53 189.849, 1071.96 172.569, 1071.63 161.113, 1071.4 150, 1071.19 146.242, 1071.11 140.219, 1071 122.863, 1070.66 118.433, 1070.57 100, 1070.21 89, 1070 80.651, 1067.54 78.6925, 1066.97 65.3546, 1063.05 55.8652, 1060.25 50, 1058.57 42.2706, 1056.36 33.3778, 1053.82 28.8945, 1052.54 20, 1050 8.8626, 1046.82 0, 1044.29 0, 946.015 0, 900 864.634, 900
Material Boundary	660.361, 1029.28 1050.15, 1047.03
Material Boundary	32.0299, 987.41 600, 1027.13
Material Boundary	713.933, 1238.11 1050.15, 1253.42
Material Boundary	979.127, 1340.65 996.981, 1341.97
Material Boundary	813.922, 1309.09 1055, 1324 1055.63, 1344.41
Material Boundary	675.203, 1217.24 717.628, 1246.27 732.198, 1256.82 757.637, 1274.37 790.365, 1294.99
Material Boundary	1055, 1324 1055.63, 1254.53
Material Boundary	617.606, 1180.9 627.144, 1186.73
Material Boundary	565.529, 1154.59 599.129, 1171.56

Material Boundary	497.579, 1130.07 521.855, 1131.4 669.22, 1139.45 869.238, 1150.38 1055.63, 1160.56

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
QTp		135	Anisotropic Linear	410	15.5	500	32	2	3	Anisotropic Surface 2	None	0
Tcag		130	Anisotropic Linear	400	15	250	34	2	3	Anisotropic Surface 5	None	0
Tcac		130	Anisotropic Linear	400	15	350	32	2	3	Anisotropic Surface 5	None	0
Qls - Landslide		130	Mohr-Coulomb	180	28						None	0

Method Name	Min FS
Spencer	1.55



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 15-15'; Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPGS1B.slmd
		Scale	1:1500
Project No.:	23-2195s	Date: 10/13/2023	Run Number: Run No. 43

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 5
    Method: spencer 5
Valid and Invalid Surfaces 5
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.55428 5
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.55428 7
Entity Information 7
    Group 1 7
        Shared Entities 8

Slide2 Analysis Information

SPGS1B

Project Summary

File Name:	SPGS1B.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:01.706s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 15-15'; Static; Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

QTp	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	410 psf
Phi 1	15.5 °
A	2 °
Cohesion 2	500 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Water Surface	None
Ru Value	0

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	250 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 5
Water Surface	None
Ru Value	0

Tcac	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	15 °
A	2 °
Cohesion 2	350 psf
Phi 2	32 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 5
Water Surface	None
Ru Value	0

Qls - Landslide	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.554280
Center:	36.491, 2562.198
Radius:	1503.850
Left Slip Surface Endpoint:	440.469, 1113.624
Right Slip Surface Endpoint:	906.518, 1335.570
Resisting Moment:	1.02945e+09 lb-ft
Driving Moment:	6.62332e+08 lb-ft
Resisting Horizontal Force:	616630 lb
Driving Horizontal Force:	396731 lb
Total Slice Area:	7934.03 ft2
Surface Horizontal Width:	466.049 ft
Surface Average Height:	17.024 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	7284
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.55428

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	9.28687	597.995	15.7666	Tcac	350	32	252.179	391.957	67.146	0	67.146	138.347	138.347
2	9.28687	1640.82	16.1345	Tcac	350	32	293.255	455.8	169.316	0	169.316	254.151	254.151

3	9.28687	1232.47	16.5032	Tcac	350	32	276.076	429.1	126.586	0	126.586	208.381	208.381
4	9.28687	848.065	16.8726	Tcac	350	32	260.002	404.115	86.6028	0	86.6028	165.462	165.462
5	9.28687	331.117	17.2427	Tcac	350	32	238.835	371.216	33.953	0	33.953	108.08	108.08
6	9.72342	3455.2	17.6223	Qls - Landslide	180	28	226.219	351.608	322.749	0	322.749	394.607	394.607
7	9.72342	10082.6	18.0114	Qls - Landslide	180	28	436.304	678.139	936.863	0	936.863	1078.72	1078.72
8	9.72342	15965.7	18.4014	Qls - Landslide	180	28	620.928	965.096	1476.55	0	1476.55	1683.12	1683.12
9	9.72342	21288.9	18.7923	Qls - Landslide	180	28	786.229	1222.02	1959.75	0	1959.75	2227.29	2227.29
10	9.72342	26219.9	19.1841	Qls - Landslide	180	28	937.714	1457.47	2402.57	0	2402.57	2728.83	2728.83
11	9.72342	30277.6	19.5768	Qls - Landslide	180	28	1060.52	1648.35	2761.56	0	2761.56	3138.72	3138.72
12	9.72342	33823.4	19.9704	Qls - Landslide	180	28	1166.26	1812.7	3070.67	0	3070.67	3494.47	3494.47
13	9.72342	35698.5	20.3651	Qls - Landslide	180	28	1219.28	1895.11	3225.65	0	3225.65	3678.25	3678.25
14	10.1094	38630.4	20.7686	Tcag	250	34	1602.57	2490.84	3322.17	0	3322.17	3929.93	3929.93
15	10.1094	39936.8	21.1811	Tcag	250	34	1642.93	2553.58	3415.2	0	3415.2	4051.83	4051.83
16	10.1094	40571.5	21.5948	Tcag	250	34	1657.93	2576.89	3449.75	0	3449.75	4105.99	4105.99
17	10.1094	40796.3	22.0096	Tcag	250	34	1657.6	2576.37	3448.99	0	3448.99	4119.02	4119.02
18	10.1094	40668	22.4257	Tcag	250	34	1644.27	2555.65	3418.26	0	3418.26	4096.84	4096.84
19	10.1094	40136.8	22.843	Tcag	250	34	1616.33	2512.23	3353.89	0	3353.89	4034.76	4034.76
20	9.37088	36329.3	23.2463	Qls - Landslide	180	28	1240.99	1928.84	3289.09	0	3289.09	3822.17	3822.17
21	9.37088	35034.8	23.6354	Qls - Landslide	180	28	1195.6	1858.29	3156.41	0	3156.41	3679.63	3679.63
22	9.37088	33647.6	24.0257	Qls - Landslide	180	28	1147.71	1783.87	3016.45	0	3016.45	3528.06	3528.06
23	9.37088	32167	24.4172	Qls - Landslide	180	28	1097.36	1705.61	2869.25	0	2869.25	3367.43	3367.43
24	9.37088	30587.3	24.8099	Qls - Landslide	180	28	1044.39	1623.28	2714.42	0	2714.42	3197.22	3197.22
25	9.37088	28834.3	25.2039	Qls - Landslide	180	28	986.611	1533.47	2545.5	0	2545.5	3009.84	3009.84
26	9.37088	26960.8	25.5991	Qls - Landslide	180	28	925.67	1438.75	2367.36	0	2367.36	2810.85	2810.85
27	9.37088	25091.4	25.9957	Qls - Landslide	180	28	865.372	1345.03	2191.11	0	2191.11	2613.1	2613.1
28	9.37088	23221.7	26.3935	Qls - Landslide	180	28	805.595	1252.12	2016.36	0	2016.36	2416.15	2416.15
29	9.37088	20960.7	26.7928	Qls - Landslide	180	28	734.665	1141.88	1809.03	0	1809.03	2180.02	2180.02
30	9.37088	18599.6	27.1935	Qls - Landslide	180	28	661.4	1028	1594.86	0	1594.86	1934.67	1934.67
31	9.37088	16137.5	27.5956	Qls - Landslide	180	28	585.81	910.513	1373.9	0	1373.9	1680.1	1680.1
32	9.37088	13603.1	27.9992	Qls - Landslide	180	28	508.787	790.797	1148.74	0	1148.74	1419.26	1419.26
33	9.37088	11066.9	28.4043	Qls - Landslide	180	28	432.421	672.103	925.511	0	925.511	1159.36	1159.36
34	9.37088	8727.24	28.811	Qls - Landslide	180	28	362.489	563.409	721.088	0	721.088	920.459	920.459
35	9.37088	6461.21	29.2193	Qls - Landslide	180	28	295.348	459.053	524.823	0	524.823	690.017	690.017
36	9.37088	4355.67	29.6292	Qls - Landslide	180	28	233.473	362.882	343.95	0	343.95	476.739	476.739
37	8.87939	2468.25	30.0299	Tcag	250	34	239.826	372.757	181.994	0	181.994	320.625	320.625
38	8.87939	4918.32	30.4215	Tcag	250	34	330.783	514.129	391.588	0	391.588	585.824	585.824
39	8.87939	8980.71	30.8146	Tcag	250	34	480.898	747.45	737.5	0	737.5	1024.34	1024.34
40	8.87939	13642.3	31.2093	Tcag	250	34	651.623	1012.8	1130.91	0	1130.91	1525.69	1525.69
41	8.87939	19363.4	31.6057	Tcag	250	34	859.575	1336.02	1610.09	0	1610.09	2139.02	2139.02
42	8.87939	25348.8	32.0038	Tcag	250	34	1074.94	1670.75	2106.35	0	2106.35	2778.14	2778.14
43	8.87939	32886.6	32.4036	Tcag	250	34	1344.55	2089.81	2727.63	0	2727.63	3581.02	3581.02
44	8.87939	34233.8	32.8052	Tcag	250	34	1386.43	2154.9	2824.13	0	2824.13	3717.8	3717.8
45	8.87939	30538.6	33.2086	Tcag	250	34	1245.74	1936.23	2499.94	0	2499.94	3315.39	3315.39
46	8.87939	25221.4	33.6139	Tcag	250	34	1048.3	1629.35	2044.97	0	2044.97	2741.82	2741.82
47	8.26799	18657.3	34.007	QTp	500	32	955.808	1485.59	1577.28	0	1577.28	2222.15	2222.15
48	8.26799	13820.4	34.3878	QTp	500	32	779.268	1211.2	1138.16	0	1138.16	1671.49	1671.49
49	8.26799	8772.27	34.7704	QTp	500	32	596.997	927.9	684.783	0	684.783	1099.25	1099.25
50	8.26799	3024.11	35.1548	QTp	500	32	392.688	610.347	176.593	0	176.593	453.14	453.14

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.55428

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	440.469	1113.62	0	0	0
2	449.756	1116.25	2165.95	687.658	17.6139
3	459.043	1118.93	4434.55	1407.91	17.6139
4	468.33	1121.68	6650.2	2111.34	17.6139
5	477.616	1124.5	8820.92	2800.51	17.6139
6	486.903	1127.38	10941.1	3473.65	17.6139
7	496.627	1130.47	12144	3855.53	17.6138
8	506.35	1133.63	13424.6	4262.1	17.6138
9	516.074	1136.87	14685.9	4662.55	17.6139
10	525.797	1140.18	15846.7	5031.1	17.6139
11	535.52	1143.56	16836.8	5345.43	17.6139
12	545.244	1147.02	17599.7	5587.64	17.6139
13	554.967	1150.55	18090.3	5743.39	17.6138
14	564.691	1154.16	18303.6	5811.12	17.6139
15	574.8	1157.99	21768.2	6911.07	17.6138
16	584.909	1161.91	24999.1	7936.84	17.6139
17	595.019	1165.91	27955.8	8875.57	17.6139
18	605.128	1170	30619.5	9721.23	17.6139
19	615.238	1174.17	32981.1	10471	17.6139
20	625.347	1178.43	35038.9	11124.3	17.6138
21	634.718	1182.46	33428.7	10613.1	17.6138
22	644.089	1186.56	31688.5	10060.6	17.6138
23	653.46	1190.73	29843.5	9474.86	17.6139
24	662.831	1194.99	27920.6	8864.37	17.6139
25	672.201	1199.32	25949	8238.44	17.6139
26	681.572	1203.73	23968	7609.5	17.6139
27	690.943	1208.22	22014.1	6989.15	17.6139
28	700.314	1212.79	20111.1	6384.97	17.6139
29	709.685	1217.44	18283.4	5804.72	17.6139
30	719.056	1222.17	16607.6	5272.66	17.6139
31	728.427	1226.99	15127	4802.59	17.6138
32	737.798	1231.88	13887.2	4408.99	17.6139
33	747.169	1236.87	12931.6	4105.59	17.6139
34	756.539	1241.94	12293.6	3903.03	17.6138
35	765.91	1247.09	11974	3801.57	17.6139
36	775.281	1252.33	11991	3806.95	17.6138
37	784.652	1257.66	12345.7	3919.57	17.6138
38	793.531	1262.79	13541.1	4299.11	17.6139
39	802.411	1268.01	14436.6	4583.41	17.6139
40	811.29	1273.3	14800.8	4699.04	17.6139
41	820.17	1278.68	14503.2	4604.56	17.6139
42	829.049	1284.15	13338.6	4234.81	17.6139
43	837.928	1289.7	11194.9	3554.21	17.6138
44	846.808	1295.33	7761.56	2464.18	17.6139
45	855.687	1301.06	3908.55	1240.91	17.6139
46	864.567	1306.87	439.549	139.55	17.6138
47	873.446	1312.77	-2322.52	-737.365	17.6139
48	881.714	1318.35	-3218.25	-1021.75	17.6139
49	889.982	1324.01	-3215.54	-1020.89	17.6139
50	898.25	1329.75	-2210.18	-701.698	17.6138
51	906.518	1335.57	0	0	0

Entity Information

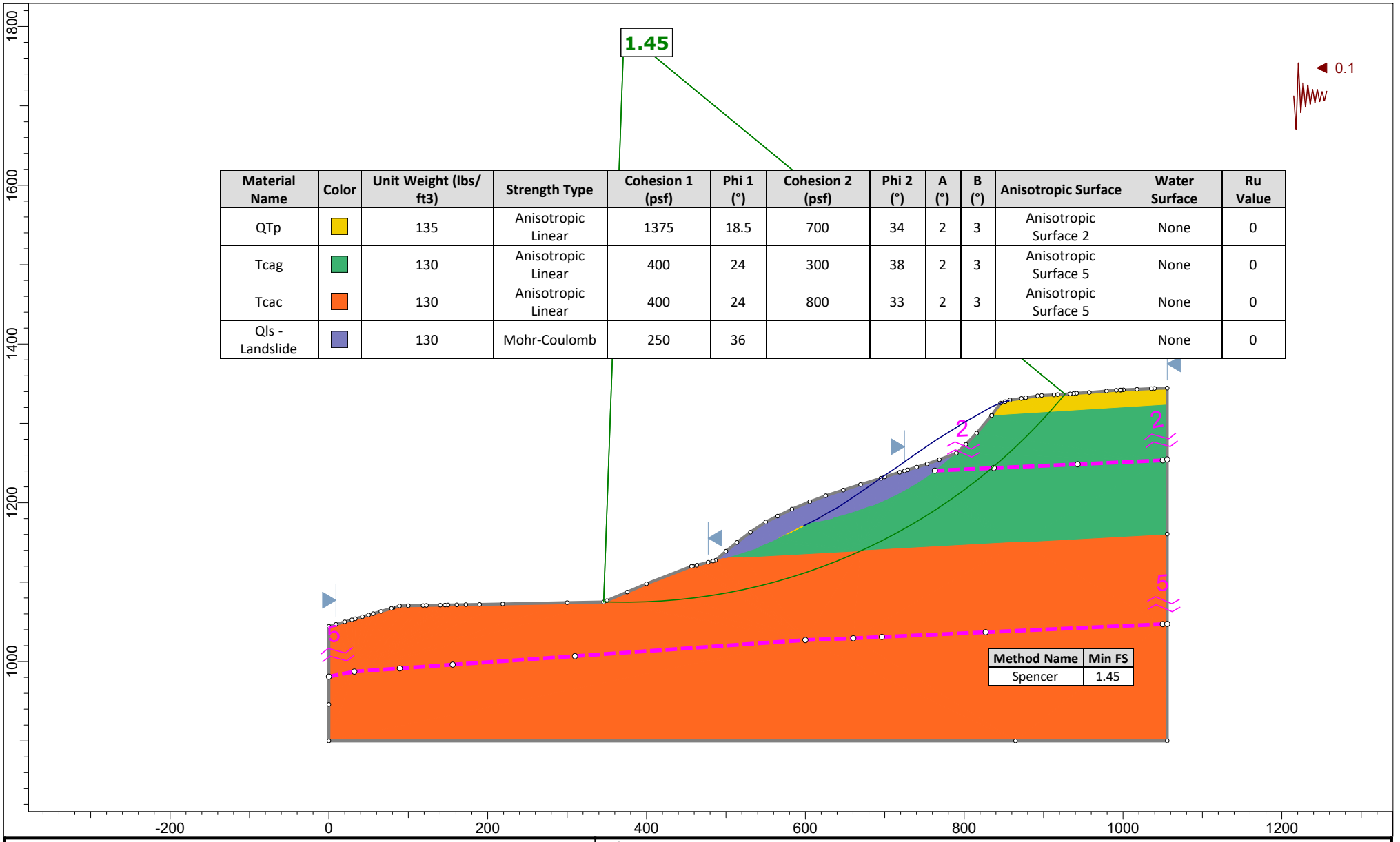
- **Group 1**

Shared Entities

Type	Coordinates (x,y)
External Boundary	486.871, 1127.38 483.77, 1126.59 477.574, 1125.04 463.33, 1121.18 458.073, 1120.02 456.476, 1119.85 400, 1097.88 375.5, 1087.5 350, 1076.69 346, 1075 300, 1074.11 218.904, 1072.53 189.849, 1071.96 172.569, 1071.63 161.113, 1071.4 150, 1071.19 146.242, 1071.11 140.219, 1071 122.863, 1070.66 118.433, 1070.57 100, 1070.21 89, 1070 80.651, 1067.54 78.6925, 1066.97 65.3546, 1063.05 55.8652, 1060.25 50, 1058.57 42.2706, 1056.36 33.3778, 1053.82 28.8945, 1052.54 20, 1050 8.8626, 1046.82 0, 1044.29 0, 946.015 0, 900 864.634, 900 1055.63, 900 1055.63, 1160.56 1055.63, 1254.53 1055.63, 1344.41 1039.67, 1343.98 1035.64, 1343.8 1017.7, 1342.89 1000.5, 1342.23 997.692, 1341.99 996.981, 1341.97 996.242, 1341.96 991.701, 1341.7 979.127, 1340.65 957.683, 1338.85 941.737, 1337.9 937.678, 1337.48 933.443, 1337.14 917.674, 1336.26 913.003, 1335.89 897.669, 1335.14

	892.563, 1334.59 877.665, 1332.3 872.124, 1331.37 857.66, 1329.46 851.684, 1327.36 845.894, 1325.49 834.82, 1310.38 834.433, 1309.85 815.707, 1287.62 802.252, 1273.67 790.349, 1262.53 768.742, 1254.29 753.304, 1248.92 740.281, 1244.85 728.637, 1241.33 724.863, 1240.19 718.726, 1238.33 699.841, 1232.62 695.074, 1230.84 669.43, 1222.88 647.717, 1215.93 625.672, 1208.87 605.588, 1201.3 583.116, 1191.92 565.085, 1183.22 550, 1175.69 530.896, 1162.88 513.829, 1150 500, 1138.87
Material Boundary	660.361, 1029.28 1050.15, 1047.03
Material Boundary	32.0299, 987.41 600, 1027.13
Material Boundary	718.726, 1238.33 763.028, 1240.35 1050.15, 1253.42
Material Boundary	979.127, 1340.65 996.981, 1341.97
Material Boundary	834.82, 1310.38 1055, 1324 1055.63, 1344.41
Material Boundary	675.203, 1217.24 695.074, 1230.84
Material Boundary	1055, 1324 1055.63, 1254.53
Material Boundary	617.606, 1180.9 627.144, 1186.73
Material Boundary	565.529, 1154.59 599.129, 1171.56
Material Boundary	497.579, 1130.07 521.855, 1131.4 669.22, 1139.45 869.238, 1150.38 1055.63, 1160.56

Material Boundary	486.871, 1127.38 497.579, 1130.07 504.21, 1132 517.583, 1135.96 524.649, 1138.32 537.588, 1142.4 545.089, 1145.49 557.592, 1150.55 565.529, 1154.59 577.597, 1160.75 585.968, 1165.05 597.601, 1170.86 599.129, 1171.56 606.408, 1174.91 606.457, 1174.94 617.606, 1180.9 626.848, 1186.58 627.144, 1186.73 637.61, 1192.04 647.287, 1198.31 660.091, 1206.89 667.512, 1211.87 675.203, 1217.24 677.619, 1218.92 688.167, 1226.28 695.074, 1230.84
Material Boundary	606.457, 1174.94 615.911, 1176.54 625.415, 1178.44 634.863, 1180.6 644.25, 1183.02 653.569, 1185.68 662.812, 1188.6 671.974, 1191.76 682.416, 1195.73 694.464, 1200.77 705.384, 1205.76 716.325, 1211.21 724.859, 1215.8 733.266, 1220.62 737.049, 1222.91 741.54, 1225.67 750, 1231.16 762.055, 1239.62 763.028, 1240.35 769.818, 1245.44 777.186, 1251.28 790.349, 1262.53



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion 1 (psf)	Phi 1 (°)	Cohesion 2 (psf)	Phi 2 (°)	A (°)	B (°)	Anisotropic Surface	Water Surface	Ru Value
QTp		135	Anisotropic Linear	1375	18.5	700	34	2	3	Anisotropic Surface 2	None	0
Tcag		130	Anisotropic Linear	400	24	300	38	2	3	Anisotropic Surface 5	None	0
Tcac		130	Anisotropic Linear	400	24	800	33	2	3	Anisotropic Surface 5	None	0
Qls - Landslide		130	Mohr-Coulomb	250	36						None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	Cross Section 15-15'; Pseudo-Static; Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santa Barbara County, California	File Name	SPGS1B_s.slmd
		Scale	1:2000
Project No.:	23-2195s	Date: 10/13/2023	Run Number: Run No. 44

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 5
    Method: spencer 5
Valid and Invalid Surfaces 5
    Method: spencer 5
Slice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.45033 5
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.45033 6
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SPGS1B_s

Project Summary

File Name:	SPGS1B_s.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.183s
Project Title:	Solomon Hills Specific Plan
Analysis:	Cross Section 15-15'; Pseudo-Static; Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santa Barbara County, California 23-2195s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

QTp	
Color	
Strength Type	Anisotropic Linear
Unit Weight	135 lbs/ft3
Cohesion 1	1375 psf
Phi 1	18.5 °
A	2 °
Cohesion 2	700 psf
Phi 2	34 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 2
Water Surface	None
Ru Value	0

Tcag	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	300 psf
Phi 2	38 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 5
Water Surface	None
Ru Value	0

Tcac	
Color	
Strength Type	Anisotropic Linear
Unit Weight	130 lbs/ft3
Cohesion 1	400 psf
Phi 1	24 °
A	2 °
Cohesion 2	800 psf
Phi 2	33 °
B	3 °
Anisotropy Definition	Surface
Anisotropic Surface	Anisotropic Surface 5
Water Surface	None
Ru Value	0

Qls - Landslide	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	36 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.450330
Center:	371.628, 1793.692
Radius:	719.145
Left Slip Surface Endpoint:	346.008, 1075.003
Right Slip Surface Endpoint:	926.966, 1336.779
Resisting Moment:	2.16769e+09 lb-ft
Driving Moment:	1.49462e+09 lb-ft
Resisting Horizontal Force:	2.70739e+06 lb
Driving Horizontal Force:	1.86674e+06 lb
Total Slice Area:	33072.7 ft2
Surface Horizontal Width:	580.958 ft
Surface Average Height:	56.9279 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	6581
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.45033

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	11.5825	3935.44	-1.58006	Tcac	800	33	942.53	1366.98	873.074	0	873.074	847.075	847.075
2	11.5825	11665.8	-0.657049	Tcac	800	33	1309.79	1899.63	1693.28	0	1693.28	1678.25	1678.25
3	11.5825	19115.2	0.265795	Tcac	800	33	1648.71	2391.18	2450.2	0	2450.2	2457.85	2457.85
4	11.5825	26283.6	1.18871	Tcac	724.517	31.4198	1788.87	2594.46	3061.08	0	3061.08	3098.2	3098.2
5	11.5825	33136.2	2.11193	Tcac	400	24	1292.77	1874.94	3312.78	0	3312.78	3360.45	3360.45
6	11.5825	39269	3.0357	Tcac	400	24	1450.96	2104.37	3828.07	0	3828.07	3905.02	3905.02
7	11.5825	44987.2	3.96026	Tcac	400	24	1592.35	2309.44	4288.67	0	4288.67	4398.91	4398.91
8	11.5825	50422.5	4.88586	Tcac	400	24	1721.33	2496.5	4708.82	0	4708.82	4855.97	4855.97
9	11.5825	55573.8	5.81274	Tcac	400	24	1838.39	2666.27	5090.11	0	5090.11	5277.26	5277.26
10	11.5825	60017.7	6.74114	Tcac	696.457	30.8184	2857.11	4143.76	5778.69	0	5778.69	6116.4	6116.4
11	11.5825	62254	7.67133	Tcac	800	33	3240.5	4699.8	6005.17	0	6005.17	6441.65	6441.65
12	11.5825	64403.4	8.60356	Tcac	800	33	3274.23	4748.72	6080.51	0	6080.51	6575.9	6575.9
13	11.5825	69848.5	9.53809	Tcac	800	33	3437.25	4985.15	6444.57	0	6444.57	7022.12	7022.12
14	11.5825	81594.1	10.4752	Tcac	800	33	3839.88	5569.1	7343.77	0	7343.77	8053.73	8053.73
15	11.5825	92194.5	11.4151	Tcac	800	33	4183.39	6067.29	8110.91	0	8110.91	8955.58	8955.58
16	11.5825	101791	12.3582	Tcac	800	33	4475.92	6491.56	8764.2	0	8764.2	9744.87	9744.87
17	11.5825	110192	13.3047	Tcac	800	33	4712.81	6835.13	9293.3	0	9293.3	10407.8	10407.8
18	11.5825	117380	14.2549	Tcac	800	33	4896.13	7101	9702.67	0	9702.67	10946.6	10946.6
19	11.5825	122061	15.2091	Tcac	800	33	4982.22	7225.86	9894.97	0	9894.97	11249.5	11249.5
20	11.5825	125702	16.1676	Tcac	800	33	5027.5	7291.53	9996.1	0	9996.1	11453.6	11453.6
21	11.5825	128746	17.1309	Tcac	800	33	5049.22	7323.03	10044.6	0	10044.6	11600.9	11600.9
22	11.5825	130610	18.0991	Tcac	800	33	5028.77	7293.37	9998.94	0	9998.94	11642.5	11642.5
23	11.5825	131896	19.0727	Tcac	800	33	4988.32	7234.71	9908.59	0	9908.59	11633.3	11633.3
24	11.5825	132331	20.0521	Tcac	800	33	4919.94	7135.53	9755.88	0	9755.88	11551.7	11551.7
25	11.5825	132007	21.0377	Tcac	800	33	4827.94	7002.11	9550.4	0	9550.4	11407.3	11407.3
26	11.5825	130719	22.0298	Tcac	800	33	4707.16	6826.94	9280.64	0	9280.64	11185.3	11185.3
27	11.5825	129068	23.0289	Tcac	800	33	4577.74	6639.23	8991.59	0	8991.59	10937.4	10937.4
28	11.5825	127056	24.0354	Tcac	800	33	4440.2	6439.76	8684.46	0	8684.46	10664.7	10664.7
29	11.896	127910	25.0638	Tcag	300	38	4725.51	6853.55	8388.13	0	8388.13	10598.1	10598.1
30	11.896	124813	26.1147	Tcag	300	38	4524.45	6561.95	8014.96	0	8014.96	10232.9	10232.9
31	11.896	121597	27.1752	Tcag	300	38	4325.04	6272.73	7644.73	0	7644.73	9865.13	9865.13
32	11.896	117646	28.2459	Tcag	300	38	4106.92	5956.39	7239.85	0	7239.85	9446.2	9446.2
33	11.896	113103	29.3274	Tcag	300	38	3876.1	5621.62	6811.36	0	6811.36	8988.96	8988.96
34	11.896	108102	30.4205	Tcag	300	38	3637.85	5276.08	6369.09	0	6369.09	8505.16	8505.16
35	11.896	102734	31.526	Tcag	300	38	3395.77	4924.99	5919.72	0	5919.72	8002.77	8002.77
36	11.896	97288.9	32.6448	Tcag	300	38	3159.23	4581.92	5480.61	0	5480.61	7504.5	7504.5
37	11.896	91808	33.7777	Tcag	300	38	2929.42	4248.62	5054.01	0	5054.01	7013.43	7013.43
38	11.896	86220.6	34.9258	Tcag	300	38	2704.21	3921.99	4635.94	0	4635.94	6524.23	6524.23
39	11.896	84328.1	36.0903	Tcag	300	38	2591.71	3758.84	4427.11	0	4427.11	6316.34	6316.34
40	11.896	88566.5	37.2722	Tcag	300	38	2652.22	3846.59	4539.43	0	4539.43	6557.85	6557.85
41	11.896	94163.7	38.4731	Tcag	300	38	2744.27	3980.09	4710.3	0	4710.3	6891.08	6891.08
42	11.896	101076	39.6943	Tcag	300	38	2863.99	4153.73	4932.55	0	4932.55	7309.8	7309.8
43	11.896	109555	40.9375	Tcag	300	38	3015.27	4373.14	5213.38	0	5213.38	7828.75	7828.75
44	11.896	105116	42.2045	Tcag	300	38	2830.29	4104.86	4870	0	4870	7436.76	7436.76
45	11.896	91682.5	43.4976	Tcag	300	38	2430.29	3524.72	4127.45	0	4127.45	6433.51	6433.51
46	11.896	76625.1	44.819	Tcag	300	38	2008.72	2913.31	3344.88	0	3344.88	5340.95	5340.95
47	11.896	60771.7	46.1714	Tcag	300	38	1588	2303.13	2563.89	0	2563.89	4218.19	4218.19
48	11.896	42901.2	47.558	Tcag	300	38	1142.25	1656.64	1736.42	0	1736.42	2985.5	2985.5
49	9.36443	19773.6	48.8268	QTp	700	34	898.915	1303.72	895.055	0	895.055	1922.85	1922.85
50	9.36443	6715.01	49.9735	QTp	700	34	595.245	863.301	242.104	0	242.104	950.823	950.823

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.45033

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	346.008	1075	0	0	0
2	357.591	1074.68	10807.7	6185.59	29.7839
3	369.173	1074.55	25044.2	14333.6	29.7839
4	380.756	1074.6	42106.7	24099.1	29.784
5	392.338	1074.85	59472.6	34038.1	29.7839
6	403.921	1075.27	69725	39905.9	29.7839
7	415.503	1075.89	80260.7	45935.8	29.7839
8	427.086	1076.69	90775.7	51953.9	29.7839
9	438.668	1077.68	101019	57816.2	29.7838
10	450.25	1078.86	110763	63393.3	29.7839
11	461.833	1080.23	129959	74379.7	29.7839
12	473.415	1081.79	151917	86946.8	29.7838
13	484.998	1083.54	172763	98878.1	29.784
14	496.58	1085.49	193068	110499	29.7839
15	508.163	1087.63	213679	122296	29.784
16	519.745	1089.97	233970	133909	29.784
17	531.328	1092.5	253418	145039	29.7838
18	542.91	1095.24	271558	155421	29.7838
19	554.493	1098.18	288006	164835	29.7839
20	566.075	1101.33	302377	173060	29.7839
21	577.658	1104.69	314501	179999	29.7839
22	589.24	1108.26	324278	185595	29.7839
23	600.823	1112.05	331640	189809	29.784
24	612.405	1116.05	336577	192634	29.7839
25	623.987	1120.28	339113	194085	29.7839
26	635.57	1124.73	339314	194201	29.784
27	647.152	1129.42	337295	193045	29.7839
28	658.735	1134.34	333167	190683	29.784
29	670.317	1139.51	327057	187185	29.7839
30	682.213	1145.07	323842	185346	29.784
31	694.109	1150.9	318471	182271	29.7839
32	706.005	1157.01	311100	178053	29.784
33	717.901	1163.4	301947	172814	29.7839
34	729.797	1170.09	291248	166691	29.784
35	741.693	1177.07	279246	159822	29.784
36	753.589	1184.37	266191	152350	29.7839
37	765.485	1191.99	252296	144397	29.7839
38	777.381	1199.95	237766	136082	29.7841
39	789.277	1208.25	222820	127527	29.7839
40	801.173	1216.92	206843	118383	29.7839
41	813.069	1225.98	188457	107860	29.7839
42	824.965	1235.43	167174	95679.4	29.784
43	836.861	1245.31	142449	81528	29.7839
44	848.757	1255.62	113588	65010	29.7839
45	860.653	1266.41	84222.8	48203.5	29.7839
46	872.549	1277.7	57389.3	32845.8	29.7839
47	884.445	1289.52	34094.4	19513.3	29.7839
48	896.341	1301.91	15144.2	8667.5	29.7839
49	908.237	1314.92	1860.66	1064.92	29.784
50	917.602	1325.63	-1278.05	-731.47	29.7839
51	926.966	1336.78	0	0	0

Entity Information

Group 1

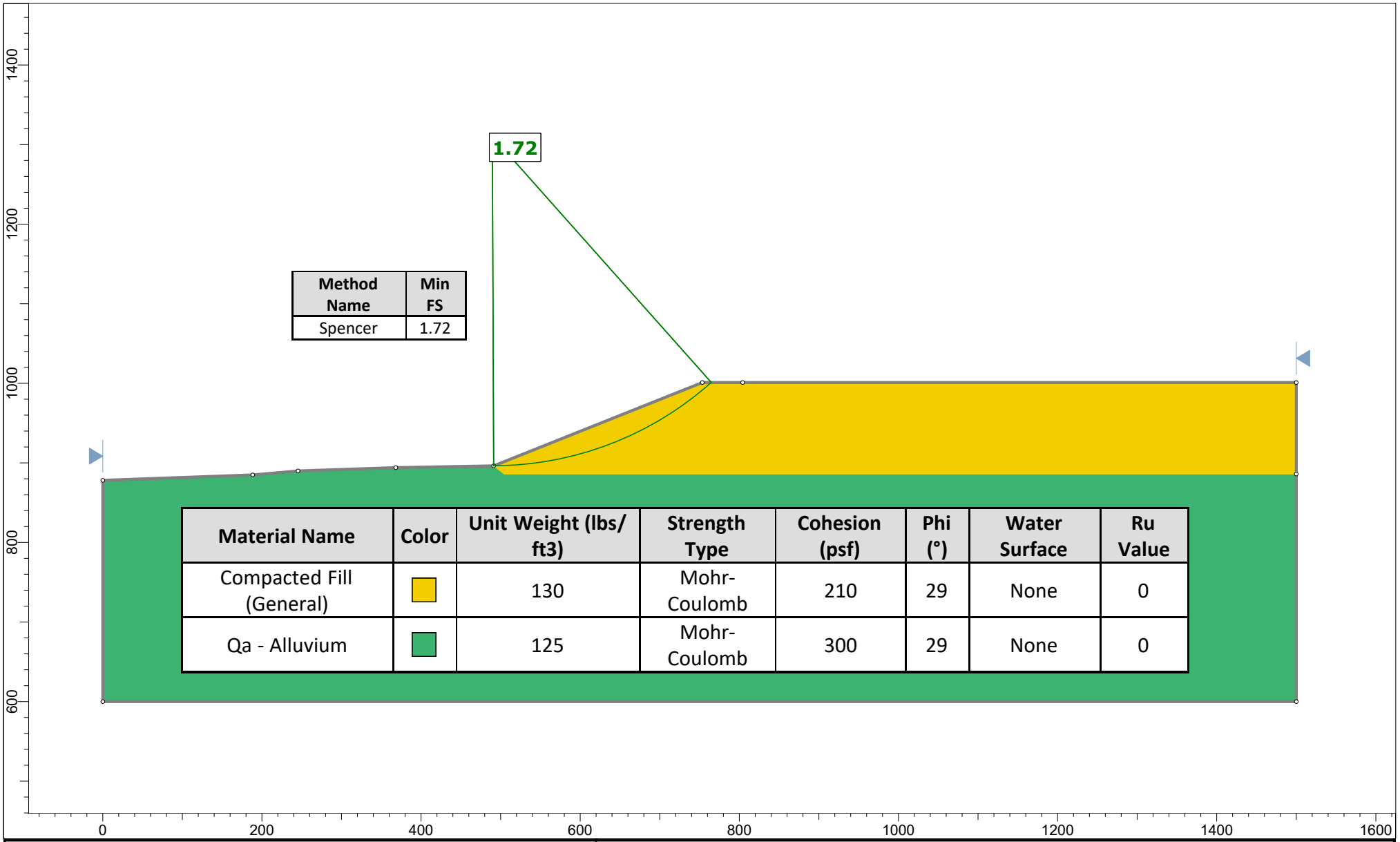
Shared Entities

Type	Coordinates (x,y)
	486.871, 1127.38 483.77, 1126.59 477.574, 1125.04 463.33, 1121.18

External Boundary	458.073, 1120.02 456.476, 1119.85 400, 1097.88 375.5, 1087.5 350, 1076.69 346, 1075 300, 1074.11 218.904, 1072.53 189.849, 1071.96 172.569, 1071.63 161.113, 1071.4 150, 1071.19 146.242, 1071.11 140.219, 1071 122.863, 1070.66 118.433, 1070.57 100, 1070.21 89, 1070 80.651, 1067.54 78.6925, 1066.97 65.3546, 1063.05 55.8652, 1060.25 50, 1058.57 42.2706, 1056.36 33.3778, 1053.82 28.8945, 1052.54 20, 1050 8.8626, 1046.82 0, 1044.29 0, 946.015 0, 900 864.634, 900 1055.63, 900 1055.63, 1160.56 1055.63, 1254.53 1055.63, 1344.41 1039.67, 1343.98 1035.64, 1343.8 1017.7, 1342.89 1000.5, 1342.23 997.692, 1341.99 996.981, 1341.97 996.242, 1341.96 991.701, 1341.7 979.127, 1340.65 957.683, 1338.85 941.737, 1337.9 937.678, 1337.48 933.443, 1337.14 917.674, 1336.26 913.003, 1335.89 897.669, 1335.14 892.563, 1334.59 877.665, 1332.3 872.124, 1331.37 857.66, 1329.46 851.684, 1327.36 845.894, 1325.49 834.82, 1310.38

	834.433, 1309.85 815.707, 1287.62 802.252, 1273.67 790.349, 1262.53 768.742, 1254.29 753.304, 1248.92 740.281, 1244.85 728.637, 1241.33 724.863, 1240.19 718.726, 1238.33 699.841, 1232.62 695.074, 1230.84 669.43, 1222.88 647.717, 1215.93 625.672, 1208.87 605.588, 1201.3 583.116, 1191.92 565.085, 1183.22 550, 1175.69 530.896, 1162.88 513.829, 1150 500, 1138.87
Material Boundary	660.361, 1029.28 1050.15, 1047.03
Material Boundary	32.0299, 987.41 600, 1027.13
Material Boundary	718.726, 1238.33 763.028, 1240.35 1050.15, 1253.42
Material Boundary	979.127, 1340.65 996.981, 1341.97
Material Boundary	834.82, 1310.38 1055, 1324 1055.63, 1344.41
Material Boundary	675.203, 1217.24 695.074, 1230.84
Material Boundary	1055, 1324 1055.63, 1254.53
Material Boundary	617.606, 1180.9 627.144, 1186.73
Material Boundary	565.529, 1154.59 599.129, 1171.56
Material Boundary	497.579, 1130.07 521.855, 1131.4 669.22, 1139.45 869.238, 1150.38 1055.63, 1160.56

Material Boundary	486.871, 1127.38 497.579, 1130.07 504.21, 1132 517.583, 1135.96 524.649, 1138.32 537.588, 1142.4 545.089, 1145.49 557.592, 1150.55 565.529, 1154.59 577.597, 1160.75 585.968, 1165.05 597.601, 1170.86 599.129, 1171.56 606.408, 1174.91 606.457, 1174.94 617.606, 1180.9 626.848, 1186.58 627.144, 1186.73 637.61, 1192.04 647.287, 1198.31 660.091, 1206.89 667.512, 1211.87 675.203, 1217.24 677.619, 1218.92 688.167, 1226.28 695.074, 1230.84
Material Boundary	606.457, 1174.94 615.911, 1176.54 625.415, 1178.44 634.863, 1180.6 644.25, 1183.02 653.569, 1185.68 662.812, 1188.6 671.974, 1191.76 682.416, 1195.73 694.464, 1200.77 705.384, 1205.76 716.325, 1211.21 724.859, 1215.8 733.266, 1220.62 737.049, 1222.91 741.54, 1225.67 750, 1231.16 762.055, 1239.62 763.028, 1240.35 769.818, 1245.44 777.186, 1251.28 790.349, 1262.53



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Compacted Fill (General)		130	Mohr-Coulomb	210	29	None	0
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/16/2023	Run Number Run No. 45

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.72443 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.72443 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.241s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Compacted Fill (General)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	210 psf
Phi	29 °
Water Surface	None
Ru Value	0

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.724430
Center:	489.637, 1310.446
Radius:	414.176
Left Slip Surface Endpoint:	491.231, 896.273
Right Slip Surface Endpoint:	764.927, 1001.000
Resisting Moment:	1.92112e+08 lb-ft
Driving Moment:	1.11406e+08 lb-ft
Resisting Horizontal Force:	428667 lb
Driving Horizontal Force:	248584 lb
Total Slice Area:	5863.63 ft2
Surface Horizontal Width:	273.696 ft
Surface Average Height:	21.4239 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12017
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.72443

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	5.47392	757.358	0.598811	Compacted Fill (General)	210	29	186.461	321.539	201.221	0	201.221	203.17	203.17
2	5.47392	2246.31	1.35656	Compacted Fill (General)	210	29	282.114	486.486	498.793	0	498.793	505.474	505.474
3	5.47392	3683.71	2.11418	Compacted Fill (General)	210	29	372.593	642.51	780.269	0	780.269	794.024	794.024
4	5.47392	5069.53	2.87216	Compacted Fill (General)	210	29	458.034	789.847	1046.07	0	1046.07	1069.05	1069.05
5	5.47392	6403.66	3.63065	Compacted Fill (General)	210	29	538.566	928.719	1296.6	0	1296.6	1330.78	1330.78
6	5.47392	7685.99	4.38978	Compacted Fill (General)	210	29	614.311	1059.34	1532.24	0	1532.24	1579.4	1579.4
7	5.47392	8916.38	5.14967	Compacted Fill (General)	210	29	685.385	1181.9	1753.35	0	1753.35	1815.12	1815.12
8	5.47392	10094.7	5.91048	Compacted Fill (General)	210	29	751.895	1296.59	1960.27	0	1960.27	2038.11	2038.11
9	5.47392	11220.6	6.67234	Compacted Fill (General)	210	29	813.95	1403.6	2153.31	0	2153.31	2248.52	2248.52
10	5.47392	12294	7.43538	Compacted Fill (General)	210	29	871.639	1503.08	2332.79	0	2332.79	2446.55	2446.55
11	5.47392	13314.6	8.19976	Compacted Fill (General)	210	29	925.065	1595.21	2498.98	0	2498.98	2632.28	2632.28
12	5.47392	14282.1	8.9656	Compacted Fill (General)	210	29	974.299	1680.11	2652.16	0	2652.16	2805.88	2805.88
13	5.47392	15196.2	9.73306	Compacted Fill (General)	210	29	1019.44	1757.95	2792.58	0	2792.58	2967.44	2967.44
14	5.47392	16056.5	10.5023	Compacted Fill (General)	210	29	1060.56	1828.86	2920.49	0	2920.49	3117.1	3117.1
15	5.47392	16862.6	11.2734	Compacted Fill (General)	210	29	1097.73	1892.96	3036.13	0	3036.13	3254.95	3254.95
16	5.47392	17614.2	12.0467	Compacted Fill (General)	210	29	1131.02	1950.37	3139.71	0	3139.71	3381.08	3381.08
17	5.47392	18310.7	12.8221	Compacted Fill (General)	210	29	1160.51	2001.21	3231.44	0	3231.44	3495.57	3495.57
18	5.47392	18951.6	13.6	Compacted Fill (General)	210	29	1186.24	2045.59	3311.5	0	3311.5	3598.48	3598.48
19	5.47392	19536.5	14.3804	Compacted Fill (General)	210	29	1208.29	2083.61	3380.09	0	3380.09	3689.89	3689.89
20	5.47392	20064.7	15.1636	Compacted Fill (General)	210	29	1226.71	2115.37	3437.38	0	3437.38	3769.83	3769.83
21	5.47392	20535.7	15.9496	Compacted Fill (General)	210	29	1241.55	2140.96	3483.54	0	3483.54	3838.37	3838.37
22	5.47392	20948.7	16.7388	Compacted Fill (General)	210	29	1252.85	2160.46	3518.73	0	3518.73	3895.53	3895.53
23	5.47392	21303.2	17.5312	Compacted Fill (General)	210	29	1260.68	2173.96	3543.09	0	3543.09	3941.34	3941.34
24	5.47392	21598.2	18.3272	Compacted Fill (General)	210	29	1265.08	2181.54	3556.75	0	3556.75	3975.8	3975.8
25	5.47392	21833	19.1268	Compacted Fill (General)	210	29	1266.08	2183.27	3559.88	0	3559.88	3998.97	3998.97

26	5.47392	22006.8	19.9303	Compacted Fill (General)	210	29	1263.74	2179.23	3552.58	0	3552.58	4010.8	4010.8
27	5.47392	22118.6	20.7379	Compacted Fill (General)	210	29	1258.07	2169.46	3534.96	0	3534.96	4011.29	4011.29
28	5.47392	22167.4	21.5498	Compacted Fill (General)	210	29	1249.14	2154.05	3507.16	0	3507.16	4000.46	4000.46
29	5.47392	22152.3	22.3663	Compacted Fill (General)	210	29	1236.95	2133.03	3469.24	0	3469.24	3978.22	3978.22
30	5.47392	22072	23.1876	Compacted Fill (General)	210	29	1221.55	2106.48	3421.35	0	3421.35	3944.6	3944.6
31	5.47392	21925.5	24.014	Compacted Fill (General)	210	29	1202.98	2074.45	3363.55	0	3363.55	3899.5	3899.5
32	5.47392	21711.3	24.8458	Compacted Fill (General)	210	29	1181.24	2036.97	3295.93	0	3295.93	3842.89	3842.89
33	5.47392	21428.3	25.6832	Compacted Fill (General)	210	29	1156.38	1994.09	3218.59	0	3218.59	3774.69	3774.69
34	5.47392	21074.9	26.5265	Compacted Fill (General)	210	29	1128.41	1945.87	3131.59	0	3131.59	3694.85	3694.85
35	5.47392	20649.6	27.376	Compacted Fill (General)	210	29	1097.37	1892.33	3035.01	0	3035.01	3603.25	3603.25
36	5.47392	20150.8	28.2322	Compacted Fill (General)	210	29	1063.26	1833.52	2928.91	0	2928.91	3499.79	3499.79
37	5.47392	19576.7	29.0952	Compacted Fill (General)	210	29	1026.11	1769.46	2813.36	0	2813.36	3384.37	3384.37
38	5.47392	18925.3	29.9656	Compacted Fill (General)	210	29	985.949	1700.2	2688.4	0	2688.4	3256.85	3256.85
39	5.47392	18194.8	30.8436	Compacted Fill (General)	210	29	942.787	1625.77	2554.1	0	2554.1	3117.09	3117.09
40	5.47392	17382.9	31.7298	Compacted Fill (General)	210	29	896.633	1546.18	2410.54	0	2410.54	2964.95	2964.95
41	5.47392	16487.3	32.6245	Compacted Fill (General)	210	29	847.509	1461.47	2257.71	0	2257.71	2800.22	2800.22
42	5.47392	15505.5	33.5282	Compacted Fill (General)	210	29	795.434	1371.67	2095.7	0	2095.7	2622.75	2622.75
43	5.47392	14434.8	34.4415	Compacted Fill (General)	210	29	740.413	1276.79	1924.54	0	1924.54	2432.3	2432.3
44	5.47392	13272.2	35.365	Compacted Fill (General)	210	29	682.463	1176.86	1744.25	0	1744.25	2228.63	2228.63
45	5.47392	12014.7	36.299	Compacted Fill (General)	210	29	621.597	1071.9	1554.91	0	1554.91	2011.5	2011.5
46	5.47392	10658.7	37.2445	Compacted Fill (General)	210	29	557.828	961.936	1356.53	0	1356.53	1780.63	1780.63
47	5.47392	9200.68	38.2019	Compacted Fill (General)	210	29	491.168	846.985	1149.15	0	1149.15	1535.69	1535.69
48	5.47392	7630.52	39.1721	Compacted Fill (General)	210	29	421.385	726.649	932.06	0	932.06	1275.39	1275.39
49	5.47392	5047.89	40.1559	Compacted Fill (General)	210	29	312.297	538.534	592.69	0	592.69	856.19	856.19
50	5.47392	1702.28	41.1542	Compacted Fill (General)	210	29	180.809	311.793	183.639	0	183.639	341.67	341.67

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.72443

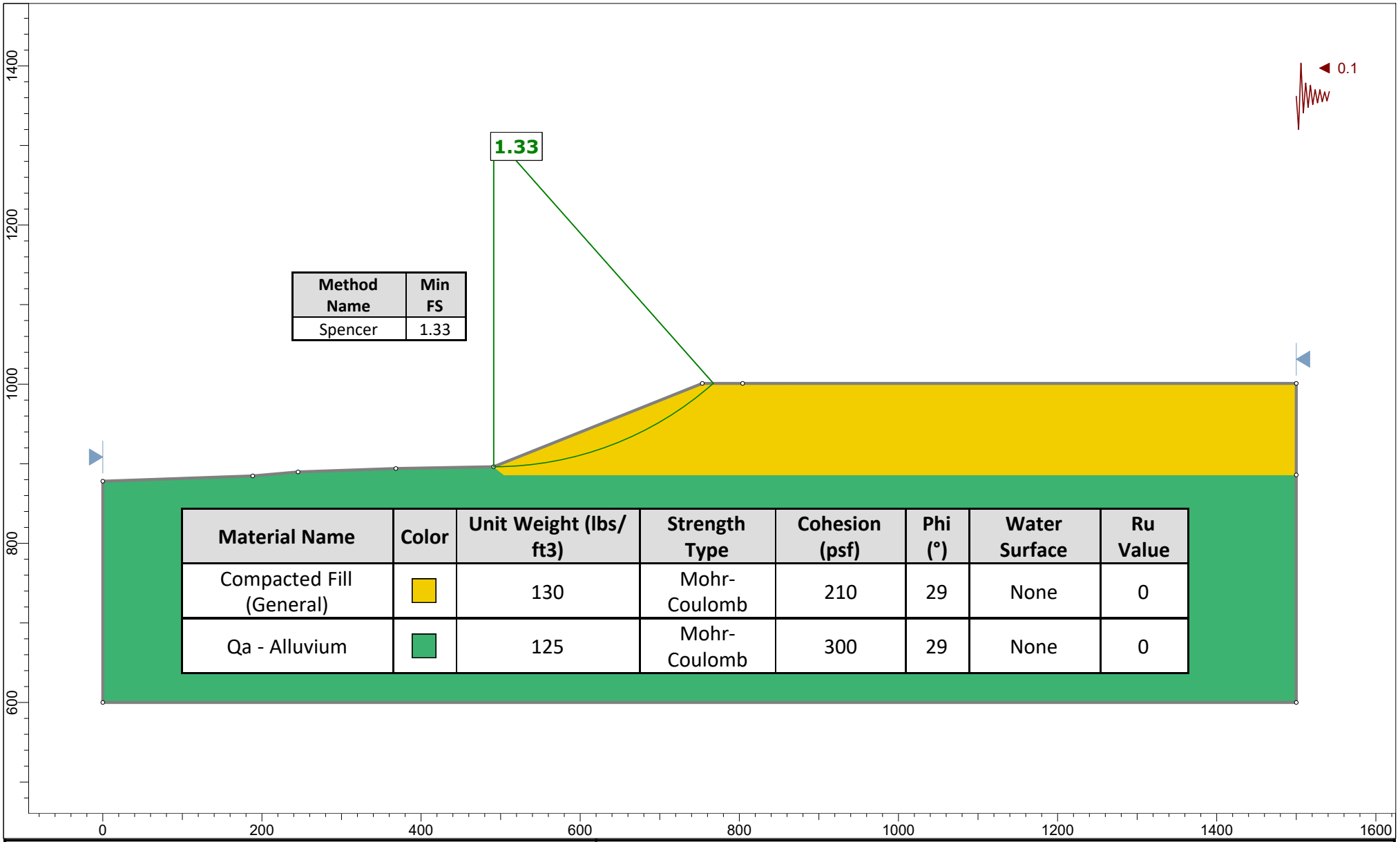
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.231	896.273	0	0	0
2	496.705	896.331	1008.8	358.219	19.5497
3	502.179	896.46	2487.88	883.428	19.5496
4	507.653	896.662	4369.04	1551.41	19.5495
5	513.127	896.937	6588.13	2339.39	19.5495
6	518.6	897.284	9084.82	3225.95	19.5496
7	524.074	897.704	11802.5	4190.97	19.5495
8	529.548	898.198	14688	5215.58	19.5495
9	535.022	898.764	17691.5	6282.11	19.5495
10	540.496	899.405	20766.6	7374.04	19.5495
11	545.97	900.119	23869.7	8475.95	19.5496
12	551.444	900.908	26960.5	9573.47	19.5496
13	556.918	901.772	30001.5	10653.3	19.5496
14	562.392	902.711	32957.8	11703.1	19.5496
15	567.866	903.725	35797.6	12711.5	19.5496
16	573.34	904.816	38491.5	13668	19.5495
17	578.814	905.985	41012.8	14563.3	19.5495
18	584.287	907.231	43337.1	15388.7	19.5496
19	589.761	908.555	45442.9	16136.4	19.5495
20	595.235	909.958	47310.9	16799.7	19.5495
21	600.709	911.442	48924.1	17372.6	19.5496
22	606.183	913.006	50268.2	17849.8	19.5495
23	611.657	914.652	51331	18227.2	19.5495
24	617.131	916.382	52102.7	18501.3	19.5496
25	622.605	918.195	52576.1	18669.4	19.5496
26	628.079	920.093	52746.2	18729.8	19.5496
27	633.553	922.078	52610.2	18681.5	19.5496
28	639.027	924.151	52168	18524.5	19.5496
29	644.501	926.312	51421.8	18259.5	19.5496
30	649.975	928.565	50376.2	17888.2	19.5496
31	655.448	930.909	49038.4	17413.2	19.5496
32	660.922	933.348	47418.2	16837.9	19.5496
33	666.396	935.883	45528.1	16166.7	19.5496
34	671.87	938.515	43383.1	15405	19.5496
35	677.344	941.248	41001.1	14559.2	19.5496
36	682.818	944.082	38403.2	13636.7	19.5496
37	688.292	947.021	35613.2	12646	19.5496
38	693.766	950.067	32658.3	11596.7	19.5495
39	699.24	953.223	29568.9	10499.7	19.5496
40	704.714	956.492	26379	9366.99	19.5496
41	710.188	959.877	23126.5	8212.05	19.5496
42	715.662	963.381	19853	7049.66	19.5496
43	721.135	967.008	16604.6	5896.15	19.5495
44	726.609	970.762	13431.6	4769.45	19.5495
45	732.083	974.647	10389.5	3689.22	19.5495
46	737.557	978.668	7538.78	2676.96	19.5495
47	743.031	982.829	4945.86	1756.24	19.5496
48	748.505	987.137	2683.17	952.775	19.5496
49	753.979	991.597	832.029	295.447	19.5496
50	759.453	996.216	-196.48	-69.7686	19.5496
51	764.927	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.33

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Compacted Fill (General)		130	Mohr-Coulomb	210	29	None	0
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/16/2023	Run Number Run No. 46

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.33487 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.33487 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.233s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Compacted Fill (General)	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	210 psf
Phi	29 °
Water Surface	None
Ru Value	0

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.334870
Center:	491.285, 1312.742
Radius:	416.463
Left Slip Surface Endpoint:	491.244, 896.279
Right Slip Surface Endpoint:	767.435, 1001.000
Resisting Moment:	1.94007e+08 lb-ft
Driving Moment:	1.45338e+08 lb-ft
Resisting Horizontal Force:	431630 lb
Driving Horizontal Force:	323350 lb
Total Slice Area:	6092.94 ft2
Surface Horizontal Width:	276.191 ft
Surface Average Height:	22.0606 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12759
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.33487

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	5.52382	778.999	0.37434	Compacted Fill (General)	210	29	260.046	347.127	247.383	0	247.383	249.083	249.083
2	5.52382	2310.68	1.13438	Compacted Fill (General)	210	29	389.83	520.373	559.927	0	559.927	567.646	567.646
3	5.52382	3789.72	1.89462	Compacted Fill (General)	210	29	511.695	683.046	853.398	0	853.398	870.324	870.324
4	5.52382	5216.05	2.65519	Compacted Fill (General)	210	29	625.923	835.526	1128.48	0	1128.48	1157.51	1157.51
5	5.52382	6589.59	3.41623	Compacted Fill (General)	210	29	732.782	978.169	1385.81	0	1385.81	1429.56	1429.56
6	5.52382	7910.24	4.17787	Compacted Fill (General)	210	29	832.522	1111.31	1626	0	1626	1686.82	1686.82
7	5.52382	9177.84	4.94026	Compacted Fill (General)	210	29	925.379	1235.26	1849.63	0	1849.63	1929.62	1929.62
8	5.52382	10392.2	5.70352	Compacted Fill (General)	210	29	1011.58	1350.33	2057.21	0	2057.21	2158.24	2158.24
9	5.52382	11553.2	6.4678	Compacted Fill (General)	210	29	1091.33	1456.78	2249.26	0	2249.26	2372.98	2372.98
10	5.52382	12660.6	7.23324	Compacted Fill (General)	210	29	1164.83	1554.89	2426.26	0	2426.26	2574.09	2574.09
11	5.52382	13714	7.99998	Compacted Fill (General)	210	29	1232.26	1644.91	2588.64	0	2588.64	2761.82	2761.82
12	5.52382	14713.3	8.76816	Compacted Fill (General)	210	29	1293.81	1727.07	2736.86	0	2736.86	2936.42	2936.42
13	5.52382	15658.1	9.53794	Compacted Fill (General)	210	29	1349.64	1801.59	2871.31	0	2871.31	3098.08	3098.08
14	5.52382	16548	10.3095	Compacted Fill (General)	210	29	1399.9	1868.69	2992.35	0	2992.35	3246.99	3246.99
15	5.52382	17382.6	11.0829	Compacted Fill (General)	210	29	1444.75	1928.56	3100.36	0	3100.36	3383.36	3383.36
16	5.52382	18161.6	11.8583	Compacted Fill (General)	210	29	1484.34	1981.4	3195.7	0	3195.7	3507.37	3507.37
17	5.52382	18884.4	12.636	Compacted Fill (General)	210	29	1518.79	2027.39	3278.65	0	3278.65	3619.14	3619.14
18	5.52382	19550.6	13.416	Compacted Fill (General)	210	29	1548.23	2066.69	3349.55	0	3349.55	3718.85	3718.85
19	5.52382	20159.7	14.1986	Compacted Fill (General)	210	29	1572.79	2099.47	3408.71	0	3408.71	3806.64	3806.64
20	5.52382	20710.9	14.9839	Compacted Fill (General)	210	29	1592.57	2125.88	3456.34	0	3456.34	3882.59	3882.59
21	5.52382	21203.9	15.7721	Compacted Fill (General)	210	29	1607.7	2146.07	3492.77	0	3492.77	3946.85	3946.85
22	5.52382	21637.7	16.5634	Compacted Fill (General)	210	29	1618.27	2160.18	3518.22	0	3518.22	3999.52	3999.52
23	5.52382	22011.8	17.3579	Compacted Fill (General)	210	29	1624.38	2168.33	3532.91	0	3532.91	4040.65	4040.65
24	5.52382	22325.4	18.1559	Compacted Fill (General)	210	29	1626.12	2170.66	3537.11	0	3537.11	4070.37	4070.37
25	5.52382	22577.7	18.9576	Compacted Fill (General)	210	29	1623.59	2167.28	3531.01	0	3531.01	4088.72	4088.72

26	5.52382	22767.7	19.7631	Compacted Fill (General)	210	29	1616.86	2158.3	3514.82	0	3514.82	4095.75	4095.75
27	5.52382	22894.6	20.5728	Compacted Fill (General)	210	29	1606.03	2143.84	3488.75	0	3488.75	4091.54	4091.54
28	5.52382	22957.4	21.3867	Compacted Fill (General)	210	29	1591.17	2124	3452.95	0	3452.95	4076.1	4076.1
29	5.52382	22955	22.2052	Compacted Fill (General)	210	29	1572.35	2098.88	3407.64	0	3407.64	4049.47	4049.47
30	5.52382	22886.3	23.0285	Compacted Fill (General)	210	29	1549.64	2068.57	3352.95	0	3352.95	4011.64	4011.64
31	5.52382	22750.1	23.8568	Compacted Fill (General)	210	29	1523.11	2033.16	3289.08	0	3289.08	3962.66	3962.66
32	5.52382	22545.1	24.6905	Compacted Fill (General)	210	29	1492.83	1992.74	3216.15	0	3216.15	3902.48	3902.48
33	5.52382	22269.9	25.5298	Compacted Fill (General)	210	29	1458.86	1947.39	3134.34	0	3134.34	3831.11	3831.11
34	5.52382	21923.1	26.3751	Compacted Fill (General)	210	29	1421.25	1897.18	3043.76	0	3043.76	3748.5	3748.5
35	5.52382	21503.1	27.2265	Compacted Fill (General)	210	29	1380.06	1842.2	2944.58	0	2944.58	3654.64	3654.64
36	5.52382	21008.3	28.0845	Compacted Fill (General)	210	29	1335.35	1782.52	2836.9	0	2836.9	3549.45	3549.45
37	5.52382	20436.8	28.9495	Compacted Fill (General)	210	29	1287.17	1718.2	2720.88	0	2720.88	3432.88	3432.88
38	5.52382	19786.8	29.8217	Compacted Fill (General)	210	29	1235.57	1649.32	2596.6	0	2596.6	3304.84	3304.84
39	5.52382	19056.2	30.7016	Compacted Fill (General)	210	29	1180.59	1575.93	2464.21	0	2464.21	3165.23	3165.23
40	5.52382	18242.8	31.5896	Compacted Fill (General)	210	29	1122.28	1498.1	2323.79	0	2323.79	3013.94	3013.94
41	5.52382	17344.2	32.4861	Compacted Fill (General)	210	29	1060.7	1415.89	2175.49	0	2175.49	2850.86	2850.86
42	5.52382	16358	33.3917	Compacted Fill (General)	210	29	995.872	1329.36	2019.39	0	2019.39	2675.84	2675.84
43	5.52382	15281.3	34.3068	Compacted Fill (General)	210	29	927.858	1238.57	1855.58	0	1855.58	2488.69	2488.69
44	5.52382	14111.2	35.232	Compacted Fill (General)	210	29	856.689	1143.57	1684.2	0	1684.2	2289.24	2289.24
45	5.52382	12844.5	36.1679	Compacted Fill (General)	210	29	782.408	1044.41	1505.32	0	1505.32	2077.28	2077.28
46	5.52382	11477.8	37.1151	Compacted Fill (General)	210	29	705.058	941.161	1319.05	0	1319.05	1852.57	1852.57
47	5.52382	10007.2	38.0742	Compacted Fill (General)	210	29	624.68	833.866	1125.48	0	1125.48	1614.84	1614.84
48	5.52382	8212.39	39.0462	Compacted Fill (General)	210	29	531.046	708.878	900	0	900	1330.74	1330.74
49	5.52382	5118.07	40.0317	Compacted Fill (General)	210	29	379.345	506.376	534.676	0	534.676	853.342	853.342
50	5.52382	1726	41.0317	Compacted Fill (General)	210	29	217.567	290.423	145.088	0	145.088	334.428	334.428

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.33487

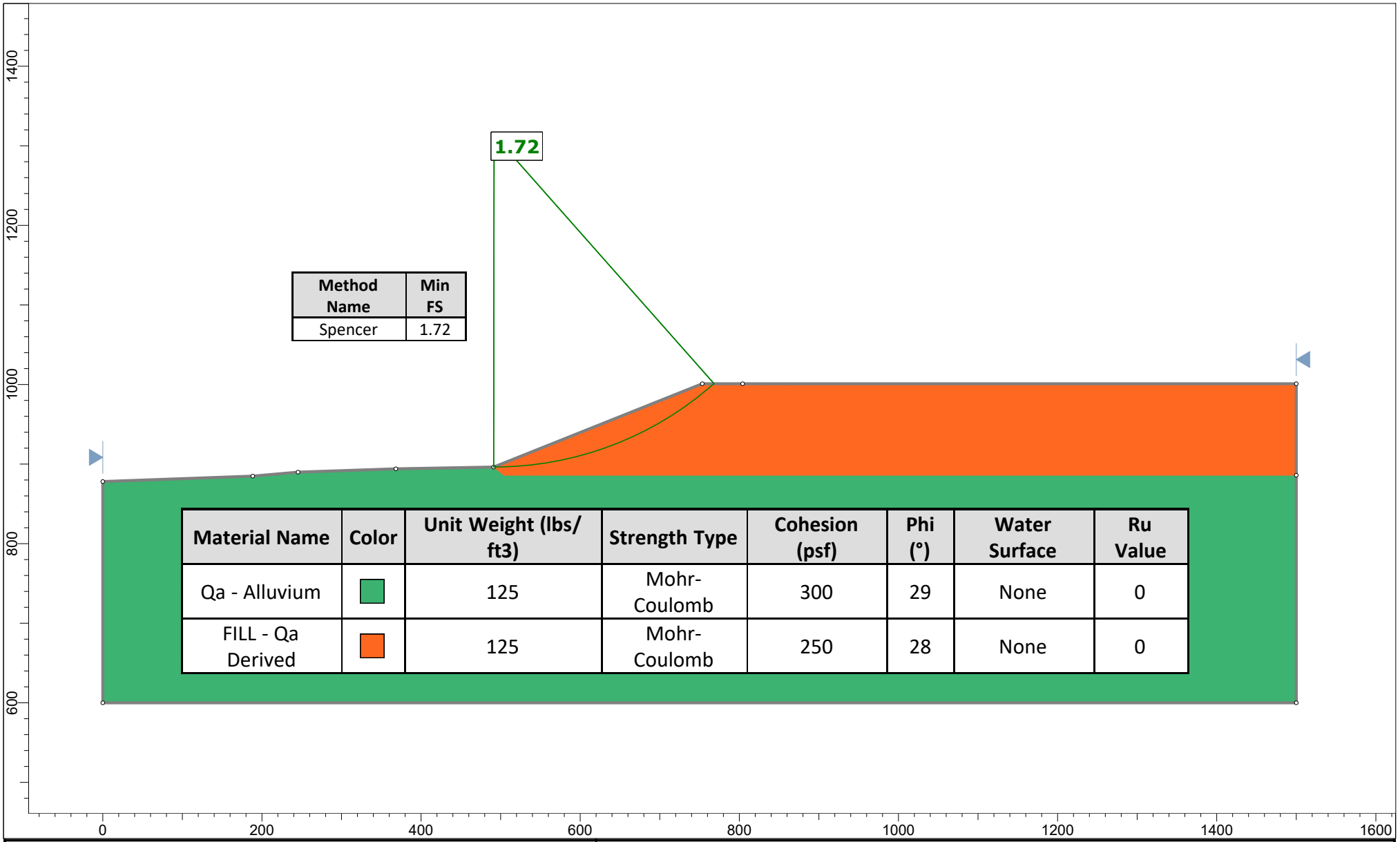
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.244	896.279	0	0	0
2	496.768	896.315	1351.82	612.071	24.3599
3	502.292	896.424	3216.17	1456.2	24.3598
4	507.815	896.607	5512.11	2495.75	24.3599
5	513.339	896.863	8164.22	3696.56	24.3599
6	518.863	897.193	11102.3	5026.84	24.3598
7	524.387	897.596	14260.9	6457	24.3599
8	529.911	898.074	17579.5	7959.56	24.3598
9	535.434	898.625	21001.7	9509.05	24.3598
10	540.958	899.252	24475.4	11081.9	24.3599
11	546.482	899.953	27952.5	12656.2	24.3598
12	552.006	900.729	31388.8	14212.1	24.3599
13	557.53	901.581	34743.4	15731	24.3599
14	563.053	902.509	37979.2	17196.1	24.3599
15	568.577	903.514	41062.5	18592.1	24.3599
16	574.101	904.596	43962.4	19905.1	24.3599
17	579.625	905.756	46651.5	21122.7	24.3599
18	585.149	906.994	49105.3	22233.7	24.3599
19	590.673	908.312	51302.2	23228.4	24.3599
20	596.196	909.709	53223.4	24098.2	24.3598
21	601.72	911.188	54852.9	24836	24.3598
22	607.244	912.748	56177.4	25435.8	24.3599
23	612.768	914.391	57186.4	25892.6	24.3599
24	618.292	916.117	57871.8	26202.9	24.3598
25	623.815	917.929	58228.2	26364.3	24.3599
26	629.339	919.826	58252.7	26375.4	24.3599
27	634.863	921.811	57945.1	26236.1	24.3598
28	640.387	923.884	57307.6	25947.5	24.3599
29	645.911	926.048	56345	25511.6	24.3598
30	651.435	928.302	55064.6	24931.9	24.3599
31	656.958	930.65	53476.5	24212.8	24.3598
32	662.482	933.093	51593.1	23360.1	24.3599
33	668.006	935.633	49429.8	22380.6	24.3599
34	673.53	938.271	47004.5	21282.5	24.3599
35	679.054	941.01	44338	20075.1	24.3598
36	684.577	943.852	41453.8	18769.3	24.3599
37	690.101	946.8	38378.7	17377	24.3599
38	695.625	949.855	35142.3	15911.6	24.3599
39	701.149	953.021	31777.6	14388.1	24.3598
40	706.673	956.301	28320.7	12822.9	24.3598
41	712.197	959.698	24811.6	11234.1	24.3599
42	717.72	963.216	21293.7	9641.26	24.3598
43	723.244	966.857	17814.5	8065.98	24.3599
44	728.768	970.626	14425.8	6531.64	24.3598
45	734.292	974.527	11183.6	5063.68	24.3599
46	739.816	978.565	8149.13	3689.73	24.3599
47	745.339	982.745	5388.44	2439.76	24.3599
48	750.863	987.072	2973.43	1346.3	24.3599
49	756.387	991.553	1057.67	478.887	24.3598
50	761.911	996.193	163.483	74.0212	24.3599
51	767.435	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.72

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Qa Derived		125	Mohr-Coulomb	250	28	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number Run No. 47

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.71854 4
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.71854 6
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.262s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Qa Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	250 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.718540
Center:	491.828, 1313.551
Radius:	417.278
Left Slip Surface Endpoint:	491.231, 896.273
Right Slip Surface Endpoint:	768.293, 1001.000
Resisting Moment:	1.94213e+08 lb-ft
Driving Moment:	1.1301e+08 lb-ft
Resisting Horizontal Force:	430233 lb
Driving Horizontal Force:	250347 lb
Total Slice Area:	6172.31 ft2
Surface Horizontal Width:	277.062 ft
Surface Average Height:	22.2777 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12039
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.71854

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.54124	756.326	0.297988	FILL - Qa Derived	250	28	209.886	360.698	208.193	0	208.193	209.284	209.284

2	5.54124	2243.47	1.05943	FILL - Qa Derived	250	28	300.452	516.339	500.911	0	500.911	506.467	506.467
3	5.54124	3679.6	1.82055	FILL - Qa Derived	250	28	386.175	663.658	777.977	0	777.977	790.252	790.252
4	5.54124	5064.68	2.58199	FILL - Qa Derived	250	28	467.181	802.87	1039.8	0	1039.8	1060.87	1060.87
5	5.54124	6398.62	3.34389	FILL - Qa Derived	250	28	543.591	934.183	1286.76	0	1286.76	1318.52	1318.52
6	5.54124	7681.33	4.10638	FILL - Qa Derived	250	28	615.517	1057.79	1519.23	0	1519.23	1563.42	1563.42
7	5.54124	8912.67	4.8696	FILL - Qa Derived	250	28	683.065	1173.87	1737.55	0	1737.55	1795.75	1795.75
8	5.54124	10092.5	5.63369	FILL - Qa Derived	250	28	746.337	1282.61	1942.05	0	1942.05	2015.67	2015.67
9	5.54124	11220.6	6.39878	FILL - Qa Derived	250	28	805.422	1384.15	2133.03	0	2133.03	2223.35	2223.35
10	5.54124	12296.7	7.16503	FILL - Qa Derived	250	28	860.422	1478.67	2310.79	0	2310.79	2418.95	2418.95
11	5.54124	13320.7	7.93256	FILL - Qa Derived	250	28	911.413	1566.3	2475.6	0	2475.6	2602.59	2602.59
12	5.54124	14292.2	8.70153	FILL - Qa Derived	250	28	958.476	1647.18	2627.73	0	2627.73	2774.42	2774.42
13	5.54124	15210.9	9.47208	FILL - Qa Derived	250	28	1001.69	1721.45	2767.4	0	2767.4	2934.53	2934.53
14	5.54124	16076.5	10.2444	FILL - Qa Derived	250	28	1041.13	1789.23	2894.87	0	2894.87	3083.03	3083.03
15	5.54124	16888.6	11.0185	FILL - Qa Derived	250	28	1076.86	1850.63	3010.34	0	3010.34	3220.03	3220.03
16	5.54124	17646.8	11.7948	FILL - Qa Derived	250	28	1108.94	1905.76	3114.04	0	3114.04	3345.6	3345.6
17	5.54124	18350.7	12.5732	FILL - Qa Derived	250	28	1137.44	1954.74	3206.14	0	3206.14	3459.83	3459.83
18	5.54124	18999.7	13.354	FILL - Qa Derived	250	28	1162.42	1997.66	3286.86	0	3286.86	3562.8	3562.8
19	5.54124	19593.4	14.1373	FILL - Qa Derived	250	28	1183.92	2034.61	3356.37	0	3356.37	3654.57	3654.57
20	5.54124	20131.2	14.9233	FILL - Qa Derived	250	28	1202	2065.69	3414.82	0	3414.82	3735.17	3735.17
21	5.54124	20612.5	15.7122	FILL - Qa Derived	250	28	1216.71	2090.97	3462.36	0	3462.36	3804.65	3804.65
22	5.54124	21036.6	16.5042	FILL - Qa Derived	250	28	1228.11	2110.55	3499.18	0	3499.18	3863.06	3863.06
23	5.54124	21402.9	17.2994	FILL - Qa Derived	250	28	1236.21	2124.48	3525.38	0	3525.38	3910.4	3910.4
24	5.54124	21710.6	18.0981	FILL - Qa Derived	250	28	1241.08	2132.85	3541.12	0	3541.12	3946.72	3946.72
25	5.54124	21959	18.9005	FILL - Qa Derived	250	28	1242.75	2135.71	3546.51	0	3546.51	3972.01	3972.01
26	5.54124	22147.2	19.7067	FILL - Qa Derived	250	28	1241.25	2133.14	3541.68	0	3541.68	3986.27	3986.27
27	5.54124	22274.2	20.517	FILL - Qa Derived	250	28	1236.63	2125.19	3526.71	0	3526.71	3989.49	3989.49
28	5.54124	22339.2	21.3316	FILL - Qa Derived	250	28	1228.9	2111.91	3501.74	0	3501.74	3981.65	3981.65
29	5.54124	22341.2	22.1507	FILL - Qa Derived	250	28	1218.11	2093.37	3466.87	0	3466.87	3962.75	3962.75
30	5.54124	22279	22.9747	FILL - Qa Derived	250	28	1204.28	2069.6	3422.18	0	3422.18	3932.74	3932.74
31	5.54124	22151.4	23.8037	FILL - Qa Derived	250	28	1187.44	2040.66	3367.74	0	3367.74	3891.55	3891.55
32	5.54124	21957.3	24.638	FILL - Qa Derived	250	28	1167.61	2006.58	3303.66	0	3303.66	3839.17	3839.17
33	5.54124	21695.3	25.478	FILL - Qa Derived	250	28	1144.82	1967.42	3229.99	0	3229.99	3775.5	3775.5
34	5.54124	21364	26.3239	FILL - Qa Derived	250	28	1119.08	1923.19	3146.81	0	3146.81	3700.47	3700.47
35	5.54124	20961.9	27.1759	FILL - Qa Derived	250	28	1090.43	1873.94	3054.19	0	3054.19	3614.02	3614.02
36	5.54124	20487.4	28.0346	FILL - Qa Derived	250	28	1058.87	1819.71	2952.19	0	2952.19	3516.02	3516.02
37	5.54124	19938.7	28.9001	FILL - Qa Derived	250	28	1024.42	1760.51	2840.86	0	2840.86	3406.38	3406.38
38	5.54124	19314.1	29.773	FILL - Qa Derived	250	28	987.111	1696.39	2720.26	0	2720.26	3284.97	3284.97

39	5.54124	18611.5	30.6535	FILL - Qa Derived	250	28	946.938	1627.35	2590.42	0	2590.42	3151.63	3151.63
40	5.54124	17828.8	31.5421	FILL - Qa Derived	250	28	903.924	1553.43	2451.4	0	2451.4	3006.24	3006.24
41	5.54124	16963.7	32.4393	FILL - Qa Derived	250	28	858.089	1474.66	2303.24	0	2303.24	2848.62	2848.62
42	5.54124	16013.8	33.3454	FILL - Qa Derived	250	28	809.431	1391.04	2145.97	0	2145.97	2678.59	2678.59
43	5.54124	14976.4	34.2611	FILL - Qa Derived	250	28	757.963	1302.59	1979.64	0	1979.64	2495.93	2495.93
44	5.54124	13848.7	35.1869	FILL - Qa Derived	250	28	703.703	1209.34	1804.26	0	1804.26	2300.43	2300.43
45	5.54124	12627.6	36.1234	FILL - Qa Derived	250	28	646.655	1111.3	1619.88	0	1619.88	2091.83	2091.83
46	5.54124	11309.7	37.0712	FILL - Qa Derived	250	28	586.828	1008.49	1426.51	0	1426.51	1869.86	1869.86
47	5.54124	9891.46	38.031	FILL - Qa Derived	250	28	524.231	900.912	1224.19	0	1224.19	1634.22	1634.22
48	5.54124	8025.28	39.0035	FILL - Qa Derived	250	28	445.4	765.438	969.397	0	969.397	1330.12	1330.12
49	5.54124	4945.01	39.9896	FILL - Qa Derived	250	28	321.366	552.281	568.507	0	568.507	838.066	838.066
50	5.54124	1667.65	40.9901	FILL - Qa Derived	250	28	198.388	340.938	171.03	0	171.03	343.426	343.426

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.71854

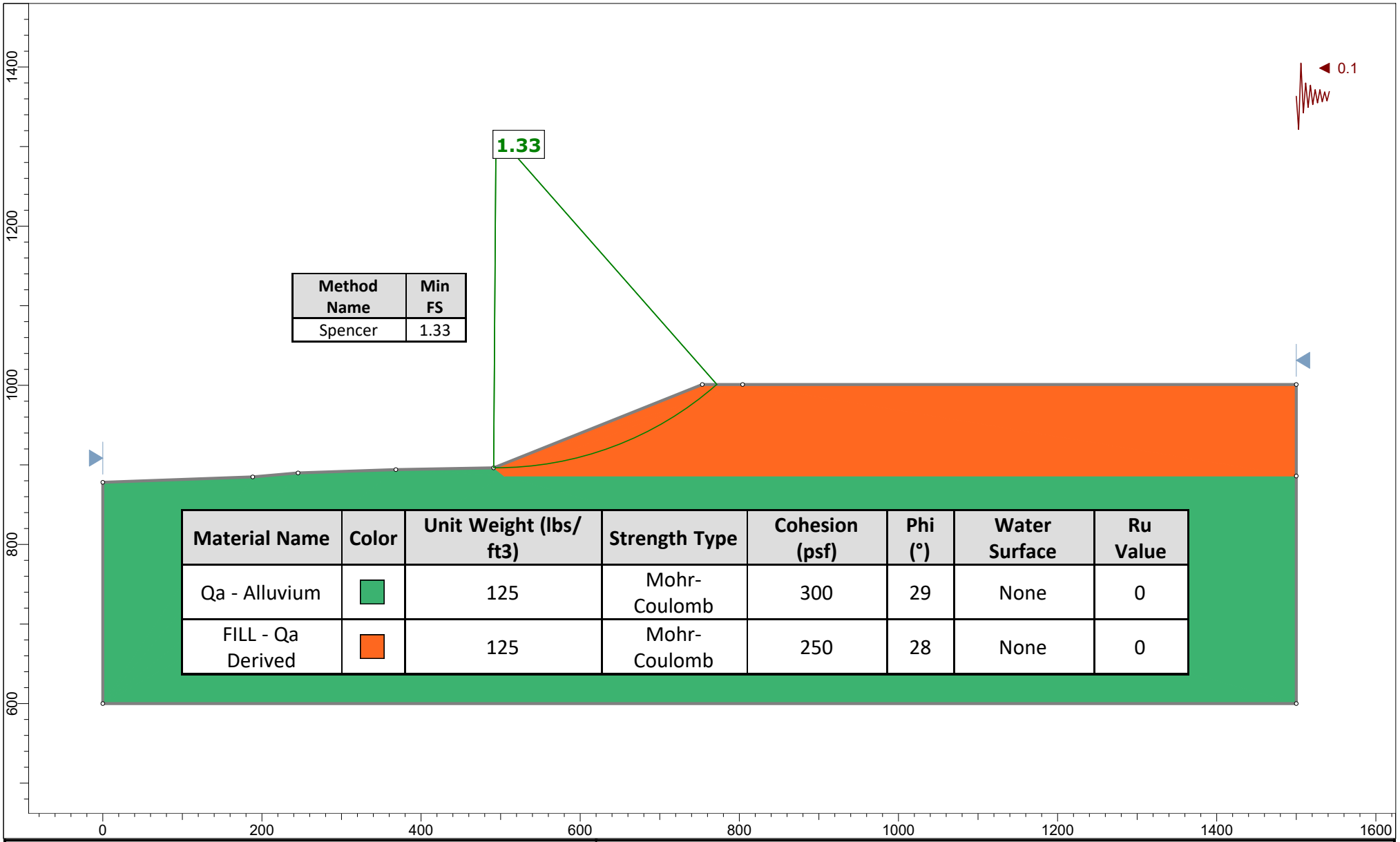
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.231	896.273	0	0	0
2	496.772	896.302	1156.62	407.121	19.3917
3	502.313	896.405	2769.57	974.871	19.3917
4	507.855	896.581	4771.68	1679.6	19.3917
5	513.396	896.831	7099.69	2499.05	19.3918
6	518.937	897.154	9694.18	3412.29	19.3917
7	524.478	897.552	12499.3	4399.67	19.3917
8	530.02	898.024	15462.7	5442.77	19.3917
9	535.561	898.571	18535.3	6524.31	19.3918
10	541.102	899.192	21671.2	7628.13	19.3918
11	546.643	899.889	24827.7	8739.18	19.3917
12	552.184	900.661	27964.8	9843.42	19.3917
13	557.726	901.509	31045.5	10927.8	19.3917
14	563.267	902.434	34035.7	11980.3	19.3917
15	568.808	903.435	36903.7	12989.9	19.3918
16	574.349	904.514	39620.7	13946.2	19.3917
17	579.891	905.671	42160.2	14840.1	19.3917
18	585.432	906.907	44498.3	15663.1	19.3917
19	590.973	908.223	46613.7	16407.7	19.3917
20	596.514	909.618	48487.3	17067.2	19.3917
21	602.056	911.095	50102.4	17635.7	19.3917
22	607.597	912.654	51444.8	18108.2	19.3917
23	613.138	914.296	52502.6	18480.6	19.3918
24	618.679	916.022	53266	18749.3	19.3918
25	624.221	917.833	53727.9	18911.9	19.3918
26	629.762	919.73	53883.2	18966.5	19.3917
27	635.303	921.715	53729.4	18912.4	19.3917
28	640.844	923.788	53266.2	18749.4	19.3918
29	646.385	925.952	52495.8	18478.2	19.3918
30	651.927	928.208	51422.7	18100.5	19.3918
31	657.468	930.557	50054.1	17618.7	19.3917
32	663.009	933.002	48399.5	17036.3	19.3917
33	668.55	935.543	46471.2	16357.6	19.3918
34	674.092	938.183	44284.1	15587.7	19.3917
35	679.633	940.925	41856	14733	19.3917
36	685.174	943.77	39207.4	13800.7	19.3917
37	690.715	946.72	36361.9	12799.2	19.3918
38	696.257	949.779	33346.5	11737.7	19.3917
39	701.798	952.949	30191	10627	19.3917
40	707.339	956.233	26929.3	9478.93	19.3917
41	712.88	959.635	23598.5	8306.5	19.3917
42	718.422	963.157	20239.8	7124.29	19.3918
43	723.963	966.803	16898.8	5948.27	19.3917
44	729.504	970.577	13625.3	4796.01	19.3917
45	735.045	974.484	10474	3686.78	19.3917
46	740.586	978.529	7504.9	2641.68	19.3918
47	746.128	982.715	4783.54	1683.77	19.3917
48	751.669	987.049	2381.63	838.317	19.3917
49	757.21	991.537	498.39	175.43	19.3917
50	762.751	996.185	-363.86	-128.076	19.3917
51	768.293	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.33

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Qa Derived		125	Mohr-Coulomb	250	28	None	0

SLIDEINTERPRET 9.029

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number Run No. 48

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.33007 4
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.33007 6
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.320s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Qa Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	250 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.330070
Center:	494.147, 1316.719
Radius:	420.434
Left Slip Surface Endpoint:	491.285, 896.295
Right Slip Surface Endpoint:	771.790, 1001.000
Resisting Moment:	1.9874e+08 lb-ft
Driving Moment:	1.49421e+08 lb-ft
Resisting Horizontal Force:	438341 lb
Driving Horizontal Force:	329562 lb
Total Slice Area:	6492.7 ft2
Surface Horizontal Width:	280.506 ft
Surface Average Height:	23.1464 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12154
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.33007

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	5.61011	785.742	-0.00773963	FILL - Qa Derived	250	28	292.903	389.581	262.513	0	262.513	262.474	262.474
2	5.61011	2330.98	0.756833	FILL - Qa Derived	250	28	416.443	553.898	571.55	0	571.55	577.051	577.051
3	5.61011	3823.69	1.52154	FILL - Qa Derived	250	28	532.54	708.315	861.965	0	861.965	876.111	876.111
4	5.61011	5263.86	2.28652	FILL - Qa Derived	250	28	641.458	853.184	1134.42	0	1134.42	1160.04	1160.04
5	5.61011	6651.39	3.05191	FILL - Qa Derived	250	28	743.445	988.834	1389.55	0	1389.55	1429.18	1429.18
6	5.61011	7986.19	3.81784	FILL - Qa Derived	250	28	838.736	1115.58	1627.91	0	1627.91	1683.88	1683.88
7	5.61011	9268.15	4.58446	FILL - Qa Derived	250	28	927.548	1233.7	1850.08	0	1850.08	1924.46	1924.46
8	5.61011	10497.1	5.3519	FILL - Qa Derived	250	28	1010.09	1343.49	2056.55	0	2056.55	2151.18	2151.18
9	5.61011	11672.8	6.1203	FILL - Qa Derived	250	28	1086.56	1445.2	2247.83	0	2247.83	2364.34	2364.34
10	5.61011	12795.2	6.88981	FILL - Qa Derived	250	28	1157.13	1539.07	2424.38	0	2424.38	2564.2	2564.2
11	5.61011	13863.9	7.66058	FILL - Qa Derived	250	28	1221.99	1625.33	2586.64	0	2586.64	2751	2751
12	5.61011	14878.6	8.43274	FILL - Qa Derived	250	28	1281.3	1704.22	2734.99	0	2734.99	2924.94	2924.94
13	5.61011	15839.1	9.20644	FILL - Qa Derived	250	28	1335.21	1775.92	2869.83	0	2869.83	3086.24	3086.24
14	5.61011	16745	9.98184	FILL - Qa Derived	250	28	1383.86	1840.63	2991.55	0	2991.55	3235.11	3235.11
15	5.61011	17596	10.7591	FILL - Qa Derived	250	28	1427.41	1898.55	3100.48	0	3100.48	3371.72	3371.72
16	5.61011	18391.6	11.5384	FILL - Qa Derived	250	28	1465.98	1949.85	3196.95	0	3196.95	3496.23	3496.23
17	5.61011	19131.3	12.3198	FILL - Qa Derived	250	28	1499.68	1994.68	3281.27	0	3281.27	3608.8	3608.8
18	5.61011	19814.8	13.1036	FILL - Qa Derived	250	28	1528.66	2033.22	3353.75	0	3353.75	3709.58	3709.58
19	5.61011	20441.4	13.8898	FILL - Qa Derived	250	28	1553	2065.6	3414.65	0	3414.65	3798.69	3798.69
20	5.61011	21010.7	14.6788	FILL - Qa Derived	250	28	1572.83	2091.98	3464.26	0	3464.26	3876.26	3876.26
21	5.61011	21521.9	15.4706	FILL - Qa Derived	250	28	1588.25	2112.48	3502.82	0	3502.82	3942.4	3942.4
22	5.61011	21974.5	16.2655	FILL - Qa Derived	250	28	1599.34	2127.23	3530.56	0	3530.56	3997.2	3997.2
23	5.61011	22367.8	17.0635	FILL - Qa Derived	250	28	1606.2	2136.36	3547.72	0	3547.72	4040.73	4040.73
24	5.61011	22700.9	17.865	FILL - Qa Derived	250	28	1608.92	2139.98	3554.54	0	3554.54	4073.12	4073.12
25	5.61011	22973.1	18.6702	FILL - Qa Derived	250	28	1607.58	2138.19	3551.17	0	3551.17	4094.38	4094.38
26	5.61011	23183.6	19.4792	FILL - Qa Derived	250	28	1602.25	2131.11	3537.86	0	3537.86	4104.59	4104.59
27	5.61011	23331.5	20.2922	FILL - Qa Derived	250	28	1593.03	2118.84	3514.78	0	3514.78	4103.81	4103.81
28	5.61011	23415.7	21.1095	FILL - Qa Derived	250	28	1579.96	2101.46	3482.1	0	3482.1	4092.06	4092.06
29	5.61011	23435.2	21.9314	FILL - Qa Derived	250	28	1563.13	2079.07	3439.99	0	3439.99	4069.36	4069.36
30	5.61011	23388.9	22.758	FILL - Qa Derived	250	28	1542.6	2051.76	3388.61	0	3388.61	4035.73	4035.73
31	5.61011	23275.7	23.5897	FILL - Qa Derived	250	28	1518.42	2019.6	3328.14	0	3328.14	3991.2	3991.2
32	5.61011	23094.3	24.4267	FILL - Qa Derived	250	28	1490.66	1982.68	3258.7	0	3258.7	3935.73	3935.73
33	5.61011	22843.3	25.2693	FILL - Qa Derived	250	28	1459.37	1941.06	3180.44	0	3180.44	3869.32	3869.32
34	5.61011	22521.3	26.1177	FILL - Qa Derived	250	28	1424.61	1894.83	3093.48	0	3093.48	3791.94	3791.94
35	5.61011	22126.7	26.9724	FILL - Qa Derived	250	28	1386.43	1844.05	2997.97	0	2997.97	3703.55	3703.55
36	5.61011	21658	27.8336	FILL - Qa Derived	250	28	1344.88	1788.78	2894.02	0	2894.02	3604.1	3604.1

37	5.61011	21113.3	28.7017	FILL - Qa Derived	250	28	1299.99	1729.08	2781.75	0	2781.75	3493.52	3493.52
38	5.61011	20490.8	29.5771	FILL - Qa Derived	250	28	1251.84	1665.03	2661.28	0	2661.28	3371.76	3371.76
39	5.61011	19788.5	30.4601	FILL - Qa Derived	250	28	1200.43	1596.66	2532.7	0	2532.7	3238.69	3238.69
40	5.61011	19004.2	31.3512	FILL - Qa Derived	250	28	1145.84	1524.05	2396.14	0	2396.14	3094.23	3094.23
41	5.61011	18135.5	32.2508	FILL - Qa Derived	250	28	1088.09	1447.24	2251.68	0	2251.68	2938.24	2938.24
42	5.61011	17180.1	33.1595	FILL - Qa Derived	250	28	1027.22	1366.28	2099.43	0	2099.43	2770.59	2770.59
43	5.61011	16135.1	34.0776	FILL - Qa Derived	250	28	963.28	1281.23	1939.46	0	1939.46	2591.1	2591.1
44	5.61011	14997.7	35.0059	FILL - Qa Derived	250	28	896.294	1192.13	1771.89	0	1771.89	2399.62	2399.62
45	5.61011	13764.7	35.9447	FILL - Qa Derived	250	28	826.3	1099.04	1596.81	0	1596.81	2195.93	2195.93
46	5.61011	12432.7	36.8949	FILL - Qa Derived	250	28	753.335	1001.99	1414.28	0	1414.28	1979.8	1979.8
47	5.61011	10944.8	37.8571	FILL - Qa Derived	250	28	674.981	897.772	1218.28	0	1218.28	1742.93	1742.93
48	5.61011	8262.27	38.832	FILL - Qa Derived	250	28	544.431	724.132	891.714	0	891.714	1329.95	1329.95
49	5.61011	5038.78	39.8204	FILL - Qa Derived	250	28	393.413	523.267	513.939	0	513.939	841.956	841.956
50	5.61011	1699.34	40.8233	FILL - Qa Derived	250	28	246.45	327.796	146.314	0	146.314	359.219	359.219

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.33007

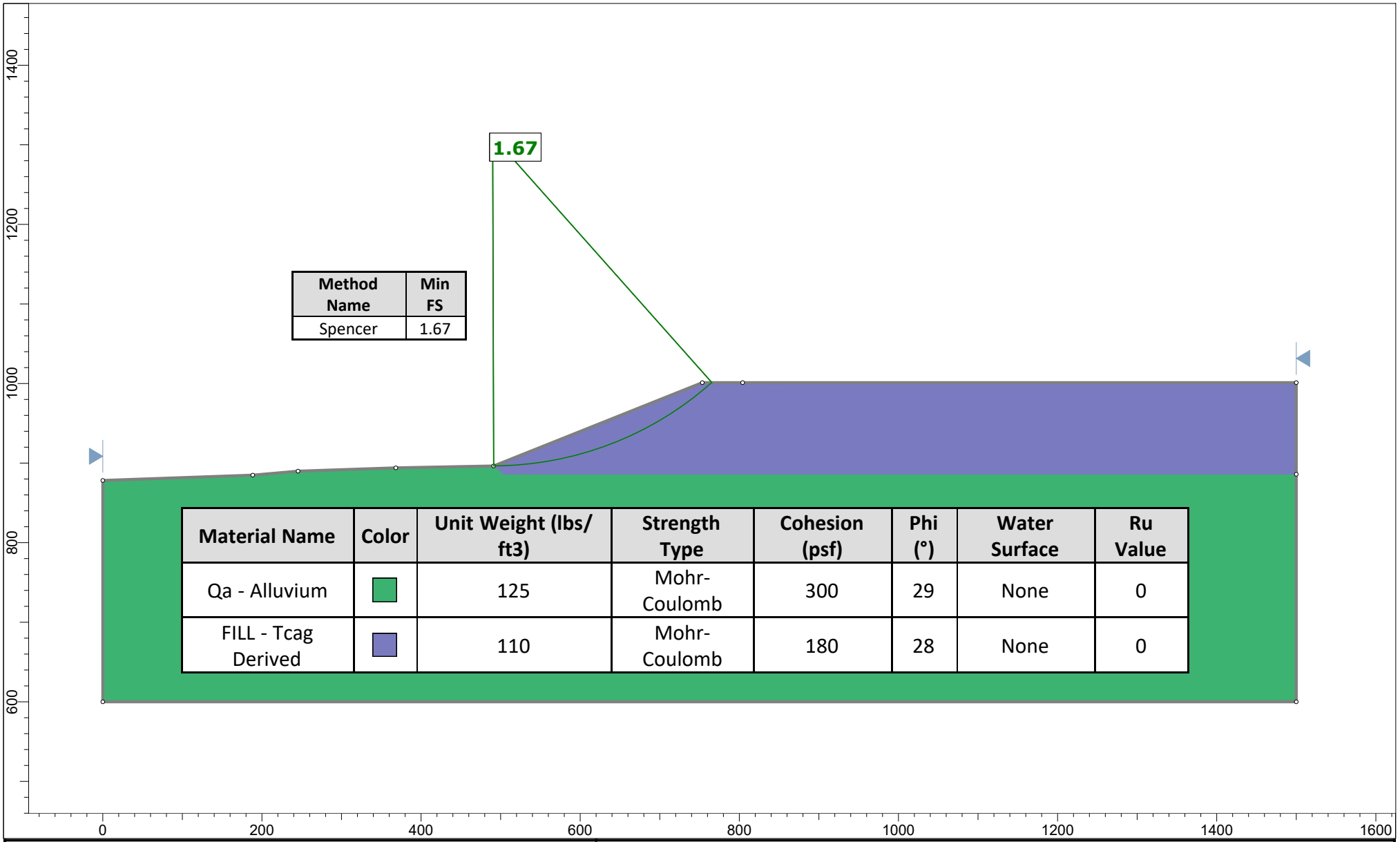
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.285	896.295	0	0	0
2	496.895	896.294	1566.15	702.966	24.1729
3	502.505	896.368	3628.85	1628.81	24.1729
4	508.115	896.517	6108.03	2741.58	24.1729
5	513.725	896.741	8929.05	4007.79	24.1729
6	519.335	897.04	12022.4	5396.25	24.1729
7	524.945	897.415	15323.5	6877.93	24.1729
8	530.556	897.865	18772.2	8425.89	24.1729
9	536.166	898.39	22312.9	10015.1	24.1728
10	541.776	898.992	25894	11622.5	24.1729
11	547.386	899.67	29467.9	13226.6	24.1728
12	552.996	900.424	32990.6	14807.8	24.1729
13	558.606	901.256	36422	16348	24.1729
14	564.216	902.165	39725.3	17830.6	24.1728
15	569.826	903.153	42866.8	19240.7	24.1729
16	575.436	904.219	45816.3	20564.6	24.1729
17	581.047	905.364	48546.5	21790	24.1728
18	586.657	906.589	51033.1	22906.1	24.1728
19	592.267	907.895	53254.8	23903.3	24.1728
20	597.877	909.282	55193	24773.3	24.1729
21	603.487	910.752	56831.7	25508.8	24.1728
22	609.097	912.305	58158	26104.1	24.1728
23	614.707	913.941	59161.2	26554.4	24.1728
24	620.317	915.663	59833.5	26856.1	24.1728
25	625.927	917.472	60169.4	27006.9	24.1728
26	631.538	919.367	60166.1	27005.5	24.1729
27	637.148	921.352	59823.4	26851.6	24.1728
28	642.758	923.426	59143.5	26546.5	24.1729
29	648.368	925.592	58131.1	26092.1	24.1729
30	653.978	927.851	56793.6	25491.7	24.1728
31	659.588	930.204	55140.8	24749.9	24.1729
32	665.198	932.654	53185.3	23872.1	24.1728
33	670.808	935.202	50942.1	22865.3	24.1729
34	676.419	937.85	48429.1	21737.3	24.1728
35	682.029	940.601	45666.9	20497.5	24.1728
36	687.639	943.456	42679	19156.4	24.1729
37	693.249	946.418	39491.8	17725.8	24.1728
38	698.859	949.49	36134.8	16219	24.1728
39	704.469	952.674	32640.7	14650.7	24.1728
40	710.079	955.973	29045.5	13037	24.1728
41	715.689	959.391	25388.8	11395.7	24.1728
42	721.299	962.931	21713.9	9746.25	24.1729
43	726.91	966.596	18067.9	8109.76	24.1729
44	732.52	970.391	14502.3	6509.34	24.1729
45	738.13	974.32	11072.9	4970.06	24.1729
46	743.74	978.388	7840.42	3519.16	24.1729
47	749.35	982.6	4870.68	2186.2	24.1729
48	754.96	986.96	2253.49	1011.48	24.1729
49	760.57	991.476	457.221	205.223	24.1729
50	766.18	996.153	-241.788	-108.526	24.1728
51	771.79	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.67

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Tcag Derived		110	Mohr-Coulomb	180	28	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/16/2023	Run Number: Run No. 49

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.66676 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.66676 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.819s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Tcag Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	110 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.666760
Center:	490.056, 1310.921
Radius:	414.632
Left Slip Surface Endpoint:	491.275, 896.291
Right Slip Surface Endpoint:	765.499, 1001.000
Resisting Moment:	1.58515e+08 lb-ft
Driving Moment:	9.5104e+07 lb-ft
Resisting Horizontal Force:	353318 lb
Driving Horizontal Force:	211979 lb
Total Slice Area:	5914.2 ft2
Surface Horizontal Width:	274.224 ft
Surface Average Height:	21.567 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	11819
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.66676

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	5.48448	644.804	0.547324	FILL - Tcag Derived	180	28	163.081	271.817	172.683	0	172.683	174.24	174.24
2	5.48448	1912.52	1.30532	FILL - Tcag Derived	180	28	243.694	406.179	425.381	0	425.381	430.934	430.934
3	5.48448	3136.43	2.06354	FILL - Tcag Derived	180	28	319.954	533.287	664.437	0	664.437	675.965	675.965
4	5.48448	4316.49	2.82212	FILL - Tcag Derived	180	28	391.979	653.335	890.213	0	890.213	909.536	909.536
5	5.48448	5452.61	3.5812	FILL - Tcag Derived	180	28	459.875	766.501	1103.05	0	1103.05	1131.83	1131.83
6	5.48448	6544.71	4.34091	FILL - Tcag Derived	180	28	523.745	872.957	1303.26	0	1303.26	1343.02	1343.02
7	5.48448	7592.66	5.10138	FILL - Tcag Derived	180	28	583.686	972.864	1491.16	0	1491.16	1543.27	1543.27
8	5.48448	8596.31	5.86276	FILL - Tcag Derived	180	28	639.789	1066.37	1667.03	0	1667.03	1732.72	1732.72
9	5.48448	9555.49	6.62518	FILL - Tcag Derived	180	28	692.14	1153.63	1831.13	0	1831.13	1911.52	1911.52
10	5.48448	10470	7.38877	FILL - Tcag Derived	180	28	740.821	1234.77	1983.74	0	1983.74	2079.81	2079.81
11	5.48448	11339.7	8.15369	FILL - Tcag Derived	180	28	785.908	1309.92	2125.08	0	2125.08	2237.68	2237.68
12	5.48448	12164.2	8.92008	FILL - Tcag Derived	180	28	827.48	1379.21	2255.39	0	2255.39	2385.27	2385.27
13	5.48448	12943.3	9.68808	FILL - Tcag Derived	180	28	865.596	1442.74	2374.87	0	2374.87	2522.65	2522.65
14	5.48448	13676.7	10.4578	FILL - Tcag Derived	180	28	900.334	1500.64	2483.77	0	2483.77	2649.95	2649.95
15	5.48448	14364.1	11.2295	FILL - Tcag Derived	180	28	931.748	1553	2582.22	0	2582.22	2767.21	2767.21
16	5.48448	15005.1	12.0033	FILL - Tcag Derived	180	28	959.898	1599.92	2670.48	0	2670.48	2874.57	2874.57
17	5.48448	15599.4	12.7792	FILL - Tcag Derived	180	28	984.839	1641.49	2748.66	0	2748.66	2972.04	2972.04
18	5.48448	16146.4	13.5576	FILL - Tcag Derived	180	28	1006.62	1677.8	2816.96	0	2816.96	3059.7	3059.7
19	5.48448	16645.8	14.3385	FILL - Tcag Derived	180	28	1025.31	1708.94	2875.52	0	2875.52	3137.6	3137.6
20	5.48448	17097.1	15.1222	FILL - Tcag Derived	180	28	1040.93	1734.98	2924.48	0	2924.48	3205.78	3205.78
21	5.48448	17499.7	15.9087	FILL - Tcag Derived	180	28	1053.54	1756	2964.01	0	2964.01	3264.3	3264.3
22	5.48448	17853.1	16.6984	FILL - Tcag Derived	180	28	1063.18	1772.06	2994.23	0	2994.23	3313.17	3313.17
23	5.48448	18156.7	17.4913	FILL - Tcag Derived	180	28	1069.88	1783.24	3015.27	0	3015.27	3352.42	3352.42
24	5.48448	18409.8	18.2877	FILL - Tcag Derived	180	28	1073.7	1789.6	3027.22	0	3027.22	3382.06	3382.06
25	5.48448	18611.8	19.0878	FILL - Tcag Derived	180	28	1074.66	1791.2	3030.22	0	3030.22	3402.1	3402.1

26	5.48448	18761.9	19.8918	FILL - Tcag Derived	180	28	1072.79	1788.09	3024.38	0	3024.38	3412.55	3412.55
27	5.48448	18859.4	20.6998	FILL - Tcag Derived	180	28	1068.14	1780.33	3009.77	0	3009.77	3413.38	3413.38
28	5.48448	18903.4	21.5122	FILL - Tcag Derived	180	28	1060.72	1767.96	2986.51	0	2986.51	3404.6	3404.6
29	5.48448	18893	22.3292	FILL - Tcag Derived	180	28	1050.56	1751.03	2954.68	0	2954.68	3386.17	3386.17
30	5.48448	18827.4	23.151	FILL - Tcag Derived	180	28	1037.7	1729.6	2914.37	0	2914.37	3358.08	3358.08
31	5.48448	18705.4	23.9779	FILL - Tcag Derived	180	28	1022.16	1703.69	2865.65	0	2865.65	3320.27	3320.27
32	5.48448	18526	24.8101	FILL - Tcag Derived	180	28	1003.95	1673.35	2808.57	0	2808.57	3272.67	3272.67
33	5.48448	18288.1	25.6479	FILL - Tcag Derived	180	28	983.111	1638.61	2743.24	0	2743.24	3215.28	3215.28
34	5.48448	17990.4	26.4916	FILL - Tcag Derived	180	28	959.652	1599.51	2669.72	0	2669.72	3148.01	3148.01
35	5.48448	17631.7	27.3416	FILL - Tcag Derived	180	28	933.596	1556.08	2588.04	0	2588.04	3070.76	3070.76
36	5.48448	17210.5	28.1982	FILL - Tcag Derived	180	28	904.959	1508.35	2498.26	0	2498.26	2983.46	2983.46
37	5.48448	16725.3	29.0617	FILL - Tcag Derived	180	28	873.761	1456.35	2400.46	0	2400.46	2886.03	2886.03
38	5.48448	16174.6	29.9325	FILL - Tcag Derived	180	28	840.013	1400.1	2294.68	0	2294.68	2778.34	2778.34
39	5.48448	15556.7	30.8109	FILL - Tcag Derived	180	28	803.733	1339.63	2180.96	0	2180.96	2660.29	2660.29
40	5.48448	14869.6	31.6975	FILL - Tcag Derived	180	28	764.939	1274.97	2059.34	0	2059.34	2531.73	2531.73
41	5.48448	14111.4	32.5927	FILL - Tcag Derived	180	28	723.631	1206.12	1929.85	0	1929.85	2392.51	2392.51
42	5.48448	13280	33.4968	FILL - Tcag Derived	180	28	679.83	1133.11	1792.55	0	1792.55	2242.46	2242.46
43	5.48448	12373.2	34.4106	FILL - Tcag Derived	180	28	633.545	1055.97	1647.45	0	1647.45	2081.42	2081.42
44	5.48448	11388.3	35.3344	FILL - Tcag Derived	180	28	584.787	974.7	1494.61	0	1494.61	1909.19	1909.19
45	5.48448	10322.8	36.2689	FILL - Tcag Derived	180	28	533.566	889.327	1334.05	0	1334.05	1725.55	1725.55
46	5.48448	9173.71	37.2147	FILL - Tcag Derived	180	28	479.893	799.866	1165.8	0	1165.8	1530.25	1530.25
47	5.48448	7937.93	38.1726	FILL - Tcag Derived	180	28	423.776	706.333	989.889	0	989.889	1323.04	1323.04
48	5.48448	6588.72	39.1432	FILL - Tcag Derived	180	28	364.28	607.168	803.386	0	803.386	1099.88	1099.88
49	5.48448	4283.53	40.1274	FILL - Tcag Derived	180	28	267.83	446.408	501.041	0	501.041	726.794	726.794
50	5.48448	1444.53	41.1261	FILL - Tcag Derived	180	28	157.308	262.195	154.585	0	154.585	291.94	291.94

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.66676

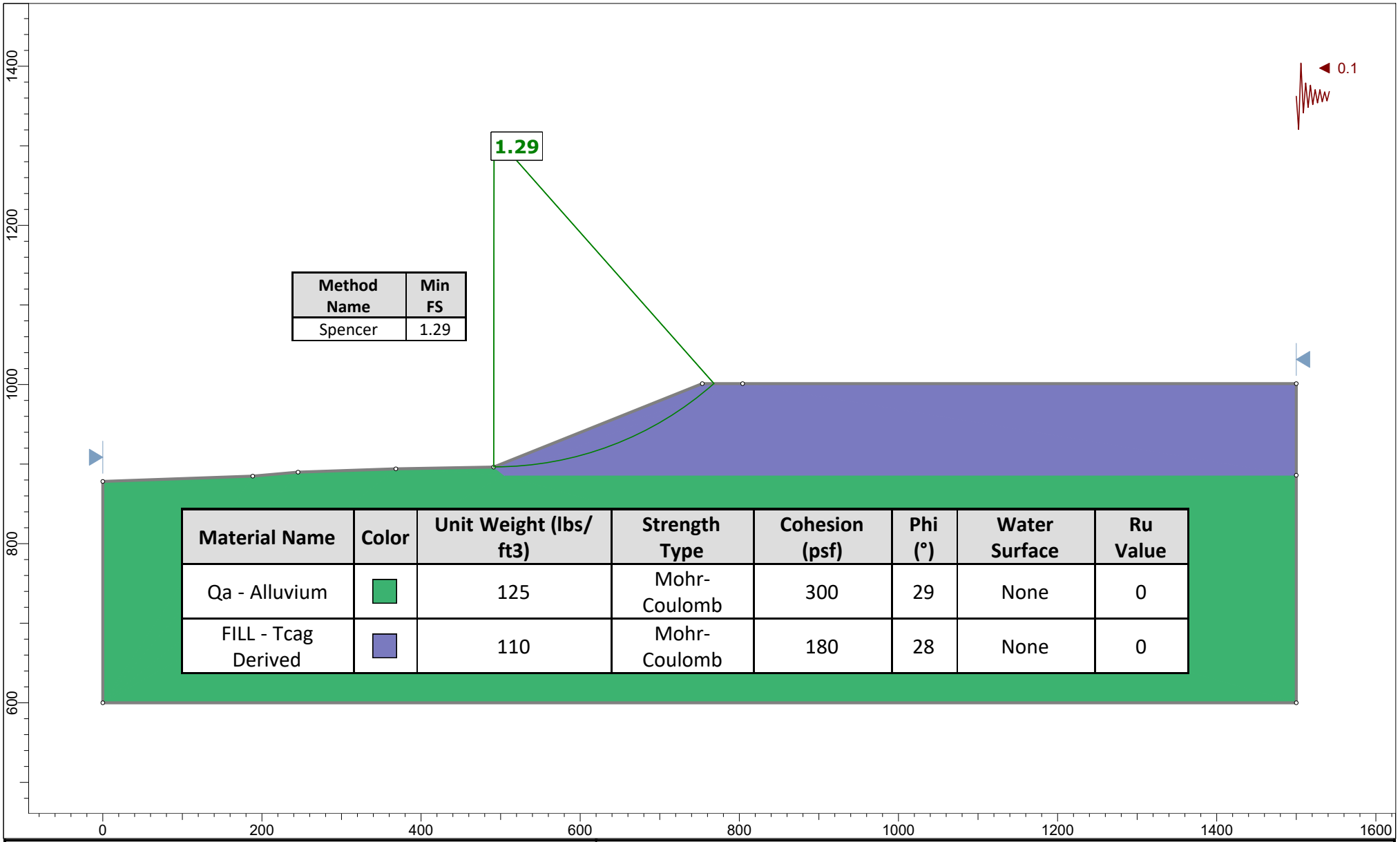
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.275	896.291	0	0	0
2	496.759	896.343	885.039	313.798	19.5224
3	502.243	896.468	2167.92	768.655	19.5224
4	507.728	896.666	3790.76	1344.05	19.5224
5	513.212	896.936	5699.1	2020.66	19.5224
6	518.697	897.279	7841.73	2780.35	19.5224
7	524.181	897.696	10170.6	3606.06	19.5223
8	529.666	898.185	12640.5	4481.81	19.5224
9	535.15	898.749	15209.3	5392.6	19.5224
10	540.635	899.386	17837.5	6324.44	19.5224
11	546.119	900.097	20488.2	7264.25	19.5224
12	551.604	900.883	23127	8199.88	19.5224
13	557.088	901.743	25722.2	9120.01	19.5224
14	562.573	902.68	28244.2	10014.2	19.5224
15	568.057	903.692	30665.9	10872.8	19.5223
16	573.542	904.781	32962.4	11687.1	19.5224
17	579.026	905.947	35110.9	12448.9	19.5224
18	584.511	907.191	37091.1	13151	19.5224
19	589.995	908.513	38884.3	13786.8	19.5224
20	595.48	909.915	40474.3	14350.5	19.5224
21	600.964	911.397	41846.8	14837.1	19.5223
22	606.449	912.961	42989.4	15242.3	19.5224
23	611.933	914.606	43892	15562.3	19.5224
24	617.418	916.334	44546.2	15794.2	19.5224
25	622.902	918.147	44945.9	15935.9	19.5223
26	628.387	920.045	45086.7	15985.9	19.5224
27	633.871	922.029	44966.5	15943.3	19.5224
28	639.356	924.102	44585.1	15808	19.5224
29	644.84	926.263	43944.3	15580.8	19.5224
30	650.325	928.516	43048.2	15263.1	19.5224
31	655.809	930.861	41902.9	14857	19.5224
32	661.294	933.3	40516.6	14365.5	19.5224
33	666.778	935.836	38900	13792.3	19.5224
34	672.263	938.469	37065.9	13142	19.5224
35	677.747	941.202	35029.6	12420.1	19.5225
36	683.231	944.038	32808.9	11632.7	19.5224
37	688.716	946.979	30424.1	10787.1	19.5224
38	694.2	950.027	27898.3	9891.57	19.5224
39	699.685	953.184	25257.4	8955.21	19.5224
40	705.169	956.455	22530.3	7988.3	19.5224
41	710.654	959.842	19749.1	7002.23	19.5224
42	716.138	963.349	16949.4	6009.57	19.5224
43	721.623	966.978	14170.3	5024.18	19.5223
44	727.107	970.735	11454.5	4061.29	19.5224
45	732.592	974.623	8849.26	3137.58	19.5224
46	738.076	978.648	6406.07	2271.33	19.5224
47	743.561	982.813	4181.31	1482.52	19.5224
48	749.045	987.124	2236.63	793.017	19.5224
49	754.53	991.588	647.482	229.57	19.5224
50	760.014	996.211	-200.385	-71.0481	19.5224
51	765.499	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.29

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Tcag Derived		110	Mohr-Coulomb	180	28	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/16/2023	Run Number Run No. 50

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.29021 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.29021 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.275s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Tcag Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	110 lbs/ft3
Cohesion	180 psf
Phi	28 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.290210
Center:	491.831, 1313.438
Radius:	417.148
Left Slip Surface Endpoint:	491.275, 896.291
Right Slip Surface Endpoint:	768.227, 1001.000
Resisting Moment:	1.60624e+08 lb-ft
Driving Moment:	1.24494e+08 lb-ft
Resisting Horizontal Force:	356810 lb
Driving Horizontal Force:	276552 lb
Total Slice Area:	6164.44 ft2
Surface Horizontal Width:	276.952 ft
Surface Average Height:	22.2581 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	13301
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.29021

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	5.53904	664.864	0.303981	FILL - Tcag Derived	180	28	227.498	293.52	213.5	0	213.5	214.707	214.707
2	5.53904	1972.18	1.06485	FILL - Tcag Derived	180	28	337.02	434.826	479.258	0	479.258	485.523	485.523
3	5.53904	3234.65	1.82591	FILL - Tcag Derived	180	28	439.873	567.529	728.837	0	728.837	742.86	742.86
4	5.53904	4452.24	2.58729	FILL - Tcag Derived	180	28	536.3	691.939	962.818	0	962.818	987.052	987.052
5	5.53904	5624.87	3.34913	FILL - Tcag Derived	180	28	626.521	808.344	1181.74	0	1181.74	1218.41	1218.41
6	5.53904	6752.46	4.11157	FILL - Tcag Derived	180	28	710.749	917.016	1386.13	0	1386.13	1437.22	1437.22
7	5.53904	7834.87	4.87473	FILL - Tcag Derived	180	28	789.182	1018.21	1576.45	0	1576.45	1643.75	1643.75
8	5.53904	8871.98	5.63876	FILL - Tcag Derived	180	28	862.007	1112.17	1753.16	0	1753.16	1838.27	1838.27
9	5.53904	9863.62	6.4038	FILL - Tcag Derived	180	28	929.399	1199.12	1916.69	0	1916.69	2021	2021
10	5.53904	10809.6	7.16999	FILL - Tcag Derived	180	28	991.529	1279.28	2067.44	0	2067.44	2192.17	2192.17
11	5.53904	11709.7	7.93746	FILL - Tcag Derived	180	28	1048.55	1352.85	2205.82	0	2205.82	2352.01	2352.01
12	5.53904	12563.6	8.70638	FILL - Tcag Derived	180	28	1100.61	1420.02	2332.14	0	2332.14	2500.68	2500.68
13	5.53904	13371.1	9.47688	FILL - Tcag Derived	180	28	1147.85	1480.97	2446.77	0	2446.77	2638.38	2638.38
14	5.53904	14132	10.2491	FILL - Tcag Derived	180	28	1190.41	1535.88	2550.04	0	2550.04	2765.28	2765.28
15	5.53904	14845.8	11.0232	FILL - Tcag Derived	180	28	1228.4	1584.9	2642.23	0	2642.23	2881.52	2881.52
16	5.53904	15512.2	11.7994	FILL - Tcag Derived	180	28	1261.96	1628.19	2723.65	0	2723.65	2987.28	2987.28
17	5.53904	16130.8	12.5778	FILL - Tcag Derived	180	28	1291.19	1665.9	2794.56	0	2794.56	3082.65	3082.65
18	5.53904	16701.2	13.3585	FILL - Tcag Derived	180	28	1316.19	1698.16	2855.24	0	2855.24	3167.79	3167.79
19	5.53904	17223	14.1418	FILL - Tcag Derived	180	28	1337.08	1725.11	2905.93	0	2905.93	3242.81	3242.81
20	5.53904	17695.6	14.9277	FILL - Tcag Derived	180	28	1353.94	1746.87	2946.84	0	2946.84	3307.8	3307.8
21	5.53904	18118.5	15.7166	FILL - Tcag Derived	180	28	1366.87	1763.55	2978.22	0	2978.22	3362.86	3362.86
22	5.53904	18491.2	16.5085	FILL - Tcag Derived	180	28	1375.96	1775.28	3000.28	0	3000.28	3408.08	3408.08
23	5.53904	18813	17.3037	FILL - Tcag Derived	180	28	1381.29	1782.15	3013.21	0	3013.21	3443.53	3443.53
24	5.53904	19083.3	18.1024	FILL - Tcag Derived	180	28	1382.94	1784.28	3017.2	0	3017.2	3469.28	3469.28
25	5.53904	19301.4	18.9047	FILL - Tcag Derived	180	28	1380.98	1781.75	3012.46	0	3012.46	3485.39	3485.39

26	5.53904	19466.6	19.7108	FILL - Tcag Derived	180	28	1375.48	1774.66	2999.12	0	2999.12	3491.91	3491.91
27	5.53904	19578	20.5211	FILL - Tcag Derived	180	28	1366.51	1763.09	2977.37	0	2977.37	3488.86	3488.86
28	5.53904	19634.9	21.3356	FILL - Tcag Derived	180	28	1354.15	1747.14	2947.37	0	2947.37	3476.3	3476.3
29	5.53904	19636.3	22.1548	FILL - Tcag Derived	180	28	1338.45	1726.88	2909.26	0	2909.26	3454.24	3454.24
30	5.53904	19581.4	22.9787	FILL - Tcag Derived	180	28	1319.46	1702.38	2863.19	0	2863.19	3422.68	3422.68
31	5.53904	19468.9	23.8076	FILL - Tcag Derived	180	28	1297.25	1673.72	2809.28	0	2809.28	3381.64	3381.64
32	5.53904	19298	24.6419	FILL - Tcag Derived	180	28	1271.87	1640.98	2747.7	0	2747.7	3331.13	3331.13
33	5.53904	19067.3	25.4818	FILL - Tcag Derived	180	28	1243.36	1604.2	2678.53	0	2678.53	3271.1	3271.1
34	5.53904	18775.7	26.3277	FILL - Tcag Derived	180	28	1211.79	1563.47	2601.92	0	2601.92	3201.56	3201.56
35	5.53904	18421.9	27.1797	FILL - Tcag Derived	180	28	1177.2	1518.83	2517.97	0	2517.97	3122.44	3122.44
36	5.53904	18004.3	28.0383	FILL - Tcag Derived	180	28	1139.63	1470.36	2426.82	0	2426.82	3033.75	3033.75
37	5.53904	17521.6	28.9038	FILL - Tcag Derived	180	28	1099.12	1418.1	2328.52	0	2328.52	2935.36	2935.36
38	5.53904	16972.1	29.7766	FILL - Tcag Derived	180	28	1055.72	1362.1	2223.21	0	2223.21	2827.26	2827.26
39	5.53904	16354	30.6571	FILL - Tcag Derived	180	28	1009.47	1302.43	2110.98	0	2110.98	2709.34	2709.34
40	5.53904	15665.5	31.5457	FILL - Tcag Derived	180	28	960.41	1239.13	1991.93	0	1991.93	2581.53	2581.53
41	5.53904	14904.5	32.4428	FILL - Tcag Derived	180	28	908.573	1172.25	1866.15	0	1866.15	2443.7	2443.7
42	5.53904	14069	33.3489	FILL - Tcag Derived	180	28	853.996	1101.83	1733.72	0	1733.72	2295.73	2295.73
43	5.53904	13156.5	34.2646	FILL - Tcag Derived	180	28	796.717	1027.93	1594.72	0	1594.72	2137.48	2137.48
44	5.53904	12164.6	35.1903	FILL - Tcag Derived	180	28	736.768	950.586	1449.26	0	1449.26	1968.81	1968.81
45	5.53904	11090.6	36.1268	FILL - Tcag Derived	180	28	674.187	869.843	1297.41	0	1297.41	1789.51	1789.51
46	5.53904	9931.49	37.0745	FILL - Tcag Derived	180	28	609.006	785.745	1139.24	0	1139.24	1599.4	1599.4
47	5.53904	8684.08	38.0343	FILL - Tcag Derived	180	28	541.258	698.337	974.851	0	974.851	1398.25	1398.25
48	5.53904	7052.55	39.0067	FILL - Tcag Derived	180	28	457.225	589.916	770.939	0	770.939	1141.28	1141.28
49	5.53904	4348.65	39.9928	FILL - Tcag Derived	180	28	325.893	420.47	452.258	0	452.258	725.645	725.645
50	5.53904	1466.54	40.9933	FILL - Tcag Derived	180	28	190.022	245.168	122.563	0	122.563	287.708	287.708

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.29021

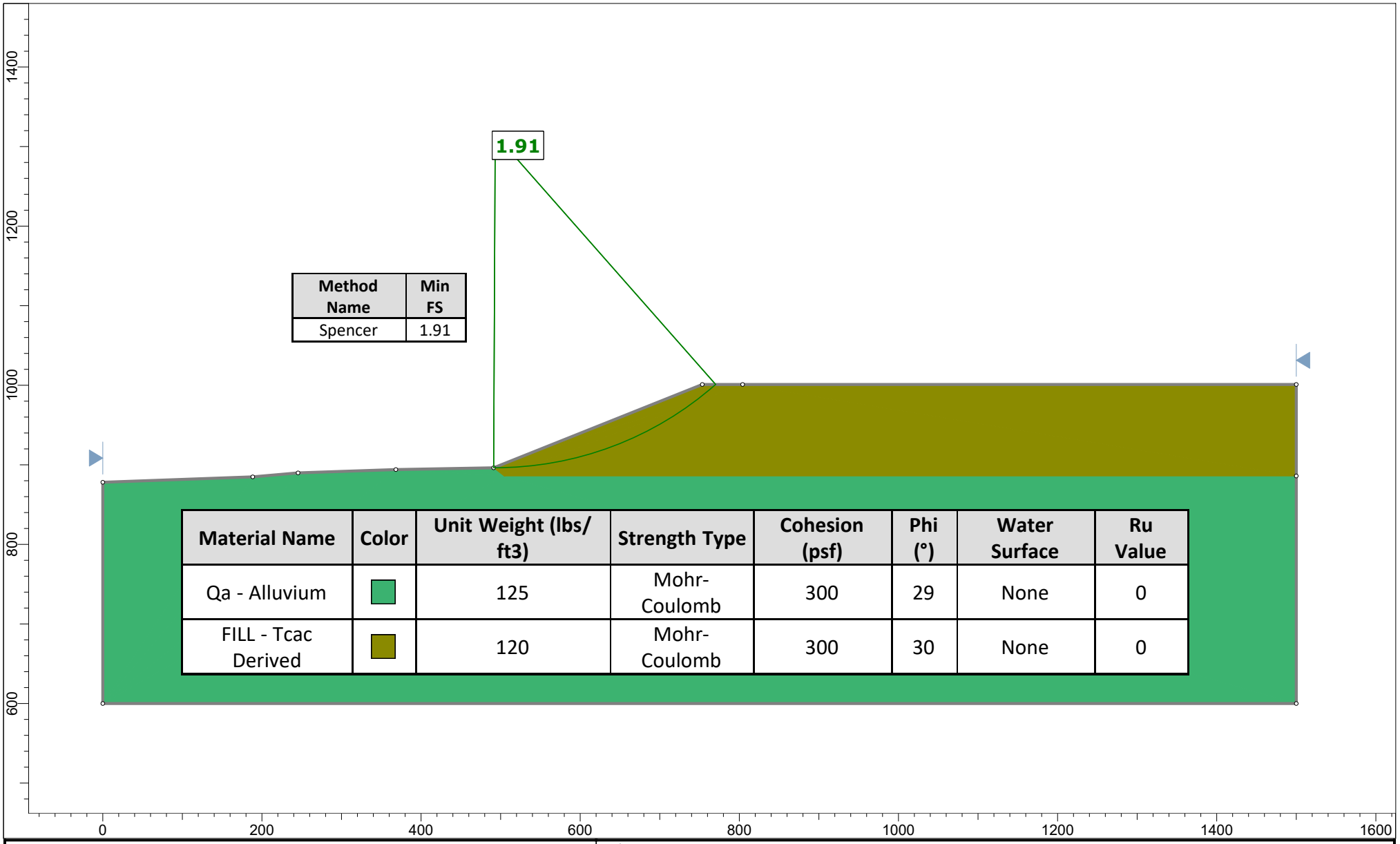
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.275	896.291	0	0	0
2	496.814	896.32	1189.22	537.59	24.3255
3	502.353	896.423	2812.19	1271.25	24.3253
4	507.892	896.6	4800.11	2169.9	24.3254
5	513.431	896.85	7088.88	3204.54	24.3254
6	518.97	897.174	9618.8	4348.19	24.3254
7	524.509	897.572	12334.3	5575.75	24.3255
8	530.048	898.045	15183.9	6863.91	24.3254
9	535.587	898.592	18119.7	8191.03	24.3254
10	541.126	899.213	21097.4	9537.09	24.3254
11	546.665	899.91	24076.1	10883.6	24.3253
12	552.204	900.682	27018.1	12213.6	24.3255
13	557.743	901.531	29888.9	13511.3	24.3254
14	563.282	902.455	32656.9	14762.6	24.3254
15	568.821	903.457	35293.2	15954.3	24.3254
16	574.36	904.536	37771.9	17074.8	24.3254
17	579.899	905.693	40069.5	18113.5	24.3254
18	585.438	906.929	42165.2	19060.8	24.3254
19	590.977	908.244	44040.7	19908.6	24.3253
20	596.516	909.64	45679.9	20649.7	24.3255
21	602.055	911.116	47069.4	21277.8	24.3254
22	607.594	912.675	48197.8	21787.9	24.3254
23	613.133	914.317	49056.1	22175.9	24.3254
24	618.673	916.042	49637.5	22438.7	24.3254
25	624.212	917.853	49937.4	22574.3	24.3254
26	629.751	919.75	49953.4	22581.5	24.3254
27	635.29	921.734	49685.3	22460.3	24.3254
28	640.829	923.808	49135	22211.5	24.3254
29	646.368	925.971	48306.5	21837	24.3254
30	651.907	928.227	47206.2	21339.6	24.3254
31	657.446	930.575	45842.5	20723.2	24.3254
32	662.985	933.019	44226.2	19992.5	24.3254
33	668.524	935.56	42370.2	19153.5	24.3254
34	674.063	938.2	40289.8	18213.1	24.3255
35	679.602	940.941	38002.8	17179.2	24.3254
36	685.141	943.785	35529.1	16061	24.3254
37	690.68	946.735	32891.6	14868.7	24.3254
38	696.219	949.793	30115.4	13613.7	24.3254
39	701.758	952.962	27228.7	12308.8	24.3255
40	707.297	956.246	24262.2	10967.8	24.3255
41	712.836	959.646	21249.9	9606.04	24.3254
42	718.375	963.167	18228.8	8240.36	24.3254
43	723.914	966.812	15239.4	6889	24.3254
44	729.453	970.586	12325.7	5571.85	24.3254
45	734.992	974.492	9535.5	4310.53	24.3254
46	740.531	978.535	6920.76	3128.54	24.3254
47	746.07	982.72	4537.88	2051.35	24.3254
48	751.61	987.053	2448.02	1106.63	24.3254
49	757.149	991.539	820.275	370.806	24.3254
50	762.688	996.186	91.7395	41.471	24.3254
51	768.227	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.91

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Tcac Derived		120	Mohr-Coulomb	300	30	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/16/2023	Run Number Run No. 51

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.91177 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.91177 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.712s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Tcac Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	120 lbs/ft3
Cohesion	300 psf
Phi	30 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.911770
Center:	493.153, 1315.441
Radius:	419.172
Left Slip Surface Endpoint:	491.231, 896.273
Right Slip Surface Endpoint:	770.339, 1001.000
Resisting Moment:	2.13958e+08 lb-ft
Driving Moment:	1.11916e+08 lb-ft
Resisting Horizontal Force:	471908 lb
Driving Horizontal Force:	246843 lb
Total Slice Area:	6360.82 ft2
Surface Horizontal Width:	279.108 ft
Surface Average Height:	22.7898 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	11899
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.91177

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	5.58215	742.701	0.118245	FILL - Tcac Derived	300	30	219.964	420.521	208.749	0	208.749	209.203	209.203
2	5.58215	2203.18	0.881891	FILL - Tcac Derived	300	30	305.977	584.958	493.561	0	493.561	498.271	498.271
3	5.58215	3613.83	1.64511	FILL - Tcac Derived	300	30	387.422	740.662	763.249	0	763.249	774.376	774.376
4	5.58215	4974.61	2.40863	FILL - Tcac Derived	300	30	464.419	887.862	1018.21	0	1018.21	1037.74	1037.74
5	5.58215	6285.45	3.17257	FILL - Tcac Derived	300	30	537.078	1026.77	1258.8	0	1258.8	1288.57	1288.57
6	5.58215	7546.27	3.93708	FILL - Tcac Derived	300	30	605.506	1157.59	1485.39	0	1485.39	1527.06	1527.06
7	5.58215	8756.93	4.70229	FILL - Tcac Derived	300	30	669.803	1280.51	1698.29	0	1698.29	1753.39	1753.39
8	5.58215	9917.28	5.46834	FILL - Tcac Derived	300	30	730.062	1395.71	1897.83	0	1897.83	1967.72	1967.72
9	5.58215	11027.1	6.23537	FILL - Tcac Derived	300	30	786.371	1503.36	2084.28	0	2084.28	2170.2	2170.2
10	5.58215	12086.3	7.00353	FILL - Tcac Derived	300	30	838.82	1603.63	2257.95	0	2257.95	2361	2361
11	5.58215	13094.5	7.77296	FILL - Tcac Derived	300	30	887.481	1696.66	2419.08	0	2419.08	2540.22	2540.22
12	5.58215	14051.6	8.5438	FILL - Tcac Derived	300	30	932.429	1782.59	2567.92	0	2567.92	2708	2708
13	5.58215	14957.1	9.3162	FILL - Tcac Derived	300	30	973.747	1861.58	2704.73	0	2704.73	2864.47	2864.47
14	5.58215	15810.8	10.0903	FILL - Tcac Derived	300	30	1011.49	1933.73	2829.7	0	2829.7	3009.7	3009.7
15	5.58215	16612.3	10.8663	FILL - Tcac Derived	300	30	1045.72	1999.18	2943.07	0	2943.07	3143.8	3143.8
16	5.58215	17361.3	11.6443	FILL - Tcac Derived	300	30	1076.51	2058.04	3045.01	0	3045.01	3266.86	3266.86
17	5.58215	18057.2	12.4245	FILL - Tcac Derived	300	30	1103.91	2110.42	3135.75	0	3135.75	3378.95	3378.95
18	5.58215	18699.7	13.207	FILL - Tcac Derived	300	30	1127.97	2156.42	3215.42	0	3215.42	3480.13	3480.13
19	5.58215	19288.2	13.9921	FILL - Tcac Derived	300	30	1148.75	2196.15	3284.22	0	3284.22	3570.47	3570.47
20	5.58215	19822.1	14.7798	FILL - Tcac Derived	300	30	1166.29	2229.68	3342.31	0	3342.31	3650.01	3650.01
21	5.58215	20301	15.5704	FILL - Tcac Derived	300	30	1180.64	2257.11	3389.82	0	3389.82	3718.81	3718.81
22	5.58215	20724.2	16.3641	FILL - Tcac Derived	300	30	1191.84	2278.53	3426.91	0	3426.91	3776.88	3776.88
23	5.58215	21091	17.161	FILL - Tcac Derived	300	30	1199.94	2294	3453.7	0	3453.7	3824.25	3824.25
24	5.58215	21400.7	17.9613	FILL - Tcac Derived	300	30	1204.96	2303.6	3470.33	0	3470.33	3860.95	3860.95
25	5.58215	21652.5	18.7653	FILL - Tcac Derived	300	30	1206.94	2307.4	3476.92	0	3476.92	3886.98	3886.98

26	5.58215	21845.6	19.5731	FILL - Tcac Derived	300	30	1205.93	2305.47	3473.57	0	3473.57	3902.35	3902.35
27	5.58215	21979.2	20.385	FILL - Tcac Derived	300	30	1201.95	2297.86	3460.39	0	3460.39	3907.04	3907.04
28	5.58215	22052.4	21.2012	FILL - Tcac Derived	300	30	1195.03	2284.63	3437.48	0	3437.48	3901.04	3901.04
29	5.58215	22064.1	22.022	FILL - Tcac Derived	300	30	1185.21	2265.84	3404.94	0	3404.94	3884.33	3884.33
30	5.58215	22013.2	22.8475	FILL - Tcac Derived	300	30	1172.49	2241.54	3362.84	0	3362.84	3856.86	3856.86
31	5.58215	21898.7	23.6781	FILL - Tcac Derived	300	30	1156.92	2211.77	3311.29	0	3311.29	3818.61	3818.61
32	5.58215	21719.4	24.514	FILL - Tcac Derived	300	30	1138.51	2176.57	3250.32	0	3250.32	3769.51	3769.51
33	5.58215	21474	25.3555	FILL - Tcac Derived	300	30	1117.28	2135.99	3180.03	0	3180.03	3709.49	3709.49
34	5.58215	21161	26.2028	FILL - Tcac Derived	300	30	1093.26	2090.06	3100.48	0	3100.48	3638.49	3638.49
35	5.58215	20779.1	27.0564	FILL - Tcac Derived	300	30	1066.46	2038.83	3011.74	0	3011.74	3556.45	3556.45
36	5.58215	20326.7	27.9166	FILL - Tcac Derived	300	30	1036.9	1982.31	2913.84	0	2913.84	3463.24	3463.24
37	5.58215	19802.1	28.7836	FILL - Tcac Derived	300	30	1004.59	1920.54	2806.85	0	2806.85	3358.76	3358.76
38	5.58215	19203.4	29.658	FILL - Tcac Derived	300	30	969.547	1853.55	2690.82	0	2690.82	3242.9	3242.9
39	5.58215	18528.9	30.5399	FILL - Tcac Derived	300	30	931.786	1781.36	2565.8	0	2565.8	3115.53	3115.53
40	5.58215	17776.4	31.43	FILL - Tcac Derived	300	30	891.315	1703.99	2431.79	0	2431.79	2976.49	2976.49
41	5.58215	16943.7	32.3286	FILL - Tcac Derived	300	30	848.151	1621.47	2288.86	0	2288.86	2825.63	2825.63
42	5.58215	16028.5	33.2362	FILL - Tcac Derived	300	30	802.298	1533.81	2137.03	0	2137.03	2662.77	2662.77
43	5.58215	15028.1	34.1534	FILL - Tcac Derived	300	30	753.773	1441.04	1976.34	0	1976.34	2487.71	2487.71
44	5.58215	13939.8	35.0806	FILL - Tcac Derived	300	30	702.569	1343.15	1806.79	0	1806.79	2300.21	2300.21
45	5.58215	12760.5	36.0185	FILL - Tcac Derived	300	30	648.707	1240.18	1628.43	0	1628.43	2100.07	2100.07
46	5.58215	11487.2	36.9677	FILL - Tcac Derived	300	30	592.188	1132.13	1441.29	0	1441.29	1887.01	1887.01
47	5.58215	10115.9	37.9288	FILL - Tcac Derived	300	30	533.011	1018.99	1245.34	0	1245.34	1660.7	1660.7
48	5.58215	7872.31	38.9028	FILL - Tcac Derived	300	30	441.771	844.564	943.212	0	943.212	1299.71	1299.71
49	5.58215	4800.85	39.8902	FILL - Tcac Derived	300	30	321.425	614.49	544.713	0	544.713	813.372	813.372
50	5.58215	1619.07	40.8921	FILL - Tcac Derived	300	30	204.996	391.905	159.184	0	159.184	336.708	336.708

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.91177

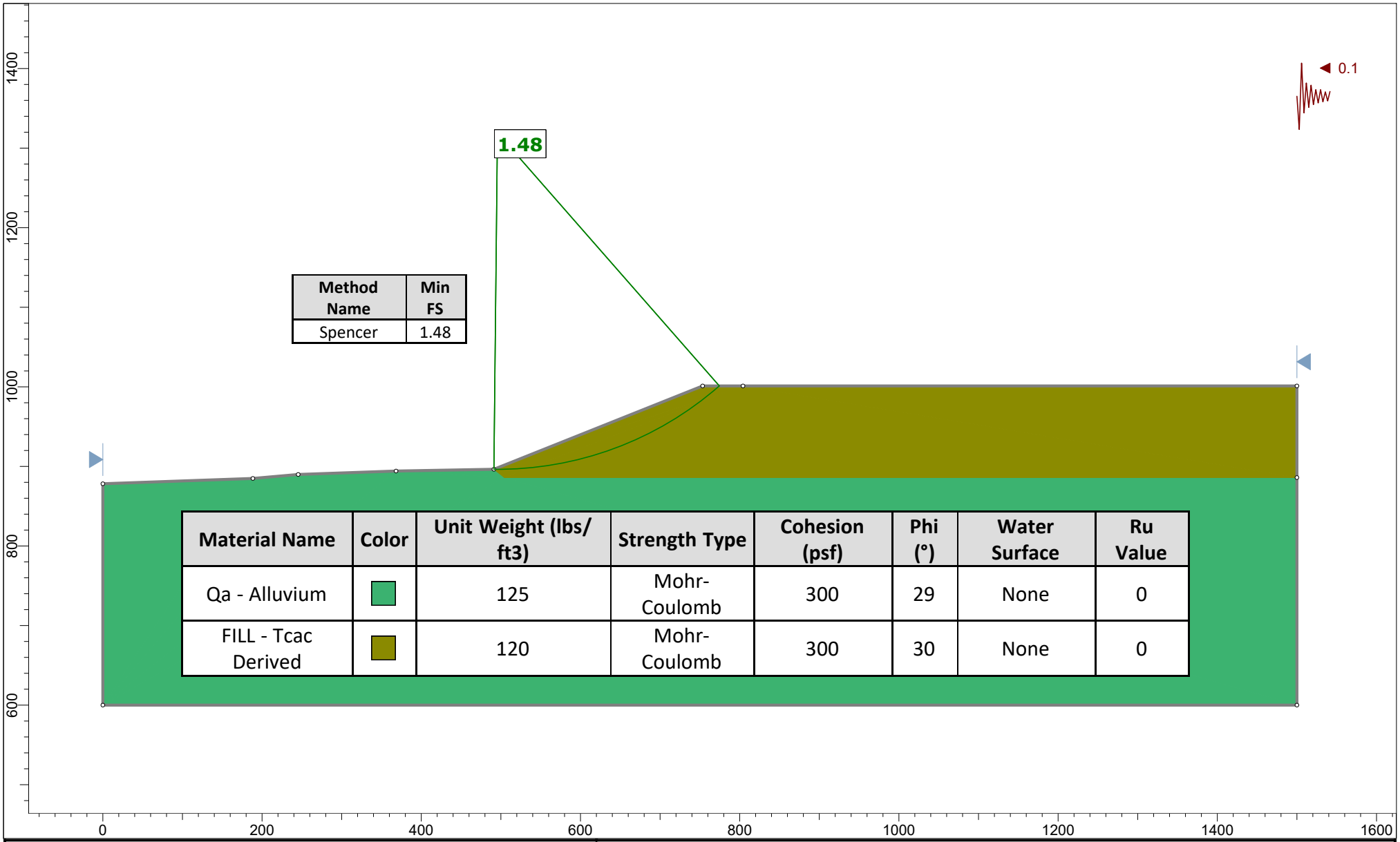
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.231	896.273	0	0	0
2	496.813	896.285	1225.17	428.988	19.2975
3	502.395	896.371	2890.35	1012.05	19.2976
4	507.977	896.531	4930.1	1726.26	19.2976
5	513.559	896.766	7282.84	2550.06	19.2975
6	519.142	897.075	9890.67	3463.18	19.2975
7	524.724	897.46	12699.2	4446.58	19.2975
8	530.306	897.919	15657.4	5482.4	19.2976
9	535.888	898.453	18717.6	6553.89	19.2975
10	541.47	899.063	21834.9	7645.42	19.2975
11	547.052	899.749	24967.8	8742.39	19.2975
12	552.635	900.511	28077.4	9831.18	19.2975
13	558.217	901.349	31127.5	10899.2	19.2975
14	563.799	902.265	34085	11934.7	19.2975
15	569.381	903.258	36919	12927	19.2974
16	574.963	904.33	39601.3	13866.2	19.2975
17	580.545	905.48	42106.2	14743.3	19.2975
18	586.127	906.71	44410.5	15550.2	19.2975
19	591.71	908.02	46493.3	16279.4	19.2975
20	597.292	909.411	48336	16924.7	19.2975
21	602.874	910.884	49922.4	17480.1	19.2975
22	608.456	912.439	51238.5	17941	19.2975
23	614.038	914.078	52272.9	18303.1	19.2975
24	619.62	915.802	53015.9	18563.3	19.2975
25	625.203	917.612	53460.7	18719	19.2975
26	630.785	919.508	53602.2	18768.6	19.2975
27	636.367	921.493	53438	18711.1	19.2975
28	641.949	923.567	52967.9	18546.5	19.2975
29	647.531	925.733	52193.9	18275.5	19.2975
30	653.113	927.991	51120.5	17899.6	19.2975
31	658.695	930.343	49754.6	17421.4	19.2975
32	664.278	932.79	48105.6	16844	19.2975
33	669.86	935.336	46185.5	16171.7	19.2975
34	675.442	937.981	44008.7	15409.5	19.2975
35	681.024	940.728	41592.6	14563.5	19.2975
36	686.606	943.58	38957.3	13640.8	19.2976
37	692.188	946.537	36125.8	12649.3	19.2975
38	697.771	949.604	33124.3	11598.3	19.2974
39	703.353	952.783	29982.1	10498.1	19.2975
40	708.935	956.076	26732.1	9360.14	19.2975
41	714.517	959.487	23410.6	8197.13	19.2975
42	720.099	963.02	20057.9	7023.19	19.2975
43	725.681	966.678	16718.3	5853.85	19.2975
44	731.263	970.465	13440.6	4706.16	19.2975
45	736.846	974.385	10278.1	3598.85	19.2976
46	742.428	978.444	7289.54	2552.4	19.2975
47	748.01	982.645	4538.82	1589.25	19.2975
48	753.592	986.995	2096.1	733.942	19.2975
49	759.174	991.5	312.663	109.478	19.2975
50	764.756	996.166	-435.048	-152.331	19.2976
51	770.339	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.48

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - Tcac Derived		120	Mohr-Coulomb	300	30	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/16/2023	Run Number: Run No. 52

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.47925 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.47925 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.998s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - Tcac Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	120 lbs/ft3
Cohesion	300 psf
Phi	30 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.479250
Center:	495.760, 1319.226
Radius:	422.978
Left Slip Surface Endpoint:	491.201, 896.273
Right Slip Surface Endpoint:	774.404, 1001.000
Resisting Moment:	2.20628e+08 lb-ft
Driving Moment:	1.49148e+08 lb-ft
Resisting Horizontal Force:	483909 lb
Driving Horizontal Force:	327131 lb
Total Slice Area:	6737.11 ft2
Surface Horizontal Width:	283.203 ft
Surface Average Height:	23.789 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12742
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.47925

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	5.66406	768.74	-0.233972	FILL - Tcac Derived	300	30	306.382	453.216	265.378	0	265.378	264.127	264.127
2	5.66406	2295.92	0.533297	FILL - Tcac Derived	300	30	424.112	627.368	567.017	0	567.017	570.965	570.965
3	5.66406	3771.56	1.30066	FILL - Tcac Derived	300	30	534.805	791.111	850.63	0	850.63	862.772	862.772
4	5.66406	5195.6	2.06826	FILL - Tcac Derived	300	30	638.709	944.811	1116.85	0	1116.85	1139.91	1139.91
5	5.66406	6567.98	2.83623	FILL - Tcac Derived	300	30	736.057	1088.81	1366.26	0	1366.26	1402.73	1402.73
6	5.66406	7888.61	3.60471	FILL - Tcac Derived	300	30	827.068	1223.44	1599.44	0	1599.44	1651.55	1651.55
7	5.66406	9157.38	4.37384	FILL - Tcac Derived	300	30	911.949	1349	1816.92	0	1816.92	1886.67	1886.67
8	5.66406	10374.1	5.14376	FILL - Tcac Derived	300	30	990.887	1465.77	2019.18	0	2019.18	2108.38	2108.38
9	5.66406	11538.7	5.91461	FILL - Tcac Derived	300	30	1064.08	1574.04	2206.7	0	2206.7	2316.94	2316.94
10	5.66406	12650.9	6.68654	FILL - Tcac Derived	300	30	1131.69	1674.05	2379.93	0	2379.93	2512.61	2512.61
11	5.66406	13710.4	7.45969	FILL - Tcac Derived	300	30	1193.88	1766.05	2539.26	0	2539.26	2695.58	2695.58
12	5.66406	14717.1	8.23421	FILL - Tcac Derived	300	30	1250.81	1850.26	2685.14	0	2685.14	2866.14	2866.14
13	5.66406	15670.6	9.01025	FILL - Tcac Derived	300	30	1302.62	1926.9	2817.87	0	2817.87	3024.42	3024.42
14	5.66406	16570.5	9.78796	FILL - Tcac Derived	300	30	1349.45	1996.18	2937.86	0	2937.86	3170.66	3170.66
15	5.66406	17416.6	10.5675	FILL - Tcac Derived	300	30	1391.43	2058.28	3045.43	0	3045.43	3305.01	3305.01
16	5.66406	18208.4	11.349	FILL - Tcac Derived	300	30	1428.69	2113.39	3140.89	0	3140.89	3427.64	3427.64
17	5.66406	18945.5	12.1327	FILL - Tcac Derived	300	30	1461.34	2161.69	3224.53	0	3224.53	3538.69	3538.69
18	5.66406	19627.5	12.9187	FILL - Tcac Derived	300	30	1489.49	2203.33	3296.66	0	3296.66	3638.31	3638.31
19	5.66406	20253.7	13.7071	FILL - Tcac Derived	300	30	1513.25	2238.47	3357.52	0	3357.52	3726.61	3726.61
20	5.66406	20823.7	14.4982	FILL - Tcac Derived	300	30	1532.71	2267.26	3407.4	0	3407.4	3803.73	3803.73
21	5.66406	21336.9	15.2922	FILL - Tcac Derived	300	30	1547.98	2289.85	3446.51	0	3446.51	3869.76	3869.76
22	5.66406	21792.7	16.0891	FILL - Tcac Derived	300	30	1559.13	2306.35	3475.11	0	3475.11	3924.81	3924.81
23	5.66406	22190.3	16.8893	FILL - Tcac Derived	300	30	1566.27	2316.91	3493.39	0	3493.39	3968.94	3968.94
24	5.66406	22529.1	17.6929	FILL - Tcac Derived	300	30	1569.46	2321.63	3501.57	0	3501.57	4002.23	4002.23
25	5.66406	22808.2	18.5001	FILL - Tcac Derived	300	30	1568.79	2320.64	3499.85	0	3499.85	4024.77	4024.77

26	5.66406	23026.9	19.3111	FILL - Tcac Derived	300	30	1564.33	2314.04	3488.42	0	3488.42	4036.59	4036.59
27	5.66406	23184.3	20.1262	FILL - Tcac Derived	300	30	1556.15	2301.94	3467.46	0	3467.46	4037.74	4037.74
28	5.66406	23279.3	20.9455	FILL - Tcac Derived	300	30	1544.32	2284.43	3437.13	0	3437.13	4028.26	4028.26
29	5.66406	23311.1	21.7694	FILL - Tcac Derived	300	30	1528.88	2261.6	3397.6	0	3397.6	4008.16	4008.16
30	5.66406	23278.4	22.598	FILL - Tcac Derived	300	30	1509.93	2233.56	3349.01	0	3349.01	3977.47	3977.47
31	5.66406	23180.3	23.4316	FILL - Tcac Derived	300	30	1487.49	2200.37	3291.54	0	3291.54	3936.21	3936.21
32	5.66406	23015.3	24.2706	FILL - Tcac Derived	300	30	1461.63	2162.12	3225.28	0	3225.28	3884.33	3884.33
33	5.66406	22782.4	25.1151	FILL - Tcac Derived	300	30	1432.42	2118.9	3150.43	0	3150.43	3821.88	3821.88
34	5.66406	22479.9	25.9654	FILL - Tcac Derived	300	30	1399.87	2070.76	3067.05	0	3067.05	3748.77	3748.77
35	5.66406	22106.5	26.822	FILL - Tcac Derived	300	30	1364.06	2017.79	2975.29	0	2975.29	3664.99	3664.99
36	5.66406	21660.6	27.6851	FILL - Tcac Derived	300	30	1325.02	1960.04	2875.28	0	2875.28	3570.49	3570.49
37	5.66406	21140.3	28.5551	FILL - Tcac Derived	300	30	1282.81	1897.59	2767.11	0	2767.11	3465.21	3465.21
38	5.66406	20544	29.4323	FILL - Tcac Derived	300	30	1237.45	1830.5	2650.9	0	2650.9	3349.09	3349.09
39	5.66406	19869.6	30.3172	FILL - Tcac Derived	300	30	1188.99	1758.81	2526.74	0	2526.74	3222.01	3222.01
40	5.66406	19115.1	31.2101	FILL - Tcac Derived	300	30	1137.47	1682.6	2394.74	0	2394.74	3083.89	3083.89
41	5.66406	18278.1	32.1116	FILL - Tcac Derived	300	30	1082.92	1601.91	2254.97	0	2254.97	2934.59	2934.59
42	5.66406	17356.2	33.022	FILL - Tcac Derived	300	30	1025.38	1516.79	2107.54	0	2107.54	2773.99	2773.99
43	5.66406	16346.9	33.942	FILL - Tcac Derived	300	30	964.881	1427.3	1952.55	0	1952.55	2601.95	2601.95
44	5.66406	15247.2	34.872	FILL - Tcac Derived	300	30	901.464	1333.49	1790.05	0	1790.05	2418.27	2418.27
45	5.66406	14054.1	35.8127	FILL - Tcac Derived	300	30	835.147	1235.39	1620.15	0	1620.15	2222.76	2222.76
46	5.66406	12764.2	36.7646	FILL - Tcac Derived	300	30	765.973	1133.07	1442.91	0	1442.91	2015.2	2015.2
47	5.66406	11007.5	37.7285	FILL - Tcac Derived	300	30	677.549	1002.26	1216.36	0	1216.36	1740.57	1740.57
48	5.66406	8049.37	38.7051	FILL - Tcac Derived	300	30	538.419	796.457	859.888	0	859.888	1291.32	1291.32
49	5.66406	4909.14	39.6953	FILL - Tcac Derived	300	30	395.296	584.742	493.188	0	493.188	821.315	821.315
50	5.66406	1655.67	40.6999	FILL - Tcac Derived	300	30	256.694	379.714	138.069	0	138.069	358.86	358.86

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.47925

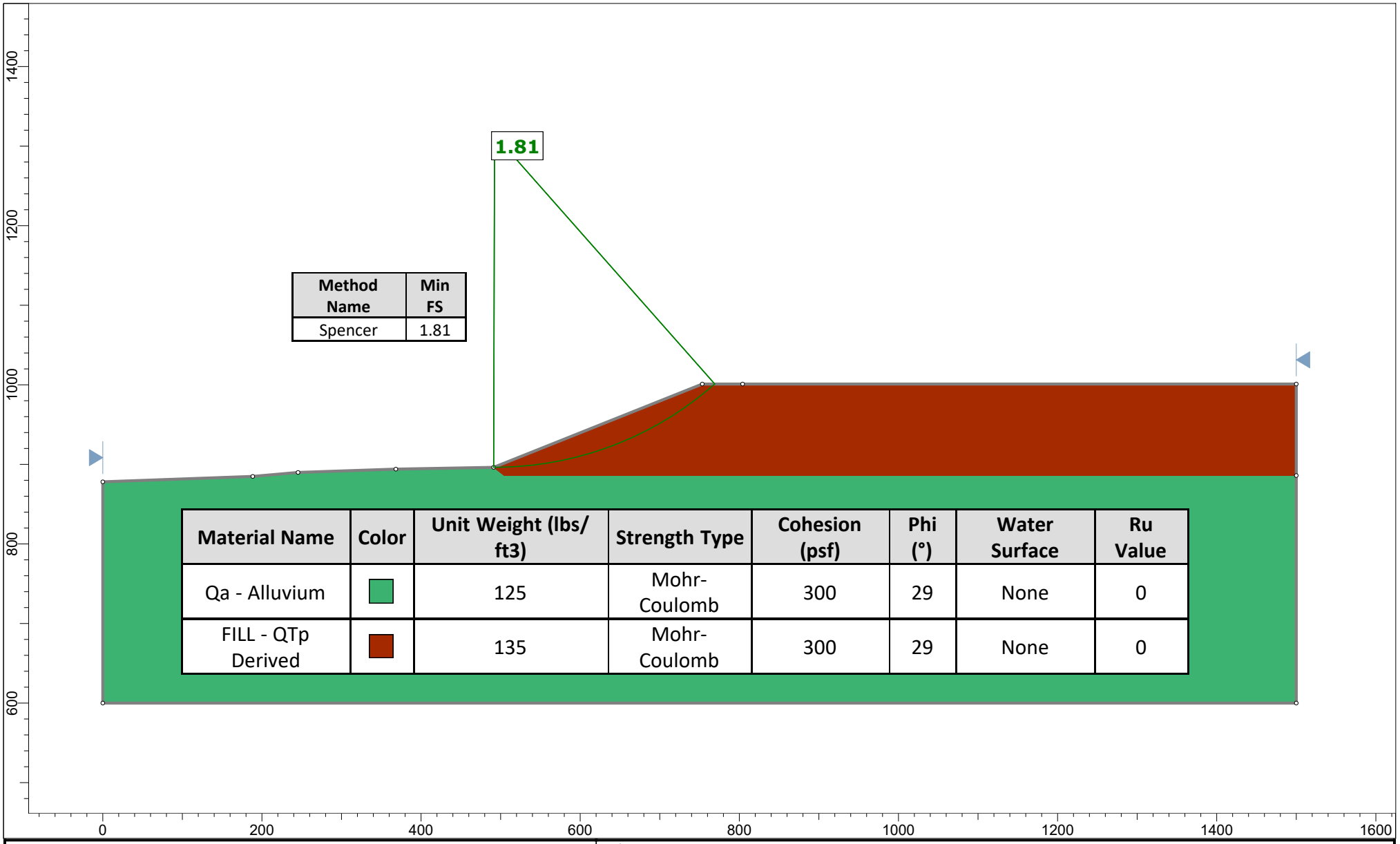
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.201	896.273	0	0	0
2	496.865	896.25	1665.97	743.906	24.0622
3	502.529	896.302	3810.53	1701.52	24.0622
4	508.193	896.431	6355.49	2837.92	24.0622
5	513.857	896.636	9227.96	4120.56	24.0622
6	519.521	896.916	12360.1	5519.14	24.0621
7	525.185	897.273	15688.7	7005.46	24.0621
8	530.849	897.706	19155.1	8553.33	24.0622
9	536.513	898.216	22705	10138.5	24.0623
10	542.177	898.803	26287.9	11738.3	24.0621
11	547.842	899.467	29857.4	13332.2	24.0622
12	553.506	900.209	33370.5	14901	24.0623
13	559.17	901.028	36788.1	16427	24.0622
14	564.834	901.926	40074	17894.2	24.0621
15	570.498	902.903	43195.5	19288.1	24.0622
16	576.162	903.96	46123.1	20595.3	24.0621
17	581.826	905.097	48830	21804.1	24.0622
18	587.49	906.315	51292.6	22903.7	24.0622
19	593.154	907.614	53490	23884.9	24.0622
20	598.818	908.995	55403.9	24739.5	24.0622
21	604.482	910.46	57019	25460.7	24.0622
22	610.146	912.009	58322.3	26042.7	24.0622
23	615.81	913.642	59303.7	26480.9	24.0622
24	621.474	915.362	59955.3	26771.9	24.0622
25	627.138	917.169	60272	26913.3	24.0622
26	632.802	919.064	60250.9	26903.8	24.0622
27	638.466	921.049	59891.8	26743.5	24.0622
28	644.131	923.125	59197	26433.2	24.0622
29	649.795	925.293	58171	25975.1	24.0622
30	655.459	927.555	56821	25372.3	24.0622
31	661.123	929.912	55156.8	24629.2	24.0622
32	666.787	932.367	53190.6	23751.2	24.0622
33	672.451	934.921	50937.1	22744.9	24.0622
34	678.115	937.576	48413.8	21618.2	24.0622
35	683.779	940.334	45641	20380.1	24.0622
36	689.443	943.198	42641.6	19040.8	24.0622
37	695.107	946.17	39441.5	17611.8	24.0622
38	700.771	949.252	36069.7	16106.2	24.0622
39	706.435	952.448	32558.1	14538.2	24.0622
40	712.099	955.76	28942	12923.5	24.0622
41	717.763	959.192	25260.3	11279.5	24.0622
42	723.427	962.746	21555.3	9625.08	24.0622
43	729.091	966.428	17873.3	7980.95	24.0622
44	734.756	970.24	14264.6	6369.58	24.0622
45	740.42	974.187	10784.1	4815.42	24.0622
46	746.084	978.274	7491.19	3345.04	24.0622
47	751.748	982.506	4450.51	1987.29	24.0622
48	757.412	986.888	1860.09	830.586	24.0622
49	763.076	991.427	204.451	91.2937	24.0622
50	768.74	996.128	-364.532	-162.775	24.0623
51	774.404	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.81

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - QTp Derived		135	Mohr-Coulomb	300	29	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/16/2023	Run Number: Run No. 53

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.8108 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.8108 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.141s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - QTp Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.810800
Center:	492.355, 1314.303
Radius:	418.031
Left Slip Surface Endpoint:	491.231, 896.273
Right Slip Surface Endpoint:	769.107, 1001.000
Resisting Moment:	2.23789e+08 lb-ft
Driving Moment:	1.23586e+08 lb-ft
Resisting Horizontal Force:	494881 lb
Driving Horizontal Force:	273294 lb
Total Slice Area:	6247.23 ft2
Surface Horizontal Width:	277.876 ft
Surface Average Height:	22.4821 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12259
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.8108

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	5.55751	824.251	0.226199	FILL - QTp Derived	300	29	235.807	426.999	229.113	0	229.113	230.044	230.044
2	5.55751	2445.01	0.988519	FILL - QTp Derived	300	29	333.086	603.152	546.901	0	546.901	552.648	552.648
3	5.55751	4010.29	1.75048	FILL - QTp Derived	300	29	425.178	769.913	847.746	0	847.746	860.74	860.74
4	5.55751	5520.05	2.51275	FILL - QTp Derived	300	29	512.219	927.526	1132.09	0	1132.09	1154.57	1154.57
5	5.55751	6974.21	3.27546	FILL - QTp Derived	300	29	594.336	1076.22	1400.34	0	1400.34	1434.36	1434.36
6	5.55751	8372.66	4.03876	FILL - QTp Derived	300	29	671.65	1216.22	1652.91	0	1652.91	1700.33	1700.33
7	5.55751	9715.26	4.80277	FILL - QTp Derived	300	29	744.273	1347.73	1890.16	0	1890.16	1952.69	1952.69
8	5.55751	11001.8	5.56765	FILL - QTp Derived	300	29	812.315	1470.94	2112.43	0	2112.43	2191.61	2191.61
9	5.55751	12232.2	6.33351	FILL - QTp Derived	300	29	875.873	1586.03	2320.07	0	2320.07	2417.29	2417.29
10	5.55751	13406	7.10052	FILL - QTp Derived	300	29	935.051	1693.19	2513.38	0	2513.38	2629.86	2629.86
11	5.55751	14523.2	7.86881	FILL - QTp Derived	300	29	989.933	1792.57	2692.67	0	2692.67	2829.49	2829.49
12	5.55751	15583.3	8.63853	FILL - QTp Derived	300	29	1040.61	1884.33	2858.19	0	2858.19	3016.28	3016.28
13	5.55751	16586	9.40982	FILL - QTp Derived	300	29	1087.15	1968.61	3010.25	0	3010.25	3190.42	3190.42
14	5.55751	17531	10.1828	FILL - QTp Derived	300	29	1129.64	2045.56	3149.07	0	3149.07	3351.98	3351.98
15	5.55751	18417.8	10.9577	FILL - QTp Derived	300	29	1168.16	2115.31	3274.92	0	3274.92	3501.09	3501.09
16	5.55751	19246.1	11.7347	FILL - QTp Derived	300	29	1202.78	2177.99	3387.97	0	3387.97	3637.81	3637.81
17	5.55751	20015.3	12.5138	FILL - QTp Derived	300	29	1233.54	2233.7	3488.49	0	3488.49	3762.27	3762.27
18	5.55751	20724.9	13.2953	FILL - QTp Derived	300	29	1260.53	2282.56	3576.63	0	3576.63	3874.5	3874.5
19	5.55751	21374.3	14.0793	FILL - QTp Derived	300	29	1283.79	2324.69	3652.63	0	3652.63	3974.6	3974.6
20	5.55751	21963	14.866	FILL - QTp Derived	300	29	1303.39	2360.17	3716.64	0	3716.64	4062.62	4062.62
21	5.55751	22490.3	15.6556	FILL - QTp Derived	300	29	1319.36	2389.1	3768.83	0	3768.83	4138.58	4138.58
22	5.55751	22955.5	16.4482	FILL - QTp Derived	300	29	1331.77	2411.57	3809.37	0	3809.37	4202.55	4202.55
23	5.55751	23357.9	17.2441	FILL - QTp Derived	300	29	1340.66	2427.67	3838.41	0	3838.41	4254.54	4254.54
24	5.55751	23696.6	18.0435	FILL - QTp Derived	300	29	1346.07	2437.47	3856.09	0	3856.09	4294.59	4294.59
25	5.55751	23970.8	18.8465	FILL - QTp Derived	300	29	1348.05	2441.05	3862.55	0	3862.55	4322.68	4322.68

26	5.55751	24179.6	19.6533	FILL - QTp Derived	300	29	1346.63	2438.47	3857.92	0	3857.92	4338.84	4338.84
27	5.55751	24322	20.4643	FILL - QTp Derived	300	29	1341.85	2429.82	3842.29	0	3842.29	4343.04	4343.04
28	5.55751	24397	21.2795	FILL - QTp Derived	300	29	1333.74	2415.14	3815.8	0	3815.8	4335.26	4335.26
29	5.55751	24403.5	22.0993	FILL - QTp Derived	300	29	1322.34	2394.49	3778.56	0	3778.56	4315.49	4315.49
30	5.55751	24340.3	22.9239	FILL - QTp Derived	300	29	1307.68	2367.94	3730.65	0	3730.65	4283.68	4283.68
31	5.55751	24206.1	23.7535	FILL - QTp Derived	300	29	1289.77	2335.52	3672.17	0	3672.17	4239.78	4239.78
32	5.55751	23999.5	24.5885	FILL - QTp Derived	300	29	1268.67	2297.3	3603.22	0	3603.22	4183.75	4183.75
33	5.55751	23719.3	25.429	FILL - QTp Derived	300	29	1244.37	2253.3	3523.85	0	3523.85	4115.49	4115.49
34	5.55751	23363.7	26.2755	FILL - QTp Derived	300	29	1216.91	2203.58	3434.16	0	3434.16	4034.95	4034.95
35	5.55751	22931.3	27.1282	FILL - QTp Derived	300	29	1186.32	2148.18	3334.19	0	3334.19	3942	3942
36	5.55751	22420.2	27.9875	FILL - QTp Derived	300	29	1152.6	2087.12	3224.05	0	3224.05	3836.57	3836.57
37	5.55751	21828.6	28.8536	FILL - QTp Derived	300	29	1115.77	2020.44	3103.76	0	3103.76	3718.52	3718.52
38	5.55751	21154.4	29.727	FILL - QTp Derived	300	29	1075.86	1948.17	2973.39	0	2973.39	3587.72	3587.72
39	5.55751	20395.6	30.6081	FILL - QTp Derived	300	29	1032.88	1870.34	2832.98	0	2832.98	3444.02	3444.02
40	5.55751	19549.7	31.4973	FILL - QTp Derived	300	29	986.846	1786.98	2682.58	0	2682.58	3287.26	3287.26
41	5.55751	18614.5	32.3951	FILL - QTp Derived	300	29	937.762	1698.1	2522.24	0	2522.24	3117.25	3117.25
42	5.55751	17587.1	33.3018	FILL - QTp Derived	300	29	885.647	1603.73	2352	0	2352	2933.8	2933.8
43	5.55751	16464.7	34.2181	FILL - QTp Derived	300	29	830.511	1503.89	2171.89	0	2171.89	2736.69	2736.69
44	5.55751	15244.2	35.1445	FILL - QTp Derived	300	29	772.366	1398.6	1981.92	0	1981.92	2525.64	2525.64
45	5.55751	13922.3	36.0815	FILL - QTp Derived	300	29	711.215	1287.87	1782.17	0	1782.17	2300.44	2300.44
46	5.55751	12495.3	37.0298	FILL - QTp Derived	300	29	647.072	1171.72	1572.62	0	1572.62	2060.75	2060.75
47	5.55751	10959.3	37.9902	FILL - QTp Derived	300	29	579.943	1050.16	1353.33	0	1353.33	1806.27	1806.27
48	5.55751	8766.24	38.9633	FILL - QTp Derived	300	29	488.76	885.046	1055.45	0	1055.45	1450.72	1450.72
49	5.55751	5364.58	39.9499	FILL - QTp Derived	300	29	353.412	639.959	613.303	0	613.303	909.325	909.325
50	5.55751	1809.16	40.951	FILL - QTp Derived	300	29	221.447	400.997	182.203	0	182.203	374.373	374.373

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.8108

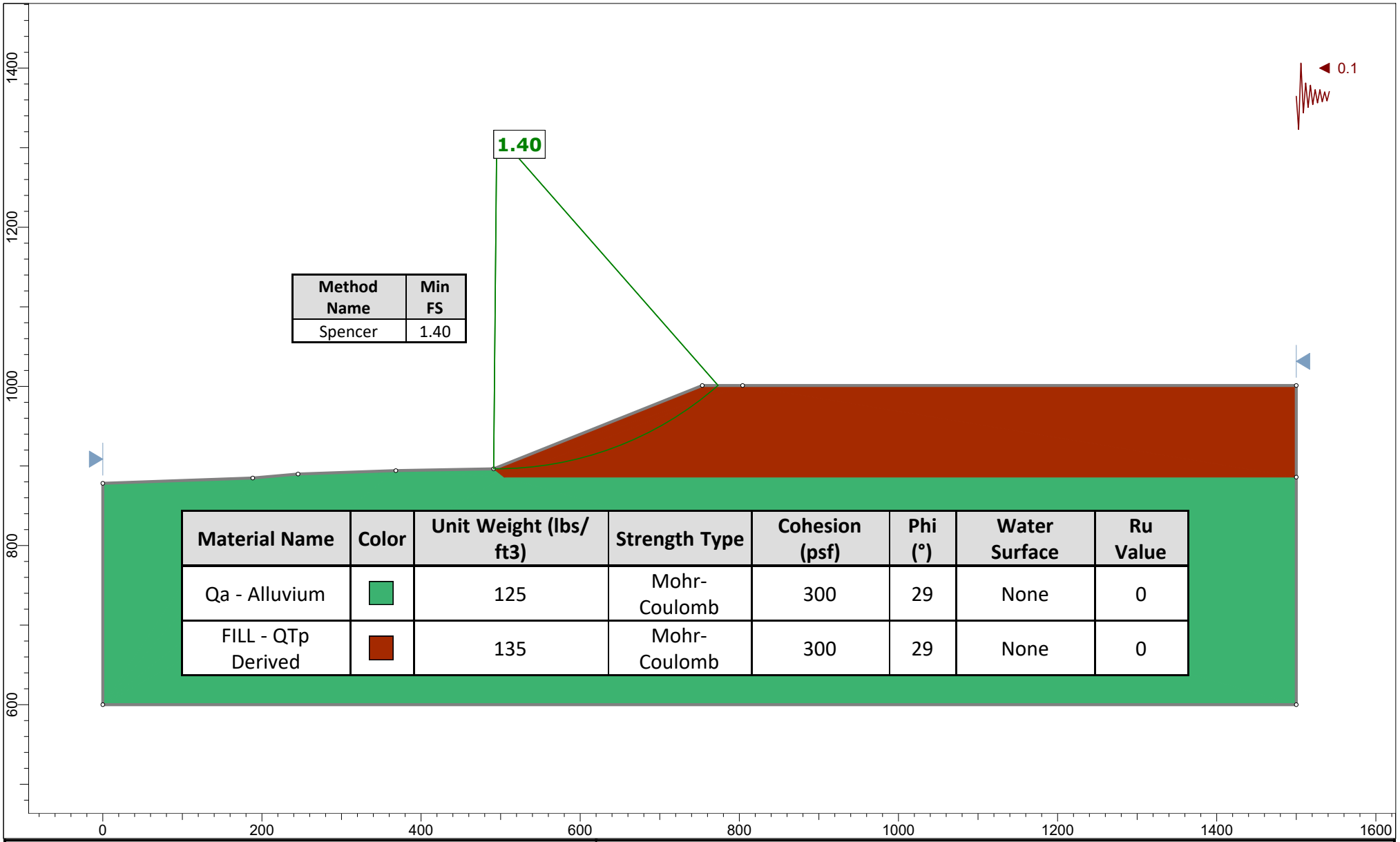
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.231	896.273	0	0	0
2	496.788	896.295	1305.07	458.413	19.3541
3	502.346	896.391	3103.18	1090.01	19.3541
4	507.903	896.561	5321.41	1869.17	19.3541
5	513.461	896.805	7891.09	2771.79	19.3541
6	519.018	897.123	10747.7	3775.19	19.3541
7	524.576	897.515	13830.7	4858.09	19.354
8	530.133	897.982	17083.1	6000.53	19.3541
9	535.691	898.524	20451.7	7183.78	19.3541
10	541.249	899.141	23886.8	8390.36	19.3541
11	546.806	899.833	27341.8	9603.95	19.3541
12	552.364	900.601	30773.5	10809.3	19.354
13	557.921	901.446	34141.6	11992.4	19.3541
14	563.479	902.367	37409.1	13140.1	19.354
15	569.036	903.365	40541.7	14240.5	19.3541
16	574.594	904.441	43507.9	15282.4	19.3541
17	580.151	905.595	46279.2	16255.8	19.3541
18	585.709	906.829	48829.5	17151.6	19.3541
19	591.266	908.142	51135.7	17961.7	19.3541
20	596.824	909.536	53177.1	18678.7	19.3541
21	602.381	911.011	54935.6	19296.4	19.3541
22	607.939	912.569	56395.8	19809.3	19.3541
23	613.496	914.209	57544.6	20212.8	19.3541
24	619.054	915.934	58371.7	20503.4	19.3541
25	624.611	917.745	58869.1	20678.1	19.3541
26	630.169	919.642	59031.5	20735.1	19.3541
27	635.726	921.626	58856	20673.5	19.3541
28	641.284	923.7	58342.4	20493.1	19.3541
29	646.841	925.865	57493.1	20194.8	19.3541
30	652.399	928.121	56313.1	19780.3	19.3541
31	657.956	930.472	54810	19252.3	19.3541
32	663.514	932.918	52994.4	18614.6	19.3541
33	669.071	935.461	50879.6	17871.7	19.3541
34	674.629	938.103	48481.8	17029.5	19.3541
35	680.186	940.847	45820.3	16094.6	19.3541
36	685.744	943.694	42917.5	15075	19.3541
37	691.301	946.648	39799.1	13979.6	19.354
38	696.859	949.71	36494.3	12818.8	19.3541
39	702.416	952.883	33035.7	11604	19.3541
40	707.974	956.171	29460	10348	19.3541
41	713.531	959.576	25807.8	9065.12	19.3541
42	719.089	963.102	22123.8	7771.09	19.3541
43	724.646	966.753	18457.5	6483.28	19.3541
44	730.204	970.533	14863.1	5220.74	19.3541
45	735.762	974.445	11400.3	4004.4	19.354
46	741.319	978.495	8134.12	2857.15	19.3541
47	746.877	982.687	5136.02	1804.05	19.3541
48	752.434	987.028	2484	872.517	19.3541
49	757.992	991.522	455.734	160.079	19.3541
50	763.549	996.177	-435.721	-153.049	19.3541
51	769.107	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.40

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
FILL - QTp Derived		135	Mohr-Coulomb	300	29	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Fill - H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/16/2023	Run Number Run No. 54

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.40135 4
Interslice Data 7
    Global Minimum Query (spencer) - Safety Factor: 1.40135 7
Entity Information 7
    Group 1 7
        Shared Entities 7

Slide2 Analysis Information

SP_Fill - H105- 2.5 to 1

Project Summary

File Name:	SP_Fill - H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.336s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High Fill Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

FILL - QTp Derived	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.401350
Center:	495.115, 1318.111
Radius:	421.833
Left Slip Surface Endpoint:	491.285, 896.295
Right Slip Surface Endpoint:	773.295, 1001.000
Resisting Moment:	2.3124e+08 lb-ft
Driving Moment:	1.65011e+08 lb-ft
Resisting Horizontal Force:	508484 lb
Driving Horizontal Force:	362852 lb
Total Slice Area:	6632.09 ft2
Surface Horizontal Width:	282.01 ft
Surface Average Height:	23.5172 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12812
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.40135

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	5.64021	862.585	-0.137255	FILL - QTp Derived	300	29	329.386	461.585	291.506	0	291.506	290.717	290.717
2	5.64021	2559.04	0.62886	FILL - QTp Derived	300	29	462.752	648.478	628.671	0	628.671	633.75	633.75
3	5.64021	4198.06	1.39509	FILL - QTp Derived	300	29	588.114	824.154	945.599	0	945.599	959.922	959.922
4	5.64021	5779.6	2.16157	FILL - QTp Derived	300	29	705.756	989.011	1243.01	0	1243.01	1269.65	1269.65
5	5.64021	7303.58	2.92843	FILL - QTp Derived	300	29	815.942	1143.42	1521.57	0	1521.57	1563.31	1563.31
6	5.64021	8769.91	3.69582	FILL - QTp Derived	300	29	918.924	1287.73	1781.91	0	1781.91	1841.27	1841.27
7	5.64021	10178.5	4.46388	FILL - QTp Derived	300	29	1014.94	1422.28	2024.65	0	2024.65	2103.88	2103.88
8	5.64021	11529	5.23273	FILL - QTp Derived	300	29	1104.21	1547.38	2250.32	0	2250.32	2351.45	2351.45
9	5.64021	12821.5	6.00254	FILL - QTp Derived	300	29	1186.93	1663.31	2459.49	0	2459.49	2584.29	2584.29
10	5.64021	14055.5	6.77344	FILL - QTp Derived	300	29	1263.32	1770.36	2652.6	0	2652.6	2802.65	2802.65
11	5.64021	15230.9	7.54556	FILL - QTp Derived	300	29	1333.56	1868.79	2830.17	0	2830.17	3006.82	3006.82
12	5.64021	16347.4	8.31908	FILL - QTp Derived	300	29	1397.82	1958.84	2992.64	0	2992.64	3197.03	3197.03
13	5.64021	17404.6	9.09412	FILL - QTp Derived	300	29	1456.27	2040.75	3140.4	0	3140.4	3373.51	3373.51
14	5.64021	18402.1	9.87084	FILL - QTp Derived	300	29	1509.07	2114.74	3273.89	0	3273.89	3536.48	3536.48
15	5.64021	19339.6	10.6494	FILL - QTp Derived	300	29	1556.37	2181.02	3393.45	0	3393.45	3686.11	3686.11
16	5.64021	20216.5	11.43	FILL - QTp Derived	300	29	1598.3	2239.78	3499.47	0	3499.47	3822.61	3822.61
17	5.64021	21032.5	12.2127	FILL - QTp Derived	300	29	1635.01	2291.22	3592.25	0	3592.25	3946.13	3946.13
18	5.64021	21787	12.9977	FILL - QTp Derived	300	29	1666.61	2335.5	3672.15	0	3672.15	4056.85	4056.85
19	5.64021	22479.4	13.7852	FILL - QTp Derived	300	29	1693.23	2372.81	3739.45	0	3739.45	4154.88	4154.88
20	5.64021	23109.1	14.5754	FILL - QTp Derived	300	29	1714.98	2403.29	3794.44	0	3794.44	4240.37	4240.37
21	5.64021	23675.4	15.3684	FILL - QTp Derived	300	29	1731.97	2427.1	3837.39	0	3837.39	4313.42	4313.42
22	5.64021	24177.7	16.1645	FILL - QTp Derived	300	29	1744.31	2444.39	3868.58	0	3868.58	4374.18	4374.18
23	5.64021	24615.1	16.9638	FILL - QTp Derived	300	29	1752.09	2455.29	3888.24	0	3888.24	4422.7	4422.7
24	5.64021	24987	17.7665	FILL - QTp Derived	300	29	1755.4	2459.93	3896.62	0	3896.62	4459.08	4459.08
25	5.64021	25292.3	18.5728	FILL - QTp Derived	300	29	1754.34	2458.44	3893.92	0	3893.92	4483.4	4483.4

26	5.64021	25530.2	19.383	FILL - QTp Derived	300	29	1748.98	2450.93	3880.39	0	3880.39	4495.71	4495.71
27	5.64021	25699.7	20.1972	FILL - QTp Derived	300	29	1739.41	2437.52	3856.19	0	3856.19	4496.07	4496.07
28	5.64021	25799.7	21.0156	FILL - QTp Derived	300	29	1725.7	2418.31	3821.53	0	3821.53	4484.5	4484.5
29	5.64021	25829.1	21.8386	FILL - QTp Derived	300	29	1707.92	2393.4	3776.59	0	3776.59	4461.05	4461.05
30	5.64021	25786.6	22.6664	FILL - QTp Derived	300	29	1686.15	2362.89	3721.55	0	3721.55	4425.72	4425.72
31	5.64021	25671.1	23.4992	FILL - QTp Derived	300	29	1660.46	2326.88	3656.58	0	3656.58	4378.54	4378.54
32	5.64021	25481.1	24.3373	FILL - QTp Derived	300	29	1630.88	2285.44	3581.84	0	3581.84	4319.49	4319.49
33	5.64021	25215.2	25.181	FILL - QTp Derived	300	29	1597.51	2238.67	3497.46	0	3497.46	4248.54	4248.54
34	5.64021	24871.8	26.0305	FILL - QTp Derived	300	29	1560.39	2186.65	3403.6	0	3403.6	4165.68	4165.68
35	5.64021	24449.2	26.8863	FILL - QTp Derived	300	29	1519.56	2129.44	3300.4	0	3300.4	4070.86	4070.86
36	5.64021	23945.6	27.7486	FILL - QTp Derived	300	29	1475.1	2067.13	3188	0	3188	3964.04	3964.04
37	5.64021	23359.2	28.6178	FILL - QTp Derived	300	29	1427.04	1999.78	3066.49	0	3066.49	3845.11	3845.11
38	5.64021	22687.9	29.4942	FILL - QTp Derived	300	29	1375.44	1927.47	2936.03	0	2936.03	3714.03	3714.03
39	5.64021	21929.4	30.3783	FILL - QTp Derived	300	29	1320.33	1850.25	2796.71	0	2796.71	3570.68	3570.68
40	5.64021	21081.5	31.2704	FILL - QTp Derived	300	29	1261.77	1768.18	2648.68	0	2648.68	3414.95	3414.95
41	5.64021	20141.6	32.1711	FILL - QTp Derived	300	29	1199.79	1681.33	2491.99	0	2491.99	3246.69	3246.69
42	5.64021	19107	33.0808	FILL - QTp Derived	300	29	1134.45	1589.76	2326.78	0	2326.78	3065.78	3065.78
43	5.64021	17974.7	34	FILL - QTp Derived	300	29	1065.77	1493.51	2153.15	0	2153.15	2872.02	2872.02
44	5.64021	16741.6	34.9292	FILL - QTp Derived	300	29	993.792	1392.65	1971.2	0	1971.2	2665.23	2665.23
45	5.64021	15404.3	35.8691	FILL - QTp Derived	300	29	918.559	1287.22	1781	0	1781	2445.17	2445.17
46	5.64021	13958.9	36.8203	FILL - QTp Derived	300	29	840.106	1177.28	1582.66	0	1582.66	2211.6	2211.6
47	5.64021	12178.9	37.7835	FILL - QTp Derived	300	29	748.343	1048.69	1350.67	0	1350.67	1930.8	1930.8
48	5.64021	8996.44	38.7594	FILL - QTp Derived	300	29	596.147	835.41	965.906	0	965.906	1444.52	1444.52
49	5.64021	5486.64	39.7488	FILL - QTp Derived	300	29	433.826	607.942	555.541	0	555.541	916.335	916.335
50	5.64021	1850.41	40.7526	FILL - QTp Derived	300	29	276.201	387.055	157.051	0	157.051	395.064	395.064

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.40135

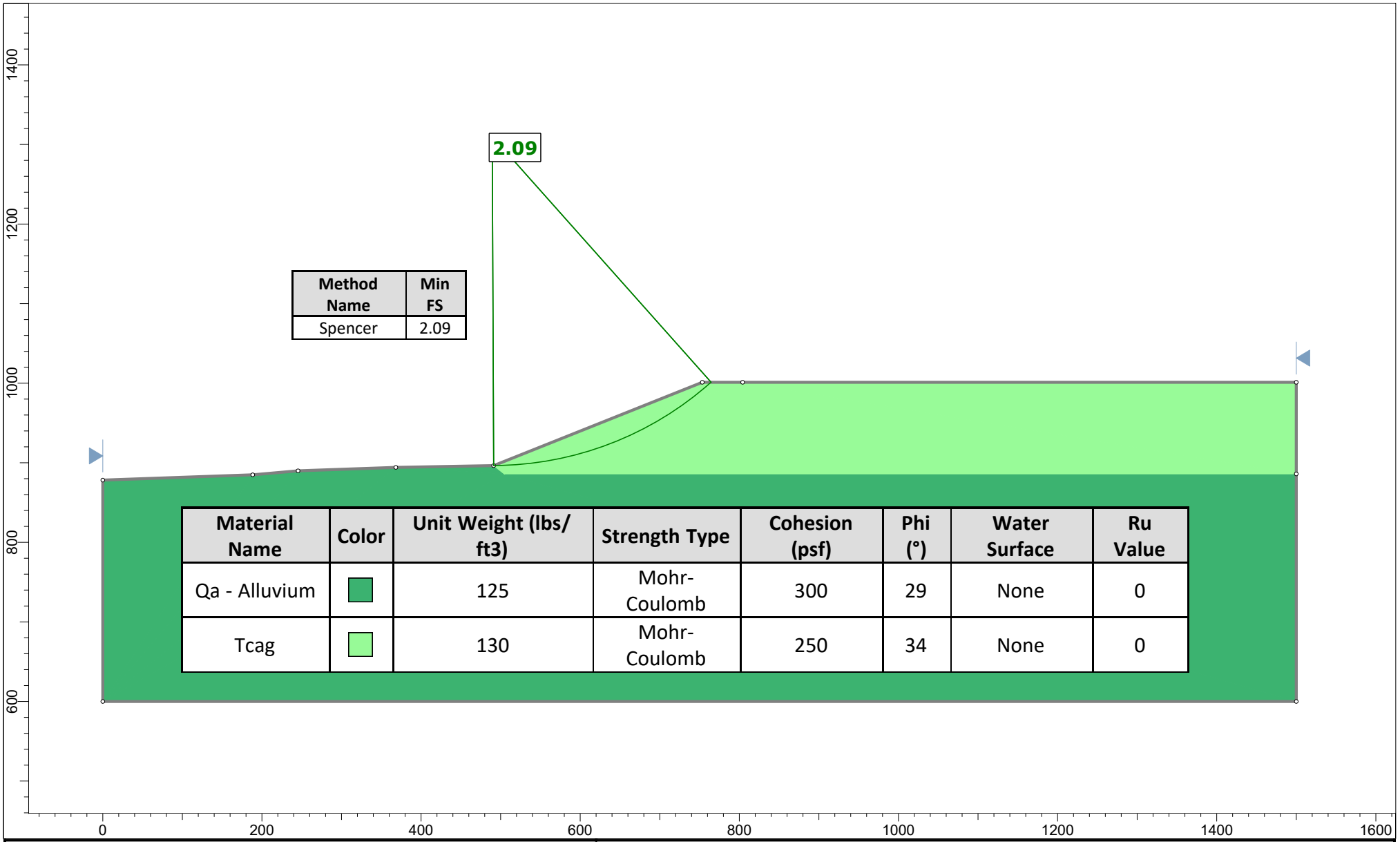
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.285	896.295	0	0	0
2	496.925	896.281	1776.95	795.22	24.1095
3	502.565	896.343	4094.19	1832.24	24.1096
4	508.205	896.481	6864.2	3071.87	24.1095
5	513.846	896.694	10005.4	4477.6	24.1094
6	519.486	896.982	13441.7	6015.43	24.1095
7	525.126	897.346	17102.5	7653.72	24.1095
8	530.766	897.787	20922.1	9363.08	24.1095
9	536.406	898.303	24839.7	11116.3	24.1095
10	542.047	898.896	28798.7	12888	24.1095
11	547.687	899.566	32747.2	14655	24.1094
12	553.327	900.313	36637.1	16395.9	24.1096
13	558.967	901.138	40424.5	18090.8	24.1095
14	564.607	902.041	44069	19721.8	24.1095
15	570.248	903.022	47533.9	21272.4	24.1095
16	575.888	904.083	50786.1	22727.8	24.1095
17	581.528	905.223	53795.8	24074.7	24.1095
18	587.168	906.444	56536.3	25301.1	24.1094
19	592.809	907.746	58984.2	26396.6	24.1095
20	598.449	909.13	61119.2	27352.1	24.1095
21	604.089	910.596	62923.9	28159.7	24.1095
22	609.729	912.147	64383.9	28813.1	24.1095
23	615.369	913.781	65487.6	29307	24.1095
24	621.01	915.502	66226.3	29637.6	24.1095
25	626.65	917.309	66594.1	29802.2	24.1095
26	632.29	919.204	66587.9	29799.4	24.1095
27	637.93	921.189	66207.2	29629.1	24.1095
28	643.57	923.263	65454.4	29292.2	24.1095
29	649.211	925.43	64334.8	28791.1	24.1095
30	654.851	927.691	62856.1	28129.4	24.1095
31	660.491	930.046	61029.2	27311.8	24.1095
32	666.131	932.498	58867.6	26344.4	24.1094
33	671.771	935.05	56387.7	25234.7	24.1095
34	677.412	937.701	53609	23991.1	24.1095
35	683.052	940.456	50554	22623.9	24.1094
36	688.692	943.316	47248.2	21144.5	24.1095
37	694.332	946.283	43720.3	19565.8	24.1096
38	699.972	949.36	40002.7	17902	24.1095
39	705.613	952.551	36130.9	16169.3	24.1095
40	711.253	955.857	32144.2	14385.2	24.1095
41	716.893	959.282	28085.7	12568.9	24.1094
42	722.533	962.83	24002.7	10741.7	24.1095
43	728.174	966.504	19946.7	8926.57	24.1095
44	733.814	970.309	15973.7	7148.58	24.1096
45	739.454	974.248	12144.8	5435.03	24.1094
46	745.094	978.326	8526.01	3815.56	24.1095
47	750.734	982.548	5189.38	2322.35	24.1095
48	756.375	986.921	2289.94	1024.8	24.1096
49	762.015	991.449	381.459	170.711	24.1095
50	767.655	996.14	-324.299	-145.13	24.1094
51	773.295	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	2.09

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
Tcag		130	Mohr-Coulomb	250	34	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High CUT Slope @ 2.5:1 (H:V) , Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Cut- H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number Run No. 55

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 2.09221 4
Interslice Data 5
    Global Minimum Query (spencer) - Safety Factor: 2.09221 5
Entity Information 6
    Group 1 6
        Shared Entities 6

Slide2 Analysis Information

SP_Cut- H105- 2.5 to 1

Project Summary

File Name:	SP_Cut- H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.51s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High CUT Slope @ 2.5:1 (H:V) , Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Tcag	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	2.092210
Center:	489.378, 1310.081
Radius:	413.812
Left Slip Surface Endpoint:	491.231, 896.273
Right Slip Surface Endpoint:	764.531, 1001.000
Resisting Moment:	2.31575e+08 lb-ft
Driving Moment:	1.10684e+08 lb-ft
Resisting Horizontal Force:	517132 lb
Driving Horizontal Force:	247170 lb
Total Slice Area:	5827.44 ft2
Surface Horizontal Width:	273.3 ft
Surface Average Height:	21.3225 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12326
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.09221

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.466	753.954	0.634628	Tcag	250	34	183.919	384.798	199.847	0	199.847	201.884	201.884
2	5.466	2236.18	1.39194	Tcag	250	34	279.571	584.922	496.542	0	496.542	503.335	503.335
3	5.466	3667.05	2.14914	Tcag	250	34	370.042	774.206	777.168	0	777.168	791.055	791.055
4	5.466	5046.49	2.90671	Tcag	250	34	455.47	952.939	1042.15	0	1042.15	1065.28	1065.28
5	5.466	6374.43	3.6648	Tcag	250	34	535.984	1121.39	1291.89	0	1291.89	1326.22	1326.22
6	5.466	7650.74	4.42352	Tcag	250	34	611.707	1279.82	1526.77	0	1526.77	1574.09	1574.09
7	5.466	8875.28	5.18303	Tcag	250	34	682.752	1428.46	1747.14	0	1747.14	1809.07	1809.07
8	5.466	10047.9	5.94344	Tcag	250	34	749.232	1567.55	1953.35	0	1953.35	2031.35	2031.35
9	5.466	11168.3	6.70492	Tcag	250	34	811.247	1697.3	2145.71	0	2145.71	2241.08	2241.08
10	5.466	12236.4	7.46758	Tcag	250	34	868.895	1817.91	2324.52	0	2324.52	2438.41	2438.41
11	5.466	13251.8	8.23157	Tcag	250	34	922.269	1929.58	2490.09	0	2490.09	2623.51	2623.51
12	5.466	14214.3	8.99705	Tcag	250	34	971.461	2032.5	2642.66	0	2642.66	2796.47	2796.47
13	5.466	15123.6	9.76414	Tcag	250	34	1016.54	2126.82	2782.5	0	2782.5	2957.43	2957.43
14	5.466	15979.3	10.533	Tcag	250	34	1057.6	2212.73	2909.86	0	2909.86	3106.51	3106.51
15	5.466	16780.9	11.3038	Tcag	250	34	1094.71	2290.37	3024.98	0	3024.98	3243.8	3243.8
16	5.466	17528.1	12.0767	Tcag	250	34	1127.94	2359.89	3128.05	0	3128.05	3369.38	3369.38
17	5.466	18220.5	12.8518	Tcag	250	34	1157.36	2421.44	3219.29	0	3219.29	3483.34	3483.34
18	5.466	18857.5	13.6293	Tcag	250	34	1183.02	2475.13	3298.89	0	3298.89	3585.73	3585.73
19	5.466	19438.6	14.4094	Tcag	250	34	1205	2521.11	3367.06	0	3367.06	3676.66	3676.66
20	5.466	19963.2	15.1922	Tcag	250	34	1223.34	2559.48	3423.94	0	3423.94	3756.14	3756.14
21	5.466	20430.7	15.9779	Tcag	250	34	1238.1	2590.36	3469.72	0	3469.72	3824.22	3824.22
22	5.466	20840.5	16.7667	Tcag	250	34	1249.32	2613.85	3504.55	0	3504.55	3880.95	3880.95
23	5.466	21191.8	17.5589	Tcag	250	34	1257.07	2630.06	3528.59	0	3528.59	3926.36	3926.36
24	5.466	21484	18.3545	Tcag	250	34	1261.38	2639.08	3541.95	0	3541.95	3960.44	3960.44
25	5.466	21716.1	19.1537	Tcag	250	34	1262.3	2640.99	3544.79	0	3544.79	3983.23	3983.23
26	5.466	21887.3	19.9569	Tcag	250	34	1259.86	2635.89	3537.23	0	3537.23	3994.71	3994.71
27	5.466	21996.7	20.7642	Tcag	250	34	1254.1	2623.85	3519.38	0	3519.38	3994.87	3994.87
28	5.466	22043.4	21.5758	Tcag	250	34	1245.07	2604.95	3491.36	0	3491.36	3983.71	3983.71
29	5.466	22026.2	22.392	Tcag	250	34	1232.79	2579.26	3453.28	0	3453.28	3961.19	3961.19
30	5.466	21944.2	23.213	Tcag	250	34	1217.3	2546.85	3405.23	0	3405.23	3927.29	3927.29
31	5.466	21796	24.0391	Tcag	250	34	1198.63	2507.78	3347.3	0	3347.3	3881.94	3881.94
32	5.466	21580.5	24.8705	Tcag	250	34	1176.79	2462.1	3279.57	0	3279.57	3825.08	3825.08
33	5.466	21296.2	25.7076	Tcag	250	34	1151.83	2409.87	3202.15	0	3202.15	3756.67	3756.67
34	5.466	20941.8	26.5506	Tcag	250	34	1123.76	2351.15	3115.08	0	3115.08	3676.61	3676.61
35	5.466	20515.7	27.3999	Tcag	250	34	1092.62	2285.99	3018.48	0	3018.48	3584.84	3584.84
36	5.466	20016.3	28.2557	Tcag	250	34	1058.41	2214.42	2912.38	0	2912.38	3481.22	3481.22
37	5.466	19441.7	29.1184	Tcag	250	34	1021.17	2136.5	2796.85	0	2796.85	3365.66	3365.66
38	5.466	18790.2	29.9885	Tcag	250	34	980.901	2052.25	2671.95	0	2671.95	3238.01	3238.01
39	5.466	18059.7	30.8663	Tcag	250	34	937.635	1961.73	2537.74	0	2537.74	3098.16	3098.16
40	5.466	17248.1	31.7521	Tcag	250	34	891.383	1864.96	2394.26	0	2394.26	2945.91	2945.91
41	5.466	16353	32.6465	Tcag	250	34	842.157	1761.97	2241.6	0	2241.6	2781.14	2781.14
42	5.466	15371.9	33.55	Tcag	250	34	789.983	1652.81	2079.74	0	2079.74	2603.61	2603.61
43	5.466	14302.1	34.463	Tcag	250	34	734.859	1537.48	1908.78	0	1908.78	2413.13	2413.13
44	5.466	13140.8	35.3861	Tcag	250	34	676.815	1416.04	1728.72	0	1728.72	2209.46	2209.46
45	5.466	11884.7	36.32	Tcag	250	34	615.851	1288.49	1539.63	0	1539.63	1992.35	1992.35
46	5.466	10530.5	37.2651	Tcag	250	34	551.99	1154.88	1341.54	0	1341.54	1761.51	1761.51
47	5.466	9074.43	38.2223	Tcag	250	34	485.237	1015.22	1134.48	0	1134.48	1516.63	1516.63
48	5.466	7512.24	39.1922	Tcag	250	34	415.596	869.514	918.468	0	918.468	1257.33	1257.33
49	5.466	5036.78	40.1757	Tcag	250	34	310.524	649.682	592.553	0	592.553	854.74	854.74
50	5.466	1698.53	41.1737	Tcag	250	34	178.08	372.58	181.732	0	181.732	337.484	337.484

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.09221

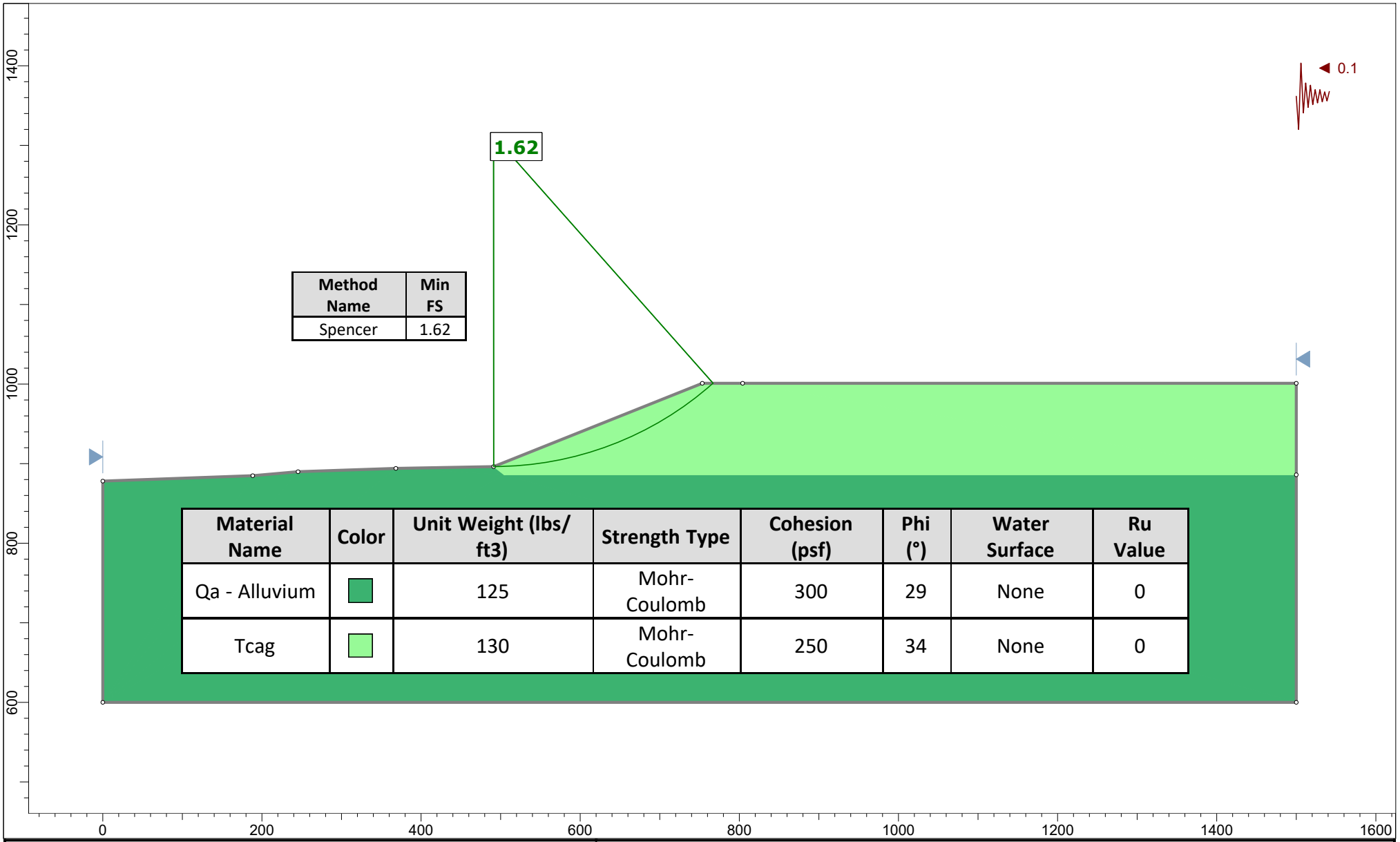
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.231	896.273	0	0	0
2	496.697	896.334	993.028	352.984	19.5684
3	502.163	896.467	2454.95	872.64	19.5683
4	507.629	896.672	4317.83	1534.82	19.5683
5	513.095	896.949	6517.75	2316.81	19.5683
6	518.561	897.3	8994.64	3197.25	19.5684
7	524.027	897.722	11692.1	4156.08	19.5683
8	529.493	898.218	14557.1	5174.48	19.5683
9	534.959	898.787	17540.1	6234.84	19.5684
10	540.425	899.43	20594.8	7320.67	19.5684
11	545.891	900.146	23677.9	8416.59	19.5684
12	551.357	900.937	26749.1	9508.3	19.5684
13	556.823	901.802	29771.1	10582.5	19.5684
14	562.289	902.743	32709.3	11626.9	19.5683
15	567.755	903.759	35531.8	12630.2	19.5684
16	573.221	904.852	38209.4	13582	19.5684
17	578.687	906.021	40715.5	14472.8	19.5684
18	584.153	907.269	43025.9	15294.1	19.5684
19	589.619	908.594	45119.1	16038.1	19.5683
20	595.085	909.998	46975.8	16698.1	19.5684
21	600.551	911.482	48579.3	17268.1	19.5684
22	606.017	913.048	49915.2	17742.9	19.5683
23	611.483	914.694	50971.4	18118.4	19.5684
24	616.949	916.424	51738.3	18391	19.5684
25	622.415	918.237	52208.6	18558.2	19.5684
26	627.881	920.136	52377.3	18618.1	19.5683
27	633.347	922.121	52241.8	18570	19.5684
28	638.813	924.193	51801.8	18413.6	19.5684
29	644.279	926.355	51059.7	18149.8	19.5684
30	649.745	928.607	50020.1	17780.3	19.5684
31	655.211	930.951	48690.2	17307.5	19.5684
32	660.677	933.389	47079.7	16735.1	19.5684
33	666.143	935.923	45201.1	16067.3	19.5684
34	671.609	938.554	43069.5	15309.6	19.5684
35	677.075	941.286	40702.7	14468.3	19.5684
36	682.541	944.119	38121.7	13550.8	19.5683
37	688.007	947.057	35350.4	12565.7	19.5683
38	693.473	950.101	32415.7	11522.5	19.5683
39	698.939	953.256	29348.1	10432.1	19.5683
40	704.405	956.522	26181.6	9306.58	19.5684
41	709.871	959.905	22953.9	8159.23	19.5683
42	715.337	963.407	19706.5	7004.89	19.5683
43	720.803	967.032	16485.2	5859.87	19.5684
44	726.269	970.783	13340.5	4742.05	19.5684
45	731.735	974.666	10327.6	3671.06	19.5683
46	737.201	978.684	7506.84	2668.4	19.5684
47	742.667	982.843	4944.41	1757.55	19.5684
48	748.133	987.147	2712.59	964.221	19.5683
49	753.599	991.604	890.483	316.533	19.5684
50	759.065	996.219	-147.213	-52.3286	19.5684
51	764.531	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.62

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
Tcag		130	Mohr-Coulomb	250	34	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High CUT Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Cut- H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number Run No. 56

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.61942 4
Interslice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.61942 5
Entity Information 6
    Group 1 6
        Shared Entities 6

Slide2 Analysis Information

SP_Cut- H105- 2.5 to 1

Project Summary

File Name:	SP_Cut- H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.158s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High CUT Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Tcag	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	250 psf
Phi	34 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.619420
Center:	491.069, 1312.355
Radius:	416.064
Left Slip Surface Endpoint:	491.275, 896.291
Right Slip Surface Endpoint:	767.053, 1001.000
Resisting Moment:	2.33852e+08 lb-ft
Driving Moment:	1.44405e+08 lb-ft
Resisting Horizontal Force:	520825 lb
Driving Horizontal Force:	321613 lb
Total Slice Area:	6056.67 ft2
Surface Horizontal Width:	275.779 ft
Surface Average Height:	21.962 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	13856
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.61942

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.51558	775.511	0.408129	Tcag	250	34	256.55	415.463	245.308	0	245.308	247.136	247.136
2	5.51558	2300.31	1.16777	Tcag	250	34	386.377	625.706	557.006	0	557.006	564.882	564.882
3	5.51558	3772.64	1.92761	Tcag	250	34	508.271	823.105	849.662	0	849.662	866.768	866.768
4	5.51558	5192.45	2.68779	Tcag	250	34	622.52	1008.12	1123.96	0	1123.96	1153.18	1153.18
5	5.51558	6559.66	3.44845	Tcag	250	34	729.388	1181.19	1380.54	0	1380.54	1424.49	1424.49
6	5.51558	7874.15	4.20972	Tcag	250	34	829.13	1342.71	1620.01	0	1620.01	1681.04	1681.04
7	5.51558	9135.77	4.97173	Tcag	250	34	921.978	1493.07	1842.93	0	1842.93	1923.13	1923.13
8	5.51558	10344.4	5.73462	Tcag	250	34	1008.16	1632.64	2049.86	0	2049.86	2151.1	2151.1
9	5.51558	11499.7	6.49854	Tcag	250	34	1087.89	1761.75	2241.26	0	2241.26	2365.18	2365.18
10	5.51558	12601.7	7.26362	Tcag	250	34	1161.35	1880.72	2417.65	0	2417.65	2565.67	2565.67
11	5.51558	13649.8	8.03	Tcag	250	34	1228.75	1989.87	2579.46	0	2579.46	2752.81	2752.81
12	5.51558	14644	8.79783	Tcag	250	34	1290.25	2089.46	2727.12	0	2727.12	2926.81	2926.81
13	5.51558	15583.9	9.56726	Tcag	250	34	1346.03	2179.79	2861.03	0	2861.03	3087.9	3087.9
14	5.51558	16469.1	10.3384	Tcag	250	34	1396.24	2261.1	2981.58	0	2981.58	3236.28	3236.28
15	5.51558	17299.2	11.1115	Tcag	250	34	1441.03	2333.64	3089.12	0	3089.12	3372.14	3372.14
16	5.51558	18073.8	11.8866	Tcag	250	34	1480.55	2397.63	3184	0	3184	3495.64	3495.64
17	5.51558	18792.4	12.664	Tcag	250	34	1514.93	2453.31	3266.54	0	3266.54	3606.95	3606.95
18	5.51558	19454.6	13.4437	Tcag	250	34	1544.29	2500.86	3337.03	0	3337.03	3706.18	3706.18
19	5.51558	20059.8	14.226	Tcag	250	34	1568.77	2540.5	3395.79	0	3395.79	3793.51	3793.51
20	5.51558	20607.5	15.0109	Tcag	250	34	1588.47	2572.4	3443.1	0	3443.1	3869.05	3869.05
21	5.51558	21096.9	15.7988	Tcag	250	34	1603.51	2596.75	3479.2	0	3479.2	3932.92	3932.92
22	5.51558	21527.5	16.5898	Tcag	250	34	1613.98	2613.71	3504.34	0	3504.34	3985.18	3985.18
23	5.51558	21898.5	17.384	Tcag	250	34	1619.99	2623.45	3518.78	0	3518.78	4025.96	4025.96
24	5.51558	22209.2	18.1817	Tcag	250	34	1621.64	2626.11	3522.74	0	3522.74	4055.33	4055.33
25	5.51558	22458.7	18.983	Tcag	250	34	1619.01	2621.85	3516.41	0	3516.41	4073.34	4073.34
26	5.51558	22646.2	19.7883	Tcag	250	34	1612.18	2610.79	3500.02	0	3500.02	4080.07	4080.07
27	5.51558	22770.8	20.5976	Tcag	250	34	1601.24	2593.08	3473.77	0	3473.77	4075.56	4075.56
28	5.51558	22831.5	21.4112	Tcag	250	34	1586.27	2568.84	3437.82	0	3437.82	4059.83	4059.83
29	5.51558	22827.1	22.2294	Tcag	250	34	1567.35	2538.19	3392.37	0	3392.37	4032.93	4032.93
30	5.51558	22756.7	23.0524	Tcag	250	34	1544.53	2501.24	3337.59	0	3337.59	3994.87	3994.87
31	5.51558	22618.9	23.8805	Tcag	250	34	1517.89	2458.1	3273.65	0	3273.65	3945.66	3945.66
32	5.51558	22412.6	24.7139	Tcag	250	34	1487.5	2408.88	3200.67	0	3200.67	3885.28	3885.28
33	5.51558	22136.3	25.5529	Tcag	250	34	1453.41	2353.68	3118.82	0	3118.82	3813.71	3813.71
34	5.51558	21788.5	26.3978	Tcag	250	34	1415.69	2292.59	3028.25	0	3028.25	3730.94	3730.94
35	5.51558	21367.9	27.249	Tcag	250	34	1374.38	2225.7	2929.11	0	2929.11	3636.93	3636.93
36	5.51558	20872.5	28.1067	Tcag	250	34	1329.56	2153.11	2821.49	0	2821.49	3531.6	3531.6
37	5.51558	20300.8	28.9714	Tcag	250	34	1281.26	2074.9	2705.52	0	2705.52	3414.9	3414.9
38	5.51558	19650.7	29.8433	Tcag	250	34	1229.55	1991.15	2581.36	0	2581.36	3286.76	3286.76
39	5.51558	18920.3	30.7229	Tcag	250	34	1174.46	1901.94	2449.09	0	2449.09	3147.07	3147.07
40	5.51558	18107.3	31.6106	Tcag	250	34	1116.04	1807.34	2308.84	0	2308.84	2995.72	2995.72
41	5.51558	17209.4	32.5069	Tcag	250	34	1054.35	1707.43	2160.72	0	2160.72	2832.6	2832.6
42	5.51558	16224.1	33.4122	Tcag	250	34	989.416	1602.28	2004.84	0	2004.84	2657.54	2657.54
43	5.51558	15148.5	34.3271	Tcag	250	34	921.293	1491.96	1841.29	0	1841.29	2470.39	2470.39
44	5.51558	13979.9	35.252	Tcag	250	34	850.02	1376.54	1670.16	0	1670.16	2270.94	2270.94
45	5.51558	12714.9	36.1876	Tcag	250	34	775.642	1256.09	1491.59	0	1491.59	2059.02	2059.02
46	5.51558	11350.1	37.1345	Tcag	250	34	698.193	1130.67	1305.64	0	1305.64	1834.34	1834.34
47	5.51558	9881.82	38.0935	Tcag	250	34	617.721	1000.35	1112.44	0	1112.44	1596.68	1596.68
48	5.51558	8140.78	39.0651	Tcag	250	34	526.401	852.464	893.19	0	893.19	1320.45	1320.45
49	5.51558	5106.15	40.0504	Tcag	250	34	376.999	610.519	534.491	0	534.491	851.396	851.396
50	5.51558	1721.97	41.0501	Tcag	250	34	219.404	355.307	156.123	0	156.123	347.185	347.185

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.61942

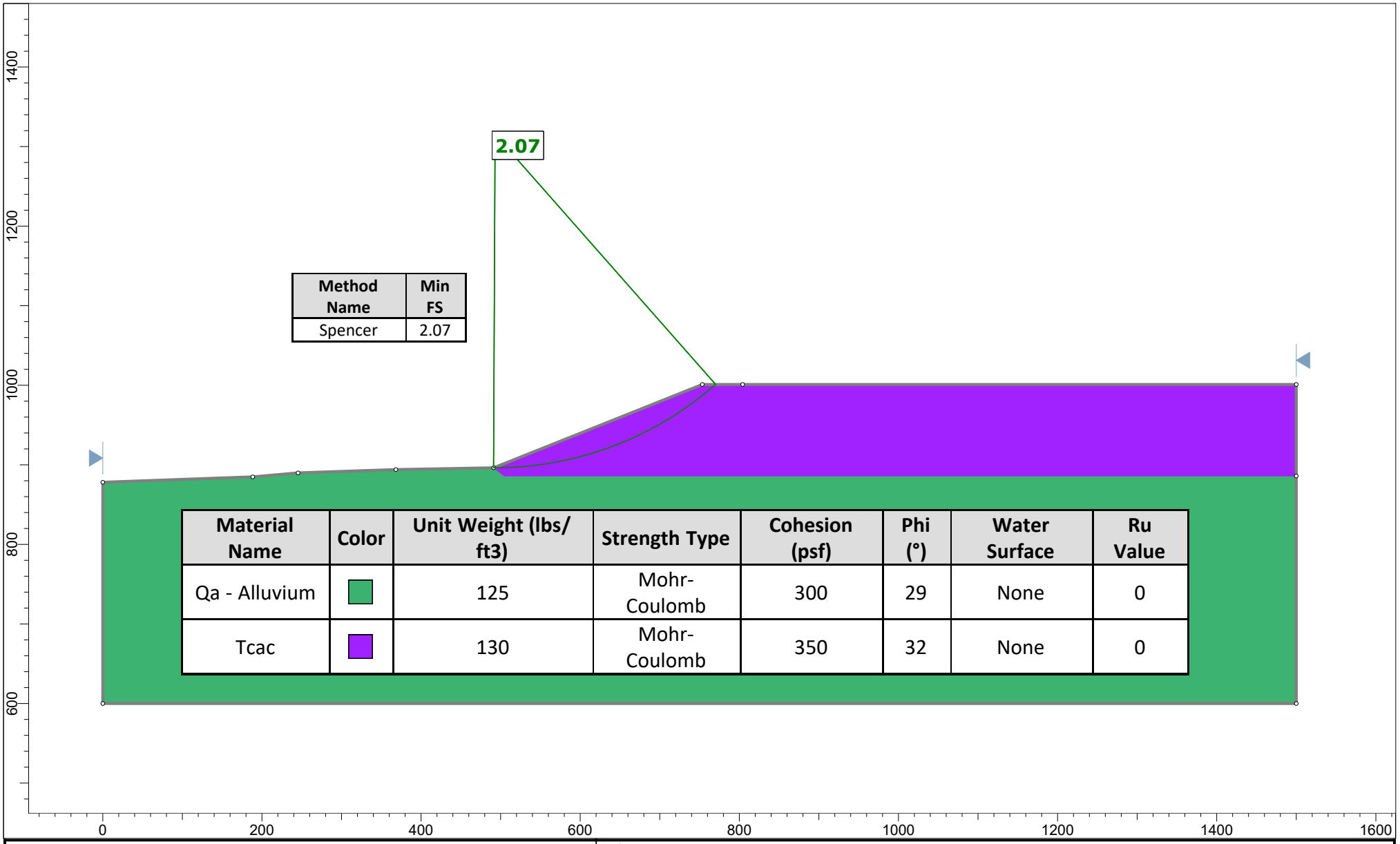
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.275	896.291	0	0	0
2	496.79	896.33	1329.05	602.226	24.3765
3	502.306	896.443	3169.33	1436.1	24.3764
4	507.821	896.628	5440.17	2465.07	24.3764
5	513.337	896.887	8066.41	3655.08	24.3764
6	518.852	897.219	10978.1	4974.42	24.3763
7	524.368	897.625	14110	6393.59	24.3765
8	529.884	898.105	17401.8	7885.18	24.3764
9	535.399	898.659	20797.4	9423.79	24.3764
10	540.915	899.287	24244.8	10985.9	24.3764
11	546.43	899.99	27696.1	12549.8	24.3765
12	551.946	900.769	31107.1	14095.4	24.3765
13	557.461	901.622	34437.4	15604.4	24.3764
14	562.977	902.552	37649.8	17060	24.3764
15	568.493	903.558	40710.6	18446.9	24.3764
16	574.008	904.641	43589.3	19751.4	24.3765
17	579.524	905.802	46258.6	20960.9	24.3764
18	585.039	907.042	48693.9	22064.3	24.3763
19	590.555	908.36	50873.7	23052.1	24.3764
20	596.07	909.758	52779.5	23915.6	24.3764
21	601.586	911.237	54395.2	24647.8	24.3764
22	607.102	912.798	55707.7	25242.5	24.3764
23	612.617	914.441	56706.3	25695	24.3764
24	618.133	916.168	57383.2	26001.7	24.3764
25	623.648	917.979	57732.9	26160.1	24.3764
26	629.164	919.877	57752.7	26169.1	24.3764
27	634.68	921.861	57442.2	26028.4	24.3764
28	640.195	923.934	56803.7	25739.1	24.3764
29	645.711	926.097	55842.1	25303.4	24.3764
30	651.226	928.351	54564.7	24724.5	24.3764
31	656.742	930.698	52981.3	24007.1	24.3764
32	662.257	933.14	51104.7	23156.8	24.3765
33	667.773	935.679	48950.1	22180.4	24.3764
34	673.289	938.316	46535.2	21086.2	24.3764
35	678.804	941.053	43881	19883.5	24.3764
36	684.32	943.894	41010.9	18583	24.3764
37	689.835	946.84	37951.5	17196.7	24.3764
38	695.351	949.894	34732.4	15738.1	24.3764
39	700.866	953.058	31386.6	14222	24.3764
40	706.382	956.336	27950.1	12664.8	24.3763
41	711.898	959.73	24462.6	11084.6	24.3764
42	717.413	963.245	20967.6	9500.9	24.3764
43	722.929	966.884	17512.4	7935.28	24.3764
44	728.444	970.65	14148.6	6411.06	24.3764
45	733.96	974.548	10932.2	4953.63	24.3764
46	739.475	978.583	7924.01	3590.56	24.3764
47	744.991	982.76	5190.08	2351.75	24.3764
48	750.507	987.084	2802.01	1269.66	24.3765
49	756.022	991.561	895.198	405.635	24.3764
50	761.538	996.197	-12.3716	-5.60589	24.3765
51	767.053	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	2.07

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
Tcac		130	Mohr-Coulomb	350	32	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High CUT Slope @ 2.5:1 (H:V) , Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Cut- H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number: Run No. 57

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 2.06723 4
Interslice Data 5
    Global Minimum Query (spencer) - Safety Factor: 2.06723 5
Entity Information 6
    Group 1 6
        Shared Entities 6

Slide2 Analysis Information

SP_Cut- H105- 2.5 to 1

Project Summary

File Name:	SP_Cut- H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.188s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High CUT Slope @ 2.5:1 (H:V) , Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Tcac	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	350 psf
Phi	32 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	2.067230
Center:	493.077, 1315.406
Radius:	419.137
Left Slip Surface Endpoint:	491.179, 896.272
Right Slip Surface Endpoint:	770.251, 1001.000
Resisting Moment:	2.50317e+08 lb-ft
Driving Moment:	1.21088e+08 lb-ft
Resisting Horizontal Force:	552185 lb
Driving Horizontal Force:	267114 lb
Total Slice Area:	6352.2 ft2
Surface Horizontal Width:	279.072 ft
Surface Average Height:	22.7619 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12195
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.06723

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.58143	789.939	0.122057	Tcac	350	32	236.707	489.327	222.969	0	222.969	223.473	223.473
2	5.58143	2371.4	0.885087	Tcac	350	32	329.959	682.102	531.474	0	531.474	536.571	536.571
3	5.58143	3898.98	1.64827	Tcac	350	32	418.264	864.647	823.607	0	823.607	835.643	835.643
4	5.58143	5372.56	2.41175	Tcac	350	32	501.744	1037.22	1099.78	0	1099.78	1120.91	1120.91
5	5.58143	6792.06	3.17566	Tcac	350	32	580.521	1200.07	1360.4	0	1360.4	1392.61	1392.61
6	5.58143	8157.37	3.94014	Tcac	350	32	654.712	1353.44	1605.84	0	1605.84	1650.93	1650.93
7	5.58143	9468.36	4.70531	Tcac	350	32	724.419	1497.54	1836.45	0	1836.45	1896.08	1896.08
8	5.58143	10724.9	5.47133	Tcac	350	32	789.752	1632.6	2052.59	0	2052.59	2128.23	2128.23
9	5.58143	11926.7	6.23833	Tcac	350	32	850.8	1758.8	2254.55	0	2254.55	2347.56	2347.56
10	5.58143	13073.6	7.00646	Tcac	350	32	907.659	1876.34	2442.66	0	2442.66	2554.21	2554.21
11	5.58143	14165.4	7.77585	Tcac	350	32	960.416	1985.4	2617.18	0	2617.18	2748.33	2748.33
12	5.58143	15201.7	8.54666	Tcac	350	32	1009.15	2086.15	2778.42	0	2778.42	2930.08	2930.08
13	5.58143	16182.2	9.31903	Tcac	350	32	1053.94	2178.74	2926.58	0	2926.58	3099.53	3099.53
14	5.58143	17106.6	10.0931	Tcac	350	32	1094.86	2263.32	3061.97	0	3061.97	3256.85	3256.85
15	5.58143	17974.5	10.8691	Tcac	350	32	1131.97	2340.05	3184.74	0	3184.74	3402.09	3402.09
16	5.58143	18785.5	11.647	Tcac	350	32	1165.35	2409.05	3295.17	0	3295.17	3535.38	3535.38
17	5.58143	19539	12.4272	Tcac	350	32	1195.05	2470.45	3393.43	0	3393.43	3656.77	3656.77
18	5.58143	20234.6	13.2097	Tcac	350	32	1221.14	2524.37	3479.72	0	3479.72	3766.36	3766.36
19	5.58143	20871.8	13.9947	Tcac	350	32	1243.66	2570.94	3554.24	0	3554.24	3864.2	3864.2
20	5.58143	21449.9	14.7824	Tcac	350	32	1262.68	2610.24	3617.14	0	3617.14	3950.34	3950.34
21	5.58143	21968.4	15.573	Tcac	350	32	1278.23	2642.4	3668.6	0	3668.6	4024.84	4024.84
22	5.58143	22426.5	16.3666	Tcac	350	32	1290.37	2667.5	3708.77	0	3708.77	4087.73	4087.73
23	5.58143	22823.5	17.1635	Tcac	350	32	1299.14	2685.63	3737.79	0	3737.79	4139.04	4139.04
24	5.58143	23158.7	17.9638	Tcac	350	32	1304.59	2696.88	3755.8	0	3755.8	4178.77	4178.77
25	5.58143	23431.3	18.7678	Tcac	350	32	1306.74	2701.33	3762.92	0	3762.92	4206.95	4206.95
26	5.58143	23640.3	19.5756	Tcac	350	32	1305.64	2699.06	3759.27	0	3759.27	4223.57	4223.57
27	5.58143	23784.8	20.3875	Tcac	350	32	1301.33	2690.14	3745.01	0	3745.01	4228.65	4228.65
28	5.58143	23863.8	21.2037	Tcac	350	32	1293.82	2674.63	3720.18	0	3720.18	4222.11	4222.11
29	5.58143	23876.3	22.0244	Tcac	350	32	1283.17	2652.6	3684.92	0	3684.92	4203.99	4203.99
30	5.58143	23821	22.8499	Tcac	350	32	1269.38	2624.1	3639.32	0	3639.32	4174.22	4174.22
31	5.58143	23696.8	23.6804	Tcac	350	32	1252.5	2589.2	3583.47	0	3583.47	4132.77	4132.77
32	5.58143	23502.4	24.5163	Tcac	350	32	1232.53	2547.93	3517.43	0	3517.43	4079.56	4079.56
33	5.58143	23236.4	25.3578	Tcac	350	32	1209.52	2500.36	3441.3	0	3441.3	4014.53	4014.53
34	5.58143	22897.2	26.2051	Tcac	350	32	1183.48	2446.52	3355.14	0	3355.14	3937.61	3937.61
35	5.58143	22483.4	27.0587	Tcac	350	32	1154.42	2386.45	3259.01	0	3259.01	3848.7	3848.7
36	5.58143	21993.2	27.9188	Tcac	350	32	1122.37	2320.2	3152.97	0	3152.97	3747.71	3747.71
37	5.58143	21424.8	28.7858	Tcac	350	32	1087.34	2247.79	3037.1	0	3037.1	3634.53	3634.53
38	5.58143	20776.2	29.6601	Tcac	350	32	1049.36	2169.26	2911.43	0	2911.43	3509	3509
39	5.58143	20045.5	30.5421	Tcac	350	32	1008.42	2084.63	2775.99	0	2775.99	3370.99	3370.99
40	5.58143	19230.3	31.4322	Tcac	350	32	964.547	1993.94	2630.86	0	2630.86	3220.37	3220.37
41	5.58143	18328.2	32.3307	Tcac	350	32	917.755	1897.21	2476.05	0	2476.05	3056.92	3056.92
42	5.58143	17336.7	33.2383	Tcac	350	32	868.05	1794.46	2311.61	0	2311.61	2880.48	2880.48
43	5.58143	16253	34.1555	Tcac	350	32	815.439	1685.7	2137.57	0	2137.57	2690.82	2690.82
44	5.58143	15074.1	35.0827	Tcac	350	32	759.94	1570.97	1953.96	0	1953.96	2487.71	2487.71
45	5.58143	13796.8	36.0205	Tcac	350	32	701.547	1450.26	1760.79	0	1760.79	2270.88	2270.88
46	5.58143	12417.4	36.9697	Tcac	350	32	640.282	1323.61	1558.1	0	1558.1	2040.06	2040.06
47	5.58143	10932.2	37.9308	Tcac	350	32	576.143	1191.02	1345.91	0	1345.91	1794.93	1794.93
48	5.58143	8526.73	38.9047	Tcac	350	32	478.18	988.509	1021.83	0	1021.83	1407.74	1407.74
49	5.58143	5199.94	39.8922	Tcac	350	32	347.715	718.807	590.213	0	590.213	880.868	880.868
50	5.58143	1753.66	40.8941	Tcac	350	32	222.843	460.667	177.104	0	177.104	370.096	370.096

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.06723

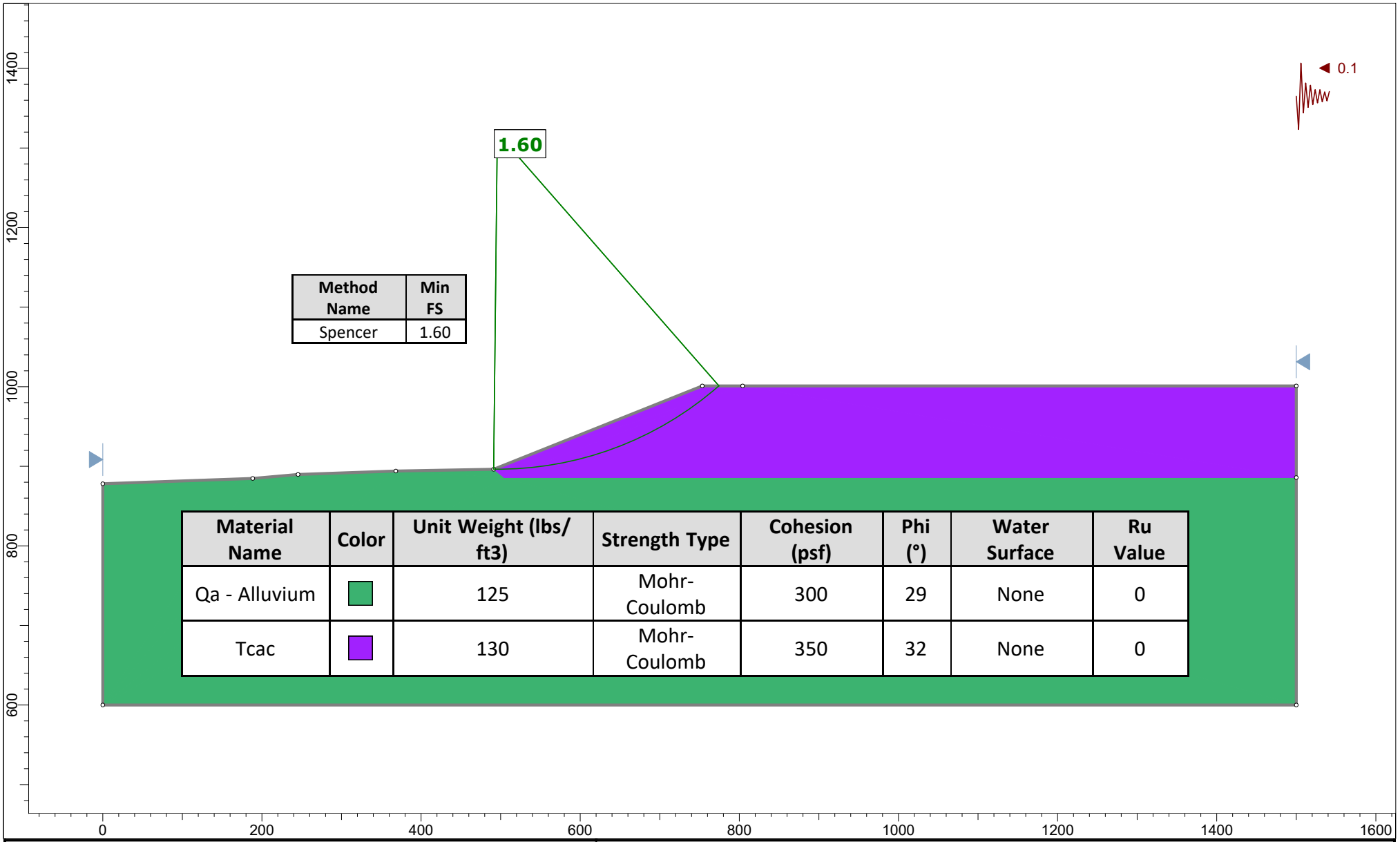
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.179	896.272	0	0	0
2	496.76	896.284	1317.77	461.459	19.2993
3	502.342	896.371	3112.56	1089.96	19.2993
4	507.923	896.531	5313.49	1860.68	19.2993
5	513.505	896.766	7853.85	2750.27	19.2993
6	519.086	897.076	10670.9	3736.74	19.2993
7	524.667	897.46	13705.8	4799.49	19.2992
8	530.249	897.92	16903.1	5919.15	19.2993
9	535.83	898.454	20211.3	7077.6	19.2993
10	541.412	899.064	23581.8	8257.89	19.2993
11	546.993	899.75	26969.5	9444.19	19.2993
12	552.575	900.513	30332.2	10621.8	19.2994
13	558.156	901.351	33631.1	11777	19.2993
14	563.738	902.267	36829.8	12897.1	19.2993
15	569.319	903.261	39895.2	13970.5	19.2992
16	574.9	904.333	42796.7	14986.6	19.2993
17	580.482	905.483	45506.3	15935.4	19.2992
18	586.063	906.713	47999	16808.3	19.2992
19	591.645	908.023	50252.1	17597.3	19.2993
20	597.226	909.414	52245.5	18295.4	19.2993
21	602.808	910.887	53961.6	18896.3	19.2993
22	608.389	912.442	55385.4	19394.9	19.2993
23	613.97	914.082	56504.2	19786.7	19.2993
24	619.552	915.805	57307.8	20068.1	19.2993
25	625.133	917.615	57788.6	20236.5	19.2993
26	630.715	919.512	57941.4	20290	19.2993
27	636.296	921.496	57763.3	20227.6	19.2993
28	641.878	923.571	57254.2	20049.3	19.2993
29	647.459	925.736	56416.2	19755.9	19.2993
30	653.04	927.994	55254.2	19349	19.2993
31	658.622	930.346	53775.8	18831.2	19.2992
32	664.203	932.794	51991	18206.2	19.2992
33	669.785	935.339	49912.8	17478.5	19.2993
34	675.366	937.984	47556.9	16653.5	19.2993
35	680.948	940.731	44942.1	15737.8	19.2992
36	686.529	943.583	42090.1	14739.1	19.2992
37	692.11	946.54	39025.9	13666.1	19.2992
38	697.692	949.607	35777.8	12528.7	19.2993
39	703.273	952.785	32377.6	11338	19.2993
40	708.855	956.078	28860.9	10106.5	19.2992
41	714.436	959.49	25267	8848.02	19.2993
42	720.018	963.022	21639.6	7577.76	19.2992
43	725.599	966.68	18026.6	6312.56	19.2992
44	731.181	970.467	14480.8	5070.9	19.2993
45	736.762	974.387	11060.1	3873.05	19.2993
46	742.343	978.445	7827.97	2741.2	19.2992
47	747.925	982.646	4853.64	1699.65	19.2993
48	753.506	986.996	2213.02	774.956	19.2992
49	759.088	991.501	277.725	97.2541	19.2993
50	764.669	996.166	-536.259	-187.788	19.2993
51	770.251	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Method Name	Min FS
Spencer	1.60

Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
Tcac		130	Mohr-Coulomb	350	32	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High CUT Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Cut- H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number Run No. 58

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.5996 4
Interslice Data 5
    Global Minimum Query (spencer) - Safety Factor: 1.5996 5
Entity Information 6
    Group 1 6
        Shared Entities 6

Slide2 Analysis Information

SP_Cut- H105- 2.5 to 1

Project Summary

File Name:	SP_Cut- H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.186s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High CUT Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

Tcac	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	130 lbs/ft3
Cohesion	350 psf
Phi	32 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.599600
Center:	495.855, 1319.203
Radius:	422.937
Left Slip Surface Endpoint:	491.275, 896.291
Right Slip Surface Endpoint:	774.463, 1001.000
Resisting Moment:	2.58556e+08 lb-ft
Driving Moment:	1.61638e+08 lb-ft
Resisting Horizontal Force:	567170 lb
Driving Horizontal Force:	354569 lb
Total Slice Area:	6740.99 ft2
Surface Horizontal Width:	283.189 ft
Surface Average Height:	23.8039 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	13347
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.5996

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.66378	841.219	-0.236895	Tcac	350	32	331.624	530.465	288.805	0	288.805	287.434	287.434
2	5.66378	2495.73	0.530409	Tcac	350	32	459.313	734.717	615.676	0	615.676	619.928	619.928
3	5.66378	4094.39	1.29781	Tcac	350	32	579.367	926.756	923.002	0	923.002	936.128	936.128
4	5.66378	5637.15	2.06544	Tcac	350	32	692.057	1107.01	1211.48	0	1211.48	1236.43	1236.43
5	5.66378	7123.95	2.83344	Tcac	350	32	797.634	1275.9	1481.74	0	1481.74	1521.22	1521.22
6	5.66378	8554.69	3.60196	Tcac	350	32	896.337	1433.78	1734.41	0	1734.41	1790.84	1790.84
7	5.66378	9929.25	4.37112	Tcac	350	32	988.391	1581.03	1970.05	0	1970.05	2045.61	2045.61
8	5.66378	11247.5	5.14107	Tcac	350	32	1074.01	1717.98	2189.21	0	2189.21	2285.84	2285.84
9	5.66378	12509.2	5.91196	Tcac	350	32	1153.38	1844.94	2392.4	0	2392.4	2511.84	2511.84
10	5.66378	13714.1	6.68392	Tcac	350	32	1226.7	1962.23	2580.1	0	2580.1	2723.85	2723.85
11	5.66378	14862	7.4571	Tcac	350	32	1294.14	2070.11	2752.76	0	2752.76	2922.15	2922.15
12	5.66378	15952.7	8.23165	Tcac	350	32	1355.88	2168.87	2910.79	0	2910.79	3106.94	3106.94
13	5.66378	16985.7	9.00772	Tcac	350	32	1412.07	2258.74	3054.62	0	3054.62	3278.46	3278.46
14	5.66378	17960.7	9.78545	Tcac	350	32	1462.85	2339.98	3184.63	0	3184.63	3436.92	3436.92
15	5.66378	18877.4	10.565	Tcac	350	32	1508.38	2412.8	3301.17	0	3301.17	3582.5	3582.5
16	5.66378	19735.3	11.3466	Tcac	350	32	1548.78	2477.43	3404.6	0	3404.6	3715.39	3715.39
17	5.66378	20533.9	12.1303	Tcac	350	32	1584.18	2534.06	3495.23	0	3495.23	3835.73	3835.73
18	5.66378	21272.8	12.9163	Tcac	350	32	1614.71	2582.89	3573.36	0	3573.36	3943.66	3943.66
19	5.66378	21951.3	13.7047	Tcac	350	32	1640.47	2624.1	3639.31	0	3639.31	4039.36	4039.36
20	5.66378	22569	14.4959	Tcac	350	32	1661.58	2657.86	3693.35	0	3693.35	4122.93	4122.93
21	5.66378	23125.1	15.2899	Tcac	350	32	1678.13	2684.34	3735.72	0	3735.72	4194.49	4194.49
22	5.66378	23618.9	16.0869	Tcac	350	32	1690.23	2703.69	3766.69	0	3766.69	4254.13	4254.13
23	5.66378	24049.8	16.8871	Tcac	350	32	1697.97	2716.07	3786.5	0	3786.5	4301.96	4301.96
24	5.66378	24417	17.6907	Tcac	350	32	1701.43	2721.6	3795.37	0	3795.37	4338.06	4338.06
25	5.66378	24719.5	18.4979	Tcac	350	32	1700.7	2720.44	3793.49	0	3793.49	4362.47	4362.47
26	5.66378	24956.6	19.309	Tcac	350	32	1695.86	2712.7	3781.11	0	3781.11	4375.29	4375.29
27	5.66378	25127.2	20.1241	Tcac	350	32	1686.98	2698.5	3758.4	0	3758.4	4376.55	4376.55
28	5.66378	25230.3	20.9434	Tcac	350	32	1674.15	2677.97	3725.53	0	3725.53	4366.28	4366.28
29	5.66378	25264.9	21.7673	Tcac	350	32	1657.42	2651.21	3682.7	0	3682.7	4344.52	4344.52
30	5.66378	25229.7	22.5959	Tcac	350	32	1636.86	2618.32	3630.08	0	3630.08	4311.3	4311.3
31	5.66378	25123.6	23.4296	Tcac	350	32	1612.53	2579.4	3567.79	0	3567.79	4266.59	4266.59
32	5.66378	24945.1	24.2686	Tcac	350	32	1584.5	2534.56	3496.02	0	3496.02	4210.4	4210.4
33	5.66378	24692.9	25.1131	Tcac	350	32	1552.81	2483.87	3414.92	0	3414.92	4142.74	4142.74
34	5.66378	24365.5	25.9635	Tcac	350	32	1517.52	2427.43	3324.59	0	3324.59	4063.54	4063.54
35	5.66378	23961.2	26.8201	Tcac	350	32	1478.69	2365.32	3225.19	0	3225.19	3972.78	3972.78
36	5.66378	23478.3	27.6832	Tcac	350	32	1436.37	2297.62	3116.85	0	3116.85	3870.42	3870.42
37	5.66378	22915	28.5532	Tcac	350	32	1390.6	2224.4	2999.66	0	2999.66	3756.37	3756.37
38	5.66378	22269.2	29.4304	Tcac	350	32	1341.42	2145.73	2873.77	0	2873.77	3630.55	3630.55
39	5.66378	21538.9	30.3153	Tcac	350	32	1288.87	2061.68	2739.25	0	2739.25	3492.87	3492.87
40	5.66378	20721.7	31.2083	Tcac	350	32	1233.01	1972.32	2596.25	0	2596.25	3343.23	3343.23
41	5.66378	19815.2	32.1098	Tcac	350	32	1173.86	1877.71	2444.85	0	2444.85	3181.49	3181.49
42	5.66378	18816.8	33.0203	Tcac	350	32	1111.48	1777.92	2285.15	0	2285.15	3007.51	3007.51
43	5.66378	17723.6	33.9402	Tcac	350	32	1045.89	1673	2117.24	0	2117.24	2821.11	2821.11
44	5.66378	16532.6	34.8703	Tcac	350	32	977.119	1563	1941.21	0	1941.21	2622.11	2622.11
45	5.66378	15240.4	35.811	Tcac	350	32	905.226	1448	1757.16	0	1757.16	2410.29	2410.29
46	5.66378	13843.4	36.7629	Tcac	350	32	830.225	1328.03	1565.17	0	1565.17	2185.42	2185.42
47	5.66378	11928.3	37.7269	Tcac	350	32	733.804	1173.79	1318.34	0	1318.34	1886.04	1886.04
48	5.66378	8718.78	38.7035	Tcac	350	32	582.733	932.139	931.617	0	931.617	1398.53	1398.53
49	5.66378	5317.4	39.6937	Tcac	350	32	427.577	683.952	534.436	0	534.436	889.338	889.338
50	5.66378	1793.36	40.6983	Tcac	350	32	277.25	443.49	149.615	0	149.615	388.074	388.074

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.5996

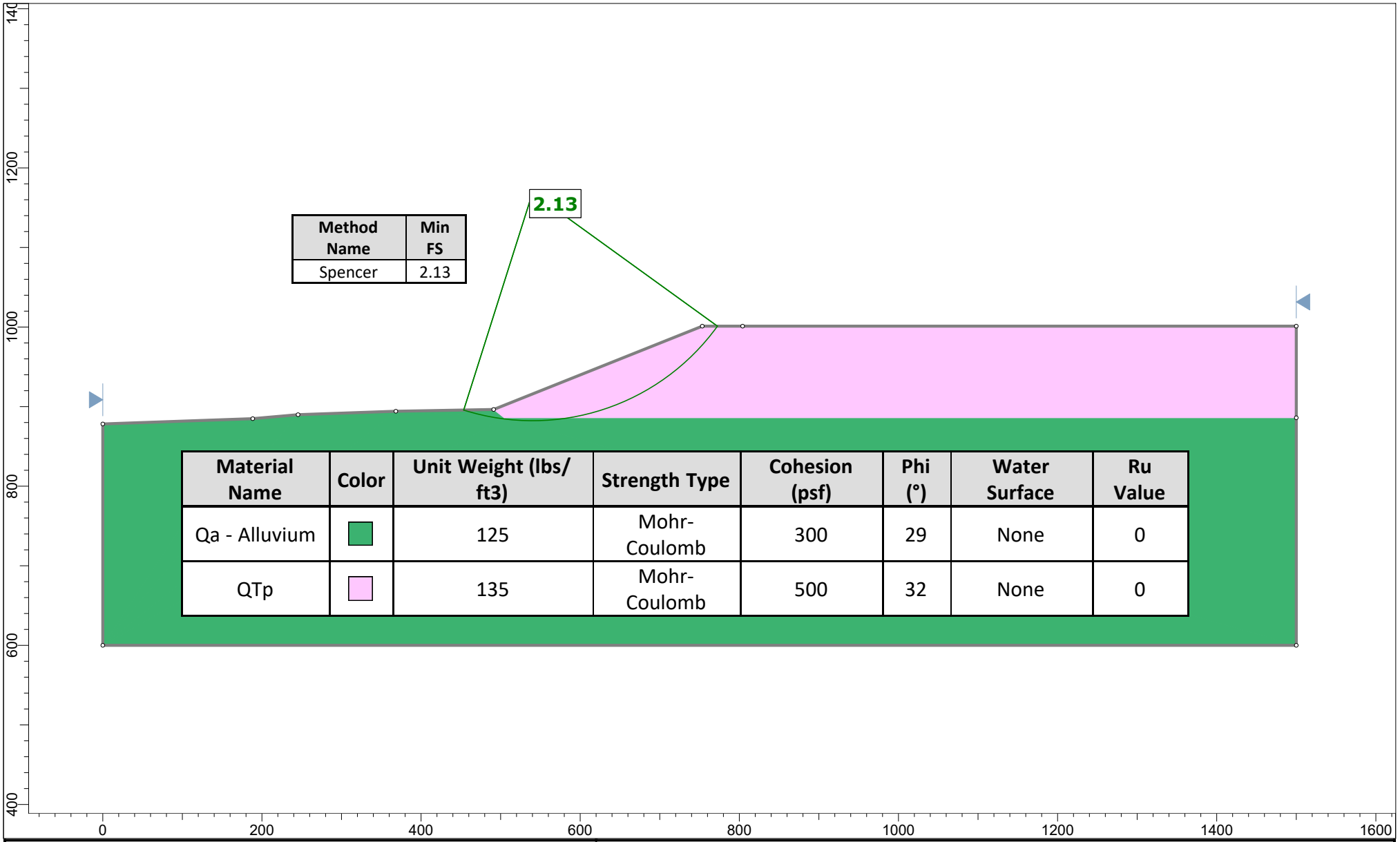
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	491.275	896.291	0	0	0
2	496.938	896.267	1802.35	804.749	24.0608
3	502.602	896.32	4123.96	1841.35	24.0608
4	508.266	896.448	6880.06	3071.95	24.0608
5	513.93	896.652	9991.6	4461.25	24.0608
6	519.593	896.933	13385	5976.4	24.0608
7	525.257	897.289	16991.8	7586.82	24.0607
8	530.921	897.722	20748.3	9264.13	24.0608
9	536.585	898.232	24595.7	10982	24.0608
10	542.249	898.818	28479.2	12716	24.0608
11	547.912	899.482	32348.5	14443.6	24.0608
12	553.576	900.223	36157	16144.1	24.0608
13	559.24	901.043	39862.1	17798.5	24.0608
14	564.904	901.941	43424.9	19389.2	24.0607
15	570.567	902.917	46809.7	20900.5	24.0607
16	576.231	903.974	49984.5	22318.1	24.0608
17	581.895	905.11	52920.3	23628.9	24.0607
18	587.559	906.328	55591.5	24821.6	24.0608
19	593.223	907.626	57975.4	25886	24.0607
20	598.886	909.008	60052.2	26813.3	24.0608
21	604.55	910.472	61805.2	27596	24.0607
22	610.214	912.02	63220.4	28227.9	24.0608
23	615.878	913.654	64286.7	28704	24.0608
24	621.541	915.373	64995.6	29020.6	24.0608
25	627.205	917.18	65341.5	29175	24.0608
26	632.869	919.074	65321.4	29166	24.0608
27	638.533	921.059	64934.9	28993.4	24.0607
28	644.196	923.134	64184.4	28658.3	24.0607
29	649.86	925.302	63074.9	28162.9	24.0607
30	655.524	927.563	61614.1	27510.7	24.0608
31	661.188	929.921	59812.6	26706.4	24.0608
32	666.852	932.375	57683.6	25755.7	24.0607
33	672.515	934.929	55243	24666	24.0608
34	678.179	937.583	52509.8	23445.7	24.0608
35	683.843	940.341	49505.9	22104.4	24.0608
36	689.507	943.205	46256.1	20653.3	24.0607
37	695.17	946.176	42788.4	19105	24.0607
38	700.834	949.258	39134.1	17473.4	24.0608
39	706.498	952.453	35327.9	15773.9	24.0608
40	712.162	955.765	31408.1	14023.7	24.0607
41	717.826	959.196	27416.5	12241.5	24.0608
42	723.489	962.751	23399.1	10447.7	24.0608
43	729.153	966.432	19406	8664.77	24.0607
44	734.817	970.243	15491.7	6917.03	24.0607
45	740.481	974.19	11715.5	5230.95	24.0607
46	746.144	978.276	8141.77	3635.3	24.0608
47	751.808	982.508	4840.54	2161.3	24.0608
48	757.472	986.889	2030.46	906.6	24.0608
49	763.136	991.428	233.838	104.409	24.0608
50	768.8	996.129	-386.75	-172.684	24.0608
51	774.463	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Water Surface	Ru Value
Qa - Alluvium		125	Mohr-Coulomb	300	29	None	0
QTp		135	Mohr-Coulomb	500	32	None	0

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High CUT Slope @ 2.5:1 (H:V) , Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Cut- H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number: Run No. 59

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 2.13276 4
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 2.13276 6
Entity Information 6
    Group 1 6
        Shared Entities 6

Slide2 Analysis Information

SP_Cut- H105- 2.5 to 1

Project Summary

File Name:	SP_Cut- H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.114s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High CUT Slope @ 2.5:1 (H:V) , Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

QTp	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	500 psf
Phi	32 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	2.132760
Center:	540.115, 1168.958
Radius:	286.741
Left Slip Surface Endpoint:	453.567, 895.591
Right Slip Surface Endpoint:	772.516, 1001.000
Resisting Moment:	3.06003e+08 lb-ft
Driving Moment:	1.43477e+08 lb-ft
Resisting Horizontal Force:	970192 lb
Driving Horizontal Force:	454899 lb
Total Slice Area:	11533.8 ft2
Surface Horizontal Width:	318.95 ft
Surface Average Height:	36.162 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	12386
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 2.13276

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	6.31993	804.049	-16.9079	Qa - Alluvium	300	29	215.314	459.213	287.229	0	287.229	221.779	221.779

2	6.31993	2349.96	-15.5924	Qa - Alluvium	300	29	296.547	632.463	599.78	0	599.78	517.025	517.025
3	6.31993	3772.67	-14.2853	Qa - Alluvium	300	29	368.409	785.728	876.276	0	876.276	782.471	782.471
4	6.31993	5074.42	-12.9857	Qa - Alluvium	300	29	431.546	920.384	1119.2	0	1119.2	1019.69	1019.69
5	6.31993	6257.18	-11.6929	Qa - Alluvium	300	29	486.529	1037.65	1330.76	0	1330.76	1230.06	1230.06
6	6.31993	7324.65	-10.4061	Qa - Alluvium	300	29	533.964	1138.82	1513.27	0	1513.27	1415.21	1415.21
7	6.31993	9556.64	-9.12456	Qa - Alluvium	300	29	637.99	1360.68	1913.52	0	1913.52	1811.05	1811.05
8	6.31993	12768.1	-7.84764	Qa - Alluvium	300	29	786.924	1678.32	2486.55	0	2486.55	2378.09	2378.09
9	6.31993	15722	-6.57464	Qa - Alluvium	300	29	918.978	1959.96	2994.64	0	2994.64	2888.72	2888.72
10	6.31993	18394.8	-5.30488	Qa - Alluvium	300	29	1033.81	2204.87	3436.47	0	3436.47	3340.48	3340.48
11	6.31993	20956	-4.03774	Qa - Alluvium	300	29	1140.11	2431.59	3845.5	0	3845.5	3765.02	3765.02
12	6.31993	23406.2	-2.77257	Qa - Alluvium	300	29	1238.29	2640.98	4223.24	0	4223.24	4163.28	4163.28
13	6.31993	25746	-1.50875	Qa - Alluvium	300	29	1328.69	2833.78	4571.06	0	4571.06	4536.06	4536.06
14	6.31993	27975.5	-0.245668	Qa - Alluvium	300	29	1411.63	3010.66	4890.17	0	4890.17	4884.11	4884.11
15	6.31993	30095	1.0173	Qa - Alluvium	300	29	1487.38	3172.23	5181.63	0	5181.63	5208.04	5208.04
16	6.31993	32104.4	2.28075	Qa - Alluvium	300	29	1556.21	3319.03	5446.48	0	5446.48	5508.46	5508.46
17	6.31993	34003.4	3.54532	Qa - Alluvium	300	29	1618.36	3451.57	5685.58	0	5685.58	5785.85	5785.85
18	6.31993	35791.8	4.81162	Qa - Alluvium	300	29	1674.03	3570.3	5899.77	0	5899.77	6040.68	6040.68
19	6.31993	37468.8	6.08029	Qa - Alluvium	300	29	1723.41	3675.61	6089.76	0	6089.76	6273.34	6273.34
20	6.31993	39034	7.35195	Qa - Alluvium	300	29	1766.67	3767.89	6256.23	0	6256.23	6484.17	6484.17
21	6.31993	40486.2	8.62727	Qa - Alluvium	300	29	1803.98	3847.46	6399.79	0	6399.79	6673.49	6673.49
22	6.42176	42472.4	9.91726	QTp	500	32	2156.69	4599.71	6560.89	0	6560.89	6937.97	6937.97
23	6.42176	43656.5	11.2227	QTp	500	32	2180.62	4650.73	6642.56	0	6642.56	7075.23	7075.23
24	6.42176	44708.4	12.5341	QTp	500	32	2197.67	4687.11	6700.78	0	6700.78	7189.37	7189.37
25	6.42176	45626.2	13.8522	QTp	500	32	2208.01	4709.15	6736.04	0	6736.04	7280.52	7280.52
26	6.42176	46407.7	15.1778	QTp	500	32	2211.74	4717.11	6748.79	0	6748.79	7348.79	7348.79
27	6.42176	47050.4	16.5118	QTp	500	32	2208.99	4711.24	6739.4	0	6739.4	7394.22	7394.22
28	6.42176	47551.6	17.8551	QTp	500	32	2199.84	4691.73	6708.17	0	6708.17	7416.79	7416.79
29	6.42176	47908.2	19.2086	QTp	500	32	2184.39	4658.77	6655.43	0	6655.43	7416.48	7416.48
30	6.42176	48116.6	20.5733	QTp	500	32	2162.7	4612.52	6581.41	0	6581.41	7393.16	7393.16
31	6.42176	48173	21.9504	QTp	500	32	2134.84	4553.11	6486.33	0	6486.33	7346.71	7346.71
32	6.42176	48073	23.3409	QTp	500	32	2100.86	4480.64	6370.35	0	6370.35	7276.91	7276.91
33	6.42176	47811.9	24.7462	QTp	500	32	2060.8	4395.19	6233.61	0	6233.61	7183.48	7183.48
34	6.42176	47384.1	26.1675	QTp	500	32	2014.68	4296.83	6076.2	0	6076.2	7066.13	7066.13
35	6.42176	46783.8	27.6065	QTp	500	32	1962.53	4185.6	5898.19	0	5898.19	6924.46	6924.46
36	6.42176	46004.1	29.0645	QTp	500	32	1904.34	4061.51	5699.6	0	5699.6	6758	6758
37	6.42176	45037.5	30.5436	QTp	500	32	1840.13	3924.56	5480.43	0	5480.43	6566.24	6566.24
38	6.42176	43875.6	32.0455	QTp	500	32	1769.88	3774.72	5240.65	0	5240.65	6348.55	6348.55
39	6.42176	42508.7	33.5725	QTp	500	32	1693.55	3611.94	4980.16	0	4980.16	6104.18	6104.18
40	6.42176	40925.9	35.127	QTp	500	32	1611.14	3436.17	4698.85	0	4698.85	5832.31	5832.31
41	6.42176	39114.8	36.7119	QTp	500	32	1522.58	3247.3	4396.6	0	4396.6	5531.99	5531.99
42	6.42176	37061.4	38.3302	QTp	500	32	1427.84	3045.23	4073.21	0	4073.21	5202.07	5202.07
43	6.42176	34749.2	39.9854	QTp	500	32	1326.83	2829.82	3728.49	0	3728.49	4841.26	4841.26
44	6.42176	32159.1	41.6819	QTp	500	32	1219.51	2600.93	3362.19	0	3362.19	4448.04	4448.04
45	6.42176	29269	43.4245	QTp	500	32	1105.79	2358.38	2974.03	0	2974.03	4020.62	4020.62
46	6.42176	26052.5	45.2187	QTp	500	32	985.582	2102.01	2563.75	0	2563.75	3556.89	3556.89
47	6.42176	22478.1	47.0717	QTp	500	32	858.793	1831.6	2131	0	2131	3054.26	3054.26
48	6.42176	17480.2	48.9915	QTp	500	32	696.067	1484.54	1575.59	0	1575.59	2376.09	2376.09
49	6.42176	10844.5	50.9887	QTp	500	32	495.259	1056.27	890.217	0	890.217	1501.56	1501.56
50	6.42176	3704.22	53.076	QTp	500	32	292.948	624.788	199.703	0	199.703	589.533	589.533

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 2.13276

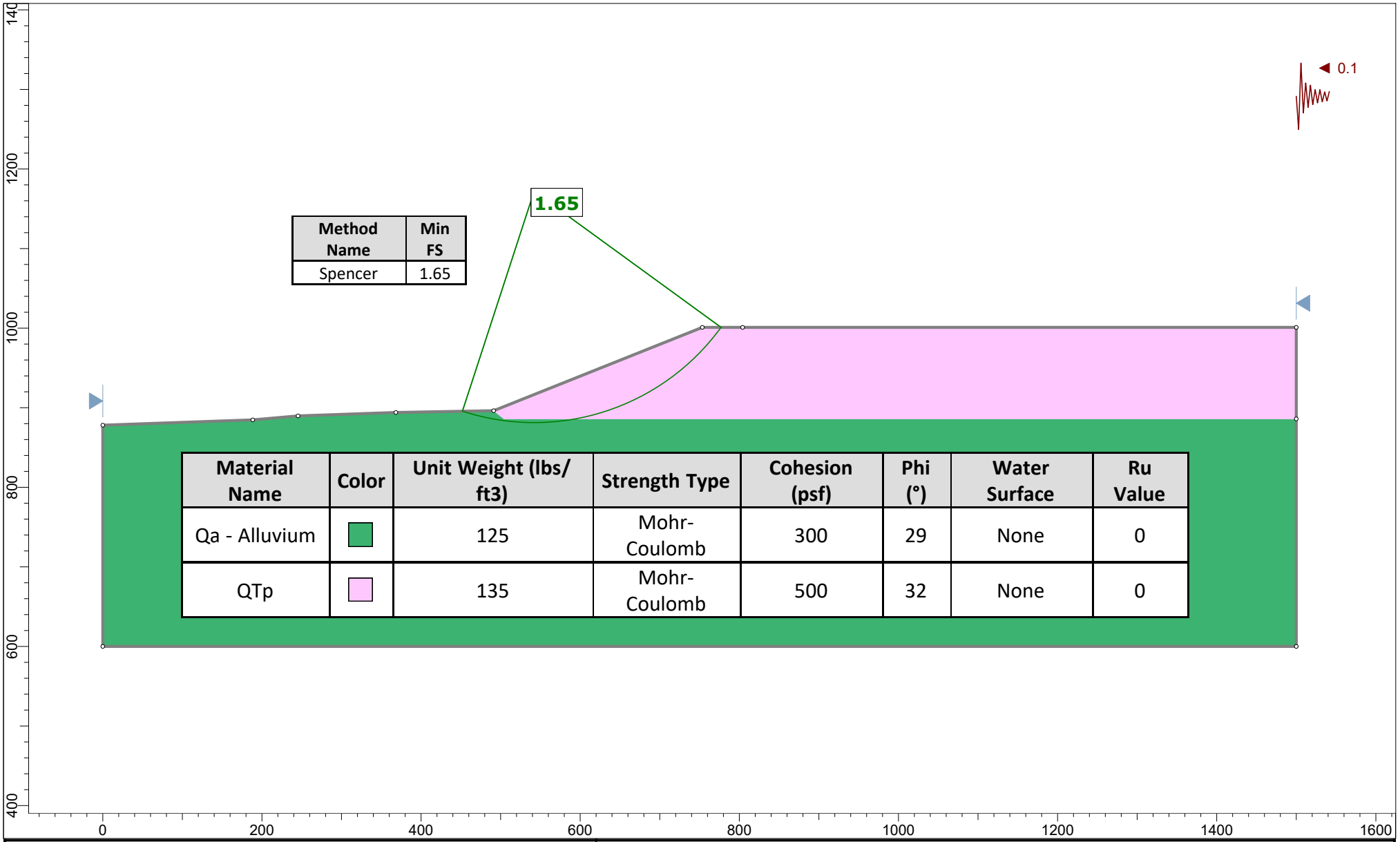
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	453.567	895.591	0	0	0
2	459.887	893.67	1910.92	612.115	17.7615
3	466.207	891.906	4840.61	1550.57	17.7616
4	472.527	890.297	8576.21	2747.18	17.7616
5	478.847	888.84	12931.4	4142.25	17.7616
6	485.167	887.532	17743.1	5683.56	17.7616
7	491.486	886.371	22870	7325.82	17.7615
8	497.806	885.356	28839.5	9238.01	17.7616
9	504.126	884.485	35972.7	11523	17.7616
10	510.446	883.757	43954.9	14079.9	17.7616
11	516.766	883.17	52497.2	16816.2	17.7616
12	523.086	882.724	61409.5	19671	17.7616
13	529.406	882.418	70518.5	22588.9	17.7616
14	535.726	882.251	79666.5	25519.2	17.7616
15	542.046	882.224	88709.6	28415.9	17.7616
16	548.366	882.336	97516.9	31237.1	17.7616
17	554.686	882.588	105969	33944.6	17.7616
18	561.006	882.979	113959	36503.8	17.7615
19	567.326	883.511	121387	38883.3	17.7616
20	573.646	884.185	128166	41054.7	17.7615
21	579.965	885	134216	42992.8	17.7616
22	586.285	885.959	139467	44674.7	17.7615
23	592.707	887.082	145933	46746.1	17.7616
24	599.129	888.356	151456	48515.1	17.7615
25	605.551	889.784	155985	49966	17.7616
26	611.972	891.367	159480	51085.6	17.7616
27	618.394	893.109	161910	51863.7	17.7615
28	624.816	895.013	163249	52292.6	17.7615
29	631.238	897.082	163482	52367.3	17.7615
30	637.66	899.319	162602	52085.4	17.7615
31	644.081	901.729	160610	51447.3	17.7615
32	650.503	904.317	157515	50456.1	17.7616
33	656.925	907.088	153337	49117.8	17.7616
34	663.347	910.048	148104	47441.5	17.7616
35	669.768	913.204	141854	45439.3	17.7615
36	676.19	916.562	134634	43126.8	17.7616
37	682.612	920.131	126506	40523.2	17.7616
38	689.034	923.92	117542	37651.7	17.7616
39	695.455	927.94	107827	34539.8	17.7616
40	701.877	932.202	97463.5	31220	17.7616
41	708.299	936.72	86568.8	27730.2	17.7616
42	714.721	941.509	75280.6	24114.3	17.7616
43	721.142	946.586	63758.6	20423.5	17.7616
44	727.564	951.972	52188.3	16717.2	17.7615
45	733.986	957.69	40785.5	13064.6	17.7615
46	740.408	963.768	29801.9	9546.31	17.7616
47	746.829	970.238	19533.5	6257.07	17.7616
48	753.251	977.142	10329.8	3308.89	17.7615
49	759.673	984.527	3158.26	1011.67	17.7616
50	766.095	992.454	-721.905	-231.244	17.7615
51	772.516	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

SLIDEINTERPRET 9.029

Analysis Description	105-ft High CUT Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular		
Client	Solstra Communities California, LLC	Drawn By	M Neely
Project	Solomon Hills Specific Plan Santra Barbara County, California	File Name	SP_Cut- H105- 2.5 to 1.slmd
		Scale	1:2000
Project No.:	23-2195s-1	Date: 10/17/2023	Run Number: Run No. 60

Table of Contents

Project Summary 2
General Settings 2
Analysis Options 2
Groundwater Analysis 3
Random Numbers 3
Surface Options 3
Seismic Loading 3
Materials 3
Global Minimums 4
    Method: spencer 4
Valid and Invalid Surfaces 4
    Method: spencer 4
Slice Data 4
    Global Minimum Query (spencer) - Safety Factor: 1.64706 4
Interslice Data 6
    Global Minimum Query (spencer) - Safety Factor: 1.64706 6
Entity Information 6
    Group 1 6
        Shared Entities 6

Slide2 Analysis Information

SP_Cut- H105- 2.5 to 1

Project Summary

File Name:	SP_Cut- H105- 2.5 to 1.slmd
Slide2 Modeler Version:	9.029
Compute Time:	00h:00m:02.47s
Project Title:	Solomon Hills Specific Plan
Analysis:	105-ft High CUT Slope @ 2.5:1 (H:V) , Pseudo-Static, Circular
Author:	M Neely
Date Created:	10/20/2023
Comments	
	Solstra Communities California, LLC Santra Barbara County, California 23-2195s-1

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
Analysis Methods Used	
	Spencer
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes
Eliminate vertical segments in non-circular search	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.1

Materials

Qa - Alluvium	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	125 lbs/ft3
Cohesion	300 psf
Phi	29 °
Water Surface	None
Ru Value	0

QTp	
Color	
Strength Type	Mohr-Coulomb
Unit Weight	135 lbs/ft3
Cohesion	500 psf
Phi	32 °
Water Surface	None
Ru Value	0

Global Minimums

Method: spencer

FS	1.647060
Center:	542.032, 1171.922
Radius:	290.669
Left Slip Surface Endpoint:	451.958, 895.562
Right Slip Surface Endpoint:	777.136, 1001.000
Resisting Moment:	3.16381e+08 lb-ft
Driving Moment:	1.92088e+08 lb-ft
Resisting Horizontal Force:	994815 lb
Driving Horizontal Force:	603994 lb
Total Slice Area:	12203.7 ft2
Surface Horizontal Width:	325.178 ft
Surface Average Height:	37.5293 ft

Global Minimum Support Data

No Supports Present

Valid and Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	14047
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.64706

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [deg]	Base Material	Base Cohesion [psf]	Base Friction Angle [deg]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	6.46197	864.391	-17.3849	Qa - Alluvium	300	29	317.896	523.594	403.375	0	403.375	303.845	303.845

2	6.46197	2527.11	-16.0548	Qa - Alluvium	300	29	438.873	722.85	762.843	0	762.843	636.544	636.544
3	6.46197	4059.03	-14.7335	Qa - Alluvium	300	29	544.071	896.117	1075.42	0	1075.42	932.349	932.349
4	6.46197	5462.6	-13.4201	Qa - Alluvium	300	29	634.903	1045.72	1345.32	0	1345.32	1193.83	1193.83
5	6.46197	6740.04	-12.114	Qa - Alluvium	300	29	712.601	1173.7	1576.2	0	1576.2	1423.25	1423.25
6	6.46197	7893.28	-10.8141	Qa - Alluvium	300	29	778.233	1281.8	1771.2	0	1771.2	1622.55	1622.55
7	6.46197	9981.05	-9.51995	Qa - Alluvium	300	29	904.175	1489.23	2145.41	0	2145.41	1993.78	1993.78
8	6.46197	13367.4	-8.23063	Qa - Alluvium	300	29	1110.55	1829.14	2758.63	0	2758.63	2597.99	2597.99
9	6.46197	16512.2	-6.94551	Qa - Alluvium	300	29	1292.6	2128.99	3299.59	0	3299.59	3142.13	3142.13
10	6.46197	19342	-5.66388	Qa - Alluvium	300	29	1447.2	2383.63	3758.97	0	3758.97	3615.44	3615.44
11	6.46197	22052	-4.3851	Qa - Alluvium	300	29	1588.13	2615.74	4177.71	0	4177.71	4055.93	4055.93
12	6.46197	24644.8	-3.1085	Qa - Alluvium	300	29	1716.33	2826.9	4558.64	0	4558.64	4465.43	4465.43
13	6.46197	27121.1	-1.83344	Qa - Alluvium	300	29	1832.54	3018.31	4903.96	0	4903.96	4845.3	4845.3
14	6.46197	29481.1	-0.559296	Qa - Alluvium	300	29	1937.44	3191.08	5215.64	0	5215.64	5196.73	5196.73
15	6.46197	31725	0.714574	Qa - Alluvium	300	29	2031.6	3346.17	5495.44	0	5495.44	5520.77	5520.77
16	6.46197	33852.8	1.9888	Qa - Alluvium	300	29	2115.56	3484.46	5744.92	0	5744.92	5818.39	5818.39
17	6.46197	35864.3	3.26401	Qa - Alluvium	300	29	2189.81	3606.75	5965.53	0	5965.53	6090.41	6090.41
18	6.46197	37759.2	4.54084	Qa - Alluvium	300	29	2254.78	3713.75	6158.57	0	6158.57	6337.64	6337.64
19	6.46197	39536.9	5.81993	Qa - Alluvium	300	29	2310.85	3806.11	6325.18	0	6325.18	6560.72	6560.72
20	6.46197	41196.8	7.10195	Qa - Alluvium	300	29	2358.39	3884.41	6466.45	0	6466.45	6760.29	6760.29
21	6.46197	42737.8	8.38755	Qa - Alluvium	300	29	2397.73	3949.2	6583.33	0	6583.33	6936.86	6936.86
22	6.46197	44158.9	9.67742	Qa - Alluvium	300	29	2429.15	4000.95	6676.69	0	6676.69	7090.93	7090.93
23	6.53623	45946.7	10.9797	QTp	500	32	2896.17	4770.17	6833.71	0	6833.71	7395.61	7395.61
24	6.53623	47061.7	12.2953	QTp	500	32	2905.9	4786.19	6859.34	0	6859.34	7492.67	7492.67
25	6.53623	48037.6	13.6175	QTp	500	32	2906.92	4787.87	6862.03	0	6862.03	7566.23	7566.23
26	6.53623	48872.2	14.9471	QTp	500	32	2899.52	4775.68	6842.53	0	6842.53	7616.58	7616.58
27	6.53623	49562.9	16.285	QTp	500	32	2883.93	4750.01	6801.45	0	6801.45	7643.95	7643.95
28	6.53623	50107	17.6322	QTp	500	32	2860.39	4711.23	6739.38	0	6739.38	7648.52	7648.52
29	6.53623	50501.1	18.9894	QTp	500	32	2829.08	4659.67	6656.85	0	6656.85	7630.4	7630.4
30	6.53623	50741.7	20.3579	QTp	500	32	2790.19	4595.61	6554.36	0	6554.36	7589.69	7589.69
31	6.53623	50824.8	21.7385	QTp	500	32	2743.89	4519.35	6432.29	0	6432.29	7526.36	7526.36
32	6.53623	50746	23.1326	QTp	500	32	2690.31	4431.1	6291.08	0	6291.08	7440.4	7440.4
33	6.53623	50500.4	24.5413	QTp	500	32	2629.59	4331.1	6131.04	0	6131.04	7331.71	7331.71
34	6.53623	50082.3	25.9661	QTp	500	32	2561.86	4219.53	5952.48	0	5952.48	7200.11	7200.11
35	6.53623	49485.6	27.4083	QTp	500	32	2487.19	4096.55	5755.68	0	5755.68	7045.38	7045.38
36	6.53623	48703.4	28.8696	QTp	500	32	2405.7	3962.33	5540.88	0	5540.88	6867.23	6867.23
37	6.53623	47727.8	30.3518	QTp	500	32	2317.44	3816.97	5308.27	0	5308.27	6665.29	6665.29
38	6.53623	46550.3	31.8568	QTp	500	32	2222.51	3660.6	5058.03	0	5058.03	6439.09	6439.09
39	6.53623	45160.8	33.3869	QTp	500	32	2120.93	3493.3	4790.29	0	4790.29	6188.09	6188.09
40	6.53623	43548.2	34.9443	QTp	500	32	2012.77	3315.15	4505.18	0	4505.18	5911.62	5911.62
41	6.53623	41699.8	36.532	QTp	500	32	1898.04	3126.19	4202.78	0	4202.78	5608.9	5608.9
42	6.53623	39601	38.153	QTp	500	32	1776.79	2926.48	3883.17	0	3883.17	5279.01	5279.01
43	6.53623	37235	39.8109	QTp	500	32	1649.02	2716.03	3546.4	0	3546.4	4920.83	4920.83
44	6.53623	34582.2	41.5098	QTp	500	32	1514.74	2494.87	3192.46	0	3192.46	4533.05	4533.05
45	6.53623	31619.8	43.2547	QTp	500	32	1373.96	2263	2821.39	0	2821.39	4114.09	4114.09
46	6.53623	28320.8	45.0511	QTp	500	32	1226.68	2020.41	2433.16	0	2433.16	3662.03	3662.03
47	6.53623	24215.4	46.9059	QTp	500	32	1058.41	1743.26	1989.64	0	1989.64	3120.91	3120.91
48	6.53623	18005.4	48.8275	QTp	500	32	830.172	1367.34	1388.04	0	1388.04	2337.26	2337.26
49	6.53623	11169.1	50.826	QTp	500	32	594.825	979.712	767.699	0	767.699	1497.7	1497.7
50	6.53623	3814.97	52.9142	QTp	500	32	355.67	585.811	137.326	0	137.326	607.849	607.849

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.64706

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [deg]
1	451.958	895.562	0	0	0
2	458.42	893.539	2789.07	1160.71	22.5953
3	464.882	891.679	6798.09	2829.13	22.5954
4	471.344	889.98	11744.3	4887.55	22.5953
5	477.806	888.438	17385.4	7235.18	22.5953
6	484.268	887.051	23513.9	9785.66	22.5954
7	490.73	885.817	29952.4	12465.1	22.5953
8	497.192	884.733	37136.7	15455	22.5954
9	503.654	883.798	45572.9	18965.8	22.5953
10	510.116	883.011	54892.8	22844.5	22.5954
11	516.578	882.37	64743	26943.8	22.5954
12	523.04	881.875	74896.3	31169.2	22.5954
13	529.502	881.524	85150.3	35436.6	22.5954
14	535.964	881.317	95324.3	39670.6	22.5954
15	542.426	881.254	105256	43804	22.5954
16	548.888	881.334	114802	47776.6	22.5954
17	555.35	881.559	123833	51534.9	22.5953
18	561.812	881.927	132234	55031.2	22.5954
19	568.274	882.441	139905	58223.4	22.5953
20	574.736	883.099	146755	61074.3	22.5954
21	581.198	883.904	152707	63551.5	22.5954
22	587.66	884.857	157694	65626.8	22.5954
23	594.122	885.959	161658	67276.2	22.5953
24	600.658	887.227	167375	69655.5	22.5953
25	607.194	888.652	171938	71554.7	22.5954
26	613.73	890.235	175317	72961	22.5954
27	620.267	891.98	177490	73865.2	22.5954
28	626.803	893.889	178444	74262.3	22.5954
29	633.339	895.967	178176	74150.6	22.5954
30	639.875	898.216	176691	73532.6	22.5954
31	646.412	900.642	174004	72414.3	22.5953
32	652.948	903.248	170137	70805.2	22.5954
33	659.484	906.04	165125	68719.1	22.5953
34	666.02	909.024	159008	66173.5	22.5953
35	672.557	912.208	151839	63190.1	22.5954
36	679.093	915.597	143681	59794.9	22.5953
37	685.629	919.201	134607	56018.6	22.5953
38	692.165	923.028	124703	51896.8	22.5953
39	698.701	927.09	114067	47470.8	22.5954
40	705.238	931.397	102814	42787.5	22.5953
41	711.774	935.965	91071.7	37900.8	22.5953
42	718.31	940.807	78988.2	32872.1	22.5954
43	724.846	945.942	66731.5	27771.3	22.5954
44	731.383	951.389	54493.1	22678.1	22.5954
45	737.919	957.174	42492.9	17684.1	22.5954
46	744.455	963.324	30983.5	12894.2	22.5953
47	750.991	969.872	20257.3	8430.39	22.5954
48	757.528	976.858	10871.2	4524.2	22.5953
49	764.064	984.331	4136.96	1721.66	22.5954
50	770.6	992.353	759.563	316.104	22.5954
51	777.136	1001	0	0	0

Entity Information

Group 1

Shared Entities

Type	Coordinates (x,y)
External Boundary	491.231, 896.273 368.297, 894.046 245.433, 889.818 188.446, 884.818 7.276e-12, 878.091 0, 600 1500, 600 1500, 885.959 1500, 1001 804.1, 1001 753.5, 1001
Material Boundary	491.231, 896.273 504.378, 885.959 1500, 885.959
Material Boundary	491.231, 896.273 804.1, 1001

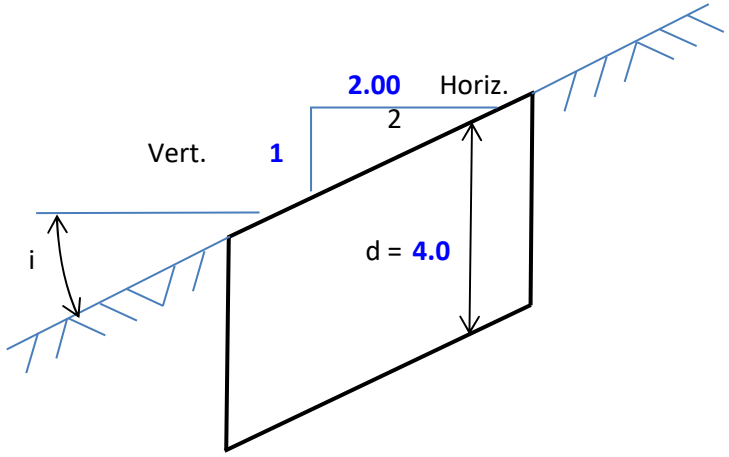
SOIL DESCRIPTION: Tcac

SOIL PROPERTIES: Native Material

Φ' =	**32.0**	Drained friction angle [degrees]
c' =	**350**	Drained cohesion [psf]
γ_t =	**130**	Total density [pcf]
γ_b =	**67.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

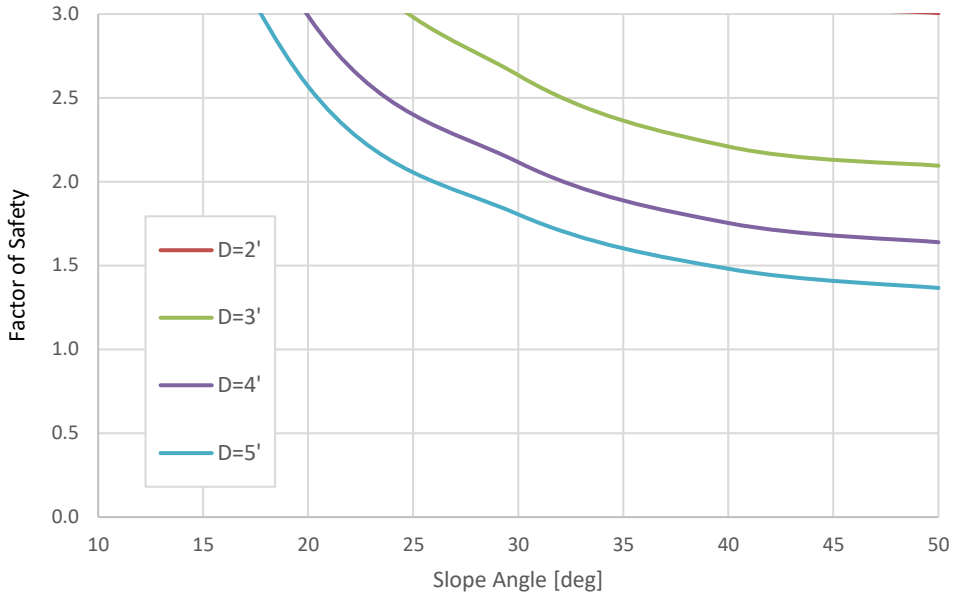
i =	**26.6**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 2.33



Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E1

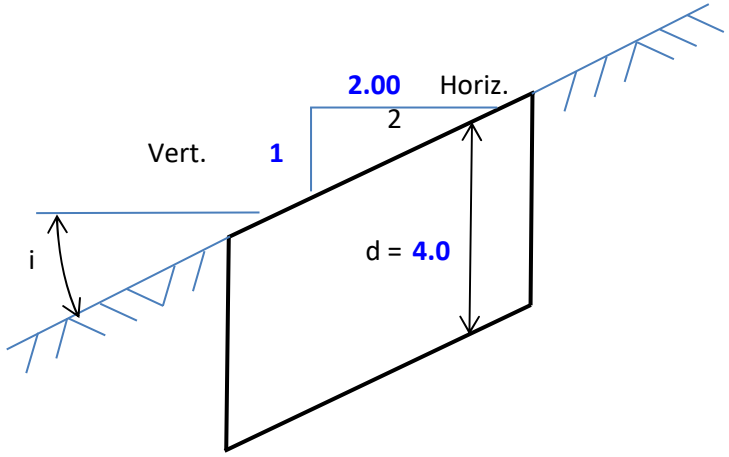
SOIL DESCRIPTION: Tcag

SOIL PROPERTIES: Native Material

Φ' =	**34.0**	Drained friction angle [degrees]
c' =	**250**	Drained cohesion [psf]
γ_t =	**130**	Total density [pcf]
γ_b =	**67.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

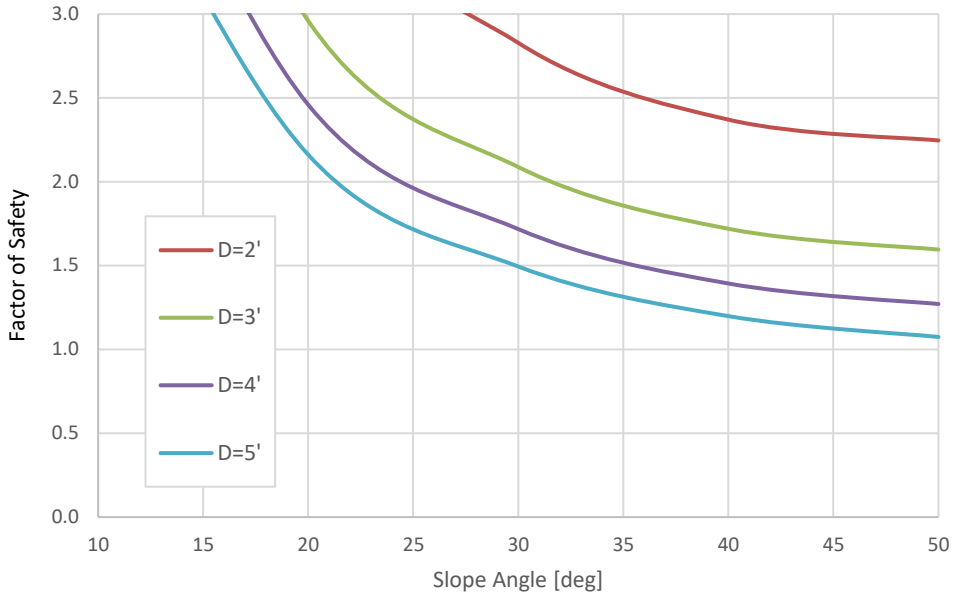
i =	**26.6**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 1.90



Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E2

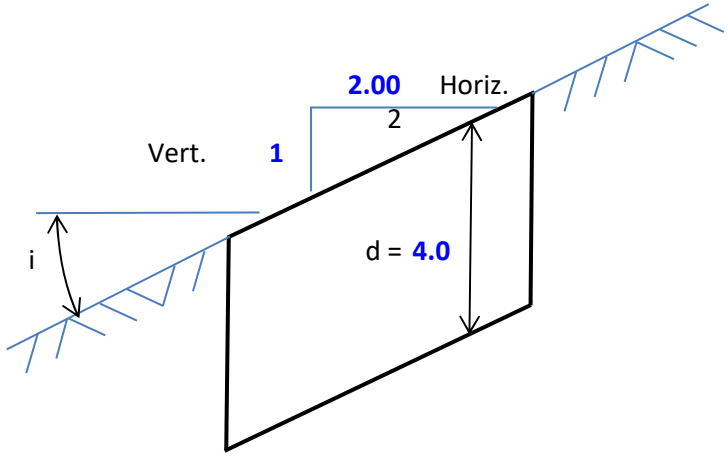
SOIL DESCRIPTION: QTp

SOIL PROPERTIES: Native Material

Φ' =	**32.0**	Drained friction angle [degrees]
c' =	**500**	Drained cohesion [psf]
γ_t =	**135**	Total density [pcf]
γ_b =	**72.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

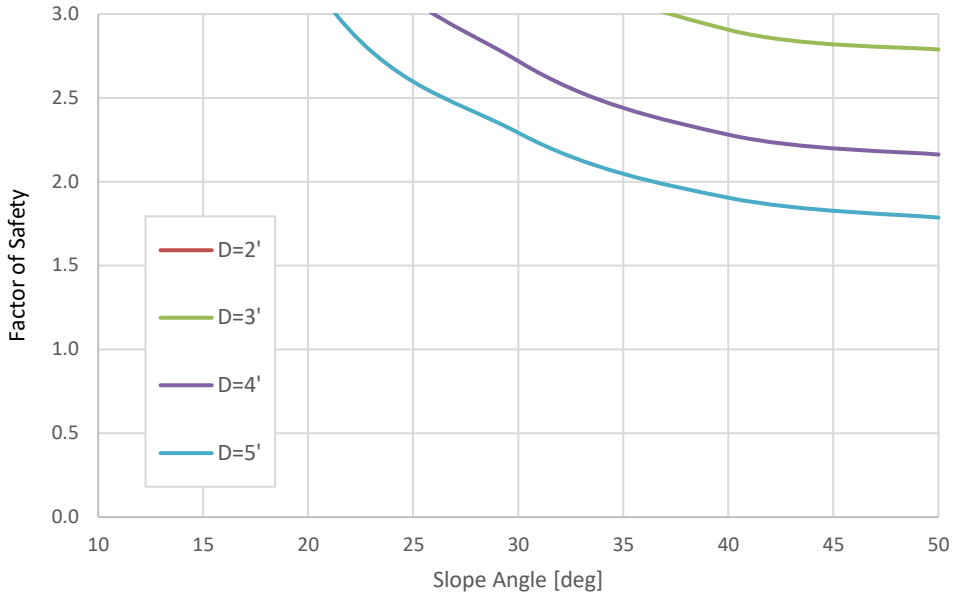
i =	**26.6**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 2.99



Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E3

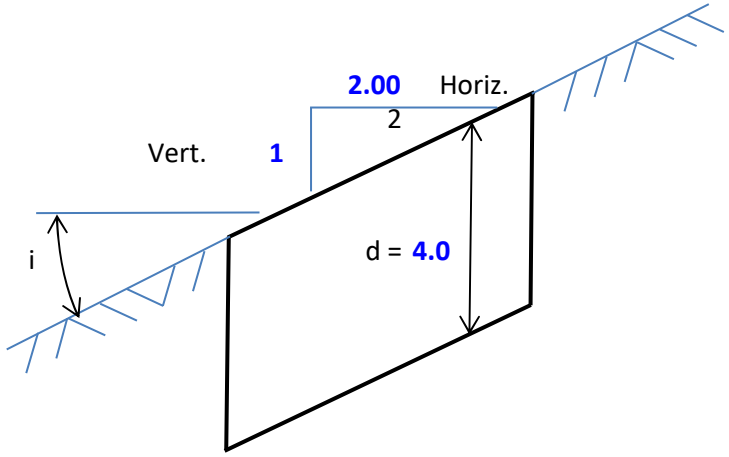
SOIL DESCRIPTION: Qa

SOIL PROPERTIES: Alluvium

Φ' =	**29.0**	Drained friction angle [degrees]
c' =	**300**	Drained cohesion [psf]
γ_t =	**125**	Total density [pcf]
γ_b =	**62.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

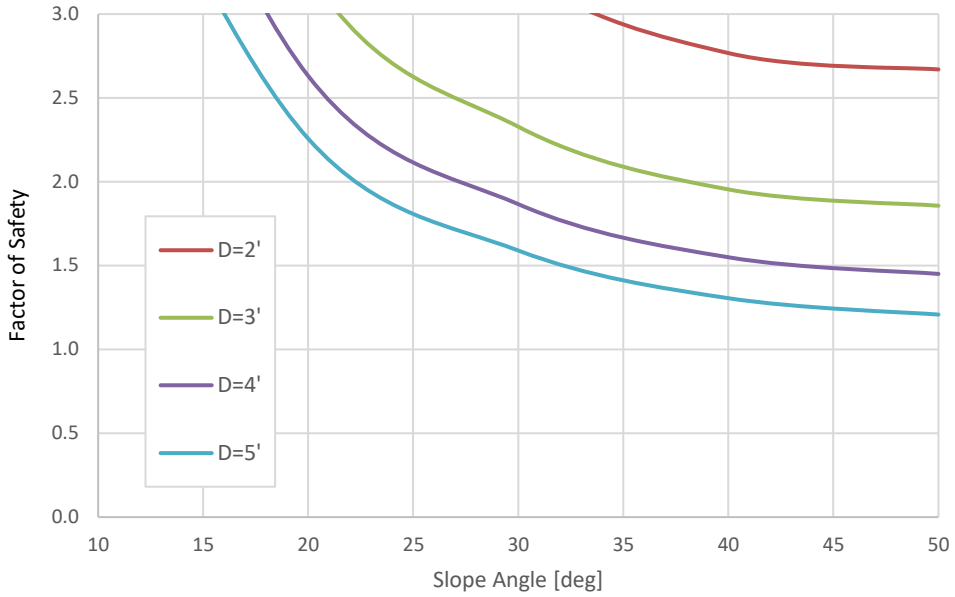
i =	**26.6**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 2.06



Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E4

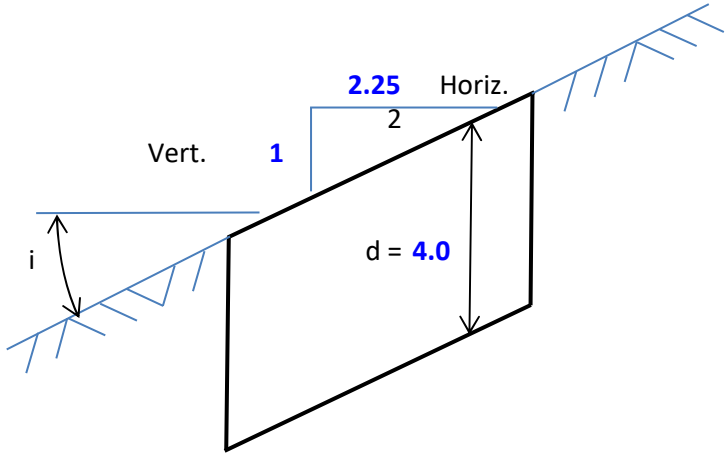
SOIL DESCRIPTION: Qls

SOIL PROPERTIES: Landslide

Φ' =	**28.0**	Drained friction angle [degrees]
c' =	**180**	Drained cohesion [psf]
γ_t =	**130**	Total density [pcf]
γ_b =	**67.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

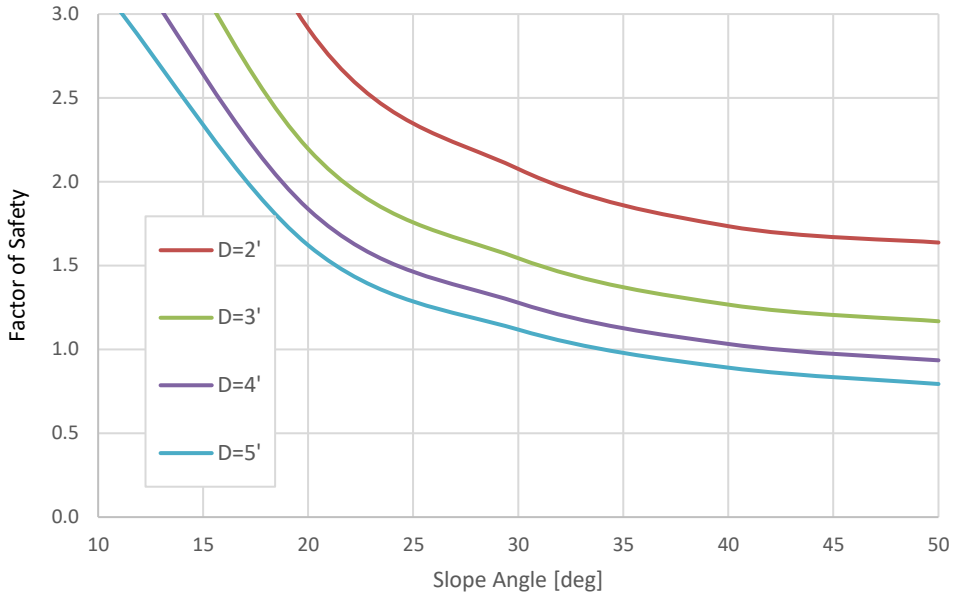
i =	**24.0**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 1.55



Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E5

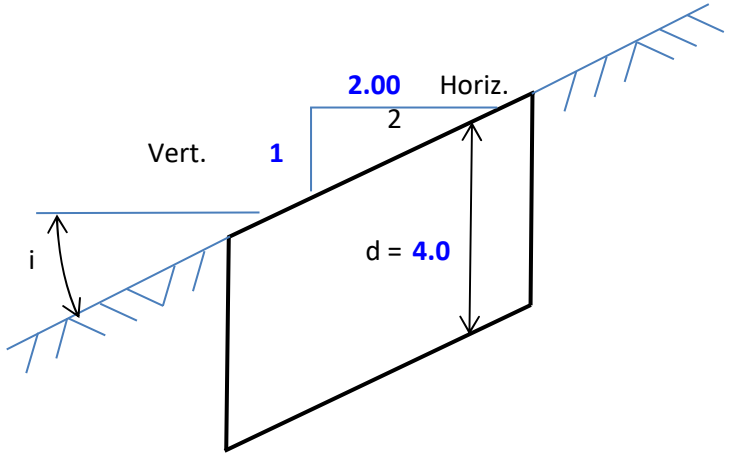
SOIL DESCRIPTION: Fill - General

SOIL PROPERTIES: Derived fill material combined

Φ' =	**29.0**	Drained friction angle [degrees]
c' =	**210**	Drained cohesion [psf]
γ_t =	**130**	Total density [pcf]
γ_b =	**67.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

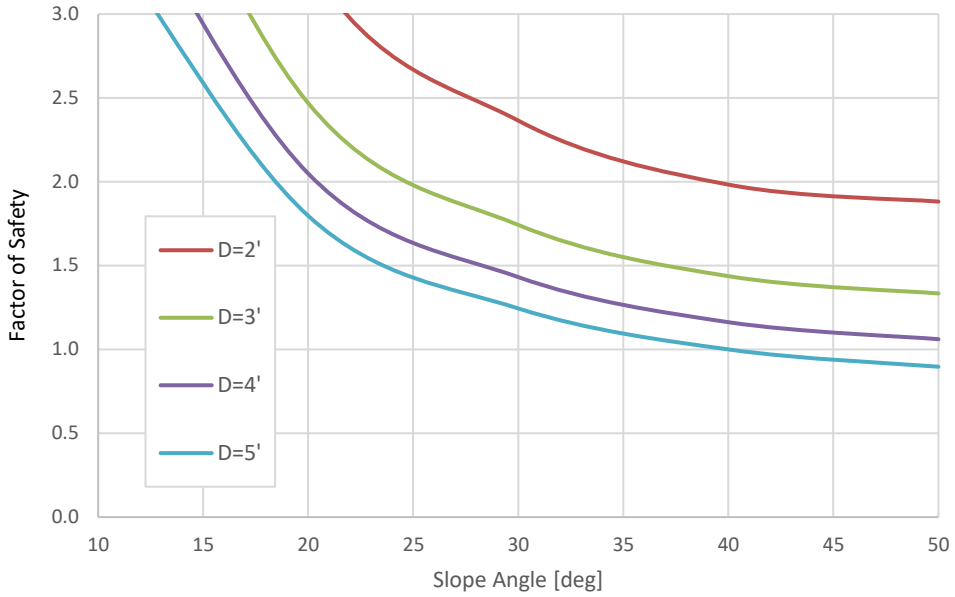
i =	**26.6**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 1.59



Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E6

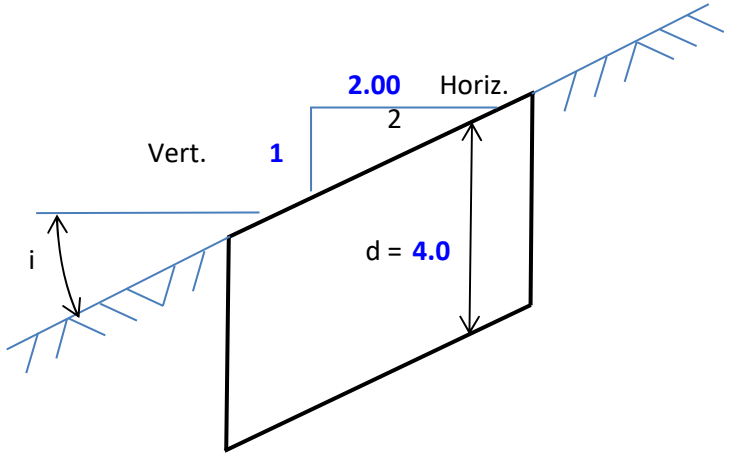
SOIL DESCRIPTION: Fill - Qa

SOIL PROPERTIES: Qa-derived fill material

Φ' =	**28.0**	Drained friction angle [degrees]
c' =	**250**	Drained cohesion [psf]
γ_t =	**125**	Total density [pcf]
γ_b =	**62.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

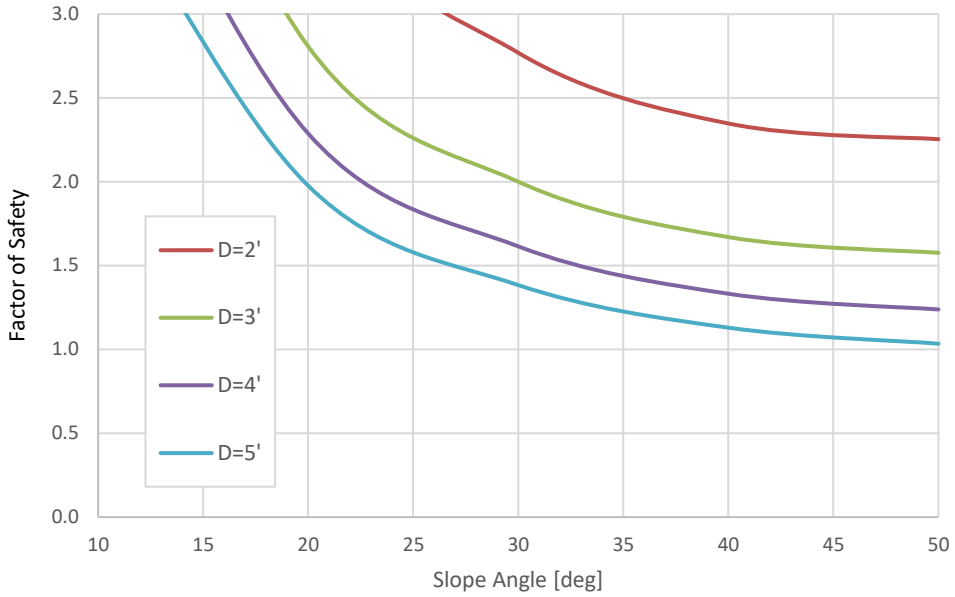
i =	**26.6**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 1.78



Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E7

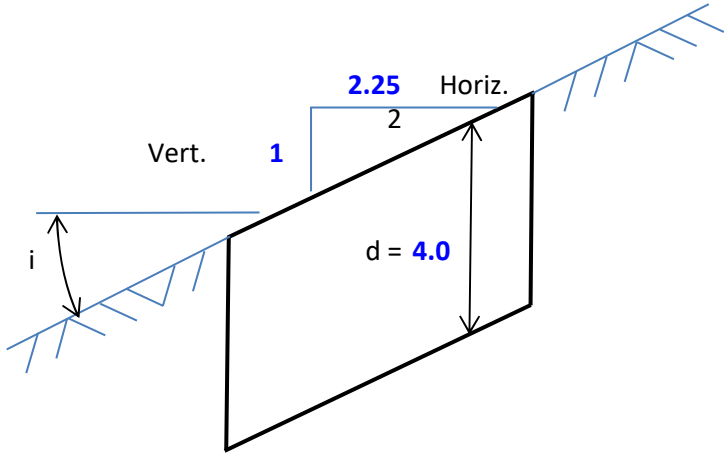
SOIL DESCRIPTION: Fill -Tcag

SOIL PROPERTIES: Tcag-derived fill material

Φ' =	**28.0**	Drained friction angle [degrees]
c' =	**180**	Drained cohesion [psf]
γ_t =	**110**	Total density [pcf]
γ_b =	**47.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

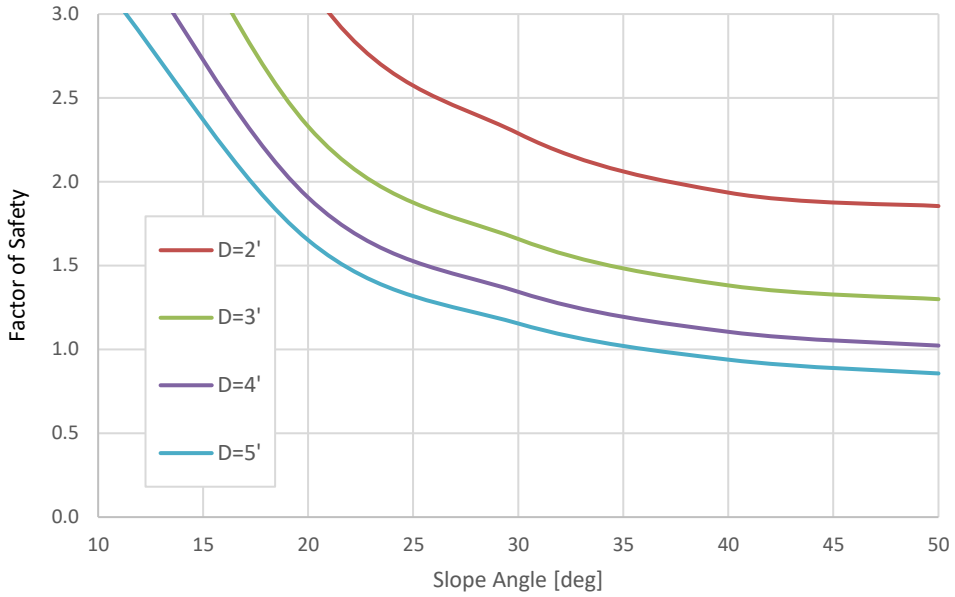
i =	**24.0**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 1.62



Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E8

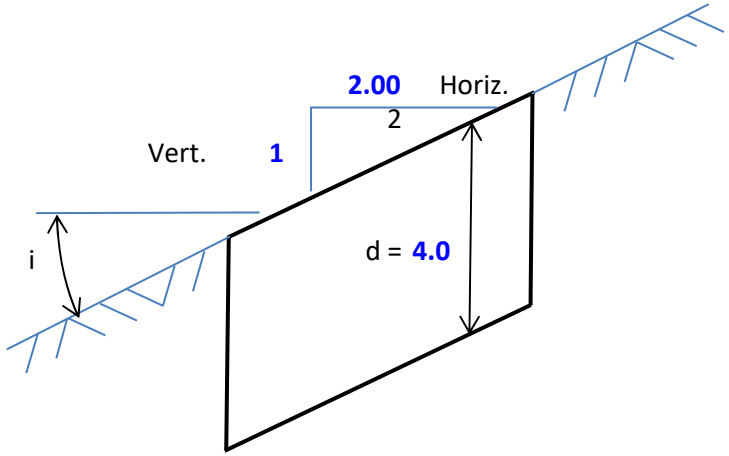
SOIL DESCRIPTION: Fill - Tcac

SOIL PROPERTIES: Tcac-derived fill material

Φ' =	**30.0**	Drained friction angle [degrees]
c' =	**300**	Drained cohesion [psf]
γ_t =	**120**	Total density [pcf]
γ_b =	**57.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

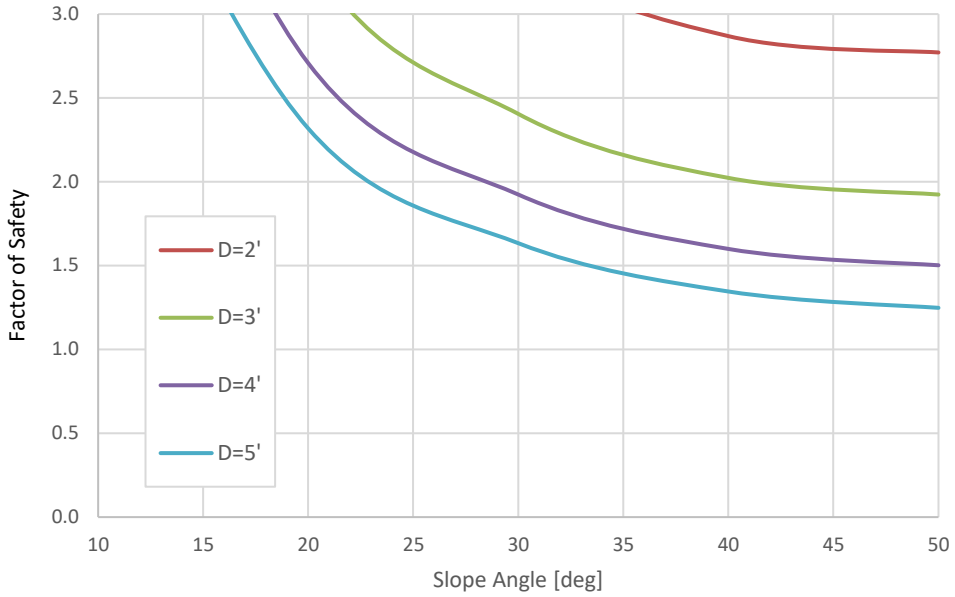
i =	**26.6**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 2.12



Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E9

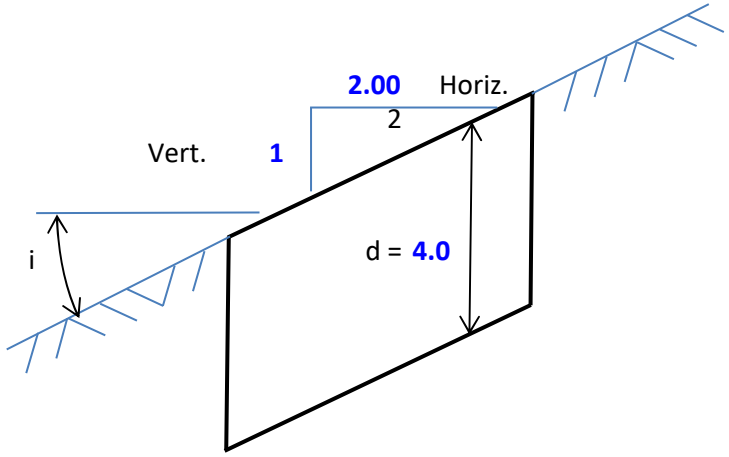
SOIL DESCRIPTION: Fill - QTp

SOIL PROPERTIES: QTp-derived fill material

Φ' =	**29.0**	Drained friction angle [degrees]
c' =	**300**	Drained cohesion [psf]
γ_t =	**135**	Total density [pcf]
γ_b =	**72.6**	Buoyant density [pcf]

SLOPE CONDITIONS: Steady-state seepage parallel to ground surface

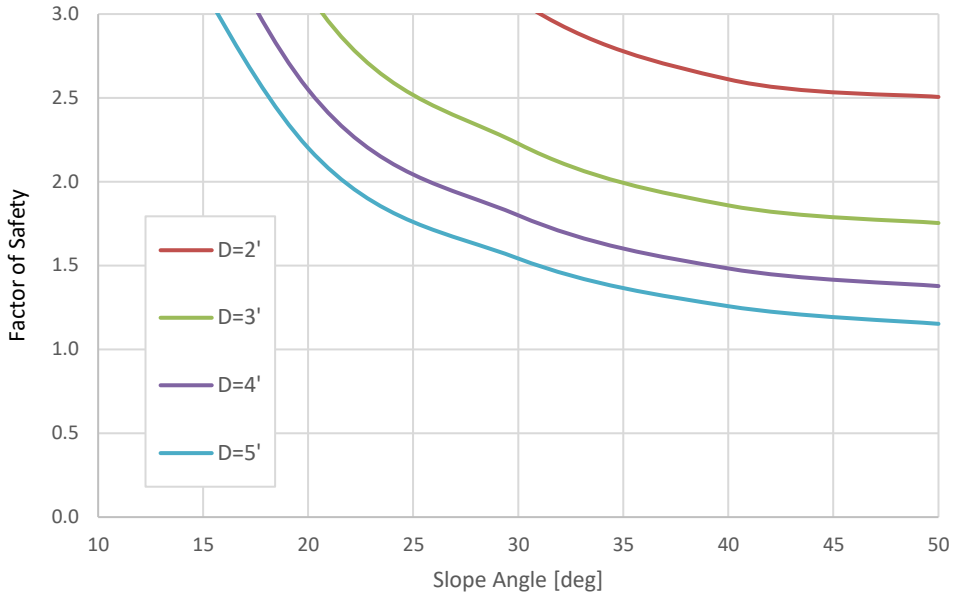
i =	**26.6**	Slope inclination [degrees]
d =	**4**	Depth of interest [feet]



CALCULATIONS:

$$FS = \frac{c' + \gamma_b d \cos^2(i) \tan(\Phi')}{\gamma_t d \sin(i) \cos(i)}$$

FS = 1.99



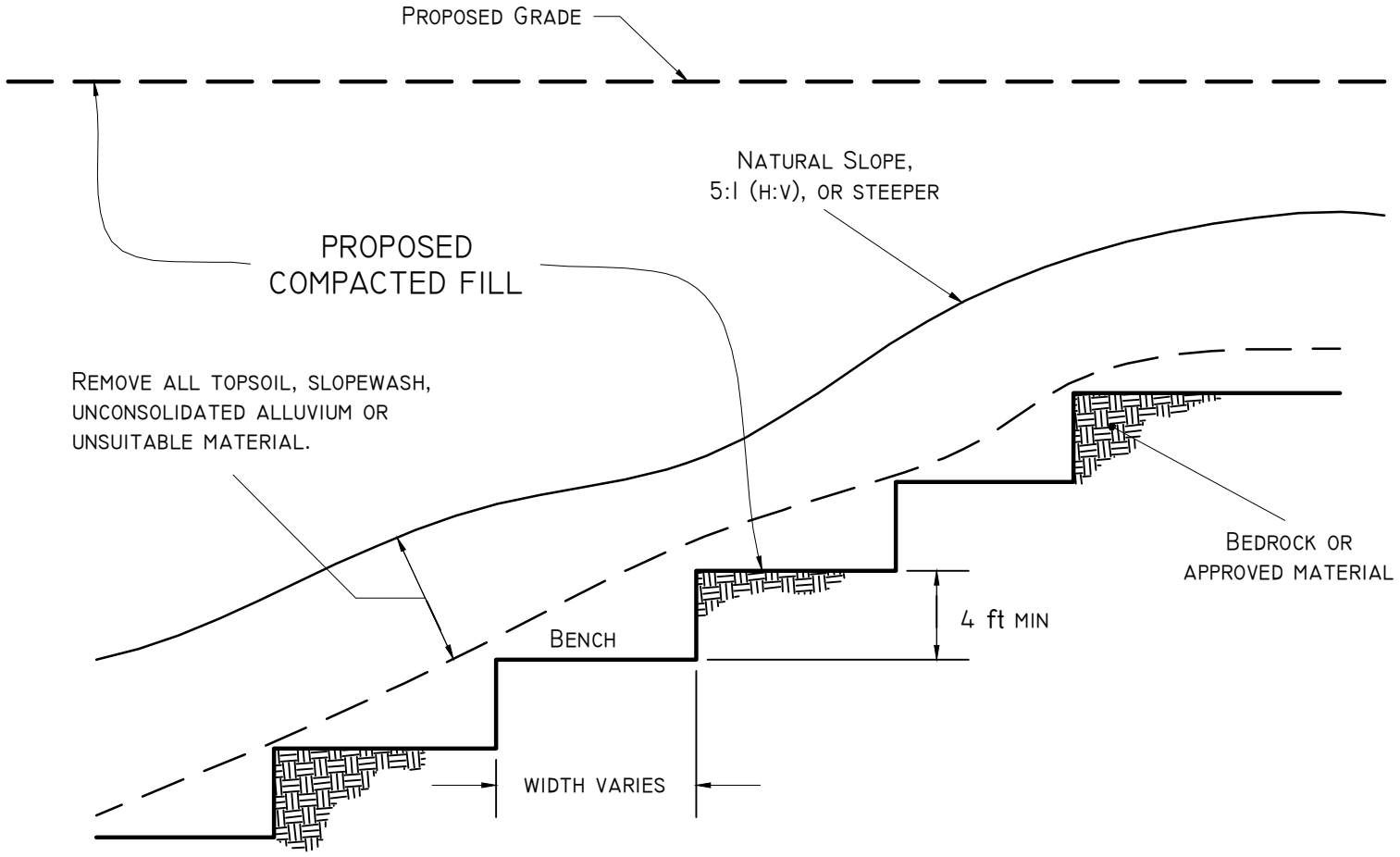
Reference: Lambe and Whitman, *Soil Mechanics* , John Wiley and Sons, Inc., 1969

ALLAN E. SEWARD ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

Infinite Slope Stability Analysis

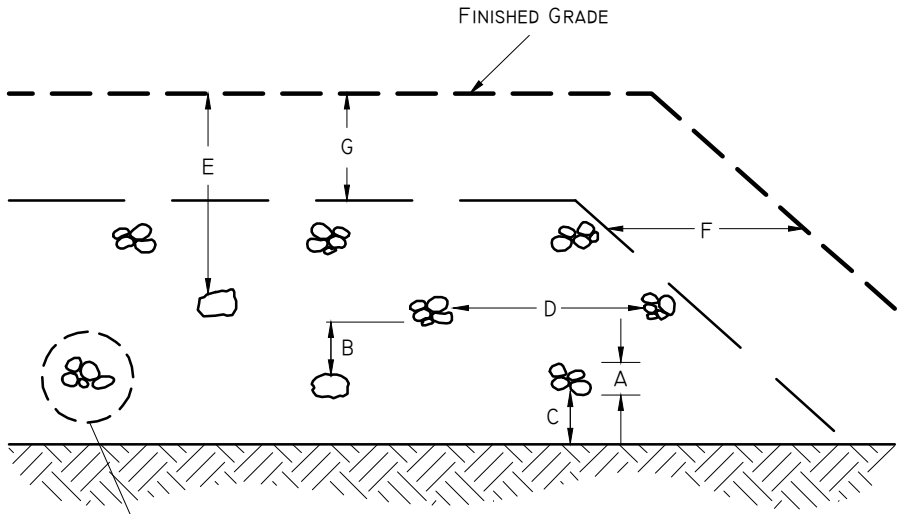
Client:	Solstra Communities California, LLC	Project No.:	23-2195s-1
Project:	Solomon Hills, Specific Plan	Date:	10/20/2023
	Santa Barbara County, California	Figure No:	E10

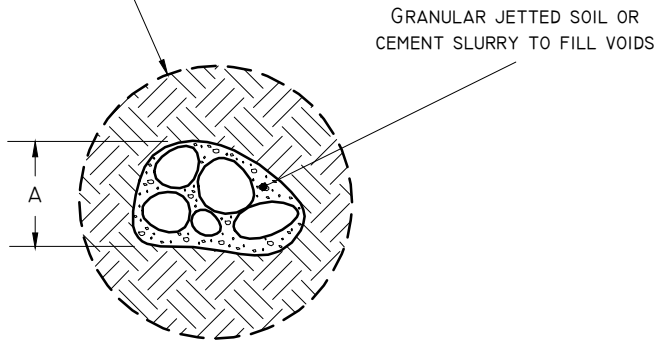
Appendix F



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□s□□□s

FILL OVER NATURAL SLOPE
5:1 OR STEEPER





EXPLANATION

A) ± 4 FT, HEIGHT AND WIDTH MAY VARY DEPENDING ON ROCK SIZE

B) MINIMUM OF 4 FT FROM STAGGER WINDROW

C) MINIMUM OF 5 FT FROM FIRST SET OF WINDROW TO COMPETENT MATERIAL OR BEDROCK

D) MINIMUM OF 15 FT BETWEEN WINDROWS

E) MINIMUM OF 23 FT FROM OVERSIZED ROCKS (LARGEST DIMENSION ≥ 4 FT) TO FINISHED SUBGRADE. ALL OVERSIZED ROCKS MUST BE INDIVIDUALLY PLACED.

F) MINIMUM OF 25 FT FROM PROJECTED WINDROW AREA TO FINISHED SLOPE SURFACE.

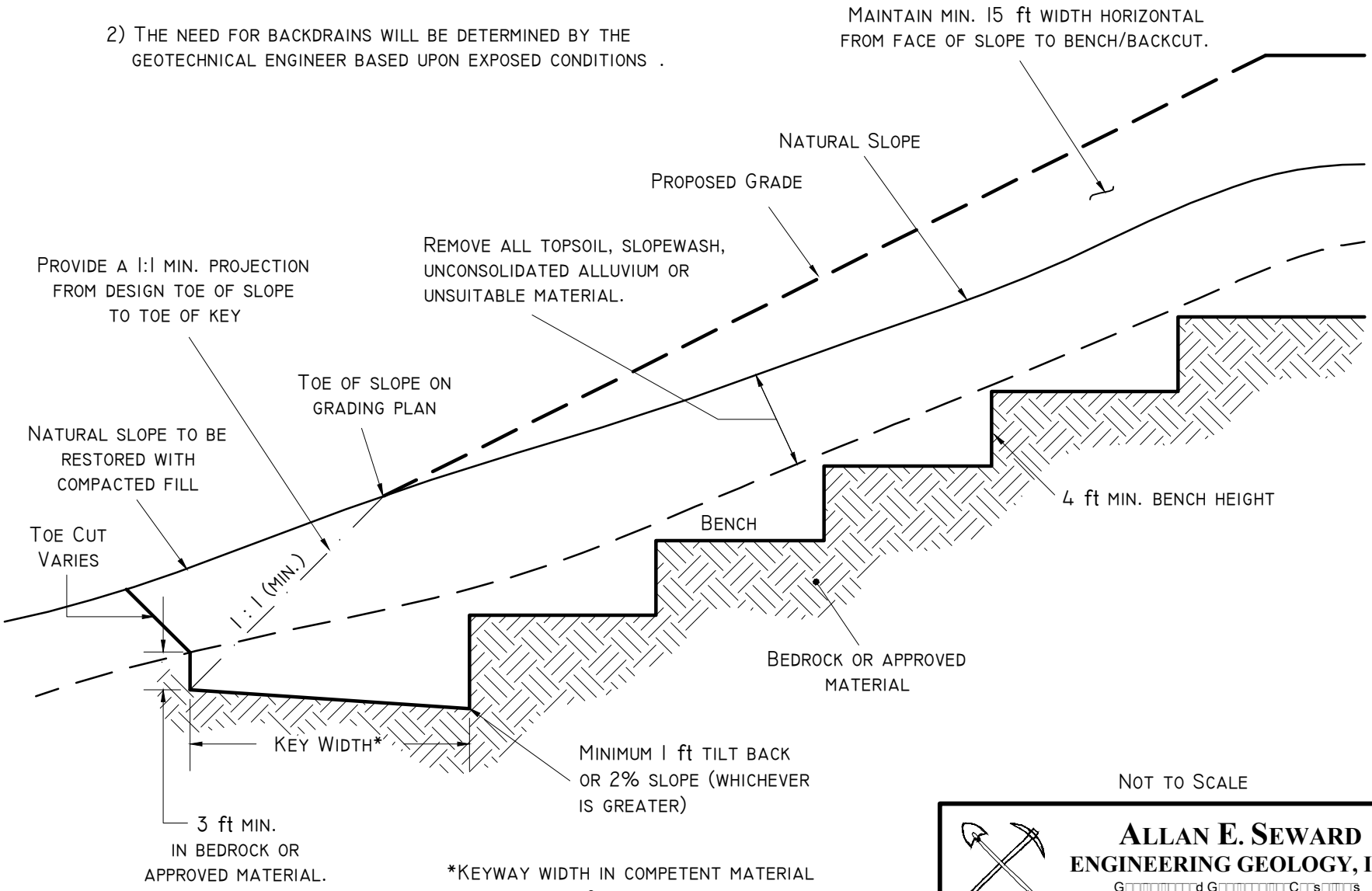
G) MINIMUM OF 15 FT BENEATH FINISHED GRADE TO PROVIDE CLEARANCE FOR FOUNDATIONS AND POOLS, OR 5 FT BELOW THE DEEPEST ADJACENT UTILITY TRENCH, WHICHEVER IS DEEPEST.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□□s□□□□s

ROCK DISPOSAL (WINDROWS)

NOTE: 1) WHERE THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN SLOPE RATIO, SPECIAL RECOMMENDATIONS WILL BE PROVIDED BY THE GEOTECHNICAL ENGINEER.

2) THE NEED FOR BACKDRAINS WILL BE DETERMINED BY THE GEOTECHNICAL ENGINEER BASED UPON EXPOSED CONDITIONS .

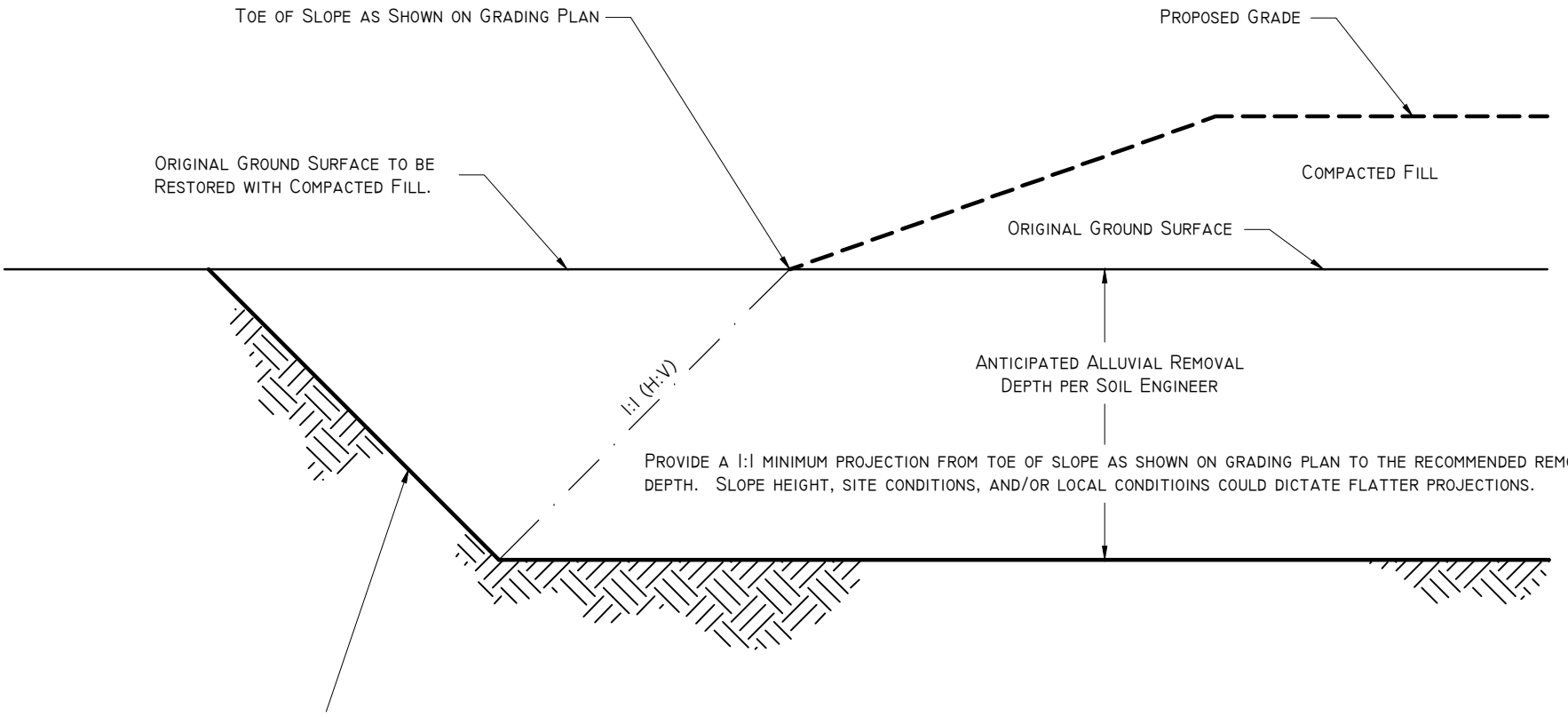


*KEYWAY WIDTH IN COMPETENT MATERIAL MINIMUM OF 15 ft OR AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

NOT TO SCALE

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□s□□□s

FILL SLOPE OVER NATURAL SLOPE
5:1 OR STEEPER



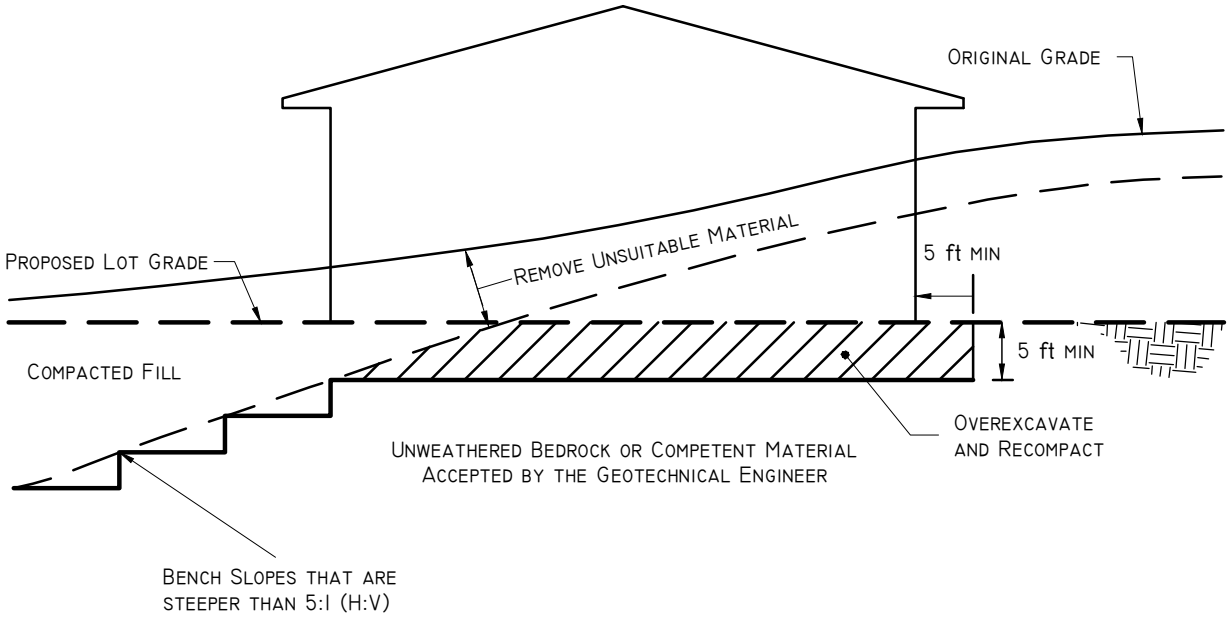
BACKCUT VARIES. BACKCUT SHOULD BE EXCAVATED AS APPROPRIATE TO PROVIDE SAFE CONDITIONS PER CAL OSHA. ALTERNATIVELY, THE SLOT-CUT METHOD CAN BE USED (SEE TEXT), OR TEMPORARY SHORING CAN BE UTILIZED.

NOT TO SCALE

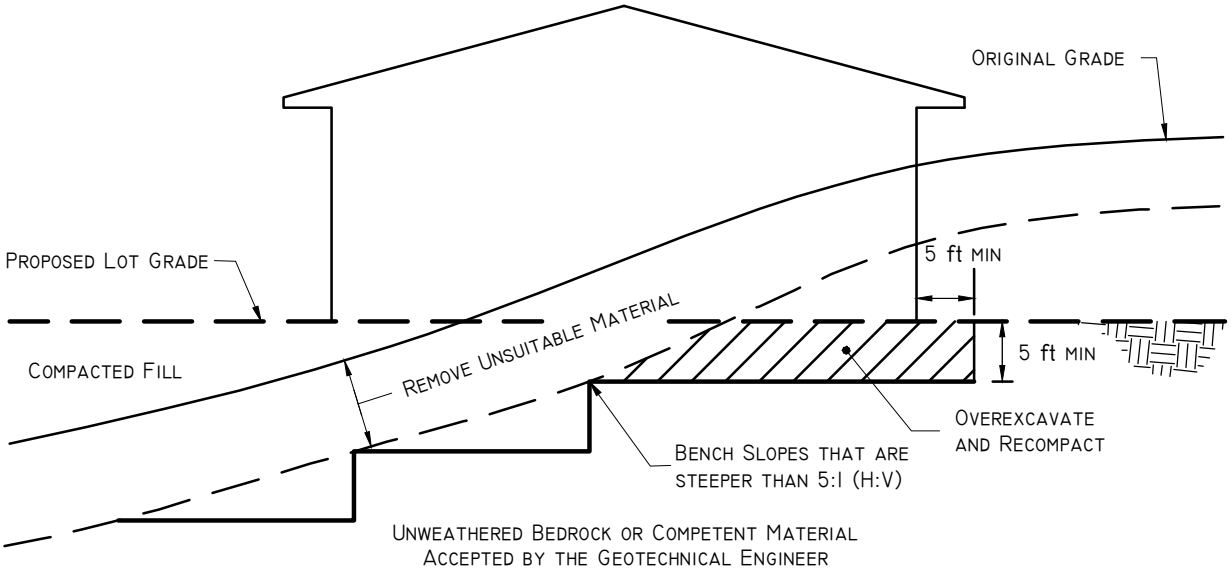
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□□s□□□□s

FILL SLOPE TOEING OUT ON FLAT ALLUVIATED CANYON

Cut Lot



Cut-Fill Lot



NOTE: If the maximum depth of fill exceeds 15 ft on a cut/fill transition lot then the minimum thickness of the fill cap should be one-third of the deepest fill thickness below any proposed structure.

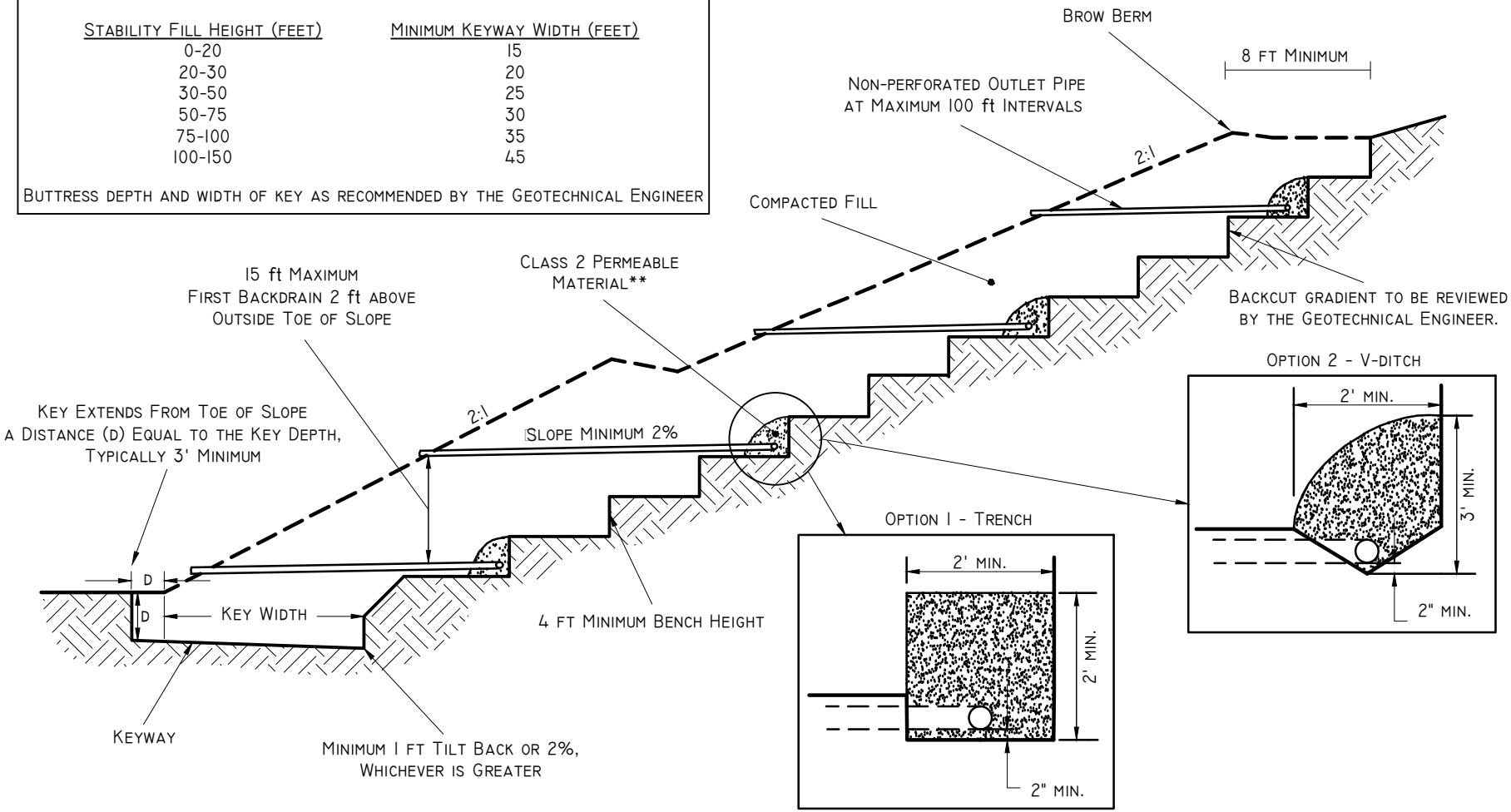
Allan E. Seward
Engineering Geology, Inc.
G□□□□□□□□□□d G□□□□□□□□□C□□s□□□□s

Over-Excavation for Transitional Cut and Cut-Fill Lots

Standard Keyway Width vs. Slope Height for Stability Fill

Stability Fill Height (feet)	Minimum Keyway Width (feet)
0-20	15
20-30	20
30-50	25
50-75	30
75-100	35
100-150	45

Buttress depth and width of key as recommended by the Geotechnical Engineer



**Specifications for CalTrans Class 2 Permeable Material

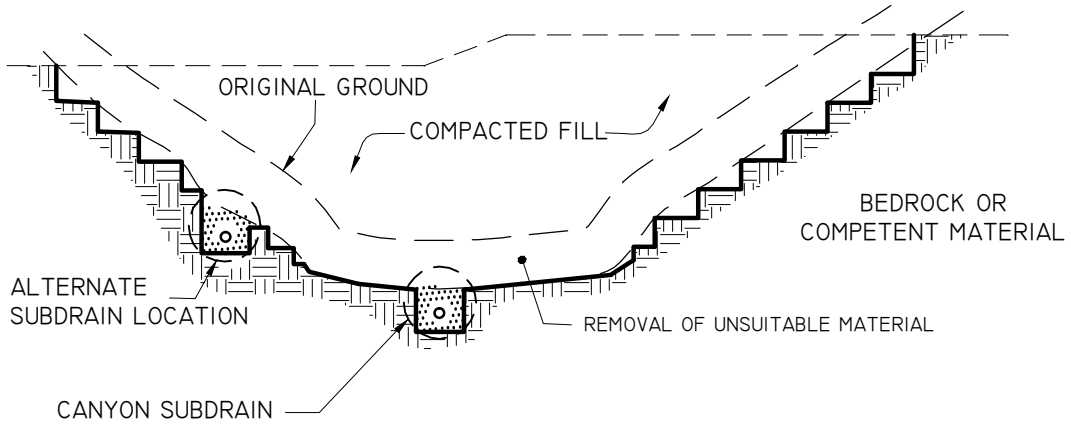
U.S. Standard Sieve Size	% Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

Sand Equivalent >75

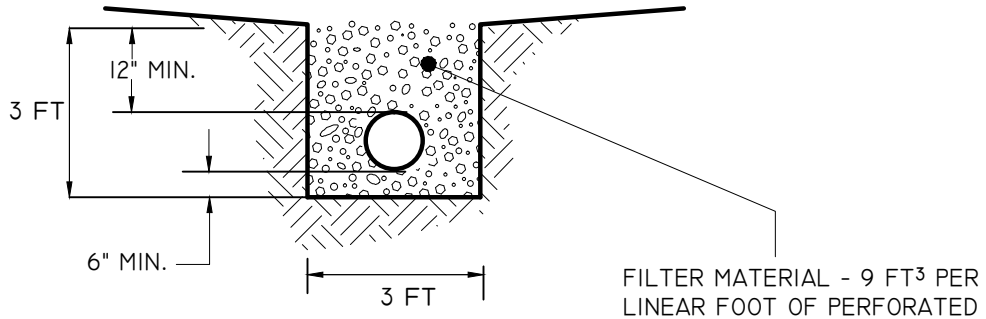
All backdrains and outlet pipes to be 4" diameter PVC pipe (SDR 35 or Schedule 40); Backdrain Perforations positioned down; Upper ends of backdrains to be sealed with an approved cap.

Allan E. Seward
Engineering Geology, Inc.
Geotechnical and Geological Consultants

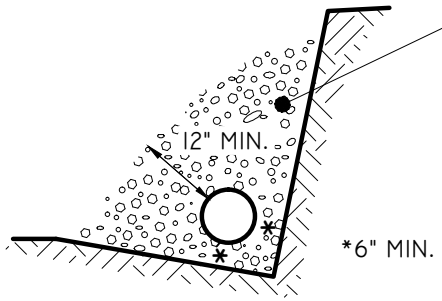
Stability/Buttress Fill and Backdrains



BACKHOE TRENCH



DOZER TRENCH



NOT TO SCALE

NOTES:

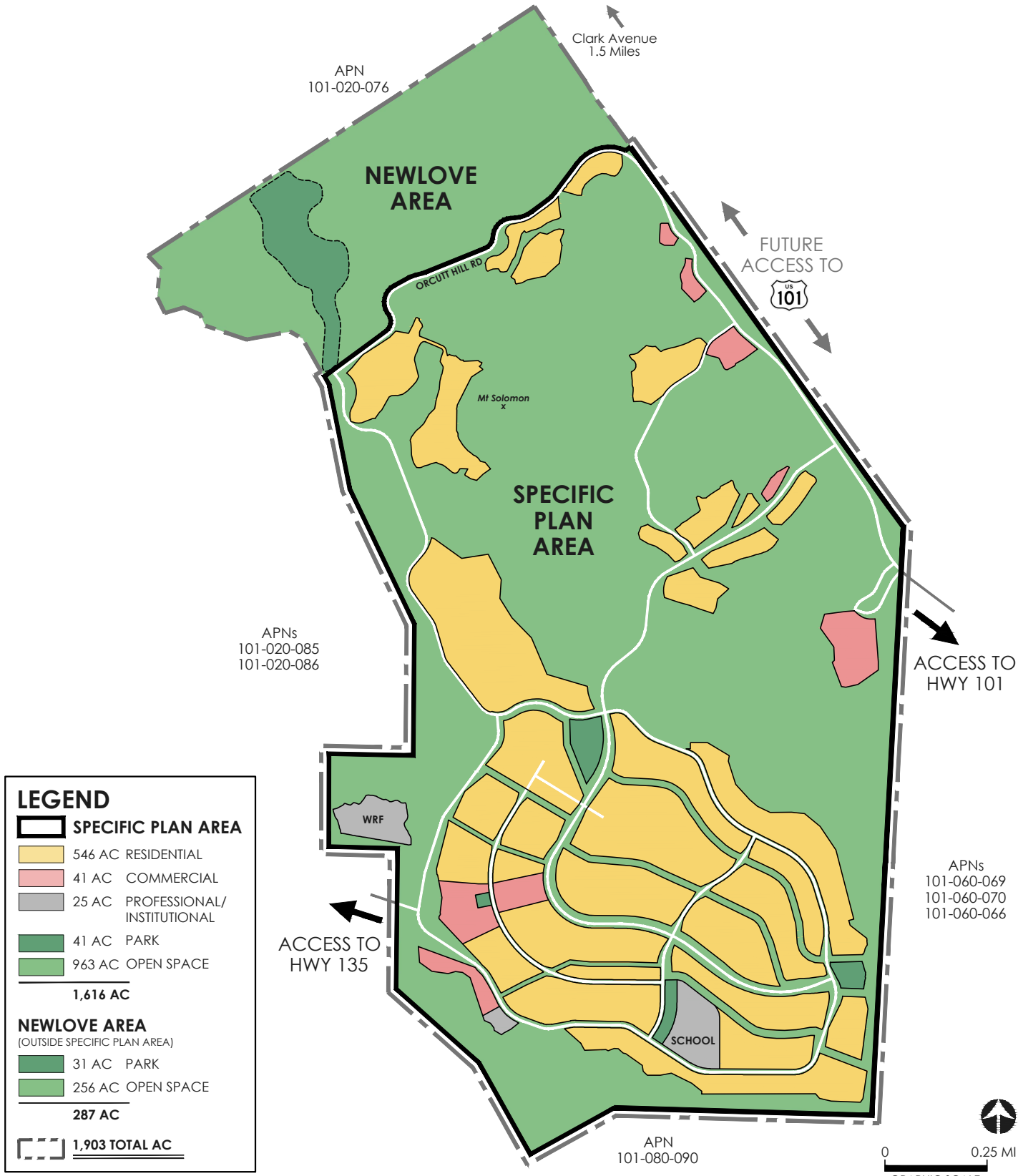
1. ALL SUBDRAINS TO BE 6" MIN. DIAMETER PVC PIPE (SDR 35 OR SCHEDULE 40), 8" MIN DIAMETER FOR PORTION OF CONTINUOUS RUNS IN EXCESS OF 500 FT, AND 10" MIN. DIAMETER FOR PORTION OF CONTINUOUS RUNS IN EXCESS OF 1500 FT.
2. DRAIN PIPE SHOULD HAVE 2 ROWS OF 1/2-INCH DIAMETER PERFORATIONS PLACED AT 90° OFFSET ON UNDERSIDE OF PIPE. CENTER TO CENTER SPACING BETWEEN PERFORATIONS IN EACH ROW SHOULD NOT EXCEED 12 INCHES.
3. A MINIMUM OF 20 FEET OF DRAIN PIPE AT DOWNSTREAM OUTLET SHOULD BE NON-PERFORATED. UPSTREAM END SHOULD BE CAPPED.
4. DRAIN PIPE SHOULD HAVE A MINIMUM 2% GRADIENT UNLESS OTHERWISE SPECIFIED.
5. SUBDRAIN ENDPOINTS AND LONG RUNS SHOULD BE SURVEYED.
6. FILTER MATERIAL SHOULD BE CLASS 2 PERMEABLE MATERIAL, AS SPECIFIED IN SECTION 68 OF THE STATE OF CALIFORNIA, DEPT. OF TRANSPORTATION STANDARD SPECS.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□s□□□s

CANYON SUBDRAIN DETAIL

Appendix G

SOLOMON HILLS
AREA DESIGNATIONS MAP
SANTA BARBARA COUNTY, CA



LEGEND

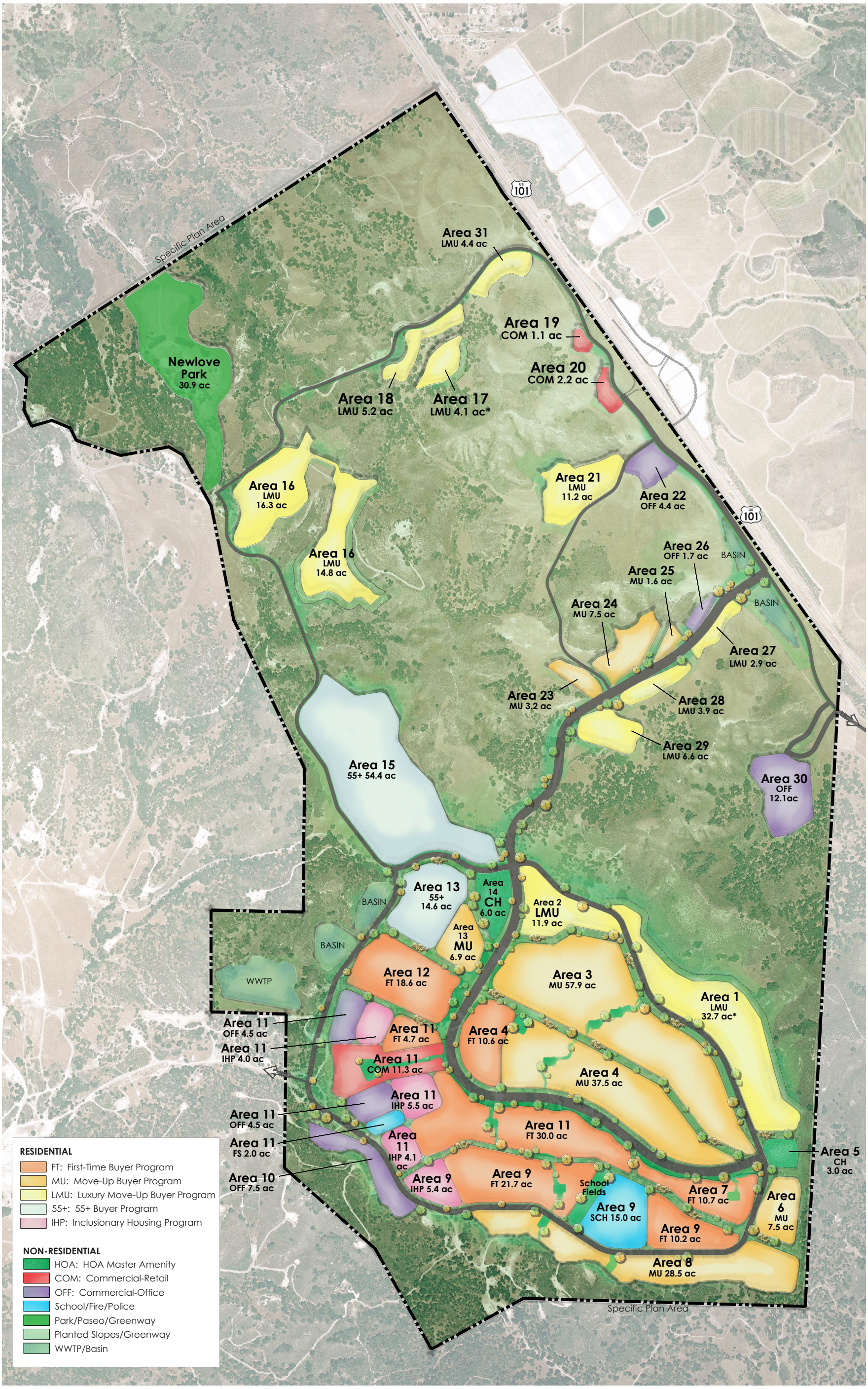
SPECIFIC PLAN AREA

546 AC	RESIDENTIAL
41 AC	COMMERCIAL
25 AC	PROFESSIONAL/ INSTITUTIONAL
41 AC	PARK
963 AC	OPEN SPACE
1,616 AC	

NEWLOVE AREA
(OUTSIDE SPECIFIC PLAN AREA)

31 AC	PARK
256 AC	OPEN SPACE
287 AC	

1,903 TOTAL AC



SOLOMON HILLS

SOLSTRA

NEIGHBORHOOD PLAN LAND USES

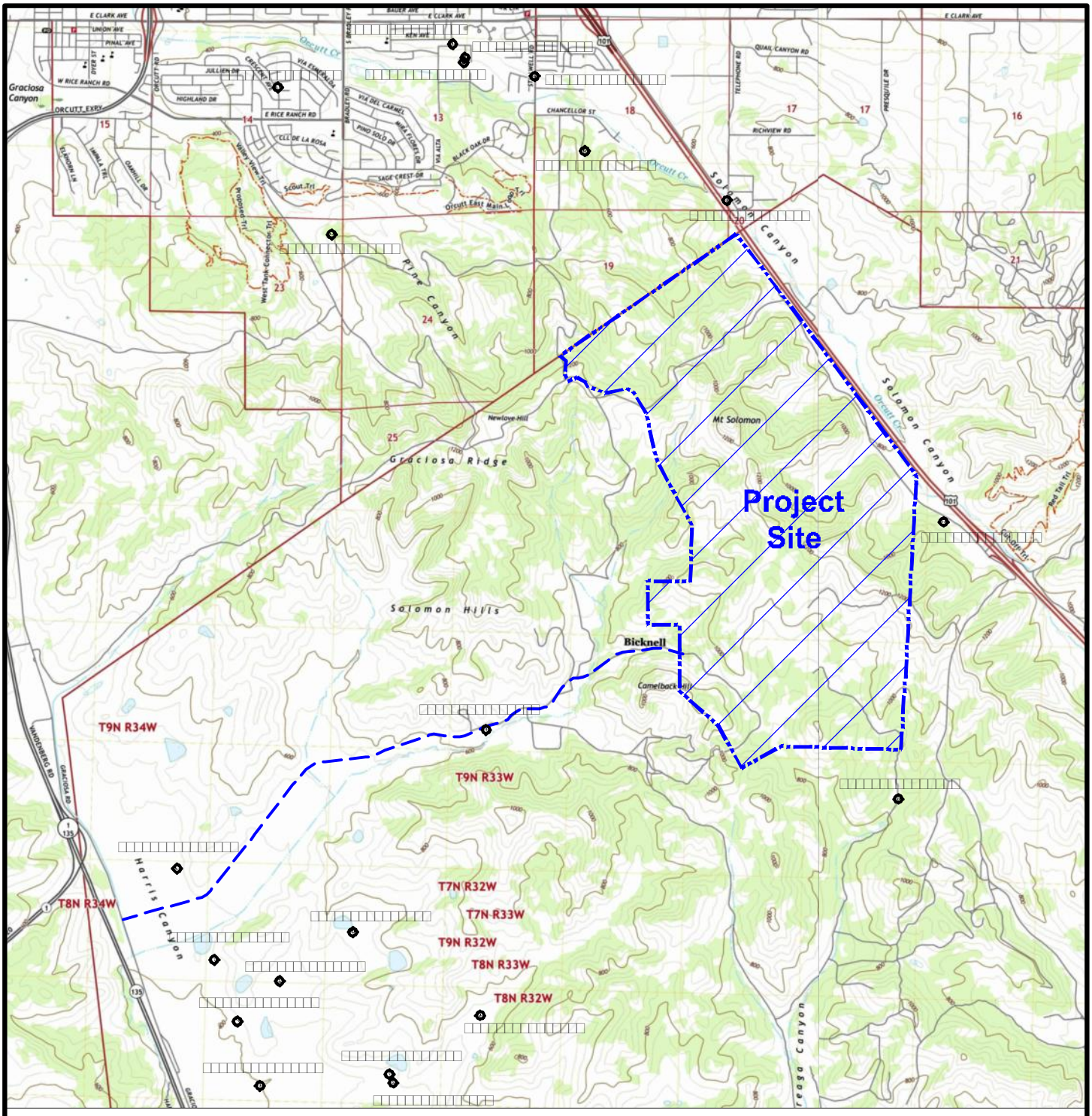
NOTES:
1. Aerial photo from LDC - dated 2022.07.
2. Background information provided by WJ Washburn & Associates, LLC.
3. Adjacent parcel data from Santa Barbara County GIS data.
4. Base and topographic data from Land Development Consultants.
5. Additional mapping data from Urban Planning Concepts.
6. Topographic contour interval is 5 feet, when shown.
7. For illustrative purposes only.

AUGUST 28, 2023
JOB# 2298-03-CU21

5 AC
1 AC

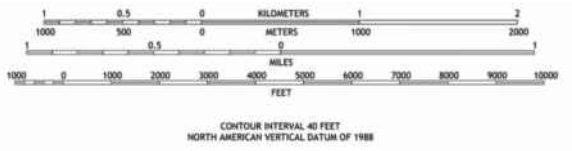
600 300 150 0 300 FT

rrm design group



LEGEND

A□r□□□ □□□ L□□□□□□□ □□□ □□r □ □□P□r □□□ □SGS □ □□□□□□□ □□r □□□r□ □□□□ S□s□□ □ □ □□ □□r□□□



Base Map Source: U.S. Geological Survey Orcutt and Sisquoc Quadrangles, Dated 2021

NOTE: THIS IS NOT A SURVEY OF THE PROPERTY

N

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□A□d G□□□□□□□□□C□s□□□s

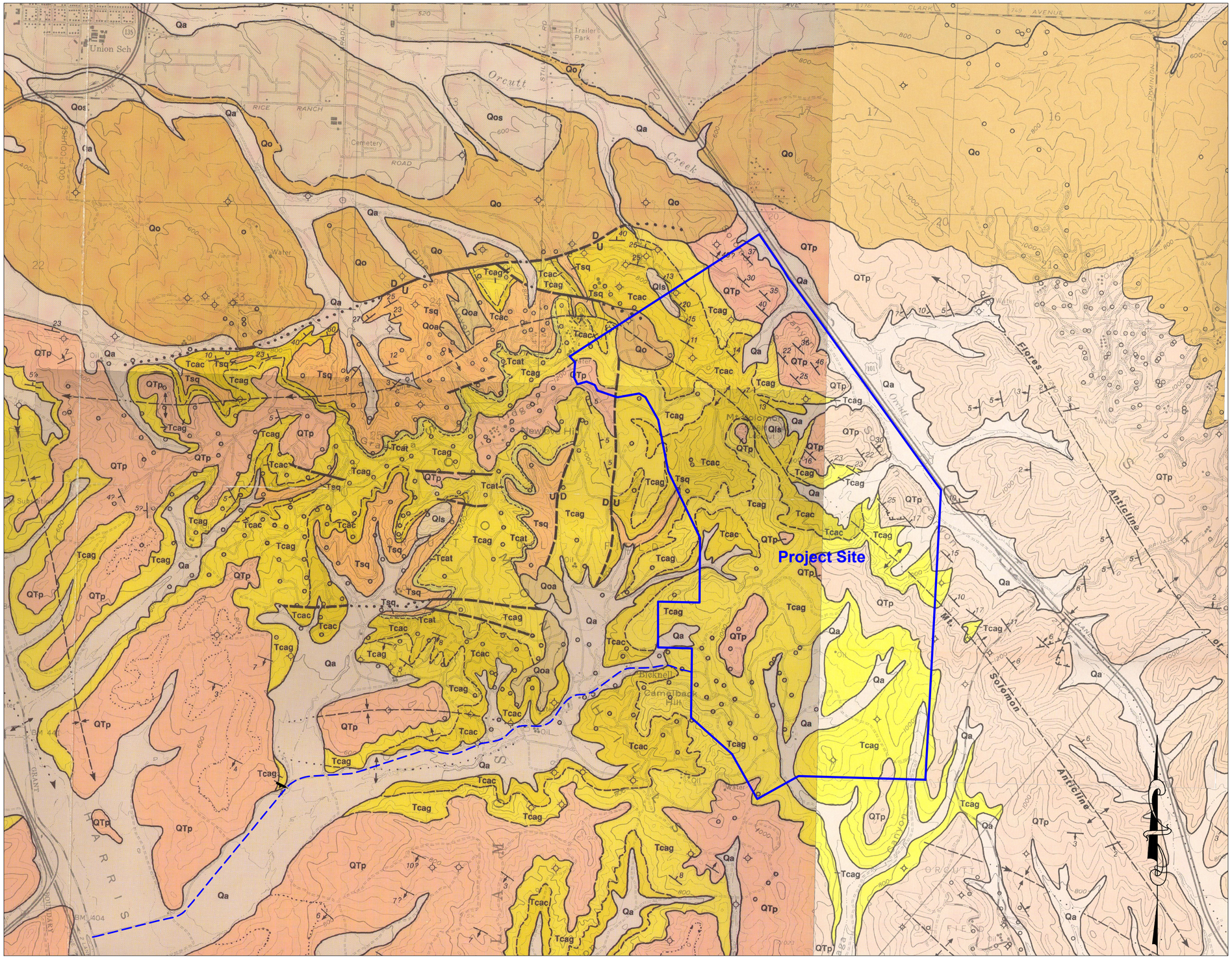
GROUNDWATER WELL LOCATION MAP

Job No.: 23-2195s-1	*Date: 10/20/23*

Table G1 – GROUNDWATER DATE

USGS Well Site Number	Depth to the Highest Measured Groundwater Below Ground Surface & (Date)	Time Period Monitored & (Number of Times Monitored)
344702120244601	112′ (4/1/71)	12/23/70 to 1/20/78 (4)
344703120253201	63′ (12/1/43)	12/1/43 to 12/9/43 (2)
344705120244801	134.08′ (1/30/80)	1/30/80 (1)
344719120253701	69.4′ (1/30/80)	1/30/80 (1)
344721120241801	188′ (10/4/51)	10/4/51 to 1/20/78 (2)
344732120252501	118.75 (1/18/78)	6/15/77 to 1/18/78 (2)
344738120254801	74.94 (1/30/80)	1/30/80 (1)
344745120250201	187.7 (1/30/80)	1/30/80 (1)
344802120255901	83.52 (1/18/78)	6/15/77 to 6/26/19 (95)
344822120215901	153.2′ (2/2/78)	10/22/51 to 2/2/78 (3)
344936120214301	198.05′ (4/12/79	2/3/56 to 4/8/91 (35)
345056120250801	502′ (6/1/61)	6/1/61 (1)
345106120225601	483′ (5/29/58)	5/29/58 to 7/19/67 (3)
345119120234401	475′ (4/13/71)	4/13/71 to 12/13/71 (3)
345135120252501	340′ (6/1/61)	6/1/61 (1)
345140120240001	330′ (6/22/56)	6/22/56 to 9/16/66 (3)
345144120242401	411′ (9/1/66)	9/1/66 (1)
345144120242402	390 (6/1/61)	6/1/61 (1)
345148120242701	476′ (2/1/71)	2/1/71 (1)
344841120242001	91.06′ (3/15/16)	3/15/16 to 6/26/19 (8)

Data From the USGS National Water Information System: Web Interface
https://maps.waterdata.usgs.gov/mapper/index.html



LEGEND

QUATERNARY

Holocene

Qa | Qds | Qg | Qa — Qls

SURFICIAL SEDIMENTS

Qs *beach sand deposits*
Qds *dune sand deposits*
Qa *valley and floodplain alluvial deposits*
Qls *landslide debris*

Pleistocene

Qos | Qoa — Qo

OLDER DISSECTED SURFICIAL SEDIMENTS

Qos *dune sand deposits, in places weakly consolidated*
Qoa *remnants of weakly consolidated stream terrace and alluvial fan deposits of silt, sand and gravel*
Qo *Orcutt Sand: tan to rusty brown, poorly consolidated to locally indurated, wind-deposited sand; pebble gravel at base locally*

UNCONFORMITY

Pliocene

QTp

PASO ROBLES FORMATION

nonmarine; latest Pliocene to early Pleistocene age

QTp *weakly consolidated, light greenish-gray to reddish alluvial sediments; conglomerate composed largely of Monterey Shale pebbles*

Tca | Tcag — Tcac

CAREAGA SAND

shallow marine regressive; late Pliocene age

Tca *undivided; weakly indurated, massive, grayish-yellow, locally pebbly sand*
Tcag *Graciosa Member: thick bedded, grayish-yellow, locally pebbly, weakly indurated sand; fossiliferous calcareous reef at base*
Tcac *Cebada Member: massive tan-yellow, weakly indurated, fine-grained sand; locally includes* **Tcat**, *basal tar-soaked sand*

Tf

FOXEN MUDSTONE

marine; middle to late Pliocene age

Tf *light gray massive claystone and siltstone*

Tsqd | Tsqo — Tsq

SISQUOC FORMATION

marine; late Miocene age

Tsqd *white to cream-white, punky, diatomaceous claystone and clayey diatomite*
Tsqo *same as Tsqd, but oil-saturated and partly burned locally to frothy stone*
Tsq *(Tudos Santos Claystone Member of Woodring and Bramlette, 1950): light gray claystone and slightly diatomaceous or siliceous clay shale*

SYMBOLS

not all symbols present on each map

FORMATION CONTACT *dashed where inferred or indefinite* — **MEMBER CONTACT**

CONTACT BETWEEN SURFICIAL SEDIMENTS *located approximately in places*

U / D — 70 — ? — **FAULT**

dashed where indefinite or inferred, dotted where concealed, queried where existence doubtful. Parallel arrows indicate inferred relative lateral movement. Relative vertical movement shown by U/D (U = upthrown side D = downthrown side). Short arrow indicates dip of fault plane.

ANTICLINE — arrow on axis indicates direction of plunge, dotted where concealed — **SYNCLINE**

horizontal · 25 inclined · 20 inclined (approximate) · vertical · 25 overturned · 25 inclined metamorphic foliation

STRIKE AND DIP OF BEDDED ROCKS

DIRECTION OF LANDSLIDE MOVEMENT · **SANDSTONE BED** · **CONGLOMERATE BED**

ABANDONED EXPLORATORY OIL WELL

OIL WELL LOCATIONS INDICATED ON TOPOGRAPHIC BASE MAP.

0 2000' 4000'

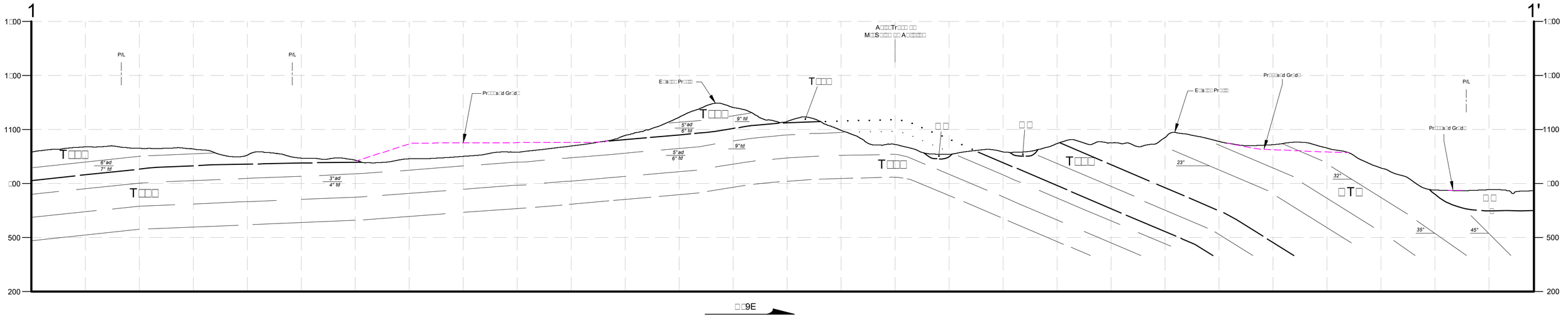
A[illegible] [illegible] S[illegible]

S[illegible] G[illegible] M[illegible] C[illegible] d r[illegible] dr[illegible] s S[illegible] r C[illegible] C[illegible] r[illegible] T[illegible] s D[illegible] R19 9 D[illegible] F[illegible] d[illegible] M[illegible] DF-2[illegible] d G[illegible] M[illegible] S[illegible] dr[illegible] S[illegible] r C[illegible] C[illegible] r[illegible] T[illegible] s D[illegible] R199[illegible] D[illegible] F[illegible] d[illegible] M[illegible] DF-53[illegible]

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

REGIONAL GEOLOGIC MAP

Date: 10/20/23	Job No.: 23-2195s-1
Scale: As S[illegible]	CAD File: R[illegible] G[illegible] M[illegible] D[illegible]
P[illegible]	Geology by: S[illegible]
	Drawn by: VCG
	Revised:



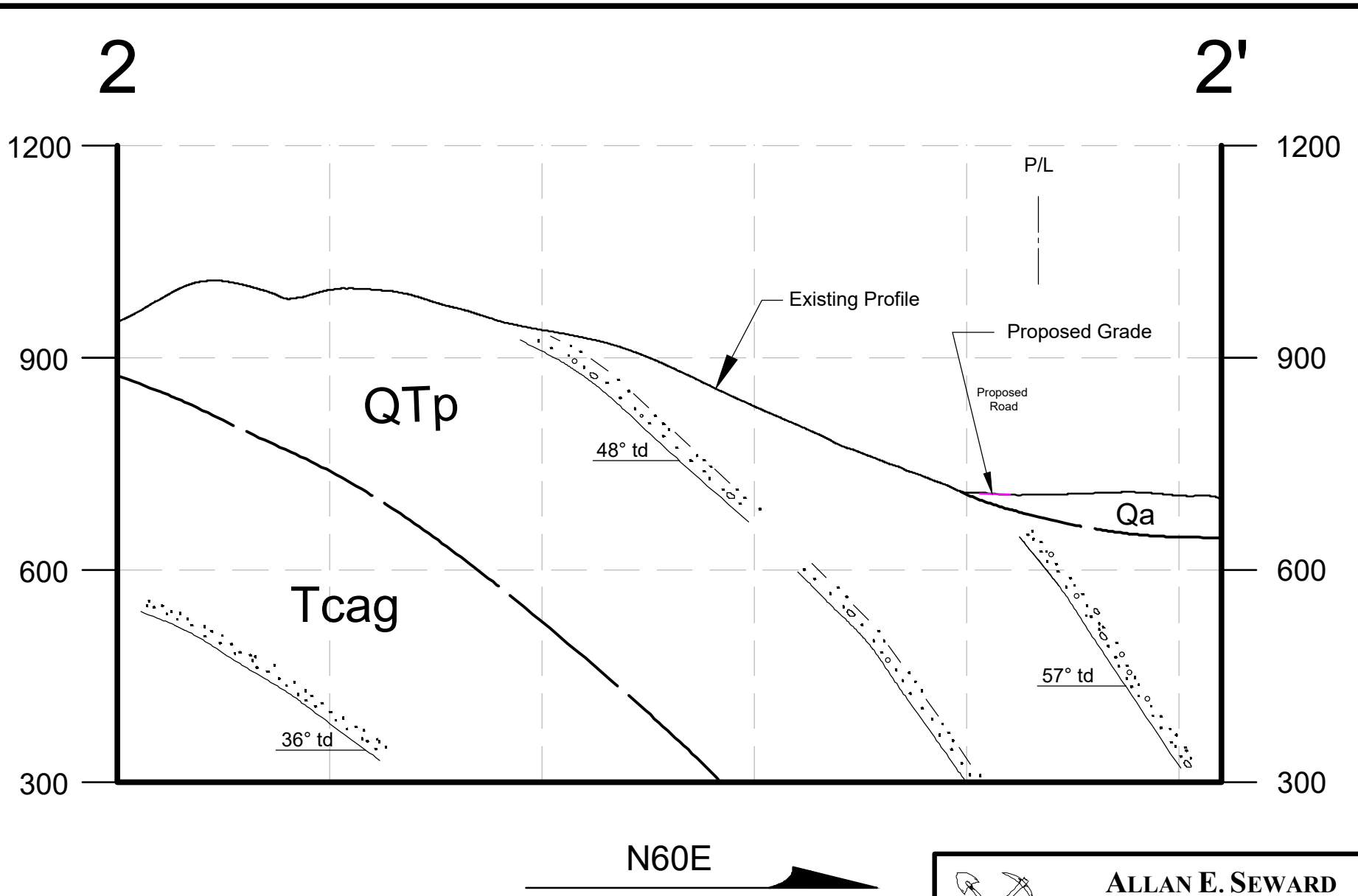
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□ d G□□□□□□□□ C□□s□□□□s

Cr□□S□□□□□ □□□□

Job No.: □□□□□□□□

Date: □□□□□□

Scale: □"□□□□□□□V□



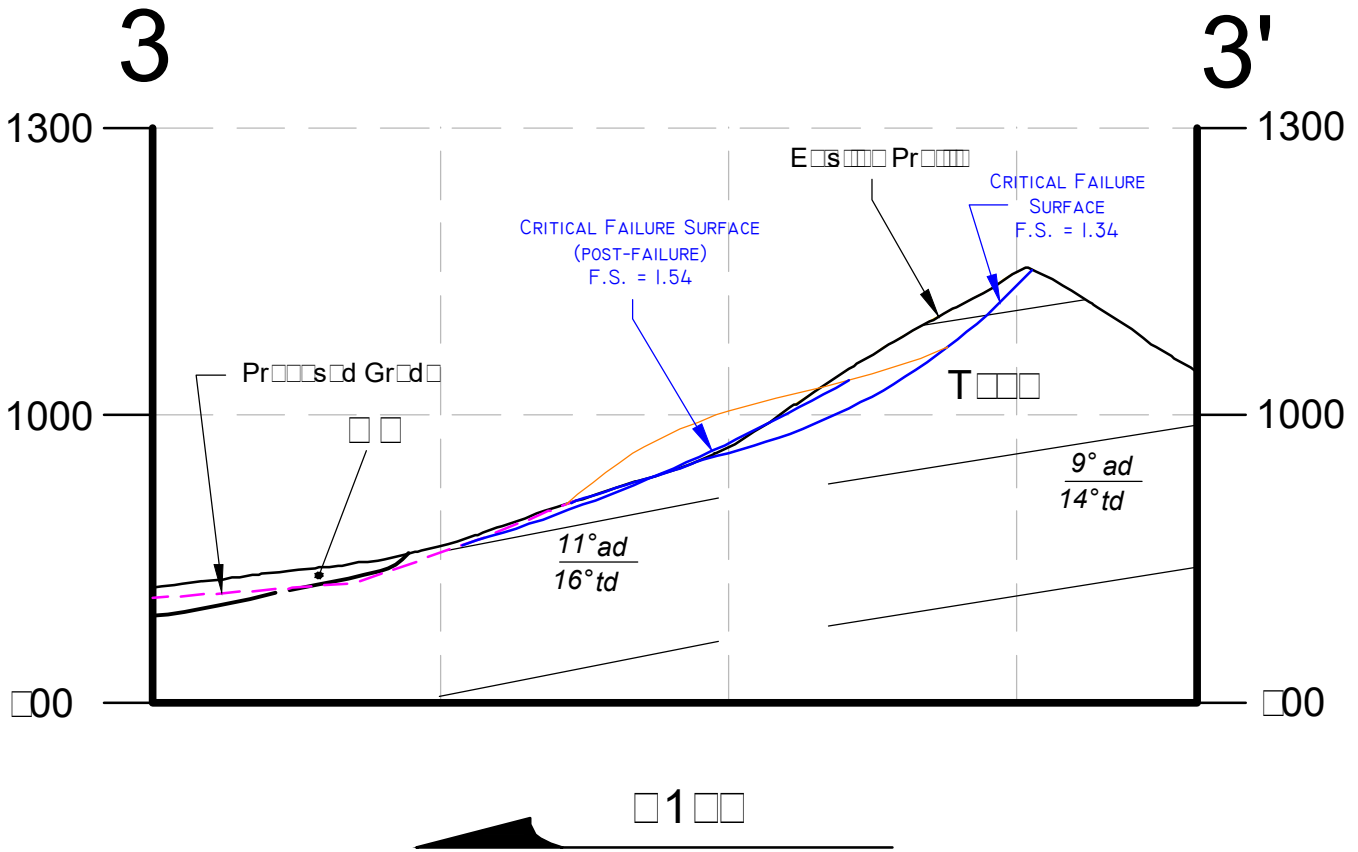
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

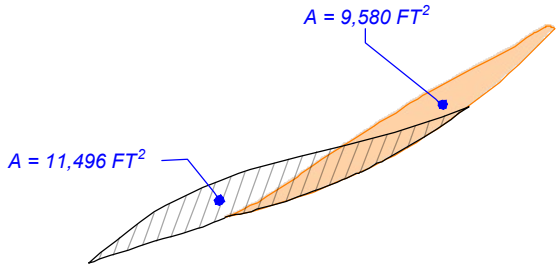
Cr□□□S□□□□□□ □□□□

Job No.: □□□□□□□□□

Date: □□□□□□□

Scale: □"□□□□□□□□V□





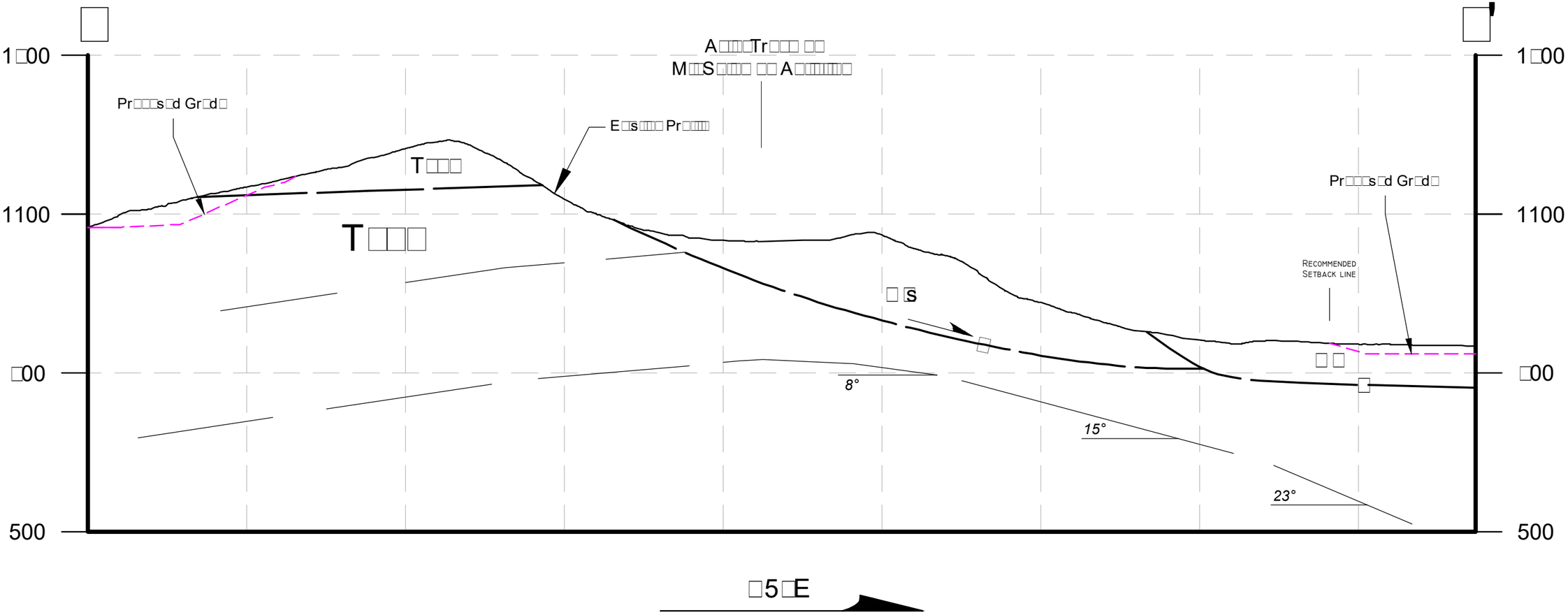
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□□d G□□□□□□□□□□C□s□□□□s

Cr□□□S□□□□□□ □□□□

Job No.: □□□□□□□□□□

Date: □□□□□□□□

Scale: □"□□□□□□□□ □V□



□5□E

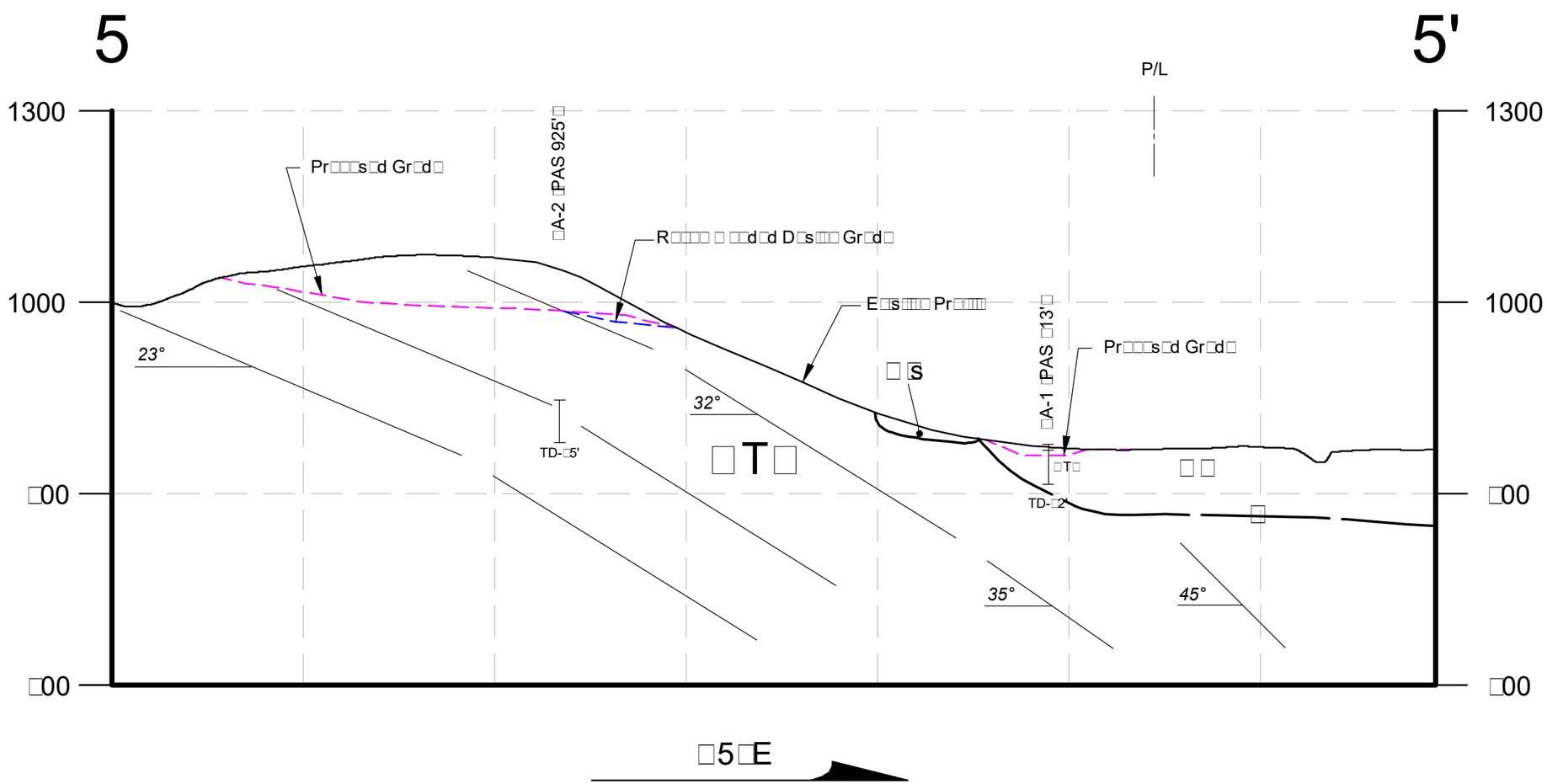
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□□s□□□□s

Cr□□□S□□□□□□ □□□□

Job No.: □□□□□□□□□

Date: □□□□□□□

Scale: □" □□□□□□□ □V□



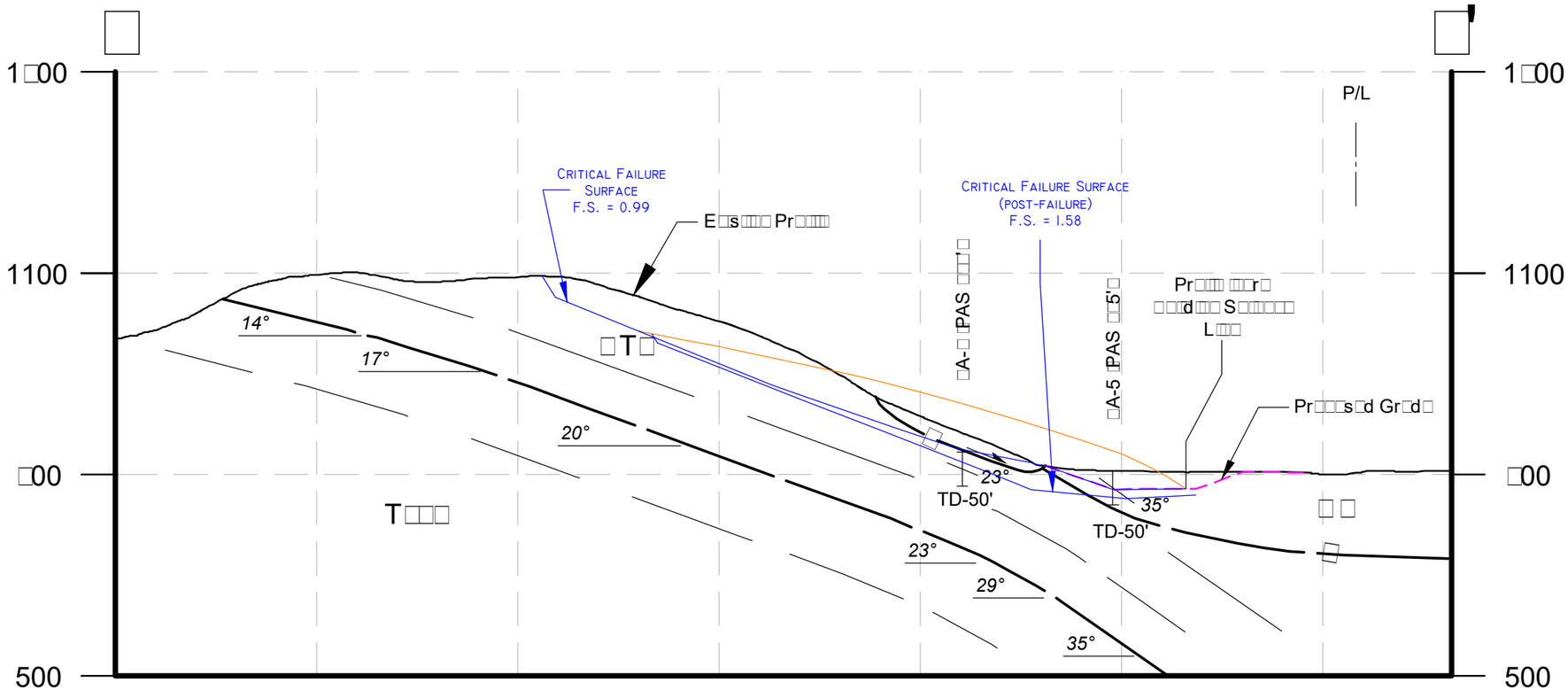
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□C□s□□□s

Cr□□S□□□□□ □□□

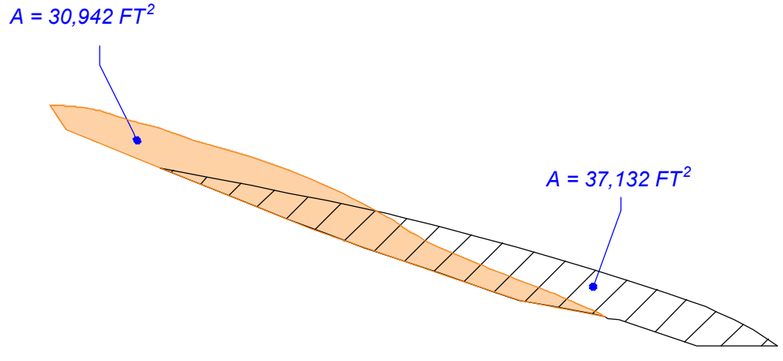
Job No.: □□□□□□□□

Date: □□□□□□□

Scale: □"□□□□□□ □V□



□□3E



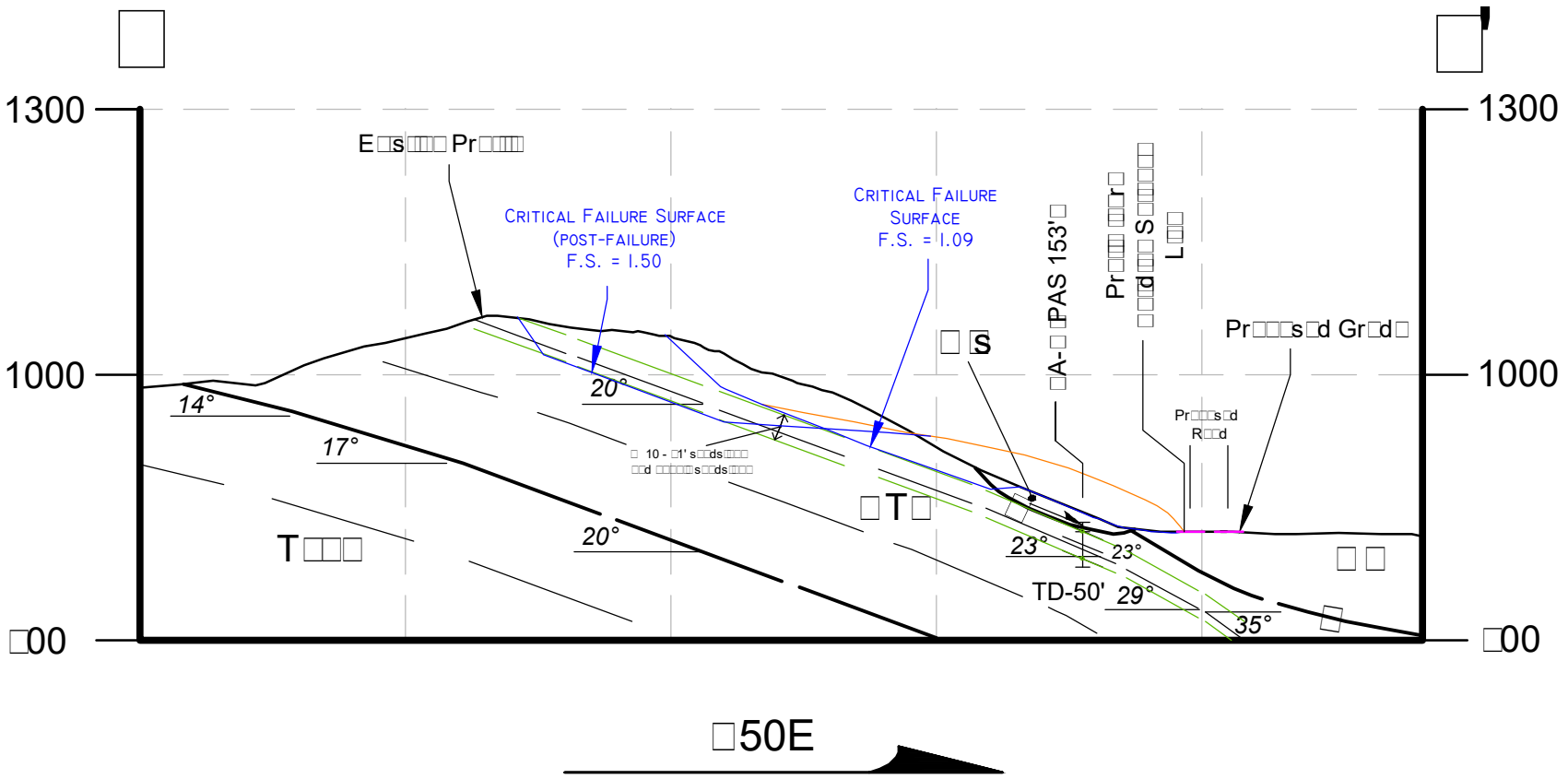
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□□s□□□□s

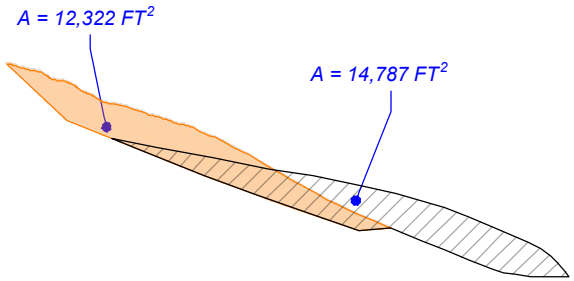
Cr□□□S□□□□□□ □□□□

Job No.: □□□□□□□□□

Date: □□□□□□□

Scale: □"□□□□□□□ □V□





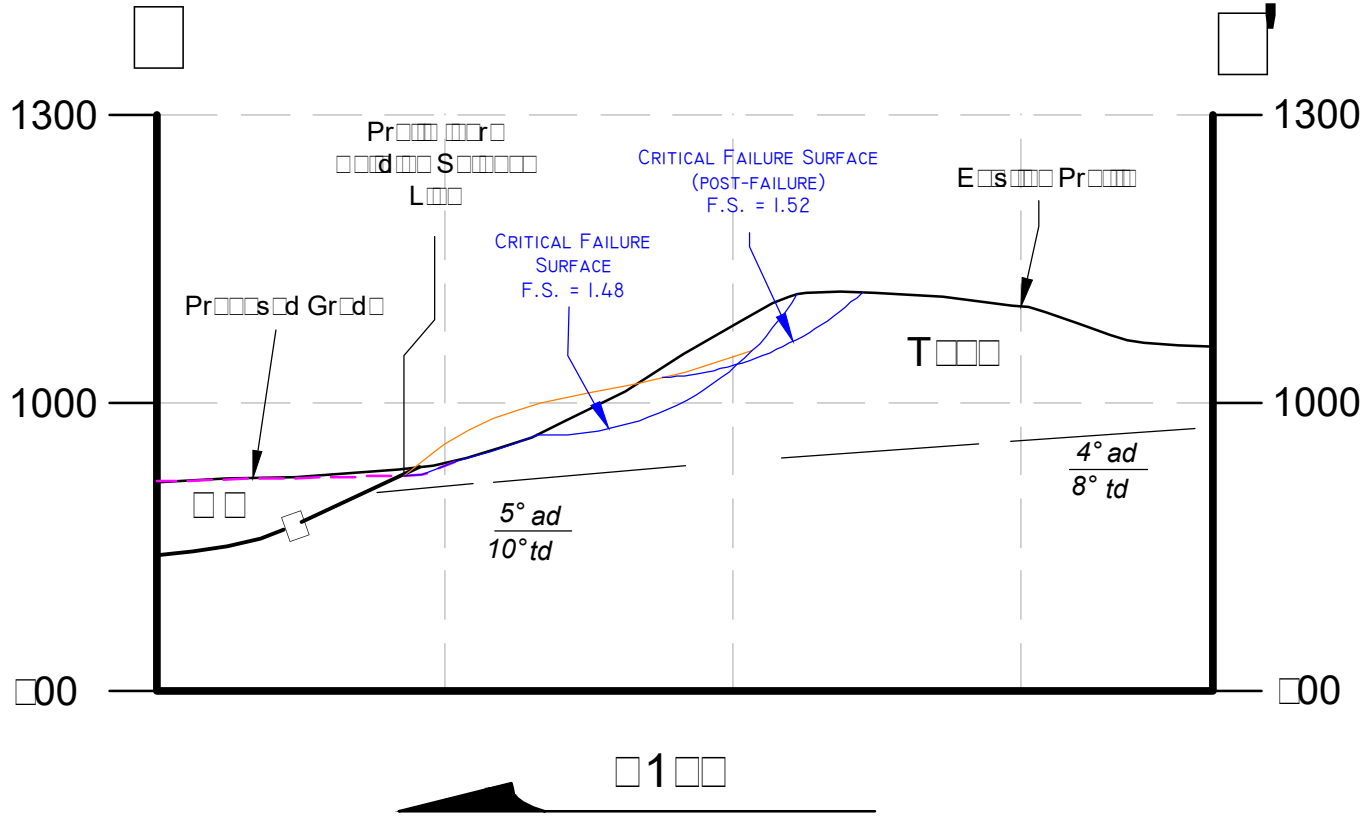
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□□d G□□□□□□□□□□C□s□□□□s

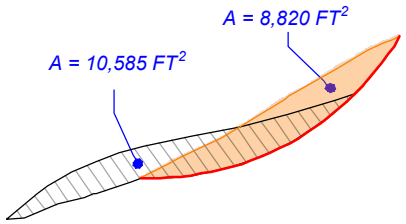
Cr□□□S□□□□□□ □□□□

Job No.: □□□□□□□□□

Date: □□□□□□□

Scale: □"□□□□□□ □V□





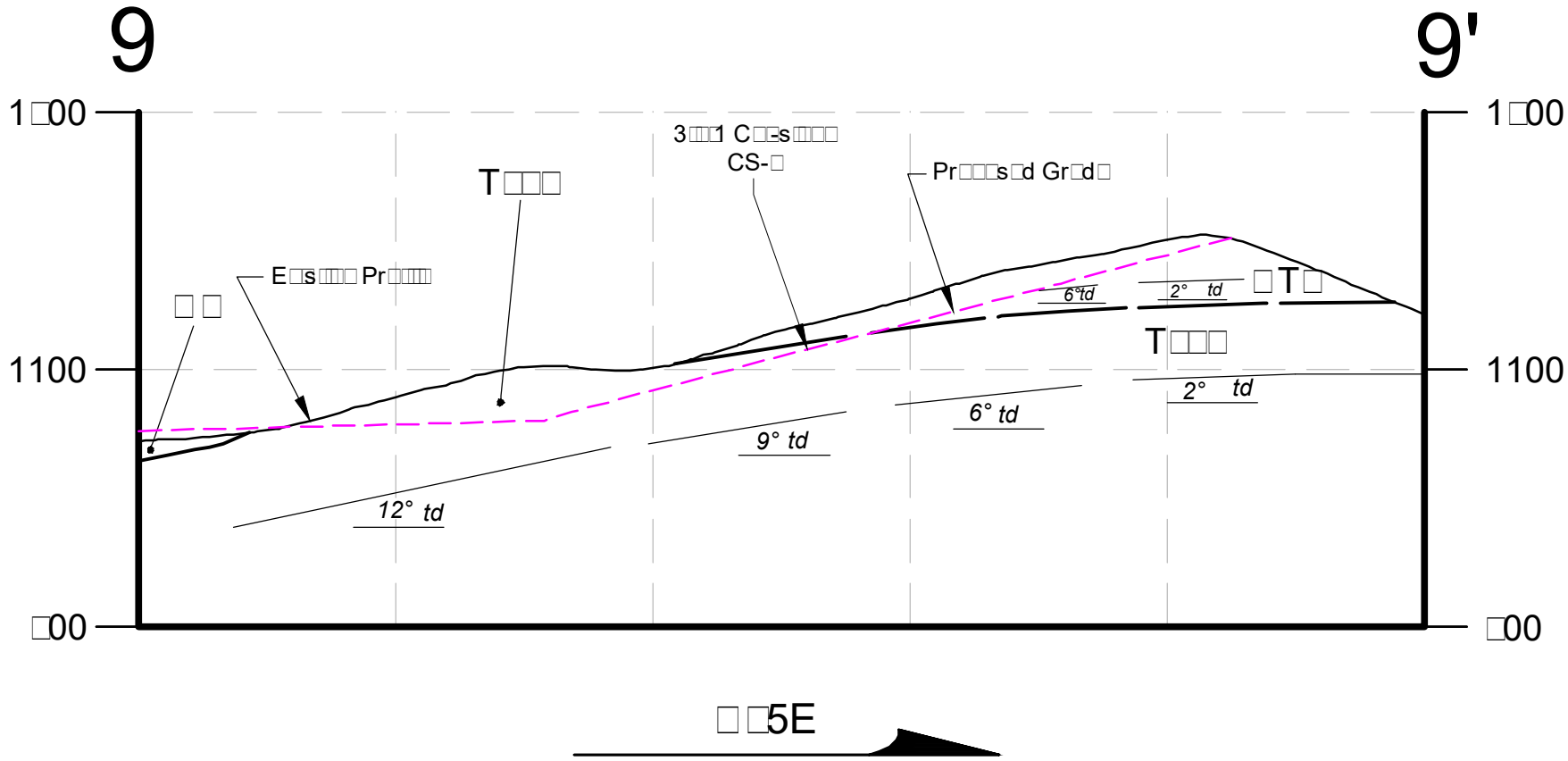
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.

Cr S

Job No.:

Date:

Scale:



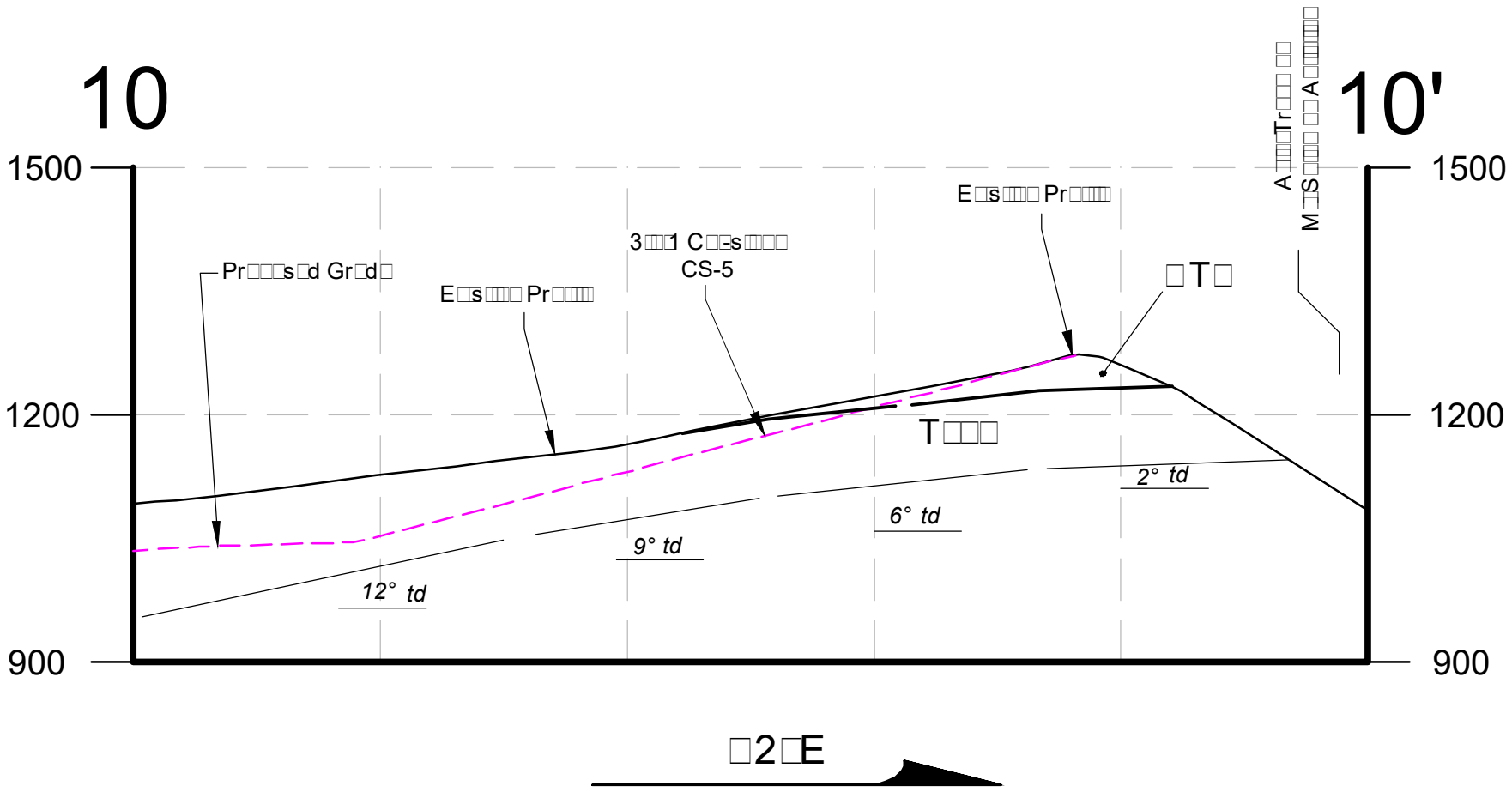
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□□d G□□□□□□□□□C□s□□□s

Cr□□□S□□□□□□ □□□□

Job No.: □□□□□□□□□

Date: □□□□□□□

Scale: □"□□□□□□□ □V□



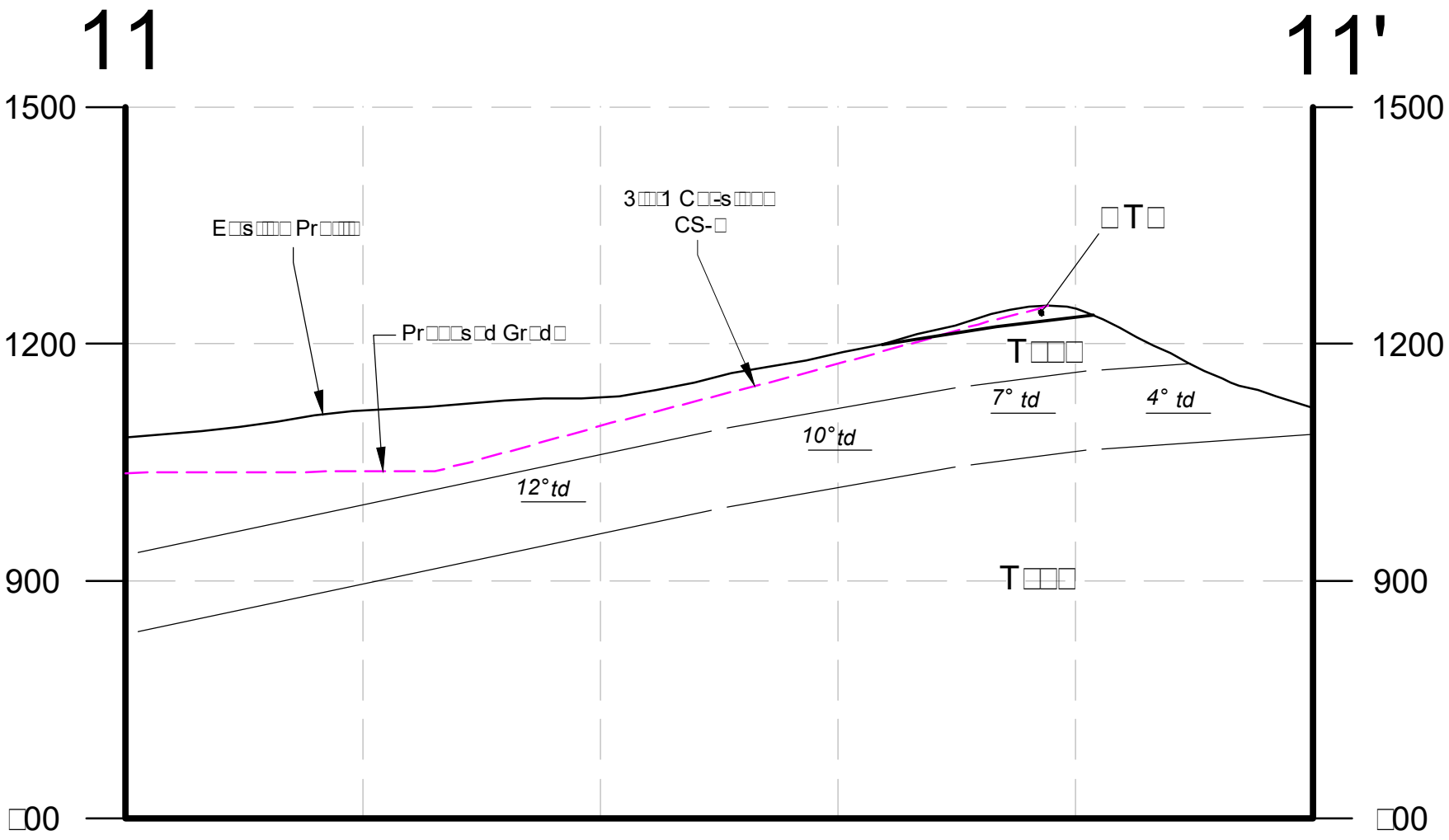
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□C□s□□□s

Cr□□S□□□□□ □□□□□

Job No.: □□□□□□□□

Date: □□□□□□

Scale: □"□□□□□□ □V□



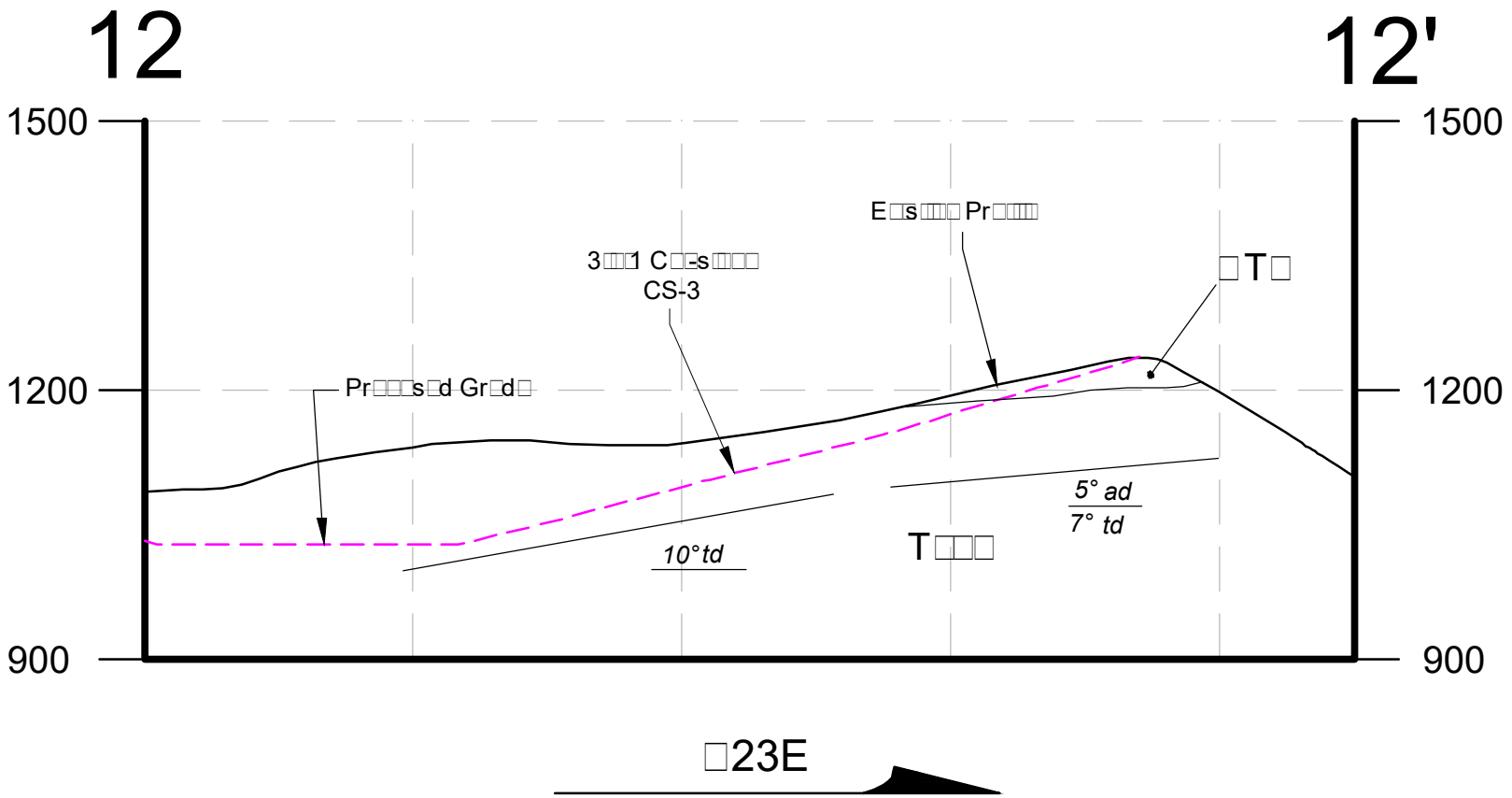
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□□d G□□□□□□□□□C□□s□□□□s

Cr□□□S□□□□□□ □□□□□□

Job No.: □□□□□□□□□

Date: □□□□□□□

Scale: □"□□□□□□□ □V□



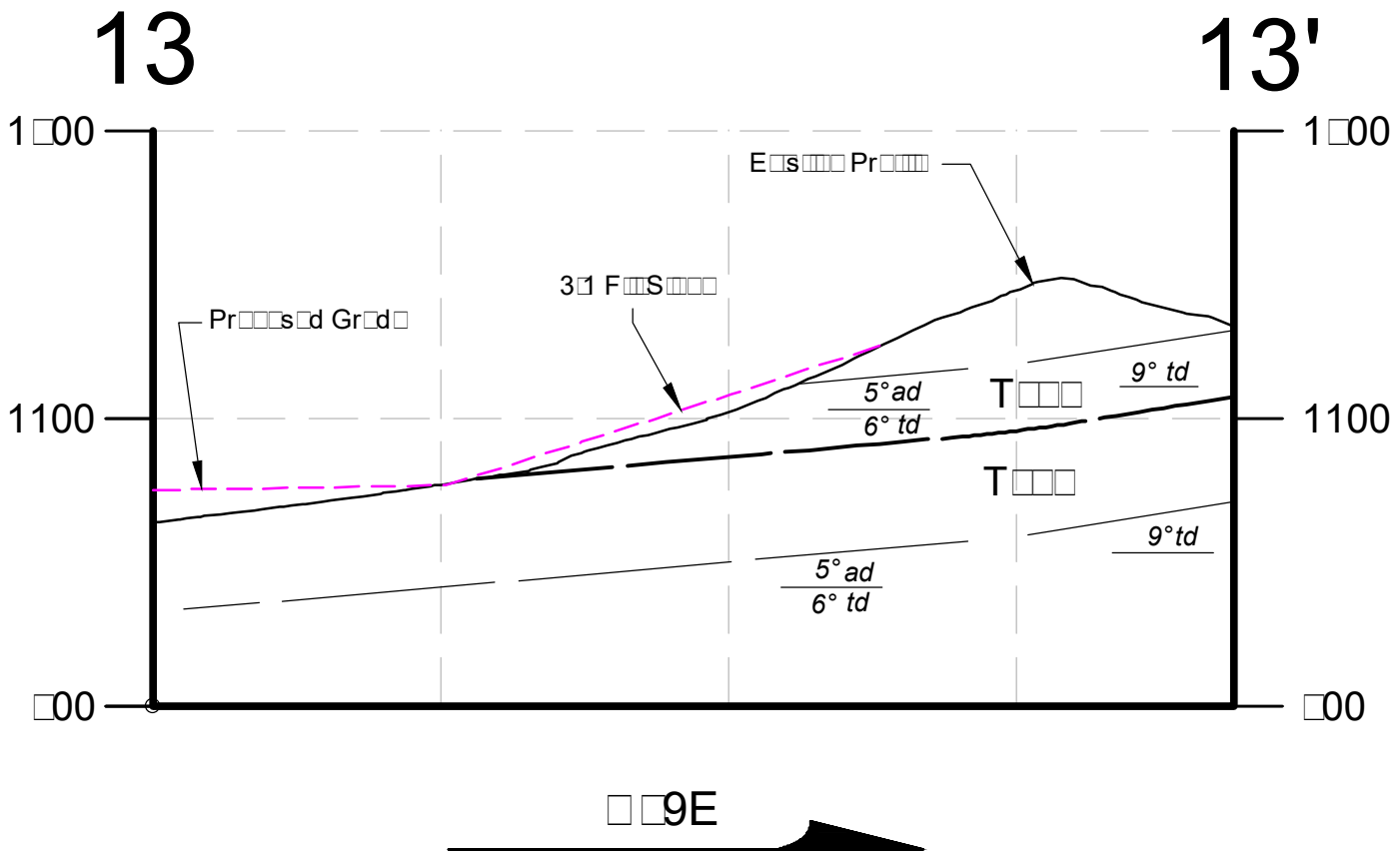
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□d G□□□□□□□□□C□s□□□s

Cr□□S□□□□□ □□□□□

Job No.: □□□□□□□□

Date: □□□□□□

Scale: □"□□□□□□ □V□



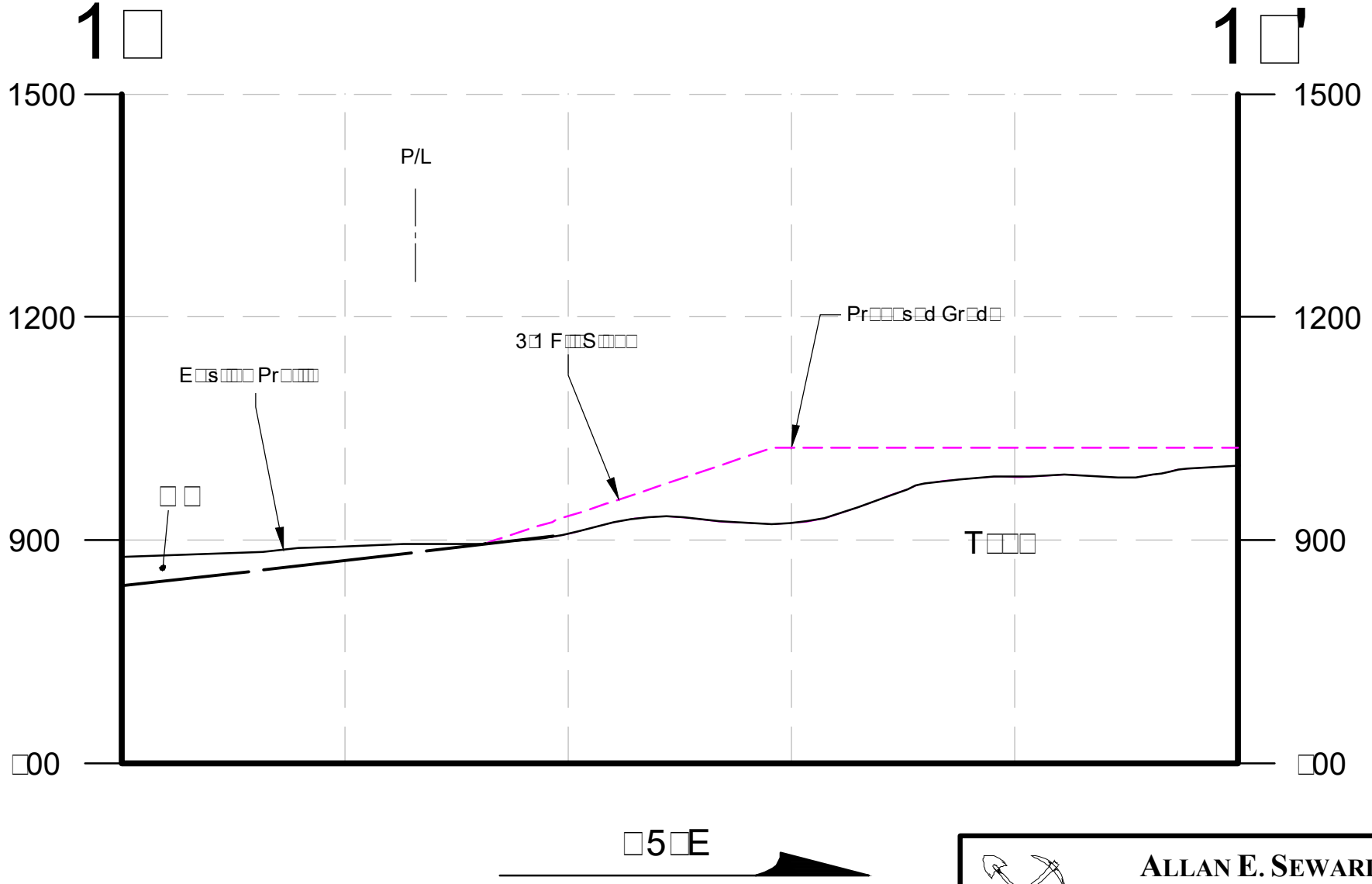
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□□d G□□□□□□□□□C□s□□□s

Cr□□S□□□□□ □□□□□

Job No.: □□□□□□□□

Date: □□□□□□□

Scale: □"□□□□□□ □V□



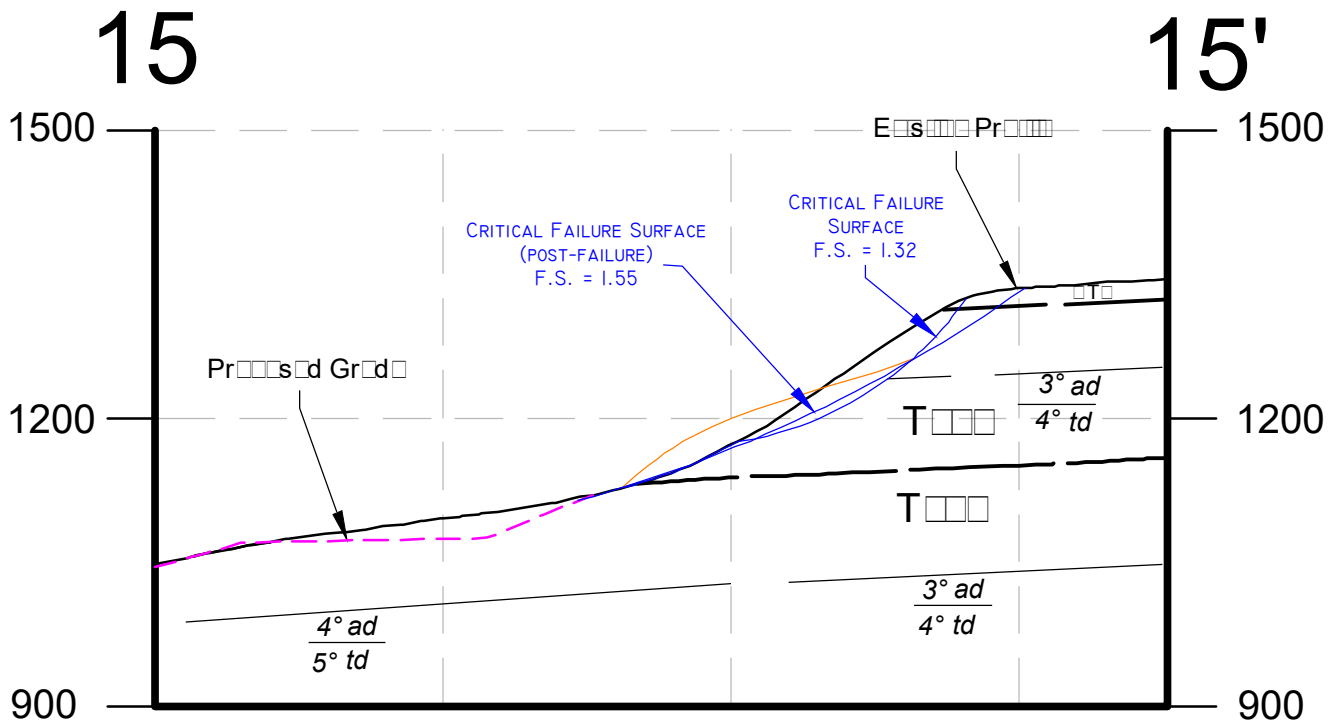
ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
G□□□□□□□□□□d G□□□□□□□□□C□s□□□□s

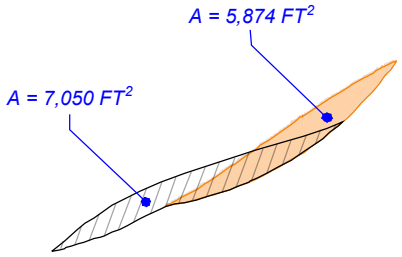
Cr□□S□□□□□ □□□□□□

Job No.: □□□□□□□□□

Date: □□□□□□□

Scale: □"□□□□□□□ □V□





ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.

Cr□□S□□□□□ □□□□□

Job No.: □□□□□□□□□

Date: □□□□□□□

Scale: □"□□□□□□ □V□

Pad Yield Break Down		
Residential	**Area (sf)**	**Area (ac)**
FTB	4,952,844	113.7
MU	6,412,342	147.2
LMU	5,280,720	121.2
55+	3,005,566	69.0
IHP	827,135	19.0
Residential Total		470.1
Non Residential	**Area (sf)**	**Area (ac)**
HOA Master Amenity	391,604	9.0
Commercial/Retail	724,414	16.6
Office	1,511,072	34.7
School/Fire/Police	739,634	17.0
WWTP	441,413	10.1
Basins	565,414	13.0
Non Residential Total		100.4
Roads	3,331,861	76.5
Slopes	12,202,314	280.1

Summary	
Land Use	**Area (ac)**
Residential	470.1
Non Residential	100.4
Roads	76.5
Slopes	280.1
Total	927.1

LEGEND

- Qa — A□□□□□
- Qoa — □ d□r □□□□□□□
- QTp — P□s□ R□□□s F□r□ □□□□
- Tcag — C□r□□□□□ S□□d F□r□ □□□□ - Gr□□□s□ □ □□ □□r
- Tcac — C□r□□□□□ S□□d F□r□ □□□□ - C□□□d□ □ □□ □□r
- Tsq — S□s□□□□□ F□r□ □□□□
- 48° — S□f□□□ □□d d□□ □□□□dd□□□
- 10° — A□□r□□□□ □□□s□f□□□ □□d d□□ □□□□dd□□□
- 19° — V□r□ □□□□r□□□□ □□□ s□f□□□ □□d d□□ □□□□dd□□□
- 35° — A□□r□□□□ s□f□□□ □□d d□□ □□□□dd□□□ □□ □□r□□□
- 5° — S□f□□□ □□d d□□ □□□□□□□□□
- 13° — S□f□□□ □□d d□□ □□□r□□□r□
- 21° — S□f□□□ □□d d□□ □□s□d□ □□□□□□□□rr□□ □□d□□□□s r□□□d □□s□f□□□□s □□□□□ □□□s□d□ □□□□□
- 15° — S□f□□□ □□d d□□ □□□□dd□□□ □□□r D□□□□□ □ □□□
- 30° — S□f□□□ □□d d□□ □□□□dd□□□ □□□r □ □□dr□□□ □ □□□
- G□□□□□ — G□□□□□□ □□s□□□□
- S□□□ — G□□□□□□□□□□□□s□□□□
- □A□□□ — □□□□□□c□□□□r □□r□□□
- □S□□□ — □ □□□□-s□□□ -□□□□r □□r□□□
- C□□□ — C□□□ P□□□r□□ □□□r T□s□CPT□
- G□□□□□□ □□□□□□□□d□□□d □ □□□r□ □□□□□□□d
- A□□□r□□□ □□□□□□□□□□
- F□□□r□□□ □□□r D□□□□□ □ □□□□d□□□d □ □□□r□ □□□□□□□d
- R=38' — Es□□ □□□d r□□ □□□□d□□□□
- 15 15' — Cr□ss S□□□□□

GROSS AFFECTED AREA OF DISTURBANCE:	912.5 ACRES
RAW CUT:	22,1744,258 CUBIC YARDS
RAW FILL:	25,587,073 CUBIC YARDS
ADJUSTED FILL: (ASSUMED 20% SHRINKAGE)	3,412,815 CUBIC YARDS

THE APPROXIMATE RAW EARTHWORK QUANTITIES SHOWN HEREON REPRESENT THE ESTIMATED VOLUMETRIC DIFFERENCE CALCULATED BETWEEN THE PROPOSED PRELIMINARY ROUGH GRADE SURFACE AND EXISTING GROUND TOPOGRAPHIC SURFACE, AND ARE SUBJECT TO CHANGE. APPROXIMATE QUANTITIES SHOWN ON ARE FOR REFERENCE ONLY, THESE ESTIMATES DO NOT INCLUDE CONSIDERATIONS FOR LOSSES OR BULKING DUE TO: SOIL AMENDMENTS, STABILIZATION, SLOPE BENCHING, DRAINAGE, SWALES, CONSTRUCTION TECHNIQUE, FOOTING & TRENCHING SPOILS, ETC. THESE CONSIDERATIONS, IN ADDITION TO ACTUAL FIELD CONDITIONS AND THE FINAL RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER, MAY SIGNIFICANTLY EFFECT THE FINAL IMPORT/EXPORT QUANTITIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CALCULATE ACTUAL QUANTITIES FOR THE PURPOSE OF BIDDING, CONSTRUCTION AND COST ESTIMATES. CONTRACTOR IS ALSO RESPONSIBLE FOR ADJUSTMENTS TO SLOPE HINGE POINTS IN ORDER TO PROVIDE GRADED PAD AREA ADJACENT TO PATHS, WALKWAYS, AND ROADS FOR UTILITY BOXES, TRANSFORMERS, AND ABOVE GROUND UTILITY INFRASTRUCTURE.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

PRELIMINARY GEOLOGIC MAP

Date: 10/20/23 | Job No.: 23-2195s-1
Scale: 1" = 300' | CAD File: AES 23:10:09 G2D Dr:□G□□□□□□□M:□□
PLATE III | Geology by: STAFF | Drawn by: VCG | Revised:

ESTIMATED PRELIMINARY EARTHWORK QUANTITIES

SOLOMON HILLS
LAND PLANNING

OVERALL GRADING & DRAINAGE PLAN

DRAFT

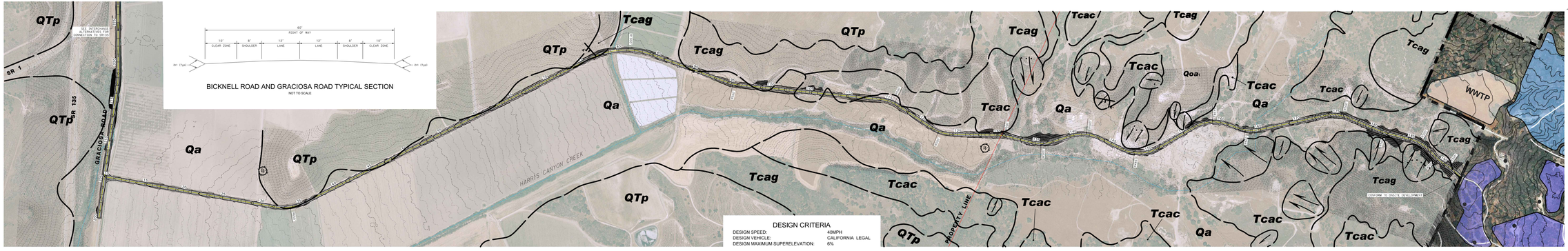
OCTOBER 15, 2023

C-1

JOB# 2298-02-CU22

300 0 300 FT

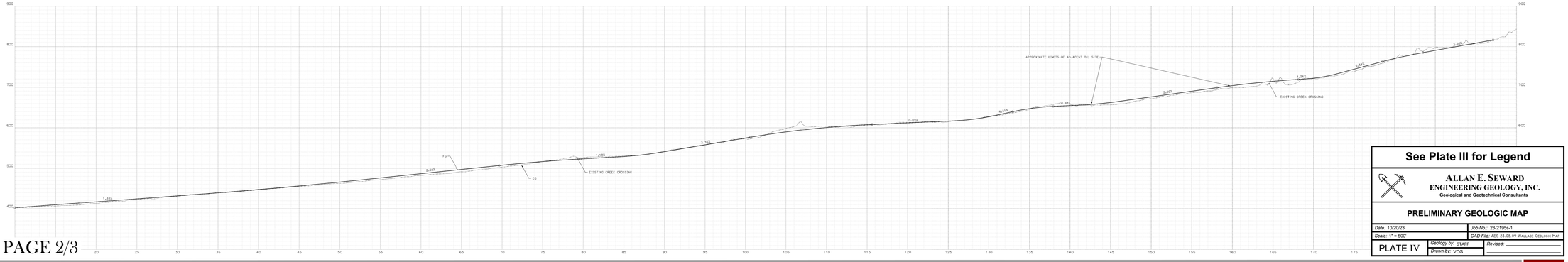
G2_D



BICKNELL ROAD AND GRACIOSA ROAD TYPICAL SECTION
NOT TO SCALE

DESIGN CRITERIA

DESIGN SPEED:	40MPH
DESIGN VEHICLE:	CALIFORNIA LEGAL
DESIGN MAXIMUM SUPERELEVATION:	6%



See Plate III for Legend

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological and Geotechnical Consultants

PRELIMINARY GEOLOGIC MAP

Date: 10/20/23	Job No.: 23-2195a-1
Scale: 1" = 500'	CAD File: AES 23.08.09 WALLACE GEOLOGIC MAP
PLATE IV	Geology by: STAFF / Drawn by: VCG
	Revised:

ATTACHMENT 3, PAGE 2/3

SOLOMON HILLS DEVELOPMENT

BICKNELL ROAD AND GRACIOSA ROAD SITE ACCESS

January 4, 2023

WALLACE GROUP®

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

August 15, 2025 Job No.: 25-2195s-1

Solstra Communities California, LLC
1130 East Clark Avenue, Suite 150 #286
Orcutt, CA 93455

Attention: Mr. Peter Kiesecker

Subject: **GEOTECHNICAL REPORT – Addendum No. 1**
Response to Applicant Technical Analysis Peer Review Letter #3 dated June 30, 2025

Project: Solomon Hills, General Plan Amendments and Specific Plan Area
Portion of Assessor's Parcel Number 101-020-085, -086 & -087
Santa Barbara County, California

References: At end of text

Dear Mr. Kiesecker:

This report has been prepared to present our geotechnical responses to the Solomon Hills Project, Applicant Technical Analysis Peer Review Letter #3, dated June 30, 2025 prepared by Rincon Consultants for the County of Santa Barbara Planning and Development Departments.

1.0 INTRODUCTION

Rincon's Applicant Technical Analysis Peer Review Letter #3, dated June 30, 2025 (peer review letter) for the Geotechnical Report (see ref. 1) made recommendations for the Geotechnical Report to be updated to address the project's planned off-site improvements, phasing of the grading, and outlining future geotechnical studies as the project design progresses. This addendum geotechnical report addresses Rincon's recommendations. A copy of the peer review letter is attached after the references.

2.0 RINCON'S RECOMMENDATIONS

To facilitate the review process, we have listed the Rincon's peer review letter recommendations in **bold** in the order in which they appear on the original letter. Each comment is followed by our response.

1. **We recommend the Geotechnical Report be updated to account for grading and potential soil removal associated with these project components.**

Response

This addendum report provides Updated Project Descriptions (see Section 3.0), Site Descriptions for Offsite Improvements (see Section 4.0), and Proposed Grading (see Section 5.0), which addresses this comment.

2. **We recommend the Geotechnical Report include discussion of potential interim conditions/impacts that may result from project phasing and assumptions regarding timing of grading with respect to project phasing to confirm the schedule is consistent with the phasing plan described in the applicant's other project technical analyses as well as application materials submitted to the County.**

Response

The project phasing is discussed in Phasing of Grading (see Section 5.2), which addresses this comment.

3. **We recommend an updated version of the Geotechnical report be prepared that accounts for the Specific Plan and anticipated discretionary entitlement path, and addresses applicable County staff comments.**

Response

The Specific Plan, entitlement path, and County staff comments on the 10/20/2023 geotechnical report are address in the Recommended Future Geotechnical Studies (see Section 6.0).

- **We recommend the Geotechnical Report be revised to add a "Next Steps" and/or "Recommendations" section outlining anticipated future geotechnical studies, evaluations, and analyses, as well as a schedule for their completion.**

Response

This addendum report provides recommended future geotechnical studies (see Section 6.0), which addresses this comment.

- **We recommend that as additional geotechnical studies, evaluations, and analyses are completed, the Geotechnical Report be updated to reflect the results and recommendations from these studies, evaluations, and analyses.**

Response

Acknowledged. After the General Plan Amendment and Specific Plan is approved further analysis and improvement plans will be submitted to Santa Barbara County as required for review and approval.

- **We recommend that once the final design of the project is completed, a final Geotechnical Report be prepared that incorporates the final design of the project and the phasing necessary to complete the project.**

Response

Acknowledged. After the General Plan Amendment and Specific Plan is approved further analysis and improvement plans will be submitted to Santa Barbara County as required for review and approval.

3.0 UPDATED PROJECT DESCRIPTION

3.1 Solomon Hills

The Solomon Hills Project is a mix of proposed land uses designed to create Santa Barbara County's first community that will result in a sustainable, resilient and healthy environment for its residents. The Project establishes a holistic framework for Smart Growth with a redevelopment of private lands historically used for grazing and oil and gas production. The proposed Solomon Hills Specific Plan includes the design and implementation of a central village closely surrounded by several neighborhoods, office and commercial space, a TK-8 school, fire/sheriff station, parks, open space and public trails to allow walking and biking as an easy alternative to vehicle transport.

The Project's proposed Specific Plan allows for a balance of land uses primarily serving working families allowing 4,000 single and multi-family residential units, 650,000 square feet of commercial retail and office use and space, 29.8-acres of public and institutional uses and space, and 1,020.3-acres of recreational and open space uses. Critical infrastructure includes water supply and a water reclamation facility, interchange improvements along Hwy 101, additional secondary access along Hwy 101 and Hwy 135 and several active and passive parks and public trails. Public benefits include developer sponsored Affordable housing near commercial and transportation access points, utility and access improvements that minimize traffic impacts to neighboring properties, new public trail access into the Orcutt Hills, recreational improvements and public access to the Newlove Picnic Grounds, the preservation of open space ridgelines and valleys for habitat protection and the remediation of all oilfield features and operations within proximity to the Project's development. The Project is designed to be built in four (4) buildout phases over a fourteen-year period for the orderly delivery of the Project. Phased grading, access, utility, horizontal and public improvements are scheduled ahead of and to align with the same buildout phases.

Other Areas for Access and Utility Improvements included:

- 1 ~10-acre proposed future easement or right of way area for Primary Access improvements along the east side of Highway 101 on APN 101-020-013.
- A 200-food wide existing easement area for Secondary access improvements on APN 101-060-069 between the existing Solomon Summit interchange and the southeastern boundary of the Specific Plan pursuant to Document 94-045049, recorded with the County of Santa Barbara on May 27, 1994.
- A 30-foot-wide existing easement area for private access improvements on APN 101-080-089 between the southwestern boundary of the Remainder Lot 2 to Graciosa Road pursuant to Document 2013-0053905 recorded with the County of Santa Barbara on August 8, 2013.
- 1 existing public right of way area for public access improvements along Graciosa Road to Highway 135.
- 1 combination of easements and rights of way for underground water line improvements from the Tanglewood Turnout to the northwestern boundary of the Specific Plan.
- 1 combination of easements and rights of way for underground water line improvements from the Tanglewood Turnout to the northwestern boundary of the Specific Plan.
- 1 Water Pump Station improvement on APN 105-330-001.
- 1 Water Pump Station improvement on APN 101-020-077.
- 1 existing public right of way area for underground gas and telecommunications commencing at Rice Ranch Road and along Orcutt Hill Road to the northern boundary of the Specific Plan. 2

3.2 Offsite Improvements

3.2.1 Primary Access Improvements

Primary access improvements include a new Highway 101 interchange approximately 2.3 miles south of the existing Clark Avenue and Highway 101 interchange with construction of an overpass over Hwy 101 for both north and southbound ingress/egress along with acceleration and deceleration improvements within the existing Caltrans ROW, and 1 ~10-acre proposed easement area for public Hwy Interchange and Landscape improvements to the east of the existing Caltrans ROW.

3.2.2 Secondary Solomon Summit Improvements

Secondary Solomon Summit Improvements include public improvements to the existing Solomon Summit Interchange within the Caltrans Right of Way consisting of road and landscape improvements, and private access and landscape frontage improvements within a 200-foot-wide existing easement area (Union Oil) that parallels the west side of Hwy 101 from the southeastern border of the VTTM boundary to the Solomon Summit interchange.

3.2.3 Secondary Bicknell Road Improvements

Secondary Bicknell Road Improvements include connecting the western edge of the Specific Plan boundary west along Bicknell Road (private) to Graciosa Road (public) to San Antonio Road. This scope of work includes road access and landscape improvements along Bicknell Road within an existing 30-foot-wide private roadway easement (Premiere Agricultural Properties), public access and landscape improvements within Graciosa Road (public) to San Antonio Road at Hwy 135 and public improvements to the Hwy 135/San Antonio Road intersection within the Caltrans right of way.

3.2.4 Utility Improvements

Water Line improvements the proposed underground Water Line Alignment Project from the Tanglewood Turnout to the Specific Plan boundary, to also include: 1 Water Pump Station improvement on APN 105-330-001 (Orcutt Fee); 1 Water Pump Station and Tank Improvements on APN 101-020-077 (PCEC).

Electrical improvements include overhead electrical lines within an existing easement on Lot 2 commencing at the western edge of Lot 2 and ending at the Specific Plan Boundary and overhead electrical lines within an existing right of way on APN 101-020-080 commencing at the Divide Substation and ending at the western edge of Lot 2.

Natural Gas improvements include the proposed underground natural gas line extension commencing from Rice Ranch Road/Orcutt Hills Road to the Specific Plan boundary generally following Orcutt Hill Road and within an existing right of way (public).

Telecommunications improvements include the proposed underground telecommunications utilities from Rice Ranch Road/Orcutt Hills Road to the Specific Plan boundary generally following Orcutt Hill Road and within an existing right of way (public).

3.2.5 Utility Improvements – Storm Water (Wet Weather Storage Basin CUP)

Effluent Utility Improvements include (Newlove Basin and Spray Fields – 25CUP-00006) one public recycled water public facility to be dedicated to the Laguna County Sanitation District to include a basin for 39.5 acre-feet of recycled water storage during periods of wet weather of approximately 7.5 acres and a 24-acre spray field west of and adjacent to water storage basin.

3.2.6 Recreational Improvements (Newlove Picnic Grounds – 25CUP-00006)

Recreational Improvements (Newlove Picnic Grounds – 25CUP-00006) improvements to the existing Newlove Picnic Grounds for rural recreational uses include the dedication of a 31-acre public access easement, and public trail segment, multi-use fields for soccer; pickleball courts; a playground; a recreational lawn; improved parking spaces and an unimproved parking area for overflow parking; fencing and signage; utility connections for sewer and water;

vegetation and tree removal; access improvements with retaining walls to allow for two-way vehicle and bicycle traffic and a sidewalk for pedestrians; secondary emergency access improvements and landscape plantings and irrigation.

4.0 UPDATED SITE DESCRIPTIONS FOR OFFSITE IMPROVEMENTS

4.1 Primary Access Improvements

The proposed Primary Access Improvements is a new Highway 101 interchange approximately 2.3 miles south of the existing Clark Avenue in northern Santa Barbara County (see Location Map). The interchange is within the Caltrans right-of-way, the Solomon Hills project and the property east of the Highway 101, Gallo Vineyards (APN 101-020-013). The proposed interchange will have an overall footprint of approximately 10 acres and is located on the Solomon Canyon alluvium with gently sloping hillside near the edges. A small drainage is located east near the toe to the ascending slopes to the east. The area east of the highway is currently utilized for agricultural crops. The project footprint elevations range from approximately 725 to 760 feet above sea level.

4.2 Secondary Solomon Summit Improvements

The proposed Secondary Solomon Summit Improvements is a secondary access to the existing Solomon Summit interchange. The proposed road alignment is located on the Solomon Canyon alluvium with gently sloping hillside to the west and Highway 101 to the east (see Location Map). Vegetation within the site consists primarily of non-native grasslands that is currently utilized as rangeland. The road alignment existing topographic elevations range from approximately 835 above sea level at Solomon Hills project to 910 feet at Solomon Summit interchange.

4.3 Secondary Bicknell Road Improvements

The proposed Bicknell Road Improvements is a secondary access from the western edge of the Specific Plan Boundary existing Graciosa to San Antonio Road (see Location Map). The proposed road alignment follows the existing unpaved Bicknell Road which is located along the north side of an alluvial canyon the drains west towards Harris Canyon. Gently slope hillside are located north of the road. Vegetation is sparse along the western portion of the alignment with the adjacent properties utilized for agricultural. The vegetation adjacent to the eastern portion of the alignment consist of grassland, bushes and oak trees. The land uses include rangeland, oil field infrastructure, and open space. The road alignment existing topographic elevations range from approximately 405 above sea level at Graciosa Road to 825 feet at the Specific Plan boundary.

4.4 Utility Improvements – Water Supply Pipeline

The proposed 10.2-mile Solomon Hills Water Supply Pipeline is a 16-inch diameter ductile iron pipe with two Booster Pump Stations. The proposed alignment begins at Black Road in the Santa Maria Valley and extends east and south to the Solomon Hills, terminating at a proposed tank site within the Solomon Hills Development (see Location Map). The alignment generally follows existing roadways, including Black Road, Dutard Street, S. Blosser Road, W. Clark Avenue, S. Broadway Street, Rice Ranch Road, and Orcutt Hill Road with an extension southeast from the PCEC facility to the Solomon Hills Development proposed water tank site. At the southern portion of the alignment Blosser Road north of the intersection with Clark Avenue horizontal directional drilling is proposed for construction of the waterline beneath a stormwater drainage culvert.

The waterline alignment transitions from relatively flat, low-lying terrain in the northwest to moderately steep, structurally uplifted hills in the southeast. Elevations range from approximately 200 feet above sea level near Black Road to 1,200 feet at proposed Water Tank site. Vegetation is sparse in developed areas and denser in the eastern hills, where land use includes rangeland, oil field infrastructure, and open space. The alignment traverses both unincorporated Santa Barbara County and portions of the Orcutt community.

4.5 Utility Improvements – Storm Water (Wet Weather Storage Basin CUP)

The proposed Wet Weather Storage Basin No. 3 (storage basin) and 3 irrigation blocks is located in northern Santa Barbara County, southeast of the community of Orcutt and along the western side of the Highway 101 (see Location Map). The storage basin is in the accessors Parcel Number 101-020-087 and is located north of the Solomon Hills Specific Plan area. The proposed storage basin will have an overall footprint of approximately 7.5 acres and is located on the alluvial flats between the south bound Highway 101 and a gently sloping hillside with slope gradients ranging from 2.9:1 to 4.3:1 (h:v). The project footprint ranging from approximately 630 to 930 feet above sea level. Vegetation within the site consists primarily of non-native grasslands interspersed with patches of low shrub cover. Access to the site is currently provided by unimproved service routes that trace the legacy infrastructure of former oil exploration.

4.6 Recreational Improvements (Newlove Picnic Grounds CUP)

The property is located in northern Santa Barbara County, south of the town of Orcutt in the Solomon Hills (see Location Map). The Solomon Hills are separated from the Casmalia Hills to the west by Graciosa Canyon, which flow to the north and is bisected by Highway 135. Solomon Canyon, which is bisected by Highway 101, drains north toward Orcutt Creek and forms the eastern boundary of the property.

The proposed improvements encompass the Newlove Park, an existing 31-acre public park located just outside the Solomon Hills Specific Plan boundary but within the larger Solomon Hills project area. The existing park is characterized by gentle sloping terrain. The terrain outside of the proposed improvements transitions into steeper hillslopes and canyon margins farther north and east. Existing slope gradients adjacent to the proposed improvements range from approximately 5:1 to 2:1 (h:v), with most proposed improvements located in areas with slopes between 10:1 and 3:1 gradient. Steeper slopes occur along the northern and eastern park boundaries, where natural terrain begins to descend more sharply into adjacent drainages.

Topography ranges from gently sloping ridge crests to more complex terrain at the margins of the park footprint, with elevations varying from approximately 980 to 1,090 feet above sea level. Vegetation consists primarily of grasses, scattered oaks, and patches of chaparral, with visible remnants of past ranch use and informal trail access.

5.0 UPDATED PROPOSED GRADING

5.1 Solomon Hills

The Vesting Tentative Tract Map (VTTM) No. 14,909 prepared by RRM Design Group, dated July 28, 2025 was reviewed relative to changes in the proposed grading for Solomon Hills from the Overall Grading & Drainage Plan, dated 10/15/23 that was addressed in this firms 10/20/2023 report (see ref. 1). VTTM Sheets C-11, C-12 and C-13 illustrate the proposed super-pads and slopes for the Solomon Hills project and the interchange at Highway 101. These plan sheets were used as the base maps for the Preliminary Geologic Maps (Sheets C-11, C-12 & C-13)

The proposed grading illustrated on Sheet C-11 is generally the same, except the elevations of the pads have been raised up to 10 feet and the addition of flood control basins at the southern portion of the site. There is subsurface exploration consisting of three hollow-stem-auger borings (HS-38 thru HS-40), which were drilled to a maximum depth of 61 ft, at the location of the proposed basins. Sheet C-12 there are no discernable changes in the pad grades and the minor slopes (in general less than 50 ft in height) have minor refinements. A basin was eliminated along the western edge. Sheet C-13 the elevations of the pads have been raised up to 5 ft and some of the smaller pads have been refined with elevations and perimeter 2.5:1 (h:v) gradient slopes. Two debris basins were added at the southern edge of the Specific Plan area alluvial canyons that drain south towards Careaga Canyon.

The increase in the Specific Plan area for the two debris basins is nominal and does not change the geotechnical analysis. Therefore, the Conclusions and Recommendations in the

10/20/2023 Geotechnical Report (see ref. 1) for the Specific Plan are still applicable to the proposed grading illustrated on the VTTM 14,909 dated 7/28/25.

5.2 Phasing of Grading

The Solomon Hills project is proposed to be constructed in four phases. The VTTM Sheet C-10 (see Appendix A) delineates the limits and estimated preliminary earthwork quantities for each phase of construction.

The first phase includes construction of the access roads along the east side of Highway 101, the main access road to the main residential area at the south of the Specific Plan area, temporary sedimentation basins, and permanent detention basins. The estimated preliminary earthwork quantities are 11,917,000 cubic yards of cut and 11,400,900 cubic yards of fill (adjusted for shrinkage). The excess cut of 516,100 cubic yards is to be placed in Phase 2 (406,000 cy) and in Phase 4 (110,000 cy). Temporary cut and fill slopes will likely be required along the boundary with Phase 3. The disposal of excess fill in Phases 2 and 4 will likely have fill slopes. In addition, temporary drainage and erosion control features. Grading Plans will be prepared for submittal to Santa Barbara County for review and approval of the interim slopes and drainage control features.

The second phase includes construction of the residential areas along the western portion of the Specific Plan Area, temporary sedimentation basins, and permanent detention basins. The estimated preliminary earthwork quantities are 3,561,273 cubic yards of cut and 3,967,681 cubic yards of fill (adjusted for shrinkage). The additional fill requirement of 406,408 cubic yards previously imported from Phase 1.

The third phase includes construction of the residential areas to the east of Phase 1. The estimated preliminary earthwork quantities are 8,184,545 cubic yards of cut and 7,795,887 cubic yards of fill (adjusted for shrinkage). The excess cut of 388,658 cubic yards is to be placed in Phase 4.

The fourth and final phase is located in the canyons west of the Highway 101. The estimated preliminary earthwork quantities are 306,200 cubic yards of cut and 823,300 cubic yards of fill (adjusted for shrinkage). The additional fill requirement of 517,100 cubic yards previously imported from Phase 1. The earthwork cut and fill volumes will usually be balanced on-site by the project supervising civil engineer (i.e., via raising or lowering the grades) at the improvement plan stages.

5.3 Offsite Improvements

5.3.1 Primary Access Improvements

VTTM Sheet C-13 illustrate the proposed new interchange concept at Highway 101 (~ post mile 79.9). The interchange includes an over-crossing bridge and on and off ramps for both north and south bound lanes of Highway 101. The New Interchange Concept, Attachment 2, prepared by the Wallace Group dated May 14, 2024 illustrates a 111,000 sq ft basin on the east side of Highway 101 north of the over-crossing. Proposed cut for the basin is estimated 33,000 cubic yards and 70,000 cubic yards of fill for the limits of the earthwork. The majority of the fill is likely required for the approaches to the over-crossing.

The new interchange concept is underlain by Quaternary age alluvium (Qa), see Preliminary Geologic Map, Sheet C-13. Based on subsurface explorations in the Solomon Canyon, the alluvium consists of unconsolidated sand mixtures of silty sand to sandy silt with interbeds of silt mixtures of clayey silt to sandy silt and clean sands. The water wells in Solomon Canyon just indicate that groundwater is greater than 198 ft below the ground surface. Groundwater may be perched on the alluvial bedrock contact or localized in sandy layers underlain by less permeable soil layers. Based on the interchange is not subject to potential landslide hazard and ground motion for seismic events is evaluated during the design of the over-crossing bridge. Expansive soil, if present, is evaluated and design features implemented for the bridge abutments and roadway pavement sections.

The new Highway 101 interchange will be processed with California Department of Transportation (Caltrans). Caltrans has established protocol for the timing of when geotechnical investigations and reports for projects within their jurisdiction. For example, a Preliminary Foundation Report would be prepared for the over-crossing bridge and submitted to Caltrans for review. As the design proceeds a Draft Foundation Report for the proposed improvements is submitted to Caltrans for review. A Final Foundation Report is prepared addressing comments from Caltrans.

5.3.2 Secondary Solomon Summit Improvements

VTTM Sheet C-16 illustrates the proposed preliminary offsite access alignment for a road from the Solomon Hills project south along the west side of Highway 101 to an existing Solomon Hills interchange on Highway 101. This plan sheet was used as the base maps for the Preliminary Geologic Map (Sheet C-16). It is assumed that this road grades will be in general the same as existing topography, since slopes are not shown on Sheet C-16. The proposed road alignment is underlain by Quaternary age alluvium (Qa). Based on subsurface explorations in the Solomon Canyon to the north, the alluvium consists of unconsolidated sand mixtures of silty sand to sandy silt with interbeds of silt mixtures of clayey silt to sandy silt

and clean sands. The water well in Solomon Canyon just east of the road alignment (Site Number 344936120214301) has a shallowest depth of measured groundwater below the ground surface of 198 ft.

When construction improvement plans are being prepared for submittal to Santa Barabara County for review and approval a geotechnical investigation should be performed to provide pavement design recommendations based on the subgrade soil conditions and anticipated traffic index.

5.3.3 Secondary Bicknell Road Improvements

VTTM Sheet C-14 illustrate the proposed offsite access alignment for Bicknell Road to existing Graciosa Road. VTTM Sheet C-15 illustrate the proposed improvements of Graciosa Road south to the existing location of Graciosa and Highway 135 connection. The plan is not to change the existing conditions at San Antonio Road and State Highway 135 or Graciosa Road. These plan sheets were used as the base maps for the Preliminary Geologic Maps (Sheets C-14 and C-15).

Bicknell Road is following an existing dirt road and road grades will be in general the same as existing topography, except at the eastern end where fills are proposed to elevate the road to the Solomon Hills project. Existing Bicknell Road will be paved and widened to accommodate two 12 ft wide lanes of travel and an 8 ft wide shoulder. A 30 ft tall 2:1 (h:v) gradient cut-slope is proposed along the north side of the road. The area of disturbance is 16.8 acres with maximum cut of 7 feet and fill up to 45 feet, which requires an estimate of 73,500 cubic yards of import.

The proposed road alignment is underlain by Quaternary age alluvium (Qa) and in some section by bedrock of the Paso Robles Formation and Careaga Sandstone Formation. The proposed cut slope is anticipated to expose alluvium. The road alignment traverses a suspected landslide. There are additional suspected landslides on the hillsides adjacent to the road eastern road alignment. The suspected landslides are based on geomorphology observed during our field reconnaissance, slides interpreted from review of aerial photographs, and geomorphology from topographic maps. The Preliminary Geologic Map (Sheet C-14) illustrates the geologic units and their descriptions are provided in the 10/20/23 report (See ref. 1).

Graciosa Road is County maintained road that is underlain by Quaternary age alluvium (Qa) and more than likely artificial fills associated with the construction of the existing road. The Preliminary Geologic Map (Sheet C-15) illustrates the geologic units and their descriptions are provided in the 10/20/23 report (see ref. 1).

When construction improvement plans are being prepared for submittal to Santa Barabara County for review and approval, a geotechnical investigation should be performed to confirm the geologic unit to be exposed in the proposed cut slope and confirm the presence or lack of landslides along the road alignment. In addition, geotechnical pavement design recommendations based on the subgrade soil conditions and anticipated traffic index. Furthermore, geotechnical design recommendations are not anticipated to be a significant constraint to the proposed improvements to the existing state road.

5.3.4 Utility Improvements – Water

The Solomon Hills Development Water Supply Pipeline plan consisting of 23 sheets prepared by Wallace Group, dated 7/3/25. The waterline is a buried pipeline that in general is within existing public roads. The excavation and installation of the waterline is likely to result in some excess soil, but has not yet been quantified. Design grades at the location of the booster pump stations is not currently provided, but it is reasonable to assume that proposed grades will be similar to existing grades. Removal of compressible soil and replacement as a compacted fill for support of the booster pump stations equipment may be required depending on the soil conditions and structural loads. A July 24, 2025 Geotechnical Report addresses the Solomon Hills Development Water Supply Pipeline (see ref. 2).

5.3.5 Utility Improvements – Storm Water (Wet Weather Storage Basin CUP)

The Wet Weather Storage Basin C.U.P. plan by RRM Design Group, dated January 31, 2025 proposes a cutting below existing grade to create the storage basin with 2:1 (h:v) gradient interior cut slopes at a maximum height of 12 feet and three associated irrigation block improvements. The storage basin bottom invert is at an elevation of 630 ft, with a maximum cut of approximately 20 feet below existing grade. A maximum of 11.6 feet of fill is proposed for the fill slope berm for the northern portion of the storage basin. The three irrigations blocks (east, middle, and west) are approximately 24.6 acres in area located on the ascending natural slopes. The western edge of the basin a 2:1 gradient (h:v) cut-slope up to 45 ft in height ascends from the 18 ft wide access road at the top of the basin side slopes.

Based on current design, the site is expected to generate a net excess of approximately 144,000 cubic yards of excavated material, which will require export or management elsewhere within the overall Solomon Hills project area. Final earthwork grading volumes will be refined during subsequent project design phases.

A July 25, 2025 Geotechnical Report addresses the Solomon Hills Offsite Wet Weather Storage Basin CUP (see ref. 3).

5.3.6 Recreational Improvements (Newlove Picnic Grounds CUP)

The Newlove Park Conditional-Use Permit (C.U.P.) plans prepared by RRM Design Group, dated 7/23/25. The 80- and 40-scale Primary Access Road Plan and Profile, Preliminary Grading and Drainage, and Secondary Access Road (sheets C4 through C7). The Primary Access Road Plan and Profile (sheet C4) and the Preliminary Grading and Drainage plans (sheet C5 and C6) illustrates proposed grading improvements within the Newlove Park area, including pad areas, slopes, bioretention basins, detention basins, and access features. A retaining wall up to 8.5 ft in exposed height is proposed at the toe of a 2:1 cut slope located along the west side of the primary access road. A secondary access road extends from the park west to private Orcutt Hills Road.

The maximum proposed cut is 16 ft in the Soccer Fields and the maximum fill thickness is 17 ft at the Primary Access Road and parking lot. Proposed cut slopes are shown at 2:1 (h:v) gradients. The maximum proposed cut slope is 25 ft in height, which is along the primary access road to the park. The maximum proposed fill slope is 16 ft in height at ~3:1 (h:v) gradient at the primary access road and the parking lot. The Little League Baseball / Softball field has up to 11 ft of fill. In general, the proposed grades for the parking lot area are within a few feet of existing grades. The lawn recreation area to the east of the parking lot has fill up to 5 ft in thickness. Based on current design, the volume of cut is 57,930 cubic yards (c.y.) and fill is 48,158 cy. Based on an assumed shrinkage of 20% for the placed compacted fill, the proposed park site improvements are anticipated to have balanced net zero (0) earthwork.

A July 26, 2025 Geotechnical Report addresses the Newlove park C.U.P. (see ref. 4).

6.0 RECOMMENDED FUTURE GEOTECHNICAL STUDIES

After the General Plan Amendment and Specific Plan is approved further analysis and improvement plans will be submitted to Santa Barbara County as required for review and approval.

6.1 Solomon Hills

The 300-scale Overall Grading & Drainage Plan is at a sufficient scale and detail for geotechnical evaluation of the grading concept for the Specific Plan. Extensive geologic and geotechnical field explorations studies consisting of 170 test pits, 15 large diameter drill holes, 21 small diameter drill holes and 23 CPT sounding were completed to characterize the site and provided geotechnical guidance to the grading design for the Specific Plan (see attached Preliminary Geologic Maps).

After the General Plan Amendment and Specific Plan is approved further analysis and improvement plans (e.g., Grading Plans) will be submitted to Santa Barbara County as required for review and approval.

6.1.1 Proposed Grading

We understand minor modification and additional details have been added to the conceptual grading graphics since the 10/20/2023 Geotechnical Report (see ref. 1). For example, the maximum proposed cut-slope (CS-5) was ~235 ft in height. However, the proposed pad grade at the toe of cut-slope CS-5 has been modified such that the maximum vertical height of the cut-slope was reduced to ~225 feet. The reduced height is a less critical from a gross stability standpoint. As discussed in the previous section pad grades have been raised and lower up to 10 ft. The prior conclusions and recommendation in the 10/20/2023 Geotechnical Report are still applicable even with the minor changes in pad grades for either earthwork balance or improved site layout. After the General Plan Amendment and Specific Plan is approved further analysis and improvement plans (e.g., Grading Plans) will be submitted to Santa Barbara County as required for review and approval.

6.1.2 Stability of Temporary Excavations

Geotechnical slope stability of temporary excavations (e.g., buttress/stability fill backcuts) are addressed by the geotechnical consultant at the Grading Plan stage. The Grading Plan and supporting geotechnical reports will be submitted to Santa Barbara County for review and approval prior to issuance of a grading permit. The temporary backcuts will be within the grading footprint addressed by the EIR.

6.1.3 Drainage Devices for Fill Slopes

The fill slopes illustrated on the 300-scale Overall Grading & Drainage Plan for the Specific Plan are designed at 2.5:1 (h:v) gradient. This is due to the fact that it is impractical to illustrate slope drainage device at a 300-scale, but a 2:1 slope with drainage devices has about the same footprint (i.e., top and toe) as a 2.5:1 slope. The Tentative Tract Maps will have details on the slope drainage devices, which are then provided at construction level detail at the 40-scale Grading Plan stage. The Grading Plans will be submitted to Santa Barbara County Department of Public Works as required for review and approval prior to issuance of a grading permit. The Overall Grading & Drainage Plan has sufficient information (e.g., debris basins) for the EIR analysis.

6.1.4 Stability of Natural Slopes

The 10/20/23 Geotechnical report provided design features for natural slopes that may have insufficient slope stability factors of safety, which included establishing restricted use areas

for habitable structures. This is similar to the California Building Code, which has minimum building setbacks from the toe of slope. A geotechnical engineer is able to reduce or increase the building setbacks based on site specific analysis.

Extensive geologic and geotechnical field explorations studies and analysis were completed to characterize the site and provided geotechnical guidance to the grading design and buildable areas for the Specific Plan. Note, the majority of the development (southern portion) will not have natural slope adjacent to the buildable areas. The significant natural slopes that have the potential to impact the Specific Plan grading design and buildable areas were analyzed. The Preliminary Geologic Maps illustrated the 16 Cross Sections utilized to evaluate the significant slopes. Development was pulled away from areas where natural slope gross instability (i.e., factor of safety less than 1.5) would impact the proposed development. The EIR can analyze the impacts of the proposed grading based on the Overall Grading & Drainage Plan. After the General Plan Amendment and Specific Plan is approved further analysis and improvement plans (e.g., Grading Plans) will be submitted to Santa Barbara County as required for review and approval.

6.1.5 Debris Flow Hazard

The submitted report provides potential debris flow hazard mitigation measure options for proposed developmental pads adjacent to ascending natural slopes. The EIR can address Debris Flow Hazard and discuss the provide mitigation options. After the General Plan Amendment and Specific Plan is approved further analysis and improvement plans (e.g., Grading Plans) will be submitted to Santa Barbara County as required for review and approval.

6.1.6 Soil Compressibility and Hydro-Consolidation

Extensive geologic and geotechnical field explorations studies consisting of 170 test pits, 15 large diameter drill holes, 21 small diameter drill holes and 23 CPT sounding were completed to characterize the site and provided geotechnical guidance to the grading design and buildable areas for the Specific Plan. Based on the testing performed on in-situ samples of alluvial deposits hydro-compression was negligible. After the General Plan Amendment and Specific Plan is approved further analysis and improvement plans (e.g., Grading Plans) will be submitted to Santa Barbara County as required for review and approval.

6.1.7 Suspect Landslides

Published maps, geomorphology observed in the field, and aerial photographs were reviewed to evaluate areas of suspected landslides. Then extensive geologic field explorations studies consisting of 170 test pits and 15 large diameter drill holes were completed to characterize the site. The majority of suspect landslide were not present. The grading design was revised and development avoid or pulled back from significant landslide (e.g., Mount Solomon landslide).

After the General Plan Amendment and Specific Plan is approved further subsurface exploration analysis will be performed to confirm the presence or lack thereof landslides and improvement plans (e.g., Grading Plans) with remedial design features, which will be submitted to Santa Barbara County as required for review and approval.

6.2 Solomon Hills Phased Grading

After the General Plan Amendment and Specific Plan and the Tentative Tract Map is approved Grading and Improvement plans (e.g., street improvement, storm drain, etc.) will prepared for each of the grading phases with further geology and soils investigations as determined appropriate by a geotechnical consultant for submittal to Santa Barbara County as required for review and approval prior to issuance of a grading permit. Temporary slopes required for each phase, if necessary, will be evaluated at the Grading Plan stage. The following grading phases will be processed the same as the first phase.

6.3 Offsite Improvements

6.3.1 Primary Access Improvements

The new Highway 101 interchange will be processed with California Department of Transportation (Caltrans). Geotechnical Reports will be prepared as required by Caltrans. Caltrans has established protocol for the timing of when geotechnical investigations and reports for projects within their jurisdiction. For example, a Preliminary Foundation Report would be prepared for the over-crossing bridge and submitted to Caltrans for review. As the design proceeds a Draft Foundation Report for the proposed improvements is submitted to Caltrans for review. A Final Foundation Report is prepared addressing comments from Caltrans.

6.3.2 Secondary Solomon Summit Improvements

When construction improvement plans are being prepared for submittal to Santa Barabara County for review and approval a geotechnical investigation should be performed to provide pavement design recommendations based on the subgrade soil conditions and anticipated traffic index.

6.3.3 Secondary Bicknell Road Improvements

When construction improvement plans are being prepared for submittal to Santa Barabara County for review and approval a geotechnical investigation should be performed to confirm the geologic unit to be exposed in the proposed cut slope and confirm the presence or lack of landslides along the road alignment. In addition, provide geotechnical pavement design recommendations based on the subgrade soil conditions and anticipated traffic index.

Furthermore, geotechnical design recommendations are not anticipated to be a significant constraint to the proposed improvements to the existing state road Graciosa.

6.3.4 Utility Improvements – Water

When construction improvement plans are being prepared for submittal to the jurisdiction water company and/or Santa Barabara County for review and approval a geotechnical investigation should be performed to provide geotechnical design recommendations based on soil conditions.

6.3.5 Utility Improvements – Storm Water (Wet Weather Storage Basin CUP)

When construction improvement plans are being prepared for submittal to Santa Barabara County for review and approval a geotechnical investigation should be performed to confirm the geologic unit to be exposed in the proposed cut slope and removal of existing soil for proposed fills. In addition, provide geotechnical design recommendations based on the soil conditions for structures.

6.3.6 Recreational Improvements (Newlove Picnic Grounds CUP)

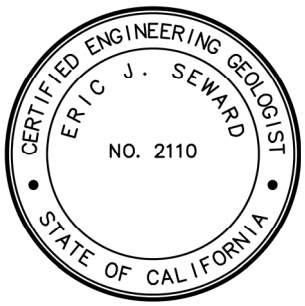
As part of the Newlove Park Grading Plan permitting process further study should be performed by a geotechnical consultant to evaluate the geologic and geotechnical conditions and provide standard design level recommendations for submitted to Santa Barbara County as required for review and approval prior to issuance of the grading permit.

This opportunity to be of service is appreciated. If you have any questions regarding this report, please contact us.

Respectfully submitted,

Eric J. Seward, CEG 2110
Principal Engineering Geologist
Vice President

Farbod Bouya, MS, PE C94592
Professional Engineer





The following attachments complete this report.

References

Rincon Consultants, Solomon Hills Project, Applicant Technical Analysis Peer Review Letter #3, dated June 30, 2025, Geotechnical and Hydrology Documentation

APPENDIX A – Maps

- Location Map
- Grading Phase Plan, Sheet C-10
- Preliminary Geologic Maps (Solomon Hills, Sheets C-11, C-12 and C-13)
- Preliminary Geologic Maps (Offsite Access, Sheets C-14 and C-15)
- Preliminary Geologic Map (Solomon Summit Access, Sheet C-16)

REFERENCES

By: Allan E. Seward Engineering Geology, Inc.

1. **Geotechnical Report**
Solomon Hills General Plan Amendments and Specific Plan
Portions of Assessor's Parcel Numbers 101-020-085, -086 & -087
Santa Barbara County, California
Dated October 20, 2023 – Job No. 23-2195s-1

2. **Geotechnical Report**
Solomon Hills Development Water Supply Pipeline
Santa Barbara County, California
Dated July 24, 2025 – Job No. 25-2195s-7

3. **Geotechnical Report**
Solomon Hills Offsite Wet Weather Storage Basin CUP
Portions of Assessor's Parcel Numbers 101-020-087
Santa Barbara County, California
Dated July 25, 2025 – Job No. 25-2195s-1

4. **Geotechnical Report**
Newlove Park C.U.P.
Solomon Hills Development
Portions of Assessor's Parcel Numbers 101-020-087
Santa Barbara County, California
Dated July 26, 2025 – Job No. 25-2195s-1

Rincon Consultants, Inc.
1530 Monterey Street, Suite D
San Luis Obispo, California 93401
805-547-0900

June 18, 2025
Project No: 24-16624

Tina Mitchell and Alia Vosburg, Senior Planners
County of Santa Barbara
Planning and Development Department
Development Review Division
624 W. Foster Road
Santa Maria, California 93455
Via email: PADSolomonHills@countyofsb.org

Subject: Solomon Hills Project, Applicant Technical Analysis Peer Review Letter #3

Tina & Alia:

Rincon Consultants, Inc. (Rincon) is in the process of conducting a peer review of technical studies and reports submitted to the County of Santa Barbara (County) by Solstra Communities California, LLC (the applicant) for the proposed Solomon Hills Project in Santa Barbara County. This is the third and final letter providing the results of our first round of reviews, with additional technical peer reviews to be provided as individual topic-based reviews are completed.

A list of the reviewed documents and reports in this peer review letter follows.

Documents Peer Reviewed

Biological Resources

- Biological Resources Assessment (David Wolff Environmental, 2025)
- Oak Tree Management and Replacement Plan (Dudek, 2025)
- Golden Eagle Nest Report (Althouse & Meade, 2025)

Geotechnical and Hydrology

- Hydrology Report for Solomon Hills (RRM Design Group, 2025)
- Geotechnical Report, Solomon Hills General Plan Amendments and Specific Plan (Allan E. Seward Engineering Geology, 2023)

Hazards and Hazardous Materials

- Phase II Investigation and Remedial Action Plan (Waterstone Environmental, 2024)

Fire Protection

- Fire Protection Plan (Dudek, 2024)
- Wildfire Evacuation Study (Dudek, 2024)

Scope of Peer Review

This peer review considers whether the provided environmental analyses are adequate for the purposes of preparing an Environmental Impact Report (EIR) for the proposed project, based on the **California Environmental Quality Act (CEQA) Guidelines Environmental Checklist Form**

(Appendix G) and the **Santa Barbara County Environmental Thresholds and Guidelines Manual**. The peer review does not include validation or verification of all original data sources and calculations used to develop the reports prepared by the applicant. In addition, it assumes report preparers have conducted a thorough quality assurance/quality control (QA/QC) review of the documents and all original data sources are valid and all calculations are correct.

The applicant-prepared technical studies and reports were peer reviewed with respect to the following parameters:

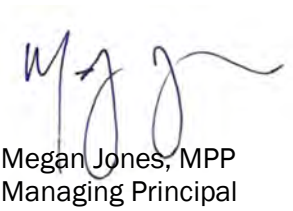
- Adequate description of the proposed project and project site;
- Adequate description of the existing setting, including the location of known on-site resources and features, resources and features in the project vicinity, on-site and nearby sensitive receptors, and applicable state, regional, and local regulations;
- Appropriate assumptions where project- and site-specific information is unavailable;
- Appropriate analytical methodology, modeling assumptions, and significance thresholds for analyzing project impacts in conformance with CEQA requirements and current professional standards; and
- Results, determinations of significance, and adequacy of any mitigation measures.

Rincon's peer review comments and recommendations for the applicant-prepared technical studies and reports, as well as qualifications of the senior staff involved in this peer review, are attached.

Sincerely,
Rincon Consultants, Inc.



Chris Bersbach, MESM
Senior Supervising Environmental Planner



Megan Jones, MPP
Managing Principal

Attachments

Attachment 1 Rincon Consultants Peer Review Comments and Recommendations
Attachment 2 Qualifications of Peer Reviewers

Geotechnical and Hydrology Documentation

The peer review of the Hydrology Report for Solomon Hills (RRM Design Group, 2025) and the Geotechnical Report, Solomon Hills General Plan Amendments and Specific Plan (Allan E. Seward Engineering Geology, 2023) was conducted to ensure that both documents are objective, accurate, and compliant with the requirements of the State Water Resources Control Board, Central Coast Regional Water Quality Control Board, and Santa Barbara County Flood Control District. This review was intended to determine if the reports adequately support an analysis of potential geology, soils, and hydrology impacts consistent with the County of Santa Barbara guidelines and thresholds and Appendix G of the State CEQA Guidelines. This review did not include an engineering-level review of baseline information, assumptions, calculations, modeling supporting drainage (including predevelopment and post development details [Exhibits 1 and 2], hydrologic calculations [Attachment 1], NRCS soil survey [Attachment 2], and HydroCAD reports [Attachment 3]) or geotechnical design used to develop the predevelopment and post development details (Exhibits 1 and 2), hydrologic calculations (Attachment 1), NRCS soil survey (Attachment 2), and HydroCAD reports (Attachment 3).

Rincon recommends the following revisions be made to the Hydrology Report and Geotechnical Report to support the independent review and validation of these reports for incorporation into the project EIR being prepared by the County, and ensure the final report consistently and thoroughly describes the hydrological, geological, and geotechnical conclusions.

Recommendations

Hydrology Report for Solomon Hills (RRM Design Group, 2025)

The analysis in the Hydrology Report partitions the project site into nine existing pre-development areas (i.e., Existing Area Pre 1-Existing Area Pre 9), which will be subject to construction, and discharge to nine corresponding detention basins (i.e., D1-D9). The disturbed areas within each Existing Area Pre 1-9 were divided into individual Drainage Management Areas (DMAs), which were subject to hydraulic analysis using the HydroCAD program for pre- and post-development site conditions. The HydroCAD modeling was used to determine peak flows up to the 100-year storm event and to design the nine detention basins for peak flow mitigation.

1. Scope of Report. The project site shown in Exhibit 1, Predevelopment Exhibit, encompasses the 1,616-acre Specific Plan area and the 286-acre Orcutt Community Plan/New Love Park improvement area, totaling 1,902 acres. The analysis in the Hydrology Report only addresses the 1,616-acre Specific Plan area. **We recommend Figure 1, the Project Vicinity Map, be updated to clearly depict the 1,900-acre "project site," the 1,616-acre Specific Plan area, and the "New Love Park Improvement Area," so that the geographic scope of the Hydrology Report is clearer to the reader.**
2. Scope of Report. The analysis in the Hydrology Report does not include many of the project's planned off-site improvements, including U.S. 101 interchange improvements and connection to SR 135 via Bicknell Road. It is also unclear whether service/utility connections, including the potential delivery of water to the site from non-connected sources (e.g., the Cadiz Water Project), and remediation of impacted soil to standards suitable for residential development are accounted for in the hydrology analysis. **We recommend the Hydrology Report be updated to account for grading associated with these project components.**
3. Scope of Report. The project schedule describes the potential for construction to be phased over 15 years. The analysis in the Hydrology Report only addresses drainage conditions and hydraulic design at full buildout of the project. **We recommend the Hydrology Report include discussion of**

potential interim conditions/impacts that may result from project phasing and assumptions regarding timing of drainage improvements with respect to project phasing to confirm the schedule is consistent with the phasing plan described in the applicant's other project technical analyses as well as application materials submitted to the County.

4. Background. The nine existing predevelopment areas are described as corresponding to the nine planned detention basins, with the exception of Existing Areas Pre 3. **We recommend the Hydrology Report confirm that Existing Area Pre 3 is planned to drain to D3.**
5. Method of Analysis. Drainage areas are defined as existing areas within the limits of the project that will not be altered during construction. However, it appears that drainage areas will be subject to alteration as needed to provide safe conveyance through culverts and to capture and divert/route runoff. **We recommend the Hydrology Report list the drainage areas that will be subject to alteration and describe the extent of alteration.**
6. Conclusions. The Hydrology Report shows that the proposed drainage design for the project within the Specific Plan area is compliant with the Santa Barbara Flood Control District requirements. However, the report does not provide any documentation or discussion relating to applicable permits and regulations for stormwater management, including:
   - Phase II MS4 Permit (*Waste Discharge Requirements [WDRs] for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems [MS4s] General Permit],* Order No. 2013-0001-DWQ, NPDES No. CAS000004, which is available at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.html.
   - *Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region* (Post-Construction Requirements; Resolution R3-2013-0032), available at: https://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.html.
   - County of Santa Barbara's *Stormwater Technical Guide for Low Impact Development,* available at: https://www.goletamonarchpress.com/wp-content/uploads/2015/05/Stormwater-Technical-Guide_6.11.14.pdf.

   We recommend the Hydrology Report include documentation and discussion of applicable permits and regulations for stormwater management.

7. Conclusions. The County of Santa Barbara's Stormwater Technical Guide for Low Impact Development requires preparation of a Stormwater Control Plan for projects to document compliance with a Phase II MS4 Permit, Post-Construction Requirements, and the County of Santa Barbara's Stormwater Technical Guide for Low Impact Development requirements. Additional National Pollution Discharge Elimination System Permits may apply to the proposed development. For example the General Permit for Stormwater Discharges Associated with Industrial Activities, Order WQ 2018-0028-DWQ, may apply to project public/institutional uses (NPDES No. CAS000001, or as amended from time to time, which is currently available at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/industrial/2014indgenpermit/order.pdf). **We recommend the applicant prepare a Stormwater Control Plan to document compliance with a Phase II MS4 Permit, Post-Construction Requirements, and the County of Santa Barbara's Stormwater Technical Guide for Low Impact Development requirements.**

8. Conclusions. **We recommend the Hydrology Report include an evaluation of the project following the Surface and Storm Water Quality Significance Guidelines of the Santa Barbara County Environmental Thresholds and Guidelines Manual** (available at https://www.countyofsb.org/1432/Environmental-Review). In addition to post-construction requirements, the guidelines include consideration of surface and storm water quality issues, Santa Barabara County water quality protection policies, and requirements for construction sites including applicability of:
    - The General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities, Order WQ 2022-0057-DWQ, NPDES No. CAS000002, or as amended from time to time, which is currently available at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction/docs/2022-0057-dwq-with-attachments/cgp2022_order.pdf, and
    - The Construction Site Stormwater Runoff Control Program requirements of the Phase II MS4 Permit, which is available at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.html.

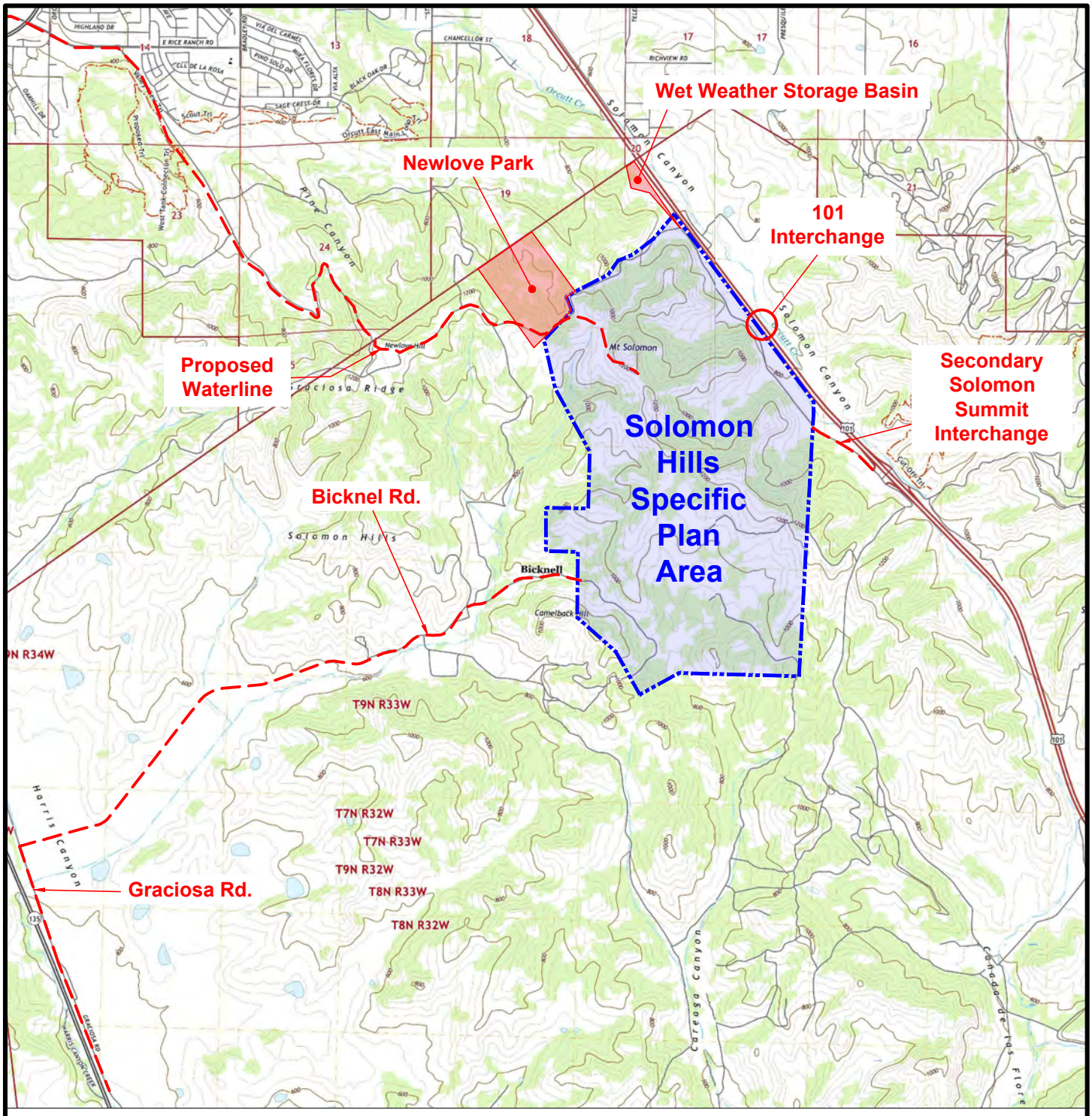
Geotechnical Report, Solomon Hills General Plan Amendments and Specific Plan (Allan E. Seward Engineering Geology, 2023)

1. Scope of Report. The analysis in the Geotechnical Report does not address potential geologic hazards that may result from all of the project's planned off-site improvements, including U.S. 101 interchange improvements and connection to SR 135 via Bicknell Road. We note that Section 1.0, Project Description Summary, states that "*Additional Off-Site Area includes approximately 40-acres for access and utility improvements*." However, the location of the 40 acres described, of which off-site improvements are included in this area, is not clearly specified in Section 3.0, Project Description or Section 4.0, Proposed Grading. It is unclear whether service/utility connections, including the potential delivery of water to the site from non-connected sources (e.g., the Cadiz Water Project), and remediation of impacted soil to standards suitable for residential development are accounted for in the geotechnical analysis. **We recommend the Geotechnical Report be updated to account for grading and potential soil removal associated with these project components.**
2. Scope of Report. The analysis in the Geotechnical Report addresses grading conditions and geological hazards/constraints associated with buildout of the proposed Specific Plan, but does not include discussion of the potential for grading to occur concurrent with individual phases of the project, or the potential for resulting temporary geologic hazards or geotechnical impacts. **We recommend the Geotechnical Report include discussion of potential interim conditions/impacts that may result from project phasing and assumptions regarding timing of grading with respect to project phasing to confirm the schedule is consistent with the phasing plan described in the applicant's other project technical analyses as well as application materials submitted to the County.**
3. County Staff Comments and Programmatic Geotechnical Evaluation. County staff provided comments and recommendations on the Geotechnical Report to the project applicant in 2024. The applicant provided a response memorandum, but has not prepared a revised Geotechnical Report. County staff comments on the Geotechnical Report were made at a time when the applicant was proposing a ministerial path for future entitlements and County staff have noted that some of their comments may no longer apply. **We recommend an updated version of the Geotechnical report be prepared that accounts for the Specific Plan and anticipated discretionary entitlement path, and addresses applicable County staff comments.**

Based the conclusions of the Geotechnical Report reviewed, we understand there will be future geotechnical studies, evaluations, and analyses required as project design progresses. As a result, we have the following recommendations:

- **We recommend the Geotechnical Report be revised to add a "Next Steps" and/or "Recommendations" section outlining anticipated future geotechnical studies, evaluations, and analyses, as well as a schedule for their completion.**
- **We recommend that as additional geotechnical studies, evaluations, and analyses are completed, the Geotechnical Report be updated to reflect the results and recommendations from these studies, evaluations, and analyses.**
- **We recommend that once the final design of the project is completed, a final Geotechnical Report be prepared that incorporates the final design of the project and the phasing necessary to complete the project.**

Appendix A



LEGEND

Base Map Source: U.S. Geological Survey Orcutt and Sisquoc Quadrangles, Dated 2021

Approximate Scale: 1"=5500'

NOTE: THIS IS NOT A SURVEY OF THE PROPERTY

KILOMETERS 0 0.5 1 2
METERS 1000 500 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

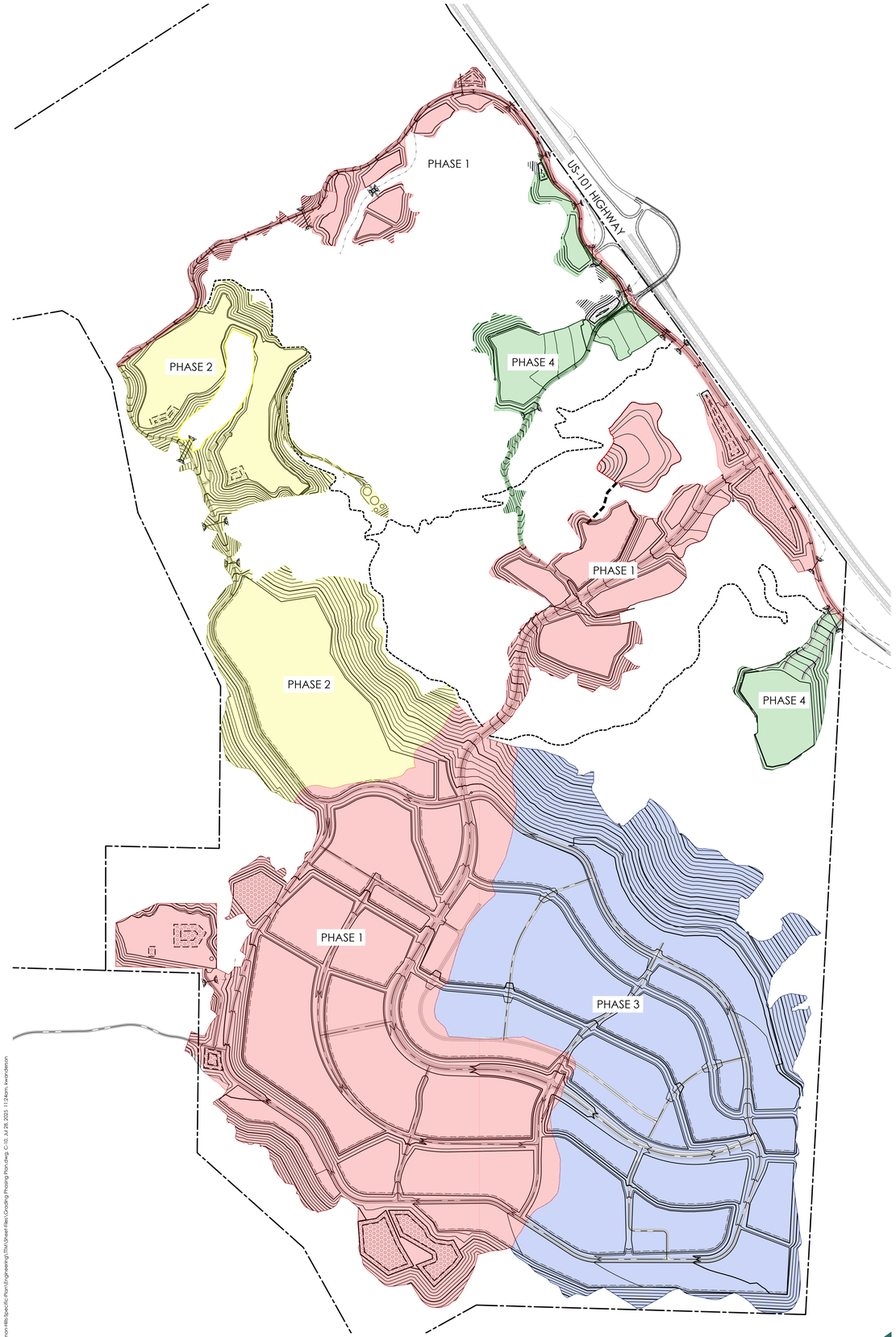
CONTOUR INTERVAL 40 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

N

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

LOCATION MAP

Job No.: 25-2195s-1 | *Date: 8/15/25*



EARTHWORK BY PHASE

EW Phase	Area (ac)	Raw Cut (CY)	Raw Fill (CY)	Adjusted Fill (CY) (10%)	Adjusted Fill (CY) (20%)	Net
1	422.9	11,917,000	9,500,800	10,450,880	11,400,900	516,100
2	151.1	3,561,273	3,306,386	3,637,024	3,967,681	406,408
3	313.0	8,184,545	6,496,573	7,146,230	7,795,887	388,658
4	50.0	306,200	686,100	754,710	823,300	517,100
Total	937.0	23,969,000	19,989,900	21,988,890	23,987,800	-

EARTHWORK BALANCE NECESSITATES BORROWING OR STOCKPILING FOR ANY PHASE FROM ANY OTHER GIVEN PHASE.

QUANTITY ESTIMATES ON THESE PLANS ARE TO BE USED FOR PERMIT PURPOSES ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ACTUAL QUANTITIES FOR THE PURPOSE OF CONSTRUCTION.

THE RAW EARTHWORK QUANTITIES SHOWN HEREON REPRESENT THE ESTIMATED VOLUMETRIC DIFFERENCE BETWEEN THE PROPOSED ROUGH GRADE AND THE LIMITED TOPOGRAPHIC EXISTING GRADES. THESE ESTIMATES DO NOT MAKE CONSIDERATIONS FOR LOSSES OR BULKING DUE TO: SHRINKAGE, SOIL AMENDMENTS, STABILIZATION, CONSTRUCTION TECHNIQUE, FOOTING & TRENCHING SPOILS, PROPOSED ROAD SECTION, ETC. THESE, IN ADDITION TO ACTUAL FIELD CONDITIONS AND THE FINAL RECOMMENDATIONS OF THE SOILS ENGINEER MAY SIGNIFICANTLY EFFECT THE FINAL IMPORT/EXPORT QUANTITIES.

GRADING PHASING NOTES

1. SEE GRADING & DRAINAGE PLAN FOR STREET SECTION REFERENCES AND NAMES.
2. GRADING PHASES ARE DIFFERENT FROM DEVELOPMENT PHASES. REFER TO SHEET C-9 FOR CONSTRUCTION PHASING. PROPOSED GRADING AREAS WERE DELINEATED IN ORDER TO BALANCE EACH EARTHWORK PHASE INDIVIDUALLY.
3. SHRINKAGE FACTOR ASSUMED TO BE 20% FOR PLANNING PURPOSES.
4. CONTOURS SHOWN ON A 10' INTERVAL.

Pad vs Total Lot Areas

Lot Number	Pad Area (AC)	Lot Area (AC)
1	9.7	11.1
2	2.6	2.9
3	2.7	2.8
4	2.5	2.6
5	9.1	9.5
6	9.8	10.5
7	4.8	5.1
8	4.7	4.9
9	3.6	4.1
10	8.1	8.3
11	2.2	2.4
12	3.1	3.2
13	6.2	6.2
14	5.2	5.3
15	3.1	3.3
16	7.1	7.2
17	2.2	2.2
18	2	2.0
19	5.7	6.8
20	2.2	2.2
21	3.5	3.5
22	14.2	16.2
23	5.3	6.2
24	5.8	5.9
25	4.8	5.5
26	5.6	6.5
27	10.4	12.0
28	16.2	16.4
29	4.6	5.0
30	7.6	8.9
31	11.7	11.7
32	9.3	9.3
33	6.3	6.7
34	2.9	3.0
35	2.4	2.6
36	5.5	6.3
37	2.1	2.5
38	3.6	5.5
39	8.8	8.9

Lot Number	Pad Area (AC)	Lot Area (AC)
40	11	11.2
41	6.7	7.4
42	11	11.1
43	9	9.0
44	6.4	6.4
45	2.8	2.8
46	6.6	6.7
47	18.2	18.4
48	7.7	7.8
49	7.7	10.6
50	1.9	2.3
51	1.9	2.1
52	12.3	12.4
53	9.3	9.4
54	3.7	4.1
55	2.7	2.7
56	1.4	1.8
57	1.4	1.7
58	7.4	7.4
59	5.3	6.2
60	8.4	9.1
61	3.1	3.7
62	54	54.1
63	9.4	10.1
64	4.1	4.1
65	15.3	16.8
66	2.2	3.3
67	1.1	1.1
68	1.7	1.8
69	1.4	1.7
70	1.4	1.7
71	0.8	0.9
72	0.8	0.8
73	1.7	1.8
74	4.2	4.3
75	12	12.0
76	12	12.0
77	5.1	5.2
78	2.4	2.5

Lot Number	Lot Area (AC)
P-79	3.2
P-80	6.7
P-81	1.5
P-82	2.1
P-83	2.3
P-84	1.1
P-85	1.6
P-86	1.1
P-87	2.1
R-88	46.9
R-89	7.1
R-90	4.8
R-91	3.7
R-92	6.9
R-93	7.0
R-94	3.3
R-95	1.9
R-96	18.4
PF-97	1.4
PF-98	0.9
PF-99	14.2
PF-100	0.1
PF-101	4.1
PF-102	9.0
PF-103	3.8
PF-104	6.7
PF-105	2.6
PF-106	2.0
PF-107	0.7
PF-108	0.8
OS-109	39.9
OS-110	22.2
OS-111	2.2
OS-112	3.5
OS-113	76.3
OS-114	6.5
OS-115	31.4
OS-116	18.4
OS-117	35.2
OS-118	3.3
OS-119	4.1
OS-120	2.4

Lot Number	Lot Area (AC)
OS-121	4.8
OS-122	12.0
OS-123	3.7
OS-124	1.8
OS-125	9.2
OS-126	7.5
OS-127	274.9
OS-128	57.8
OS-129	140.1
OS-130	52.9
OS-131	23.9
OS-132	6.9
OS-133	0.4
OS-134	17.9
OS-135	2.8
OS-136	9.6
OS-137	3.6
OS-138	8.7
OS-139	1.7
OS-140	2.1
OS-141	1.3
OS-142	1.3
OS-143	1.0
OS-144	0.9
OS-145	1.2
OS-146	0.5
OS-147	1.2
OS-148	2.6
OS-149	2.3
OS-150	1.4
OS-151	0.9
OS-152	1.3
OS-153	2.2
OS-154	1.7
OS-155	1.5
OS-156	0.4
OS-157	0.8
OS-158	0.5
OS-159	1.6
OS-160	0.3
OS-161	1.1
OS-162	287.4

0 500 1000 1500feet
1"=500'

H:\2000\229843-C\23 Solomon Hills\Specific Plan\Engineering\TM\Sheet Files\Grading Phasing Plan.dwg C-10, Jul 28, 2025 11:24am, kwanderson

rrm

solomon hills

July 28, 2025

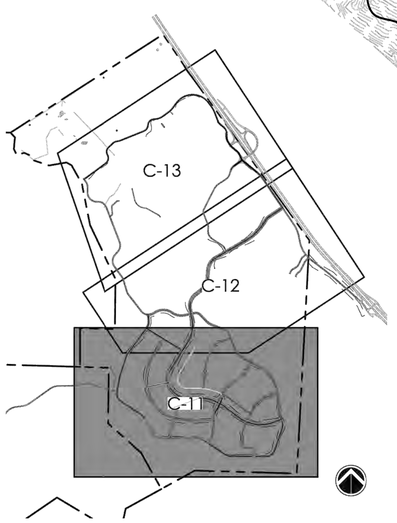
VESTING TENTATIVE TRACT MAP NO. 14,909

GRADING PHASING PLAN C-10

OIL WELL LEGEND

ONSITE OIL WELL TO BE ABANDONED. A 40' X 50' ACCESS EASEMENT REQUIRED. FUTURE DEVELOPMENT MAY RELOCATE THE EASEMENT, BUT IT MUST MAINTAIN THE SAME 40' X 50' DIMENSIONS. A TEMPORARY ACCESS EASEMENT PROPOSED TO THE NEAREST POINT OF ACCESS. A PERMANENT 20' NO-BUILD ZONE IS PROPOSED FOR EVERY OIL WELL LOCATION.

ABANDONED ONSITE OIL WELL. A 40' X 50' ACCESS EASEMENT REQUIRED. FUTURE DEVELOPMENT MAY RELOCATE THE EASEMENT, BUT IT MUST MAINTAIN THE SAME 40' X 50' DIMENSIONS. A TEMPORARY ACCESS EASEMENT PROPOSED TO THE NEAREST POINT OF ACCESS. A PERMANENT 20' NO-BUILD ZONE IS PROPOSED FOR EVERY OIL WELL LOCATION.



KEYMAP
NTS

LEGEND

- TRACT BOUNDARY
- 500 EXISTING MAJOR CONTOUR
- 495 EXISTING MINOR CONTOUR
- 500 PROPOSED MAJOR CONTOUR
- 495 PROPOSED MINOR CONTOUR
- SD PROPOSED STORM DRAIN, SIZE PER PLAN
- PROPOSED 10' PUBLIC TRAIL & EASEMENT PER DETAIL ON SHEET C-17, FINAL LOCATIONS TBD
- PROPOSED DRAINAGE SWALE
- PROPOSED PIPE OR CULVERT ROAD CROSSING WITH HEADWALLS (N.T.S.)
- PROPOSED CULVERT ROCK SLOPE PROTECTION (N.T.S.)
- PROPOSED CONCRETE CATCH BASIN
- PROPOSED ENERGY DISSIPATOR (N.T.S.)
- (D) PROPOSED STORM DRAIN MANHOLE PER S.B. COUNTY STANDARDS

GRADING NOTES

1. THE MAXIMUM MASS GRADING SLOPES SHALL BE 3:1 FOR FILL CONDITION AND 2.5:1 FOR CUT CONDITION.
2. PROPOSED CONTOURS SHOWN REPRESENT FINISHED SURFACE.
3. IMPACTED TREES ARE THOSE TREES WITHIN THE LIMIT OF GRADING.
4. INDIVIDUAL TREE TRUNKS HAVE NOT BEEN SURVEYED AND ARE ASSUMED TO BE THE CENTER OF DRIP LINES AND SCATTERED THROUGHOUT THE CLUSTER OF DRIP LINES.
5. SLOPES THAT EXTEND BEYOND ROAD RIGHT OF WAYS REQUIRE SLOPE MAINTENANCE EASEMENTS AND ARE PROPOSED TO BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
6. REFER TO CIVIL SHEETS C-18 & C-19 FOR ROAD SECTION DETAILS AND PROJECT GRADING SECTIONS.
7. STORM DRAIN INFRASTRUCTURE SHALL BE PRIVATELY MAINTAINED.
8. SEE SHEETS ### THROUGH C-4 FOR DISPOSITION OF EXISTING STRUCTURES AND EXISTING EASEMENT INFORMATION.
9. RUNOFF FROM OFFSITE DRAINAGE WILL BE MANAGED AND CONVEYED IN AN NON-EROSIVE MANNER.
10. SEE SHEETS C-9 & C-10 FOR PROJECT PHASING INFORMATION.
11. SEE SHEET C-17 FOR TYPICAL SLOPE GRADING DETAILS.

LEGEND

- Qoa1/Qoa2 — Quaternary older alluvium
- Quaternary landslide
- QTp — Paso Robles Formation
- Tcag — Careaga Sand - Graciosa member
- Tcac — Careaga Sand - Cebada member
- tss — Tar Soaked Sand
- Tsq — Sisquoc Formation
- Strike and dip of bedding (Seward)
- Approximate strike and dip of bedding (Seward)
- Very approximate strike and dip of bedding (Seward)
- Average strike and dip of bedding in boring (Seward)
- Strike and dip of contact (Seward)
- Strike and dip of fracture (Seward)
- Strike and dip of slide plane; arrow indicates trend of striations upon the slide plane (Seward)
- Strike and dip of bedding (per Dibblee map)
- Strike and dip of bedding (per Woodring map)
- GT-244 — Approximate location of geologic trench
- ST-24 — Approximate location of geotechnical trench
- BA-22 — Approximate location of bucket-auger boring
- HS-49 — Approximate location of hollow-stem-auger boring
- CPT-54 — Cone Penetrometer Test (CPT)
- Geologic contact; dotted where concealed
- Axial trace of anticline
- Fault trace (per Dibblee map)
- R=60' — Estimated removal depth
- R'=30-80' — Estimated removal depth; no subsurface exploration in these areas; depth estimates are based on relative information to the north
- 36 36' — Cross Section

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

PRELIMINARY GRADING

DATE: 8/15/25	JOB NO.: 2995s
SCALE: 1" = 200'	FILE NAME: AES 15 10-09 GRADING & DRAINAGE EXHIBIT_32_0_20250909
SHEET C-11	GEOLOGY BY: VCG
	DRAWN BY: EV
	REVISED:

0 200 400 600 feet
1"=200'

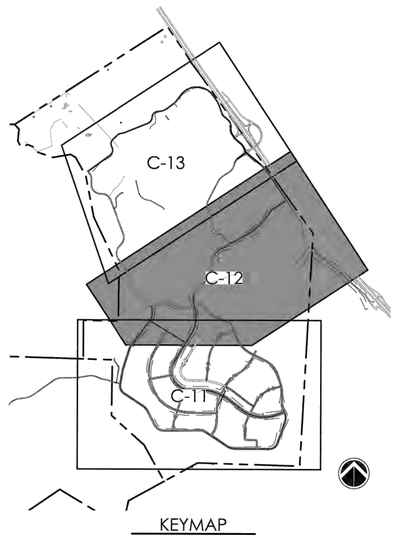
July 18, 2025

VESTING TENTATIVE TRACT MAP NO. 14,909
GRADING & DRAINAGE
C-11

N:\2000\2998.05-C\03\Solomon Hills Specific Plan\Engineering\TM\Sheet Files\C3_Preliminary Grading.dwg, C-11, Jul 18, 2025 - 9:30am, ivanderson

SEE SHEET C-13

SEE SHEET C-11



KEYMAP
NTS

LEGEND

- TRACT BOUNDARY
- 500 EXISTING MAJOR CONTOUR
- 495 EXISTING MINOR CONTOUR
- 500 PROPOSED MAJOR CONTOUR
- 495 PROPOSED MINOR CONTOUR
- SD PROPOSED STORM DRAIN, SIZE PER PLAN
- PROPOSED 10' PUBLIC TRAIL & EASEMENT PER DETAIL ON SHEET C-17, FINAL LOCATIONS TBD
- PROPOSED DRAINAGE SWALE
- PROPOSED PIPE OR CULVERT ROAD CROSSING WITH HEADWALLS (N.T.S.)
- PROPOSED CULVERT ROCK SLOPE PROTECTION (N.T.S.)
- PROPOSED CONCRETE CATCH BASIN
- PROPOSED ENERGY DISSIPATOR (N.T.S.)
- PROPOSED STORM DRAIN MANHOLE PER S.B. COUNTY STANDARDS
- ONSITE OIL WELL TO BE ABANDONED. A 40' X 50' ACCESS EASEMENT REQUIRED. FUTURE DEVELOPMENT MAY RELOCATE THE EASEMENT, BUT IT MUST MAINTAIN THE SAME 40' X 50' DIMENSIONS. A TEMPORARY ACCESS EASEMENT PROPOSED TO THE NEAREST POINT OF ACCESS. A PERMANENT 20' NO-BUILD ZONE IS PROPOSED FOR EVERY OIL WELL LOCATION.
- ABANDONED ONSITE OIL WELL. A 40' X 50' ACCESS EASEMENT REQUIRED. FUTURE DEVELOPMENT MAY RELOCATE THE EASEMENT, BUT IT MUST MAINTAIN THE SAME 40' X 50' DIMENSIONS. A TEMPORARY ACCESS EASEMENT PROPOSED TO THE NEAREST POINT OF ACCESS. A PERMANENT 20' NO-BUILD ZONE IS PROPOSED FOR EVERY OIL WELL LOCATION.

GRADING NOTES

1. THE MAXIMUM MASS GRADING SLOPES SHALL BE 3:1 FOR FILL CONDITION AND 2.5:1 FOR CUT CONDITION.
2. PROPOSED CONTOURS SHOWN REPRESENT FINISHED SURFACE.
3. IMPACTED TREES ARE THOSE TREES WITHIN THE LIMIT OF GRADING.
4. INDIVIDUAL TREE TRUNKS HAVE NOT BEEN SURVEYED AND ARE ASSUMED TO BE THE CENTER OF DRIP LINES AND SCATTERED THROUGHOUT THE CLUSTER OF DRIP LINES.
5. SLOPES THAT EXTEND BEYOND ROAD RIGHT OF WAYS REQUIRE SLOPE MAINTENANCE EASEMENTS AND ARE PROPOSED TO BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
6. REFER TO CIVIL SHEETS C-18 & C-19 FOR ROAD SECTION DETAILS AND PROJECT GRADING SECTIONS.
7. STORM DRAIN INFRASTRUCTURE SHALL BE PRIVATELY MAINTAINED.
8. SEE SHEETS ### THROUGH C-4 FOR DISPOSITION OF EXISTING STRUCTURES AND EXISTING EASEMENT INFORMATION.
9. RUNOFF FROM OFFSITE DRAINAGE WILL BE MANAGED AND CONVEYED IN AN NON-EROSIVE MANNER.
10. SEE SHEETS C-9 & C-10 FOR PROJECT PHASING INFORMATION.
11. SEE SHEET C-17 FOR TYPICAL SLOPE GRADING DETAILS.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

PRELIMINARY GEOLOGIC MAP

DATE: 8/15/25	JOB NO.: 25-21950-1
SCALE: 1" = 200'	FILE NAME: AES 25-1019 GRADING & DRAINAGE EXHIBIT_C2_D_20250909
SHEET C-12	GEOLOGY BY: VCC
	DRAWN BY: EV
	REVISED:

LEGEND SEE SHEET C-11

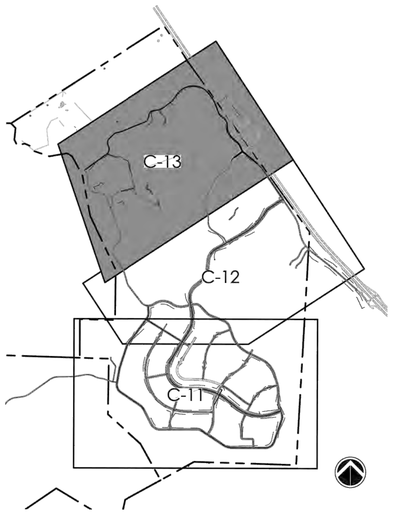
0 200 400 600 feet
1"=200'

solomon hills

July 18, 2025

VESTING TENTATIVE TRACT MAP NO. 14,909
GRADING & DRAINAGE
C-12

N:\2025\25019-01\03-Solomon Hills Specific Plan\Engineering\Vtm\Sheet Files\C3_Preliminary Grading.dwg, C-13, Jul 18, 2025 - 9:54am, kvanderson



KEYMAP
NTS

LEGEND

- TRACT BOUNDARY
- 500 EXISTING MAJOR CONTOUR
- 495 EXISTING MINOR CONTOUR
- 500 PROPOSED MAJOR CONTOUR
- 495 PROPOSED MINOR CONTOUR
- SD PROPOSED STORM DRAIN, SIZE PER PLAN
- PROPOSED 10' PUBLIC TRAIL & EASEMENT PER DETAIL ON SHEET C-17, FINAL LOCATIONS TBD
- PROPOSED DRAINAGE SWALE
- PROPOSED PIPE OR CULVERT ROAD CROSSING WITH HEADWALLS (N.T.S.)
- PROPOSED CULVERT ROCK SLOPE PROTECTION (N.T.S.)
- PROPOSED CONCRETE CATCH BASIN
- PROPOSED ENERGY DISSIPATOR (N.T.S.)
- D PROPOSED STORM DRAIN MANHOLE PER S.B. COUNTY STANDARDS
- ONSITE OIL WELL TO BE ABANDONED. A 40' X 50' ACCESS EASEMENT REQUIRED. FUTURE DEVELOPMENT MAY RELOCATE THE EASEMENT, BUT IT MUST MAINTAIN THE SAME 40' X 50' DIMENSIONS. A TEMPORARY ACCESS EASEMENT PROPOSED TO THE NEAREST POINT OF ACCESS. A PERMANENT 20' NO-BUILD ZONE IS PROPOSED FOR EVERY OIL WELL LOCATION.
- ABANDONED ONSITE OIL WELL. A 40' X 50' ACCESS EASEMENT REQUIRED. FUTURE DEVELOPMENT MAY RELOCATE THE EASEMENT, BUT IT MUST MAINTAIN THE SAME 40' X 50' DIMENSIONS. A TEMPORARY ACCESS EASEMENT PROPOSED TO THE NEAREST POINT OF ACCESS. A PERMANENT 20' NO-BUILD ZONE IS PROPOSED FOR EVERY OIL WELL LOCATION.

SEE SHEET C-12

GRADING NOTES

1. THE MAXIMUM MASS GRADING SLOPES SHALL BE 3:1 FOR FILL CONDITION AND 2.5:1 FOR CUT CONDITION.
2. PROPOSED CONTOURS SHOWN REPRESENT FINISHED SURFACE.
3. IMPACTED TREES ARE THOSE TREES WITHIN THE LIMIT OF GRADING.
4. INDIVIDUAL TREE TRUNKS HAVE NOT BEEN SURVEYED AND ARE ASSUMED TO BE THE CENTER OF DRIP LINES AND SCATTERED THROUGHOUT THE CLUSTER OF DRIP LINES.
5. SLOPES THAT EXTEND BEYOND ROAD RIGHT OF WAYS REQUIRE SLOPE MAINTENANCE EASEMENTS AND ARE PROPOSED TO BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
6. REFER TO CIVIL SHEETS C-18 & C-19 FOR ROAD SECTION DETAILS AND PROJECT GRADING SECTIONS.
7. STORM DRAIN INFRASTRUCTURE SHALL BE PRIVATELY MAINTAINED.
8. SEE SHEETS ### THROUGH C-4 FOR DISPOSITION OF EXISTING STRUCTURES AND EXISTING EASEMENT INFORMATION.
9. RUNOFF FROM OFFSITE DRAINAGE WILL BE MANAGED AND CONVEYED IN AN NON-EROSIVE MANNER.
10. SEE SHEETS C-9 & C-10 FOR PROJECT PHASING INFORMATION.
11. SEE SHEET C-17 FOR TYPICAL SLOPE GRADING DETAILS.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

PRELIMINARY GEOLOGIC MAP

DATE: 8/15/25 | JOB NO.: 25-2195s-1
SCALE: 1" = 200' | FILE NAME: AES 23.0.09 Grading & Drainage Exhibit_GE_0-20250009
SHEET C-13 | GEOLOGY BY: VCG | DRAWN BY: EV | REVISED:

LEGEND SEE SHEET C-11

0 200 400 600 feet
1"=200'

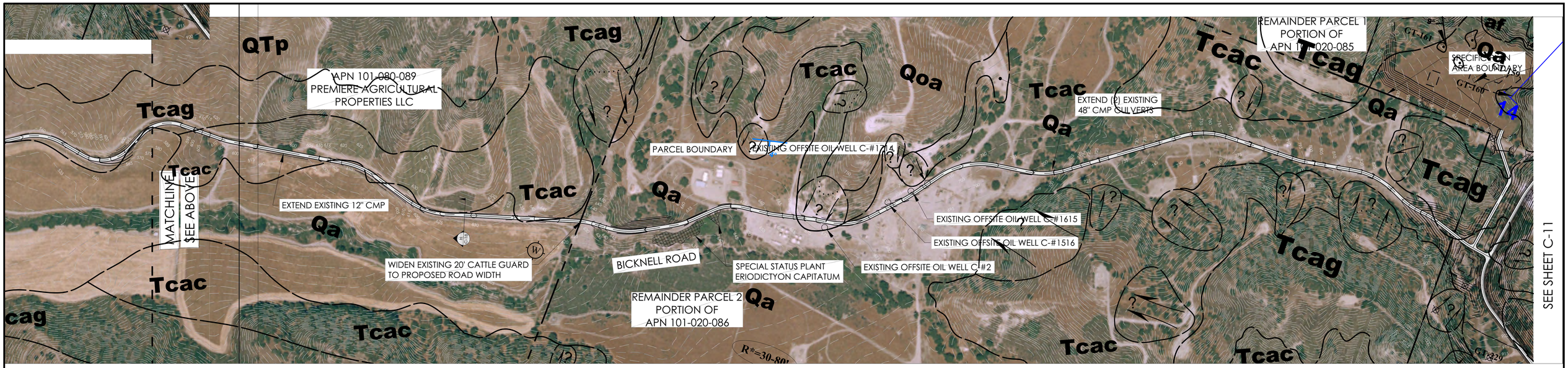
rrm

solomon hills

July 18, 2025

VESTING TENTATIVE TRACT MAP NO. 14,909
GRADING & DRAINAGE C-13

N:\2025\2025-09-03\25-0903 Solomon Hills Specific Plan\Engineering\TM\Sheet Files\25_Preliminary Grading.dwg, C-13, Jul 18, 2025, 3:50pm, evanderson





SEE SHEET C-15

BICKNELL ROAD EARTHWORK SUMMARY

AREA OF DISTURBANCE:	16.8	ACRES
MAXIMUM CUT HEIGHT:	7	FEET
MAXIMUM FILL HEIGHT:	45	FEET
RAW CUT:	0	CU YD
RAW FILL:	61,300	CU YD
ADJUSTED FILL (ASSUMED 20% SHRINKAGE):	73,500	CU YD
NET QUANTITY:	73,500	CU YD <IMPORT>

PRELIMINARY ESTIMATED QUANTITY ESTIMATES ON THESE PLANS ARE TO BE USED FOR PERMIT PURPOSES ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ACTUAL QUANTITIES FOR THE PURPOSE OF CONSTRUCTION.

THE ASSUMED SHRINKAGE FACTOR IS SUBJECT TO CHANGE BASED ON ACTUAL FIELD CONDITIONS AND THE FINAL RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.

THE APPROXIMATE RAW EARTHWORK QUANTITIES SHOWN HEREON REPRESENT THE ESTIMATED VOLUMETRIC DIFFERENCE BETWEEN THE PROPOSED ROUGH GRADE AND THE LIMITED TOPOGRAPHIC EXISTING GRADES. THESE ESTIMATES DO NOT MAKE CONSIDERATIONS FOR LOSSES OR BULKING DUE TO: SHRINKAGE, SOIL AMENDMENTS, STABILIZATION, CONSTRUCTION TECHNIQUE, FOOTING & TRENCHING SPOILS, ETC.. THESE CONSIDERATIONS, IN ADDITION TO ACTUAL FIELD CONDITIONS AND THE FINAL RECOMMENDATIONS OF THE SOILS ENGINEER MAY SIGNIFICANTLY EFFECT THE FINAL IMPORT/EXPORT QUANTITIES. CONTRACTOR IS ALSO RESPONSIBLE FOR ADJUSTMENTS TO SLOPE HINGE POINTS IN ORDER TO PROVIDE GRADED PAD AREA AND ADJACENT TO PATHS, WALKWAYS, AND ROADS FOR UTILITY BOXES, TRANSFORMERS, ETC. AND ABOVE GROUND UTILITY INFRASTRUCTURE.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

PRELIMINARY GEOLOGIC MAP

DATE: 8/15/25	JOB NO.: 25-21956-1
SCALE: 1" = 250	FILE NAME: AES 25.08.06 OFFSITE Access
SHEET C-14	GEOLOGY BY: VCG
	DRAWN BY: EV
	REVISED:

0 250 500 750 feet
1"=250'

rrm

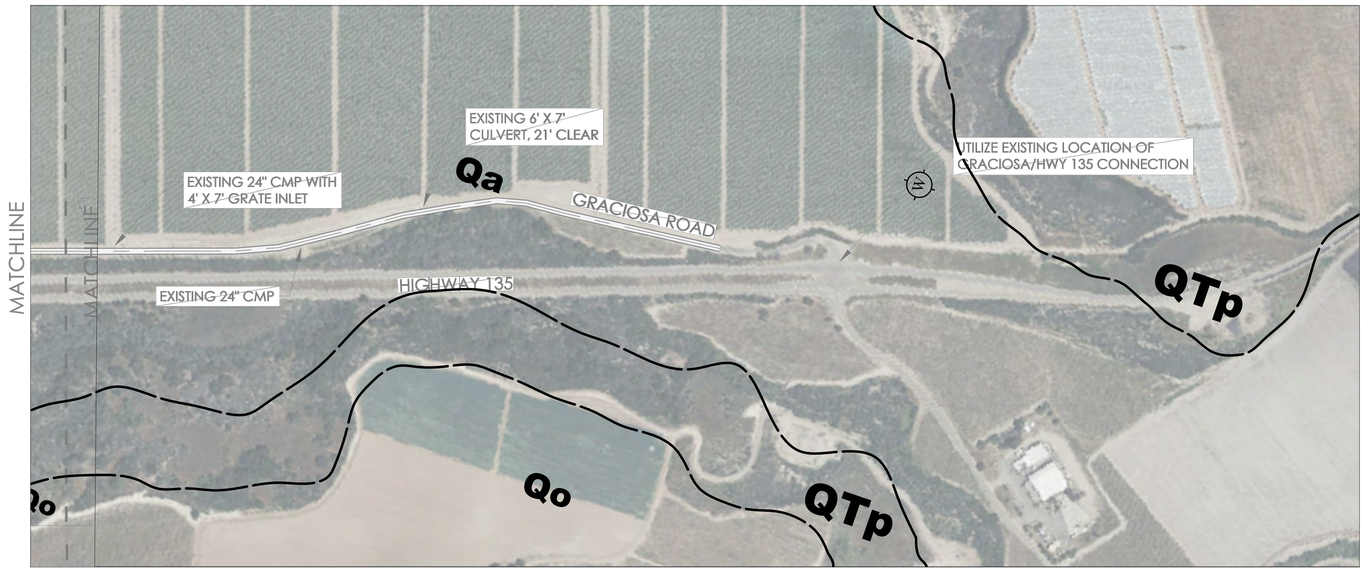
solomon hills

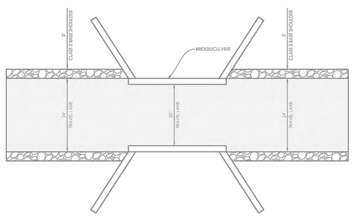
July 28, 2025

VESTING TENTATIVE TRACT MAP NO. 14,909
OFFSITE ACCESS C-14

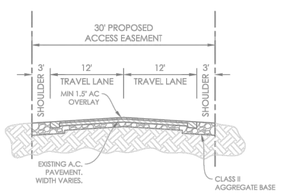
SEE SHEET C-14







1 GRACIOSA BRIDGE/CULVERT CROSSINGS
SCALE: N.T.S.



2 GRACIOSA ROAD SECTION
SCALE: N.T.S.

ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

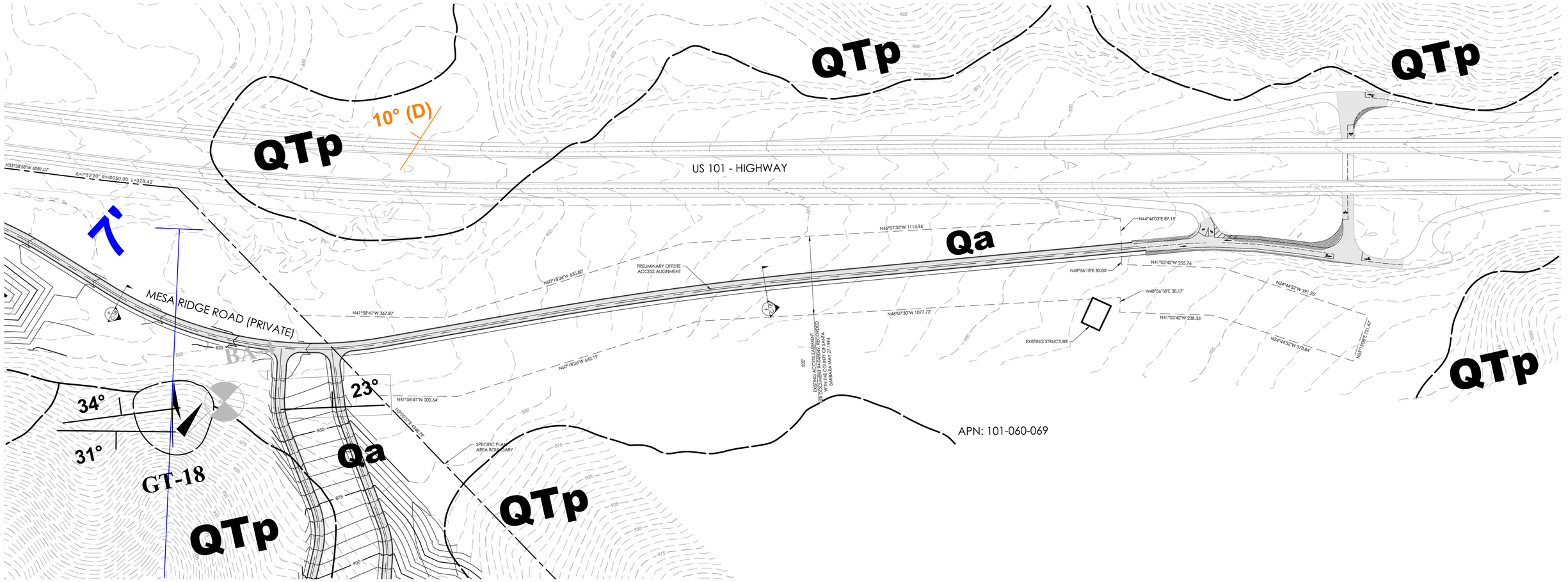
PRELIMINARY GEOLOGIC MAP

DATE: 8/15/25 | JOB NO.: 25-2195-1
SCALE: 1" = 250' | FILE NAME: AES 25.08.04 Offsite Access
SHEET C-15 | GEOLOGY BY: VCG | REVISED:
DRAWN BY: EV

LEGEND SEE SHEET C-11

0 250 500 750 feet
1"=250'

N:\2025\25195.05-C103-Solomon Hills-Specific Plan\Engineering\TM\Sheet Files\VC_Offsite Access.dwg, C-15, Jul 28, 2025, 11:29pm, brendanson



ALLAN E. SEWARD
ENGINEERING GEOLOGY, INC.
Geological And Geotechnical Consultants

PRELIMINARY GEOLOGIC MAP

DATE: 8/15/25	JOB NO.: 25-21956-1
SCALE: 1" = 100'	FILE NAME: AES 25.08.04 Offsite Access
SHEET C-16	GEOLOGY BY: VCG
	DRAWN BY: EV
	REVISED:

LEGEND SEE SHEET C-11

0 100 200 300 feet
1"=100'

rrm

solomon hills

July 28, 2025

VESTING TENTATIVE TRACT MAP NO. 14,909
SOLOMON SUMMIT ACCESS

C-16