Initial Study

Herbert Hoover Elementary School Replacement Campus

Prepared for

Palo Alto Unified School District
25 Churchill Avenue
Palo Alto, California 94306

Prepared by

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September 27, 2023

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Acronyms and Abbreviations

µg/m^3	micrograms per cubic meter
AB	Assembly Bill
BAAQMD	Bay Area Air Quality Management District
BLM	U.S. Department of the Interior, Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act (federal)
CAAA	1990 CAA Amendments
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model
CALGreen	California Green Building Standards Code
Cal/OSHA	California Division of Occupational Safety and Health
CAP	criteria air pollutant
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDE	California Department of Education
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CGS	California Geological Survey
City	City of Palo Alto
CNDDB	California Native Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO2e	carbon dioxide equivalents

CWA	Clean Water Act (federal)
dBA	a-weighted decibel
District	Palo Alto Unified School District
DSA	California Division of the State Architect
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EV	electric vehicle
FEMA	Federal Emergency Management Agency
FESA	Endangered Species Act (federal)
FGC	California Fish and Game Code
FHWA	Federal Highway Administration
FIFRA	federal Insecticide, Fungicide, and Rodenticide Act
FTA	Federal Transit Administration
GHG	greenhouse gas
GLO	General Land Office
HCD	California Department of Housing and Community Development
Hoover ES	Herbert Hoover Elementary School
HSC	California Health and Safety Code
HUD	U.S. Department of Housing and Urban Development
I-280	Interstate 280
IPAC	USFWS Information, Planning, and Conservation
IS	Initial Study
JLSMS	J.L. Stanford Middle School
lbs/day	pounds per day
LBP	lead-based paint
Ldn	day-night average sound level

Leq	equivalent continuous sound pressure level
LUST	Leaking Underground Storage Tank
MBTA	Migratory Bird Treaty Act of 1918 (federal)
MLD	Most Likely Descendent
MMT	million metric tons
MND	Mitigated Negative Declaration
MRZ	mineral resources zone
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
ND	Negative Declaration
NMFS	National Marine Fisheries Service
NO2	nitrogen dioxide
NPDES	National Pollution Discharge Elimination System
NWIC	Northwest Information Center
O3	ozone
OPR	Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PAFD	Palo Alto Fire Department
PCB	polychlorinated biphenyl
PF	Public Facilities
PM	particulate matter
PM_{10}	coarse particulate matter 10 micrometers or less in diameter
$PM_{2.5}$	fine particulate matter 2.5 micrometers or less in diameter
ppm	parts per million
PPS	Proposed Project site
PRC	Public Resources Code
Proposed Project	Herbert Hoover Elementary School Replacement Campus Project
RCRA	Resource Conservation and Recovery Act
RPA	registered professional archaeologist
RPS	Renewables Portfolio Standard

S/CAP	*Sustainability and Climate Action Plan*
SAS	Solano Archaeological Services
SB	Senate Bill
SFPUC	San Francisco Public Utilities Commission
SLF	Sacred Lands File
SMARA	Surface Mining and Reclamation Act
SO2	sulfur dioxide
SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TCM	transportation control measures
TCR	tribal cultural resource
tpy	tons per year
TSCA	Toxic Substances Control Act of 1976
U.S. 101	U.S. Highway 101
USGS.	U.S. Geological Survey
USFWS	U.S. Fish & Wildlife Service
UW	Universal Waste
VMT	vehicle miles traveled
WELO	Water Efficient Landscape Ordinance

1 Introduction

The proposed Herbert Hoover Elementary School Replacement Campus Project (Proposed Project) is a project as defined under the California Environmental Quality Act of 1970 (CEQA[1]; Public Resources Code [PRC] § 21000, et seq., as amended[2]). This Initial Study (IS) was prepared for the Palo Alto Unified School District (District) pursuant to CEQA and the implementing CEQA Guidelines (Title 14, Chapter 3 of the California Code of Regulations [CCRs]; collectively, CEQA Guidelines).[3]

1.	**Project Title:**	Herbert Hoover Elementary School Replacement Campus Project
2.	**Lead Agency Name and Address:**	Palo Alto Unified School District 25 Churchill Avenue, Palo Alto, California 94306
3.	**Contact Person and Phone Number:**	Eric Holm, Director, Facilities & Construction (650) 329-3700
4.	**Project Location:**	445 East Charleston Road Palo Alto, California 94306
5.	**Project Sponsor's/Applicant's Name and Address:**	Palo Alto Unified School District 25 Churchill Avenue, Palo Alto, California 94306
6.	**General Plan Land Use Designation:**	Urban Service Area
7.	**Zoning:**	PF (Public Facilities)
8.	**Surrounding Land Uses and Setting:**	Residential and urban development, educational, senior living and supporting infrastructure
9.	**Description of Project:**	The Proposed Project is the replacement of the existing Herbert Hoover Elementary School with an updated and more efficient elementary school and a redesign of the parking and on-site traffic flow to provide safety for students. The redesigned facilities would better utilize the entire campus, including allowing students to safely access the adjacent athletic fields and modernizing the library and other buildings.
10.	**Project Entitlements:**	District Board Approval
11.	**California Native American Consultation Requests**	The Native American Heritage Commission was contacted on June 21, 2023, for a Sacred Lands File search and a list of Native American community representatives to contact.
12.	**Date Initial Study Completed:**	September 27, 2023

[1] 2023 CEQA Statute & Guidelines

[2] PRC § 21000, et seq.

[3] Guidelines for Implementation of the California Environmental Quality Act

1.1 Purpose of the Study

This IS examines the potential effects of the Proposed Project on the environment. The Proposed Project assessed within this IS, described in Section 2, includes provisions to address known environmental concerns. The project description, including these provisions, provides the baseline for which environmental impacts are analyzed in Section 3. This IS was prepared pursuant to CEQA.

This IS has identified potentially significant impacts and mitigation measures, which, when incorporated into the Proposed Project as described in Section 2, would reduce these impacts to less-than-significant levels. Therefore, this IS would support a "Mitigated Negative Declaration" (MND) under CEQA Guidelines (14 CCR § 15070).[4]

This IS is organized into the following sections:

Section 1. Introduction: Provides an overview of the Proposed Project, location, sponsor, when the IS was completed, environmental resources potentially affected by the Proposed Project, and the significance determination of the Proposed Project on the environment by the Lead Agency (the District).

Section 2. Project Description: Includes a detailed description of the Proposed Project and background information.

Section 3. Environmental Checklist and Discussion: Contains the Environmental Checklist form and a discussion of environmental issues. Mitigation measures, if necessary, are included after each impact discussion. The numbering sequence for each mitigation measure relates to the associated topical section.

Section 4. Preparers

Section 5. References

1.2 Environmental Factors Potentially Affected

Impacts to the resources listed below were evaluated using the Environmental Checklist included in Section 0. However, only the environmental factors that are checked could be potentially affected by the Proposed Project and involve impacts that require mitigation to reduce the impacts to less-than-significant levels. The resource areas that are unchecked were determined to have a less-than-significant impact or no impact, even without mitigation.

- ☐ Aesthetics
- ☐ Agriculture and Forestry Resources
- ☒ Air Quality
- ☐ Biological Resources
- ☐ Cultural Resources
- ☐ Mineral Resources
- ☐ Noise/Vibration
- ☐ Population and Housing
- ☐ Public Services
- ☐ Recreation

[4] 14 CCR § 15070, Decision to Prepare a Negative or Mitigated Negative Declaration

- ☐ Aesthetics
- ☐ Agriculture and Forestry Resources
- ☒ Air Quality
- ☐ Biological Resources
- ☐ Cultural Resources
- ☐ Energy
- ☒ Geology and Soils
- ☐ Greenhouse Gas Emissions
- ☒ Hazards and Hazardous Materials
- ☐ Hydrology and Water Quality
- ☐ Land Use and Planning
- ☐ Mineral Resources
- ☐ Noise/Vibration
- ☐ Population and Housing
- ☐ Public Services
- ☐ Recreation
- ☐ Transportation and Circulation
- ☒ Tribal Cultural Resources
- ☐ Utilities and Service Systems
- ☐ Wildfire
- ☒ Mandatory Findings of Significance

1.3 Significance Determination

On the basis of the environmental evaluation presented in Section 3, as the representative for the Lead Agency:

☐ I find that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project design and project-specific mitigation measures described in Section 3 have been agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION is recommended to be adopted.

☐ I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Eric Holm — Signature

9/27/23 — Date

Eric Holm, Director, Facilities & Construction — Printed Name

Palo Alto Unified School District — Lead Agency

2 Project Description

The District proposes to demolish and replace the existing Herbert Hoover Elementary School (Hoover ES) campus to improve density and seismic safety, and increase the safe use of adjacent athletic fields (the Proposed Project). The Proposed Project site (PPS) is located on a portion of a 35.64-acre parcel at 445 East Charleston Road in the City of Palo Alto (City) in Santa Clara County (County), California.[5] The demolition and replacement would address the most critical needs at Hoover ES through the reconfiguration of the campus and construction of new buildings. The Proposed Project is required to undergo an environmental review pursuant to CEQA.

As the Lead Agency charged with approving and executing the Proposed Project, the District is required to consider the Proposed Project's potential environmental consequences and determine if its benefits outweigh any significant effects.

2.1 Location and Existing Setting

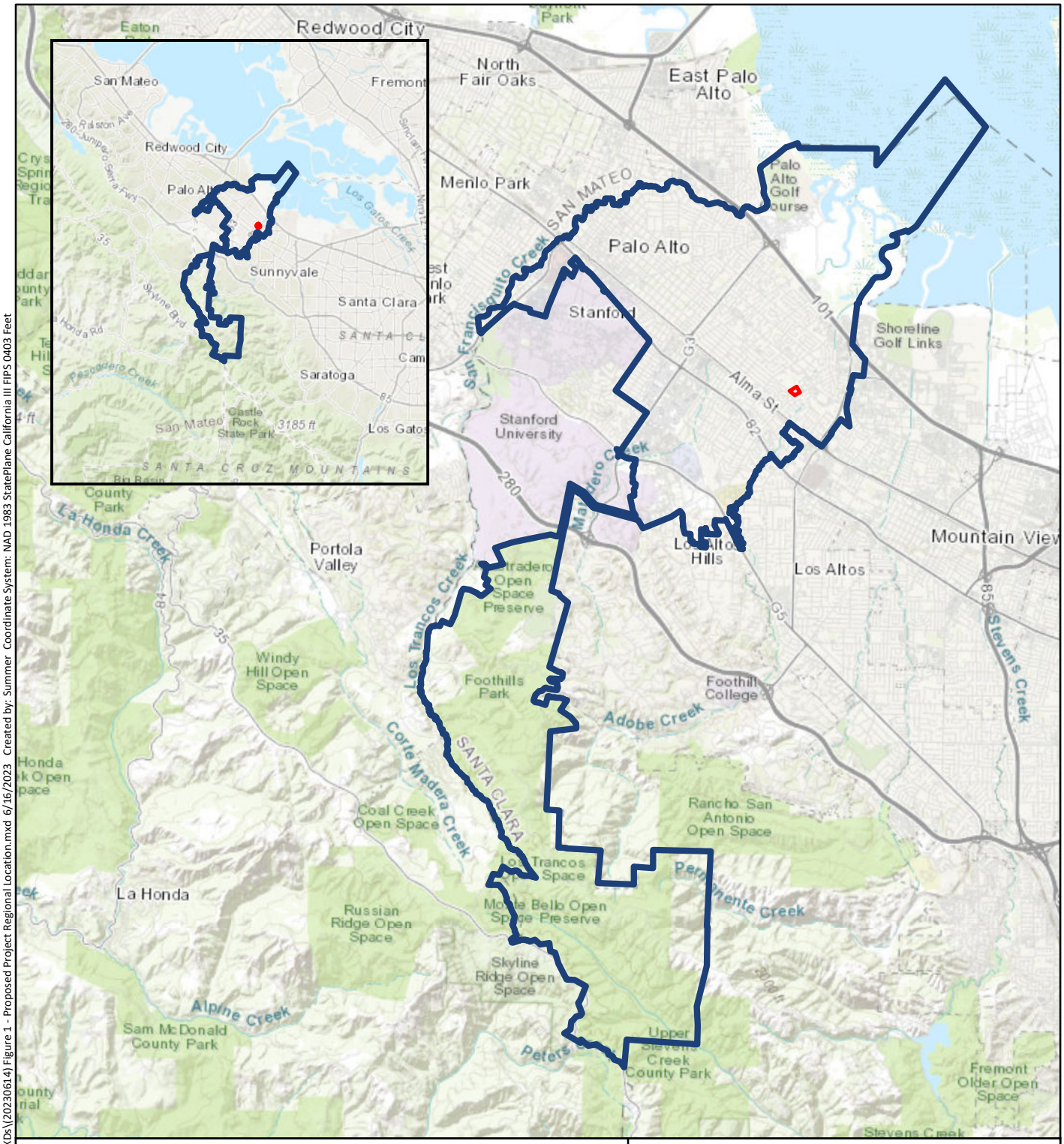
The PPS is situated on a 35.64-acre parcel (Assessor's Parcel Number 132-06-001) at 445 East Charleston Road, Palo Alto, Santa Clara County, California. This parcel includes the existing Herbert Hoover Elementary School (5.6 acres [District 2023a]) as well as J.L. Stanford Middle School (JLSMS), Fairmeadow Elementary School, and various athletic fields. The PPS is currently bound by East Charleston Road to the south, a school drop-off/parking area to the west, athletic fields for JLSMS to the north, and Stevenson House (affordable senior housing building) to the east. The PPS assessed in this IS includes the original Hoover ES campus and approximately 31 adjoining feet of the JLSMS athletic fields.

Santa Clara County is comprised of the cities of Campbell, Cupertino, Gilroy, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Morgan Hill, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale (Santa Clara LAFCO 2023). The county is bound by Alameda County to the north, San Benito County to the south, Stanislaus and Merced counties to the east, and San Mateo and Santa Cruz counties to the west (Geology.com 2023).

The PPS is midway between U.S. Highway 101 (U.S. 101) to the east and State Route (SR) 82 to the west; the closest interstate (Interstate 280 [I-280]) is approximately 3.31 miles to the southwest and is accessible by Page Mill Road.[6] Figures 1, 2, and 3 show the PPS in its regional and local contexts.

[5] California School Directory

[6] Google Earth



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CLIENT: Palo Alto Unified School District

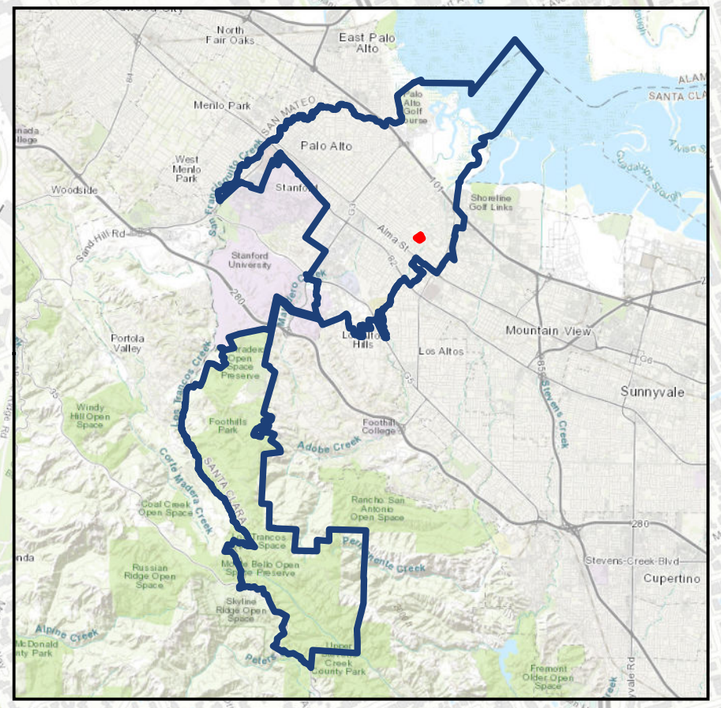
PROJECT: Herbert Hoover Elementary School Replacement Campus CEQA Compliance Services
445 E. Charleston Road, Palo Alto, CA 94306

PROJECT NUMBER: 0275.002.001

Proposed Project Regional Location

FIGURE 1

File: N:\GIS\Prj\0275.002_Palo Alto Unified School District\MXDs\(20230614) Figure 1 - Proposed Project Regional Location.mxd 6/16/2023 Created by: Summer Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet



Legend

- Site Boundary
- City of Palo Alto Boundary

Base Map: ESRI World Topographic Map

0 500 1,000 2,000 Feet

1 inch = 1,000 feet

N

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CLIENT: Palo Alto Unified School District

PROJECT: Herbert Hoover Elementary School Replacement Campus CEQA Compliance Services
445 E. Charleston Road, Palo Alto, CA 94306

PROJECT NUMBER: 0275.002.001

Proposed Project Site and Vicinity

FIGURE 2

File: N:\GIS\Prj\0275.002_Palo Alto Unified School District\MXDs\(20230614) Figure 2 - Proposed Project Site and Vicinity.mxd 6/16/2023 Created by: Summer Coordinate System: NAD 1983 StatePlane New York Long Island FIPS 3104 Feet



Legend

Site Boundary

Aerial Imagery Source: ESRI World Imagery (Clarity)

0 50 100 200 Feet

1 inch = 100 feet

N

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CLIENT: Palo Alto Unified School District

PROJECT: Herbert Hoover Elementary School Replacement Campus CEQA Compliance Services 445 E. Charleston Road, Palo Alto, CA 94306

PROJECT NUMBER: 0275.002.001

Aerial Photograph of Proposed Project Site

FIGURE 3

File: N:\GIS\Prj\0275.002_Palo Alto Unified School District\MXDs\(20230615) Figure 3 - Aerial Photograph of Proposed Project Site.mxd 6/16/2023 Created by: Summer Coordinate System: NAD 1983 StatePlane New York Long Island FIPS 3104 Feet

2.1.1 Existing Land Uses

Facilities

The District currently operates the PPS as an elementary school (Hoover ES) consisting of four permanent buildings constructed in 1953, 1956, 1998, and 2004, and seven relocatable buildings that have been added to the campus over time (District 2023a, 2023b).The campus is comprised of a multi-purpose room, library, administration building, classrooms (grades K through 5), and two relocatable buildings used for day-care facilities; the day-care facilities are located across the access road on the JLSMS fields (District 2023a). The campus consists of 18 classrooms with a total square footage of 32,750 (District 2023a). The buildings are positioned in a U-shaped format along the west, north, and east borders of the PPS with the permanent structures in an L-shaped format along the north and east perimeters. The central area of the PPS between the buildings contains hard athletic courts, playgrounds shaded with trees and bushes, and grassy open space; an additional playground is on the far northwest corner of the PPS. Parking spaces to the north/northeast of the PPS separate the campus from additional athletic fields on the grounds of JLSMS.

Figure 3 shows the existing site facilities from an aerial view. According to the District's *2018 Facilities Master Plans: Hoover Elementary School*, Hoover ES did not receive the typical upgrades that many schools received during the Building for Excellence Program; therefore, the majority of the PPS is planned to be replaced or renovated under the Strong Schools Bond Project. Changes would improve parking and site accessibility and utility services; issues with windows are noted and replacements have been planned for whenever air conditioning and building envelope improvements occur. Additionally, the library at Hoover ES is the only library in the District that does not meet District standards for library facilities. (District 2023a).

Access and Parking

Hoover ES is accessible from East Charleston Road on the south/southwest side of the campus. The campus has a loop road on the other three sides to accommodate both parking and student drop off/pick up. While access was noted as a challenge in the *2018 Facilities Master Plans: Hoover Elementary School* (District 2023a), the City completed the "Charleston/Arastradero Corridor Project" in May 2023 which had a goal of enhanced safety for K-12 students walking and biking to schools as well as smoother traffic flow along the corridor. The project also included the installation of landscaped medians, curb extensions/bulb-outs, and traffic signal modifications (City 2023a). The District and its traffic consultant met with the City's Transportation Department to review the design and changes associated with the PPS. Those changes were incorporated into the Proposed Project.

The Hoover ES parking areas contain 63 spaces on the north and east sides of the campus. Student drop off and pick up, as well as bus parking, occurs on the east side of the campus between the buildings and the parking areas adjacent to the JLSMS athletic fields.[7]

[7] Google Earth

Operations

The District serves 10,318 students in transitional kindergarten through grade 12 and has 22 school facilities (12 elementary, 3 middle, and 2 high schools, as well as 5 additional facilities).[8] Hoover ES opens at 7:45 a.m. with school starting at 8 a.m, Monday through Friday. Kindergarten programs end at 2:05 p.m. on Mondays, Tuesdays, Thursdays, and Fridays and at 1:10 p.m. on Wednesdays and Minimum Days. Grades 1–3 are dismissed at 2:05 p.m., and grades 4–5 are dismissed at 2:30 p.m. on Mondays, Tuesdays, Thursdays, and Fridays; dismissal occurs at 1:10 p.m. for grades 1-5 on Wednesdays and Minimum Days. (District 2023c).

Enrollment at Hoover ES for the 2022–2023 school year was 386 students with an average enrollment over the past 7 years of 384 students. The highest enrollment in the past 7 years, 397 students, occurred during the 2017–2018 school year (California Department of Education [CDE] 2023a). Table 1 shows the 7-year enrollment history for Hoover ES.

Table 1. Hoover Elementary School 7-Year Enrollment History

School Year	Enrollment
2022-2023	386
2021-2022	372
2020-2021	352
2019-2020	392
2018-2019	395
2017-2018	397
2016-2017	392
7-Year Average Enrollment	384

Source: CDE 2023a

The total current capacity of the school is 405 students.

2.1.2 Surrounding Land Uses

The PPS is in a residential community with primarily single-family houses and other schools. The site is surrounded by the land uses described below.

- **North:** access road/parking area separates the PPS from JLSMS athletic fields
- **East:** access road/parking area separates the PPS from Stevenson House (affordable senior housing building)
- **South:** East Charleston Road separates the PPS from single-family residences

[8] District, Additional Schools

- **West:** entry/access road separates the PPS from single-family residences

2.2 Existing Zoning and General Plan

A parcel search on the City's Property Information site[9] indicates that the parcel, which includes the PPS, is zoned as PF. Section 18.28.010 of the City's Municipal Code defines PF as a public facilities district which is "designed to accommodate governmental, public utility, educational, and community service or recreational facilities."[10] The parcels to the north, south, and west are zoned R-1 (single-family residential district, Palo Alto Municipal Code § 18.08.010), the parcel to the northeast which includes Mitchell Park and Mitchell Park Library is zoned PF, and the parcel to the east where Stevenson House is situated is zoned PC-2236 (planned community district, Palo Alto Municipal Code § 18.08.010).[11]

"Permitted Primary Use" is a use allowed by right, subject to compliance with the regulations of the respective zoning district in which the use is located, including Design Review. The District may exempt the PPS from local zoning due to its authority under California Government Code § 53094.[12] The current use of the PPS as an elementary school would remain if the Proposed Project were implemented; thus, no rezoning would be required.

2.3 District Action Requested

The IS/MND examines the potential environmental impacts of the Proposed Project and is being prepared to address various actions by the District to adopt and implement the Proposed Project. The IS/MND intends to enable the District to make an informed decision with respect to the Proposed Project. The District is required to approve the IS/MND prior to approving the Proposed Project and initiating construction activities.

2.4 Project Description

2.4.1 Proposed Project

In the midst of the progressive educational movement of the 1970s, including open classrooms and an unstructured environment, parents within the District sought an alternative that would provide a more steady program with clear expectations. This included a consistent school philosophy, single-grade-level classrooms, and regular homework and writing assignments. The District responded with the creation of Hoover ES at a different location on Middlefield Road and enrollment began on May 4, 1974. However, due to declining enrollment, the District sold the parcel and Hoover ES was relocated to another District school known as Barron Park (District 2023d).

[9] City of Palo Alto Property Information

[10] Special Purpose (PF, OS and AC) Districts, 18.28.010 Purposes

[11] Designation of General Districts,

[12] California Government Code § 53094

Ohlone Elementary School was constructed from 1952–1957 at the PPS and operated through 1989. Ohlone Elementary School closed on June 30, 1989, and Hoover ES was relocated to the PPS and reopened by the District in 1998, when the facility was 46 years old. At that time, a light modernization project occurred to add heater closets and address deferred maintenance as the building had been closed for many years. As part of the Strong Schools Bond Project, also referred to as "Measure A," planning and design began in 2015 for a modernization and addition project at Hoover ES. Bids were received in 2020 but due to uncertainty surrounding the COVID-19 pandemic, as well as approved scope increases, the bids were well over budget and the project was tabled.

In an October 15, 2021, letter to the Board, the District evaluated investments at their elementary sites and noted that classroom and infrastructure improvements had not been undertaken at Hoover ES similar to improvements at its other elementary sites. Hoover ES is the oldest site in the District and in need of the greatest amount of work to modernize the campus. While the District has considered reduced scopes to improve Hoover ES, the District states that doing so would be equivalent to doing nothing because the campus would still require additional work. In consideration of the California Division of the State Architect (DSA) rehabilitation criteria mentioned in the same letter, the District makes an argument that buildings around 70–80 years of age should be replaced with new buildings and that many school districts throughout California are replacing buildings at just 50 years of age due to maintenance costs and the buildings not supporting current teaching practices. It was also noted, for planning purposes, that a new building typically lasts 50 years and a full modernization of a building lasts 30 years. For these reasons, the Proposed Project has been planned by the District.

Hoover ES was designed prior to the existence of "2018 Ed Specs" and in a limited space; therefore, many of the spaces on campus do not meet current criteria. While a different site was considered, it was determined that the most cost-effective solution would be to demolish the current structures and rebuild at the same location. The current design has a significant impact on student learning and some of the proposed designs would maintain some of the existing challenges. For these reasons, the rearrangement of buildings was investigated, and several issues were identified that could be resolved. The selected site plan would ensure the following.

1. Pedestrian and bicycle access would be improved. The existing configuration requires anyone entering the school campus from any direction to cross vehicular traffic.
2. The playing field would no longer be exposed to and facing a busy main street.
3. Access to playing fields shared with the adjacent middle school would no longer be blocked by the parking lot, access road, and classroom wing.
4. Hardcourts would be consolidated.
5. The square footage of the multi-purpose room, library, and administration building would be increased.
6. Relocatables would be removed.

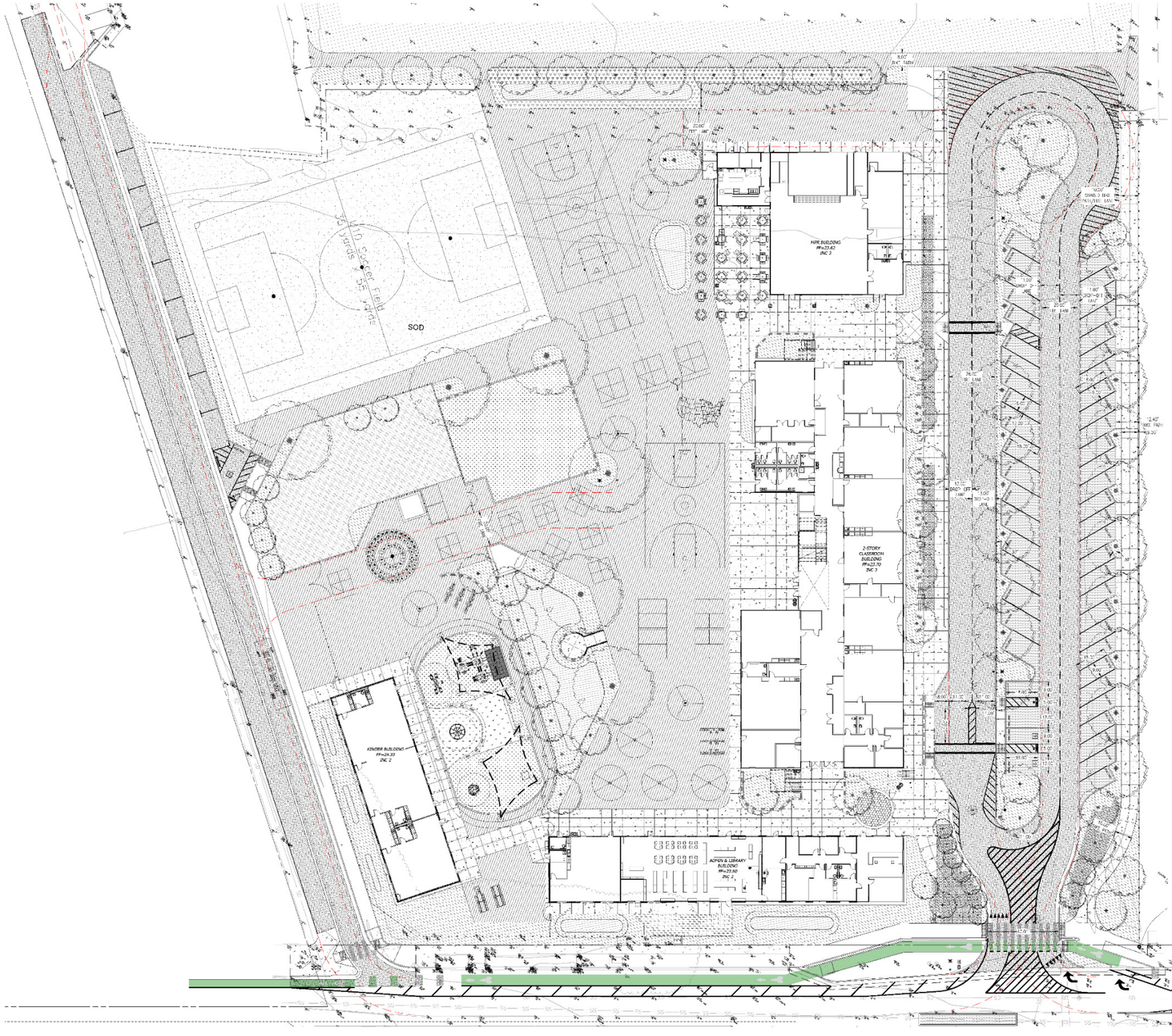
7. The main entry would be more visible.
8. The opportunity for outdoor learning spaces would increase.
9. Some outdoor space would be reclaimed by the repositioning of the access road.
10. Program adjacencies would better align with the 2018 Ed Specs.
11. Flexibility and functionality of the campus would improve for future growth, if needed.
12. Safety and security would be improved by a greater amount of visibility and a sense of security, including better site lines and a more centrally located administration building.
13. Enrichment labs would be created.

All considered design options would result in the reconfiguration of the campus to create a visible, community-centric front door to the campus. The selected design (Proposed Project) would create a large, protected quad that provides connectivity to the athletic fields at the adjacent middle school (JLSMS) and the ability for future expansion. The reconfiguration of the access road and drop-off/pick-up areas would create improvements to circulation that would improve safety and allow for more green space. A combination of both one- and two-story buildings would create buildings that would grow in scale and vary in height depending on the existing structures they would border. The front door to the building would be positioned on East Charleston Street and would create direct access to the multi-purpose room, library, and administration building while providing a buffer of public spaces along the public access way. The Proposed Project adds square footage, increases visibility, provides for more flexible classrooms, and includes more collaboration and breakout spaces (District 2023e).

New Facilities

The Proposed Project would involve demolishing existing structures and redeveloping the PPS, including approximately 30 feet of the adjoining JLSMS athletic fields owned by the District, by reorienting and reducing the building footprint while maintaining the same student capacity of 405 students for grades K–5. The Proposed Project would result in various updates to the building orientation resulting in a net beneficial environment for students (refer to **Figure 4**).

The main entrance to the school campus, the administration building, and the library would be constructed to front East Charleston Street along the southern boundary of the PPS. The 7,555-square foot, single-story building would include administration offices in the eastern portion of the building, library facilities in the center, and an enrichment classroom in the western portion.



SAFETY FIRST	CLIENT: Palo Alto Unified School District	**Site Plan**
terraphase engineering	PROJECT: Herbert Hoover Elementary School Replacement Campus CEQA Compliance Services 445 E. Charleston Road, Palo Alto, CA 94306	
	PROJECT NUMBER: 0275.002.001	**FIGURE 4**

The classrooms would be housed in two separate buildings, creating an open area in the center of the PPS for playgrounds, playing fields, circulation, and hardcourts that would face and promote access to the JLSMS athletic fields currently blocked by the existing parking lot and classroom wing. One building would be a single-story kindergarten complex encompassing three kindergarten classrooms totaling 4,556 square feet constructed near the southwestern corner of the PPS where the existing classrooms are located (**Figure 4**). The kindergarten building would include three kindergarten classrooms, a restroom for each classroom, and a storage/preparation area for each classroom. A dedicated kindergarten play area would be developed adjacent to the classroom complex. The remaining grades would be housed in a single, 38,047-square-foot, two-story building (18,702 square feet on the first floor and 19,345 square feet on the second floor) located along the eastern boundary of the PPS perpendicular to the eastern half of the administration building and library. The first floor would consist of three first grade and three second grade classrooms and spaces for counselors, speech therapists, English language learners, and a counselor/wellness/conference room along the eastern half of the building. The western half of the first floor would house an enrichment classroom, restroom cluster, resource center, learning center/occupational therapist offices, reading specialist office, and an additional storage/work area. The stairwells to the second floor would be located along the northern and southern boundaries of the building along with a central staircase in the middle of the building. The second floor would house three each of third, fourth, and fifth grade classrooms, a staff lounge and work room, a flexible classroom, and a restroom cluster.

The Proposed Project also includes a 7,063-square-foot multi-purpose building located just north of the two-story classroom building. The building would include a 2,850-square-foot multi-purpose room with a 868-square foot platform (stage). The building would also include a food storage and preparation room, a storage area, a lobby with two restrooms, physical education equipment storage, and a custodial work area.

With the massing of the elementary classrooms into a single, two-story building, additional outdoor amenities would be developed for the students. The additional space would allow for the installation of various play areas (natural and artificial turf), including a youth under 10 soccer field at the northwestern corner of the PPS, creating continuity with the JLSMS fields north of the PPS. The realigned outdoor spaces would provide a safer environment compared to the existing campus where the turf play areas are adjacent to East Charleston Road.

Access, Circulation, and Parking

The existing access and circulation pattern would be removed and concentrated along the eastern boundary of the PPS. The massing of the elementary school classrooms would allow the development of a one-way access/egress pattern with parking as well as a new bicycle path along the eastern portion of the PPS that connects to the existing Waverley bicycle path and the JLSMS athletic fields.

Bicycle Access and Circulation. A 10-foot-wide bicycle path would be developed from the sidewalk along East Charleston Road traversing the entirety of the eastern PPS boundary connecting to an 8-foot-wide bicycle path that would traverse east to west along the north boundary of the PPS; the path would be separated from vehicular traffic. A connection to the JLSMS athletic fields would be provided at the intersection of the bicycle paths at the northeastern corner of the PPS. A secured (fenced) bicycle

parking area would be developed north of the multi-purpose building providing spaces for 80 to 100 bicycles. The existing Waverley bicycle path that connects East Charleston Road and East Meadow Drive would remain along the western boundary of the PPS with minor adjustments to accommodate the new site plan while maintaining access to JLSMS, Mitchell Park, and the new bicycle/pedestrian pathway that would lead to the Hoover ES bicycle parking area.

Vehicle Access. Access for faculty, students, and visitors would be provided by a dedicated access driveway off the westbound lane of East Charleston Road. Vehicle access to the PPS would only be provided by Waverley Street for school bus circulation, limited staff and District vehicles, and emergency vehicles via key card access gates. The access driveway along the eastern perimeter of the campus would connect to a two-lane circulation roadway with angled parking spaces on both sides of the two lanes. The two-lane roadway would circle 180 degrees at the northeastern portion of the PPS, heading south to generate drop-off lanes for families and school buses. Near the southern-most edge of the elementary school building, the two lanes would merge, with a turn lane allowing circulation back to the north circulation lanes and the lane continuing south towards a right-turn only onto East Charleston Boulevard. The access and egress driveways would be separated by a median to provide safety. Redesigning and concentrating the access, egress, and circulation to the eastern portion of the PPS would prevent the existing issues associated with the current access requiring cars to traverse the entirety of the campus to park then exit onto East Charleston Road. Access would also improve for pedestrians and bicyclists as newly designed routes that avoid vehicles would be created for these users to promote safer crossings.

Parking. A total of 63 parking spaces would available, which includes 52 spaces installed along the eastern access driveway (48 standard, 2 accessible, and 2 van accessible). These spaces would include 10 electric vehicle (EV) parking stalls served by 10 single chargers and 1 accessible stall. Staff would be allotted 28 of the 52 spaces along the eastern boundary of the PPS. An additional 11 spaces would be positioned northwest of the PPS along Waverley Street and would be restricted to specific school staff after development of the Proposed Project.

Emergency Vehicle Access and Circulation. The eastern access and egress lanes provide a 26-foot-wide fire lane for emergency vehicles. A 20-foot-wide fire lane through the PPS would traverse from a gate adjacent to the northeastern edge of the multi-purpose building with access from the 26-foot-wide eastern access and egress lanes traversing south and then west to another 20-foot-wide gate in the central portion of the western boundary of the PPS providing access to Waverley Street. Emergency vehicles would have access to all of the aforementioned gated areas of the PPS.

Fencing

As shown in **Figure 4**, chain-link fencing would be installed along the perimeter of the PPS with various secured access gates around the perimeter of the kindergarten buildings and play area, and at the southwestern portion of the PPS adjacent to the administration building and library to provide secure outside space. Decorative fencing is planned for the main entries.

Stormwater

Stormwater improvements over existing conditions would be achieved through the development of five bioretention areas as well as the development of the natural soccer field. Three of the bioretention areas would be located within the northeastern portion of the PPS. One would be installed in the northern portion of the median between the access and egress lanes. Two would be installed adjacent to the multi-purpose building, one adjacent to the lobby, and one adjacent (west) of the fenced bicycle parking area. A large bioretention area would be installed adjacent (east) of the fenced kindergarten playground area along the southern portion of the hardscape of the elementary school playground. The fifth bioretention area would be installed adjacent to the administration building and library fronting East Charleston Road.

Silva Cells would also be installed to improve stormwater infrastructure. Silva Cells are a type of underground bioretention solution that provide a proprietary structure system to support the finish grade above (hardscape or softscape). Silva Cells use an engineered bioretention soil mix over a section of drain rock.

Lighting

The school walkways and parking areas would have motion-detected lighting for security and safety purposes. Exterior lights would be designed to meet DSA photometric requirements. Afterschool programming would conclude by 6:30 p.m.

Off-Site Improvements

The Proposed Project would also consist of improvements to sidewalks and driveway curb cuts as well as the replacement of underground utility connections.

2.4.2 Student Relocation

The existing students that would attend Hoover ES during construction of the Proposed Project would temporarily attend school at the District's Greendell Temporary School located at 4120 Middlefield Road approximately 0.4 miles south of the PPS. Temporary portables were previously set up at the Greendell Temporary School to house students during Palo Verde Elementary School's temporary relocation. Construction at Palo Verde Elementary School was completed and staff and students returned to the campus in the summer of 2022. In anticipation of the Proposed Project being approved by the Board upon the completion of the CEQA process, and to ensure construction can begin shortly thereafter, the staff and students of Hoover ES have already relocated to the temporary spaces at the Greendell School. Because all of the spaces necessary for the relocation are pre-existing, no additional actions would be required at the Greendell School that would require assessment within this CEQA document.

2.4.3 Construction

Construction activities would include removal of relocatable buildings; building, concrete, and asphalt demolition and excavation; hazardous material abatement; site preparation and rough grading; utility trenching; fine grading; building construction; architectural coating; asphalt paving and finishing; and

landscaping. A construction worksite traffic control plan would be prepared by the construction contractor and implemented by the District. The plan would identify haul routes, hours of construction (in accordance with City regulations), protective devices, warning signs, and access. A flagman would also be present during any construction on East Charleston Road. The active construction and staging areas would be located on the PPS.

Construction activities would occur in one phase from January 2024 through April 2025. The following is the estimated construction phases and duration:

1. Demolition and Site Preparation: January 2024 to March 2024
2. Grading: April 2024 (15 days)
3. Site Utilities/Infrastructure and Delivery/Staging of Manufacturer Prefabricated Units: May 2024 to July 2024
4. Building Construction: August 2024 to July 2025
5. Paving: May 2025 to June 2025

General Demolition/Construction Provisions

Construction would occur between the hours stated in the City's noise ordinance (refer to Section 3.3.1 for a summary of the ordinance). The District would require, through contractual obligations, that all contractors observe the noise ordinance on the PPS at all times including, without limitation, all other applicable local, City, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.

If portable lights are used after dark, the District would require, through design and contractual obligations, that all lighting be located so as not to direct light onto neighboring properties.

Dust and Dirt

The District would require the following through contractual obligations and in compliance with a Stormwater Pollution Prevention Plan (SWPPP) that would be monitored by the regional water agency:

1. Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, to prevent dust and dirt from interfering with work progress, and to prevent dust and dirt from accumulating in the work and adjacent areas including, without limitation, occupied facilities.
2. Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
3. Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinances.
4. Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

5. At any time when construction dirt/debris is hauled off site via neighboring streets, the contractor shall provide an on-site tire wash/cleaning service (for construction vehicles) and ongoing street-sweeping service.

Waste Management Plan

The District would require, through contractual obligations, that the Proposed Project achieve end-of-project rates for salvage/recycling of a minimum 65 percent by weight of total non-hazardous solid waste generated during the construction of the Proposed Project. The District would also require, through contractual obligations, the development of a waste management plan, which shall include the following:

1. Identification of the construction and demolition waste materials that can be diverted from disposal by efficient usage, recycling, and/or reuse on the Proposed Project or salvage for future use or sale.
2. Determination of whether construction and demolition waste materials would be sorted on site (source separated) or bulk mixed (single stream).
3. Identification of diversion facilities where collected construction and demolition waste material would be taken.
4. Calculation by weight or volume, but not by both, of the amount of diverted construction and demolition waste materials diverted.

Traffic

The District would require, through contractual obligations, that contractors conduct site-clearing operations to ensure minimum interference with traffic associated with driveways, parking lots, and other adjacent occupied/used buildings or facilities. No closure or obstruction of streets or other occupied or used facilities would be allowed without expressed written permission of the District's representative and other authorities having jurisdiction over the PPS. A construction worksite traffic control plan would be prepared by the construction contractor and implemented through contractual obligations from the District. The plan would identify haul routes, hours of construction, protective devices, warning signs, and access. The active construction and staging areas would be located on the PPS.

Trees and Vegetation

The District's arborist will prepare a tree protection plan. Through contractual obligations, the District's arborist would require all contractors to protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking, or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within the drip line, excess foot or vehicular traffic, or parking of vehicles within the drip line. Contractual obligations and design requirements as outlined within the final recommendations by the District's arborist shall include, at a minimum:

1. Temporary guards or barriers to protect trees and vegetation to be preserved shall be provided.

2. Trees and other vegetation shall be watered within the limits of contract work as required to maintain their health during the course of construction.
3. Roots over 1 ½ inches in diameter that are cut during construction operation shall be protected. Faces shall be coat cut with a protective coating formulated for use on damaged plant tissue. Exposed roots shall be temporarily covered with wet burlap to prevent roots from desiccation and then covered with earth as soon as possible.
4. Trees (and other vegetation not designated for removal) that become damaged during the duration of the Proposed Project construction shall be repaired or replaced by the contractor at no cost to the District, subject to the discretion of the District.
5. Existing trees, regardless of species, that are indicated to remain shall be barricaded with protective fencing along the perimeter of the drip line of the tree. The contractor shall provide protection of roots while excavating along any remaining trees as indicated on the civil engineering plans. If deemed necessary by the District's representatives, the contractor shall hand dig along the drip line of the remaining trees.

2.5 Comparison with Land Use Policy

2.5.1 General Plan Consistency

Because the existing use and zoning would remain the same, the Proposed Project is consistent with the *Santa Clara County General Plan* for the PPS.

2.5.2 Airport Influence Area

The PPS is outside of an airport influence area.

2.5.3 Zoning and Development Code Consistency

No change in zoning would be required to implement the Proposed Project.

2.6 Regulatory Requirements, Permits, and Approvals

2.6.1 Palo Alto Unified School District Board of Education

The District's Board of Education is responsible for approval of the CEQA document and selected alternative.

2.6.2 State Water Resources Control Board

During construction, the Proposed Project would be subject to the State Water Resources Control Board's (SWRCB) Construction General Permit. Implementation of the Proposed Project would require development of a SWPPP outlining the required best management practices (BMPs) to avoid adverse effects on water quality or run off during construction.

2.6.3 California Department of General Services, Division of State Architect

Prior to commencement of construction of the new school facilities, approval of site-specific construction drawings from the Division of State Architect is required.

3 Environmental Checklist

Pursuant to 14 CCR § 15063[13], an IS should provide the lead agency with sufficient information to determine whether to prepare an environmental impact report (EIR), "Negative Declaration" (ND), or MND for a proposed project. The CEQA Guidelines state that an IS may identify environmental impacts by use of a checklist, matrix, or other method, provided that conclusions are briefly explained and supported by relevant evidence. If it is determined that a particular physical impact to the environment could occur, then the checklist must indicate whether the impact is "Potentially Significant," "Less Than Significant with Mitigation," or "Less Than Significant." Findings of "No Impact" for issues that can be demonstrated not to apply to a proposed project do not require further discussion.

This IS was prepared to assess the environmental impacts of the Proposed Project in accordance with CEQA to provide California permitting agencies with sufficient information to determine whether to prepare an EIR, ND, or MND for the Proposed Project.

[13] CCR § 15063, Initial Study

3.1 Aesthetics

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings. (Public views are those that are experienced from publicly accessible vantage points). If the Proposed Project is in an urbanized area, would the Proposed Project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

3.1.1 Regulatory Setting

There are no regulatory requirements impacting aesthetics for the demolition and rebuilding of the Hoover ES on the same site.

3.1.2 Environmental Setting

The PPS is the current Hoover ES located within a fully built and flat urban residential environment with adjoining athletic fields. The school is currently arranged in an “L” shape consisting of single-story buildings. Additional buildings are clustered adjacent to the L-shaped main classroom buildings to the east at the northeastern corner of the PPS with a cluster of relocatable buildings housing kindergarten classrooms along the southwestern boundary. The hard and softscapes for recreational activities are located within the center of the PPS, with the softscape fronting East Charleston Road. The JLSMS fields are north of the PPS, and Mitchell Park is located northeast of the PPS adjacent to the JLSMS fields. East of the PPS is the three-story Stevenson House, which provides affordable senior housing. Residential communities are located south of East Charleston Road and west of the PPS. There are no scenic vistas with views of the PPS due to the relatively flat topography of the area. The nearest California Scenic Highway is I-280, which is “Eligible” for listing, but is not officially listed as a designated California Scenic Highway. I-280 is located approximately 3 miles southwest of the PPS and therefore is not visible from the highway (California Department of Transportation 2023).

3.1.3 Impact Discussion

a) Have a substantial adverse effect on a scenic vista?

A scenic vista is a viewpoint that provides expansive views of a highly valued landscape for the benefit of the public. There are no designated scenic vistas in the vicinity of the PPS. The PPS is in an urbanized area with flat topography. Views from the PPS and surrounding properties are limited to the foreground and include residential development, an adjacent school (JLSMS), an affordable senior housing complex, a public park, and a library. The PPS is currently developed as a school site and upon completion of the Proposed Project, the PPS would continue to be used as an elementary school. The Proposed Project would have a no impact on scenic vistas.

Impact Designation: No Impact.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Due to the distance from any designated State Scenic Highways (3 miles from I-280), and the fact that the Proposed Project would replace an existing elementary school with a modernized and upgraded campus and is in an already developed urbanized environment, the Proposed Project would not result in impacts to scenic resources within a designated State Scenic Highway. Therefore, no impact would occur.

Impact Designation: No Impact.

c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Proposed Project is in an urbanized area, would the Proposed Project conflict with applicable zoning and other regulations governing scenic quality?

The PPS is located within a fully urbanized portion of Palo Alto with development surrounding the PPS in all directions. The PPS currently contains an elementary school and upon project completion, the PPS would continue to be used as an elementary school. The Proposed Project is therefore consistent with the zoning designation of PF for the PPS, which includes K-12 public schools as a permitted primary use. The PPS is surrounded by residential uses, an adjacent school campus, residential areas, a public park, a library, and an affordable senior housing complex; there are no scenic resources visible from the PPS.

Additionally, the Proposed Project would not substantially change the existing character of the PPS. The Proposed Project would be compatible with the existing on-site development pattern and the character of the surrounding area. Building materials and colors would complement the existing development on adjacent properties. The visual qualities impact to the PPS during construction would be temporary. When completed, the Proposed Project would include landscaping, new drop-off areas, and new buildings that complement the design of the surrounding development while improving the same existing use of the property as an elementary school site.

The Proposed Project would be better able to share the existing playing fields of the adjacent middle school (JLSMS) as the current road separating the existing elementary school from the playing fields would be removed, thereby increasing the safety of the PPS as well. The Proposed Project would reconfigure the campus buildings to better facilitate the construction of new courts and play areas across the central area of the PPS, and by having a direct link to the adjacent middle school playing fields, an improved outdoor play area would be added. Although implementation of the Proposed Project would alter the visual appearance of the PPS, the improvements would not substantially degrade the visual character and quality of the PPS and surrounding area. Therefore, no additional overall impacts on the existing environment are anticipated.

Impact Designation: No Impact.

d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?

The two major causes of light pollution are glare and spill light. Spill light is caused by misdirected light that illuminates areas outside the intended area to be lit. Glare occurs when a bright object is against a dark background, such as oncoming vehicle headlights or an unshielded light bulb. The PPS currently generates light from its buildings (interior and exterior), parking lot, and bus drop-off/pick-up zone. Vehicle headlights, streetlights, and exterior and interior building lights also exist on both the existing elementary school and in the surrounding area.

Where required by city, county, state, or federal codes, the lights would be motion activated. In other areas where motion-activated lighting is not required, lighting would be controlled via the building management system. The Proposed Project does not include field lighting. The proposed lighting would be directed onto the intended area to be lit and would not cause glare or spill light off the campus; furthermore, proposed landscaping surrounding the PPS would diffuse light and glare. Light from the second-story classrooms would result in a minimal impact, similar to the lighting from the second and third floors from the Stevenson House located to the east of the PPS. Light and glare levels caused by the Proposed Project would not be substantially greater than existing levels. Therefore, light and glare impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

3.2 Agriculture and Forestry Resources

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation (DOC) as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection (CAL FIRE) regarding the state's inventory of forest land, including the Forest Range Assessment Project and Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Proposed Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

3.2.1 Regulatory Setting

Due to the location of the PPS and its current use as a school, there are no significant regulatory requirements addressing agriculture or forestry issues with the Proposed Project or the PPS. Some protected agriculture lands are enrolled in the DOC's Williamson Act Program;[14] however, because this is not agricultural land, the Williamson Act does not apply.

3.2.2 Environmental Setting

The PPS is currently in an urban setting and is the location of the existing Hoover ES. There are no agricultural or forested areas on the PPS.

3.2.3 Impact Discussion

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The Proposed Project is on the existing Hoover ES campus and located adjacent to an existing middle school (JLSMS). The Proposed Project would modernize the existing school buildings which range in age from the 1950s to the most recent addition in the early 2000s. The PPS currently includes several relocatable buildings as well. The Proposed Project would replace the existing school with a modernized campus designed to better serve the students, parents, faculty, and staff. The PPS has no agricultural or farm use on it, nor is there agricultural or farm use in its immediate proximity. No Proposed Project-related farmland conversion impact would occur. The PPS is fully developed and is not mapped as important farmland. No impact on agricultural resources would occur.

Impact Designation: No Impact.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

The PPS is zoned as PF (Public Facilities District) which is a designation for existing school sites. The Proposed Project would not conflict with agricultural zoning or a Williamson Act contract as it is not zoned for agricultural use. Williamson Act contracts restrict the use of privately owned land to agriculture and compatible open space uses under contract with local governments; in exchange, the land is taxed based on actual use rather than potential market value. There is no Williamson Act contract in effect on site. No impact would occur.

Impact Designation: No Impact.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code

[14] DOC, Williamson Act Program

Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

Development of the Proposed Project would not conflict with existing zoning for forest land, timberland, or timberland production. Forest land is defined as "land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits" (PRC § 12220(g)).[15] Timberland is defined as "land…which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees" (PRC § 4526).[16] The PPS is zoned as PF. Replacing and upgrading the existing Hoover ES with a modernized and upgraded elementary school would not impact forest land. No impact would occur.

Impact Designation: No Impact.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

On-site vegetation is limited to scattered ornamental trees and shrubs. Construction of the Proposed Project would not result in the loss or conversion of forest land and development would not cause a loss of forest land. The current landscape plan would add additional trees and shrubs to the PPS, offsetting any loss of current trees and shrubs. No impact would occur.

Impact Designation: No Impact.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

Maps from the DOC's California Important Farmland Finder indicate that there is no important farmland or forest land on or within the surrounding vicinity of the PPS.[17] Development of the Proposed Project would not indirectly cause conversion of such land to non-agricultural or non-forest use. No impact would occur.

Impact Designation: No Impact.

[15] PRC § 12220(g), Definition of Forest Land

[16] PRC § 4526, Definition of Timberland

[17] DOC, California Important Farmland Finder

3.3 Air Quality

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the Proposed Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☒	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

3.3.1 Regulatory Setting

Air quality within the District is under the jurisdiction of the U.S. Environmental Protection Agency (EPA) and the Bay Area Air Quality Management District (BAAQMD). Santa Clara County is one of the seven counties that comprise the San Francisco Bay Area air basin. The PPS is located within the City limits.

Federal and State

Air quality in the area is a function of the criteria air pollutants (CAPs) emitted locally, the existing regional ambient air quality, and the meteorological and topographic factors that influence the intrusion of pollutants into the area from sources outside the immediate vicinity. The PPS's air quality is based on the CAPs meeting the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS). The 1977 federal Clean Air Act (CAA) required the EPA to identify NAAQS to protect public health and welfare. NAAQS have been established for the six "criteria" air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (PM), and lead. PM is designated into two size classes, coarse (10 micrometers or less in diameter [PM_{10}]) and fine (2.5 micrometers or less in diameter [$PM_{2.5}$]). The smaller size of $PM_{2.5}$ allows

it to enter the cardiovascular system and cause more serious health problems. For this reason, the NAAQS sets a more stringent standard on $PM_{2.5}$ in ambient air quality. Pursuant to the 1990 CAA Amendments (CAAA), the EPA has classified air basins (or portions thereof) as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether the NAAQS have been achieved.

California has adopted ambient standards that are more stringent than the Federal standards for the criteria air pollutants. Under the California Clean Air Act (CCAA), patterned after the federal CAA, areas have been designated as attainment or non-attainment with respect to CAAQS. The Bay Area's attainment status for the CAAQS is listed in Table 2.

Local

Bay Area Air Quality Management District

The BAAQMD controls criteria and toxic air pollutants. The primary role of cities in achieving and maintaining regional air quality standards is through land use decision-making, which can affect vehicle miles traveled, and through other measures that manage the emission of pollutants. The BAAQMD identifies specific transportation control measures (TCMs) that, together with other approaches, may help reduce emissions in the City. These contribute to regional pollution control and greenhouse gas (GHG) reduction efforts.

The BAAQMD notes a particular need to reduce exposure to particulates and air toxins related to freeways and major arterials, especially those with high volumes of truck traffic, as well as exposure related to goods movement and distribution centers. Ambient concentrations of toxic air contaminants (TACs) are similar throughout the urbanized area of the Bay Area. The BAAQMD regulates TACs from stationary sources through their permit process; mobile sources of TACs are regulated indirectly through vehicle emissions standards and fuel specifications.

The most recently adopted air quality plan for the Bay Area is the 2017 *Clean Air Plan*, which provides a regional strategy to protect public health and the climate. The *Clean Air Plan* control strategy includes 85 individual control measures to reduce emissions which are categorized into sectors, including stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, water, and super-GHG pollutants (BAAQMD 2017).

3.3.2 Environmental Setting

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions, however, are equally important. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

Two types of air pollutants affect air quality in the City: CAPs and TACs. The major source of air pollutants in the City is motor vehicle emissions. Heavy commute patterns throughout the Bay Area have resulted in poor regional air quality levels. U.S. 101 is located approximately 1 mile east of the PPS. The region's attainment status for the NAAQS is listed in Table 2. The Bay Area is considered a nonattainment area for ground-level O_3 and $PM_{2.5}$ under both the CAA and CCAA. The area is also

considered nonattainment for PM_{10} under the CCAA, but not the CAA. The area has attained both state and federal ambient air quality standards for CO.

Table 2. Regional Attainment Status for CAAQS and NAAQS

Pollutant	Averaging Time	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone (O_3)	8 Hour	0.070 ppm	Nonattainment	0.070 ppm Primary same as secondary	Nonattainment
	1 Hour	0.09 ppm (180 µg/m^3)	Nonattainment	N/A	N/A
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment
	1 Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m^3)	Attainment	0.100 ppm	Unclassified
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Attainment
Sulfur Dioxide (SO_2)	24 Hour	0.04 ppm (105 µg/m^3)	Attainment	0.014	Attainment
	1 Hour	0.25 ppm (655 µg/m^3)	Attainment	0.075 ppm (196 µg/m^3)	Attainment
Coarse Particulate Matter 10 Micrometers or Less in Diameter (PM_{10})	Annual	20 µg/m^3	Nonattainment	N/A	N/A
	24 Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
Fine Particulate Matter 2.5 Micrometers or Less in Diameter ($PM_{2.5}$)	Annual	12 µg/m^3	Nonattainment	12 µg/m^3	Unclassified
	24 Hour	N/A	N/A	35 µg/m^3	Nonattainment
Lead	30-day Average	1.5 µg/m^3	Attainment	N/A	N/A
	Calendar Quarter	N/A	N/A	0.15 µg/m^3	Attainment

Source: EPA 2023a

Note: µg/m^3= micrograms per cubic meter; N/A = not applicable; ppm = parts per million;

The BAAQMD adopted revised *Air Quality Guidelines* in April 2022, which contain CEQA thresholds of significance for projects, shown in Table 3. These thresholds are for O_3 precursor pollutants (reactive organic gas [ROG] and nitrogen oxide [NOx]), PM_{10}, and $PM_{2.5}$, and apply to both construction period

and operational period impacts. If the daily average or annual emissions of operation-related CAPs or precursors exceeds any of these thresholds, the Proposed Project would result in a cumulatively significant impact.[18]

Table 3. BAAQMD Threshold of Significance for Construction and Operational Emissions

Pollutant	Construction Related Emissions	Operations Emissions	
	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Maximum Annual Emissions (tpy)
Reactive Organic Gas (ROG)	54	54	10
Nitrogen Oxide (NOx)	54	54	10
Particulate Matter-Coarse (PM_{10})	82 (exhaust)	82	15
Particulate Matter-Fine ($PM_{2.5}$)	54 (exhaust)	54	10
Fugitive Dust	Best Management Practices	None	
Local Carbon Monoxide (CO)	None	9.0 ppm (8-hour average); 20.0 ppm (1-hour average)	

Source: BAAQMD 2022

Note: lbs/day = pounds per day; ppm = parts per million; tpy = tons per year

Additionally, the 2022 *Air Quality Guidelines* provide significance thresholds for odors at five confirmed complaints per year averaged over a period of 3 years in the project source area (BAAQMD 2022).

The 2022 *Air Quality Guidelines* also contains screening criteria for operational-related CAPs for numerous land use types. They also contain odor screening distances for various facility types, which include manufacturing and industrial facilities; hotels are not included (BAAQMD 2022).

Sensitive Receptors

Sensitive receptors are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors.

Several sensitive receptors in the vicinity of the PPS. The nearest sensitive receptors are the Stevenson House (affordable senior housing building) approximately 45 feet east of the existing Hoover ES parking and exit lane (eastern border of the PPS) and the rear fence lines of single-family residences adjacent to the bikeway adjacent to the school's western main access roadway. Additional single-family residences are located south facing East Charleston Road. Harvest Church is located approximately 800 feet northeast of the PPS across Willow Pass Road. The JLSMS athletic fields are adjacent to the northern portion of the PPS.

[18] BAAQMD, CEQA Thresholds and Guidelines Update

3.3.3 Impact Discussion

a) Conflict with or obstruct implementation of the applicable air quality plan?

The CCAA requires that air districts create a clean air plan that describes how the jurisdiction will meet air quality standards. As noted above, the BAAQMD released the 2017 *Clean Air Plan*. To fulfill State ozone planning requirements, the 2017 control strategy includes all feasible measures to reduce emissions of O_3 precursors—ROG and NOx—and reduce transport of O_3 and its precursors to neighboring air basins. The 2017 *Clean Air Plan* does not include control measures that apply directly to individual development projects. Instead, the control strategy includes control measures related to stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, water, and super-GHG pollutants. The development of a modern school building that is replacing buildings that were constructed between 1952 (the administration building) and 1969 (library) complies with the goals of the 2017 *Clean Air Plan*. The development would follow the California Green Building Standards Code (CALGreen)[19] requirements and would involve the installation of new energy infrastructure. Accordingly, the new facility would be consistent with the goals of the 2017 *Clean Air Plan*.

Impact Designation: Less-than-Significant Impact.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?

Implementation of the Proposed Project would result in the construction of 54,750 square feet of educational facilities. The buildings would be constructed using CLT panels fabricated off-site which would reduce the overall construction period when compared to constructing a structure of a similar size with traditional building methods. While the square footage is less than the BAAQMD screening criteria for elementary schools, the Proposed Project involves demolition activities and a project-specific analysis is therefore required. Accordingly, Proposed Project-related emissions were calculated using the California Emissions Estimator Model (CalEEMod) version 2022.1. Construction and operation emissions would not overlap as the students would remain off site until the facilities are ready for occupation; therefore, construction and operation emissions are analyzed separately. It was assumed that construction would last approximately 1.5 years starting January 1, 2024, and ending in July 2025. The first full year of operation is assumed to occur in 2026 for the 2025–2026 school year. All CalEEMod data tables, including input values, assumptions used, and output values, are detailed in Appendix A.

To estimate criteria emissions from construction equipment, CalEEMod default construction equipment was used in this analysis. Additionally, it was assumed that 3.239 acres would be paved, resulting in 72 percent asphalt. Furthermore, 10 EV charging stalls would be included within the 63 parking spaces. The Proposed Project would result in the temporary generation of ROG, NOx, PM_{10}, and other regulated pollutants during construction. ROG and NOx emissions are associated with employee vehicle trips,

[19] California Department of Housing and Community Development, CALGreen

delivery of materials, and construction equipment exhaust. PM_{10} is generated during site preparation, excavation, road paving, and from exhaust associated with construction equipment. The Proposed Project would result in annual emissions of the *Clean Air Plan* CAPs and precursors during construction as presented in Table 4. Emissions include mitigations that are incorporated into the CalEEMod calculations if selected. Various features of the Proposed Project that are already required within the design specifications would further reduce emissions and were selected within these mitigation options. For example, the construction specifications require a waste reduction plan and recycling of demolished construction materials, as described in Section 2.4.3. Accordingly, the selected emissions mitigations that were not included in the design plans or project specifications have been included as mitigation measures to ensure accuracy of the analysis and results.

Table 4. Construction-Related Emissions

Year	Reactive Organic Gas (ROG)	Nitrogen Oxide (NOx)	Particulate Matter-Coarse (PM_{10}) Total	Particulate Matter-Fine ($PM_{2.5}$) Total
	lbs/day (Max)			
2024	3.71	36.4	6.78	4.15
2025	7.98	17.3	0.64	0.33
BAAQMD Thresholds	54	54	82	54
Exceeds Threshold	No	No	No	No

Source: BAAQMD 2022; Appendix A

Note: BAAQMD = Bay Area Air Quality Management District; lbs/day = pounds per day

Operational emissions would result from area sources such as landscaping equipment, electricity use, and mobile emissions from vehicles traveling to and from the PPS. However, daily trips generated by the Proposed Project would not increase as the Proposed Project constitutes a rebuild of a school site without an increase in student capacity. The mobile sources were included in the analysis to provide a comprehensive and conservative analysis of operation CAP emissions. The results are presented in Table 5. As with construction, mitigation measures can be selected when conducting the emissions estimates within CalEEMod. Various design provisions already included in the Proposed Project to reduce operational emissions. For example, the transition from natural gas to electric heating, ventilation, and air conditioning (HVAC) systems, the inclusion of end-of-trip secure bike parking, the addition of extra bike pathways for bicycle circulation, and the installation of EV charging stations help reduce emissions from daily school operations (i.e., reduce vehicle emissions, which would be a beneficial impact compared to existing emissions at Hoover ES as currently configured). Accordingly, the selected emissions mitigations that are not included within the design or project specification plans have been included as mitigation measures to ensure accuracy of the analysis and results.

Table 5. Operational-Related Emissions

	Reactive Organic Gas (ROG	Nitrogen Oxide (NOx)	Particulate Matter-Coarse (PM_{10}) Total	Particulate Matter-Fine ($PM_{2.5}$) Total
	lbs/day (Max)			
Mobile[1]	---	---	---	--
Area	1.80	0.02	0.005	0.005
Energy	0.005	0.01	0.005	0.005
Total	1.85	0.03	0.01	0.01
BAAQMD Thresholds	54	54	82	54
Exceeds Threshold	No	No	No	No

Source: BAAQMD 2022; Appendix A

Note: [1] The mobile sources are not "new" emissions as the number of students and employees would not. Mobile emissions would continue to be regulated through the state GHG reduction actions (fuel emission and electric vehicle requirements).

BAAQMD = Bay Area Air Quality Management District; lbs/day = pounds per day.

As shown in Tables 4 and 5, the construction-related emissions and the operational emissions, with mitigation, would not result in exceedance of the BAAQMD thresholds. Therefore, in accordance with the 2023 CEQA Guidelines[20], the Proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard. Accordingly, no violation of any air quality standard or contribution to an existing or projected air quality violation would occur.

Although construction emissions from the Proposed Project would not exceed BAAQMD thresholds, construction dust and diesel emissions could disturb neighbors for short periods of time which could be a potentially significant impact. The BAAQMD has not adopted thresholds for fugitive dust emissions and requires that all projects employ BMPs, regardless of whether a project exceeds applicable thresholds of significance. These are included as Mitigation Measure AQ-1 below and include some of the mitigation measures selected within the CalEEMod model run.

Mitigation Measures

AQ-1: The following BAAQMD BMPs shall be implemented during construction through contractual and specification requirements:

- Exterior demolition and construction areas shall be watered periodically to minimize the generation of dust and dirt.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers when required. The use of dry power sweeping is prohibited.

[20] 2023 CEQA Statute & Guidelines

- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure, 13 CCR § 2485).[21] Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
- A publicly visible sign shall be posted with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

AQ-2: The following additional mitigation measures from CalEEMod shall be implemented during construction through contractual and construction specification requirements:

- All off-road equipment shall use advanced engine tiers for air quality controls.
- Off-road equipment that does not meet the advanced engine tier air quality controls shall incorporate diesel particulate filters.
- The contractor shall use additional dust suppressants during demolition.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
- All paved roads surrounding the access and egress driveways to the construction site shall be swept daily.

AQ-3: The following additional design features shall be incorporated into design of the Proposed Project:

- Energy efficient appliances shall be installed within the school facilities.
- Low-flow water fixtures shall be installed within the school facilities.

Impact Designation: Less-than-Significant Impact with Mitigation.

c) Expose sensitive receptors to substantial pollutant concentrations?

Construction activities could expose sensitive receptors (students and residences located adjacent to the PPS) to substantial pollutant concentrations, principally PM_{10} and $PM_{2.5}$, from fugitive dust sources. However, with implementation of Mitigation Measures AQ-1 through AQ-3 and the provisions outlined in Section 2.4.3, impacts from construction-related PM_{10} and $PM_{2.5}$ emissions would be less than significant. The abatement of hazardous materials would be performed in accordance with California regulatory requirements and the air would be monitored daily during such activities. The PPS would

[21] 13 CCR § 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

continue to operate as a school, with modernized facilities, and therefore would not expose sensitive receptors to substantial pollutant concentrations.

Impact Designation: Less-than-Significant Impact.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The PPS would continue to operate as a school. Therefore, the Proposed Project would not result in a change in land use that would generate odors and no objectionable odors are anticipated to result from the operational activity of the Proposed Project. The type of facilities that are considered to have objectionable odors include wastewater treatments plants, compost facilities, landfills, solid waste transfer stations, fiberglass manufacturing facilities, paint/coating operations (e.g., auto body shops), dairy farms, petroleum refineries, asphalt batch plants, chemical manufacturing, and food manufacturing facilities. The Proposed Project does not fit into these types of facilities and would not generate objectionable odors that would lead to a public nuisance.

During construction activities, construction equipment exhaust, application of asphalt and architectural coatings would temporarily generate odors. However, any construction-related odor emissions would be low in concentration and temporary in nature. Additionally, odors would typically be confined to the immediate vicinity of the construction equipment. By the time such emissions reach any sensitive receptor sites, they would be diluted to well below any level of air quality concern.

In summary, construction-related odor emissions would be temporary, and the Proposed Project is not considered the type of use that would generate odors that would affect a substantial number of people.

Impact Designation: Less-Than-Significant Impact.

3.4 Biological Resources

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the federal Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

3.4.1 Regulatory Setting

The PPS would be subject to the California Endangered Species Act (CESA)[22] and federal Endangered Species Act (FESA)[23] if listed or candidate species or other special-status species were present or if

[22] CDFW, Threatened and Endangered Species

[23] USFWS, Endangered Species Act

habitat for those species were present on the PPS. There are no species or habitat on the PPS; therefore, neither CESA or FESA apply.

If the PPS contained wetlands or "waters of the state" or waters of the U.S. were present on the PPS, then various sections of the California Fish and Game Code (FGC)[24] or the federal Clean Water Act (CWA; 33 U.S.C. § 1251 et seq.)[25] or regulations of the SWRCB could apply. However, no such wetlands or water are present on the PPS.

The federal Migratory Bird Treaty Act of 1918 (MBTA; 16 U.S.C. §§ 703-712)[26] and bird nesting sections of the FGC could apply to the removal of trees if they are removed during the nesting season and if active nests could be disturbed (California FGC §§ 3503 et seq.).[27]

Federal

Federal Endangered Species Act

Under FESA, the Secretary of the Interior and the Secretary of Commerce have the joint authority to list a species as threatened or endangered (16 U.S.C. § 1533c)[28]. The purposes of FESA are to provide a means to conserve the ecosystems that endangered and threatened species depend on and to provide a program for conservation and recovery of the species with the intent of removing the species from a listed, protected status. Regulatory protection is given to any species listed as endangered or threatened.

The U.S. Fish & Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) are the federal agencies that enforce FESA. Pursuant to the requirements of FESA, it is unlawful for any person to take (Harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [16 U.S.C. § 1532 (19)])[29] any such species within the U.S. or territorial sea or violate any regulation pertaining to such species or to any threatened species of fish or wildlife (16 U.S.C. § 1538);[30] endangered species (50 CFR § 17.21 (c));[31] or threatened species (50 CFR § 17.31 (a)).[32]

[24] FGC

[25] EPA, Summary of the Clean Water Act,

[26] 16 USC §§ 703-712, Subchapter II—Migratory Bird Treaty

[27] FGC § 3503 et seq.

[28] 116 U.S.C § 1533c, Lists,

[29] 16 U.S.C. § 1532(19), Definition of "Take"

[30] 16 U.S.C. § 1538, Prohibited acts

[31] 50 CFR § 17.21(c), Prohibitions

[32] 50 CFR § 17.31(a), Prohibitions

Migratory Bird Treaty Act

Migratory birds are protected under the federal MBTA. The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR §§ 10.1-10.22,[33] including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR §§ 21.4-21.183).[34] The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered take under federal law. As such, project-related disturbances must be reduced or eliminated during the nesting season.

State

California Department of Fish and Wildlife

California FGC §§ 3503 and 3503.5[35] provide protection of birds and their nests by prohibiting the take of birds, their nests, or their eggs. California FGC § 1600 et seq.,[36] requires notification to the California Department of Fish and Wildlife (CDFW) for proposed projects that may: divert, obstruct, or change the natural flow or the bed, channel or bank of any river, stream, or lake; use material from a streambed; or result in the disposal or deposition of debris, waste, or other material where it may pass into any river stream, or lake.

The CDFW also is the lead agency under CESA (FGC §§ 2050–2115.5)[37] with similar provisions to FESA as referenced earlier. Should the take of a State-listed species through direct take be anticipated or likely to occur, then a consultation with CDFW is required. CDFW may issues an incidental take permit (FGC § 2081[38]) to authorize such a potential limited take and the permit would identify any mandatory avoidance measures which the CDFW believes would reduce the likelihood of such a take; the permit must be adhered to by the applicant if potential take or adverse impact cannot be avoided. The issuance of such an incidental take permit must be requested by the applicant and the CDFW is now required to post all such take permits online for public viewing. Should a species be listed under both FESA and CESA, then a consistency determination (FGC § 2080.1[39]) is also required. Applicable fees may also be collected under CESA.

[33] USFWS, Wildlife and Fisheries

[34] 50 CFR §§ 21.4-21.183, Part 21-Migratory Bird Permits

[35] GC §§ 3503 and 3503.5, Taking or destroying nests or eggs; Taking, possessing, or destroying birds-of-prey or their eggs

[36] FGC § 1600 et seq., Chapter 6. Fish and Wildlife Protection and Conservation

[37] FGC §§ 2050-2115.5, Chapter 1.5 Endangered Species

[38] FGC § 2081, Article 3. Taking, Importation, Exportation, or Sale

[39] FGC § 2080.1, Article 3. Taking, Importation, Exportation, or Sale

CEQA Guidelines

Several federal and State statutes protect rare, threatened, and endangered species. Article 20, § 15380 of the CEQA Guidelines[40] provides that a species not listed on the federal or state lists of protected species may be considered rare, threatened, or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definitions of endangered, rare, or threatened provided in FESA and CESA. This section of the CEQA Guidelines gives public agencies the ability to protect a species from any potential impacts of proposed projects until the respective government agency has the opportunity to designate (list) a species as protected, if warranted.

The California Native Plant Society (CNPS) maintains an extensive list of plant species that it considers to be rare, threatened, or endangered, but have no designated status or protection under FESA or CESA. Impacts to CNPS listed species (e.g., CNPS list 1B and 2) are considered pursuant during CEQA environmental review.

California Endangered Species Act

Under CESA, it is unlawful to take a state-listed endangered or threatened species. FGC § 86[41] defines take as "hunt, pursue, catch, capture or kill or attempt to hunt, pursue, catch, capture or kill." CESA maintains authorization, over CDFW, if there is potential for take of a State-listed plant or wildlife species.

3.4.2 Environmental Setting

The PPS consists of a current school facility classified as ruderal-disturbed habitat with marginal habitat for nesting bird species within ornamental trees. The adjacent park facilities, themselves ruderal and disturbed habitats, are isolated by the current configuration of the school facilities (circulation driveways with parking and building orientation).

Critical Habitat

The CDFW's California Native Diversity Database (CNDDB)[42] and USFWS map (USFWS 2023) was consulted for areas marked as critical habitat for listed species. No designated critical habitat occurs on or adjacent to the PPS.

Special-Status Species

For the purposes of this assessment, special-status species have been defined to include those species that are:

- Listed as endangered or threatened under FESA (or formally proposed for, or candidates for, listing);

[40] 2023 CEQA Statute & Guidelines

[41] FGC, Division 0.5. General Provisions and Definitions [1-99.5], Chapter 1 General Definitions [1.89.5]

[42] CDFW, California Natural Diversity Database

- Listed as endangered or threatened under CESA (or proposed for listing);
- Designated as endangered or rare, pursuant FGC § 1901;[43]
- Designated as fully protected, pursuant to FGC § 3511,[44] § 4700,[45] or § 5050[46]);
- Designated as species of concern to the CDFW;
- Covered under the International MBTA; or
- Defined as rare or endangered under CEQA.

An Official Special-Status Species List was generated from the USFWS Information for Planning and Consultation (IPaC)[47] project planning tool and the CNDDB. The list identifies 23 special-status animal species and 34 plant species with the potential to occur in the region of the PPS that are proposed, candidate, threatened, or endangered under federal status. The only relatively nearby listed species is the salt marsh harvest mouse and there is no habitat for the salt marsh harvest mouse on or near the PPS.

3.4.3 Impact Discussion

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

The PPS is currently developed with a school and is within an urbanized portion of the City. The PPS is surrounded by residential uses to the west and south and on the north and northeast by an adjacent school; a senior affordable housing complex is located across the new entrance way/ parking area from the school to the east. Mitchell Park is located to the northeast of the PPS. Given that the PPS and surrounding area are developed and disturbed by human activities, it is unlikely that there are sensitive animal species on site. The only relatively nearby listed species is the salt marsh harvest mouse, but the PPS contains no habitat for this listed species. Therefore, no impacts are anticipated to occur.

Impact Designation: No Impact.

[43] FGC § 1901, Chapter 10. Native Plant Protection

[44] FGC § 3511, Chapter 1. General Provisions

[45] FGC § 4700, Chapter 8. Fully Protected Mammals

[46] FGC § 5050, Chapter 2. Fully Protected Reptiles and Amphibians

[47] USFWS, Information for Planning and Consultation

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

The PPS is currently developed as a school. No riparian habitats were identified on site (IPaC). As such, no impacts would occur.

Impact Designation: No Impact.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The PPS is currently developed as a school; no wetland or drainage areas have been identified on IPaC for the PPS. Therefore, no impacts would occur to wetlands or drainage areas.

Impact Designation: No Impact.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Wildlife movement corridors facilitate movement of species between large patches of natural habitat. The PPS receives heavy use and is in an urbanized area. No wildlife corridors exist on the PPS. However, the ornamental trees onsite could be used for nesting by birds protected under the MBTA and FGC § 3503 et seq.

Compliance with the MBTA requires:

- The avoidance of grading activities during the nesting season (February 15 to August 15); or
- If grading activities are to be undertaken during the nesting season, a qualified biologist would be required to complete a site survey for nesting birds prior to the commencement of grading activities. If nesting birds are found, the applicant would consult with the USFWS regarding means to avoid or minimize impacts to nesting birds.

Impacts would be less than significant through compliance with the MBTA, and no additional mitigation would be required.

Impact Designation: Less-than-Significant Impact.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

While the provisions of the City's Trees and Vegetation Ordinance[48] do not apply to the District's property, they provide guidance for protection and replacement of specified trees. The Trees and Vegetation Ordinance specifically protects the following native trees: big leaf maple, California incense cedar, coast live oak, blue oak, California black oak, valley oak (all 11.5 inches or more diameter at breast height [DBH]) and coastal redwood (18 inches or more DBH). The Ordinance also protects mature trees identified as 15 inches or more DBH and Heritage Trees. Based on information on the City's website, no heritage trees have been identified on the PPS. The Proposed Project would remove several trees which, based on landscaping plans, would be replaced with more than 20 new trees for a net gain in trees on the PPS.

Impact Designation: Less-than-Significant Impact.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The PPS is currently developed and would be rebuilt with the same use (a school); the PPS is surrounded by urban uses. The PPS is not covered by any adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan. Therefore, no impact would occur.

Impact Designation: No Impact.

[48] City – Municipal Code, Title 8 – Trees and Vegetation

3.5 Cultural Resources

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the proposed project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☐	☒
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

3.5.1 Regulatory Setting

State

CEQA requires that public agencies having authority to finance or approve public or private projects assess the effects of those projects on cultural resources. Cultural resources include buildings, sites, structures, objects, or districts, each of which may have historical, architectural, archaeological, cultural, or scientific significance. CEQA states that if a proposed project would result in an effect that may cause a substantial adverse change in the significance of a significant cultural resource (termed a "historical resource"), alternative plans or mitigation measures must be considered. Because only significant cultural resources need to be addressed, the significance of cultural resources must be determined before mitigation measures are developed.

PRC § 5024.1[49] and CEQA Guidelines § 21084.1[50] define a historical resource as "a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources." A historical resource may be eligible for inclusion in the California Register of Historical Resources if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important to our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction represents the work of an important creative individual; or possesses high artistic values; or

[49] PRC § 5024.1

[50] 2023 CEQA Statute & Guidelines

4. Has yielded, or may be likely to yield, information important to prehistory or history.

In addition, CEQA also distinguishes between two classes of archaeological resources: archaeological sites that meet the definition of a historical resource, and "unique archaeological resources." An archaeological resource is considered unique if it:

- Is associated with an event or person of recognized significance in California or American history or of recognized scientific importance in prehistory;
- Can provide information that is of demonstrable public interest and is useful in addressing scientifically consequential and reasonable research questions;
- Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind;
- Is at least 100 years old and possesses substantial stratigraphic integrity; or
- Involves important research questions that historical research has shown can be answered only with archaeological methods (PRC § 21083.2).[51]

According to the CEQA Guidelines, a project with an effect that may cause a substantial adverse change in the significance of a historical resource, or a unique archaeological resource is a project that may have a significant effect on the environment (14 CCR § 15064.5[b]).[52] CEQA further states that a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired.

3.5.2 Environmental Setting

Existing Environment

The project area lies within the South Bay Region of the San Francisco Bay Area, where warm, dry summers are complemented by cool, wet winters with rainfall averaging 25–50 inches per year. This climate is complemented by a diverse topographic landscape bounded on the west by the Pacific Ocean, to the east by low coastal mountains and the Central Valley, and to the south by the southern coast mountain ranges. Accordingly, this region has a rich and diverse natural environment with lush stands of redwood, pine, and fir trees, as well as grassland, oak, and chaparral zones. Large expanses of these varied vegetation zones form extensive, highly productive interfaces where prehistoric people exploited staples, such as acorns. Moreover, these widespread verdant areas support abundant species of wildlife, also a staple of prehistoric people (Baumhoff 1978).

The geologic legacy of the San Francisco Bay area also proved important to local prehistoric groups. Rocks and minerals for tool production and other uses were abundant in the general region. Sources of obsidian continue to be present at Napa Mountain and Anadel, and Franciscan chert can be found in local streambeds. Equally important were deposits of asphaltum (a tar-like substance originating from

[51] PRC § 21083.2, Chapter 2.6. General

[52] 14 CCR § 15064.5[b], Determining the Significance of Impacts to Archaeological and Historical Resources

natural oil seepage) in Marin County and hematite and cinnabar in Sonoma County. The geology of the project area vicinity is also an important consideration when evaluating factors that affect archaeological site visibility. The geomorphic setting of the project area and vicinity includes alluvial, colluvial, and estuarine environments that actively deposited sediments during the Holocene epoch. The region has also been subject to widespread filling during the historic and modern periods (Rice et al. 2002; Wagner et al. 2002), which may have buried prehistoric and early historic-period archaeological sites and remains.

Prehistoric Setting

The prehistoric cultural chronology for the Bay Area was developed over a century of organized archaeological survey, from N. C. Nelson in 1906 to the present day. Since the 1950s, archaeological work in Marin, San Francisco, and Contra Costa counties has led to identification and refinement of a cultural sequence of early Native American occupation. This sequence consists of the Early Holocene (Lower Archaic), Early Period (Middle Archaic), Lower Middle Period (Initial Upper Archaic), Upper Middle Period (Late Upper Archaic), Initial Late Period (Lower Emergent), and Terminal Late Period.

The Early Holocene or Lower Archaic (8,000 B.C. – 3,500 B.C.) is characterized as a mobile forager pattern, with milling slabs, handstones, and a variety of large, wide-stemmed and leaf-shaped projectile points, largely composed of local Franciscan chert dominating archaeological assemblages (Hylkema 2002:235; Milliken et al. 2007:114). During the Early Period or Middle Archaic (3,500 B.C. – 500 B.C.), several technological and social developments emerged including new groundstone technology and the first cut shell beads in mortuaries suggest new levels of sedentism, and increased regional trade in the Bay Area (Vellanoweth 2001). The Lower Middle Period or Initial Upper Archaic (500 B.C. – A.D. 430) is marked by a "major disruption in symbolic integration systems" (Milliken et al. 2007, 115) and new bone tools appeared for the first time, including barbless fish spears, elk femur spatulas, tubes, and whistles, as well as coiled basketry manufacture (Bennyhoff 1986:70; Bieling 1998, 218). During the Upper Middle Period or Late Upper Archaic, (A.D. 430 – 1050), many sites from the previous period were abandoned, and single-barbed bone fish spears, ear spools, and large mortars were developed (Milliken et al. 2007, 116).

Following the Archaic Period, the Initial Late Period or Lower Emergent (A.D. 1050 – 1550) is marked by an increase in sedentism, status ascription, and ceremonial integration in lowland Central California (Fredrickson 1973). Increased social stratification throughout the Bay Area after 1250 A.D. is expressed in mortuary practices through the quality of goods in high-status burials and cremations (Fredrickson 1994). The Terminal Late Period is defined by changes in artifact types and mortuary objects including toggle harpoons, hopper mortars, plain corner-notched arrow-sized projectile points, clamshell disk beads, magnesite tube beads, and secondary cremation in the North Bay (Bennyhoff 1994, 54; Wickstrom 1986).

Ethnographic Context

During the early decades of the 20th century, pioneering anthropologists including Alfred Kroeber of University of California, Berkeley, laid the groundwork for understanding the cultures of California's indigenous peoples (Lightfoot 2005). Due to the extensive cultural diversity that existed within

precolonial California, Kroeber and other early anthropologists created a framework to organize populations into language groups. The people living in central coastal California at the time of Euro-American contact were grouped into the Costanoan language family (also referred to as Ohlone), which occupied the coastal area from San Francisco Bay to south of Monterey Bay. Eight separate language groups are believed to have been within this family. Around 50 politically autonomous groups referred to as tribelets ranged in population from 50 to 500 individuals (Levy 1978). Linguistically, the Costanoan people were divided into large groups consisting of sets of tribelets that spoke a common dialect within a particular geographical area. The dialect spoken amongst the tribelets that occupied the Palo Alto area is believed to have been Ramaytush, one of the eight linguistically separate groups within the Costanoan family (Levy 1978). The closest documented village to the project area where Ramaytush was likely spoken was Ssiputca, about 1.75 mi. to the northeast (Milliken 1995).

The Costanoan carefully managed the landscape within their territory with wildlife habitat and desirable fauna being enhanced through controlled burns. This burning also eased the gathering of acorns; a staple food for the Costanoans. Other plants utilized ethnographically include nuts of buckeye, laurel and hazelnut trees, seeds of various plants, numerous berries, and roots. Animals consumed by the Costanoan included deer, elk, antelope, grizzly bear, sea lion, whale, various small mammals, numerous species of birds and waterfowl, and several species of fish including steelhead, salmon, and sturgeon. The Costanoan people traded mussels, abalone shells, salt, and dried abalone with neighbors to the east, and obtained piñon nuts, obsidian, and other items in return (Levy 1978).

With the establishment of seven Spanish missions within traditional Costanoan territory beginning in 1769, native peoples experienced dramatic cultural changes. The introduction of Spanish administration led to the relocation of many native Californians from their villages to missions for the purpose of being “converted” and to serve as laborers. The exact timing and nature of the relocation of the triblets associated with the project area is difficult to determine. Mission Santa Clara began converting Indians in 1777 but prior to 1806 their records are problematic for determining tribal group affiliation. In 1797, Mission San Jose de Guadeloupe (Mission San Jose) began converting native peoples, yet their registers provide no tribal names until 1803 (Milliken 1995). Despite this information gap, more than likely, the Ramaytush group was brought under Spanish administration sometime between 1801, and 1806 in both the Santa Clara, and San Jose Missions (Milliken 1995) when other Costanoan groups were subjected to the same fate.

At the missions, native groups were subjected to a daily routine of agricultural labor and a regimented lifeway. By 1810, the indigenous people of western and central Alameda and Santa Clara counties had been entirely relocated to the missions. With notable exceptions, such as the village of Alisal (in present-day Alameda County) where the traditional native social system persisted into the 20th century, the indigenous mode of existence had largely disappeared by 1810. By 1935, for all practical purposes the Costanoan language was extinct and, by 1968, less than 200 people could claim probable Costanoan/Ohlone descent (Levy 1978). Today, however, the Ohlone people are reinvesting in their culture and traditional lifeways. Through new-found political, economic, and social influence, Costanoan peoples constitute a thriving native community within the broader context of present-day California.

Historic Period Setting

Although Spanish expeditions to the California coastline date to the 16th and early 17th centuries (e.g., Juan Rodriguez Cabrillo in 1542, Sebastian Rodriguez Cermeño in 1595, and Sebastián Vizcaino in 1602), the conventional date for the beginning of the Spanish Period in California is 1769, the date of the founding of the first mission in California, Mission San Diego de Alcalá. Spanish exploration of the San Francisco Peninsula and surrounding lands also began in 1769 when Gaspar de Portola led his expedition into Alta California to locate Monterey Bay. In 1774, Don Fernando de Rivera y Moncada headed another party to identify potential mission sites, and Juan Bautista de Anza followed with an expedition in 1776 (Beck and Haase 1974).

The Franciscans eventually established 21 missions and four presidios between Sonoma and San Diego between 1769, and 1823 (Beck and Haase 1974). The missions were situated so that they could be reached within a day's ride of each other. The presidios were spread out evenly among the missions although some missions also housed soldiers within their walls. Most missions included a Convento (padre's residence), housing for the neophytes, and various other facilities such as school rooms, shops, mills, tanneries, storehouses, sheds, and livestock corrals. Other amenities, such as gardens, vineyards, orchards, cultivated fields, and grazing land were developed in and around the missions (Blackmar 1976) that were self-sustaining as they raised a variety of grains and crops as well as sheep and cattle.

Mexico achieved independence from Spain in 1821 at which time Alta California was declared a territory of the Mexican republic. In 1834, the Mexican government secularized the missions and divided their land holdings into ranchos, two of which encompass the present-day Palo Alto area. The project area is located within the former Rancho Rincon de San Francisquito which bordered Rancho Pastoria de las Borregas about where Thompson Road in Palo Alto is now located (Beck and Haase 1974). These ranchos were granted to prominent Mexican citizens or in some cases to Americans who married into Mexican families or were otherwise politically connected.

During the 1830s and 1840s, new settlers arrived in California and commercial activity between other U.S. states and California increased. Settlers in search of large expanses of land or trappers and mountain men in search of fur-bearing animals began to occupy California in large numbers. Tensions between these Euro-American settlers and the Mexican government escalated, culminating with the Mexican War in 1846. The conflict ended with the Treaty of Guadalupe Hidalgo signed in February of 1848 that included the cession of California to the U.S. Shortly after the end of the war in 1850, Santa Clara County became one of the original counties of California. However, it wasn't until several decades later that the area that would become Palo Alto began to see significant development, most of which was closely associated with the establishment of Stanford University. The university was founded in 1885 when Leland Stanford, a leading railroad baron of the day, created an endowment fund in honor of his son, who had died of typhoid the year before. Stanford built the university near the community of Mayfield, on his country estate, the Palo Alto Stock Farm (City 2000).

The City was founded by Timothy Hopkins, a close friend of Leland Stanford. Hopkins purchased a large tract of land adjacent to the university and laid out a new town, which he called University Park (Staiger 1999). Hopkins subdivided his land into lots for sale, donating corner lots to congregations for the construction of churches. He named the streets in his new town after family and friends, including

Kellogg Avenue for his wife's family and Alma Street for a family friend. University Park became Palo Alto in 1892 and the City was incorporated in 1894. Many of the early homes in the City were built by tradesmen who moved to the city to work on the construction of Stanford University. These carpenters, masons, and other tradesmen used their skills to build simple houses for their families, working from published images, purchased plans, or inspiration from other homes on their block (City 2000). By contrast, a number of stately homes were also built in the southwest part of town on large lots built for Stanford University faculty and the district became known as Professorville.

Another development that shaped the City was the interurban (streetcars) railway line connecting San Jose with the City and Mayfield, a neighboring community which was annexed to the City in 1925. The line began operating in 1910, making it easier for faculty, staff, and students of the university to live in the City (City 2000). During this time, downtown development centered around the railway station and the university was promoted by the Palo Alto Improvement Company.

Following the Great Depression, and World War II, the City went through its greatest period of 20th century expansion. The City extended its boundary south to Mountain View, which resulted in nearly a doubling of its size. It was during this time that the city began to transform from a college town to a technology hub and the 1950s saw a steep increase in research, light industrial, and office space in the City. One of the most important was the development of the Stanford Research Park, which focused on the rapidly developing computer field and directly led to the region becoming referred to as Silicon Valley.

Native American Community Outreach

PRC §§ 21080.1,[53] 21080.3.1,[54] and 21080.3.2[55] require public agencies to consult with the appropriate California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of mitigating impacts to cultural resources. To meet PRC requirements, on June 21, 2023, Solano Archaeological Services (SAS) emailed a letter and a map depicting the project area and surrounding vicinity to the NAHC requesting a Sacred Lands File (SLF) search, and a list of Native American community representatives who might have an interest in, or concerns with the Proposed Project (Attachment B to Appendix B). On July 7, 2023, the NAHC responded to SAS stating that the SLF did not contain any information on sensitive Native American cultural properties within or near the area of the PPS. The NAHC also provided contact information for the following individuals and organizations:

- Valentin Lopez, Chairman – Amah Mutsun Tribal Band
- Irene Zwierlein, Chair – Amah Mutsun Tribal Band of Mission San Juan Bautista
- Ann Marie Sayers, Chair – Indian Canyon Mutsun Band of Costanoan
- Kanyon Sayers-Roods, Most Likely Descendent – Indian Canyon Mutsun Band of Costanoan
- Monica Arellano, Vice Chair – Muwekma Ohlone Indian Tribe of the San Francisco Bay Area

[53] PRC § 21080.1, Chapter 2.6. General

[54] PRC § 21080.3.1, Chapter 2.6 General

[55] PRC § 21080.3.2, Chapter 2.6 General

- Charlene Nijmeh, Chair – Muwekma Ohlone Indian Tribe of the San Francisco Bay Area
- Johnathan Wasaka Costillas, Tribal Historic Preservation Officer – Tamien Nation
- Quirina Luna Geary, Chair – Tamien Nation
- Lillian Camarena, Secretary – Tamien Nation
- Andew Galvan, Chair – The Ohlone Indian Tribe
- Kenneth Woodrow, Chair – Wuksachi Indian Tribe/Eshom Valley Band

SAS contacted each of the individuals listed above by letter on July 10, 2023, inquiring if they had any knowledge of culturally sensitive properties or archaeological sites within or near the area of the PPS. As of this report, SAS has not received any information from any of the contacts listed above. If substantive information is forwarded or concerns regarding the Proposed Project are expressed by any of these individuals or groups at a later date, SAS will provide an addendum to the cultural report (Appendix B) as necessary.

California Historical Resources Information System Records Search

On June 27, 2023, the Northwest Information Center (NWIC) of the California Historical Resources Information System, provided the results of a record search for the area around the PPS (NWIC File No. 22-1987; Attachment C to Appendix B). The NWIC indicated that no cultural resources were known to be present within the project area, but four resources had been documented within a half-mile search area. These sites consisted of two prehistoric occupation sites associated with the “Alma Adobe” (P-43-000595 and P-43- 000669), another prehistoric habitation locale on Barron Creek (P-43-000619), and a historic-period building complex (P-43-003139). The NWIC research also reported that three previous cultural resources studies conducted in 2000, 2001, and 2006 included at least a portion of the current project area, and that an additional 11 investigations have occurred within the half-mile search area (Attachment C to Appendix B).

Additional Research

To ascertain patterns of land ownership and use within the project area and identify potential undocumented sites, cultural deposits, and sensitive landforms, SAS conducted additional archival research focused on historical mapping and land transfer records. This consisted of reviews of the U.S. Department of the Interior, Bureau of Land Management (BLM) General Land Office’s (GLO) archives including patent records and plat maps, historical U.S. Geological Survey (USGS) topographic quadrangle maps, and other archival sources.

Starting in the early 1850s, the GLO started conducting widespread mapping of lands within California, as well as throughout the western U.S. These “plat” maps, ranges, and sections typically depicted major landforms, waterways, historic-era developments such as ranches, farms, and associated buildings, and occasionally provided assessments of the suitability of land for livestock grazing, agriculture, or timber harvesting. However, the GLO typically did not survey Spanish/Mexican West (within which the project area is located) where no developments or natural features are shown within the Rancho Rincon de San Francisquito.

Apart from surveying government lands, the GLO was also responsible for selling, granting, or otherwise transferring public lands to private individuals, corporations, and state governments. Numerous regulatory frameworks governed and provided for these transfers and one of these, the 1851 California Land Act (9 Stat. 631) was invoked by Secundino, and Teodoro Robles in their formal U.S. grant for Rancho Rincon de San Francisquito in 1868. The California Land Act was enacted following the Treaty of Guadalupe Hidalgo and the admission of California as a state in 1850. This act stablished a three-member Public Land Commission to determine the validity of prior Spanish and Mexican land grants. It required landowners who claimed title under the Mexican government to file their claim with a commission within 2 years. Contrary to the Treaty of Guadalupe Hidalgo, which guaranteed full protection of all property rights for Mexican citizens, it placed the burden on landholders to prove their title. While the commission eventually confirmed 604 of the 813 claims, almost all claims went to court and resulted in protracted litigation. The expense of the long court battles required many land holders to sell portions of the property or trade it in payment for legal services and a few cases were litigated into the 1940s (Gates 1971).

A review of historic USGS topographic mapping, and aerial photography shows how development within Palo Alto proceeded from the late 19th through the mid-20th centuries. The earliest aerial photograph showing the project area and vicinity dates to 1948 at which time no buildings or structures are visible where the Hoover ES would be built in later years. Although some residential and commercial development had occurred, agriculture appears to have been the predominant land use pattern at the time. However, that changed rapidly over the following decade and by 1958, the school is in place and dense residential and likely commercial development has appeared. By 1960, only a few undeveloped lots can be seen in the vicinity of the school, and none appear to have been cultivated. Topographic mapping by the USGS also reflects the rapid urbanization of the area surrounding the school. Starting in 1897, several roadways including the alignments of present-day Charleston Road, and Middlefield Road to the east are depicted. A number of routes to the south of Charleston Road are also shown and this pattern seems to hold for much of the next 40 years (1899, 1901, 1906, 1909, 1911, 1920, 1923, 1930, and 1937 topographic quadrangles). Increased development wasn't depicted until the 1943 topographic map, and by 1955, significant urbanization like that confirmed in aerial photography can be seen.

Other than the historic development trends, several natural features were also depicted on USGS mapping starting with the 1897 quadrangle. These include the channel of Adobe Creek which passes immediately to the south and west of the project area. The creek appears to have been a perennial waterway, the type of which often attracted early Native American activities. USGS mapping shows that the channel was significantly realigned, channelized, and concrete lined during the 20th century.

Field Survey

Methods

On July 4, 2023, SAS archaeologists conducted an intensive pedestrian survey of the project area utilizing pedestrian transects spaced no greater than 15 meters apart. A sub-meter accurate Trimble® GPS unit was utilized to verify project area boundaries and if encountered, record locations of landscape features and cultural resources.

Results

The PPS consists largely of asphalt (e.g., parking lots, ball courts), standing in-use buildings, and areas exhibiting landscaping such as the open grassy yard facing East Charleston Road. Ground surface visibility was only available in landscaped areas (i.e., small bare patches in the yard off East Charleston Road) or on road margins, some of which exhibited minor erosional areas. No prehistoric or historic-era cultural sites, features, or artifacts or potentially sensitive soil types (i.e., prehistoric midden) were encountered. Representative photographs of the project area are provided in Attachment D of Appendix B.

Summary And Recommendations

Archival research and an intensive field survey did not identify any prehistoric or historic-period cultural resources within the project area. A review of historic mapping and aerial photographs demonstrates that the channelized alignment of Adobe Creek is located adjacent to the project area. As creeks were often the focus of early Native American activities and settlement, the project area retains a moderate level of sensitivity for containing prehistoric materials. Concerning historic period resources, historic mapping, aerial photographs, and archival research clearly indicate that the project area remained undeveloped until the construction of the school starting in the mid-1950s. Consequently, there is very little chance that any intact and potentially significant historic-era resources could be present within the project area.

A potentially sensitive landscape feature (Adobe Creek) is present adjacent to the project area, but no prehistoric resources have been documented at the school location despite archaeological investigations that have identified other early Native American sites in the surrounding area. In addition, no evidence suggests that historic-era developments occurred in the project area and research has not identified any such resources. Consequently, with no prehistoric or historic-era resources identified in the project area by the NWIC and SAS research, and the shifted and channelized nature of Adobe Creek, SAS recommends that the Proposed Project would have no impact on historical resources per CEQA.

If human remains or any associated funerary artifacts are discovered during construction, all work must cease within the immediate vicinity of the discovery. In accordance with the California Health and Safety Code (HSC) § 7050.5,[56] the Santa Clara County Sheriff/Coroner must be contacted immediately. If the Coroner determines the remains to be Native American, the Coroner will notify the Native American Heritage Commission, which will in turn appoint a "Most Likely Descendent" (MLD) to act as a tribal representative. The MLD will work with the applicant and a qualified archaeologist to determine the proper treatment of the human remains and any associated funerary objects. Construction activities will not resume until either the human remains are exhumed or the remains are avoided via project construction design change.

[56] California HSC § 7050.5

3.5.3 Impact Discussion

a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?

Historical resource is defined in CEQA Guidelines § 15064.5[57] as "a resource listed or eligible for listing on the California Register of Historical Resources." Generally, if it meets one of the following criteria, a resource is considered significant if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important to our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

The PPS contains Hoover ES where construction began in the early 1950s. No prehistoric or historic-era cultural sites, features, or artifacts or potentially sensitive soil types (i.e., prehistoric midden) were encountered during the site survey on the PPS (Appendix B). Construction of the Proposed Project would occur within the PPS boundaries, except for off-site improvements (e.g., sidewalks, curb cuts, utility undergrounding). Therefore, no impact would occur.

Impact Designation: No Impact.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

The PPS is heavily developed and various construction projects have occurred on the PPS since the early 1950s. A potentially sensitive landscape feature (Adobe Creek) is present adjacent to the project area, but no prehistoric resources have been documented at the school location despite archaeological investigations that have identified other early Native American sites in the surrounding area. In addition, no evidence suggests that historic-era developments occurred in the project area and research has not identified any such resources. Consequently, with no prehistoric or historic-era resources having been identified in the project area by the NWIC and SAS research, and the shifted and channelized nature of Adobe Creek, the Proposed Project would have no impact on historical resources.

Impact Designation: No Impact.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

The PPS is currently developed and would require grading and other ground-disturbing activities. If human remains or any associated funerary artifacts are discovered during construction, all work must

[57] 2023 CEQA Statute & Guidelines

cease within the immediate vicinity of the discovery. In accordance with the California HSC § 7050.5,[58] the Santa Clara County Sheriff/Coroner must be contacted immediately. If the Coroner determines the remains to be Native American, the Coroner will notify the Native American Heritage Commission, which will in turn appoint a MLD to act as a tribal representative. The MLD will work with the District and a qualified archaeologist to determine the proper treatment of the human remains and any associated funerary objects. Construction activities will not resume until either the human remains are exhumed, or the remains are avoided via project construction design change. A less-than-significant impact would occur.

Impact Designation: Less-Than-Significant Impact.

[58] California HSC § 7050.5

3.6 Energy

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Proposed Project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a State or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

3.6.1 Regulatory Setting

State

California's electricity grid is transitioning to renewable energy under the Renewables Portfolio Standard (RPS) program.[59] Renewable sources of electricity include biomass, geothermal, hydroelectric, solar, and wind. Electricity production from renewable sources is generally considered carbon neutral.

Executive Order (EO) S-14-08,[60] signed in November 2008, required retail sellers of electricity to serve 33 percent of their load with renewable power by the year 2020. Senate Bill (SB) 350 was signed into law in 2015 and mandated a 50 percent RPS by 2030. In 2018, SB 100 was signed, raising California's renewable resources target to 60 percent by December 31, 2030, and requiring 100 percent of the state's electricity be generated by carbon-free resources by 2045. Under SB 100, California cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free resource target.[61]

California Green Building Standards Code

CALGreen (Title 24, Part 11 of the CCRs) was developed by the California Energy Commission (CEC) and applies to energy consumed for heating, cooling, ventilation, water heating, and lighting in new residential, commercial, and public school buildings. CALGreen is updated every 3 years; the 2022 update became effective January 1, 2023. The purpose of CALGreen is to improve public health, safety,

[59] California Energy Commission, Renewable Portfolios Standard

[60] California, Office of the Governor, EO S-14-08

[61] California SB 100, California Renewables Portfolio Standard Program: emissions of greenhouse gases

and general welfare by enhancing the design and construction of buildings utilizing building concepts that have a positive environmental impact and encourage sustainable construction practices in the following categories: (1) planning and design, (2) energy efficiency, (3) water efficiency and conservation, (4) material conservation and resource efficiency, and (5) environmental quality. The CEC's long-term vision is that future updates to the California Energy Code will support zero-net energy for all new single-family and low-rise residential buildings by 2020 and new high-rise residential and non-residential buildings by 2030.

The 2022 CALGreen update includes numerous revisions to Chapter 5 (Nonresidential Mandatory Measures). Section 5.106.5.3[62] pertains to EV charging and provides standards for the number of EV spaces that must be provided based on the total number of actual parking spaces. Additional technical requirements regarding the electrical load capacity, connection types, and other details are also provided in this section. Section 5.106.12.1[63] provides a new exception for surface parking areas to be covered with either photovoltaic shade structures or shade structures with specific roofing materials in lieu of shade tree plantings in whole or in part; a similar exception applies to hardscape areas in Section 5.106.12.3[64]. A new subsection, 5.504.4.7.1[65], has been added to provide compliance verification requirements for all thermal insulation materials meeting the pollutant emission limits.

A detailed provision was also added regarding indoor air quality specific to schools. Section 5.506.3[66] provides requirements for carbon dioxide monitoring in classrooms. Specifications include the location and installation for each monitor or sensor as well as the way the device is monitored or provides notifications to monitoring personnel. The monitors or sensors must also store the measurements for at least 30 days and should be able to read carbon dioxide levels within a range of 400 to 2,000 parts per million (ppm) or greater. Additional standards regarding manufacturer certification of the device and calibration frequency are also detailed in this section.

California Code of Regulations (13 CCR § 2449)

Nonessential idling of diesel-powered off-road equipment is limited to 5 minutes per 13 CCR § 2449.[67] The purpose of the regulation is to reduce diesel particulate matter and criteria pollutant emissions from off-road diesel-powered vehicles while they are in use. This regulation applies to diesel- or alternative diesel-fueled vehicles that have a maximum horsepower of 25 or greater. It should be noted that this regulation does not apply to stationary or portable equipment. The 5-minute idling limit does not apply when queuing; when verifying the vehicle is in safe operating condition; when testing, servicing, repairing, or diagnosing the equipment; while idling if the idling is necessary to accomplish

[62] CALGreen, Section 5.106.5.3, Electric Vehicle (EV) Charging [N]

[63] CALGreen, Section 5.106.12.1, Surface Parking Areas

[64] CALGreen, Section 5.106.12.3, Hardscape Areas

[65] CALGreen, Section 5.504.4.7.1, Verification of compliance

[66] CALGreen, Section 5.506.3, Carbon dioxide (CO2) monitoring in classrooms,

[67] 13 CCR § 2449, General Requirements for In-Use Off-Road Diesel-Fueled Fleets

work for which the vehicle was designed (e.g., a crane); when bringing the equipment to temperature; or when idling is necessary to ensure safe operation of the vehicle.

Local

The City has been providing utilities since 1896 and is the only city in California to operate a full suite of municipal utility services. City-owned and operated utility services include electricity, natural gas, water, sanitary sewer, and commercial fiber optics (City 2023b).

3.6.2 Environmental Setting

Hoover ES is in a residential neighborhood within the City. The PPS is served by both electricity and natural gas connections, which are supplied by the City. The associated infrastructure is provided and maintained by the City.

Current energy demands are derived from the operation of the existing Hoover ES. Energy demand from the existing land uses includes building energy (e.g., lighting and heating) and energy demand from vehicle trips.

3.6.3 Impact Discussion

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The potential energy demands from construction and operation activities associated with the development of the Proposed Project are discussed in the following sections.

Short-Term Impacts During Construction

Electrical Energy. Construction of the Proposed Project would not require electricity to power most equipment. The electricity used during construction would vary based on the phase of construction; however, the majority of equipment during demolition, site preparation, trenching, and grading would be powered by diesel or gasoline. Some construction activities later in the process could require electric-powered equipment such as hand tools (e.g., drills, saws, compressors) and task lighting, which would result in minimal electricity usage. Overall, the use of electricity would be temporary in nature and would fluctuate according to the particular construction activity. Therefore, as electricity consumption during construction would be minimal and would occur only when necessary to construct the Proposed Project, related construction activities would not result in wasteful or unnecessary electricity demands, and impacts would be less than significant.

Natural Gas Energy. It is not anticipated that any natural gas-powered equipment would be used during construction of the Proposed Project. Therefore, impacts would be less than significant with respect to natural gas usage.

Transportation Energy. Transportation energy use depends on the mode of travel, type and number of trips, vehicle miles traveled, and the fuel efficiency of vehicles. Transportation energy used during construction would result from the transportation of construction equipment and materials to the PPS, the use of construction equipment, delivery vehicles, and vehicles operated by construction workers traveling to the PPS that would use diesel fuel and/or gasoline. The use of energy resources by these vehicles would fluctuate according to the construction activity and would be temporary in nature. Once construction is complete, the use of construction equipment would cease. Furthermore, construction contractors are anticipated to minimize nonessential idling of construction equipment during construction in accordance with 13 CCR § 2449[68] which limits the nonessential idling of diesel-powered off-road equipment to 5 minutes. Such required practices would limit wasteful and unnecessary energy consumption.

There are no unusual characteristics that would directly or indirectly cause construction activities to be any less efficient than at other construction sites. The proposed utility infrastructure would connect to the existing water, sewer, storm drain system, and electricity network in the area because the land use would remain the same. Therefore, it is expected that energy used during construction of the Proposed Project would not be differ significantly from similar projects and impacts would be less than significant.

Long-Term Impacts During Operation

The Proposed Project would have various energy needs during operation such as heating, cooling, and ventilation of buildings; water heating; use of on-site equipment and appliances; transportation of staff, students, and parents driving to and from the school; and indoor, outdoor, perimeter, and parking lot lighting.

Electrical Energy. The Proposed Project involves the demolition and reconstruction of an existing elementary school. Electrical service to the PPS is and would continue to be provided by City utility connections to existing electrical lines and new on-site infrastructure.

New buildings on the PPS would be constructed in compliance with the current Building Energy Efficiency Standards[69] and CALGreen (Title 24, Part 11 of the CCRs)[70]. New replacement buildings that comply with these standards would generally have greater energy efficiency than existing buildings. Compliance with such standards would decrease overall reliance on fossil fuels and increase reliance on renewable energy sources for electricity generation. Thus, operation of the Proposed Project would not result in the wasteful or unnecessary use of electricity.

Natural Gas Energy. The Proposed Project would use only electric energy; therefore, an increase in natural gas consumption would not occur. No natural gas would be consumed during operation of the Proposed Project.

[68] 13 CCR § 2449, General Requirements for In-Use Off-Road Diesel-Fueled Fleets

[69] California Energy Commission, Building Energy Efficiency Standards

[70] CALGreen 2022, Title 24, Part 11, Revision Record for the State of California

Transportation Energy. The Proposed Project would not increase student or staff capacity for the schools. Implementation of the Proposed Project would not generate additional vehicle fuel usage compared to existing conditions. Based on the traffic study, the Proposed Project would result in an improvement to the access and circulation system near the campus. The existing U-shaped access road is accessible from East Charleston Road on the west side of the PPS and loops around the north side of the building before traveling along the east side of the campus to exit back onto East Charleston Road. The access road would be replaced with a condensed U-shaped driveway that is accessible from the east side of the PPS along East Charleston Road and exits directly back to East Charleston Road rather than looping around the PPS. The new format provides a student drop-off/pick-up zone, short-term parking for visitors, and long-term parking for staff. These activities currently occur around the north and east side of the buildings. Improving the flow of traffic would decrease transportation-related energy by streamlining the drop-off/pick-up zones and reducing the long loop that currently surrounds the PPS.

Additionally, fuel efficiency of vehicles during the buildout years of 2026 would, on average, improve when compared to vehicle fuel efficiencies experienced under existing conditions. The result would be lower per capita fuel consumption if the average vehicle types, travel distances, travel modes, and trip frequency remain the same. The improvement in fuel efficiency would be attributable to the State-wide fuel reduction strategies and other regulatory measures (e.g., CAFE Standards),[71] that result in newer, more fuel-efficient cars. Because CAFE Standards and other similar regulations are not directly applicable to development projects, neither Hoover ES users nor the District have direct control in determining the fuel efficiency of vehicles manufactured and that are made available. However, compliance with such standards and regulations by auto manufacturers would ensure that vehicles produced in future years have increased fuel efficiency and would generally result in an overall reduction in fuel usage by providing more fuel-efficient vehicle options.

The Proposed Project includes the installation of EV chargers at 10 parking spaces, which is consistent with the applicable CALGreen Tier 2 non-residential measures for EV capable and EV charging spaces; however, this would increase reliance on electricity for transportation energy demand (CalGreen Energy Services Inc. 2023). As electricity consumed in California is required to meet the increasing renewable energy mix requirements under the state's RPS, greater proportions of electricity consumed for transportation energy demand envisioned under the Proposed Project would continue to be sourced from renewable energy sources. Because vehicle fuel efficiencies would improve each year through the buildout year of 2026 and a decrease in overall per capita transportation energy consumption would occur, impacts would be less than significant with respect to operation-related fuel usage.

Impact Designation: Less-Than-Significant Impact.

b) Conflict with or obstruct a State or local plan for renewable energy or energy efficiency?

While the state-wide RPS goal is not directly applicable to individual development projects, the goals do apply to utilities and energy providers such as the City, which is the provider that would meet all of the

[71] U.S. Department of Transportation, Corporate Average Fuel Economy (CAFE) Standards

utility needs for the Proposed Project. The City's compliance with SB 350 and SB 100 would assist the state in meeting its objective towards renewable energy in addition to supporting the City's own goal of achieving an 80 percent reduction in GHGs below 1990 levels by the year 2030 (City 2023c).

Furthermore, implementation of the Proposed Project would encompass only all-electric buildings, which would generally have greater energy efficiency than existing buildings and must comply with the latest Building Energy Efficiency Standards and CALGreen.

Therefore, implementation of the Proposed Project would not conflict or obstruct plans for renewable energy or energy efficiency, and impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

3.7 Geology and Soils

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the proposed project:				
a) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?				
i) Rupture of a known earthquake fault, as delineated in the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines & Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☒	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d) Be located on expansive soils, as defined in Table 181-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☒	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternate wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

3.7.1 Regulatory Setting

Federal

The Federal Emergency Management Agency (FEMA) has established seismic building codes to control seismic hazards in the event of an earthquake to save lives and reduce losses. Building codes "specify

the minimum requirements to adequately safeguard the health, safety and welfare of building occupants" by regulating the design, construction, alteration, and maintenance of structures (FEMA 2023a). Code enforcement is largely the "responsibility of local building officials who review design plans, inspect construction work, and issue building and occupancy permits" (FEMA 2023b).

State

The Alquist-Priolo Earthquake Fault Zoning Act of 1972[72] established earthquake fault zones that are regulatory zones surrounding the surface traces of active faults in California. Structures for human occupancy cannot be built over a fault and must be a minimum distance from fault lines. The act defines an active fault as one that has ruptured in the last 11,000 years (DOC 2023a).

The Seismic Hazards Mapping Act of 1990[73] requires the DOC and California Geological Survey (CGS) to identify and map areas that are susceptible to liquefaction, earthquake-induced landslides, and amplified ground shaking. This act requires the State Geologist to establish "Zones of Requires Investigation" and "Seismic Hazard Zone" maps that cities, counties, and state agencies can use for planning, construction, and development (DOC 2023a).

These two acts were implemented to establish regulatory "Zones of Required Investigation" to reduce the threat to public health and safety and to minimize the loss of life and property that can be caused by earthquake-triggered ground failures. Property sellers in California are required to disclose at the time of sale if a property is within a mapped hazard zone (DOC 2023a).

Local

The City has not always taken fault rupture and seismic safety hazards into consideration, therefore, some structures could be at risk in a major earthquake event (City 2017). In 2017, the City published an update to their *Threat and Hazards Identification and Risk Assessment* report to enforce a uniform building code to mitigate damages that may result from a potential earthquake event (City 2017, Section 5.2 "Earthquake Hazard Summary").

The City also established a Seismic Hazards Identification Program in Chapter 16.42 of the City Municipal Code,[74] which identifies buildings in the City that exhibit structural deficiencies that have the potential to cause loss of life and injury due to their proximity to the San Andreas and Hayward faults. The City implemented this program to identify the hazards that these structural deficiencies may pose to building occupants and pedestrians in an earthquake event.

3.7.2 Environmental Setting

Hoover ES is currently developed and located within a residential neighborhood in the City. The City is not located in an Alquist-Priolo Earthquake Fault Zone and there are no fault lines that traverse the PPS

[72] Alquist-Priolo Earthquake Fault Zoning Act of 1972

[73] DOC, California Seismic Hazard Zones

[74] Palo Alto Municipal Code, Chapter 16.42, Seismic Hazards Identification Program

(DOC 2023b, 2023c). Due to the "porous nature and high water content of the soil," liquefaction hazards in the area east of U.S. 101 are significant (City 2017). Landslides are common in the Palo Alto foothills and may result from "heavy rain, erosion, removal of vegetation, or human activities" (City 2017). In the eastern and southern areas of the City, "settlement and subsidence due to groundwater withdrawal has historically been a problem," "but has been largely halted by groundwater recharge efforts and reduced pumping" (City 2017). The City is in a seismically active area; however, the PPS is not in an earthquake fault zone and has low liquefaction due to its proximity from U.S. 101; the Proposed Project would not require groundwater withdrawal.

3.7.3 Impact Discussion

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

The PPS is not in an Alquist-Priolo Earthquake Fault Zone and no fault lines traverse the PPS (DOC 2023b, 2023c). Therefore, impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

ii) Strong seismic ground shaking?

As stated in Section 3.7.3, the PPS is not within a known fault or earthquake zone. The nearest potentially active faults are the Monte Vista-Shannon Fault located approximately 4 miles southwest of the PPS, the San Andreas Fault located approximately 7 miles southwest of the PPS, and the Hayward Fault approximately 12 miles northeast of the PPS. According to CGS's Earthquake Shaking Potential for California Map, the City (located in Santa Clara County) experiences higher levels of shaking more frequently than most areas of California (CGS 2016). Due to the proximity to the Monte Vista-Shannon, San Andreas, and Hayward faults, there is potential that a seismic event could occur and cause significant impacts. Implementation of Mitigation Measure GEO-1 would ensure that that if seismic ground shaking occurs, the structures would be seismically engineered for safety in accordance with state and federal requirements. Implementation of Mitigation Measure GEO-1 would reduce impacts of seismic ground shaking to a less-than-significant level.

Impact Designation: Less-Than-Significant Impact with Mitigation Incorporated.

Mitigation Measures

GEO-1: Prior to construction, the District shall identify geotechnical, engineering, and construction measures to ensure that the structure is seismically safe. All safety measures must be reviewed and followed.

iii) Seismic-related ground failure, including liquefaction?

Liquefaction refers to loose, saturated sand or gravel deposits that lose their load-supporting capability when subjected to intense shaking. Liquefaction potential varies based upon three main contributing factors: (1) cohesionless, granular soils having relatively low densities (usually of Holocene age); (2) shallow groundwater (generally less than 50 feet), and (3) moderate to high seismic ground shaking. According to the City's *Threat and Hazards Identification and Risk Assessment*, the area east of U.S. 101 is at risk of liquefaction due to the "porous nature and high-water content of the soil" (City 2017). The PPS is within both state- and county-designated Liquefaction Hazard Zones (Appendix C) . Because the Proposed Project is the demolition and rebuilding of an existing school, CGS and DSA would ensure that the buildings are sufficiently evaluated for liquefaction potential. Additionally, all structures would be built to adhere to the 2023 California Building Code (CBC), or the most recent version, which provides minimum standards to protect property and public welfare by regulating design and construction to reduce the effects of adverse soil conditions. Therefore, impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

iv) Landslides?

Landsliding is a type of erosion in which masses of earth and rock move downslope as a single unit. No landslides have been mapped on the PPS (DOC 2023d) and the PPS is relatively flat. Furthermore, all structures on the PPS would comply with the 2022 CBC, or most recent version, as well as the DSA criteria, which provides minimum standards to protect property and public welfare by regulating design and construction to reduce the effects of adverse soil conditions. Therefore, impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

b) Result in substantial soil erosion or the loss of topsoil?

Erosion is a normal and inevitable geologic process whereby earthen materials are loosened, worn away, decomposed, or dissolved, and removed from one place and transported to another. The PPS is an existing school site with paved and impervious surfaces (parking lots, buildings) as well as pervious surfaces (turf field, vegetation). The PPS would implement structural and non-structural BMPs before and during construction to control surface runoff and erosion to retain sediment on the PPS. Once the Proposed Project is constructed, soil erosion would be controlled with improvements installed on the PPS. Therefore, a less-than-significant impact would occur.

Impact Designation: Less-Than-Significant Impact.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

As discussed in Section 3.7.3, the PPS is not in a liquefaction zone and is not within a mapped hazard zone (DOC 2023c). Lateral spreading is a phenomenon where large blocks of intact, non-liquefied soil

move downslope on a large, liquefied substratum; the mass moves toward an unconfined area, such as a descending slope or stream-cut bluff and has been known to move on slope gradients as little as one degree. The topography of the PPS is relatively flat and there no slopes adjacent to it. The Adobe Creek channel is approximately 250 feet northeast of the PPS and appears to be concrete lined (Appendix C); therefore, impacts from lateral spreading would be less than significant.

Subsidence of basins attributed to overdraft of groundwater aquifers or over pumping of petroleum reserves has been reported in various parts of California. Collapsible soils may appear strong and stable in their natural (dry) state, but they rapidly consolidate under wetting, generating large and often unexpected settlements. Seismically induced settlement consists of dynamic settlement of unsaturated soil (above groundwater) and liquefaction-induced settlement (below groundwater). These settlements occur primarily in low-density sandy soil due to the reduction in volume during and shortly after an earthquake. The Proposed Project would not require the withdrawal of groundwater from the PPS but is within areas of land subsidence (USGS 2023). Because groundwater withdrawal is not required for the Proposed Project, impacts to subsidence would be less than significant.

The Proposed Project would be required to comply with CBC and DSA criteria which would ensure adequate design and construction of building foundations to resist soil movement. Therefore, impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Expansive soils swell when they become wet and shrink when they dry out resulting in the potential for cracked building foundations. Soil plasticity index tests performed on the PPS's subsurface soil resulted in a plasticity index of 46, indicating high expansion potential to wetting and drying cycles (Appendix C). Because the Proposed Project is the demolition and reconstruction of an existing school, CGS and DSA would ensure that the buildings are sufficiently evaluated for expansive soil potential. All structures built onsite would adhere to the 2023 CBC, or the most recent version. Additionally, because the PPS would be a school site, CGS and DSA would ensure that the buildings are sufficiently reduced. Implementation of Mitigation Measure GEO-2 would ensure that the structures would withstand wetting and drying cycles. Therefore, the PPS would have less-than-significant impacts on exposing people or the proposed structures to adverse effects associated with expansive soils.

Impact Designation: Less-Than-Significant Impact with Mitigation Incorporated.

Mitigation Measures

GEO-2: Prior to construction, the District shall ensure that construction measures include slabs-on grade that have sufficient reinforcement and are supported by a layer of non-expansive fill. Footings should extend below the zone of seasonal moisture fluctuation. It is also recommended that moisture changes in the surficial soils are limited by using positive drainage away from buildings, along with limiting landscape watering by using drip irrigation near foundations and exterior slabs-on-grade.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The Proposed Project would not require the installation of a septic tank or alternative wastewater disposal system as it would utilize the local sewer system. Therefore, no impacts would result from soil conditions in relation to septic tanks or other on-site water disposal systems.

Impact Designation: No Impact.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The PPS is currently developed. The Proposed Project would require limited grading and other ground-disturbing construction activities to accommodate construction and utility requirements. Due to the ground disturbance associated with construction, there is potential that natural landforms beneath the PPS would be encountered during construction and that subsurface resources and/or paleontological resources could be discovered. Implementation of Mitigation Measure GEO-3 would ensure that if resources are discovered during ground disturbing activities that resources would be recovered in accordance with state and federal requirements. Implementation of Mitigation Measure GEO-3 would reduce impacts to paleontological resources to a less-than-significant level.

Impact Designation: Less-Than-Significant Impact with Mitigation Incorporated.

Mitigation Measures

GEO-3: Prior to construction, the District shall identify a qualified paleontologist to be on call. If unique paleontological resources are discovered during excavation and/or construction activities, construction shall stop within 50 feet of the find, and the qualified paleontologist shall be consulted to determine whether the resource requires further study. The paleontologist shall make recommendations to the District to protect the discovered resources. Any paleontological resources recovered shall be provided to the North Central Information Center and California State University, Sacramento, Natural History Museums or repository willing and able to accept and house the resource to preserve for future scientific study.

3.8 Greenhouse Gas Emissions

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the proposed project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant effect on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

3.8.1 Regulatory Setting

State

The state of California has passed many regulations intended to reduce GHG emissions from the transportation sector, commercial and industrial facilities, and the general public. Governors have also signed EOs, with which state entities must comply but which remain goals and recommendations for other jurisdictions until and unless they are signed into law. Some of the most prominent GHG-related legislation is described below.

Assembly Bill 1493

Signed by the California governor in 2002, Assembly Bill (AB) 1493[75] requires the California Air Resources Board (CARB) to adopt regulations requiring a reduction in GHG emissions emitted by cars in the state. AB 1493 is intended to apply to 2009 and newer vehicles. On June 30, 2009, the EPA granted a necessary CAA waiver for California to implement AB 1493.

Executive Order S-3-05

EO S-3-05[76] was signed by the California governor on June 1, 2005, and established the following State-wide emission reduction targets:

- Reduce GHG emissions to 2000 levels by 2010;
- Reduce GHG emissions to 1990 levels by 2020; and

[75] AB 1493, Vehicular emissions: greenhouse gases

[76] California, Office of the Governor, EO-S-3-05

- Reduce GHG emissions to 80 percent below 1990 levels by 2050.

EO S-3-05 created a Climate Action Team headed by the California Environmental Protection Agency that included several other state agencies. The Climate Action Team is tasked by EO S-3-05 with outlining the effects of climate change on California and recommending an adaptation plan, as well as creating a strategy to meet the emission reduction targets.

California Global Warming Solutions Act of 2006 (AB 32)

AB 32, the California Global Warming Solutions Act of 2006,[77] was passed in September 2006. The bill codified the first GHG target of EO S-3-05 and established the first comprehensive GHG regulatory program in the U.S. AB 32 required GHG emissions to be reduced to 1990 levels by 2020. This bill provided CARB authority to enforce a state-wide GHG cap by identifying the state-wide emissions level and implementing a scoping plan to identify all strategies necessary to fully achieve the required 2020 emissions reductions across sectors.

In the *Climate Change Scoping Plan* approved in December 2008, CARB laid out the GHG reductions that would need to be achieved and the types of measures that would be used to reach them. The *Climate Change Scoping Plan* predicted that under a "business as usual" scenario, GHG emissions in 2020 would equal 596 million metric tons (MMT) of carbon dioxide equivalents (CO_2e). Consequently, compared to the State's 1990 GHG emissions inventory, emissions would need to be reduced by 169 MMT of CO_2e in 2020. This represents a 30 percent GHG reduction from the business as usual scenario for 2020. The *Scoping Plan* provides the following key recommendations to reduce GHG emissions:

- Expand and strengthen existing energy efficiency programs as well as building and appliance standards;
- Achieve a state-wide renewable energy mix of 33 percent;
- Develop a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establish targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets; and
- Adopt and implement measures pursuant to existing state laws and policies, including California's Clean Car Standards, Goods Movement Measures, and the Low Carbon Fuel Standard.

Executive Order S-01-07

EO S-01-07[78] was signed by the California governor in January of 2007. It mandates a state-wide goal to reduce the carbon intensity of transportation fuels by at least 10 percent by 2020. This target reduction was identified by CARB as one of the AB 32 early action measures in the October 2007 report.

[77] AB 32 Air pollution: greenhouse gases: California Global Warming Solutions Act of 2006

[78] California, Office of the Governor, EO S-01-07

Senate Bill 97

In August 2007, SB 97[79] was adopted to recognize the need to address climate change under CEQA. The Governor's Office of Planning and Research (OPR) was directed to prepare guidelines for mitigation of GHG emissions, including guidelines for public agencies in analyzing and mitigating GHG emissions. Particularly, it recognized the need to address cumulative contribution of emissions for a development project. It also required that lead agencies make a good-faith effort to calculate and describe GHG emissions potentially resulting from a project. SB 97 allowed on- and off-site mitigation, including project design features to reduce emissions, as well as sequestration. Following SB 97, the California Air Pollution Control Officers Association provided guidance on integrating analysis of climate change in its 2008 white paper *CEQA & Climate Change-+*.

Senate Bill 375

SB 375, the Sustainable Communities and Climate Protection Act,[80] was adopted in September 2008. Building on AB 32, SB 375 directed CARB to develop regional GHG emission reduction targets to be achieved by metropolitan planning organizations. These organizations became required to align their regional transportation, housing, and land use plans and prepare sustainable communities strategies to reduce vehicular travel and GHG emissions.

Through SB 375, the State encouraged alternative transportation planning in regional plans. CARB determines whether the sustainable communities strategies will achieve the region's GHG emissions reduction goals. Under SB 375, certain qualifying in-fill residential and mixed-use projects would be eligible for streamlined CEQA review.

Senate Bill 605

On September 21, 2014, the California governor signed SB 605[81] that requires CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants in the state no later than January 1, 2016. As defined in the statute, short-lived climate pollutant means "an agent that has a relatively short lifetime in the atmosphere, from a few days to a few decades, and a warming influence on the climate that is more potent than that of carbon dioxide." SB 605, however, does not prescribe specific compounds as short-lived climate pollutants or add to the list of GHGs regulated under AB 32. In developing the strategy, CARB completed an inventory of sources and emissions of short-lived climate pollutants in the state based on available data, identified research needs to address any data gaps, identified existing and potential new control measures to reduce emissions, and prioritized the development of new measures for short-lived climate pollutants that offer co-benefits by improving water quality or reducing other air pollutants that impact community health and benefit disadvantaged communities.

[79] SB 97 CEQA: greenhouse gas emissions

[80] SB 375 Transportation planning: travel demand models: sustainable communities strategy: environmental review

[81] SB 605 Short-lived climate pollutants

The final strategy released by CARB in March 2017 focuses on methane, black carbon, and fluorinated gases, particularly hydrofluorocarbons, as important short-lived climate pollutants. The final strategy recognizes emission reduction efforts implemented under AB 32 (e.g., refrigerant management programs) and other regulatory programs (e.g., in-use diesel engines, solid waste diversion). The measures identified in the final strategy and their expected emission reductions will feed into the update to the CARB Scoping Plan.

Executive Order B-30-15

EO B-30-15[82] was signed by the California governor on April 29, 2015, and established a state-wide GHG reduction target of 40 percent below 1990 levels by 2030. This intermediate GHG emissions reduction target would make it possible to meet the ultimate GHG emissions reduction target of 80 percent below 1990 levels by 2050 as established in EO S-3-05. It also directs the CARB to update the *Climate Change Scoping Plan*. The *2030 Target Scoping Plan Update Concept Paper*[83] was released on June 17, 2016.

Senate Bill 350

SB 350 codifies the GHG targets for 2030 set by EO B-30-15. To meet these goals, SB 350 also raises the California RPS from 33 percent renewable generation by 2020 to 50 percent renewable generation by December 31, 2030.

Senate Bill 32

Additionally, SB 32,[84] signed in 2016, further strengthens AB 32 with goals of reducing GHG emissions to 40 percent below 1990 levels by 2030. Based on GHG emissions inventory data compiled by CARB through 2017 and the emission limit of 431 MMT of CO_2e established in the *IPCC Fourth Assessment Report*, California emission reduction goals for near-term 2020 will be met by abiding by the California *Climate Change Scoping Plan*.

California Renewable Portfolio Standards - SB 1078, SB 350, and SB 100

The California RPS Program was established in 2002 by SB 1078[85] and requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide a certain percentage of their supply from renewable sources. The initial requirement was for at least 20 percent of electricity retail sales to be served by renewable resources by 2017. The RPS program was accelerated in 2015 with SB 350 which mandated a 50 percent RPS by 2030. In 2018, SB 100[86] was signed into law, which again increased the RPS to 60 percent by 2030 and requires all electricity in the state to come from carbon-free resources by 2045.

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[82] California, Office of the Governor, EO B-30-15

[83] State of California, 2030 Target Scoping Plan Update Concept Paper (June 17, 2016)

[84] SB 32 California Global Warming Solutions Act of 2006: emissions limit

[85] SB 1078 Renewable energy: California Renewables Portfolio Standard Program

[86] SB 100 California Renewables Portfolio Standard Program: emissions of greenhouse gases

Executive Order B-55-85

EO B-55-18,[87] signed on the same day as SB 100 (September 10, 2018), directs the state as a whole to achieve carbon neutrality by 2045 and net negative emissions thereafter. The EO does not specify the means by which carbon neutrality must be met, allowing for flexibility as technologies advance and costs change, and allows for the option of atmospheric removal such as sequestration. The order also calls on the CARB to work with state agencies to ensure future scoping plans identify and recommend measures to meet the new carbon neutrality goal.

California Code of Regulations Title 20: Appliance Efficiency Regulations

California's Appliance Efficiency Regulations, CCR Title 20,[88] contain standards for both federally regulated appliances and non-federally regulated appliances. The regulations are updated regularly to allow consideration of new energy efficiency technologies and methods. The current standards were adopted by the CEC in 2018. The standards outlined in the regulations apply to appliances that are sold or offered for sale in California. More than 23 different categories of appliances are regulated, including refrigerators, freezers, water heaters, washing machines, dryers, air conditioners, pool equipment, and plumbing fittings.

California Code of Regulations Title 24, Part 6: California Energy Efficiency Standards

California regulates energy consumption under California Building Standards Code, Title 24, Part 6 of the CCR (also known as the California Energy Code). The *Building Energy Efficiency Standards for Residential and Nonresidential Building* were developed by the CEC and apply to energy consumed for heating, cooling, ventilation, water heating, and lighting in new residential and non-residential buildings.[89] The California Energy Code is updated every 3 years, with the most recent iteration (2022) effective January 1, 2023, and the next version (2025) planned to go into effect on January 1, 2026. The CEC's long-term vision is that future updates to the California Energy Code will support zero-net energy for all new single-family and low-rise residential buildings by 2020 and new high-rise residential and non-residential buildings by 2030. Refer to Section 3.6.1 for additional information.

California Code of Regulations Title 24, Part 11: California Green Building Standards Code

The purpose of CALGreen is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) planning and design, (2) energy efficiency, (3) water efficiency and conservation, (4) material conservation and resource efficiency, and (5) environmental air quality. Refer to Section 3.6.1 for additional information.

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[87] California, Office of the Governor, EO B-55-18

[88] CCR Title 20, Public Utilities and Energy

[89] California Energy Commission, 2022 Building Energy Efficiency Standards for Residential and Nonresidential Buildings

Senate Bill 743

SB 743[90] changes how public agencies must evaluate the transportation impacts of projects under CEQA. The bill required revisions to the CEQA Guidelines that would establish new criteria for determining the significance of a project's transportation impacts that will more appropriately balance the needs of congestion management with state-wide goals related to infill development, promotion of public health through active transportation, and reduction of GHG emissions. As required under SB 743, OPR developed potential metrics to measure transportation impacts that may include, but are not limited to, vehicle miles traveled (VMT), VMT per capita, automobile trip generation rates, or automobile trips generated. The new metric would replace the use of automobile delay and level of service as the metric to analyze transportation impacts under CEQA. OPR recommends different thresholds of significance for projects depending on land use types. For example, residential and office space projects must demonstrate a VMT level that is 15 percent less than that of existing development to determine whether the mobile-source GHG emissions associated with a project are consistent with state-wide GHG reduction targets. With respect to retail land uses, any net increase of VMT may be sufficient to indicate a significant transportation impact.

Local

Bay Area Air Quality Management District Climate Change Guidelines

On April 20, 2022, the BAAQMD adopted new thresholds of significance[91] for operational GHG emissions from land use projects for projects beginning the CEQA process recommending that lead agencies use a "fair share" approach for determining whether an individual project's GHG emissions would be cumulatively considerable. If the project is doing its "fair share" to implement California's plans to address the cumulative problem, its contribution can be treated as less than cumulatively considerable. Because construction emissions are temporary and variable, BAAQMD has not developed a quantitative threshold of significance for construction-related GHG emissions. However, the analysis should quantify and disclose GHG emissions that would occur during construction. For a project to have a less-than-significant impact related to operational GHG emissions, it must include, at a minimum, either the following project design elements or be consistent with a local GHG reduction strategy that meets CEQA Guidelines § 15183.5(b)[92] requirements:

1. Projects must include, at a minimum, the following project design elements:
    a. Buildings:
        1) The project will not include natural gas appliances or natural gas plumbing (in both residential and non-residential development).

[90] SB 743 Environmental quality: transit oriented infill projects, judicial review streamlining for environmental leadership development projects, and entertainment and sports center in the City of Sacramento

[91] Bay Area Air Quality Management District, CEQA, Air Quality Guidelines, Chapter 3. Thresholds of Significance

[92] 2023 CEQA Statute & Guidelines

2) The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under §§ 21100(b)(3) and 15126.2(b) of the CEQA Guidelines.[93]

b. Transportation:

1) Achieve a reduction in project-generated VMT below the regional average consistent with the current version of the California *Climate Change Scoping Plan* (currently 15 percent) or meet a locally adopted SB 743 VMT target, reflecting the recommendations provided in OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA* (2018):

a) Residential Projects: 15 percent below the existing VMT per capita

b) Office Projects: 15 percent below the existing VMT per employee

c) Retail Projects: no net increase in existing VMT

2) Achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

2. Be consistent with a local GHG reduction strategy that meets the criteria under CEQA Guidelines § 15183.5(b).

Any new land use project would have to include either section A or B from the above list, not both, to be considered in compliance for GHG emissions from project operation.

Palo Alto Sustainability and Climate Change Plan

The City approved its *Sustainability and Climate Action Plan* (S/CAP) in October 2022 to advance strategies to meet sustainability goals, including the goal of reducing GHG emissions to 80 percent below 1990 levels by 2030. The S/CAP proposes goals and actions in seven areas: Energy (E), EV, Mobility (M), Water (W), Climate Adaptation and Sea Level Rise (S), Natural Environment (N), and Zero Waste (ZW).

Applicable energy reduction key actions in the S/CAP include:

- E2. Reduce GHG emissions in non-residential equipment, including mixed-fuel rooftop packaged HVAC units, cooking equipment, and small non-residential gas appliances.
- E3. Partner with major facility owners to reduce gas use in major facilities by at least 20 percent.
- E7. Use codes and ordinances - such as the energy reach code, green building ordinance, zoning code, or other mandates - to facilitate electrification in both existing buildings and new-construction projects where feasible.
- EV2. Collaborate with regional partners, other agencies, and local non-profit partners to promote EV adoption regionally to reduce commuter and visitor emissions.
- EV3. Partner with employers and business districts to promote commuter EV adoption and EV charging access as well as alternative commute promotion.

[93] 2023 CEQA Statute & Guidelines

- N2. Ensure No Net Tree Canopy Loss for all projects.
- N6. Evaluate and modify plant palette selection in project plans to maximize biodiversity and soil health to adapt to the changing climate and incorporate buffers for existing natural ecosystems.
- N8. Expand the requirements of the Water Efficient Landscape Ordinance (WELO) to increase native and drought-tolerant species composition.
- N10. Establish policies and ordinance changes as needed to support the Green Stormwater Infrastructure Plan.
- ZW7. Expand the Deconstruction and Construction Materials Management Ordinance.

3.8.2 Environmental Setting

The existing elementary school generates GHG emissions from transportation sources, energy (natural gas and purchased energy), and area sources such as landscaping equipment. The existing facility utilizes natural gas for heating and meal preparation.

3.8.3 Impact Discussion

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

or

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Global climate change is not confined to a particular project area and is generally accepted as the consequence of global industrialization over the last 200 years. A typical project, even a very large one, does not generate enough GHG emissions on its own to influence global climate change significantly; hence, the issue of global climate change is, by definition, a cumulative environmental impact.

Implementation of the Proposed Project would result in the demolition and reconstruction of an existing elementary school. Emissions generated during construction of the Proposed Project are an estimated 483 metric tons CO_2e per year (max annual emissions). However, as the BAAQMD does not have a recommended threshold for construction-related GHG emissions, as noted in Section 3.8.1; emissions associated with construction are not included in Table 6.

Project-related operational GHG emissions are shown in Table 6 for information purposes as the BAAQMD CEQA guidelines for GHG emissions relate to project design features to reduce emissions. The proposed elementary school buildings square footage would increase when compared to the existing building square footage. As such, there may be a net increase in area sources (e.g., consumer cleaning products) and energy usage (i.e., electricity). However, the Proposed Project would not result in an increase in student capacity and therefore would not result in an increase of mobile emissions. While building square footage would increase when compared to the existing structures onsite, the new buildings would be designed to be all-electric, would be compliant with the current CBC and, thus, more

energy-efficient in comparison to the existing structures. The buildings would comply with the finding of No Significant Impact under BAAQMD's 2022 CEQA significance thresholds for GHG emissions. Furthermore, with new construction and consistency with updated building codes including CALGreen, the new facility would not result in any wasteful, inefficient, or unnecessary energy use. EV spaces would account for 35 percent of the 52 new parking spaces to be developed on the PPS. The PPS is currently a school site and would remain a school site; therefore, no impact to VMT would occur. With the development of dedicated bicycle parking and bicycle access from westbound East Charleston Road onto the PPS, increased bicycle usage is anticipated. Accordingly, the Proposed Project would be consistent with the project design elements outlined by the BAAQMD for projects that would be considered to have a less-than-significant impact regarding GHG emissions under CEQA.

Table 6. Operational GHG Emissions

Emission Source	**GHG Emissions Operation (MT CO_2e/year)**
Area	0.84
Energy	2.35
Mobile	-----[1]
Waste	4.64
Water	1.98
Total Project-Related GHG Emissions	9.81

Source: Appendix A

Note: [1] Mobile emissions removed as there would be no increase in vehicle trips compared to existing conditions. Mobile emissions would continue to be regulated through the state GHG reduction actions (fuel emission and electric vehicle requirements).

CO_2e = carbon dioxide equivalents; MT = metric ton

Furthermore, implementation of the Proposed Project would provide consistency and help implement the goals of the City's S/CAP as shown in Table 7.

Table 7. Project Consistency with the City's S/CAP

Key Action	**Consistency**
E2. Reduce GHG emissions in non-residential equipment, including mixed-fuel rooftop packaged HVAC units, cooking equipment, and small non-residential gas appliances.	Consistent. The new school would be 100 percent electric.
E3. Partner with major facility owners to reduce gas use in major facilities by at least 20 percent.	Consistent. By capping the existing meter and gas line to the school site and switching to 100 percent electric, gas use would be reduced by 100 percent.
E7. Use codes and ordinances - such as the energy reach code, green building ordinance, zoning code, or other	Consistent. The new school would be 100 percent electric.

Table 7. Project Consistency with the City's S/CAP

Key Action	Consistency
mandates - to facilitate electrification in both existing buildings and new-construction projects where feasible.	
EV2. Collaborate with regional partners, other agencies, and local non-profit partners to promote EV adoption regionally to reduce commuter and visitor emissions.	Consistent. The Proposed Project includes developing 35 percent of the new parking spaces as EV charging spaces.
EV3. Partner with employers and business districts to promote commuter EV adoption and EV charging access as well as alternative commute promotion.	Consistent. The Proposed Project includes developing 35 percent of the new parking spaces as EV charging spaces.
N2. Ensure No Net Tree Canopy Loss for all projects.	Consistent. The Proposed Project would result in an increase in tree canopy compared to the existing conditions on the PPS.
N6. Evaluate and modify plant palette selection in project plans to maximize biodiversity and soil health to adapt to the changing climate and incorporate buffers for existing natural ecosystems.	Consistent. The plant palette for the design includes 12 tree species and 17 shrub species to be planted within the PPS.
N8. Expand the requirements of the Water Efficient Landscape Ordinance (WELO) to increase native and drought-tolerant species composition.	Consistent. Of the 19 species of trees and shrubs included on the plant palette for the Proposed Project, one is medium in regard to water requirements and the rest are low demand trees and shrubs.
N10. Establish policies and ordinance changes as needed to support the Green Stormwater Infrastructure Plan.	Consistent. The Proposed Project includes installation of five bio-retention areas to support Green Stormwater Infrastructure.
ZW7. Expand the Deconstruction and Construction Materials Management Ordinance.	Consistent. Project design plans and specifications require waste reduction and recycling during construction.

Source: City 2022

Accordingly, by complying with the BAAQMD's CEQA guidelines outlining design provisions and with the City's local GHG reduction strategy, Implementation of the Proposed Project would result in a less-than-significant impact regarding GHG emissions.

Impact Designation: Less-than-Significant Impact.

3.9 Hazards and Hazardous Materials

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or to the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	☒

3.9.1 Regulatory Setting

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. A hazardous material, per Title 22 of the CCRs,[94] is defined by California HSC § 25501(n)[95] as follows.

> "Hazardous material" means a material listed in paragraph (2) that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment, or a material specified in an ordinance adopted pursuant to paragraph (3).

Paragraph 2 of the HSC clarifies hazardous materials to include all of the following:

A. A substance or product for which the manufacturer or producer is required to prepare a material safety data sheet pursuant to the Hazardous Substances Information and Training Act (Chapter 2.5 [commencing with § 6360] of Part 1 of Division 5 of the Labor Code) or pursuant to any applicable federal law or regulation.

B. A substance listed as a radioactive material in Appendix B of Part 30 (commencing with Section 30.1) of Title 10 of the CFR, as maintained and updated by the Nuclear Regulatory Commission.

C. A substance listed pursuant to Title 49 of the CFR.

D. A substance listed in Section 339 of Title 8 of the CCR.

E. A material listed as a hazardous waste, as defined by Sections 25115, 25117, and 25316.

Federal

The EPA provides leadership for environmental science, research education, and assessment across the U.S. The EPA works with state and local agencies, Native American tribes, and other federal agencies including the U.S. Department of Transportation, the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA), and the National Institute of Health to develop and enforce regulations related to hazards.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA)[96] was enacted in 1976 as an amendment to the Solid Waste Disposal Act. The purpose of RCRA is to address municipal and industrial waste across the U.S. that is currently being disposed of, and includes the following goals:

[94] CCR § 66260.10, Definitions

[95] California HSC § 25501(n), "Hazardous material"

[96] RCRA Orientation Manual 2014, Resource Conservation and Recovery Act

- To protect human health and the environment from the potential hazards of waste disposal;
- To conserve energy and natural resources;
- To reduce the amount of waste generated; and
- To ensure that wastes are managed in an environmentally sound manner.

RCRA enables the EPA to develop criteria for identifying hazardous waste and provides the EPA with the authority to regulate underground storage tanks. The EPA develops guidance documents advising how to comply with various hazardous waste regulations and provides an interpretation of RCRA requirements. The EPA is also charged with making policy statements that serve to provide standard operating procedures for how to implement RCRA programs.

Subtitle C of RCRA established a cradle to grave process for managing hazardous waste. These regulations were developed by EPA to specify the way hazardous waste is generated, transported, treated, stored, and disposed of. The EPA requires individual states to develop their own permitting program to ensure the program meets the minimum federal criteria under Subtitle C. If the state's program is at least as stringent as the federal program, the EPA will grant authority to the state to implement their own program in lieu of the federal program.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[97] was enacted by the U.S. Congress in 1980. CERCLA, most often referred to as the Superfund, created a tax on the chemical and petroleum industries but also gave the federal government the authority to directly respond to potential or actual releases that could endanger human health or the environment. Importantly, CERCLA "established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at these sites, and established a trust fund to provide for cleanup when no responsible party could be identified" (EPA 2023b).

CERCLA enables the federal government to respond with both short- and long-term actions; short-term removals are implemented when a potential or actual release requires a swift response. Long-term actions are those that respond to situations that, while serious, are not immediately life threatening. Long-term actions require responses that provide permanent results to significantly reduce the related dangers caused by hazardous materials. Regardless of the type of response, CERCLA also provides both the funds and the authority for the EPA to respond to and clean up contaminated sites, particularly when no responsible party can be identified.

Toxic Substances Control Act

The Toxic Substances Control Act of 1976 (TSCA)[98] became effective January 1, 1977, and grants the EPA the authority to require reporting, record keeping, and testing requirements as well as restrictions

[97] EPA, Superfund: CERCLA Overview

[98] Toxic Substances Control Act

related to chemical substances and mixtures. TSCA excludes some items including food, drugs, cosmetics, and pesticides but does address polychlorinated biphenyls, asbestos, radon, and lead-based paint (LBP; EPA 2023c).

Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)[99] regulates the registration, distribution, sale, use, and disposal of pesticides across the U.S. Most pesticides must be registered with the EPA which requires the pesticide to conform with specifications that ensure the product will not generally cause adverse effects to the environment. FIFRA is administered by the U.S. Food and Drug Administration and specifies labeling and packaging requirements as well as protection standards for workers who are exposed to pesticides in the workplace. Standards for commercial pesticide applicators are also established by the EPA (2023d).

State

Cortese List

California Government Code § 65962.5[100] requires that the Department of Toxic Substances Control (DTSC), a division of the California Environmental Protection Agency, compile and update, at least annually, a list detailing important information about hazardous waste facilities and lands designated as or bordering hazardous waste properties. This inventory, commonly referred to as the Cortese List, provides detailed information about the locations and provides a method for various parties to comply with CEQA (DTSC 2023).

Envirostor

EnviroStor[101] is an online database maintained by DTSC for the purpose of tracking hazardous material incidents in California. The database lists facilities that process or transfer hazardous waste, have known contamination, or have possible contamination that warrants further investigation, including sites found on the Cortese List. The database includes federally designated, state response, military, school, and voluntary cleanup sites. Each entry in the database contains a report that includes information on the location and site type; site information such as the cleanup status, acreage, assessor's parcel number, agencies providing cleanup oversight, and other information about the location; a regulatory profile that lists past uses that caused contamination, potential contaminants of concern, and potential media affected; and a site history. EnviroStor also provides a running log of completed cleanup activities at a particular site including the date the activity concluded and any comments on the activity. Related documents are also easily accessible within the database as well as information regarding related sites. The California Office of Environmental Health Hazard Assessment also provides a mapping tool (CalEnviroScreen) via EnviroStor. The CalEnviroScreen provides detailed information about air quality,

[99] Federal Insecticide, Fungicide, and Rodenticide Act

[100] California Government Code § 65962.5, Article 6. Development Permits for Classes of Projects

[101] California Department of Toxic Substances Control, EnviroStor

drinking water contaminants, lead risk, and other indicators related to sensitive populations or socioeconomic factors.

GeoTracker

The SWRCB maintains an online database (GeoTracker)[102] to track sites that impact or have the potential to impact water quality in California. GeoTracker provides records about a variety of sites that require cleanup such as leaking underground storage tank (LUST) sites, U.S. Department of Defense sites, and Cleanup Program sites. Records are also kept for unregulated projects related to irrigated lands, oil and gas production, operating permitted underground storage tanks, and land disposal sites (SWRCB 2023a).

GeoTracker allows a user to query a particular address and locate information about a site's regulatory profile and history. This includes the cleanup status, facility type, potential contaminants of concern, potential media of concern, designated groundwater beneficial uses, the respective Department of Water Resources groundwater sub-basin, and the California Water Service (CalWater) watershed name. Cleanup action reports, a log of regulatory activities with related notes and documentation, environmental data, site maps and documents, community involvement information and environmental justice statistics are all posted on GeoTracker as well as information about related cases near a particular site.

Local

Santa Clara County Hazardous Materials Storage Ordinance

The Santa Clara County Hazardous Materials Compliance Division regulates the storage of hazardous materials whether above or below ground. This division was formed in 1983 and enforces the Hazardous Materials Storage Ordinance.[103] The ordinance serves to protect health, life, resources, and property by preventing and controlling unauthorized discharges of hazardous materials. These materials include those regulated by California HSC §§ 25100–25259,[104] and any material listed on the EPA list of pollutants, classified by the National Fire Protection Association as a flammable or liquid or certain type of combustible liquid, listed by 8 CCR § 339,[105] determined as hazardous by the EPA or the California Department of Health Services, or determined to create a significant potential or actual hazard to public health, safety, or welfare by the party storing the material. The ordinance also discusses how hazardous materials may be stored, what disclosures must be made with regard to hazardous materials, who must report discharges, how and when inspections of the materials will be conducted, what type of permits are required and the process for obtaining such, what types of remedial actions are permitted after a permit is issued, and what types of enforcement are allowed for noncompliance with the permitting.

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[102] SWRCB, GeoTracker

[103] Santa Clara County, Ordinance Code, Chapter XIII. Hazardous Materials Storage

[104] California HSC §§ 25100–25259, Chapter 6.5. Hazardous Waste Control

[105] The Hazardous Substances List, 8 CCR § 339, The Hazardous Substances List

City of Palo Alto Comprehensive Plan

The City's *Comprehensive Plan* (2016a) includes a provision regarding hazardous materials. Goal S-3 of the plan is "An environment free of the damaging effects of human-caused threats and hazardous materials." The *Comprehensive Plan* suggests minimization of toxic and hazardous materials use and promotes the use of alternative materials and environmentally benign practices. Program S3.1.1 notes that the City has permitting procedures for the storage, use, and handling of hazardous materials use by commercial or industrial parties (City 2016a).

3.9.2 Environmental Setting

The PPS is currently used as an elementary school and upon completion of the Proposed Project would continue to be used as an elementary school. A *Hazardous Material Survey* (Appendix D) was conducted in December of 2016 to identify the potential presence of asbestos-containing materials, LBP, universal waste (UW) materials, and polychlorinated biphenyl (PCB)-containing devices. An additional survey was conducted of the relocatable classrooms on the PPS in August 2018. Both summary reports are included as Appendix D. Refer to Appendix D for the assessment methodologies and further descriptions of the findings.

The results identified the following potential hazardous materials:

Table 8. Hazardous Materials

Building/Location	Asbestos Present?	Lead-Based Paint Present?	Universal Waste Present?	Suspect PCBs?
Administration	Yes	Yes	Yes	Yes
Classroom Wing 1 to 8	No	Yes	Yes	Yes
Classroom Wing 9 to 14	Yes	Yes	Yes	Yes
Library	Yes	No	Yes	Yes
MPR	Yes	No	Yes	Yes
Portable 15	No	No	Yes	Yes
Portable 16	No	No	Yes	Yes
Portable 17	No	No	Yes	Yes
Portable 18	No	No	Yes	Yes
Portable 19	No	No	Yes	Yes

Source: Appendix D

The assessment also indicated the probability of asbestos utility pipelines within the PPS due to the age of construction of the existing school facilities.

Additional information regarding hazardous material releases within the PPS area is described in the corresponding impact discussion below.

3.9.3 Impact Discussion

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? And

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

As noted above, a *Hazardous Materials Survey* identified the presence of asbestos-containing materials, lead based coatings, UW, and potential PCB-containing devices. Routine construction practices involving certified professionals would reduce the potential for a significant release during demolition of these materials. These provisions have been included as mitigation below. Based on a review of historical aerial photographs, the project site was utilized for agricultural purposes prior to development of Ohlone Elementary School. Based on the site history, should State funding be requested, the District will perform a Preliminary Environmental Assessment (PEA) to evaluate the potential for residual pesticides and metals to be in shallow soil. The District would comply with any requirements the Department of Toxic Substances Control (DTSC) recommends during the PEA process in accordance with a forthcoming Environmental Oversight Agreement between the District and DTSC.

Routine construction activities would not involve a significant amount of hazardous materials and the use of such items would be temporary. Construction workers would be trained in the proper handling, use, storage, and disposal of hazardous materials. Furthermore, supplies would be maintained on site for containing and cleaning small spills of hazardous materials and workers would be trained in how to respond to hazardous material releases. The PPS would continue to be operated as a school and would not warrant use of hazardous materials in quantities that could result in a significant impact.

The preparation of a SWPPP, which would include BMPs to reduce or eliminate pollutants in stormwater discharges, would be required for the Proposed Project. BMPs for hazardous materials may include, but are not limited to, off-site refueling, placement of generators on impervious surfaces, establishment of cleanout areas, and other measures. While the risk of exposure to hazardous materials cannot be eliminated, adherence to existing regulations would ensure compliance with safety standards related to the use and storage of hazardous materials and with the related safety procedures imposed by applicable federal, state, and local laws and regulations.

Based on a review of historical aerial photographs dating back 55 years,[106] the PPS was developed as a school. No obvious signs of hazardous materials are present in the aerial photographs. Because the Proposed Project would operate as an elementary school, routine maintenance could require the use of cleaners, solvents, and other custodial products, as well as pesticides, that are potentially hazardous.

[106] Historic Aerials: Viewer

These materials would be used in small quantities, clearly labeled, and stored in compliance with state and federal requirements. With these routine practices, the Proposed Project would not create substantial hazards to the public or the environment.

Compliance with the aforementioned regulations and mitigation measure below would ensure that risks resulting from the routine transportation, use, storage, and/or disposal of hazardous materials or hazardous wastes associated with the Proposed Project and the potential for an accidental release is less than significant with the following mitigation.

Mitigation Measures

HAZ-1: The following mitigation measures shall be implemented through contractual and construction specification requirements:

- The contractor shall verify quantities and locations of hazardous materials under the direction of a qualified individual (California Certified Asbestos Consultant for asbestos and Certified Inspector/Assessor for lead) in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the owner or owner's representative, prior to bidding.
- All asbestos (greater than 0.1 percent) disturbance and/or removal operations shall be conducted by a California Division of Occupational Safety and Health (Cal/OSHA)-registered and California-licensed asbestos removal contractor. All disturbance and/or abatement operations shall be under the direction of a California Certified Asbestos Consultant. Negative pressure enclosures shall be created and air monitoring shall be conducted by a licensed professional during asbestos abatement for all buildings requiring such remediation.
- Should the removal of identified regulated asbestos-containing materials involve at least 100 square feet or 100 linear feet per project site, per year, then notification to the BAAQMD and Cal/OSHA shall be accomplished prior to the initiation of such activities.
- All activities involving potential and identified lead-containing surfaces shall be conducted in accordance with California HSC § 17920.10 as well as 8 CCR § 1532.1.[107]
- In addition, all removal activities involving identified LBP shall be conducted in accordance with 17 CCR §§ 35001–36100,[108] which prescribes the use of California Department of Public Health certified workers, work practices, and other requirements.
- Written notification to Cal/OSHA shall be accomplished should LBP activities involve equal to or more than 100 square feet or 100 linear feet of removal in accordance with the requirements of 8 CCR § 1532.1.

[107] 8 CCR § 1532.1, Lead

[108] 17 CCR §§ 35001–36100, Chapter 8. Accreditation, Certification and Work Practices of Lead-Based Paint and Lead Hazards

- Any welding, cutting, or heating of metal surfaces containing surface coatings shall be conducted in accordance with 8 CCR § 1537,[109] which require surfaces covered with toxic preservatives, and in enclosed areas, be stripped of all toxic coatings for a distance of at least 4 inches, in all directions, from the area of heat application prior to the initiation of such heat application, or 8 CCR § 1536.[110]
- All potential and identified UW materials impacted by the work shall be removed and recycled or disposed of in accordance with the UW guidelines established by the DTSC, as stated in 22 CCR §§ 66261.9[111] and 66273.1–66273.90.[112]
- All ballasts shall be visually inspected prior to disposal to determine if they contain PCBs. Those ballasts marked "No PCBs" or "PCB Free" can be considered as such and shall be treated as UW-electronic waste. All PCB-containing devices, including, but not limited to ballasts shall be removed or have the oils removed and properly handled, collected, stored, transported, and recycled or disposed of by an approved recycling or disposal facility in accordance with the requirements of 22 CCR § 67426.1.[113]
- Devices containing ozone depleting chemicals, petroleum, or other chemicals, shall be collected, and the waste shall be characterized, disposed of, or recycled according to California rules and regulations.

Impact Designation: Less-Than-Significant Impact with Mitigation.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The PPS would operate as an elementary school and would not emit hazardous emissions or handle hazardous materials or substances beyond the minor custodial supplies and pesticides discussed in Section 3.9.3(a,b). Those items would be transported, used, stored, and disposed of according to applicable laws and regulations. Therefore, a less-than-significant impact would occur.

Impact Designation: Less-Than-Significant Impact.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

The PPS is not listed on EnviroStor and no cleanup sites or other permitted sites are listed within 0.5 miles of the PPS.[114] The SWRCB GeoTracker database lists one LUST cleanup site within 0.5 miles of

[109] 8 CCR § 1537, Welding, Cutting, and Heating of Coated Metals

[110] 8 CCR § 1536, Ventilation Requirements for Welding, Brazing, and Cutting

[111] 22 CCR § 66261.9, Requirements for Universal Waste

[112] 22 CCR § 66273.1, Scope and 22 CCR § 66273.90, Applicability

[113] 22 CCR § 67426.1, Generator Requirements

[114] EnviroStor Database

the PPS—a Shell fuel station located at 3900 Middlefield Road, Palo Alto, California 94306.[115] The site has been listed as "completed-case closed" since April 6, 1999 (SWRCB 2023b). Therefore, impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles or a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

The PPS is not within 2 miles of a public use airport; the PPS is approximately 4.1 miles southwest[116] of the Palo Alto Airport (Airnav 2023). Santa Clara County published a *Comprehensive Land Use Plan: Palo Alto Airport* (2020) that provides maps of flight paths. The PPS is not located beneath the flight path for either runway. Additionally, the PPS is currently developed as an elementary school and is in a highly developed residential area. There would be no change in land use and an increase in noise resulting from airports is not anticipated. Therefore, no impacts would occur.

Impact Designation: No Impact.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The Proposed Project would not conflict with adopted emergency response or evacuation plans, including the *Emergency Operations Plan: Basic Plan*[117] adopted by the City Council on January 11, 2016 (City 2016b). The surrounding public roadways would continue to provide emergency access to the PPS and surrounding properties during both construction and operation in the same manner as existing conditions. No impact would occur.

Impact Designation: No Impact.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

The PPS is not located in a fire hazard zone of any severity level per the CAL FIRE fire hazard severity zones map.[118] The PPS is located in an urbanized portion of the City on a site that is currently developed as an elementary school. The Proposed Project would be required to comply with the 2022 California

[115] SWRCB GeoTracker

[116] Google Maps: Palo Alto Airport to 445 E Charleston Rd, Palo Alto, CA 94306

[117] City of Palo Alto, Emergency Operations Plan, Basic Plan, January 11, 2016

[118] CAL FIRE, Fire Hazard Severity Zones

Fire Code[119] and applicable building standards, such as the 2022 CBC.[120] Therefore, no impact would occur.

Impact Designation: No Impact.

[119] California Fire Code 2022

[120] 2022 California Building Code, Title 24, Part 2

3.10 Hydrology and Water Quality

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☒	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in a substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv) impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☒	☒	☐

3.10.1 Regulatory Setting

There is no applicable regulatory setting that applies to the Proposed Project.

3.10.2 Environmental Setting

The City is located in the watersheds of several creeks and drainageways, including the Adobe, Barron, Matadero, and San Francisquito creeks. The Santa Clara Valley Water District regulates creekside development and provides flood control services for the City. Barron Creek begins in the foothills of Los Alto Hills and flows northwest through the City until it joins Adobe Creek just west of U.S. 101.

The PPS is located within the Adobe Creek Subwatershed. The Adobe Creek watershed drains the PPS area including the Los Altos Hills and Los Altos. The creek originates in the uplands of the Santa Cruz Mountains and ends in the Baylands Preserve. Adobe Creek is over 11 miles long and drains approximately 10 square miles. However, approximately 33 percent of Adobe Creek is classified as hardened, including the area of the creek near the PPS (City 2016a).

An engineered concrete channel traverses east crossing under Middlefield Road northeast of the PPS, then traverses south creating the southeastern boundary of Mitchell Park. The channel traverses past the eastern boundary of the Stevenson House property before crossing underneath East Charleston Road in a southwest direction. The channel emerges south of East Charleston Road traverses southwest for approximately 1,000 feet then turns to head due west crossing under Alma Street. There are no surface water resources on the PPS.

Most of the urban core of the City is located within FEMA Zone X. The PPS is located within Flood Zone X, an area deemed to be of minimal flood hazard (FEMA 2023c).

3.10.3 Impact Discussion

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

The PPS is within the jurisdiction of the San Francisco Bay Regional Water Quality Control Board. Drainage and surface water discharges during construction and operation of the Proposed Project would not violate any water quality standards or waste discharge requirements. However, site preparation and other soil-disturbing activities during construction of the Proposed Project could temporarily increase the amount of soil erosion and siltation entering the local stormwater drainage system.

The Proposed Project would disturb approximately 5.6 acres. Pursuant to Section 402 of the CWA,[121] the EPA has established regulations under the National Pollution Discharge Elimination System (NPDES) program to control direct stormwater discharges. In California, the SWRCB administers the NPDES permitting program and is responsible for developing permitting requirements. The NPDES program regulates industrial pollutant discharges, including construction activities for sites larger than 1 acre. Because implementation of the Proposed Project would disturb more than 1 acre, the Proposed Project

[121] EPA, Clean Water Act, Section 402: National Pollutant Discharge Elimination System

would be subject to the NPDES Construction General Permit requirements (Order No. 2009-0009-DWQ).[122]

Construction

Clearing, grading, excavation, and construction activities associated with the Proposed Project have the potential to impact water quality through soil erosion and increase the amount of silt and debris carried in runoff. Additionally, the use of construction materials such as fuels, solvents, and paints may present a risk to surface water quality. To minimize these potential impacts, the Proposed Project would be required to comply with the NPDES Construction General Permit as well as BMPs to control erosion and prevent any discharge of sediments from the PPS to reduce potential impacts to less-than-significant levels.

Operation

For site operations, structural BMPs, including landscaping, would reduce runoff. Therefore, a less-than-significant impact to water quality standards would occur. The Proposed Project would also be required to comply with applicable federal, state, and local regulations. Provided that the standard BMPs are implemented, the Proposed Project would not substantially degrade water quality. A less-than-significant impact would occur.

Impact Designation: Less-Than-Significant Impact.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The Proposed Project does not propose groundwater wells that would extract groundwater from an aquifer, nor would the Proposed Project affect recharge capabilities for the basin, as there are no wetlands on site. The replacement of an existing school of essentially the same size would not impact the use of imported water or groundwater. Therefore, a less-than-significant impact would occur.

Impact Designation: Less-Than-Significant Impact.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i) Result in a substantial erosion or siltation on- or off-site?

The Proposed Project would not alter the course of a stream or river. Construction of the Proposed Project would increase the potential for erosion and siltation. However, the Proposed Project would

[122] SWRCB, Construction General Permit Fact Sheet

include BMPs such as landscaping which would reduce runoff, and improvements would be constructed over a short period of time. Therefore, a less-than-significant impact would occur.

Impact Designation: Less-Than-Significant Impact.

ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?

The Proposed Project would not alter the course of a stream. The Proposed Project would include pervious and impervious surfaces on site and five bioretention areas would be built on the PPS as part of the Proposed Project. The use of BMPs, the creation of bioretention areas, and compliance with local, state, and federal regulations would ensure that drainage patterns and stormwater runoff are maintained. Therefore, a less-than-significant impact would occur.

Impact Designation: Less-Than-Significant Impact.

iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Project implementation would include pervious and impervious surfaces on site. With the proposed BMPs, impacts associated with the impervious surfaces would be reduced. The Proposed Project would be required to comply with local, state, and federal regulations pertaining to stormwater. The runoff from the existing school site due to the Proposed Project would not significantly change and the runoff is not anticipated to significantly change from the current use of the PPS. Therefore, the Proposed Project would not exceed the capacity of existing or planned stormwater drainage systems. Impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

iv) Impede or redirect flood flows?

The PPS is currently developed with an elementary school. The Proposed Project would take place within the footprint of the PPS, which is within FEMA Zone X as noted earlier. Because the likelihood of floods in the project area is relatively low, the Proposed Project would have a less-than-significant impact on impeding or redirecting flood flows.

Impact Designation: Less-Than-Significant Impact.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

A seiche is a surface wave created when a body of water is shaken, usually by earthquake activity. Seiches are of concern relative to water storage facilities because inundation from a seiche can occur if the wave overflows a containment wall, such as the wall of a reservoir, water storage tank, dams, or other artificial body of water. There are no large water tanks in the area that could impact the PPS, and there are no dams or similar bodies of water in proximity to the PPS that are likely to experience seiche

wave effects in the region that could create flooding impacts. Given the distance from likely seiche impact areas (contained bodies of water), impacts of seiche affecting the PPS are less than significant.

A tsunami is earthquake-induced flooding that is created from a large displacement of the ocean floor. The PPS is identified as being outside of a tsunami zone based on FEMA mapping and therefore, the likelihood of a tsunami impacting the PPS is low. No impact would occur.

A mudflow is a landslide event in which debris, land mass, and soil are saturated during their displacement. The PPS is relatively flat, with no slopes near the PPS that can generate a mudflow. No mudflow impact would occur.

Provided that standard BMPs are implemented, the Proposed Project would not substantially degrade water quality. As impacts related to the occurrence of site inundation by seiche, tsunami, or mudflow are less than significant, the release of pollutants would be less than significant.

Impact Designation: Less-Than-Significant Impact.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The Proposed Project would not obstruct or conflict with the implementation of a water quality control plan or sustainable water management plan. The Proposed Project would comply with the water quality and use requirements of these plans through the implementation of BMPs. Therefore, impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

3.11 Land Use and Planning

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Physically divide an established community?	☐	☒	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

3.11.1 Regulatory Setting

Federal

There are no federal regulations or policies related to land use or planning that apply to the Proposed Project.

State

Governor's Office of Planning and Research

The OPR was established by California Government Code § 65040.12.[123] Among other tasks, the OPR is charged with working with state agencies, regional planning organizations, and local jurisdictions on land use planning. The responsibilities of OPR include recommending to local agencies that their general plans include the following:

- Propose methods for planning for the equitable distribution of new public facilities and services that increase and enhance community quality of life throughout the community, given the fiscal and legal constraints that restrict the siting of these facilities.
- Propose methods for providing for the location, if any, of industrial facilities and uses that, even with the best available technology, will contain or produce material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant hazard to human health and safety, in a manner that seeks to avoid overconcentrating these uses in proximity to schools or residential dwellings.

[123] California Government Code § 65040.12, Article 4. Powers and Duties

- Propose methods for providing for the location of new schools and residential dwellings in a manner that seeks to avoid locating these uses in proximity to industrial facilities and uses that will contain or produce material that because of its quantity, concentration, or physical or chemical characteristics, poses a significant hazard to human health and safety.
- Propose methods for promoting more livable communities by expanding opportunities for transit-oriented development so that residents minimize traffic and pollution impacts from traveling for purposes of work, shopping, schools, and recreation.

Local

The *Santa Clara County General Plan* (2023c) does include any applicable regulations pertaining to land use or planning in the City. Additionally, there are no land use or planning regulations or policies of the City, including area plans,[124] that apply to the PPS.

3.11.2 Environmental Setting

The PPS is within an established residential community in an urban setting within City limits. The PPS is currently developed as an elementary school and is surrounded by established residences, other schools, and an affordable senior housing building.

The PPS lies within an area designated by Santa Clara County as an "Urban Service Area." The PPS is within a PF (Public Facilities) zoning district and does not lie within a historic district of the City. The City has several ongoing area plans and studies; however, the PPS does not lie within any of the designated areas.

3.11.3 Impact Discussion

a) Physically divide an established community?

The PPS is surrounded by established residences, other schools, and an affordable senior housing building. The Proposed Project consists of demolishing and rebuilding school buildings within the PPS, reconfiguring the parking and student drop-off/pick-up zones, and additional off-site improvements such as fencing and landscaping. These improvements are considered a replacement of an existing use and would not alter the existing use of the PPS. Therefore, the Proposed Project would not divide an established community. No impact would occur.

Impact Designation: No Impact.

[124] City of Palo Alto, Planning & Development Department, Area Plans and Studies

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The PPS is currently zoned PF (Public Facilities) by the City and the existing Santa Clara County land use designation is Urban Service Area. Because the PPS would involve the demolition and reconstruction of an existing elementary school which aligns with the zoning and land use designations, no impact would occur as a result of implementation of the Proposed Project.

Impact Designation: No Impact.

3.12 Mineral Resources

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

3.12.1 Regulatory Setting

Federal

The U.S. Department of the Interior has been defining minerals in the U.S. since 1873. Their definition of locatable minerals are those minerals that are "recognized as a mineral by the standard experts, are not subject to disposal under some other law, and make the land more valuable for mining than for farming" (BLM 2023). The federal government's authority over minerals generally applies to lands owned by the U.S. or lands on Indian reservations. Federal laws related to minerals include the following:

- Mining Law of 1872 (declared all valuable minerals on lands belonging to the U.S. to be free and open to exploration and purchase);
- Mineral Leasing Act of 1920 (provided for the leasing of minerals on publics lands and required royalties to be paid on materials mined and sold);
- Materials Act of 1947 (provided for the disposal of mining materials on public lands and subjects some common materials like sand and gravel to sale rather than rent or royalty);
- Federal Land Policy & Management Act of 1976 (required persons holding claims to record their claims with the BLM to assist BLM with information regarding unpatented mining claims, mill sites, and tunnel sites); and,
- Stock Raising Homestead Act Amendment of April 16, 1993 (granted the United States the rights to any minerals beneath homestead lands but not the land itself, including the right to enter, mine, and remove materials).

State

California Department of Conservation

The DOC is charged with protecting energy, land, and mineral resources within California. The agency notes that the primary mineral hazards of concern in the state are mercury, naturally occurring asbestos, and radon (DOC 2023e).

California Geological Survey

The CGS is an agency within the DOC that is charged with providing geological expertise and information about non-fuel mineral resources (metals, industrial minerals, and construction aggregate) within the state.

Division of Mines and Geology

The Division of Mines and Geology also falls within the DOC. This agency is responsible for setting guidelines and creating protections for mineral resources within the state.

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act (SMARA)[125] was enacted by the California Legislature in 1975 and provides for the reclamation of mined lands. SMARA also directs the State Geologist to identify and map minerals within the state to indicate where "economically significant mineral deposits occur" (DOC 2023f).

There are four mineral resources zones (MRZs) identified in the *Guidelines for Classification and Designation of Mineral Lands* (DOC 2023g):

- **MRZ-1. Areas of No Mineral Resource Significance:** Adequate information indicates that no significant mineral deposits are present or likely to be present.
- **MRZ-2a/MRZ-2b. Areas of Identified Mineral Resource Significance:** Information indicates that significant measured, indicated, or inferred mineral deposits are present, or there is a high likelihood for their presence.
- **MRZ-3a/MRZ-3b. Areas of Undetermined Mineral Resource Significance:** These zones contain known or inferred mineral deposits that may qualify as mineral resources but warrant further investigation.
- **MRZ-4. Areas of Unknown Mineral Resource Significance:** Insufficient data exists to assign any other MRZ designation. This designation does not indicate a presence or absence of resources, but rather a lack of knowledge about their potential occurrence.

[125] SMARA Statutes and Regulations (ca.gov)

Local

Santa Clara County Zoning Ordinance § 4.10.370

Santa Clara County Zoning Ordinance § 4.10.370[126] applies to uses classified as "surface mining" as described in County Zoning Ordinance § 2.10.040[127] as well as reclamation of mined lands in unincorporated areas of the County. The ordinance exists to ensure that mineral resources remain available and surface mining operations are performed in compliance with SMARA (Santa Clara County 2023b).

Santa Clara County General Plan

The "Resource Conservation" section of the *Santa Clara County General Plan* (2023c) discusses issues and policies of the county including mineral, heritage, scenic, and energy resources as well as solid waste management. Relative to minerals, Santa Clara County has known construction aggregate deposits as well as salts from evaporation ponds bordering San Francisco Bay. Santa Clara County identifies eight quarries operating in unincorporated areas of the county and explains the importance of protecting these resources from development and assures access to the resource sites with large vehicles. There are no mineral resources identified within incorporated areas of the county. The *Santa Clara County General Plan* includes three strategies for preserving and managing these mineral resources within the county:

- Strategy 1: Ensure Continued Availability of Mineral Resources
- Strategy 2: Mitigate the Environmental Impacts of Extraction and Transport
- Strategy 3: Reclaim Sites for Appropriate Subsequent Uses

City of Palo Alto Comprehensive Plan

The City maintains a *Comprehensive Plan* (2016a) that includes a natural environment element that addresses open land and natural resource management relative to open space, urban forest and understory, creeks and riparian areas, water resources, air quality, noise, energy, and climate. The *Comprehensive Plan* specifically notes that no policies related to mineral resources are included because no mineral resources of regional significance are present within the City.

3.12.2 Environmental Setting

The PPS is within an established residential community in an urban setting within the City limits in Santa Clara County. The PPS has been developed as an elementary school since the early 1950s and is surrounded by established residences, other schools, and an affordable senior housing building. There are no known mineral resources within the incorporated areas of Santa Clara County nor within the City.

[126] Santa Clara County Code of Ordinances, § 4.10.370. Surface Mining

[127] Santa Clara County Zoning Ordinance, § 2.10.040. Surface Mining (definition)

3.12.3 Impact Discussion

a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the State?

The areas surrounding the PPS are developed with residences, school buildings, and an affordable senior housing building and are not developed for any type of mineral extraction or mining activity. Additionally, the City's *Comprehensive Plan* (2016a) notes that no mineral resources of significance exist within the City limits. Therefore, no loss of known resources would result from implementation of the Proposed Project. No impact would occur.

Impact Designation: No Impact.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

According to the *Santa County General Plan* (2023c), Goal 7 of the "Goals for Responsible Resource Conservation" explains that it is a high priority for the County to protect mineral resources from development and encroachment. Because the PPS has been developed as an elementary school since the early 1950s and no mining or extraction activities occur onsite, the Proposed Project would not result in a loss of availability of a mining site. No impact would occur.

Impact Designation: No Impact.

3.13 Noise

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the proposed project:				
a) Generation of a substantial temporary or periodic increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of, excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing in or working in the project area to excessive noise levels?	☐	☐	☐	☒

3.13.1 Regulatory Setting

Federal

Federal Transit Administration

Neither the District nor the City have a quantified threshold for temporary construction noise and vibration. Therefore, to determine impact significance, the following Federal Transit Administration (FTA) criteria are adopted:

A vibration or construction noise impact would occur if:

- Vibration levels would exceed 0.20 inches per second peak particle velocity at the facade of a non-engineered structure (e.g., wood-frame residential). Additionally, the FTA's threshold of 72 vibration velocity for frequent events will be used to assess vibration annoyance to residences at the nearby sensitive receptors.

State

California Code of Regulations Title 5, Section 14040(q): California Department of Education Standards for School Site Selection

Under 5 CCR 14040,[128] CDE regulations require school districts to consider noise in the site selection process. As recommended by CDE guidance, if a school district is considering a potential school site near a freeway or other source of noise, it should hire an acoustical engineer to determine the level of sound that the site is exposed to and to assist in designing the school should that site be chosen.

California Building Code

The state of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a general plan that includes a noise element which is to be prepared according to guidelines adopted by OPR. The purpose of the noise element is to "limit the exposure of the community to excessive noise levels."

CALGreen has requirements for insulation that affect exterior interior noise transmission for non-residential structures. Pursuant to CALGreen Section 5.507.4.1, "Exterior Noise Transmission," an architectural acoustics study may be required when a PPS is within a 65 a-weighted decibels (dBA) community noise equivalent level (CNEL) or day-night average sound level (Ldn) noise contour of an airport, freeway or expressway, railroad, industrial source, or fixed-guideway source. Where noise contours are not readily available, if buildings are exposed to a noise level of 65 dBA equivalent continuous sound pressure level (Leq) during any hour of operation, specific wall and ceiling assembly and sound-rated windows may be necessary to reduce interior noise to acceptable levels.

Local

City of Palo Alto Noise Ordinance

Construction. The City's noise ordinance states that construction, alteration, and repair activities that are authorized by a valid city building permit shall be prohibited on Sundays and holidays and shall be prohibited except between the hours of 8 a.m. to 6 p.m. Monday through Friday, and 9 a.m. and 6 p.m. on Saturday, provided that the construction, demolition, or repair activities during those hours meet the following standards:

- No individual piece of equipment shall produce a noise level exceeding 110 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible.
- The noise level at any point outside of the property plane of the project shall not exceed 110 dBA.
- The holder of a valid construction permit for a construction project located within any residential zone shall post a sign at all entrances to the construction site upon commencement of construction,

[128] 5 CCR 14040, Determining Specific Allowable Operational Direct Costs

for the purpose of informing all contractors and subcontractors, their employees, agents, materialmen, and all other persons at the construction site, of the basic requirements of this chapter.

Said sign(s) shall be posted at no less than 3 and no higher than 5 feet above ground level, and shall be of a white background, with black lettering, which lettering shall be a minimum of 1.5 inches in height.

Exterior Noise Standards. The Natural Environment Element of the City's *Comprehensive Plan* (2016a)includes goals and policies related to noise. This element establishes land use compatibility categories for community noise exposure. For schools, noise levels up to 60 dBA Ldn are identified as normally acceptable and noise levels between 60 and 75 dBA Ldn are identified as conditionally acceptable. Noise levels above 75 dBA Ldn are unacceptable at school settings.

3.13.2 Environmental Setting

Noise Fundamentals

Noise is defined as unwanted sound and is known to have several adverse effects on people, including hearing loss, speech and sleep interference, physiological responses, and annoyance. Based on these known adverse effects of noise, federal, state, and local governments have established criteria to protect public health and safety and to prevent the disruption of certain human activities, such as classroom instruction, communication, or sleep.

Existing Noise Environment

The Proposed Project is an existing school with a residential neighborhood, neighborhood park setting. The PPS noise environment is primarily influenced by the school itself with transportation noise from local roadways during drop-off and pick-up and outdoor school activities. Noise from nearby residential uses (e.g., property maintenance and vehicle noise) also contribute to the total noise environment intermittently in the project vicinity and the associated traffic.

Sensitive Receptors

Several sensitive receptors in the vicinity of the PPS. The nearest sensitive receptors are the Stevenson House (affordable senior housing building) located approximately 45 feet east of the existing school's eastern parking and exit lane and the rear fence lines of single-family residences adjacent to the bikeway that is adjacent to the school's western main access roadway. Additional single-family residences are located south facing East Charleston Road. The JLSMS athletic fields are adjacent to the northern portion of the PPS.

3.13.3 Impact Discussion

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction Noise

Construction of the Proposed Project would generate temporary noise that would be audible at the single-family residence adjacent to the northeastern of PPS. Noise associated with construction is a function of the type of construction equipment, the location and sensitivity of nearby land uses, and the timing and duration of the construction activities. Based on construction details, it is estimated that the construction period would involve approximately 50 days for demolition and site preparation, 15 days for grading, 189 days for building construction, 30 days for paving, and 85 days for architectural coating. While all phases of construction would generate noise, the building construction phase would represent the longest period of noise-generating activity.

Heavy trucks associated with demolition, site preparation, and grading would temporarily generate noise above background noise levels. The closest sensitive receptor that would be exposed to noise during project construction is the Stevenson House (affordable senior housing building) located approximately 45 feet east of the eastern property line of the PPS where grading and demolition activities would occur. Construction noise levels at and near the PPS would fluctuate depending on the type, number, and duration of uses of various pieces of construction equipment. Construction-related excavation (assuming a concrete saw for conservative analysis) would raise ambient noise levels at the PPS.

Construction noise levels from construction equipment were compiled by the Federal Highway Administration (FHWA) by measuring noise levels for various construction equipment at a reference distance of 50 feet (FHWA 2006). With the nearest sensitive receptor located 45 feet from the PPS, the noise levels measured by the FHWA were used to assess impacts during construction. The maximum projected construction noise level on the PPS would be approximately 90 dBA for a concrete saw at 50 feet. This is a conservative exercise to assess noise levels based on the assumption that concrete saw would be used 8 hours a day during the entire duration of construction. However, all equipment would not be used all day and/or daily. Thus, the actual noise level would be significantly lower than calculated for the daily noise level exposures to the nearest sensitive receptor. There would be no construction at night. Accordingly, the Proposed Project would comply with the City's noise ordinance which states that no individual piece of equipment shall produce a noise level exceeding 110 dBA at a distance of 25 feet. Impacts would be less than significant.

Operational Noise

The Proposed Project would not result in an increase in student capacity. Additionally, the Proposed Project would create a dedicated drop-off/pick-up lane within the PPS boundary, thus reducing the amount of traffic surrounding the school. A vegetative buffer would be established along the eastern boundary of the PPS and between the northbound and southbound circulation lanes to shield noise

generated during student drop-off and pick-up times. While the sound would be concentrated, the noise would be consistent with existing conditions and would not significantly impact the adjacent facility. HVAC systems would be installed further east than the existing buildings closest to the nearest sensitive receptor as the main campus would be shifted to the west to allow development of the circulation and parking improvements along the eastern portion of the PPS. Operational noise typical of a school site would also exist including a school announcement system and fire alarms that would be used during actual emergency events, as well as practice drills.

Student Recreational Noise

As shown in in **Figure 4**, the school's outdoor amenities would include a garden, natural turf, artificial turf, and seating areas, walkways, hardcourts, and a soccer field. A natural turf soccer field would be provided along the northwestern boundary of the PPSs. Abutting the southern and eastern ends of the soccer field would be hard courts. The primary noise source associated with the exterior uses of the proposed school would be from students playing at the hardcourts and playfields during the daytime hours (no nighttime lighting or amplified equipment is proposed, however the playfield and certain areas of the school would remain open until 6:30 p.m. for after-school activities).

These additions and reconfigurations could change the existing noise environment during outdoor student recreation activities. The reconfiguration of the existing elementary playgrounds and hardcourts to be relocated within the PPS would not cause a significant noise increase or change in use from its existing outdoor recreational uses. Under the Proposed Project, the reconfiguration of outdoor recreational uses would be located either at the same distance or further away from some of the surrounding residences than currently located under existing conditions. However, the addition and use of the new proposed soccer field could increase recreational noise levels at nearby sensitive receptors to the northeast of the PPS; however, this noise would be consistent with the use of the JLSMS athletic fields and Mitchell Park. Therefore, recreational noise would be less than significant.

Impact Designation: Less-Than-Significant Impact.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Excessive vibration has the potential to be generated during construction that requires the use of equipment with high vibration levels (i.e., compactors, large dozers, pile drives, jack hammers, etc.) occurring within 25 to 100 feet of an existing structure. The nearest sensitive receptor, the Stevenson House, is approximately 45 feet from where construction would occur. Impact pile driving, which typically produces the highest vibration levels, is not anticipated to occur. No pile drivers, blasting, or major earthmoving with large dozers would take place during construction. All equipment would be considered standard construction equipment and would not produce substantial vibration of the project areas. Additionally, construction vehicles would be equipped with mufflers and would not be permitted to idle. Given the infrequent use of heavy equipment and the distance to the nearest sensitive receptor, exposure to groundborne vibration from construction activities would be detected at minimal levels at the nearest sensitive receptor (Stevenson House).

The long-term operation of the Proposed Project includes no operations that would result in the exposure of residents to excessive groundborne vibration as the land use would remain the same.

Impact Designation: Less-Than-Significant Impact.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The nearest airport is the Palo Alto Airport located adjacent to the Baylands Nature Preserve near the San Francisco Bay, more than 2 miles from the PPS. No impact would occur.

Impact Designation: No Impact.

3.14 Population and Housing

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Induce substantial population growth in an area either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

3.14.1 Regulatory Setting

Federal

U.S. Department of Housing and Urban Development

The U.S. Department of Housing and Urban Development (HUD) was established by the Department of Housing and Urban Development Act of 1965.[129] HUD exists to assist with home purchases and improvements, rules for rental properties, fairness in lending, housing discrimination, housing for the disabled, and rental assistance. HUD recently released a *Climate Action Plan* which aims to assist the agency with their efforts to help communities with climate-related planning including building resilient infrastructure, reducing greenhouse gas emission, creating well paid jobs, and pursuing environmental justice. Additionally, a number of the actions undertaken by HUD are related to the Fair Housing Act.[130] The purpose of the Fair Housing Act is to protect both renters and buyers from discrimination when renting or buying a home, obtaining a mortgage, seeking housing assistance, or engaging in other activities related to housing.

State

California Department of Housing and Community Development

The vision of the California Department of Housing and Community Development (HCD) is to ensure that "every California resident can live, work, and play in healthy communities of opportunity" (HCD 2023a).

[129] Federal Fair Housing Act

[130] U.S. Department of Housing and Urban Development, Housing Discrimination Under the Fair Housing Act

While HCD does not manage properties or make placements for housing, the agency does assist with providing housing to veterans, seniors, young families, farm workers, tribes, disabled persons, and those experiencing homelessness through various grant and loan programs. HCD is also responsible for the titling and registration of mobile homes.

Furthermore, HCD implements construction standards for housing and creates specialized standards for CALGreen for green building and for universal design to ensure accessibility for the elderly and those with disabilities. Local government inspectors are also trained by HCD to assist in the identification of health and safety code violations. Most applicable to CEQA, HCD is the agency charged with developing policies to support housing and community development. HCD researches and analyses housing needs within the state and is responsible for preparing both the *Statewide Housing Plan* (HCD 2023b) and the *State of California 2020-2024 Federal Consolidated Plan* (HCD 2020).

Statewide Housing Plan

HCD is charged with preparing the *Statewide Housing Plan* (HCD 2023b). The most recent plan was published in March 2022, and has three objectives:

- Keep Californians in their homes;
- Produce more affordable and climate-smart housing; and
- Continue to act with urgency to address homelessness and housing need.

The *Statewide Housing Plan* is meant to guide housing policy at the local level and is pursuant to California HSC § 50423.[131]

Local

Santa Clara County General Plan

The *Santa Clara County General Plan* (2023c) previously included a chapter regarding housing. That information was updated and included as *Appendix #4: Housing Element Update 2015-2022* to the *Santa Clara County General Plan* (2023d); however, it has been removed as part of the 2023 update process. The newest update was pending and was posted as a draft EIR at the time this document was prepared.

The 2015-2022 Housing Element serves to document local housing needs, to explain differences in urban growth management policies that guide urban housing development in cities within Santa Clara County, and to document the ways the county contributes to local and countywide housing needs (County 2023d).

City of Palo Alto Housing Element

The City is also in the process of updating their Housing Element. The 2023-2031 Housing Element, adopted by the City Council on May 8, 2023, provides an assessment of both current and future housing

[131] California HSC § 50423, Chapter 1.5. Statewide Housing Plan

needs and the constraints that can be encountered while meeting these needs. The Housing Element also provides housing goals, policies, and programs.

Furthermore, the Housing Element provides a "Regional Housing Needs Allocation." This assessment includes future housing needs for all income levels in a region. For the City, these calculations are based on information defined by the Association of Bay Area Governments as well as the HCD (City 2023d).

3.14.2 Environmental Setting

The PPS is within an established residential community in an urban setting within the City limits in Santa Clara County. The PPS has been developed as an elementary school since the early 1950s and is surrounded by established residences, other schools, and an affordable senior housing building. Because of the urban setting of the PPS and the large workforce in the region, workers who would serve the construction phase of the Proposed Project are likely to be local to the area. Regarding population, the Proposed Project currently serves the residents of the City and would continue to do so if the Proposed Project is implemented.

3.14.3 Impact Discussion

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The Proposed Project would not increase the capacity of Hoover ES; student capacity would remain the same at 405 students. Therefore, the Proposed Project would not directly increase population growth in the area. No construction of new homes or businesses is proposed, nor is the extension of roads or other infrastructure. No impact would occur as a result of implementing the Proposed Project.

Impact Designation: No Impact.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The Proposed Project is the demolition and reconstruction of an elementary school. The replacement by an improved elementary school would not create a need for any additional housing as the area served by both the existing school and the Proposed Project would be the same and is in an existing urbanized setting. No housing would be displaced or replaced. Therefore, no impact would occur.

Impact Designation: No Impact.

3.15 Public Services

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service rations, response times or other performance objectives for any of the public services:				
a) Fire protection?	☐	☐	☒	☐
b) Police protection?	☐	☐	☐	☒
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☒	☐
e) Other public facilities?	☐	☐	☐	☒

3.15.1 Regulatory Setting

No significant regulatory requirements are unique to the PPS because its present use is a school and would remain as such if the Proposed Project is implemented. The current services would not change due to the reconstruction of the school and the overall safer use of the existing PPS and the adjacent JLSMS shared athletic fields.

3.15.2 Environmental Setting

The PPS is in an urban environment with a nearby park and adjacent middle school (JLSMS), which shares the same parcel. The PPS has housing on several sides and the improvements would allow for more efficient and safer use of the PPS with appropriate school buildings including the new library and related buildings, landscaping, and safer play areas for all students.

3.15.3 Impact Discussion

a) Fire protection?

The PPS would continue to be served by the Palo Alto Fire Department (PAFD). However, the addition of a second story on some classroom buildings may require some changes in the type of firefighting activities that could be required in the event of an emergency. The closest fire station, PAFD Station 4 at

3600 Middlefield Road (approximately five blocks from the PPS), would be the primary response unit. The addition of another story on some buildings is not anticipated to require the PAFD to acquire any additional equipment. The Proposed Project would not increase the number of students or staff on site, and the PPS would continue to operate as an elementary school. Both the City Fire Marshal and the District would be required to approve fire access around the PPS. Additionally, the improvement of the on-site parking and queuing should remove congestion in the adjacent neighborhood. Therefore, implementation of the Proposed Project would not substantially affect PAFD's response times or require expansion of fire protection services such that new or physically altered fire stations would be required. Impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

b) Police protection?

Law enforcement and police protection services to the PPS are provided by the Palo Alto Police Department. The student capacity of the Proposed Project would remain unchanged, and the PPS would continue to operate as a school. Furthermore, improved parking onsite and queuing would remove congestion in the adjacent neighborhood, potentially reducing the response time to the PPS. Therefore, implementation of the Proposed Project would not warrant additional law enforcement facilities. Therefore, no additional Impact to police protection services is anticipated.

Impact Designation: No Impact.

c) Schools?

School service needs are related to the size of a residential population, geographic area served, and community characteristics. The Proposed Project would address the most critical physical needs of buildings and grounds at the Hoover ES campus through the rebuilding and reconfiguration of buildings onsite. Once constructed, the new school facilities would continue to serve the existing Hoover ES population and students in the District's attendance area. No impact on school facilities or services would occur.

Impact Designation: No Impact.

d) Parks?

The Proposed Project would not generate a demand for park space, which is typically caused by population and/or employment growth. The Proposed Project would improve the recreational facilities at Hoover ES that are available for community use. The redesigned school grounds would also make the athletic fields at the adjacent JLSMS more readily available to Hoover ES students as the PPS would include 30 feet of the JLSMS athletic fields as part of the new Hoover ES footprint. A less-than-significant impact would occur.

Impact Designation: Less-than-Significant Impact.

e) Other public facilities?

The need for public services and facilities (e.g., libraries, hospitals, childcare, and teen or senior centers) is typically caused by residential uses. As the PPS is currently developed as an elementary school, and would continue to operate as such, the Proposed Project is designed to improve the library and childcare facilities on the PPS and would not result in the need for new or expanded public facilities. No impact would occur.

Impact Designation: No Impact.

3.16 Recreation

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☒	☐

3.16.1 Regulatory Setting

Federal

There are no federal regulations or policies related to recreation that apply to the Proposed Project.

State

There are no state regulations or policies related to recreation that apply to the Proposed Project.

Local

City of Palo Alto Parks, Trails, Open Space & Recreation Master Plan

The City's *Parks, Trails, Open Space & Recreation Master Plan* serves to guide future renovations and capital improvements for parks, trails, open space, and recreational facilities and programs. The most recent version was adopted in September 2017 and provides guidance and recommendations to meet recreational, programming, environmental, and maintenance needs. The plan also prioritizes park renovations and facility improvements (City 2023e).

3.16.2 Environmental Setting

The PPS is within an established residential community in an urban setting within the City limits in Santa Clara County. The PPS has been developed as an elementary school since the early 1950s and is surrounded by established residences, other schools, and an affordable senior housing building. The PPS

is adjacent to athletic fields at JLSMS and has various playgrounds and recreational facilities present that would be replaced if the Proposed Project is implemented.

3.16.3 Impact Discussion

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated?

As is the case today, operation of the reconfigured school would not require students to use existing neighborhood or regional parks to any greater or lesser extent. The Proposed Project would enhance and update the school's outdoor recreational spaces. The redesigned school grounds would also make the athletic fields at the adjacent JLSMS more readily available to Hoover ES students as the Proposed Project would include 30 feet of the JLSMS athletic fields as part of the new Hoover ES footprint. The student capacity would remain unchanged upon implementation of the Proposed Project and a less-than-significant impact to off-site recreational facilities would result.

Impact Designation: Less-than-Significant Impact.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

As discussed in Section 3.16.3, the Proposed Project would not require construction of off-site recreational facilities but would include 30 feet of the existing JLSMS athletic fields adjacent to the PPS as part of the new Hoover ES footprint. The Proposed Project includes the rebuilding and enhancement of recreational facilities at the PPS. The environmental effects related to the whole project, including the recreational facility improvements and addition of 30 feet of athletic field space from the adjacent JLSMS athletic fields, are discussed throughout this IS. A less-than-significant impact would occur.

Impact Designation: Less-than-Significant Impact.

3.17 Transportation and Circulation

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the proposed project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☐	☒
c) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

3.17.1 Regulatory Setting

State

Senate Bill 375

SB 375,[132] the Sustainable Communities and Climate Protection Act, was adopted in September 2008. Building on AB 32 (Global Warming Solutions Act of 2006),[133] SB 375 directed CARB to develop regional GHG emission reduction targets by using a regional transportation planning process. SB 375 also required city and county involvement in regional transportation, housing, and land use planning.

Local governments retain authority over land use decisions under SB 375 but are expected to coordinate their regional housing needs with regional transportation. Furthermore, SB 375 offers CEQA incentives for projects that are consistent with a regional plan that reduces GHGs. These incentives are offered if a project is consistent with the local Sustainable Communities Strategy, a component of the regional transportation plan that demonstrates how GHG targets will be met (Institute for Local Government 2023).

[132] SB 375 Transportation planning: travel demand models: sustainable communities strategy: environmental review

[133] AB 32 Air pollution: greenhouse gases: California Global Warming Solutions Act of 2006

Senate Bill 743

SB 743[134] was signed into law in 2013 and changed how public agencies must evaluate project-related transportation impacts. The bill required the CEQA Guidelines to be updated to establish new criteria for determining the significance of a project's transportation impacts that more appropriately balances the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of GHG emissions.

As required under SB 743, OPR developed potential metrics to measure transportation impacts that may include, but are not limited to, VMT, VMT per capita, automobile trip generation rates, or automobile trips generated. The new metrics would replace the use of auto delay (measured by "level of service") as the metric to analyze transportation impacts under CEQA. OPR recommends different thresholds of significance for projects depending on land use.

Local

City of Palo Alto Comprehensive Plan

One of the major themes of the City's *Comprehensive Plan* (2016a) is "reducing reliance on the automobile." Increased pedestrian, bicycle, transit use, and electric vehicle usage is encouraged in the Plan as a means to reduce both traffic congestion and emissions from automobiles. The plan also provides policies related to parking as well as parking management strategies. The vision for the transportation element, which meets State requirements for a circulation element, is as follows:

> Palo Alto will build and maintain a sustainable network of safe, accessible and efficient transportation and parking solutions for all users and modes, while protecting and enhancing the quality of life in Palo Alto. Programs will include alternative and innovate transportation processes, and the adverse impacts of automobile traffic on the environment in general and residential streets in particular will be reduced. Streets will be safe, attractive and designed to enhance the quality and aesthetics of Palo Alto neighborhoods. Palo Alto recognizes the regional nature of its transportation system, and will be a leader in seeking regional transportation solutions, prioritizing Caltrain service improvements and railroad grade separations. (City 2016a)

The transportation element has several goals, policies, and programs, including the following:

- **Goal T-1:** Create a sustainable transportation system, complemented by a mix of land uses, that emphasizes walking, bicycling, use of public transportation and other methods to reduce GHG emissions and the use of single-occupancy motor vehicles.
  - **Policy T-1.3:** Reduce GHG and pollutant emissions associated with transportation by reducing VMT and per-mile emissions through increasing transit options, supporting biking and walking, and the use of zero-emission vehicle technologies to meet City and state goals for GHG reductions by 2030.

[134] CEQA: Transportation Impacts (SB 743) - Office of Planning and Research (ca.gov)

  - **Policy T-1.8:** Work to ensure public and private school commute patterns are accommodated in the local transit system, including through schedule and route coordination.
  - **Policy T-1.14:** Continue the Palo Alto Free Shuttle Program and work with partners to enhance service by increasing frequency and prioritizing destinations of value to the community, including health centers, parks, schools, senior centers and shopping areas and other places where residents gather.
  - **Policy T-1.16:** Promote personal transportation vehicles an alternative to cars (e.g. bicycles, skateboards, roller blades) to get to work, school, shopping, recreational facilities and transit stops.
- **Goal T-2:** Decrease delay, congestion and VMT with a priority on our worst intersections and our peak commute times, including school traffic.
  - **Policy T-2.6:** Work with PAUSD to ensure that decisions regarding school assignments are analyzed to reduce peak period motor vehicle trips to and from school sites.
  - **Policy T-2.7:** Work with the PAUSD to resolve traffic congestion issues associated with student drop-off and pick-up. Address pedestrian and bicycle access, circulation and related issues such as coordinating bell schedules on City rights-of-way adjacent to schools and on PAUSD property.
- **Goal T-3:** Maintain an efficient roadway network for all users.
  - **Policy T-3.2:** Enhance connections to, from and between parks, community centers, recreation facilities, libraries and schools for all users.
  - **Policy T-3.14:** Continue to prioritize the safety of school children in street modification projects that affect school travel routes, including during construction.
- **Goal T-4:** Protect streets and adopted school commute corridors that contribute to neighborhood character and provide a range of local transportation options.
- **Goal T-5:** Encourage attractive, convenient, efficient and innovative parking solutions for all users.
  - **Policy T-5.5:** Minimize the need for employees to park in and adjacent to commercial centers, employment districts and schools.
  - **Policy T-5.7:** Require new or redesigned parking lots to optimize pedestrian and bicycle safety.
  - **Policy T-5.12:** To promote bicycle use, increase the number of safe, attractive and well-designed bicycle parking spaces available in the city, including spots for diverse types of bicycle and associated equipment, including bicycle trailers, prioritizing heavily travelled areas such as commercial and retail centers, employment districts, recreational/cultural facilities, multi-modal transit facilities and ride share stops for bicycle parking infrastructure.
- **Goal T-6:** Provide a safe environment for motorists, pedestrians, and bicyclists on Palo Alto Streets.
  - **Policy T-6.4:** Continue the Safe Routes to School partnership with PAUSD and the Palo Alto Council of PTAs.
  - **Policy T-6.5:** Support PAUSD adoption of standard Safe Routes to School policies and regulations that address the five E's of education, encouragement, enforcement, engineering and evaluation.

- **Goal T-7:** Provide mobility options that allow people who are transit dependent to reach their destinations.
- **Goal T-8:** Influence the shape and implementation of regional transportation policies and technologies to reduce traffic congestion and GHG emissions.

3.17.2 Environmental Setting

Major roadways within City limits include U.S. 101, SR-82 (El Camino Real), Embarcadero Road, San Antonio Road, Alma Street, and Page Mill Road. Bicycle lanes, pedestrian walkways (sidewalks), and public transit facilities are also present. Public transit services include the regional Caltrain system which has two stops in the City (Palo Alto and California Avenue stations), a free bus shuttle service offered by Stanford Marguerite, and an additional bus service via the Santa Clara Valley Transportation Authority. The closest Caltrain station is the California Avenue Station located 2.6 miles from Hoover ES (City 2023f). Various taxi services also operate within City limits, as well as rideshares (Uber and Lyft) (City 2023f). The City also offers a rideshare service called “Palo Alto Link” which provides a set number of rides for a flat fee and provides $1.00 rides to students, senior citizens, disabled persons, and low-income riders (City 2023g). The nearest airport to Hoover ES is the Palo Alto Airport (1925 Embarcadero Road, Palo Alto) which is 4.3 miles from the PPS.

The PPS is bound by East Charleston Road to the south. Primary access to the PPS is provided by West Charleston Road (which becomes East Charleston Road at its intersection with Alma Street) off SR-82 and San Antonio Road which connects shortly after its exit off U.S. 101 with East Charleston Road.

East Charleston Road was recently upgraded by the Charleston/Arastradero Corridor Project near Hoover ES. This 2.3-mile corridor is heavily traveled and serves 11 schools as well as parks, shopping centers, a library, community centers, a senior housing complex, and residential neighborhoods. The project included the installation of landscaped medians, curb extensions/bulb-outs, enhancements to bicycle and pedestrian areas, and traffic signal modifications to complement the striping/roadway configuration. A major reason for the project was to increase safety, including pavement markings and dedicated/buffered bicycle lanes (City 2023a).

Hoover ES is currently accessed from East Charleston Road by a one-way, double-lane, ring road that enters the PPS along its western boundary, turns right and traverses the northern boundary, then turns right along the eastern boundary and exits the PPS through another access point back onto East Charleston Road. School buses, private vehicles related to students and staff, delivery vehicles, and other service vehicles all use the access road that loops around the PPS.

3.17.3 Impact Discussion

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The Proposed Project would not conflict with a program, plan, ordinance, or policy related to circulation. The District met with the City’s Transportation Department and Safe Routes to School to collaborate and develop the suggested layout for the Proposed Project. Furthermore, the City recently completed the

Charleston/Arastradero Corridor Project which improved the roadway and pedestrian walkways in front of Hoover ES and also created protected bicycle lanes (City 2023a).

The majority of the U-shaped ring road that loops around the campus from west to north to east would be removed. The western portion of the road would remain as a bus drop-off/pick-up lane and the current Waverley bicycle path would remain in place as a means to access JLSMS, the Hoover ES bicycle parking area, and Mitchell Park, while restricting vehicular traffic. The northern portion of the road would be removed to provide direct access from Hoover ES to the athletic fields at JLSMS. The eastern portion of the road would be removed and replaced with a more condensed, U-shaped access road/parking lot that would exit and enter back onto East Charleston Road at the same point. The access road would serve private vehicles related to students and staff, delivery vehicles, and other service vehicles (trash and recycle service trucks) and would have parking spaces and bus lanes integrated.

Pedestrian and bicycle access would improve. Vehicle access from Waverley Drive would change to a key card access system and would only be used by bus drivers and limited staff. The main access loop would separate vehicle traffic from pedestrian/bicycle lanes that lead directly to Mitchell Park. A large bicycle parking area for student use would be available at the northeast corner of the PPS by the Mitchell Park entry, encouraging safe biking through the park. Bike lockers would also be available for use by staff. Bicycle parking at the front of the school would also accommodate bicycles of varying types for parents and visitors. In addition to the Waverley bicycle path, a dedicated bicycle/pedestrian pathway that is separated from the vehicle access road would be installed on the east side of the PPS, further improving bicycle and pedestrian safety across the campus.

There would be no change in the overall volume of traffic that would be generated by the school because capacity would not increase as a result of the Proposed Project. The Proposed Project would not affect any public transportation facilities or operations. Construction would occur within the PPS, with the exception of the 30-foot portion of the JLSMS athletic fields and the off-site improvements (e.g., driveway cuts); operation would be the same as the existing conditions. Overall, the proposed modifications would improve the PPS's access, parking, and overall circulation.

Impact Designation: Less-Than-Significant Impact.

b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?

The Proposed Project would not result in an increase in student capacity of Hoover ES. Accordingly, the number of trips generated by the Proposed Project would remain consistent with the current use of the PPS. Therefore, there would be no change to VMT that would constitute a potentially significant impact.

Furthermore, one of the goals of the redesigned school campus is to promote additional bicycle and pedestrian transportation to the PPS. With the addition of the secured bicycle parking area and additional bicycle pathway that would be located along the eastern perimeter of PPS connecting to the existing bicycle pathway for the JLSMS fields and Mitchell Park, the District anticipates an increase in bicycle usage and therefore a reduction in VMT over existing conditions. Therefore, no impact would occur.

Impact Designation: No Impact.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The Proposed Project is designed to meet the specifications for a school and must be approved by the DSA. Compliance with established standards would ensure that hazards due to design features would not occur and that circulation improvements would not create conflicts for vehicles, pedestrians, or bicyclists traveling within or around the PPS.

Access to the PPS for pedestrians, bicyclists, and vehicles would occur via properly designed walkways, bicycle paths, and access roads that have been designed to accommodate the amount and type of traffic visiting the PPS. East Charleston Road has accommodated the traffic load historically and has recently been upgraded by the City via the Charleston/Arastradero Corridor Project. The traffic would exit the redesigned school site via a right turn only, thereby reducing the existing hazard associated with conflicts with the current ability to exit the school site via a left turn into the center merge lane with the eastbound lane of East Charleston Road. The one-way access road on the western boundary of the PPS would be used by school buses and limited staff and access would be limited via a key card system; traffic would enter via a right turn only and would not re-enter East Charleston Road as the access road would exit onto East Meadow Drive. No on- or off-site access or circulation features would substantially increase hazards as the design of the Proposed Project would result in improved conditions relative to vehicular, pedestrian, and bicyclist safety. Therefore, a less-than-significant impact would occur.

Impact Designation: Less-Than-Significant Impact.

d) Result in inadequate emergency access?

The access road to/within Hoover ES would be required to meet the standards of the DSA as well as all City codes; this would ensure that emergency access within the PPS is adequate. Fire apparatus, ambulances, and police vehicles would have sufficient access to the PPS in the event of an emergency as shown in **Figure 4**. The District has engaged PAFD and would implement PAFD's recommendation of rolled curbs and pavers in the landscape median on East Charleston Road to ensure that emergency vehicles traveling eastbound would be able to access the PPS. The eastern access and egress lanes provide a 20-foot and 26-foot fire lane, respectively. A 20-foot-wide fire lane through the PPS would traverse from a gate adjacent to the northeastern edge of the multi-purpose building with access from the 26-foot-wide eastern access and egress lanes traversing south and then west to another gate in the central portion of the western boundary of the PPS providing access to Waverley Street. Therefore, a less-than-significant Impact would occur.

Impact Designation: Less-Than-Significant Impact.

3.18 Tribal Cultural Resources

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the proposed project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

3.18.1 Regulatory Setting

State

Refer to Section 3.5.1 for a discussion of the State regulations relative to tribal cultural resources (TCRs).

3.18.2 Environmental Setting

Refer to Section 3.5.2 for a discussion of environmental setting as it relates to TCRs.

3.18.3 Impact Discussion

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American

tribe, and that is: Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC § 5020.1(k)?

The PPS contains Hoover ES where construction began in the early 1950s. The PPS is not listed or eligible for listing as a historic resource. No prehistoric or historic-era cultural sites, features, or artifacts or potentially sensitive soil types (i.e., prehistoric midden) were encountered during the site survey on the PPS (Appendix B). Construction of the Proposed Project would occur within the PPS boundaries, except for off-site improvements (sidewalks, curb cuts, utility undergrounding). Therefore, no impacts to historical resources would occur.

Impact Designation: No Impact.

b) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC §5024.1. In applying the criteria set forth in subdivision (c) of PRC § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

The NAHC was contacted on June 21, 2023, by letter and was provided with a map depicting the project area and surrounding vicinity. A SLF search was also requested. On July 7, 2023, the NAHC responded stating the SLF did not contain any information on sensitive Native American cultural properties within or near the project area. The NAHC also provided a list of Native American community representatives who might have an interest in or concerns with the Proposed Project. SAS sent notification letters to the following individuals and organizations on July 10, 2023; however, no responses were received.

- Valentin Lopez, Chairman – Amah Mutsun Tribal Band
- Irene Zwierlein, Chair – Amah Mutsun Tribal Band of Mission San Juan Bautista
- Ann Marie Sayers, Chair – Indian Canyon Mutsun Band of Costanoan
- Kanyon Sayers-Roods, Most Likely Descendent – Indian Canyon Mutsun Band of Costanoan
- Monica Arellano, Vice Chair – Muwekma Ohlone Indian Tribe of the San Francisco Bay Area
- Charlene Nijmeh, Shair - Muwekma Ohlone Indian Tribe of the San Francisco Bay Area
- Johnathan Wasaka Costillas, Tribal Historic Preservation Officer – Tamien Nation
- Quirina Luna Geary, Chair – Tamien Nation
- Lillian Camarena, Secretary – Tamien Nation
- Andew Galvan, Chair – The Ohlone Indian Tribe
- Kenneth Woodrow, Chair – Wuksachi Indian Tribe / Eshom Valley Band

While the PPS is not listed or eligible for listing as a historic resource and no responses were received from any of the above-listed parties, any time grading and excavation occur, an opportunity exists for historical resources to be encountered. For this reason, mitigation would be required.

Impact Designation: Less-than-Significant with Mitigation.

Mitigation Measure

TCR-1: Prior to any ground-disturbing construction activities, a California Registered Professional Archaeologist (RPA) shall be identified to be on call.

In the event any TCRs are discovered, construction activities shall cease within 100 feet of the find until the RPA can assess the find and provide recommendations. The evaluation of all TCRs unearthed by project construction activities shall be evaluated by the RPA. If the resources are Native American in origin, the RPA shall coordinate with the District regarding treatment of these resources as well as notifying local tribes of the find. Typically, the tribe(s) will request reburial, preservation in place within the landscapes, the minimization of handling of the objects, construction monitoring of any further activities, or returning objects to a location within the project area where they would not be subject to future impacts. The District may continue work on other parts of the PPS while evaluation occurs and, if necessary, mitigation takes place (14 CCR § 15064.5[f]). Work in the area(s) of the cultural find may only proceed after all necessary investigation and evaluation of the discovery under the requirements of CEQA, including AB 52, have been satisfied, as well as with authorization from the District in coordination with the tribe(s). If the RPA determines a resource to constitute a “historical resource” or “unique archaeological resource,” time and funding sufficient to allow for implementation of avoidance measures or appropriate mitigation must be available. The treatment plan established for the resources shall be in accordance with 14 CCR § 15064.5(f) for historical resources and PRC § 21083.2(b) for unique archaeological resources.

The construction contractor shall implement any measures deemed by the District to be necessary and feasible to preserve in place, avoid, or minimize impacts to the resource, including but not limited to, facilitating the appropriate treatment of the find by the appropriate tribe(s), as necessary. Treatment that preserves or restores the cultural character and integrity of a TCR may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil.

If preservation in place is not feasible, treatment may include implementation of archaeological data recovery excavations to remove the resource along with subsequent laboratory processing and analysis for curation, only if specifically requested by the tribe(s). The District shall be responsible for ensuring that a public, non-profit institution with a research interest in the materials would curate any historic archaeological material that is not Native American in origin if such an institution agrees to accept the material. If no institution accepts the archaeological material, the District shall offer it to a local historical society for educational purposes or retain the material and use it for educational purposes.

3.19 Utilities and Service Systems

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the Proposed Project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

3.19.1 Environmental Setting

Existing services provided to the PPS include stormwater, potable water, wastewater service, solid waste transfer and disposal, power, natural gas, and telecommunications. Existing connections to utilities are located along the southern (eastbound lane) of East Charleston Road.

3.19.2 Impact Discussion

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or

telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

The Proposed Project involves the demolition and reconstruction of Hoover ES and would not increase capacity. Under the Proposed Project, the PPS would be reconfigured, requiring the reconfiguration of utility connections. As such, the Proposed Project would remove existing utilities on site and provide new utilities in addition to replacing existing connections (primarily on site). New connections from the PPS to the existing connections along East Charleston Road would be required; these connections (fire, water, and irrigation) were installed in 2019 as part of a separate project. Minor updates such as new pressure detectors and sewer cleanouts would also be installed within East Charleston Road. These connections and updates have been incorporated into project site design and specifications. Accordingly, all mitigation measures presented throughout the IS would be applicable to all the construction activities within East Charleston Road. No utility expansions are necessary to meet the needs of the Proposed Project.

Impact Designation: Less-Than-Significant Impact.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

The City's water comes from the San Francisco Public Utilities Commission (SFPUC). The Proposed Project is within the San Francisco Bay Regional Water Quality Control Board (Region 5). The City provides water service connections to the PPS and would continue to do so. (City 2023h). As student capacity at Hoover ES would remain unchanged, the water needs of the school are expected to be similar to existing conditions. Therefore, water supply is anticipated to be sufficient for the Proposed Project and impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

c) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The City's Wastewater Engineering Section is responsible for the collection of wastewaters within the portion of the City that contains the PPS. Wastewater is treated at the Regional Water Quality Control Plant which is owned and operated by the City and serves surrounding areas and communities. The existing facilities treats up to 17 million gallons of wastewater every day (City 2023h). The Proposed Project would not increase the capacity of Hoover ES; therefore, it is anticipated that the wastewater facilities would continue to have adequate capacity to serve the Proposed Project. Any impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

As noted previously, contractual requirements include a waste minimization plan and the recycling of demolition materials to the extent practicable during construction. Accordingly, waste generated during construction would meet solid waste reduction goals.

As is the case today, waste from operation of the Proposed Project would be collected, separated to increase diversion, and the remainder would be transported by the City through its contractor to the same locations. The currently used landfill has sufficient capacity to meet the requirements of the City as a whole based on findings by the City in their recent conversion to a contractor, which provides much greater reuse of waste materials and a significant overall reduction of material to landfills. This is the case today and would remain the case with the Proposed Project. The proposed improvements would not result in an increase in the student or staff populations; therefore, generation of waste during operational activities would be similar to existing conditions. Project impacts on landfill capacity would be less than significant.

Impact Designation: Less-Than-Significant Impact.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Solid waste would be generated during construction and operation of the Proposed Project; however, the amount of waste would be smaller than what is typically generated during projects of a similar size because panels would be prefabricated offsite which would result in less direct construction on the PPS. The Proposed Project would comply with all regulations pertaining to solid waste, such as the California Integrated Waste Management Act and the City's recycling and waste programs. The District and its construction contractor would comply with all applicable laws and regulations and would make every effort to reuse and/or recycle the construction debris that would otherwise be taken to a landfill. Hazardous waste, such as paint used during construction, would be disposed of only at facilities permitted to receive them in accordance with local, state, and federal regulations. The Proposed Project would comply with all applicable local, state, and federal statutes and regulations related to solid waste disposal. Therefore, impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

3.20 Wildfire

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Proposed Project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

3.20.1 Regulatory Setting

Due to the existing urban setting of the PPS, the Proposed Project would not be subject to any significant wildfire impacts that do not exist today. No new or specific regulatory modifications are required to address wildfire risk at the PPS.

3.20.2 Environmental Setting

The existing setting is a school site within an urban setting. CAL FIRE identifies State Responsibility Area Fire Hazard Severity Zones. The PPS is not located in a Fire Hazard Severity Zone.

3.20.3 Impact Discussion

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

The Proposed Project would not conflict with adopted emergency response or evacuation plans. The surrounding roadways would continue to provide emergency access to the PPS and surrounding properties during construction and operation. The Proposed Project would fully implement all existing fire safety codes and requirements. The District has engaged PAFD and would implement PAFD's recommendation of rolled curbs and pavers in the landscape median on East Charleston Road to ensure that emergency vehicles traveling eastbound would be able to access the PPS. The western access road (Waverley Street) on the PPS, while gated and accessible via a key card system, would remain accessible to emergency vehicles.

The closest PAFD fire station (Station 4) is only about five blocks away. Full access to the interior of the PPS would still be available on the east and west sides. The Proposed Project would not result in inadequate emergency access; therefore, impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

The PPS is within an existing urbanized setting and is in a relatively flat area. No change in use or prevailing conditions would occur. The PPS is not prone to wildland fires today and the risk would not increase if the Proposed Project were implemented. No impact would occur.

Impact Designation: No Impact.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Due to the existing location and no change in use, the Proposed Project would not increase the fire risk to the PPS. All of the buildings on the PPS would be demolished and rebuilt in compliance with existing fire codes; this includes the addition of a modern fire sprinkler system which the current school buildings do not have in place.

The Proposed Project may require only limited changes to the connections to utilities such as electricity, water, and sewer. The utilities would be installed to meet service requirements. The construction of infrastructure improvements for the Proposed Project would not increase fire risk, and impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The PPS is relatively flat and is not within a mapped landslide hazard area (DOC 2022h). Additionally, the PPS is located within FEMA Zone X. As stated above, no change is anticipated in fire risk and no impact to increased runoff or flooding from such risks would occur. Construction activities related to the Proposed Project would be subject to compliance with the CBC and would include BMPs. Therefore, with implementation of BMPs and compliance with the CBC, impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

3.21 Mandatory Findings of Significance

	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the proposed project:				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

The Proposed Project would improve the school facilities as well as the parking and queuing on the PPS. The Proposed Project would not result in an increase in student capacity. The Proposed Project would comply with the MBTA bird nesting season restrictions and therefore would not result in impacts to nesting regulatory birds protected by the MBTA. No sensitive animal or plant species would be impacted. The Proposed Project would occur within Hoover ES's existing fence line and the 30-foot expansion into the JLSMS athletic fields, except for off-site improvements related to the replacement of underground utilities. Additionally, the implementation of mitigation measures would ensure that air

quality, geology and soils, and TCRs are protected and preserved and that impacts related to hazards and hazardous materials are able to be mitigated. Therefore, impacts would be less than significant with mitigation incorporated.

Mitigation Measures for Air Quality

AQ-1: The following BAAQMD BMPs shall be implemented during construction through contractual and specification requirements:

- Exterior demolition and construction areas shall be watered periodically to minimize the generation of dust and dirt.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers when required. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure, 13 CCR § 2485).[135] Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
- A publicly visible sign shall be posted with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

AQ-2: The following additional mitigation measures from CalEEMod shall be implemented during construction through contractual and construction specification requirements:

- All off-road equipment shall use advanced engine tiers for air quality controls.
- Off-road equipment that does not meet the advanced engine tier air quality controls shall incorporate diesel particulate filters.
- The contractor shall use additional dust suppressants during demolition.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
- All paved roads surrounding the access and egress driveways to the construction site shall be swept daily.

AQ-3: The following additional design features shall be incorporated into design of the Proposed Project:

- Energy efficient appliances shall be installed within the school facilities.

[135] 13 CCR § 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

- Low-flow water fixtures shall be installed within the school facilities.

Mitigation Measures for Geology and Soils

GEO-1: Prior to construction, the District shall identify geotechnical, engineering, and construction measures to ensure that the structure is seismically safe. All safety measures must be reviewed and followed.

GEO-2: Prior to construction, the District shall ensure that construction measures include slabs-on grade that have sufficient reinforcement and are supported by a layer of non-expansive fill. Footings should extend below the zone of seasonal moisture fluctuation. It is also recommended that moisture changes in the surficial soils are limited by using positive drainage away from buildings, along with limiting landscape watering by using drip irrigation near foundations and exterior slabs-on-grade.

GEO-3: Prior to construction, the District shall identify a qualified paleontologist to be on call. If unique paleontological resources are discovered during excavation and/or construction activities, construction shall stop within 50 feet of the find, and the qualified paleontologist shall be consulted to determine whether the resource requires further study. The paleontologist shall make recommendations to the District to protect the discovered resources. Any paleontological resources recovered shall be provided to the North Central Information Center and California State University, Sacramento, Natural History Museums or repository willing and able to accept and house the resource to preserve for future scientific study.

Mitigation Measure for Hazards and Hazardous Materials

HAZ-1: The following mitigation measures shall be implemented through contractual and construction specification requirements:

- The contractor shall verify quantities and locations of hazardous materials under the direction of a qualified individual (California Certified Asbestos Consultant for asbestos and Certified Inspector/Assessor for lead) in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the owner or owner's representative, prior to bidding.
- All asbestos (greater than 0.1 percent) disturbance and/or removal operations shall be conducted by a California Division of Occupational Safety and Health (Cal/OSHA)-registered and California-licensed asbestos removal contractor. All disturbance and/or abatement operations shall be under the direction of a California Certified Asbestos Consultant. Negative pressure enclosures shall be created and air monitoring shall be conducted by a licensed professional during asbestos abatement for all buildings requiring such remediation.
- Should the removal of identified regulated asbestos-containing materials involve at least 100 square feet or 100 linear feet per project site, per year, then notification to the BAAQMD and Cal/OSHA shall be accomplished prior to the initiation of such activities.

- All activities involving potential and identified lead-containing surfaces shall be conducted in accordance with California HSC §§ 17920.10 and 10525, 10525.7 as well as 8 CCR § 1532.1.[136]

Mitigation Measure for Tribal Cultural Resources

TCR-1: Prior to any ground-disturbing construction activities, a California Registered Professional Archaeologist (RPA) shall be identified to be on call.

In the event any TCRs are discovered, construction activities shall cease within 100 feet of the find until the RPA can assess the find and provide recommendations. The evaluation of all TCRs unearthed by project construction activities shall be evaluated by the RPA. If the resources are Native American in origin, the RPA shall coordinate with the District regarding treatment of these resources as well as notifying local tribes of the find. Typically, the tribe(s) will request reburial, preservation in place within the landscapes, the minimization of handling of the objects, construction monitoring of any further activities, or returning objects to a location within the project area where they would not be subject to future impacts. The District may continue work on other parts of the PPS while evaluation occurs and, if necessary, mitigation takes place (14 CCR § 15064.5[f]). Work in the area(s) of the cultural find may only proceed after all necessary investigation and evaluation of the discovery under the requirements of CEQA, including AB 52, have been satisfied, as well as with authorization from the District in coordination with the tribe(s). If the RPA determines a resource to constitute a "historical resource" or "unique archaeological resource," time and funding sufficient to allow for implementation of avoidance measures or appropriate mitigation must be available. The treatment plan established for the resources shall be in accordance with 14 CCR § 15064.5(f) for historical resources and PRC § 21083.2(b) for unique archaeological resources.

The construction contractor shall implement any measures deemed by the District to be necessary and feasible to preserve in place, avoid, or minimize impacts to the resource, including but not limited to, facilitating the appropriate treatment of the find by the appropriate tribe(s), as necessary. Treatment that preserves or restores the cultural character and integrity of a TCR may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil.

If preservation in place is not feasible, treatment may include implementation of archaeological data recovery excavations to remove the resource along with subsequent laboratory processing and analysis for curation, only if specifically requested by the tribe(s). The District shall be responsible for ensuring that a public, non-profit institution with a research interest in the materials would curate any historic archaeological material that is not Native American in origin if such an institution agrees to accept the material. If no institution accepts the archaeological material, the District shall offer it to a local historical society for educational purposes or retain the material and use it for educational purposes.

[136] 8 CCR § 1532.1, Lead

- In addition, all removal activities involving identified LBP shall be conducted in accordance with 17 CCR §§ 35001–36100,[137] which prescribes the use of California Department of Public Health certified workers, work practices, and other requirements.
- Written notification to Cal/OSHA shall be accomplished should LBP activities involve equal to or more than 100 square feet or 100 linear feet of removal in accordance with the requirements of 8 CCR § 1532.1.
- Any welding, cutting, or heating of metal surfaces containing surface coatings shall be conducted in accordance with 8 CCR § 1537,[138] which require surfaces covered with toxic preservatives, and in enclosed areas, be stripped of all toxic coatings for a distance of at least 4 inches, in all directions, from the area of heat application prior to the initiation of such heat application, or 8 CCR § 1536.[139]
- All potential and identified UW materials impacted by the work shall be removed and recycled or disposed of in accordance with the UW guidelines established by the DTSC, as stated in 22 CCR §§ 66261.9[140] and 66273.1–66273.90.[141]
- All ballasts shall be visually inspected prior to disposal to determine if they contain PCBs. Those ballasts marked "No PCBs" or "PCB Free" can be considered as such and shall be treated as UW-electronic waste. All PCB-containing devices, including, but not limited to ballasts shall be removed or have the oils removed and properly handled, collected, stored, transported, and recycled or disposed of by an approved recycling or disposal facility in accordance with the requirements of 22 CCR § 67426.1.[142]

Devices containing ozone depleting chemicals, petroleum, or other chemicals, shall be collected, and the waste shall be characterized, disposed of, or recycled according to California rules and regulations.

Impact Designation: Less-Than-Significant Impact with Mitigation Incorporated.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

The Proposed Project would improve the existing school facility. The Proposed Project would not result in an increase in capacity at the school. The Proposed Project would improve parking and queuing onsite, thereby reducing congestion on the surrounding roadways. Therefore, the Proposed Project would not result in cumulative impacts in the surrounding area.

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[137] 17 CCR §§ 35001–36100, Chapter 8. Accreditation, Certification and Work Practices of Lead-Based Paint and Lead Hazards

[138] 8 CCR § 1537, Welding, Cutting, and Heating of Coated Metals

[139] 8 CCR § 1536, Ventilation Requirements for Welding, Brazing, and Cutting

[140] 22 CCR § 66261.9, Requirements for Universal Waste

[141] 22 CCR § 66273.1, Scope and 22 CCR § 66273.90, Applicability

[142] 22 CCR § 67426.1, Generator Requirements

Impact Designation: Less-Than-Significant Impact.

c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

The Proposed Project would improve the facilities at Hoover ES and would improve parking and queuing onsite. The proposed circulation changes would provide access to the PPS for both staff and parent vehicles, as well as bicycles and pedestrians. The new, larger parking lot would also provide a student drop-off/pick-up zone.

As demonstrated in this IS, the Proposed Project would not substantially increase environmental effects that would directly or indirectly affect human beings. Impacts would be less than significant.

Impact Designation: Less-Than-Significant Impact.

4 Preparers

4.1 Lead Agency

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4.2 Terraphase Engineering Inc.

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Appendix A

Air Quality: CalEEMod Results

Herbert Hoover Elementary School Reconstruction Detailed Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Herbert Hoover Elementary School Reconstruction
Construction Start Date	1/3/2024
Operational Year	2026
Lead Agency	Palo Alto Unified School District
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	4.20
Precipitation (days)	32.8
Location	37.418564472637414, -122.1143938317746
County	Santa Clara
City	Palo Alto
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1727
EDFZ	1
Electric Utility	City of Palo Alto
Gas Utility	City of Palo Alto Ultilities
App Version	2022.1.1.19

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Elementary School	57.2	1000sqft	5.60	57,220	55,344	26,400	—	Elementary school rebuild

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers
Construction	C-6	Use Diesel Particulate Filters
Construction	C-9	Use Dust Suppressants
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Construction	C-12	Sweep Paved Roads
Transportation	T-10	Provide End-of-Trip Bicycle Facilities
Transportation	T-14*	Provide Electric Vehicle Charging Infrastructure
Transportation	T-32*	Orient Project Toward Transit, Bicycle, or Pedestrian Facility
Transportation	T-33*	Locate Project near Bike Path/Bike Lane
Transportation	T-34*	Provide Bike Parking
Transportation	T-40*	Implement School Bus Program
Transportation	T-46*	Improve Transit Access, Safety, and Comfort
Energy	E-1	Buildings Exceed 2019 Title 24 Building Envelope Energy Efficiency Standards
Energy	E-2	Require Energy Efficient Appliances
Water	W-4	Require Low-Flow Water Fixtures
Water	W-5	Design Water-Efficient Landscapes
Waste	S-1/S-2	Implement Waste Reduction Plan
Waste	S-4*	Recycle Demolished Construction Material

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.97	8.38	65.7	58.4	0.11	2.73	6.78	9.50	2.49	3.02	5.51	—	12,735	12,735	0.67	12,964
Mit.	4.43	7.98	36.4	50.2	0.11	1.60	6.78	7.15	1.48	3.02	4.15	—	12,735	12,735	0.67	12,964
% Reduced	44%	5%	45%	14%	—	41%	—	25%	41%	—	25%	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.96	8.38	66.0	58.2	0.11	2.73	6.78	9.50	2.49	3.02	5.51	—	12,715	12,715	0.67	12,935
Mit.	1.56	7.98	31.7	50.0	0.11	0.37	6.78	7.15	0.33	3.02	3.35	—	12,715	12,715	0.67	12,935
% Reduced	80%	5%	52%	14%	—	86%	—	25%	87%	—	39%	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.45	2.29	19.9	19.0	0.03	0.84	2.09	2.94	0.77	0.97	1.74	—	3,911	3,911	0.19	3,966
Mit.	1.33	2.07	14.5	18.4	0.03	0.39	2.09	2.48	0.36	0.97	1.32	—	3,911	3,911	0.19	3,966
% Reduced	46%	9%	27%	3%	—	54%	—	16%	54%	—	24%	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.45	0.42	3.63	3.47	0.01	0.15	0.38	0.54	0.14	0.18	0.32	—	648	648	0.03	657
Mit.	0.24	0.38	2.65	3.35	0.01	0.07	0.38	0.45	0.07	0.18	0.24	—	648	648	0.03	657
% Reduced	46%	9%	27%	3%	—	54%	—	16%	54%	—	24%	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	7.97	6.45	65.7	58.4	0.11	2.73	6.78	9.50	2.49	3.02	5.51	—	12,735	12,735	0.67	12,964
2025	2.47	8.38	18.3	24.8	0.04	0.78	0.39	1.17	0.72	0.09	0.82	—	4,497	4,497	0.18	4,527
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	7.96	6.44	66.0	58.2	0.11	2.73	6.78	9.50	2.49	3.02	5.51	—	12,715	12,715	0.67	12,935
2025	1.62	8.38	11.8	15.3	0.03	0.46	0.30	0.77	0.43	0.07	0.50	—	3,013	3,013	0.12	3,036
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.45	2.00	19.9	19.0	0.03	0.84	2.09	2.94	0.77	0.97	1.74	—	3,911	3,911	0.19	3,966
2025	0.76	2.29	5.57	7.33	0.01	0.23	0.13	0.36	0.21	0.03	0.24	—	1,408	1,408	0.06	1,418
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.45	0.37	3.63	3.47	0.01	0.15	0.38	0.54	0.14	0.18	0.32	—	648	648	0.03	657
2025	0.14	0.42	1.02	1.34	< 0.005	0.04	0.02	0.07	0.04	0.01	0.04	—	233	233	0.01	235

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.43	3.71	36.4	50.2	0.11	1.60	6.78	7.15	1.48	3.02	4.15	—	12,735	12,735	0.67	12,964
2025	1.41	7.98	17.3	26.9	0.04	0.25	0.39	0.64	0.24	0.09	0.33	—	4,497	4,497	0.18	4,527

Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.56	1.24	31.7	50.0	0.11	0.37	6.78	7.15	0.33	3.02	3.35	—	12,715	12,715	0.67	12,935
2025	1.10	7.98	10.9	17.2	0.03	0.14	0.30	0.45	0.13	0.07	0.21	—	3,013	3,013	0.12	3,036
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.33	1.10	14.5	18.4	0.03	0.39	2.09	2.48	0.36	0.97	1.32	—	3,911	3,911	0.19	3,966
2025	0.48	2.07	5.18	8.14	0.01	0.07	0.13	0.20	0.07	0.03	0.10	—	1,408	1,408	0.06	1,418
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.24	0.20	2.65	3.35	0.01	0.07	0.38	0.45	0.07	0.18	0.24	—	648	648	0.03	657
2025	0.09	0.38	0.95	1.48	< 0.005	0.01	0.02	0.04	0.01	0.01	0.02	—	233	233	0.01	235

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.51	1.83	0.65	3.02	< 0.005	0.05	0.00	0.05	0.05	0.00	0.05	43.3	763	806	4.40	919
Mit.	0.44	1.80	0.03	2.50	< 0.005	0.01	0.00	0.01	< 0.005	0.00	< 0.005	10.8	24.4	35.2	1.09	64.7
% Reduced	13%	2%	95%	17%	94%	90%	—	90%	92%	—	92%	75%	97%	96%	75%	93%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.07	1.42	0.63	0.53	< 0.005	0.05	0.00	0.05	0.05	0.00	0.05	43.3	753	796	4.40	909
Mit.	< 0.005	1.39	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	10.8	14.1	24.9	1.09	54.4
% Reduced	98%	2%	98%	98%	98%	98%	—	98%	98%	—	98%	75%	98%	97%	75%	94%

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.29	1.62	0.64	1.76	< 0.005	0.05	0.00	0.05	0.05	0.00	0.05	43.3	758	801	4.40	914
Mit.	0.22	1.59	0.02	1.24	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	10.8	19.2	30.0	1.09	59.5
% Reduced	24%	2%	97%	30%	96%	94%	—	94%	95%	—	95%	75%	97%	96%	75%	93%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.05	0.30	0.12	0.32	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	7.16	126	133	0.73	151
Mit.	0.04	0.29	< 0.005	0.23	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	1.79	3.17	4.96	0.18	9.84
% Reduced	24%	2%	97%	30%	96%	94%	—	94%	95%	—	95%	75%	97%	96%	75%	93%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Area	0.44	1.80	0.02	2.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.2	10.2	< 0.005	10.3
Energy	0.07	0.03	0.63	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	753	753	0.07	755
Water	—	—	—	—	—	—	—	—	—	—	—	3.18	0.00	3.18	0.33	13.6
Waste	—	—	—	—	—	—	—	—	—	—	—	40.1	0.00	40.1	4.01	140
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	0.51	1.83	0.65	3.02	< 0.005	0.05	0.00	0.05	0.05	0.00	0.05	43.3	763	806	4.40	919

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Area	—	1.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.07	0.03	0.63	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	753	753	0.07	755
Water	—	—	—	—	—	—	—	—	—	—	—	3.18	0.00	3.18	0.33	13.6
Waste	—	—	—	—	—	—	—	—	—	—	—	40.1	0.00	40.1	4.01	140
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	0.07	1.42	0.63	0.53	< 0.005	0.05	0.00	0.05	0.05	0.00	0.05	43.3	753	796	4.40	909
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Area	0.22	1.59	0.01	1.23	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.05	5.05	< 0.005	5.06
Energy	0.07	0.03	0.63	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	753	753	0.07	755
Water	—	—	—	—	—	—	—	—	—	—	—	3.18	0.00	3.18	0.33	13.6
Waste	—	—	—	—	—	—	—	—	—	—	—	40.1	0.00	40.1	4.01	140
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	0.29	1.62	0.64	1.76	< 0.005	0.05	0.00	0.05	0.05	0.00	0.05	43.3	758	801	4.40	914
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Area	0.04	0.29	< 0.005	0.22	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.84	0.84	< 0.005	0.84
Energy	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	125	125	0.01	125
Water	—	—	—	—	—	—	—	—	—	—	—	0.53	0.00	0.53	0.05	2.26
Waste	—	—	—	—	—	—	—	—	—	—	—	6.64	0.00	6.64	0.66	23.2
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00

Total	0.05	0.30	0.12	0.32	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	7.16	126	133	0.73	151

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Area	0.44	1.80	0.02	2.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.2	10.2	< 0.005	10.3
Energy	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.1	14.1	< 0.005	14.2
Water	—	—	—	—	—	—	—	—	—	—	—	2.79	0.00	2.79	0.29	12.0
Waste	—	—	—	—	—	—	—	—	—	—	—	8.02	0.00	8.02	0.80	28.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	0.44	1.80	0.03	2.50	< 0.005	0.01	0.00	0.01	< 0.005	0.00	< 0.005	10.8	24.4	35.2	1.09	64.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Area	—	1.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.1	14.1	< 0.005	14.2
Water	—	—	—	—	—	—	—	—	—	—	—	2.79	0.00	2.79	0.29	12.0
Waste	—	—	—	—	—	—	—	—	—	—	—	8.02	0.00	8.02	0.80	28.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	< 0.005	1.39	0.01	0.01	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	10.8	14.1	24.9	1.09	54.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Area	0.22	1.59	0.01	1.23	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.05	5.05	< 0.005	5.06
Energy	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.1	14.1	< 0.005	14.2
Water	—	—	—	—	—	—	—	—	—	—	—	2.79	0.00	2.79	0.29	12.0
Waste	—	—	—	—	—	—	—	—	—	—	—	8.02	0.00	8.02	0.80	28.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	0.22	1.59	0.02	1.24	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	10.8	19.2	30.0	1.09	59.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Area	0.04	0.29	< 0.005	0.22	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.84	0.84	< 0.005	0.84
Energy	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.34	2.34	< 0.005	2.35
Water	—	—	—	—	—	—	—	—	—	—	—	0.46	0.00	0.46	0.05	1.98
Waste	—	—	—	—	—	—	—	—	—	—	—	1.33	0.00	1.33	0.13	4.64
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	0.04	0.29	< 0.005	0.23	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	1.79	3.17	4.96	0.18	9.84

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	3.12	2.62	24.9	21.7	0.03	1.06	—	1.06	0.98	—	0.98	—	3,425	3,425	0.14	3,437
Demolition	—	—	—	—	—	—	0.44	0.44	—	0.07	0.07	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.12	2.62	24.9	21.7	0.03	1.06	—	1.06	0.98	—	0.98	—	3,425	3,425	0.14	3,437
Demolition	—	—	—	—	—	—	0.44	0.44	—	0.07	0.07	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.41	2.98	< 0.005	0.15	—	0.15	0.13	—	0.13	—	469	469	0.02	471
Demolition	—	—	—	—	—	—	0.06	0.06	—	0.01	0.01	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.62	0.54	< 0.005	0.03	—	0.03	0.02	—	0.02	—	77.7	77.7	< 0.005	77.9
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.04	0.66	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	131	131	< 0.005	133
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

Hauling	0.06	0.01	0.70	0.34	< 0.005	0.01	0.14	0.15	0.01	0.04	0.04	—	550	550	0.05	579
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	121	121	< 0.005	123
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.06	0.01	0.74	0.34	< 0.005	0.01	0.14	0.15	0.01	0.04	0.04	—	551	551	0.05	578
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.8	16.8	< 0.005	17.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	75.4	75.4	0.01	79.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.78	2.78	< 0.005	2.83
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.5	12.5	< 0.005	13.1

3.2. Demolition (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	0.41	11.9	18.2	0.03	0.20	—	0.20	0.19	—	0.19	—	3,425	3,425	0.14	3,437
Demolition	—	—	—	—	—	—	0.44	0.44	—	0.07	0.07	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	0.41	11.9	18.2	0.03	0.20	—	0.20	0.19	—	0.19	—	3,425	3,425	0.14	3,437
Demolition	—	—	—	—	—	—	0.44	0.44	—	0.07	0.07	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.06	1.63	2.49	< 0.005	0.03	—	0.03	0.03	—	0.03	—	469	469	0.02	471
Demolition	—	—	—	—	—	—	0.06	0.06	—	0.01	0.01	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.30	0.45	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	77.7	77.7	< 0.005	77.9
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.04	0.66	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	131	131	< 0.005	133
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.06	0.01	0.70	0.34	< 0.005	0.01	0.14	0.15	0.01	0.04	0.04	—	550	550	0.05	579
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	121	121	< 0.005	123

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.06	0.01	0.74	0.34	< 0.005	0.01	0.14	0.15	0.01	0.04	0.04	—	551	551	0.05	578
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.8	16.8	< 0.005	17.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	75.4	75.4	0.01	79.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.78	2.78	< 0.005	2.83
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.5	12.5	< 0.005	13.1

3.3. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	5,314
Dust From Material Movement	—	—	—	—	—	—	5.12	5.12	—	2.63	2.63	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	5,314

Dust From Material Movement	—	—	—	—	—	—	5.12	5.12	—	2.63	2.63	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.59	0.50	4.93	4.51	0.01	0.22	—	0.22	0.20	—	0.20	—	725	725	0.03	728
Dust From Material Movement	—	—	—	—	—	—	0.70	0.70	—	0.36	0.36	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.90	0.82	< 0.005	0.04	—	0.04	0.04	—	0.04	—	120	120	< 0.005	121
Dust From Material Movement	—	—	—	—	—	—	0.13	0.13	—	0.07	0.07	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.77	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	153	153	< 0.005	155
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.33	0.07	4.04	1.94	0.02	0.06	0.81	0.87	0.04	0.22	0.26	—	3,179	3,179	0.26	3,345
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.06	0.66	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	142	142	< 0.005	144

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.33	0.06	4.26	1.94	0.02	0.06	0.81	0.87	0.04	0.22	0.26	—	3,180	3,180	0.26	3,340
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.6	19.6	< 0.005	19.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.05	0.01	0.57	0.26	< 0.005	0.01	0.11	0.12	0.01	0.03	0.04	—	436	436	0.04	458
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.25	3.25	< 0.005	3.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	72.1	72.1	0.01	75.8

3.4. Site Preparation (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.64	14.7	28.3	0.05	0.10	—	0.10	0.10	—	0.10	—	5,296	5,296	0.21	5,314
Dust From Material Movement	—	—	—	—	—	—	5.12	5.12	—	2.63	2.63	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.64	14.7	28.3	0.05	0.10	—	0.10	0.10	—	0.10	—	5,296	5,296	0.21	5,314

Dust From Material Movement	—	—	—	—	—	—	5.12	5.12	—	2.63	2.63	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.09	2.02	3.88	0.01	0.01	—	0.01	0.01	—	0.01	—	725	725	0.03	728
Dust From Material Movement	—	—	—	—	—	—	0.70	0.70	—	0.36	0.36	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.37	0.71	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	120	120	< 0.005	121
Dust From Material Movement	—	—	—	—	—	—	0.13	0.13	—	0.07	0.07	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.77	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	153	153	< 0.005	155
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.33	0.07	4.04	1.94	0.02	0.06	0.81	0.87	0.04	0.22	0.26	—	3,179	3,179	0.26	3,345
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.06	0.66	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	142	142	< 0.005	144

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.33	0.06	4.26	1.94	0.02	0.06	0.81	0.87	0.04	0.22	0.26	—	3,180	3,180	0.26	3,340
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	19.6	19.6	< 0.005	19.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.05	0.01	0.57	0.26	< 0.005	0.01	0.11	0.12	0.01	0.03	0.04	—	436	436	0.04	458
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.25	3.25	< 0.005	3.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	72.1	72.1	0.01	75.8

3.5. Utilities and Prefab Buildings (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	5,314
Dust From Material Movement	—	—	—	—	—	—	5.11	5.11	—	2.63	2.63	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.78	0.66	6.50	5.95	0.01	0.29	—	0.29	0.27	—	0.27	—	958	958	0.04	961
Dust From Material Movement	—	—	—	—	—	—	0.92	0.92	—	0.47	0.47	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.12	1.19	1.09	< 0.005	0.05	—	0.05	0.05	—	0.05	—	159	159	0.01	159
Dust From Material Movement	—	—	—	—	—	—	0.17	0.17	—	0.09	0.09	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.77	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	153	153	< 0.005	155
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.03	0.01	0.35	0.17	< 0.005	0.01	0.07	0.08	< 0.005	0.02	0.02	—	276	276	0.02	291
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	25.9	25.9	< 0.005	26.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.0	50.0	< 0.005	52.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.29	4.29	< 0.005	4.35

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.28	8.28	< 0.005	8.70

3.6. Utilities and Prefab Buildings (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	5,314
Dust From Material Movement	—	—	—	—	—	—	5.11	5.11	—	2.63	2.63	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.78	0.66	6.50	5.95	0.01	0.29	—	0.29	0.27	—	0.27	—	958	958	0.04	961
Dust From Material Movement	—	—	—	—	—	—	0.92	0.92	—	0.47	0.47	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.12	1.19	1.09	< 0.005	0.05	—	0.05	0.05	—	0.05	—	159	159	0.01	159

Dust From Material Movement	—	—	—	—	—	—	0.17	0.17	—	0.09	0.09	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.77	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	153	153	< 0.005	155
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.03	0.01	0.35	0.17	< 0.005	0.01	0.07	0.08	< 0.005	0.02	0.02	—	276	276	0.02	291
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	25.9	25.9	< 0.005	26.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	50.0	50.0	< 0.005	52.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.29	4.29	< 0.005	4.35
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.28	8.28	< 0.005	8.70

3.7. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.26	1.90	18.2	18.8	0.03	0.84	—	0.84	0.77	—	0.77	—	2,958	2,958	0.12	2,969
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.89	0.89	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.08	0.75	0.77	< 0.005	0.03	—	0.03	0.03	—	0.03	—	122	122	< 0.005	122
Dust From Material Movement	—	—	—	—	—	—	0.08	0.08	—	0.04	0.04	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.14	0.14	< 0.005	0.01	—	0.01	0.01	—	0.01	—	20.1	20.1	< 0.005	20.2
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	0.01	0.01	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.04	0.66	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	131	131	< 0.005	133

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.51	0.10	6.18	2.98	0.03	0.09	1.24	1.32	0.06	0.34	0.40	—	4,866	4,866	0.40	5,120
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	5.05	5.05	< 0.005	5.12
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.26	0.12	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	200	200	0.02	210
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.84	0.84	< 0.005	0.85
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.1	33.1	< 0.005	34.8

3.8. Grading (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.39	0.39	10.3	17.8	0.03	0.08	—	0.08	0.08	—	0.08	—	2,958	2,958	0.12	2,969
Dust From Material Movement	—	—	—	—	—	—	1.86	1.86	—	0.89	0.89	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.42	0.73	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	122	122	< 0.005	122
Dust From Material Movement	—	—	—	—	—	—	0.08	0.08	—	0.04	0.04	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.08	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	20.1	20.1	< 0.005	20.2
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	0.01	0.01	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.04	0.66	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	131	131	< 0.005	133
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.51	0.10	6.18	2.98	0.03	0.09	1.24	1.32	0.06	0.34	0.40	—	4,866	4,866	0.40	5,120
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	5.05	5.05	< 0.005	5.12

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.26	0.12	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	200	200	0.02	210
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.84	0.84	< 0.005	0.85
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	33.1	33.1	< 0.005	34.8

3.9. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	0.34	3.18	3.72	0.01	0.14	—	0.14	0.13	—	0.13	—	680	680	0.03	683
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.58	0.68	< 0.005	0.03	—	0.03	0.02	—	0.02	—	113	113	< 0.005	113
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.06	1.06	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	210	210	< 0.005	213
Vendor	0.03	0.01	0.34	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	257	257	0.02	270
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	0.91	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	195	195	0.01	197
Vendor	0.03	0.01	0.36	0.17	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	257	257	0.02	269
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.25	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	55.8	55.8	< 0.005	56.7
Vendor	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	73.0	73.0	< 0.005	76.4
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.24	9.24	< 0.005	9.38
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.1	12.1	< 0.005	12.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

3.10. Building Construction (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.87	0.76	9.78	14.9	0.02	0.14	—	0.14	0.13	—	0.13	—	2,398	2,398	0.10	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.87	0.76	9.78	14.9	0.02	0.14	—	0.14	0.13	—	0.13	—	2,398	2,398	0.10	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.25	0.22	2.77	4.23	0.01	0.04	—	0.04	0.04	—	0.04	—	680	680	0.03	683
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.51	0.77	< 0.005	0.01	—	0.01	0.01	—	0.01	—	113	113	< 0.005	113
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.06	1.06	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	210	210	< 0.005	213
Vendor	0.03	0.01	0.34	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	257	257	0.02	270

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	0.91	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	195	195	0.01	197
Vendor	0.03	0.01	0.36	0.17	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	257	257	0.02	269
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.25	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	55.8	55.8	< 0.005	56.7
Vendor	0.01	< 0.005	0.10	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	73.0	73.0	< 0.005	76.4
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.24	9.24	< 0.005	9.38
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.1	12.1	< 0.005	12.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

3.11. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	0.47	4.33	5.41	0.01	0.18	—	0.18	0.16	—	0.16	—	995	995	0.04	998
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.09	0.79	0.99	< 0.005	0.03	—	0.03	0.03	—	0.03	—	165	165	0.01	165
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.06	0.98	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	206	206	< 0.005	209
Vendor	0.02	0.01	0.32	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	253	253	0.01	265
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.07	0.84	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	191	191	< 0.005	193
Vendor	0.02	0.01	0.34	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	253	253	0.01	264
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.03	0.03	0.03	0.34	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	80.0	80.0	< 0.005	81.2
Vendor	0.01	< 0.005	0.14	0.07	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	105	105	0.01	110
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.2	13.2	< 0.005	13.4
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	17.4	17.4	< 0.005	18.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

3.12. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.83	0.73	9.56	14.9	0.02	0.13	—	0.13	0.12	—	0.12	—	2,398	2,398	0.10	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.83	0.73	9.56	14.9	0.02	0.13	—	0.13	0.12	—	0.12	—	2,398	2,398	0.10	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.35	0.30	3.97	6.18	0.01	0.05	—	0.05	0.05	—	0.05	—	995	995	0.04	998

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.06	0.72	1.13	< 0.005	0.01	—	0.01	0.01	—	0.01	—	165	165	0.01	165
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.06	0.98	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	206	206	< 0.005	209
Vendor	0.02	0.01	0.32	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	253	253	0.01	265
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.07	0.84	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	191	191	< 0.005	193
Vendor	0.02	0.01	0.34	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	253	253	0.01	264
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.34	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	80.0	80.0	< 0.005	81.2
Vendor	0.01	< 0.005	0.14	0.07	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	105	105	0.01	110
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.2	13.2	< 0.005	13.4
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	17.4	17.4	< 0.005	18.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

3.13. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	1,517
Paving	—	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.86	1.15	< 0.005	0.04	—	0.04	0.04	—	0.04	—	174	174	0.01	175
Paving	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.16	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	—	28.8	28.8	< 0.005	28.9
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.05	0.05	0.04	0.61	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	129	129	< 0.005	131
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.9	13.9	< 0.005	14.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.29	2.29	< 0.005	2.33
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

3.14. Paving (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.41	0.37	7.28	10.3	0.01	0.13	—	0.13	0.12	—	0.12	—	1,511	1,511	0.06	1,517
Paving	—	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.84	1.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	174	174	0.01	175
Paving	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.15	0.22	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	28.8	28.8	< 0.005	28.9
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.61	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	129	129	< 0.005	131
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.9	13.9	< 0.005	14.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.29	2.29	< 0.005	2.33
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

3.15. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	134
Architectural Coatings	—	7.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	134
Architectural Coatings	—	7.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.21	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	31.1	31.1	< 0.005	31.2

Architectu Coatings	—	1.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.15	5.15	< 0.005	5.17
Architectu ral Coatings	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.20	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.2	41.2	< 0.005	41.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.17	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	38.2	38.2	< 0.005	38.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.98	8.98	< 0.005	9.11
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.49	1.49	< 0.005	1.51

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

3.16. Architectural Coating (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	134
Architectural Coatings	—	7.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	134
Architectural Coatings	—	7.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.21	0.27	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	31.1	31.1	< 0.005	31.2

Architectural Coatings	—	1.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.15	5.15	< 0.005	5.17
Architectural Coatings	—	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.20	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.2	41.2	< 0.005	41.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.17	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	38.2	38.2	< 0.005	38.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.98	8.98	< 0.005	9.11
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.49	1.49	< 0.005	1.51
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Elementar School	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementar y School	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementar y School	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementar y School	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementar y School	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.07	0.03	0.63	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	753	753	0.07	755
Total	0.07	0.03	0.63	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	753	753	0.07	755
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.07	0.03	0.63	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	753	753	0.07	755
Total	0.07	0.03	0.63	0.53	< 0.005	0.05	—	0.05	0.05	—	0.05	—	753	753	0.07	755
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	125	125	0.01	125
Total	0.01	0.01	0.12	0.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	125	125	0.01	125

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.1	14.1	< 0.005	14.2
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.1	14.1	< 0.005	14.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.1	14.1	< 0.005	14.2
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.1	14.1	< 0.005	14.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.34	2.34	< 0.005	2.35
Total	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.34	2.34	< 0.005	2.35

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	1.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	—	0.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.44	0.41	0.02	2.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.2	10.2	< 0.005	10.3
Total	0.44	1.80	0.02	2.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.2	10.2	< 0.005	10.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	1.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	1.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.04	0.04	< 0.005	0.22	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.84	0.84	< 0.005	0.84
Total	0.04	0.29	< 0.005	0.22	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.84	0.84	< 0.005	0.84

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	1.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.44	0.41	0.02	2.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.2	10.2	< 0.005	10.3
Total	0.44	1.80	0.02	2.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.2	10.2	< 0.005	10.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	1.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	1.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.04	0.04	< 0.005	0.22	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.84	0.84	< 0.005	0.84
Total	0.04	0.29	< 0.005	0.22	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.84	0.84	< 0.005	0.84

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	3.18	0.00	3.18	0.33	13.6
Total	—	—	—	—	—	—	—	—	—	—	—	3.18	0.00	3.18	0.33	13.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	3.18	0.00	3.18	0.33	13.6
Total	—	—	—	—	—	—	—	—	—	—	—	3.18	0.00	3.18	0.33	13.6
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	0.53	0.00	0.53	0.05	2.26
Total	—	—	—	—	—	—	—	—	—	—	—	0.53	0.00	0.53	0.05	2.26

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Elementary School	—	—	—	—	—	—	—	—	—	—	—	2.79	0.00	2.79	0.29	12.0
Total	—	—	—	—	—	—	—	—	—	—	—	2.79	0.00	2.79	0.29	12.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	2.79	0.00	2.79	0.29	12.0
Total	—	—	—	—	—	—	—	—	—	—	—	2.79	0.00	2.79	0.29	12.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	0.46	0.00	0.46	0.05	1.98
Total	—	—	—	—	—	—	—	—	—	—	—	0.46	0.00	0.46	0.05	1.98

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	40.1	0.00	40.1	4.01	140
Total	—	—	—	—	—	—	—	—	—	—	—	40.1	0.00	40.1	4.01	140
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Elementary School	—	—	—	—	—	—	—	—	—	—	—	40.1	0.00	40.1	4.01	140
Total	—	—	—	—	—	—	—	—	—	—	—	40.1	0.00	40.1	4.01	140
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	6.64	0.00	6.64	0.66	23.2
Total	—	—	—	—	—	—	—	—	—	—	—	6.64	0.00	6.64	0.66	23.2

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	8.02	0.00	8.02	0.80	28.1
Total	—	—	—	—	—	—	—	—	—	—	—	8.02	0.00	8.02	0.80	28.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	8.02	0.00	8.02	0.80	28.1
Total	—	—	—	—	—	—	—	—	—	—	—	8.02	0.00	8.02	0.80	28.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	1.33	0.00	1.33	0.13	4.64
Total	—	—	—	—	—	—	—	—	—	—	—	1.33	0.00	1.33	0.13	4.64

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Elementar School	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementar y School	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.22
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementar y School	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Urban	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urban	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urban	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urban	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urban	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urban	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	0.00

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	1/25/2024	4/3/2024	5.00	50.0	—
Site Preparation	Site Preparation	1/25/2024	4/3/2024	5.00	50.0	—
Utilities and Prefab Buildings	Site Preparation	5/1/2024	7/31/2024	5.00	66.0	—
Grading	Grading	4/4/2024	4/24/2024	5.00	15.0	—
Building Construction	Building Construction	8/9/2024	7/31/2025	5.00	255	—
Paving	Paving	5/1/2025	6/28/2025	5.00	42.0	—
Architectural Coating	Architectural Coating	1/1/2025	4/29/2025	5.00	85.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40

Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Utilities and Prefab Buildings	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Utilities and Prefab Buildings	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Tier 4 Interim	2.00	8.00	367	0.40

Demolition	Excavators	Diesel	Tier 4 Interim	3.00	8.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Tier 4 Interim	1.00	8.00	33.0	0.73
Site Preparation	Rubber Tired Dozers	Diesel	Tier 4 Interim	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	4.00	8.00	84.0	0.37
Utilities and Prefab Buildings	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Utilities and Prefab Buildings	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Tier 4 Interim	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Tier 4 Interim	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	3.00	8.00	84.0	0.37
Grading	Rubber Tired Dozers	Diesel	Tier 4 Interim	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Tier 4 Interim	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Tier 4 Interim	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Tier 4 Interim	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix

Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	7.54	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	43.6	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	66.7	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	24.0	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	9.38	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	4.81	11.7	LDA,LDT1,LDT2

Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
Utilities and Prefab Buildings	—	—	—	—
Utilities and Prefab Buildings	Worker	17.5	11.7	LDA,LDT1,LDT2
Utilities and Prefab Buildings	Vendor	—	8.40	HHDT,MHDT
Utilities and Prefab Buildings	Hauling	3.79	20.0	HHDT
Utilities and Prefab Buildings	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	7.54	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	43.6	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	66.7	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—

Building Construction	Worker	24.0	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	9.38	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	4.81	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
Utilities and Prefab Buildings	—	—	—	—
Utilities and Prefab Buildings	Worker	17.5	11.7	LDA,LDT1,LDT2
Utilities and Prefab Buildings	Vendor	—	8.40	HHDT,MHDT
Utilities and Prefab Buildings	Hauling	3.79	20.0	HHDT
Utilities and Prefab Buildings	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

Architectural Coating	0.00	0.00	85,830	28,610	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	32,750	—
Site Preparation	0.00	17,424	75.0	0.00	—
Utilities and Prefab Buildings	2,000	0.00	99.0	0.00	—
Grading	8,000	0.00	15.0	0.00	—
Paving	0.00	0.00	0.00	0.00	3.24

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Elementary School	3.24	72%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	0.00	0.00	0.00

2025	0.00	0.00	0.00	0.00

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Elementary School	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Elementary School	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	85,830	28,610	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00

Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Elementary School	253,910	0.00	0.0000	0.0000	2,349,503

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Elementary School	90,906	0.00	0.0000	0.0000	44,079

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Elementary School	1,659,204	936,596

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Elementary School	1,454,126	261,382

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Elementary School	74.4	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Elementary School	14.9	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Elementary School	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Elementary School	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Elementary School	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Elementary School	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Elementary School	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Elementary School	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Elementary School	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
Elementary School	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
Urban	Vertisols	5.20	5.20

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
Urban	Vertisols	5.20	5.20

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	12.7	annual days of extreme heat
Extreme Precipitation	4.40	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	8.55	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	1	0	0	N/A
Sea Level Rise	3	0	0	N/A

Wildfire	N/A	N/A	N/A	N/A
Flooding	2	0	0	N/A
Drought	5	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	1	1	1	2
Sea Level Rise	3	1	1	3
Wildfire	N/A	N/A	N/A	N/A
Flooding	2	1	1	3
Drought	5	1	1	4
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	5	1	1	4

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	13.6
AQ-PM	17.6
AQ-DPM	47.3
Drinking Water	38.1
Lead Risk Housing	41.1
Pesticides	0.00
Toxic Releases	27.6
Traffic	23.9
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	55.7
Haz Waste Facilities/Generators	10.5
Impaired Water Bodies	23.9
Solid Waste	0.00
Sensitive Population	—
Asthma	4.75
Cardio-vascular	5.30
Low Birth Weights	44.5
Socioeconomic Factor Indicators	—
Education	25.5
Housing	17.9
Linguistic	56.9
Poverty	24.2

Unemployment	1.34

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	71.50006416
Employed	83.35685872
Median HI	81.22674195
Education	—
Bachelor's or higher	98.13935583
High school enrollment	100
Preschool enrollment	95.7141024
Transportation	—
Auto Access	27.10124471
Active commuting	74.24611831
Social	—
2-parent households	43.07712049
Voting	92.44193507
Neighborhood	—
Alcohol availability	43.98819453
Park access	81.35506224
Retail density	79.52008212
Supermarket access	94.25125112
Tree canopy	83.08738612
Housing	—
Homeownership	48.80020531

Housing habitability	77.78775824
Low-inc homeowner severe housing cost burden	46.32362376
Low-inc renter severe housing cost burden	82.80508148
Uncrowded housing	81.14974978
Health Outcomes	—
Insured adults	98.47298858
Arthritis	0.0
Asthma ER Admissions	97.8
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	98.3
Cognitively Disabled	41.3
Physically Disabled	30.9
Heart Attack ER Admissions	92.1
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0

No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	84.8
Children	94.0
Elderly	13.7
English Speaking	40.9
Foreign-born	64.9
Outdoor Workers	90.1
Climate Change Adaptive Capacity	—
Impervious Surface Cover	54.0
Traffic Density	34.2
Traffic Access	71.8
Other Indices	—
Hardship	13.6
Other Decision Support	—
2016 Voting	91.5

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	6.00
Healthy Places Index Score for Project Location (b)	92.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

Measure Title	Co-Benefits Achieved
CE-3: Post a Clear, Visible Enforcement and Complaint Sign	—
PH-1: Establish Vegetative Barriers to Reduce Pollution Exposure	—
PH-2: Increase Urban Tree Canopy and Green Spaces	—

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Earth moving activities include removal of all hard and softscapes beyond just building pads.
Construction: Construction Phases	Per construction contractor
Construction: Paving	Per architect
Operations: Vehicle Data	No new trips

Appendix B

Cultural Resources Report (Confidential. Not included within this report.)

Appendix C

Geotechnical Study

CORNERSTONE EARTH GROUP

TYPE OF SERVICES	Geotechnical Investigation and Geologic Hazards Evaluation
PROJECT NAME	Hoover Elementary School Re-Design
LOCATION	445 E. Charleston Road Palo Alto, California
CLIENT	Palo Alto Unified School District
PROJECT NUMBER	288-11-4
DATE	March 24, 2023

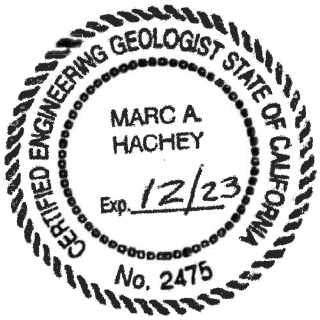


CORNERSTONE EARTH GROUP

Type of Services	**Geotechnical Investigation and Geologic Hazards Evaluation**
Project Name	**Hoover Elementary School Re-Design**
Location	**445 E. Charleston Road Palo Alto, California**
Client	**Palo Alto Unified School District**
Client Address	**25 Churchill Avenue Palo Alto, California**
Project Number	**288-11-4**
Date	**March 24, 2023**



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CORNERSTONE EARTH GROUP

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CORNERSTONE EARTH GROUP

Type of Services	**Geotechnical Investigation and Geologic Hazards Evaluation**
Project Name	**Hoover Elementary School Re-Design**
Location	**445 E. Charleston Avenue** **Palo Alto, California**

SECTION 1: INTRODUCTION

This geotechnical investigation and geologic hazards evaluation report was prepared for the sole use of Palo Alto Unified School District for the Hoover Elementary School Re-Design project in Palo Alto, California. As you know, we have previously prepared a geotechnical investigation and geologic hazards evaluation report titled "Geotechnical Investigation and Geologic Hazards Evaluation, Hoover Elementary School Modernization, 445 E. Charleston Road, Palo Alto, California," dated March 7, 2017. The location of the site is shown on the Vicinity Map, Figure 1. The site is located at Latitude 37.41486°N and Longitude -122.11433°W.

For our use, we were provided with the following documents:

- A site plan titled "Hoover ES Replacement Campus, Increment #1, Palo Alto Unified School District," Sheet 2-AA0.01, prepared by Aedis Architects, dated February 20, 2023.
- An untitled topographic survey of existing school, undated.
- A previous geotechnical report titled "Geotechnical Investigation, Proposed Classroom Building, J. L. Stanford Middle School, Palo Alto, California," prepared by Kleinfelder, dated February 22, 2000.

1.1 PROJECT DESCRIPTION

We understand the project includes a new re-design of the Hoover Elementary School campus which includes demolishing the existing classrooms, multipurpose building, library, and administration building. We understand the new classroom building is two-story while the remainder of the new buildings are single story. Based on discussions with you, we understand the new buildings will have building footprints ranging between 4,520 square feet and 18,735 square feet. The new campus will have a total building square footage of approximately 37,765

square feet (including the classroom building second story). New parking and drop off area is planned for the eastern side of the school campus. New blacktop and other outdoor play and learning spaces, including play structure, basketball courts, and student garden are planned for the remainder of the site. Appurtenant utilities, retaining walls, landscaping, and other improvements necessary for site development are also planned.

Structural loads provided by Daedalus Structural Engineering, the project structural engineer, range from 53 to 136 pounds per square foot for dead plus live loads on the structures and footing dead plus live loads ranging from 1,040 to 2,400 pounds per lineal foot. Minor cuts and fills will be required as part of the overall project.

1.2 SCOPE OF SERVICES

Our scope of services was presented in our proposal dated March 29, 2022 and consisted of field and laboratory programs to evaluate physical and engineering properties of the subsurface soils, engineering analysis to prepare recommendations for site work and grading, building foundations, flatwork, retaining walls, and pavements, and preparation of this report. Brief descriptions of our exploration and laboratory programs are presented below.

1.3 PREVIOUS FIELD EXPLORATION BY CORNERSTONE

As discussed above, we performed a geotechnical investigation and geologic hazards evaluation in 2017. Our previous field exploration consisted of three borings drilled on January 16, 2017 with truck-mounted, hollow-stem auger drilling equipment and four Cone Penetration Tests (CPTs) advanced on January 21, 2017. The borings were drilled to depths of approximately 21½ to 35 feet; the CPTs were advance to depths of approximately 50 to 100 feet. Seismic shear wave velocity measurements were collected from CPT-4. One of the borings (Boring EB-3) was advanced adjacent to CPT-2 for direct evaluation of physical samples to correlated soil behavior.

The borings and CPTs were backfilled with cement grout in accordance with local requirements; exploration permits were obtained as required by local jurisdictions.

The approximate locations of our exploratory borings are shown on the Site Plan and Geologic Map, Figure 2. Details regarding our previous field program are included in Appendix D.

1.4 EXPLORATION PROGRAM

Field exploration consisted of two borings drilled on April 8, 2022 with truck-mounted, hollow-stem auger drilling equipment and three Cone Penetration Tests (CPTs) advanced on April 6, 2022. The borings were drilled to depths of 30 to 40 feet; the CPTs were advanced to depths of 45 feet. Two of the borings (Boring EB-4 and EB-5) were advanced adjacent to CPT-5 and CPT-7, respectively, for direct evaluation of physical samples to correlated soil behavior. The borings and CPTs were backfilled with cement grout in accordance with local requirements.

The approximate locations of our exploratory borings are shown on the Site Plan and Geologic Map, Figure 2. Details regarding our field program are included in Appendix A.

1.5 PREVIOUS EXPLORATION BY OTHERS

Kleinfelder previously performed eight exploratory borings at the site using truck-mounted, hollow-stem auger drilling equipment on December 23, 24, and 26, 1996. The borings were drilled to depths ranging from 16½ to 41½ feet. The approximate locations of the previous exploratory borings are shown on the Site Plan and Geologic Map, Figure 2. Previous boring logs are provided in Appendix E.

1.6 LABORATORY TESTING PROGRAM

In addition to visual classification of samples, the laboratory program focused on obtaining data for foundation design and seismic ground deformation estimates. Testing included moisture contents, dry densities, washed sieve analyses, Plasticity Index tests, one-dimension consolidation, and triaxial compression tests. Details regarding our current and previous laboratory program are included in Appendix B.

1.7 CORROSION EVALUATION

Three samples from our borings from depths from 2 to 6 feet were tested for saturated resistivity, pH, and soluble sulfates and chlorides. In general, the on-site soils can be characterized as very severely corrosive to buried metal, and not corrosive to buried concrete. Please refer to Section 3 for further information.

1.8 ENVIRONMENTAL SERVICES

Environmental services were not requested for this project. If environmental concerns are determined to be present during future evaluations, the project environmental consultant should review our geotechnical recommendations for compatibility with the environmental concerns.

SECTION 2: REGIONAL SETTING

2.1 GEOLOGIC SETTING

2.1.1 Regional Geologic Setting

The relatively flat-lying plain along the southwestern edge of the San Francisco Bay is bound by the Santa Cruz Mountains on the west and the San Francisco Bay to the east. The site is situated in the Coast Ranges geomorphic province of California, which stretches from the Oregon border nearly to Point Conception. In the San Francisco Bay area, most of the Coast Ranges has developed on a basement of tectonically mixed Cretaceous- and Jurassic-age (70- to 200-million years old) rocks of the Franciscan Complex. Younger sedimentary and volcanic units locally cap these basement rocks. Still younger surficial deposits that reflect geologic conditions of the last million years or so cover most of the Coast Ranges.

Movement on the many splays of the San Andreas Fault system has produced the dominant northwest-oriented structural and topographic trend seen throughout the Coast Ranges today. This trend reflects the boundary between two of the Earth's major tectonic plates: the North American plate to the east and the Pacific plate to the west. The San Andreas Fault system is and its major branch faults is about 40 miles wide in the Bay area and extends from the San Gregorio Fault near the coastline to the Coast Ranges-Central Valley blind thrust at the western edge of the Great Central Valley as shown on the Regional Fault Map, Figure 3. The San Andreas Fault is the dominant structure in the system, nearly spanning the length of California, and capable of producing the highest magnitude earthquakes. Many other subparallel or branch faults within the San Andreas system are equally active and nearly as capable of generating large earthquakes. Right-lateral movement dominates on these faults but an increasingly large amount of thrust faulting resulting from compression across the system is now being identified also.

2.1.2 Local Geology

Published geologic maps covering the region of the site show the Hoover Elementary School campus area and surrounding areas as underlain by Holocene Alluvial fan deposits (Dibblee, 1972; Helley et al., 1994; Kuudsen et al., 2000, CGS, 2006; Dibblee and Minch, 2007). The map of the California Geologic Survey (2006) is shown on Figure 4, Vicinity Geologic Map (The CGS published “Quaternary Geologic Map of the Mountain View 7.5-minute Quadrangle, as modified from Knudson and others, 2000). This map shows the school campus and surrounding areas as underlain by Holocene Alluvial fan (fine-grained facies), Qhff. A compilation of 69 geotechnical tests within the unit compiled by the CGS within the Mountain View Quadrangle indicates that the Qhff unit averaged 64% lean clay, and 30% fat clay (CGS, 2006). 735 tests compiled within the adjacent Palo Alto Quadrangle produced averages of 76% lean clay, 8% silty sand, 5% clayey sand, 5% silt, and 6% other soil constituents. The Qhf unit (Holocene alluvial fan deposits) is mapped as being just beyond the southwest campus property line. A compilation of 223 geotechnical tests within the unit indicates that the Qhf unit averaged 48% lean clay, 12% sandy clay, 10% silty sand, 10% poorly graded sand, and 20% other soil constituents (CGS, 2006). Generalized mapping in the area suggests that the Holocene alluvial fan geologic units are underlain at an unknown depth by Pleistocene alluvial fan deposits. The mapping of Pampeyan for the adjacent quadrangle (Palo Alto 7.5-minute Quadrangle) suggest the hard rock basement may be over 1,000 feet beneath the ground surface (Pampeyan 1993).

2.2 REGIONAL SEISMICITY

The San Francisco Bay area is recognized by geologists and seismologists as one of the most seismically active regions in the United States. Significant earthquakes occurring in the Bay area are generally associated with crustal movement along well-defined, active fault zones of the San Andreas Fault system. A regional fault map is presented as Figure 3, illustrating the relative distances of the site to significant fault zones. Figure 5 also shows regional faults with historical earthquake information superimposed.

The faults considered capable of generating significant earthquakes are generally associated with the well-defined areas of crustal movement, which trend northwesterly. Tables 1A and 1B

list all known active faults in order of increasing distance within 100 kilometers (62 miles) of the site. The fault distances presented in Table 1A are based on USGS fault and fold database for the faults considered significant. The fault distances presented in Table 1B are based on the 2014 Unified Hazard Tool (UHT). The seismic characteristics of some faults vary along its length so different segments of the same fault could be listed separately in the table. We have presented three different fault sources to provide a comprehensive look at the faults considered significant to the project site. At this time, the USGS fault model is only available in the UHT format and we are not aware of an option for a fault distance search. Therefore, we have compiled a list of faults considered geologically significant within 100 km based on the USGS fault and fold database (Table 1A). We have also included faults considered significant in the UHT (Table 1B).

Table 1A: Approximate Fault Distances (USGS Fault Database)

Fault Name	Distance	
	(miles)	(kilometers)
Palo Alto/San Jose	0.6	1.0
Stanford	1.0	1.6
Monte-Vista Shannon	3.5	5.6
San Andreas	6.6	10.6
Hayward-Rogers Creek	11.8	19.0
Calaveras	16.3	26.2
San Gregorio Connected	16.5	26.6
Zayante-Vergeles	18.4	29.6
Mount Diablo Thrust	26.7	43.0
Greenville Connected	30.4	49.0
Concord	33.9	54.6
Great Valley	38.6	62.1
Green Valley Connected	45.0	72.4
Ortigalita	48.0	77.3
West Napa	51.1	82.2
Monterey Bay - Tularcitos	55.4	89.1

Table 1B: Approximate Fault Distances (USGS 2014 via UHT)

Fault Name	Distance	
	(miles)	(kilometers)
Monte-Vista Shannon [2]	3.9	6.2
Monte-Vista Shannon [1]	4.3	6.9
Monte-Vista Shannon [3]	4.7	7.6
San Andreas (Peninsula) [4]	6.6	10.6
San Andreas (Peninsula) [3]	6.8	10.9
Hayward So [1]	12.0	19.3

While seismologists cannot predict earthquake events, geologists from the U.S. Geological Survey have recently updated (in 2015) earlier estimates from their 2014 Uniform California Earthquake Rupture Forecast (Version 3; UCERF3) publication. The estimated probability of one or more magnitude 6.7 earthquakes (the size of the destructive 1994 Northridge earthquake) expected to occur somewhere in the San Francisco Bay Area has been revised (increased) to 72 percent for the period 2014 to 2043 (Aagaard et al., 2016). The faults in the region with the highest estimated probability of generating damaging earthquakes between 2014 and 2043 are the Hayward (33%), Calaveras (26%), and San Andreas Faults (22%). In this 30-year period, the probability of an earthquake of magnitude 6.7 or larger occurring is 22 percent along the San Andreas Fault and 33 percent for the Hayward Fault.

2.3 HISTORICAL EARTHQUAKES

Figure 5 shows the epicenters of historical earthquakes within approximately 100 kilometers of the site. we also performed a catalogue search of known historical earthquakes of magnitude 5 or greater within approximately 100-kilometer radius of the site from 1906 to present using the USGS computer program located at http://earthquake.usgs.gov/earthquakes/search/. The results generated from that search are listed in Table 2.

Table 2: Magnitude 5 or Larger Earthquakes within 100 km

Date	Magnitude
8/24/2014	6.0
10/31/2007	5.5
5/14/2002	5.0
8/12/1998	5.1
4/18/1990	5.1
4/18/1990	5.4

Table 2 continues on next page.

Table 2: Magnitude 5 or Larger Earthquakes within 100 km (continued)

Date	Magnitude
10/18/1989	5.1
10/18/1989	6.9
8/08/1989	5.4
6/27/1988	5.3
6/13/1988	5.3
2/20/1988	5.1
3/31/1986	5.7
4/24/1984	6.2
01/27/1980	5.4
1/24/1980	5.1
1/24/1980	5.8
8/06/1979	5.8
11/28/1974	5.2
12/18/1967	5.3
11/16/1964	5.2
9/14/1963	5.4
1/20/1960	5.0
3/2/1959	5.3
3/22/1957	5.7
9/05/1955	5.8
4/25/1954	5.3
6/24/1939	5.5
12/13/1933	5.0
2/15/1927	5.0
10/22/1926	6.1
10/22/1926	6.3
10/22/1926	6.4
8/8/1916	5.0
7/1/1911	6.5
12/31/1910	5.0
3/11/1910	5.8
4/18/1906	7.9

2.4 MAXIMUM PAST GROUND SHAKING

Due largely to the sparse nature of the population in the area at the time, very few observations of the 1868 Hayward earthquake record specific evidence for liquefaction in the region. No anecdotal accounts were available for the Palo Alto area. As a result of the 1906 earthquake, Lawson (Lawson et al., 1908) was the first investigation of damage over the entire felt area of the April 18, 1906 earthquake. The report documented earthquake effects felt by people and damage to structures and included a series of regional isoseismal intensity maps according to the then-current Rossi–Forel scale. Toppozada et al. (1982) relied on the earlier work of Lawson et al. (1908) and Nason (1980a, 1980b, and 1982), as well as newspaper reports of damage, to interpret intensities at the scale of towns or cities. The 1906 earthquake on the San Andreas Fault was the highest magnitude earthquake recorded in California. The area of the site was sparsely populated however, and therefore the main sources of information come from residents of areas of concentrated population such as downtown San Jose and Los Gatos. Lawson (1908, p. 246) described damage resulting from the 1906 earthquake in the downtown area of San Jose as “severe structural damage to many brick and mortar buildings” and many chimneys were toppled. The main part of San Jose and surrounding areas shook at Rossi-Forel intensity VIII (many chimneys fall) to IX (partial or complete collapse of some buildings). Witter et al. (2001) indicate four historical occurrences of ground deformation within the “Qhl” mapping unit (alluvial fan levee deposits), mapped to the northeast of the site. However, these documented ground failures were concentrated close to the San Francisco bay a few miles north-northeast of the site. The Loma Prieta earthquake of 1989 was smaller in magnitude (M 6.9) than the 1906 earthquake (M 8.25) but its epicenter was further away from the site than the 1906 quake. Schmidt et al. (1995) indicate that breaks in concrete sidewalks occurred during the Loma Prieta Earthquake in the general area of the site but were sparsely distributed without an overall pattern. Based on the previous studies, Stover and Coffman (1993) employed a recalibrated 1931 MMI scale (Wood and Neumann, 1931) to produce a small-scale isoseismal map for the 1906 felt area. More recently, Boatwright and Bundock (2005) relocated numerous damage points from the Lawson report and used their recalibrated MMI scale to create a ShakeMap for the 1906 earthquake. In these studies, intensity assigned to the vicinity of Palo Alto was MMI 8–9. According to Lawson et al. (1908), 70% of chimneys in the Palo Alto-Menlo Park area during the 1906 earthquake. Shostak (2008) indicates an earthquake (MMI) shaking intensity in the vicinity equal to 8.5. As a comparison, the general area experienced a shaking intensity equal to approximately 7.1 in the 1989 Loma Prieta Earthquake (Shostak, 2008).

SECTION 3: SITE CONDITIONS

3.1 SITE HISTORY

Vertical aerial images reviewed for the current study show the site vicinity at various times spanning the period from 1948 to 2012. The 1948 photos show that the site and surrounding parcels were undeveloped and used for agriculture with extensive fields of row crops dominating the area. The Adobe Creek is not apparent at its current location in these pre-development photos. It appears that between 1948 and 1956 Adobe Creek was re-routed to its current location. Prior to 1956, the creek appears to have run alongside East Charleston Road along the section that now runs approximately 800 feet northwest of the road. The 1956 photos show

that the two primary classroom complexes were already present. The grass play field was already present just beyond the north side of the complex. Interior paved access drives were also present. A review of subsequent photographs (post 1958) revealed that between 1993 and 1998 several of the portable classroom buildings on the southwest side of the school were constructed with the remaining portable classroom buildings constructed between 1998 and 2002. Since 2002, the school site has remained largely unchanged.

3.2 SITE RECONNAISSANCE AND SURFACE DESCRIPTION

The project site is located at 445 E. Charleston Road in Palo Alto, California, at Latitude 37.41486°N and Longitude -122.11433°W. Our Certified Engineering Geologist performed a reconnaissance of the site on April 27, 2022. At the time of the reconnaissance, the area of the proposed two-story classroom building was occupied by a blacktop ball court on the north portion and lawn and existing classroom buildings on the south portion. The area is essentially topographically flat. The area of the proposed new administration building on the south side of the site is occupied primarily by a lawn area with a blacktop ball court on a small portion of the eastern edge. A new muli-purpose building is proposed in the western corner of the site currently occupied existing portable classrooms and asphalt concrete pavement where previous portables were recently removed. The campus property and adjacent area is nearly topographically flat with extensive development in the form of various buildings, asphalt and concrete paved surfaces, and landscaping. Accordingly, there are no exposures of subsurface materials near the campus. There are no slopes of any significance within several hundred feet of the campus.

3.3 SITE GEOLOGY AND SUBSURFACE CONDITIONS

The school campus is located on a very gently inclined alluvial fan surface between the foothills of the Peninsula segment of the Santa Cruz Mountains to the southwest and the tidal flats of the San Francisco Bay to the northeast. This alluvial fan surface has been dissected by creeks including the San Francisquito Creek to the northwest of the site.

Below the surface pavements, Borings EB-4 encountered undocumented fill consisting of hard sandy fat clay to a depth of about 1¾ feet below existing grades. Below the surface pavements and undocumented fill, our explorations generally encountered 4½ to 5½ feet of stiff to had fat clay. Beneath the fat clay, Borings EB-1 and EB-2 encountered very stiff to hard sandy lean clay with varying amounts of sand and gravel to a depth of approximately 8 feet underlain by medium dense to very dense sands with varying amounts of clay, silt, and gravel to depths of approximately 13 to 28½ feet. Beneath the sands, Borings EB-1 and EB-2 encountered medium stiff to very stiff lean clays with varying amounts of sand to depths of 29½ to 35 feet, or maximum depth of borings, respectively. Beneath the fat clay, Boring EB-3 encountered medium dense clayey sand with varying amounts of gravel to a depth of 12½ feet underlain by a layer of medium dense poorly graded sand with silt and gravel to a depth of 17 feet. Beneath the poorly graded sand, EB-1 encountered loose clayey sand to a depth of 20½ feet underlain by stiff sandy lean clay to a depth of 21½ feet, or maximum depth of boring. Beneath the fat clay, Boring EB-4 encountered very stiff sandy lean clay to a depth of about 9¾ feet underlain by loose poorly graded sand with silt and gravel to a depth of about 13 feet below existing

grades. Below the loose sand, Boring EB-4 encountered very stiff sandy lean clay to a depth of about 17 feet underlain by loose to medium dense poorly graded sand with silt and gravel to a depth of about 27 feet and stiff lean clay with sand to the terminal boring depth of 30 feet below existing grades. Below the fat clay, Boring EB-5 encountered medium stiff to very stiff lean clay with varying amounts of sand underlain by medium dense clayey sand with gravel to the terminal boring depth of 40 feet below existing grades.

Below the surface pavements, our CPTs generally encountered interbedded layers of medium stiff to hard clays with varying amounts of silt and sand and medium dense to very dense sands with varying amounts of clay and silt to the maximum depth explored of 100 feet.

Explorations performed by Kleinfelder in 1996 (Kleinfelder, 2000) generally encountered 3 to 5 feet of medium stiff to very stiff fat clay below the ground surface or surface pavements. Beneath the fat clay, the explorations generally encountered interbedded layers of medium stiff to very stiff lean clays with varying amounts of sands and silts and loose to medium dense sands with varying amounts of silts and gravels to the maximum boring depths of 41½ feet.

Our explorations encountered alluvial soils to a depth of approximately 100 feet, or maximum depth explored. As already mentioned, the CGS have mapped the Qhff unit at the site and the Qhf unit just beyond the south property line. Based on the characterization by CGS of the Qhff and Qhf mapping units, we infer the soils encountered beneath the depth range of 8 to 10 feet belong to the Qhf unit (see Cross Sections A-A' and B-B'). The subsurface materials generally conform to the published description of the Qhff geologic unit.

Our interpretations of the subsurface conditions are presented on the Geologic Cross-Sections A-A' and B-B', Figures 6 and 7.

3.3.1 Plasticity/Expansion Potential

We performed five Plasticity Index (PI) tests on representative samples. Test results were used to evaluate expansion potential of surficial soils, and the plasticity of the fines in potentially liquefiable layers. The results of the surficial PI tests indicated PIs ranging from 46 to 47, indicating high expansion potential to wetting and drying cycles. The results of the PI tests in the potentially liquefiable layers indicated PIs of 18 to 24.

3.3.2 In-Situ Moisture Contents

Laboratory testing indicated that the in-situ moisture contents within the upper 10 feet range from about optimum to about 12 percent over the estimated laboratory optimum moisture.

3.4 GROUNDWATER

Groundwater was encountered in our Exploratory Borings EB-1 through EB-5 at depths of approximately 9½ to 10½ feet below current grades. Pore pressures were inferred from CPT-1, CPT-3, CPT-4, CPT-5, CPT-6, and CPT-7 at depths of approximately 12.5, 14.2, 14.7, 11.7, 10.5, and 29.2 feet below current grades, respectively. All measurements were taken at the

time of drilling and may not represent the stabilized levels that can be higher or lower than the initial levels encountered.

Previous Exploratory Borings at the site performed by Kleinfelder in 1996 (Kleinfelder, 2000) encountered groundwater at depths of approximately 7½ to 10 feet below current grades.

The depth to historic high groundwater is estimated to be approximately 6 feet below the existing grade (CGS, Mountain View 7.5 Minute Quadrangle, 2006). Fluctuations in groundwater levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors.

We also reviewed groundwater data available online from the website GeoTracker, https://geotracker.waterboards.ca.gov/. Nearby monitoring well data indicates that groundwater has been measured at depths of approximately 5 to 14½ feet at wells located east of the site at 699-705 San Antonio Road from October 2001 to December 2007. We note that these wells are located closer to the San Francisco Bay and CGS maps historic high groundwater in this area at less than 5 feet below existing grades (CGS, Mountain View 7.5 Minute Quadrangle, 2006).

Based on the above, we recommend a design groundwater depth of 6 feet. Fluctuations in groundwater levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors.

3.5 CORROSION SCREENING

We tested three samples collected at depths of 1½ to 3½ feet for resistivity, pH, soluble sulfates, and chlorides. The laboratory test results are summarized in Table 3A.

Table 3A: Summary of Corrosion Test Results

Sample Location	Depth (feet)	Soil pH[1]	Resistivity[2] (ohm-cm)	Chloride[3] (mg/kg)	Sulfate[4,5] (mg/kg)
EB-1	3	7.7	914	3	18
EB-2	1½	7.7	871	9	56
EB-4	3½	6.7	637	6	56

Notes: [1]ASTM G51
[2]ASTM G57 - 100% saturation
[3]ASTM D3427/Cal 422 Modified
[4]ASTM D3427/Cal 417 Modified
[5]1 mg/kg = 0.0001 % by dry weight

Many factors can affect the corrosion potential of soil including moisture content, resistivity, permeability, and pH, as well as chloride and sulfate concentration. Typically, soil resistivity, which is a measurement of how easily electrical current flows through a medium (soil and/or water), is the most influential factor. In addition to soil resistivity, chloride and sulfate ion concentrations, and pH also contribute in affecting corrosion potential.

3.5.1 Preliminary Soil Corrosion Screening

Based on the laboratory test results summarized in Table 3A and published correlations between resistivity and corrosion potential, the soils may be considered very severely corrosive to buried metallic improvements (Chaker and Palmer, 1989).

In accordance with the 2019 CBC Section 1904A.1, alternative cementitious materials for different exposure categories and classes shall be determined in accordance with ACI 318-19 Table 19.3.1.1, Table R19.3.1, and Table 19.3.2.1. Based on the laboratory sulfate test results, a cement type restriction is not required, although, in our opinion, it is generally a good idea to include some sulfate resistance and to maintain a relatively low water-cement ratio. We have summarized applicable exposure categories and classes from ACI 318-19, Table 19.3.1.1 below in Table 3B.

Table 3B: ACI 318-19 Table 19.3.1.1 Exposure Categories and Classes

Freezing and Thawing (F)	Sulfate (S, soil)	In Contact with Water (W)	Corrosion Protection of Reinforcement (C)
F0[1]	S0[2]	W0[3]	C0[4]

1 (F0) “Concrete not exposed to freezing-and-thawing cycles” (ACI 318-19)
2 (S0) “Water soluble sulfate in soil, percent by mass” (ACI 318-19)
3 (W0) “Concrete dry in service” (ACI 318-19)
4 (C0) “Concrete dry or protected from moisture” (ACI 318-19)

We recommend the structural engineer and a corrosion engineer be retained to confirm the above information and provide additional recommendations, as needed.

3.6 IN-SITU WATER INFILTRATION

To estimate the infiltration rate of the soils at locations and depths provided to us by the civil engineer for the project, we performed five in-situ field infiltration tests using a Guelph permeameter by SoilMoisture Equipment Corp., Model #2800, in general accordance with ASTM D5126. Generally, the Guelph permeameter is a constant head device which uses two water-filled chambers to measure infiltration rate in a shallow borehole. A constant head level is established in the borehole and the rate of water outflow into the surrounding soil is noted. The rate of flow when it reaches a steady state, or constant rate, is used to determine an approximate infiltration rate for that location and depth.

The approximate location of the field infiltration tests (P-1 through P-5) are shown on the Site Plan and Geologic Map, Figure 2. The infiltration tests were performed at an approximate depth of 6 feet below existing site grades. The test results are summarized in Table 4.

Table 4: In-Situ Field Guelph Permeameter Test Results

Location	Depth Below Existing Grade (ft)	3D Infiltration Rate (in/hr)
P-1	6	19.1
P-2	6	10.0
P-3	6	0.7
P-4	6	0.5
P-5	6	3.1

3.6.1 Reliability of Field Test Data

Test results may not be truly indicative of the long-term, in-situ infiltration. Other factors including stratifications, heterogeneous deposits, overburden stress, disturbance, organic content, depth to groundwater, and other factors can influence test results. In addition, for stratified soils such as those encountered at the site, the average horizontal infiltration is typically greater than the average vertical infiltration.

3.6.2 Findings and Recommendations

Based on our findings, the soil at the locations tested and at depths of about 6 feet below existing grade have infiltration rates ranging from about 0.5 to 19.1 inches per hour. Based on our test results, the in-situ field tests indicated highly variable rated ranging from low to high infiltration rates at the depth and locations tested. Based on our experience, we anticipate the low infiltration rates in P-3 and P-4 to be representative of the fat clay encountered in the upper 4½ to 5½ feet and the moderate to high infiltration rates in P-1, P-2, and P-5 to be representative of the sandy clay and sands encountered below the upper clays.

We recommend the above estimate be confirmed in the field at the time of construction, as required. In addition, the project civil engineer should review the above information and provide additional recommendations as deemed necessary.

3.6.3 General Comments and Design Considerations

As discussed, the tests were performed at discrete locations and depth. In addition, some disturbance in preparing the test holes may have occurred. Therefore, the above results can vary significantly and may not be representative over the entire site. Localized areas/depths with higher or lower permeable materials can increase or decrease the actual infiltration rates. Therefore, we recommend the potential for variations be considered when evaluating the soil infiltration capacity or performance.

SECTION 4: GEOLOGIC HAZARDS

This section provides our geologic hazards review, as per the requirements of the Division of State Architects (DSA), the Office of Regulatory Services (ORS), and the CGS, formerly CDMG for the Hoover Elementary School Re-Design project, located in Palo Alto, California, at Latitude

37.41480°N and Longitude -122.11433°W. Our comments concerning potential hazards are presented below.

4.1 FAULT SURFACE RUPTURE

As discussed above several significant faults are located within 25 kilometers of the site. However, no faults have been mapped as trending through the site (Rogers and Williams, 1974; Brabb et al., 2000; Dibblee and Minch, 2005; Graymer et al., 2006; U.S.G.S., 2006). The site is not located within a currently designated Alquist-Priolo Earthquake Fault Zone, known formerly as a Special Studies Zone (CDMG, 1974a), nor is it located within a Santa Clara County Fault Hazard Zone. No tonal evidence or geomorphic evidence of fault surface traces was noted in our review of aerial images and site reconnaissance. No abrupt changes in the local ground water were noted. As shown in Figure 3, no known surface expression of fault traces is thought to cross the site; therefore, fault rupture hazard is not a significant geologic hazard at the site.

4.2 HISTORICAL GROUND FAILURES

Earthquakes have affected the site in the past and strong ground shaking accompanying large earthquakes on the San Andreas and other minor faults in the area must have resulted from them. Within the Mountain View Quadrangle, Youd and Hoose (1978) compiled two instances of ground failure recorded following the 1906 earthquake. Ground settlement was recorded at the location of Moffett Field (3.25 miles east of the site). Four instances of ground failure were recorded in the adjacent Palo Alto Quadrangle. One of the incidents occurred in Holocene alluvial fan deposits (Qhf), two incidents occurred in Holocene levee deposits (Qhl), and one incident occurred in Bay mud deposits (Qhbm, afbm). The report by Lawson and others (1908) noted that in addition to ground cracks, lateral spreading was observed in the Palo Alto-Menlo Park area. Youd and Hoose (1978) includes a report by Gilbert and others (1907) noting the absence of earthquake-induced ground failure in Bay mud deposits in the northeast corner of the Palo Alto Quadrangle, in the vicinity of the Dumbarton Bridge.

4.3 ESTIMATED GROUND SHAKING

Moderate to severe (design-level) earthquakes can cause strong ground shaking, which is the case for most sites within the Bay Area. A peak ground acceleration $(PGA)_M$ was estimated for analysis using a value equal to F_{PGA} x PGA, as allowed in the 2019 edition of the California Building Code when an exception has been taken per ASCE 7-16, Section 11.4.8. For our liquefaction analysis we used a PGA_M of 0.75g.

4.4 LIQUEFACTION POTENTIAL

As shown in Figure 8, the site is within a State-designated Liquefaction Hazard Zone (CGS, Mountain View Quadrangle, 2006) as well as a Santa Clara County Liquefaction Hazard Zone (Santa Clara County, 2003). Our field and laboratory programs addressed this issue by testing and sampling potentially liquefiable layers to depths of at least 50 feet, performing visual classification on sampled materials, evaluating CPT data, and performing various tests to further classify soil properties.

4.4.1 Background

During strong seismic shaking, cyclically induced stresses can cause increased pore pressures within the soil matrix that can result in liquefaction triggering, soil softening due to shear stress loss, potentially significant ground deformation due to settlement within sandy liquefiable layers as pore pressures dissipate, and/or flow failures in sloping ground or where open faces are present (lateral spreading) (NCEER 1998). Limited field and laboratory data is available regarding ground deformation due to settlement; however, in clean sand layers settlement on the order of 2 to 4 percent of the liquefied layer thickness can occur. Soils most susceptible to liquefaction are loose, non-cohesive soils that are saturated and are bedded with poor drainage, such as sand and silt layers bedded with a cohesive cap.

4.4.2 Analysis

As discussed in the "Subsurface" section above, several sand layers were encountered below the design groundwater depth of 6 feet. Following the liquefaction analysis framework in the 2008 monograph, *Soil Liquefaction During Earthquakes* (Idriss and Boulanger, 2008), incorporating updates in *CPT and SPT Based Liquefaction Triggering Procedures* (Boulanger and Idriss, 2014), and in accordance with CDMG Special Publication 117A guidelines (CDMG, 2008) for quantitative analysis, these layers were analyzed for liquefaction triggering and potential post-liquefaction settlement. These methods compare the ratio of the estimated cyclic shaking (Cyclic Stress Ratio - CSR) to the soil's estimated resistance to cyclic shaking (Cyclic Resistance Ratio - CRR), providing a factor of safety against liquefaction triggering. Factors of safety less than or equal to 1.3 are considered to be potentially liquefiable and capable of post-liquefaction re-consolidation (i.e. settlement).

The CSR for each layer quantifies the stresses anticipated to be generated due to a design-level seismic event, is based on the peak horizontal acceleration generated at the ground surface discussed in the "Estimated Ground Shaking" section above, and is corrected for overburden and stress reduction factors as discussed in the procedure developed by Seed and Idriss (1971) and updated in the 2008 Idriss and Boulanger monograph.

The soil's CRR is estimated from the in-situ measurements from CPTs and laboratory testing on samples retrieved from our borings. SPT "N" values obtained from hollow-stem auger borings were not used in our analyses, as the "N" values obtained are less reliable in sands below groundwater. The tip pressures are corrected for effective overburden stresses, taking into consideration both the groundwater level at the time of exploration and the design groundwater level, and stress reduction versus depth factors. The CPT method utilizes the soil behavior type index (I_C) to estimate the plasticity of the layers.

The results of our CPT analyses (CPT-1 through CPT-7) and calculations for these CPTs are attached as Appendix C.

4.4.3 Summary

Our analyses indicate that several layers could potentially experience liquefaction triggering that could result in post-liquefaction total settlement at the ground surface ranging up to about 1⅔ inches inches based on the Yoshimine (2006) method. As discussed in SP 117A, differential movement for level ground sites over deep soil sites will be up to about two-thirds of the total settlement between independent foundation elements. In our opinion, differential settlements are anticipated to be on the order of about 1-inch or less over a horizontal distance of 30 feet.

4.4.4 Ground Deformation and Surficial Cracking Potential

The methods used to estimate liquefaction settlements assume that there is a sufficient cap of non-liquefiable material to prevent ground deformation or sand boils. For ground deformation to occur, the pore water pressure within the liquefiable soil layer will need to be great enough to break through the overlying non-liquefiable layer, which could cause significant ground deformation and settlement. The work of Youd and Garris (1995) indicates that the minimum 6½-foot thick layer of non-liquefiable cap is sufficient to prevent ground deformation and significant surficial cracking; therefore, the above total settlement estimates are reasonable.

4.5 LATERAL SPREADING

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits towards a free face such as an excavation, channel, or open body of water; typically lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope. As failure tends to propagate as block failures, it is difficult to analyze and estimate where the first tension crack will form.

The Adobe Creek channel is located approximately 250 feet northeast of the site. However, the channel appears concrete lined; therefore, in our opinion, the potential for lateral spreading to affect the site is low.

4.6 SEISMIC SETTLEMENT/UNSATURATED SAND SHAKING

Loose unsaturated sandy soils can settle during strong seismic shaking. As the soils encountered at the site were predominantly stiff to very stiff clays and medium dense to dense sands, in our opinion, the potential for significant differential seismic settlement affecting the proposed improvements is low.

4.7 LANDSLIDING

The site is essentially flat lying and there are no slopes located adjacent to it. The nearest creek is Adobe Creek located about 250 feet northeast of the northeast property line. The channel is approximately 14 feet deep but is confined within a reinforced concrete channel. The proposed school site is not mapped within a landslide hazard zone (Santa Clara County, 2002; California Geological Survey, 2006). Therefore, in our opinion, the potential for landsliding to affect the site is low.

4.8 SEISMICALLY INDUCED WAVES - TSUNAMI/SEICHE

The terms tsunami or seiche are described as ocean waves or similar waves usually created by undersea fault movement or by a coastal or submerged landslide. Tsunamis may be generated at great distance from shore (far field events) or nearby (near field events). Waves are formed, as the displaced water moves to regain equilibrium, and radiates across the open water, similar to ripples from a rock being thrown into a pond. When the waveform reaches the coastline, it quickly raises the water level, with water velocities as high as 15 to 20 knots. The water mass, as well as vessels, vehicles, or other objects in its path create tremendous forces as they impact coastal structures.

Tsunamis have affected the coastline along the Pacific Northwest during historic times. The Fort Point tide gauge in San Francisco recorded approximately 21 tsunamis between 1854 and 1964. The 1964 Alaska earthquake generated a recorded wave height of 7.4 feet and drowned eleven people in Crescent City, California.

A tsunami or seiche originating in the Pacific Ocean would lose much of its energy passing through San Francisco Bay. Based on the mapping of tsunami inundation potential for the San Francisco Bay Area by CGS (conservation.ca.gov/cgs/tsunami/maps), areas most likely to be inundated are marshlands, tidal flats, and former bay margin lands that are now artificially filled, but are still at or below sea level, and are generally within 1½ miles of the shoreline The site is approximately 2½ miles inland from the San Francisco Bay shoreline, and is approximately 18 to 21 feet above mean sea level. In addition, the site is not located within a tsunami hazard zone (State of California, 2021). Therefore, the potential for inundation due to tsunami or seiche is considered low.

4.9 FLOODING

Based on our internet search of the Federal Emergency Management Agency (FEMA) flood map public database, the site is located within Zone X, an area described as “Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.” We recommend the project civil engineer be retained to confirm this information and verify the base flood elevation, if appropriate.

The Department of Water Resources (DWR), Division of Safety of Dams (DSOD) compiled a database of Dam Failure Inundation Hazard Maps (DSOD, 2015). The generalized hazard maps were prepared by dam owners as required by the State Office of Emergency Services; they are intended for planning purposes only. Based on our review of these maps, the site is not located within a dam failure inundation area.

4.10 NATURALLY OCCURRING ASBESTOS

Our mapping and subsurface investigation of the project site revealed Holocene aged alluvial fan deposits, which may or may not contain Naturally Occurring Asbestos (NOA). The Department of Toxic Substances Control (DTSC), 2004, prepared an interim guidance

document titled “Naturally Occurring Asbestos (NOA) at School Sites” that recommends soil sampling when a proposed school site is located within a 10-mile radius of NOA geologic formation. Published regional scale geologic maps covering the area indicate that formations that could potentially contain NOA are mapped within 10 miles of the site (Pampeyan, 1993; Brabb et al., 2000). If DTSC is going to provide oversight on this project, we would recommend that the project environmental consultant perform NOA sampling. If the DTSC is not going to provide oversight on the project, we would recommend that a few of our soil samples from our borings be tested for NOA before the project is bid.

SECTION 5: CONCLUSIONS

5.1 SUMMARY

From a geotechnical viewpoint, the project is feasible provided the concerns listed below are addressed in the project design. Descriptions of each concern with brief outlines of our recommendations follow the listed concerns.

- Potential for static and seismic settlements
- Shallow groundwater
- Presence of highly expansive soils
- Redevelopment considerations and presence of undocumented fill
- Soil corrosion potential

5.1.1 Potential for Significant Static and Seismic Settlements

As discussed, our liquefaction analysis indicates that there is a potential for liquefaction of localized sand layers during a significant seismic event. Although the potential for liquefied sands to vent to the ground surface through cracks in the surficial soils is low, our analysis indicates that liquefaction-induced settlement on the order of up to about 1⅔ inches could occur, resulting in differential settlement up to about 1-inch. In addition to liquefaction-induced settlement, spread footings for the buildings could experience up to about ¾-inch total static settlement, resulting in a combined differential settlement of about 1¼ to 1⅓ inches from static and seismic settlements between foundation elements or over a horizontal distance of 30 feet for strip footings. Foundations should be designed to tolerate the anticipated total and differential settlements. Additionally, building foundations will need to be designed to limit the effects of expansive soils as discussed in Section 5.1.3. Detailed foundation recommendations are presented in the “Foundations” section.

5.1.2 Shallow Groundwater

Shallow groundwater was measured at depths ranging from approximately 9½ to 29 feet below the existing ground surface during our explorations and at depths ranging from approximately 7½ to 10 feet during the previous exploration by Kleinfelder in 1996. Additionally, historic high groundwater is mapped at a depth of approximately 6 feet below existing ground surface (CGS, 2006). As discussed above, we recommend a design groundwater depth of 6 feet. Our

experience with similar sites in the vicinity indicates that shallow groundwater could significantly impact grading and underground construction. These impacts typically consist of potentially wet and unstable pavement subgrade, difficulty achieving compaction, and difficult underground utility installation. Dewatering and shoring of utility trenches may be required in some isolated areas of the site. Detailed recommendations addressing this concern are presented in the "Earthwork" section of this report.

5.1.3 Presence of Highly Expansive Soils

Highly expansive surficial soils generally blanket the site. Expansive soils can undergo significant volume change with changes in moisture content. They shrink and harden when dried and expand and soften when wetted. To reduce the potential for damage to the planned structures, slabs-on-grade should have sufficient reinforcement and be supported on a layer of non-expansive fill; footings should extend below the zone of seasonal moisture fluctuation. In addition, it is important to limit moisture changes in the surficial soils by using positive drainage away from buildings as well as limiting landscaping watering. Evaluation of potential import sources for the site should consider the acceptable range of plasticity. Detailed grading and foundation recommendations addressing this concern are presented in the following sections. We recommend that a plug of low-permeability clay soil, sand-cement slurry, or lean concrete be placed within trenches just outside where the trenches pass into building and pavement areas. Detailed grading and foundation recommendations addressing this concern are presented in the following sections.

5.1.4 Redevelopment Considerations and Presence of Undocumented Fills

As discussed, the site is currently occupied by existing buildings and appurtenant flatwork, site fixtures, and landscaping. We understand that all of the existing improvements will be demolished for the construction of the new buildings and campus re-design. Potential issues that are often associated with redeveloping sites include demolition of existing improvements, abandonment of existing utilities, and undocumented fills. Please refer to the "Earthwork" section below for further recommendations.

In addition, as previously discussed approximately 1¾ feet of undocumented fill was encountered in Boring EB-4. While fills were not identified in our other explorations, undocumented fill may be present in other areas of the site as a result of prior development grading; any fills encountered during site grading should be completely removed from within building areas and to a lateral distance of at least 5 feet beyond the building footprint or to a lateral distance equal to fill depth below the perimeter footing, whichever is greater. Provided the fills meet the "Material for Fill" requirements below, the fills may be reused when backfilling the excavations. Based on review of the samples collected from our borings, it appears that the fill may be reused. If materials are encountered that do not meet the requirements, such as debris, wood, trash, those materials should be screened out of the remaining material and be removed from the site. Backfill of excavations should be placed in lifts and compacted in accordance with the "Compaction" section below.

Provided undocumented fills are mitigated by removal and replacement as engineered fill, the potential impact due to undocumented fill should be low.

5.1.5 Soil Corrosion Potential

Preliminary soil corrosion data was collected based on the results of the analytical tests on three samples of the near-surface soils. In general, the corrosion potential for concrete does not warrant the use of sulfate resistant concrete; however, the corrosion potential for buried metallic structures, such as metal pipes, is considered severely corrosive. Based on the results of the preliminary soil corrosion screening, special requirements for corrosion control will likely be required to protect metal pipes and fittings. We recommend that a corrosion engineering specialist be retained for corrosion protection recommendations.

5.2 PLANS AND SPECIFICATIONS REVIEW

We recommend that we be retained to review the geotechnical aspects of the project structural, civil, and landscape plans and specifications, allowing sufficient time to provide the design team with any comments prior to issuing the plans for construction.

5.3 CONSTRUCTION OBSERVATION AND TESTING

As site conditions may vary significantly between the small-diameter borings performed during this investigation, we also recommend that a Cornerstone representative be present to provide geotechnical observation and testing during earthwork and foundation construction. This will allow us to form an opinion and prepare a letter at the end of construction regarding contractor compliance with project plans and specifications, and with the recommendations in our report. We will also be allowed to evaluate any conditions differing from those encountered during our investigation and provide supplemental recommendations as necessary. For these reasons, the recommendations in this report are contingent of Cornerstone providing observation and testing during construction. Contractors should provide at least a 48-hour notice when scheduling our field personnel.

SECTION 6: EARTHWORK

6.1 SITE DEMOLITION

All existing improvements not to be reused for the current development, including all foundations, flatwork, pavements, utilities, and other improvements should be demolished and removed from the site. Recommendations in this section apply to the removal of these improvements, which are currently present on the site, prior to the start of mass grading or the construction of new improvements for the project.

Cornerstone should be notified prior to the start of demolition and should be present on at least a part-time basis during all backfill and mass grading as a result of demolition. Occasionally, other types of buried structures (wells, cisterns, debris pits, etc.) can be found on sites with prior

development. If encountered, Cornerstone should be contacted to address these types of structures on a case-by-case basis.

6.1.1 Demolition of Existing Slabs, Foundations and Pavements

All slabs, foundations, and pavements should be completely removed from within planned building areas. A discussion of recycling existing improvements is provided later in this report.

Special care should be taken during the demolition and removal of existing floor slabs, foundations, utilities and pavements to minimize disturbance of the subgrade. Excessive disturbance of the subgrade, which includes either native or previously placed engineered fill, resulting from demolition activities can have serious detrimental effects on planned foundation and paving elements.

Existing foundations are typically mat-slabs, shallow footings, or piers/piles. If slab or shallow footings are encountered, they should be completely removed. If drilled piers are encountered, they should be cut off at an elevation at least 48-inches below proposed footings or the final subgrade elevation, whichever is deeper. The remainder of the drilled pier could remain in place. Foundation elements to remain in place should be surveyed and superimposed on the proposed development plans to determine the potential for conflicts or detrimental impacts to the planned construction. Following review, additional mitigation or planned foundation elements may need to be modified.

6.1.2 Abandonment of Existing Utilities

All utilities should be completely removed from within planned building areas. For any utility line to be considered acceptable to remain within building areas, the utility line must be completely backfilled with grout or sand-cement slurry (sand slurry is not acceptable), the ends outside the building area capped with concrete, and the trench fills either removed and replaced as engineered fill with the trench side slopes flattened to at least 1:1, or the trench fills are determined not to be a risk to the structure. The assessment of the level of risk posed by the particular utility line will determine whether the utility may be abandoned in place or needs to be completely removed. The contractor should assume that all utilities will be removed from within building areas unless provided written confirmation from both the owner and the geotechnical engineer.

Utilities extending beyond the building area may be abandoned in place provided the ends are plugged with concrete, they do not conflict with planned improvements, and that the trench fills do not pose significant risk to the planned surface improvements.

The risk for owners associated with abandoning utilities in place include the potential for future differential settlement of existing trench fills, and/or partial collapse and potential ground loss into utility lines that are not completely filled with grout.

6.2 SITE CLEARING AND PREPARATION

6.2.1 Site Stripping

The site should be stripped of all surface vegetation, and surface and subsurface improvements to be removed within the proposed development area. Demolition of existing improvements is discussed in the prior paragraphs. A detailed discussion of removal of existing fills is provided later in this report. Surface vegetation and topsoil should be stripped to a sufficient depth to remove all material greater than 3 percent organic content by weight. Based on our site observations, surficial stripping should extend about 4 to 6 inches below existing grade in vegetated areas.

6.2.2 Tree and Shrub Removal

Trees and shrubs designated for removal should have the root balls and any roots greater than ½-inch diameter removed completely. Mature trees are estimated to have root balls extending to depths of 2 to 4 feet, depending on the tree size. Significant root zones are anticipated to extend to the diameter of the tree canopy. Grade depressions resulting from root ball removal should be cleaned of loose material and backfilled in accordance with the recommendations in the "Compaction" section of this report.

6.3 MITIGATION OF UNDOCUMENTED FILLS

As discussed above, approximately 1¾ feet of undocumented fill was encountered in Boring EB-4. Additional fills may also be present as a result of the current site development. All undocumented fills should be completely removed from within building areas and to a lateral distance of at least 5 feet beyond the building footprint or to a lateral distance equal to fill depth below the perimeter footing, whichever is greater. Provided the fills meet the "Material for Fill" requirements below, the fills may be reused when backfilling the excavations. Based on review of the samples collected from our borings, it appears that the fill may be reused. If materials are encountered that do not meet the requirements, such as debris, wood, trash, those materials should be screened out of the remaining material and be removed from the site. Backfill of excavations should be placed in lifts and compacted in accordance with the "Compaction" section below.

Fills extending into planned pavement and flatwork areas may be left in place provided they are determined to be a low risk for future differential settlement and that the upper 12 inches of fill below pavement subgrade is re-worked and compacted as discussed in the "Compaction" section below.

6.4 TEMPORARY CUT AND FILL SLOPES

The contractor is responsible for maintaining all temporary slopes and providing temporary shoring where required. Temporary shoring, bracing, and cuts/fills should be performed in accordance with the strictest government safety standards. On a preliminary basis, the upper

10 feet at the site may be classified as OSHA Soil Type C materials. A Cornerstone representative should be retained to confirm the preliminary site classification.

Excavations performed during site demolition and fill removal should be sloped at 3:1 (horizontal:vertical) within the upper 5 feet below building subgrade. Actual excavation inclinations should be reviewed in the field during construction, as needed. Excavations below building subgrade and excavations in pavement and flatwork areas should be sloped in accordance with OSHA soil classification requirements.

6.5 SUBGRADE PREPARATION

After site clearing and demolition is complete, and prior to backfilling any excavations resulting from fill removal or demolition, the excavation subgrade and subgrade within areas to receive additional site fills, slabs-on-grade and/or pavements should be scarified to a depth of 6 inches, moisture conditioned, and compacted in accordance with the “Compaction” section below.

It is noted that in the drier months, the on-site soils may dry down to depths of 12 inches or greater. If this is the case, we should re-evaluate the site conditions and recommend a deeper depth of excavation and moisture conditioning.

6.6 WET SOIL STABILIZATION GUIDELINES

Native soil and fill materials, especially soils with high fines contents such as clays and silty soils, can become unstable due to high moisture content, whether from high in-situ moisture contents or from winter rains. As the moisture content increases over the laboratory optimum, it becomes more likely the materials will be subject to softening and yielding (pumping) from construction loading or become unworkable during placement and compaction.

As discussed in the “Subsurface” section in this report, the in-situ moisture contents are up to about 12 percent over the estimated laboratory optimum in the upper 10 feet of the soil profile. The contractor should anticipate drying the soils prior to reusing them as fill. In addition, repetitive rubber-tire loading will likely de-stabilize the soils.

There are several methods to address potential unstable soil conditions and facilitate fill placement and trench backfill. Some of the methods are briefly discussed below. Implementation of the appropriate stabilization measures should be evaluated on a case-by-case basis according to the project construction goals and the site conditions.

6.6.1 Scarification and Drying

The subgrade may be scarified to a depth of 8 to 10 inches and allowed to dry to near optimum conditions, if sufficient dry weather is anticipated to allow sufficient drying. More than one round of scarification may be needed to break up the soil clods.

6.6.2 Removal and Replacement

As an alternative to scarification, the contractor may choose to over-excavate the unstable soils and replace them with dry on-site or import materials. A Cornerstone representative should be present to provide recommendations regarding the appropriate depth of over-excavation, whether a geosynthetic (stabilization fabric or geogrid) is recommended, and what materials are recommended for backfill.

6.6.3 Chemical Treatment

Where the unstable area exceeds about 5,000 to 10,000 square feet and/or site winterization is desired, chemical treatment with quicklime (CaO), kiln-dust, or cement may be more cost-effective than removal and replacement. Recommended chemical treatment depths will typically range from 12 to 18 inches depending on the magnitude of the instability.

6.7 MATERIAL FOR FILL

6.7.1 Re-Use of On-site Soils

On-site soils with an organic content less than 3 percent by weight may be reused as general fill below any layer of non-expansive fill. General fill should not have lumps, clods or cobble pieces larger than 6 inches in diameter; 85 percent of the fill should be smaller than 2½ inches in diameter. Minor amounts of oversize material (smaller than 12 inches in diameter) may be allowed provided the oversized pieces are not allowed to nest together and the compaction method will allow for loosely placed lifts not exceeding 12 inches.

6.7.2 Re-Use of On-Site Site Improvements

We anticipate that minor to moderate quantities of asphalt concrete (AC) grindings and aggregate base (AB) may be generated during site demolition. If the underlying AB is separated and meets Class 2 AB specifications, it may be reused within the new pavement and flatwork structural sections. AC grindings may not be reused within the habitable building areas. Laboratory testing will be required to confirm the grindings meet project specifications.

6.7.3 Potential Import Sources

Non-expansive and import material should be inorganic with a Plasticity Index (PI) of 15 or less, and not contain recycled asphalt concrete where it will be used within the habitable building areas. To prevent significant caving during trenching or foundation construction, imported material should have sufficient fines. Samples of potential import sources should be delivered to our office at least 10 days prior to the desired import start date. Information regarding the import source should be provided, such as any site geotechnical reports. If the material will be derived from an excavation rather than a stockpile, potholes will likely be required to collect samples from throughout the depth of the planned cut that will be imported. At a minimum, laboratory testing will include PI tests. Material data sheets for select fill materials (Class 2 aggregate base, ¾-inch crushed rock, quarry fines, etc.) listing current laboratory testing data

(not older than 6 months from the import date) may be provided for our review without providing a sample. If current data is not available, specification testing will need to be completed prior to approval.

Environmental and soil corrosion characterization should also be considered by the project team prior to acceptance. Suitable environmental laboratory data to the planned import quantity should be provided to the project environmental consultant; additional laboratory testing may be required based on the project environmental consultant's review. The potential import source should also not be more corrosive than the on-site soils, based on pH, saturated resistivity, and soluble sulfate and chloride testing.

6.7.4 Non-Expansive Fill Using Lime Treatment

As discussed above, non-expansive fill should have a Plasticity Index (PI) of 15 or less. Due to the high clay content and PI of the on-site soil [and bedrock] materials, it is not likely that sufficient quantities of non-expansive fill would be generated from cut materials. As an alternative to importing non-expansive fill, chemical treatment can be considered to create non-expansive fill. If this option is considered, additional laboratory tests should be performed during initial site grading to further evaluate the optimum percentage of quicklime required.

6.8 COMPACTION REQUIREMENTS

All fills, and subgrade areas where fill, slabs-on-grade, and pavements are planned, should be placed in loose lifts 8 inches thick or less and compacted in accordance with ASTM D1557 (latest version) requirements as shown in the table below. In general, clayey soils should be compacted with sheepsfoot equipment and sandy/gravelly soils with vibratory equipment; open-graded materials such as crushed rock should be placed in lifts no thicker than 18 inches and consolidated in place with vibratory equipment. Each lift of fill and all subgrade should be firm and unyielding under construction equipment loading in addition to meeting the compaction requirements to be approved. The contractor (with input from a Cornerstone representative) should evaluate the in-situ moisture conditions, as the use of vibratory equipment on soils with high moistures can cause unstable conditions. General recommendations for soil stabilization are provided in the "Wet Soil Stabilization Guidelines" section of this report. Where the soil's PI is 20 or greater, the expansive soil criteria should be used.

Table 5: Compaction Requirements

Description	Material Description	Minimum Relative[1] Compaction (percent)	Moisture[2] Content (percent)
General Fill (within upper 5 feet)	On-Site Expansive Soils	87 – 92	>3
	Low Expansion Soils	90	>1
General Fill (below a depth of 5 feet)	On-Site Expansive Soils	95	>3
	Low Expansion Soils	95	>1
Trench Backfill	On-Site Expansive Soils	87 – 92	>3
	Low Expansion Soils	90	>1
Trench Backfill (upper 6 inches of subgrade)	On-Site Low Expansion Soils	95	>1
Crushed Rock Fill	¾-inch Clean Crushed Rock	Consolidate In-Place	NA
Non-Expansive Fill	Imported Non-Expansive Fill	90	Optimum
Flatwork Subgrade	On-Site Expansive Soils	87 - 92	>3
	Low Expansion Soils	90	>1
Flatwork Aggregate Base	Class 2 Aggregate Base[3]	90	Optimum
Pavement Subgrade	On-Site Expansive Soils	87 - 92	>3
	Low Expansion Soils	95	>1
Pavement Aggregate Base	Class 2 Aggregate Base[3]	95	Optimum
Asphalt Concrete	Asphalt Concrete	95 (Marshall)	NA

1 – Relative compaction based on maximum density determined by ASTM D1557 (latest version)
2 – Moisture content based on optimum moisture content determined by ASTM D1557 (latest version)
3 – Class 2 aggregate base shall conform to Caltrans Standard Specifications, latest edition, except that the relative compaction should be determined by ASTM D1557 (latest version)

6.8.1 Construction Moisture Conditioning

Expansive soils can undergo significant volume change when dried then wetted. The contractor should keep all exposed expansive soil subgrade (and also trench excavation side walls) moist until protected by overlying improvements (or trenches are backfilled). If expansive soils are allowed to dry out significantly, re-moisture conditioning may require several days of re-wetting (flooding is not recommended), or deep scarification, moisture conditioning, and re-compaction.

6.9 TRENCH BACKFILL

Utility lines constructed within public right-of-way should be trenched, bedded and shaded, and backfilled in accordance with the local or governing jurisdictional requirements. Utility lines in private improvement areas should be constructed in accordance with the following requirements unless superseded by other governing requirements.

All utility lines should be bedded and shaded to at least 6 inches over the top of the lines with crushed rock (⅜-inch-diameter or greater) or well-graded sand and gravel materials conforming to the pipe manufacturer's requirements. Open-graded shading materials should be consolidated in place with vibratory equipment and well-graded materials should be compacted to at least 90 percent relative compaction with vibratory equipment prior to placing subsequent backfill materials.

General backfill over shading materials may consist of on-site native materials provided they meet the requirements in the "Material for Fill" section, and are moisture conditioned and compacted in accordance with the requirements in the "Compaction" section.

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

On expansive soils sites it is desirable to reduce the potential for water migration into building and pavement areas through the granular shading materials. We recommend that a plug of low-permeability clay soil, sand-cement slurry, or lean concrete be placed within trenches just outside where the trenches pass into building and pavement areas.

6.10 SITE DRAINAGE

6.10.1 Surface Drainage

Ponding should not be allowed adjacent to building foundations, slabs-on-grade, or pavements. Hardscape surfaces should slope at least 2 percent towards suitable discharge facilities; landscape areas should slope at least 3 percent towards suitable discharge facilities. Roof runoff should be directed away from building areas in closed conduits, to approved infiltration facilities, or on to hardscaped surfaces that drain to suitable facilities. Retention, detention or infiltration facilities should be spaced at least 10 feet from buildings, and preferably at least 5 feet from slabs-on-grade or pavements. However, if retention, detention or infiltration facilities are located within these zones, we recommend that these treatment facilities meet the requirements in the Storm Water Treatment Design Considerations section of this report.

6.11 LOW-IMPACT DEVELOPMENT (LID) IMPROVEMENTS

The Municipal Regional Permit (MRP) requires regulated projects to treat 100 percent of the amount of runoff identified in Provision C.3.d from a regulated project's drainage area with low impact development (LID) treatment measures onsite or at a joint stormwater treatment facility. LID treatment measures are defined as rainwater harvesting and use, infiltration,

evapotranspiration, or biotreatment. A biotreatment system may only be used if it is infeasible to implement harvesting and use, infiltration, or evapotranspiration at a project site.

Technical infeasibility of infiltration may result from site conditions that restrict the operability of infiltration measures and devices. Various factors affecting the feasibility of infiltration treatment may create an environmental risk, structural stability risk, or physically restrict infiltration. The presence of any of these limiting factors may render infiltration technically infeasible for a proposed project. To aid in determining if infiltration may be feasible at the site, we provide the following site information regarding factors that may aid in determining the feasibility of infiltration facilities at the site.

- The near-surface soils at the site are clayey and categorized as Hydrologic Soil Group D, and is expected to have infiltration rates of less than 0.2 inches per hour. In our opinion, these clayey soils will significantly limit the infiltration of stormwater. However, sandy soils were encountered below a depth of at least 5 feet in some of our explorations. Additional information on infiltration rates below the surficial clays is provided in Section 3 above.

- Locally, seasonal high groundwater is mapped at a depth of 6 feet, and therefore is expected to be within 10 feet of the base of the infiltration measure.

- In our opinion, infiltration locations within 10 feet of the buildings would create a geotechnical hazard.

6.11.1 Storm Water Treatment Design Considerations

If storm water treatment improvements, such as shallow bio-retention swales, basins or pervious pavements, are required as part of the site improvements to satisfy Storm Water Quality (C.3) requirements, we recommend the following items be considered for design and construction.

6.11.1.1 General Bioswale Design Guidelines

- If possible, avoid placing bioswales or basins within 10 feet of the building perimeter or within 5 feet of exterior flatwork or pavements. If bioswales must be constructed within these setbacks, the side(s) and bottom of the trench excavation should be lined with 10-mil visqueen to reduce water infiltration into the surrounding expansive clay.

- Bioswales constructed within 3 feet of proposed buildings may be within the foundation zone of influence for perimeter wall loads. Therefore, where bioswales will parallel foundations and will extend below the “foundation plane of influence,” an imaginary 1:1 plane projected down from the bottom edge of the foundation, the foundation will need to be deepened so that the bottom edge of the bioswale filter material is above the foundation plane of influence.

- The bottom of bioswale or detention areas should include a perforated drain placed at a low point, such as a shallow trench or sloped bottom, to reduce water infiltration into the surrounding soils near structural improvements, and to address the low infiltration capacity of the on-site clay soils.

6.11.1.2 Bioswale Infiltration Material

- Gradation specifications for bioswale filter material, if required, should be specified on the grading and improvement plans.

- Compaction requirements for bioswale filter material in non-landscaped areas or in pervious pavement areas, if any, should be indicated on the plans and specifications to satisfy the anticipated use of the infiltration area.

- If bioswales are to be vegetated, the landscape architect should select planting materials that do not reduce or inhibit the water infiltration rate, such as covering the bioswale with grass sod containing a clayey soil base.

- Due to the relatively loose consistency and/or high organic content of many bioswale filter materials, long-term settlement of the bioswale medium should be anticipated. To reduce initial volume loss, bioswale filter material should be wetted in 12-inch lifts during placement to pre-consolidate the material. Mechanical compaction should not be allowed, unless specified on the grading and improvement plans, since this could significantly decrease the infiltration rate of the bioswale materials.

- It should be noted that the volume of bioswale filter material may decrease over time depending on the organic content of the material. Additional filter material may need to be added to bioswales after the initial exposure to winter rains and periodically over the life of the bioswale areas, as needed.

6.11.1.3 Bioswale Construction Adjacent to Pavements

If bio-infiltration swales or basins are considered adjacent to proposed parking lots or exterior flatwork, we recommend that mitigative measures be considered in the design and construction of these facilities to reduce potential impacts to flatwork or pavements. Exterior flatwork, concrete curbs, and pavements located directly adjacent to bio-swales may be susceptible to settlement or lateral movement, depending on the configuration of the bioswale and the setback between the improvements and edge of the swale. To reduce the potential for distress to these improvements due to vertical or lateral movement, the following options should be considered by the project civil engineer:

- Improvements should be setback from the vertical edge of a bioswale such that there is at least 1 foot of horizontal distance between the edge of improvements and the top edge of the bioswale excavation for every 1 foot of vertical bioswale depth, or

- Concrete curbs for pavements, or lateral restraint for exterior flatwork, located directly adjacent to a vertical bioswale cut should be designed to resist lateral earth pressures in accordance with the recommendations in the "Retaining Walls" section of this report, or concrete curbs or edge restraint should be adequately keyed into the native soil or engineered to reduce the potential for rotation or lateral movement of the curbs.

6.12 LANDSCAPE CONSIDERATIONS

Since the near-surface soils are [moderately/highly] expansive, we recommend greatly reducing the amount of surface water infiltrating these soils near foundations and exterior slabs-on-grade. This can typically be achieved by:

- Using drip irrigation
- Avoiding open planting within 3 feet of the building perimeter or near the top of existing slopes
- Regulating the amount of water distributed to lawns or planter areas by using irrigation timers
- Selecting landscaping that requires little or no watering, especially near foundations.

We recommend that the landscape architect consider these items when developing landscaping plans.

SECTION 7: 2019 CBC SEISMIC DESIGN CRITERIA

7.1 SEISMIC DESIGN CRITERIA

We understand that the project structural design will be based on the 2019 California Building Code (CBC), which provides criteria for the seismic design of buildings in Chapter 16. The "Seismic Coefficients" used to design buildings are established based on a series of tables and figures addressing different site factors, including the time-weighted average shear wave velocity of the top approximately 100 feet (30 meters) of the soil profile (V_{S30}) and mapped spectral acceleration parameters based on distance to the controlling seismic source/fault system.

Shear wave velocity (V_S) measurements were performed while advancing CPT-4, resulting in a time-averaged shear wave velocity for the top 30 meters (V_{S30}) of 249 meters per second. Therefore, we have classified the site as Soil Classification D. Because we used site specific data from our explorations and laboratory testing, the site class should be considered as "determined" for the purposes of estimating the seismic design parameters from the code outlined below. The mapped spectral acceleration parameters S_s and S_1 were calculated using the web-based program ATC Hazards by Locations, located at https://hazards.atcouncil.org/, based on the site coordinates presented below and the site classification. ***Recommended values in Table 6 may only be used for design if in the judgement of the project structural***

engineer an exception can be taken per ASCE 7-16 Section 11.4.8. The table below lists the various factors used to determine the seismic coefficients and other parameters.

Table 6: CBC Site Categorization and Site Coefficients

Classification/Coefficient	Design Value
Site Class	D
Site Latitude	37.418496°
Site Longitude	-122.114355°
0.2-second Period Mapped Spectral Acceleration[1], S_S	1.658g
1-second Period Mapped Spectral Acceleration[1], S_1	0.600g
Short-Period Site Coefficient – Fa	1.0
Long-Period Site Coefficient – Fv	1.7
0.2-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects - S_{MS}	1.658g
1-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects – S_{M1}	1.020g
0.2-second Period, Design Earthquake Spectral Response Acceleration – S_{DS}	1.105g
1-second Period, Design Earthquake Spectral Response Acceleration – S_{D1}	0.680g
Site Amplification Factor at PGA – F_{PGA}	1.1
Site Modified Peak Ground Acceleration – PGA_M	0.75

SECTION 8: FOUNDATIONS

8.1 SUMMARY OF RECOMMENDATIONS

In our opinion, the proposed structures may be supported on shallow foundations provided the recommendations in the “Earthwork” section and the sections below are followed. Optional foundation recommendations for drilled, cast-in-place piers are also provided for building overhangs and light-weight shade structures or canopies.

8.2 SHALLOW FOUNDATIONS

8.2.1 Conventional Shallow Footings

Conventional shallow footings should bear on natural, undisturbed soil or engineered fill, be at least 15 inches wide, and extend at least 36 inches below the lowest adjacent grade. Lowest adjacent grade is defined as the deeper of the following: 1) bottom of the adjacent interior slab-on-grade, or 2) finished exterior grade, excluding landscaping topsoil. The deeper footing embedment is due to the presence of moderately [to highly] expansive soils and is intended to embed the footing below the zone of significant seasonal moisture fluctuation, reducing the potential for differential movement.

Footings constructed to the above dimensions and in accordance with the "Earthwork" recommendations of this report are capable of supporting maximum allowable bearing pressures of 2,000 psf for dead loads, 3,000 psf for combined dead plus live loads, and 4,000 psf for all loads including wind and seismic. These pressures are based on factors of safety of 3.0, 2.0, and 1.5 applied to the ultimate bearing pressure for dead, dead plus live, and all loads, respectively. These pressures are net values; the weight of the footing may be neglected for the portion of the footing extending below grade (typically, the full footing depth). Top and bottom mats of reinforcing steel should be included in continuous footings to help span irregularities and differential settlement.

Based on our analysis, it appears that the site has layers of cohesionless soil that are potentially liquefiable. The total differential settlement exceeds ¼ x the limit in Table 12.13-3 of ASCE 7 and thus is not exempt from the requirements of ASCE 7 12.13.9. Because the foundations are not exempt from consideration, we screened the foundations for reduced bearing capacity based on the above criteria. In our opinion, based on our review, it appears no modification to the above bearing capacity or other criteria is needed.

8.2.2 Footing Settlement

The typical structural loading presented in the following table was provided to us by Daedalus Structural Engineering, the project structural engineer.

Table 7: Anticipated Structural Loading

Foundation Area	Range of Assumed Loads
Dead + Live Building Loads	53 to 136 psf
Spread Footings	1,040 to 2,400 pounds per lineal foot

Based on the above loading and the allowable bearing pressures presented above, we estimate that the total static footing settlement will be on the order of up ½-inch or less for one-story Kinder and Admin structures and up to about ¾-inch for two-story Classroom and one-story MPR structures, with up to about ⅓-inch of post-construction differential settlement between adjacent foundation elements, or over a horizontal distance of 30 feet for strip footings. In addition, we estimate that differential seismic movement will be on the order of about 1-inch over a horizontal distance of 30 feet, resulting in a total estimated differential footing movement of up to 1¼ to 1⅓ inches between foundation elements, assumed to be on the order of 30 feet. As our footing sizes were assumed, we recommend we be retained to review the final footing layout and loading, and verify the settlement estimates above.

Approximately ½ to ¾ inches of the total settlement discussed above is due to primary consolidation of saturated clay layers. The time to achieve about 90 to 95 percent of the primary consolidation is anticipated to take several months to a year after all the dead and live loads are in place based on the encountered alluvial conditions. The contractor should take this into consideration when scheduling the construction of sensitive finishes.

8.2.3 Lateral Loading

Lateral loads may be resisted by friction between the bottom of footing and the supporting subgrade, and also by passive pressures generated against footing sidewalls. An ultimate frictional resistance of 0.45 applied to the footing dead load, and an ultimate passive pressure based on an equivalent fluid pressure of 450 pcf may be used in design. The structural engineer should apply an appropriate factor of safety (such as 1.5) to the ultimate values above. Where footings are adjacent to landscape areas without hardscape, the upper 12 inches of soil should be neglected when determining passive pressure capacity.

8.2.4 Conventional Shallow Footing Construction Considerations

Where utility lines will cross perpendicular to strip footings, the footing should be deepened to encase the utility line, providing sleeves or flexible cushions to protect the pipes from anticipated foundation settlement, or the utility lines should be backfilled to the bottom of footing with sand-cement slurry or lean concrete. Where utility lines will parallel footings and will extend below the "foundation plane of influence," an imaginary 1:1 plane projected down from the bottom edge of the footing, either the footing will need to be deepened so that the pipe is above the foundation plane of influence or the utility trench will need to be backfilled with sand-cement slurry or lean concrete within the influence zone. Sand-cement slurry used within foundation influence zones should have a minimum compressive strength of 75 psi.

The on-site soils are highly expansive and will dry out once the footings are excavated, especially during the dry months of the year. Footing excavations should be filled as soon as possible or be kept moist until concrete placement by regular sprinkling to prevent desiccation. The contractor should anticipate sprinkling the footings with water several times a day (including weekends) to mitigate soil desiccation. A Cornerstone representative should observe all footing excavations prior to placing reinforcing steel and concrete. If there is a significant schedule delay between our initial observation and concrete placement, we may need to re-observe the excavations. It is noted that even with these construction techniques, some heave or settlement may occur in the building foundation during the life time of the structure.

8.3 DRILLED PIER FOUNDATIONS FOR OVERHANGS

As an alternative to shallow foundations, walkways and canopies may be supported on drilled piers provided recommendations herein are used for design. We anticipate relatively light vertical and lateral loads will be required.

8.3.1 Allowable Skin Friction

The piers should have a minimum diameter of 18 inches and extend to a depth of at least 5 feet below the surface. The vertical capacity of the piers may be designed based on an allowable skin friction of 500 pounds per square foot (psf) for the upper 5 feet and 140 pounds per square foot (psf) for sandy soils below 5 feet to a maximum depth of 10 feet. The allowable skin frictions provided are for combined dead plus live loads based on a factor of safety of 2.0; dead loads should not exceed two-thirds of the allowable capacities. The allowable skin friction may

be increased by one-third for wind and seismic loads. Frictional resistance to uplift loads may be developed along the pier shafts based on an ultimate frictional resistance of 80 percent of the downward capacities; the structural engineer should apply an appropriate factor of safety (such as 1.5) to the ultimate uplift capacity. The depth of landscaping soil (typically 12 inches or less) should be neglected if piers are constructed in landscape areas but do not need to be neglected in pavement areas. The above allowable capacities are based on a maximum pier depth of 10 feet. We recommend pier depths be limited to 10 feet to avoid encountering significant groundwater and liquefiable sands. If pier depths exceed 10 feet, we should be notified to review the design.

Total static settlement of individual piers should not exceed ½-inch, with post-construction differential settlement between adjacent piers of less than ¼-inch due to static loads. As discussed above, we recommend limiting the maximum pier depth to 10 feet to limit liquefaction settlement and avoid encountering significant groundwater and loose sands.

8.3.2 Lateral Load Capacities

Lateral loads exerted on drilled piers may be resisted by a passive resistance based on an ultimate equivalent fluid pressure of 350 pounds per cubic (pcf) acting over two pier diameters for single piers, up to a maximum uniform earth pressure of 2,000 psf at depth. If the canopy and overhang piers will be constructed in an area that is paved, the passive pressure can be assumed to start at the ground surface. If piers are constructed in landscape areas, the depth of landscaping soil (typically 12 inches or less) should be neglected when determining lateral capacity. The structural engineer should apply an appropriate factor of safety to the ultimate passive pressures. Adjacent piers centers should be spaced at least three diameters apart, otherwise, a reduction for group effects may be required.

8.3.3 Construction Considerations

The excavation of all drilled shafts should be observed by a Cornerstone representative to confirm the soil profile, verify that the piers extend the minimum depth into suitable materials, and that the piers are constructed in accordance with our recommendations and project requirements. Note, groundwater should be anticipated 6 feet below the existing surface grade. The drilled shafts should be straight, dry, and relatively free of loose material before reinforcing steel is installed and concrete is placed. If groundwater cannot be removed from the excavations prior to concrete placement, drilling slurry or casing may be required to stabilize the shaft and the concrete should be placed using a tremie pipe, keeping the tremie pipe below the surface of the concrete to avoid entrapment of water or drilling slurry in the concrete. Due to potentially high groundwater, the used of drilling slurry and/or casing of each drilled shaft may be required. Some loose to medium dense sand and soils with lower fines contents were encountered in our boring. The contractor should plan on encountering caving soil that will likely require casing or other stability measures to prevent caving and sloughing into the pier foundation excavations.

SECTION 9: CONCRETE SLABS AND PEDESTRIAN PAVEMENTS

9.1 INTERIOR SLABS-ON-GRADE

Due to the high to very high expansion potential of the surficial soils, the proposed slabs-on-grade should be supported on at least 30 inches of non-expansive fill (NEF) to reduce the potential for slab damage due to soil heave. The NEF layer should be constructed over subgrade prepared in accordance with the recommendations in the "Earthwork" section of this report. If moisture-sensitive floor coverings are planned, the recommendations in the "Interior Slabs Moisture Protection Considerations" section below may be incorporated in the project design if desired. If significant time elapses between initial subgrade preparation and slab-on-grade NEF construction, the subgrade should be proof-rolled to confirm subgrade stability, and if the soil has been allowed to dry out, the subgrade should be re-moisture conditioned to at least 3 percent over the optimum moisture content.

The structural engineer should determine the appropriate slab reinforcement for the loading requirements and considering the expansion potential of the underlying soils. For unreinforced concrete slabs, ACI 302.1R recommends limiting control joint spacing to 24 to 36 times the slab thickness in each direction, or a maximum of 18 feet.

9.2 INTERIOR SLABS MOISTURE PROTECTION CONSIDERATIONS

The following general guidelines for concrete slab-on-grade construction where floor coverings are planned are presented for the consideration by the developer, design team, and contractor. These guidelines are based on information obtained from a variety of sources, including the American Concrete Institute (ACI) and are intended to reduce the potential for moisture-related problems causing floor covering failures, and may be supplemented as necessary based on project-specific requirements. The application of these guidelines or not will not affect the geotechnical aspects of the slab-on-grade performance.

- Place a minimum 15-mil vapor retarder conforming to ASTM E 1745, Class C requirements or better directly below the concrete slab; the vapor retarder should extend to the slab edges and be sealed at all seams and penetrations in accordance with manufacturer's recommendations and ASTM E 1643 requirements. A 4-inch-thick capillary break, consisting of crushed rock should be placed below the vapor retarder and consolidated in place with vibratory equipment. The mineral aggregate shall be of such size that the percentage composition by dry weight as determined by laboratory sieves will conform to the following gradation:

Sieve Size	Percentage Passing Sieve
1"	100
¾"	90 – 100
No. 4	0 – 10
No. 200	0 – 5

The capillary break rock may be considered as the upper 4 inches of the non-expansive fill previously recommended.

- The concrete water:cement ratio should be 0.45 or less. Mid-range plasticizers may be used to increase concrete workability and facilitate pumping and placement.
- Water should not be added after initial batching unless the slump is less than specified and/or the resulting water:cement ratio will not exceed 0.45.
- Polishing the concrete surface with metal trowels is not recommended.
- Where floor coverings are planned, all concrete surfaces should be properly cured.
- Water vapor emission levels and concrete pH should be determined in accordance with ASTM F1869-98 and F710-98 requirements and evaluated against the floor covering manufacturer's requirements prior to installation.

9.3 EXTERIOR FLATWORK

Exterior flatwork, such as pedestrian walkways, patios, driveways, and sidewalks, may experience seasonal movement due to the native expansive soils; therefore, some cracking or vertical movement of conventional slabs should be anticipated where imported fill is not planned in flatwork areas. There are several alternatives for mitigating the impacts of expansive soils beneath concrete flatwork. We are providing recommendations to reduce distress to concrete flatwork that includes moisture conditioning the subgrade soils, using non-expansive fill, and providing adequate construction and control joints to control cracks that do occur. It should be noted that minor slab movement or localized cracking and/or distress could still occur.

- The minimum recommendation for concrete flatwork constructed on moderately to highly expansive soils is to properly prepare the clayey soils prior to placing concrete. This is typically achieved by scarifying, moisture conditioning, and re-compacting the subgrade soil. Subgrade soil should be moisture conditioned to at least 3 percent over the laboratory optimum and compacted using moderate compaction effort to a relative compaction of 87 to 92 percent (ASTM Test Method D1557). Since the near surface soils may have been previously compacted and tested, the subgrade soils could possibly be moisture conditioned by gradually wetting the soil, depending on the time of year slab construction occurs. This should not include flooding or excessively watering the soil, which would likely result in a soft, unstable subgrade condition, and possible delays in the construction while waiting for the soil to dry out. In general, the subgrade should be relatively firm and non-yielding prior to construction.
- Concrete flatwork, excluding pavements that would be subject to wheel loads, should be at least 4 inches thick and underlain by at least 18 inches of non-expansive fill. Non-expansive fill may include aggregate base, crushed rock, or imported soil with a PI of 15 or less. Non-expansive fill should be compacted to at least 90 percent relative compaction. Flatwork that will be subject to heavier or frequent vehicular loading should

be designed in accordance with the recommendations in the "Vehicular Pavements" section below.

- We recommend a maximum control joint spacing of about 2 feet in each direction for each inch of concrete thickness and a construction joint spacing of 10 to 12 feet. Construction joints that abut the foundations or garage slabs should include a felt strip, or approved equivalent, that extends the full depth of the exterior slab. This will help to reduce the potential for permanent vertical offset between the slabs due to friction between the concrete edges. We recommend that exterior slabs be isolated from adjacent foundations.

At the owner's option, if desired to reduce the potential for vertical offset or widening of concrete cracks, consideration should be given to using reinforcing steel, such as No. 3 rebar spaced at 18 inches on center each direction.

SECTION 10: VEHICULAR PAVEMENTS

10.1 ASPHALT CONCRETE

The following asphalt concrete pavement recommendations tabulated below are based on the Procedure 608 of the Caltrans Highway Design Manual, estimated traffic indices for various pavement-loading conditions, and on a design R-value of 5. The design R-value was chosen based on engineering judgement considering the variable and expansive soil conditions. Additionally, due to the presence of highly expansive soils, we have also included an option for lime-treated subgrade soils using an estimated design R-value of 50.

Table 8: Asphalt Concrete Pavement Recommendations

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base[1] (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	7.5	10.0
4.5	2.5	9.5	12.0
5.0	3.0	10.0	13.0
5.5	3.0	12.0	15.0
6.0	3.5	12.5	16.0
6.5	4.0	14.0	18.0

[1]Caltrans Class 2 aggregate base; minimum R-value of 78; subgrade R-value of 5

Table 9: Asphalt Concrete Pavement Recommendations, Lime Treated Subgrade

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base[1] (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	4.0	6.5
4.5	2.5	4.0	6.5
5.0	3.0	4.0	7.0
5.5	3.0	4.0	7.0
6.0	3.5	4.0	7.5
6.5	4.0	4.0	8.0

[1]Caltrans Class 2 aggregate base; minimum R-value of 78; subgrade R-value of 50 assuming 18-inch-thick subgrade treatment with at least 5 percent high-calcium quicklime

Frequently, the full asphalt concrete section is not constructed prior to construction traffic loading. This can result in significant loss of asphalt concrete layer life, rutting, or other pavement failures. To improve the pavement life and reduce the potential for pavement distress through construction, we recommend the full design asphalt concrete section be constructed prior to construction traffic loading. Alternatively, a higher traffic index may be chosen for the areas where construction traffic will use the pavements.

Asphalt concrete pavements constructed on expansive subgrade where the adjacent areas will not be irrigated for several months after the pavements are constructed may experience longitudinal cracking parallel to the pavement edge. These cracks typically form within a few feet of the pavement edge and are due to seasonal wetting and drying of the adjacent soil. The cracking may also occur during construction where the adjacent grade is allowed to significantly dry during the summer, pulling moisture out of the pavement subgrade. Any cracks that form should be sealed with bituminous sealant prior to the start of winter rains. One alternative to reduce the potential for this type of cracking is to install a moisture barrier at least 24 inches deep behind the pavement curb.

10.2 PORTLAND CEMENT CONCRETE

The Portland Cement Concrete (PCC) pavement recommendations outlined below are based on methods presented in American Concrete Pavement Association (ACPA, 2006). We have provided a few pavement alternatives as an anticipated Average Daily Truck Traffic (ADTT) was not provided. The following table presents minimum PCC pavements thicknesses for various traffic loading categories and the anticipated maximum Average Daily Truck Traffic (ADTT). An allowable ADTT should be chosen that is greater than what is expected for the development.

Table 10: PCC Pavement Recommendations

Traffic Category	Minimum PCC Thickness[1] (inches)	Class 2 Aggregate Base (inches)
Maximum ADTT = 3	5.0	6.0
Maximum ADTT = 10	5.5	6.0
Maximum ADTT = 20	6.0	6.0

[1]Subgrade design R-Value = 5

The PCC thicknesses above are based on a concrete compressive strength of at least 3,500 psi, and laterally restraining the PCC with curbs or concrete shoulders. Adequate expansion and control joints should be included. Consideration should be given to limiting the control joint spacing to a maximum of about 2 feet in each direction for each inch of concrete thickness. Due to the expansive surficial soils present, we recommend that the construction and expansion joints be dowelled.

10.2.1 Stress Pads for Trash Enclosures and PCC Pavement for Fire Truck Access

Pads where trash containers will be stored, and where garbage trucks will park while emptying trash containers, should be constructed on Portland Cement Concrete. We recommend that the trash enclosure pads and stress (landing) pads where garbage trucks will store, pick up, and empty trash be increased to a minimum PCC thickness of 7 inches. The compressive strength, underlayment, and construction details should be consistent with the above recommendations for PCC pavements.

We understand portions of the new bike lane and sidewalk will be used for fire truck access. Based on the provided fire truck loading of 43,500 pounds for a fire truck loaded with water and 66,720 pounds for a ladder truck, we recommend PCC pavement areas subjected to these loads have a minimum PCC thickness of 6 inches. The compressive strength, underlayment, and construction details should be consistent with the above recommendations for PCC pavements.

10.3 PAVEMENT CUTOFF

Surface water penetration into the pavement section can significantly reduce the pavement life, due to the native expansive clays. While quantifying the life reduction is difficult, a normal 20-year pavement design could be reduced to less than 10 years; therefore, increased long-term maintenance may be required.

It would be beneficial to include a pavement cut-off, such as deepened curbs, redwood-headers, or “Deep-Root Moisture Barriers” that are keyed at least 4 inches into the pavement subgrade. This will help limit the additional long-term maintenance.

SECTION 11: RETAINING WALLS

11.1 STATIC LATERAL EARTH PRESSURES

The structural design of any site retaining wall should include resistance to lateral earth pressures that develop from the soil behind the wall, any undrained water pressure, and surcharge loads acting behind the wall. Provided a drainage system is constructed behind the wall to prevent the build-up of hydrostatic pressures as discussed in the section below, we recommend that the walls with level backfill be designed for the following pressures:

Table 11: Recommended Lateral Earth Pressures

Wall Condition	Lateral Earth Pressure*	Additional Surcharge Loads
Unrestrained – Cantilever Wall	45 pcf	⅓ of vertical loads at top of wall
Restrained – Braced Wall	45 pcf + 8H** psf	½ of vertical loads at top of wall

* Lateral earth pressures are based on an equivalent fluid pressure for level backfill conditions
** H is the distance in feet between the bottom of footing and top of retained soil

If adequate drainage cannot be provided behind the wall, an additional equivalent fluid pressure of 40 pcf should be added to the values above for both restrained and unrestrained walls for the portion of the wall that will not have drainage. Damp proofing or waterproofing of the walls may be considered where moisture penetration and/or efflorescence are not desired.

11.2 SEISMIC LATERAL EARTH PRESSURES

11.2.1 Site Walls

The 2019 CBC states that lateral pressures from earthquakes should be considered in the design of basements and retaining walls. At this time, we are not aware of any retaining walls for the project. However, minor landscaping walls (i.e. walls 6 feet or less in height) may be proposed. In our opinion, design of these walls for seismic lateral earth pressures in addition to static earth pressures is not warranted.

11.3 WALL DRAINAGE

11.3.1 At-Grade Site Walls

Adequate drainage should be provided by a subdrain system behind all walls. This system should consist of a 4-inch minimum diameter perforated pipe placed near the base of the wall (perforations placed downward). The pipe should be bedded and backfilled with Class 2 Permeable Material per Caltrans Standard Specifications, latest edition. The permeable backfill should extend at least 12 inches out from the wall and to within 2 feet of outside finished grade. Alternatively, ½-inch to ¾-inch crushed rock may be used in place of the Class 2 Permeable Material provided the crushed rock and pipe are enclosed in filter fabric, such as Mirafi 140N or

approved equivalent. The upper 2 feet of wall backfill should consist of compacted on-site soil. The subdrain outlet should be connected to a free-draining outlet or sump.

Miradrain, Geotech Drainage Panels, or equivalent drainage matting can be used for wall drainage as an alternative to the Class 2 Permeable Material or drain rock backfill. Horizontal strip drains connecting to the vertical drainage matting may be used in lieu of the perforated pipe and crushed rock section. The vertical drainage panel should be connected to the perforated pipe or horizontal drainage strip at the base of the wall, or to some other closed or through-wall system such as the TotalDrain system from AmerDrain. Sections of horizontal drainage strips should be connected with either the manufacturer's connector pieces or by pulling back the filter fabric, overlapping the panel dimples, and replacing the filter fabric over the connection. At corners, a corner guard, corner connection insert, or a section of crushed rock covered with filter fabric must be used to maintain the drainage path.

Drainage panels should terminate 18 to 24 inches from final exterior grade. The Miradrain panel filter fabric should be extended over the top of and behind the panel to protect it from intrusion of the adjacent soil.

11.4 BACKFILL

Where surface improvements will be located over the retaining wall backfill, backfill placed behind the walls should be compacted to at least 95 percent relative compaction using light compaction equipment. Where no surface improvements are planned, backfill should be compacted to at least 90 percent. If heavy compaction equipment is used, the walls should be temporarily braced.

11.5 FOUNDATIONS

Retaining walls may be supported on a continuous and or spread footing designed in accordance with the recommendations presented in the "Foundations" section of this report.

SECTION 12: LIMITATIONS

This report, an instrument of professional service, has been prepared for the sole use of Palo Alto Unified School District specifically to support the design of the Hoover Elementary School Re-Design project in Palo Alto, California. The opinions, conclusions, and recommendations presented in this report have been formulated in accordance with accepted geotechnical engineering practices that exist in Northern California at the time this report was prepared. No warranty, expressed or implied, is made or should be inferred.

Recommendations in this report are based upon the soil and groundwater conditions encountered during our subsurface exploration. If variations or unsuitable conditions are encountered during construction, Cornerstone must be contacted to provide supplemental recommendations, as needed.

Palo Alto Unified School District may have provided Cornerstone with plans, reports and other documents prepared by others. Palo Alto Unified School District understands that Cornerstone reviewed and relied on the information presented in these documents and cannot be responsible for their accuracy.

Cornerstone prepared this report with the understanding that it is the responsibility of the owner or his representatives to see that the recommendations contained in this report are presented to other members of the design team and incorporated into the project plans and specifications, and that appropriate actions are taken to implement the geotechnical recommendations during construction.

Conclusions and recommendations presented in this report are valid as of the present time for the development as currently planned. Changes in the condition of the property or adjacent properties may occur with the passage of time, whether by natural processes or the acts of other persons. In addition, changes in applicable or appropriate standards may occur through legislation or the broadening of knowledge. Therefore, the conclusions and recommendations presented in this report may be invalidated, wholly or in part, by changes beyond Cornerstone's control. This report should be reviewed by Cornerstone after a period of three (3) years has elapsed from the date of this report. In addition, if the current project design is changed, then Cornerstone must review the proposed changes and provide supplemental recommendations, as needed.

An electronic transmission of this report may also have been issued. While Cornerstone has taken precautions to produce a complete and secure electronic transmission, please check the electronic transmission against the hard copy version for conformity.

Recommendations provided in this report are based on the assumption that Cornerstone will be retained to provide observation and testing services during construction to confirm that conditions are similar to that assumed for design, and to form an opinion as to whether the work has been performed in accordance with the project plans and specifications. If we are not retained for these services, Cornerstone cannot assume any responsibility for any potential claims that may arise during or after construction as a result of misuse or misinterpretation of Cornerstone's report by others. Furthermore, Cornerstone will cease to be the Geotechnical-Engineer-of-Record if we are not retained for these services.

SECTION 13: REFERENCES

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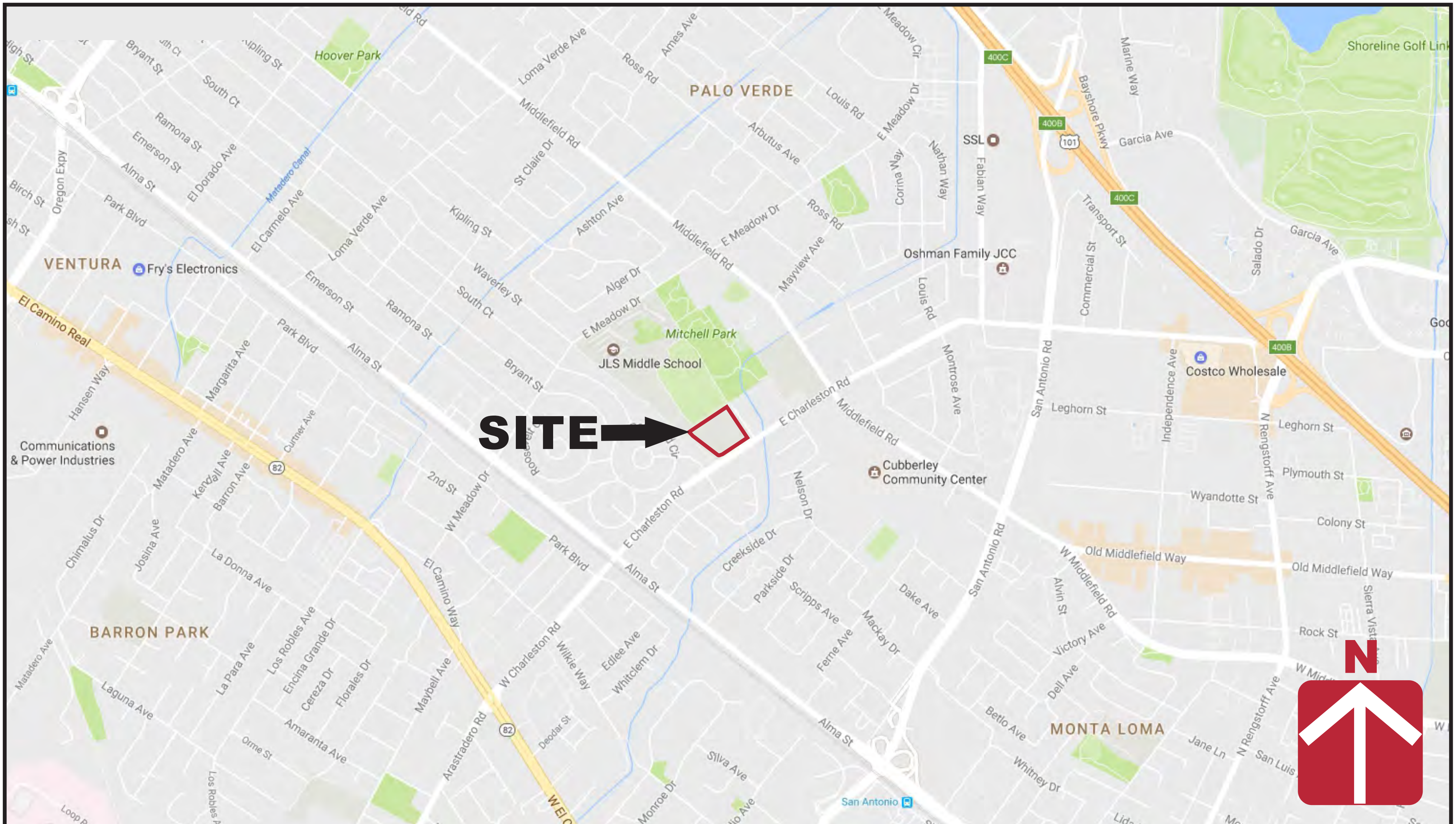
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AERIAL PHOTOS REVIEWED

Date	Type
1948	vertical black & white
1956	vertical black & white
1960	vertical black & white
1968	vertical black & white
1980	vertical black & white
1987	natural color
1993	natural color
1998	natural color
2002	natural color
2005	natural color
2009	natural color
2010	natural color
2012	natural color



CORNERSTONE
EARTH GROUP

Vicinity Map

Hoover Elementary School
Palo Alto, CA

Project Number	288-11-4
Figure Number	Figure 1
Date	May 2022
Drawn By	RRN

Approximate location of exploratory boring (EB) (Cornerstone, current investigation)

Approximate location of cone penetration test (CPT) (Cornerstone, current investigation)

Approximate location of infiltration test (P) (Cornerstone, current investigation)

B-6 A' P-1 B-7 RELOCATED BIKE LANE BIKE ENCLOSURE TRASH ENCLOSURE

Qhff

CPT-7 EB-5 P-5 BIKE ENCLOSURE B-5 TRANSFORMER PAD 1 CPT-4 SWITCH BOARD

FUTURE MPR BUILDING #INC 3 6,970 SF

Proposed Buildings

B-4 P-2 CPT-1 B-3

FUTURE CLASSROOM BUILDING #INC 3 17,930 SF (First Floor)

B-12 P-4 CPT-2 EB-3

STUDENT GARDEN AREA 3,950 SF

CPT-6

Waverly Street

B-1 EB-1

Proposed Buildings

KINDER BUILDING INC#2

B-2

B

Qhff

Qhf

CPT-5 EB-4 26 SF

ADMIN & LIBRARY BUILDING INC#2 7,540 SF

EB-2 CPT-3 P-3

B' A

Approximate Site Boundary

East Charleston Road

Geologic Units

Qhf Alluvial fan deposits (Holocene)

Qhff Alluvial fan deposits, fine grained facies (Holocene)

Legend

Approximate location of exploratory boring (EB) (Cornerstone, 2017)

Approximate location of cone penetration test (CPT) (Cornerstone, 2017)

Approximate location of soil boring (B) (Kleinfelder, 2000)

A A' Approximate location of cross section

Approximate geologic contact (CGS, 2006)

0 60 120

APPROXIMATE SCALE (FEET)

Base by Google Earth, dated 09/27/2021

Overlay by Aedis Architects, Fire Department Access Plan - 2-AA0.01, dated 02/20/2023

Project Number 288-11-4

Figure Number Figure 2

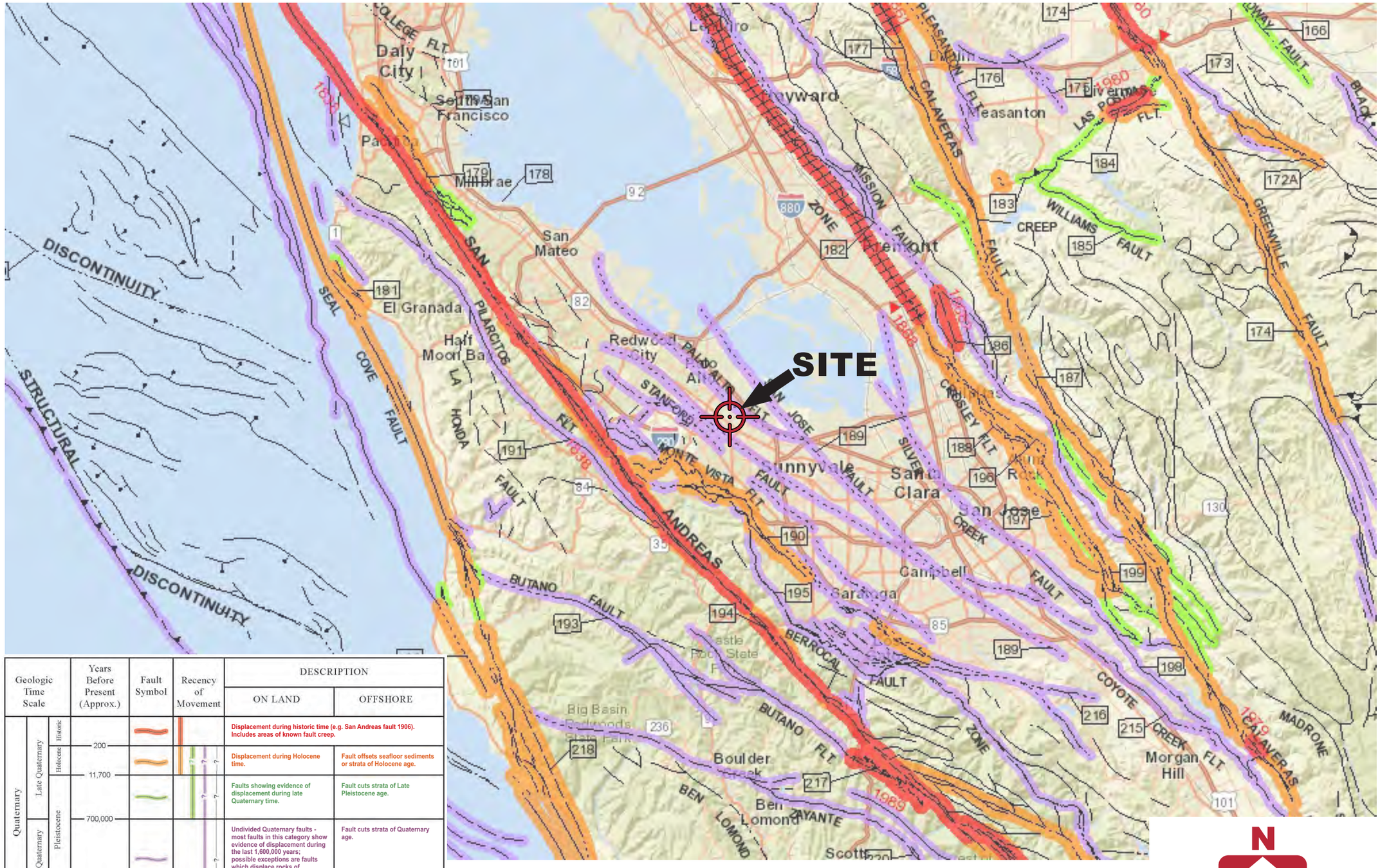
Drawn By RRN

Date February 2023

Site Plan and Geologic Map

Hoover Elementary School
Palo Alto, CA

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Geologic Time Scale		Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
					ON LAND	OFFSHORE
Quaternary	Historic	200			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
	Late Quaternary, Holocene	11,700		? ? ?	Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
	Late Quaternary, Pleistocene	700,000		? ? ?	Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary, Pleistocene	1,600,000		?	Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Pilo-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary		4.5 billion (Age of Earth)			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.

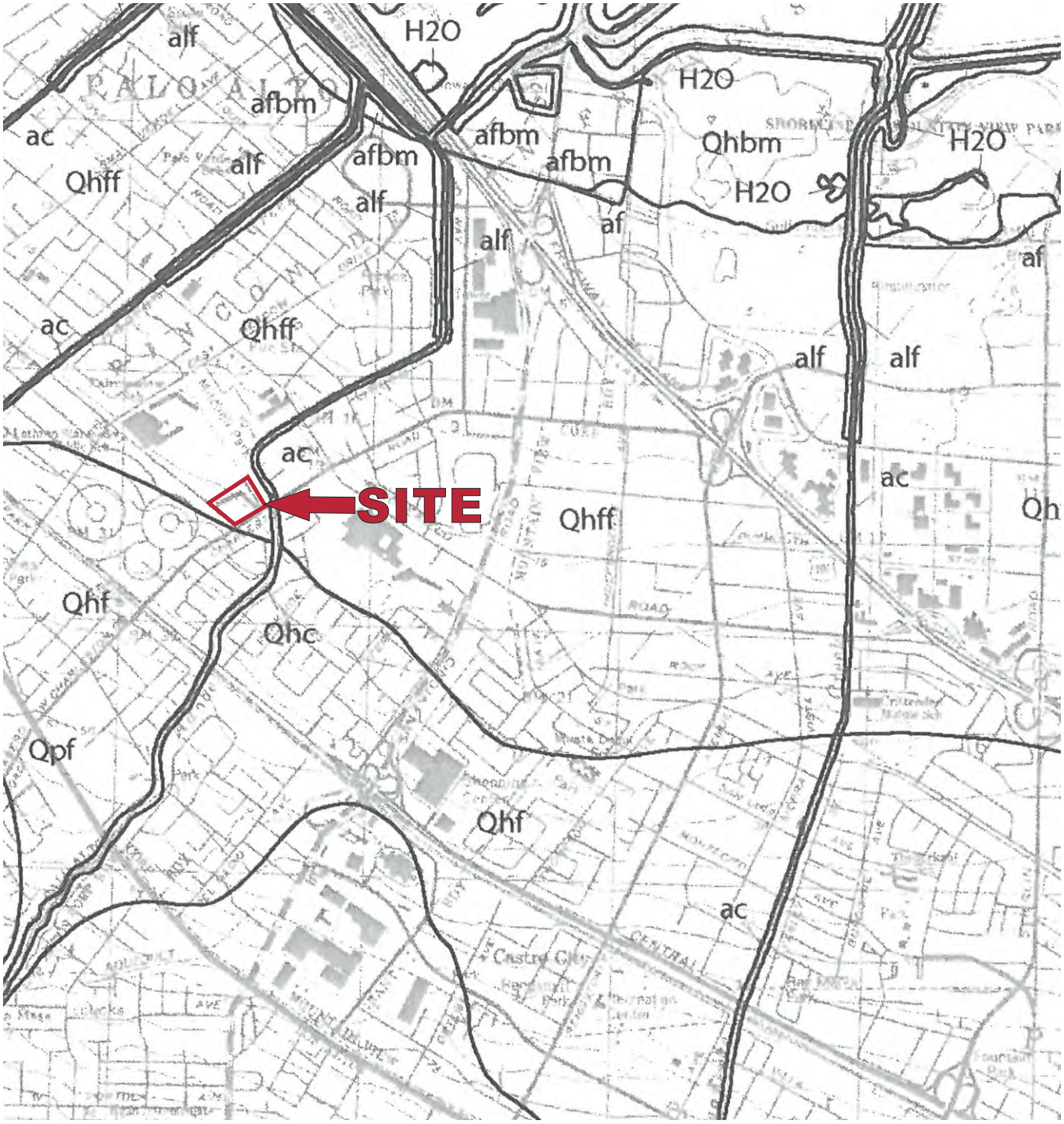
Base by California Geological Survey - 2010 Fault Activity Map of California (Jennings and Bryant, 2010)

Project Number	288-11-4
Figure Number	Figure 3
Date	May 2022
Drawn By	RRN

Regional Fault Map

Hoover Elementary School
Palo Alto, CA

CORNERSTONE EARTH GROUP



Geologic Units

ac	Artificial stream channel
Qhc	Modern stream channel deposits (Holocene)
Qhf	Alluvial fan deposits (Holocene)
Qhff	Alluvial fan deposits, fine grained facies (Holocene)

Explanation

Contact- dashed where approximate, dotted where concealed

N

0 2000 4000

APPROXIMATE SCALE (FEET)

Base: Plate 1.1 Quaternary Geologic of the Mountain View 7.5-Minute Quadrangle, California, Modified from Knudsen and others, 2000

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Vicinity Geologic Map

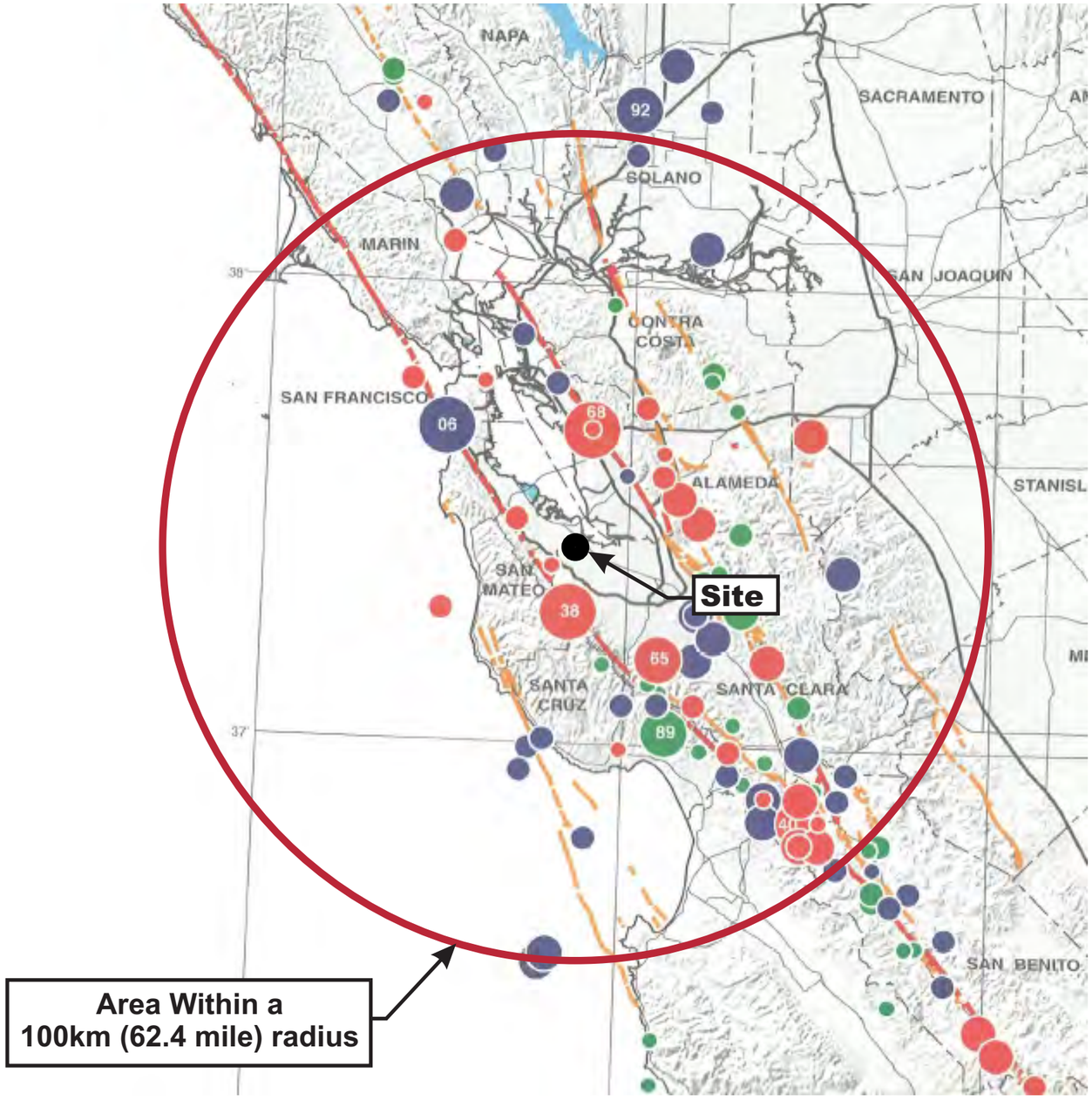
Hoover Elementary School
Palo Alto, CA

Project Number: 288-11-4

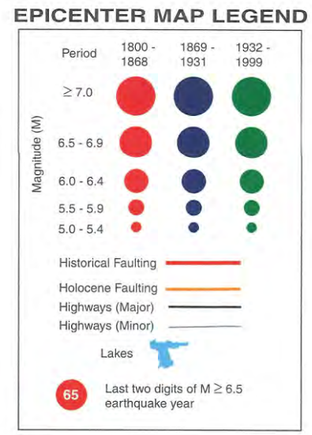
Figure Number: Figure 4

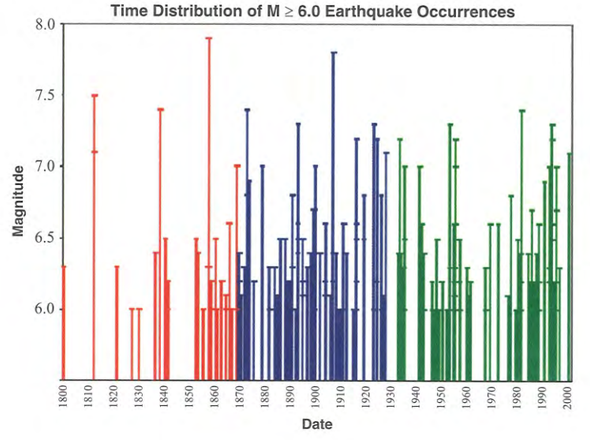
Date: May 2022

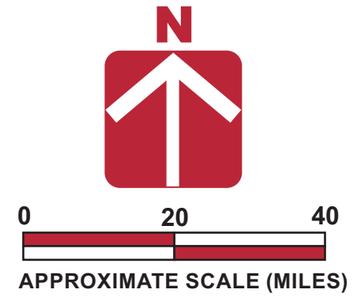
Drawn By: RRN



From: T. Toppozada & Others (2000)







Project Number 288-11-4

Figure Number Figure 5

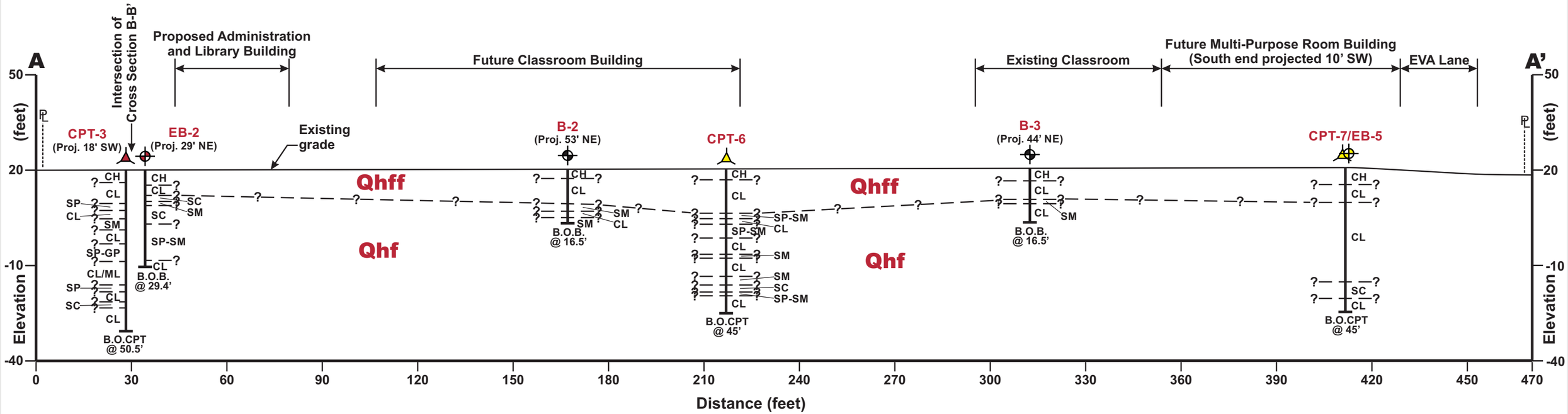
Drawn By RRN

Date May 2022

Historical Earthquakes Map

Hoover Elementary School
Palo Alto, CA

CORNERSTONE EARTH GROUP



Section A-A'

(View Looking Southwest)
1"=30' H:V

Explanation

Geologic Units

Qhf	Alluvial fan deposits (Holocene)
Qhff	Alluvial fan deposits, fine grained facies (Holocene)

Symbols

CL	Lean Clay
CH	Fat Clay
SC	Clayey Sand
SM	Silty Sand
SP	Poorly Graded Sand
SP-SM	Poorly Graded Sand with Silt and Gravel
SP-GP	Poorly Graded Sand with Gravel

- Approximate location of exploratory boring (EB) (Cornerstone, current investigation)
- Approximate location of cone penetration test (CPT) (Cornerstone, current investigation)
- Approximate location of exploratory boring (EB) (Cornerstone, 2017)
- Approximate location of cone penetration test (CPT) (Cornerstone, 2017)
- Approximate location of soil boring (B) (Kleinfelder, 2000)

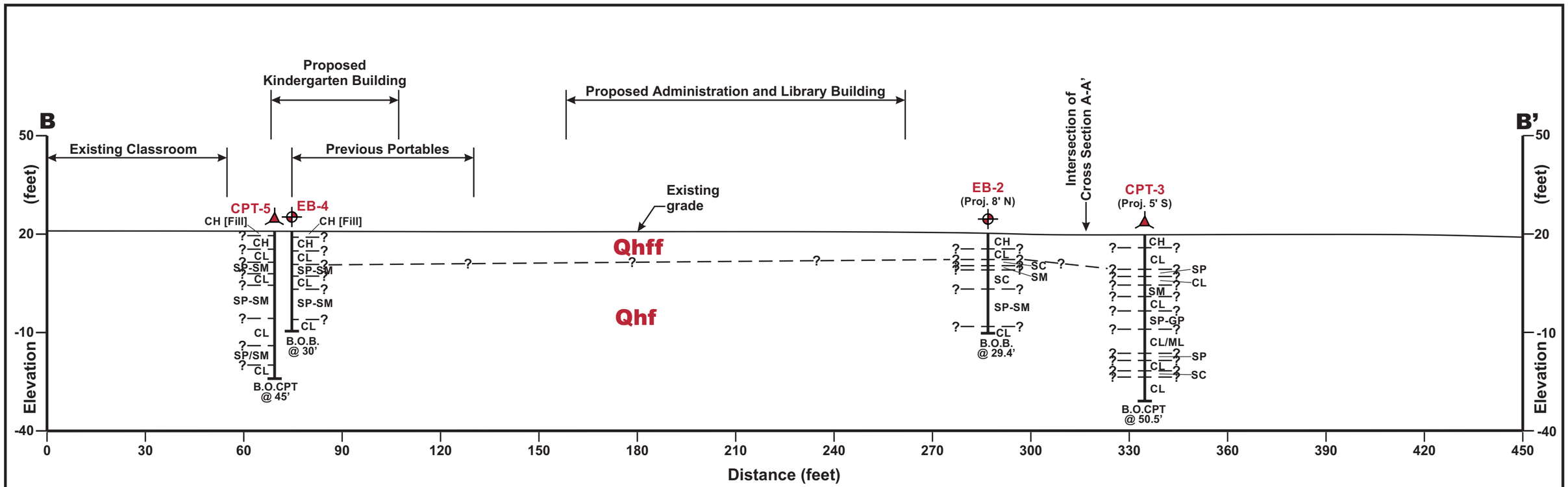
Notes:
1) Surficial fills associated with existing pavements, landscaping or utilities are not shown.
2) The subsurface profile is conceptual and is based on limited subsurface data obtained from widely spaced borings. Actual subsurface conditions may vary significantly between borings.
3) See Figure 2 for location of cross section.

CORNERSTONE EARTH GROUP

Geologic Cross Section A-A'

Hoover Elementary School
Palo Alto, CA

Project Number: 288-11-4
Figure Number: Figure 6
Date: March 2023
Drawn By: RRN



Section B-B'

(View Looking North)
1"=30' H:V

Explanation

Geologic Units

Qhf	Alluvial fan deposits (Holocene)
Qhff	Alluvial fan deposits, fine grained facies (Holocene)

Symbols

Fill	Artificial fill
CL	Lean Clay
CH	Fat Clay
SC	Clayey Sand
SM	Silty Sand
SP	Poorly Graded Sand
SP-SM	Poorly Graded Sand with Silt and Gravel
SP-GP	Poorly Graded Sand with Gravel

- Approximate location of exploratory boring (EB) (Cornerstone, current investigation)
- Approximate location of cone penetration test (CPT) (Cornerstone, current investigation)
- Approximate location of exploratory boring (EB) (Cornerstone, 2017)
- Approximate location of cone penetration test (CPT) (Cornerstone, 2017)

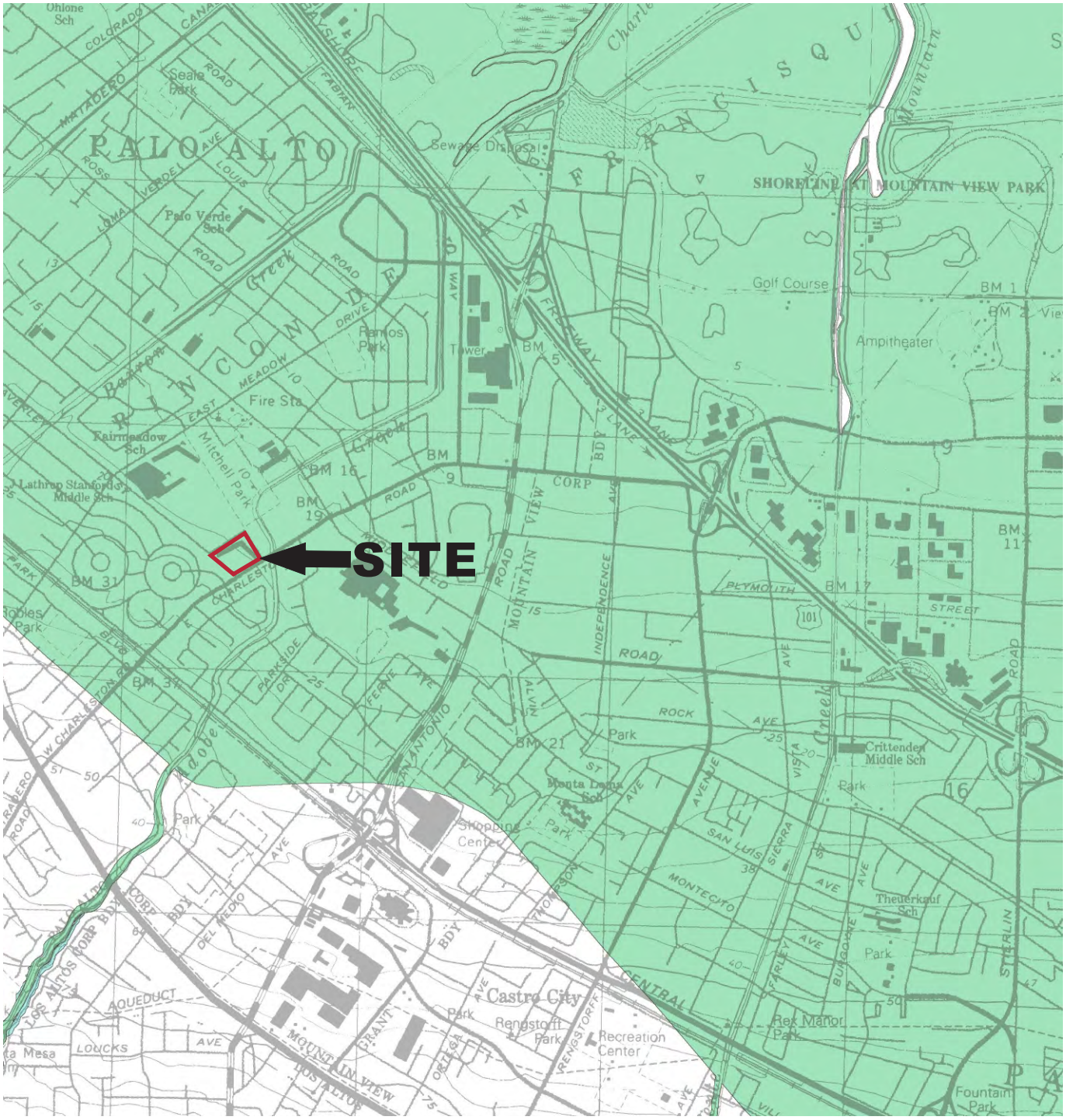
Notes:
1) Surficial fills associated with existing pavements, landscaping or utilities are not shown.
2) The subsurface profile is conceptual and is based on limited subsurface data obtained from widely spaced borings. Actual subsurface conditions may vary significantly between borings.
3) See Figure 2 for location of cross section.

CORNERSTONE EARTH GROUP

Geologic Cross Section B-B'

Hoover Elementary School
Palo Alto, CA

Project Number	288-11-4
Figure Number	Figure 7
Date	March 2023
Drawn By	RRN



Explanation

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

N

0 2000 4000

APPROXIMATE SCALE (FEET)

Base by State of California, Seismic Hazard Zones.

CORNERSTONE EARTH GROUP

Seismic Hazard Map

Hoover Elementary School
Palo Alto, CA

Project Number	288-11-4
Figure Number	Figure 8
Date	May 2022
Drawn By	RRN

APPENDIX A: FIELD INVESTIGATION

The field investigation consisted of a surface reconnaissance and a subsurface exploration program using truck-mounted, hollow-stem auger drilling equipment and 25-ton truck-mounted Cone Penetration Test equipment. Two 8-inch-diameter exploratory borings were drilled on April 8, 2022 to depths of 30 to 40 feet. Three CPT soundings were also performed in accordance with ASTM D 5778-95 (revised, 2002) on April 6, 2022, to depths of approximately 45 feet each. The approximate locations of exploratory borings and CPTs are shown on the Site Plan and Geologic Map, Figure 2. The soils encountered were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D2488). Boring logs, as well as a key to the classification of the soil and bedrock, are included as part of this appendix.

Boring and CPT locations were approximated using existing site boundaries, a hand held GPS unit, and other site features as references. Boring and CPT elevations were not determined. The locations of the borings and CPTs should be considered accurate only to the degree implied by the method used.

Representative soil samples were obtained from the borings at selected depths. All samples were returned to our laboratory for evaluation and appropriate testing. The standard penetration resistance blow counts were obtained by dropping a 140-pound hammer through a 30-inch free fall. The 2-inch O.D. split-spoon sampler was driven 18 inches and the number of blows was recorded for each 6 inches of penetration (ASTM D1586). 2.5-inch I.D. samples were obtained using a Modified California Sampler driven into the soil with the 140-pound hammer previously described. Relatively undisturbed samples were also obtained with 2.875-inch I.D. Shelby Tube sampler which were hydraulically pushed. Unless otherwise indicated, the blows per foot recorded on the boring log represent the accumulated number of blows required to drive the last 12 inches. The various samplers are denoted at the appropriate depth on the boring logs.

The CPT involved advancing an instrumented cone-tipped probe into the ground while simultaneously recording the resistance at the cone tip (q_c) and along the friction sleeve (f_s) at approximately 5-centimeter intervals. Based on the tip resistance and tip to sleeve ratio (R_f), the CPT classified the soil behavior type and estimated engineering properties of the soil, such as equivalent Standard Penetration Test (SPT) blow count, internal friction angle within sand layers, and undrained shear strength in silts and clays. A pressure transducer behind the tip of the CPT cone measured pore water pressure (u_2). Graphical logs of the CPT data is included as part of this appendix.

Field tests included an evaluation of the unconfined compressive strength of the soil samples using a pocket penetrometer device. The results of these tests are presented on the individual boring logs at the appropriate sample depths.

Attached boring and CPT logs and related information depict subsurface conditions at the locations indicated and on the date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these boring and CPT locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition,

any stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

UNIFIED SOIL CLASSIFICATION (ASTM D-2487-98)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LEAN CLAY
			PI>4 AND PLOTS<"A" LINE	ML	SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY
			PI PLOTS <"A" LINE	MH	ELASTIC SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT

OTHER MATERIAL SYMBOLS

- Poorly-Graded Sand with Clay
- Clayey Sand
- Sandy Silt
- Artificial/Undocumented Fill
- Poorly-Graded Gravelly Sand
- Topsoil
- Well-Graded Gravel with Clay
- Well-Graded Gravel with Silt
- Sand
- Silt
- Well Graded Gravelly Sand
- Gravelly Silt
- Asphalt
- Boulders and Cobble

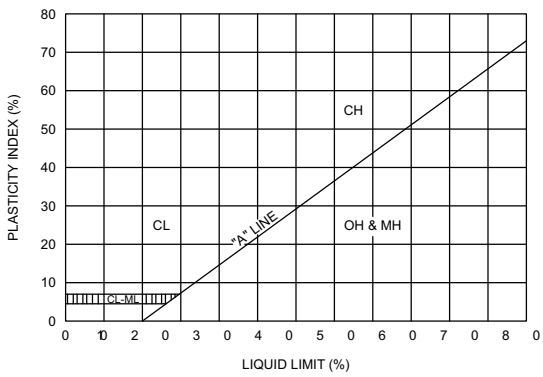
SAMPLER TYPES

- SPT
- Modified California (2.5" I.D.)
- Rock Core
- Shelby Tube
- No Recovery
- Grab Sample

ADDITIONAL TESTS

CA	-	CHEMICAL ANALYSIS (CORROSIVITY)	PI	-	PLASTICITY INDEX
CD	-	CONSOLIDATED DRAINED TRIAXIAL	SW	-	SWELL TEST
CN	-	CONSOLIDATION	TC	-	CYCLIC TRIAXIAL
CU	-	CONSOLIDATED UNDRAINED TRIAXIAL	TV	-	TORVANE SHEAR
DS	-	DIRECT SHEAR	UC	-	UNCONFINED COMPRESSION
PP	-	POCKET PENETROMETER (TSF)	(1.5)	-	(WITH SHEAR STRENGTH IN KSF)
(3.0)	-	(WITH SHEAR STRENGTH IN KSF)			
RV	-	R-VALUE	UU	-	UNCONSOLIDATED UNDRAINED TRIAXIAL
SA	-	SIEVE ANALYSIS: % PASSING #200 SIEVE			
	-	WATER LEVEL			

PLASTICITY CHART



PENETRATION RESISTANCE
(RECORDED AS BLOWS / FOOT)

SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	STRENGTH** (KSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.5
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.5 - 1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

** UNDRAINED SHEAR STRENGTH IN KIPS/SQ. FT. AS DETERMINED BY LABORATORY TESTING OR APPROXIMATED BY THE STANDARD PENETRATION TEST, POCKET PENETROMETER, TORVANE, OR VISUAL OBSERVATION.

CORNERSTONE EARTH GROUP

LEGEND TO SOIL DESCRIPTIONS

Figure Number A-1

BORING NUMBER EB-4

CORNERSTONE EARTH GROUP

PROJECT NAME Hoover Elementary School Modernization
PROJECT NUMBER 288-11-4
PROJECT LOCATION 445 East Charleston Road, Palo Alto, CA

DATE STARTED 4/8/22 **DATE COMPLETED** 4/8/22
GROUND ELEVATION _____ **BORING DEPTH** 30 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE 37.4180701° **LONGITUDE** -122.1144426°
DRILLING METHOD Mobile B-40, 8 inch Hollow-Stem Auger
GROUND WATER LEVELS:
LOGGED BY JDS
▽ **AT TIME OF DRILLING** 9.5 ft.
NOTES _____
▼ **AT END OF DRILLING** 9.5 ft.

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf
	0		2 inches asphalt concrete over 10 inches aggregate base							
			Sandy Fat Clay (CH) [Af] hard, moist, dark brown to brown, fine to coarse sand, high plasticity	15	MC-1B	86	29			>4.5
			Fat Clay (CH) [Qhff] very stiff, moist, dark brown to brown, some fine sand, high plasticity	14	MC-2B	86	30			
	5		**Sandy Lean Clay (CL) [Qhff]** very stiff, moist, brown with light brown mottles, fine to coarse sand, trace fine subangular gravel, moderate plasticity	16	MC-3B	98	24			
				18	MC					
				20	MC-5B	110	7		9	
	10		**Poorly Graded Sand with Silt and Gravel (SP-SM) [Qhf]** loose, moist, gray and brown, fine to coarse sand, fine to coarse subangular to subrounded gravel	11	MC-6B	112	17			
				8	SPT					
			Sandy Lean Clay (CL) [Qhf] very stiff, moist, light brown with gray mottles, fine to coarse sand, low plasticity							
	15		Liquid Limit = 33, Plastic Limit = 15	11	MC-8B	119	16	18		
			Poorly Graded Sand with Silt and Gravel (SP-SM) [Qhf] loose to medium dense, moist, gray and brown, fine to coarse sand, fine to coarse subangular to subrounded gravel	14	MC-9B	115	16		9	
	20			23	MC-10B	123	12		7	
				17	MC					
	25			51	MC-12B	126	12			
			Lean Clay with Sand (CL) [Qhf] stiff, moist, light brown with gray mottles, fine to coarse sand, moderate plasticity							
				12	MC-13B	98	24			
	30		Bottom of Boring at 30.0 feet.							

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 5/4/22 08:19 - P:\DRAFTING\GINT FILES\288-11-4 HOOVER ES.GPJ

BORING NUMBER EB-5

CORNERSTONE EARTH GROUP

PROJECT NAME Hoover Elementary School Modernization
PROJECT NUMBER 288-11-4
PROJECT LOCATION 445 East Charleston Road, Palo Alto, CA

DATE STARTED 4/8/22 **DATE COMPLETED** 4/8/22
GROUND ELEVATION _____ **BORING DEPTH** 40 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE 37.4190654° **LONGITUDE** -122.1145667°
DRILLING METHOD Mobile B-40, 8 inch Hollow-Stem Auger
GROUND WATER LEVELS:
LOGGED BY JDS
▽ **AT TIME OF DRILLING** 10.5 ft.
NOTES _____
▼ **AT END OF DRILLING** 10.5 ft.

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	0	4 inches asphalt concrete over 12 inches aggregate base						
		Fat Clay (CH) [Qhff] hard, moist, dark brown to brown, some fine sand, high plasticity Liquid Limit = 71, Plastic Limit = 24	25	MC-1B	94	24	47	
			35	MC-2B	100	21		
	5	**Sandy Lean Clay (CL) [Qhff]** very stiff, moist, brown with light brown mottles, fine to coarse sand, trace fine subangular gravel, moderate plasticity Liquid Limit = 38, Plastic Limit = 17	15	MC-3B	112	16	21	
			14	MC-4B	109	18		
		Lean Clay with Sand (CL) [Qhff] stiff, moist, brown, fine to medium sand, moderate plasticity	7	MC-5B	98	25		
	10	**Lean Clay (CL) [Qhf]** very stiff, moist, brown, some fine sand, moderate plasticity	11	MC-6B	97	28		
	15	**Lean Clay with Sand (CL) [Qhf]** stiff, moist, brown, fine to medium sand, moderate plasticity	7	MC				
	20	becomes medium stiff		ST-8	98	26		
	25		13	MC-9B	94	29		
	30		10	MC-10B	93	29		

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0
>4.5 >4.5

Continued Next Page

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 5/4/22 08:19 - P:\DRAFTING\GINT FILES\288-11-4 HOOVER ES.GPJ

BORING NUMBER EB-5

CORNERSTONE EARTH GROUP

PROJECT NAME Hoover Elementary School Modernization

PROJECT NUMBER 288-11-4

PROJECT LOCATION 445 East Charleston Road, Palo Alto, CA

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL; 1.0 2.0 3.0 4.0)
	30		**Lean Clay with Sand (CL) [Qhf]** stiff, moist, brown, fine to medium sand, moderate plasticity							
	35			11	MC-11B	101	25			○
			Clayey Sand with Gravel (SC) [Qhf] medium dense, moist, gray and brown, fine to coarse sand, fine to coarse subangular to subrounded gravel	41	MC-12B	127	12			
	40		Bottom of Boring at 40.0 feet.							
	45									
	50									
	55									
	60									

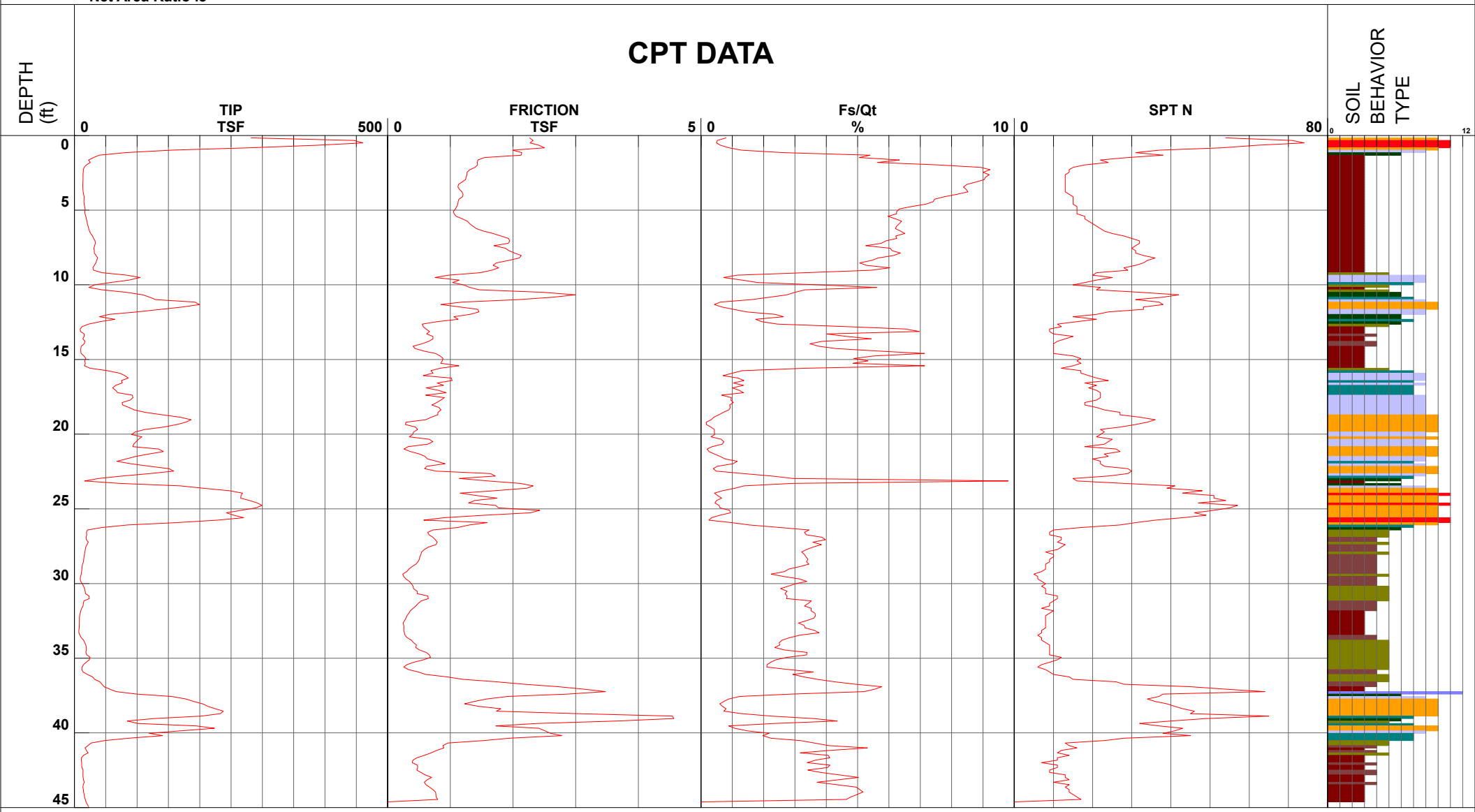
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Cornerstone Earth Group

Project	Hoover Elementary School ReDesign	Operator	JM-GM	Filename	SDF(955).cpt
Job Number	288-11-4	Cone Number	DDG1589	GPS	
Hole Number	CPT-05	Date and Time	4/6/2022 2:10:57 PM	Maximum Depth	44.95 ft
EST GW Depth During Test	9.00 ft				

Net Area Ratio .8

CPT DATA



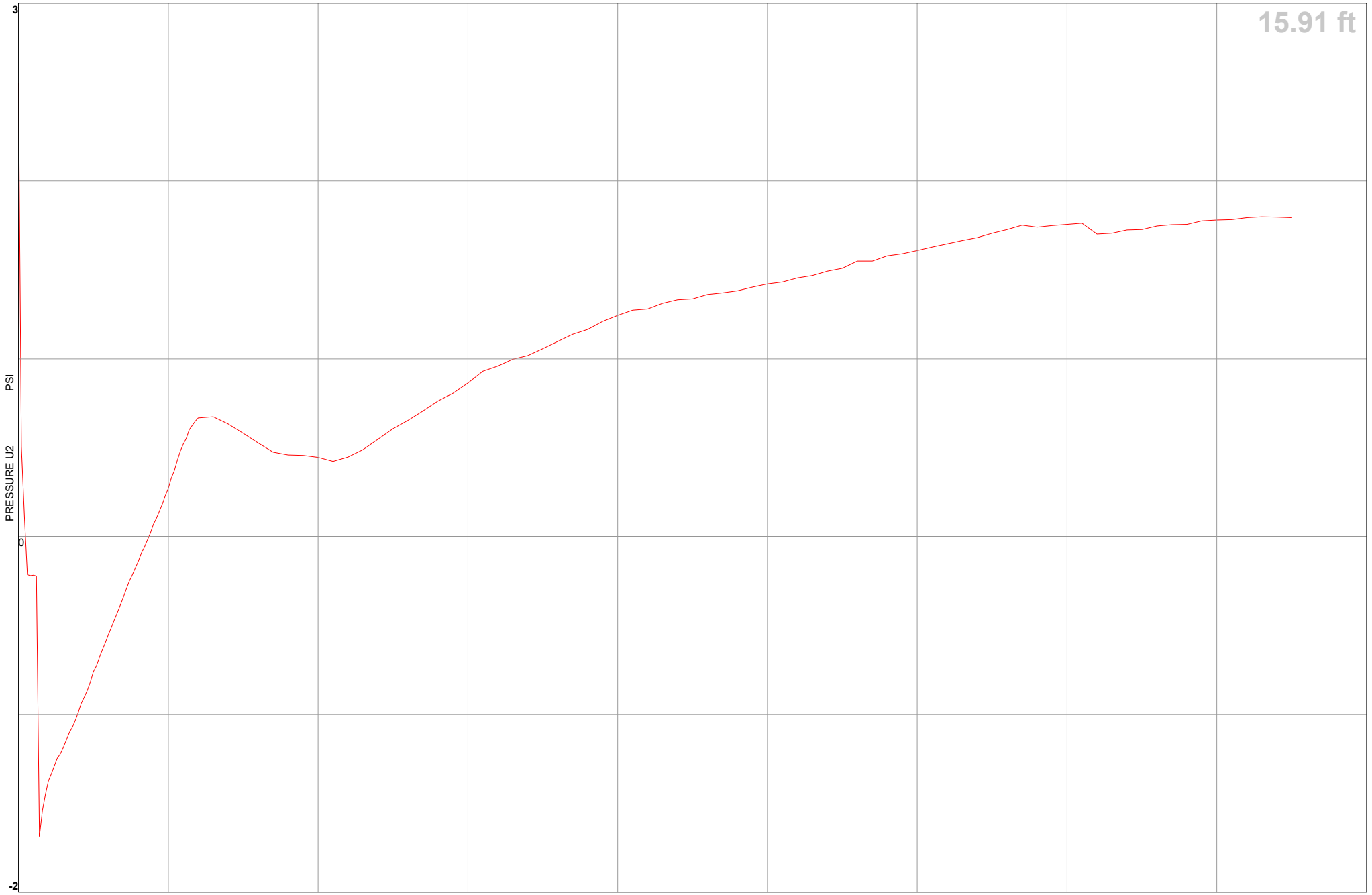
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Cornerstone Earth Group

Location	Hoover Elementary School ReDesign	Operator	JM-GM		
Job Number	288-11-4	Cone Number	DDG1589	GPS	
Hole Number	CPT-05	Date and Time	4/6/2022 2:10:57 PM		
Equilized Pressure	1.8	EST GW Depth During Test	11.7		

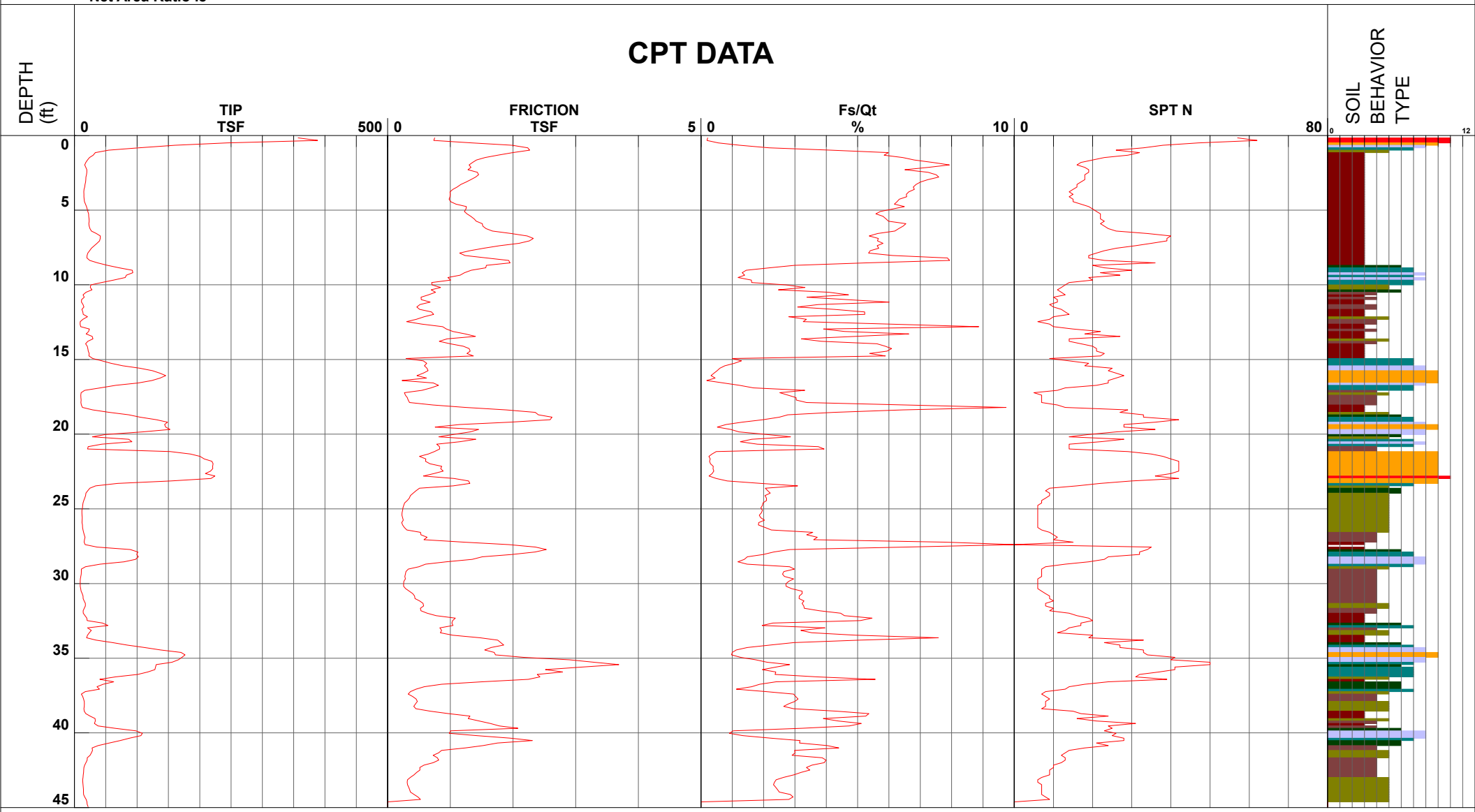


Cornerstone Earth Group

Project	Hoover Elementary School ReDesign	Operator	JM-GM	Filename	SDF(954).cpt
Job Number	288-11-4	Cone Number	DDG1589	GPS	
Hole Number	CPT-06	Date and Time	4/6/2022 1:25:50 PM	Maximum Depth	44.95 ft
EST GW Depth During Test		13.00 ft			

Net Area Ratio .8

CPT DATA



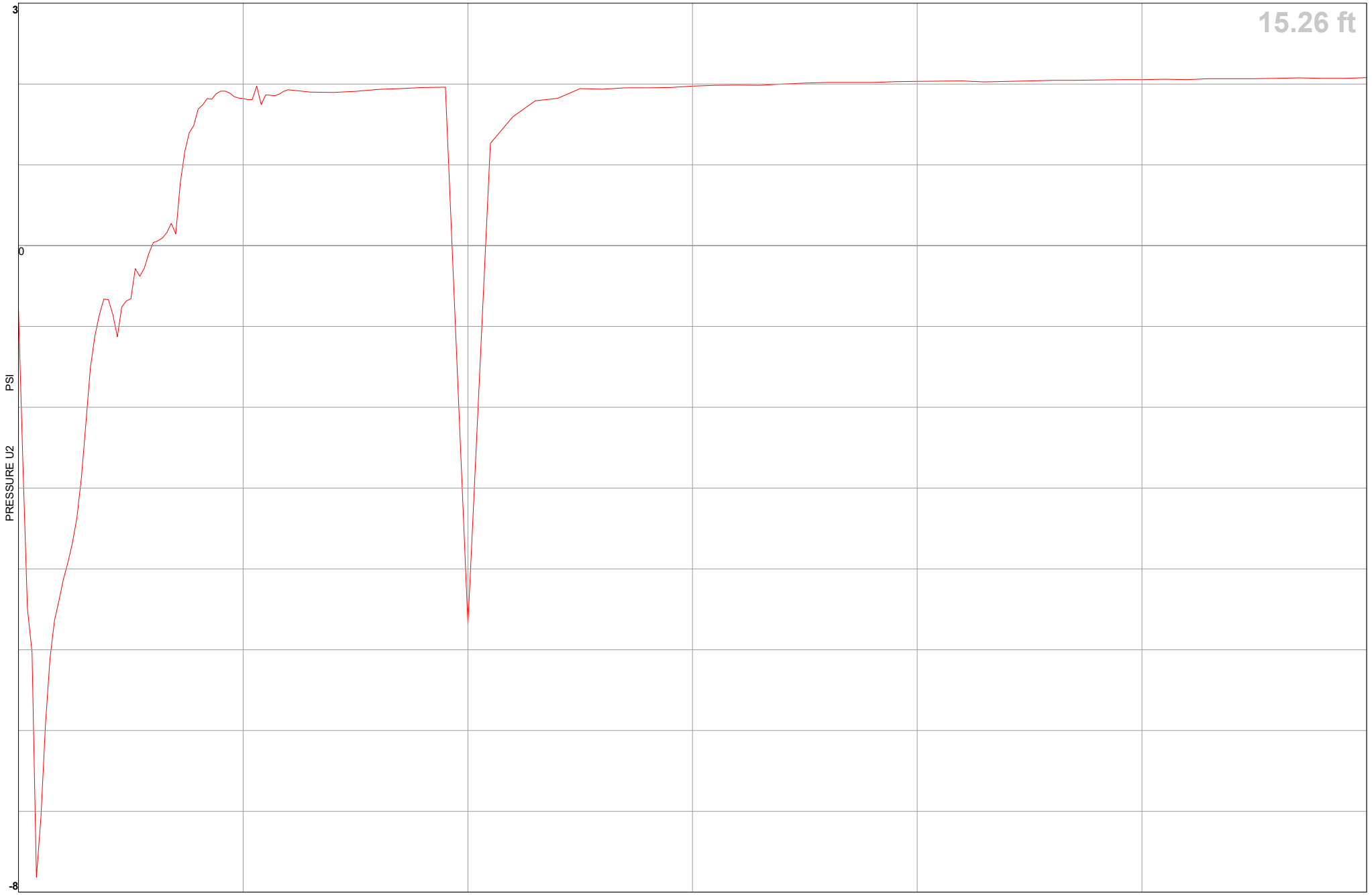
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Cornerstone Earth Group

Location	Hoover Elementary School ReDesign	Operator	JM-GM		
Job Number	288-11-4	Cone Number	DDG1589	GPS	
Hole Number	CPT-06	Date and Time	4/6/2022 1:25:50 PM		
Equilized Pressure	2.0	EST GW Depth During Test	10.5		

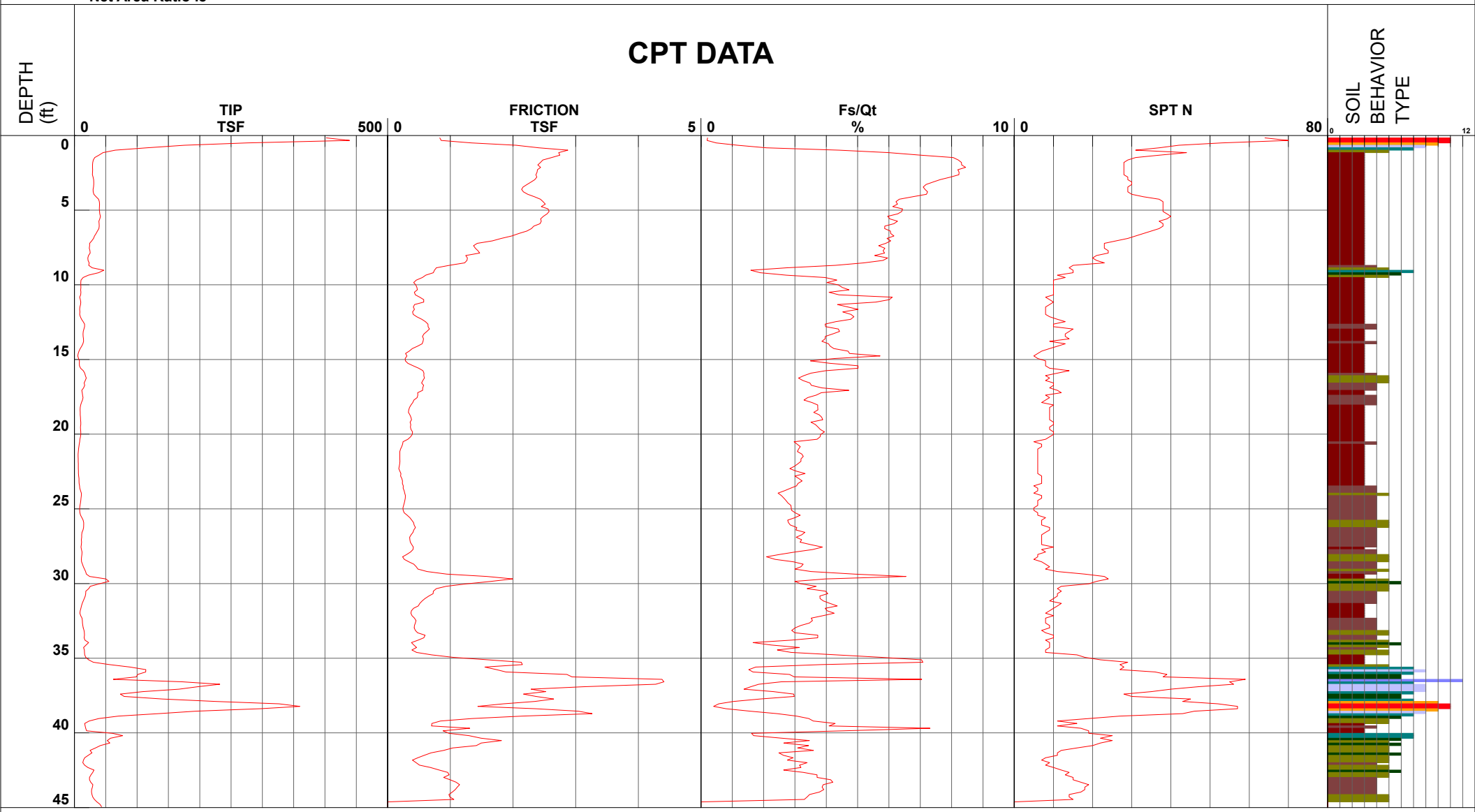


Cornerstone Earth Group

Project	Hoover Elementary School ReDesign	Operator	JM-GM	Filename	SDF(956).cpt
Job Number	288-11-4	Cone Number	DDG1589	GPS	
Hole Number	CPT-07	Date and Time	4/6/2022 4:39:59 PM	Maximum Depth	44.95 ft
EST GW Depth During Test		10.00 ft			

Net Area Ratio .8

CPT DATA



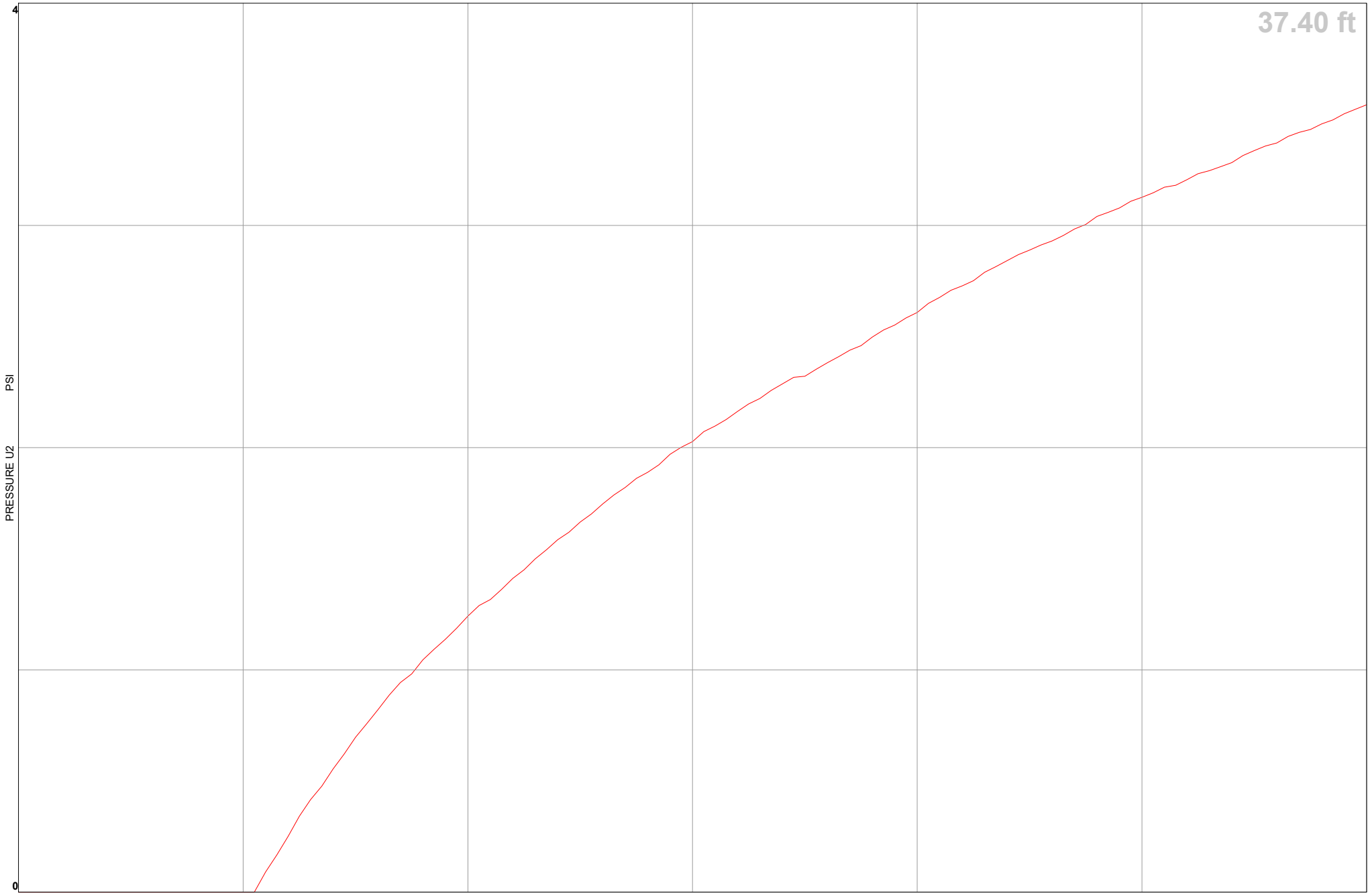
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Cornerstone Earth Group

Location	Hoover Elementary School ReDesign	Operator	JM-GM		
Job Number	288-11-4	Cone Number	DDG1589	GPS	
Hole Number	CPT-07	Date and Time	4/6/2022 4:39:59 PM		
Equilized Pressure	3.5	EST GW Depth During Test	29.2		



APPENDIX B: LABORATORY TEST PROGRAM

The laboratory testing program was performed to evaluate the physical and mechanical properties of the soils retrieved from the site to aid in verifying soil classification.

Moisture Content: The natural water content was determined (ASTM D2216) on 40 samples of the materials recovered from the borings. These water contents are recorded on the boring logs at the appropriate sample depths.

Dry Densities: In place dry density determinations (ASTM D2937) were performed on 38 samples to measure the unit weight of the subsurface soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

Washed Sieve Analyses: The percent soil fraction passing the No. 200 sieve (ASTM D1140) was determined on six samples of the subsurface soils to aid in the classification of these soils. Results of these tests are shown on the boring logs at the appropriate sample depths.

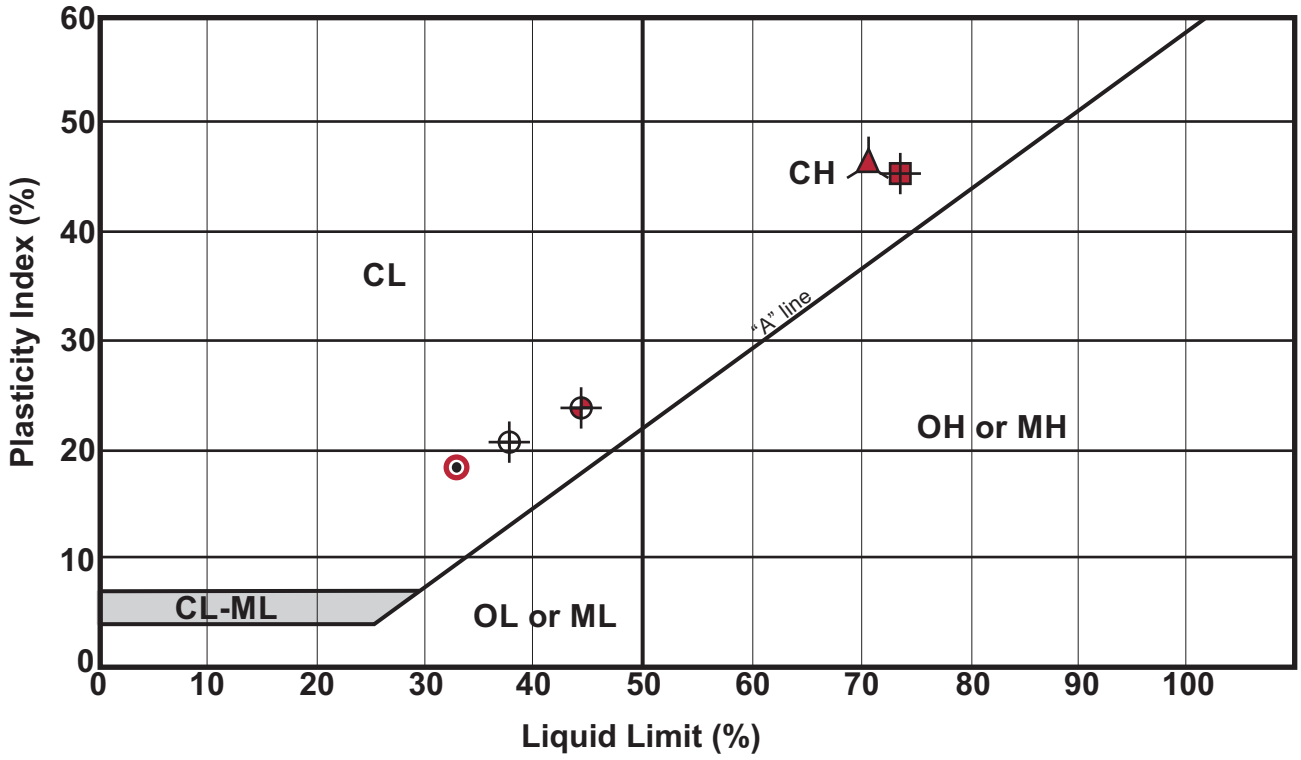
Plasticity Index: Four Plasticity Index determinations (ASTM D4318) were performed on samples of the subsurface soils to measure the range of water contents over which this material exhibits plasticity. The Plasticity Index was used to classify the soil in accordance with the Unified Soil Classification System and to evaluate the soil expansion potential. Results of these tests are shown on the boring logs at the appropriate sample depths.

Undrained-Unconsolidated Triaxial Shear Strength: The undrained shear strength was determined on one relatively undisturbed sample(s) by unconsolidated-undrained triaxial shear strength testing (ASTM D2850). The results of this test are included as part of this appendix.

Consolidation: One consolidation test (ASTM D2435) was performed on a relatively undisturbed sample of the subsurface clayey soils to assist in evaluating the compressibility property of this soil. Results of the consolidation test are presented graphically in this appendix.

Corrosion: Corrosion test suites were performed on three samples from depths of 1½ to 3½ feet. Corrosion tests included: 100% saturated resistivity (ASTM G57), chloride (Caltrans 422), soluble sulfate (Caltrans 417), pH (ASTM G51), Redox (SM 2580B), and sulfide.

Plasticity Index (ASTM D4318) Testing Summary



Symbol	Boring No.	Depth (ft)	Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	Passing No. 200 (%)	Group Name (USCS - ASTM D2487)
⊕	EB-1	5.5	19	44	20	24	50	Sandy Lean Clay (CL) [Qhff]
⊞	EB-3	2.0	30	73	27	46	—	Fat Clay (CH) [Qhff]
◉	EB-4	16.0	16	33	15	18	—	Sandy Lean Clay (CL) [Qhff]
▲	EB-5	2.0	24	71	24	47	—	Fat Clay (CH) [Qhff]
⊕	EB-5	6.0	16	38	17	21	—	Sandy Lean Clay (CL) [Qhff]

CORNERSTONE EARTH GROUP

Plasticity Index Testing Summary

Hoover Elementary School Modernization
445 East Charleston Road
Palo Alto, CA

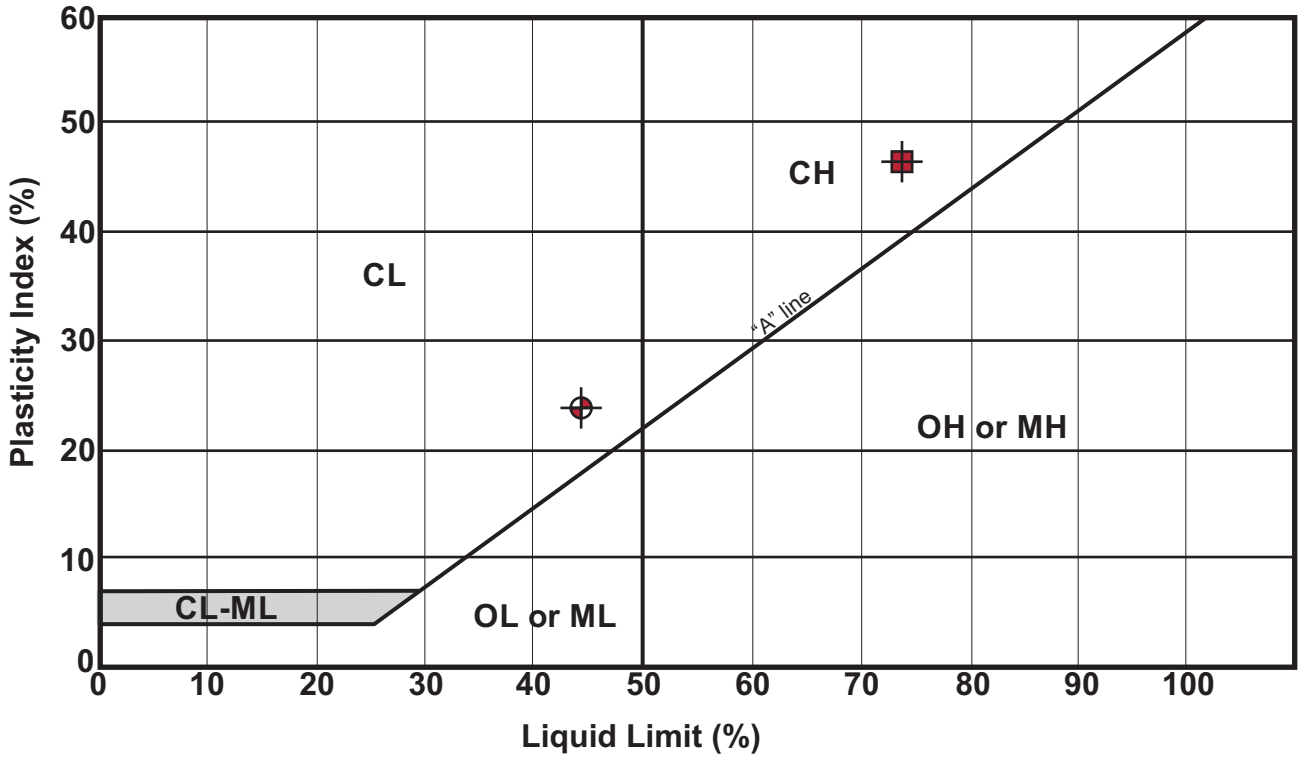
Project Number: 288-11-4

Figure Number: Figure B1

Date: April 2022

Drawn By: FLL

Plasticity Index (ASTM D4318) Testing Summary



Symbol	Boring No.	Depth (ft)	Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	Passing No. 200 (%)	Group Name (USCS - ASTM D2487)
⊕	EB-1	5.5	19	44	20	24	50	Sandy Lean Clay (CL)
⊞	EB-3	2.0	30	73	27	46	—	Fat Clay (CH)

CORNERSTONE EARTH GROUP

Plasticity Index Testing Summary

Hoover Elementary School
Palo Alto, CA

Project Number: 288-11-1

Figure Number: Figure B1

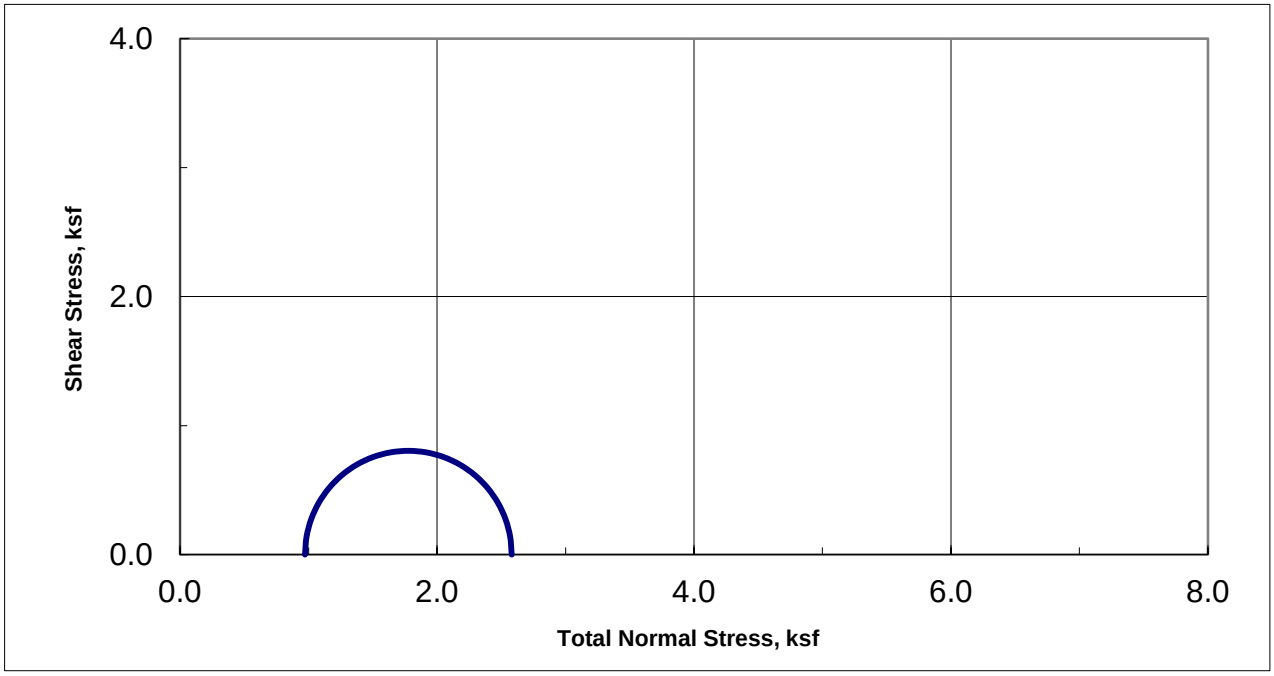
Date: January 2017

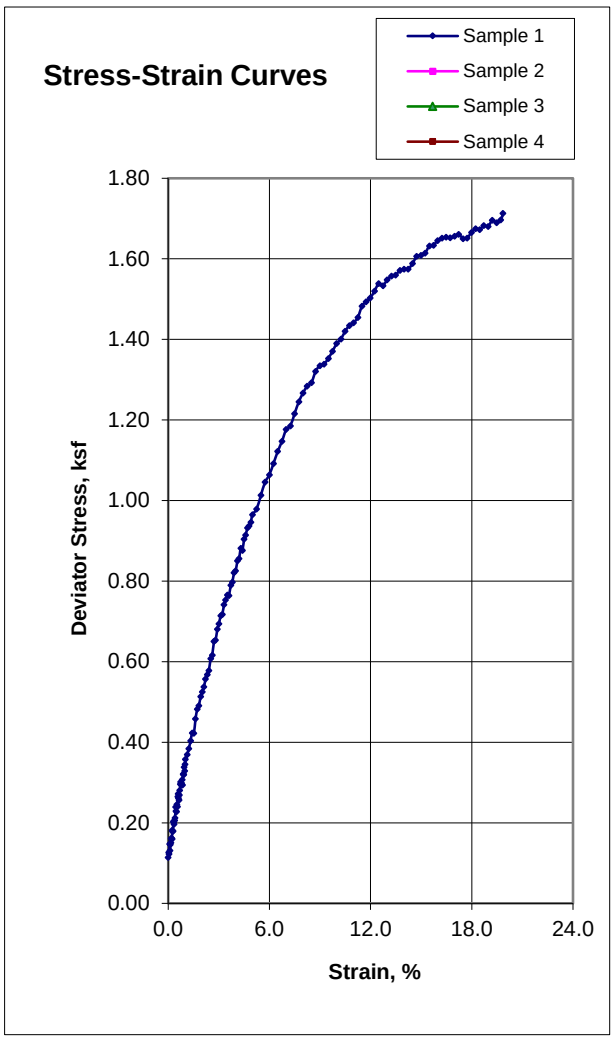
Drawn By: FLL

Cooper Testing Labs, Inc.
937 Commercial Street
Palo Alto, CA 94303

Unconsolidated-Undrained Triaxial Test

ASTM D2850





Sample Data	1	2	3	4
Moisture %	20.9			
Dry Den,pcf	107.7			
Void Ratio	0.565			
Saturation %	99.8			
Height in	5.08			
Diameter in	2.42			
Cell psi	6.8			
Strain %	15.00			
Deviator, ksf	1.609			
Rate %/min	0.99			
in/min	0.050			
Job No.:	640-1076			
Client:	Cornerstone Earth Group			
Project:	Hoover ES Modernization - 288-11-1			
Boring:	EB-1			
Sample:	5B			
Depth ft:	14.5			

Visual Soil Description	
Sample #	
1	Olive Brown Sandy CLAY
2	
3	
4	

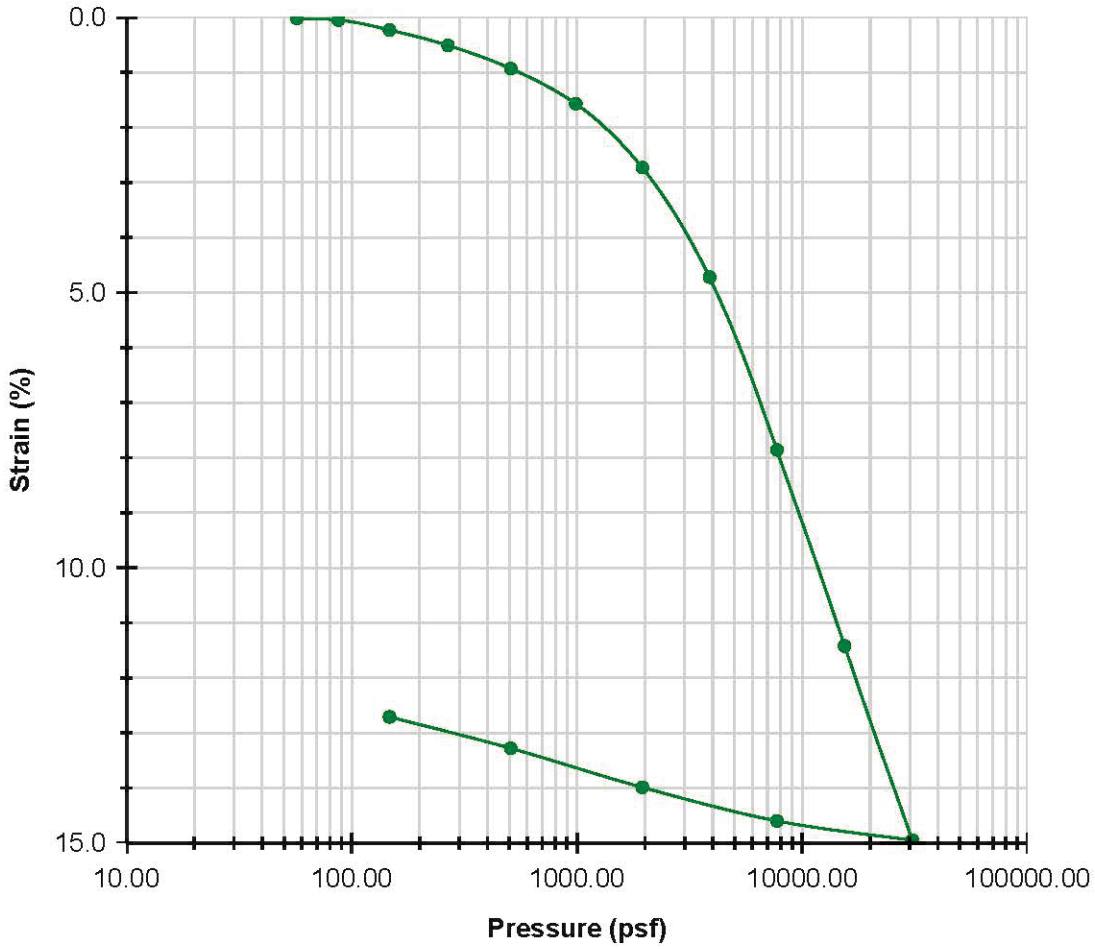
Remarks:

Note: Strengths are picked at the peak deviator stress or 15% strain which ever occurs first per ASTM D2850.

Consolidation Test ASTM D2435

Boring: EB-5 Sample: 8 Depth: 22.3'

Desription: Lean Clay with Sand (CL)



	BEFORE	AFTER
Moisture (%)	26.4	20.1
Dry Density (pcf)	98.4	109.7
Saturation (%)	99.0	100.0
Void Ratio	0.73	0.55

(A) Stress Strain Curve

CORNERSTONE EARTH GROUP

Strain-Log Curve - EB-5 @ 223'

Hoover Elementary School Modernization
445 East Charleston Road
Palo Alto, CA

Project Number: 288-11-4

Figure Number: Figure B2

Date: April 2022

Drawn By: FLL

Corrosivity Tests Summary

CORNERSTONE EARTH GROUP

Job Number	288-11-4	Date Tested	4/22/2022
Job Name	Hoover Elementary School	Tested By	BBA, FL
Location	East Charleston Avenue, Palo Alto, CA		

Sample I.D.			Soil Visual Description	Moisture Content	pH	Temp. at Testing	Resistivity (Ohm-cm) Corrected to 15.5 C°		Chloride Dry Wt.	Sulfate Dry Wt.
Boring	Sample No.	Depth, ft.		%		C°	As Received	Saturated	mg/kg	mg/kg
				ASTM D2216	ASTM G51		G57	ASTM G57	ASTM D4327	ASTM D4327
EB-4	2A	3.5	Dark Brown Fat Clay (CH)	30.2	6.7	23.0	-	637	6	56

Corrosivity Tests Summary

CTL # 640-1076 **Date:** 1/20/2017 **Tested By:** PJ **Checked:** PJ

Client: Cornerstone Earth Group **Project:** Hoover ES Modernization **Proj. No:** 288-1-1

Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP (Redox)		Sulfide	Moisture	Soil Visual Description
			As Rec.	Min	Sat.	mg/kg	mg/kg	%		E_H (mv)	At Test	Qualitative by Lead	At Test %	
						Dry Wt.	Dry Wt.	Dry Wt.						
Boring	Sample, No.	Depth, ft.	ASTM G57	Cal 643	ASTM G57	ASTM D4327	ASTM D4327	ASTM D4327	ASTM G51	ASTM G200	Temp °C	Acetate Paper	ASTM D2216	
EB-1	2A	3.0	-	-	914	3	18	0.0018	7.7	-	-	-	29.6	Very Dark Gray Sandy CLAY
EB-2	1A	1.5	-	-	871	9	56	0.0056	7.7	-	-	-	31.8	Very Dark Gray Sandy CLAY

APPENDIX C: LIQUEFACTION ANALYSES CALCULATIONS

CORNERSTONE EARTH GROUP

FIGURE 9A

CPT NO. 1

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PROJECT/CPT DATA

Project Title	Hoover Elementary School Re-Design
Project No.	288-11-4
Project Manager	MFR

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	7.9	
PGA (Amax)	0.75	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	12.5
Design Water Depth (feet)	6
Ave. Unit Weight Above GW (pcf)	120
Ave. Unit Weight Below GW (pcf)	125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM	6	FEET
	0.00	(Inches)
LIQUEFACTION SETTLEMENT FROM	50	FEET
	0.17	(Inches)
TOTAL SEISMIC SETTLEMENT	**0.2**	**INCHES**

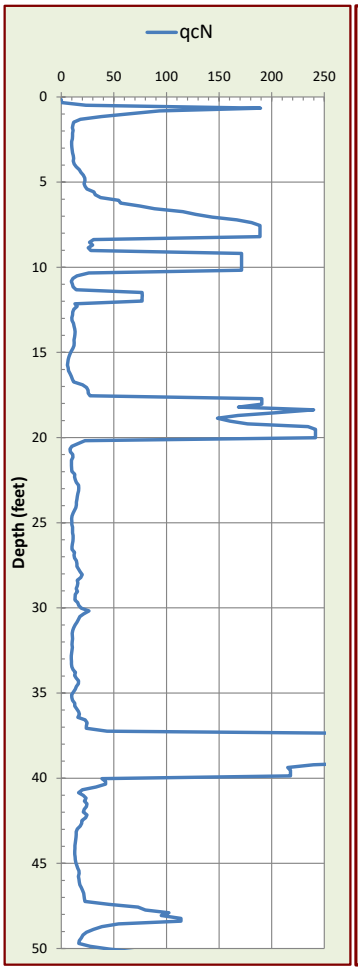
POTENTIAL LATERAL DISPLACEMENT

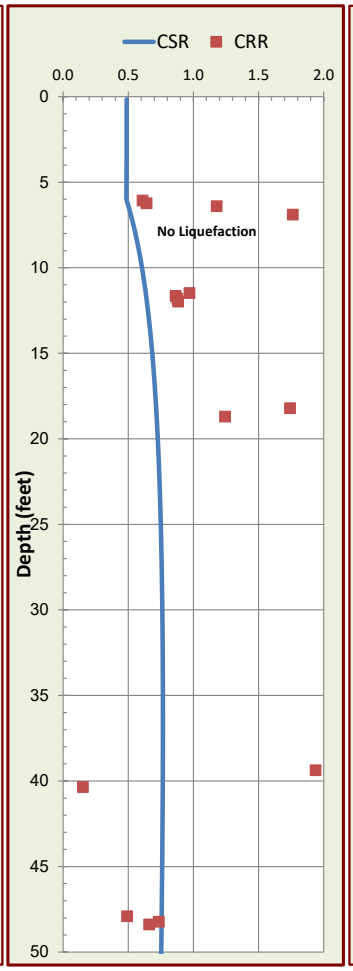
LDI[2]	0.02	L/H	67.0
LDI[1] Corrected for Distance	0.00	(4 < L/H < 40)	

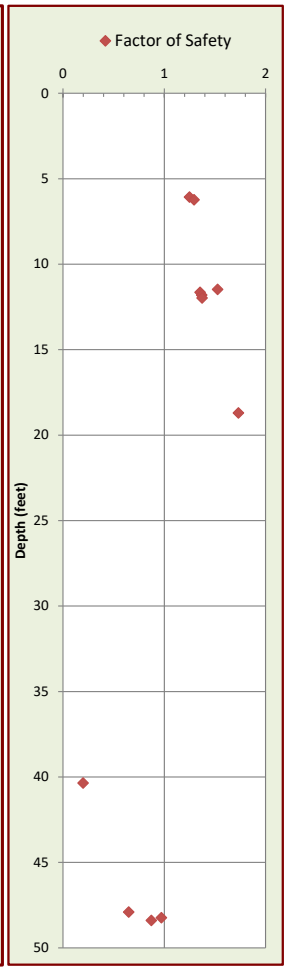
EXPECTED RANGE OF DISPLACEMENT

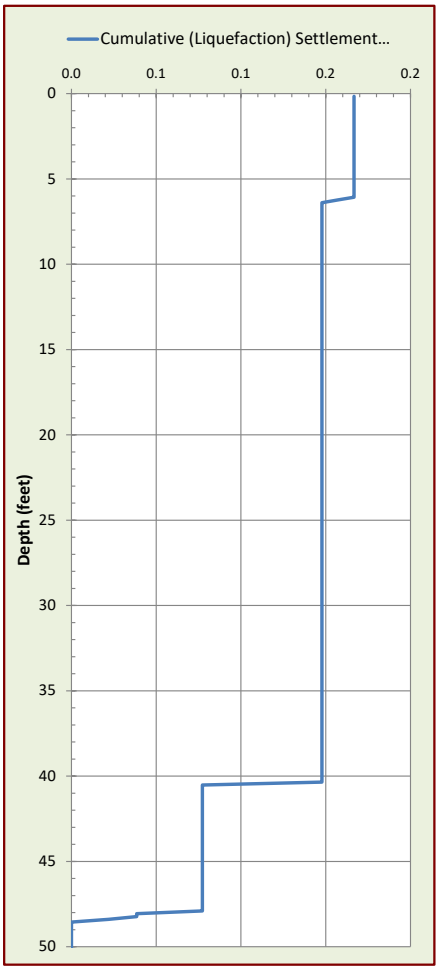
0.0 to 0.0 feet

[1]Not Valid for L/H Values < 4 and > 40.
[2]LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE 9B

CPT NO. 2

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PROJECT/CPT DATA

Project Title	Hoover Elementary School Re-Design
Project No.	288-11-4
Project Manager	MFR

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	7.9	
PGA (Amax)	0.75	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	14.2
Design Water Depth (feet)	6
Ave. Unit Weight Above GW (pcf)	120
Ave. Unit Weight Below GW (pcf)	125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM	6	FEET
	0.00	(Inches)
LIQUEFACTION SETTLEMENT FROM	50	FEET
	1.31	(Inches)
TOTAL SEISMIC SETTLEMENT	**1.3**	**INCHES**

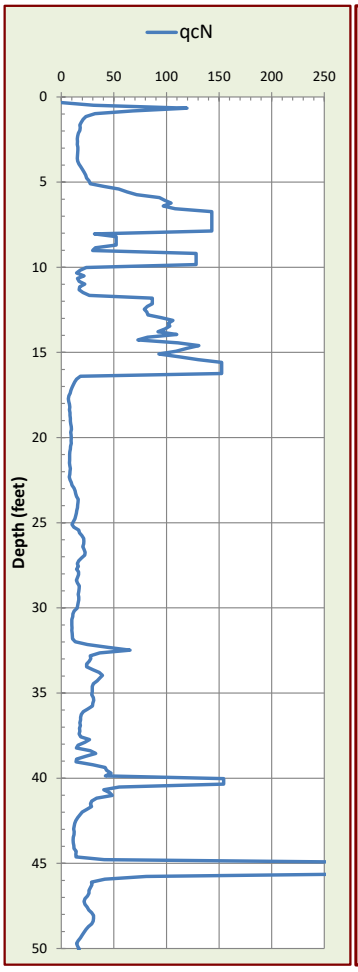
POTENTIAL LATERAL DISPLACEMENT

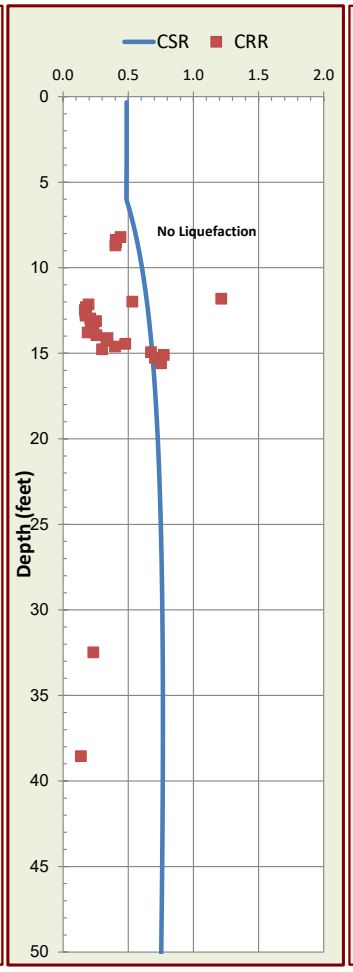
LDI[2]	0.71	L/H	17.9
LDI[1] Corrected for Distance	0.42	(4 < L/H < 40)	

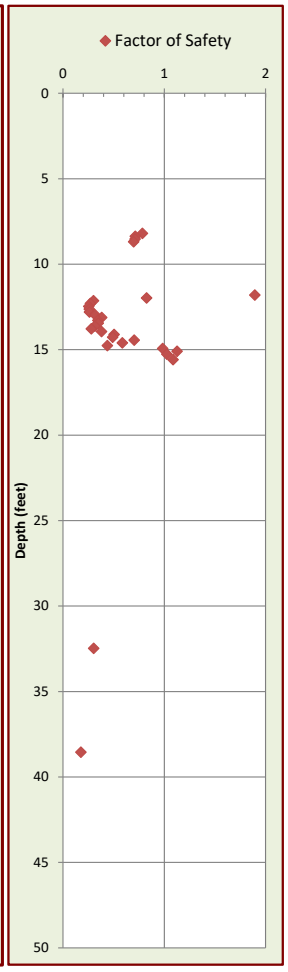
EXPECTED RANGE OF DISPLACEMENT

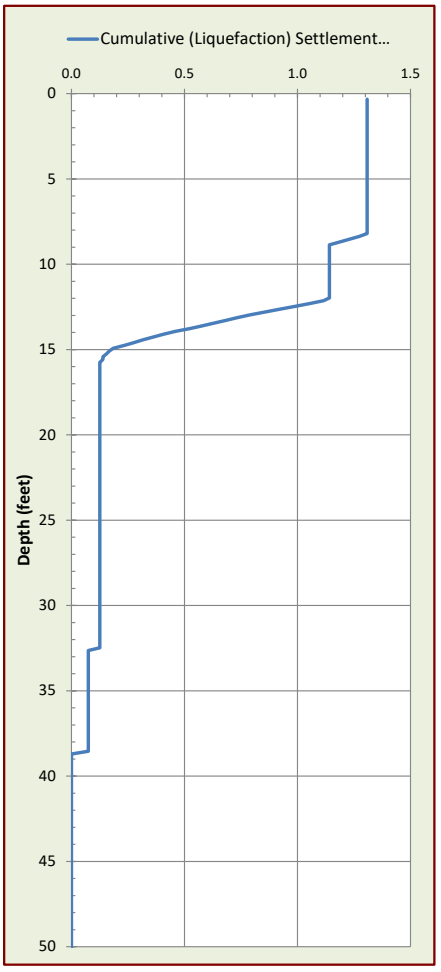
0.2 to 0.8 feet

[1]Not Valid for L/H Values < 4 and > 40.
[2]LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE 9C

CPT NO. 3

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PROJECT/CPT DATA

Project Title	Hoover Elementary School Re-Design
Project No.	288-11-4
Project Manager	MFR

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	7.9	
PGA (Amax)	0.75	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	14.2
Design Water Depth (feet)	6
Ave. Unit Weight Above GW (pcf)	120
Ave. Unit Weight Below GW (pcf)	125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM	6	FEET
	0.00	(Inches)
LIQUEFACTION SETTLEMENT FROM	50	FEET
	0.84	(Inches)
TOTAL SEISMIC SETTLEMENT	**0.8**	**INCHES**

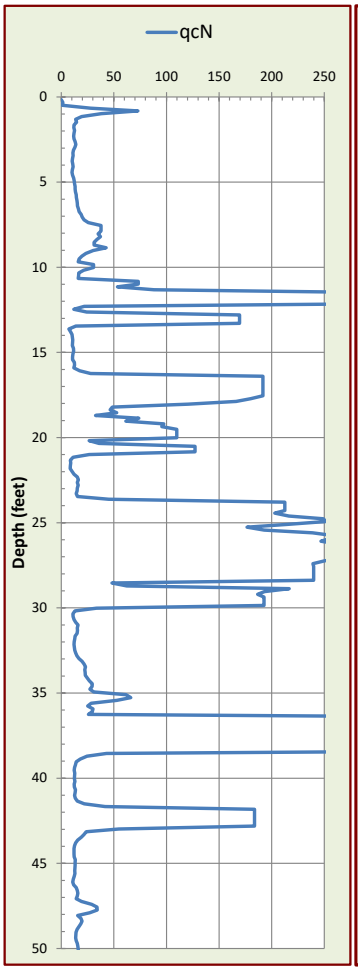
POTENTIAL LATERAL DISPLACEMENT

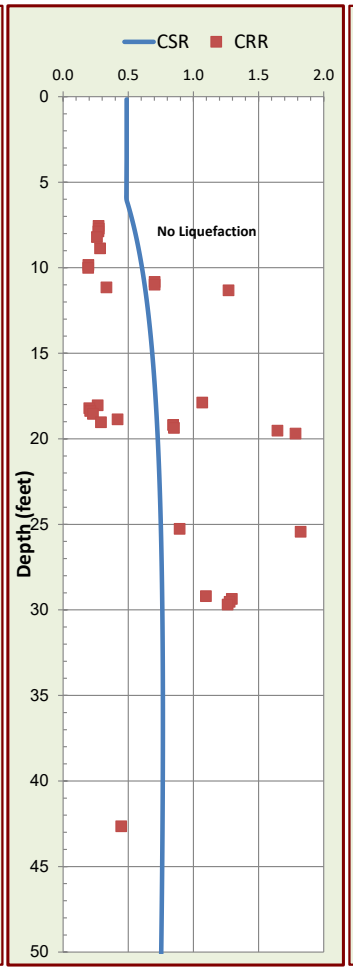
LDI[2]	0.48	L/H	17.9
LDI[1] Corrected for Distance	0.29	(4 < L/H < 40)	

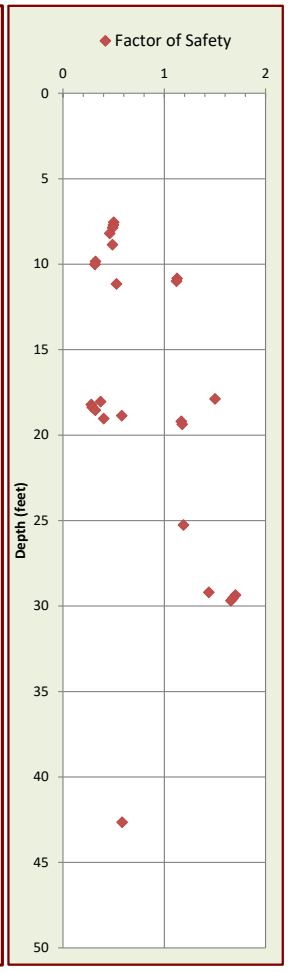
EXPECTED RANGE OF DISPLACEMENT

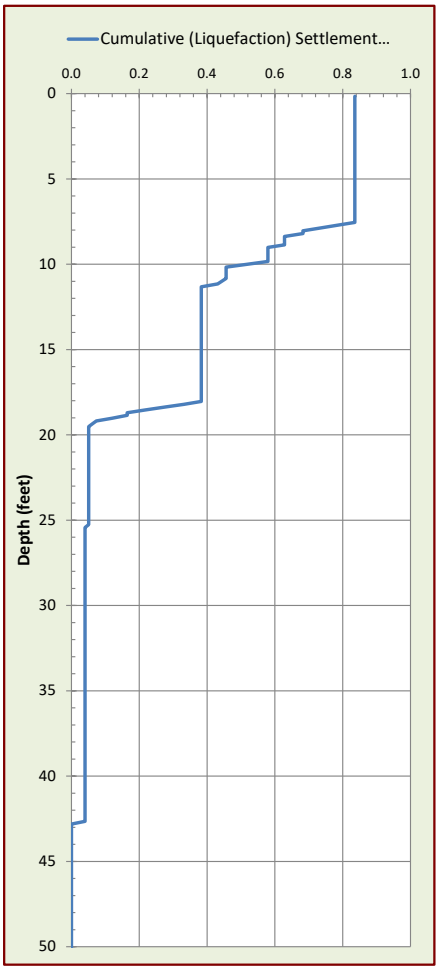
0.1 to 0.6 feet

[1]Not Valid for L/H Values < 4 and > 40.
[2]LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE 9D

CPT NO. 4

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PROJECT/CPT DATA

Project Title	Hoover Elementary School Re-Design
Project No.	288-11-4
Project Manager	MFR

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	7.9	
PGA (Amax)	0.75	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	14.7
Design Water Depth (feet)	6
Ave. Unit Weight Above GW (pcf)	120
Ave. Unit Weight Below GW (pcf)	125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM	6	FEET
	0.02	(Inches)
LIQUEFACTION SETTLEMENT FROM	50	FEET
	0.69	(Inches)
TOTAL SEISMIC SETTLEMENT	**0.7**	**INCHES**

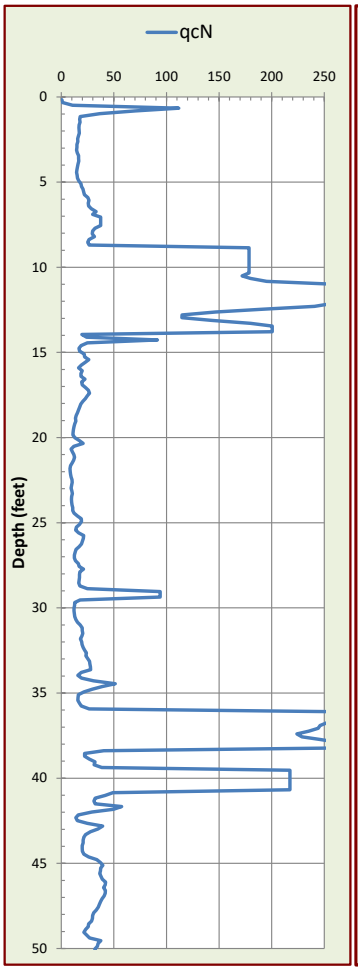
POTENTIAL LATERAL DISPLACEMENT

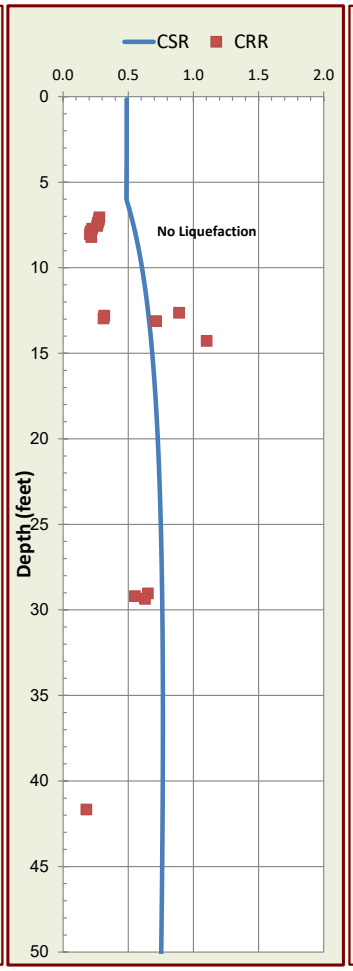
LDI[2]	0.35	L/H	17.9
LDI[1] Corrected for Distance	0.21	(4 < L/H < 40)	

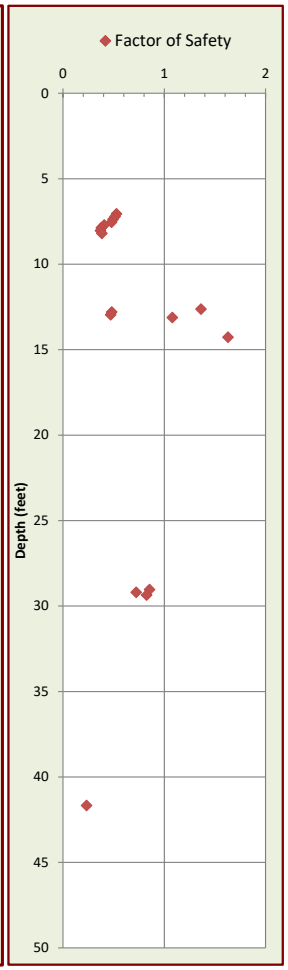
EXPECTED RANGE OF DISPLACEMENT

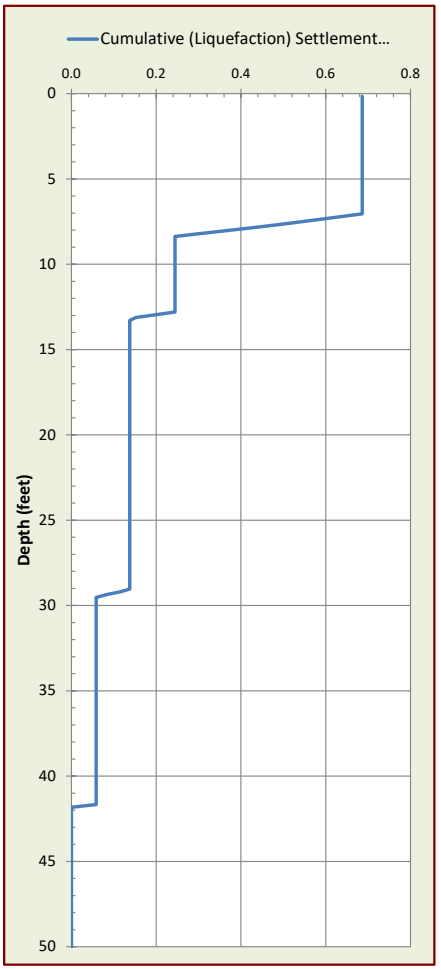
0.1 to 0.4 feet

[1]Not Valid for L/H Values < 4 and > 40.
[2]LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE 9E

CPT NO. 5

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PROJECT/CPT DATA

Project Title	Hoover Elementary School Re-Design
Project No.	288-11-4
Project Manager	MFR

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	7.9	
PGA (Amax)	0.75	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	11.7
Design Water Depth (feet)	6
Ave. Unit Weight Above GW (pcf)	120
Ave. Unit Weight Below GW (pcf)	125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM	6	FEET
	0.00	(Inches)
LIQUEFACTION SETTLEMENT FROM	50	FEET
	1.66	(Inches)
TOTAL SEISMIC SETTLEMENT	**1.7**	**INCHES**

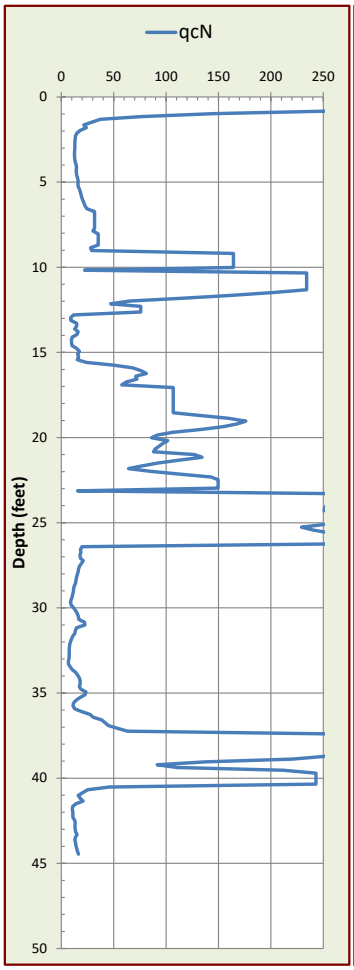
POTENTIAL LATERAL DISPLACEMENT

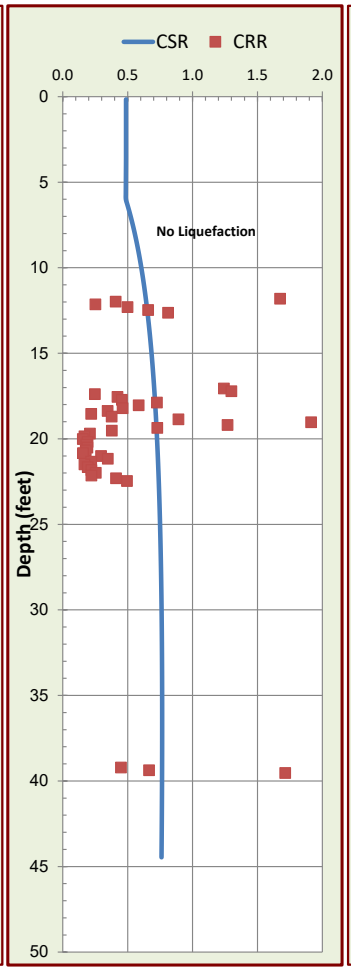
LDI[2]	0.00	L/H	1000.0
LDI[1] Corrected for Distance	0.00	(4 < L/H < 40)	

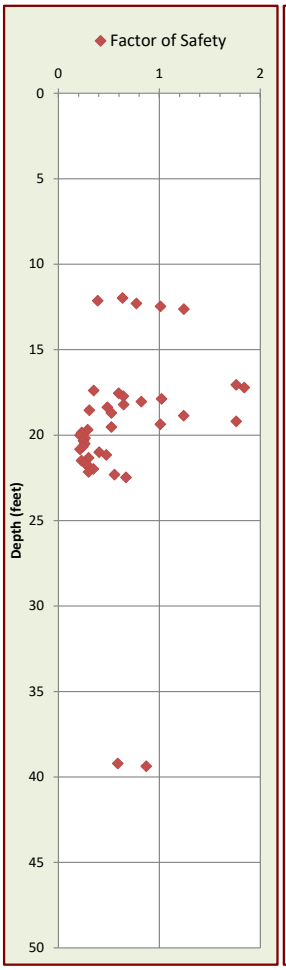
EXPECTED RANGE OF DISPLACEMENT

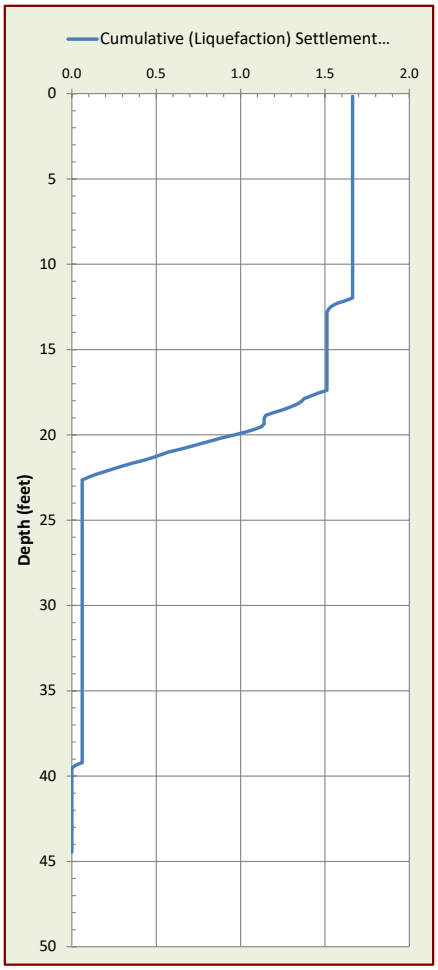
0.0 to 0.0 feet

[1]Not Valid for L/H Values < 4 and > 40.
[2]LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE 9F

CPT NO. 6

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PROJECT/CPT DATA

Project Title	Hoover Elementary School Re-Design
Project No.	288-11-4
Project Manager	MFR

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	7.9	
PGA (Amax)	0.75	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	10.5
Design Water Depth (feet)	6
Ave. Unit Weight Above GW (pcf)	120
Ave. Unit Weight Below GW (pcf)	125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM	6	FEET
	0.00	(Inches)
LIQUEFACTION SETTLEMENT FROM	50	FEET
	0.65	(Inches)
TOTAL SEISMIC SETTLEMENT	**0.6**	**INCHES**

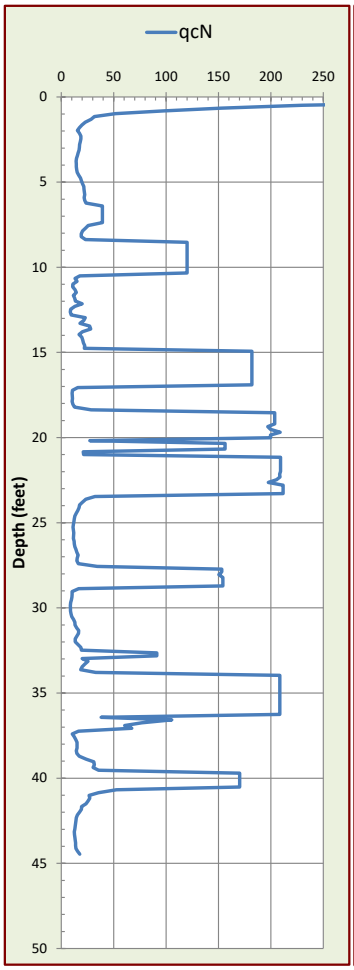
POTENTIAL LATERAL DISPLACEMENT

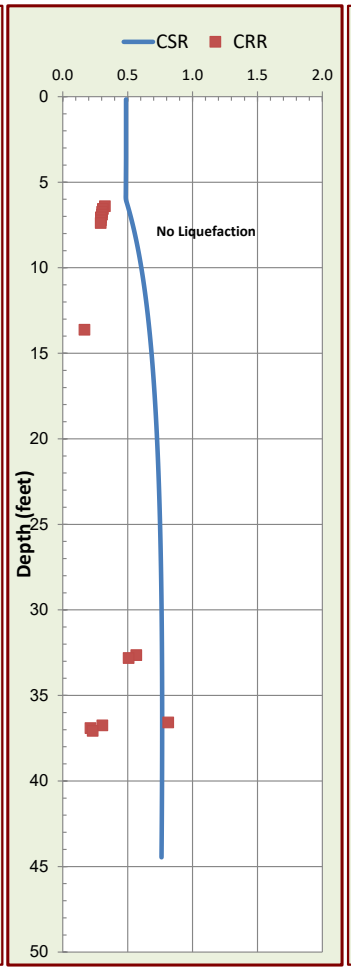
LDI[2]	0.00	L/H	1000.0
LDI[1] Corrected for Distance	0.00	(4 < L/H < 40)	

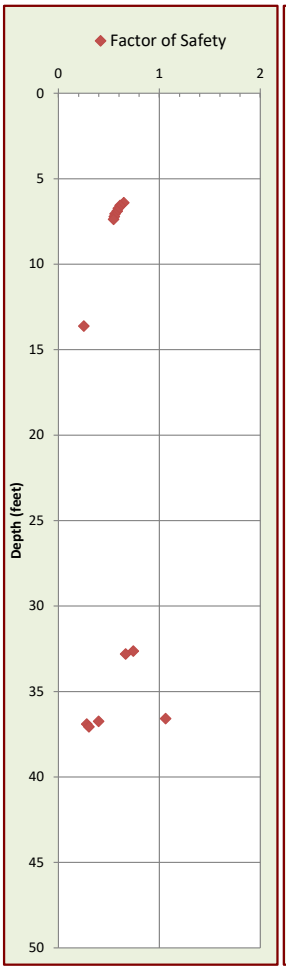
EXPECTED RANGE OF DISPLACEMENT

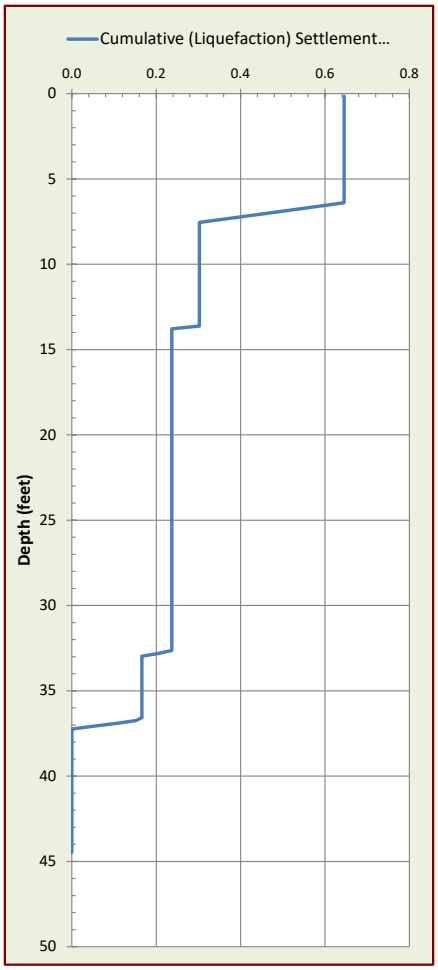
0.0 to 0.0 feet

[1]Not Valid for L/H Values < 4 and > 40.
[2]LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE 9G

CPT NO. 7

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PROJECT/CPT DATA

Project Title	Hoover Elementary School Re-Design
Project No.	288-11-4
Project Manager	MFR

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	7.9	
PGA (Amax)	0.75	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	11
Design Water Depth (feet)	6
Ave. Unit Weight Above GW (pcf)	120
Ave. Unit Weight Below GW (pcf)	125

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM 6 FEET

0.00 (Inches)

LIQUEFACTION SETTLEMENT FROM 50 FEET

0.12 (Inches)

TOTAL SEISMIC SETTLEMENT 0.1 **INCHES**

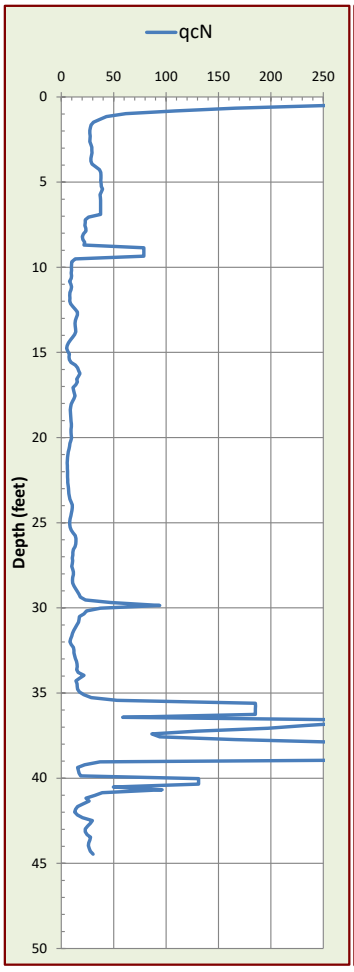
POTENTIAL LATERAL DISPLACEMENT

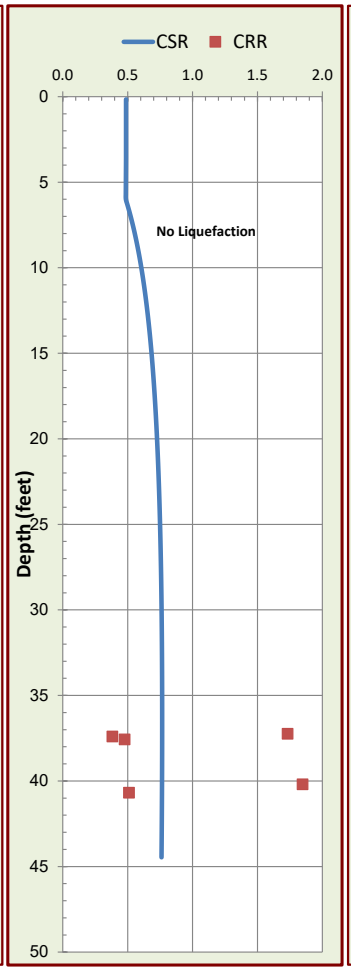
LDI[2]	0.00	L/H	1000.0
LDI[1] Corrected for Distance	0.00	(4 < L/H < 40)	

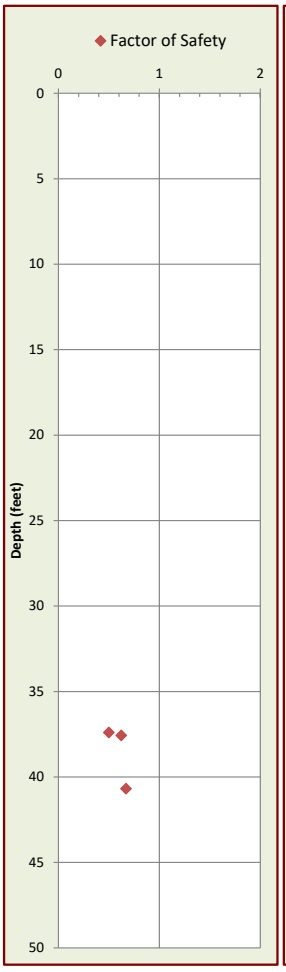
EXPECTED RANGE OF DISPLACEMENT

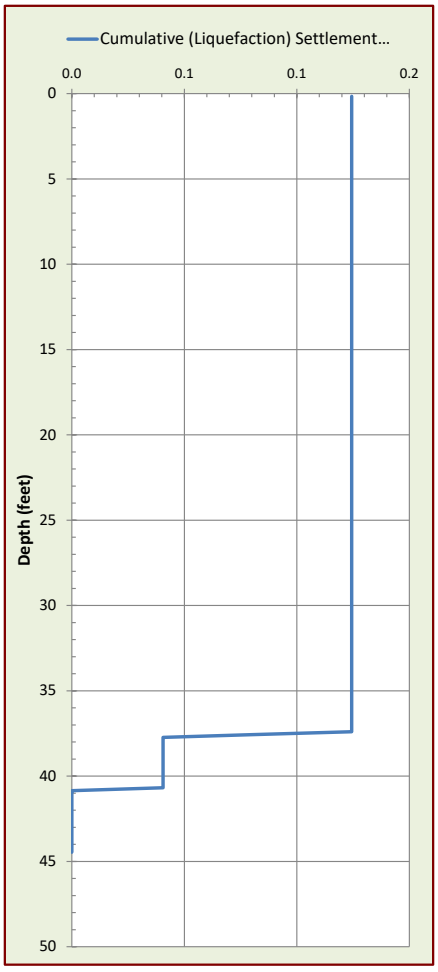
0.0 to 0.0 feet

[1]Not Valid for L/H Values < 4 and > 40.
[2]LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.75

Total Settlement:	0.17	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160	0.030	0.081	19.2	19.2	2.125	396.569	4.95		Unsaturated	100.0			0.03	1.70	0.05	54.00	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	0.030	0.727	39.6	39.6	0.515	7124.510	6.31		Unsaturated	100.0			0.03	1.70	0.05	54.00	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	24.660	1.652	58.8	58.8	139.656	6.706	2.44		Unsaturated	58.0			23.31	1.70	39.62	98.89	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	200.340	2.278	79.2	79.2	978.569	1.137	1.36		Unsaturated	0.0			189.36	1.70	321.91	321.91	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	98.560	3.031	98.4	98.4	431.776	3.077	1.90		Unsaturated	15.1			93.16	1.70	158.37	186.69	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	70.150	2.968	117.6	117.6	281.017	4.235	2.11		Unsaturated	31.8			66.30	1.70	112.72	173.33	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	40.250	2.415	138.0	138.0	148.715	6.011	2.38		Unsaturated	53.7			38.04	1.70	64.67	129.33	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	19.310	1.476	157.2	157.2	112.168	7.677	2.54		Unsaturated	66.2			18.25	1.70	31.03	89.90	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	12.480	1.206	177.6	177.6	66.356	9.734	2.76		Unsaturated	83.4			11.80	1.70	20.05	78.52	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	11.610	1.234	196.8	196.8	116.988	10.716	2.65		Unsaturated	75.1			10.97	1.70	18.66	75.55	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	11.160	1.175	216.0	216.0	102.333	10.631	2.68		Unsaturated	77.3			10.55	1.70	17.93	74.95	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	11.880	1.164	236.4	236.4	99.508	9.896	2.66		Unsaturated	75.8			11.23	1.70	19.09	76.22	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	11.310	1.134	255.6	255.6	87.498	10.140	2.70		Unsaturated	79.0			10.69	1.70	18.17	75.50	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	11.280	1.104	276.0	276.0	80.739	9.908	2.71		Unsaturated	79.9			10.66	1.70	18.12	75.56	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	11.080	1.037	295.2	295.2	74.068	9.484	2.72		Unsaturated	80.4			10.47	1.70	17.80	75.21	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	10.480	0.982	314.4	314.4	65.667	9.515	2.75		Unsaturated	83.0			9.91	1.70	16.84	74.29	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	10.410	0.962	334.8	334.8	61.186	9.393	2.76		Unsaturated	84.2			9.84	1.70	16.73	74.28	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	10.560	0.943	354.0	354.0	58.661	9.082	2.76		Unsaturated	84.1			9.98	1.70	16.97	74.59	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	10.920	0.979	374.4	374.4	57.333	9.122	2.77		Unsaturated	84.7			10.32	1.70	17.55	75.41	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	11.300	0.981	393.6	393.6	56.419	8.833	2.77		Unsaturated	84.2			10.68	1.70	18.16	76.15	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	12.100	1.036	412.8	412.8	57.624	8.712	2.75		Unsaturated	83.4			11.44	1.70	19.44	77.72	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	12.370	0.994	433.2	433.2	56.110	8.179	2.74		Unsaturated	82.2			11.69	1.70	19.88	78.14	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	12.050	0.937	452.4	452.4	52.271	7.926	2.75		Unsaturated	82.9			11.39	1.70	19.36	77.56	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	12.990	0.966	472.8	472.8	53.949	7.576	2.73		Unsaturated	81.0			12.28	1.70	20.87	79.28	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	15.040	1.104	492.0	492.0	60.138	7.461	2.69		Unsaturated	78.2			14.22	1.70	24.17	83.17	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	18.100	1.231	512.4	512.4	69.648	6.898	2.62		Unsaturated	72.9			17.11	1.70	29.08	88.70	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	19.750	1.381	531.6	531.6	73.304	7.087	2.62		Unsaturated	72.6			18.67	1.70	31.73	92.07	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	22.240	1.531	550.8	550.8	53.260	6.971	2.70		Unsaturated	79.1			21.02	1.70	35.74	98.32	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	23.680	1.691	571.2	571.2	55.301	7.227	2.70		Unsaturated	79.2			22.38	1.70	38.05	101.34	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	23.900	1.730	590.4	590.4	79.962	7.330	2.61		Unsaturated	71.7			22.59	1.70	38.40	100.53	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	22.840	1.729	610.8	610.8	73.787	7.673	2.65		Unsaturated	74.6			21.59	1.70	36.70	98.85	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	23.990	1.744	630.0	630.0	75.159	7.364	2.63		Unsaturated	73.1			22.67	1.70	38.55	100.98	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	25.740	1.882	649.2	649.2	78.298	7.404	2.62		Unsaturated	72.4			24.33	1.70	41.36	104.49	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	32.790	2.034	669.6	669.6	68.642	6.268	2.60		Unsaturated	70.6			30.99	1.70	52.58	118.65	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	34.000	2.195	688.8	688.8	69.786	6.522	2.60		Unsaturated	71.4			32.14	1.67	53.64	120.16	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	39.530	2.565	709.2	709.2	79.589	6.548	2.57		Unsaturated	68.6			37.36	1.62	60.49	128.43	1.00	0.485	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	57.790	2.824	728.4	728.4	92.511	4.917	2.43		Sand	57.6			54.62	1.53	83.31	154.55	1.00	0.488	1.100	0.322	0.610	1.25	0.01	0.01
6.230	59.660	2.807	747.6	747.6	94.274	4.735	2.41		Sand	56.1			56.39	1.51	84.91	156.06	1.00	0.495	1.100	0.334	0.640	1.29	0.00	0.01
6.400	78.900	2.155	768.0	768.0	123.183	2.745	2.16		Sand	35.6			74.57	1.45	108.33	172.30	0.99	0.501	1.100	0.545	1.178	2.35	0.00	0.00
6.560	93.820	2.563	787.2	787.2	144.777	2.743	2.11		Sand	32.0			88.68	1.41	124.79	188.22	0.99	0.507	1.100	1.034	2.503	4.93	0.00	0.00
6.730	122.290	2.117	807.6	807.6	186.478	1.737	1.89		Sand	14.1			115.59	1.40	161.60	186.54	0.99	0.514	1.100	0.958	2.319	4.52	0.00	0.00
6.890	135.230	1.955	826.8	826.8	203.852	1.450	1.80		Sand	7.3			127.82	1.40	178.53	181.12	0.99	0.519	1.100	0.760	1.762	3.39	0.00	0.00
7.050	151.760	2.051	846.0	846.0	226.221	1.355	1.75		Sand	3.2			143.44	1.36	195.18	195.18	0.99	0.525	1.100	1.456	3.523	6.71	0.00	0.00
7.220	176.600	1.611	866.4	866.4	260.218	0.914	1.58		Sand	0.0			166.92	1.31	219.15	219.15	0.99	0.531	1.100	6.680	16.165	30.47	0.00	0.00
7.380	191.380	1.413	885.6	885.6	278.961	0.740	1.50		Sand	0.0			180.89	1.29	232.57	232.57	0.99	0.536	1.100	20.756	50.230	93.75	0.00	0.00
7.550	199.840	1.427	906.0	906.0	288.008	0.716	1.48		Sand	0.0			188.88	1.27	239.58	239.58	0.99	0.541	1.100	41.189	99.677	184.17	0.00	0.00
7.710	162.590	1.992	925.2	925.2	231.745	1.229	1.71		Sand	0.1	188.88		188.88	1.26	238.43	238.43	0.99	0.546	1.100	36.649	88.690	162.38	0.00	0.00
7.870	136.020	3.181	944.4	944.4	191.773	2.347	1.98		Sand	21.8	188.88		188.88	1.24	233.68	294.92	0.99	0.551	1.100	########	########	732249.62	0.00	0.00
8.040	96.670	3.732	964.8	964.8	134.640	3.880	2.25		Sand	43.1	188.88		188.88	1.23	232.36	333.82	0.99	0.556	1.100	########	########	##########	0.00	0.00
8.200	50.810	2.699	984.0	984.0	69.743	5.363	2.54		Sand	66.1	188.88		188.88	1.22	231.16	347.56	0.99	0.561	1.100	########	########	##########	0.00	0.00
8.370	32.360	2.277	1004.4	1004.4	63.436	7.147	2.66		Clay	75.9			30.59	1.22	n.a.	n.a.	0.99	0.565	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.530	28.350	1.991	1023.6	1023.6	54.393	7.152	2.70		Clay	79.3			26.80	1.21	n.a.	n.a.	0.99	0.570	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.690	31.510	1.939	1042.8	1042.8	59.433	6.256	2.63		Clay	73.8			29.78	1.21	n.a.	n.a.	0.99	0.574	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.860	27.180	1.576	1063.2	1063.2	50.129	5.913	2.66		Clay	76.2			25.69	1.20	n.a.	n.a.	0.99	0.578	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.020	29.600	1.592	1082.4	1082.4	53.693	5.479	2.62		Clay	72.6			27.98	1.19	n.a.	n.a.	0.99	0.582	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.190	39.900	1.645	1102.8	1102.8	51.517	4.180	2.55		Sand	66.7	107.06	1.6	171.30	1.19	203.43	312.08	0.99	0.587	1.100	########	########	##########	0.00	0.00
9.350	42.510	1.716	1122.0	1122.0	54.450	4.091	2.52		Sand	64.8	107.06	1.6	171.30	1.18	202.51	310.14	0.99	0.591	1.100	########	########	##########	0.00	0.00
9.510	58.450	1.960	1141.2	1141.2	74.493	3.386	2.37		Sand	52.6	107.06	1.6	171.30	1.18	201.60	302.71	0.99	0.594	1.100	########	########	3621637.92	0.00	0.00
9.680	59.950	1.808	1161.6	1161.6	75.736	3.045	2.33		Sand	49.5	107.06	1.6	171.30	1.17	200.66	299.42	0.99	0.598	1.100	########	########	1743562.89	0.00	0.00
9.840	113.270	1.350	1180.8	1180.8	142.570	1.198	1.85		Sand	10.9		1.6	171.30	1.19	204.68	218.86	0.99	0.602	1.100	6.538	15.822	26.29	0.00	0.00
10.010	95.790	1.058	1201.2	1201.2	119.413	1.111	1.88		Sand	13.6	107.06	1.6	171.30	1.18	202.34	227.85	0.99	0.606	1.100	13.578	32.860	54.27	0.00	0.00
10.170	57.610	1.065	1220.4	1220.4	70.941	1.868	2.20		Sand	39.1	107.06	1.6	171.30	1.16	198.06	286.79	0.99	0.609	1.100	33735.070	########	134069.52	0.00	0.00
10.330	27.580	1.185	1239.6	1239.6	43.498	4.396	2.61		Clay	72.0			26.07	1.15	n.a.	n.a.	0.99	0.612	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.500	15.710	0.922	1260.0	1260.0	23.937	6.115	2.90		Clay	94.8			14.85	1.15	n.a.	n.a.	0.99	0.616	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.660	11.780	0.743	1279.2	1279.2	17.418	6.673	3.02		Clay	100.0			11.13	1.14	n.a.	n.a.	0.99	0.619	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.75

Total Settlement:	0.17	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
10.830	9.980	0.647	1299.6	1299.6	14.359	6.933	3.10		Clay	100.0			9.43	1.14	n.a.	n.a.	0.99	0.622	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.990	11.080	0.690	1318.8	1318.8	15.803	6.621	3.05		Clay	100.0			10.47	1.13	n.a.	n.a.	0.99	0.625	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.150	11.940	0.738	1338.0	1338.0	16.848	6.546	3.03		Clay	100.0			11.29	1.13	n.a.	n.a.	0.99	0.628	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.320	15.090	1.027	1358.4	1358.4	21.217	7.124	2.98		Clay	100.0			14.26	1.12	n.a.	n.a.	0.98	0.631	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.480	33.050	1.412	1377.6	1377.6	41.306	4.362	2.63		Mixed	73.1	43.2	1.78	76.90	1.17	90.32	167.97	0.98	0.634	1.081	0.471	0.969	1.53	0.00	0.00
11.650	45.710	1.691	1398.0	1398.0	52.340	3.756	2.51		Sand	63.6		1.78	76.90	1.17	90.00	165.09	0.98	0.637	1.076	0.431	0.862	1.35	0.00	0.00
11.810	42.850	1.731	1417.2	1417.2	48.670	4.106	2.56		Sand	67.6	43.2	1.78	76.90	1.16	89.50	165.57	0.98	0.640	1.074	0.437	0.876	1.37	0.00	0.00
11.980	27.640	0.865	1437.6	1437.6	33.352	3.213	2.60		Mixed	71.2	43.2	1.78	76.90	1.16	89.00	165.83	0.98	0.643	1.071	0.440	0.883	1.37	0.00	0.00
12.140	13.730	0.910	1456.8	1456.8	17.850	6.995	3.03		Clay	100.0			12.98	1.10	n.a.	n.a.	0.98	0.645	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.300	15.870	0.769	1476.0	1476.0	20.504	5.084	2.89		Clay	94.4			15.00	1.10	n.a.	n.a.	0.98	0.648	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.470	12.600	0.699	1496.4	1496.4	15.840	5.900	3.02		Clay	100.0			11.91	1.10	n.a.	n.a.	0.98	0.651	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.630	11.570	0.601	1516.3	1508.1	14.338	5.555	3.04		Clay	100.0			10.94	1.09	n.a.	n.a.	0.98	0.653	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.800	11.260	0.558	1537.5	1518.8	13.815	5.315	3.04		Clay	100.0			10.64	1.09	n.a.	n.a.	0.98	0.656	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.960	10.540	0.530	1557.5	1528.8	12.770	5.433	3.07		Clay	100.0			9.96	1.09	n.a.	n.a.	0.98	0.658	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.120	10.770	0.535	1577.5	1538.8	12.973	5.356	3.06		Clay	100.0			10.18	1.09	n.a.	n.a.	0.98	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	12.180	0.595	1598.8	1549.5	14.690	5.225	3.01		Clay	100.0			11.51	1.09	n.a.	n.a.	0.98	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	12.830	0.685	1618.8	1559.5	15.416	5.701	3.02		Clay	100.0			12.13	1.08	n.a.	n.a.	0.98	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	13.620	0.701	1640.0	1570.1	16.305	5.476	2.99		Clay	100.0			12.87	1.08	n.a.	n.a.	0.98	0.667	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.780	13.840	0.702	1660.0	1580.1	16.467	5.396	2.98		Clay	100.0			13.08	1.08	n.a.	n.a.	0.98	0.669	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	13.710	0.684	1680.0	1590.1	16.187	5.315	2.98		Clay	100.0			12.96	1.08	n.a.	n.a.	0.98	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	13.330	0.655	1701.3	1600.8	15.592	5.245	2.99		Clay	100.0			12.60	1.08	n.a.	n.a.	0.98	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	12.880	0.617	1721.3	1610.8	14.923	5.131	3.00		Clay	100.0			12.17	1.07	n.a.	n.a.	0.98	0.675	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.440	12.980	0.608	1742.5	1621.4	14.936	5.022	2.99		Clay	100.0			12.27	1.07	n.a.	n.a.	0.98	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	12.740	0.590	1762.5	1631.5	14.538	4.974	3.00		Clay	100.0			12.04	1.07	n.a.	n.a.	0.98	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	11.660	0.546	1782.5	1641.5	13.121	5.074	3.04		Clay	100.0			11.02	1.07	n.a.	n.a.	0.98	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	10.090	0.497	1803.8	1652.1	11.123	5.411	3.11		Clay	100.0			9.54	1.07	n.a.	n.a.	0.98	0.683	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	8.750	0.427	1823.8	1662.1	9.431	5.446	3.17		Clay	100.0			8.27	1.07	n.a.	n.a.	0.98	0.685	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	7.710	0.360	1845.0	1672.8	8.115	5.297	3.22		Clay	100.0			7.29	1.06	n.a.	n.a.	0.98	0.687	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	7.010	0.317	1865.0	1682.8	7.223	5.221	3.25		Clay	100.0			6.63	1.06	n.a.	n.a.	0.97	0.689	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	6.470	0.270	1885.0	1692.8	6.531	4.890	3.27		Clay	100.0			6.12	1.06	n.a.	n.a.	0.97	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	6.250	0.273	1906.3	1703.5	6.219	5.156	3.30		Clay	100.0			5.91	1.06	n.a.	n.a.	0.97	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	6.940	0.274	1926.3	1713.5	6.976	4.584	3.23		Clay	100.0			6.56	1.06	n.a.	n.a.	0.97	0.694	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	7.340	0.294	1947.5	1724.1	7.385	4.612	3.21		Clay	100.0			6.94	1.06	n.a.	n.a.	0.97	0.695	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	8.740	0.312	1967.5	1734.1	8.945	4.025	3.11		Clay	100.0			8.26	1.05	n.a.	n.a.	0.97	0.697	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	10.050	0.355	1987.5	1744.1	10.385	3.917	3.05		Clay	100.0			9.50	1.05	n.a.	n.a.	0.97	0.699	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	11.070	0.447	2008.8	1754.8	11.472	4.440	3.05		Clay	100.0			10.46	1.05	n.a.	n.a.	0.97	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	12.450	0.612	2028.8	1764.8	12.960	5.349	3.06		Clay	100.0			11.77	1.05	n.a.	n.a.	0.97	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	21.380	1.152	2050.0	1775.4	22.930	5.659	2.89		Clay	94.1			20.21	1.05	n.a.	n.a.	0.97	0.703	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	25.500	1.536	2070.0	1785.5	27.405	6.276	2.86		Clay	92.1			24.10	1.05	n.a.	n.a.	0.97	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	26.860	1.470	2090.0	1795.5	28.756	5.695	2.82		Clay	88.5			25.39	1.04	n.a.	n.a.	0.97	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	27.150	1.434	2111.3	1806.1	28.896	5.494	2.81		Clay	87.5			25.66	1.04	n.a.	n.a.	0.97	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.550	28.960	1.613	2131.3	1816.1	30.718	5.781	2.80		Clay	87.3			27.37	1.04	n.a.	n.a.	0.97	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.720	56.510	1.775	2152.5	1826.8	56.390	3.202	2.44		Sand	57.8	152.53	1.25	190.66	1.04	198.20	301.41	0.97	0.710	1.044	#########	########	2151518.30	0.00	0.00
17.880	128.590	1.308	2172.5	1836.8	129.350	1.025	1.83		Sand	9.6	152.53	1.25	190.66	1.05	199.44	208.64	0.97	0.711	1.041	3.188	7.302	10.26	0.00	0.00
18.040	161.380	1.077	2192.5	1846.8	162.163	0.672	1.64		Sand	0.0		1.25	190.67	1.05	199.43	199.43	0.97	0.713	1.036	1.830	4.169	5.85	0.00	0.00
18.210	142.570	1.552	2213.8	1857.4	142.711	1.097	1.82		Sand	8.7		1.25	168.44	1.05	176.40	182.24	0.97	0.714	1.028	0.796	1.741	2.44	0.00	0.00
18.370	203.060	1.623	2233.8	1867.5	203.177	0.804	1.62		Sand	0.0		1.25	239.91	1.03	248.15	248.15	0.97	0.715	1.037	104.938	239.518	334.90	0.00	0.00
18.540	172.490	0.941	2255.0	1878.1	171.921	0.549	1.56		Sand	0.0		1.25	203.79	1.04	211.58	211.58	0.97	0.716	1.036	3.873	8.826	12.32	0.00	0.00
18.700	142.090	1.304	2275.0	1888.1	141.036	0.925	1.78		Sand	5.0		1.25	167.88	1.04	174.99	175.19	0.97	0.718	1.023	0.604	1.243	1.73	0.00	0.00
18.860	125.700	1.897	2295.0	1898.1	124.297	1.523	1.96		Sand	20.2		1.25	148.51	1.04	153.95	198.75	0.97	0.719	1.028	1.762	3.986	5.55	0.00	0.00
19.030	135.830	3.355	2316.3	1908.8	134.021	2.491	2.10		Sand	31.1		1.25	160.48	1.03	165.26	235.87	0.97	0.720	1.031	28.409	64.433	89.49	0.00	0.00
19.190	149.880	3.175	2336.3	1918.8	147.606	2.135	2.02		Sand	24.9		1.25	177.08	1.03	181.92	243.47	0.97	0.721	1.029	62.103	140.638	195.04	0.00	0.00
19.360	198.470	2.801	2357.5	1929.4	195.283	1.420	1.81		Sand	7.8		1.25	234.49	1.03	240.51	244.52	0.96	0.722	1.028	69.638	157.446	218.00	0.00	0.00
19.520	204.460	2.307	2377.5	1939.5	200.682	1.135	1.73		Sand	1.3		1.25	241.56	1.02	247.34	247.34	0.96	0.723	1.026	95.592	215.799	298.36	0.00	0.00
19.690	201.690	1.506	2398.8	1950.1	197.396	0.751	1.61		Sand	0.0	193.25	1.25	241.56	1.02	246.98	246.98	0.96	0.724	1.024	91.743	206.778	285.45	0.00	0.00
19.850	118.000	1.468	2418.8	1960.1	114.694	1.257	1.93		Sand	17.5	193.25	1.25	241.56	1.02	246.49	293.21	0.96	0.725	1.023	#########	########	364988.43	0.00	0.00
20.010	49.350	1.516	2438.8	1970.1	47.146	3.150	2.49		Sand	61.9	193.25	1.25	241.56	1.02	246.16	364.87	0.96	0.726	1.021	#########	########	##########	0.00	0.00
20.180	23.740	1.280	2460.0	1980.8	22.729	5.687	2.89		Clay	94.4			22.44	1.02	n.a.	n.a.	0.96	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	17.450	0.699	2480.0	1990.8	16.285	4.310	2.92		Clay	96.8			16.49	1.02	n.a.	n.a.	0.96	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.510	10.640	0.510	2501.3	2001.4	9.383	5.431	3.17		Clay	100.0			10.06	1.01	n.a.	n.a.	0.96	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.670	8.820	0.405	2521.3	2011.4	7.516	5.360	3.24		Clay	100.0			8.34	1.01	n.a.	n.a.	0.96	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.830	9.190	0.396	2541.3	2021.5	7.835	4.994	3.21		Clay	100.0			8.69	1.01	n.a.	n.a.	0.96	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.000	11.540	0.401	2562.5	2032.1	10.097	3.906	3.06		Clay	100.0			10.91	1.01	n.a.	n.a.	0.96	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	11.620	0.420	2582.5	2042.1	10.116	4.070	3.07		Clay	100.0			10.98	1.01	n.a.	n.a.	0.96	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 1

PGA (A_{max}) 0.75

Total Settlement: 0.17 (Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
21.330	10.280	0.449	2603.8	2052.8	8.747	4.997	3.17		Clay	100.0			9.72	1.01	n.a.	n.a.	0.96	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.490	10.160	0.436	2623.8	2062.8	8.579	4.931	3.18		Clay	100.0			9.60	1.01	n.a.	n.a.	0.96	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.650	10.210	0.429	2643.8	2072.8	8.576	4.826	3.17		Clay	100.0			9.65	1.01	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.820	10.500	0.472	2665.0	2083.4	8.800	5.153	3.18		Clay	100.0			9.92	1.00	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.980	10.670	0.526	2685.0	2093.4	8.911	5.639	3.20		Clay	100.0			10.09	1.00	n.a.	n.a.	0.96	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.150	13.570	0.509	2706.3	2104.1	11.613	4.166	3.03		Clay	100.0			12.83	1.00	n.a.	n.a.	0.96	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.310	13.410	0.488	2726.3	2114.1	11.397	4.054	3.03		Clay	100.0			12.67	1.00	n.a.	n.a.	0.96	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	14.070	0.520	2746.3	2124.1	11.955	4.097	3.01		Clay	100.0			13.30	1.00	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	15.100	0.580	2767.5	2134.8	12.850	4.231	3.00		Clay	100.0			14.27	1.00	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	17.390	0.617	2787.5	2144.8	14.916	3.856	2.92		Clay	96.7			16.44	1.00	n.a.	n.a.	0.96	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	17.490	0.635	2808.8	2155.4	14.926	3.946	2.93		Clay	97.2			16.53	1.00	n.a.	n.a.	0.95	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	17.320	0.614	2828.8	2165.4	14.690	3.860	2.93		Clay	97.2			16.37	0.99	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	16.640	0.583	2848.8	2175.5	13.988	3.831	2.94		Clay	98.3			15.73	0.99	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	16.180	0.544	2870.0	2186.1	13.490	3.686	2.94		Clay	98.5			15.29	0.99	n.a.	n.a.	0.95	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	15.750	0.511	2890.0	2196.1	13.028	3.569	2.95		Clay	98.8			14.89	0.99	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	15.260	0.493	2911.3	2206.8	12.511	3.569	2.96		Clay	99.9			14.42	0.99	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	15.220	0.495	2931.3	2216.8	12.409	3.601	2.97		Clay	100.0			14.39	0.99	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	14.570	0.475	2951.3	2226.8	11.761	3.629	2.99		Clay	100.0			13.77	0.99	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	13.110	0.448	2972.5	2237.4	10.390	3.852	3.05		Clay	100.0			12.39	0.99	n.a.	n.a.	0.95	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	11.920	0.419	2992.5	2247.4	9.276	4.018	3.10		Clay	100.0			11.27	0.98	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	10.820	0.406	3013.8	2258.1	8.249	4.354	3.16		Clay	100.0			10.23	0.98	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	10.450	0.401	3033.8	2268.1	7.877	4.491	3.18		Clay	100.0			9.88	0.98	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	10.520	0.408	3053.8	2278.1	7.895	4.533	3.18		Clay	100.0			9.94	0.98	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	10.540	0.414	3075.0	2288.8	7.867	4.595	3.19		Clay	100.0			9.96	0.98	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	11.380	0.430	3095.0	2298.8	8.555	4.374	3.15		Clay	100.0			10.76	0.98	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	11.400	0.409	3116.3	2309.4	8.523	4.152	3.13		Clay	100.0			10.78	0.98	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	11.290	0.401	3136.3	2319.4	8.383	4.126	3.14		Clay	100.0			10.67	0.98	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	11.930	0.406	3156.3	2329.5	8.888	3.920	3.11		Clay	100.0			11.28	0.97	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	11.810	0.389	3177.5	2340.1	8.736	3.810	3.10		Clay	100.0			11.16	0.97	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	11.680	0.404	3197.5	2350.1	8.579	4.002	3.12		Clay	100.0			11.04	0.97	n.a.	n.a.	0.95	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	11.070	0.407	3218.8	2360.8	8.015	4.299	3.17		Clay	100.0			10.46	0.97	n.a.	n.a.	0.94	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	10.860	0.392	3238.8	2370.8	7.795	4.246	3.17		Clay	100.0			10.26	0.97	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	10.840	0.385	3258.8	2380.8	7.737	4.184	3.17		Clay	100.0			10.25	0.97	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	13.330	0.406	3280.0	2391.4	9.777	3.472	3.04		Clay	100.0			12.60	0.97	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	12.810	0.408	3300.0	2401.4	9.294	3.657	3.07		Clay	100.0			12.11	0.97	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	13.330	0.423	3321.3	2412.1	9.676	3.625	3.06		Clay	100.0			12.60	0.97	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	15.100	0.500	3341.3	2422.1	11.089	3.721	3.01		Clay	100.0			14.27	0.96	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	15.690	0.545	3362.5	2432.7	11.517	3.890	3.01		Clay	100.0			14.83	0.96	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	15.710	0.607	3382.5	2442.8	11.478	4.327	3.04		Clay	100.0			14.85	0.96	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	17.340	0.656	3402.5	2452.8	12.752	4.195	3.00		Clay	100.0			16.39	0.96	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	19.050	0.743	3423.8	2463.4	14.077	4.285	2.97		Clay	100.0			18.01	0.96	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	21.000	0.790	3443.8	2473.4	15.588	4.096	2.92		Clay	96.8			19.85	0.96	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	19.590	0.721	3465.0	2484.1	14.378	4.037	2.95		Clay	98.7			18.52	0.96	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	16.170	0.737	3485.0	2494.1	11.569	5.105	3.08		Clay	100.0			15.28	0.96	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	16.580	0.712	3505.0	2504.1	11.843	4.800	3.06		Clay	100.0			15.67	0.96	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	16.140	1.057	3526.3	2514.7	11.434	7.351	3.19		Clay	100.0			15.26	0.96	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	14.920	0.939	3546.3	2524.8	10.414	7.139	3.21		Clay	100.0			14.10	0.95	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	16.320	0.748	3567.5	2535.4	11.467	5.145	3.09		Clay	100.0			15.43	0.95	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	14.010	0.563	3587.5	2545.4	9.599	4.611	3.12		Clay	100.0			13.24	0.95	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	13.970	0.492	3607.5	2555.4	9.522	4.045	3.09		Clay	100.0			13.20	0.95	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	13.710	0.534	3628.8	2566.1	9.271	4.487	3.13		Clay	100.0			12.96	0.95	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	16.510	0.581	3648.8	2576.1	11.401	3.956	3.02		Clay	100.0			15.60	0.95	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	17.660	0.580	3670.0	2586.7	12.235	3.663	2.98		Clay	100.0			16.69	0.95	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	20.090	0.728	3690.0	2596.8	14.052	3.992	2.95		Clay	99.1			18.99	0.95	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	27.800	0.881	3710.0	2606.8	19.906	3.396	2.79		Clay	86.1			26.28	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	22.580	0.851	3731.3	2617.4	15.828	4.106	2.92		Clay	96.5			21.34	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	18.710	0.674	3751.3	2627.4	12.814	4.005	2.98		Clay	100.0			17.68	0.94	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	17.250	0.582	3772.5	2638.1	11.648	3.791	3.00		Clay	100.0			16.30	0.94	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	15.730	0.551	3792.5	2648.1	10.448	3.984	3.05		Clay	100.0			14.87	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	13.960	0.486	3812.5	2658.1	9.069	4.034	3.11		Clay	100.0			13.19	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	12.520	0.431	3833.8	2668.7	7.946	4.060	3.15		Clay	100.0			11.83	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	11.530	0.403	3853.8	2678.8	7.170	4.194	3.20		Clay	100.0			10.90	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	11.000	0.397	3875.0	2689.4	6.739	4.384	3.23		Clay	100.0			10.40	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	11.080	0.407	3895.0	2699.4	6.766	4.457	3.23		Clay	100.0			10.47	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.75

Total Settlement:	0.17	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
31.820	11.260	0.422	3915.0	2709.4	6.867	4.534	3.23		Clay	100.0			10.64	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	10.990	0.400	3936.3	2720.1	6.634	4.438	3.24		Clay	100.0			10.39	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	10.780	0.396	3956.3	2730.1	6.448	4.497	3.25		Clay	100.0			10.19	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	11.170	0.404	3977.5	2740.7	6.700	4.399	3.23		Clay	100.0			10.56	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	10.800	0.384	3997.5	2750.7	6.399	4.363	3.25		Clay	100.0			10.21	0.93	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.640	10.410	0.366	4017.5	2760.8	6.086	4.354	3.27		Clay	100.0			9.84	0.93	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	10.060	0.335	4038.8	2771.4	5.803	4.170	3.27		Clay	100.0			9.51	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	10.090	0.326	4058.8	2781.4	5.796	4.039	3.27		Clay	100.0			9.54	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	10.210	0.330	4080.0	2792.1	5.852	4.043	3.26		Clay	100.0			9.65	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.300	10.310	0.336	4100.0	2802.1	5.896	4.062	3.26		Clay	100.0			9.74	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	10.530	0.340	4120.0	2812.1	6.024	4.009	3.25		Clay	100.0			9.95	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	11.920	0.369	4141.3	2822.7	6.979	3.746	3.18		Clay	100.0			11.27	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	14.260	0.407	4161.3	2832.8	8.599	3.345	3.08		Clay	100.0			13.48	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	13.360	0.465	4182.5	2843.4	7.926	4.123	3.16		Clay	100.0			12.63	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	15.020	0.492	4202.5	2853.4	9.055	3.810	3.09		Clay	100.0			14.20	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	17.460	0.499	4222.5	2863.4	10.721	3.248	2.99		Clay	100.0			16.50	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	17.270	0.503	4243.8	2874.1	10.541	3.321	3.00		Clay	100.0			16.32	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	15.220	0.495	4263.8	2884.1	9.076	3.780	3.09		Clay	100.0			14.39	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	14.050	0.408	4285.0	2894.7	8.227	3.430	3.10		Clay	100.0			13.28	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	12.310	0.353	4305.0	2904.7	6.994	3.478	3.16		Clay	100.0			11.64	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	10.340	0.299	4325.0	2914.8	5.611	3.654	3.25		Clay	100.0			9.77	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	10.640	0.287	4346.3	2925.4	5.789	3.393	3.22		Clay	100.0			10.06	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	11.370	0.356	4366.3	2935.4	6.259	3.877	3.23		Clay	100.0			10.75	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	13.470	0.377	4387.5	2946.1	7.655	3.347	3.12		Clay	100.0			12.73	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.760	13.480	0.429	4407.5	2956.1	7.629	3.808	3.15		Clay	100.0			12.74	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.930	15.480	0.555	4428.8	2966.7	8.943	4.187	3.12		Clay	100.0			14.63	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	17.390	0.573	4448.8	2976.7	10.189	3.777	3.05		Clay	100.0			16.44	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.250	18.320	0.516	4468.8	2986.8	10.771	3.205	2.99		Clay	100.0			17.32	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.420	16.700	0.758	4490.0	2997.4	9.645	5.245	3.15		Clay	100.0			15.78	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.580	23.930	0.925	4510.0	3007.4	14.414	4.265	2.96		Clay	99.8			22.62	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.750	26.060	0.852	4531.3	3018.1	15.768	3.580	2.88		Clay	93.6			24.63	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.910	25.220	0.793	4551.3	3028.1	15.154	3.455	2.89		Clay	93.9			23.84	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.070	25.030	1.381	4571.3	3038.1	14.973	6.073	3.05		Clay	100.0			23.66	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.240	46.050	1.880	4592.5	3048.7	28.703	4.297	2.74		Clay	81.8			43.53	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.400	112.130	2.690	4612.5	3058.7	86.337	2.449	2.22		Sand	40.8	284.23	1.21	343.92	0.91	312.06	430.45	0.91	0.766	0.889	########	########	##########	0.00	0.00
37.570	127.870	2.780	4633.8	3069.4	98.531	2.214	2.15		Sand	35.1	284.23	1.21	343.92	0.91	311.77	421.09	0.91	0.766	0.888	########	########	##########	0.00	0.00
37.730	150.670	3.022	4653.8	3079.4	116.227	2.037	2.08		Sand	29.1	284.23	1.21	343.92	0.91	311.51	407.77	0.91	0.766	0.887	########	########	##########	0.00	0.00
37.890	186.230	2.509	4673.8	3089.4	143.847	1.364	1.89		Sand	13.9	284.23	1.21	343.92	0.90	311.24	345.91	0.91	0.766	0.886	########	########	##########	0.00	0.00
38.060	206.790	2.688	4695.0	3100.1	159.646	1.315	1.84		Sand	10.5	284.23	1.21	343.92	0.90	310.96	326.85	0.91	0.766	0.885	########	########	##########	0.00	0.00
38.220	270.680	2.083	4715.0	3110.1	209.191	0.776	1.60		Sand	0.0	284.23	1.21	343.92	0.90	310.69	310.69	0.91	0.766	0.884	########	########	##########	0.00	0.00
38.390	300.720	2.115	4736.3	3120.7	232.206	0.709	1.54		Sand	0.0		1.21	343.92	0.90	310.42	310.42	0.90	0.766	0.883	########	########	##########	0.00	0.00
38.550	291.090	1.151	4756.3	3130.7	224.344	0.399	1.39		Sand	0.0		1.21	332.91	0.90	300.22	300.22	0.90	0.765	0.882	########	########	1299733.11	0.00	0.00
38.710	291.890	1.235	4776.3	3140.7	224.599	0.427	1.40		Sand	0.0		1.21	333.83	0.90	300.79	300.79	0.90	0.765	0.882	########	########	1471425.33	0.00	0.00
38.880	285.340	1.376	4797.5	3151.4	219.138	0.486	1.45		Sand	0.0		1.21	326.33	0.90	293.78	293.78	0.90	0.765	0.881	########	########	334292.54	0.00	0.00
39.040	275.220	1.189	4817.5	3161.4	210.957	0.436	1.43		Sand	0.0		1.21	314.76	0.90	283.12	283.12	0.90	0.765	0.880	17241.475	########	43594.86	0.00	0.00
39.210	209.560	1.246	4838.8	3172.0	159.907	0.602	1.61		Sand	0.0		1.21	239.67	0.88	210.95	210.95	0.90	0.765	0.879	3.713	7.176	9.38	0.00	0.00
39.370	188.240	1.233	4858.8	3182.1	143.215	0.663	1.68		Sand	0.0		1.21	215.28	0.87	186.83	186.83	0.90	0.765	0.907	0.971	1.937	2.53	0.00	0.00
39.530	190.500	1.485	4878.8	3192.1	144.722	0.790	1.72		Sand	0.7		1.21	217.87	0.87	189.11	189.11	0.90	0.765	0.904	1.078	2.145	2.80	0.00	0.00
39.700	148.770	2.704	4900.0	3202.7	112.413	1.848	2.06		Sand	27.4	180.06	1.21	217.87	0.90	195.31	265.10	0.90	0.765	0.876	941.320	1813.405	2370.58	0.00	0.00
39.860	78.000	2.620	4920.0	3212.7	57.944	3.468	2.45		Sand	59.2	180.06	1.21	217.87	0.90	195.14	298.16	0.90	0.765	0.875	########	########	827103.39	0.00	0.00
40.030	40.880	2.368	4941.3	3223.4	23.832	6.164	2.90		Clay	95.1			38.64	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.190	44.600	1.509	4961.3	3233.4	26.053	3.584	2.71		Clay	80.1			42.16	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.350	44.510	0.942	4981.3	3243.4	32.079	2.241	2.51		Sand	64.2			42.07	0.80	33.78	93.00	0.90	0.765	0.957	0.129	0.151	0.20	0.03	0.07
40.520	34.780	0.815	5002.5	3254.1	19.839	2.526	2.71		Clay	79.9			32.87	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.680	21.210	1.001	5022.5	3264.1	11.457	5.351	3.10		Clay	100.0			20.05	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.850	17.310	1.025	5043.8	3274.7	9.032	6.928	3.25		Clay	100.0			16.36	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	22.230	0.961	5063.8	3284.7	11.994	4.878	3.06		Clay	100.0			21.01	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	24.930	1.060	5083.8	3294.7	13.590	4.735	3.01		Clay	100.0			23.56	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	23.260	1.074	5105.0	3305.4	12.530	5.186	3.06		Clay	100.0			21.98	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	25.760	1.168	5125.0	3315.4	13.994	5.034	3.02		Clay	100.0			24.35	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	25.210	1.173	5146.3	3326.0	13.612	5.182	3.03		Clay	100.0			23.83	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	23.070	1.021	5166.3	3336.1	12.282	4.985	3.06		Clay	100.0			21.81	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	22.200	1.160	5186.3	3346.1	11.719	5.917	3.12		Clay	100.0			20.98	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	25.810	1.147	5207.5	3356.7	13.827	4.944	3.01		Clay	100.0			24.40	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	1

PGA (A_{max})	0.75

Total Settlement:	0.17	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
42.320	24.540	1.101	5227.5	3366.7	13.025	5.023	3.04		Clay	100.0			23.19	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.490	20.750	0.933	5248.8	3377.4	10.734	5.147	3.11		Clay	100.0			19.61	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	20.540	0.698	5268.8	3387.4	10.572	3.900	3.04		Clay	100.0			19.41	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	18.990	0.659	5288.8	3397.4	9.622	4.034	3.08		Clay	100.0			17.95	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	16.160	0.654	5310.0	3408.0	7.925	4.840	3.20		Clay	100.0			15.27	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	15.080	0.709	5330.0	3418.1	7.264	5.712	3.27		Clay	100.0			14.25	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	14.930	0.696	5351.3	3428.7	7.148	5.676	3.28		Clay	100.0			14.11	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.470	14.860	0.698	5371.3	3438.7	7.081	5.733	3.28		Clay	100.0			14.05	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	14.480	0.669	5392.5	3449.4	6.832	5.681	3.29		Clay	100.0			13.69	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	14.140	0.675	5412.5	3459.4	6.610	5.906	3.31		Clay	100.0			13.36	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	13.790	0.669	5432.5	3469.4	6.384	6.040	3.33		Clay	100.0			13.03	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	13.740	0.652	5453.8	3480.0	6.329	5.920	3.33		Clay	100.0			12.99	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.290	13.590	0.636	5473.8	3490.1	6.219	5.860	3.33		Clay	100.0			12.84	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	13.610	0.610	5495.0	3500.7	6.206	5.616	3.32		Clay	100.0			12.86	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.620	13.950	0.608	5515.0	3510.7	6.376	5.428	3.31		Clay	100.0			13.19	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.780	14.170	0.597	5535.0	3520.7	6.477	5.238	3.29		Clay	100.0			13.39	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	14.700	0.624	5556.3	3531.4	6.752	5.232	3.28		Clay	100.0			13.89	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.110	15.630	0.544	5576.3	3541.4	7.252	4.233	3.20		Clay	100.0			14.77	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.280	16.550	0.560	5597.5	3552.0	7.743	4.070	3.16		Clay	100.0			15.64	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.440	17.680	0.588	5617.5	3562.0	8.350	3.952	3.13		Clay	100.0			16.71	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.600	17.990	0.545	5637.5	3572.1	8.494	3.589	3.10		Clay	100.0			17.00	0.87	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.770	17.200	0.492	5658.8	3582.7	8.022	3.422	3.11		Clay	100.0			16.26	0.87	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.930	17.830	0.520	5678.8	3592.7	8.345	3.468	3.10		Clay	100.0			16.85	0.87	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.100	18.160	0.496	5700.0	3603.4	8.498	3.240	3.07		Clay	100.0			17.16	0.87	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.260	18.680	0.550	5720.0	3613.4	8.756	3.473	3.08		Clay	100.0			17.66	0.87	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.420	20.060	0.591	5740.0	3623.4	9.488	3.440	3.05		Clay	100.0			18.96	0.87	n.a.	n.a.	0.88	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.590	21.430	0.669	5761.3	3634.0	10.209	3.606	3.04		Clay	100.0			20.26	0.87	n.a.	n.a.	0.88	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.750	22.590	0.681	5781.3	3644.1	10.812	3.456	3.00		Clay	100.0			21.35	0.87	n.a.	n.a.	0.87	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.920	22.890	0.746	5802.5	3654.7	10.939	3.734	3.02		Clay	100.0			21.64	0.87	n.a.	n.a.	0.87	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.080	23.330	0.870	5822.5	3664.7	11.143	4.261	3.05		Clay	100.0			22.05	0.87	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	23.800	1.685	5842.5	3674.7	11.363	8.069	3.22		Clay	100.0			22.50	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	48.070	2.507	5863.8	3685.4	24.496	5.555	2.86		Clay	91.9			45.43	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	77.300	3.628	5883.8	3695.4	40.244	4.879	2.67		Clay	76.5			73.06	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	84.580	4.135	5905.0	3706.0	44.051	5.065	2.65		Clay	75.2			79.94	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.900	108.300	4.936	5925.0	3716.0	75.130	4.686	2.47		Sand	60.9			102.36	0.80	81.85	153.79	0.87	0.756	0.907	0.316	0.491	0.65	0.02	0.04
48.060	100.530	5.090	5945.0	3726.1	52.365	5.217	2.61		Clay	71.9			95.02	0.86	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.230	120.350	5.530	5966.3	3736.7	83.478	4.712	2.45		Sand	58.7			113.75	0.81	91.73	165.69	0.87	0.756	0.895	0.439	0.734	0.97	0.01	0.02
48.390	106.740	3.464	5986.3	3746.7	73.692	3.339	2.37		Sand	52.5	113.75		113.75	0.80	91.40	162.78	0.87	0.756	0.898	0.402	0.660	0.87	0.01	0.02
48.560	57.630	2.999	6007.5	3757.4	29.077	5.489	2.80		Clay	87.4			54.47	0.86	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	40.930	2.237	6027.5	3767.4	20.129	5.900	2.94		Clay	98.4			38.69	0.86	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	32.350	1.871	6047.5	3777.4	15.527	6.379	3.05		Clay	100.0			30.58	0.86	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	25.210	1.436	6068.8	3788.0	11.708	6.477	3.15		Clay	100.0			23.83	0.86	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	21.710	1.200	6088.8	3798.0	9.829	6.427	3.20		Clay	100.0			20.52	0.86	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	20.130	1.025	6110.0	3808.7	8.966	6.001	3.21		Clay	100.0			19.03	0.86	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	18.120	0.899	6130.0	3818.7	7.885	5.968	3.26		Clay	100.0			17.13	0.86	n.a.	n.a.	0.86	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	17.560	1.074	6150.0	3828.7	7.566	7.414	3.33		Clay	100.0			16.60	0.86	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	29.190	2.059	6171.3	3839.4	13.598	7.887	3.15		Clay	100.0			27.59	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	48.250	3.103	6191.3	3849.4	23.461	6.873	2.94		Clay	98.2			45.60	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.200	75.230	3.878	6212.5	3860.0	37.370	5.376	2.72		Clay	80.7			71.11	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	2

PGA (A_{max})	0.75

Total Settlement:	1.31	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.330	0.310	0.367	39.6	39.6	14.657	126.361	4.04		Unsaturated	100.0			0.29	1.70	0.50	54.59	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	32.420	1.374	58.8	58.8	183.655	4.241	2.21		Unsaturated	39.5			30.64	1.70	52.09	106.25	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	126.460	2.763	79.2	79.2	617.628	2.186	1.70		Unsaturated	0.0			119.53	1.70	203.20	203.20	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	71.970	3.008	98.4	98.4	315.231	4.183	2.08		Unsaturated	29.6			68.02	1.70	115.64	173.72	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	33.900	2.336	117.6	117.6	135.680	6.903	2.46		Unsaturated	59.4			32.04	1.70	54.47	118.29	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	24.660	2.023	138.0	138.0	157.122	8.227	2.49		Unsaturated	61.9			23.31	1.70	39.62	99.95	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	21.930	1.927	157.2	157.2	127.449	8.819	2.56		Unsaturated	67.8			20.73	1.70	35.24	95.67	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	20.090	1.841	177.6	177.6	107.108	9.206	2.62		Unsaturated	72.3			18.99	1.70	32.28	92.73	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	18.750	1.760	196.8	196.8	92.955	9.434	2.66		Unsaturated	75.7			17.72	1.70	30.13	90.52	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	19.030	1.676	216.0	216.0	88.354	8.857	2.65		Unsaturated	74.9			17.99	1.70	30.58	90.98	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	18.650	1.628	236.4	236.4	81.234	8.785	2.67		Unsaturated	76.4			17.63	1.70	29.97	90.42	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	17.260	1.562	255.6	255.6	71.104	9.119	2.71		Unsaturated	80.2			16.31	1.70	27.73	88.08	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	16.430	1.475	276.0	276.0	64.079	9.055	2.74		Unsaturated	82.2			15.53	1.70	26.40	86.62	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	16.110	1.405	295.2	295.2	59.895	8.802	2.75		Unsaturated	82.8			15.23	1.70	25.89	86.03	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	16.370	1.400	314.4	314.4	103.135	8.633	2.60		Unsaturated	71.2			15.47	1.70	26.30	84.80	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	16.130	1.441	334.8	334.8	95.356	9.030	2.64		Unsaturated	74.0			15.25	1.70	25.92	84.78	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	16.590	1.397	354.0	354.0	92.729	8.512	2.62		Unsaturated	72.9			15.68	1.70	26.66	85.55	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	16.710	1.409	374.4	374.4	88.263	8.526	2.64		Unsaturated	73.9			15.79	1.70	26.85	85.97	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	16.500	1.336	393.6	393.6	82.841	8.193	2.64		Unsaturated	74.0			15.60	1.70	26.51	85.56	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	16.300	1.246	412.8	412.8	77.973	7.740	2.63		Unsaturated	73.7			15.41	1.70	26.19	85.09	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	16.160	1.173	433.2	433.2	73.608	7.357	2.63		Unsaturated	73.5			15.27	1.70	25.97	84.77	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	16.410	1.167	452.4	452.4	71.546	7.210	2.63		Unsaturated	73.6			15.51	1.70	26.37	85.29	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	17.770	1.261	472.8	472.8	74.169	7.189	2.62		Unsaturated	72.7			16.80	1.70	28.55	87.98	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	19.620	1.320	492.0	492.0	50.842	6.815	2.71		Unsaturated	79.6			18.54	1.70	31.53	92.92	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	21.350	1.391	512.4	512.4	53.803	6.596	2.68		Unsaturated	77.4			20.18	1.70	34.31	96.20	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	23.030	1.480	531.6	531.6	56.587	6.500	2.66		Unsaturated	75.9			21.77	1.70	37.00	99.46	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	24.540	1.588	550.8	550.8	58.837	6.546	2.65		Unsaturated	75.2			23.19	1.70	39.43	102.49	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	25.490	1.759	571.2	571.2	59.580	6.979	2.67		Unsaturated	76.6			24.09	1.70	40.96	104.71	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	27.770	1.781	590.4	590.4	63.461	6.483	2.63		Unsaturated	73.3			26.25	1.70	44.62	108.87	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	29.150	2.032	610.8	610.8	65.059	7.044	2.65		Unsaturated	75.0			27.55	1.70	46.84	112.05	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	43.030	2.480	630.0	630.0	73.992	5.806	2.55		Unsaturated	66.9			40.67	1.67	67.99	137.70	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	57.750	3.111	649.2	649.2	97.991	5.418	2.45		Unsaturated	59.0			54.58	1.58	86.41	159.02	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	66.180	2.997	669.6	669.6	110.634	4.552	2.36		Unsaturated	51.7			62.55	1.54	96.20	168.50	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	75.750	3.028	688.8	688.8	124.919	4.016	2.28		Unsaturated	45.6			71.60	1.50	107.09	178.94	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	98.620	3.631	709.2	709.2	160.431	3.695	2.19		Unsaturated	38.2			93.21	1.42	132.69	204.92	1.00	0.485	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	104.070	3.540	728.4	728.4	167.067	3.413	2.15		Sand	35.1			98.36	1.40	138.16	208.36	1.00	0.488	1.100	3.130	7.575	15.51	0.00	0.00
6.230	110.420	4.086	747.6	747.6	174.990	3.713	2.17		Sand	36.6			104.37	1.38	143.74	216.90	1.00	0.495	1.100	5.644	13.658	27.61	0.00	0.00
6.400	102.560	3.152	768.0	768.0	160.303	3.085	2.13		Sand	33.1			96.94	1.39	135.00	202.04	0.99	0.501	1.100	2.124	5.141	10.26	0.00	0.00
6.560	114.570	3.522	787.2	787.2	176.932	3.084	2.10		Sand	31.1			108.29	1.36	147.30	214.15	0.99	0.507	1.100	4.627	11.198	22.07	0.00	0.00
6.730	151.380	3.840	807.6	807.6	230.984	2.543	1.97		Sand	20.3			143.08	1.31	187.83	237.66	0.99	0.514	1.100	33.907	82.056	159.78	0.00	0.00
6.890	103.310	4.873	826.8	826.8	155.587	4.736	2.29		Sand	45.9	143.08		143.08	1.28	183.34	274.88	0.99	0.519	1.100	4213.263	########	19635.63	0.00	0.00
7.050	72.110	3.560	846.0	846.0	107.159	4.966	2.40		Sand	54.7	143.08		143.08	1.27	182.23	279.39	0.99	0.525	1.100	8945.730	########	41250.11	0.00	0.00
7.220	51.530	3.387	866.4	866.4	75.476	6.629	2.59		Sand	70.1	143.08		143.08	1.27	181.09	284.50	0.99	0.531	1.100	22102.534	########	100816.58	0.00	0.00
7.380	46.590	2.778	885.6	885.6	67.422	6.021	2.59		Sand	70.0	143.08		143.08	1.26	180.04	283.10	0.99	0.536	1.100	17154.317	########	77479.55	0.00	0.00
7.550	40.790	2.527	906.0	906.0	69.038	6.263	2.59		Mixed	70.5	143.08		143.08	1.25	178.97	281.88	0.99	0.541	1.100	13815.264	########	61772.57	0.00	0.00
7.710	34.610	2.242	925.2	925.2	57.593	6.565	2.66		Mixed	75.8	143.08		143.08	1.24	177.98	282.18	0.99	0.546	1.100	14559.719	########	64508.66	0.00	0.00
7.870	34.970	2.049	944.4	944.4	57.353	5.939	2.63		Mixed	73.2	143.08		143.08	1.24	177.02	280.20	0.99	0.551	1.100	10289.190	########	45186.76	0.00	0.00
8.040	33.380	2.185	964.8	964.8	68.196	6.642	2.62		Clay	72.4			31.55	1.23	n.a.	n.a.	0.99	0.556	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.200	41.580	2.527	984.0	984.0	66.373	6.149	2.60		Mixed	70.9	52.22		52.22	1.37	71.71	143.42	0.99	0.561	1.100	0.250	0.440	0.78	0.02	0.03
8.370	55.250	2.475	1004.4	1004.4	75.108	4.521	2.46		Sand	59.9			52.22	1.37	71.41	140.11	0.99	0.565	1.100	0.235	0.403	0.71	0.02	0.04
8.530	53.850	2.649	1023.6	1023.6	72.485	4.967	2.50		Sand	63.2	52.22		52.22	1.36	70.82	140.35	0.99	0.570	1.100	0.236	0.406	0.71	0.02	0.04
8.690	50.830	2.406	1042.8	1042.8	67.735	4.782	2.51		Sand	63.7	52.22		52.22	1.35	70.31	139.84	0.99	0.574	1.100	0.234	0.401	0.70	0.02	0.05
8.860	34.350	2.163	1063.2	1063.2	63.616	6.396	2.62		Clay	72.9			32.47	1.20	n.a.	n.a.	0.99	0.578	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.020	31.580	1.894	1082.4	1082.4	57.352	6.103	2.64		Clay	73.9			29.85	1.19	n.a.	n.a.	0.99	0.582	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.190	33.690	1.760	1102.8	1102.8	49.427	5.311	2.63		Mixed	73.7	74.48	1.72	128.11	1.19	152.71	248.88	0.99	0.587	1.100	114.202	276.368	471.07	0.00	0.00
9.350	72.420	1.370	1122.0	1122.0	93.273	1.906	2.12		Sand	32.7	74.48	1.72	128.11	1.21	154.68	225.45	0.99	0.591	1.100	11.066	26.779	45.35	0.00	0.00
9.510	78.800	0.902	1141.2	1141.2	100.684	1.153	1.95		Sand	18.9		1.72	128.11	1.23	157.21	198.45	0.99	0.594	1.100	1.734	4.196	7.06	0.00	0.00
9.680	57.290	0.778	1161.6	1161.6	72.343	1.372	2.11		Sand	31.5	74.48	1.72	128.11	1.20	153.46	222.21	0.99	0.598	1.100	8.482	20.527	34.31	0.00	0.00
9.840	37.550	0.947	1180.8	1180.8	46.764	2.563	2.43		Sand	57.2	74.48	1.72	128.11	1.18	150.76	240.52	0.99	0.602	1.100	45.406	109.884	182.59	0.00	0.00
10.010	25.150	1.085	1201.2	1201.2	40.875	4.421	2.63		Clay	73.7			23.77	1.16	n.a.	n.a.	0.99	0.606	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.170	19.070	1.111	1220.4	1220.4	30.252	6.021	2.82		Clay	88.6			18.02	1.16	n.a.	n.a.	0.99	0.609	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.330	15.450	0.982	1239.6	1239.6	23.927	6.618	2.92		Clay	96.7			14.60	1.15	n.a.	n.a.	0.99	0.612	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.500	22.910	1.030	1260.0	1260.0	35.365	4.622	2.69		Clay	78.3			21.65	1.15	n.a.	n.a.	0.99	0.616	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.660	16.330	1.010	1279.2	1279.2	24.532	6.437	2.91		Clay	95.5			15.43	1.14	n.a.	n.a.	0.99	0.619	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.830	17.940	1.290	1299.6	1299.6	26.608	7.463	2.93		Clay	97.1			16.96	1.14	n.a.	n.a.	0.99	0.622	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	2

PGA (A_{max})	0.75

Total Settlement:	1.31	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
10.990	23.560	1.307	1318.8	1318.8	34.729	5.709	2.76		Clay	84.0			22.27	1.13	n.a.	n.a.	0.99	0.625	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.150	18.460	1.176	1338.0	1338.0	26.593	6.612	2.89		Clay	94.1			17.45	1.13	n.a.	n.a.	0.99	0.628	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.320	17.950	1.141	1358.4	1358.4	25.428	6.607	2.90		Clay	95.2			16.97	1.12	n.a.	n.a.	0.98	0.631	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.480	21.730	1.355	1377.6	1377.6	30.548	6.437	2.84		Clay	90.1			20.54	1.12	n.a.	n.a.	0.98	0.634	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.650	28.280	1.208	1398.0	1398.0	39.458	4.379	2.64		Clay	74.3			26.73	1.12	n.a.	n.a.	0.98	0.637	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.810	52.340	1.338	1417.2	1417.2	59.631	2.591	2.35		Sand	51.3	86.51		86.51	1.16	100.21	173.41	0.98	0.640	1.079	0.566	1.212	1.89	0.00	0.00
11.980	77.410	1.051	1437.6	1437.6	87.942	1.370	2.04		Sand	26.3	86.51		86.51	1.17	101.03	151.22	0.98	0.643	1.062	0.297	0.531	0.83	0.01	0.03
12.140	91.530	0.625	1456.8	1456.8	103.435	0.689	1.80		Sand	6.9			86.51	1.20	103.75	105.25	0.98	0.645	1.041	0.145	0.194	0.30	0.03	0.06
12.300	86.660	0.248	1476.0	1476.0	97.237	0.289	1.63		Sand	0.0			81.91	1.20	98.15	98.15	0.98	0.648	1.038	0.135	0.175	0.27	0.03	0.07
12.470	83.400	0.230	1496.4	1496.4	92.897	0.278	1.64		Sand	0.0			78.83	1.19	94.11	94.11	0.98	0.651	1.035	0.130	0.166	0.26	0.03	0.07
12.630	85.970	0.336	1515.6	1515.6	95.166	0.394	1.70		Sand	0.0			81.26	1.18	96.23	96.23	0.98	0.653	1.034	0.133	0.170	0.26	0.03	0.07
12.800	87.120	0.379	1536.0	1536.0	95.796	0.439	1.72		Sand	0.6			82.34	1.18	96.81	96.81	0.98	0.656	1.033	0.133	0.172	0.26	0.03	0.06
12.960	100.580	0.366	1555.2	1555.2	110.032	0.367	1.63		Sand	0.0			95.07	1.16	110.09	110.09	0.98	0.658	1.035	0.152	0.208	0.32	0.03	0.06
13.120	112.240	0.285	1574.4	1574.4	122.125	0.255	1.52		Sand	0.0			106.09	1.14	121.33	121.33	0.98	0.660	1.037	0.174	0.252	0.38	0.03	0.05
13.290	107.500	0.278	1594.8	1594.8	116.170	0.261	1.54		Sand	0.0			101.61	1.14	115.88	115.88	0.98	0.663	1.034	0.163	0.228	0.34	0.03	0.05
13.450	109.130	0.190	1614.0	1614.0	117.231	0.175	1.48		Sand	0.0			103.15	1.13	116.92	116.92	0.98	0.665	1.033	0.165	0.232	0.35	0.03	0.06
13.620	104.260	0.334	1634.4	1634.4	111.248	0.323	1.60		Sand	0.0			98.54	1.13	111.37	111.37	0.98	0.667	1.030	0.154	0.211	0.32	0.03	0.06
13.780	97.190	0.363	1653.6	1653.6	103.031	0.376	1.66		Sand	0.0			91.86	1.13	103.66	103.66	0.98	0.669	1.027	0.142	0.187	0.28	0.03	0.06
13.940	116.070	0.923	1672.8	1672.8	122.498	0.801	1.78		Sand	5.5			109.71	1.11	122.01	122.35	0.98	0.671	1.030	0.177	0.255	0.38	0.03	0.05
14.110	86.770	1.140	1693.2	1693.2	90.788	1.327	2.02		Sand	24.8			82.01	1.10	90.21	135.75	0.98	0.673	1.032	0.217	0.340	0.50	0.02	0.04
14.270	77.090	1.251	1712.8	1708.4	80.191	1.640	2.12		Sand	32.9			72.86	1.10	79.88	134.73	0.98	0.675	1.030	0.213	0.332	0.49	0.02	0.05
14.440	117.460	1.467	1734.0	1719.0	122.265	1.258	1.91		Sand	15.9			111.02	1.09	120.78	148.56	0.98	0.678	1.033	0.279	0.477	0.70	0.02	0.04
14.600	138.280	0.927	1754.0	1729.0	143.670	0.675	1.68		Sand	0.0			130.70	1.09	142.17	142.17	0.98	0.679	1.030	0.244	0.398	0.59	0.02	0.04
14.760	126.460	0.966	1774.0	1739.1	130.922	0.769	1.75		Sand	2.8			119.53	1.09	130.24	130.24	0.98	0.681	1.027	0.198	0.299	0.44	0.02	0.05
14.930	115.460	1.730	1795.3	1749.7	119.078	1.510	1.98		Sand	21.0			109.13	1.08	117.49	159.40	0.98	0.683	1.033	0.365	0.673	0.99	0.01	0.02
15.090	98.240	2.392	1815.3	1759.7	100.881	2.457	2.18		Sand	37.2			92.85	1.07	99.63	163.22	0.98	0.685	1.033	0.407	0.772	1.13	0.01	0.01
15.260	119.190	1.767	1836.5	1770.4	122.215	1.494	1.96		Sand	20.1			112.66	1.07	120.69	160.74	0.98	0.687	1.031	0.379	0.705	1.03	0.01	0.02
15.420	137.560	2.517	1856.5	1780.4	140.789	1.842	1.99		Sand	22.0			130.02	1.06	138.10	185.65	0.97	0.689	1.039	0.921	2.092	3.04	0.00	0.00
15.580	161.260	1.676	1876.5	1790.4	164.737	1.045	1.76		Sand	4.0			152.42	1.07	162.50	162.52	0.97	0.690	1.030	0.399	0.750	1.09	0.01	0.01
15.750	134.030	2.438	1897.8	1801.0	136.342	1.832	2.00		Sand	22.6	152.42		152.42	1.05	160.30	212.80	0.97	0.692	1.048	4.211	9.711	14.03	0.00	0.00
15.910	117.230	1.634	1917.8	1811.0	118.790	1.405	1.95		Sand	19.3	152.42		152.42	1.05	160.33	203.35	0.97	0.694	1.043	2.294	5.262	7.59	0.00	0.00
16.080	85.620	2.073	1939.0	1821.7	86.231	2.449	2.22		Sand	40.9	152.42		152.42	1.04	158.94	240.04	0.97	0.695	1.045	43.206	99.324	142.83	0.00	0.00
16.240	42.120	1.693	1959.0	1831.7	43.018	4.116	2.60		Mixed	70.7	152.42		152.42	1.04	158.33	255.28	0.97	0.697	1.043	248.795	571.040	819.31	0.00	0.00
16.400	19.250	0.942	1979.0	1841.7	19.830	5.159	2.91		Clay	95.6			18.19	1.04	n.a.	n.a.	0.97	0.699	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	15.450	0.603	2000.3	1852.4	15.602	4.170	2.93		Clay	97.2			14.60	1.04	n.a.	n.a.	0.97	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	13.570	0.544	2020.3	1862.4	13.488	4.327	2.99		Clay	100.0			12.83	1.03	n.a.	n.a.	0.97	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	12.110	0.495	2041.5	1873.0	11.841	4.466	3.04		Clay	100.0			11.45	1.03	n.a.	n.a.	0.97	0.703	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	10.850	0.439	2061.5	1883.0	10.429	4.469	3.08		Clay	100.0			10.26	1.03	n.a.	n.a.	0.97	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	9.760	0.410	2081.5	1893.1	9.212	4.705	3.14		Clay	100.0			9.22	1.03	n.a.	n.a.	0.97	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	8.870	0.365	2102.8	1903.7	8.214	4.667	3.18		Clay	100.0			8.38	1.03	n.a.	n.a.	0.97	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.550	7.610	0.326	2122.8	1913.7	6.844	4.978	3.26		Clay	100.0			7.19	1.03	n.a.	n.a.	0.97	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.720	7.090	0.297	2144.0	1924.4	6.255	4.934	3.29		Clay	100.0			6.70	1.03	n.a.	n.a.	0.97	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.880	7.420	0.291	2164.0	1934.4	6.553	4.588	3.25		Clay	100.0			7.01	1.02	n.a.	n.a.	0.97	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.040	8.120	0.321	2184.0	1944.4	7.229	4.569	3.22		Clay	100.0			7.67	1.02	n.a.	n.a.	0.97	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.210	8.560	0.302	2205.3	1955.0	7.629	4.052	3.17		Clay	100.0			8.09	1.02	n.a.	n.a.	0.97	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.370	8.190	0.284	2225.3	1965.0	7.203	4.011	3.19		Clay	100.0			7.74	1.02	n.a.	n.a.	0.97	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.540	8.750	0.278	2246.5	1975.7	7.721	3.639	3.14		Clay	100.0			8.27	1.02	n.a.	n.a.	0.97	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.700	8.690	0.270	2266.5	1985.7	7.611	3.570	3.14		Clay	100.0			8.21	1.02	n.a.	n.a.	0.97	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.860	9.160	0.280	2286.5	1995.7	8.034	3.489	3.11		Clay	100.0			8.66	1.02	n.a.	n.a.	0.97	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.030	9.060	0.303	2307.8	2006.4	7.881	3.832	3.14		Clay	100.0			8.56	1.01	n.a.	n.a.	0.97	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.190	9.540	0.335	2327.8	2016.4	8.308	3.997	3.13		Clay	100.0			9.02	1.01	n.a.	n.a.	0.97	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.360	10.090	0.376	2349.0	2027.0	8.797	4.217	3.13		Clay	100.0			9.54	1.01	n.a.	n.a.	0.96	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.520	10.300	0.361	2369.0	2037.0	8.950	3.958	3.11		Clay	100.0			9.74	1.01	n.a.	n.a.	0.96	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.690	9.570	0.359	2390.3	2047.7	8.180	4.290	3.16		Clay	100.0			9.05	1.01	n.a.	n.a.	0.96	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.850	9.850	0.350	2410.3	2057.7	8.403	4.044	3.13		Clay	100.0			9.31	1.01	n.a.	n.a.	0.96	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.010	9.970	0.348	2430.3	2067.7	8.468	3.975	3.13		Clay	100.0			9.42	1.01	n.a.	n.a.	0.96	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.180	9.940	0.355	2451.5	2078.3	8.386	4.070	3.14		Clay	100.0			9.40	1.00	n.a.	n.a.	0.96	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	10.090	0.369	2471.5	2088.4	8.480	4.164	3.14		Clay	100.0			9.54	1.00	n.a.	n.a.	0.96	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.510	9.400	0.354	2492.8	2099.0	7.769	4.343	3.18		Clay	100.0			8.88	1.00	n.a.	n.a.	0.96	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.670	9.090	0.347	2512.8	2109.0	7.429	4.426	3.20		Clay	100.0			8.59	1.00	n.a.	n.a.	0.96	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.830	8.660	0.328	2532.8	2119.0	6.978	4.429	3.22		Clay	100.0			8.19	1.00	n.a.	n.a.	0.96	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.000	8.400	0.313	2554.0	2129.7	6.689	4.397	3.24		Clay	100.0			7.94	1.00	n.a.	n.a.	0.96	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	8.330	0.315	2574.0	2139.7	6.583	4.477	3.25		Clay	100.0			7.87	1.00	n.a.	n.a.	0.96	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.330	8.400	0.314	2595.3	2150.3	6.606	4.420	3.24		Clay	100.0			7.94	1.00	n.a.	n.a.	0.96	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	2

PGA (A_{max})	0.75

Total Settlement:	1.31	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
21.490	8.230	0.301	2615.3	2160.4	6.409	4.344	3.25		Clay	100.0			7.78	0.99	n.a.	n.a.	0.96	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.650	8.580	0.318	2635.3	2170.4	6.692	4.381	3.23		Clay	100.0			8.11	0.99	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.820	9.170	0.296	2656.5	2181.0	7.191	3.768	3.17		Clay	100.0			8.67	0.99	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.980	8.700	0.288	2676.5	2191.0	6.720	3.918	3.20		Clay	100.0			8.22	0.99	n.a.	n.a.	0.96	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.150	8.580	0.276	2697.8	2201.7	6.569	3.810	3.21		Clay	100.0			8.11	0.99	n.a.	n.a.	0.96	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.310	8.100	0.281	2717.8	2211.7	6.096	4.167	3.25		Clay	100.0			7.66	0.99	n.a.	n.a.	0.96	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	8.710	0.301	2737.8	2221.7	6.609	4.096	3.22		Clay	100.0			8.23	0.99	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	10.030	0.331	2759.0	2232.3	7.750	3.830	3.15		Clay	100.0			9.48	0.99	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	10.760	0.391	2779.0	2242.4	8.358	4.168	3.14		Clay	100.0			10.17	0.98	n.a.	n.a.	0.96	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	12.790	0.487	2800.3	2253.0	10.111	4.277	3.08		Clay	100.0			12.09	0.98	n.a.	n.a.	0.95	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	13.980	0.522	2820.3	2263.0	11.109	4.153	3.04		Clay	100.0			13.21	0.98	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	14.360	0.547	2840.3	2273.0	11.386	4.225	3.04		Clay	100.0			13.57	0.98	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	15.310	0.632	2861.5	2283.7	12.155	4.553	3.04		Clay	100.0			14.47	0.98	n.a.	n.a.	0.95	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	17.110	0.593	2881.5	2293.7	13.663	3.783	2.95		Clay	98.7			16.17	0.98	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	16.910	0.583	2902.8	2304.3	13.417	3.772	2.95		Clay	99.2			15.98	0.98	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	16.560	0.572	2922.8	2314.4	13.048	3.790	2.96		Clay	100.0			15.65	0.98	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	16.230	0.530	2942.8	2324.4	12.699	3.588	2.96		Clay	99.6			15.34	0.98	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	15.530	0.459	2964.0	2335.0	12.033	3.265	2.95		Clay	99.2			14.68	0.97	n.a.	n.a.	0.95	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	15.110	0.438	2984.0	2345.0	11.614	3.219	2.96		Clay	99.9			14.28	0.97	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	14.430	0.432	3005.3	2355.7	10.976	3.343	2.99		Clay	100.0			13.64	0.97	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	13.630	0.438	3025.3	2365.7	10.244	3.611	3.03		Clay	100.0			12.88	0.97	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	12.230	0.440	3045.3	2375.7	9.014	4.113	3.11		Clay	100.0			11.56	0.97	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	10.860	0.389	3066.5	2386.3	7.817	4.173	3.17		Clay	100.0			10.26	0.97	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	12.540	0.429	3086.5	2396.4	9.178	3.897	3.09		Clay	100.0			11.85	0.97	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	17.570	0.518	3107.8	2407.0	13.308	3.232	2.91		Clay	96.2			16.61	0.97	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	18.320	0.600	3127.8	2417.0	13.865	3.583	2.93		Clay	97.2			17.32	0.97	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	20.690	0.612	3147.8	2427.0	15.753	3.199	2.85		Clay	91.3			19.56	0.96	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	22.490	0.655	3169.0	2437.7	17.152	3.132	2.82		Clay	88.5			21.26	0.96	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	22.710	0.656	3189.0	2447.7	17.253	3.105	2.81		Clay	88.1			21.47	0.96	n.a.	n.a.	0.95	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	22.550	0.693	3210.3	2458.3	17.040	3.309	2.84		Clay	89.8			21.31	0.96	n.a.	n.a.	0.94	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	21.690	0.705	3230.3	2468.3	16.266	3.510	2.87		Clay	92.3			20.50	0.96	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	22.920	0.729	3250.3	2478.4	17.185	3.422	2.84		Clay	90.3			21.66	0.96	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	24.050	0.770	3271.5	2489.0	18.011	3.434	2.83		Clay	89.1			22.73	0.96	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	23.670	0.788	3291.5	2499.0	17.626	3.579	2.84		Clay	90.6			22.37	0.96	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	20.250	0.777	3312.8	2509.7	14.818	4.178	2.95		Clay	98.6			19.14	0.96	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	17.510	0.693	3332.8	2519.7	12.576	4.371	3.01		Clay	100.0			16.55	0.95	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	16.070	0.649	3354.0	2530.3	11.376	4.511	3.06		Clay	100.0			15.19	0.95	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	17.220	0.617	3374.0	2540.3	12.229	3.975	3.00		Clay	100.0			16.28	0.95	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	15.290	0.602	3394.0	2550.4	10.660	4.428	3.07		Clay	100.0			14.45	0.95	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	17.390	0.567	3415.3	2561.0	12.247	3.616	2.97		Clay	100.0			16.44	0.95	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	17.420	0.596	3435.3	2571.0	12.215	3.798	2.99		Clay	100.0			16.47	0.95	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	16.330	0.477	3456.5	2581.7	11.312	3.267	2.97		Clay	100.0			15.43	0.95	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	15.150	0.487	3476.5	2591.7	10.350	3.628	3.03		Clay	100.0			14.32	0.95	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	16.320	0.568	3496.5	2601.7	11.202	3.897	3.02		Clay	100.0			15.43	0.95	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	18.100	0.590	3517.8	2612.3	12.511	3.609	2.96		Clay	100.0			17.11	0.95	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	17.860	0.555	3537.8	2622.3	12.272	3.448	2.96		Clay	99.8			16.88	0.94	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	17.540	0.553	3559.0	2633.0	11.972	3.506	2.97		Clay	100.0			16.58	0.94	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	17.000	0.578	3579.0	2643.0	11.510	3.798	3.01		Clay	100.0			16.07	0.94	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	17.600	0.600	3599.0	2653.0	11.911	3.794	2.99		Clay	100.0			16.64	0.94	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	17.530	0.618	3620.3	2663.7	11.803	3.931	3.01		Clay	100.0			16.57	0.94	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	17.070	0.567	3640.3	2673.7	11.407	3.716	3.00		Clay	100.0			16.13	0.94	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	16.440	0.551	3661.5	2684.3	10.885	3.770	3.02		Clay	100.0			15.54	0.94	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	15.990	0.588	3681.5	2694.3	10.503	4.156	3.06		Clay	100.0			15.11	0.94	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	13.070	0.542	3701.5	2704.3	8.297	4.835	3.18		Clay	100.0			12.35	0.94	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	11.690	0.474	3722.8	2715.0	7.240	4.819	3.23		Clay	100.0			11.05	0.94	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	11.530	0.400	3742.8	2725.0	7.089	4.140	3.20		Clay	100.0			10.90	0.94	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	10.620	0.347	3764.0	2735.6	6.388	3.970	3.23		Clay	100.0			10.04	0.93	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	10.540	0.316	3784.0	2745.7	6.299	3.653	3.21		Clay	100.0			9.96	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	10.600	0.317	3804.0	2755.7	6.313	3.645	3.21		Clay	100.0			10.02	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	10.790	0.314	3825.3	2766.3	6.418	3.539	3.20		Clay	100.0			10.20	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	10.520	0.303	3845.3	2776.3	6.193	3.521	3.21		Clay	100.0			9.94	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	10.900	0.312	3866.5	2787.0	6.435	3.484	3.19		Clay	100.0			10.30	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	11.190	0.353	3886.5	2797.0	6.612	3.821	3.20		Clay	100.0			10.58	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.820	11.350	0.435	3906.5	2807.0	6.695	4.634	3.25		Clay	100.0			10.73	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	2

PGA (A_{max})	0.75

Total Settlement:	1.31	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
31.990	14.050	0.745	3927.8	2817.7	8.579	6.162	3.24		Clay	100.0			13.28	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	26.230	1.233	3947.8	2827.7	17.156	5.084	2.95		Clay	99.1			24.79	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	47.410	1.819	3969.0	2838.3	32.009	4.004	2.68		Clay	77.4			44.81	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	69.160	1.982	3989.0	2848.3	54.717	2.950	2.42		Sand	56.6			65.37	0.87	57.10	120.74	0.92	0.764	0.963	0.173	0.232	0.30	0.03	0.05
32.640	38.760	1.730	4009.0	2858.3	25.718	4.707	2.80		Clay	86.8			36.64	0.92	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	29.190	1.203	4030.3	2869.0	18.944	4.425	2.88		Clay	93.3			27.59	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	29.690	1.168	4050.3	2879.0	19.218	4.223	2.86		Clay	91.9			28.06	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	28.000	1.033	4071.5	2889.6	17.971	3.978	2.87		Clay	92.4			26.47	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.300	25.490	0.933	4091.5	2899.7	16.170	3.978	2.90		Clay	95.2			24.09	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	25.470	0.847	4111.5	2909.7	16.094	3.618	2.88		Clay	93.3			24.07	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	31.750	0.969	4132.8	2920.3	20.329	3.265	2.77		Clay	84.7			30.01	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	38.220	1.212	4152.8	2930.3	24.669	3.354	2.71		Clay	80.1			36.12	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	41.450	1.332	4174.0	2941.0	26.769	3.383	2.69		Clay	78.1			39.18	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	38.720	1.381	4194.0	2951.0	24.821	3.770	2.74		Clay	82.6			36.60	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	36.090	1.403	4214.0	2961.0	22.954	4.129	2.80		Clay	86.7			34.11	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	32.310	1.328	4235.3	2971.7	20.320	4.397	2.85		Clay	91.3			30.54	0.91	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	31.190	1.259	4255.3	2981.7	19.494	4.332	2.86		Clay	92.1			29.48	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	31.130	1.048	4276.5	2992.3	19.378	3.614	2.82		Clay	88.2			29.42	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	31.130	1.010	4296.5	3002.3	19.306	3.486	2.81		Clay	87.5			29.42	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	30.620	0.948	4316.5	3012.3	18.897	3.329	2.80		Clay	87.1			28.94	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	32.210	1.069	4337.8	3023.0	19.875	3.560	2.80		Clay	87.2			30.44	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	32.700	1.277	4357.8	3033.0	20.126	4.185	2.84		Clay	90.5			30.91	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	31.680	1.345	4379.0	3043.6	19.378	4.561	2.88		Clay	93.4			29.94	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.760	31.360	1.220	4399.0	3053.7	19.099	4.185	2.86		Clay	91.9			29.64	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.930	26.750	1.193	4420.3	3064.3	16.017	4.859	2.96		Clay	99.9			25.28	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	22.130	1.067	4440.3	3074.3	12.952	5.361	3.06		Clay	100.0			20.92	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.250	20.060	0.981	4460.3	3084.3	11.562	5.501	3.10		Clay	100.0			18.96	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.420	19.440	0.883	4481.5	3095.0	11.114	5.132	3.10		Clay	100.0			18.37	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.580	19.340	0.850	4501.5	3105.0	11.008	4.972	3.09		Clay	100.0			18.28	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.750	18.710	0.806	4522.8	3115.6	10.559	4.903	3.10		Clay	100.0			17.68	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.910	19.280	0.786	4542.8	3125.6	10.883	4.621	3.08		Clay	100.0			18.22	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.070	18.340	0.833	4562.8	3135.7	10.243	5.186	3.13		Clay	100.0			17.33	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.240	18.680	0.842	4584.0	3146.3	10.417	5.138	3.12		Clay	100.0			17.66	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.400	17.900	0.825	4604.0	3156.3	9.884	5.287	3.15		Clay	100.0			16.92	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.570	19.590	0.891	4625.3	3167.0	10.911	5.159	3.11		Clay	100.0			18.52	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.730	28.330	0.910	4645.3	3177.0	16.372	3.498	2.86		Clay	92.1			26.78	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.890	23.670	0.938	4665.3	3187.0	13.390	4.396	2.99		Clay	100.0			22.37	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.060	16.900	0.777	4686.5	3197.6	9.105	5.334	3.18		Clay	100.0			15.97	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.220	15.270	1.028	4706.5	3207.7	8.054	7.961	3.33		Clay	100.0			14.43	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.390	29.120	0.808	4727.8	3218.3	16.628	3.020	2.82		Clay	88.6			27.52	0.90	n.a.	n.a.	0.90	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.550	34.650	0.478	4747.8	3228.3	24.698	1.482	2.50		Sand	63.0			32.75	0.80	26.08	82.84	0.90	0.765	0.961	0.118	0.135	0.18	0.04	0.07
38.710	24.860	0.384	4767.8	3238.3	13.881	1.706	2.74		Clay	82.5			23.50	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	15.330	0.488	4789.0	3249.0	7.963	3.769	3.13		Clay	100.0			14.49	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	14.880	0.970	4809.0	3259.0	7.656	7.773	3.34		Clay	100.0			14.06	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	31.750	1.276	4830.3	3269.6	17.944	4.348	2.89		Clay	94.4			30.01	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	44.270	1.579	4850.3	3279.6	25.518	3.772	2.74		Clay	81.9			41.84	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	45.520	1.621	4870.3	3289.7	26.194	3.762	2.73		Clay	81.1			43.02	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.700	49.990	2.013	4891.5	3300.3	28.812	4.235	2.73		Clay	81.4			47.25	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.860	44.420	2.190	4911.5	3310.3	25.354	5.218	2.83		Clay	89.6			41.98	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.030	67.980	1.975	4932.8	3321.0	49.428	3.015	2.46		Sand	59.6	85.77	1.8	154.39	0.87	134.71	221.05	0.90	0.765	0.865	7.738	14.722	19.25	0.00	0.00
40.190	90.740	1.571	4952.8	3331.0	66.492	1.780	2.21		Sand	39.6		1.8	154.38	0.86	133.52	207.34	0.90	0.765	0.870	2.933	5.612	7.34	0.00	0.00
40.350	81.270	1.806	4972.8	3341.0	59.261	2.292	2.32		Sand	48.5	85.77	1.8	154.39	0.87	133.97	214.57	0.90	0.765	0.863	4.767	9.050	11.84	0.00	0.00
40.520	58.150	1.895	4994.0	3351.6	33.209	3.404	2.62		Clay	72.6			54.96	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.680	42.650	1.891	5014.0	3361.6	23.883	4.711	2.82		Clay	88.7			40.31	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.850	48.510	1.555	5035.3	3372.3	27.277	3.381	2.68		Clay	77.6			45.85	0.88	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	51.420	1.687	5055.3	3382.3	28.911	3.450	2.67		Clay	76.6			48.60	0.88	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	35.580	1.507	5075.3	3392.3	19.481	4.561	2.88		Clay	93.3			33.63	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	30.610	1.484	5096.5	3403.0	16.493	5.290	2.98		Clay	100.0			28.93	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	29.340	1.244	5116.5	3413.0	15.694	4.643	2.96		Clay	99.4			27.73	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	30.510	1.245	5137.8	3423.6	16.323	4.457	2.93		Clay	97.4			28.84	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	25.910	1.147	5157.8	3433.6	13.590	4.917	3.02		Clay	100.0			24.49	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	21.100	0.917	5177.8	3443.7	10.751	4.956	3.10		Clay	100.0			19.94	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	18.640	0.740	5199.0	3454.3	9.287	4.611	3.13		Clay	100.0			17.62	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.320	16.450	0.640	5219.0	3464.3	7.990	4.623	3.19		Clay	100.0			15.55	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	2

PGA (A_{max})	0.75

Total Settlement:	1.31	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
42.490	14.570	0.626	5240.3	3475.0	6.878	5.234	3.27		Clay	100.0			13.77	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	13.530	0.619	5260.3	3485.0	6.255	5.678	3.32		Clay	100.0			12.79	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	13.020	0.521	5280.3	3495.0	5.940	5.017	3.31		Clay	100.0			12.31	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	12.520	0.460	5301.5	3505.6	5.631	4.658	3.31		Clay	100.0			11.83	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	12.950	0.443	5321.5	3515.6	5.853	4.308	3.28		Clay	100.0			12.24	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	12.780	0.434	5342.8	3526.3	5.733	4.293	3.28		Clay	100.0			12.08	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.470	12.010	0.402	5362.8	3536.3	5.276	4.309	3.31		Clay	100.0			11.35	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	11.930	0.404	5384.0	3546.9	5.209	4.368	3.32		Clay	100.0			11.28	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	12.080	0.435	5404.0	3557.0	5.273	4.636	3.33		Clay	100.0			11.42	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	12.680	0.431	5424.0	3567.0	5.589	4.328	3.30		Clay	100.0			11.98	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	12.710	0.488	5445.3	3577.6	5.583	4.888	3.33		Clay	100.0			12.01	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.290	15.000	0.461	5465.3	3587.6	6.839	3.761	3.19		Clay	100.0			14.18	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	14.630	0.496	5486.5	3598.3	6.607	4.169	3.23		Clay	100.0			13.83	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.620	14.800	0.894	5506.5	3608.3	6.677	7.419	3.37		Clay	100.0			13.99	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.780	43.130	1.099	5526.5	3618.3	22.313	2.723	2.69		Clay	78.3			40.77	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	148.520	1.035	5547.8	3629.0	105.191	0.710	1.80		Sand	7.1	186.17	1.72	320.21	0.87	277.74	280.53	0.88	0.760	0.838	10891.485	########	26416.27	0.00	0.00
45.110	196.970	1.535	5567.8	3639.0	139.959	0.790	1.73		Sand	1.6		1.72	320.22	0.87	277.54	277.54	0.88	0.760	0.837	6534.238	########	15836.60	0.00	0.00
45.280	191.730	2.978	5589.0	3649.6	135.976	1.576	1.95		Sand	18.9	186.17	1.72	320.21	0.87	277.32	333.55	0.88	0.760	0.836	#########	########	##########	0.00	0.00
45.440	148.830	4.193	5609.0	3659.6	104.950	2.872	2.22		Sand	40.4	186.17	1.72	320.21	0.87	277.12	386.40	0.88	0.760	0.836	#########	########	##########	0.00	0.00
45.600	115.570	5.318	5629.0	3669.6	80.928	4.716	2.45		Sand	59.4	186.17	1.72	320.21	0.86	276.92	402.91	0.88	0.759	0.835	#########	########	##########	0.00	0.00
45.770	85.440	3.727	5650.3	3680.3	44.896	4.511	2.61		Clay	71.9			80.76	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.930	43.830	2.451	5670.3	3690.3	22.218	5.978	2.91		Clay	96.2			41.43	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.100	30.440	1.874	5691.5	3700.9	14.912	6.790	3.08		Clay	100.0			28.77	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.260	30.870	1.535	5711.5	3711.0	15.098	5.479	3.01		Clay	100.0			29.18	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.420	29.340	1.507	5731.5	3721.0	14.230	5.694	3.04		Clay	100.0			27.73	0.86	n.a.	n.a.	0.88	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.590	27.790	1.352	5752.8	3731.6	13.353	5.425	3.05		Clay	100.0			26.27	0.86	n.a.	n.a.	0.88	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.750	27.860	1.388	5772.8	3741.6	13.349	5.556	3.06		Clay	100.0			26.33	0.86	n.a.	n.a.	0.87	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.920	26.320	1.285	5794.0	3752.3	12.485	5.488	3.08		Clay	100.0			24.88	0.86	n.a.	n.a.	0.87	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.080	23.830	1.098	5814.0	3762.3	11.122	5.247	3.10		Clay	100.0			22.52	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	22.910	0.958	5834.0	3772.3	10.600	4.793	3.10		Clay	100.0			21.65	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	23.760	1.034	5855.3	3782.9	11.014	4.964	3.09		Clay	100.0			22.46	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	25.960	1.123	5875.3	3793.0	12.140	4.876	3.05		Clay	100.0			24.54	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	27.620	1.264	5896.5	3803.6	12.973	5.124	3.05		Clay	100.0			26.11	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.900	30.690	1.529	5916.5	3813.6	14.544	5.515	3.03		Clay	100.0			29.01	0.86	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.060	32.430	1.626	5936.5	3823.6	15.410	5.519	3.01		Clay	100.0			30.65	0.86	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.230	32.350	1.553	5957.8	3834.3	15.320	5.289	3.00		Clay	100.0			30.58	0.85	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.390	31.990	1.420	5977.8	3844.3	15.088	4.895	2.98		Clay	100.0			30.24	0.85	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.560	30.600	1.249	5999.0	3854.9	14.320	4.526	2.98		Clay	100.0			28.92	0.85	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	27.210	1.164	6019.0	3865.0	12.523	4.810	3.04		Clay	100.0			25.72	0.85	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	24.880	1.036	6039.0	3875.0	11.283	4.740	3.07		Clay	100.0			23.52	0.85	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	22.970	0.956	6060.3	3885.6	10.263	4.796	3.11		Clay	100.0			21.71	0.85	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	21.140	0.884	6080.3	3895.6	9.292	4.885	3.15		Clay	100.0			19.98	0.85	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	19.240	0.790	6101.5	3906.3	8.289	4.877	3.19		Clay	100.0			18.19	0.85	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	17.090	0.676	6121.5	3916.3	7.165	4.818	3.23		Clay	100.0			16.15	0.85	n.a.	n.a.	0.86	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	15.330	0.611	6141.5	3926.3	6.245	4.983	3.29		Clay	100.0			14.49	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	16.430	0.633	6162.8	3936.9	6.781	4.740	3.25		Clay	100.0			15.53	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	18.100	0.574	6182.8	3947.0	7.605	3.827	3.15		Clay	100.0			17.11	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.200	16.230	0.551	6204.0	3957.6	6.634	4.197	3.23		Clay	100.0			15.34	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	3

PGA (A_{max})	0.75

Total Settlement:	0.84	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160	0.020	0.082	19.2	19.2	1.083	792.308	5.36		Unsaturated	100.0			0.02	1.70	0.03	53.98	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	1.690	0.025	39.6	39.6	25.572	1.497	2.49		Unsaturated	62.2			1.60	1.70	2.72	52.67	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	0.940	0.361	58.8	58.8	30.973	39.655	3.44		Unsaturated	100.0			0.89	1.70	1.51	55.91	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	29.270	0.904	79.2	79.2	142.805	3.094	2.16		Unsaturated	35.6			27.67	1.70	47.03	97.13	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	77.090	1.294	98.4	98.4	337.672	1.680	1.72		Unsaturated	1.0			72.86	1.70	123.87	123.87	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	40.270	1.418	117.6	117.6	161.219	3.526	2.17		Unsaturated	36.8			38.06	1.70	64.71	119.78	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	20.450	1.212	138.0	138.0	75.432	5.947	2.55		Unsaturated	67.2			19.33	1.70	32.86	92.48	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	14.450	1.174	157.2	157.2	83.822	8.166	2.63		Unsaturated	73.7			13.66	1.70	23.22	81.24	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	15.370	0.962	177.6	177.6	81.832	6.293	2.55		Unsaturated	67.0			14.53	1.70	24.70	81.92	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	12.880	0.942	196.8	196.8	63.701	7.368	2.67		Unsaturated	76.6			12.17	1.70	20.70	78.43	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	12.590	0.972	216.0	216.0	58.283	7.786	2.71		Unsaturated	80.1			11.90	1.70	20.23	78.31	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	13.290	1.077	236.4	236.4	57.739	8.173	2.73		Unsaturated	81.6			12.56	1.70	21.35	79.98	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	12.850	1.128	255.6	255.6	99.548	8.869	2.62		Unsaturated	72.6			12.15	1.70	20.65	77.74	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	12.410	1.116	276.0	276.0	88.928	9.096	2.66		Unsaturated	75.6			11.73	1.70	19.94	77.29	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	12.750	1.098	295.2	295.2	85.382	8.711	2.65		Unsaturated	75.2			12.05	1.70	20.49	77.94	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	13.870	1.122	314.4	314.4	87.232	8.182	2.62		Unsaturated	73.0			13.11	1.70	22.29	79.91	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	14.710	1.228	334.8	334.8	86.873	8.444	2.64		Unsaturated	73.9			13.90	1.70	23.64	81.82	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	13.660	1.347	354.0	354.0	76.175	9.989	2.73		Unsaturated	81.3			12.91	1.70	21.95	80.72	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	12.310	1.299	374.4	374.4	64.759	10.718	2.80		Unsaturated	86.6			11.64	1.70	19.78	78.54	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	11.760	1.160	393.6	393.6	58.756	10.028	2.80		Unsaturated	86.8			11.12	1.70	18.90	77.41	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	11.800	1.046	412.8	412.8	56.171	9.026	2.77		Unsaturated	84.9			11.15	1.70	18.96	77.27	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	11.290	1.033	433.2	433.2	51.124	9.327	2.81		Unsaturated	87.8			10.67	1.70	18.14	76.54	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	10.930	1.044	452.4	452.4	47.320	9.750	2.85		Unsaturated	90.7			10.33	1.70	17.56	76.09	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	11.540	1.030	472.8	472.8	47.816	9.109	2.82		Unsaturated	88.6			10.91	1.70	18.54	77.15	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	11.950	1.038	492.0	492.0	47.577	8.871	2.81		Unsaturated	88.0			11.29	1.70	19.20	77.95	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	11.190	0.870	512.4	512.4	42.677	7.953	2.81		Unsaturated	87.6			10.58	1.70	17.98	76.31	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	10.750	0.800	531.6	531.6	39.444	7.632	2.82		Unsaturated	88.3			10.16	1.70	17.27	75.46	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	11.400	0.852	550.8	550.8	40.394	7.658	2.81		Unsaturated	87.9			10.78	1.70	18.32	76.78	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	12.490	0.909	571.2	571.2	42.732	7.451	2.79		Unsaturated	85.9			11.81	1.70	20.07	78.83	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	13.010	0.957	590.4	590.4	43.072	7.525	2.79		Unsaturated	85.9			12.30	1.70	20.90	79.93	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	13.430	0.967	610.8	610.8	42.975	7.369	2.78		Unsaturated	85.4			12.69	1.70	21.58	80.75	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	13.860	0.990	630.0	630.0	43.000	7.310	2.78		Unsaturated	85.2			13.10	1.70	22.27	81.62	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	13.930	1.019	649.2	649.2	41.914	7.491	2.79		Unsaturated	86.4			13.17	1.70	22.38	81.92	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	14.300	1.061	669.6	669.6	41.712	7.595	2.80		Unsaturated	86.9			13.52	1.70	22.98	82.75	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	14.940	1.056	688.8	688.8	42.380	7.233	2.78		Unsaturated	85.3			14.12	1.70	24.01	83.89	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	15.180	1.093	709.2	709.2	41.809	7.372	2.79		Unsaturated	86.1			14.35	1.70	24.39	84.49	1.00	0.485	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	15.650	1.087	728.4	728.4	41.971	7.111	2.78		Clay	85.1			14.79	1.32	n.a.	n.a.	1.00	0.488	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.230	16.020	1.130	747.6	747.6	41.857	7.224	2.78		Clay	85.5			15.14	1.32	n.a.	n.a.	1.00	0.495	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.400	16.220	1.164	768.0	768.0	41.240	7.352	2.79		Clay	86.3			15.33	1.31	n.a.	n.a.	0.99	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.560	17.150	1.165	787.2	787.2	42.572	6.950	2.76		Clay	84.1			16.21	1.30	n.a.	n.a.	0.99	0.507	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.730	17.940	1.199	807.6	807.6	43.428	6.837	2.75		Clay	83.2			16.96	1.29	n.a.	n.a.	0.99	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.890	19.880	1.275	826.8	826.8	47.089	6.550	2.72		Clay	80.3			18.79	1.28	n.a.	n.a.	0.99	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.050	21.140	1.362	846.0	846.0	48.976	6.572	2.71		Clay	79.5			19.98	1.27	n.a.	n.a.	0.99	0.525	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.220	22.900	1.459	866.4	866.4	51.862	6.492	2.69		Clay	77.8			21.64	1.27	n.a.	n.a.	0.99	0.531	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.380	27.180	1.684	885.6	885.6	60.382	6.298	2.63		Clay	73.6			25.69	1.26	n.a.	n.a.	0.99	0.536	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.550	39.490	2.273	906.0	906.0	66.813	5.823	2.58		Mixed	69.3	37.79		37.79	1.47	55.48	122.10	0.99	0.541	1.100	0.176	0.272	0.50	0.03	0.05
7.710	39.980	2.694	925.2	925.2	66.650	6.816	2.63		Mixed	73.6			37.79	1.45	54.94	122.28	0.99	0.546	1.100	0.176	0.272	0.50	0.03	0.05
7.870	38.240	2.529	944.4	944.4	62.790	6.697	2.64		Mixed	74.4	37.79		37.79	1.44	54.47	121.83	0.99	0.551	1.100	0.175	0.270	0.49	0.03	0.05
8.040	37.020	2.688	964.8	964.8	75.741	7.356	2.62		Clay	72.9			34.99	1.23	n.a.	n.a.	0.99	0.556	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.200	39.350	2.668	984.0	984.0	62.771	6.867	2.65		Mixed	75.1			37.19	1.42	52.78	119.77	0.99	0.561	1.095	0.171	0.259	0.46	0.03	0.05
8.370	35.690	2.476	1004.4	1004.4	70.067	7.036	2.63		Clay	73.3			33.73	1.22	n.a.	n.a.	0.99	0.565	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.530	32.930	2.202	1023.6	1023.6	63.342	6.791	2.64		Clay	74.6			31.12	1.21	n.a.	n.a.	0.99	0.570	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.690	33.060	2.026	1042.8	1042.8	62.406	6.227	2.62		Clay	72.6			31.25	1.21	n.a.	n.a.	0.99	0.574	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.860	45.110	2.140	1063.2	1063.2	59.441	4.801	2.55		Sand	66.8			42.64	1.36	58.02	124.82	0.99	0.578	1.089	0.183	0.283	0.49	0.03	0.05
9.020	32.120	2.045	1082.4	1082.4	58.350	6.476	2.65		Clay	75.1			30.36	1.19	n.a.	n.a.	0.99	0.582	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.190	24.680	1.746	1102.8	1102.8	43.759	7.237	2.77		Clay	84.6			23.33	1.19	n.a.	n.a.	0.99	0.587	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.350	20.620	1.417	1122.0	1122.0	35.756	7.066	2.82		Clay	88.6			19.49	1.18	n.a.	n.a.	0.99	0.591	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.510	17.940	1.225	1141.2	1141.2	30.441	7.053	2.87		Clay	92.4			16.96	1.18	n.a.	n.a.	0.99	0.594	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.680	17.060	1.092	1161.6	1161.6	28.373	6.624	2.87		Clay	92.6			16.12	1.17	n.a.	n.a.	0.99	0.598	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.840	32.490	1.209	1180.8	1180.8	40.362	3.789	2.59		Sand	70.2			30.71	1.33	40.88	103.45	0.99	0.602	1.064	0.142	0.193	0.32	0.03	0.06
10.010	31.520	1.259	1201.2	1201.2	43.439	4.070	2.59		Mixed	70.1	30.71		30.71	1.32	40.56	103.03	0.99	0.606	1.062	0.141	0.192	0.32	0.03	0.06
10.170	22.440	1.393	1220.4	1220.4	35.775	6.383	2.79		Clay	86.0			21.21	1.16	n.a.	n.a.	0.99	0.609	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.330	17.630	1.315	1239.6	1239.6	27.445	7.733	2.93		Clay	97.2			16.66	1.15	n.a.	n.a.	0.99	0.612	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.500	17.370	1.174	1260.0	1260.0	26.571	7.016	2.91		Clay	95.6			16.42	1.15	n.a.	n.a.	0.99	0.616	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.660	17.040	1.042	1279.2	1279.2	25.642	6.356	2.89		Clay	94.0			16.11	1.14	n.a.	n.a.	0.99	0.619	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	3

PGA (A_{max})	0.75

Total Settlement:	0.84	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
10.830	40.870	0.901	1299.6	1299.6	48.508	2.240	2.38		Sand	53.1	48.73	1.5	73.10	1.21	88.33	159.19	0.99	0.622	1.085	0.363	0.702	1.13	0.01	0.01
10.990	51.560	1.556	1318.8	1318.8	60.940	3.057	2.40		Sand	54.8		1.5	73.10	1.20	87.84	159.25	0.99	0.625	1.082	0.364	0.701	1.12	0.01	0.01
11.150	37.690	1.206	1338.0	1338.0	44.004	3.258	2.52		Sand	64.4		1.5	53.44	1.22	65.13	133.37	0.99	0.628	1.064	0.208	0.332	0.53	0.02	0.05
11.320	62.100	1.519	1358.4	1358.4	72.456	2.474	2.28		Sand	45.3		1.5	88.04	1.18	103.53	174.27	0.98	0.631	1.089	0.584	1.270	2.01	0.00	0.00
11.480	207.700	1.329	1377.6	1377.6	242.496	0.642	1.49		Sand	0.0		1.5	294.47	1.12	329.77	329.77	0.98	0.634	1.100	#########	########	#########	0.00	0.00
11.650	191.770	0.642	1398.0	1398.0	222.184	0.336	1.35		Sand	0.0	196.31	1.5	294.47	1.12	328.49	328.49	0.98	0.637	1.100	#########	########	#########	0.00	0.00
11.810	134.200	0.505	1417.2	1417.2	154.174	0.378	1.51		Sand	0.0	196.31	1.5	294.47	1.11	327.31	327.31	0.98	0.640	1.100	#########	########	#########	0.00	0.00
11.980	89.060	0.757	1437.6	1437.6	101.302	0.857	1.86		Sand	12.1	196.31	1.5	294.47	1.11	326.08	351.54	0.98	0.643	1.100	#########	########	#########	0.00	0.00
12.140	47.070	1.184	1456.8	1456.8	52.789	2.555	2.39		Sand	54.0	196.31	1.5	294.47	1.10	324.94	460.49	0.98	0.645	1.100	#########	########	#########	0.00	0.00
12.300	23.020	1.197	1476.0	1476.0	30.192	5.373	2.79		Clay	85.9			21.76	1.10	n.a.	n.a.	0.98	0.648	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.470	12.640	1.028	1496.4	1496.4	15.894	8.645	3.13		Clay	100.0			11.95	1.10	n.a.	n.a.	0.98	0.651	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.630	25.460	0.976	1515.6	1515.6	32.597	3.950	2.67		Clay	76.6			24.06	1.09	n.a.	n.a.	0.98	0.653	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.800	100.740	0.552	1536.0	1536.0	110.906	0.552	1.72		Sand	0.5		1.78	169.49	1.12	189.24	189.24	0.98	0.656	1.075	1.085	2.565	3.91	0.00	0.00
12.960	99.190	0.259	1555.2	1555.2	108.500	0.263	1.57		Sand	0.0	95.22	1.78	169.49	1.11	188.50	188.50	0.98	0.658	1.071	1.048	2.469	3.75	0.00	0.00
13.120	59.420	0.372	1574.4	1574.4	64.247	0.634	1.95		Sand	19.1	95.22	1.78	169.49	1.09	184.74	230.22	0.98	0.660	1.089	16.745	40.107	60.75	0.00	0.00
13.290	27.840	0.632	1594.8	1594.8	29.442	2.336	2.55		Sand	67.4	95.22	1.78	169.49	1.08	182.62	285.54	0.98	0.663	1.085	26752.816	########	96361.03	0.00	0.00
13.450	14.700	0.519	1614.0	1614.0	17.216	3.734	2.86		Clay	92.1			13.89	1.07	n.a.	n.a.	0.98	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	7.750	0.426	1634.4	1634.4	8.484	6.139	3.24		Clay	100.0			7.33	1.07	n.a.	n.a.	0.98	0.667	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.780	9.270	0.361	1653.6	1653.6	10.212	4.270	3.08		Clay	100.0			8.76	1.07	n.a.	n.a.	0.98	0.669	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	10.720	0.464	1672.8	1672.8	11.817	4.690	3.05		Clay	100.0			10.13	1.06	n.a.	n.a.	0.98	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	11.200	0.496	1693.2	1693.2	12.229	4.789	3.05		Clay	100.0			10.59	1.06	n.a.	n.a.	0.98	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	11.570	0.512	1712.8	1708.4	12.542	4.783	3.04		Clay	100.0			10.94	1.06	n.a.	n.a.	0.98	0.675	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.440	11.290	0.496	1734.0	1719.0	12.127	4.755	3.05		Clay	100.0			10.67	1.06	n.a.	n.a.	0.98	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	11.060	0.394	1754.0	1729.0	11.779	3.869	3.00		Clay	100.0			10.45	1.05	n.a.	n.a.	0.98	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	12.160	0.452	1774.0	1739.1	12.965	4.006	2.98		Clay	100.0			11.49	1.05	n.a.	n.a.	0.98	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	12.400	0.450	1795.3	1749.7	13.148	3.916	2.97		Clay	100.0			11.72	1.05	n.a.	n.a.	0.98	0.683	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	11.740	0.417	1815.3	1759.7	12.312	3.848	2.99		Clay	100.0			11.10	1.05	n.a.	n.a.	0.98	0.685	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	11.410	0.385	1836.5	1770.4	11.853	3.673	2.99		Clay	100.0			10.78	1.05	n.a.	n.a.	0.98	0.687	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	11.360	0.384	1856.5	1780.4	11.719	3.681	2.99		Clay	100.0			10.74	1.05	n.a.	n.a.	0.97	0.689	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	13.170	0.526	1876.5	1790.4	13.664	4.299	2.98		Clay	100.0			12.45	1.05	n.a.	n.a.	0.97	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	13.370	0.677	1897.8	1801.0	13.793	5.451	3.04		Clay	100.0			12.64	1.04	n.a.	n.a.	0.97	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	12.700	0.706	1917.8	1811.0	12.966	6.010	3.09		Clay	100.0			12.00	1.04	n.a.	n.a.	0.97	0.694	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	18.480	1.126	1939.0	1821.7	19.224	6.432	2.98		Clay	100.0			17.47	1.04	n.a.	n.a.	0.97	0.695	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	29.460	1.232	1959.0	1831.7	31.097	4.324	2.71		Clay	79.9			27.84	1.04	n.a.	n.a.	0.97	0.697	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	39.490	1.165	1979.0	1841.7	39.006	3.025	2.53		Sand	65.7	149.74	1.28	191.67	1.04	198.82	305.78	0.97	0.699	1.042	#########	########	5867646.48	0.00	0.00
16.570	58.380	0.660	2000.3	1852.4	57.965	1.149	2.13		Sand	33.7	149.74	1.28	191.67	1.04	198.52	280.25	0.97	0.700	1.040	10374.046	########	33900.51	0.00	0.00
16.730	74.370	0.438	2020.3	1862.4	73.909	0.597	1.89		Sand	13.9	149.74	1.28	191.67	1.04	199.07	225.59	0.97	0.702	1.038	11.192	25.565	36.44	0.00	0.00
16.900	85.860	0.451	2041.5	1873.0	85.231	0.532	1.81		Sand	7.5	149.74	1.28	191.67	1.04	199.44	202.58	0.97	0.703	1.033	2.193	4.984	7.09	0.00	0.00
17.060	99.230	0.486	2061.5	1883.0	98.390	0.495	1.74		Sand	2.0	149.74	1.28	191.67	1.04	199.20	199.20	0.97	0.705	1.030	1.807	4.096	5.81	0.00	0.00
17.220	114.690	0.667	2081.5	1893.1	113.568	0.586	1.73		Sand	1.1	149.74	1.28	191.67	1.04	198.86	198.86	0.97	0.706	1.029	1.773	4.014	5.69	0.00	0.00
17.390	138.610	0.813	2102.8	1903.7	137.076	0.591	1.66		Sand	0.0	149.74	1.28	191.67	1.04	198.50	198.50	0.97	0.707	1.027	1.739	3.929	5.55	0.00	0.00
17.550	158.420	0.671	2122.8	1913.7	156.396	0.426	1.53		Sand	0.0		1.28	191.66	1.03	198.16	198.16	0.97	0.709	1.026	1.706	3.851	5.43	0.00	0.00
17.720	148.800	0.811	2144.0	1924.4	146.417	0.549	1.62		Sand	0.0		1.28	180.02	1.03	186.08	186.08	0.97	0.710	1.021	0.939	2.104	2.96	0.00	0.00
17.880	137.390	0.692	2164.0	1934.4	134.749	0.508	1.63		Sand	0.0		1.28	166.22	1.03	171.82	171.82	0.97	0.711	1.018	0.536	1.068	1.50	0.00	0.00
18.040	99.570	0.515	2184.0	1944.4	97.100	0.523	1.75		Sand	3.4		1.28	120.46	1.04	125.10	125.11	0.97	0.713	1.011	0.184	0.265	0.37	0.03	0.05
18.210	40.150	0.526	2205.3	1955.0	38.396	1.347	2.32		Sand	48.5		1.28	48.57	1.04	50.45	109.17	0.97	0.714	1.009	0.151	0.200	0.28	0.03	0.06
18.370	38.430	0.986	2225.3	1965.0	36.601	2.642	2.52		Sand	64.3		1.28	46.49	1.04	48.15	111.51	0.97	0.715	1.009	0.155	0.207	0.29	0.03	0.06
18.540	43.540	0.947	2246.5	1975.7	41.491	2.234	2.43		Sand	57.2		1.28	52.68	1.03	54.37	117.46	0.97	0.716	1.008	0.166	0.229	0.32	0.03	0.05
18.700	34.420	1.114	2266.5	1985.7	33.526	3.346	2.61		Clay	72.0			32.53	1.02	n.a.	n.a.	0.97	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.860	50.280	1.332	2286.5	1995.7	47.822	2.711	2.44		Sand	58.0		1.55	73.66	1.02	75.46	144.65	0.97	0.719	1.009	0.257	0.417	0.58	0.02	0.04
19.030	41.860	1.070	2307.8	2006.4	39.512	2.629	2.49		Sand	62.2		1.55	61.33	1.02	62.77	129.72	0.97	0.720	1.007	0.197	0.290	0.40	0.02	0.05
19.190	66.570	1.182	2327.8	2016.4	63.329	1.806	2.23		Sand	41.2		1.55	97.53	1.02	99.32	166.18	0.97	0.721	1.009	0.445	0.843	1.17	0.01	0.01
19.360	65.200	1.365	2349.0	2027.0	61.830	2.131	2.28		Sand	45.7		1.55	95.52	1.02	97.08	166.41	0.96	0.722	1.008	0.448	0.850	1.18	0.01	0.01
19.520	74.940	1.546	2369.0	2037.0	71.051	2.095	2.23		Sand	41.8		1.55	109.79	1.01	111.28	181.49	0.96	0.723	1.008	0.771	1.645	2.27	0.00	0.00
19.690	66.450	1.337	2390.3	2047.7	62.698	2.049	2.27		Sand	44.4	70.83	1.55	109.79	1.01	111.06	183.13	0.96	0.724	1.007	0.826	1.783	2.46	0.00	0.00
19.850	55.700	1.347	2410.3	2057.7	52.232	2.472	2.38		Sand	53.5	70.83	1.55	109.79	1.01	110.85	187.97	0.96	0.725	1.006	1.023	2.264	3.12	0.00	0.00
20.010	54.310	1.327	2430.3	2067.7	50.767	2.499	2.39		Sand	54.5	70.83	1.55	109.79	1.01	110.67	188.18	0.96	0.726	1.005	1.033	2.284	3.14	0.00	0.00
20.180	27.960	1.636	2451.5	2078.3	25.726	6.118	2.88		Clay	93.0			26.43	1.00	n.a.	n.a.	0.96	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	37.910	1.750	2471.5	2088.4	35.122	4.772	2.70		Clay	79.3			35.83	1.00	n.a.	n.a.	0.96	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.510	43.180	1.297	2492.8	2099.0	39.795	3.093	2.53		Sand	65.8	70.6	1.8	127.08	1.00	127.40	213.86	0.96	0.729	1.002	4.534	10.000	13.71	0.00	0.00
20.670	74.690	0.941	2512.8	2109.0	69.523	1.282	2.10		Sand	31.1		1.8	127.07	1.00	127.22	189.83	0.96	0.730	1.001	1.115	2.455	3.36	0.00	0.00
20.830	57.380	1.019	2532.8	2119.0	52.999	1.816	2.29		Sand	46.0	70.6	1.8	127.08	1.00	127.02	204.24	0.96	0.731	1.000	2.420	5.322	7.28	0.00	0.00
21.000	27.980	0.796	2554.0	2129.7	25.077	2.980	2.68		Clay	77.0			26.45	1.00	n.a.	n.a.	0.96	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	11.960	0.613	2574.0	2139.7	9.976	5.745	3.17		Clay	100.0			11.30	1.00	n.a.	n.a.	0.96	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	3

PGA (A_{max})	0.75

Total Settlement:	0.84	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
21.330	9.170	0.303	2595.3	2150.3	7.322	3.851	3.17		Clay	100.0			8.67	1.00	n.a.	n.a.	0.96	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.490	9.540	0.312	2615.3	2160.4	7.621	3.791	3.15		Clay	100.0			9.02	0.99	n.a.	n.a.	0.96	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.650	9.090	0.297	2635.3	2170.4	7.162	3.820	3.18		Clay	100.0			8.59	0.99	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.820	8.860	0.268	2656.5	2181.0	6.907	3.552	3.17		Clay	100.0			8.37	0.99	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.980	10.750	0.333	2676.5	2191.0	8.591	3.542	3.09		Clay	100.0			10.16	0.99	n.a.	n.a.	0.96	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.150	12.850	0.410	2697.8	2201.7	10.448	3.568	3.02		Clay	100.0			12.15	0.99	n.a.	n.a.	0.96	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.310	16.070	0.555	2717.8	2211.7	13.303	3.775	2.96		Clay	99.4			15.19	0.99	n.a.	n.a.	0.96	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	17.290	0.615	2737.8	2221.7	14.332	3.865	2.94		Clay	97.9			16.34	0.99	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	16.160	0.602	2759.0	2232.3	13.242	4.073	2.98		Clay	100.0			15.27	0.99	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	17.000	0.608	2779.0	2242.4	13.923	3.894	2.95		Clay	98.8			16.07	0.98	n.a.	n.a.	0.96	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	16.060	0.576	2800.3	2253.0	13.014	3.928	2.97		Clay	100.0			15.18	0.98	n.a.	n.a.	0.95	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	15.840	0.522	2820.3	2263.0	12.753	3.619	2.96		Clay	99.7			14.97	0.98	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	15.010	0.630	2840.3	2273.0	11.957	4.632	3.05		Clay	100.0			14.19	0.98	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	16.320	1.299	2861.5	2283.7	13.040	8.722	3.20		Clay	100.0			15.43	0.98	n.a.	n.a.	0.95	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	47.750	2.624	2881.5	2293.7	40.380	5.667	2.71		Clay	80.2			45.13	0.98	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	83.430	4.255	2902.8	2304.3	74.251	5.190	2.51		Sand	63.8	212.54		212.54	0.98	207.81	316.56	0.95	0.745	0.974	#########	########	##########	0.00	0.00
23.950	138.960	3.836	2922.8	2314.4	124.267	2.790	2.16		Sand	35.8	212.54		212.54	0.98	207.57	294.39	0.95	0.746	0.973	#########	########	429151.42	0.00	0.00
24.110	202.030	2.335	2942.8	2324.4	180.868	1.164	1.77		Sand	4.4	212.54		212.54	0.97	206.22	206.30	0.95	0.746	0.973	2.746	5.880	7.88	0.00	0.00
24.280	224.870	1.119	2964.0	2335.0	200.996	0.501	1.49		Sand	0.0			212.54	0.97	205.91	205.91	0.95	0.747	0.972	2.681	5.735	7.68	0.00	0.00
24.440	214.690	1.908	2984.0	2345.0	191.418	0.895	1.67		Sand	0.0			202.92	0.97	196.06	196.06	0.95	0.748	0.974	1.524	3.266	4.37	0.00	0.00
24.610	228.870	1.233	3005.3	2355.7	203.678	0.542	1.50		Sand	0.0			216.32	0.97	209.08	209.08	0.95	0.748	0.969	3.279	6.986	9.34	0.00	0.00
24.770	263.600	1.050	3025.3	2365.7	234.283	0.401	1.37		Sand	0.0			249.15	0.97	241.54	241.54	0.95	0.749	0.967	50.541	107.470	143.52	0.00	0.00
24.930	266.120	0.672	3045.3	2375.7	236.027	0.254	1.26		Sand	0.0			251.53	0.97	243.63	243.63	0.95	0.749	0.965	63.227	134.268	179.18	0.00	0.00
25.100	226.870	0.792	3066.5	2386.3	200.557	0.351	1.40		Sand	0.0			214.43	0.96	206.31	206.31	0.95	0.750	0.966	2.748	5.840	7.79	0.00	0.00
25.260	186.740	0.993	3086.5	2396.4	164.486	0.536	1.57		Sand	0.0			176.50	0.95	168.47	168.47	0.95	0.750	0.976	0.479	0.893	1.19	0.01	0.01
25.430	203.990	1.026	3107.8	2407.0	179.400	0.507	1.53		Sand	0.0			192.81	0.96	184.28	184.28	0.95	0.751	0.972	0.867	1.823	2.43	0.00	0.00
25.590	252.670	1.200	3127.8	2417.0	222.070	0.478	1.44		Sand	0.0			238.82	0.96	229.72	229.72	0.95	0.751	0.960	16.011	33.820	45.01	0.00	0.00
25.750	273.390	1.199	3147.8	2427.0	239.889	0.441	1.39		Sand	0.0			258.40	0.96	249.03	249.03	0.95	0.752	0.959	116.173	245.064	325.91	0.00	0.00
25.920	270.100	1.987	3169.0	2437.7	236.458	0.740	1.55		Sand	0.0			255.29	0.96	245.61	245.61	0.95	0.752	0.958	78.579	165.534	219.99	0.00	0.00
26.080	261.080	1.825	3189.0	2447.7	228.038	0.703	1.54		Sand	0.0			246.77	0.96	236.79	236.79	0.95	0.753	0.956	31.093	65.417	86.88	0.00	0.00
26.250	277.980	1.847	3210.3	2458.3	242.354	0.668	1.51		Sand	0.0			262.74	0.96	252.49	252.49	0.94	0.753	0.955	175.661	369.069	489.88	0.00	0.00
26.410	292.500	1.527	3230.3	2468.3	254.560	0.525	1.42		Sand	0.0			276.47	0.96	265.46	265.46	0.94	0.754	0.954	990.694	2078.818	2757.65	0.00	0.00
26.570	309.270	1.368	3250.3	2478.4	268.683	0.445	1.36		Sand	0.0			292.32	0.96	280.38	280.38	0.94	0.754	0.953	10610.759	########	29481.09	0.00	0.00
26.740	322.700	1.789	3271.5	2489.0	279.802	0.557	1.41		Sand	0.0			305.01	0.96	292.22	292.22	0.94	0.755	0.951	96485.190	########	267554.91	0.00	0.00
26.900	307.430	1.521	3291.5	2499.0	265.951	0.498	1.39		Sand	0.0			290.58	0.96	278.10	278.10	0.94	0.755	0.950	7181.265	########	19877.68	0.00	0.00
27.070	286.650	1.379	3312.8	2509.7	247.343	0.484	1.41		Sand	0.0			270.94	0.96	259.01	259.01	0.94	0.756	0.949	404.466	844.278	1117.42	0.00	0.00
27.230	265.280	1.338	3332.8	2519.7	228.332	0.507	1.45		Sand	0.0			250.74	0.95	238.72	238.72	0.94	0.756	0.948	37.738	78.675	104.07	0.00	0.00
27.400	253.000	1.281	3354.0	2530.3	217.228	0.510	1.46		Sand	0.0			239.13	0.95	226.83	226.83	0.94	0.756	0.946	12.429	25.876	34.21	0.00	0.00
27.560	253.800	0.955	3374.0	2540.3	217.481	0.379	1.39		Sand	0.0			239.89	0.95	227.30	227.30	0.94	0.757	0.945	12.947	26.921	35.58	0.00	0.00
27.720	253.750	0.687	3394.0	2550.4	217.002	0.272	1.31		Sand	0.0	239.89		239.89	0.95	227.03	227.03	0.94	0.757	0.944	12.645	26.261	34.69	0.00	0.00
27.890	230.240	1.152	3415.3	2561.0	196.343	0.504	1.50		Sand	0.0	239.89		239.89	0.95	226.73	226.73	0.94	0.757	0.943	12.330	25.573	33.76	0.00	0.00
28.050	195.200	1.267	3435.3	2571.0	165.906	0.655	1.62		Sand	0.0	239.89		239.89	0.94	226.46	226.46	0.94	0.758	0.942	12.043	24.947	32.92	0.00	0.00
28.220	137.420	2.061	3456.5	2581.7	116.112	1.519	1.98		Sand	21.8	239.89		239.89	0.95	227.63	287.93	0.94	0.758	0.940	41875.724	########	114260.32	0.00	0.00
28.380	64.000	2.317	3476.5	2591.7	53.175	3.722	2.50		Sand	63.0	239.89		239.89	0.95	227.39	341.33	0.94	0.759	0.939	#########	########	##########	0.00	0.00
28.540	50.930	2.856	3496.5	2601.7	37.808	5.807	2.74		Clay	82.3			48.14	0.95	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	65.830	3.678	3517.8	2612.3	49.053	5.740	2.66		Clay	75.9			62.22	0.95	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	229.200	4.672	3537.8	2622.3	193.098	2.054	1.94		Sand	17.9			216.64	0.94	204.43	248.18	0.94	0.759	0.936	105.230	216.605	285.21	0.00	0.00
29.040	204.350	3.409	3559.0	2633.0	171.642	1.683	1.90		Sand	15.2			193.15	0.93	180.27	210.69	0.94	0.760	0.935	3.647	7.499	9.87	0.00	0.00
29.200	197.510	2.310	3579.0	2643.0	165.524	1.180	1.80		Sand	6.9			186.68	0.92	172.09	173.87	0.94	0.760	0.956	0.576	1.095	1.44	0.00	0.00
29.360	203.920	1.074	3599.0	2653.0	170.613	0.531	1.56		Sand	0.0			192.74	0.92	177.65	177.65	0.94	0.760	0.953	0.662	1.295	1.70	0.00	0.00
29.530	191.950	0.925	3620.3	2663.7	160.179	0.486	1.56		Sand	0.0	192.74		192.74	0.92	177.37	177.37	0.93	0.761	0.953	0.655	1.278	1.68	0.00	0.00
29.690	153.650	0.985	3640.3	2673.7	127.666	0.649	1.71		Sand	0.0	192.74		192.74	0.92	177.12	177.12	0.93	0.761	0.952	0.649	1.262	1.66	0.00	0.00
29.860	79.600	1.716	3661.5	2684.3	65.262	2.206	2.28		Sand	45.2	192.74		192.74	0.94	181.01	271.39	0.93	0.761	0.929	2416.287	4936.443	6485.58	0.00	0.00
30.020	35.320	1.246	3681.5	2694.3	24.852	3.721	2.74		Clay	82.2			33.38	0.94	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	13.690	0.975	3701.5	2704.3	8.756	8.237	3.31		Clay	100.0			12.94	0.94	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	11.670	0.415	3722.8	2715.0	7.226	4.228	3.20		Clay	100.0			11.03	0.94	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	11.870	0.437	3742.8	2725.0	7.338	4.375	3.20		Clay	100.0			11.22	0.94	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	12.840	0.442	3764.0	2735.6	8.011	4.037	3.15		Clay	100.0			12.14	0.93	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	14.370	0.515	3784.0	2745.7	9.089	4.126	3.11		Clay	100.0			13.58	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	16.820	0.547	3804.0	2755.7	10.827	3.666	3.02		Clay	100.0			15.90	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	16.110	0.538	3825.3	2766.3	10.264	3.791	3.05		Clay	100.0			15.23	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	16.260	0.536	3845.3	2776.3	10.328	3.736	3.04		Clay	100.0			15.37	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	15.880	0.401	3866.5	2787.0	10.009	2.877	2.99		Clay	100.0			15.01	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	13.990	0.398	3886.5	2797.0	8.614	3.301	3.07		Clay	100.0			13.22	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	3

PGA (A_{max})	0.75

Total Settlement:	0.84	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5,}$ $s'vc$ = 1 atm	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
31.820	13.460	0.406	3906.5	2807.0	8.199	3.528	3.11		Clay	100.0			12.72	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	12.950	0.411	3927.8	2817.7	7.798	3.741	3.14		Clay	100.0			12.24	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	12.830	0.424	3947.8	2827.7	7.678	3.903	3.16		Clay	100.0			12.13	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	13.210	0.433	3969.0	2838.3	7.910	3.860	3.14		Clay	100.0			12.49	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	13.600	0.453	3989.0	2848.3	8.149	3.902	3.14		Clay	100.0			12.85	0.92	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.640	14.380	0.435	4009.0	2858.3	8.659	3.513	3.09		Clay	100.0			13.59	0.92	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	15.690	0.457	4030.3	2869.0	9.533	3.339	3.04		Clay	100.0			14.83	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	17.670	0.548	4050.3	2879.0	10.868	3.500	3.01		Clay	100.0			16.70	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	20.920	0.659	4071.5	2889.6	13.070	3.491	2.94		Clay	98.3			19.77	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.300	22.830	0.777	4091.5	2899.7	14.336	3.737	2.93		Clay	97.1			21.58	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	24.420	0.804	4111.5	2909.7	15.372	3.595	2.89		Clay	94.4			23.08	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	23.670	0.797	4132.8	2920.3	14.795	3.689	2.91		Clay	96.0			22.37	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	23.990	0.809	4152.8	2930.3	14.956	3.693	2.91		Clay	95.7			22.67	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	24.200	0.837	4174.0	2941.0	15.038	3.786	2.91		Clay	96.1			22.87	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	26.110	0.866	4194.0	2951.0	16.275	3.608	2.87		Clay	92.9			24.68	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	28.270	0.944	4214.0	2961.0	17.672	3.607	2.85		Clay	90.7			26.72	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	31.210	1.039	4235.3	2971.7	19.580	3.570	2.81		Clay	87.7			29.50	0.91	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	31.030	1.097	4255.3	2981.7	19.387	3.794	2.83		Clay	89.3			29.33	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	28.850	1.026	4276.5	2992.3	17.854	3.841	2.86		Clay	91.8			27.27	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	32.630	1.634	4296.5	3002.3	20.305	5.359	2.91		Clay	95.9			30.84	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	65.190	2.929	4316.5	3012.3	41.849	4.647	2.64		Clay	74.3			61.62	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	69.950	3.385	4337.8	3023.0	44.844	4.994	2.64		Clay	74.5			66.12	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	55.920	2.609	4357.8	3033.0	35.438	4.855	2.71		Clay	79.5			52.85	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	29.990	1.541	4379.0	3043.6	18.268	5.544	2.96		Clay	99.4			28.35	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.760	26.530	1.324	4399.0	3053.7	15.935	5.440	2.99		Clay	100.0			25.08	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.930	31.960	1.282	4420.3	3064.3	19.417	4.310	2.86		Clay	92.1			30.21	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	31.080	1.294	4440.3	3074.3	18.775	4.485	2.89		Clay	93.9			29.38	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.250	27.340	2.111	4460.3	3084.3	16.282	8.408	3.11		Clay	100.0			25.84	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.420	80.160	2.291	4481.5	3095.0	60.896	2.940	2.39		Sand	53.8	426.76		426.76	0.90	386.03	538.01	0.91	0.766	0.886	#########	########	##########	0.00	0.00
36.580	185.880	2.384	4501.5	3105.0	143.280	1.298	1.87		Sand	12.7	426.76		426.76	0.90	385.70	418.31	0.91	0.766	0.885	#########	########	##########	0.00	0.00
36.750	187.310	3.060	4522.8	3115.6	144.140	1.654	1.95		Sand	18.7	426.76		426.76	0.90	385.35	454.21	0.91	0.766	0.884	#########	########	##########	0.00	0.00
36.910	201.580	4.243	4542.8	3125.6	154.999	2.129	2.01		Sand	23.7	426.76		426.76	0.90	385.02	477.16	0.91	0.766	0.883	#########	########	##########	0.00	0.00
37.070	292.280	4.273	4562.8	3135.7	225.166	1.473	1.78		Sand	5.6	426.76		426.76	0.90	384.70	385.44	0.91	0.766	0.882	#########	########	##########	0.00	0.00
37.240	344.780	4.208	4584.0	3146.3	265.471	1.229	1.68		Sand	0.0	426.76		426.76	0.90	384.35	384.35	0.91	0.766	0.881	#########	########	##########	0.00	0.00
37.400	408.590	4.358	4604.0	3156.3	314.424	1.073	1.58		Sand	0.0	426.76		426.76	0.90	384.03	384.03	0.91	0.766	0.880	#########	########	##########	0.00	0.00
37.570	451.510	4.633	4625.3	3167.0	347.047	1.031	1.54		Sand	0.0			426.76	0.90	383.69	383.69	0.91	0.766	0.879	#########	########	##########	0.00	0.00
37.730	413.040	3.591	4645.3	3177.0	316.817	0.874	1.51		Sand	0.0	426.76		426.76	0.90	383.37	383.37	0.91	0.766	0.878	#########	########	##########	0.00	0.00
37.890	401.050	1.466	4665.3	3187.0	307.077	0.368	1.26		Sand	0.0	426.76		426.76	0.90	383.05	383.05	0.91	0.766	0.877	#########	########	##########	0.00	0.00
38.060	329.760	0.949	4686.5	3197.6	251.744	0.290	1.27		Sand	0.0	426.76		426.76	0.90	382.72	382.72	0.91	0.766	0.876	#########	########	##########	0.00	0.00
38.220	216.440	1.638	4706.5	3207.7	164.349	0.765	1.67		Sand	0.0	426.76		426.76	0.90	382.40	382.40	0.91	0.766	0.875	#########	########	##########	0.00	0.00
38.390	89.970	1.995	4727.8	3218.3	67.142	2.278	2.28		Sand	45.2	426.76		426.76	0.90	382.07	523.72	0.90	0.766	0.874	#########	########	##########	0.00	0.00
38.550	45.550	1.706	4747.8	3228.3	26.748	3.952	2.73		Clay	81.7			43.05	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.710	25.760	1.016	4767.8	3238.3	14.437	4.348	2.97		Clay	100.0			24.35	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	18.960	0.717	4789.0	3249.0	10.197	4.326	3.08		Clay	100.0			17.92	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	14.960	0.610	4809.0	3259.0	7.705	4.862	3.21		Clay	100.0			14.14	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	14.200	0.537	4830.3	3269.6	7.209	4.560	3.22		Clay	100.0			13.42	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	13.260	0.505	4850.3	3279.6	6.607	4.662	3.25		Clay	100.0			12.53	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	13.010	0.502	4870.3	3289.7	6.429	4.747	3.27		Clay	100.0			12.30	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.700	13.480	0.497	4891.5	3300.3	6.687	4.506	3.24		Clay	100.0			12.74	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.860	13.330	0.485	4911.5	3310.3	6.570	4.455	3.24		Clay	100.0			12.60	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.030	13.240	0.541	4932.8	3321.0	6.488	5.018	3.28		Clay	100.0			12.51	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.190	13.690	0.522	4952.8	3331.0	6.733	4.655	3.25		Clay	100.0			12.94	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.350	12.910	0.513	4972.8	3341.0	6.240	4.923	3.29		Clay	100.0			12.20	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.520	13.080	0.623	4994.0	3351.6	6.315	5.888	3.33		Clay	100.0			12.36	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.680	14.310	0.636	5014.0	3361.6	7.022	5.387	3.27		Clay	100.0			13.53	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.850	13.830	0.575	5035.3	3372.3	6.709	5.084	3.27		Clay	100.0			13.07	0.88	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	13.440	0.539	5055.3	3382.3	6.453	4.939	3.28		Clay	100.0			12.70	0.88	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	14.120	0.628	5075.3	3392.3	6.829	5.425	3.28		Clay	100.0			13.35	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	16.130	0.844	5096.5	3403.0	7.982	6.217	3.26		Clay	100.0			15.25	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	23.130	1.172	5116.5	3413.0	12.055	5.695	3.10		Clay	100.0			21.86	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	44.000	1.497	5137.8	3423.6	24.203	3.612	2.74		Clay	82.3			41.59	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	68.600	1.852	5157.8	3433.6	48.987	2.805	2.44		Sand	58.1	161.06	1.14	183.61	0.88	161.59	254.79	0.89	0.763	0.855	233.829	439.715	575.93	0.00	0.00
41.990	100.080	1.760	5177.8	3443.7	72.232	1.806	2.19		Sand	37.8	161.06	1.14	183.61	0.87	160.07	238.40	0.89	0.763	0.854	36.524	68.613	89.88	0.00	0.00
42.160	129.870	1.609	5199.0	3454.3	94.150	1.264	2.00		Sand	22.7	161.06	1.14	183.61	0.86	157.17	209.36	0.89	0.763	0.856	3.340	6.289	8.24	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	3

PGA (A_{max})	0.75

Total Settlement:	0.84	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
42.320	139.590	2.220	5219.0	3464.3	101.186	1.620	2.05		Sand	26.7	161.06	1.14	183.61	0.86	158.01	219.43	0.89	0.763	0.852	6.828	12.799	16.77	0.00	0.00
42.490	153.800	1.851	5240.3	3475.0	111.504	1.224	1.93		Sand	17.6	161.06	1.14	183.61	0.84	155.09	191.99	0.89	0.763	0.881	1.238	2.400	3.15	0.00	0.00
42.650	170.400	0.973	5260.3	3485.0	123.562	0.580	1.69		Sand	0.0		1.14	183.61	0.82	150.16	150.16	0.89	0.763	0.920	0.290	0.445	0.58	0.02	0.04
42.810	129.620	1.591	5280.3	3495.0	93.387	1.253	2.00		Sand	22.7	161.06	1.14	183.61	0.85	156.51	208.62	0.89	0.763	0.854	3.183	5.979	7.84	0.00	0.00
42.980	58.010	1.854	5301.5	3505.6	31.583	3.349	2.63		Clay	73.6			54.83	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	25.090	1.482	5321.5	3515.6	12.760	6.609	3.12		Clay	100.0			23.71	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	22.660	0.663	5342.8	3526.3	11.337	3.319	2.98		Clay	100.0			21.42	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.470	20.160	0.589	5362.8	3536.3	9.885	3.368	3.03		Clay	100.0			19.05	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	16.520	0.556	5384.0	3546.9	7.797	4.019	3.16		Clay	100.0			15.61	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	14.410	0.508	5404.0	3557.0	6.583	4.336	3.24		Clay	100.0			13.62	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	13.340	0.464	5424.0	3567.0	5.959	4.370	3.27		Clay	100.0			12.61	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	12.790	0.444	5445.3	3577.6	5.628	4.411	3.30		Clay	100.0			12.09	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.290	12.740	0.441	5465.3	3587.6	5.579	4.407	3.30		Clay	100.0			12.04	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	12.880	0.405	5486.5	3598.3	5.634	3.997	3.27		Clay	100.0			12.17	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.620	13.010	0.414	5506.5	3608.3	5.685	4.036	3.27		Clay	100.0			12.30	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.780	14.140	0.426	5526.5	3618.3	6.288	3.744	3.22		Clay	100.0			13.36	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	13.970	0.429	5547.8	3629.0	6.170	3.834	3.23		Clay	100.0			13.20	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.110	13.820	0.429	5567.8	3639.0	6.066	3.885	3.24		Clay	100.0			13.06	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.280	13.800	0.440	5589.0	3649.6	6.031	3.996	3.25		Clay	100.0			13.04	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.440	13.520	0.437	5609.0	3659.6	5.856	4.079	3.26		Clay	100.0			12.78	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.600	13.720	0.433	5629.0	3669.6	5.944	3.970	3.25		Clay	100.0			12.97	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.770	13.050	0.409	5650.3	3680.3	5.557	3.996	3.28		Clay	100.0			12.33	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.930	12.000	0.368	5670.3	3690.3	4.967	4.020	3.32		Clay	100.0			11.34	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.100	11.540	0.352	5691.5	3700.9	4.698	4.051	3.34		Clay	100.0			10.91	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.260	12.520	0.398	5711.5	3711.0	5.208	4.119	3.31		Clay	100.0			11.83	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.420	15.040	0.452	5731.5	3721.0	6.544	3.712	3.20		Clay	100.0			14.22	0.86	n.a.	n.a.	0.88	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.590	16.130	0.484	5752.8	3731.6	7.103	3.650	3.17		Clay	100.0			15.25	0.86	n.a.	n.a.	0.88	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.750	16.600	0.521	5772.8	3741.6	7.330	3.802	3.17		Clay	100.0			15.69	0.86	n.a.	n.a.	0.87	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.920	16.030	0.483	5794.0	3752.3	7.000	3.680	3.17		Clay	100.0			15.15	0.86	n.a.	n.a.	0.87	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.080	15.070	0.607	5814.0	3762.3	6.466	4.990	3.28		Clay	100.0			14.24	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	20.300	1.054	5834.0	3772.3	9.216	6.062	3.21		Clay	100.0			19.19	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	30.620	1.440	5855.3	3782.9	14.641	5.200	3.01		Clay	100.0			28.94	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	35.950	1.431	5875.3	3793.0	17.407	4.336	2.90		Clay	95.1			33.98	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	36.020	1.178	5896.5	3803.6	17.390	3.563	2.85		Clay	90.8			34.05	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.900	28.640	1.053	5916.5	3813.6	13.468	4.099	2.97		Clay	100.0			27.07	0.86	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.060	16.440	0.763	5936.5	3823.6	7.047	5.663	3.28		Clay	100.0			15.54	0.86	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.230	19.710	0.669	5957.8	3834.3	8.727	3.999	3.12		Clay	100.0			18.63	0.85	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.390	20.830	0.822	5977.8	3844.3	9.282	4.606	3.13		Clay	100.0			19.69	0.85	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.560	19.580	0.823	5999.0	3854.9	8.602	4.965	3.18		Clay	100.0			18.51	0.85	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	17.720	0.701	6019.0	3865.0	7.612	4.767	3.21		Clay	100.0			16.75	0.85	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	15.890	0.599	6039.0	3875.0	6.643	4.652	3.25		Clay	100.0			15.02	0.85	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	14.880	0.541	6060.3	3885.6	6.099	4.562	3.28		Clay	100.0			14.06	0.85	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	14.660	0.502	6080.3	3895.6	5.966	4.319	3.27		Clay	100.0			13.86	0.85	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	14.460	0.462	6101.5	3906.3	5.842	4.052	3.26		Clay	100.0			13.67	0.85	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	14.940	0.458	6121.5	3916.3	6.067	3.855	3.24		Clay	100.0			14.12	0.85	n.a.	n.a.	0.86	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	16.050	0.488	6141.5	3926.3	6.611	3.756	3.20		Clay	100.0			15.17	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	16.610	0.514	6162.8	3936.9	6.873	3.800	3.19		Clay	100.0			15.70	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	16.930	0.503	6182.8	3947.0	7.012	3.631	3.17		Clay	100.0			16.00	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.200	17.220	0.436	6204.0	3957.6	7.135	3.088	3.13		Clay	100.0			16.28	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	4

PGA (A_{max})	0.75

Total Settlement:	0.69	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160	0.560	0.005	19.2	19.2	13.988	0.963	2.62		Unsaturated	72.4			0.53	1.70	0.90	52.15	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	1.280	0.086	39.6	39.6	63.646	6.856	2.65		Unsaturated	74.7			1.21	1.70	2.06	53.99	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	11.390	0.376	58.8	58.8	64.415	3.311	2.41		Unsaturated	55.4			10.77	1.70	18.30	70.92	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	118.160	0.858	79.2	79.2	577.078	0.726	1.29		Unsaturated	0.0			111.68	1.70	189.86	189.86	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	74.330	1.300	98.4	98.4	325.575	1.750	1.75		Unsaturated	2.9			70.26	1.70	119.43	119.43	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	38.930	1.091	117.6	117.6	155.846	2.807	2.10		Unsaturated	31.1			36.80	1.70	62.55	111.74	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	18.990	0.885	138.0	138.0	70.029	4.679	2.49		Unsaturated	62.4			17.95	1.70	30.51	88.39	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	18.500	0.795	157.2	157.2	63.881	4.315	2.49		Unsaturated	62.4			17.49	1.70	29.73	87.38	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	18.770	0.824	177.6	177.6	60.947	4.409	2.51		Unsaturated	64.0			17.74	1.70	30.16	88.32	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	18.020	0.813	196.8	196.8	55.544	4.538	2.55		Unsaturated	67.0			17.03	1.70	28.95	87.40	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	17.670	0.789	216.0	216.0	51.954	4.494	2.57		Unsaturated	68.3			16.70	1.70	28.39	86.95	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	17.970	0.861	236.4	236.4	50.481	4.824	2.60		Unsaturated	70.8			16.98	1.70	28.87	88.04	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	18.110	0.916	255.6	255.6	74.632	5.094	2.50		Unsaturated	63.2			17.12	1.70	29.10	86.77	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	17.160	0.978	276.0	276.0	66.950	5.746	2.57		Unsaturated	68.9			16.22	1.70	27.57	86.00	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	16.540	0.966	295.2	295.2	61.509	5.890	2.61		Unsaturated	71.4			15.63	1.70	26.58	85.19	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	16.640	0.954	314.4	314.4	59.179	5.789	2.61		Unsaturated	71.8			15.73	1.70	26.74	85.47	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	15.740	0.978	334.8	334.8	53.504	6.278	2.67		Unsaturated	76.2			14.88	1.70	25.29	84.33	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	15.700	0.978	354.0	354.0	51.292	6.299	2.68		Unsaturated	77.3			14.84	1.70	25.23	84.41	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	15.390	0.934	374.4	374.4	48.302	6.144	2.69		Unsaturated	78.0			14.55	1.70	24.73	83.87	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	16.110	0.981	393.6	393.6	48.820	6.162	2.69		Unsaturated	77.8			15.23	1.70	25.89	85.34	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	17.460	1.036	412.8	412.8	51.196	6.003	2.66		Unsaturated	76.1			16.50	1.70	28.05	87.89	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	17.440	1.062	433.2	433.2	49.410	6.166	2.68		Unsaturated	77.6			16.48	1.70	28.02	88.08	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	17.550	1.050	452.4	452.4	48.212	6.063	2.68		Unsaturated	77.7			16.59	1.70	28.20	88.33	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	16.900	1.019	472.8	472.8	44.965	6.114	2.71		Unsaturated	79.6			15.97	1.70	27.16	87.24	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	16.290	0.977	492.0	492.0	42.103	6.089	2.72		Unsaturated	81.0			15.40	1.70	26.17	86.17	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	15.730	0.898	512.4	512.4	60.397	5.802	2.61		Unsaturated	71.4			14.87	1.70	25.28	83.51	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	15.370	0.848	531.6	531.6	56.825	5.611	2.61		Unsaturated	71.9			14.53	1.70	24.70	82.85	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	15.970	0.834	550.8	550.8	38.057	5.313	2.71		Unsaturated	80.0			15.09	1.70	25.66	85.36	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	16.350	0.843	571.2	571.2	37.974	5.248	2.71		Unsaturated	79.7			15.45	1.70	26.27	86.11	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	17.540	0.804	590.4	590.4	39.832	4.664	2.66		Unsaturated	75.6			16.58	1.70	28.18	87.98	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	19.820	0.799	610.8	610.8	44.015	4.094	2.59		Unsaturated	70.0			18.73	1.70	31.85	91.73	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	20.390	0.799	630.0	630.0	44.309	3.980	2.58		Unsaturated	69.1			19.27	1.70	32.76	92.75	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	21.870	0.895	649.2	649.2	46.566	4.153	2.57		Unsaturated	68.9			20.67	1.70	35.14	95.78	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	22.500	0.933	669.6	669.6	46.879	4.211	2.58		Unsaturated	69.1			21.27	1.70	36.15	97.13	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	23.310	0.963	688.8	688.8	47.620	4.195	2.57		Unsaturated	68.6			22.03	1.70	37.45	98.71	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	26.710	1.126	709.2	709.2	53.544	4.271	2.54		Unsaturated	66.3			25.25	1.70	42.92	105.24	1.00	0.485	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	27.930	1.222	728.4	728.4	54.965	4.432	2.54	plastic	Clay	66.6			26.40	1.32	n.a.	n.a.	1.00	0.488	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.230	27.090	1.280	747.6	747.6	52.310	4.789	2.58	plastic	Clay	69.7			25.60	1.32	n.a.	n.a.	1.00	0.495	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.400	27.550	1.455	768.0	768.0	52.197	5.357	2.62	plastic	Clay	72.7			26.04	1.31	n.a.	n.a.	0.99	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.560	30.280	1.639	787.2	787.2	56.440	5.485	2.61	plastic	Clay	71.5			28.62	1.30	n.a.	n.a.	0.99	0.507	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.730	35.060	1.651	807.6	807.6	53.022	4.765	2.58	plastic	Clay	69.3			33.14	1.29	n.a.	n.a.	0.99	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.890	31.510	1.494	826.8	826.8	56.742	4.805	2.56	plastic	Clay	67.9			29.78	1.28	n.a.	n.a.	0.99	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.050	34.010	1.416	846.0	846.0	50.206	4.217	2.56		Sand	67.5	37.44		37.44	1.51	56.60	123.14	0.99	0.525	1.100	0.179	0.277	0.53	0.03	0.05
7.220	35.220	1.455	866.4	866.4	51.384	4.181	2.55		Sand	66.7	37.44		37.44	1.50	56.07	122.29	0.99	0.531	1.100	0.176	0.272	0.51	0.03	0.05
7.380	38.990	1.534	885.6	885.6	56.318	3.978	2.50		Sand	63.3	37.44		37.44	1.49	55.65	120.88	0.99	0.536	1.100	0.173	0.265	0.50	0.03	0.05
7.550	39.610	1.445	906.0	906.0	56.561	3.691	2.48		Sand	61.3			37.44	1.47	55.18	119.73	0.99	0.541	1.100	0.171	0.260	0.48	0.03	0.05
7.710	33.830	1.270	925.2	925.2	47.695	3.807	2.54		Sand	66.2			31.98	1.48	47.36	110.94	0.99	0.546	1.096	0.154	0.223	0.41	0.03	0.06
7.870	31.560	1.206	944.4	944.4	43.983	3.878	2.57		Sand	68.6			29.83	1.48	44.03	107.19	0.99	0.551	1.091	0.147	0.209	0.38	0.03	0.06
8.040	31.150	1.226	964.8	964.8	42.927	3.999	2.59		Sand	70.0			29.44	1.46	43.08	106.24	0.99	0.556	1.088	0.146	0.206	0.37	0.03	0.06
8.200	33.390	1.340	984.0	984.0	45.598	4.074	2.57		Sand	69.0			31.56	1.44	45.52	109.19	0.99	0.561	1.087	0.151	0.215	0.38	0.03	0.06
8.370	27.830	1.378	1004.4	1004.4	43.516	5.042	2.66	plastic	Clay	75.4			26.30	1.22	n.a.	n.a.	0.99	0.565	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.530	26.550	1.244	1023.6	1023.6	40.916	4.776	2.66	plastic	Clay	75.6			25.09	1.21	n.a.	n.a.	0.99	0.570	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.690	27.990	1.224	1042.8	1042.8	42.606	4.454	2.62	plastic	Clay	72.8			26.46	1.21	n.a.	n.a.	0.99	0.574	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.860	32.840	1.319	1063.2	1063.2	43.080	4.081	2.59		Sand	70.4	178.4		178.40	1.20	213.92	327.00	0.99	0.578	1.100	#########	########	#########	0.00	0.00
9.020	38.290	1.522	1082.4	1082.4	49.886	4.033	2.54		Sand	66.5	178.4		178.40	1.19	212.91	324.24	0.99	0.582	1.100	#########	########	#########	0.00	0.00
9.190	52.380	1.853	1102.8	1102.8	67.857	3.575	2.41		Sand	56.1	178.4		178.40	1.19	211.87	317.93	0.99	0.587	1.100	#########	########	#########	0.00	0.00
9.350	57.830	1.663	1122.0	1122.0	74.335	2.903	2.32		Sand	48.7	178.4		178.40	1.18	210.90	311.80	0.99	0.591	1.100	#########	########	#########	0.00	0.00
9.510	57.350	1.212	1141.2	1141.2	73.077	2.135	2.23		Sand	41.5	178.4		178.40	1.18	209.96	304.22	0.99	0.594	1.100	#########	########	5086170.58	0.00	0.00
9.680	62.070	1.006	1161.6	1161.6	78.441	1.635	2.13		Sand	33.4	178.4		178.40	1.17	208.98	292.56	0.99	0.598	1.100	#########	########	417485.74	0.00	0.00
9.840	64.660	1.291	1180.8	1180.8	81.065	2.015	2.18		Sand	37.6	178.4		178.40	1.17	208.08	297.31	0.99	0.602	1.100	#########	########	1101850.86	0.00	0.00
10.010	64.870	1.499	1201.2	1201.2	80.625	2.333	2.23		Sand	41.3	178.4		178.40	1.16	207.14	300.43	0.99	0.606	1.100	#########	########	2145384.76	0.00	0.00
10.170	147.050	1.732	1220.4	1220.4	182.255	1.183	1.77		Sand	4.6	178.4		178.40	1.19	212.02	212.13	0.99	0.609	1.100	4.022	9.734	15.99	0.00	0.00
10.330	188.750	1.623	1239.6	1239.6	232.322	0.863	1.60		Sand	0.0			178.40	1.18	211.13	211.13	0.99	0.612	1.100	3.758	9.093	14.85	0.00	0.00
10.500	181.920	1.610	1260.0	1260.0	222.055	0.888	1.62		Sand	0.0			171.95	1.18	203.49	203.49	0.99	0.616	1.100	2.314	5.599	9.09	0.00	0.00
10.660	190.240	2.108	1279.2	1279.2	230.485	1.112	1.68		Sand	0.0			179.81	1.17	210.75	210.75	0.99	0.619	1.100	3.663	8.865	14.32	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 4

PGA (A_{max}) 0.75

Total Settlement: 0.69 (Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
10.830	206.470	3.374	1299.6	1299.6	248.231	1.639	1.79		Sand	6.4			195.15	1.15	225.39	226.76	0.99	0.622	1.100	12.359	29.908	48.06	0.00	0.00
10.990	270.960	2.855	1318.8	1318.8	323.616	1.056	1.57		Sand	0.0			256.11	1.13	290.13	290.13	0.99	0.625	1.100	63901.695	########	247311.10	0.00	0.00
11.150	271.630	1.985	1338.0	1338.0	322.070	0.733	1.45		Sand	0.0			256.74	1.13	289.74	289.74	0.99	0.628	1.100	59244.132	########	228197.30	0.00	0.00
11.320	284.230	1.654	1358.4	1358.4	334.495	0.583	1.37		Sand	0.0			268.65	1.12	301.97	301.97	0.98	0.631	1.100	#########	########	2888309.30	0.00	0.00
11.480	285.850	1.235	1377.6	1377.6	334.042	0.433	1.28		Sand	0.0			270.18	1.12	302.57	302.57	0.98	0.634	1.100	#########	########	3286306.29	0.00	0.00
11.650	351.200	1.730	1398.0	1398.0	407.575	0.493	1.25		Sand	0.0			331.95	1.12	370.30	370.30	0.98	0.637	1.100	#########	########	#########	0.00	0.00
11.810	336.310	1.884	1417.2	1417.2	387.597	0.561	1.31		Sand	0.0			317.87	1.11	353.33	353.33	0.98	0.640	1.100	#########	########	#########	0.00	0.00
11.980	292.450	1.534	1437.6	1437.6	334.531	0.526	1.33		Sand	0.0			276.42	1.11	306.09	306.09	0.98	0.643	1.100	#########	########	7248416.84	0.00	0.00
12.140	270.500	1.536	1456.8	1456.8	307.304	0.569	1.38		Sand	0.0			255.67	1.10	282.13	282.13	0.98	0.645	1.100	14440.774	########	54150.71	0.00	0.00
12.300	254.680	1.530	1476.0	1476.0	287.385	0.602	1.42		Sand	0.0			240.72	1.10	264.72	264.72	0.98	0.648	1.100	890.387	2154.737	3325.65	0.00	0.00
12.470	201.480	1.981	1496.4	1496.4	225.613	0.987	1.65		Sand	0.0			190.43	1.11	212.29	212.29	0.98	0.651	1.100	4.064	9.836	15.12	0.00	0.00
12.630	155.080	1.313	1515.6	1515.6	172.349	0.851	1.69		Sand	0.0			146.58	1.13	166.26	166.26	0.98	0.653	1.062	0.446	0.890	1.36	0.00	0.00
12.800	121.480	0.835	1536.0	1536.0	133.914	0.692	1.71		Sand	0.0			114.82	1.15	131.96	131.96	0.98	0.656	1.044	0.204	0.315	0.48	0.02	0.05
12.960	121.370	0.793	1555.2	1555.2	132.953	0.657	1.70		Sand	0.0			114.72	1.14	131.19	131.19	0.98	0.658	1.042	0.201	0.310	0.47	0.02	0.05
13.120	151.490	0.703	1574.4	1574.4	165.134	0.467	1.54		Sand	0.0			143.19	1.12	160.51	160.51	0.98	0.660	1.052	0.377	0.713	1.08	0.01	0.01
13.290	190.330	0.611	1594.8	1594.8	206.349	0.323	1.37		Sand	0.0			179.90	1.10	197.64	197.64	0.98	0.663	1.072	1.659	3.913	5.91	0.00	0.00
13.450	212.100	1.102	1614.0	1614.0	228.668	0.522	1.45		Sand	0.0			200.47	1.09	217.82	217.82	0.98	0.665	1.081	6.045	14.379	21.63	0.00	0.00
13.620	123.140	1.592	1634.4	1634.4	131.553	1.301	1.90		Sand	14.9	200.47		200.47	1.07	215.02	247.35	0.98	0.667	1.077	95.708	226.871	340.08	0.00	0.00
13.780	35.790	1.252	1653.6	1653.6	37.382	3.579	2.60		Sand	70.8	200.47		200.47	1.07	213.94	327.17	0.98	0.669	1.074	#########	########	#########	0.00	0.00
13.940	20.700	1.024	1672.8	1672.8	23.749	5.155	2.85		Clay	91.0			19.57	1.06	n.a.	n.a.	0.98	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	25.380	1.172	1693.2	1693.2	28.979	4.777	2.76		Clay	84.1			23.99	1.06	n.a.	n.a.	0.98	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	53.670	1.321	1712.4	1712.4	55.490	2.501	2.37		Sand	52.3		1.8	91.31	1.08	98.72	171.98	0.98	0.675	1.041	0.539	1.101	1.63	0.00	0.00
14.440	26.180	0.984	1732.8	1732.8	29.217	3.886	2.70		Clay	79.0			24.74	1.05	n.a.	n.a.	0.98	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	19.950	0.577	1752.0	1752.0	21.774	3.023	2.73		Clay	81.2			18.86	1.05	n.a.	n.a.	0.98	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	17.810	0.533	1771.5	1767.8	19.148	3.149	2.78		Clay	85.5			16.83	1.05	n.a.	n.a.	0.98	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	18.580	0.827	1792.8	1778.4	19.887	4.674	2.88		Clay	93.3			17.56	1.05	n.a.	n.a.	0.98	0.683	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	23.150	0.929	1812.8	1788.4	24.875	4.176	2.77		Clay	84.9			21.88	1.05	n.a.	n.a.	0.98	0.685	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	23.410	0.941	1834.0	1799.1	25.005	4.182	2.77		Clay	84.8			22.13	1.04	n.a.	n.a.	0.98	0.687	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	27.710	1.086	1854.0	1809.1	29.610	4.055	2.71		Clay	79.7			26.19	1.04	n.a.	n.a.	0.97	0.689	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	23.960	1.113	1874.0	1819.1	25.313	4.834	2.81		Clay	87.8			22.65	1.04	n.a.	n.a.	0.97	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	20.070	0.906	1895.3	1829.7	20.902	4.738	2.87		Clay	92.3			18.97	1.04	n.a.	n.a.	0.97	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	17.350	0.927	1915.3	1839.7	17.820	5.656	2.97		Clay	100.0			16.40	1.04	n.a.	n.a.	0.97	0.694	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	21.110	1.049	1936.5	1850.4	21.770	5.208	2.88		Clay	93.4			19.95	1.04	n.a.	n.a.	0.97	0.695	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	19.730	1.061	1956.5	1860.4	20.159	5.655	2.93		Clay	97.3			18.65	1.03	n.a.	n.a.	0.97	0.697	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	19.840	0.858	1976.5	1870.4	20.158	4.551	2.87		Clay	92.3			18.75	1.03	n.a.	n.a.	0.97	0.699	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	23.730	0.734	1997.8	1881.1	24.168	3.228	2.71		Clay	79.8			22.43	1.03	n.a.	n.a.	0.97	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	20.460	0.680	2017.8	1891.1	20.571	3.493	2.79		Clay	85.9			19.34	1.03	n.a.	n.a.	0.97	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	21.040	0.664	2039.0	1901.7	21.055	3.318	2.76		Clay	84.1			19.89	1.03	n.a.	n.a.	0.97	0.703	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	24.420	0.808	2059.0	1911.7	24.470	3.456	2.72		Clay	81.0			23.08	1.03	n.a.	n.a.	0.97	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	27.280	0.974	2079.0	1921.8	27.309	3.713	2.71		Clay	79.7			25.78	1.03	n.a.	n.a.	0.97	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	28.410	1.028	2100.3	1932.4	28.317	3.759	2.70		Clay	79.1			26.85	1.02	n.a.	n.a.	0.97	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.550	26.170	1.028	2120.3	1942.4	25.854	4.095	2.76		Clay	83.4			24.74	1.02	n.a.	n.a.	0.97	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.720	24.160	0.927	2141.5	1953.1	23.644	4.015	2.78		Clay	85.3			22.84	1.02	n.a.	n.a.	0.97	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.880	21.620	0.799	2161.5	1963.1	20.926	3.891	2.81		Clay	87.8			20.43	1.02	n.a.	n.a.	0.97	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.040	19.540	0.731	2181.5	1973.1	18.701	3.963	2.85		Clay	91.2			18.47	1.02	n.a.	n.a.	0.97	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.210	18.530	0.724	2202.8	1983.7	17.572	4.154	2.89		Clay	93.9			17.51	1.02	n.a.	n.a.	0.97	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.370	17.400	0.676	2222.8	1993.7	16.340	4.150	2.91		Clay	95.8			16.45	1.02	n.a.	n.a.	0.97	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.540	16.220	0.605	2244.0	2004.4	15.065	4.010	2.93		Clay	97.3			15.33	1.01	n.a.	n.a.	0.97	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.700	14.960	0.552	2264.0	2014.4	13.729	3.990	2.96		Clay	99.7			14.14	1.01	n.a.	n.a.	0.97	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.860	14.330	0.522	2284.0	2024.4	13.029	3.960	2.97		Clay	100.0			13.54	1.01	n.a.	n.a.	0.97	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.030	14.630	0.484	2305.3	2035.1	13.245	3.590	2.94		Clay	98.5			13.83	1.01	n.a.	n.a.	0.97	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.190	13.550	0.428	2325.3	2045.1	12.114	3.455	2.96		Clay	100.0			12.81	1.01	n.a.	n.a.	0.97	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.360	12.870	0.388	2346.5	2055.7	11.380	3.321	2.98		Clay	100.0			12.16	1.01	n.a.	n.a.	0.96	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.520	12.280	0.350	2366.5	2065.7	10.744	3.151	2.98		Clay	100.0			11.61	1.01	n.a.	n.a.	0.96	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.690	11.850	0.330	2387.8	2076.4	10.264	3.100	3.00		Clay	100.0			11.20	1.00	n.a.	n.a.	0.96	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.850	11.700	0.357	2407.8	2086.4	10.062	3.397	3.03		Clay	100.0			11.06	1.00	n.a.	n.a.	0.96	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.010	13.630	0.615	2427.8	2096.4	11.845	4.952	3.07		Clay	100.0			12.88	1.00	n.a.	n.a.	0.96	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.180	18.300	0.598	2449.0	2107.0	16.208	3.503	2.87		Clay	92.4			17.30	1.00	n.a.	n.a.	0.96	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	22.030	0.417	2469.0	2117.1	19.646	2.006	2.66		Clay	75.5			20.82	1.00	n.a.	n.a.	0.96	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.510	12.670	0.324	2490.3	2127.7	10.739	2.838	2.96		Clay	99.6			11.98	1.00	n.a.	n.a.	0.96	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.670	9.880	0.295	2510.3	2137.7	8.069	3.419	3.11		Clay	100.0			9.34	1.00	n.a.	n.a.	0.96	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.830	11.190	0.390	2530.3	2147.7	9.242	3.930	3.09		Clay	100.0			10.58	1.00	n.a.	n.a.	0.96	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.000	12.670	0.441	2551.5	2158.4	10.558	3.869	3.04		Clay	100.0			11.98	0.99	n.a.	n.a.	0.96	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	13.400	0.470	2571.5	2168.4	11.173	3.880	3.02		Clay	100.0			12.67	0.99	n.a.	n.a.	0.96	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 4

PGA (A_{max}) 0.75

Total Settlement: 0.69 (Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
21.330	12.350	0.474	2592.8	2179.0	10.145	4.285	3.08		Clay	100.0			11.67	0.99	n.a.	n.a.	0.96	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.490	11.040	0.377	2612.8	2189.1	8.893	3.874	3.10		Clay	100.0			10.43	0.99	n.a.	n.a.	0.96	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.650	9.280	0.296	2632.8	2199.1	7.243	3.713	3.16		Clay	100.0			8.77	0.99	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.820	8.740	0.252	2654.0	2209.7	6.709	3.402	3.17		Clay	100.0			8.26	0.99	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.980	8.900	0.266	2674.0	2219.7	6.814	3.514	3.17		Clay	100.0			8.41	0.99	n.a.	n.a.	0.96	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.150	9.240	0.269	2695.3	2230.4	7.077	3.411	3.15		Clay	100.0			8.73	0.99	n.a.	n.a.	0.96	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.310	9.880	0.312	2715.3	2240.4	7.608	3.655	3.14		Clay	100.0			9.34	0.99	n.a.	n.a.	0.96	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	10.840	0.369	2735.3	2250.4	8.418	3.892	3.12		Clay	100.0			10.25	0.98	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	10.890	0.381	2756.5	2261.0	8.414	4.009	3.13		Clay	100.0			10.29	0.98	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	10.390	0.362	2776.5	2271.1	7.927	4.021	3.15		Clay	100.0			9.82	0.98	n.a.	n.a.	0.96	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	9.880	0.326	2797.8	2281.7	7.434	3.849	3.16		Clay	100.0			9.34	0.98	n.a.	n.a.	0.95	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	10.520	0.319	2817.8	2291.7	7.951	3.496	3.12		Clay	100.0			9.94	0.98	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	11.170	0.316	2837.8	2301.7	8.473	3.243	3.08		Clay	100.0			10.56	0.98	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	10.450	0.312	2859.0	2312.4	7.802	3.454	3.12		Clay	100.0			9.88	0.98	n.a.	n.a.	0.95	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	10.220	0.335	2879.0	2322.4	7.562	3.813	3.16		Clay	100.0			9.66	0.98	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	10.400	0.347	2900.3	2333.0	7.672	3.882	3.16		Clay	100.0			9.83	0.97	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	10.740	0.335	2920.3	2343.1	7.921	3.611	3.13		Clay	100.0			10.15	0.97	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	11.580	0.269	2940.3	2353.1	8.593	2.661	3.02		Clay	100.0			10.95	0.97	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	11.430	0.281	2961.5	2363.7	8.418	2.826	3.04		Clay	100.0			10.80	0.97	n.a.	n.a.	0.95	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	12.710	0.339	2981.5	2373.7	9.453	3.020	3.02		Clay	100.0			12.01	0.97	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	16.370	0.446	3002.8	2384.4	12.472	3.002	2.92		Clay	96.5			15.47	0.97	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	20.230	0.571	3022.8	2394.4	15.635	3.052	2.84		Clay	90.5			19.12	0.97	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	20.250	0.666	3042.8	2404.4	15.579	3.553	2.88		Clay	93.8			19.14	0.97	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	18.240	0.584	3064.0	2415.0	13.837	3.497	2.92		Clay	96.7			17.24	0.97	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	15.160	0.470	3084.0	2425.1	11.231	3.454	2.99		Clay	100.0			14.33	0.96	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	14.520	0.407	3105.3	2435.7	10.648	3.138	2.99		Clay	100.0			13.72	0.96	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	17.360	0.473	3125.3	2445.7	12.918	2.994	2.91		Clay	95.4			16.41	0.96	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	22.520	0.602	3145.3	2455.7	17.060	2.872	2.80		Clay	86.8			21.29	0.96	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	22.160	0.725	3166.5	2466.4	16.686	3.525	2.86		Clay	91.7			20.95	0.96	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	21.260	0.766	3186.5	2476.4	15.883	3.894	2.90		Clay	95.2			20.09	0.96	n.a.	n.a.	0.95	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	20.300	0.818	3207.8	2487.0	15.035	4.374	2.95		Clay	99.2			19.19	0.96	n.a.	n.a.	0.94	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	17.920	0.767	3227.8	2497.0	13.060	4.702	3.02		Clay	100.0			16.94	0.96	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	14.840	0.679	3247.8	2507.1	10.543	5.136	3.12		Clay	100.0			14.03	0.96	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	13.860	0.565	3269.0	2517.7	9.712	4.618	3.12		Clay	100.0			13.10	0.96	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	13.150	0.492	3289.0	2527.7	9.103	4.279	3.12		Clay	100.0			12.43	0.95	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	13.170	0.542	3310.3	2538.4	9.073	4.708	3.15		Clay	100.0			12.45	0.95	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	14.320	0.576	3330.3	2548.4	9.932	4.554	3.11		Clay	100.0			13.53	0.95	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	17.230	0.590	3351.5	2559.0	12.156	3.796	2.99		Clay	100.0			16.29	0.95	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	17.890	0.708	3371.5	2569.0	12.615	4.369	3.01		Clay	100.0			16.91	0.95	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	22.320	0.717	3391.5	2579.1	15.994	3.474	2.87		Clay	92.6			21.10	0.95	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	18.700	0.735	3412.8	2589.7	13.124	4.323	3.00		Clay	100.0			17.67	0.95	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	18.380	0.683	3432.8	2599.7	12.820	4.096	2.99		Clay	100.0			17.37	0.95	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	18.360	0.569	3454.0	2610.4	12.744	3.421	2.94		Clay	98.5			17.35	0.95	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	17.980	0.645	3474.0	2620.4	12.397	3.969	2.99		Clay	100.0			16.99	0.95	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	17.620	0.650	3494.0	2630.4	12.069	4.092	3.01		Clay	100.0			16.65	0.94	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	18.730	0.889	3515.3	2641.0	12.853	5.240	3.06		Clay	100.0			17.70	0.94	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	26.270	1.272	3535.3	2651.0	18.485	5.191	2.93		Clay	97.6			24.83	0.94	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	46.040	1.260	3556.5	2661.7	37.301	2.846	2.53		Sand	65.5	52.2	1.8	93.96	0.92	85.99	160.49	0.94	0.760	0.960	0.376	0.650	0.86	0.01	0.02
29.200	55.230	1.062	3576.5	2671.7	44.953	1.987	2.37		Sand	52.4		1.8	93.96	0.91	85.71	155.55	0.94	0.760	0.961	0.330	0.550	0.72	0.02	0.03
29.360	41.540	0.905	3596.5	2681.7	33.367	2.277	2.51		Sand	63.4	52.2	1.8	93.96	0.91	85.71	159.54	0.94	0.760	0.959	0.367	0.628	0.83	0.01	0.03
29.530	18.860	0.765	3617.8	2692.4	12.666	4.487	3.02		Clay	100.0			17.83	0.94	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	13.560	0.463	3637.8	2702.4	8.689	3.943	3.11		Clay	100.0			12.82	0.94	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	13.260	0.440	3659.0	2713.0	8.426	3.848	3.12		Clay	100.0			12.53	0.94	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	12.730	0.400	3679.0	2723.0	7.999	3.673	3.13		Clay	100.0			12.03	0.94	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	12.820	0.392	3699.0	2733.0	8.028	3.577	3.12		Clay	100.0			12.12	0.93	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	13.150	0.407	3720.3	2743.7	8.230	3.607	3.11		Clay	100.0			12.43	0.93	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	13.460	0.448	3740.3	2753.7	8.418	3.867	3.12		Clay	100.0			12.72	0.93	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	14.590	0.468	3761.5	2764.3	9.195	3.681	3.08		Clay	100.0			13.79	0.93	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	16.370	0.563	3781.5	2774.4	10.438	3.888	3.05		Clay	100.0			15.47	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	19.120	0.709	3801.5	2784.4	12.368	4.116	3.00		Clay	100.0			18.07	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	21.140	0.802	3822.8	2795.0	13.759	4.172	2.97		Clay	100.0			19.98	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	20.970	0.763	3842.8	2805.0	13.582	4.003	2.96		Clay	100.0			19.82	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	21.670	0.713	3864.0	2815.7	14.020	3.610	2.93		Clay	97.0			20.48	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	20.720	0.648	3884.0	2825.7	13.291	3.452	2.93		Clay	97.6			19.58	0.93	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	4

PGA (A_{max})	0.75

Total Settlement:	0.69	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
31.820	19.180	0.596	3904.0	2835.7	12.151	3.459	2.96		Clay	100.0			18.13	0.93	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	20.450	0.561	3925.3	2846.4	12.990	3.035	2.91		Clay	95.5			19.33	0.92	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	20.930	0.625	3945.3	2856.4	13.274	3.297	2.92		Clay	96.6			19.78	0.92	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	21.980	0.712	3966.5	2867.0	13.950	3.560	2.92		Clay	96.9			20.78	0.92	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	23.460	0.776	3986.5	2877.0	14.923	3.614	2.90		Clay	95.3			22.17	0.92	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.640	25.320	0.793	4006.5	2887.0	16.153	3.401	2.86		Clay	91.9			23.93	0.92	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	24.790	0.853	4027.8	2897.7	15.720	3.744	2.90		Clay	94.7			23.43	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	26.610	0.907	4047.8	2907.7	16.911	3.689	2.87		Clay	92.3			25.15	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	28.460	0.942	4069.0	2918.3	18.110	3.565	2.83		Clay	89.7			26.90	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.300	28.840	0.953	4089.0	2928.4	18.301	3.557	2.83		Clay	89.4			27.26	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	29.350	1.159	4109.0	2938.4	18.579	4.246	2.87		Clay	92.9			27.74	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	29.470	1.156	4130.3	2949.0	18.586	4.218	2.87		Clay	92.8			27.85	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	20.150	0.986	4150.3	2959.0	12.217	5.457	3.08		Clay	100.0			19.05	0.92	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	16.700	0.672	4171.5	2969.7	9.842	4.598	3.11		Clay	100.0			15.78	0.91	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	20.310	0.762	4191.5	2979.7	12.226	4.181	3.01		Clay	100.0			19.20	0.91	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	32.480	1.231	4211.5	2989.7	20.319	4.052	2.83		Clay	89.5			30.70	0.91	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	54.300	1.918	4232.8	3000.4	34.785	3.675	2.63		Clay	73.2			51.32	0.91	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	41.430	2.018	4252.8	3010.4	26.112	5.134	2.82		Clay	88.5			39.16	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	31.120	1.660	4274.0	3021.0	19.188	5.727	2.95		Clay	98.9			29.41	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	22.620	1.169	4294.0	3031.0	13.509	5.711	3.06		Clay	100.0			21.38	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	17.120	0.865	4314.0	3041.0	9.841	5.778	3.17		Clay	100.0			16.18	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	16.780	0.714	4335.3	3051.7	9.577	4.888	3.14		Clay	100.0			15.86	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	16.570	0.676	4355.3	3061.7	9.402	4.700	3.13		Clay	100.0			15.66	0.91	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	18.320	0.739	4376.5	3072.3	10.501	4.580	3.09		Clay	100.0			17.32	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.760	20.130	1.125	4396.5	3082.4	11.635	6.275	3.14		Clay	100.0			19.03	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.930	28.030	1.792	4417.8	3093.0	16.697	6.939	3.05		Clay	100.0			26.49	0.90	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	79.910	2.122	4437.8	3103.0	60.639	2.731	2.36		Sand	52.2	200.46	1.28	256.59	0.90	231.94	340.94	0.91	0.766	0.885	#########	########	##########	0.00	0.00
36.250	138.800	1.750	4457.8	3113.0	106.424	1.281	1.96		Sand	19.9	200.46	1.28	256.59	0.90	231.74	286.06	0.91	0.766	0.884	29461.992	########	74829.64	0.00	0.00
36.420	193.580	1.393	4479.0	3123.7	148.849	0.728	1.69		Sand	0.0	200.46	1.28	256.59	0.89	228.93	228.93	0.91	0.766	0.883	14.917	28.983	37.84	0.00	0.00
36.580	212.090	1.131	4499.0	3133.7	162.980	0.539	1.58		Sand	0.0		1.28	256.59	0.89	228.69	228.69	0.91	0.766	0.882	14.609	28.355	37.02	0.00	0.00
36.750	208.650	0.899	4520.3	3144.3	160.028	0.435	1.53		Sand	0.0		1.28	252.43	0.89	224.28	224.28	0.91	0.766	0.881	10.037	19.457	25.41	0.00	0.00
36.910	203.330	1.532	4540.3	3154.3	155.648	0.762	1.69		Sand	0.0		1.28	245.99	0.88	217.64	217.64	0.91	0.766	0.880	5.962	11.545	15.08	0.00	0.00
37.070	201.870	1.610	4560.3	3164.4	154.265	0.807	1.71		Sand	0.0		1.28	244.23	0.88	215.65	215.65	0.91	0.766	0.879	5.152	9.965	13.01	0.00	0.00
37.240	194.360	1.382	4581.5	3175.0	148.203	0.720	1.69		Sand	0.0		1.28	235.14	0.88	206.42	206.42	0.91	0.766	0.885	2.767	5.386	7.03	0.00	0.00
37.400	185.040	1.247	4601.5	3185.0	140.782	0.683	1.69		Sand	0.0		1.28	223.87	0.87	195.12	195.12	0.91	0.766	0.898	1.451	2.868	3.74	0.00	0.00
37.570	189.160	1.022	4622.8	3195.7	143.708	0.547	1.63		Sand	0.0		1.28	228.85	0.87	199.76	199.76	0.91	0.766	0.892	1.864	3.657	4.78	0.00	0.00
37.730	203.930	0.845	4642.8	3205.7	154.818	0.419	1.53		Sand	0.0		1.28	246.72	0.88	217.15	217.15	0.91	0.766	0.875	5.748	11.070	14.46	0.00	0.00
37.890	217.120	0.965	4662.8	3215.7	164.682	0.449	1.53		Sand	0.0		1.28	262.68	0.89	232.83	232.83	0.91	0.766	0.874	21.261	40.902	53.42	0.00	0.00
38.060	195.480	1.907	4684.0	3226.3	147.838	0.987	1.78		Sand	5.3	205.22	1.28	262.68	0.89	232.63	233.02	0.91	0.766	0.873	21.641	41.585	54.31	0.00	0.00
38.220	124.330	2.705	4704.0	3236.4	93.224	2.217	2.17		Sand	36.5	205.22	1.28	262.68	0.89	234.82	328.83	0.91	0.766	0.873	#########	########	##########	0.00	0.00
38.390	42.720	1.882	4725.3	3247.0	24.858	4.663	2.81		Clay	87.4			40.38	0.89	n.a.	n.a.	0.90	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.550	23.400	1.205	4745.3	3257.0	12.912	5.732	3.08		Clay	100.0			22.12	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.710	23.430	1.079	4765.3	3267.0	12.885	5.125	3.05		Clay	100.0			22.15	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	28.170	1.540	4786.5	3277.7	15.729	5.973	3.03		Clay	100.0			26.63	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	33.940	1.496	4806.5	3287.7	19.185	4.743	2.89		Clay	94.6			32.08	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	32.960	1.564	4827.8	3298.3	18.522	5.121	2.93		Clay	97.2			31.15	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	40.760	2.074	4847.8	3308.3	23.175	5.409	2.87		Clay	92.7			38.53	0.89	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	77.920	1.909	4867.8	3318.4	56.974	2.529	2.36		Sand	51.9	140.26	1.55	217.40	0.89	193.07	291.43	0.90	0.765	0.865	82546.010	########	205329.82	0.00	0.00
39.700	116.670	1.547	4889.0	3329.0	86.075	1.354	2.05		Sand	26.6	140.26	1.55	217.40	0.89	192.91	260.52	0.90	0.765	0.864	495.949	942.761	1232.43	0.00	0.00
39.860	148.390	1.270	4909.0	3339.0	109.805	0.870	1.84		Sand	10.3		1.55	217.40	0.86	186.82	197.88	0.90	0.765	0.883	1.680	3.264	4.27	0.00	0.00
40.030	146.880	1.170	4930.3	3349.7	108.489	0.810	1.83		Sand	9.0	140.26	1.55	217.40	0.86	186.05	192.93	0.90	0.765	0.889	1.297	2.536	3.32	0.00	0.00
40.190	125.680	0.941	4950.3	3359.7	92.417	0.764	1.87		Sand	12.2	140.26	1.55	217.40	0.86	187.40	206.29	0.90	0.765	0.869	2.745	5.248	6.86	0.00	0.00
40.350	108.200	1.265	4970.3	3369.7	79.180	1.197	2.04		Sand	26.0	140.26	1.55	217.40	0.88	192.29	258.48	0.90	0.765	0.860	376.878	713.394	933.05	0.00	0.00
40.520	96.860	1.730	4991.5	3380.3	70.567	1.834	2.20		Sand	38.8	140.26	1.55	217.40	0.88	192.13	279.09	0.90	0.764	0.859	8501.562	########	21027.56	0.00	0.00
40.680	81.030	2.383	5011.5	3390.3	58.635	3.035	2.41		Sand	55.6	140.26	1.55	217.40	0.88	191.98	292.25	0.90	0.764	0.859	97124.240	########	240010.35	0.00	0.00
40.850	51.890	2.174	5032.8	3401.0	29.035	4.403	2.74		Clay	82.1			49.05	0.88	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	44.110	1.713	5052.8	3411.0	24.382	4.119	2.78		Clay	85.1			41.69	0.88	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	34.040	1.259	5072.8	3421.0	18.418	3.995	2.86		Clay	91.8			32.17	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	32.890	1.606	5094.0	3431.7	17.684	5.293	2.95		Clay	99.2			31.09	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	34.030	1.811	5114.0	3441.7	18.289	5.754	2.97		Clay	100.0			32.16	0.88	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	60.620	1.342	5135.3	3452.3	42.957	2.312	2.43		Sand	57.0			57.30	0.79	45.17	105.67	0.89	0.764	0.946	0.145	0.177	0.23	0.03	0.06
41.830	52.460	1.479	5155.3	3462.3	28.814	2.964	2.63		Clay	73.2			49.58	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	30.760	1.270	5175.3	3472.4	16.227	4.508	2.94		Clay	97.9			29.07	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	17.110	0.727	5196.5	3483.0	8.333	5.009	3.19		Clay	100.0			16.17	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 4

PGA (A_{max}) 0.75

Total Settlement: 0.69 (Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
42.320	14.660	0.637	5216.5	3493.0	6.900	5.283	3.27		Clay	100.0			13.86	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.490	16.060	0.691	5237.8	3503.7	7.673	5.142	3.23		Clay	100.0			15.18	0.88	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	26.110	1.399	5257.8	3513.7	13.366	5.960	3.08		Clay	100.0			24.68	0.87	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	41.560	2.013	5277.8	3523.7	22.091	5.173	2.87		Clay	92.9			39.28	0.87	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	36.760	1.859	5299.0	3534.3	19.302	5.451	2.93		Clay	97.6			34.74	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	29.390	1.259	5319.0	3544.3	15.083	4.708	2.97		Clay	100.0			27.78	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	24.300	0.878	5340.3	3555.0	12.169	4.058	3.00		Clay	100.0			22.97	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.470	22.750	0.743	5360.3	3565.0	11.259	3.704	3.01		Clay	100.0			21.50	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	22.040	0.763	5381.5	3575.6	10.823	3.942	3.04		Clay	100.0			20.83	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	21.890	0.737	5401.5	3585.7	10.703	3.843	3.04		Clay	100.0			20.69	0.87	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	21.060	0.728	5421.5	3595.7	10.206	3.970	3.06		Clay	100.0			19.91	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	21.010	0.639	5442.8	3606.3	10.143	3.496	3.03		Clay	100.0			19.86	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.290	21.300	0.636	5462.8	3616.3	10.269	3.423	3.02		Clay	100.0			20.13	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	22.730	0.723	5484.0	3627.0	11.022	3.617	3.01		Clay	100.0			21.48	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.620	27.560	1.105	5504.0	3637.0	13.642	4.453	2.99		Clay	100.0			26.05	0.87	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.780	35.720	1.325	5524.0	3647.0	18.074	4.021	2.87		Clay	92.4			33.76	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.950	39.500	1.550	5545.3	3657.7	20.082	4.221	2.85		Clay	90.7			37.33	0.87	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.110	41.730	1.566	5565.3	3667.7	21.238	4.020	2.81		Clay	88.1			39.44	0.86	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.280	39.680	1.608	5586.5	3678.3	20.056	4.358	2.86		Clay	91.5			37.50	0.86	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.440	39.400	1.530	5606.5	3688.3	19.845	4.180	2.85		Clay	90.8			37.24	0.86	n.a.	n.a.	0.88	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.600	38.760	1.514	5626.5	3698.3	19.439	4.211	2.86		Clay	91.5			36.64	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.770	39.900	1.424	5647.8	3709.0	19.993	3.840	2.82		Clay	88.7			37.71	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
45.930	41.220	1.590	5667.8	3719.0	20.643	4.143	2.83		Clay	89.6			38.96	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.100	44.620	1.838	5689.0	3729.6	22.402	4.399	2.82		Clay	88.8			42.17	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.260	44.230	1.911	5709.0	3739.7	22.128	4.619	2.84		Clay	90.2			41.81	0.86	n.a.	n.a.	0.88	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.420	42.520	1.805	5729.0	3749.7	21.151	4.550	2.85		Clay	91.1			40.19	0.86	n.a.	n.a.	0.88	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.590	44.360	1.684	5750.3	3760.3	22.065	4.058	2.80		Clay	87.3			41.93	0.86	n.a.	n.a.	0.88	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.750	44.130	1.618	5770.3	3770.3	21.879	3.924	2.80		Clay	86.8			41.71	0.86	n.a.	n.a.	0.87	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
46.920	43.000	1.572	5791.5	3781.0	21.214	3.919	2.81		Clay	87.6			40.64	0.86	n.a.	n.a.	0.87	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.080	41.110	1.537	5811.5	3791.0	20.155	4.023	2.83		Clay	89.5			38.86	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.240	39.600	1.460	5831.5	3801.0	19.302	3.979	2.84		Clay	90.4			37.43	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.410	38.300	1.399	5852.8	3811.6	18.561	3.955	2.85		Clay	91.4			36.20	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.570	37.130	1.400	5872.8	3821.7	17.895	4.094	2.88		Clay	93.1			35.09	0.86	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.740	35.220	1.380	5894.0	3832.3	16.843	4.277	2.91		Clay	95.7			33.29	0.85	n.a.	n.a.	0.87	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
47.900	32.620	1.228	5914.0	3842.3	15.440	4.140	2.93		Clay	97.3			30.83	0.85	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.060	31.470	1.102	5934.0	3852.3	14.798	3.867	2.93		Clay	97.0			29.74	0.85	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.230	31.310	1.023	5955.3	3863.0	14.669	3.612	2.91		Clay	95.8			29.59	0.85	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.390	30.430	0.961	5975.3	3873.0	14.171	3.502	2.91		Clay	96.1			28.76	0.85	n.a.	n.a.	0.87	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.560	27.480	0.998	5996.5	3883.6	12.608	4.076	2.99		Clay	100.0			25.97	0.85	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.720	27.090	0.939	6016.5	3893.7	12.370	3.900	2.99		Clay	100.0			25.60	0.85	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
48.880	24.620	0.882	6036.5	3903.7	11.067	4.084	3.04		Clay	100.0			23.27	0.85	n.a.	n.a.	0.87	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.050	22.770	0.716	6057.8	3914.3	10.087	3.627	3.04		Clay	100.0			21.52	0.85	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.210	25.380	0.681	6077.8	3924.3	11.386	3.048	2.95		Clay	99.4			23.99	0.85	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.380	28.440	0.854	6099.0	3935.0	12.905	3.365	2.94		Clay	97.9			26.88	0.85	n.a.	n.a.	0.87	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.540	39.810	1.097	6119.0	3945.0	18.632	2.984	2.78		Clay	85.2			37.63	0.85	n.a.	n.a.	0.86	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.700	36.960	1.166	6139.0	3955.0	17.138	3.440	2.84		Clay	90.5			34.93	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
49.870	36.270	1.204	6160.3	3965.6	16.739	3.626	2.87		Clay	92.3			34.28	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.030	33.770	1.390	6180.3	3975.7	15.434	4.531	2.95		Clay	99.3			31.92	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.200	34.810	1.435	6201.5	3986.3	15.909	4.527	2.94		Clay	98.5			32.90	0.85	n.a.	n.a.	0.86	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.360	30.950	1.313	6221.5	3996.3	13.932	4.716	3.00		Clay	100.0			29.25	0.85	n.a.	n.a.	0.86	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.520	28.570	1.226	6241.5	4006.3	12.705	4.815	3.04		Clay	100.0			27.00	0.85	n.a.	n.a.	0.86	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.690	29.880	1.463	6262.8	4017.0	13.318	5.471	3.06		Clay	100.0			28.24	0.84	n.a.	n.a.	0.86	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
50.850	38.500	2.357	6282.8	4027.0	17.561	6.667	3.02		Clay	100.0			36.39	0.84	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.020	86.040	2.594	6304.0	4037.6	56.715	3.130	2.43		Sand	57.1			81.32	0.75	60.98	125.88	0.86	0.751	0.916	0.186	0.243	0.32	0.03	0.00
51.180	80.840	2.830	6324.0	4047.6	53.085	3.643	2.49		Sand	62.5			76.41	0.75	56.99	122.39	0.86	0.751	0.918	0.177	0.228	0.30	0.03	0.00
51.350	51.260	2.172	6345.3	4058.3	23.698	4.517	2.81		Clay	87.9			48.45	0.84	n.a.	n.a.	0.86	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.510	31.980	1.433	6365.3	4068.3	14.157	4.977	3.01		Clay	100.0			30.23	0.84	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.670	25.950	1.070	6385.3	4078.3	11.160	4.701	3.07		Clay	100.0			24.53	0.84	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
51.840	22.840	1.090	6406.5	4089.0	9.605	5.551	3.17		Clay	100.0			21.59	0.84	n.a.	n.a.	0.86	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.000	24.050	0.970	6426.5	4099.0	10.167	4.653	3.10		Clay	100.0			22.73	0.84	n.a.	n.a.	0.86	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.170	21.220	0.820	6447.8	4109.6	8.758	4.555	3.15		Clay	100.0			20.06	0.84	n.a.	n.a.	0.85	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.330	19.300	0.707	6467.8	4119.6	7.800	4.401	3.18		Clay	100.0			18.24	0.84	n.a.	n.a.	0.85	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.490	18.600	0.661	6487.8	4129.7	7.437	4.304	3.19		Clay	100.0			17.58	0.84	n.a.	n.a.	0.85	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.660	19.350	0.659	6509.0	4140.3	7.775	4.095	3.16		Clay	100.0			18.29	0.84	n.a.	n.a.	0.85	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	4

PGA (A_{max})	0.75

Total Settlement:	0.69	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
52.820	19.530	0.643	6529.0	4150.3	7.838	3.956	3.15		Clay	100.0			18.46	0.84	n.a.	n.a.	0.85	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
52.990	19.950	0.731	6550.3	4161.0	8.015	4.386	3.17		Clay	100.0			18.86	0.84	n.a.	n.a.	0.85	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.150	22.620	1.411	6570.3	4171.0	9.271	7.298	3.26		Clay	100.0			21.38	0.84	n.a.	n.a.	0.85	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.310	45.330	2.461	6590.3	4181.0	20.108	5.856	2.94		Clay	98.2			42.84	0.84	n.a.	n.a.	0.85	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.480	51.080	3.257	6611.5	4191.6	22.795	6.817	2.95		Clay	98.7			48.28	0.83	n.a.	n.a.	0.85	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.640	67.710	2.471	6631.5	4201.6	30.652	3.837	2.68		Clay	77.5			64.00	0.83	n.a.	n.a.	0.85	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
53.810	93.370	1.945	6652.8	4212.3	60.321	2.160	2.30		Sand	46.7			88.25	0.74	65.00	126.62	0.85	0.746	0.910	0.188	0.245	0.33	0.03	0.00
53.970	52.740	1.729	6672.8	4222.3	23.401	3.499	2.74		Clay	82.5			49.85	0.83	n.a.	n.a.	0.85	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.130	22.490	1.085	6692.8	4232.3	9.046	5.666	3.20		Clay	100.0			21.26	0.83	n.a.	n.a.	0.85	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.300	19.340	0.584	6714.0	4243.0	7.534	3.651	3.15		Clay	100.0			18.28	0.83	n.a.	n.a.	0.85	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.460	19.690	0.647	6734.0	4253.0	7.676	3.961	3.16		Clay	100.0			18.61	0.83	n.a.	n.a.	0.85	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.630	21.960	0.652	6755.3	4263.6	8.717	3.506	3.08		Clay	100.0			20.76	0.83	n.a.	n.a.	0.85	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.790	22.730	1.016	6775.3	4273.6	9.052	5.254	3.18		Clay	100.0			21.48	0.83	n.a.	n.a.	0.84	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
54.950	22.950	1.034	6795.3	4283.7	9.129	5.290	3.17		Clay	100.0			21.69	0.83	n.a.	n.a.	0.84	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.120	24.210	0.824	6816.5	4294.3	9.688	3.962	3.08		Clay	100.0			22.88	0.83	n.a.	n.a.	0.84	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.280	19.300	0.630	6836.5	4304.3	7.379	3.969	3.17		Clay	100.0			18.24	0.83	n.a.	n.a.	0.84	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.450	19.540	0.625	6857.8	4315.0	7.468	3.879	3.16		Clay	100.0			18.47	0.83	n.a.	n.a.	0.84	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.610	19.720	0.740	6877.8	4325.0	7.529	4.547	3.20		Clay	100.0			18.64	0.83	n.a.	n.a.	0.84	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.770	24.800	0.829	6897.8	4335.0	9.851	3.885	3.07		Clay	100.0			23.44	0.83	n.a.	n.a.	0.84	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
55.940	25.010	0.970	6919.0	4345.6	9.918	4.502	3.10		Clay	100.0			23.64	0.83	n.a.	n.a.	0.84	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.100	30.950	1.331	6939.0	4355.6	12.618	4.842	3.04		Clay	100.0			29.25	0.83	n.a.	n.a.	0.84	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.270	24.600	1.211	6960.3	4366.3	9.674	5.732	3.18		Clay	100.0			23.25	0.83	n.a.	n.a.	0.84	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.430	20.090	0.730	6980.3	4376.3	7.586	4.398	3.19		Clay	100.0			18.99	0.83	n.a.	n.a.	0.84	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.590	20.320	0.565	7000.3	4386.3	7.669	3.357	3.12		Clay	100.0			19.21	0.83	n.a.	n.a.	0.84	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.760	19.090	0.539	7021.5	4397.0	7.086	3.458	3.16		Clay	100.0			18.04	0.82	n.a.	n.a.	0.84	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
56.920	19.590	0.513	7041.5	4407.0	7.293	3.191	3.13		Clay	100.0			18.52	0.82	n.a.	n.a.	0.84	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.090	19.500	0.579	7062.8	4417.6	7.230	3.623	3.16		Clay	100.0			18.43	0.82	n.a.	n.a.	0.84	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.250	20.260	0.591	7082.8	4427.6	7.552	3.533	3.14		Clay	100.0			19.15	0.82	n.a.	n.a.	0.84	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.410	19.610	0.590	7102.8	4437.6	7.237	3.672	3.16		Clay	100.0			18.53	0.82	n.a.	n.a.	0.84	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.580	19.320	0.580	7124.0	4448.3	7.085	3.679	3.17		Clay	100.0			18.26	0.82	n.a.	n.a.	0.83	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.740	19.670	0.607	7144.0	4458.3	7.222	3.771	3.17		Clay	100.0			18.59	0.82	n.a.	n.a.	0.83	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
57.910	20.220	0.625	7165.3	4468.9	7.446	3.757	3.16		Clay	100.0			19.11	0.82	n.a.	n.a.	0.83	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.070	19.080	0.645	7185.3	4479.0	6.916	4.165	3.21		Clay	100.0			18.03	0.82	n.a.	n.a.	0.83	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.230	18.950	0.602	7205.3	4489.0	6.838	3.922	3.20		Clay	100.0			17.91	0.82	n.a.	n.a.	0.83	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.400	19.970	0.674	7226.5	4499.6	7.270	4.120	3.19		Clay	100.0			18.88	0.82	n.a.	n.a.	0.83	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.560	21.190	0.682	7246.5	4509.6	7.791	3.880	3.15		Clay	100.0			20.03	0.82	n.a.	n.a.	0.83	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.730	20.410	0.816	7267.8	4520.3	7.423	4.863	3.22		Clay	100.0			19.29	0.82	n.a.	n.a.	0.83	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
58.890	27.060	0.980	7287.8	4530.3	10.338	4.183	3.07		Clay	100.0			25.58	0.82	n.a.	n.a.	0.83	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.060	30.330	1.483	7309.0	4540.9	11.749	5.561	3.10		Clay	100.0			28.67	0.82	n.a.	n.a.	0.83	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.220	37.340	1.812	7329.0	4551.0	14.799	5.381	3.02		Clay	100.0			35.29	0.82	n.a.	n.a.	0.83	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.380	33.380	2.179	7349.0	4561.0	13.026	7.336	3.15		Clay	100.0			31.55	0.82	n.a.	n.a.	0.83	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.550	53.010	2.317	7370.3	4571.6	21.579	4.697	2.85		Clay	91.3			50.10	0.82	n.a.	n.a.	0.83	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.710	54.410	2.639	7390.3	4581.6	22.138	5.203	2.87		Clay	93.0			51.43	0.82	n.a.	n.a.	0.83	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
59.880	55.560	2.427	7411.5	4592.3	22.583	4.681	2.84		Clay	90.0			52.51	0.82	n.a.	n.a.	0.83	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.040	68.050	2.613	7431.5	4602.3	27.958	4.062	2.73		Clay	81.2			64.32	0.81	n.a.	n.a.	0.83	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.200	85.860	2.955	7451.5	4612.3	35.615	3.597	2.61		Clay	72.1			81.15	0.81	n.a.	n.a.	0.82	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.370	77.660	3.280	7472.8	4622.9	31.981	4.436	2.71		Clay	79.8			73.40	0.81	n.a.	n.a.	0.82	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.530	50.030	2.461	7492.8	4633.0	19.980	5.316	2.91		Clay	96.1			47.29	0.81	n.a.	n.a.	0.82	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.700	39.020	2.176	7514.0	4643.6	15.188	6.170	3.05		Clay	100.0			36.88	0.81	n.a.	n.a.	0.82	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
60.860	29.730	1.637	7534.0	4653.6	11.158	6.306	3.15		Clay	100.0			28.10	0.81	n.a.	n.a.	0.82	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.020	30.070	1.277	7554.0	4663.6	11.276	4.858	3.08		Clay	100.0			28.42	0.81	n.a.	n.a.	0.82	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.190	28.580	1.187	7575.3	4674.3	10.608	4.789	3.10		Clay	100.0			27.01	0.81	n.a.	n.a.	0.82	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.350	25.840	1.137	7595.3	4684.3	9.411	5.159	3.16		Clay	100.0			24.42	0.81	n.a.	n.a.	0.82	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.520	23.980	1.108	7616.5	4694.9	8.593	5.493	3.20		Clay	100.0			22.67	0.81	n.a.	n.a.	0.82	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.680	22.150	0.895	7636.5	4704.9	7.793	4.881	3.21		Clay	100.0			20.94	0.81	n.a.	n.a.	0.82	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
61.840	21.240	0.721	7656.5	4715.0	7.386	4.143	3.18		Clay	100.0			20.08	0.81	n.a.	n.a.	0.82	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.010	20.100	0.643	7677.8	4725.6	6.882	3.956	3.20		Clay	100.0			19.00	0.81	n.a.	n.a.	0.82	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.170	19.040	0.595	7697.8	4735.6	6.416	3.913	3.22		Clay	100.0			18.00	0.81	n.a.	n.a.	0.82	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.340	19.740	0.593	7719.0	4746.3	6.692	3.735	3.19		Clay	100.0			18.66	0.81	n.a.	n.a.	0.82	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.500	20.460	0.599	7739.0	4756.3	6.976	3.607	3.17		Clay	100.0			19.34	0.81	n.a.	n.a.	0.82	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.660	19.360	0.583	7759.0	4766.3	6.496	3.767	3.21		Clay	100.0			18.30	0.81	n.a.	n.a.	0.82	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.830	17.590	0.522	7780.3	4776.9	5.736	3.810	3.26		Clay	100.0			16.63	0.81	n.a.	n.a.	0.81	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
62.990	17.490	0.527	7800.3	4787.0	5.678	3.879	3.26		Clay	100.0			16.53	0.81	n.a.	n.a.	0.81	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.160	18.140	0.503	7821.5	4797.6	5.932	3.537	3.23		Clay	100.0			17.15	0.81	n.a.	n.a.	0.81	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	4

PGA (A_{max})	0.75

Total Settlement:	0.69	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, \sigma'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
63.320	18.270	0.517	7841.5	4807.6	5.969	3.604	3.23		Clay	100.0			17.27	0.81	n.a.	n.a.	0.81	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.480	18.500	0.510	7861.5	4817.6	6.048	3.500	3.22		Clay	100.0			17.49	0.80	n.a.	n.a.	0.81	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.650	18.000	0.502	7882.8	4828.3	5.823	3.572	3.23		Clay	100.0			17.01	0.80	n.a.	n.a.	0.81	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.810	18.530	0.515	7902.8	4838.3	6.026	3.533	3.22		Clay	100.0			17.51	0.80	n.a.	n.a.	0.81	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
63.980	20.080	0.625	7924.0	4848.9	6.648	3.875	3.21		Clay	100.0			18.98	0.80	n.a.	n.a.	0.81	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.140	22.110	0.707	7944.0	4858.9	7.466	3.900	3.17		Clay	100.0			20.90	0.80	n.a.	n.a.	0.81	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.300	21.180	0.737	7964.0	4869.0	7.064	4.287	3.21		Clay	100.0			20.02	0.80	n.a.	n.a.	0.81	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.470	20.030	0.708	7985.3	4879.6	6.573	4.417	3.24		Clay	100.0			18.93	0.80	n.a.	n.a.	0.81	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.630	19.700	0.705	8005.3	4889.6	6.421	4.492	3.25		Clay	100.0			18.62	0.80	n.a.	n.a.	0.81	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.800	19.530	0.662	8026.5	4900.3	6.333	4.269	3.25		Clay	100.0			18.46	0.80	n.a.	n.a.	0.81	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
64.960	19.150	0.639	8046.5	4910.3	6.161	4.222	3.25		Clay	100.0			18.10	0.80	n.a.	n.a.	0.81	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.120	20.070	0.693	8066.5	4920.3	6.519	4.324	3.24		Clay	100.0			18.97	0.80	n.a.	n.a.	0.81	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.290	20.460	0.740	8087.8	4930.9	6.658	4.505	3.24		Clay	100.0			19.34	0.80	n.a.	n.a.	0.81	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.450	20.020	0.721	8107.8	4941.0	6.463	4.518	3.25		Clay	100.0			18.92	0.80	n.a.	n.a.	0.81	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.620	21.130	0.718	8129.0	4951.6	6.893	4.207	3.21		Clay	100.0			19.97	0.80	n.a.	n.a.	0.80	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.780	21.890	0.728	8149.0	4961.6	7.181	4.086	3.19		Clay	100.0			20.69	0.80	n.a.	n.a.	0.80	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
65.940	21.600	0.742	8169.0	4971.6	7.046	4.235	3.21		Clay	100.0			20.42	0.80	n.a.	n.a.	0.80	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.110	21.560	0.747	8190.3	4982.3	7.011	4.275	3.21		Clay	100.0			20.38	0.80	n.a.	n.a.	0.80	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.270	21.210	0.718	8210.3	4992.3	6.853	4.197	3.21		Clay	100.0			20.05	0.80	n.a.	n.a.	0.80	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.440	21.500	0.742	8231.5	5002.9	6.950	4.265	3.21		Clay	100.0			20.32	0.80	n.a.	n.a.	0.80	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.600	21.730	0.755	8251.5	5012.9	7.024	4.288	3.21		Clay	100.0			20.54	0.80	n.a.	n.a.	0.80	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.770	21.830	0.775	8272.8	5023.6	7.044	4.380	3.22		Clay	100.0			20.63	0.80	n.a.	n.a.	0.80	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
66.930	21.650	0.764	8292.8	5033.6	6.955	4.367	3.22		Clay	100.0			20.46	0.80	n.a.	n.a.	0.80	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.090	21.480	0.729	8312.8	5043.6	6.870	4.206	3.21		Clay	100.0			20.30	0.80	n.a.	n.a.	0.80	0.717	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.260	21.590	0.739	8334.0	5054.3	6.894	4.242	3.22		Clay	100.0			20.41	0.79	n.a.	n.a.	0.80	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.420	21.740	0.770	8354.0	5064.3	6.936	4.384	3.22		Clay	100.0			20.55	0.79	n.a.	n.a.	0.80	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.590	22.440	0.830	8375.3	5074.9	7.193	4.545	3.22		Clay	100.0			21.21	0.79	n.a.	n.a.	0.80	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.750	22.710	0.890	8395.3	5084.9	7.281	4.807	3.23		Clay	100.0			21.47	0.79	n.a.	n.a.	0.80	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
67.910	23.560	0.892	8415.3	5094.9	7.597	4.611	3.20		Clay	100.0			22.27	0.79	n.a.	n.a.	0.80	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.080	23.520	0.921	8436.5	5105.6	7.561	4.774	3.21		Clay	100.0			22.23	0.79	n.a.	n.a.	0.80	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.240	24.130	0.944	8456.5	5115.6	7.781	4.745	3.20		Clay	100.0			22.81	0.79	n.a.	n.a.	0.80	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.410	26.570	1.051	8477.8	5126.2	8.712	4.707	3.16		Clay	100.0			25.11	0.79	n.a.	n.a.	0.79	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.570	26.630	1.103	8497.8	5136.3	8.715	4.929	3.17		Clay	100.0			25.17	0.79	n.a.	n.a.	0.79	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.730	25.620	1.082	8517.8	5146.3	8.302	5.064	3.20		Clay	100.0			24.22	0.79	n.a.	n.a.	0.79	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
68.900	25.730	1.048	8539.0	5156.9	8.323	4.882	3.18		Clay	100.0			24.32	0.79	n.a.	n.a.	0.79	0.712	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.060	26.600	1.048	8559.0	5166.9	8.640	4.696	3.16		Clay	100.0			25.14	0.79	n.a.	n.a.	0.79	0.712	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.230	25.500	1.035	8580.3	5177.6	8.193	4.881	3.19		Clay	100.0			24.10	0.79	n.a.	n.a.	0.79	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.390	24.010	0.990	8600.3	5187.6	7.599	5.023	3.22		Clay	100.0			22.69	0.79	n.a.	n.a.	0.79	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.550	22.780	0.943	8620.3	5197.6	7.107	5.105	3.25		Clay	100.0			21.53	0.79	n.a.	n.a.	0.79	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.720	22.170	0.874	8641.5	5208.3	6.854	4.898	3.25		Clay	100.0			20.95	0.79	n.a.	n.a.	0.79	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
69.880	21.540	0.822	8661.5	5218.3	6.596	4.774	3.26		Clay	100.0			20.36	0.79	n.a.	n.a.	0.79	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.050	22.570	0.880	8682.8	5228.9	6.972	4.826	3.24		Clay	100.0			21.33	0.79	n.a.	n.a.	0.79	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.210	23.160	0.937	8702.8	5238.9	7.180	4.981	3.24		Clay	100.0			21.89	0.79	n.a.	n.a.	0.79	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.370	22.820	0.958	8722.8	5248.9	7.033	5.189	3.26		Clay	100.0			21.57	0.79	n.a.	n.a.	0.79	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.540	22.720	0.959	8744.0	5259.6	6.977	5.228	3.26		Clay	100.0			21.47	0.79	n.a.	n.a.	0.79	0.708	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.700	23.100	1.000	8764.0	5269.6	7.104	5.341	3.26		Clay	100.0			21.83	0.79	n.a.	n.a.	0.79	0.708	n.a.	n.a.	n.a.	n.a.	0.00	0.00
70.870	22.770	0.974	8785.3	5280.2	6.961	5.300	3.27		Clay	100.0			21.52	0.79	n.a.	n.a.	0.79	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.030	23.370	0.930	8805.3	5290.3	7.171	4.902	3.24		Clay	100.0			22.09	0.79	n.a.	n.a.	0.79	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.190	23.340	1.035	8825.3	5300.3	7.142	5.469	3.27		Clay	100.0			22.06	0.78	n.a.	n.a.	0.78	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.360	24.210	1.040	8846.5	5310.9	7.451	5.258	3.24		Clay	100.0			22.88	0.78	n.a.	n.a.	0.78	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.520	23.090	0.927	8866.5	5320.9	7.013	4.968	3.25		Clay	100.0			21.82	0.78	n.a.	n.a.	0.78	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.690	23.460	0.928	8887.8	5331.6	7.133	4.878	3.24		Clay	100.0			22.17	0.78	n.a.	n.a.	0.78	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
71.850	24.520	1.044	8907.8	5341.6	7.513	5.204	3.24		Clay	100.0			23.18	0.78	n.a.	n.a.	0.78	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.010	24.850	1.082	8927.8	5351.6	7.619	5.306	3.24		Clay	100.0			23.49	0.78	n.a.	n.a.	0.78	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.180	25.270	1.098	8949.0	5362.2	7.756	5.279	3.23		Clay	100.0			23.88	0.78	n.a.	n.a.	0.78	0.704	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.340	24.610	1.138	8969.0	5372.3	7.492	5.655	3.26		Clay	100.0			23.26	0.78	n.a.	n.a.	0.78	0.704	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.510	28.300	1.221	8990.3	5382.9	8.845	5.130	3.18		Clay	100.0			26.75	0.78	n.a.	n.a.	0.78	0.703	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.670	29.270	1.432	9010.3	5392.9	9.184	5.780	3.20		Clay	100.0			27.67	0.78	n.a.	n.a.	0.78	0.703	n.a.	n.a.	n.a.	n.a.	0.00	0.00
72.830	31.800	1.693	9030.3	5402.9	10.100	6.204	3.18		Clay	100.0			30.06	0.78	n.a.	n.a.	0.78	0.703	n.a.	n.a.	n.a.	n.a.	0.00	0.00
73.000	33.800	1.832	9051.5	5413.6	10.815	6.259	3.16		Clay	100.0			31.95	0.78	n.a.	n.a.	0.78	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
73.160	33.550	1.896	9071.5	5423.6	10.699	6.536	3.18		Clay	100.0			31.71	0.78	n.a.	n.a.	0.78	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
73.330	34.110	1.875	9092.8	5434.2	10.881	6.342	3.16		Clay	100.0			32.24	0.78	n.a.	n.a.	0.78	0.701	n.a.	n.a.	n.a.	n.a.	0.00	0.00
73.490	37.130	2.082	9112.8	5444.3	11.966	6.391	3.13		Clay	100.0			35.09	0.78	n.a.	n.a.	0.78	0.701	n.a.	n.a.	n.a.	n.a.	0.00	0.00
73.650	42.450	2.067	9132.8	5454.3	13.891	5.456	3.04		Clay	100.0			40.12	0.78	n.a.	n.a.	0.78	0.701	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	4

PGA (A_{max})	0.75

Total Settlement:	0.69	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
73.820	38.800	1.919	9154.0	5464.9	12.525	5.607	3.08		Clay	100.0			36.67	0.78	n.a.	n.a.	0.78	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
73.980	36.050	1.587	9174.0	5474.9	11.493	5.042	3.08		Clay	100.0			34.07	0.78	n.a.	n.a.	0.77	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
74.150	34.200	1.727	9195.3	5485.6	10.793	5.832	3.14		Clay	100.0			32.33	0.78	n.a.	n.a.	0.77	0.699	n.a.	n.a.	n.a.	n.a.	0.00	0.00
74.310	39.200	1.987	9215.3	5495.6	12.589	5.743	3.09		Clay	100.0			37.05	0.78	n.a.	n.a.	0.77	0.699	n.a.	n.a.	n.a.	n.a.	0.00	0.00
74.480	39.390	2.211	9236.5	5506.2	12.630	6.358	3.12		Clay	100.0			37.23	0.78	n.a.	n.a.	0.77	0.699	n.a.	n.a.	n.a.	n.a.	0.00	0.00
74.640	42.190	2.026	9256.5	5516.2	13.619	5.393	3.04		Clay	100.0			39.88	0.78	n.a.	n.a.	0.77	0.698	n.a.	n.a.	n.a.	n.a.	0.00	0.00
74.800	42.100	2.052	9276.5	5526.3	13.558	5.477	3.05		Clay	100.0			39.79	0.78	n.a.	n.a.	0.77	0.698	n.a.	n.a.	n.a.	n.a.	0.00	0.00
74.970	35.950	1.572	9297.8	5536.9	11.306	5.023	3.09		Clay	100.0			33.98	0.78	n.a.	n.a.	0.77	0.697	n.a.	n.a.	n.a.	n.a.	0.00	0.00
75.130	30.930	1.323	9317.8	5546.9	9.472	5.037	3.15		Clay	100.0			29.23	0.78	n.a.	n.a.	0.77	0.697	n.a.	n.a.	n.a.	n.a.	0.00	0.00
75.300	30.520	1.233	9339.0	5557.6	9.303	4.768	3.14		Clay	100.0			28.85	0.78	n.a.	n.a.	0.77	0.697	n.a.	n.a.	n.a.	n.a.	0.00	0.00
75.460	36.140	1.283	9359.0	5567.6	11.301	4.077	3.03		Clay	100.0			34.16	0.77	n.a.	n.a.	0.77	0.696	n.a.	n.a.	n.a.	n.a.	0.00	0.00
75.620	32.750	1.321	9379.0	5577.6	10.062	4.709	3.11		Clay	100.0			30.95	0.77	n.a.	n.a.	0.77	0.696	n.a.	n.a.	n.a.	n.a.	0.00	0.00
75.790	32.320	1.094	9400.3	5588.2	9.885	3.959	3.07		Clay	100.0			30.55	0.77	n.a.	n.a.	0.77	0.695	n.a.	n.a.	n.a.	n.a.	0.00	0.00
75.950	30.970	0.951	9420.3	5598.3	9.381	3.620	3.07		Clay	100.0			29.27	0.77	n.a.	n.a.	0.77	0.695	n.a.	n.a.	n.a.	n.a.	0.00	0.00
76.120	27.310	0.705	9441.5	5608.9	8.055	3.121	3.08		Clay	100.0			25.81	0.77	n.a.	n.a.	0.77	0.695	n.a.	n.a.	n.a.	n.a.	0.00	0.00
76.280	23.950	0.644	9461.5	5618.9	6.841	3.352	3.16		Clay	100.0			22.64	0.77	n.a.	n.a.	0.77	0.694	n.a.	n.a.	n.a.	n.a.	0.00	0.00
76.440	23.980	0.693	9481.5	5628.9	6.836	3.599	3.18		Clay	100.0			22.67	0.77	n.a.	n.a.	0.77	0.694	n.a.	n.a.	n.a.	n.a.	0.00	0.00
76.610	26.480	0.749	9502.8	5639.6	7.706	3.448	3.12		Clay	100.0			25.03	0.77	n.a.	n.a.	0.77	0.693	n.a.	n.a.	n.a.	n.a.	0.00	0.00
76.770	26.500	0.808	9522.8	5649.6	7.696	3.716	3.14		Clay	100.0			25.05	0.77	n.a.	n.a.	0.77	0.693	n.a.	n.a.	n.a.	n.a.	0.00	0.00
76.940	27.310	0.925	9544.0	5660.2	7.964	4.102	3.16		Clay	100.0			25.81	0.77	n.a.	n.a.	0.76	0.693	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.100	28.370	1.117	9564.0	5670.2	8.320	4.737	3.18		Clay	100.0			26.81	0.77	n.a.	n.a.	0.76	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.260	26.950	1.031	9584.0	5680.3	7.802	4.652	3.20		Clay	100.0			25.47	0.77	n.a.	n.a.	0.76	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.430	23.440	1.023	9605.3	5690.9	6.550	5.491	3.30		Clay	100.0			22.16	0.77	n.a.	n.a.	0.76	0.691	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.590	23.640	0.938	9625.3	5700.9	6.605	4.981	3.27		Clay	100.0			22.34	0.77	n.a.	n.a.	0.76	0.691	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.760	22.360	0.894	9646.5	5711.6	6.141	5.097	3.30		Clay	100.0			21.13	0.77	n.a.	n.a.	0.76	0.691	n.a.	n.a.	n.a.	n.a.	0.00	0.00
77.920	25.370	1.000	9666.5	5721.6	7.179	4.867	3.24		Clay	100.0			23.98	0.77	n.a.	n.a.	0.76	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.080	31.220	1.276	9686.5	5731.6	9.204	4.838	3.15		Clay	100.0			29.51	0.77	n.a.	n.a.	0.76	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.250	40.450	1.487	9707.8	5742.2	12.398	4.179	3.01		Clay	100.0			38.23	0.77	n.a.	n.a.	0.76	0.689	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.410	27.640	1.304	9727.8	5752.2	7.919	5.723	3.24		Clay	100.0			26.12	0.77	n.a.	n.a.	0.76	0.689	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.580	24.440	0.907	9749.0	5762.9	6.790	4.636	3.24		Clay	100.0			23.10	0.77	n.a.	n.a.	0.76	0.689	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.740	27.200	0.964	9769.0	5772.9	7.731	4.321	3.18		Clay	100.0			25.71	0.77	n.a.	n.a.	0.76	0.688	n.a.	n.a.	n.a.	n.a.	0.00	0.00
78.900	31.070	1.208	9789.0	5782.9	9.053	4.616	3.14		Clay	100.0			29.37	0.77	n.a.	n.a.	0.76	0.688	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.070	32.540	1.349	9810.3	5793.6	9.540	4.882	3.14		Clay	100.0			30.76	0.77	n.a.	n.a.	0.76	0.687	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.230	32.390	1.244	9830.3	5803.6	9.468	4.529	3.12		Clay	100.0			30.61	0.77	n.a.	n.a.	0.76	0.687	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.400	31.420	1.210	9851.5	5814.2	9.114	4.568	3.14		Clay	100.0			29.70	0.77	n.a.	n.a.	0.76	0.687	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.560	30.930	1.187	9871.5	5824.2	8.926	4.568	3.14		Clay	100.0			29.23	0.77	n.a.	n.a.	0.76	0.686	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.720	30.110	1.268	9891.5	5834.3	8.626	5.038	3.18		Clay	100.0			28.46	0.77	n.a.	n.a.	0.76	0.686	n.a.	n.a.	n.a.	n.a.	0.00	0.00
79.890	29.580	1.205	9912.8	5844.9	8.426	4.895	3.18		Clay	100.0			27.96	0.76	n.a.	n.a.	0.75	0.685	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.050	27.700	1.203	9932.8	5854.9	7.766	5.292	3.23		Clay	100.0			26.18	0.76	n.a.	n.a.	0.75	0.685	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.220	26.330	1.125	9954.0	5865.6	7.281	5.268	3.25		Clay	100.0			24.89	0.76	n.a.	n.a.	0.75	0.685	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.380	25.000	1.069	9974.0	5875.6	6.812	5.342	3.28		Clay	100.0			23.63	0.76	n.a.	n.a.	0.75	0.684	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.540	24.650	1.047	9994.0	5885.6	6.678	5.328	3.28		Clay	100.0			23.30	0.76	n.a.	n.a.	0.75	0.684	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.710	24.620	1.026	10015.3	5896.2	6.653	5.232	3.28		Clay	100.0			23.27	0.76	n.a.	n.a.	0.75	0.683	n.a.	n.a.	n.a.	n.a.	0.00	0.00
80.870	25.760	1.030	10035.3	5906.2	7.024	4.967	3.25		Clay	100.0			24.35	0.76	n.a.	n.a.	0.75	0.683	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.040	25.910	1.011	10056.5	5916.9	7.058	4.840	3.24		Clay	100.0			24.49	0.76	n.a.	n.a.	0.75	0.683	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.200	23.540	0.880	10076.5	5926.9	6.243	4.754	3.28		Clay	100.0			22.25	0.76	n.a.	n.a.	0.75	0.682	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.360	22.120	0.778	10096.5	5936.9	5.751	4.559	3.30		Clay	100.0			20.91	0.76	n.a.	n.a.	0.75	0.682	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.530	20.870	0.747	10117.8	5947.6	5.317	4.723	3.33		Clay	100.0			19.73	0.76	n.a.	n.a.	0.75	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.690	21.680	1.011	10137.8	5957.6	5.576	6.085	3.38		Clay	100.0			20.49	0.76	n.a.	n.a.	0.75	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
81.860	25.900	1.276	10159.0	5968.2	6.977	6.129	3.31		Clay	100.0			24.48	0.76	n.a.	n.a.	0.75	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.020	32.720	1.270	10179.0	5978.2	9.244	4.595	3.13		Clay	100.0			30.93	0.76	n.a.	n.a.	0.75	0.680	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.190	25.250	1.013	10200.3	5988.9	6.729	5.025	3.27		Clay	100.0			23.87	0.76	n.a.	n.a.	0.75	0.680	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.350	22.790	0.861	10220.3	5998.9	5.894	4.868	3.31		Clay	100.0			21.54	0.76	n.a.	n.a.	0.75	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.510	23.470	0.781	10240.3	6008.9	6.108	4.257	3.26		Clay	100.0			22.18	0.76	n.a.	n.a.	0.75	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.680	23.010	0.842	10261.5	6019.5	5.940	4.708	3.29		Clay	100.0			21.75	0.76	n.a.	n.a.	0.75	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
82.840	23.560	0.938	10281.5	6029.6	6.110	5.092	3.30		Clay	100.0			22.27	0.76	n.a.	n.a.	0.75	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.010	24.390	0.932	10302.8	6040.2	6.370	4.845	3.28		Clay	100.0			23.05	0.76	n.a.	n.a.	0.74	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.170	24.630	0.934	10322.8	6050.2	6.436	4.798	3.27		Clay	100.0			23.28	0.76	n.a.	n.a.	0.74	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.330	26.200	0.985	10342.8	6060.2	6.940	4.682	3.24		Clay	100.0			24.76	0.76	n.a.	n.a.	0.74	0.677	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.500	26.200	1.180	10364.0	6070.9	6.924	5.613	3.29		Clay	100.0			24.76	0.76	n.a.	n.a.	0.74	0.677	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.660	25.780	1.196	10384.0	6080.9	6.771	5.810	3.30		Clay	100.0			24.37	0.76	n.a.	n.a.	0.74	0.676	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.830	26.520	1.182	10405.3	6091.5	6.999	5.544	3.28		Clay	100.0			25.07	0.76	n.a.	n.a.	0.74	0.676	n.a.	n.a.	n.a.	n.a.	0.00	0.00
83.990	27.330	1.128	10425.3	6101.6	7.250	5.099	3.24		Clay	100.0			25.83	0.76	n.a.	n.a.	0.74	0.676	n.a.	n.a.	n.a.	n.a.	0.00	0.00
84.150	26.460	1.121	10445.3	6111.6	6.950	5.278	3.27		Clay	100.0			25.01	0.76	n.a.	n.a.	0.74	0.675	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 4

PGA (A_{max}) 0.75

Total Settlement: 0.69 (Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	Ks for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
84.320	26.260	1.072	10466.5	6122.2	6.869	5.100	3.26		Clay	100.0			24.82	0.76	n.a.	n.a.	0.74	0.675	n.a.	n.a.	n.a.	n.a.	0.00	0.00
84.480	26.880	1.065	10486.5	6132.2	7.057	4.921	3.24		Clay	100.0			25.41	0.76	n.a.	n.a.	0.74	0.674	n.a.	n.a.	n.a.	n.a.	0.00	0.00
84.650	28.150	1.186	10507.8	6142.9	7.455	5.180	3.24		Clay	100.0			26.61	0.75	n.a.	n.a.	0.74	0.674	n.a.	n.a.	n.a.	n.a.	0.00	0.00
84.810	30.400	1.178	10527.8	6152.9	8.171	4.686	3.18		Clay	100.0			28.73	0.75	n.a.	n.a.	0.74	0.674	n.a.	n.a.	n.a.	n.a.	0.00	0.00
84.970	31.140	1.267	10547.8	6162.9	8.394	4.897	3.18		Clay	100.0			29.43	0.75	n.a.	n.a.	0.74	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
85.140	33.070	1.315	10569.0	6173.5	9.001	4.732	3.15		Clay	100.0			31.26	0.75	n.a.	n.a.	0.74	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
85.300	30.670	1.236	10589.0	6183.6	8.207	4.871	3.19		Clay	100.0			28.99	0.75	n.a.	n.a.	0.74	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
85.470	28.220	1.114	10610.3	6194.2	7.399	4.861	3.22		Clay	100.0			26.67	0.75	n.a.	n.a.	0.74	0.672	n.a.	n.a.	n.a.	n.a.	0.00	0.00
85.630	28.460	1.158	10630.3	6204.2	7.461	5.004	3.23		Clay	100.0			26.90	0.75	n.a.	n.a.	0.74	0.672	n.a.	n.a.	n.a.	n.a.	0.00	0.00
85.790	29.050	1.228	10650.3	6214.2	7.636	5.177	3.23		Clay	100.0			27.46	0.75	n.a.	n.a.	0.74	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
85.960	29.770	1.296	10671.5	6224.9	7.851	5.305	3.23		Clay	100.0			28.14	0.75	n.a.	n.a.	0.74	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
86.120	29.080	1.310	10691.5	6234.9	7.613	5.517	3.25		Clay	100.0			27.49	0.75	n.a.	n.a.	0.74	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
86.290	28.300	1.237	10712.8	6245.5	7.347	5.392	3.25		Clay	100.0			26.75	0.75	n.a.	n.a.	0.73	0.670	n.a.	n.a.	n.a.	n.a.	0.00	0.00
86.450	27.250	1.104	10732.8	6255.6	6.997	5.043	3.25		Clay	100.0			25.76	0.75	n.a.	n.a.	0.73	0.670	n.a.	n.a.	n.a.	n.a.	0.00	0.00
86.610	27.120	1.036	10752.8	6265.6	6.941	4.765	3.24		Clay	100.0			25.63	0.75	n.a.	n.a.	0.73	0.670	n.a.	n.a.	n.a.	n.a.	0.00	0.00
86.780	27.770	1.045	10774.0	6276.2	7.133	4.668	3.23		Clay	100.0			26.25	0.75	n.a.	n.a.	0.73	0.669	n.a.	n.a.	n.a.	n.a.	0.00	0.00
86.940	29.080	1.006	10794.0	6286.2	7.535	4.249	3.18		Clay	100.0			27.49	0.75	n.a.	n.a.	0.73	0.669	n.a.	n.a.	n.a.	n.a.	0.00	0.00
87.110	29.300	0.930	10815.3	6296.9	7.589	3.892	3.16		Clay	100.0			27.69	0.75	n.a.	n.a.	0.73	0.668	n.a.	n.a.	n.a.	n.a.	0.00	0.00
87.270	29.650	0.920	10835.3	6306.9	7.684	3.795	3.15		Clay	100.0			28.02	0.75	n.a.	n.a.	0.73	0.668	n.a.	n.a.	n.a.	n.a.	0.00	0.00
87.430	30.580	1.002	10855.3	6316.9	7.964	3.982	3.15		Clay	100.0			28.90	0.75	n.a.	n.a.	0.73	0.668	n.a.	n.a.	n.a.	n.a.	0.00	0.00
87.600	31.980	1.104	10876.5	6327.5	8.389	4.161	3.14		Clay	100.0			30.23	0.75	n.a.	n.a.	0.73	0.667	n.a.	n.a.	n.a.	n.a.	0.00	0.00
87.760	34.120	1.138	10896.5	6337.6	9.048	3.970	3.10		Clay	100.0			32.25	0.75	n.a.	n.a.	0.73	0.667	n.a.	n.a.	n.a.	n.a.	0.00	0.00
87.930	34.650	1.088	10917.8	6348.2	9.197	3.725	3.08		Clay	100.0			32.75	0.75	n.a.	n.a.	0.73	0.667	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.090	36.400	1.030	10937.8	6358.2	9.730	3.330	3.03		Clay	100.0			34.40	0.75	n.a.	n.a.	0.73	0.666	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.250	35.640	1.027	10957.8	6368.2	9.472	3.405	3.05		Clay	100.0			33.69	0.75	n.a.	n.a.	0.73	0.666	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.420	37.440	1.115	10979.0	6378.9	10.018	3.490	3.03		Clay	100.0			35.39	0.75	n.a.	n.a.	0.73	0.666	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.580	39.880	1.201	10999.0	6388.9	10.763	3.493	3.01		Clay	100.0			37.69	0.75	n.a.	n.a.	0.73	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.750	40.750	1.295	11020.3	6399.5	11.013	3.674	3.01		Clay	100.0			38.52	0.75	n.a.	n.a.	0.73	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
88.910	35.660	1.062	11040.3	6409.5	9.405	3.524	3.06		Clay	100.0			33.71	0.75	n.a.	n.a.	0.73	0.664	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.070	32.310	0.875	11060.3	6419.6	8.343	3.266	3.08		Clay	100.0			30.54	0.75	n.a.	n.a.	0.73	0.664	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.240	33.940	0.875	11081.5	6430.2	8.833	3.081	3.05		Clay	100.0			32.08	0.75	n.a.	n.a.	0.73	0.664	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.400	41.120	1.110	11101.5	6440.2	11.046	3.119	2.97		Clay	100.0			38.87	0.75	n.a.	n.a.	0.73	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.570	49.020	1.379	11122.8	6450.9	13.474	3.173	2.91		Clay	95.4			46.33	0.75	n.a.	n.a.	0.72	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.730	46.210	1.712	11142.8	6460.9	12.580	4.213	3.00		Clay	100.0			43.68	0.74	n.a.	n.a.	0.72	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
89.900	48.790	1.656	11164.0	6471.5	13.353	3.832	2.96		Clay	99.6			46.12	0.74	n.a.	n.a.	0.72	0.662	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.060	48.400	1.588	11184.0	6481.5	13.209	3.709	2.95		Clay	99.2			45.75	0.74	n.a.	n.a.	0.72	0.662	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.220	47.420	1.380	11204.0	6491.6	12.884	3.299	2.93		Clay	97.5			44.82	0.74	n.a.	n.a.	0.72	0.662	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.390	45.230	1.288	11225.3	6502.2	12.186	3.252	2.95		Clay	98.8			42.75	0.74	n.a.	n.a.	0.72	0.661	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.550	46.540	1.313	11245.3	6512.2	12.566	3.208	2.93		Clay	97.6			43.99	0.74	n.a.	n.a.	0.72	0.661	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.720	45.260	1.530	11266.5	6522.9	12.150	3.861	2.99		Clay	100.0			42.78	0.74	n.a.	n.a.	0.72	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
90.880	44.350	1.575	11286.5	6532.9	11.850	4.069	3.01		Clay	100.0			41.92	0.74	n.a.	n.a.	0.72	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.040	41.950	1.839	11306.5	6542.9	11.095	5.067	3.10		Clay	100.0			39.65	0.74	n.a.	n.a.	0.72	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.210	43.130	2.121	11327.8	6553.5	11.434	5.661	3.12		Clay	100.0			40.77	0.74	n.a.	n.a.	0.72	0.659	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.370	42.790	2.035	11347.8	6563.5	11.310	5.481	3.11		Clay	100.0			40.44	0.74	n.a.	n.a.	0.72	0.659	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.540	41.080	1.953	11369.0	6574.2	10.768	5.519	3.13		Clay	100.0			38.83	0.74	n.a.	n.a.	0.72	0.659	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.700	43.790	2.158	11389.0	6584.2	11.572	5.664	3.11		Clay	100.0			41.39	0.74	n.a.	n.a.	0.72	0.658	n.a.	n.a.	n.a.	n.a.	0.00	0.00
91.860	60.490	3.032	11409.0	6594.2	16.616	5.534	2.99		Clay	100.0			57.17	0.74	n.a.	n.a.	0.72	0.658	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.030	67.170	4.002	11430.3	6604.9	18.609	6.512	3.00		Clay	100.0			63.49	0.74	n.a.	n.a.	0.72	0.658	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.190	128.820	5.197	11450.3	6614.9	37.218	4.222	2.65		Clay	74.9			121.76	0.74	n.a.	n.a.	0.72	0.657	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.360	142.640	6.222	11471.5	6625.5	41.326	4.545	2.64		Clay	74.1			134.82	0.74	n.a.	n.a.	0.72	0.657	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.520	92.680	4.858	11491.5	6635.5	26.203	5.588	2.84		Clay	90.4			87.60	0.74	n.a.	n.a.	0.72	0.657	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.680	45.070	2.625	11511.5	6645.5	11.832	6.677	3.15		Clay	100.0			42.60	0.74	n.a.	n.a.	0.72	0.656	n.a.	n.a.	n.a.	n.a.	0.00	0.00
92.850	28.450	1.306	11532.8	6656.2	6.816	5.756	3.30		Clay	100.0			26.89	0.74	n.a.	n.a.	0.72	0.656	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.010	28.170	1.083	11552.8	6666.2	6.719	4.837	3.26		Clay	100.0			26.63	0.74	n.a.	n.a.	0.72	0.656	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.180	26.430	0.969	11574.0	6676.8	6.183	4.693	3.28		Clay	100.0			24.98	0.74	n.a.	n.a.	0.71	0.655	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.340	26.280	0.941	11594.0	6686.9	6.126	4.594	3.28		Clay	100.0			24.84	0.74	n.a.	n.a.	0.71	0.655	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.500	30.290	1.348	11614.0	6696.9	7.312	5.507	3.26		Clay	100.0			28.63	0.74	n.a.	n.a.	0.71	0.655	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.670	40.310	1.989	11635.3	6707.5	10.285	5.766	3.16		Clay	100.0			38.10	0.74	n.a.	n.a.	0.71	0.654	n.a.	n.a.	n.a.	n.a.	0.00	0.00
93.830	48.020	1.862	11655.3	6717.5	12.562	4.412	3.02		Clay	100.0			45.39	0.74	n.a.	n.a.	0.71	0.654	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.000	35.790	1.324	11676.5	6728.2	8.903	4.420	3.14		Clay	100.0			33.83	0.74	n.a.	n.a.	0.71	0.654	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.160	26.360	0.846	11696.5	6738.2	6.088	4.124	3.25		Clay	100.0			24.91	0.74	n.a.	n.a.	0.71	0.653	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.320	29.040	0.957	11716.5	6748.2	6.870	4.127	3.21		Clay	100.0			27.45	0.74	n.a.	n.a.	0.71	0.653	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.490	30.220	1.054	11737.8	6758.9	7.206	4.330	3.20		Clay	100.0			28.56	0.74	n.a.	n.a.	0.71	0.653	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.650	29.400	1.013	11757.8	6768.9	6.950	4.305	3.22		Clay	100.0			27.79	0.74	n.a.	n.a.	0.71	0.652	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	4

PGA (A_{max})	0.75

Total Settlement:	0.69	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
94.820	30.310	0.952	11779.0	6779.5	7.204	3.898	3.18		Clay	100.0			28.65	0.74	n.a.	n.a.	0.71	0.652	n.a.	n.a.	n.a.	n.a.	0.00	0.00
94.980	32.200	1.125	11799.0	6789.5	7.747	4.277	3.18		Clay	100.0			30.43	0.74	n.a.	n.a.	0.71	0.652	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.140	36.810	1.305	11819.0	6799.5	9.089	4.222	3.12		Clay	100.0			34.79	0.73	n.a.	n.a.	0.71	0.651	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.310	35.040	1.341	11840.3	6810.2	8.552	4.606	3.16		Clay	100.0			33.12	0.73	n.a.	n.a.	0.71	0.651	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.470	35.490	1.248	11860.3	6820.2	8.668	4.223	3.13		Clay	100.0			33.54	0.73	n.a.	n.a.	0.71	0.651	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.640	35.080	1.102	11881.5	6830.8	8.532	3.782	3.11		Clay	100.0			33.16	0.73	n.a.	n.a.	0.71	0.650	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.800	32.600	1.027	11901.5	6840.9	7.791	3.853	3.15		Clay	100.0			30.81	0.73	n.a.	n.a.	0.71	0.650	n.a.	n.a.	n.a.	n.a.	0.00	0.00
95.960	31.690	1.040	11921.5	6850.9	7.511	4.042	3.17		Clay	100.0			29.95	0.73	n.a.	n.a.	0.71	0.650	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.130	31.390	0.969	11942.8	6861.5	7.409	3.812	3.16		Clay	100.0			29.67	0.73	n.a.	n.a.	0.71	0.649	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.290	28.960	0.991	11962.8	6871.5	6.688	4.313	3.23		Clay	100.0			27.37	0.73	n.a.	n.a.	0.71	0.649	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.460	29.610	1.091	11984.0	6882.2	6.864	4.618	3.24		Clay	100.0			27.99	0.73	n.a.	n.a.	0.71	0.649	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.620	31.010	1.058	12004.0	6892.2	7.257	4.230	3.20		Clay	100.0			29.31	0.73	n.a.	n.a.	0.71	0.648	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.780	28.720	1.079	12024.0	6902.2	6.580	4.750	3.26		Clay	100.0			27.15	0.73	n.a.	n.a.	0.71	0.648	n.a.	n.a.	n.a.	n.a.	0.00	0.00
96.950	28.290	0.892	12045.3	6912.9	6.442	4.006	3.23		Clay	100.0			26.74	0.73	n.a.	n.a.	0.70	0.648	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.110	28.420	0.898	12065.3	6922.9	6.468	4.012	3.22		Clay	100.0			26.86	0.73	n.a.	n.a.	0.70	0.647	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.280	28.760	0.926	12086.5	6933.5	6.553	4.075	3.22		Clay	100.0			27.18	0.73	n.a.	n.a.	0.70	0.647	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.440	30.950	0.998	12106.5	6943.5	7.171	4.008	3.19		Clay	100.0			29.25	0.73	n.a.	n.a.	0.70	0.647	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.600	30.640	0.844	12126.5	6953.5	7.069	3.433	3.15		Clay	100.0			28.96	0.73	n.a.	n.a.	0.70	0.647	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.770	29.050	0.967	12147.8	6964.2	6.598	4.207	3.23		Clay	100.0			27.46	0.73	n.a.	n.a.	0.70	0.646	n.a.	n.a.	n.a.	n.a.	0.00	0.00
97.930	30.260	1.050	12167.8	6974.2	6.933	4.341	3.22		Clay	100.0			28.60	0.73	n.a.	n.a.	0.70	0.646	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.100	30.950	1.028	12189.0	6984.8	7.117	4.138	3.20		Clay	100.0			29.25	0.73	n.a.	n.a.	0.70	0.646	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.260	31.010	1.252	12209.0	6994.9	7.121	5.028	3.25		Clay	100.0			29.31	0.73	n.a.	n.a.	0.70	0.645	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.430	35.260	2.292	12230.3	7005.5	8.321	7.865	3.31		Clay	100.0			33.33	0.73	n.a.	n.a.	0.70	0.645	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.590	59.010	2.081	12250.3	7015.5	15.077	3.934	2.92		Clay	96.9			55.78	0.73	n.a.	n.a.	0.70	0.645	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.750	47.300	2.074	12270.3	7025.5	11.719	5.039	3.08		Clay	100.0			44.71	0.73	n.a.	n.a.	0.70	0.644	n.a.	n.a.	n.a.	n.a.	0.00	0.00
98.920	41.350	1.634	12291.5	7036.2	10.007	4.641	3.11		Clay	100.0			39.08	0.73	n.a.	n.a.	0.70	0.644	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.080	29.360	1.075	12311.5	7046.2	6.586	4.634	3.25		Clay	100.0			27.75	0.73	n.a.	n.a.	0.70	0.644	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.250	27.470	0.797	12332.8	7056.8	6.038	3.740	3.23		Clay	100.0			25.96	0.73	n.a.	n.a.	0.70	0.643	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.410	31.000	0.897	12352.8	7066.8	7.025	3.612	3.17		Clay	100.0			29.30	0.73	n.a.	n.a.	0.70	0.643	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.570	29.610	0.972	12372.8	7076.9	6.620	4.151	3.22		Clay	100.0			27.99	0.73	n.a.	n.a.	0.70	0.643	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.740	29.740	1.004	12394.0	7087.5	6.644	4.264	3.23		Clay	100.0			28.11	0.73	n.a.	n.a.	0.70	0.643	n.a.	n.a.	n.a.	n.a.	0.00	0.00
99.900	29.590	0.992	12414.0	7097.5	6.589	4.243	3.23		Clay	100.0			27.97	0.73	n.a.	n.a.	0.70	0.642	n.a.	n.a.	n.a.	n.a.	0.00	0.00
100.070	28.480	0.991	12435.3	7108.2	6.264	4.453	3.26		Clay	100.0			26.92	0.73	n.a.	n.a.	0.70	0.642	n.a.	n.a.	n.a.	n.a.	0.00	0.00
100.230	28.730	0.948	12455.3	7118.2	6.323	4.213	3.24		Clay	100.0			27.16	0.73	n.a.	n.a.	0.70	0.642	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 5

PGA (A_{max}) 0.75

Total Settlement: 1.66 (Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160	281.990	2.266	19.2	19.2	2797.953	0.804	1.13		Unsaturated	0.0			266.53	1.70	453.10	453.10	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	446.490	2.320	39.6	39.6	3084.729	0.520	0.94		Unsaturated	0.0			422.01	1.70	717.42	717.42	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	460.430	2.273	58.8	58.8	2610.474	0.494	0.91		Unsaturated	0.0			435.19	1.70	739.82	739.82	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	387.220	2.413	79.2	79.2	1891.572	0.623	1.03		Unsaturated	0.0			365.99	1.70	622.19	622.19	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	278.440	2.503	98.4	98.4	1220.196	0.899	1.23		Unsaturated	0.0			263.18	1.70	447.40	447.40	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	153.770	1.995	117.6	117.6	616.274	1.298	1.50		Unsaturated	0.0			145.34	1.70	247.08	247.08	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	81.500	2.141	138.0	138.0	301.386	2.629	1.92		Unsaturated	16.3			77.03	1.70	130.95	160.91	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	39.460	2.128	157.2	157.2	136.564	5.404	2.37		Unsaturated	52.2			37.30	1.70	63.40	127.15	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	30.590	1.544	177.6	177.6	99.510	5.063	2.42		Unsaturated	56.8			28.91	1.70	49.15	110.69	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	22.800	1.440	196.8	196.8	70.358	6.345	2.59		Unsaturated	70.4			21.55	1.70	36.64	98.01	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	25.400	1.429	216.0	216.0	74.822	5.650	2.54		Unsaturated	66.0			24.01	1.70	40.81	102.46	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	18.990	1.436	236.4	236.4	82.725	7.609	2.61		Unsaturated	72.0			17.95	1.70	30.51	90.39	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	15.640	1.394	255.6	255.6	64.381	8.986	2.74		Unsaturated	81.9			14.78	1.70	25.13	84.92	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	14.220	1.310	276.0	276.0	102.043	9.303	2.63		Unsaturated	73.5			13.44	1.70	22.85	80.73	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	14.100	1.267	295.2	295.2	94.528	9.083	2.64		Unsaturated	74.3			13.33	1.70	22.66	80.61	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	13.760	1.265	314.4	314.4	86.532	9.299	2.67		Unsaturated	76.7			13.01	1.70	22.11	80.28	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	13.790	1.253	334.8	334.8	81.378	9.195	2.68		Unsaturated	77.7			13.03	1.70	22.16	80.48	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	13.760	1.242	354.0	354.0	76.740	9.145	2.70		Unsaturated	78.7			13.01	1.70	22.11	80.57	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	13.520	1.187	374.4	374.4	71.222	8.901	2.71		Unsaturated	79.5			12.78	1.70	21.72	80.17	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	13.340	1.131	393.6	393.6	66.785	8.607	2.71		Unsaturated	79.9			12.61	1.70	21.43	79.86	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	13.390	1.121	412.8	412.8	63.874	8.499	2.72		Unsaturated	80.5			12.66	1.70	21.52	80.04	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	13.540	1.145	433.2	433.2	61.512	8.595	2.73		Unsaturated	81.6			12.80	1.70	21.76	80.50	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	13.910	1.185	452.4	452.4	60.494	8.660	2.74		Unsaturated	82.2			13.15	1.70	22.35	81.35	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	14.750	1.204	472.8	472.8	61.394	8.298	2.72		Unsaturated	80.7			13.94	1.70	23.70	82.91	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	15.390	1.194	492.0	492.0	61.561	7.887	2.70		Unsaturated	79.2			14.55	1.70	24.73	84.04	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	15.250	1.136	512.4	512.4	58.524	7.578	2.70		Unsaturated	79.3			14.41	1.70	24.50	83.75	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	15.190	1.125	531.6	531.6	56.148	7.537	2.71		Unsaturated	80.0			14.36	1.70	24.41	83.74	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	15.580	1.118	550.8	550.8	55.572	7.307	2.71		Unsaturated	79.4			14.73	1.70	25.03	84.47	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	16.420	1.101	571.2	571.2	56.493	6.825	2.68		Unsaturated	77.2			15.52	1.70	26.38	85.90	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	17.090	1.081	590.4	590.4	56.893	6.438	2.66		Unsaturated	75.5			16.15	1.70	27.46	87.03	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	16.790	1.048	610.8	610.8	53.977	6.357	2.67		Unsaturated	76.4			15.87	1.70	26.98	86.54	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	17.020	1.061	630.0	630.0	53.032	6.350	2.67		Unsaturated	76.7			16.09	1.70	27.35	87.07	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	18.340	1.092	649.2	649.2	55.500	6.064	2.64		Unsaturated	74.5			17.33	1.70	29.47	89.46	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	19.270	1.195	669.6	669.6	56.557	6.313	2.65		Unsaturated	75.1			18.21	1.70	30.96	91.51	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	19.910	1.272	688.8	688.8	56.811	6.500	2.66		Unsaturated	75.8			18.82	1.70	31.99	92.95	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	20.730	1.309	709.2	709.2	57.460	6.423	2.65		Unsaturated	75.2			19.59	1.70	33.31	94.56	1.00	0.485	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	21.800	1.358	728.4	728.4	58.857	6.333	2.64		Clay	74.3			20.60	1.32	n.a.	n.a.	1.00	0.488	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.230	22.910	1.417	747.6	747.6	60.289	6.286	2.63		Clay	73.6			21.65	1.32	n.a.	n.a.	1.00	0.495	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.400	24.090	1.528	768.0	768.0	61.734	6.445	2.63		Clay	73.7			22.77	1.31	n.a.	n.a.	0.99	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.560	25.950	1.684	787.2	787.2	64.930	6.589	2.63		Clay	73.2			24.53	1.30	n.a.	n.a.	0.99	0.507	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.730	29.130	1.806	807.6	807.6	53.286	6.286	2.67	plastic	Clay	76.4	31.7		31.70	1.29	n.a.	n.a.	0.99	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.890	30.900	1.927	826.8	826.8	55.629	6.319	2.66	plastic	Clay	75.5	31.7		31.70	1.28	n.a.	n.a.	0.99	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.050	33.100	1.948	846.0	846.0	58.676	5.960	2.62	plastic	Clay	72.8	31.7		31.70	1.27	n.a.	n.a.	0.99	0.525	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.220	33.540	1.925	866.4	866.4	58.464	5.814	2.62	plastic	Clay	72.2			31.70	1.27	n.a.	n.a.	0.99	0.531	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.380	32.390	1.697	885.6	885.6	55.557	5.310	2.60	plastic	Clay	71.0	31.7		31.70	1.26	n.a.	n.a.	0.99	0.536	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.550	31.250	1.880	906.0	906.0	52.710	6.105	2.66	plastic	Clay	75.8	31.7		31.70	1.25	n.a.	n.a.	0.99	0.541	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.710	31.860	1.937	925.2	925.2	52.955	6.169	2.66	plastic	Clay	76.0	31.7		31.70	1.24	n.a.	n.a.	0.99	0.546	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.870	31.940	2.025	944.4	944.4	66.641	6.434	2.61		Clay	72.0			30.19	1.24	n.a.	n.a.	0.99	0.551	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.040	34.830	2.132	964.8	964.8	56.256	6.207	2.65	plastic	Clay	74.8	35.22		35.22	1.23	n.a.	n.a.	0.99	0.556	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.200	37.260	2.100	984.0	984.0	59.395	5.712	2.60	plastic	Clay	71.4			35.22	1.22	n.a.	n.a.	0.99	0.561	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.370	35.590	1.932	1004.4	1004.4	55.872	5.505	2.61	plastic	Clay	71.8	35.22		35.22	1.22	n.a.	n.a.	0.99	0.565	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.530	34.380	1.734	1023.6	1023.6	53.220	5.119	2.60	plastic	Clay	71.0	35.22		35.22	1.21	n.a.	n.a.	0.99	0.570	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.690	32.020	1.683	1042.8	1042.8	48.857	5.343	2.64	plastic	Clay	74.1	35.22		35.22	1.21	n.a.	n.a.	0.99	0.574	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.860	29.570	1.773	1063.2	1063.2	54.625	6.105	2.65		Clay	75.0			27.95	1.20	n.a.	n.a.	0.99	0.578	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.020	30.710	1.658	1082.4	1082.4	55.744	5.495	2.61		Clay	71.8			29.03	1.19	n.a.	n.a.	0.99	0.582	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.190	44.660	1.474	1102.8	1102.8	57.749	3.341	2.44		Sand	58.3	98.92	1.66	164.21	1.19	195.01	297.57	0.99	0.587	1.100	########	########	1196265.54	0.00	0.00
9.350	83.950	0.973	1122.0	1122.0	108.239	1.167	1.93		Sand	17.2	98.92	1.66	164.21	1.20	196.57	236.77	0.99	0.591	1.100	31.049	75.137	127.24	0.00	0.00
9.510	104.660	0.755	1141.2	1141.2	133.967	0.725	1.72		Sand	0.9		1.66	164.21	1.22	201.08	201.08	0.99	0.594	1.100	2.010	4.863	8.18	0.00	0.00
9.680	87.320	1.141	1161.6	1161.6	110.652	1.315	1.96		Sand	19.5	98.92	1.66	164.21	1.18	193.94	241.94	0.99	0.598	1.100	52.734	127.617	213.33	0.00	0.00
9.840	57.240	1.036	1180.8	1180.8	71.677	1.828	2.19		Sand	38.3	98.92	1.66	164.21	1.17	191.53	277.80	0.99	0.602	1.100	6833.227	16536.410	27478.72	0.00	0.00
10.010	32.020	1.212	1201.2	1201.2	44.141	3.858	2.57		Mixed	68.4	98.92	1.66	164.21	1.16	190.66	296.28	0.99	0.606	1.100	########	########	883203.02	0.00	0.00
10.170	23.480	1.313	1220.4	1220.4	37.479	5.741	2.74		Clay	82.3			22.19	1.16	n.a.	n.a.	0.99	0.609	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.330	43.970	1.460	1239.6	1239.6	53.533	3.368	2.47		Sand	60.4	188.74	1.24	234.04	1.15	269.50	393.98	0.99	0.612	1.100	########	########	########	0.00	0.00
10.500	82.240	2.468	1260.0	1260.0	99.961	3.024	2.25		Sand	42.8	188.74	1.24	234.04	1.15	268.34	378.45	0.99	0.616	1.100	########	########	########	0.00	0.00
10.660	109.300	2.993	1279.2	1279.2	132.091	2.755	2.14		Sand	34.1	188.74	1.24	234.04	1.14	267.27	364.86	0.99	0.619	1.100	########	########	########	0.00	0.00
10.830	120.180	2.646	1299.6	1299.6	144.160	2.214	2.04		Sand	26.3	188.74	1.24	234.04	1.14	266.16	346.50	0.99	0.622	1.100	########	########	########	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	5

PGA (A_{max})	0.75

Total Settlement:	1.66	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5,}$ $_{s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
10.990	130.090	2.082	1318.8	1318.8	154.960	1.609	1.92		Sand	16.3	188.74	1.24	234.04	1.13	265.13	308.45	0.99	0.625	1.100	########	########	########	0.00	0.00
11.150	192.560	1.185	1338.0	1338.0	228.086	0.618	1.50		Sand	0.0	188.74	1.24	234.04	1.13	264.12	264.12	0.99	0.628	1.100	817.875	1979.257	3150.30	0.00	0.00
11.320	199.690	0.849	1358.4	1358.4	234.766	0.427	1.39		Sand	0.0		1.24	234.04	1.12	263.07	263.07	0.98	0.631	1.100	705.220	1706.633	2703.05	0.00	0.00
11.480	172.900	1.156	1377.6	1377.6	201.731	0.671	1.57		Sand	0.0		1.24	202.64	1.13	229.70	229.70	0.98	0.634	1.100	15.972	38.652	60.94	0.00	0.00
11.650	137.980	1.438	1398.0	1398.0	159.635	1.047	1.77		Sand	4.8		1.24	161.72	1.15	186.76	186.91	0.98	0.637	1.094	0.974	2.346	3.68	0.00	0.00
11.810	99.840	1.457	1417.8	1410.9	114.746	1.470	1.98		Sand	21.3		1.24	117.01	1.16	135.22	180.34	0.98	0.640	1.086	0.736	1.675	2.62	0.00	0.00
11.980	55.450	1.313	1439.0	1421.5	63.114	2.399	2.31		Sand	48.0		1.24	64.99	1.18	76.70	142.05	0.98	0.643	1.059	0.244	0.408	0.64	0.02	0.04
12.140	40.210	1.056	1459.0	1431.5	45.368	2.675	2.45		Sand	59.0		1.24	47.13	1.19	56.31	120.51	0.98	0.645	1.049	0.172	0.251	0.39	0.03	0.05
12.300	64.680	1.126	1479.0	1441.6	73.220	1.761	2.17		Sand	36.9		1.24	75.81	1.17	88.54	149.26	0.98	0.648	1.061	0.284	0.500	0.77	0.02	0.03
12.470	41.040	0.793	1500.3	1452.2	45.968	1.969	2.36		Sand	51.6	61.13	1.24	75.80	1.16	87.81	157.85	0.98	0.651	1.065	0.350	0.658	1.01	0.01	0.02
12.630	22.680	0.552	1520.3	1462.2	26.835	2.520	2.61		Mixed	71.5	61.13	1.24	75.80	1.15	87.28	163.69	0.98	0.653	1.067	0.413	0.811	1.24	0.00	0.01
12.800	12.220	0.569	1541.5	1472.9	15.547	4.973	2.98		Clay	100.0			11.55	1.10	n.a.	n.a.	0.98	0.656	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.960	9.520	0.614	1561.5	1482.9	11.787	7.022	3.17		Clay	100.0			9.00	1.10	n.a.	n.a.	0.98	0.658	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.120	9.690	0.669	1581.5	1492.9	11.922	7.520	3.18		Clay	100.0			9.16	1.10	n.a.	n.a.	0.98	0.660	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	15.580	0.622	1602.8	1503.5	19.659	4.207	2.85		Clay	91.2			14.73	1.09	n.a.	n.a.	0.98	0.663	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	15.620	0.722	1622.8	1513.6	19.568	4.874	2.90		Clay	94.7			14.76	1.09	n.a.	n.a.	0.98	0.665	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	13.430	0.724	1644.0	1524.2	16.544	5.744	3.00		Clay	100.0			12.69	1.09	n.a.	n.a.	0.98	0.667	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.780	17.070	0.657	1664.0	1534.2	21.168	4.047	2.82		Clay	88.4			16.13	1.09	n.a.	n.a.	0.98	0.669	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	15.860	0.549	1684.0	1544.2	19.451	3.652	2.82		Clay	88.3			14.99	1.09	n.a.	n.a.	0.98	0.671	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	10.890	0.405	1705.3	1554.9	12.911	4.036	2.98		Clay	100.0			10.29	1.08	n.a.	n.a.	0.98	0.673	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	10.250	0.437	1725.3	1564.9	11.998	4.656	3.05		Clay	100.0			9.69	1.08	n.a.	n.a.	0.98	0.675	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.440	10.310	0.583	1746.5	1575.5	11.979	6.176	3.12		Clay	100.0			9.74	1.08	n.a.	n.a.	0.98	0.678	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	10.820	0.764	1766.5	1585.5	12.534	7.689	3.17		Clay	100.0			10.23	1.08	n.a.	n.a.	0.98	0.679	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	15.310	0.838	1786.5	1595.6	18.071	5.815	2.97		Clay	100.0			14.47	1.08	n.a.	n.a.	0.98	0.681	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	18.250	0.884	1807.8	1606.2	21.599	5.097	2.88		Clay	93.1			17.25	1.08	n.a.	n.a.	0.98	0.683	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	16.490	0.872	1827.8	1616.2	19.275	5.596	2.94		Clay	98.2			15.59	1.07	n.a.	n.a.	0.98	0.685	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	17.640	0.849	1849.0	1626.9	20.549	5.079	2.89		Clay	94.3			16.67	1.07	n.a.	n.a.	0.98	0.687	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	16.060	1.136	1869.0	1636.9	18.481	7.511	3.04		Clay	100.0			15.18	1.07	n.a.	n.a.	0.97	0.689	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	25.150	0.835	1889.0	1646.9	29.395	3.449	2.66		Clay	76.1			23.77	1.07	n.a.	n.a.	0.97	0.690	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	52.660	0.690	1910.3	1657.5	55.217	1.334	2.19	plastic	Clay	38.2			49.77	1.07	n.a.	n.a.	0.97	0.692	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	72.150	0.726	1930.3	1667.5	75.792	1.019	2.01	plastic	Clay	23.8			68.19	1.06	n.a.	n.a.	0.97	0.694	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	80.690	0.568	1951.5	1678.2	84.603	0.713	1.88	plastic	Clay	13.3			76.27	1.06	n.a.	n.a.	0.97	0.695	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	85.910	1.016	1971.5	1688.2	89.865	1.196	2.00	plastic	Clay	22.7			81.20	1.06	n.a.	n.a.	0.97	0.697	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	75.070	1.028	1991.5	1698.2	78.152	1.388	2.08	plastic	Clay	29.7			70.95	1.06	n.a.	n.a.	0.97	0.699	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	76.370	0.789	2012.8	1708.9	79.265	1.047	2.00	plastic	Clay	23.1			72.18	1.06	n.a.	n.a.	0.97	0.700	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	65.850	0.892	2032.8	1718.9	67.991	1.376	2.13	plastic	Clay	33.2			62.24	1.06	n.a.	n.a.	0.97	0.702	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	61.040	0.612	2054.0	1729.5	62.741	1.019	2.07	plastic	Clay	29.0			57.69	1.05	n.a.	n.a.	0.97	0.703	n.a.	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	65.980	0.808	2074.0	1739.5	67.700	1.244	2.10		Sand	31.1	106.8		106.80	1.07	114.71	174.80	0.97	0.705	1.039	0.595	1.241	1.76	0.00	0.00
17.220	69.100	0.936	2094.0	1749.6	70.739	1.376	2.11		Sand	32.2	106.8		106.80	1.07	114.44	175.84	0.97	0.706	1.039	0.618	1.299	1.84	0.00	0.00
17.390	92.360	0.607	2115.3	1760.2	94.618	0.665	1.82		Sand	8.8	106.8		106.80	1.09	116.13	121.00	0.97	0.707	1.023	0.173	0.247	0.35	0.03	0.05
17.550	93.430	0.905	2135.3	1770.2	95.445	0.980	1.92		Sand	16.6	106.8		106.80	1.08	114.96	144.45	0.97	0.709	1.027	0.256	0.422	0.60	0.02	0.04
17.720	89.140	0.850	2156.5	1780.9	90.729	0.966	1.93		Sand	17.7	106.8		106.80	1.07	114.58	147.17	0.97	0.710	1.027	0.271	0.455	0.64	0.02	0.04
17.880	76.110	0.785	2176.5	1790.9	77.077	1.046	2.01		Sand	23.8	106.8		106.80	1.07	113.88	161.64	0.97	0.711	1.030	0.389	0.726	1.02	0.01	0.02
18.040	77.020	0.706	2196.5	1800.9	77.785	0.929	1.98		Sand	21.1	106.8		106.80	1.07	113.81	155.42	0.97	0.713	1.027	0.329	0.586	0.82	0.01	0.03
18.210	87.100	0.816	2217.8	1811.5	87.842	0.949	1.94		Sand	18.2	106.8		106.80	1.07	113.77	147.73	0.97	0.714	1.024	0.274	0.461	0.65	0.02	0.04
18.370	95.410	0.851	2237.8	1821.5	96.056	0.902	1.90		Sand	14.7	106.8		106.80	1.07	113.83	136.93	0.97	0.715	1.021	0.222	0.346	0.48	0.02	0.05
18.540	112.990	0.803	2259.0	1832.2	113.623	0.717	1.78		Sand	5.2			106.80	1.07	114.24	114.45	0.97	0.716	1.017	0.160	0.219	0.31	0.03	0.05
18.700	140.080	0.799	2279.0	1842.2	140.745	0.575	1.65		Sand	0.0			132.40	1.06	140.33	140.33	0.97	0.718	1.020	0.236	0.376	0.52	0.02	0.04
18.860	168.270	0.698	2299.0	1852.2	168.833	0.418	1.50		Sand	0.0			159.05	1.05	167.21	167.21	0.97	0.719	1.025	0.460	0.891	1.24	0.00	0.01
19.030	186.280	0.609	2320.3	1862.9	186.481	0.329	1.41		Sand	0.0			176.07	1.05	184.13	184.13	0.97	0.720	1.028	0.862	1.914	2.66	0.00	0.00
19.190	177.760	0.294	2340.3	1872.9	177.412	0.166	1.30		Sand	0.0			168.02	1.05	175.64	175.64	0.97	0.721	1.025	0.614	1.270	1.76	0.00	0.00
19.360	163.870	0.283	2361.5	1883.5	162.985	0.174	1.34		Sand	0.0			154.89	1.05	161.97	161.97	0.96	0.722	1.021	0.392	0.729	1.01	0.01	0.02
19.520	142.120	0.447	2381.5	1893.5	140.811	0.317	1.51		Sand	0.0			134.33	1.05	140.73	140.73	0.96	0.723	1.016	0.238	0.379	0.52	0.02	0.05
19.690	112.750	0.480	2402.8	1904.2	111.143	0.430	1.66		Sand	0.0			106.57	1.05	112.02	112.02	0.96	0.724	1.012	0.155	0.209	0.29	0.03	0.05
19.850	97.200	0.417	2422.8	1914.2	95.389	0.434	1.72		Sand	0.6			91.87	1.05	96.65	96.65	0.96	0.725	1.010	0.133	0.167	0.23	0.03	0.06
20.010	91.080	0.397	2442.8	1924.2	89.065	0.441	1.75		Sand	2.9			86.09	1.05	90.45	90.45	0.96	0.726	1.009	0.126	0.155	0.21	0.04	0.07
20.180	107.570	0.346	2464.0	1934.8	105.108	0.325	1.62		Sand	0.0			101.67	1.04	106.18	106.18	0.96	0.727	1.010	0.146	0.191	0.26	0.03	0.06
20.340	102.450	0.664	2484.0	1944.9	99.780	0.656	1.80		Sand	7.0			96.83	1.04	100.94	102.46	0.96	0.728	1.009	0.141	0.181	0.25	0.03	0.06
20.510	98.670	0.719	2505.3	1955.5	95.781	0.738	1.84		Sand	10.5			93.26	1.04	96.90	105.92	0.96	0.729	1.009	0.146	0.190	0.26	0.03	0.06
20.670	94.770	0.640	2525.3	1965.5	91.702	0.684	1.84		Sand	10.2			89.57	1.04	92.91	100.98	0.96	0.730	1.008	0.139	0.177	0.24	0.03	0.06
20.830	93.050	0.329	2545.3	1975.5	89.777	0.358	1.70		Sand	0.0			87.95	1.04	91.14	91.14	0.96	0.731	1.007	0.127	0.156	0.21	0.04	0.07
21.000	134.290	0.260	2566.5	1986.2	129.759	0.195	1.45		Sand	0.0			126.93	1.03	130.49	130.49	0.96	0.732	1.009	0.199	0.295	0.40	0.02	0.05
21.160	142.070	0.364	2586.5	1996.2	136.994	0.259	1.48		Sand	0.0			134.28	1.03	137.64	137.64	0.96	0.733	1.008	0.224	0.348	0.47	0.02	0.05
21.330	118.710	0.510	2607.8	2006.8	113.948	0.434	1.65		Sand	0.0			112.20	1.03	115.01	115.01	0.96	0.734	1.006	0.161	0.219	0.30	0.03	0.05
21.490	98.300	0.595	2627.8	2016.9	93.895	0.614	1.80		Sand	7.4			92.91	1.02	95.19	97.24	0.96	0.735	1.005	0.134	0.168	0.23	0.03	0.06
21.650	82.720	0.636	2647.8	2026.9	78.607	0.781	1.93		Sand	17.2			78.19	1.02	79.82	107.34	0.96	0.736	1.005	0.148	0.193	0.26	0.03	0.06

CORNERSTONE EARTH GROUP

CPT No. 5

PGA (A_{max}) 0.75

Total Settlement: 1.66 (Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
21.820	67.930	0.784	2669.0	2037.5	64.146	1.177	2.11		Sand	31.4			64.21	1.02	65.35	115.47	0.96	0.736	1.005	0.162	0.220	0.30	0.03	0.05
21.980	90.010	0.917	2689.0	2047.5	85.195	1.034	1.97		Sand	20.9			85.08	1.01	86.34	123.49	0.96	0.737	1.004	0.179	0.255	0.35	0.03	0.05
22.150	120.700	0.623	2710.3	2058.2	114.376	0.522	1.69		Sand	0.0			114.08	1.01	115.56	115.56	0.96	0.738	1.003	0.162	0.220	0.30	0.03	0.05
22.310	151.190	0.590	2730.3	2068.2	143.239	0.393	1.55		Sand	0.0			142.90	1.01	144.26	144.26	0.96	0.739	1.003	0.255	0.410	0.56	0.02	0.04
22.470	158.410	0.769	2750.3	2078.2	149.770	0.490	1.58		Sand	0.0			149.73	1.01	150.81	150.81	0.96	0.740	1.003	0.294	0.495	0.67	0.02	0.04
22.640	120.930	1.638	2771.5	2088.8	113.723	1.370	1.96		Sand	19.8	149.73		149.73	1.00	150.39	193.56	0.96	0.740	1.003	1.340	2.956	3.99	0.00	0.00
22.800	76.190	1.719	2791.5	2098.9	70.982	2.298	2.26		Sand	44.0	149.73		149.73	1.00	150.08	231.71	0.96	0.741	1.002	19.173	42.284	57.06	0.00	0.00
22.970	38.920	1.144	2812.8	2109.5	35.512	3.048	2.57		Sand	68.4	149.73		149.73	1.00	149.86	243.62	0.95	0.742	1.001	63.148	139.053	187.44	0.00	0.00
23.130	16.440	1.604	2832.8	2119.5	14.176	10.676	3.23		Clay	100.0			15.54	1.00	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	72.510	2.114	2852.8	2129.5	66.973	2.974	2.36		Sand	51.8	253.52		253.52	1.00	253.09	367.53	0.95	0.743	0.998	########	########	#########	0.00	0.00
23.460	169.250	2.320	2874.0	2140.2	157.715	1.382	1.86		Sand	12.0	253.52		253.52	1.00	252.76	274.03	0.95	0.744	0.997	3671.454	8049.669	10821.05	0.00	0.00
23.620	205.170	2.223	2894.0	2150.2	191.018	1.091	1.73		Sand	1.5	253.52		253.52	1.00	252.44	252.44	0.95	0.745	0.995	174.756	382.614	513.90	0.00	0.00
23.790	248.090	1.696	2915.3	2160.8	230.681	0.688	1.53		Sand	0.0	253.52		253.52	0.99	252.11	252.11	0.95	0.745	0.994	167.799	366.836	492.26	0.00	0.00
23.950	268.220	1.158	2935.3	2170.9	248.923	0.434	1.37		Sand	0.0			253.52	0.99	251.79	251.79	0.95	0.746	0.992	161.474	352.516	472.66	0.00	0.00
24.110	265.880	1.426	2955.3	2180.9	246.163	0.539	1.44		Sand	0.0			251.30	0.99	249.27	249.27	0.95	0.746	0.991	119.496	260.509	349.01	0.00	0.00
24.280	265.450	1.747	2976.5	2191.5	245.155	0.662	1.50		Sand	0.0			250.90	0.99	248.53	248.53	0.95	0.747	0.989	109.657	238.708	319.53	0.00	0.00
24.440	279.520	1.391	2996.5	2201.5	257.626	0.500	1.40		Sand	0.0			264.20	0.99	261.45	261.45	0.95	0.748	0.988	562.781	1223.402	1636.36	0.00	0.00
24.610	291.850	1.291	3017.8	2212.2	268.393	0.445	1.36		Sand	0.0			275.85	0.99	272.64	272.64	0.95	0.748	0.987	2937.768	6376.915	8522.57	0.00	0.00
24.770	299.480	1.725	3037.8	2222.2	274.816	0.579	1.42		Sand	0.0			283.06	0.99	279.43	279.43	0.95	0.749	0.985	9010.128	19531.121	26083.47	0.00	0.00
24.930	289.620	1.767	3057.8	2232.2	265.116	0.613	1.45		Sand	0.0			273.74	0.99	269.91	269.91	0.95	0.749	0.984	1922.202	4161.023	5552.94	0.00	0.00
25.100	265.930	2.426	3079.0	2242.8	242.727	0.918	1.60		Sand	0.0			251.35	0.98	247.41	247.41	0.95	0.750	0.983	96.372	208.317	277.79	0.00	0.00
25.260	242.480	2.283	3099.0	2252.9	220.697	0.947	1.64		Sand	0.0			229.19	0.98	224.95	224.95	0.95	0.750	0.981	10.610	22.903	30.52	0.00	0.00
25.430	254.450	1.543	3120.3	2263.5	231.107	0.610	1.49		Sand	0.0			240.50	0.98	235.93	235.93	0.95	0.751	0.980	28.596	61.639	82.08	0.00	0.00
25.590	270.190	0.898	3140.3	2273.5	244.941	0.334	1.31		Sand	0.0			255.38	0.98	250.52	250.52	0.95	0.751	0.978	138.459	298.049	396.63	0.00	0.00
25.750	227.930	0.578	3160.3	2283.5	205.944	0.255	1.32		Sand	0.0	255.38		255.38	0.98	250.22	250.22	0.95	0.752	0.977	133.615	287.234	381.99	0.00	0.00
25.920	163.530	1.589	3181.5	2294.2	146.998	0.981	1.78		Sand	5.3	255.38		255.38	0.98	249.91	250.31	0.95	0.752	0.976	135.144	290.105	385.55	0.00	0.00
26.080	84.700	1.305	3201.5	2304.2	75.268	1.570	2.13		Sand	33.5	255.38		255.38	0.98	249.70	342.39	0.95	0.753	0.974	########	########	#########	0.00	0.00
26.250	44.100	1.117	3222.8	2314.8	38.396	2.628	2.50		Sand	62.9	255.38		255.38	0.98	249.40	369.55	0.94	0.753	0.973	########	########	#########	0.00	0.00
26.410	20.950	0.722	3242.8	2324.8	16.628	3.736	2.88		Clay	93.1			19.80	0.98	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	19.360	0.637	3262.8	2334.9	15.186	3.594	2.90		Clay	94.7			18.30	0.97	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	19.730	0.661	3284.0	2345.5	15.424	3.655	2.90		Clay	94.7			18.65	0.97	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	18.800	0.723	3304.0	2355.5	14.560	4.213	2.95		Clay	99.3			17.77	0.97	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	19.160	0.759	3325.3	2366.2	14.790	4.339	2.96		Clay	99.5			18.11	0.97	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	22.240	0.792	3345.3	2376.2	17.311	3.850	2.87		Clay	92.6			21.02	0.97	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	20.080	0.770	3366.5	2386.8	15.415	4.184	2.93		Clay	97.6			18.98	0.97	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	18.270	0.651	3386.5	2396.8	13.832	3.930	2.95		Clay	99.2			17.27	0.97	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	17.420	0.585	3406.5	2406.9	13.060	3.722	2.96		Clay	99.6			16.47	0.97	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	16.930	0.542	3427.8	2417.5	12.588	3.562	2.96		Clay	99.7			16.00	0.97	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	16.100	0.530	3447.8	2427.5	11.844	3.685	2.99		Clay	100.0			15.22	0.96	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	15.390	0.513	3469.0	2438.2	11.202	3.760	3.01		Clay	100.0			14.55	0.96	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	14.880	0.506	3489.0	2448.2	10.731	3.850	3.03		Clay	100.0			14.06	0.96	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	14.400	0.483	3509.0	2458.2	10.288	3.820	3.05		Clay	100.0			13.61	0.96	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	13.120	0.450	3530.3	2468.8	9.199	3.965	3.10		Clay	100.0			12.40	0.96	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	12.350	0.386	3550.3	2478.8	8.532	3.649	3.10		Clay	100.0			11.67	0.96	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	12.160	0.339	3571.5	2489.5	8.334	3.266	3.08		Clay	100.0			11.49	0.96	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	11.560	0.307	3591.5	2499.5	7.813	3.142	3.10		Clay	100.0			10.93	0.96	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	10.870	0.241	3611.5	2509.5	7.224	2.663	3.09		Clay	100.0			10.27	0.96	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	9.810	0.257	3632.8	2520.2	6.344	3.209	3.18		Clay	100.0			9.27	0.95	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	9.300	0.289	3652.8	2530.2	5.908	3.871	3.25		Clay	100.0			8.79	0.95	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	10.280	0.345	3674.0	2540.8	6.646	4.084	3.22		Clay	100.0			9.72	0.95	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	12.730	0.382	3694.0	2550.8	8.533	3.508	3.09		Clay	100.0			12.03	0.95	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	14.680	0.406	3714.0	2560.8	10.015	3.162	3.01		Clay	100.0			13.88	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	16.330	0.413	3735.3	2571.5	11.248	2.858	2.94		Clay	98.4			15.43	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	17.180	0.470	3755.3	2581.5	11.855	3.074	2.94		Clay	98.4			16.24	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	17.690	0.472	3776.5	2592.1	12.192	2.990	2.93		Clay	97.0			16.72	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	23.420	0.642	3796.5	2602.2	16.541	2.983	2.82		Clay	88.4			22.14	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	23.840	0.650	3816.5	2612.2	16.792	2.962	2.81		Clay	87.9			22.53	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	15.260	0.534	3837.8	2622.8	10.173	4.006	3.06		Clay	100.0			14.42	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	14.310	0.488	3857.8	2632.8	9.405	3.941	3.09		Clay	100.0			13.53	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	13.680	0.450	3879.0	2643.5	8.883	3.829	3.10		Clay	100.0			12.93	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	11.700	0.409	3899.0	2653.5	7.349	4.195	3.19		Clay	100.0			11.06	0.94	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.820	10.350	0.362	3919.0	2663.5	6.300	4.308	3.25		Clay	100.0			9.78	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	9.360	0.338	3940.3	2674.2	5.527	4.574	3.31		Clay	100.0			8.85	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	8.490	0.308	3960.3	2684.2	4.851	4.728	3.37		Clay	100.0			8.02	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	8.140	0.291	3981.5	2694.8	4.564	4.729	3.39		Clay	100.0			7.69	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	8.080	0.270	4001.5	2704.8	4.495	4.445	3.38		Clay	100.0			7.64	0.94	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	5

PGA (A_{max})	0.75

Total Settlement:	1.66	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5,}$ $_{s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
32.640	7.940	0.245	4021.5	2714.8	4.368	4.129	3.37		Clay	100.0			7.50	0.94	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	7.940	0.259	4042.8	2725.5	4.343	4.379	3.39		Clay	100.0			7.50	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	7.860	0.259	4062.8	2735.5	4.261	4.438	3.40		Clay	100.0			7.43	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	7.150	0.256	4084.0	2746.1	3.720	5.020	3.48		Clay	100.0			6.76	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.300	7.170	0.267	4104.0	2756.2	3.714	5.217	3.49		Clay	100.0			6.78	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	8.920	0.279	4124.0	2766.2	4.958	4.061	3.32		Clay	100.0			8.43	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	11.210	0.314	4145.3	2776.8	6.581	3.433	3.18		Clay	100.0			10.60	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	14.660	0.378	4165.3	2786.8	9.026	3.007	3.03		Clay	100.0			13.86	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	16.570	0.411	4186.5	2797.5	10.350	2.842	2.97		Clay	100.0			15.66	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	18.340	0.459	4206.5	2807.5	11.567	2.828	2.93		Clay	97.4			17.33	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	19.120	0.449	4226.5	2817.5	12.072	2.640	2.90		Clay	94.8			18.07	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	19.070	0.506	4247.8	2828.2	11.984	2.984	2.93		Clay	97.5			18.02	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	18.210	0.615	4267.8	2838.2	11.329	3.825	3.01		Clay	100.0			17.21	0.93	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	19.810	0.665	4289.0	2848.8	12.402	3.763	2.98		Clay	100.0			18.72	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	25.010	0.685	4309.0	2858.8	15.989	2.995	2.83		Clay	89.5			23.64	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	23.970	0.572	4329.0	2868.8	15.202	2.623	2.81		Clay	88.2			22.66	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	18.780	0.417	4350.3	2879.5	11.533	2.511	2.90		Clay	95.2			17.75	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	14.800	0.311	4370.3	2889.5	8.732	2.466	3.00		Clay	100.0			13.99	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	12.240	0.256	4391.5	2900.1	6.927	2.544	3.09		Clay	100.0			11.57	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.760	11.910	0.333	4411.5	2910.2	6.669	3.436	3.18		Clay	100.0			11.26	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.930	13.750	0.490	4432.8	2920.8	7.898	4.252	3.17		Clay	100.0			13.00	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.090	20.750	0.606	4452.8	2930.8	12.641	3.270	2.94		Clay	97.8			19.61	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.250	28.920	0.947	4472.8	2940.8	18.147	3.549	2.83		Clay	89.6			27.33	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.420	32.350	1.200	4494.0	2951.5	20.399	3.987	2.83		Clay	89.0			30.58	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.580	40.860	1.741	4514.0	2961.5	26.070	4.509	2.78		Clay	85.4			38.62	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.750	44.230	2.182	4535.3	2972.1	28.237	5.200	2.80		Clay	86.8			41.81	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.910	47.350	2.726	4555.3	2982.1	30.228	6.048	2.82		Clay	88.8			44.75	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.070	56.560	3.131	4575.3	2992.2	36.276	5.769	2.75		Clay	83.2			53.46	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.240	66.830	3.477	4596.5	3002.8	42.981	5.387	2.68		Clay	77.4			63.17	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.400	99.340	2.872	4616.5	3012.8	76.860	2.960	2.32		Sand	48.4	224.69	1.15	258.39	0.91	235.39	342.47	0.91	0.766	0.894	########	########	#########	0.00	0.00
37.570	154.870	1.918	4637.8	3023.5	120.624	1.257	1.92		Sand	16.2	224.69	1.15	258.39	0.91	235.18	275.17	0.91	0.766	0.893	4417.529	8678.070	11332.67	0.00	0.00
37.730	178.180	1.579	4657.8	3033.5	138.818	0.898	1.77		Sand	4.7	224.69	1.15	258.39	0.90	232.94	233.09	0.91	0.766	0.892	21.781	42.740	55.82	0.00	0.00
37.890	190.390	1.382	4677.8	3043.5	148.205	0.735	1.69		Sand	0.0	224.69	1.15	258.39	0.90	232.68	232.68	0.91	0.766	0.891	20.964	41.091	53.67	0.00	0.00
38.060	204.440	1.229	4699.0	3054.1	158.991	0.608	1.62		Sand	0.0	224.69	1.15	258.39	0.90	232.42	232.42	0.91	0.766	0.890	20.462	40.061	52.32	0.00	0.00
38.220	213.120	1.456	4719.0	3064.2	165.541	0.691	1.64		Sand	0.0	224.69	1.15	258.39	0.90	232.17	232.17	0.91	0.766	0.889	20.003	39.119	51.10	0.00	0.00
38.390	224.760	1.805	4740.3	3074.8	174.373	0.812	1.67		Sand	0.0	224.69	1.15	258.39	0.90	231.91	231.91	0.90	0.766	0.888	19.530	38.149	49.83	0.00	0.00
38.550	237.720	1.736	4760.3	3084.8	184.227	0.738	1.62		Sand	0.0		1.15	258.39	0.90	231.67	231.67	0.90	0.765	0.887	19.094	37.256	48.67	0.00	0.00
38.710	233.050	3.021	4780.3	3094.8	180.271	1.310	1.81		Sand	7.5		1.15	253.32	0.90	226.73	229.99	0.90	0.765	0.886	16.401	31.966	41.76	0.00	0.00
38.880	202.660	4.545	4801.5	3105.5	156.243	2.270	2.03		Sand	25.2		1.15	220.28	0.90	199.08	264.54	0.90	0.765	0.885	868.421	1690.642	2208.97	0.00	0.00
39.040	126.820	4.566	4821.5	3115.5	96.909	3.670	2.32		Sand	48.7		1.15	137.85	0.88	121.26	198.63	0.90	0.765	0.900	1.750	3.466	4.53	0.00	0.00
39.210	84.140	3.663	4842.8	3126.1	63.546	4.482	2.51		Sand	63.5		1.15	91.46	0.85	78.13	149.82	0.90	0.765	0.938	0.287	0.449	0.59	0.02	0.04
39.370	101.590	2.380	4862.8	3136.1	76.985	2.400	2.25		Sand	43.1		1.15	110.42	0.86	94.94	162.05	0.90	0.765	0.930	0.393	0.666	0.87	0.01	0.02
39.530	194.900	1.725	4882.8	3146.2	149.183	0.896	1.75		Sand	2.8		1.15	211.85	0.87	184.31	184.31	0.90	0.765	0.912	0.869	1.715	2.24	0.00	0.00
39.700	223.550	2.414	4904.0	3156.8	171.093	1.092	1.76		Sand	4.1		1.15	242.99	0.88	214.61	214.65	0.90	0.765	0.880	4.793	9.280	12.13	0.00	0.00
39.860	169.590	2.508	4924.0	3166.8	129.125	1.501	1.95		Sand	18.9	211.29	1.15	242.98	0.90	218.46	267.41	0.90	0.765	0.879	1318.409	2549.655	3333.43	0.00	0.00
40.030	119.480	2.600	4945.3	3177.5	90.250	2.222	2.18		Sand	37.3	211.29	1.15	242.98	0.90	218.27	309.59	0.90	0.765	0.878	########	########	#########	0.00	0.00
40.190	140.790	2.778	4965.3	3187.5	106.511	2.008	2.10		Sand	30.8	211.29	1.15	242.98	0.90	218.09	299.15	0.90	0.765	0.877	########	########	1025291.78	0.00	0.00
40.350	87.040	1.944	4985.3	3197.5	65.008	2.299	2.29		Sand	46.2	211.29	1.15	242.98	0.90	217.91	318.64	0.90	0.765	0.876	########	########	#########	0.00	0.00
40.520	48.370	1.532	5006.5	3208.1	28.594	3.339	2.66		Clay	76.1			45.72	0.90	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.680	26.650	0.962	5026.5	3218.1	15.000	3.985	2.93		Clay	97.3			25.19	0.90	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.850	21.680	0.880	5047.8	3228.8	11.866	4.594	3.05		Clay	100.0			20.49	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	16.940	0.897	5067.8	3238.8	8.896	6.223	3.23		Clay	100.0			16.01	0.89	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	19.030	0.782	5087.8	3248.8	10.149	4.742	3.11		Clay	100.0			17.99	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	22.000	0.695	5109.0	3259.5	11.932	3.575	2.98		Clay	100.0			20.79	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	14.540	0.588	5129.0	3269.5	7.326	4.908	3.23		Clay	100.0			13.74	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	11.410	0.467	5150.3	3280.1	5.387	5.284	3.36		Clay	100.0			10.78	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	11.110	0.404	5170.3	3290.1	5.182	4.740	3.34		Clay	100.0			10.50	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	11.630	0.392	5190.3	3300.2	5.475	4.342	3.30		Clay	100.0			10.99	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	11.620	0.475	5211.5	3310.8	5.445	5.273	3.35		Clay	100.0			10.98	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.320	11.940	0.480	5231.5	3320.8	5.616	5.144	3.34		Clay	100.0			11.29	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.490	13.710	0.465	5252.8	3331.5	6.654	4.194	3.23		Clay	100.0			12.96	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	13.990	0.529	5272.8	3341.5	6.796	4.662	3.24		Clay	100.0			13.22	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	13.690	0.598	5292.8	3351.5	6.590	5.411	3.29		Clay	100.0			12.94	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	14.060	0.701	5314.0	3362.1	6.783	6.148	3.32		Clay	100.0			13.29	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	14.470	0.629	5334.0	3372.1	7.000	5.333	3.27		Clay	100.0			13.68	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	15.870	0.583	5355.3	3382.8	7.800	4.422	3.18		Clay	100.0			15.00	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	5

PGA (A_{max})	0.75

Total Settlement:	1.66	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
43.470	14.230	0.611	5375.3	3392.8	6.804	5.291	3.28		Clay	100.0			13.45	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	13.620	0.669	5396.5	3403.4	6.418	6.124	3.33		Clay	100.0			12.87	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	14.370	0.722	5416.5	3413.5	6.833	6.190	3.32		Clay	100.0			13.58	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	14.880	0.763	5436.5	3423.5	7.105	6.275	3.31		Clay	100.0			14.06	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	15.590	0.770	5457.8	3434.1	7.490	5.984	3.27		Clay	100.0			14.74	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.290	16.320	0.774	5477.8	3444.1	7.887	5.697	3.24		Clay	100.0			15.43	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	17.350	0.798	5499.0	3454.8	8.452	5.466	3.21		Clay	100.0			16.40	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	6

PGA (A_{max})	0.75

Total Settlement:	0.65	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5,}$ $_{s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160	357.180	0.750	19.2	19.2	3544.027	0.210	0.55		Unsaturated	0.0			337.60	1.70	573.92	573.92	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	388.400	0.736	39.6	39.6	2683.377	0.189	0.50		Unsaturated	0.0			367.11	1.70	624.08	624.08	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	243.370	1.346	58.8	58.8	1379.743	0.553	1.02		Unsaturated	0.0			230.03	1.70	391.05	391.05	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	160.740	1.987	79.2	79.2	785.103	1.237	1.43		Unsaturated	0.0			151.93	1.70	258.28	258.28	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	102.980	2.237	98.4	98.4	451.149	2.173	1.76		Unsaturated	3.6			97.33	1.70	165.47	165.48	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	54.640	2.266	117.6	117.6	218.832	4.152	2.16		Unsaturated	35.6			51.64	1.70	87.80	147.15	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	33.400	1.996	138.0	138.0	123.362	5.989	2.43		Unsaturated	57.2			31.57	1.70	53.67	116.56	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	30.090	1.756	157.2	157.2	104.072	5.850	2.46		Unsaturated	59.9			28.44	1.70	48.35	110.60	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	24.120	1.554	177.6	177.6	78.402	6.467	2.57		Unsaturated	68.6			22.80	1.70	38.76	100.39	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	20.800	1.418	196.8	196.8	103.172	6.850	2.52		Unsaturated	64.5			19.66	1.70	33.42	92.63	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	18.260	1.355	216.0	216.0	84.758	7.463	2.60		Unsaturated	71.0			17.26	1.70	29.34	88.68	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	16.330	1.299	236.4	236.4	71.065	8.013	2.67		Unsaturated	76.6			15.43	1.70	26.24	85.62	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	18.320	1.331	255.6	255.6	75.504	7.314	2.62		Unsaturated	72.8			17.32	1.70	29.44	89.14	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	19.690	1.282	276.0	276.0	76.901	6.558	2.58		Unsaturated	69.4			18.61	1.70	31.64	91.36	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	19.740	1.432	295.2	295.2	73.516	7.307	2.63		Unsaturated	73.3			18.66	1.70	31.72	92.18	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	19.300	1.450	314.4	314.4	68.729	7.574	2.66		Unsaturated	75.8			18.24	1.70	31.01	91.67	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	18.470	1.403	334.8	334.8	62.884	7.663	2.69		Unsaturated	78.0			17.46	1.70	29.68	90.29	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	18.300	1.326	354.0	354.0	59.883	7.314	2.68		Unsaturated	77.8			17.30	1.70	29.40	89.90	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	17.850	1.252	374.4	374.4	56.118	7.089	2.69		Unsaturated	78.4			16.87	1.70	28.68	89.05	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	17.010	1.168	393.6	393.6	51.581	6.949	2.71		Unsaturated	79.7			16.08	1.70	27.33	87.50	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	16.350	1.108	412.8	412.8	47.902	6.863	2.73		Unsaturated	81.1			15.45	1.70	26.27	86.31	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	15.290	1.042	433.2	433.2	69.591	6.914	2.63		Unsaturated	73.0			14.45	1.70	24.57	82.87	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	14.990	0.995	452.4	452.4	65.269	6.736	2.63		Unsaturated	73.7			14.17	1.70	24.09	82.36	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	15.220	0.998	472.8	472.8	63.382	6.661	2.64		Unsaturated	74.0			14.39	1.70	24.46	82.90	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	15.120	0.994	492.0	492.0	60.463	6.679	2.65		Unsaturated	75.1			14.29	1.70	24.29	82.87	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	15.490	0.981	512.4	512.4	59.461	6.440	2.64		Unsaturated	74.5			14.64	1.70	24.89	83.54	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	16.060	1.005	531.6	531.6	59.421	6.361	2.64		Unsaturated	74.2			15.18	1.70	25.81	84.68	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	17.650	1.090	550.8	550.8	63.089	6.272	2.62		Unsaturated	72.5			16.68	1.70	28.36	87.69	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	19.370	1.257	571.2	571.2	66.822	6.585	2.62		Unsaturated	72.6			18.31	1.70	31.12	91.28	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	20.380	1.249	590.4	590.4	46.392	6.219	2.70		Unsaturated	79.3			19.26	1.70	32.75	94.46	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	21.400	1.225	610.8	610.8	47.579	5.807	2.67		Unsaturated	76.9			20.23	1.70	34.39	96.23	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	22.690	1.265	630.0	630.0	49.386	5.655	2.65		Unsaturated	75.4			21.45	1.70	36.46	98.66	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	22.850	1.326	649.2	649.2	48.684	5.886	2.67		Unsaturated	76.7			21.60	1.70	36.72	99.22	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	23.370	1.379	669.6	669.6	48.719	5.984	2.68		Unsaturated	77.1			22.09	1.70	37.55	100.37	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	23.640	1.413	688.8	688.8	48.304	6.064	2.68		Unsaturated	77.7			22.34	1.70	37.98	101.02	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	23.110	1.509	709.2	709.2	64.172	6.633	2.63		Unsaturated	73.6			21.84	1.70	37.13	99.24	1.00	0.485	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	23.610	1.519	728.4	728.4	63.827	6.535	2.63		Clay	73.4			22.32	1.32	n.a.	n.a.	1.00	0.488	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.230	24.910	1.569	747.6	747.6	65.640	6.393	2.61		Clay	72.2			23.54	1.32	n.a.	n.a.	1.00	0.495	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.400	27.090	1.671	768.0	768.0	51.313	6.259	2.68		Mixed	77.1	39.23		39.23	1.56	61.05	130.85	0.99	0.501	1.100	0.200	0.324	0.65	0.02	0.05
6.560	35.010	1.971	787.2	787.2	65.373	5.694	2.58		Mixed	69.1	39.23		39.23	1.55	60.63	128.72	0.99	0.507	1.100	0.194	0.310	0.61	0.02	0.05
6.730	41.510	2.226	807.6	807.6	62.890	5.415	2.57		Sand	68.7			39.23	1.53	60.05	127.87	0.99	0.514	1.100	0.191	0.304	0.59	0.02	0.05
6.890	41.170	2.326	826.8	826.8	61.627	5.706	2.59		Sand	70.5	39.23		39.23	1.52	59.46	127.51	0.99	0.519	1.100	0.190	0.302	0.58	0.02	0.05
7.050	40.240	2.262	846.0	846.0	71.496	5.682	2.55		Mixed	67.1	39.23		39.23	1.50	58.99	126.14	0.99	0.525	1.100	0.186	0.294	0.56	0.03	0.05
7.220	36.180	2.097	866.4	866.4	63.126	5.865	2.60		Mixed	70.7	39.23		39.23	1.49	58.37	126.15	0.99	0.531	1.100	0.186	0.294	0.55	0.03	0.05
7.380	31.870	1.789	885.6	885.6	54.653	5.691	2.63		Mixed	73.2	39.23		39.23	1.47	57.82	125.94	0.99	0.536	1.100	0.186	0.293	0.55	0.03	0.05
7.550	27.080	1.532	906.0	906.0	58.779	5.754	2.61		Clay	71.8			25.60	1.25	n.a.	n.a.	0.99	0.541	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.710	24.360	1.312	925.2	925.2	51.659	5.491	2.63		Clay	73.5			23.02	1.24	n.a.	n.a.	0.99	0.546	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.870	21.500	1.147	944.4	944.4	44.532	5.452	2.67		Clay	76.8			20.32	1.24	n.a.	n.a.	0.99	0.551	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.040	20.240	1.234	964.8	964.8	40.957	6.243	2.74		Clay	82.3			19.13	1.23	n.a.	n.a.	0.99	0.556	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.200	20.140	1.580	984.0	984.0	39.935	8.040	2.83		Clay	89.4			19.04	1.22	n.a.	n.a.	0.99	0.561	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.370	24.380	1.930	1004.4	1004.4	47.546	8.081	2.78		Clay	85.6			23.04	1.22	n.a.	n.a.	0.99	0.565	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.530	37.190	1.953	1023.6	1023.6	57.636	5.326	2.59		Mixed	70.2	88.22	1.36	119.98	1.22	146.95	240.45	0.99	0.570	1.100	45.076	109.083	191.45	0.00	0.00
8.690	52.790	1.575	1042.8	1042.8	70.374	3.013	2.35		Sand	50.9	88.22	1.36	119.98	1.23	147.14	232.68	0.99	0.574	1.100	20.959	50.722	88.36	0.00	0.00
8.860	71.380	1.564	1063.2	1063.2	94.470	2.208	2.16		Sand	36.1	88.22	1.36	119.98	1.23	147.73	221.21	0.99	0.578	1.100	7.835	18.962	32.78	0.00	0.00
9.020	92.520	1.332	1082.4	1082.4	121.553	1.448	1.96		Sand	19.5	88.22	1.36	119.98	1.26	150.60	192.89	0.99	0.582	1.100	1.295	3.134	5.38	0.00	0.00
9.190	93.340	1.226	1102.8	1102.8	121.484	1.321	1.93		Sand	17.3		1.36	119.98	1.26	150.61	185.86	0.99	0.587	1.100	0.929	2.240	3.82	0.00	0.00
9.350	83.040	1.158	1122.0	1122.0	107.058	1.404	1.99		Sand	21.9	88.22	1.36	119.98	1.24	148.26	196.93	0.99	0.591	1.100	1.596	3.862	6.54	0.00	0.00
9.510	81.150	0.960	1141.2	1141.2	103.709	1.192	1.95		Sand	18.8	88.22	1.36	119.98	1.24	148.47	188.57	0.99	0.594	1.100	1.051	2.544	4.28	0.00	0.00
9.680	62.610	1.006	1161.6	1161.6	79.130	1.622	2.12		Sand	33.0	88.22	1.36	119.98	1.21	144.65	213.63	0.99	0.598	1.100	4.462	10.797	18.05	0.00	0.00
9.840	43.440	0.702	1180.8	1180.8	54.216	1.639	2.25		Sand	43.2	88.22	1.36	119.98	1.19	143.02	222.17	0.99	0.602	1.100	8.461	20.476	34.02	0.00	0.00
10.010	26.180	0.707	1201.2	1201.2	32.089	2.765	2.57		Sand	68.8	88.22	1.36	119.98	1.18	141.26	232.67	0.99	0.606	1.100	20.952	50.703	83.74	0.00	0.00
10.170	25.540	0.845	1220.4	1220.4	34.637	3.388	2.61		Mixed	71.4	88.22	1.36	119.98	1.17	140.62	232.62	0.99	0.609	1.100	20.849	50.454	82.86	0.00	0.00
10.330	28.190	0.695	1239.6	1239.6	34.046	2.522	2.53		Sand	65.2	88.22	1.36	119.98	1.17	140.21	230.15	0.99	0.612	1.100	16.635	40.257	65.75	0.00	0.00
10.500	18.690	0.762	1260.0	1260.0	28.667	4.221	2.73		Clay	81.4			17.67	1.15	n.a.	n.a.	0.99	0.616	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.660	13.910	0.652	1280.0	1270.0	20.897	4.912	2.88		Clay	93.1			13.15	1.14	n.a.	n.a.	0.99	0.619	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.830	15.820	0.532	1301.3	1280.7	23.690	3.505	2.74		Clay	82.2			14.95	1.14	n.a.	n.a.	0.99	0.622	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	6

PGA (A_{max})	0.75

Total Settlement:	0.65	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5,}$ $_{s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
10.990	11.590	0.537	1321.3	1290.7	16.936	4.914	2.95		Clay	98.6			10.95	1.14	n.a.	n.a.	0.99	0.625	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.150	11.430	0.680	1341.3	1300.7	16.544	6.317	3.03		Clay	100.0			10.80	1.14	n.a.	n.a.	0.99	0.628	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.320	13.910	0.516	1362.5	1311.3	20.176	3.902	2.82		Clay	88.8			13.15	1.13	n.a.	n.a.	0.98	0.631	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.480	15.160	0.465	1382.5	1321.3	21.900	3.214	2.74		Clay	82.3			14.33	1.13	n.a.	n.a.	0.98	0.634	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.650	12.140	0.510	1403.8	1332.0	17.174	4.459	2.91		Clay	96.1			11.47	1.13	n.a.	n.a.	0.98	0.637	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.810	13.520	0.698	1423.8	1342.0	19.088	5.447	2.94		Clay	97.9			12.78	1.13	n.a.	n.a.	0.98	0.640	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.980	14.210	0.735	1445.0	1352.6	19.942	5.446	2.92		Clay	96.7			13.43	1.13	n.a.	n.a.	0.98	0.643	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.140	21.000	0.584	1465.0	1362.7	29.747	2.882	2.61		Clay	71.7			19.85	1.12	n.a.	n.a.	0.98	0.645	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.300	13.670	0.457	1485.0	1372.7	18.835	3.535	2.82		Clay	88.5			12.92	1.12	n.a.	n.a.	0.98	0.648	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.470	9.420	0.303	1506.3	1383.3	12.531	3.498	2.96		Clay	99.5			8.90	1.12	n.a.	n.a.	0.98	0.651	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.630	9.180	0.544	1526.3	1393.3	12.082	6.457	3.13		Clay	100.0			8.68	1.12	n.a.	n.a.	0.98	0.653	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.800	10.040	0.877	1547.5	1404.0	13.200	9.462	3.22		Clay	100.0			9.49	1.11	n.a.	n.a.	0.98	0.656	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.960	24.200	0.938	1567.5	1414.0	33.121	4.006	2.67		Clay	76.5			22.87	1.11	n.a.	n.a.	0.98	0.658	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.120	22.810	1.042	1587.5	1424.0	30.921	4.731	2.74		Clay	82.2			21.56	1.11	n.a.	n.a.	0.98	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	18.810	1.239	1608.8	1434.7	25.101	6.881	2.92		Clay	96.5			17.78	1.11	n.a.	n.a.	0.98	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	28.600	1.400	1628.8	1444.7	38.466	5.038	2.69		Clay	78.4			27.03	1.11	n.a.	n.a.	0.98	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	29.730	0.948	1650.0	1455.3	35.504	3.281	2.59		Mixed	70.1			28.10	1.21	34.02	94.55	0.98	0.667	1.038	0.131	0.167	0.25	0.03	0.07
13.780	21.500	0.823	1670.0	1465.3	28.205	3.983	2.72		Clay	80.5			20.32	1.10	n.a.	n.a.	0.98	0.669	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	17.940	0.998	1690.0	1475.3	23.174	5.836	2.89		Clay	94.5			16.96	1.10	n.a.	n.a.	0.98	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	20.730	1.206	1711.3	1486.0	26.749	6.069	2.86		Clay	91.9			19.59	1.10	n.a.	n.a.	0.98	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	21.590	1.300	1731.3	1496.0	27.706	6.273	2.86		Clay	91.8			20.41	1.10	n.a.	n.a.	0.98	0.675	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.440	22.380	1.316	1752.5	1506.6	28.545	6.121	2.84		Clay	90.5			21.15	1.09	n.a.	n.a.	0.98	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	23.700	1.266	1772.5	1516.7	30.084	5.551	2.80		Clay	86.8			22.40	1.09	n.a.	n.a.	0.98	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	23.360	1.367	1792.5	1526.7	29.428	6.085	2.83		Clay	89.6			22.08	1.09	n.a.	n.a.	0.98	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	29.420	0.291	1813.8	1537.3	31.618	1.022	2.32		Sand	48.8	137.76	1.32	181.84	1.09	197.84	295.36	0.98	0.683	1.096	########	########	643804.00	0.00	0.00
15.090	44.040	0.568	1833.8	1547.3	47.664	1.317	2.24		Sand	42.0	137.76	1.32	181.84	1.09	197.50	289.13	0.98	0.685	1.094	52670.639	########	185037.04	0.00	0.00
15.260	58.530	0.624	1855.0	1558.0	63.450	1.083	2.09		Sand	29.9	137.76	1.32	181.84	1.08	197.14	272.30	0.98	0.687	1.092	2785.396	6690.666	9740.35	0.00	0.00
15.420	76.950	0.585	1875.0	1568.0	83.461	0.770	1.90		Sand	15.3	137.76	1.32	181.84	1.09	198.40	230.79	0.97	0.689	1.090	17.627	42.267	61.38	0.00	0.00
15.580	104.440	0.628	1895.0	1578.0	113.273	0.607	1.74		Sand	1.8	137.76	1.32	181.84	1.10	200.28	200.28	0.97	0.690	1.077	1.919	4.549	6.59	0.00	0.00
15.750	124.510	0.645	1916.3	1588.7	134.774	0.522	1.64		Sand	0.0	137.76	1.32	181.84	1.10	199.87	199.87	0.97	0.692	1.075	1.875	4.436	6.41	0.00	0.00
15.910	136.270	0.568	1936.3	1598.7	147.129	0.420	1.55		Sand	0.0	137.76	1.32	181.84	1.10	199.48	199.48	0.97	0.694	1.073	1.835	4.334	6.25	0.00	0.00
16.080	145.750	0.467	1957.5	1609.3	156.904	0.322	1.47		Sand	0.0		1.32	181.84	1.09	199.07	199.07	0.97	0.695	1.071	1.794	4.228	6.08	0.00	0.00
16.240	136.970	0.619	1977.5	1619.3	146.921	0.455	1.57		Sand	0.0	137.76	1.32	181.84	1.09	198.69	198.69	0.97	0.697	1.069	1.757	4.133	5.93	0.00	0.00
16.400	123.840	0.230	1997.5	1629.3	132.315	0.187	1.44		Sand	0.0	137.76	1.32	181.84	1.09	198.31	198.31	0.97	0.699	1.067	1.721	4.040	5.78	0.00	0.00
16.570	101.860	0.729	2018.8	1640.0	108.276	0.723	1.80		Sand	6.7	137.76	1.32	181.84	1.09	197.81	199.40	0.97	0.700	1.067	1.827	4.288	6.12	0.00	0.00
16.730	65.960	0.812	2038.8	1650.0	69.510	1.250	2.09		Sand	30.5	137.76	1.32	181.84	1.07	194.18	269.76	0.97	0.702	1.075	1878.800	4441.816	6331.14	0.00	0.00
16.900	41.260	0.691	2060.0	1660.6	42.922	1.717	2.34		Sand	50.5	137.76	1.32	181.84	1.07	193.85	291.52	0.97	0.703	1.073	84018.937	########	281999.26	0.00	0.00
17.060	16.600	0.547	2080.0	1670.7	18.627	3.517	2.82		Clay	88.7			15.69	1.06	n.a.	n.a.	0.97	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	11.320	0.268	2100.0	1680.7	12.221	2.611	2.89		Clay	94.3			10.70	1.06	n.a.	n.a.	0.97	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	10.900	0.283	2121.3	1691.3	11.635	2.880	2.93		Clay	97.6			10.30	1.06	n.a.	n.a.	0.97	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.550	11.040	0.314	2141.3	1701.3	11.720	3.149	2.95		Clay	99.2			10.43	1.06	n.a.	n.a.	0.97	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.720	11.230	0.327	2162.5	1712.0	11.856	3.219	2.95		Clay	99.3			10.61	1.06	n.a.	n.a.	0.97	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.880	10.870	0.350	2182.5	1722.0	11.358	3.574	3.00		Clay	100.0			10.27	1.06	n.a.	n.a.	0.97	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.040	11.660	0.722	2202.5	1732.0	12.193	6.836	3.15		Clay	100.0			11.02	1.05	n.a.	n.a.	0.97	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.210	13.420	1.244	2223.8	1742.6	14.126	10.107	3.21		Clay	100.0			12.68	1.05	n.a.	n.a.	0.97	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.370	30.030	1.889	2243.8	1752.7	32.988	6.536	2.82		Clay	88.6			28.38	1.05	n.a.	n.a.	0.97	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.540	55.670	2.355	2265.0	1763.3	56.468	4.318	2.53		Sand	65.3	140.43	1.45	203.62	1.05	213.66	324.70	0.97	0.716	1.055	########	########	#########	0.00	0.00
18.700	86.720	2.404	2285.0	1773.3	88.356	2.809	2.26		Sand	43.8	140.43	1.45	203.62	1.05	213.34	310.66	0.97	0.718	1.053	########	########	#########	0.00	0.00
18.860	104.740	2.623	2305.0	1783.3	106.651	2.532	2.17		Sand	36.7	140.43	1.45	203.62	1.05	213.02	302.30	0.97	0.719	1.051	########	########	2608861.37	0.00	0.00
19.030	130.800	2.591	2326.3	1794.0	133.074	1.999	2.03		Sand	25.5	140.43	1.45	203.62	1.04	212.69	281.13	0.97	0.720	1.050	12109.808	27961.071	38836.51	0.00	0.00
19.190	148.580	1.951	2346.3	1804.0	150.894	1.323	1.86		Sand	12.0		1.45	203.63	1.05	213.23	232.34	0.97	0.721	1.048	20.318	46.838	64.96	0.00	0.00
19.360	143.790	1.148	2367.5	1814.6	145.551	0.805	1.72		Sand	1.0		1.45	197.07	1.05	207.01	207.01	0.96	0.722	1.044	2.871	6.593	9.13	0.00	0.00
19.520	145.610	0.758	2387.5	1824.7	146.994	0.525	1.61		Sand	0.0		1.45	199.56	1.05	209.17	209.17	0.96	0.723	1.043	3.299	7.574	10.47	0.00	0.00
19.690	152.370	1.450	2408.8	1835.3	153.417	0.959	1.76		Sand	3.7	137.63	1.45	208.82	1.04	218.12	218.14	0.96	0.724	1.043	6.189	14.196	19.60	0.00	0.00
19.850	108.610	1.318	2428.8	1845.3	108.699	1.227	1.94		Sand	18.3	137.63	1.45	199.56	1.04	206.95	252.35	0.96	0.725	1.041	172.719	395.585	545.33	0.00	0.00
20.010	49.830	1.046	2448.8	1855.3	49.062	2.151	2.36		Sand	51.9	137.63	1.45	199.56	1.04	206.61	308.65	0.96	0.726	1.039	########	########	#########	0.00	0.00
20.180	28.740	0.819	2470.0	1866.0	29.481	2.976	2.62		Clay	72.7			27.16	1.03	n.a.	n.a.	0.96	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	86.800	1.406	2490.0	1876.0	85.882	1.643	2.10		Sand	31.2	86.83	1.8	156.29	1.04	161.83	231.88	0.96	0.728	1.036	19.479	44.401	60.96	0.00	0.00
20.510	91.870	1.151	2511.3	1886.6	90.704	1.270	2.01		Sand	23.8		1.8	156.30	1.04	161.90	217.52	0.96	0.729	1.034	5.910	13.449	18.44	0.00	0.00
20.670	43.640	0.784	2531.3	1896.6	42.304	1.849	2.37		Sand	52.5	86.83	1.8	156.29	1.03	160.93	251.04	0.96	0.730	1.033	147.460	335.064	458.78	0.00	0.00
20.830	22.220	0.826	2551.3	1906.7	21.970	3.942	2.80		Clay	86.8			21.00	1.03	n.a.	n.a.	0.96	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.000	22.560	0.830	2572.5	1917.3	22.191	3.902	2.79		Clay	86.3			21.32	1.03	n.a.	n.a.	0.96	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	152.760	0.746	2592.5	1927.3	150.005	0.492	1.58		Sand	0.0	209.17		209.17	1.03	215.31	215.31	0.96	0.733	1.028	5.026	11.368	15.51	0.00	0.00
21.330	185.080	0.649	2613.8	1938.0	181.502	0.353	1.43		Sand	0.0	209.17		209.17	1.03	214.95	214.95	0.96	0.734	1.026	4.899	11.062	15.07	0.00	0.00
21.490	200.490	0.508	2633.8	1948.0	196.206	0.255	1.33		Sand	0.0	209.17		209.17	1.03	214.61	214.61	0.96	0.735	1.025	4.783	10.784	14.68	0.00	0.00
21.650	207.310	0.609	2653.8	1958.0	202.394	0.296	1.35		Sand	0.0	209.17		209.17	1.02	214.28	214.28	0.96	0.736	1.023	4.671	10.515	14.29	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 6

PGA (A_{max}) 0.75

Total Settlement: 0.65 (Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5,}$ $_{s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
21.820	219.390	0.603	2675.0	1968.6	213.674	0.276	1.32		Sand	0.0	209.17		209.17	1.02	213.93	213.93	0.96	0.736	1.022	4.555	10.239	13.90	0.00	0.00
21.980	221.300	0.673	2695.0	1978.6	214.989	0.306	1.34		Sand	0.0			209.17	1.02	213.59	213.59	0.96	0.737	1.020	4.450	9.987	13.55	0.00	0.00
22.150	220.460	0.863	2716.3	1989.3	213.584	0.394	1.40		Sand	0.0			208.37	1.02	212.44	212.44	0.96	0.738	1.019	4.109	9.208	12.48	0.00	0.00
22.310	220.710	0.847	2736.3	1999.3	213.282	0.386	1.40		Sand	0.0			208.61	1.02	212.35	212.35	0.96	0.739	1.017	4.083	9.136	12.37	0.00	0.00
22.470	217.280	0.886	2756.3	2009.3	209.413	0.410	1.42		Sand	0.0			205.37	1.02	208.78	208.78	0.96	0.740	1.015	3.215	7.180	9.71	0.00	0.00
22.640	209.050	0.739	2777.5	2020.0	200.889	0.356	1.40		Sand	0.0			197.59	1.02	200.63	200.63	0.96	0.740	1.012	1.958	4.361	5.89	0.00	0.00
22.800	223.970	0.572	2797.5	2030.0	214.781	0.257	1.30		Sand	0.0			211.69	1.01	214.44	214.44	0.96	0.741	1.012	4.724	10.522	14.20	0.00	0.00
22.970	217.760	1.060	2818.8	2040.6	208.233	0.490	1.47		Sand	0.0	211.69		211.69	1.01	214.09	214.09	0.95	0.742	1.011	4.610	10.251	13.82	0.00	0.00
23.130	154.010	1.291	2838.8	2050.6	146.506	0.846	1.74		Sand	2.0	211.69		211.69	1.01	213.77	213.77	0.95	0.743	1.009	4.506	10.006	13.48	0.00	0.00
23.290	68.800	1.312	2858.8	2060.7	64.527	1.947	2.24		Sand	42.5	211.69		211.69	1.01	213.18	309.22	0.95	0.743	1.008	########	########	########	0.00	0.00
23.460	33.910	1.046	2880.0	2071.3	31.352	3.220	2.62		Clay	72.9			32.05	1.01	n.a.	n.a.	0.95	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	24.790	0.508	2900.0	2081.3	22.428	2.175	2.63		Clay	73.4			23.43	1.00	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	21.360	0.453	2921.3	2092.0	19.025	2.276	2.70		Clay	78.9			20.19	1.00	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	18.520	0.408	2941.3	2102.0	16.222	2.392	2.77		Clay	84.5			17.50	1.00	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	17.850	0.363	2961.3	2112.0	15.501	2.218	2.77		Clay	84.2			16.87	1.00	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	16.580	0.345	2982.5	2122.6	14.217	2.286	2.80		Clay	87.3			15.67	1.00	n.a.	n.a.	0.95	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	15.090	0.314	3002.5	2132.6	12.744	2.312	2.85		Clay	90.7			14.26	1.00	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	13.750	0.271	3023.8	2143.3	11.420	2.214	2.88		Clay	93.0			13.00	1.00	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	13.230	0.258	3043.8	2153.3	10.875	2.202	2.89		Clay	94.4			12.50	1.00	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	12.790	0.243	3063.8	2163.3	10.408	2.161	2.90		Clay	95.3			12.09	0.99	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	12.180	0.237	3085.0	2174.0	9.786	2.231	2.93		Clay	97.7			11.51	0.99	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	11.950	0.229	3105.0	2184.0	9.522	2.203	2.94		Clay	98.3			11.29	0.99	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	12.270	0.227	3126.3	2194.6	9.757	2.119	2.92		Clay	96.8			11.60	0.99	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	12.540	0.238	3146.3	2204.6	9.949	2.166	2.92		Clay	96.7			11.85	0.99	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	12.400	0.249	3166.3	2214.7	9.768	2.306	2.94		Clay	98.4			11.72	0.99	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	12.210	0.224	3187.5	2225.3	9.541	2.109	2.93		Clay	97.4			11.54	0.99	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	13.050	0.238	3207.5	2235.3	10.241	2.077	2.90		Clay	95.0			12.33	0.99	n.a.	n.a.	0.95	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	13.120	0.267	3228.8	2246.0	10.246	2.324	2.93		Clay	97.1			12.40	0.98	n.a.	n.a.	0.94	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	13.690	0.306	3248.8	2256.0	10.697	2.538	2.93		Clay	97.6			12.94	0.98	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	14.720	0.523	3268.8	2266.0	11.550	3.994	3.02		Clay	100.0			13.91	0.98	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	15.790	0.531	3290.0	2276.6	12.426	3.753	2.98		Clay	100.0			14.92	0.98	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	16.980	0.628	3310.0	2286.6	13.404	4.097	2.97		Clay	100.0			16.05	0.98	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	16.180	0.579	3331.3	2297.3	12.636	3.988	2.99		Clay	100.0			15.29	0.98	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	15.640	1.217	3351.3	2307.3	12.105	8.711	3.22		Clay	100.0			14.78	0.98	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	17.110	1.935	3372.5	2317.9	13.308	12.546	3.30		Clay	100.0			16.17	0.98	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	36.270	2.362	3392.5	2328.0	29.703	6.831	2.87		Clay	92.2			34.28	0.98	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	89.170	2.533	3412.5	2338.0	78.647	2.895	2.30		Sand	47.3	95.69	1.6	153.10	0.97	148.76	232.42	0.94	0.757	0.970	20.471	43.689	57.71	0.00	0.00
27.890	101.240	2.354	3433.8	2348.6	89.287	2.365	2.20		Sand	39.1		1.6	153.10	0.97	148.43	225.35	0.94	0.757	0.969	10.970	23.379	30.86	0.00	0.00
28.050	99.450	1.990	3453.8	2358.6	87.486	2.036	2.16		Sand	35.9		1.6	150.40	0.97	145.48	218.28	0.94	0.758	0.967	6.256	13.316	17.57	0.00	0.00
28.220	101.900	1.510	3475.0	2369.3	89.468	1.507	2.06		Sand	28.1		1.6	154.10	0.96	148.71	210.96	0.94	0.758	0.966	3.714	7.894	10.41	0.00	0.00
28.380	97.460	1.349	3495.0	2379.3	85.313	1.409	2.06		Sand	27.8	96.31	1.6	154.10	0.96	148.48	210.08	0.94	0.759	0.965	3.502	7.437	9.80	0.00	0.00
28.540	79.060	0.935	3515.0	2389.3	68.759	1.210	2.09		Sand	30.1	96.31	1.6	154.10	0.96	148.37	213.90	0.94	0.759	0.964	4.546	9.637	12.70	0.00	0.00
28.710	40.840	0.603	3536.3	2399.9	34.677	1.544	2.39		Sand	54.2	96.31	1.6	154.10	0.96	148.68	236.38	0.94	0.759	0.962	29.882	63.258	83.33	0.00	0.00
28.870	17.540	0.499	3556.3	2410.0	13.081	3.167	2.92		Clay	96.2			16.58	0.97	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	10.960	0.330	3577.5	2420.6	7.578	3.595	3.14		Clay	100.0			10.36	0.97	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	10.990	0.293	3597.5	2430.6	7.563	3.187	3.11		Clay	100.0			10.39	0.96	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	10.830	0.284	3617.5	2440.6	7.393	3.151	3.12		Clay	100.0			10.24	0.96	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	10.220	0.275	3638.8	2451.3	6.854	3.269	3.15		Clay	100.0			9.66	0.96	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	9.460	0.282	3658.8	2461.3	6.200	3.693	3.22		Clay	100.0			8.94	0.96	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	9.150	0.258	3680.0	2471.9	5.914	3.534	3.23		Clay	100.0			8.65	0.96	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	9.290	0.254	3700.0	2482.0	5.995	3.407	3.21		Clay	100.0			8.78	0.96	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	9.310	0.255	3720.0	2492.0	5.979	3.420	3.21		Clay	100.0			8.80	0.96	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	9.860	0.287	3741.3	2502.6	6.385	3.592	3.20		Clay	100.0			9.32	0.96	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	10.640	0.345	3761.3	2512.6	6.972	3.937	3.19		Clay	100.0			10.06	0.96	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	12.410	0.402	3782.5	2523.3	8.337	3.820	3.12		Clay	100.0			11.73	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	13.640	0.430	3802.5	2533.3	9.268	3.661	3.07		Clay	100.0			12.89	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	13.940	0.438	3822.5	2543.3	9.459	3.638	3.06		Clay	100.0			13.18	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	15.490	0.510	3843.8	2553.9	10.625	3.760	3.03		Clay	100.0			14.64	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	17.490	0.565	3863.8	2564.0	12.136	3.630	2.98		Clay	100.0			16.53	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	17.460	0.573	3885.0	2574.6	12.054	3.694	2.98		Clay	100.0			16.50	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	15.790	0.522	3905.0	2584.6	10.708	3.769	3.03		Clay	100.0			14.92	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.820	14.020	0.530	3925.0	2594.6	9.294	4.399	3.12		Clay	100.0			13.25	0.95	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	14.150	0.632	3946.3	2605.3	9.348	5.189	3.16		Clay	100.0			13.37	0.95	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	16.880	0.774	3966.3	2615.3	11.392	5.192	3.09		Clay	100.0			15.95	0.95	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	19.750	1.080	3987.5	2625.9	13.524	6.080	3.08		Clay	100.0			18.67	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	20.390	1.038	4007.5	2635.9	13.950	5.644	3.05		Clay	100.0			19.27	0.94	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	6

PGA (A_{max})	0.75

Total Settlement:	0.65	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
32.640	44.750	1.025	4027.5	2646.0	36.122	2.398	2.49		Sand	62.5	50.66	1.8	91.19	0.92	83.52	156.44	0.92	0.764	0.962	0.337	0.567	0.74	0.02	0.03
32.810	53.600	1.044	4048.8	2656.6	43.506	2.023	2.38		Sand	53.7		1.8	91.19	0.91	83.29	153.02	0.92	0.765	0.963	0.310	0.508	0.66	0.02	0.04
32.970	21.160	0.833	4068.8	2666.6	14.344	4.356	2.97		Clay	100.0			20.00	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	27.040	0.860	4090.0	2677.3	18.672	3.440	2.81		Clay	88.1			25.56	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.300	23.870	0.841	4110.0	2687.3	16.236	3.856	2.89		Clay	94.4			22.56	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	21.030	1.038	4130.0	2697.3	14.062	5.471	3.04		Clay	100.0			19.88	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	19.540	1.475	4151.3	2707.9	12.899	8.446	3.19		Clay	100.0			18.47	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	34.770	1.757	4171.3	2718.0	24.051	5.375	2.86		Clay	91.6			32.86	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	60.810	1.804	4192.5	2728.6	48.870	3.072	2.47		Sand	60.4	166.8	1.25	208.50	0.94	194.97	298.53	0.92	0.765	0.924	########	########	944166.16	0.00	0.00
34.120	83.850	1.853	4212.5	2738.6	67.914	2.266	2.27		Sand	44.8	166.8	1.25	208.50	0.93	194.78	288.36	0.92	0.765	0.923	45424.837	92201.987	120473.16	0.00	0.00
34.280	111.740	1.650	4232.5	2748.6	90.912	1.505	2.06		Sand	27.7	166.8	1.25	208.50	0.93	194.60	264.80	0.92	0.765	0.922	901.596	1827.861	2388.10	0.00	0.00
34.450	137.470	1.548	4253.8	2759.3	112.024	1.144	1.91		Sand	15.9	166.8	1.25	208.50	0.92	192.81	227.33	0.92	0.765	0.920	12.980	26.281	34.33	0.00	0.00
34.610	170.070	1.702	4273.8	2769.3	138.747	1.013	1.81		Sand	7.6	166.8	1.25	208.50	0.91	190.36	193.49	0.92	0.766	0.934	1.334	2.743	3.58	0.00	0.00
34.780	176.470	1.720	4295.0	2779.9	143.750	0.987	1.79		Sand	6.0		1.25	208.49	0.91	189.91	190.75	0.92	0.766	0.935	1.166	2.398	3.13	0.00	0.00
34.940	171.390	2.169	4315.0	2789.9	139.302	1.281	1.88		Sand	13.1	166.8	1.25	208.50	0.92	191.31	214.16	0.92	0.766	0.917	4.632	9.346	12.21	0.00	0.00
35.100	165.740	2.900	4335.0	2800.0	134.402	1.773	1.99		Sand	22.1	166.8	1.25	208.50	0.93	193.38	249.63	0.92	0.766	0.916	124.615	251.118	327.96	0.00	0.00
35.270	155.680	3.293	4356.3	2810.6	125.889	2.145	2.07		Sand	28.6	166.8	1.25	208.50	0.93	193.46	265.27	0.92	0.766	0.915	964.965	1942.132	2536.31	0.00	0.00
35.430	130.380	3.689	4376.3	2820.6	104.945	2.877	2.22		Sand	40.4	166.8	1.25	208.50	0.93	193.27	282.29	0.92	0.766	0.914	14852.279	29857.495	38990.32	0.00	0.00
35.600	129.350	3.103	4397.5	2831.3	103.897	2.440	2.17		Sand	36.4	166.8	1.25	208.50	0.93	193.08	277.32	0.91	0.766	0.913	6294.962	12639.098	16504.49	0.00	0.00
35.760	128.330	2.517	4417.5	2841.3	102.874	1.996	2.11		Sand	31.5	166.8	1.25	208.50	0.93	192.90	269.91	0.91	0.766	0.912	1921.233	3852.997	5031.19	0.00	0.00
35.930	116.940	2.793	4438.8	2851.9	93.400	2.434	2.20		Sand	38.8	166.8	1.25	208.50	0.92	192.71	279.82	0.91	0.766	0.910	9630.417	19289.856	25187.80	0.00	0.00
36.090	100.920	2.388	4458.8	2861.9	80.208	2.419	2.24		Sand	42.3	166.8	1.25	208.50	0.92	192.53	283.26	0.91	0.766	0.909	17666.118	35344.598	46150.52	0.00	0.00
36.250	65.310	2.430	4478.8	2872.0	51.169	3.852	2.52		Sand	64.8	166.8	1.25	208.50	0.92	192.36	297.08	0.91	0.766	0.908	########	########	682069.67	0.00	0.00
36.420	40.240	2.246	4500.0	2882.6	26.358	5.912	2.86		Clay	91.6			38.03	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.580	62.670	1.505	4520.0	2892.6	48.836	2.491	2.41		Sand	55.4		1.78	105.44	0.89	93.73	167.02	0.91	0.766	0.942	0.457	0.813	1.06	0.01	0.01
36.750	45.730	0.860	4541.3	2903.3	35.068	1.979	2.45		Sand	59.0		1.78	76.94	0.87	67.15	134.40	0.91	0.766	0.956	0.212	0.305	0.40	0.02	0.05
36.910	35.990	0.584	4561.3	2913.3	27.154	1.731	2.50		Sand	63.4		1.78	60.55	0.86	52.21	116.48	0.91	0.766	0.961	0.164	0.214	0.28	0.03	0.05
37.070	39.970	0.453	4581.3	2923.3	30.300	1.202	2.38		Sand	53.1		1.78	67.25	0.86	58.04	120.68	0.91	0.766	0.960	0.173	0.231	0.30	0.03	0.05
37.240	17.370	0.363	4602.5	2933.9	10.272	2.408	2.93		Clay	97.7			16.42	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.400	11.040	0.327	4622.5	2943.9	5.930	3.742	3.24		Clay	100.0			10.43	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.570	13.160	0.398	4643.8	2954.6	7.336	3.668	3.16		Clay	100.0			12.44	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.730	14.700	0.455	4663.8	2964.6	8.344	3.677	3.11		Clay	100.0			13.89	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
37.890	15.830	0.474	4683.8	2974.6	9.069	3.515	3.07		Clay	100.0			14.96	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.060	15.940	0.446	4705.0	2985.3	9.103	3.282	3.05		Clay	100.0			15.07	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.220	15.840	0.417	4725.0	2995.3	8.999	3.096	3.04		Clay	100.0			14.97	0.91	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.390	15.260	0.450	4746.3	3005.9	8.574	3.493	3.09		Clay	100.0			14.42	0.91	n.a.	n.a.	0.90	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.550	15.730	0.680	4766.3	3015.9	8.851	5.092	3.17		Clay	100.0			14.87	0.91	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.710	18.200	0.974	4786.3	3025.9	10.448	6.162	3.17		Clay	100.0			17.20	0.91	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
38.880	25.000	1.314	4807.5	3036.6	14.883	5.813	3.04		Clay	100.0			23.63	0.91	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.040	32.950	1.285	4827.5	3046.6	20.046	4.208	2.85		Clay	90.7			31.14	0.91	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	33.340	1.462	4848.8	3057.2	20.224	4.728	2.88		Clay	93.1			31.51	0.91	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	32.050	1.639	4868.8	3067.3	19.311	5.534	2.94		Clay	97.9			30.29	0.91	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	37.630	1.780	4888.8	3077.3	22.868	5.059	2.86		Clay	91.5			35.57	0.91	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.700	64.340	2.079	4910.0	3087.9	48.420	3.359	2.50		Sand	62.8	102.52	1.66	170.18	0.90	153.53	246.41	0.90	0.765	0.887	85.953	167.654	219.17	0.00	0.00
39.860	98.040	1.007	4930.0	3097.9	74.659	1.054	2.02		Sand	24.9	102.52	1.66	170.18	0.88	150.61	206.81	0.90	0.765	0.891	2.835	5.560	7.27	0.00	0.00
40.030	108.470	0.982	4951.3	3108.6	82.656	0.926	1.95		Sand	19.3		1.66	170.19	0.88	149.23	190.96	0.90	0.765	0.909	1.178	2.354	3.08	0.00	0.00
40.190	106.080	1.424	4971.3	3118.6	80.655	1.375	2.07		Sand	28.7	102.52	1.66	170.18	0.89	150.86	214.52	0.90	0.765	0.884	4.752	9.238	12.08	0.00	0.00
40.350	87.590	1.968	4991.3	3128.6	66.145	2.312	2.29		Sand	46.0	102.52	1.66	170.18	0.89	152.26	235.89	0.90	0.765	0.883	28.474	55.294	72.32	0.00	0.00
40.520	73.000	2.310	5012.5	3139.3	54.703	3.277	2.45		Sand	59.1	102.52	1.66	170.18	0.90	152.67	243.82	0.90	0.764	0.882	64.536	125.178	163.74	0.00	0.00
40.680	55.620	1.752	5032.5	3149.3	33.725	3.299	2.61		Clay	71.5			52.57	0.90	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.850	37.720	1.523	5053.8	3159.9	22.275	4.329	2.82		Clay	88.6			35.65	0.90	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	28.110	1.240	5073.8	3169.9	16.135	4.848	2.96		Clay	99.6			26.57	0.90	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	28.730	0.860	5093.8	3179.9	16.468	3.285	2.84		Clay	90.6			27.16	0.90	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	27.020	0.813	5115.0	3190.6	15.334	3.324	2.87		Clay	92.8			25.54	0.90	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	24.910	0.725	5135.0	3200.6	13.961	3.244	2.90		Clay	94.9			23.54	0.90	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	20.490	0.794	5156.3	3211.2	11.156	4.433	3.06		Clay	100.0			19.37	0.90	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	20.390	0.815	5176.3	3221.3	11.053	4.577	3.07		Clay	100.0			19.27	0.90	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	18.450	0.727	5196.3	3231.3	9.812	4.586	3.11		Clay	100.0			17.44	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	16.320	0.579	5217.5	3241.9	8.459	4.223	3.14		Clay	100.0			15.43	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.320	15.200	0.513	5237.5	3251.9	7.738	4.074	3.16		Clay	100.0			14.37	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.490	14.760	0.514	5258.8	3262.6	7.436	4.235	3.19		Clay	100.0			13.95	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	14.470	0.463	5278.8	3272.6	7.230	3.916	3.18		Clay	100.0			13.68	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	14.150	0.420	5298.8	3282.6	7.007	3.654	3.17		Clay	100.0			13.37	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	13.700	0.361	5320.0	3293.2	6.705	3.272	3.16		Clay	100.0			12.95	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	13.150	0.316	5340.0	3303.3	6.345	3.016	3.16		Clay	100.0			12.43	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	13.300	0.312	5361.3	3313.9	6.409	2.942	3.15		Clay	100.0			12.57	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	6

PGA (A_{max})	0.75

Total Settlement:	0.65	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5,}$ $_{s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
43.470	13.710	0.317	5381.3	3323.9	6.630	2.879	3.14		Clay	100.0			12.96	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	14.040	0.335	5402.5	3334.6	6.801	2.952	3.13		Clay	100.0			13.27	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	14.350	0.351	5422.5	3344.6	6.960	3.015	3.13		Clay	100.0			13.56	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	14.470	0.362	5442.5	3354.6	7.005	3.083	3.13		Clay	100.0			13.68	0.89	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	14.780	0.422	5463.8	3365.2	7.160	3.503	3.15		Clay	100.0			13.97	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.290	16.440	0.483	5483.8	3375.3	8.117	3.524	3.11		Clay	100.0			15.54	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	18.720	0.525	5505.0	3385.9	9.432	3.287	3.04		Clay	100.0			17.69	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No. 7

PGA (A_{max}) 0.75

Total Settlement: 0.12 (Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
0.160	401.980	0.832	19.2	19.2	3988.555	0.207	0.55		Unsaturated	0.0			379.94	1.70	645.90	645.90	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.330	439.160	0.854	39.6	39.6	3034.085	0.195	0.51		Unsaturated	0.0			415.09	1.70	705.64	705.64	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.490	275.700	1.335	58.8	58.8	1563.054	0.484	0.95		Unsaturated	0.0			260.59	1.70	443.00	443.00	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.660	175.730	2.049	79.2	79.2	858.337	1.166	1.39		Unsaturated	0.0			166.10	1.70	282.36	282.36	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.820	115.350	2.413	98.4	98.4	505.367	2.093	1.72		Unsaturated	0.7			109.03	1.70	185.34	185.34	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
0.980	65.170	2.876	117.6	117.6	261.050	4.417	2.14		Unsaturated	34.4			61.60	1.70	104.72	166.58	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.150	45.570	2.729	138.0	138.0	168.404	5.998	2.35		Unsaturated	51.3			43.07	1.70	73.22	139.20	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.310	39.130	2.747	157.2	157.2	135.420	7.035	2.46		Unsaturated	60.0			36.98	1.70	62.87	129.22	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.480	32.480	2.616	177.6	177.6	105.676	8.076	2.57		Unsaturated	68.8			30.70	1.70	52.19	117.75	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.640	30.120	2.476	196.8	196.8	149.621	8.247	2.50		Unsaturated	62.9			28.47	1.70	48.40	111.46	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.800	29.280	2.438	216.0	216.0	136.215	8.358	2.52		Unsaturated	65.0			27.67	1.70	47.05	110.25	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
1.970	28.800	2.396	236.4	236.4	125.727	8.355	2.54		Unsaturated	66.4			27.22	1.70	46.28	109.60	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.130	28.890	2.440	255.6	255.6	119.373	8.483	2.56		Unsaturated	67.9			27.31	1.70	46.42	110.11	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.300	29.150	2.391	276.0	276.0	114.108	8.240	2.56		Unsaturated	67.9			27.55	1.70	46.84	110.65	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.460	28.910	2.383	295.2	295.2	107.924	8.285	2.58		Unsaturated	69.1			27.33	1.70	46.45	110.41	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.620	28.740	2.366	314.4	314.4	102.622	8.279	2.59		Unsaturated	70.1			27.16	1.70	46.18	110.26	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.790	29.880	2.380	334.8	334.8	102.086	8.009	2.58		Unsaturated	69.2			28.24	1.70	48.01	112.45	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
2.950	30.760	2.348	354.0	354.0	101.054	7.679	2.57		Unsaturated	68.2			29.07	1.70	49.43	114.06	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.120	30.870	2.289	374.4	374.4	97.484	7.460	2.56		Unsaturated	68.1			29.18	1.70	49.60	114.26	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.280	30.930	2.224	393.6	393.6	94.285	7.237	2.56		Unsaturated	67.9			29.23	1.70	49.70	114.35	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.440	30.430	2.161	412.8	412.8	89.682	7.148	2.57		Unsaturated	68.6			28.76	1.70	48.90	113.46	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.610	29.880	2.139	433.2	433.2	85.097	7.211	2.59		Unsaturated	69.9			28.24	1.70	48.01	112.60	1.00	0.488	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.770	29.920	2.166	452.4	452.4	82.637	7.295	2.60		Unsaturated	70.9			28.28	1.70	48.08	112.87	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
3.940	31.040	2.236	472.8	472.8	83.119	7.258	2.59		Unsaturated	70.6			29.34	1.70	49.88	115.14	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.100	34.630	2.342	492.0	492.0	90.231	6.811	2.55		Unsaturated	67.1			32.73	1.70	55.64	121.83	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.270	38.490	2.437	512.4	512.4	73.437	6.375	2.58		Unsaturated	69.6			36.38	1.70	61.85	130.40	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.430	39.850	2.481	531.6	531.6	74.645	6.267	2.57		Unsaturated	68.8			37.67	1.70	64.03	133.04	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.590	40.090	2.515	550.8	550.8	73.759	6.318	2.58		Unsaturated	69.3			37.89	1.70	64.42	133.64	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.760	40.040	2.452	571.2	571.2	72.321	6.168	2.58		Unsaturated	69.1			37.84	1.70	64.34	133.49	1.00	0.487	1.100	n.a.	n.a.	n.a.	0.00	0.00
4.920	39.800	2.561	590.4	590.4	70.689	6.483	2.60		Unsaturated	70.9			37.62	1.70	63.95	133.40	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.090	40.190	2.577	610.8	610.8	70.166	6.460	2.60		Unsaturated	71.0			37.99	1.70	64.58	134.22	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.250	40.450	2.544	630.0	630.0	69.522	6.338	2.60		Unsaturated	70.7			38.23	1.69	64.43	133.96	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.410	41.640	2.484	649.2	649.2	70.501	6.012	2.57		Unsaturated	68.9			39.36	1.66	65.36	134.78	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.580	40.450	2.441	669.6	669.6	67.402	6.084	2.59		Unsaturated	70.2			38.23	1.65	63.01	132.04	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.740	39.060	2.452	688.8	688.8	80.278	6.334	2.56		Unsaturated	67.6			36.92	1.64	60.57	128.28	1.00	0.486	1.100	n.a.	n.a.	n.a.	0.00	0.00
5.910	39.440	2.431	709.2	709.2	79.406	6.219	2.55		Unsaturated	67.3			37.28	1.62	60.41	128.01	1.00	0.485	1.100	n.a.	n.a.	n.a.	0.00	0.00
6.070	39.700	2.331	728.4	728.4	63.369	5.926	2.60	plastic	Clay	70.9			37.52	1.32	n.a.	n.a.	1.00	0.488	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.230	39.110	2.294	747.6	747.6	75.844	5.922	2.55	plastic	Clay	66.9	37.52		37.52	1.32	n.a.	n.a.	1.00	0.495	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.400	36.730	2.222	768.0	768.0	69.836	6.113	2.58	plastic	Clay	69.6	37.52		37.52	1.31	n.a.	n.a.	0.99	0.501	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.560	34.540	2.094	787.2	787.2	64.485	6.132	2.61	plastic	Clay	71.4	37.52		37.52	1.30	n.a.	n.a.	0.99	0.507	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.730	32.110	1.980	807.6	807.6	58.814	6.245	2.64	plastic	Clay	74.0	37.52		37.52	1.29	n.a.	n.a.	0.99	0.514	n.a.	n.a.	n.a.	n.a.	0.00	0.00
6.890	30.480	1.812	826.8	826.8	54.863	6.027	2.64	plastic	Clay	74.6	37.52		37.52	1.28	n.a.	n.a.	0.99	0.519	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.050	27.540	1.671	846.0	846.0	64.106	6.161	2.61		Clay	71.7			26.03	1.27	n.a.	n.a.	0.99	0.525	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.220	24.210	1.430	866.4	866.4	54.886	6.015	2.64		Clay	74.5			22.88	1.27	n.a.	n.a.	0.99	0.531	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.380	24.120	1.371	885.6	885.6	53.472	5.790	2.64		Clay	74.1			22.80	1.26	n.a.	n.a.	0.99	0.536	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.550	23.800	1.400	906.0	906.0	51.539	5.996	2.66		Clay	75.9			22.50	1.25	n.a.	n.a.	0.99	0.541	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.710	24.750	1.440	925.2	925.2	52.502	5.930	2.65		Clay	75.2			23.39	1.24	n.a.	n.a.	0.99	0.546	n.a.	n.a.	n.a.	n.a.	0.00	0.00
7.870	25.010	1.467	944.4	944.4	51.965	5.980	2.66		Clay	75.6			23.64	1.24	n.a.	n.a.	0.99	0.551	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.040	22.420	1.246	964.8	964.8	45.476	5.677	2.68		Clay	77.4			21.19	1.23	n.a.	n.a.	0.99	0.556	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.200	21.300	1.272	984.0	984.0	42.293	6.112	2.72		Clay	81.0			20.13	1.22	n.a.	n.a.	0.99	0.561	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.370	21.760	1.266	1004.4	1004.4	42.329	5.955	2.72		Clay	80.3			20.57	1.22	n.a.	n.a.	0.99	0.565	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.530	23.630	1.229	1023.6	1023.6	45.170	5.317	2.66		Clay	75.9			22.33	1.21	n.a.	n.a.	0.99	0.570	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.690	22.890	0.984	1042.8	1042.8	42.901	4.397	2.62		Clay	72.3			21.64	1.21	n.a.	n.a.	0.99	0.574	n.a.	n.a.	n.a.	n.a.	0.00	0.00
8.860	28.390	0.777	1063.2	1063.2	37.147	2.791	2.53	plastic	Clay	65.1	44.3	1.78	78.85	1.20	n.a.	n.a.	0.99	0.578	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.020	46.870	0.746	1082.4	1082.4	61.225	1.610	2.21	plastic	Clay	39.5		1.78	78.86	1.19	n.a.	n.a.	0.99	0.582	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.190	38.540	0.730	1102.8	1102.8	49.737	1.922	2.33	plastic	Clay	49.0	44.3	1.78	78.85	1.19	n.a.	n.a.	0.99	0.587	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.350	22.300	0.608	1122.0	1122.0	32.035	2.795	2.58	plastic	Clay	69.1	44.3	1.78	78.85	1.18	n.a.	n.a.	0.99	0.591	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.510	14.000	0.555	1141.2	1141.2	23.536	4.133	2.79		Clay	86.1			13.23	1.18	n.a.	n.a.	0.99	0.594	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.680	10.560	0.458	1161.6	1161.6	17.182	4.590	2.92		Clay	96.7			9.98	1.17	n.a.	n.a.	0.99	0.598	n.a.	n.a.	n.a.	n.a.	0.00	0.00
9.840	10.340	0.415	1180.8	1180.8	16.514	4.256	2.91		Clay	96.1			9.77	1.17	n.a.	n.a.	0.99	0.602	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.010	10.260	0.449	1201.2	1201.2	16.083	4.647	2.95		Clay	98.8			9.70	1.16	n.a.	n.a.	0.99	0.606	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.170	10.380	0.467	1220.4	1220.4	16.011	4.782	2.96		Clay	99.5			9.81	1.16	n.a.	n.a.	0.99	0.609	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.330	10.050	0.474	1239.6	1239.6	15.215	5.023	2.99		Clay	100.0			9.50	1.15	n.a.	n.a.	0.99	0.612	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.500	10.410	0.425	1260.0	1260.0	15.524	4.345	2.94		Clay	98.2			9.84	1.15	n.a.	n.a.	0.99	0.616	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.660	10.030	0.441	1279.2	1279.2	14.682	4.696	2.98		Clay	100.0			9.48	1.14	n.a.	n.a.	0.99	0.619	n.a.	n.a.	n.a.	n.a.	0.00	0.00
10.830	8.400	0.512	1299.6	1299.6	11.927	6.604	3.14		Clay	100.0			7.94	1.14	n.a.	n.a.	0.99	0.622	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	7

PGA (A_{max})	0.75

Total Settlement:	0.12	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	$CRR_{M=7.5, s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
10.990	9.580	0.575	1318.8	1318.8	13.528	6.444	3.10		Clay	100.0			9.05	1.13	n.a.	n.a.	0.99	0.625	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.150	10.320	0.575	1338.8	1329.4	14.519	5.954	3.05		Clay	100.0			9.75	1.13	n.a.	n.a.	0.99	0.628	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.320	9.860	0.429	1360.0	1340.0	13.701	4.672	3.00		Clay	100.0			9.32	1.13	n.a.	n.a.	0.98	0.631	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.480	8.760	0.410	1380.0	1350.0	11.955	5.084	3.07		Clay	100.0			8.28	1.13	n.a.	n.a.	0.98	0.634	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.650	8.540	0.427	1401.3	1360.7	11.523	5.449	3.10		Clay	100.0			8.07	1.12	n.a.	n.a.	0.98	0.637	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.810	8.780	0.396	1421.3	1370.7	11.774	4.911	3.07		Clay	100.0			8.30	1.12	n.a.	n.a.	0.98	0.640	n.a.	n.a.	n.a.	n.a.	0.00	0.00
11.980	8.520	0.406	1442.5	1381.3	11.292	5.211	3.10		Clay	100.0			8.05	1.12	n.a.	n.a.	0.98	0.643	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.140	9.530	0.464	1462.5	1391.4	12.648	5.270	3.06		Clay	100.0			9.01	1.12	n.a.	n.a.	0.98	0.645	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.300	11.460	0.546	1482.5	1401.4	15.297	5.093	2.99		Clay	100.0			10.83	1.11	n.a.	n.a.	0.98	0.648	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.470	14.030	0.602	1503.8	1412.0	18.807	4.535	2.89		Clay	94.1			13.26	1.11	n.a.	n.a.	0.98	0.651	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.630	16.260	0.643	1523.8	1422.0	21.797	4.147	2.81		Clay	88.2			15.37	1.11	n.a.	n.a.	0.98	0.653	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.800	16.220	0.645	1545.0	1432.7	21.564	4.172	2.82		Clay	88.6			15.33	1.11	n.a.	n.a.	0.98	0.656	n.a.	n.a.	n.a.	n.a.	0.00	0.00
12.960	15.200	0.666	1565.0	1442.7	19.987	4.617	2.87		Clay	92.9			14.37	1.11	n.a.	n.a.	0.98	0.658	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.120	14.180	0.625	1585.0	1452.7	18.431	4.669	2.90		Clay	95.3			13.40	1.10	n.a.	n.a.	0.98	0.660	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.290	13.810	0.579	1606.3	1463.4	17.777	4.450	2.90		Clay	95.1			13.05	1.10	n.a.	n.a.	0.98	0.663	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.450	14.050	0.556	1626.3	1473.4	17.968	4.201	2.88		Clay	93.6			13.28	1.10	n.a.	n.a.	0.98	0.665	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.620	14.460	0.572	1647.5	1484.0	18.378	4.193	2.87		Clay	92.9			13.67	1.10	n.a.	n.a.	0.98	0.667	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.780	14.660	0.564	1667.5	1494.0	18.509	4.081	2.86		Clay	92.1			13.86	1.10	n.a.	n.a.	0.98	0.669	n.a.	n.a.	n.a.	n.a.	0.00	0.00
13.940	13.570	0.551	1687.5	1504.0	16.923	4.326	2.91		Clay	95.8			12.83	1.09	n.a.	n.a.	0.98	0.671	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.110	11.550	0.475	1708.8	1514.7	14.123	4.444	2.98		Clay	100.0			10.92	1.09	n.a.	n.a.	0.98	0.673	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.270	9.300	0.393	1728.8	1524.7	11.065	4.660	3.07		Clay	100.0			8.79	1.09	n.a.	n.a.	0.98	0.675	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.440	7.330	0.343	1750.0	1535.3	8.409	5.309	3.20		Clay	100.0			6.93	1.09	n.a.	n.a.	0.98	0.678	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.600	6.050	0.286	1770.0	1545.4	6.685	5.530	3.29		Clay	100.0			5.72	1.09	n.a.	n.a.	0.98	0.679	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.760	5.420	0.308	1790.0	1555.4	5.819	6.809	3.40		Clay	100.0			5.12	1.08	n.a.	n.a.	0.98	0.681	n.a.	n.a.	n.a.	n.a.	0.00	0.00
14.930	6.590	0.280	1811.3	1566.0	7.260	4.924	3.23		Clay	100.0			6.23	1.08	n.a.	n.a.	0.98	0.683	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.090	8.110	0.282	1831.3	1576.0	9.130	3.920	3.10		Clay	100.0			7.67	1.08	n.a.	n.a.	0.98	0.685	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.260	7.840	0.322	1852.5	1586.7	8.715	4.653	3.16		Clay	100.0			7.41	1.08	n.a.	n.a.	0.98	0.687	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.420	8.110	0.405	1872.5	1596.7	8.986	5.648	3.20		Clay	100.0			7.67	1.08	n.a.	n.a.	0.97	0.689	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.580	9.900	0.495	1892.5	1606.7	11.145	5.525	3.12		Clay	100.0			9.36	1.08	n.a.	n.a.	0.97	0.690	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.750	14.170	0.563	1913.8	1617.4	16.339	4.261	2.92		Clay	96.4			13.39	1.07	n.a.	n.a.	0.97	0.692	n.a.	n.a.	n.a.	n.a.	0.00	0.00
15.910	16.550	0.580	1933.8	1627.4	19.151	3.722	2.83		Clay	89.2			15.64	1.07	n.a.	n.a.	0.97	0.694	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.080	17.590	0.577	1955.0	1638.0	20.284	3.474	2.79		Clay	86.1			16.63	1.07	n.a.	n.a.	0.97	0.695	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.240	18.890	0.586	1975.0	1648.0	21.726	3.275	2.75		Clay	83.0			17.85	1.07	n.a.	n.a.	0.97	0.697	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.400	17.300	0.561	1995.0	1658.0	19.665	3.443	2.80		Clay	86.8			16.35	1.07	n.a.	n.a.	0.97	0.699	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.570	15.610	0.541	2016.3	1668.7	17.501	3.704	2.86		Clay	91.5			14.75	1.06	n.a.	n.a.	0.97	0.700	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.730	16.320	0.573	2036.3	1678.7	18.231	3.747	2.85		Clay	90.7			15.43	1.06	n.a.	n.a.	0.97	0.702	n.a.	n.a.	n.a.	n.a.	0.00	0.00
16.900	14.560	0.560	2057.5	1689.3	16.020	4.138	2.92		Clay	96.3			13.76	1.06	n.a.	n.a.	0.97	0.703	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.060	11.850	0.557	2077.5	1699.4	12.724	5.152	3.05		Clay	100.0			11.20	1.06	n.a.	n.a.	0.97	0.705	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.220	12.500	0.478	2097.5	1709.4	13.398	4.177	2.98		Clay	100.0			11.81	1.06	n.a.	n.a.	0.97	0.706	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.390	13.130	0.481	2118.8	1720.0	14.035	3.982	2.95		Clay	99.1			12.41	1.06	n.a.	n.a.	0.97	0.707	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.550	13.840	0.470	2138.8	1730.0	14.763	3.678	2.91		Clay	96.0			13.08	1.05	n.a.	n.a.	0.97	0.709	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.720	12.770	0.418	2160.0	1740.7	13.432	3.578	2.94		Clay	98.0			12.07	1.05	n.a.	n.a.	0.97	0.710	n.a.	n.a.	n.a.	n.a.	0.00	0.00
17.880	11.380	0.401	2180.0	1750.7	11.755	3.899	3.01		Clay	100.0			10.76	1.05	n.a.	n.a.	0.97	0.711	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.040	10.010	0.371	2200.0	1760.7	10.121	4.165	3.08		Clay	100.0			9.46	1.05	n.a.	n.a.	0.97	0.713	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.210	9.430	0.349	2221.3	1771.3	9.393	4.200	3.10		Clay	100.0			8.91	1.05	n.a.	n.a.	0.97	0.714	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.370	9.100	0.338	2241.3	1781.4	8.959	4.233	3.12		Clay	100.0			8.60	1.05	n.a.	n.a.	0.97	0.715	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.540	9.270	0.332	2262.5	1792.0	9.083	4.077	3.11		Clay	100.0			8.76	1.04	n.a.	n.a.	0.97	0.716	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.700	9.480	0.356	2282.5	1802.0	9.255	4.267	3.11		Clay	100.0			8.96	1.04	n.a.	n.a.	0.97	0.718	n.a.	n.a.	n.a.	n.a.	0.00	0.00
18.860	9.660	0.370	2302.5	1812.0	9.391	4.352	3.11		Clay	100.0			9.13	1.04	n.a.	n.a.	0.97	0.719	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.030	9.890	0.382	2323.8	1822.7	9.577	4.378	3.11		Clay	100.0			9.35	1.04	n.a.	n.a.	0.97	0.720	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.190	10.240	0.357	2343.8	1832.7	9.896	3.941	3.07		Clay	100.0			9.68	1.04	n.a.	n.a.	0.97	0.721	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.360	10.140	0.368	2365.0	1843.3	9.719	4.111	3.09		Clay	100.0			9.58	1.04	n.a.	n.a.	0.96	0.722	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.520	9.750	0.362	2385.0	1853.4	9.235	4.231	3.11		Clay	100.0			9.22	1.04	n.a.	n.a.	0.96	0.723	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.690	9.830	0.372	2406.3	1864.0	9.256	4.316	3.12		Clay	100.0			9.29	1.03	n.a.	n.a.	0.96	0.724	n.a.	n.a.	n.a.	n.a.	0.00	0.00
19.850	10.100	0.396	2426.3	1874.0	9.484	4.456	3.12		Clay	100.0			9.55	1.03	n.a.	n.a.	0.96	0.725	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.010	10.340	0.393	2446.3	1884.0	9.678	4.308	3.10		Clay	100.0			9.77	1.03	n.a.	n.a.	0.96	0.726	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.180	9.680	0.366	2467.5	1894.7	8.916	4.334	3.13		Clay	100.0			9.15	1.03	n.a.	n.a.	0.96	0.727	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.340	8.780	0.323	2487.5	1904.7	7.913	4.287	3.17		Clay	100.0			8.30	1.03	n.a.	n.a.	0.96	0.728	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.510	8.330	0.246	2508.8	1915.3	7.388	3.471	3.14		Clay	100.0			7.87	1.03	n.a.	n.a.	0.96	0.729	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.670	7.820	0.238	2528.8	1925.3	6.810	3.635	3.18		Clay	100.0			7.39	1.03	n.a.	n.a.	0.96	0.730	n.a.	n.a.	n.a.	n.a.	0.00	0.00
20.830	7.120	0.224	2548.8	1935.4	6.041	3.829	3.24		Clay	100.0			6.73	1.02	n.a.	n.a.	0.96	0.731	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.000	6.710	0.207	2570.0	1946.0	5.576	3.819	3.27		Clay	100.0			6.34	1.02	n.a.	n.a.	0.96	0.732	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.160	6.330	0.193	2590.0	1956.0	5.148	3.835	3.30		Clay	100.0			5.98	1.02	n.a.	n.a.	0.96	0.733	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.330	6.060	0.193	2611.3	1966.7	4.835	4.057	3.33		Clay	100.0			5.73	1.02	n.a.	n.a.	0.96	0.734	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.490	5.960	0.193	2631.3	1976.7	4.699	4.151	3.35		Clay	100.0			5.63	1.02	n.a.	n.a.	0.96	0.735	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.650	6.120	0.193	2651.3	1986.7	4.826	4.034	3.33		Clay	100.0			5.78	1.02	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	7

PGA (A_{max})	0.75

Total Settlement:	0.12	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5,}$ $_{s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
21.820	6.230	0.197	2672.5	1997.3	4.900	4.017	3.32		Clay	100.0			5.89	1.02	n.a.	n.a.	0.96	0.736	n.a.	n.a.	n.a.	n.a.	0.00	0.00
21.980	6.240	0.191	2692.5	2007.3	4.876	3.905	3.32		Clay	100.0			5.90	1.01	n.a.	n.a.	0.96	0.737	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.150	6.280	0.185	2713.8	2018.0	4.879	3.766	3.31		Clay	100.0			5.94	1.01	n.a.	n.a.	0.96	0.738	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.310	6.360	0.179	2733.8	2028.0	4.924	3.577	3.30		Clay	100.0			6.01	1.01	n.a.	n.a.	0.96	0.739	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.470	6.470	0.195	2753.8	2038.0	4.998	3.825	3.31		Clay	100.0			6.12	1.01	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.640	6.430	0.212	2775.0	2048.7	4.923	4.196	3.33		Clay	100.0			6.08	1.01	n.a.	n.a.	0.96	0.740	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.800	6.960	0.207	2795.0	2058.7	5.404	3.714	3.27		Clay	100.0			6.58	1.01	n.a.	n.a.	0.96	0.741	n.a.	n.a.	n.a.	n.a.	0.00	0.00
22.970	7.330	0.227	2816.3	2069.3	5.723	3.825	3.26		Clay	100.0			6.93	1.01	n.a.	n.a.	0.95	0.742	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.130	7.380	0.236	2836.3	2079.3	5.734	3.958	3.26		Clay	100.0			6.98	1.00	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.290	7.630	0.234	2856.3	2089.4	5.937	3.776	3.24		Clay	100.0			7.21	1.00	n.a.	n.a.	0.95	0.743	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.460	8.240	0.249	2877.5	2100.0	6.477	3.661	3.20		Clay	100.0			7.79	1.00	n.a.	n.a.	0.95	0.744	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.620	8.750	0.249	2897.5	2110.0	6.921	3.404	3.16		Clay	100.0			8.27	1.00	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.790	9.950	0.263	2918.8	2120.7	8.008	3.099	3.08		Clay	100.0			9.40	1.00	n.a.	n.a.	0.95	0.745	n.a.	n.a.	n.a.	n.a.	0.00	0.00
23.950	11.110	0.272	2938.8	2130.7	9.049	2.818	3.02		Clay	100.0			10.50	1.00	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.110	11.160	0.284	2958.8	2140.7	9.044	2.938	3.03		Clay	100.0			10.55	1.00	n.a.	n.a.	0.95	0.746	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.280	10.680	0.281	2980.0	2151.3	8.544	3.057	3.06		Clay	100.0			10.09	1.00	n.a.	n.a.	0.95	0.747	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.440	10.140	0.273	3000.0	2161.3	7.995	3.161	3.09		Clay	100.0			9.58	0.99	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.610	9.680	0.266	3021.3	2172.0	7.522	3.257	3.12		Clay	100.0			9.15	0.99	n.a.	n.a.	0.95	0.748	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.770	8.920	0.254	3041.3	2182.0	6.782	3.431	3.17		Clay	100.0			8.43	0.99	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
24.930	8.540	0.244	3061.3	2192.0	6.395	3.480	3.19		Clay	100.0			8.07	0.99	n.a.	n.a.	0.95	0.749	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.100	8.600	0.246	3082.5	2202.7	6.409	3.491	3.19		Clay	100.0			8.13	0.99	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.260	8.850	0.264	3102.5	2212.7	6.597	3.612	3.19		Clay	100.0			8.36	0.99	n.a.	n.a.	0.95	0.750	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.430	9.930	0.312	3123.8	2223.3	7.528	3.727	3.15		Clay	100.0			9.39	0.99	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.590	11.950	0.356	3143.8	2233.3	9.294	3.425	3.06		Clay	100.0			11.29	0.99	n.a.	n.a.	0.95	0.751	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.750	14.000	0.385	3163.8	2243.4	11.071	3.103	2.97		Clay	100.0			13.23	0.98	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
25.920	14.880	0.413	3185.0	2254.0	11.790	3.107	2.95		Clay	98.8			14.06	0.98	n.a.	n.a.	0.95	0.752	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.080	14.890	0.422	3205.0	2264.0	11.738	3.174	2.95		Clay	99.3			14.07	0.98	n.a.	n.a.	0.95	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.250	14.620	0.445	3226.3	2274.7	11.436	3.421	2.98		Clay	100.0			13.82	0.98	n.a.	n.a.	0.94	0.753	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.410	13.800	0.416	3246.3	2284.7	10.660	3.418	3.01		Clay	100.0			13.04	0.98	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.570	12.270	0.404	3266.3	2294.7	9.271	3.801	3.08		Clay	100.0			11.60	0.98	n.a.	n.a.	0.94	0.754	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.740	11.730	0.375	3287.5	2305.3	8.750	3.716	3.10		Clay	100.0			11.09	0.98	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
26.900	11.600	0.350	3307.5	2315.3	8.592	3.522	3.09		Clay	100.0			10.96	0.98	n.a.	n.a.	0.94	0.755	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.070	11.120	0.355	3328.8	2326.0	8.130	3.754	3.13		Clay	100.0			10.51	0.98	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.230	11.500	0.362	3348.8	2336.0	8.412	3.679	3.11		Clay	100.0			10.87	0.97	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.400	11.060	0.385	3370.0	2346.6	7.990	4.102	3.15		Clay	100.0			10.45	0.97	n.a.	n.a.	0.94	0.756	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.560	10.650	0.410	3390.0	2356.7	7.600	4.580	3.20		Clay	100.0			10.07	0.97	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.720	11.400	0.404	3410.0	2366.7	8.193	4.167	3.15		Clay	100.0			10.78	0.97	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
27.890	12.210	0.365	3431.3	2377.3	8.829	3.478	3.08		Clay	100.0			11.54	0.97	n.a.	n.a.	0.94	0.757	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.050	12.180	0.304	3451.3	2387.3	8.758	2.907	3.04		Clay	100.0			11.51	0.97	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.220	11.540	0.240	3472.5	2398.0	8.177	2.447	3.02		Clay	100.0			10.91	0.97	n.a.	n.a.	0.94	0.758	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.380	11.280	0.265	3492.5	2408.0	7.918	2.781	3.06		Clay	100.0			10.66	0.97	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.540	11.560	0.339	3512.5	2418.0	8.109	3.458	3.11		Clay	100.0			10.93	0.97	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.710	12.820	0.416	3533.8	2428.6	9.102	3.762	3.09		Clay	100.0			12.12	0.96	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
28.870	14.370	0.456	3553.8	2438.7	10.328	3.621	3.03		Clay	100.0			13.58	0.96	n.a.	n.a.	0.94	0.759	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.040	16.190	0.483	3575.0	2449.3	11.760	3.352	2.97		Clay	100.0			15.30	0.96	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.200	17.970	0.628	3595.0	2459.3	13.152	3.884	2.97		Clay	100.0			16.98	0.96	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.360	19.300	0.941	3615.0	2469.3	14.168	5.381	3.03		Clay	100.0			18.24	0.96	n.a.	n.a.	0.94	0.760	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.530	24.310	1.582	3636.3	2480.0	18.139	7.034	3.03		Clay	100.0			22.98	0.96	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.690	50.230	1.996	3656.3	2490.0	38.877	4.123	2.63		Clay	73.2			47.48	0.96	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
29.860	55.180	1.651	3677.5	2500.6	46.378	3.095	2.49	plastic	Clay	61.9		1.8	93.88	0.96	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.020	39.560	1.261	3697.5	2510.7	30.041	3.344	2.65		Clay	74.8			37.39	0.96	n.a.	n.a.	0.93	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.180	25.440	0.935	3717.5	2520.7	18.710	3.963	2.85		Clay	91.2			24.05	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.350	22.990	0.778	3738.8	2531.3	16.688	3.683	2.87		Clay	92.7			21.73	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.510	18.360	0.729	3758.8	2541.3	12.970	4.420	3.01		Clay	100.0			17.35	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.680	17.970	0.726	3780.0	2552.0	12.602	4.512	3.02		Clay	100.0			16.98	0.95	n.a.	n.a.	0.93	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
30.840	17.370	0.657	3800.0	2562.0	12.077	4.248	3.02		Clay	100.0			16.42	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.000	15.740	0.596	3820.0	2572.0	10.754	4.310	3.06		Clay	100.0			14.88	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.170	14.160	0.551	3841.3	2582.6	9.478	4.499	3.12		Clay	100.0			13.38	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.330	12.520	0.513	3861.3	2592.7	8.169	4.842	3.19		Clay	100.0			11.83	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.500	11.320	0.490	3882.5	2603.3	7.205	5.219	3.25		Clay	100.0			10.70	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.660	10.490	0.414	3902.5	2613.3	6.535	4.844	3.27		Clay	100.0			9.91	0.95	n.a.	n.a.	0.93	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.820	9.480	0.379	3922.5	2623.3	5.732	5.045	3.32		Clay	100.0			8.96	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
31.990	8.750	0.370	3943.8	2634.0	5.147	5.456	3.38		Clay	100.0			8.27	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.150	10.010	0.388	3963.8	2644.0	6.073	4.828	3.29		Clay	100.0			9.46	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.320	12.220	0.428	3985.0	2654.6	7.705	4.186	3.17		Clay	100.0			11.55	0.94	n.a.	n.a.	0.93	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.480	12.740	0.451	4005.0	2664.6	8.059	4.203	3.16		Clay	100.0			12.04	0.94	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	7

PGA (A_{max})	0.75

Total Settlement:	0.12	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5,}$ $_{s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
32.640	12.810	0.441	4025.0	2674.7	8.074	4.085	3.15		Clay	100.0			12.11	0.94	n.a.	n.a.	0.92	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.810	13.490	0.428	4046.3	2685.3	8.540	3.728	3.11		Clay	100.0			12.75	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
32.970	14.170	0.424	4066.3	2695.3	9.006	3.490	3.07		Clay	100.0			13.39	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.140	15.340	0.442	4087.5	2706.0	9.827	3.323	3.03		Clay	100.0			14.50	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.300	15.990	0.477	4107.5	2716.0	10.262	3.423	3.02		Clay	100.0			15.11	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.460	16.100	0.598	4127.5	2726.0	10.298	4.258	3.08		Clay	100.0			15.22	0.94	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.630	15.590	0.578	4148.8	2736.6	9.878	4.278	3.09		Clay	100.0			14.74	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.790	16.950	0.486	4168.8	2746.7	10.825	3.271	2.99		Clay	100.0			16.02	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
33.960	22.900	0.379	4190.0	2757.3	15.091	1.821	2.73		Clay	81.2			21.64	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.120	18.680	0.419	4210.0	2767.3	11.979	2.526	2.89		Clay	94.2			17.66	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.280	14.810	0.462	4230.0	2777.3	9.142	3.641	3.08		Clay	100.0			14.00	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.450	16.000	0.387	4251.3	2788.0	9.953	2.788	2.98		Clay	100.0			15.12	0.93	n.a.	n.a.	0.92	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.610	16.160	0.462	4271.3	2798.0	10.025	3.292	3.02		Clay	100.0			15.27	0.93	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.780	16.410	0.705	4292.5	2808.6	10.157	4.943	3.12		Clay	100.0			15.51	0.93	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
34.940	18.280	1.045	4312.5	2818.6	11.441	6.482	3.15		Clay	100.0			17.28	0.93	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.100	22.820	1.598	4332.5	2828.7	14.603	7.737	3.12		Clay	100.0			21.57	0.93	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.270	30.230	2.132	4353.8	2839.3	19.761	7.601	3.02		Clay	100.0			28.57	0.93	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.430	56.210	2.150	4373.8	2849.3	37.920	3.980	2.62		Clay	73.0			53.13	0.92	n.a.	n.a.	0.92	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
35.600	88.910	1.552	4395.0	2860.0	70.498	1.790	2.19		Sand	38.3	107.71	1.72	185.26	0.92	171.01	252.36	0.91	0.766	0.910	173.088	346.376	452.31	0.00	0.00
35.760	113.960	1.736	4415.0	2870.0	90.696	1.554	2.07		Sand	28.5		1.72	185.27	0.92	169.94	236.99	0.91	0.766	0.909	31.719	63.402	82.79	0.00	0.00
35.930	113.790	1.885	4436.3	2880.6	90.382	1.690	2.09		Sand	30.6	107.71	1.72	185.26	0.92	169.99	240.72	0.91	0.766	0.907	46.382	92.598	120.91	0.00	0.00
36.090	101.200	2.859	4456.3	2890.6	80.036	2.889	2.30		Sand	46.8	107.71	1.72	185.26	0.92	170.62	259.62	0.91	0.766	0.906	438.647	874.711	1142.14	0.00	0.00
36.250	98.790	2.942	4476.3	2900.7	77.944	3.047	2.32		Sand	48.8	107.71	1.72	185.26	0.92	170.47	260.83	0.91	0.766	0.905	516.787	1029.352	1344.04	0.00	0.00
36.420	62.050	4.377	4497.5	2911.3	41.082	7.320	2.79		Clay	86.3			58.65	0.92	n.a.	n.a.	0.91	0.766	n.a.	n.a.	n.a.	n.a.	0.00	0.00
36.580	171.960	4.409	4517.5	2921.3	136.511	2.598	2.11		Sand	31.8	219.26	1.25	274.08	0.92	251.72	341.75	0.91	0.766	0.903	########	########	########	0.00	0.00
36.750	231.980	4.276	4538.8	2932.0	184.448	1.861	1.92		Sand	16.2		1.25	274.08	0.92	251.48	293.15	0.91	0.766	0.902	########	########	301238.21	0.00	0.00
36.910	196.760	3.131	4558.8	2942.0	155.894	1.610	1.91		Sand	16.2		1.25	232.47	0.92	212.83	250.48	0.91	0.766	0.901	137.787	273.163	356.68	0.00	0.00
37.070	166.870	2.289	4578.8	2952.0	131.702	1.391	1.92		Sand	16.5		1.25	197.15	0.90	177.67	213.09	0.91	0.766	0.900	4.296	8.507	11.11	0.00	0.00
37.240	109.040	2.524	4600.0	2962.6	85.263	2.364	2.22		Sand	40.3		1.25	128.83	0.89	114.47	184.22	0.91	0.766	0.926	0.865	1.732	2.26	0.00	0.00
37.400	73.190	2.167	4620.0	2972.6	56.523	3.058	2.42		Sand	56.6		1.25	86.47	0.87	75.13	143.77	0.91	0.766	0.949	0.252	0.383	0.50	0.02	0.04
37.570	79.490	2.366	4641.3	2983.3	61.429	3.066	2.40		Sand	54.7		1.25	93.92	0.87	81.84	151.57	0.91	0.766	0.944	0.299	0.477	0.62	0.02	0.04
37.730	140.560	2.649	4661.3	2993.3	109.849	1.916	2.07		Sand	28.9		1.25	166.07	0.90	148.98	212.63	0.91	0.766	0.896	4.162	8.203	10.71	0.00	0.00
37.890	225.900	2.346	4681.3	3003.3	177.364	1.049	1.74		Sand	2.3		1.25	266.90	0.91	242.20	242.20	0.91	0.766	0.895	54.204	106.722	139.38	0.00	0.00
38.060	326.460	1.850	4702.5	3014.0	256.681	0.571	1.44		Sand	0.0		1.25	385.70	0.91	351.34	351.34	0.91	0.766	0.894	########	########	########	0.00	0.00
38.220	359.660	1.439	4722.5	3024.0	282.498	0.403	1.31		Sand	0.0		1.25	424.93	0.91	386.73	386.73	0.91	0.766	0.893	########	########	########	0.00	0.00
38.390	296.520	2.360	4743.8	3034.6	232.160	0.802	1.58		Sand	0.0	339.94	1.25	424.93	0.91	386.37	386.37	0.90	0.766	0.892	########	########	########	0.00	0.00
38.550	193.830	3.039	4763.8	3044.6	150.854	1.587	1.92		Sand	16.6	339.94	1.25	424.93	0.91	386.03	442.97	0.90	0.765	0.891	########	########	########	0.00	0.00
38.710	134.340	3.263	4783.8	3054.6	103.799	2.473	2.17		Sand	36.7	339.94	1.25	424.93	0.91	385.70	514.86	0.90	0.765	0.890	########	########	########	0.00	0.00
38.880	70.450	2.149	4805.0	3065.3	53.438	3.159	2.45		Sand	58.8	339.94	1.25	424.93	0.91	385.34	541.24	0.90	0.765	0.889	########	########	########	0.00	0.00
39.040	39.060	1.342	4825.0	3075.3	23.833	3.662	2.75		Clay	83.0			36.92	0.91	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.210	23.600	0.843	4846.3	3085.9	13.725	3.982	2.96		Clay	99.7			22.31	0.91	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.370	16.550	0.705	4866.3	3096.0	9.120	4.996	3.16		Clay	100.0			15.64	0.90	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.530	17.220	0.700	4886.3	3106.0	9.515	4.738	3.13		Clay	100.0			16.28	0.90	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.700	18.000	1.310	4907.5	3116.6	9.976	8.429	3.27		Clay	100.0			17.01	0.90	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
39.860	19.560	0.884	4927.5	3126.6	10.936	5.168	3.11		Clay	100.0			18.49	0.90	n.a.	n.a.	0.90	0.765	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.030	60.700	0.978	4948.8	3137.3	45.197	1.679	2.32		Sand	48.6	72.83	1.8	131.09	0.87	114.53	190.09	0.90	0.765	0.907	1.129	2.254	2.95	0.00	0.00
40.190	77.050	1.297	4968.8	3147.3	57.789	1.739	2.25		Sand	42.8		1.8	131.09	0.87	114.13	185.79	0.90	0.765	0.911	0.927	1.848	2.42	0.00	0.00
40.350	57.760	1.491	4988.8	3157.3	42.763	2.699	2.47		Sand	60.7	72.83	1.8	131.09	0.87	114.64	195.75	0.90	0.765	0.900	1.500	2.969	3.88	0.00	0.00
40.520	52.510	1.816	5010.0	3168.0	31.569	3.631	2.66		Clay	75.4			49.63	0.90	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
40.680	56.560	1.494	5030.0	3178.0	41.682	2.764	2.49		Sand	61.9		1.8	96.23	0.85	81.90	154.19	0.90	0.764	0.933	0.319	0.511	0.67	0.02	0.04
40.850	41.320	1.417	5051.3	3188.6	24.333	3.652	2.74		Clay	82.4			39.05	0.90	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.010	33.790	1.039	5071.3	3198.6	19.542	3.324	2.79		Clay	86.2			31.94	0.90	n.a.	n.a.	0.90	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.170	25.000	0.895	5091.3	3208.6	13.996	3.985	2.95		Clay	99.2			23.63	0.90	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.340	27.990	0.693	5112.5	3219.3	15.801	2.724	2.81		Clay	87.8			26.46	0.90	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.500	22.250	0.583	5132.5	3229.3	12.191	2.963	2.92		Clay	96.9			21.03	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.670	16.490	0.482	5153.8	3239.9	8.589	3.465	3.09		Clay	100.0			15.59	0.89	n.a.	n.a.	0.89	0.764	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.830	14.460	0.396	5173.8	3250.0	7.307	3.335	3.14		Clay	100.0			13.67	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
41.990	13.530	0.455	5193.8	3260.0	6.707	4.160	3.22		Clay	100.0			12.79	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.160	16.280	0.509	5215.0	3270.6	8.361	3.720	3.11		Clay	100.0			15.39	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.320	21.470	0.683	5235.0	3280.6	11.493	3.621	3.00		Clay	100.0			20.29	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.490	31.310	0.823	5256.3	3291.3	17.429	2.870	2.79		Clay	86.2			29.59	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.650	29.400	0.958	5276.3	3301.3	16.213	3.581	2.87		Clay	92.9			27.79	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.810	26.580	0.981	5296.3	3311.3	14.455	4.100	2.95		Clay	98.9			25.12	0.89	n.a.	n.a.	0.89	0.763	n.a.	n.a.	n.a.	n.a.	0.00	0.00
42.980	24.210	0.893	5317.5	3321.9	12.975	4.145	2.99		Clay	100.0			22.88	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.140	24.120	0.995	5337.5	3332.0	12.876	4.639	3.02		Clay	100.0			22.80	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.310	26.050	1.092	5358.8	3342.6	13.983	4.672	3.00		Clay	100.0			24.62	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00

CORNERSTONE EARTH GROUP

CPT No.	7

PGA (A_{max})	0.75

Total Settlement:	0.12	(Inches)

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Depth (ft)	q_c (tsf)	f_s (tsf)	S_{vc} (psf)	Insitu S'_{vc} (psf)	Q	F (%)	I_c	Layer "Plastic" PI > 7	Flag Soil Type	Fines (%)	q_{cN} near interfaces (soft layer)	Thin Layer Factor (K_H)	Interpreted q_{cN}	C_N	q_{c1N}	q_{c1N-CS}	Stress Reduction Coeff, r_d	CSR	K_s for Sand	CRR$_{M=7.5,}$ $_{s'vc = 1 atm}$	CRR	Factor of Safety (CRR/CSR)	Vertical Strain ε_v	Settlement (Inches)
43.470	29.520	1.148	5378.8	3352.6	16.006	4.277	2.93		Clay	97.1			27.90	0.89	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.640	28.830	1.110	5400.0	3363.3	15.538	4.250	2.93		Clay	97.7			27.25	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.800	27.620	1.079	5420.0	3373.3	14.769	4.331	2.96		Clay	99.5			26.11	0.88	n.a.	n.a.	0.89	0.762	n.a.	n.a.	n.a.	n.a.	0.00	0.00
43.960	27.400	1.032	5440.0	3383.3	14.589	4.179	2.95		Clay	99.1			25.90	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.130	28.250	0.976	5461.3	3393.9	15.038	3.824	2.92		Clay	96.3			26.70	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.290	29.400	0.993	5481.3	3404.0	15.664	3.724	2.90		Clay	94.6			27.79	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00
44.460	32.090	1.056	5502.5	3414.6	17.184	3.600	2.85		Clay	91.4			30.33	0.88	n.a.	n.a.	0.88	0.761	n.a.	n.a.	n.a.	n.a.	0.00	0.00

APPENDIX D: PREVIOUS FIELD INVESTIGATION BY CORNERSTONE

The previous field investigation consisted of a surface reconnaissance and a subsurface exploration program using truck-mounted, hollow-stem, auger drilling equipment and 20-ton truck-mounted Cone Penetration Test equipment. Three 8-inch-diameter exploratory borings were drilled on January 16, 2017 to depths of approximately 21½ to 35 feet. Four CPT soundings were also performed in accordance with ASTM D 5778-95 (revised, 2002) on January 21, 2017, to depths ranging from approximately 50 to 100 feet. The approximate locations of exploratory borings and CPTs are shown on the Site Plan, Figure 2. The soils encountered were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D2488). Boring logs, as well as a key to the classification of the soil and bedrock, are included as part of this appendix.

Boring and CPT locations were approximated using existing site boundaries, a hand held GPS unit, and other site features as references. Boring and CPT elevations were not determined. The locations of the borings and CPTs should be considered accurate only to the degree implied by the method used.

Representative soil samples were obtained from the borings at selected depths. All samples were returned to our laboratory for evaluation and appropriate testing. The standard penetration resistance blow counts were obtained by dropping a 140-pound hammer through a 30-inch free fall. The 2-inch O.D. split-spoon sampler was driven 18 inches and the number of blows was recorded for each 6 inches of penetration (ASTM D1586). 2.5-inch I.D. samples were obtained using a Modified California Sampler driven into the soil with the 140-pound hammer previously described. Unless otherwise indicated, the blows per foot recorded on the boring log represent the accumulated number of blows required to drive the last 12 inches. The various samplers are denoted at the appropriate depth on the boring logs.

The CPT involved advancing an instrumented cone-tipped probe into the ground while simultaneously recording the resistance at the cone tip (q_c) and along the friction sleeve (f_s) at approximately 5-centimeter intervals. Based on the tip resistance and tip to sleeve ratio (R_f), the CPT classified the soil behavior type and estimated engineering properties of the soil, such as equivalent Standard Penetration Test (SPT) blow count, internal friction angle within sand layers, and undrained shear strength in silts and clays. A pressure transducer behind the tip of the CPT cone measured pore water pressure (u_2). Graphical logs of the CPT data is included as part of this appendix.

Field tests included an evaluation of the unconfined compressive strength of the soil samples using a pocket penetrometer device. The results of these tests are presented on the individual boring logs at the appropriate sample depths.

Attached boring and CPT logs and related information depict subsurface conditions at the locations indicated and on the date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these boring and CPT locations. The passage of time may result in altered subsurface conditions due to environmental changes. In addition,

any stratification lines on the logs represent the approximate boundary between soil types and the transition may be gradual.

UNIFIED SOIL CLASSIFICATION (ASTM D-2487-98)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO 4. SIEVE	CLEAN GRAVELS <5% FINES	Cu>4 AND 1<Cc<3	GW	WELL-GRADED GRAVEL
			Cu>4 AND 1>Cc>3	GP	POORLY-GRADED GRAVEL
		GRAVELS WITH FINES >12% FINES	FINES CLASSIFY AS ML OR CL	GM	SILTY GRAVEL
			FINES CLASSIFY AS CL OR CH	GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO 4. SIEVE	CLEAN SANDS <5% FINES	Cu>6 AND 1<Cc<3	SW	WELL-GRADED SAND
			Cu>6 AND 1>Cc>3	SP	POORLY-GRADED SAND
		SANDS AND FINES >12% FINES	FINES CLASSIFY AS ML OR CL	SM	SILTY SAND
			FINES CLASSIFY AS CL OR CH	SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT<50	INORGANIC	PI>7 AND PLOTS>"A" LINE	CL	LEAN CLAY
			PI>4 AND PLOTS<"A" LINE	ML	SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OL	ORGANIC CLAY OR SILT
	SILTS AND CLAYS LIQUID LIMIT>50	INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY
			PI PLOTS <"A" LINE	MH	ELASTIC SILT
		ORGANIC	LL (oven dried)/LL (not dried)<0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARILY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR		PT	PEAT

OTHER MATERIAL SYMBOLS

- Poorly-Graded Sand with Clay
- Clayey Sand
- Sandy Silt
- Artificial/Undocumented Fill
- Poorly-Graded Gravelly Sand
- Topsoil
- Well-Graded Gravel with Clay
- Well-Graded Gravel with Silt
- Sand
- Silt
- Well Graded Gravelly Sand
- Gravelly Silt
- Asphalt
- Boulders and Cobble

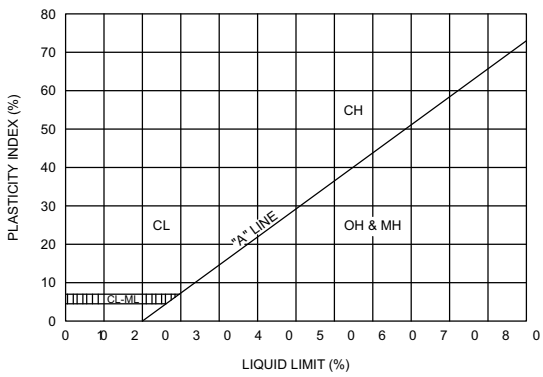
SAMPLER TYPES

- SPT
- Modified California (2.5" I.D.)
- Rock Core
- Shelby Tube
- No Recovery
- Grab Sample

ADDITIONAL TESTS

CA	-	CHEMICAL ANALYSIS (CORROSIVITY)	PI	-	PLASTICITY INDEX
CD	-	CONSOLIDATED DRAINED TRIAXIAL	SW	-	SWELL TEST
CN	-	CONSOLIDATION	TC	-	CYCLIC TRIAXIAL
CU	-	CONSOLIDATED UNDRAINED TRIAXIAL	TV	-	TORVANE SHEAR
DS	-	DIRECT SHEAR	UC	-	UNCONFINED COMPRESSION
PP	-	POCKET PENETROMETER (TSF)	(1.5)	-	(WITH SHEAR STRENGTH IN KSF)
(3.0)	-	(WITH SHEAR STRENGTH IN KSF)			
RV	-	R-VALUE	UU	-	UNCONSOLIDATED UNDRAINED TRIAXIAL
SA	-	SIEVE ANALYSIS: % PASSING #200 SIEVE			
	-	WATER LEVEL			

PLASTICITY CHART



PENETRATION RESISTANCE
(RECORDED AS BLOWS / FOOT)

SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	STRENGTH** (KSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.5
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.5 - 1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

** UNDRAINED SHEAR STRENGTH IN KIPS/SQ. FT. AS DETERMINED BY LABORATORY TESTING OR APPROXIMATED BY THE STANDARD PENETRATION TEST, POCKET PENETROMETER, TORVANE, OR VISUAL OBSERVATION.

CORNERSTONE EARTH GROUP

LEGEND TO SOIL DESCRIPTIONS

Figure Number A-1

BORING NUMBER EB-1

CORNERSTONE EARTH GROUP

PROJECT NAME Hoover Elementary School Modernization
PROJECT NUMBER 288-11-1
PROJECT LOCATION Palo Alto, CA

DATE STARTED 1/16/17 **DATE COMPLETED** 1/16/17
GROUND ELEVATION _____ **BORING DEPTH** 35 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE _____ **LONGITUDE** _____
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
GROUND WATER LEVELS:
LOGGED BY DL
▽ **AT TIME OF DRILLING** 18 ft.
NOTES _____
▼ **AT END OF DRILLING** 10 ft.

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	0	2 inches asphalt concrete over 4 inches aggregate base						
		Fat Clay (CH) [Qhff] very stiff, moist, dark brown, some fine sand, high plasticity	25	MC-1B	88	30		
			36	MC-2B	91	30		
	5	**Sandy Lean Clay (CL) [Qhff]** hard, moist, brown with light brown mottles, fine to coarse sand, trace fine subangular to subrounded gravel, moderate plasticity Liquid Limit = 44, Plastic Limit = 20	36	MC-3B	108	19	24	50
		Poorly Graded Sand with Silt and Gravel (SP-SM) [Qhf] dense, moist, brown, fine to coarse sand, fine to coarse subangular to subrounded gravel	72	MC-4B	105	4		
	10							
		Sandy Lean Clay (CL) [Qhf] medium stiff, moist, brown, fine to coarse sand, low plasticity	16	MC-5B	108	21		
	15							
		Lean Clay with Sand (CL) [Qhf] stiff, moist, brown, fine to medium sand, moderate plasticity	17	MC-6B	93	30		
	20							
			15	MC				
	25							
			17	MC-8B	94	27		
	30							

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

>4.5

Continued Next Page

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 3/7/17 13:15 - P:\DRAFTING\GINT FILES\288-11-1 HOOVER ES.GPJ

BORING NUMBER EB-1

CORNERSTONE EARTH GROUP

PROJECT NAME Hoover Elementary School Modernization

PROJECT NUMBER 288-11-1

PROJECT LOCATION Palo Alto, CA

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE	UNDRAINED SHEAR STRENGTH, ksf (○ HAND PENETROMETER, △ TORVANE, ● UNCONFINED COMPRESSION, ▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL; 1.0 2.0 3.0 4.0)
	30		**Lean Clay with Sand (CL) [Qhf]** stiff, moist, brown, fine to medium sand, moderate plasticity							
			Lean Clay (CL) [Qhf] very stiff, moist, gray with brown mottles, trace fine sand, moderate plasticity	26	MC-9B	104	24			○
	35		Bottom of Boring at 35.0 feet.							
	40									
	45									
	50									
	55									
	60									

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 3/7/17 13:15 - P:\DRAFTING\GINT FILES\288-11-1 HOOVER ES.GPJ

BORING NUMBER EB-2

CORNERSTONE EARTH GROUP

PROJECT NAME Hoover Elementary School Modernization
PROJECT NUMBER 288-11-1
PROJECT LOCATION Palo Alto, CA

DATE STARTED 1/16/17 **DATE COMPLETED** 1/16/17
GROUND ELEVATION _____ **BORING DEPTH** 29.4 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE _____ **LONGITUDE** _____
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
GROUND WATER LEVELS:
LOGGED BY DL
▽ **AT TIME OF DRILLING** 14 ft.
NOTES _____
▼ **AT END OF DRILLING** 10 ft.

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	0	**Fat Clay (CH) [Qhff]** stiff to very stiff, moist, dark brown, some fine sand, high plasticity	21	MC-1B	86	31		
			29	MC-2B	93	29		
	5	**Sandy Lean Clay (CL) [Qhff]** very stiff, moist, brown with light brown mottles, fine to coarse sand, trace fine subangular to subrounded gravel, low plasticity	31	MC-3B	110	19		
		Clayey Sand (SC) [Qhf] medium dense, moist, brown, fine to medium sand, some fine subangular to subrounded gravel	19	MC-4B	105	21		47
	10		11	SPT				
		Silty Sand (SM) [Qhf] medium dense, moist, brown, fine to medium sand, some fine subangular to subrounded gravel						
		Clayey Sand (SC) [Qhf] medium dense to dense, moist, brown, fine to medium sand, some fine subangular to subrounded gravel	20	MC-6B	102	17		
	15		33	SPT				
		Poorly Graded Sand with Silt and Gravel (SP-SM) [Qhf] dense, moist, gray and brown, fine to coarse sand, fine to coarse subangular to subrounded gravel	68	MC-8B	130	13		
	20							
			58	MC				
	25	becomes very dense						
		Lean Clay with Sand (CL) [Qhf] very stiff, moist, gray, fine sand, moderate plasticity	50/5"	MC-10B	102	23		
	30	Bottom of Boring at 29.4 feet.						

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

CORNERSTONE EARTH GROUP2 - CORNERSTONE 0812.GDT - 3/7/17 13:15 - P:\DRAFTING\GINT FILES\288-11-1 HOOVER ES.GPJ

BORING NUMBER EB-3

CORNERSTONE EARTH GROUP

PROJECT NAME Hoover Elementary School Modernization
PROJECT NUMBER 288-11-1
PROJECT LOCATION Palo Alto, CA

DATE STARTED 1/16/17 **DATE COMPLETED** 1/16/17
GROUND ELEVATION _____ **BORING DEPTH** 21.5 ft.
DRILLING CONTRACTOR Exploration Geoservices, Inc.
LATITUDE _____ **LONGITUDE** _____
DRILLING METHOD Mobile B-53, 8 inch Hollow-Stem Auger
GROUND WATER LEVELS:
LOGGED BY DL
▽ **AT TIME OF DRILLING** 13 ft.
NOTES _____
▼ **AT END OF DRILLING** 10 ft.

This log is a part of a report by Cornerstone Earth Group, and should not be used as a stand-alone document. This description applies only to the location of the exploration at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with time. The description presented is a simplification of actual conditions encountered. Transitions between soil types may be gradual.

ELEVATION (ft)	DEPTH (ft)	SYMBOL	DESCRIPTION	N-Value (uncorrected) blows per foot	SAMPLES TYPE AND NUMBER	DRY UNIT WEIGHT PCF	NATURAL MOISTURE CONTENT	PLASTICITY INDEX, %	PERCENT PASSING No. 200 SIEVE
	0		3½ inches asphalt concrete over 2 inches aggregate base						
			Fat Clay (CH) [Qhff] very stiff, moist, dark brown, some fine sand, high plasticity Liquid Limit = 73, Plastic Limit = 27	42	MC-1	82	30	46	
				41	MC				
	5		**Clayey Sand (SC) [Qhff]** dense, moist, brown with light brown mottles, fine to medium sand, some fine subangular to subrounded gravel	54	MC-3B	119	16		
			Clayey Sand (SC) [Qhf] medium dense, moist, gray and brown, fine to medium sand, some fine subangular to subrounded gravel	32	MC-4B	113	16		
	10		**Clayey Sand (SC) [Qhf]** medium dense, moist, gray and brown, fine to medium sand, some fine subangular to subrounded gravel	9	SPT-5		13		19
			Poorly Graded Sand with Silt and Gravel (SP-SM) [Qhf] medium dense, moist, brown, fine to coarse sand, fine to coarse subangular to subrounded gravel	55	MC				
	15		**Clayey Sand (SC) [Qhf]** loose, moist, gray, fine to medium sand, some fine subangular to subrounded gravel	7	SPT-7		19		
	20		**Sandy Lean Clay (CL) [Qhf]** stiff, moist, brown, fine to coarse sand, low plasticity	5	SPT				
			Bottom of Boring at 21.5 feet.						
	25								
	30								

UNDRAINED SHEAR STRENGTH, ksf
○ HAND PENETROMETER
△ TORVANE
● UNCONFINED COMPRESSION
▲ UNCONSOLIDATED-UNDRAINED TRIAXIAL
1.0 2.0 3.0 4.0

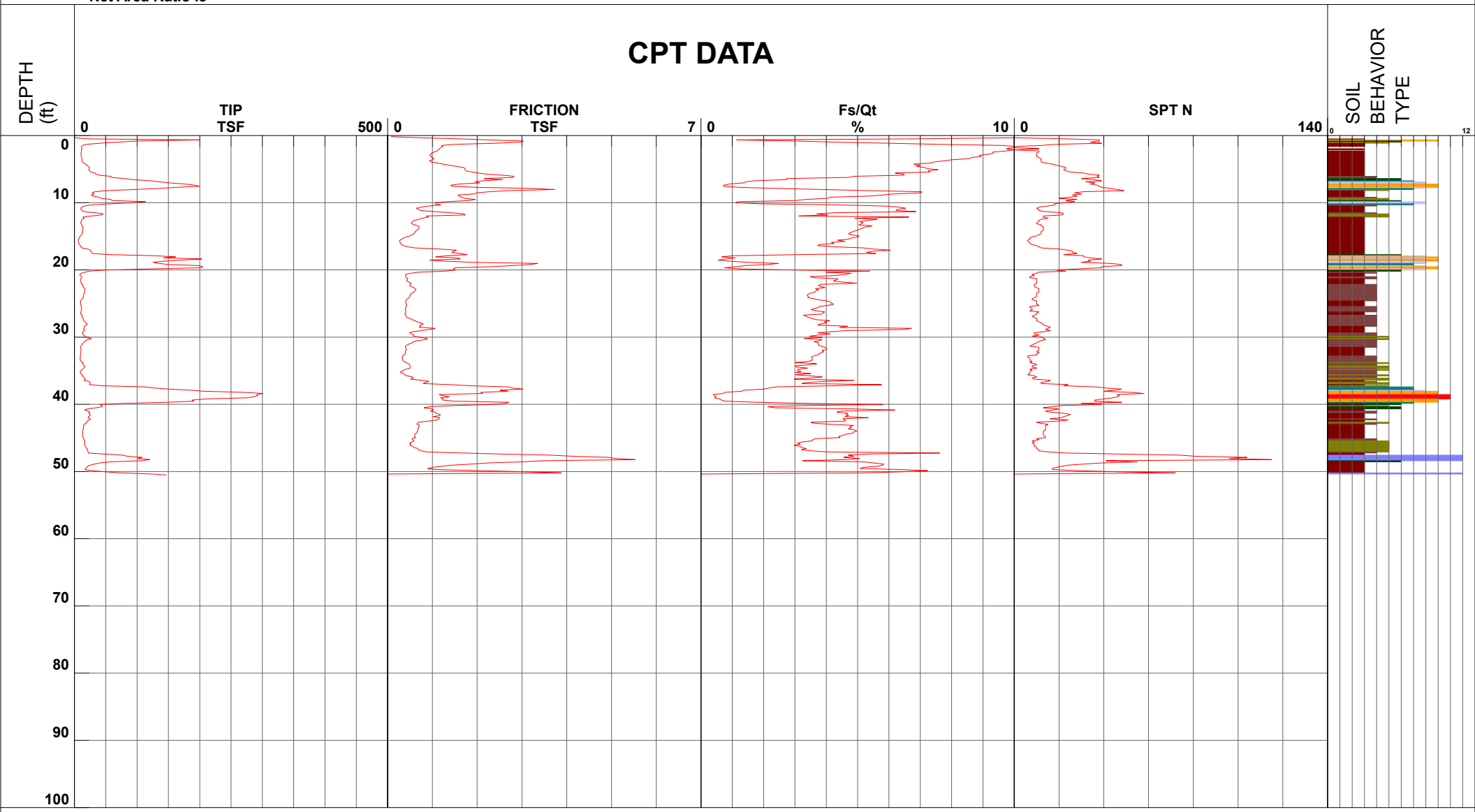
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Cornerstone Earth Group

Project	Hoover Elem Sch Modernization	Operator	RB KK	Filename	SDF(056).cpt
Job Number	288-11-1	Cone Number	DDG1333	GPS	
Hole Number	CPT-01	Date and Time	1/21/2017 11:53:15 AM	Maximum Depth	50.52 ft
EST GW Depth During Test		12.50 ft			

Net Area Ratio .8

CPT DATA



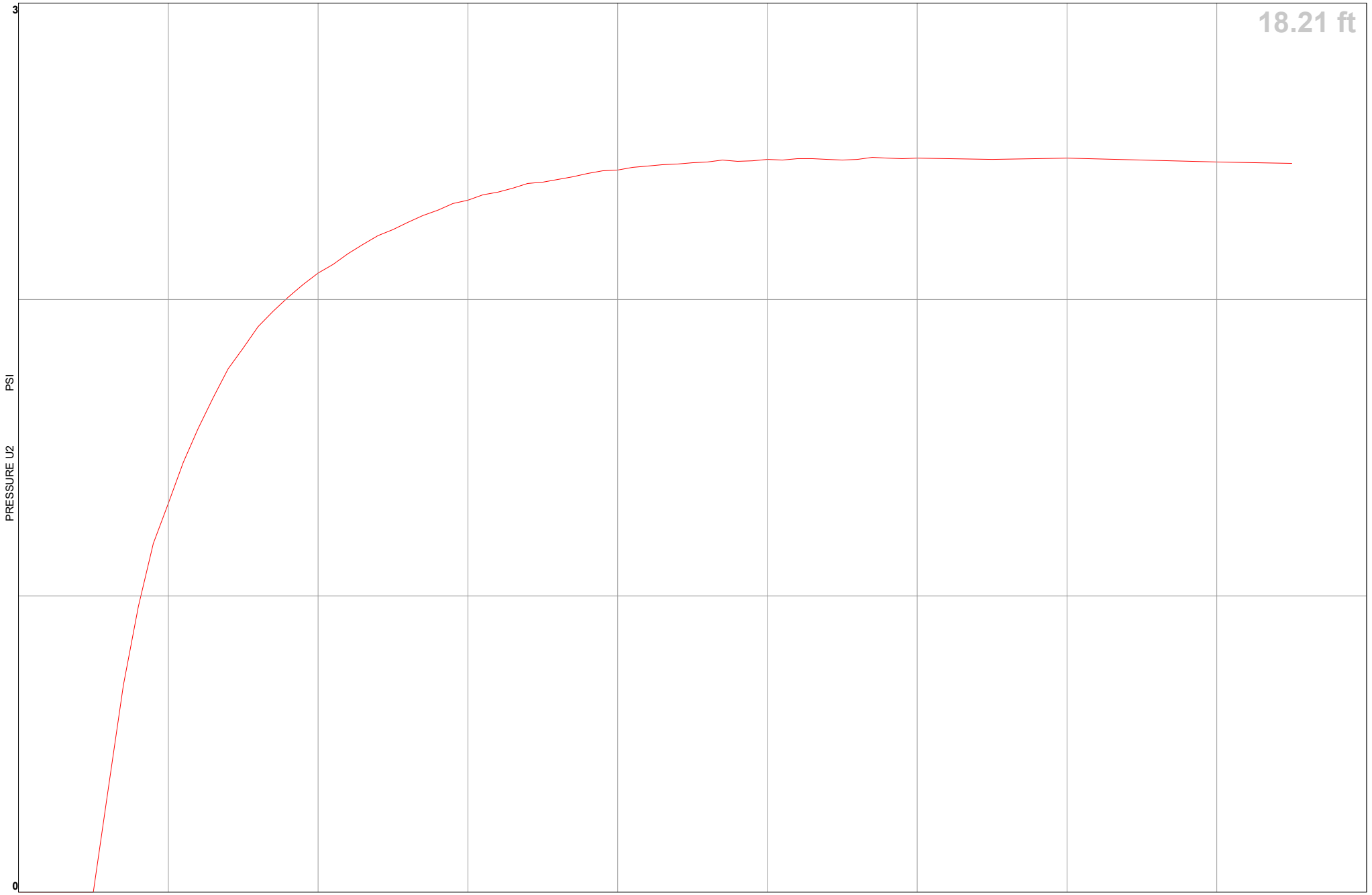
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Cornerstone Earth Group

Location	Hoover Elem Sch Modernization	Operator	RB KK	
Job Number	288-11-1	Cone Number	DDG1333	GPS
Hole Number	CPT-01	Date and Time	1/21/2017 11:53:15 AM	
Equilized Pressure	2.4	EST GW Depth During Test	12.5	

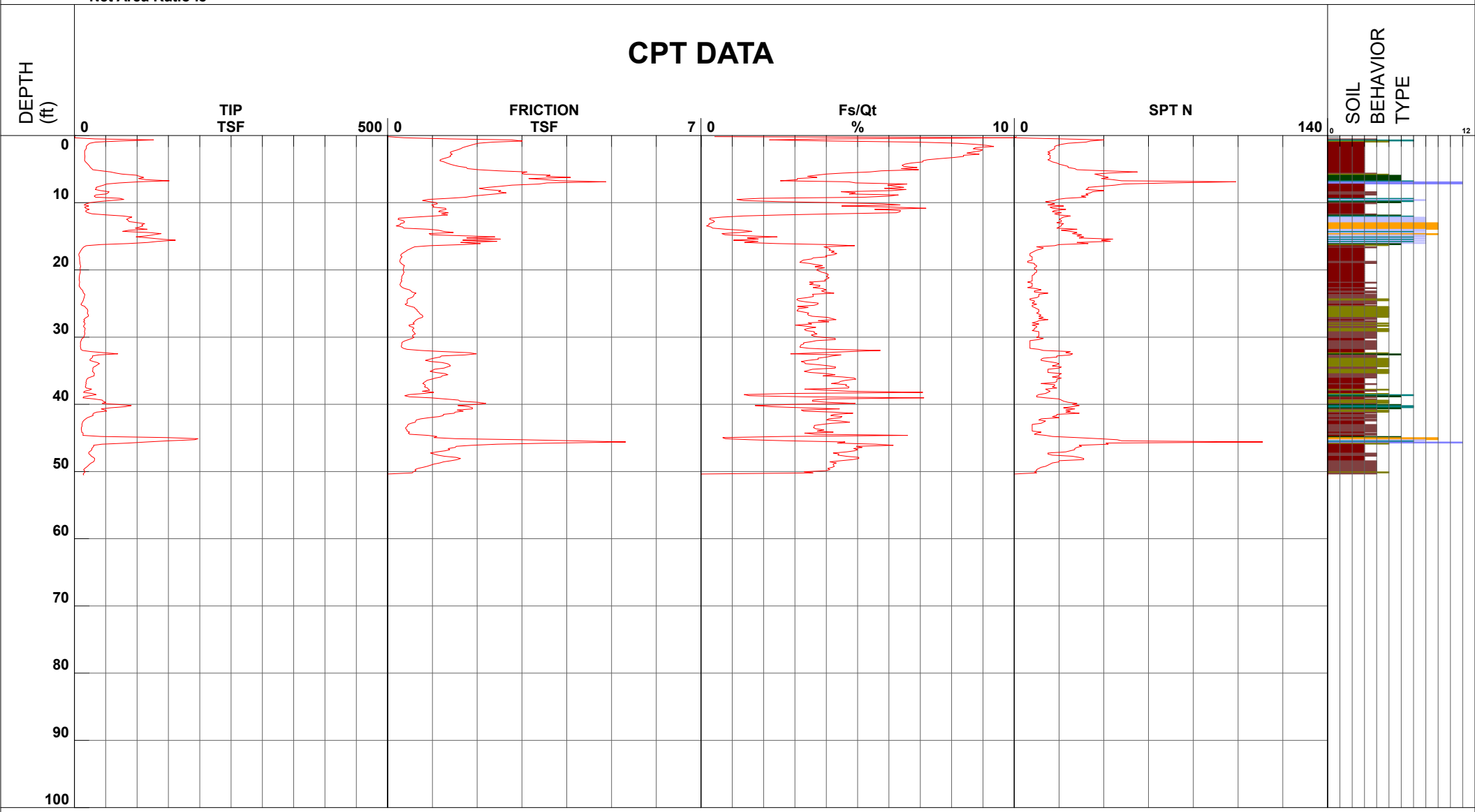


Cornerstone Earth Group

Project	Hoover Elem Sch Modernization	Operator	RB KK	Filename	SDF(054).cpt
Job Number	288-11-1	Cone Number	DDG1333	GPS	
Hole Number	CPT-02ALT	Date and Time	1/21/2017 10:27:30 AM	Maximum Depth	50.52 ft
EST GW Depth During Test		14.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

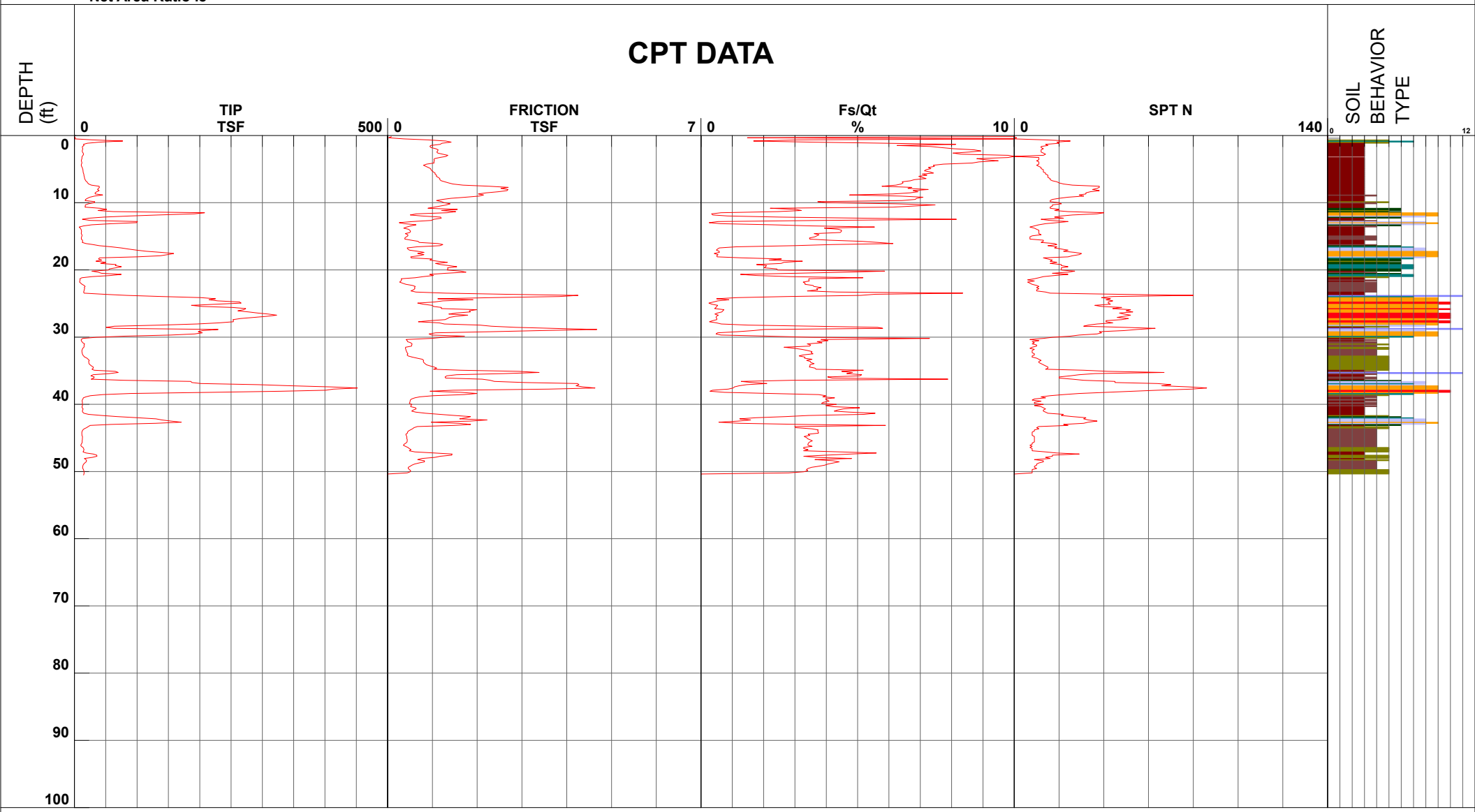
S*Soil behavior type and SPT based on data from UBC-1983

Cornerstone Earth Group

Project	Hoover Elem Sch Modernization	Operator	RB KK	Filename	SDF(055).cpt
Job Number	288-11-1	Cone Number	DDG1333	GPS	
Hole Number	CPT-03	Date and Time	1/21/2017 11:14:10 AM	Maximum Depth	50.52 ft
EST GW Depth During Test		14.20 ft			

Net Area Ratio .8

CPT DATA



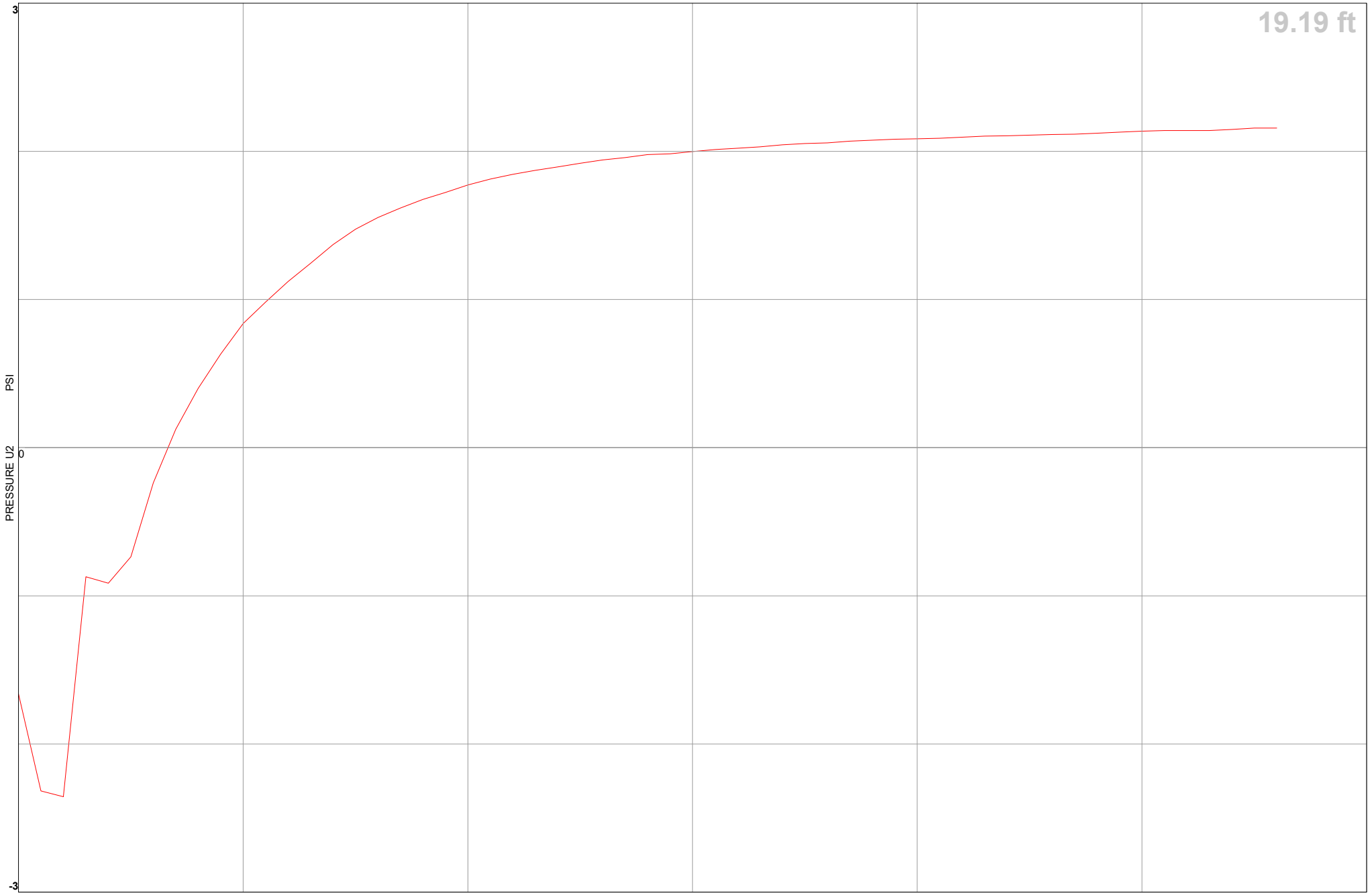
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Cornerstone Earth Group

Location	Hoover Elem Sch Modernization	Operator	RB KK	
Job Number	288-11-1	Cone Number	DDG1333	GPS
Hole Number	CPT-03	Date and Time	1/21/2017 11:14:10 AM	
Equilized Pressure	2.1	EST GW Depth During Test	14.2	

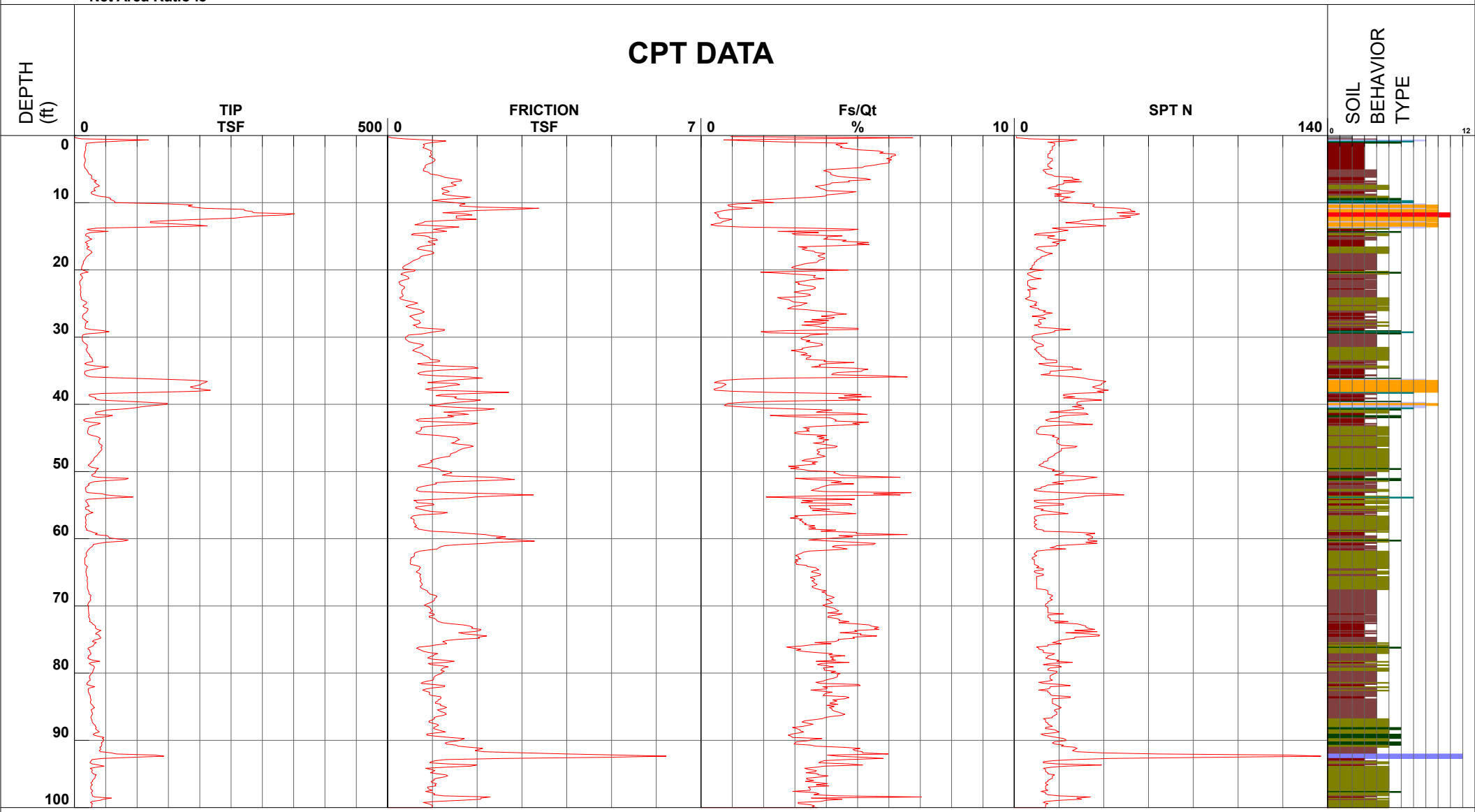


Cornerstone Earth Group

Project	Hoover Elem Sch Modernization	Operator	RB KK	Filename	SDF(053).cpt
Job Number	288-11-1	Cone Number	DDG1333	GPS	
Hole Number	CPT-04	Date and Time	1/21/2017 8:58:56 AM	Maximum Depth	100.56 ft
EST GW Depth During Test		14.70 ft			

Net Area Ratio .8

CPT DATA



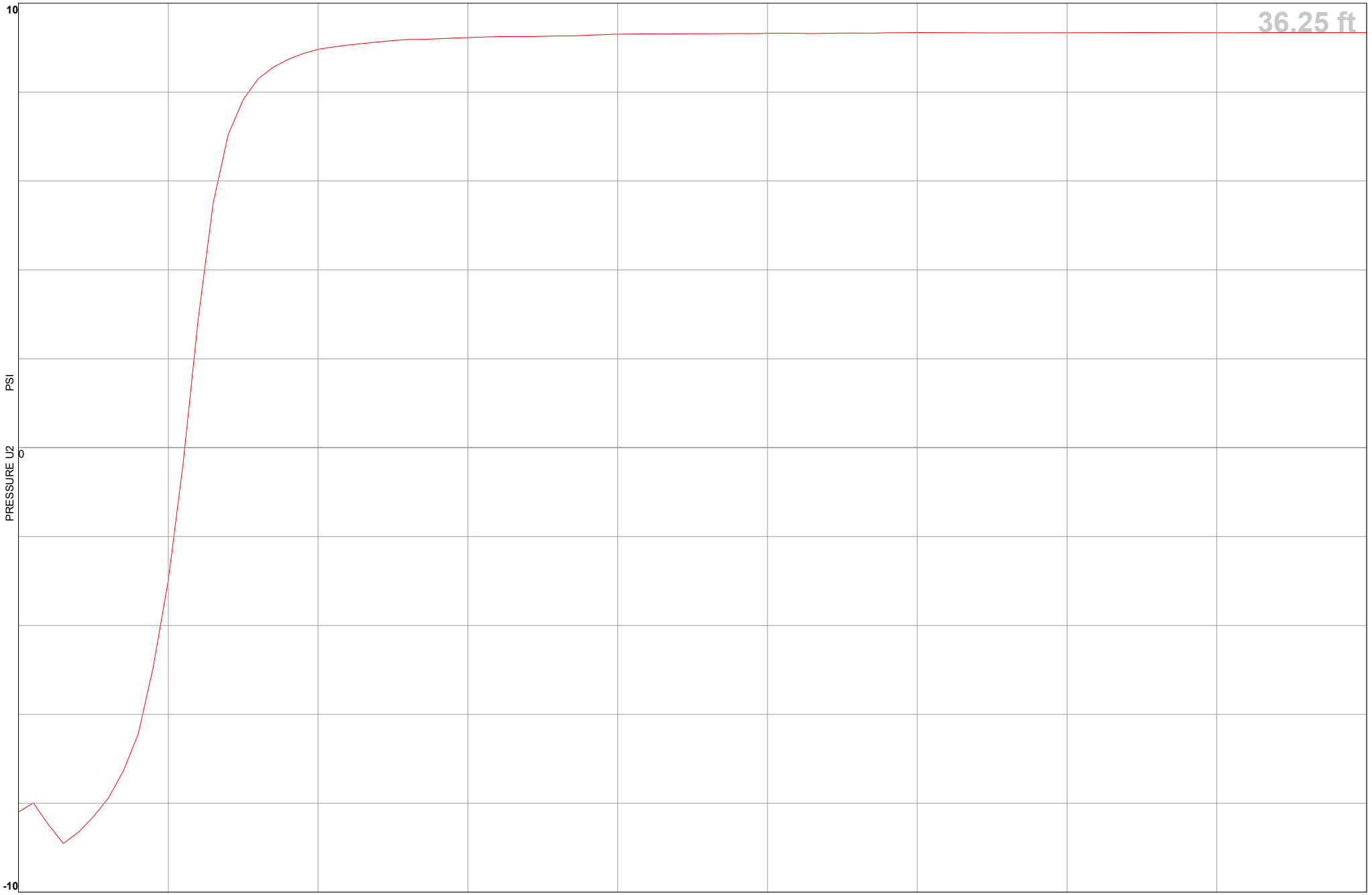
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Cornerstone Earth Group

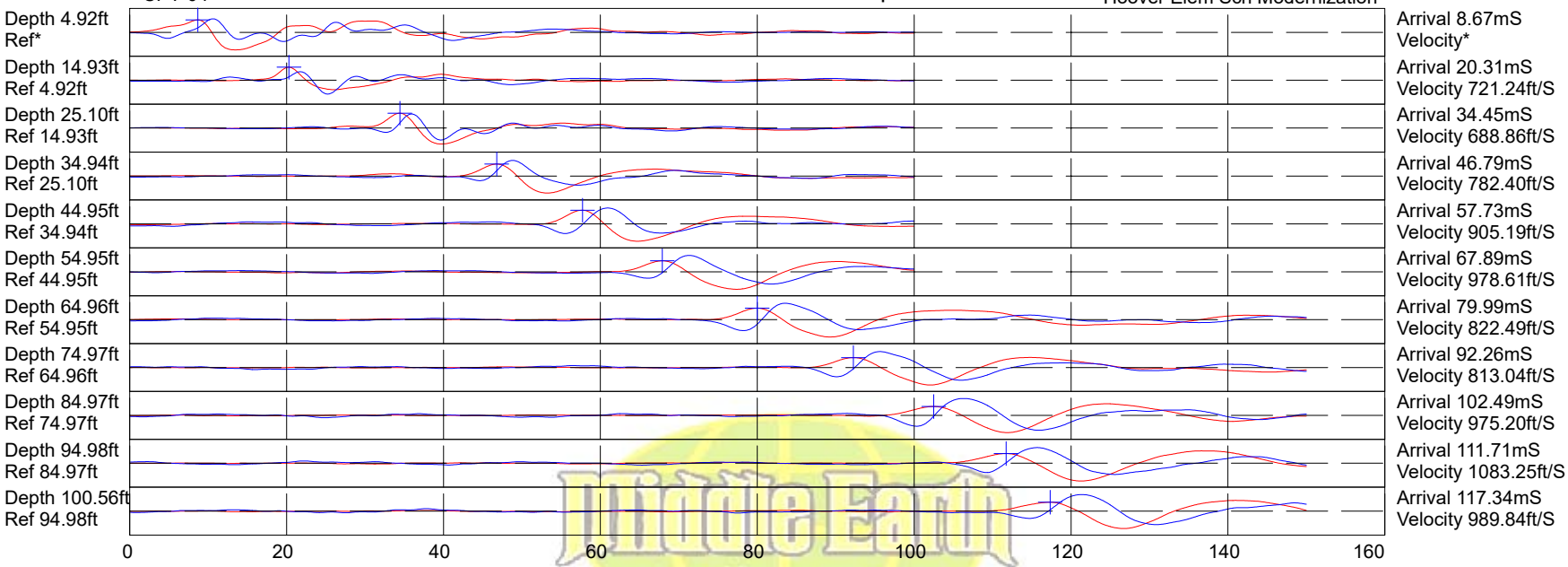
Location	Hoover Elem Sch Modernization	Operator	RB KK	
Job Number	288-11-1	Cone Number	DDG1333	GPS
Hole Number	CPT-04	Date and Time	1/21/2017 8:58:56 AM	
Equilized Pressure	9.3	EST GW Depth During Test	14.7	



CPT-04

Cornerstone Earth Group

Hoover Elem Sch Modernization



Hammer to Rod String Distance (ft): 5.83

* = Not Determined

COMMENT:

APPENDIX E: PREVIOUS EXPLORATION BY KLEINFELDER

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS More than Half > #200 sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POOORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More than Half < #200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS 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

UNIFIED SOIL CLASSIFICATION SYSTEM

			Shear Strength, psf / Confining Pressure, psf	
PS	Percent Saturation			
SG	Specific Gravity			
Consol	Consolidation	Tx	2630 (240)	Unconsolidated Undrained Triaxial
LL	Liquid Limit (in %)	Tx sat	2100 (575)	Unconsolidated Undrained Triaxial, saturated prior to test
PL	Plastic Limit (in %)	DS	3740 (960)	Consolidated Drained Direct Shear
PI	Plasticity Index	FVS	1320	Field Vane Shear
TS	Total Saturation Moisture Content	UC	4200	Unconfined Compression
SA	Sieve Analysis	LVS	500	Laboratory Vane Shear
■	Undisturbed Sample	C	Concrete Compressive Strength	
☒	Bulk Sample	PE	Petrographic Examination	
◪	Standard Penetration Test	Perm	Permeability	
◨	Sample Attempt with No Recovery	SE	Sand Equivalent	

KEY TO TEST DATA

KLEINFELDER
Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE DEC 1996

SOIL CLASSIFICATION CHART AND KEY TO TEST DATA
JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-24-96

FINISH DATE: 12-24-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	BLACK TO OLIVE BROWN SILTY CLAY (CH) stiff, moist to wet, with traces of roots
PI = 51, see Plate B-1			11		
		27.1	16		
UC, see Plate B-2	95	27.0	20	5	DARK BROWN SANDY CLAY (CL) stiff to very stiff, wet, with gravel
		35.7	14	10	YELLOW TO GRAY BROWN SANDY CLAY (CL) medium stiff, saturated
	104	23.2	5	15	
			8	20	
	98	29.2	7	25	BROWN SILTY SAND (SP-SM) loose to medium dense, saturated
minus #200 = 6%			9	30	YELLOW TO GRAY BROWN SILTY CLAY (CL) stiff to very stiff, saturated, slightly sandy
	100	25.1	26	35	YELLOW BROWN SILTY SAND (SM) medium dense, saturated
			14	40	grading coarse-grained with gravel
					YELLOW BROWN SILTY CLAY (CL) stiff, saturated
					Bottom of Boring B-1 @ 41.5 feet. Groundwater Observed @ Depth of 9 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER

Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-1

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-24-96

FINISH DATE: 12-24-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	1" AC PAVEMENT
		28.8	7		BLACK SILTY CLAY (CH) medium stiff, moist to wet
UC, see Plate B-3	101	24.0	22	5	OLIVE BROWN SANDY CLAY (CL) stiff to very stiff, wet, with some gravel
			12		
UC, see Plate B-4	99	23.0	8	10	GRAY BROWN SILTY SAND (SM) loose, saturated
					YELLOW BROWN SILTY CLAY (CL) stiff, saturated
minus #200 = 17%		14.5	17	15	YELLOW BROWN SILTY SAND (SM) medium dense, saturated
					Bottom of Boring B-2 @ 16.5 feet. Groundwater Observed at a Depth of 9 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER

Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-2

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-26-96

FINISH DATE: 12-26-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	1.5" AC PAVEMENT 4" AGGREGATE BASEROCK BLACK TO OLIVE BROWN SILTY CLAY (CH) medium stiff, moist to wet
	73	36.9	7		
		30.0	10		
	94	23.8	13	5	BLACK TO DARK GRAY SANDY CLAY (CL) stiff, wet
					BLACK SILTY CLAY (CL) very stiff, wet
		30.5	17	10	YELLOW BROWN SILTY SAND (SM) medium dense, saturated YELLOW TO DARK BROWN SANDY CLAY (CL) medium stiff to stiff, saturated
	98	24.5	5	15	

Bottom of Boring B-3 @ 16.5 feet.
Groundwater Observed at a Depth of 9.5 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER
Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-3

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-26-96

FINISH DATE: 12-26-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	1.5" AC PAVEMENT 4" AGGREGATE BASEROCK DARK BROWN TO BLACK SILTY CLAY (CH) stiff to very stiff, moist to wet, slightly sandy
			9		
	86	26.1	19		
				5	DARK BROWN SANDY CLAY (CL) very stiff, wet, with some gravel
		19.1	20		
				10	MOTTLED YELLOW BROWN SANDY CLAY (CL) stiff, saturated
minus #200 = 67%	101	26.6	10		
					DARK BROWN TO BLACK SILTY CLAY (CL) very stiff, saturated
				15	
		16.6	18		GRAY BROWN SILTY SANDY (SM) medium dense, saturated
					Bottom of Boring B-4 @ 16.5 feet. Groundwater Observed @ Depth of 9 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER

Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-4

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-23-96

FINISH DATE: 12-23-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	1.5" AC PAVEMENT 2" AGGREGATE BASEROCK BLACK TO DARK GRAY SILTY CLAY (CH) stiff to very stiff, moist to wet grading sandy with gravel @ 2.5 - 3 feet
PI = 51, see Plate B-1	74	33.7	11		
		31.0	17		
			14	5	LIGHT TO YELLOW BROWN SANDY CLAY (CL) medium stiff to stiff, wet, with some gravel
			11	10	
minus #200 = 4%		17.9	7	15	GRAY TO YELLOW BROWN SILTY SAND (SP-SM) loose to medium dense, saturated, with gravel
		22.5	16	20	
UC, see Plate B-5	116	18.0	9	25	YELLOW BROWN SILTY CLAY (CL) stiff, saturated, with some gravel
			12	30	OLIVE GRAY SILTY CLAY (CL) very stiff, saturated, slightly sandy
UC, see Plate B-6	98	28.0	17	35	
	100	26.2	19	40	YELLOW TO DARK BROWN SANDY CLAY (CL) very stiff, saturated
					Bottom of Boring B-5 @ 41.5 feet. Groundwater Observed @ Depth of 10 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER

Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-5

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-26-96

FINISH DATE: 12-26-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	1.5" AC PAVEMENT
					2" AGGREGATE BASEROCK
	81	27.3	15		BLACK SILTY CLAY (CH) stiff to very stiff, moist to wet
			21		
				5	OLIVE GRAY SANDY CLAY (CL) very stiff, wet
	108	13.3	24		YELLOW BROWN SANDY CLAY (CL) medium stiff to stiff, wet to saturated
				10	
			4		
				15	BLACK SILTY CLAY (CL) medium stiff, saturated, with some coarse sand and gravel
	100	24.0	9		YELLOW BROWN SILTY CLAY (CL) medium stiff, saturated, trace of sand
					Bottom of Boring B-6 @ 16.5 feet. Groundwater Observed @ Depth of 9 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER

Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-6

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-24-96

FINISH DATE: 12-24-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	2" AC PAVEMENT
	89	24.9	20		BLACK SILTY CLAY (CH) very stiff, moist to wet
		10.2	33	5	BROWN SANDY CLAY (CL) stiff to very stiff, wet to saturated, with gravel
	109	14.6	26		
		9.1	10	10	
UC, see Plate B-7	110	20.0	16	15	
			36	20	MOTTLED YELLOW BROWN SILTY SAND (SM) dense, saturated
minus #200 = 27%			4	25	YELLOW BROWN SILTY SAND (SM) loose, saturated
			7	30	YELLOW BROWN SILTY CLAY (CL) medium stiff, saturated
					Bottom of Boring B-7 @ 31.5 feet. Groundwater Observed @ Depth of 8 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER

Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-7

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-26-96

FINISH DATE: 12-26-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	1.5" AC PAVEMENT
	84	30.0	11		BLACK TO DARK GRAY SILTY CLAY (CH) stiff to very stiff, moist to wet
			25		
				5	YELLOW BROWN SILTY SAND (SM) medium dense, wet, with gravel
	111	13.6	23		
					MOTTLED YELLOW BROWN SITLY CLAY (CL) stiff, saturated
				10	
		25.0	13		YELLOW TO GRAY BROWN SILTY SAND (SM) medium dense, saturated
					DARK TO YELLOW BROWN SITLY CLAY (CL) stiff, moist, slightly sandy
				15	
	95	28.5	11		YELLOW BROWN SILTY SAND (SM) medium dense, saturated
					Bottom of Boring B-12 @ 16.5 feet. Groundwater Observed @ Depthof 7.5 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER

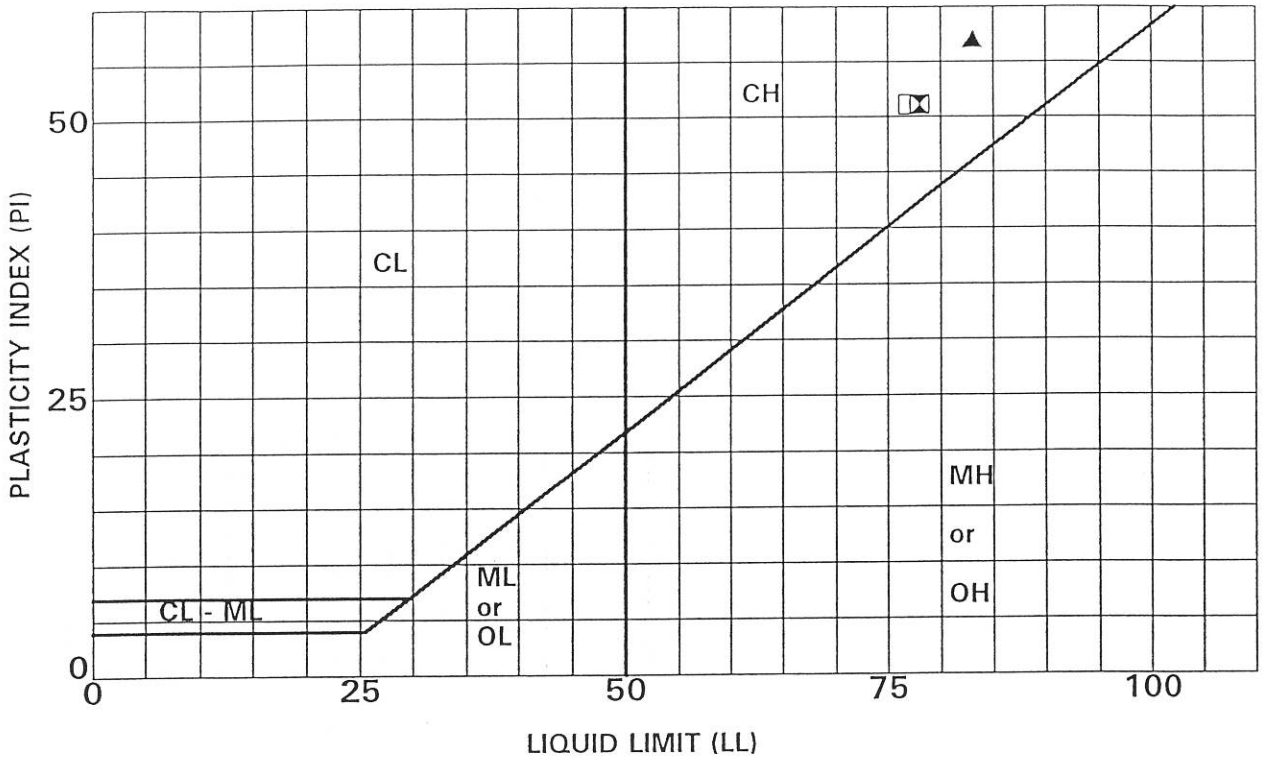
Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-12

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE



Symbol	Boring	Depth	LL	PL	PI	Sample Description
□	B-1	1.5	77	26	51	Black Silty Clay (CH)
⊠	B-5	1.5	78	27	51	Dark Gray Silty Clay (CH)
▲	B-8	1.5	83	26	57	Black Silty Clay (CH)

Unified Soil Classification
Fine Grained Soil Groups

Symbol	LL < 50	Symbol	LL > 50
ML	Inorganic clayey silts to very fine of slight plasticity	MH	Inorganic silts and clayey silts of high plasticity
CL	Inorganic clays of low to medium plasticity	CH	Inorganic clays of high plasticity
OL	Organic silts and organic silty clays of low plasticity	OH	Organic clays of medium to high plasticity, organic silts

KLEINFELDER

PROJECT NO.: 12-3023-10

PLASTICITY CHART

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-26-96

FINISH DATE: 12-26-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	1.5" AC PAVEMENT
	84	30.0	11		BLACK TO DARK GRAY SILTY CLAY (CH) stiff to very stiff, moist to wet
			25		
				5	YELLOW BROWN SILTY SAND (SM) medium dense, wet, with gravel
	111	13.6	23		
					MOTTLED YELLOW BROWN SITLY CLAY (CL) stiff, saturated
				10	
		25.0	13		YELLOW TO GRAY BROWN SILTY SAND (SM) medium dense, saturated
					DARK TO YELLOW BROWN SITLY CLAY (CL) stiff, moist, slightly sandy
				15	
	95	28.5	11		YELLOW BROWN SILTY SAND (SM) medium dense, saturated
					Bottom of Boring B-12 @ 16.5 feet. Groundwater Observed @ Depthof 7.5 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER

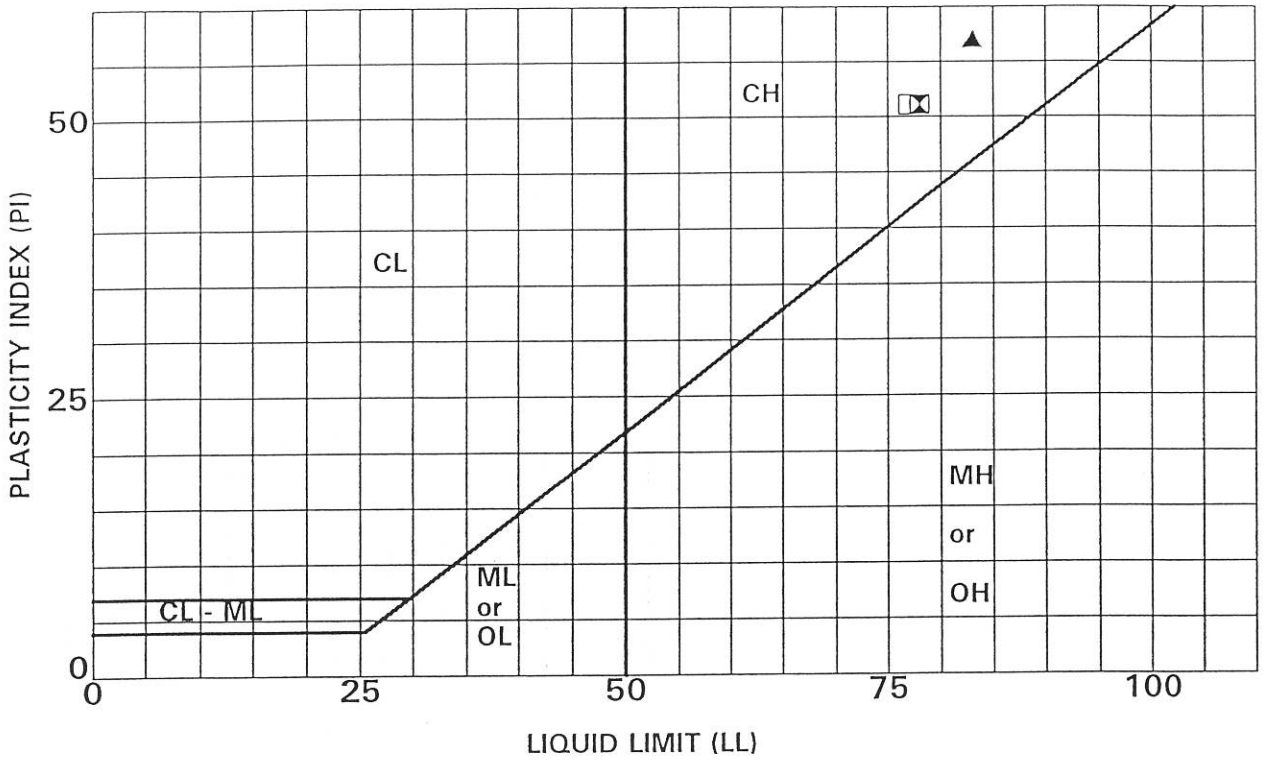
Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-12

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE



Symbol	Boring	Depth	LL	PL	PI	Sample Description
□	B-1	1.5	77	26	51	Black Silty Clay (CH)
⊠	B-5	1.5	78	27	51	Dark Gray Silty Clay (CH)
▲	B-8	1.5	83	26	57	Black Silty Clay (CH)

Unified Soil Classification
Fine Grained Soil Groups

Symbol	LL < 50	Symbol	LL > 50
ML	Inorganic clayey silts to very fine of slight plasticity	MH	Inorganic silts and clayey silts of high plasticity
CL	Inorganic clays of low to medium plasticity	CH	Inorganic clays of high plasticity
OL	Organic silts and organic silty clays of low plasticity	OH	Organic clays of medium to high plasticity, organic silts

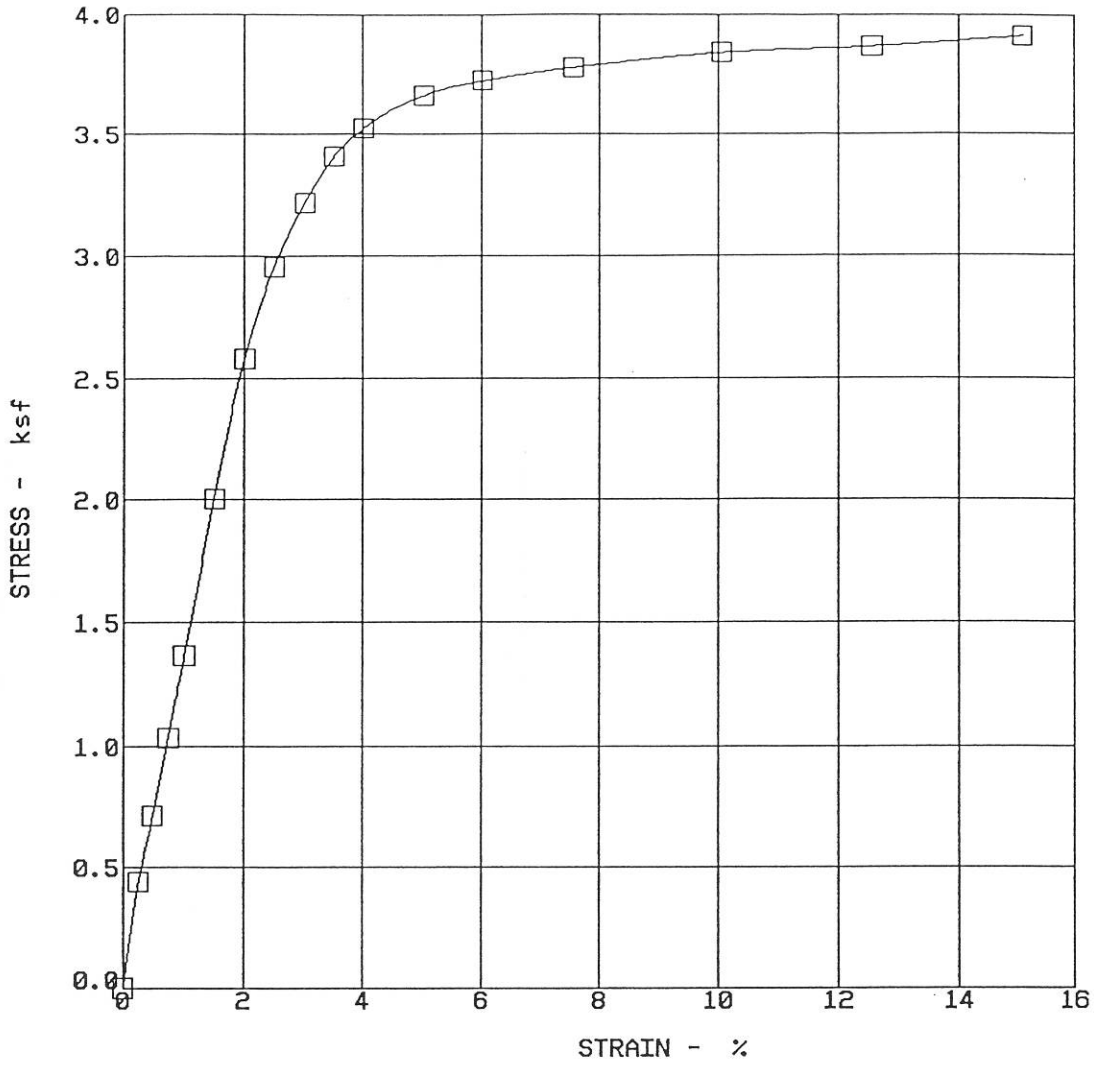
KLEINFELDER

PROJECT NO.: 12-3023-10

PLASTICITY CHART

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE



BORING NO.	B- 1	DRY DENSITY - pcf	95
DEPTH - ft	5.5	WATER CONTENT - %	27
SOIL DESCRIPTION	Black Gravelly Clay		

MAX. UC STRENGTH= 3.9 ksf AT 15.1 % STRAIN

KLEINFELDER	J. L. Stanford Middle School	PLATE
PROJECT NO. 12-3023-10	UNCONFINED COMPRESSION TEST	

EQUIPMENT: 8"-Dia. Hollow Auger ELEVATION: **

LOGGED BY: M.Briseno START DATE: 12-26-96

FINISH DATE: 12-26-96

Other Laboratory Tests	Dry Density (pcf)	Moisture Content (%)	Blows/ Foot *	DEPTH (FEET)	
				0	1.5" AC PAVEMENT
	84	30.0	11		BLACK TO DARK GRAY SILTY CLAY (CH) stiff to very stiff, moist to wet
			25		
				5	YELLOW BROWN SILTY SAND (SM) medium dense, wet, with gravel
	111	13.6	23		
					MOTTLED YELLOW BROWN SITLY CLAY (CL) stiff, saturated
				10	
		25.0	13		YELLOW TO GRAY BROWN SILTY SAND (SM) medium dense, saturated
					DARK TO YELLOW BROWN SITLY CLAY (CL) stiff, moist, slightly sandy
				15	
	95	28.5	11		YELLOW BROWN SILTY SAND (SM) medium dense, saturated
					Bottom of Boring B-12 @ 16.5 feet. Groundwater Observed @ Depthof 7.5 feet.

* Converted to equivalent standard penetration blow counts.

** Existing ground surface at time of drilling.

KLEINFELDER

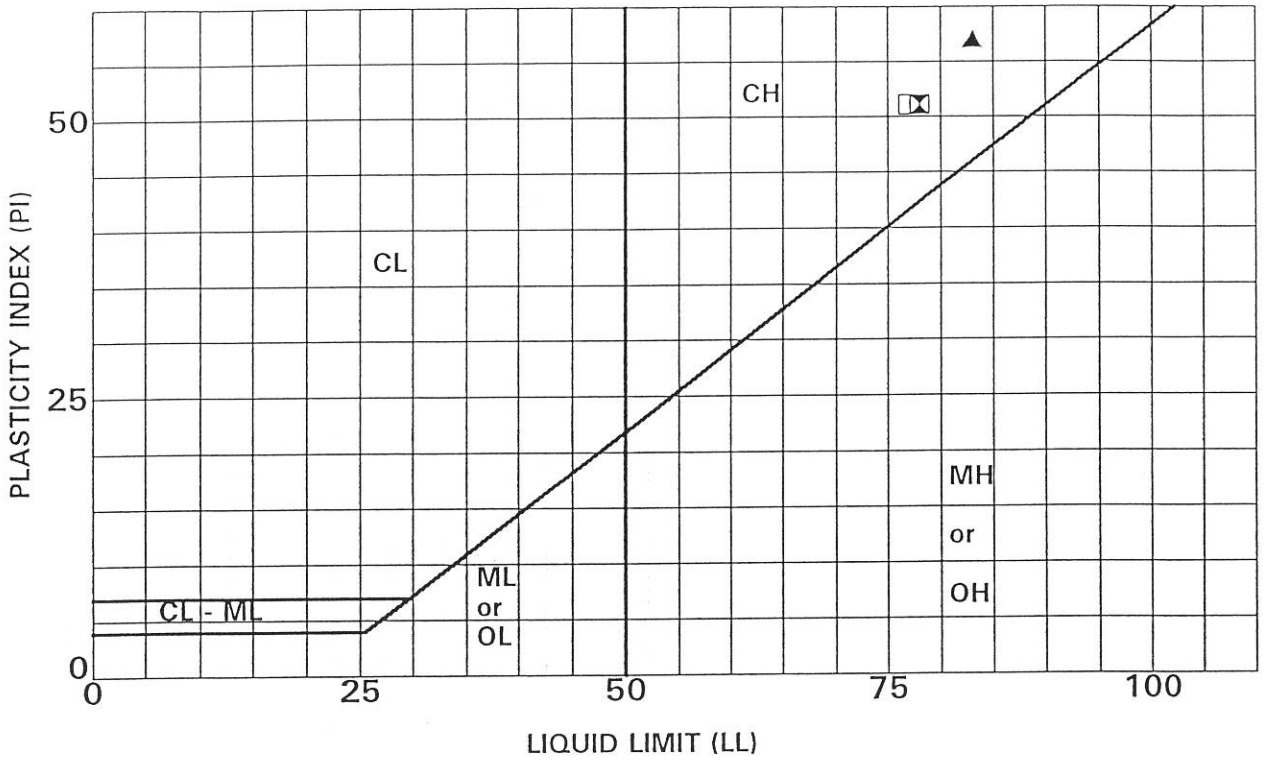
Geotechnical, Materials and Environmental Engineering

PROJECT NUMBER 12-3023-10 DATE MAR 1997

LOG OF BORING B-12

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE



Symbol	Boring	Depth	LL	PL	PI	Sample Description
□	B-1	1.5	77	26	51	Black Silty Clay (CH)
⊠	B-5	1.5	78	27	51	Dark Gray Silty Clay (CH)
▲	B-8	1.5	83	26	57	Black Silty Clay (CH)

Unified Soil Classification
Fine Grained Soil Groups

Symbol	LL < 50	Symbol	LL > 50
ML	Inorganic clayey silts to very fine of slight plasticity	MH	Inorganic silts and clayey silts of high plasticity
CL	Inorganic clays of low to medium plasticity	CH	Inorganic clays of high plasticity
OL	Organic silts and organic silty clays of low plasticity	OH	Organic clays of medium to high plasticity, organic silts

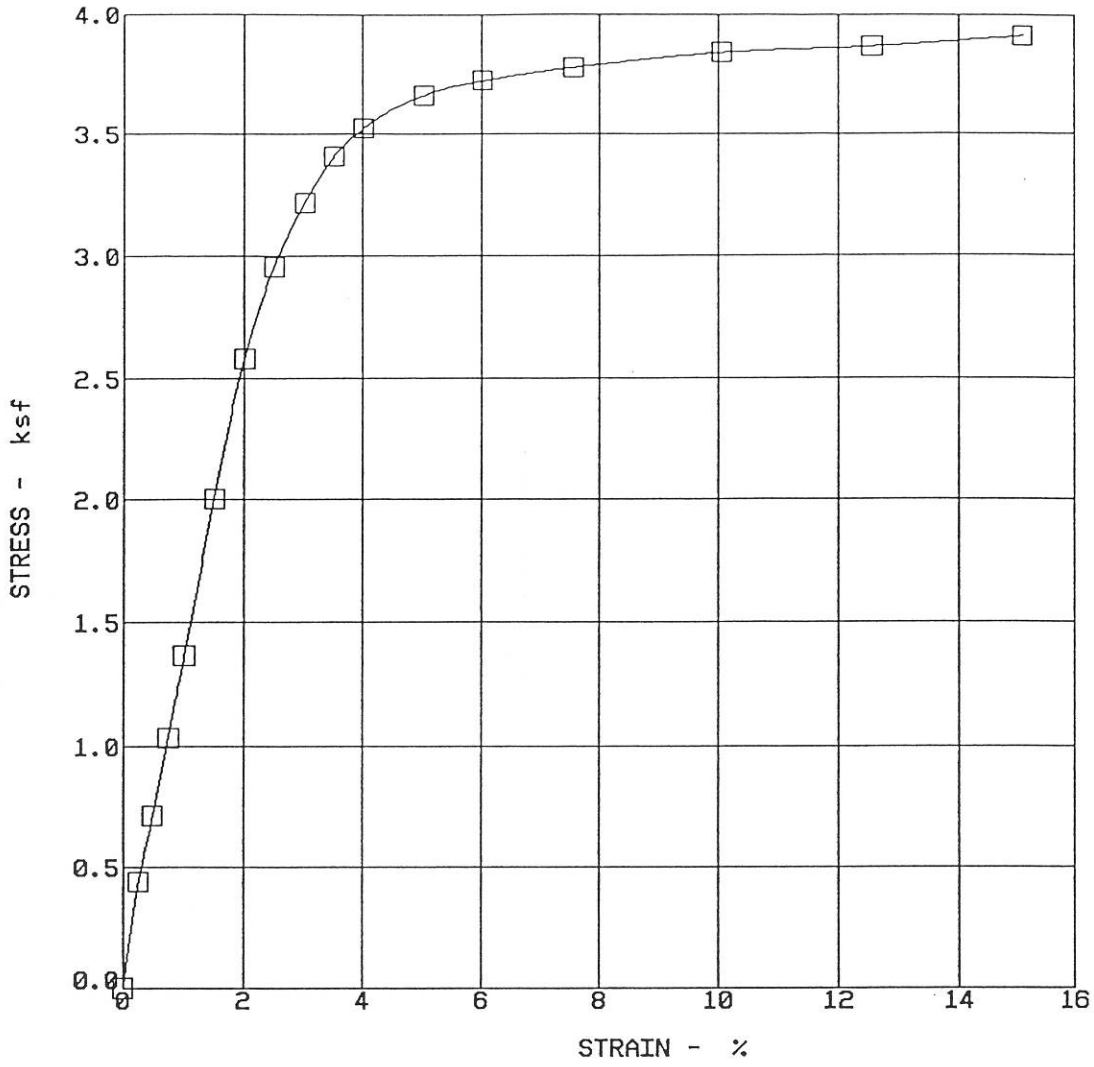
KLEINFELDER

PROJECT NO.: 12-3023-10

PLASTICITY CHART

JL STANFORD MIDDLE SCHOOL
480 E. MEADOW AVENUE
PALO ALTO, CALIFORNIA

PLATE



BORING NO.	B- 1	DRY DENSITY - pcf	95
DEPTH - ft	5.5	WATER CONTENT - %	27
SOIL DESCRIPTION	Black Gravelly Clay		

MAX. UC STRENGTH= 3.9 ksf AT 15.1 % STRAIN

KLEINFELDER	J. L. Stanford Middle School	PLATE
PROJECT NO. 12-3023-10	UNCONFINED COMPRESSION TEST	

CORNERSTONE EARTH GROUP

APPENDIX F: GUIDE SPECIFICATIONS FOR LIME TREATMENT

Guide Specifications for Soil-Lime Treatment of Highly Expansive Soils at Hoover Elementary School

1.01 Description

This item shall govern the treatment of on-site expansive soils with dry quicklime, and water; work consisting of spreading, mixing, hydrating and compacting the mixture to the lines, grades and dimensions shown on the plans and as specified in these specifications or special provisions. Contractor is required to complete initial mixing and hydration of soil-lime, then mellowed for a specified time prior to re-mixing, optimizing moisture and compacting. The entire operation shall be completed within 2 to 3 days of initial application of quicklime, unless otherwise permitted by engineer.

1.02 Submittals

The submittal requirements of this specification item shall include:

A. Type and source of quicklime proposed and a source of water.
B. A plan describing the stabilization equipment proposed to perform the work and identifying the type and condition of each equipment item.

1.03 Materials

Soil. Soil to be treated with quicklime shall be within (+) 5 percent of the soils optimum moisture content prior to application of quicklime unless approved at the engineers discretion prior to treatment**.** At the engineers discretion the in-situ moisture may be higher for soil-lime mixtures above 5 percent quicklime content. Soil shall not contain rocks or solids other than soil clods larger than 2.5 inches in any dimension. The soils should be mixed thoroughly with a mechanical mixer to achieve the following particle break-down:

Sieve Size - Passing Percentage
1-inch Sieve – 98 percent passing Min
No. 4 Sieve – 60 percent passing Min

Soil beneath the soil-lime layer should be visibly moist within 6 inches from the bottom of soil-lime layer.

Removing and disposing of oversize material or adjusting the in-situ moisture content by pre-watering or additional quicklime to reduce excess moisture shall be included in the contractors bid as a unit price to be approved by the owner at the start of construction if needed.

Quicklime. Quicklime shall meet ASTM Designation: C 977. Quicklime shall be dry non-hydrated quicklime. The Quicklime shall be protected from moisture until used and be sufficiently dry to flow freely when handled. Quicklime shall be furnished in bulk.

When dry sieved in a mechanical sieve shaker for 10 minutes +/- 30 seconds a 250-gram test sample of Quicklime shall conform to the following grading requirements:

Sieve Size - Percentage Passing
2.5 inch Sieve – 100%
#100 Sieve – 0 to 25%
#200 Sieve – 0 to 15%

Water. Water shall be free from oils, acids, organic matter or other substances deleterious to the quick lime treatment of materials. The water shall not contain more than 1000 parts per million of chlorides nor more than 1000 parts per million of sulfates as SO4. Water shall be clean and potable and shall be added as needed during mixing, compacting, and finishing operations and during the curing period, as required.

1.04 Proportioning / Spreading

The quicklime shall be applied in one operation to the required width, grade and cross section. Quicklime shall be evenly applied at the designated rate and shall not vary more than 10 percent on any area. The percent quicklime is based on the in-place dry weight of the soil to be treated or as determined by the engineer or representative. For the purposes of project pricing, the contactor shall assume **5** percent quicklime based on a in-place compacted dry unit weight of **115** pounds per cubic foot for a treatment depth of **18** inches. Only a calibrated spreader able to provide a uniform distribution of the quicklime throughout the treatment area shall apply the quicklime. The quicklime shall be added in a dry state and every precaution shall be taken to prevent dusting. Tailgate spreading of the quicklime will not be permitted. Tailgating is defined as having manual control of the spread rate, instead of automatic. The spreader truck shall demonstrate the ability to maintain a consistent spread rate over variable travel speeds. The contractor will demonstrate the consistency of the spread rate by conducting multiple pan tests in the presence of a representative of the geotechnical engineer.

The pan test consists of placing a 2 to 3 square foot pan on the grade in front of the spreader truck. After quicklime has been spread, the quicklime is weighed to determine the rate of spread in pounds per square foot. No traffic other than the mixing equipment or other related construction equipment will be allowed to pass over the exposed quicklime until after completion of mixing.

Quicklime shall not be spread or mixed/hydrated while the atmospheric temperature is below 35° F or below 1.67° C.

At the engineer's discretion, processing will be allowed if temperature is rising.

1.05 Mixing / Hydrating

Mixing equipment shall be equipped with a visible depth indicator showing mixing depth and an odometer to indicate travel speed. The initial hydration water shall be introduced by means of a regulated water additive system integrated into the mixing equipment. Mixing equipment shall be the type that can mix to the full depth of the desired thickness

and leave a relatively smooth bottom of the treated section. Mixing and re-mixing, regardless of equipment used, will continue until the material is uniformly mixed, free of streaks and/or pockets of non-hydrated quicklime.

The quicklime to water ratio for hydrating the quicklime shall be 2 quicklime to 1.5 water, plus 3 percent above the optimum moisture content.

a. Preliminary/Initial mixing. The full depth of the treated subgrade shall be mixed with an approved mixing machine. Lime shall not be left exposed for more than six (6) hours. The mixing machine shall make at least two coverages. Water shall be added to the subgrade during mixing to provide a moisture content approximately 5% above the optimum moisture of the material and to ensure chemical action of the lime and subgrade. Preliminary mixing shall consist of at least two pass (1 pass = 1 coverage) with the mixing machine. After mixing, the subgrade shall be lightly rolled to seal the surface and help prevent evaporation of moisture. The water content of the subgrade mixture shall be maintained at a moisture content above the optimum moisture content for a minimum of 48 hours or until the material becomes friable. During the curing period, the material shall be sprinkled as directed by the Engineer.

b. Final mixing. After the required curing time, the material shall be uniformly mixed by approved methods. If the mixture contains clods, they shall be reduced in size by blading, discing, harrowing, scarifying, or the use of other approved pulverization methods so that the remainder of the clods shall meet the following requirements when tested dry by laboratory sieves. After curing, pulverize lime treated material until soil particles pass a one inch (25 mm) sieve and 60% pass the No. 4 (4.75 mm) sieve. If resultant mixture contains clods, reduce their size by scarifying, remixing, or pulverization to meet specified gradation. Final mixing shall consist of at least one pass with the mixing machine. The first and final mixings shall not be performed on the same day, unless approved by the Engineer.

1.06 Compaction

Maintain moisture content within allowable range during all compaction procedures. The soil-quicklime shall be compacted to 90 percent relative compaction as determined by ASTM 1557, latest editions. The maximum compacted thickness of a single layer may be any thickness the contractor can demonstrate to the engineer that his equipment and method of operation will provide the required compacted density throughout the soil-lime layer but shall be limited to 18 inches maximum thickness. Compaction of the mixture shall immediately follow the final mixing operation and confirmation that the material particle size is achieved as outlined above with no part of the mixture uncompacted more than 30 minutes after final mixing. The material shall be aerated or sprinkled as necessary to provide a moisture content of 2 to 5 percent above optimum during compaction as needed to achieve the specified relative compaction and result in a stable subgrade condition.

Initial compaction. Contractor shall achieve the project's minimum compaction requirement during initial compaction operation. Lift thickness of 6 to 8 inches shall be compacted by means of a sheepsfoot compactor. Lift thickness greater than 8 inches shall be compacted by a sheepsfoot compactor with an open ring design to prevent

bridging of the lower half of treated section. Areas inaccessible to production compactor shall be compacted to project requirements by other means satisfactory to the engineer.

Surface Compaction. Surface compaction is defined as the upper 3 inches of the soil-lime section. Surface compaction shall be by means of steel-drum or pneumatic-tired rollers. Areas inaccessible to rollers shall be compacted to the required compaction by other means satisfactory to the engineer.

1.07 Final Grading. Surface compaction and finishing of soil-lime section shall proceed in such a manner as to produce a smooth, closely knit surface conforming to the crown, grade and lines indicated. Maintain moisture content on surface within allowable range during all grading procedures.

All excess material above the grade tolerance specified by the plans should be removed from the grade prior to final surface compaction of the soil-lime section. This excess material can be used in areas inaccessible to treatment equipment, provided the soil-lime is maintained above the optimum moisture content.

The trimmed and completed surface shall be rolled with steel drum or pneumatic tired rollers. Minor indentations may remain in the surface of the finished material as long as no loose material remains in the indentations. Any sliver fills required to maintain grades shall be scarified into the soil-lime layer.

1.08 Curing.

After the soil-lime has been finished as specified above, the compacted surface of soil-lime shall be kept moist until cured or covered. In multiple soil-lime layers, the exposed surface of each layer shall be kept moist until covered by a subsequent layer of soil-lime. Soil-lime cure is defined as soil-lime section meeting the project performance requirement. Cure time is dependent on temperature and rate of hydration throughout the soil-lime section and shall be specified by the engineer at the time of construction based on field conditions observed. 1 to 3 days of curing time may be needed depending on the field conditions observed.

1.09 Traffic Loading

Once soil-lime is finished, contractor may be allowed to place subsequent structural layers (with the exception of Asphaltic Concrete) over the soil-lime section provided that the following criteria's are met:

A. The soil-lime section is stable and non-yielding under a minimum 10 ton fully loaded water truck used for proof rolling.

B. The soil-lime section criteria's have been met, including the soil-lime section thickness, percentage of quicklime placed, and quantity or volume of soil-lime treated.

C. If treated section begins to deflect under repetitive loading, loading must immediately be rerouted and section left to heal or reviewed or fixed.

Appendix D

Hazardous Materials Report

VISTA ENVIRONMENTAL CONSULTING

10 YEARS

A STELLAR PAST • A BRIGHTER FUTURE

Pre-Renovation/Demolition Hazardous Materials Survey Report
Herbert Hoover Elementary School
Palo Alto, CA



Prepared for:

Palo Alto Unified School District

25 Churchill Avenue, Unit D
Palo Alto, CA 94306

Prepared By:
Vista Environmental Consulting
2984 Teagarden Street
San Leandro, CA 94577

February 14, 2017
Project No. 160003003

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EXECUTIVE SUMMARY

Vista Environmental Consulting (Vista) performed a pre-renovation/demolition hazardous materials survey of Herbert Hoover Elementary School, 445 E Charleston Rd, Palo Alto, CA 94306 (Project Site). The survey was performed to identify and sample accessible suspect asbestos-containing materials, to identify representative building components for the presence of lead-containing surface coatings/lead-based paints (LCSC/LBP), and to visually identify universal waste (UW) materials, polychlorinated biphenyls (PCBs) containing devices, devices which contain ozone depleting chemicals, and other hazardous materials. Vista performed the hazardous materials survey on December 21 and 22, 2016.

The following buildings were surveyed and contain the following hazardous materials:

Building	Asbestos	Lead-Based Paint	Universal Waste	Suspect PCBs
Administration	☑	☑	☑	☑
Classroom Wing 1 to 8	No	☑	☑	☑
Classroom Wing 9 to 14	☑	☑	☑	☑
Library	☑	No	☑	☑
MPR	☑	No	☑	☑

Subsurface asbestos utility piping is assumed throughout the Project Site.

The Hazardous Materials Summary, Asbestos Sampling Inventory, Sample and Asbestos-Containing Materials Location Drawings, Photo Documentation (If Applicable), Asbestos Analytical Reports, and Lead XRF Sequential Reports can be found in *Appendix A – Building Data.* They are arranged building by building in alphabetical order.

The documents found in the appendices are not stand-alone documents and should not be separated from this report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

BAAQMD classifications are based upon the material's condition at the time of the survey or as rendered as a result of standard manual removal/demolition techniques. The use of "mechanical

means", non-standard or other aggressive removal/demolition techniques may result in a different classification.

All asbestos (>0.1%) disturbance and/or removal operations must be conducted by a Cal/OSHA registered and State licensed asbestos removal contractor. All disturbance and/or abatement operations should be under the direction of a California Certified Asbestos Consultant. Should the removal of identified regulated asbestos-containing materials (RACM) involve at least 100 square feet or 100 linear feet per project site, per year, then notification to the Bay Area Air Quality Management District (BAAQMD) and Cal/OSHA must be accomplished prior to the initiation of such activities.

All activities involving potential and identified lead-containing surfaces should be conducted in accordance with California Health & Safety Code sections 17920.10 and 10525, 10525.7, Title 8, California Code of Regulations (CCR), Section 1532.1.

In addition, all removal activities involving identified lead-based paints (LBP) must be conducted in accordance with Title 17, CCR, Division 1, Chapter 8, Sections 35001 through 36100, which prescribes the use of California Department of Public Health (CDPH) certified workers, work practices, and other requirements.

Written notification to Cal/OSHA must be accomplished should LBP activities involve equal to or more than 100 square feet or 100 linear feet of removal in accordance with the requirements of 8 CCR 1532.1.

Any welding, cutting or heating of metal surfaces containing surface coatings should be conducted in accordance with 8 CCR 1537 Welding, Cutting, and Heating of Coated Metals, which require surfaces covered with toxic preservatives, and in enclosed areas, be stripped of all toxic coatings for a distance of at least 4 inches, in all directions, from the area of heat application prior to the initiation of such heat application, or 8 CCR 1536 Ventilation Requirements for Welding, Brazing, and Cutting.

All potential and identified Universal Waste materials (UW) impacted by the work should be removed and recycled or disposed of in accordance with the UW guidelines established by the DTSC, as stated in 22 CCR Sections 66261.9 and 66273.1 thru 66273.90.

All ballasts must be visually inspected prior to disposal to determine if they contain PCB's. Those ballasts marked No PCB's or PCB Free can be considered as such and should be treated as UW - electronic waste. All PCB-containing devices, including, but not limited to ballasts should be removed or have the oils removed and properly handled, collected, stored, transported and recycled or disposed of by an approved recycling or disposal facility in accordance with the requirements of Title 22 CCR 67426.1.

Devices containing ozone depleting chemicals, petroleum or other chemicals, should be collected, waste characterized, disposed or recycled according to California rules and regulations.

Should materials similar to those identified in this report, or if other forms of suspect hazardous materials are encountered, contractors should be instructed to immediately cease work activities which may initiate an exposure episode, and notify the appropriate management personnel.

Report prepared for the Company by:



Christopher R. Burns
Senior Project Manager
CAC #92-0224
LRCIA #663

1.0 INTRODUCTION

Vista Environmental Consulting (Vista) performed a pre-renovation/demolition hazardous materials survey of Herbert Hoover Elementary School, 445 E Charleston Rd, Palo Alto, CA 94306 (Project Site).

The purpose of this survey was to identify hazardous building materials so they could be removed; waste characterized, and properly disposed of prior to being impacted by renovation activities. The data provided in this report can assist all parties involved in this project make informed decisions regarding regulatory compliance and the health and safety of their employees. This survey included the following:

- Visible and accessible suspect asbestos-containing materials (ACM) were assessed and sampled to determine asbestos content.
- Representative painted and coated building components were assessed and categorized based upon standard selective demolition practices and sampled for lead content which can be used in preliminary waste stream characterization estimates and for worker protection.
- Visible and accessible materials commonly found in buildings which can potentially have hazardous properties that are regulated were assessed, but not sampled. These materials include, but are not limited to:
    - Universal Waste (UW) materials, such as non-incandescent lamps, batteries, mercury-containing devices, and electronic waste; Batteries include, but are not limited to those found in exit signs, emergency lights, fire alarm systems, and back-up power systems.
    - Polychlorinated biphenyls (PCBs) containing devices such as lamp ballasts, wet-type transformers, and hydraulic systems;
    - Devices which may contain ozone depleting chemicals, such as Heating, Ventilation and Air Conditioning (HVAC) systems, refrigerators, freezers, fire suppression systems and water coolers/fountains.

2.0 METHODOLOGY

Vista performed the hazardous materials survey on December 21 and 22, 2016. The asbestos survey was conducted by Christopher Burns, a State of California Division of Occupational Safety and Health (Cal/OSHA) Certified Asbestos Consultant (CAC) #92-0224. Javier Rocha, a

Cal/OSHA Certified Site Surveillance Technician (CSST) #13-5037, assisted on the survey. The lead paint screening survey was conducted by Christopher Burns a State of California Department of Public Health (CDPH) Lead-Related Construction Certified Inspector/Assessor (LRCIA) #I-663.

The survey was not intrusive in nature, and did not include access of areas and sampling of materials which would have required demolition or large scale destructive testing. Vista's intent was to perform a thorough survey and made a good faith effort to access all building materials down to the structural components and/or interstitial spaces. Energized mechanical equipment was deemed inaccessible at the time of this survey.

Quantities and locations are based upon areas that were accessed. Materials similar to those in this report may be present in areas which were not accessed.

Different types of fire doors were checked as part of this survey, however not all doors were checked, and/or sampled. Vista recommends that all doors are checked prior to demolition for suspect asbestos-containing materials not addressed in this report.

Sub-surface areas were not included as part of this survey, hence no excavation was conducted to discover buried asbestos utility piping concealed below the surface. The project site was not assessed for the presence of Naturally Occurring Asbestos in the soil.

2.1 *Asbestos*

The asbestos survey was performed generally in accordance with the AHERA protocol (40 CFR Part 763, Subpart E). Visual identification was performed by assessing visible and accessible structural, architectural, and mechanical components for the presence of suspect ACM at the Project Site.

This ACM survey was conducted in the following manner:

- Suspect ACM was categorized into homogeneous materials. A homogeneous material is defined as being a surfacing material, thermal system insulation, or miscellaneous material which is uniform in color and texture. It may also be additionally subcategorized using the date of installation, when available.

- A sampling scheme was developed based upon the location and quantity of the suspect homogeneous ACM. A rough order of magnitude estimate of each suspect homogenous ACM was calculated and recorded for future reference. A sampling scheme, including a specific number of samples per suspect homogeneous ACM, was calculated prior to sampling.
- Sampling guidelines established by the United States Environmental Protection Agency (USEPA) were utilized for sampling each suspected homogeneous ACM. Methods described in Appendix K of 8 California Code of Regulation (CCR) 1529 were utilized in the collection of each suspect homogeneous ACM sample.
- Trained California asbestos certified personnel, using appropriate sampling tools and leak-tight closable bags, collected building materials that were suspected to contain ACM.
- Each suspect ACM sample was collected and sealed in its container and appropriately labeled with a unique sample identification number and recorded on an asbestos bulk sampling log. Each log contains a chain-of-custody to assure the proper transition of the samples from Vista to the analytical laboratory.
- Sampling tools were decontaminated, by using a clean wet cloth, between the collection of each suspect sample to prevent the possibility of cross contamination of subsequent suspect ACM samples.

Suspect ACM samples were delivered, under proper chain-of-custody protocol, to Forensic Analytical Laboratories in Hayward, California. Forensic Analytical Laboratories is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) and the California Environmental Laboratory Accreditation Program (Cal-ELAP). The samples were submitted for analysis by Polarized Light Microscopy (PLM) utilizing dispersion staining techniques in accordance with the EPA's "Method for the Determination of Asbestos in Bulk Building Materials" U.S. EPA/600/R-93/116, Visual Area Estimate, dated July 1993 and adopted by the NVLAP as Test Method Code 18/A01.

2.2 *Lead*

Vista's lead construction screening survey used an X-Ray Fluorescence (XRF) direct read spectrum analyzer device to take readings of representative painted and coated surfaces for evaluation of lead levels for worker health and safety and preliminary waste characterization prior to construction activities. The device was a NITON Corporation XRF Spectrum Analyzer, Model XLp- 300 A. This device is a solid-state detector optimized for lead L-shell and K-shell X-ray detection and uses a 40 mCi 109Cd (1,480 Mbq) isotope for an excitation source.

This survey was a limited screening for the purpose of characterizing the lead content in paint and coatings likely to be disturbed during work activities. For this purpose, XRF analysis was used to screen for lead levels and provides results that are generally representative of typical conditions but are not inclusive of all painted/coated surfaces present at the Project Site. This survey was not a surface by surface inspection as outlined in the U.S. Department of Housing and Urban Development (HUD) Guidelines For the Evaluation and Control of Lead-Based Paint Hazards in Housing pursuant to Title X of the Housing and Community Development Act of 1992. This analytical data can be helpful in evaluation of lead-related environmental risks in general, but cannot be used to calculate worker exposures and is not a substitute for employee exposure monitoring or waste stream sampling.

Lead-Based Paint (LBP) is defined by CDPH as any paint containing lead levels exceeding 0.5 wt % (or 5000 parts per million) via paint chip sampling or 1.0 milligrams per centimeter squared (mg/cm^2) or greater via X-Ray Fluorescence (XRF) direct read instrument sampling. Cal/OSHA rules apply to "any detectable concentration of lead" without a specified detection level.

2.3 *Devices with Potential Hazardous Materials*

Devices with potential hazardous materials were visually identified during the survey walk through and their quantities were estimated and recorded. No attempt was made to disassemble devices or sample suspect materials within the devices. For example, fluorescent light fixtures must be presumed to contain Universal Waste lamps and ballasts which contain PCB oil or are electronic waste, pending removal and disassembly of each unit to determine explicit product specific information that proves otherwise.

3.0 RESULTS

The following buildings were surveyed and contain the following hazardous materials:

Building	Asbestos	Lead-Based Paint	Universal Waste	Suspect PCBs
Administration	☑	☑	☑	☑
Classroom Wing 1 to 8	No	☑	☑	☑
Classroom Wing 9 to 14	☑	☑	☑	☑
Library	☑	No	☑	☑
MPR	☑	No	☑	☑

Subsurface asbestos utility piping is assumed throughout the Project Site.

The Hazardous Materials Summary, Asbestos Sampling Inventory, Sample and Asbestos-Containing Materials Location Drawings, Photo Documentation (If Applicable), Asbestos Analytical Reports, and the Lead XRF Sequential Reports can be found in *Appendix A – Building Data.* They are arranged building by building in alphabetical order.

The documents found in the appendices are not stand-alone documents and should not be separated from this report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

BAAQMD classifications are based upon the material's condition at the time of the survey or as rendered as a result of standard manual removal/demolition techniques. The use of "mechanical means", non-standard or other aggressive removal/demolition techniques may result in a different classification.

4.0 RECOMMENDATIONS

4.1 *Asbestos*

Work performed during any activities that disturb the asbestos-containing materials identified in this report must be done in compliance with the most recent edition of all applicable federal, state, and local regulations, standards, and codes governing abatement, transport, and disposal of asbestos-containing materials. These include, but are not limited to, the following:

- CCR, Title 8, Chapter 3.2, Subchapter 2, Article 2.5 - Registration Asbestos-Related Work Sections 341.6 through 341.14
- CCR, Title 8, Section 1529 - Asbestos in the Construction Industry
- BAAQMD Regulation 11, Hazardous Pollutants, Rule 2, Asbestos Demolition, Renovation and Manufacturing
- 40 CFR Part 763 - Subpart E, Asbestos Containing Materials in Schools (AHERA)

Materials encountered in the building that are not part of this report must be properly sampled for the content of asbestos or assumed to be asbestos containing prior to any disturbance.

Prior to activities which will disturb identified or assumed asbestos, a Cal/OSHA registered and California licensed asbestos contractor must be utilized for abatement of asbestos that will be impacted. Vista recommends that all abatement operations be conducted under the direction of a California Certified Asbestos Consultant.

4.2 *Lead*

At present there is no state or federal regulation requiring mandatory lead removal or abatement prior to disturbance of building materials with identified lead paint or coatings. However, there are applicable Cal/OSHA worker protection and training requirements, Cal/EPA waste disposal requirements, CDPH requirements for public and residential buildings, and SB 460 lead hazard regulations that apply to lead-related construction activities, abatement activities and their associated wastes. The following is a brief discussion and summary of applicable regulatory requirements:

♦ **Cal/OSHA:** Title 8, California Code of Regulation (CCR), Section 1532.1 (8 CCR 1532.1) governs occupational exposure to lead. This regulation requires that prior to initiation of certain activities, referred to as “trigger tasks”, workers must be trained, medically evaluated, and properly fitted with respiratory protection, and protective clothing until statistically reliable

personal eight-hour time weighted average (TWA) results indicate lead exposure levels below the Personal Exposure Limit (PEL) for each unique task which disturbs lead-based and lead-containing coatings. This process is known as a Negative Exposure Assessment or NEA.

If the result of the exposure assessment is above the Action Level (AL) additional monitoring is required and if the result is above the PEL additional exposure monitoring, worker protection (including respirator protection and PPE), training and medical requirements apply. However even where the NEA criteria is met, certain hazard communication training and work practice controls still apply where lead is disturbed. "Trigger tasks" are tasks that are assumed to exceed the PEL pending an exposure assessment and they encompass the majority of construction activities that disturb surface coatings. Examples of "trigger" tasks range from manual paint scraping as a lower expected exposure up to hot work and abrasive blasting as the highest expected exposures, and include any non-listed task that the employer determines may potentially expose employees to lead levels above the AL.

"OSHA does not consider any method that relies solely on the analysis of bulk materials or surface content of lead (or other toxic material) to be acceptable for safely predicting employee exposure to airborne contaminates. Without air monitoring results or without the benefit of historical or objective data (including air sampling which clearly demonstrates that the employee can not be exposed above the action level during any process, operation, or activity) the analysis of bulk or surface samples can not be used to determine employee exposure."- OSHA Standard Interpretation May 8, 2000.

OSHA states that these rules apply to "any detectable concentration of lead" without a specified detection level. Due to the Consumer Product Safety Commission currently allowing paint to contain up to 90 parts per million (ppm) or 0.009 wt% of lead, the variation of lead content due to aging and weathering, and the variation of detection limits associated with analysis of bulk materials, such as paint chips and surface content analysis via XRF, it is recommended that all painted or coated surfaces be treated as potentially containing lead. Positive analytical results by either method can be used to indicate that detectable lead is present but negative results cannot be interpreted as conclusively demonstrating the absence of lead.

Analytical data from analysis of bulk materials or surface content of lead can be helpful in evaluation of lead-related environmental risks in general but cannot be used to calculate worker exposures and are not a substitute for employee exposure monitoring. As a result of the above, any employee that works around potential lead-based or lead-containing coatings must have

HAZCOM training and personal exposure air monitoring is additionally required for employees that disturb such coatings. Significant additional certification, notification, and work practices are required for materials found to be lead-based.

Any welding, cutting or heating of metal surfaces containing surface coatings should be conducted in accordance with 29 CFR 1926.354 and 8 CCR 1537. These regulations require surfaces covered with toxic preservatives, and in enclosed areas, be stripped of all toxic coatings for a distance of at least 4 inches, in all directions, from the area of heat application prior to the initiation of such heat application.

♦ **Cal/EPA** through the Division of Toxic Substance Control (DTSC) regulates disposal of lead hazardous waste (22 CCR Division 4.5, Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes). DTSC has issued guidance indicating that architectural debris with intact lead paint is normally expected to be handled as general construction waste. However, waste stream segregation and analysis is still required for all lead painted or coated debris regardless if the paint or coating is intact on a building component or not. The resulting wastes may be hazardous under California and federal RCRA standards for lead and therefore require proper handling, packaging, labeling, and transportation under a proper manifest to a permitted hazardous waste storage, treatment and disposal facility.

♦ **CDPH**: The Department of Public Health (CDPH) has specific requirements (Title 17 Sections 35001 thru 36100 et. al.) for hazard assessment and work in public or residential structures in regards to lead-based paint. These regulations require special certifications, work practices, and notification for such activities.

♦ **Senate Bill 460 (SB 460)**: An act to amend Section 1941.1 of the Civil Code, and to amend Sections 17961, 17980, and 124130 of, and to add Sections 17920.10, 105251, 105252, 105253, 105254, 105255, 105256, and 105257 to, the Health and Safety Code, relating to lead abatement. This bill allows for fines and criminal penalties to be levied on any person who is found to have performed lead abatement without containment or created a measurable “lead hazard” based upon current CDPH standards. A “lead hazard” means deteriorated lead-based paint, lead contaminated dust, lead contaminated soil, disturbing lead-based paint or presumed lead-based paint without containment, or any other nuisance which may result in persistent and quantifiable lead exposure.

Vista recommends that all parties that come into contact with paint and dust that has detectable lead content follow all applicable federal, state and local regulations relating to employee health and safety and proper disposal of generated wastes.

4.3 *Devices with Potential Hazardous Materials*

All potential and identified Universal Waste materials (UW) impacted by the work should be removed and recycled or disposed of in accordance with the UW guidelines established by the DTSC, as stated in 22 CCR Sections 66261.9 and 66273.1 thru 66273.90.

Vista's limited visual survey indicated that light fixtures with ballasts that may contain PCB oil are present. However, due to the limited nature of the random spot checks, Vista recommends that all ballasts be visually inspected prior to disposal to determine if they contain PCB's. Those ballasts marked No PCB's or PCB Free can be considered as such as should be treated as UW - electronic waste.

All PCB-containing devices, including, but not limited to ballasts and transformers should be removed or have the oils removed and properly handled, collected, stored, transported and recycled or disposed of by an approved recycling or disposal facility in accordance with the requirements of Title 22 CCR 67426.1.

Devices containing ozone depleting chemicals, petroleum or other chemicals, should be collected, waste characterized, disposed or recycled according to California rules and regulations.

If the underground storage tanks still exist, the closure of them requires following all local rules and regulations for obtaining permits, performing soil sampling and obtaining closure certification on the tank system.

All personnel who perform hazardous materials work must be trained and qualified to do so. They must also follow the most current OSHA regulations including 29 CFR 1910.120 and 8 CCR 5192, Hazardous Waste Operations and Emergency Response, as well as other applicable federal, state and local laws and regulations.

5.0 LIMITATIONS & EXCLUSIONS

Quantities and locations are based upon areas that were accessed. Materials similar those in this report may be present in areas which were not accessed. Because of this, Vista recommends including line item pricing, allowances, and/or additive/deductive wording to bid sheets for unforeseen conditions.

All material quantities reported herein are rough order of magnitude estimates and should not be used for bidding purposes. All contractors are responsible for accurately determining quantities and locations of materials identified in this report.

The survey was not intrusive in nature, and did not include access of areas and sampling of materials which would have required demolition or large scale destructive testing. Vista's intent was to perform a thorough survey and made a good faith effort to access all building materials down to the structural components and/or interstitial spaces. Energized mechanical equipment was deemed inaccessible at the time of this survey.

Sub-surface areas were not included as part of this survey, hence no excavation was conducted to discover buried asbestos utility piping concealed below the surface. The project site was not assessed for the presence of Naturally Occurring Asbestos in the soil.

Respectfully Submitted,
Vista Environmental Consulting

Reviewed and Approved





Christopher R. Burns
Senior Project Manager
CAC #92-0224
LRCIA #663

Charles R. Bove
Principal
CAC #92-0160

APPENDIX A - BUILDING DATA

ADMINISTRATION



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

BAAQMD classifications are based upon the material's condition at the time of the survey or as rendered as a result of standard manual removal/demolition techniques. The use of "mechanical means", non-standard or other aggressive removal/demolition techniques may result in a different classification. BAAQMD & Cal-OSHA classifications are based on the materials being >1% asbestos pending further analytical data that proves otherwise.

ADMINISTRATION
HAZARDOUS MATERIALS SUMMARY

Asbestos

HOMO. ID	MATERIAL	DESCRIPTION	LOCATION	CAL/OSHA CLASS	BAAQMD CATEGORY	ESTIMATED QUANTITY
O	Mastic	Gray and Black, Patching, Penetrations, Seams	Roof - Patches, Penetrations, and Seams	Class II	Category I - Non-Friable	150 SF

Lead

ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	PB	UNITS
Inside	Wall	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall Panel	Vinyl	Yellow	Intact	0.01	mg/cm^2
Inside	Cabinet	Wood	Varnish	Intact	0.01	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Shelf	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall	Plaster	Beige	Intact	0.03	mg/cm^2
Inside	Door	Wood	Beige	Intact	0.03	mg/cm^2
Inside	Door	Wood	Varnish	Intact	0.03	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.11	mg/cm^2
Inside	Wall	Wood	Beige	Intact	0.11	mg/cm^2
Inside	Tackboard	Wood	Beige	Intact	0.2	mg/cm^2
Inside	Store Front Window	Wood	Beige	Intact	0.22	mg/cm^2
Inside	Trim	Wood	Beige	Intact	0.24	mg/cm^2
Inside	Trim	Wood	Beige	Intact	0.25	mg/cm^2
Inside	Door	Wood	Green	Intact	0.26	mg/cm^2
Inside	Shelf	Wood	Varnish	Intact	0.4	mg/cm^2
Inside	Wall	Wood	Blue	Intact	0.5	mg/cm^2
Inside	Cabinet	Wood	Beige	Intact	0.5	mg/cm^2
Inside	Wall	Wood	Green	Intact	0.5	mg/cm^2
Inside	Window Frame	Wood	Beige	Intact	1.9	mg/cm^2
Inside	Window	Wood	Beige	Intact	2.1	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	2.3	mg/cm^2
Inside	Counter	Ceramic	Yellow	Intact	9.3	mg/cm^2
Inside	Wall	Ceramic	Yellow	Intact	10.1	mg/cm^2
Outside	Wall	Stucco	Beige	Intact	0.01	mg/cm^2
Outside	Sign	Wood	Green, Dark	Intact	0.01	mg/cm^2
Outside	Trim Upper	Wood	Green, Dark	Intact	0.01	mg/cm^2
Outside	Storefront Window	Wood	Green, Dark	Intact	0.03	mg/cm^2

ADMINISTRATION
HAZARDOUS MATERIALS SUMMARY

ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	PB	UNITS
Outside	Trim Upper	Wood	Beige	Intact	0.03	mg/cm^2
Outside	Wall	Stucco	Beige	Intact	0.04	mg/cm^2
Outside	Wall	Stucco	Black	Intact	0.04	mg/cm^2
Outside	Door	Wood	Green, Light	Intact	0.05	mg/cm^2
Outside	Wall	Stucco	Gray	Intact	0.05	mg/cm^2
Outside	Column	Stucco	Beige	Intact	0.08	mg/cm^2
Outside	Cage	Metal	Green, Dark	Intact	0.09	mg/cm^2
Outside	Ceiling	Wood	Beige	Intact	0.09	mg/cm^2
Outside	Pole	Metal	Green, Dark	Intact	0.13	mg/cm^2
Outside	Pole	Metal	Green, Dark	Intact	0.2	mg/cm^2
Outside	Door Frame	Wood	Green, Dark	Intact	0.7	mg/cm^2
Outside	Wall Panel	Wood	Beige	Intact	1.5	mg/cm^2
Outside	Window Sill	Wood	Green, Dark	Intact	2	mg/cm^2
Outside	Window Casing	Wood	Green, Dark	Intact	2.2	mg/cm^2
Outside	Window	Wood	Green, Dark	Intact	2.3	mg/cm^2
Outside	Fascia	Wood	Green, Dark	Deteriorated	2.5	mg/cm^2

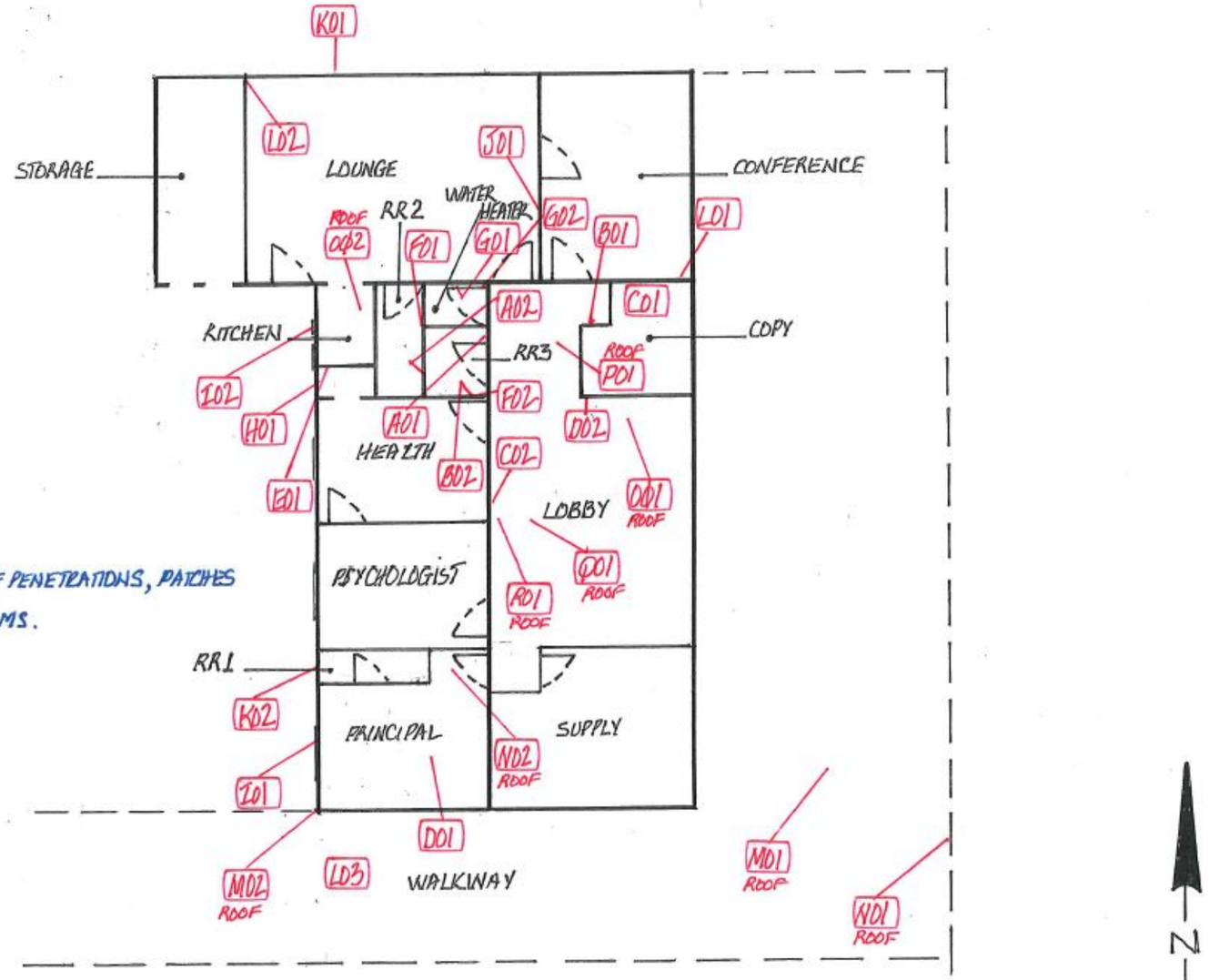
Please see Recommendation section for regulatory clarifications regarding lead in paint and ceramic tiles.

Other Hazardous Materials

MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	92
Other Non-incandescent Lamps	Universal Waste	6
Batteries: Back-up	Universal Waste	2
Transformers	Polychlorinated Biphenyls	46
HVAC	Ozone Depleting Chemicals	3
Window Mounted AC Unit	Ozone Depleting Chemicals	1

ADMINISTRATION
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Wallboard/Joint Compound	White/White	2
B	Vinyl Floor Tile/Mastic	12" Beige with Brown Streaks/Yellow	2
C	Basecove/Mastic	4" Brown/Brown and Beige	2
D	Acoustical Ceiling Tile/Vapor Paper	12" White, Uniform Hole/Black and Tan	2
E	Mortar/Grout	Gray/White, Ceramic	1
F	Basecove/Mastic	6" Brown/Brown	2
G	Paint/Plaster	White/White, Wall and Ceiling	2
H	Mastic	White, Sink	1
I	Putty	White, Window	2
J	Temporary Wall	White	1
K	Paint/Stucco	White/ Gray, Exterior Wall	2
L	Mastic	Yellow, Carpet	3
M	Roof Field	Gray and Black, Built Up	2
N	Base/Flashing	Gray and Black, Built Up	2
O	Mastic	Gray and Black, Patching, Penetrations, Seams	2
P	Sealant	White, Duct Surface	1
Q	Sealant	White, Duct Seam	1
R	Gasket	Green, Pipe	1



⓪ _ TYP ROOF PENETRATIONS, PATCHES AND SEAMS.

○ _ ASBESTOS CONTAINING MATERIAL

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PROJECT TITLE

ADMINISTRATION
HOOVER ELEMENTARY
SCHOOL

SHEET TITLE

SAMPLE & MATERIAL LOCATIONS

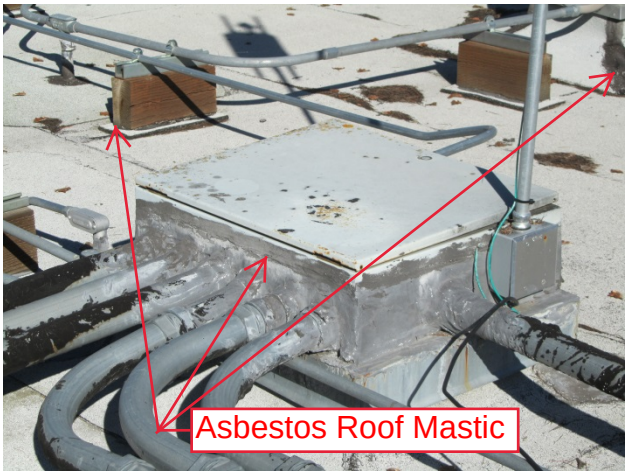
SCALE: NTS
DRAWN BY: JR
CHECKED BY: CB
PROJECT No. 160003003
DATE: 020917
DRAWING No. 1

FIGURE

1

ADMINISTRATION
PHOTO DOCUMENTATION





Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B232775
Date Received: 12/27/16
Date Analyzed: 01/03/17
Date Printed: 01/04/17
First Reported: 01/04/17

Job ID/Site: 160003003 - PAUSD, Hoover - Main Bldg. (Administration)

Date(s) Collected: 12/23/2016

FALI Job ID: L1161
Total Samples Submitted: 31
Total Samples Analyzed: 31

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
ADM-A01	11842939						
Layer: White Drywall			**ND**				
Layer: Off-White Joint Compound			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (ND)**					
ADM-A02	11842940						
Layer: White Drywall			**ND**				
Layer: Off-White Joint Compound			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (ND)**					
ADM-B01	11842941						
Layer: Beige Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-B02	11842942						
Layer: Beige Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-C01	11842943						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Brown Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-C02	11842944						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B232775

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
ADM-D01	11842945						
Layer: Tan/ Black Tape			**ND**				
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
ADM-D02	11842946						
Layer: Tan/ Black Tape			**ND**				
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
ADM-E01	11842947						
Layer: White Mortar			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-F01	11842948						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-F02	11842949						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-G01	11842950						
Layer: White Plaster			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-G02	11842951						
Layer: White Plaster			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-H01	11842952						
Layer: White Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-I01	11842953						
Layer: White Putty			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B232775

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
ADM-I02	11842954						
Layer: White Putty			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-J01	11842955						
Layer: White Drywall			**ND**				
Layer: White Joint Compound			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (ND)**					
ADM-K01	11842956						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-K02	11842957						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-L01	11842958						
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Fibrous Glass (Trace)		**Asbestos (ND)**					
ADM-L02	11842959						
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Fibrous Glass (Trace)		**Asbestos (ND)**					
ADM-L03	11842960						
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Fibrous Glass (Trace)		**Asbestos (ND)**					
ADM-M01	11842961						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components: Cellulose (55 %) Fibrous Glass (10 %) Comment: Bulk complex sample.		**Asbestos (ND)**					

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Report Number: B232775

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
ADM-M02	11842962						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							
ADM-N01	11842963						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							
ADM-N02	11842964						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							
ADM-O01	11842965						
Layer: Black Mastic		Chrysotile	**5 %**				
Total Composite Values of Fibrous Components:		**Asbestos (5%)**					
Cellulose (5 %) Synthetic (Trace)							
ADM-O02	11842966						
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (10 %) Synthetic (5 %)							
ADM-P01	11842967						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (Trace)							

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Report Number: B232775

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
ADM-Q01	11842968						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
ADM-R01	11842969						
Layer: Green Semi-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (2 %) Synthetic (15 %)		**Asbestos (ND)**					

Tad Thrower

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/21/16

LOCATION: Hoover - Main Bldg. (ADMINISTRATION) PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST No: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
ADM	A	01	WB/JC	WHITE/WHITE	W & C	
ADM	A	02	↓	↓	↓	
ADM	B	01	VFT/MAS	12" BEIGE WITH BROWN STREAKS/YELLOW		
ADM	B	02	↓	↓		
ADM	C	01	BASECOVE/MAS	4" BROWN/BROWN & BEIGE		
ADM	C	02	↓	↓		
ADM	D	01	ACT/VAPOR PAPER	12" WHITE/BLACK & TAN		
ADM	D	02	↓	↓		
ADM	E	01	MORTAR/GROUT	GRAY/WHITE	CERAMIC TILES	
ADM	F	01	BASECOVE/MAS	6" BROWN/BROWN		

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1. Luis J Rocha — LUIS J ROCHA — 12/23/16
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

2. _____ — _____ — _____
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

3. _____ — _____ — _____
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

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ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/21/16

LOCATION: Hoover - Main Bldg. (ADMINISTRATION) PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST No: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
ADM	F	02	↓	↓		
ADM	G	01	PAINT/PLASTER	WHITE/WHITE	W & C	
ADM	G	02	↓	↓	↓	
ADM	H	01	MASTIC	WHITE, SINK		
ADM	I	01	PUTTY	WHITE, WINDOW		
ADM	I	02	↓	↓		
ADM	J	01	TEMP WALL	WHITE, WALL		
ADM	K	01	PAINT/STUCCO	WHITE/GREY	EXTERIOR WALLS	
ADM	K	02	↓	↓	↓	
ADM	L	01	MASTIC	YELLOW, CARPET		

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

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1. Luis J Rocha — LUIS J ROCHA — 12/23/16
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

2. _____ — _____ — _____
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

3. _____ — _____ — _____
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ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/21/16

LOCATION: Hoover - Main Bldg (ADMINISTRATION) PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
ADM	L	02	↓	↓		
ADM	L	03	↓	↓		
ADM	M	01	ROOF FIELD	GRAY & BLACK	BUILT-UP	
ADM	M	02	↓	↓	↓	
ADM	N	01	BASE/FLASHING	GRAY & BLACK	BUILT-UP	
ADM	N	02	↓	↓	↓	
ADM	O	01	MASTIC	GRAY & BLACK	ROOF PENT. & SEAMS	
ADM	O	02	↓	↓	↓	
ADM	P	01	SEALANT	WHITE	ROOF DUCT SURFACE	
ADM	Q	01	SEALANT	WHITE	ROOF DUCT INNER SEAM	

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

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SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1. [signature] LUIS JAVIER ROCHA 12/23/16
TRANSFER SIGNATURE PRINTED NAME DATE/TIME

2. _____ _____ _____
TRANSFER SIGNATURE PRINTED NAME DATE/TIME

3. _____ _____ _____
TRANSFER SIGNATURE PRINTED NAME DATE/TIME

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ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/21/16

LOCATION: Hoover - Main Bldg. PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
ADM	R	01	GASKET	GREEN	ROOF PIPE	

31 SAMPLES

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

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QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1. Louis J Rocha (TRANSFER SIGNATURE) LOUIS J ROCHA (PRINTED NAME) 12/23/16 (DATE/TIME)
2. _____ (TRANSFER SIGNATURE) _____ (PRINTED NAME) _____ (DATE/TIME)
3. _____ (TRANSFER SIGNATURE) _____ (PRINTED NAME) _____ (DATE/TIME)

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PAGE 4 OF 4

Administration
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
186	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
187	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
188	INSIDE	WALL	WOOD	BLUE	INTACT	Negative	0.5	mg / cm ^2
189	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
190	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.11	mg / cm ^2
191	INSIDE	WINDOW CASING	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
192	INSIDE	TRIM	WOOD	BEIGE	INTACT	Negative	0.25	mg / cm ^2
193	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Positive	2.1	mg / cm ^2
194	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
195	INSIDE	BEAM	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
196	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0.5	mg / cm ^2
197	INSIDE	COUNTER	CERAMIC	YELLOW	INTACT	Positive	9.3	mg / cm ^2
198	INSIDE	WALL PANEL	VINYL	YELLOW	INTACT	Negative	0.01	mg / cm ^2
199	INSIDE	TRIM	WOOD	BEIGE	INTACT	Negative	0.24	mg / cm ^2
200	INSIDE	COUNTER	VINYL	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
201	INSIDE	WALL	PLASTER	BEIGE	INTACT	Negative	0.03	mg / cm ^2
202	INSIDE	CEILING	PLASTER	BEIGE	INTACT	Negative	0	mg / cm ^2
203	INSIDE	CEILING	DRYWALL	BEIGE	INTACT	Negative	0	mg / cm ^2
204	INSIDE	WALL	DRYWALL	BEIGE	INTACT	Negative	0	mg / cm ^2
205	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
206	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
207	INSIDE	FRONTSTORE WINDOW	WOOD	BEIGE	INTACT	Negative	0.22	mg / cm ^2
208	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Positive	1.9	mg / cm ^2
209	INSIDE	TACKBOARD	WOOD	BEIGE	INTACT	Negative	0.2	mg / cm ^2
210	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0.11	mg / cm ^2
211	INSIDE	CABINET	WOOD	VARNISH	INTACT	Negative	0.01	mg / cm ^2
212	INSIDE	TRIM UPPER	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
213	INSIDE	MIRROW	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
214	INSIDE	WALL	CERAMIC	YELLOW	INTACT	Positive	10.1	mg / cm ^2
215	INSIDE	WALL	WOOD	YELLOW	INTACT	Negative	0	mg / cm ^2

Administration
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
216	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0.03	mg / cm ^2
217	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
218	INSIDE	SHELF	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
219	INSIDE	SHELF	WOOD	VARNISH	INTACT	Negative	0.4	mg / cm ^2
220	INSIDE	WALL	WOOD	GREEN	INTACT	Negative	0.5	mg / cm ^2
221	INSIDE	DOOR	WOOD	GREEN	INTACT	Negative	0.26	mg / cm ^2
222	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Positive	2.3	mg / cm ^2
223	INSIDE	DOOR	WOOD	VARNISH	INTACT	Negative	0.03	mg / cm ^2
224	OUTSIDE	DOOR	WOOD	GREEN, LIGHT	INTACT	Negative	0.05	mg / cm ^2
225	OUTSIDE	DOOR FRAME	WOOD	GREEN, DARK	INTACT	Negative	0.7	mg / cm ^2
226	OUTSIDE	WINDOW	WOOD	GREEN, DARK	INTACT	Positive	2.3	mg / cm ^2
227	OUTSIDE	WINDOW CASING	WOOD	GREEN, DARK	INTACT	Positive	2.2	mg / cm ^2
228	OUTSIDE	WINDOW SILL	WOOD	GREEN, DARK	INTACT	Positive	2	mg / cm ^2
229	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0.04	mg / cm ^2
230	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0.01	mg / cm ^2
231	OUTSIDE	CAGE	METAL	GREEN, DARK	INTACT	Negative	0.09	mg / cm ^2
232	OUTSIDE	POLE	METAL	GREEN, DARK	INTACT	Negative	0.13	mg / cm ^2
233	OUTSIDE	FLOOR	CONCRETE	RED	INTACT	Negative	0	mg / cm ^2
234	OUTSIDE	FLOOR STRIPE	CONCRETE	YELLOW	INTACT	Negative	0	mg / cm ^2
235	OUTSIDE	WALL PANEL	WOOD	BEIGE	INTACT	Positive	1.5	mg / cm ^2
236	OUTSIDE	TACKBOARD	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
237	OUTSIDE	STOREFRONT WINDOW	WOOD	GREEN, DARK	INTACT	Negative	0.03	mg / cm ^2
238	OUTSIDE	COLUMN	STUCCO	BEIGE	INTACT	Negative	0.08	mg / cm ^2
239	OUTSIDE	SIGN	WOOD	GREEN, DARK	INTACT	Negative	0.01	mg / cm ^2
240	OUTSIDE	WALL	STUCCO	BLACK	INTACT	Negative	0.04	mg / cm ^2
241	OUTSIDE	WALL	STUCCO	GRAY	INTACT	Negative	0.05	mg / cm ^2
242	OUTSIDE	BENCH	WOOD	GREEN, DARK	INTACT	Negative	0	mg / cm ^2
243	OUTSIDE	POLE	METAL	GREEN, DARK	INTACT	Negative	0.2	mg / cm ^2
244	OUTSIDE	CEILING	WOOD	BEIGE	INTACT	Negative	0.09	mg / cm ^2
245	OUTSIDE	TRIM UPPER	WOOD	BEIGE	INTACT	Negative	0.03	mg / cm ^2

Administration
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
246	OUTSIDE	TRIM UPPER	WOOD	GREEN, DARK	INTACT	Negative	0.01	mg / cm ^2
247	OUTSIDE	FASCIA	WOOD	GREEN, DARK	DETERIORATED	Positive	2.5	mg / cm ^2
248	OUTSIDE	GUTTER	METAL	GREEN, DARK	DETERIORATED	Negative	0	mg / cm ^2
453	OUTSIDE	FLASHING	METAL	GREEN	INTACT	Negative	0	mg / cm ^2
454	OUTSIDE	AC UNIT	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2

CLASSROOM WING 1 to 8



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

BAAQMD classifications are based upon the material's condition at the time of the survey or as rendered as a result of standard manual removal/demolition techniques. The use of "mechanical means", non-standard or other aggressive removal/demolition techniques may result in a different classification. BAAQMD & Cal-OSHA classifications are based on the materials being >1% asbestos pending further analytical data that proves otherwise.

CLASSROOM WING 1 TO 8
HAZARDOUS MATERIALS SUMMARY

Asbestos

- No asbestos was detected in the 37 samples collected and analyzed.

Lead

ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	PB	UNITS
Inside	Ceiling Panel	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall	Ceramic	White	Intact	0.01	mg/cm^2
Inside	Wall	Ceramic	White	Intact	0.01	mg/cm^2
Inside	Wall	Wood	Beige	Intact	0.02	mg/cm^2
Inside	Trim	Wood	Beige	Intact	0.02	mg/cm^2
Inside	Wall	Wood	Beige	Intact	0.02	mg/cm^2
Inside	Trim Upper	Wood	Beige	Intact	0.02	mg/cm^2
Inside	Wall	Wood	White	Intact	0.03	mg/cm^2
Inside	Wall	Stucco	White	Intact	0.05	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.06	mg/cm^2
Inside	Wall	Wood	Beige	Intact	0.07	mg/cm^2
Inside	Panel	Wood	Beige	Intact	0.07	mg/cm^2
Inside	Cabinet	Wood	Beige	Intact	0.07	mg/cm^2
Inside	Tackboard	Wood	Green, Light	Intact	0.07	mg/cm^2
Inside	Trim Upper	Wood	White	Intact	0.08	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.12	mg/cm^2
Inside	Window Frame	Wood	Beige	Intact	0.13	mg/cm^2
Inside	Door	Wood	Beige	Intact	0.16	mg/cm^2
Inside	Floor	Concrete	Blue	Intact	0.18	mg/cm^2
Inside	Ceiling	Plaster	Beige	Intact	0.19	mg/cm^2
Inside	Cabinet	Wood	Beige	Intact	0.22	mg/cm^2
Inside	Window Frame	Wood	Beige	Intact	0.24	mg/cm^2
Inside	Door	Wood	Beige	Intact	0.24	mg/cm^2
Inside	Window Frame	Wood	Beige	Intact	0.4	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.4	mg/cm^2
Inside	Window Frame	Wood	Beige	Intact	0.5	mg/cm^2
Inside	Wall	Wood	Blue	Intact	0.5	mg/cm^2
Inside	Door	Metal	Green	Intact	0.6	mg/cm^2
Inside	Window Sill	Wood	White	Intact	0.7	mg/cm^2
Inside	Trim Upper	Wood	Beige	Intact	0.7	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.9	mg/cm^2
Inside	Window	Wood	Beige	Intact	1.5	mg/cm^2
Inside	Window	Wood	Beige	Intact	2.4	mg/cm^2
Inside	Window	Wood	Beige	Intact	2.5	mg/cm^2
Inside	Window	Wood	Beige	Intact	2.7	mg/cm^2
Outside	Door Frame	Wood	Green	Intact	0.01	mg/cm^2
Outside	Eave Ceiling	Wood	Beige	Intact	0.01	mg/cm^2
Outside	Hand Rail	Metal	Green	Intact	0.02	mg/cm^2

CLASSROOM WING 1 TO 8
HAZARDOUS MATERIALS SUMMARY

ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	PB	UNITS
Outside	Floor Stripe	Concrete	White	Intact	0.02	mg/cm^2
Outside	Wall	Stucco	Beige	Intact	0.02	mg/cm^2
Outside	Floor	Concrete	Red	Intact	0.03	mg/cm^2
Outside	Door Frame	Metal	Green	Intact	0.03	mg/cm^2
Outside	Downspout	Metal	Green	Intact	0.05	mg/cm^2
Outside	Screen	Metal	Green	Intact	0.08	mg/cm^2
Outside	Door	Wood	Green, Light	Intact	0.09	mg/cm^2
Outside	Screen	Metal	Green	Intact	0.24	mg/cm^2
Outside	Pole	Metal	Green	Intact	0.26	mg/cm^2
Outside	Pole	Metal	Green	Intact	0.28	mg/cm^2
Outside	Panel	Wood	Beige	Intact	0.5	mg/cm^2
Outside	Downspout	Metal	Beige	Intact	0.7	mg/cm^2
Outside	Roof Flashing	Metal	Beige	Intact	1.1	mg/cm^2
Outside	Window Frame	Wood	Green	Intact	1.5	mg/cm^2
Outside	Door Frame	Wood	Beige	Intact	1.6	mg/cm^2
Outside	Fascia	Wood	Green	Intact	1.7	mg/cm^2
Outside	Eave	Wood	Beige	Intact	1.8	mg/cm^2
Outside	Trim	Wood	Green	Intact	1.9	mg/cm^2
Outside	Trim Upper	Wood	Beige	Intact	2	mg/cm^2
Outside	Over Hang Ceiling	Wood	Beige	Intact	2	mg/cm^2
Outside	Window	Wood	Green	Intact	3.6	mg/cm^2

Please see Recommendation section for regulatory clarifications regarding lead in paint and ceramic tiles.

Other Hazardous Materials

MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	226
Other Non-incandescent Lamps	Universal Waste	12
Light Fixture Ballasts	Polychlorinated Biphenyls	113

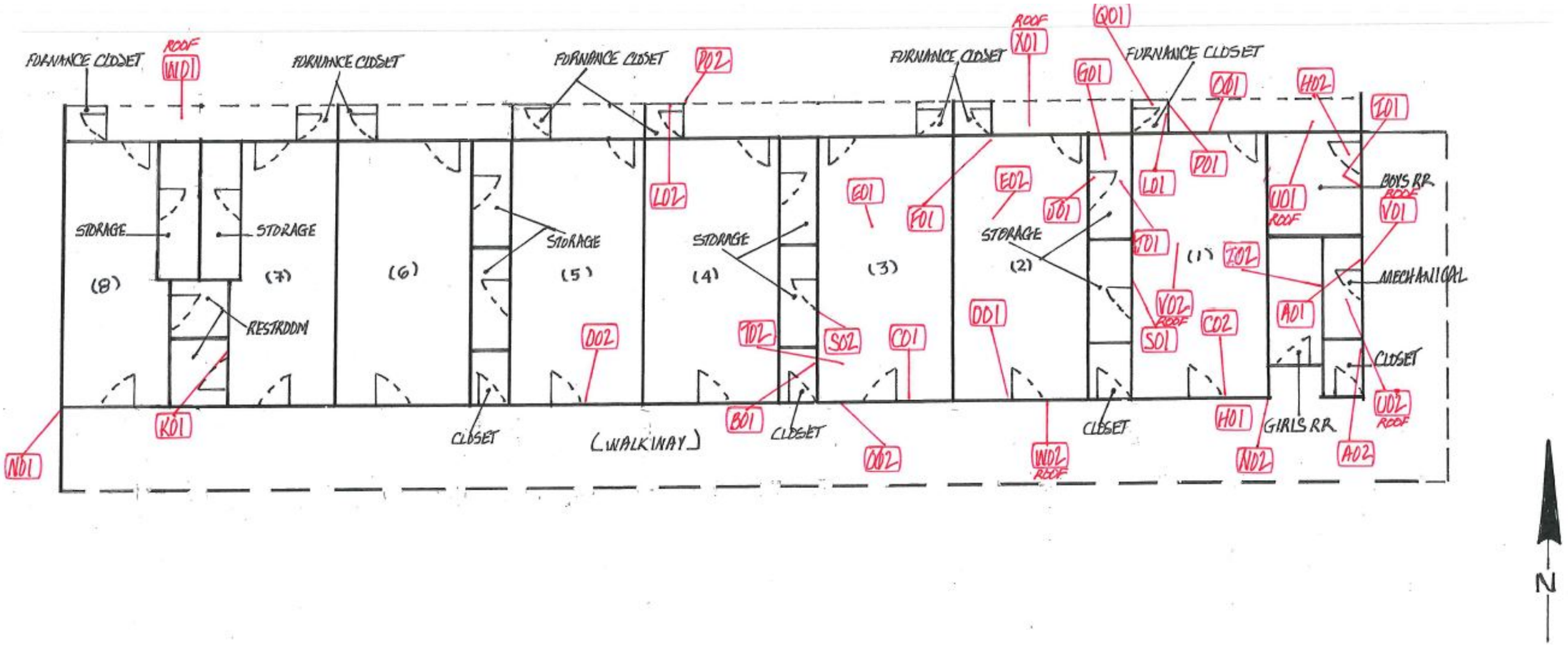
CLASSROOM WING 1 TO 8
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Paint/Plaster	White/White, Wall and Ceiling	2
B	Basecove/Mastic	4" Black/Brown	1
C	Vinyl Floor Tile/Mastic	12" Beige with Beige Streaks/Yellow	2
D	Basecove/Mastic	4" Brown/White	2
E	Acoustical Ceiling Tile/Vapor Paper	12" White, Uniform Hole/Black and Tan	2
F	Mastic	Gray, Sink	1
G	Acoustical Ceiling Tile	12" White, Fissured, Pinhole	1
H	Coating	Blue, Floor	2
I	Mortar/Grout	Gray/White, Ceramic	2
J	Vinyl Floor Tile/Mastic	12" Faux Wood/Yellow	1
K	Basecove/Mastic	6" Brown/White	1
L	Wallboard/Joint Compound	White/White	2
M	Not Used	Not Used	Not Used
N	Paint/Stucco	Beige/Gray	2
O	Putty	White, Window	2
P	Paint/Stucco	Beige/Gray	2
Q	Sealant	Gray, HVAC	1
R	Not Used	Not Used	Not Used
S	Panels	Beige, Sound, Upper Wall	2
T	Acoustical Ceiling Tile/Vapor Paper	1'x2' White/Black and Tan	2
U	Roof Field	Gray and Black, Built Up	2
V	Parapet/Base	Gray and Black, Built Up	2

VISTA ENVIRONMENTAL CONSULTING

CLASSROOM WING 1 TO 8
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
W	Mastic	Gray and Black	2
X	Sealant	Gray, Pipe	1



VISTA ENVIRONMENTAL CONSULTING www.vista-env.com 2984 TEAGARDEN STREET SAN LEANDRO, CA 94577 510-346-8860		PROJECT TITLE CLASSROOM WING 1 to 8 HOOVER ELEMENTARY SCHOOL	SHEET TITLE SAMPLE & MATERIAL LOCATIONS	SCALE: NTS DRAWN BY: JR CHECKED BY: CB PROJECT No. 160003003 DATE: 020917 DRAWING No. 1	FIGURE 1

Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B232774
Date Received: 12/27/16
Date Analyzed: 01/03/17
Date Printed: 01/04/17
First Reported: 01/04/17

Job ID/Site: 160003003 - PAUSD, Hoover - Classroom 1-8

Date(s) Collected: 12/23/2016

FALI Job ID: L1161
Total Samples Submitted: 37
Total Samples Analyzed: 37

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C18-A01	11842902						
Layer: White Plaster			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-A02	11842903						
Layer: White Plaster			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-B01	11842904						
Layer: Black Non-Fibrous Material			**ND**				
Layer: Brown Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-C01	11842905						
Layer: Beige Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-C02	11842906						
Layer: Beige Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-D01	11842907						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: White Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B232774

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C18-D02	11842908						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: White Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-E01	11842909						
Layer: Black/Tan Fibrous Material			**ND**				
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
C18-E02	11842910						
Layer: Black/Tan Fibrous Material			**ND**				
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
C18-F01	11842911						
Layer: Grey Semi-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (25 %) Synthetic (Trace)		**Asbestos (ND)**					
C18-G01	11842912						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
C18-H01	11842913						
Layer: Blue Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-H02	11842914						
Layer: Blue Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-I01	11842915						
Layer: Grey Mortar			**ND**				
Layer: White Grout			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-I02	11842916						
Layer: Grey Mortar			**ND**				
Layer: White Grout			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C18-J01	11842917						
Layer: Tan Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-K01	11842918						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: White Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-L01	11842919						
Layer: White Drywall			**ND**				
Layer: White Joint Compound			**ND**				
Layer: White Tape			**ND**				
Layer: White Joint Compound			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (ND)**					
C18-L02	11842920						
Layer: White Drywall			**ND**				
Layer: White Joint Compound			**ND**				
Layer: White Tape			**ND**				
Layer: White Joint Compound			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (ND)**					
C18-N01	11842921						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-N02	11842922						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-O01	11842923						
Layer: White Putty			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-O02	11842924						
Layer: White Putty			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B232774

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C18-P01	11842925						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-P02	11842926						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-Q01	11842927						
Layer: Grey Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C18-S01	11842928						
Layer: Brown Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
C18-S02	11842929						
Layer: Brown Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
C18-T01	11842930						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
C18-T02	11842931						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					

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Report Number: B232774

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C18-U01	11842932						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							
C18-U02	11842933						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							
C18-V01	11842934						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							

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Report Number: B232774

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C18-V02	11842935						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							
C18-W01	11842936						
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (25 %) Synthetic (Trace)							
C18-W02	11842937						
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (25 %) Synthetic (Trace)							
C18-X01	11842938						
Layer: Grey Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (Trace)							

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/22/16

LOCATION: Hoover - CLASSROOM 1-8 PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
C18	A	01	PAINT/PLASTER	WHITE/WHITE	W & C	
C18	A	02	↓	↓	↓	
C18	B	01	BC/MAS	4" BLACK/BROWN		
C18	C	01	VFT/MAS	12" BEIGE WITH BEIGE STREAKS/YELLOW		
C18	C	02	↓	↓		
C18	D	01	BC/MAS	4" BROWN/WHITE		
C18	D	02	↓	↓		
C18	E	01	ACT/VAPOR PAPER	12" WHITE UNIFORM HOLE/BLACK & TAN		
C18	E	02	↓	↓		
C18	F	01	MASTIC	GRAY, SINK		

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	Louis J Rocha	LOUIS J ROCHA	12/23/16
2.			
3.			

DEC 27 2016

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ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/22/16

LOCATION: Hoover - CLASSROOM 1-8 PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3249

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
C18	G	01	ACT	12" WHITE, FISSURED		
C18	H	01	COATING	BLUE, FLOOR		
C18	H	02	↓	↓		
C18	I	01	MORTAR/GROUT	GRAY/WHITE, CERAMIC		
C18	I	02	↓	↓		
C18	J	01	VFT/MAS	12" FAUX WOOD/YELLOW		
C18	K	01	BC/MAS	6" BROWN/WHITE		
C18	L	01	WB/JC	WHITE/WHITE		
C18	L	02	↓	↓		
C18	N	01	PAINT/STUCCO	BEIGE/GRAY		

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2.			
3.			

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ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/22/16

LOCATION: Hoover - CLASSROOM 1-8 PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
C18	N	02	↓	↓		
C18	O	01	PUTTY	WHITE, WINDOW		
C18	O	02	↓	↓		
C18	P	01	PAINT/STUCCO	BEIGE/GRAY,	HVAC CLOSETS	
C18	P	02	↓	↓	↓	
C18	Q	01	SEALANT	GRAY	HVAC UNIT	
C18	S	01	PANELS	BEIGE	SOUND, UPPER WALL	
C18	S	02	↓	↓	↓	
C18	T	01	ACT/VAPOR PAPER	1'X2' WHITE/	BLACK & TAN	
C18	T	02	↓	↓	↓	

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

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SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1. Luis J Rocha — LUIS J ROCHA — 12/23/16
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

2. _____ — _____ — _____
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

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ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/22/16

LOCATION: Hoover - CLASSROOM 1-8 PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
C18	U	01	ROOF FIELD	GRAY & BLACK	BUILT-UP	
C18	U	02	↓	↓	↓	
C18	V	01	PARAPET/BASE	GRAY & BLACK	BUILT-UP	
C18	V	02	↓	↓	↓	
C18	W	01	MASTIC	GRAY & BLACK	ROOF VENT, & BLOCKS	
C18	W	02	↓	↓	↓	
C18	X	01	SEALANT	GRAY	ROOF PIPE	
			37 SAMPLES			

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

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CHAIN OF CUSTODY:

1. Luis J Rocha — LUIS J ROCHA — 12/23/16
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

2. _____ — _____ — _____
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

3. _____ — _____ — _____
TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

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PAGE 4 OF 4

Classroom Wing 1 to 8
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
354	INSIDE	COUNTER	WOOD	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
355	INSIDE	CABINET	WOOD	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
356	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
357	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
358	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
359	INSIDE	TRIM	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
360	INSIDE	SHELF	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
361	INSIDE	CEILING	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
362	INSIDE	BRACKET	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
363	INSIDE	DUCT	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
364	INSIDE	WALL PANEL	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
365	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Positive	2.7	mg / cm ^2
366	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.06	mg / cm ^2
367	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
368	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Negative	0.24	mg / cm ^2
369	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
370	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Positive	2.4	mg / cm ^2
371	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Negative	0.4	mg / cm ^2
372	INSIDE	VENT	METAL	WHITE	INTACT	Negative	0	mg / cm ^2
373	INSIDE	FLOOR	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
374	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0.07	mg / cm ^2
375	INSIDE	CEILING PANEL	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
376	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0.16	mg / cm ^2
377	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.12	mg / cm ^2
378	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Negative	0.13	mg / cm ^2
379	INSIDE	PANEL	WOOD	BEIGE	INTACT	Negative	0.07	mg / cm ^2
380	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
381	INSIDE	TACKBOARD	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
382	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Positive	2.5	mg / cm ^2
383	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Negative	0.5	mg / cm ^2

Classroom Wing 1 to 8
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
384	INSIDE	TRIM UPPER	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
385	INSIDE	TRIM UPPER	WOOD	WHITE	INTACT	Negative	0.08	mg / cm ^2
386	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0.07	mg / cm ^2
387	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0.24	mg / cm ^2
388	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.4	mg / cm ^2
389	INSIDE	CABINET	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
390	INSIDE	CABINET	WOOD	BLUE	INTACT	Negative	0	mg / cm ^2
391	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0.22	mg / cm ^2
392	INSIDE	TACKBOARD	WOOD	GREEN, LIGHT	INTACT	Negative	0.07	mg / cm ^2
393	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
394	INSIDE	WALL	WOOD	BLUE	INTACT	Negative	0.5	mg / cm ^2
395	INSIDE	WALL	DRYWALL	BLUE	INTACT	Negative	0	mg / cm ^2
396	INSIDE	WALL	DRYWALL	WHITE	INTACT	Negative	0	mg / cm ^2
397	INSIDE	WALL	STUCCO	WHITE	INTACT	Negative	0.05	mg / cm ^2
398	INSIDE	WALL	WOOD	WHITE	INTACT	Negative	0.03	mg / cm ^2
399	INSIDE	WINDOW SILL	WOOD	WHITE	INTACT	Negative	0.7	mg / cm ^2
400	INSIDE	DOOR	METAL	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
401	INSIDE	DOOR FRAME	METAL	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
402	INSIDE	CEILING	DRYWALL	WHITE	INTACT	Negative	0	mg / cm ^2
403	INSIDE	CEILING	PLASTER	BEIGE	INTACT	Negative	0.19	mg / cm ^2
404	INSIDE	WALL	PLASTER	BEIGE	INTACT	Negative	0	mg / cm ^2
405	INSIDE	WALL	CERAMIC	WHITE	INTACT	Negative	0.01	mg / cm ^2
406	INSIDE	FLOOR	CONCRETE	BLUE	INTACT	Negative	0.18	mg / cm ^2
407	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
408	INSIDE	DOOR FRAME	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
409	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
410	INSIDE	DOOR	WOOD	GREEN, LIGHT	INTACT	Negative	0	mg / cm ^2
411	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.9	mg / cm ^2
412	INSIDE	WALL	PLASTER	BEIGE	INTACT	Negative	0	mg / cm ^2
413	INSIDE	DOOR	METAL	GREEN	INTACT	Negative	0.6	mg / cm ^2

Classroom Wing 1 to 8
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
414	INSIDE	WALL	CERAMIC	WHITE	INTACT	Negative	0.01	mg / cm ^2
415	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Positive	1.5	mg / cm ^2
416	INSIDE	TRIM UPPER	WOOD	BEIGE	INTACT	Negative	0.7	mg / cm ^2
417	OUTSIDE	TRIM UPPER	WOOD	BEIGE	INTACT	Positive	2	mg / cm ^2
418	OUTSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Positive	1.6	mg / cm ^2
419	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
420	OUTSIDE	FLOOR	CONCRETE	RED	INTACT	Negative	0.03	mg / cm ^2
421	OUTSIDE	FLOOR STRIPE	CONCRETE	YELLOW	INTACT	Negative	0	mg / cm ^2
422	OUTSIDE	POLE	METAL	GREEN	INTACT	Negative	0.28	mg / cm ^2
423	OUTSIDE	DOWNSPOUT	METAL	GREEN	INTACT	Negative	0.05	mg / cm ^2
424	OUTSIDE	DOOR FRAME	METAL	GREEN	INTACT	Negative	0.03	mg / cm ^2
425	OUTSIDE	DOOR	METAL	GREEN, LIGHT	INTACT	Negative	0	mg / cm ^2
426	OUTSIDE	TRIM	WOOD	GREEN	INTACT	Positive	1.9	mg / cm ^2
427	OUTSIDE	WINDOW	WOOD	GREEN	INTACT	Positive	3.6	mg / cm ^2
428	OUTSIDE	WINDOW FRAME	WOOD	GREEN	INTACT	Positive	1.5	mg / cm ^2
429	OUTSIDE	SHELF	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
430	OUTSIDE	HAND RAIL	METAL	GREEN	INTACT	Negative	0.02	mg / cm ^2
431	OUTSIDE	FLOOR STRIPE	CONCRETE	WHITE	INTACT	Negative	0.02	mg / cm ^2
432	OUTSIDE	PANEL	WOOD	BEIGE	INTACT	Negative	0.5	mg / cm ^2
433	OUTSIDE	SCREEN	METAL	GREEN	INTACT	Negative	0.24	mg / cm ^2
434	OUTSIDE	POLE	METAL	GREEN	INTACT	Negative	0.26	mg / cm ^2
435	OUTSIDE	POLE	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
436	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0.02	mg / cm ^2
437	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
438	OUTSIDE	TRIM	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
439	OUTSIDE	DOWNSPOUT	METAL	BEIGE	INTACT	Negative	0.7	mg / cm ^2
440	OUTSIDE	SHED WALL	WOOD	YELLOW	INTACT	Negative	0	mg / cm ^2
441	OUTSIDE	DOOR	WOOD	GREEN, LIGHT	INTACT	Negative	0.09	mg / cm ^2
442	OUTSIDE	DOOR FRAME	WOOD	GREEN	INTACT	Negative	0.01	mg / cm ^2
443	OUTSIDE	EAVE CEILING	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2

Classroom Wing 1 to 8
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
444	OUTSIDE	OVER HANG CEILING	WOOD	BEIGE	INTACT	Positive	2	mg / cm ^2
445	OUTSIDE	FASCIA	WOOD	GREEN	INTACT	Positive	1.7	mg / cm ^2
446	OUTSIDE	GUTTER	METAL	GREEN	INTACT	Negative	0	mg / cm ^2
447	OUTSIDE	ROOF VENT	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
448	OUTSIDE	ROOF FLASHING	METAL	BEIGE	INTACT	Positive	1.1	mg / cm ^2
449	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
450	OUTSIDE	EAVE	WOOD	BEIGE	INTACT	Positive	1.8	mg / cm ^2
451	OUTSIDE	SCREEN	METAL	GREEN	INTACT	Negative	0.08	mg / cm ^2
452	OUTSIDE	FLASHING	METAL	GREEN	INTACT	Negative	0	mg / cm ^2

CLASSROOM WING 9 to 14



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

BAAQMD classifications are based upon the material's condition at the time of the survey or as rendered as a result of standard manual removal/demolition techniques. The use of "mechanical means", non-standard or other aggressive removal/demolition techniques may result in a different classification. BAAQMD & Cal-OSHA classifications are based on the materials being >1% asbestos pending further analytical data that proves otherwise.

CLASSROOM WING 9 TO 14
HAZARDOUS MATERIALS SUMMARY

Asbestos

HOMO. ID	MATERIAL	DESCRIPTION	LOCATION	CAL/OSHA CLASS	BAAQMD CATEGORY	ESTIMATED QUANTITY
J	Vinyl Floor Tile/Mastic	9" Green/Black	East Side - Central and South Closet	Class II	Category I - Non-Friable	80 SF
K	Vinyl Floor Tile	9" Maroon	East Side - Central Closet	Class II	Category I - Non-Friable	20 SF
X	Mastic	Gray and Black	Roof- Patches, Penetrations, Seams, and Conduit Blocks	Class II	Category I - Non-Friable	125 SF

Lead

ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	PB	UNITS
Inside	Wall	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall Panel	Vinyl	Yellow	Intact	0.01	mg/cm^2
Inside	Cabinet	Wood	Varnish	Intact	0.01	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Shelf	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall	Plaster	Beige	Intact	0.03	mg/cm^2
Inside	Door	Wood	Beige	Intact	0.03	mg/cm^2
Inside	Door	Wood	Varnish	Intact	0.03	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.11	mg/cm^2
Inside	Wall	Wood	Beige	Intact	0.11	mg/cm^2
Inside	Tackboard	Wood	Beige	Intact	0.2	mg/cm^2
Inside	Store Front Window	Wood	Beige	Intact	0.22	mg/cm^2
Inside	Trim	Wood	Beige	Intact	0.24	mg/cm^2
Inside	Trim	Wood	Beige	Intact	0.25	mg/cm^2
Inside	Door	Wood	Green	Intact	0.26	mg/cm^2
Inside	Shelf	Wood	Varnish	Intact	0.4	mg/cm^2
Inside	Wall	Wood	Blue	Intact	0.5	mg/cm^2
Inside	Cabinet	Wood	Beige	Intact	0.5	mg/cm^2
Inside	Wall	Wood	Green	Intact	0.5	mg/cm^2
Inside	Window Frame	Wood	Beige	Intact	1.9	mg/cm^2
Inside	Window	Wood	Beige	Intact	2.1	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	2.3	mg/cm^2
Inside	Counter	Ceramic	Yellow	Intact	9.3	mg/cm^2
Inside	Wall	Ceramic	Yellow	Intact	10.1	mg/cm^2

CLASSROOM WING 9 TO 14
HAZARDOUS MATERIALS SUMMARY

ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	PB	UNITS
Outside	Wall	Stucco	Beige	Intact	0.01	mg/cm^2
Outside	Sign	Wood	Green, Dark	Intact	0.01	mg/cm^2
Outside	Trim Upper	Wood	Green, Dark	Intact	0.01	mg/cm^2
Outside	Storefront Window	Wood	Green, Dark	Intact	0.03	mg/cm^2
Outside	Trim Upper	Wood	Beige	Intact	0.03	mg/cm^2
Outside	Wall	Stucco	Beige	Intact	0.04	mg/cm^2
Outside	Wall	Stucco	Black	Intact	0.04	mg/cm^2
Outside	Door	Wood	Green, Light	Intact	0.05	mg/cm^2
Outside	Wall	Stucco	Gray	Intact	0.05	mg/cm^2
Outside	Column	Stucco	Beige	Intact	0.08	mg/cm^2
Outside	Cage	Metal	Green, Dark	Intact	0.09	mg/cm^2
Outside	Ceiling	Wood	Beige	Intact	0.09	mg/cm^2
Outside	Pole	Metal	Green, Dark	Intact	0.13	mg/cm^2
Outside	Pole	Metal	Green, Dark	Intact	0.2	mg/cm^2
Outside	Door Frame	Wood	Green, Dark	Intact	0.7	mg/cm^2
Outside	Wall Panel	Wood	Beige	Intact	1.5	mg/cm^2
Outside	Window Sill	Wood	Green, Dark	Intact	2	mg/cm^2
Outside	Window Casing	Wood	Green, Dark	Intact	2.2	mg/cm^2
Outside	Window	Wood	Green, Dark	Intact	2.3	mg/cm^2
Outside	Fascia	Wood	Green, Dark	Deteriorated	2.5	mg/cm^2

Please see Recommendation section for regulatory clarifications regarding lead in paint and ceramic tiles.

Other Hazardous Materials

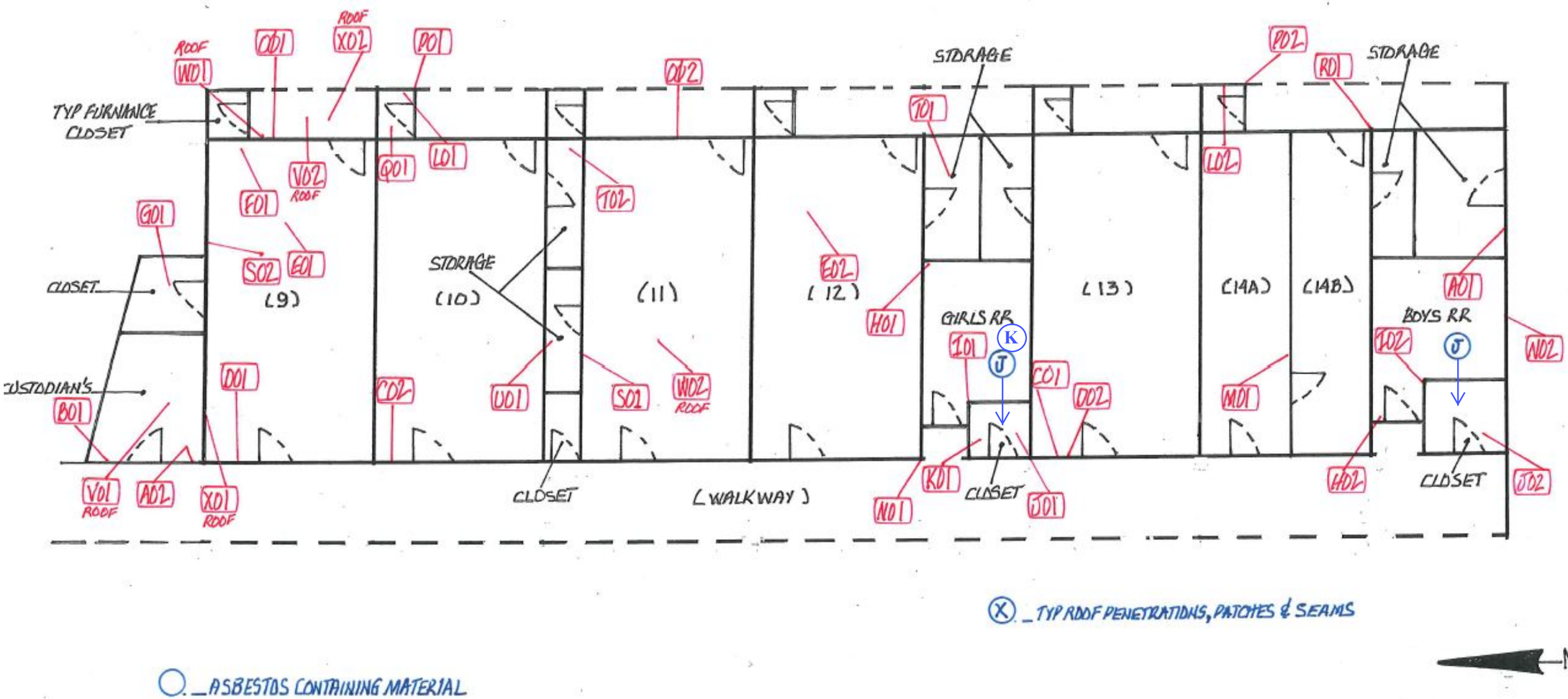
MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	176
Other Non-incandescent Lamps	Universal Waste	10
Batteries: Back-up	Universal Waste	6
Light Fixture Ballasts	Polychlorinated Biphenyls	88

CLASSROOM WING 9 TO 14
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Paint/Plaster	White/White, Wall and Ceiling	2
B	Basecove/Mastic	4" Black/Brown	1
C	Vinyl Floor Tile/Mastic	12" Beige with Beige Streaks/Tan	2
D	Basecove/Mastic	4" Brown/White	2
E	Acoustical Ceiling Tile/Vapor Paper	12" White, Uniform Hole/Black and Tan	2
F	Mastic	Gray, Sink	1
G	Acoustical Ceiling Tile	White, Various Sizes	1
H	Coating	Blue, Floor	2
I	Mortar/Grout	Gray/White, Ceramic	2
J	Vinyl Floor Tile/Mastic	9" Green/Black	2
K	Vinyl Floor Tile/Mastic	9" Maroon/Yellow	1
L	Wallboard/Joint Compound	White/White	2
M	Temporary Wall	White	1
N	Paint/Stucco	Beige/Gray	2
O	Putty	White, Window	2
P	Paint/Stucco	Beige/Gray	2
Q	Sealant	Gray, HVAC	1
R	Gasket	Green, Round	1
S	Panels	Beige, Sound, Upper Wall	2
T	Acoustical Ceiling Tile/Vapor Paper	1'x2' White/Black and Tan	2
U	Wallboard	White, Attic	1
V	Roof Field	Gray and Black, Built Up	2

CLASSROOM WING 9 TO 14
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
W	Parapet Base	Gray and Black, Built Up	2
X	Mastic	Gray and Black	2



X _ TYP ROOF PENETRATIONS, PATCHES & SEAMS

N

○ _ ASBESTOS CONTAINING MATERIAL

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2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
510-346-8860

PROJECT TITLE

CLASSROOM WING 9 to 14
HOOVER ELEMENTARY SCHOOL

SHEET TITLE

SAMPLE & MATERIAL LOCATIONS

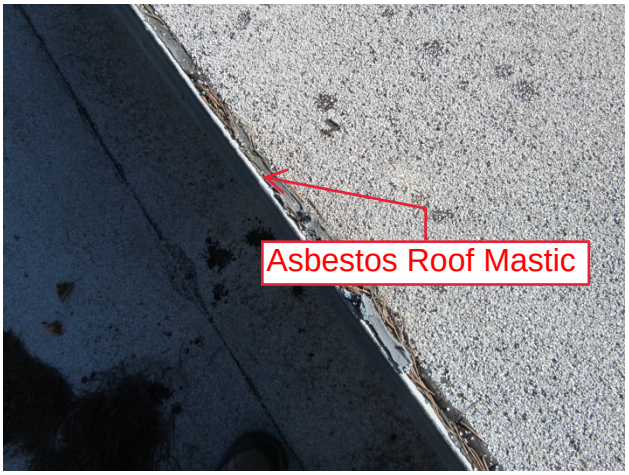
SCALE: NTS
DRAWN BY: JR
CHECKED BY: CB
PROJECT No. 160003003
DATE: 020917
DRAWING No. 1

FIGURE

1

CLASSROOM WING 9 TO 14
PHOTO DOCUMENTATION





Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B232789
Date Received: 12/27/16
Date Analyzed: 01/03/17
Date Printed: 01/04/17
First Reported: 01/04/17

Job ID/Site: 160003003 - PAUSD, Hoover, CW 9-14

Date(s) Collected: 12/22/2016

FALI Job ID: L1161
Total Samples Submitted: 40
Total Samples Analyzed: 40

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C914-A01	11843144						
Layer: White Plaster			**ND**				
Layer: Beige Plaster			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-A02	11843145						
Layer: White Plaster			**ND**				
Layer: Beige Plaster			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-B01	11843146						
Layer: Black Non-Fibrous Material			**ND**				
Layer: Tan Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-C01	11843147						
Layer: Beige Tile			**ND**				
Layer: Tan Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-C02	11843148						
Layer: Beige Tile			**ND**				
Layer: Tan Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-D01	11843149						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B232789

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C914-D02	11843150						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-E01	11843151						
Layer: Brown Semi-Fibrous Material			**ND**				
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (90 %)		**Asbestos (ND)**					
C914-E02	11843152						
Layer: Brown Semi-Fibrous Material			**ND**				
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (90 %)		**Asbestos (ND)**					
C914-F01	11843153						
Layer: Grey Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %)		**Asbestos (ND)**					
C914-G01	11843154						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
C914-H01	11843155						
Layer: Blue/Clear Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-H02	11843156						
Layer: Blue/Clear Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-I01	11843157						
Layer: Grey Mortar			**ND**				
Layer: White Grout			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-I02	11843158						
Layer: Grey Mortar			**ND**				
Layer: White Grout			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B232789

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C914-J01	11843159						
Layer: Green Tile		Chrysotile	**5 %**				
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (5%)**					
C914-J02	11843160						
Layer: Green Tile		Chrysotile	**5 %**				
Layer: Black Mastic		Chrysotile	**Trace**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (5%)**					
C914-K01	11843161						
Layer: Brown Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Layer: Brown Cementitious Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-L01	11843162						
Layer: Off-White Drywall			**ND**				
Layer: White Joint Compound			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (ND)**					
C914-L02	11843163						
Layer: Off-White Drywall			**ND**				
Layer: White Joint Compound			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (ND)**					
C914-M01	11843164						
Layer: White Semi-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (15 %)		**Asbestos (ND)**					
C914-N01	11843165						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-N02	11843166						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B232789

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C914-O01	11843167						
Layer: Off-White Putty			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-O02	11843168						
Layer: Off-White Putty			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-P01	11843169						
Layer: Beige Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-P02	11843170						
Layer: Beige Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-Q01	11843171						
Layer: Grey Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
C914-R01	11843172						
Layer: Green Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Synthetic (95 %)		**Asbestos (ND)**					
C914-S01	11843173						
Layer: Tan Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
C914-S02	11843174						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
C914-T01	11843175						
Layer: Brown Fibrous Material			**ND**				
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (90 %)		**Asbestos (ND)**					

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Report Number: B232789

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C914-T02	11843176						
Layer: Brown Fibrous Material			**ND**				
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (90 %)		**Asbestos (ND)**					
C914-U01	11843177						
Layer: White Drywall			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %)		**Asbestos (ND)**					
C914-V01	11843178						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Tan Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (25 %) Comment: Bulk complex sample.		**Asbestos (ND)**					
C914-V02	11843179						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Fibrous Glass (25 %) Comment: Bulk complex sample.		**Asbestos (ND)**					

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Report Number: B232789

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
C914-W01	11843180						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (Trace) Fibrous Glass (25 %)							
Comment: Bulk complex sample.							
C914-W02	11843181						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Tan Fibrous Material			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (10 %) Fibrous Glass (25 %)							
Comment: Bulk complex sample.							
C914-X01	11843182						
Layer: Black Mastic		Chrysotile	**3 %**				
Total Composite Values of Fibrous Components:		**Asbestos (3%)**					
Cellulose (5 %)							
C914-X02	11843183						
Layer: Black Mastic		Chrysotile	**5 %**				
Total Composite Values of Fibrous Components:		**Asbestos (5%)**					
Cellulose (Trace)							

Tad Thrower

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Material Analysis

(EPA Method 600/R-93/116, Point Count Analysis)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: N009008
Date Received: 12/27/16
Date Analyzed: 01/23/17
Date Printed: 01/23/17

Job ID/Site: 160003003 - PAUSD, Hoover, CW 9-14

PLM Report Number: B232789

FALI Job ID: L1161
Total Samples Submitted: 1
Total Samples Analyzed: 1

Sample Preparation and Analysis:

Each sample was prepared using the gravimetric technique. A representative subsample was weighed, ashed for eight hours, and reweighed to determine the proportion of the organic component. The ashed residue was ground in concentrated hydrochloric acid, dried and reweighed to determine the acid-soluble component weight percentage. The residual material was analyzed for asbestos using polarized light microscopy. Asbestos quantitation was performed using the semi-quantitative Point Count method following the general guidelines in EPA Method 600/R-93/116. The analytical sensitivity for the method is calculated as the asbestos concentration that results from one point counted in the analysis adjusted using the residual weight of the sample. The limit of detection for this method has not been determined.

Sample ID	Lab Number	Sample Description
C914-J02	11843160	**Black Mastic**

Point Count Results:

Number of asbestos points counted:	22	Organic weight percentage:	63.20
Number of non-empty points:	400	Acid-soluble weight percentage	31.56
Percent asbestos in layer:	**0.29**	Residual weight percentage:	5.24
Analytical sensitivity (%):	0.01		
Asbestos type(s) detected:	Chrysotile		

Comment:

Tad Thrower

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

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2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/22/16

LOCATION: Hoover - CW 9-14 PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
C914	A	01	Paint/Plaster	White/white, walls & ceilings		
C914	A	02	↓	↓		
C914	B	01	BC/M	4" black / brown		
C914	C	01	VFT/M	12" Beige w/ Beige streaks		
C914	C	02	↓	↓		
C914	D	01	BC/M	4" Brown / white		
C914	D	02	↓	↓		
C914	E	01	ACT / Vapor Paper	12" white, uniform hole/ black & tan		
C914	E	02	↓	↓		
C914	F	01	mastic	Gray, sink		

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	Luis J Rocha	LUIS J ROCHA	12/23/16
2.			
3.		S. HOLLISTER	DEC 27 2016

PAGE 1 OF 4

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SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/22/16

LOCATION: Hoover - CW 9-14 PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST No: 02-3249

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
C914	G	01	ACT	3'x3' white various sizes		
C914	H	01	Coating	Blue, Floor		
C914	H	02	↓	↓		
C914	I	01	Mortar / Grout	white / ceramic		
C914	I	02	↓	↓		
C914	J	01	VFT/Mas	9" Green		
C914	J	02	↓	↓		
C914	K	01	VFT/Mas	9" Maroon		
C914	L	01	WB/JC	white/white		
C914	L	02	↓	↓		

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1.	TRANSFER SIGNATURE	LUIS J ROCHA (PRINTED NAME)	12/23/16 DATE/TIME
2.	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
3.	TRANSFER SIGNATURE	S. HOLLISTER (PRINTED NAME)	DATE/TIME

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PAGE 2 OF 4

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2984 TEAGARDEN STREET
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ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/22/16

LOCATION: Hoover - CW 9-14 PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
C914	M	01	Temp Wall	White		
C914	N	01	Paint/Stucco	Beige / Gray		
C914	N	02	↓	↓		
C914	O	01	Putty	White, Window		
C914	O	02	↓	↓		
C914	P	01	Paint/Stucco	Beige/Gray, New HVAC		
C914	P	02	↓	↓		
C914	Q	01	Sealant	Gray, HVAC		
C914	R	01	Gasket	Green, Round, Gasket		
C914	S	01	Panel	Beige, Sound, Upper Wall		

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	Luis J. Rocha	LUIS J ROCHA	12/23/16
2.			
3.		S. HOLLISTER	

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2984 TEAGARDEN STREET
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ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/22/16

LOCATION: Hoover - CW 9-14 PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
C914	S	02	↓	↓		
C914	T	01	ACT / Vapor Paper	1'x2' White / Black & Tan		
C914	T	02	↓	↓		
C914	U	01	Wallboard	White, in Pile (Attic)		
C914	V	01	Roof Feild	Grey & Black, Built up		
C914	V	02	↓	↓		
C914	W	01	Parapet / base	Gray & Black, Built up		
C914	W	02	↓	↓		
C914	X	01	Mastic	Gray & Black Pen Roof		
C914	X	02	↓	↓		

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1.	TRANSFER SIGNATURE	LUIS J ROCHA (PRINTED NAME)	12/23/16 DATE/TIME
2.	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
3.	TRANSFER SIGNATURE	S. Hollister (PRINTED NAME)	DEC 27 2016 DATE/TIME

PAGE 1 OF 1

Classroom Wing 9 to 14
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
258	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0.04	mg / cm ^2
259	INSIDE	TRIM UPPER	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
260	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0.05	mg / cm ^2
261	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.03	mg / cm ^2
262	INSIDE	SHELF	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
263	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0.09	mg / cm ^2
264	INSIDE	DUCT	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
265	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Negative	0.3	mg / cm ^2
266	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Negative	0.3	mg / cm ^2
267	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Negative	0.5	mg / cm ^2
268	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Negative	0.3	mg / cm ^2
269	INSIDE	WALL PANEL	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
270	INSIDE	WALL	PLASTER	BEIGE	INTACT	Negative	0	mg / cm ^2
271	INSIDE	CEILING	PLASTER	BEIGE	INTACT	Negative	0	mg / cm ^2
272	INSIDE	MIRROW	WOOD	BEIGE	INTACT	Negative	0.1	mg / cm ^2
273	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0.7	mg / cm ^2
274	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.1	mg / cm ^2
275	INSIDE	TRIM	WOOD	BEIGE	INTACT	Negative	0.08	mg / cm ^2
276	INSIDE	COUNTER	WOOD	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
277	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Negative	0.2	mg / cm ^2
278	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Negative	0.5	mg / cm ^2
279	INSIDE	TACKBOARD	WOOD	GREEN	INTACT	Negative	0	mg / cm ^2
280	INSIDE	SHELF	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
281	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0.9	mg / cm ^2
282	INSIDE	DOOR FRAME	WOOD	GREEN	INTACT	Negative	0.7	mg / cm ^2
283	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
284	INSIDE	CEILING	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
285	INSIDE	DUCT	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
286	INSIDE	BRACKET	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
287	INSIDE	HATCH	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2

Classroom Wing 9 to 14
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
288	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0.15	mg / cm ^2
289	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Negative	0.5	mg / cm ^2
290	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Negative	0.4	mg / cm ^2
291	INSIDE	TACKBOARD	WOOD	BLUE	INTACT	Negative	0	mg / cm ^2
292	INSIDE	TACKBOARD	WOOD	YELLOW	INTACT	Negative	0	mg / cm ^2
293	INSIDE	TACKBOARD	WOOD	PINK	INTACT	Negative	0	mg / cm ^2
294	INSIDE	WAL PANEL	WOOD	PINK	INTACT	Negative	0.02	mg / cm ^2
295	INSIDE	CEILING PANELS	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
296	INSIDE	TRIM	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
297	INSIDE	CEILING	PLASTER	BEIGE	INTACT	Negative	0.08	mg / cm ^2
298	INSIDE	WALL	PLASTER	BEIGE	INTACT	Negative	0.03	mg / cm ^2
299	INSIDE	WALL	CERAMIC	WHITE	INTACT	Negative	0.01	mg / cm ^2
300	INSIDE	FLOOR	CONCRETE	BLUE	INTACT	Negative	0	mg / cm ^2
301	INSIDE	DOOR	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
302	INSIDE	DOOR FRAME	METAL	BEIGE	INTACT	Negative	0.02	mg / cm ^2
303	INSIDE	WINDOW FRAME	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
304	INSIDE	TRIM	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
305	INSIDE	CEILING	DRYWALL	BEIGE	INTACT	Negative	0	mg / cm ^2
306	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
307	INSIDE	DOOR	WOOD	BLACK	INTACT	Negative	0	mg / cm ^2
308	INSIDE	VENT	METAL	WHITE	INTACT	Negative	0	mg / cm ^2
309	INSIDE	TEMPWALL	VINYL	WHITE	INTACT	Negative	0	mg / cm ^2
310	INSIDE	DOOR	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
311	INSIDE	DOOR FRAME	METAL	BLACK	INTACT	Negative	0	mg / cm ^2
312	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
313	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
314	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0.15	mg / cm ^2
315	INSIDE	WALL	CERAMIC	WHITE	INTACT	Negative	0.02	mg / cm ^2
316	INSIDE	WALL	PLASTER	BEIGE	INTACT	Negative	0	mg / cm ^2
317	INSIDE	CEILING	PLASTER	BEIGE	INTACT	Negative	0	mg / cm ^2

Classroom Wing 9 to 14
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
318	INSIDE	DOOR	METAL	GREEN, LIGHT	INTACT	Negative	0	mg / cm ^2
319	INSIDE	DOOR FRAME	METAL	GREEN	INTACT	Negative	0	mg / cm ^2
320	INSIDE	PIPE	METAL	BEIGE	INTACT	Negative	0.3	mg / cm ^2
321	INSIDE	DOOR	METAL	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
322	INSIDE	DOOR FRAME	METAL	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
323	INSIDE	WALL	DRYWALL	WHITE	INTACT	Negative	0	mg / cm ^2
324	INSIDE	WALL	WOOD	WHITE	INTACT	Negative	0	mg / cm ^2
325	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0.01	mg / cm ^2
326	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
327	OUTSIDE	TRIM	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2
328	OUTSIDE	WINDOW FRAME	WOOD	GREEN	INTACT	Negative	0.7	mg / cm ^2
329	OUTSIDE	WINDOW SILL	WOOD	GREEN	INTACT	Negative	0.4	mg / cm ^2
330	OUTSIDE	DOOR FRAME	WOOD	GREEN	INTACT	Negative	0.05	mg / cm ^2
331	OUTSIDE	DOOR	WOOD	GREEN, LIGHT	INTACT	Negative	0.03	mg / cm ^2
332	OUTSIDE	FLOOR STRIPE	CONCRETE	YELLOW	INTACT	Negative	0	mg / cm ^2
333	OUTSIDE	DOOR	METAL	BROWN, LIGHT	INTACT	Negative	0.03	mg / cm ^2
334	OUTSIDE	DOOR FRAME	METAL	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
335	OUTSIDE	WINDOW	WOOD	GREEN	INTACT	Negative	0.4	mg / cm ^2
336	OUTSIDE	WINDOW FRAME	WOOD	GREEN	INTACT	Negative	0.4	mg / cm ^2
337	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
338	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
339	OUTSIDE	DOWNSPOUT	METAL	BEIGE	INTACT	Negative	0.7	mg / cm ^2
340	OUTSIDE	POLE	METAL	GREEN	INTACT	Negative	0.08	mg / cm ^2
341	OUTSIDE	FLOOR	CONCRETE	RED	INTACT	Negative	0	mg / cm ^2
342	OUTSIDE	FLOOR STRIPE	CONCRETE	YELLOW	INTACT	Negative	0	mg / cm ^2
343	OUTSIDE	DOOR FRAME	WOOD	GREEN	INTACT	Negative	0.8	mg / cm ^2
344	OUTSIDE	DOOR	WOOD	GREEN, LIGHT	INTACT	Negative	0.02	mg / cm ^2
345	OUTSIDE	SHELF	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
346	OUTSIDE	WINDOW	WOOD	GREEN	INTACT	Negative	0.6	mg / cm ^2
347	OUTSIDE	WINDOW FRAME	WOOD	GREEN	INTACT	Negative	0.7	mg / cm ^2

Classroom Wing 9 to 14
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
348	OUTSIDE	WINDOW SILL	WOOD	GREEN	INTACT	Negative	0.7	mg / cm ^2
349	OUTSIDE	TRIM UPPER	WOOD	GREEN	INTACT	Negative	0.8	mg / cm ^2
350	OUTSIDE	CEILING	WOOD	BEIGE	INTACT	Positive	1.3	mg / cm ^2
351	OUTSIDE	FASCIA	WOOD	GREEN	DETERIORATED	Negative	0.8	mg / cm ^2
352	OUTSIDE	GUTTER	METAL	GREEN	INTACT	Negative	0	mg / cm ^2
353	OUTSIDE	EAVE CEILING	WOOD	BEIGE	INTACT	Negative	0.6	mg / cm ^2
455	OUTSIDE	FLASHING	METAL	GREEN	INTACT	Negative	0	mg / cm ^2
456	OUTSIDE	ROOF VENT	METAL	BEIGE	INTACT	Negative	0	mg / cm ^2

LIBRARY



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

BAAQMD classifications are based upon the material's condition at the time of the survey or as rendered as a result of standard manual removal/demolition techniques. The use of "mechanical means", non-standard or other aggressive removal/demolition techniques may result in a different classification. BAAQMD & Cal-OSHA classifications are based on the materials being >1% asbestos pending further analytical data that proves otherwise.

LIBRARY
HAZARDOUS MATERIALS SUMMARY

Asbestos

HOMO. ID	MATERIAL	DESCRIPTION	LOCATION	CAL/OSHA CLASS	BAAQMD CATEGORY	ESTIMATED QUANTITY
A	Wallboard/Joint Compound	White/White	Throughout Walls and Ceilings. This Material is Under Finishes Such as Acoustic Ceiling Tiles.	Class II	NA (Composite <1% by Point Count, Wallboard=ND, Joint Compound=2%)	6,500 SF
B	Vinyl Floor Tile/Mastic	12" Off-White with Brown Streaks/Yellow and Black	Storage Room. This Material May Be Under Cabinets.	Class II	Category I - Non-Friable	300 SF
E	Acoustical Ceiling Tile	12" White Fissure Pinhole	Library and Office	Class II	Friable (RACM when Removed)	2,400 SF
J	Glazing	White, Windows	Windows	Class II	Category II - Non-Friable	150 SF (Windows)
K	Glazing	White, Windows on Doors	Windows on Doors	Class II	Category II - Non-Friable	50 SF (Doors)
O	Mastic	Gray and Black, Roof Seams, Penetrations	Roof - Seams and Penetrations	Class II	Category I - Non-Friable	50 SF

Lead

ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	PB	UNITS
Inside	Window Casing	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Wall	Vinyl	Beige	Intact	0.01	mg/cm^2
Inside	Window Casing	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Vent	Metal	Beige	Intact	0.01	mg/cm^2
Inside	Cabinet	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Door	Wood	Varnish	Intact	0.01	mg/cm^2
Inside	Door	Metal	Beige	Intact	0.01	mg/cm^2
Inside	Door Frame	Metal	Beige	Intact	0.01	mg/cm^2
Inside	Wall	Drywall	Beige	Intact	0.02	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.02	mg/cm^2
Inside	Wall	Drywall	Beige	Intact	0.02	mg/cm^2
Inside	Ceiling	Drywall	Beige	Intact	0.02	mg/cm^2
Inside	Door Frame	Metal	Brown, Light	Intact	0.02	mg/cm^2
Inside	Wall	Drywall	Beige	Intact	0.03	mg/cm^2
Inside	Door	Wood	Beige	Intact	0.04	mg/cm^2

LIBRARY
HAZARDOUS MATERIALS SUMMARY

ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	PB	UNITS
Inside	Storefront Window	Wood	Beige	Intact	0.07	mg/cm^2
Inside	Soffit	Wood	Beige	Intact	0.12	mg/cm^2
Inside	Shelf	Wood	Beige	Intact	0.16	mg/cm^2
Outside	Pipe	Metal	Beige	Intact	0.02	mg/cm^2
Outside	Door	Metal	Green, Light	Intact	0.03	mg/cm^2
Outside	Door Frame	Metal	Green, Light	Intact	0.03	mg/cm^2
Outside	Storefront Window	Wood	Green, Light	Intact	0.03	mg/cm^2
Outside	Foundation	Concrete	Beige	Intact	0.07	mg/cm^2
Outside	Vent	Metal	White	Intact	0.17	mg/cm^2
Outside	Downspout	Metal	Beige	Intact	0.2	mg/cm^2
Outside	Foundation Trim	Metal	Beige	Intact	0.25	mg/cm^2

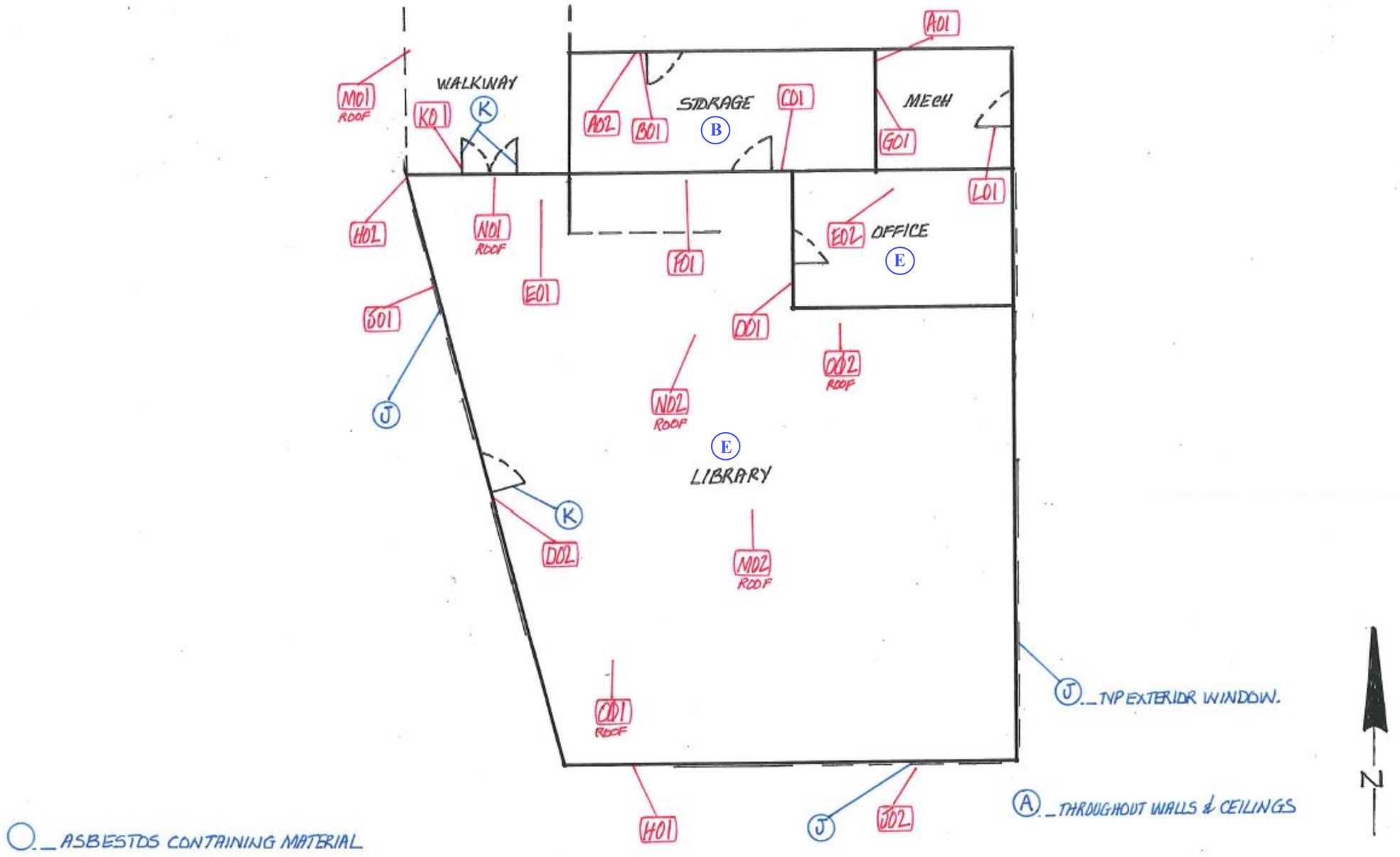
Please see Recommendation section for regulatory clarifications regarding lead in paint and ceramic tiles.

Other Hazardous Materials

MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	128
Batteries: Back-up	Universal Waste	2
Light Fixture Ballasts	Polychlorinated Biphenyls	64

LIBRARY
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Wallboard/Joint Compound	White/White	2
B	Vinyl Floor Tile/Mastic	12" Off-White with Brown Streaks/Yellow and Black	1
C	Basecove/Mastic	4" Brown/Yellow and Brown	1
D	Basecove/Mastic	4" Green/Yellow and Brown	2
E	Acoustical Ceiling Tile/Mastic	12" White Fissure Pinhole/Brown	2
F	Mastic	Gray, Sink	1
G	Jacketing	Beige, Pipe	1
H	Paint/Stucco	Tan/Gray	2
I	Glazing	White, Storefront	1
J	Glazing	White, Windows	2
K	Glazing	White, Windows on Doors	1
L	Insulation	Brown, Fire Door	1
M	Roof Field	Gray and Black, Built Up	2
N	Parapet /Base	Gray and Black, Built Up	2
O	Mastic	Gray and Black, Roof Seams, Penetrations	2



VISTA ENVIRONMENTAL CONSULTING
www.vista-env.com
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
510-346-8860

PROJECT TITLE

LIBRARY
HOOVER ELEMENTARY SCHOOL

SHEET TITLE

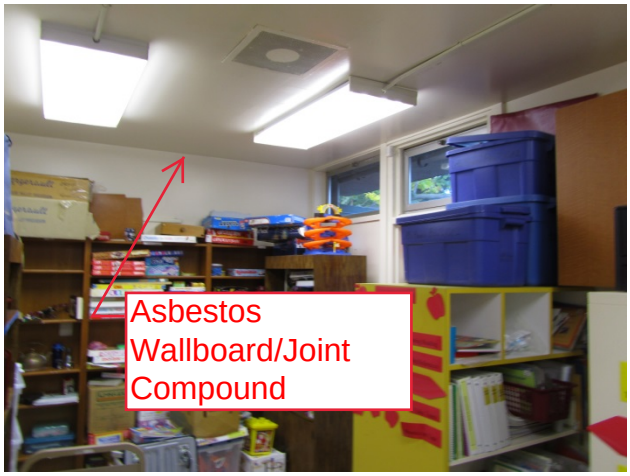
SAMPLE & MATERIAL LOCATIONS

SCALE: NTS
DRAWN BY: JR
CHECKED BY: CB
PROJECT No. 160003003
DATE: 020917
DRAWING No. 1

FIGURE

1

LIBRARY
PHOTO DOCUMENTATION













Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B232788
Date Received: 12/27/16
Date Analyzed: 01/03/17
Date Printed: 01/04/17
First Reported: 01/04/17

Job ID/Site: 160003003 - PAUSD, Hoover, Library

Date(s) Collected: 12/21/2016

FALI Job ID: L1161
Total Samples Submitted: 23
Total Samples Analyzed: 23

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
LIB-A01	11843121						
Layer: White Drywall			**ND**				
Layer: Off-White Joint Compound		Chrysotile	**2 %**				
Layer: Off-White Tape			**ND**				
Layer: Off-White Joint Compound		Chrysotile	**2 %**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (Trace)**					
Cellulose (20 %) Fibrous Glass (10 %)							
LIB-A02	11843122						
Layer: White Drywall			**ND**				
Layer: Off-White Joint Compound		Chrysotile	**2 %**				
Layer: Off-White Tape			**ND**				
Layer: Off-White Joint Compound		Chrysotile	**2 %**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (Trace)**					
Cellulose (20 %) Fibrous Glass (10 %)							
LIB-B01	11843123						
Layer: Beige Tile			**ND**				
Layer: Tan/Black Mastic		Chrysotile	**2 %**				
Total Composite Values of Fibrous Components:		**Asbestos (Trace)**					
Cellulose (Trace)							
LIB-C01	11843124						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Layer: Brown Mastic			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (Trace) Talc (Trace)							
LIB-D01	11843125						
Layer: Green Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Layer: Brown Mastic			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (Trace) Talc (Trace)							

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Report Number: B232788

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
LIB-D02	11843126						
Layer: Green Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Layer: Brown Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Talc (Trace)		**Asbestos (ND)**					
LIB-E01	11843127						
Layer: White Fibrous Tile		Chrysotile	**2 %**				
Layer: Brown Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (2 %) Fibrous Glass (90 %) Talc (Trace)		**Asbestos (2%)**					
LIB-E02	11843128						
Layer: White Fibrous Tile		Chrysotile	**2 %**				
Layer: Brown Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (2 %) Fibrous Glass (90 %) Talc (Trace)		**Asbestos (2%)**					
LIB-F01	11843129						
Layer: Grey Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %)		**Asbestos (ND)**					
LIB-G01	11843130						
Layer: Yellow Fibrous Material			**ND**				
Layer: Tan Fibrous Material			**ND**				
Layer: Foil			**ND**				
Total Composite Values of Fibrous Components: Cellulose (5 %) Fibrous Glass (90 %)		**Asbestos (ND)**					
LIB-H01	11843131						
Layer: Grey Cementitious Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
LIB-H02	11843132						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
LIB-I01	11843133						
Layer: Off-White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B232788

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
LIB-J01	11843134						
Layer: Off-White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
LIB-J02	11843135						
Layer: Off-White Non-Fibrous Material		Chrysotile	**2 %**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (2%)**					
LIB-K01	11843136						
Layer: Off-White Non-Fibrous Material		Chrysotile	**Trace**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (Trace)**					
LIB-L01	11843137						
Layer: Tan Fibrous Material			**ND**				
Layer: Tan Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (99 %)		**Asbestos (ND)**					
LIB-M01	11843138						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Fibrous Glass (25 %) Comment: Bulk complex sample.		**Asbestos (ND)**					
LIB-M02	11843139						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Fibrous Glass (25 %) Comment: Bulk complex sample.		**Asbestos (ND)**					

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Report Number: B232788

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
LIB-N01	11843140						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (2 %) Fibrous Glass (25 %)							
Comment: Bulk complex sample.							
LIB-N02	11843141						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (Trace) Fibrous Glass (25 %)							
Comment: Bulk complex sample.							
LIB-O01	11843142						
Layer: Silver Metal			**ND**				
Layer: Black Semi-Fibrous Tar			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (Trace)							
LIB-O02	11843143						
Layer: Black Mastic		Chrysotile	**2 %**				
Total Composite Values of Fibrous Components:		**Asbestos (2%)**					
Cellulose (10 %)							

Tad Thrower

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Point Count Analysis

(NESHAP Final Rule, 40 CFR, Part 61)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: N009007
Date Received: 12/27/16
Date Analyzed: 01/23/17
Date Printed: 01/23/17

Job ID/Site: 160003003 - PAUSD, Hoover, Library

PLM Report Number: B232788

FALI Job ID: L1161
Total Samples Submitted: 2
Total Samples Analyzed: 2

Sample Preparation and Analysis:

The NESHAP Final Rule does not define the preparation method for multi-layered samples. In order to determine the composite quantity of asbestos, the volume percent of each layer is determined, the asbestos containing layers are analyzed by point counting and the composite quantity of asbestos is calculated. The NESHAP Final Rule can not be applied to matrices that dissolve in refractive index liquid. This includes tar, mastic or adhesive typically found on the back of floor tiles. According to the NESHAP Final Rule, point count data is only necessary when the visual estimate of asbestos is below 10%.

Sample ID	Lab Number	Layer Description
LIB-A01	11843121	**Composite of ALL Layers** White Drywall Off-White Joint Compound Off-White Tape Off-White Joint Compound Paint

Point Count Results:

Number of asbestos points counted:	0
Number of non-empty points:	400
Layer percentage of entire sample:	100
Percent asbestos in layer:	**< 1**

Asbestos type(s) detected: Chrysotile

Comment: Asbestos was detected but no points were counted due to counting criteria. Therefore quantitation deemed to be < 1%.

Sample ID	Lab Number	Layer Description
LIB-A02	11843122	**Composite of ALL Layers** White Drywall Off-White Joint Compound Off-White Tape Off-White Joint Compound Paint

Point Count Results:

Number of asbestos points counted:	0
Number of non-empty points:	400
Layer percentage of entire sample:	100
Percent asbestos in layer:	**< 1**

Asbestos type(s) detected: Chrysotile

Comment: Asbestos was detected but no points were counted due to counting criteria. Therefore quantitation deemed to be < 1%.

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Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Point Count Analysis

(NESHAP Final Rule, 40 CFR, Part 61)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: N009007
Date Received: 12/27/16
Date Analyzed: 01/23/17
Date Printed: 01/23/17

Job ID/Site: 160003003 - PAUSD, Hoover, Library

PLM Report Number: B232788

FALI Job ID: L1161
Total Samples Submitted: 2
Total Samples Analyzed: 2

Sample Preparation and Analysis:

The NESHAP Final Rule does not define the preparation method for multi-layered samples. In order to determine the composite quantity of asbestos, the volume percent of each layer is determined, the asbestos containing layers are analyzed by point counting and the composite quantity of asbestos is calculated. The NESHAP Final Rule can not be applied to matrices that dissolve in refractive index liquid. This includes tar, mastic or adhesive typically found on the back of floor tiles. According to the NESHAP Final Rule, point count data is only necessary when the visual estimate of asbestos is below 10%.

Sample ID	Lab Number	Layer Description

Note: Point count results are reported to the nearest percent per EPA method.

Tad Thrower

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification (LOQ) = 1%. Trace denotes the presence of asbestos below the LOQ. ND = None Detected.

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VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD
DATE: 12/21/16
LOCATION: Hoover - Library
PROJECT NUMBER: 160003003
SAMPLED BY: DR
CAC OR SST No: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
LIB	A	01	WB/JC	WHITE/WHITE		
LIB	A	02	↓	↓		
LIB	B	01	VFT/MAS	12" OFF-WHITE WITH BROWN STREAKS/YELLOW & BLACK		
LIB	C	01	BASECOVE/MAS	4" BROWN/YELLOW & BROWN		
LIB	D	01	BASECOVE/MAS	4" GREEN/YELLOW & BROWN		
LIB	D	02	↓	↓		
LIB	E	01	ACT/MAS	12" WHITE FISSUE PINHOLE/BROWN		
LIB	E	02	↓	↓		
LIB	F	01	MASTIC	GRAY, SINK		
LIB	G	01	JACKETING	BEIGE, PIPE		

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	Luis J Rocha	LUIS J ROCHA	12/23/16
2.			
3.		S. Hollister	

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VISTA ENVIRONMENTAL CONSULTING

ASBESTOS BULK SAMPLE LOG

2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577

OFFICE 510.346.8860
FAX 888.653.8889

CLIENT: PAUSD

DATE: 12/21/16

LOCATION: Hoover - Library

PROJECT NUMBER: 160003003

SAMPLED BY: DR

CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
LIB	H	01	PAINT/STUCCO	TAN/GRAY,	EXTERIOR	
LIB	H	02	↓	↓	↓	
LIB	I	01	GLAZING	WHITE	STORE FRONT	
LIB	J	01	GLAZING	WHITE	WINDOWS	
LIB	J	02	↓	↓	↓	
LIB	K	01	GLAZING	WHITE	WINDOWS ON DOORS	
LIB	L	01	INSULATION	BROWN	FIRE DOOR	
LIB	M	01	ROOFFIELD	GRAY & BLACK	BUILT-UP	
LIB	M	02	↓	↓	↓	
LIB	N	01	PARAPET/BASE	GRAY & BLACK	BUILT-UP	

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1. Luis J Rocha — TRANSFER SIGNATURE; LUIS J ROCHA — PRINTED NAME; 12/23/16 — DATE/TIME
2. _____ — TRANSFER SIGNATURE; _____ — PRINTED NAME; _____ — DATE/TIME
3. _____ — TRANSFER SIGNATURE; S. HOLLISTER — PRINTED NAME; _____ — DATE/TIME

RECEIVED DEC 27 2016 — DATE/TIME

VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/21/16

LOCATION: Hoover - Library PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST No: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
LIB	N	01	↓	↓		
LIB	O	01	MASTIC	GRAY & BLACK	ROOF PLNT. & SEAMS	
LIB	O	02	↓	↓	↓	

23 SAMPLES

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1.	Luis J Rocha (TRANSFER SIGNATURE)	LUIS J ROCHA (PRINTED NAME)	12/23/16 (DATE/TIME)
2.	(TRANSFER SIGNATURE)	(PRINTED NAME)	(DATE/TIME)
3.	(TRANSFER SIGNATURE)	S. Hollister (PRINTED NAME)	(DATE/TIME)

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PAGE 3 OF 3

Library
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
106	INSIDE	WALL	DRYWALL	BEIGE	INTACT	Negative	0.02	mg / cm ^2
107	INSIDE	WINDOW CASING	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
108	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
109	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
110	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
111	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0.04	mg / cm ^2
112	INSIDE	WALL	VINYL	BEIGE	INTACT	Negative	0.01	mg / cm ^2
113	INSIDE	WALL	DRYWALL	BEIGE	INTACT	Negative	0.02	mg / cm ^2
114	INSIDE	WINDOW CASING	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
115	INSIDE	SOFFIT	WOOD	BEIGE	INTACT	Negative	0.12	mg / cm ^2
116	INSIDE	TRIM UPPER	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
117	INSIDE	VENT	METAL	BEIGE	INTACT	Negative	0.01	mg / cm ^2
118	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
119	INSIDE	CABINET	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
120	INSIDE	SHELF	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
121	INSIDE	SHELF	WOOD	BEIGE	INTACT	Negative	0.16	mg / cm ^2
122	INSIDE	DOOR	WOOD	VARNISH	INTACT	Negative	0.01	mg / cm ^2
123	INSIDE	DOOR	METAL	BEIGE	INTACT	Negative	0.01	mg / cm ^2
124	INSIDE	DOOR FRAME	METAL	BEIGE	INTACT	Negative	0.01	mg / cm ^2
125	INSIDE	STOREFRONT WINDOW	WOOD	BEIGE	INTACT	Negative	0.07	mg / cm ^2
126	INSIDE	CEILING	DRYWALL	BEIGE	INTACT	Negative	0.02	mg / cm ^2
127	INSIDE	WALL	DRYWALL	BEIGE	INTACT	Negative	0.03	mg / cm ^2
128	INSIDE	DOOR	METAL	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
129	INSIDE	DOOR FRAME	METAL	BROWN, LIGHT	INTACT	Negative	0.02	mg / cm ^2
130	INSIDE	TRIM	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
131	OUTSIDE	TRIM	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
132	OUTSIDE	WALL	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
133	OUTSIDE	DOOR	METAL	GREEN, LIGHT	INTACT	Negative	0.03	mg / cm ^2
134	OUTSIDE	DOOR FRAME	METAL	GREEN, LIGHT	INTACT	Negative	0.03	mg / cm ^2
135	OUTSIDE	FOUDATION	CONCRETE	BEIGE	INTACT	Negative	0.07	mg / cm ^2

Library
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
136	OUTSIDE	FOUDATION TRIM	METAL	BEIGE	INTACT	Negative	0.25	mg / cm ^2
137	OUTSIDE	DOWNSPOUT	METAL	BROWN, DARK	INTACT	Negative	0	mg / cm ^2
138	OUTSIDE	VENT	METAL	WHITE	INTACT	Negative	0.17	mg / cm ^2
139	OUTSIDE	DOWNSPOUT	METAL	BEIGE	INTACT	Negative	0.2	mg / cm ^2
140	OUTSIDE	WALL	CONCRETE	BEIGE	INTACT	Negative	0	mg / cm ^2
141	OUTSIDE	WINDOW CASING	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
142	OUTSIDE	STOREFRONT WINDOW	WOOD	GREEN, LIGHT	INTACT	Negative	0.03	mg / cm ^2
143	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
144	OUTSIDE	CEILING	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
145	OUTSIDE	FLOOR	CONCRETE	RED	INTACT	Negative	0	mg / cm ^2
146	OUTSIDE	STRIPES	CONCRETE	YELLOW	INTACT	Negative	0	mg / cm ^2
147	OUTSIDE	EAVES	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
465	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
466	OUTSIDE	FASCIA	METAL	GREEN	INTACT	Negative	0	mg / cm ^2
467	OUTSIDE	FLASHING	METAL	GREEN	INTACT	Negative	0	mg / cm ^2
468	OUTSIDE	VENT	METAL	RED	INTACT	Negative	0	mg / cm ^2
469	OUTSIDE	PIPE	METAL	BEIGE	INTACT	Negative	0.02	mg / cm ^2



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

BAAQMD classifications are based upon the material's condition at the time of the survey or as rendered as a result of standard manual removal/demolition techniques. The use of "mechanical means", non-standard or other aggressive removal/demolition techniques may result in a different classification. BAAQMD & Cal-OSHA classifications are based on the materials being >1% asbestos pending further analytical data that proves otherwise.

MPR
HAZARDOUS MATERIALS SUMMARY

Asbestos

HOMO. ID	MATERIAL	DESCRIPTION	LOCATION	CAL/OSHA CLASS	BAAQMD CATEGORY	ESTIMATED QUANTITY
D	Mastic	Black, Sink	Kitchen	Class II	Category I - Non-Friable	10 SF
E	Wallboard/Joint Compound	White/White	Kitchen and Stage Ceiling Under Acoustic Ceiling Tiles.	Class II	NA (Composite <1% by Point Count, Wallboard=ND, Joint Compound=2%)	1,500 SF
G	Putty	White, Window	Windows	Class II	Category II- Non-Friable	600 SF (Windows)

Lead

ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	PB	UNITS
Inside	Riser	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Stringer	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Ceiling	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Cabinet	Wood	Beige	Intact	0.01	mg/cm^2
Inside	Door Frame	Wood	Beige	Intact	0.02	mg/cm^2
Inside	Window Casing	Wood	Beige	Intact	0.02	mg/cm^2
Inside	Hand Rail	Metal	Beige	Intact	0.06	mg/cm^2
Inside	Window	Wood	Beige	Intact	0.07	mg/cm^2
Inside	Beam	Wood	Beige	Intact	0.12	mg/cm^2
Inside	Pipe	Metal	Beige	Intact	0.16	mg/cm^2
Inside	Floor	Drywall	Beige	Intact	0.26	mg/cm^2
Inside	Door	Wood	Beige	Intact	0.7	mg/cm^2
Outside	Floor Stripe	Concrete	Yellow	Intact	0.01	mg/cm^2
Outside	Downspout	Metal	Beige	Intact	0.05	mg/cm^2
Outside	Eave	Wood	Blue, Light	Intact	0.1	mg/cm^2
Outside	Window	Wood	Green, Dark	Intact	0.14	mg/cm^2
Outside	Window Casing	Wood	Green, Dark	Intact	0.23	mg/cm^2
Outside	Door Frame	Wood	Gray, Dark	Intact	0.27	mg/cm^2
Outside	Window Casing	Wood	Green	Intact	0.28	mg/cm^2
Outside	Door	Wood	Green, Light	Deteriorated	0.3	mg/cm^2
Outside	Door	Wood	Green, Light	Intact	0.4	mg/cm^2
Outside	Door Frame	Wood	Green, Dark	Intact	0.4	mg/cm^2
Outside	Beam	Wood	Beige	Intact	0.4	mg/cm^2
Outside	Fascia	Wood	Green	Intact	0.5	mg/cm^2
Outside	Window Frame	Wood	Green	Intact	0.5	mg/cm^2
Outside	Window	Wood	Green	Intact	0.6	mg/cm^2

MPR
HAZARDOUS MATERIALS SUMMARY

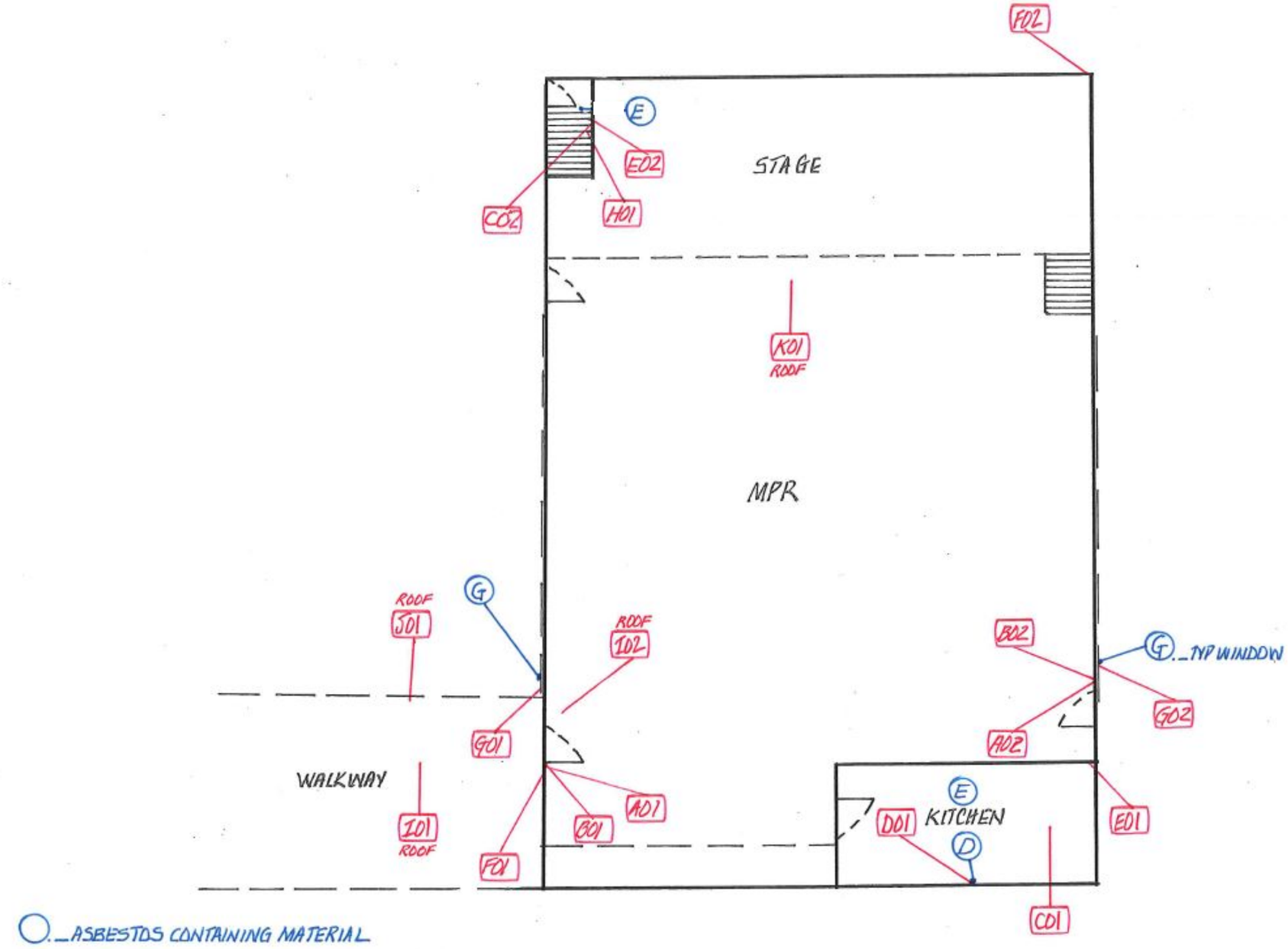
Please see Recommendation section for regulatory clarifications regarding lead in paint and ceramic tiles.

Other Hazardous Materials

MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	82
Other Non-incandescent Lamps	Universal Waste	6
Batteries: Exit Signs & Back-up	Universal Waste	6
Light Fixture Ballasts	Polychlorinated Biphenyls	41

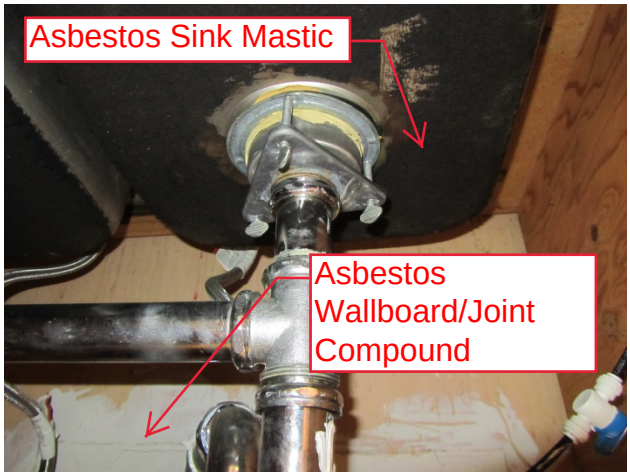
MPR
ASBESTOS SAMPLING INVENTORY

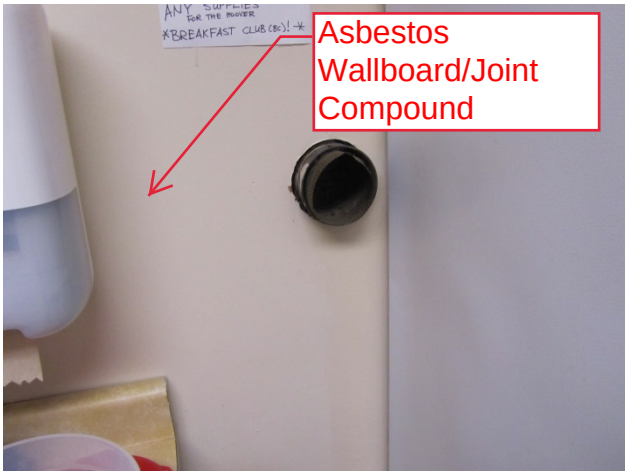
HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Vinyl Sheet Flooring/Mastic	Off-White/Yellow	2
B	Basecove/Mastic	2" White/White	2
C	Acoustical Ceiling Tile	12" White, Non-Uniform Hole	2
D	Mastic	Black, Sink	1
E	Wallboard/Joint Compound	White/White	2
F	Paint/Stucco	Tan/Gray, Exterior Wall	2
G	Putty	White, Window	2
H	Mastic	Brown, Acoustical Ceiling Tile	1
I	Roof Field	Gray and Black, Built Up	2
J	Flashing	Gray and Black, Built Up	1
K	Mastic	Gray and Black, Penetration	1



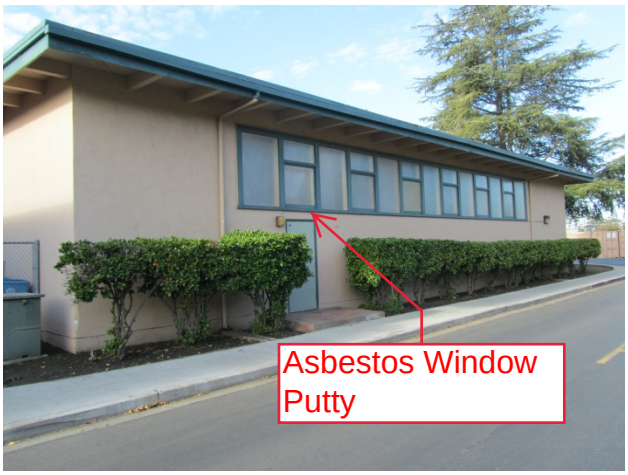
VISTA ENVIRONMENTAL CONSULTING www.vista-env.com 2984 TEAGARDEN STREET SAN LEANDRO, CA 94577 510-346-8860		PROJECT TITLE MPR HOOVER ELEMENTARY SCHOOL	SHEET TITLE SAMPLE & MATERIAL LOCATIONS	SCALE: NTS DRAWN BY: JR CHECKED BY: CB PROJECT No. 160003003 DATE: 020917 DRAWING No. 1	FIGURE 1

MPR
PHOTO DOCUMENTATION









Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B232776
Date Received: 12/27/16
Date Analyzed: 12/30/16
Date Printed: 01/04/17
First Reported: 01/04/17

Job ID/Site: 160003003 - PAUSD, Hoover - MPR

Date(s) Collected: 12/21/2016

FALI Job ID: L1161
Total Samples Submitted: 18
Total Samples Analyzed: 18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
MPR-A01	11842970						
Layer: Off-White Sheet Flooring			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Synthetic (10 %)		**Asbestos (ND)**					
MPR-A02	11842971						
Layer: Off-White Sheet Flooring			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Synthetic (10 %)		**Asbestos (ND)**					
MPR-B01	11842972						
Layer: White Non-Fibrous Material			**ND**				
Layer: White Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
MPR-B02	11842973						
Layer: White Non-Fibrous Material			**ND**				
Layer: White Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
MPR-C01	11842974						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
MPR-C02	11842975						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
MPR-D01	11842976						
Layer: Black Mastic		Chrysotile	**2 %**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (2%)**					

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Report Number: B232776

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
MPR-E01	11842977						
Layer: White Drywall			**ND**				
Layer: White Joint Compound		Chrysotile	**2 %**				
Layer: White Tape			**ND**				
Layer: White Joint Compound		Chrysotile	**2 %**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (Trace)**					
MPR-E02	11842978						
Layer: White Drywall			**ND**				
Layer: White Joint Compound		Chrysotile	**2 %**				
Layer: White Tape			**ND**				
Layer: White Joint Compound		Chrysotile	**2 %**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (Trace)**					
MPR-F01	11842979						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
MPR-F02	11842980						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
MPR-G01	11842981						
Layer: White Putty		Chrysotile	**Trace**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (Trace)**					
MPR-G02	11842982						
Layer: White Putty			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
MPR-H01	11842983						
Layer: Brown Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B232776

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
MPR-I01	11842984						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							
MPR-I02	11842985						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							
MPR-J01	11842986						
Layer: White Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (55 %) Fibrous Glass (10 %)							
Comment: Bulk complex sample.							
MPR-K01	11842987						
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Cellulose (Trace) Fibrous Glass (2 %)							

3777 Depot Road, Suite 409, Hayward, CA 94545 / Telephone: (510) 887-8828 (800) 827-FASI / Fax: (510) 887-4218

Report Number: B232776

Client Name: Vista Environmental Consultants **Date Printed:** 01/04/17

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

Analytical results and reports are generated by Forensic Analytical Laboratories Inc. (FALI) at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by FALI to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by FALI. The client is solely responsible for the use and interpretation of test results and reports requested from FALI. Forensic Analytical Laboratories Inc. is not able to assess the degree of hazard resulting from materials analyzed. FALI reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. All samples were received in acceptable condition unless otherwise noted.

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Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Point Count Analysis

(NESHAP Final Rule, 40 CFR, Part 61)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: N009009
Date Received: 12/27/16
Date Analyzed: 01/23/17
Date Printed: 01/23/17

Job ID/Site: 160003003 - PAUSD, Hoover - MPR

PLM Report Number: B232776

FALI Job ID: L1161
Total Samples Submitted: 2
Total Samples Analyzed: 2

Sample Preparation and Analysis:

The NESHAP Final Rule does not define the preparation method for multi-layered samples. In order to determine the composite quantity of asbestos, the volume percent of each layer is determined, the asbestos containing layers are analyzed by point counting and the composite quantity of asbestos is calculated. The NESHAP Final Rule can not be applied to matrices that dissolve in refractive index liquid. This includes tar, mastic or adhesive typically found on the back of floor tiles. According to the NESHAP Final Rule, point count data is only necessary when the visual estimate of asbestos is below 10%.

Sample ID	Lab Number	Layer Description
MPR-E01	11842977	**Composite of ALL Layers** White Drywall White Joint Compound White Tape White Joint Compound Paint

Point Count Results:

Number of asbestos points counted:	0
Number of non-empty points:	400
Layer percentage of entire sample:	100
Percent asbestos in layer:	**< 1**

Asbestos type(s) detected: Chrysotile

Comment: Asbestos was detected but no points were counted due to counting criteria. Therefore quantitation deemed to be < 1%.

Sample ID	Lab Number	Layer Description
MPR-E02	11842978	**Composite of ALL Layers** White Drywall White Joint Compound White Tape White Joint Compound Paint

Point Count Results:

Number of asbestos points counted:	0
Number of non-empty points:	400
Layer percentage of entire sample:	100
Percent asbestos in layer:	**< 1**

Asbestos type(s) detected: Chrysotile

Comment: Asbestos was detected but no points were counted due to counting criteria. Therefore quantitation deemed to be < 1%.

3777 Depot Road, Suite 409, Hayward, CA 94545 / Telephone: (510) 887-8828 (800) 827-FASI / Fax: (510) 887-4218

Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Point Count Analysis

(NESHAP Final Rule, 40 CFR, Part 61)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: N009009
Date Received: 12/27/16
Date Analyzed: 01/23/17
Date Printed: 01/23/17

Job ID/Site: 160003003 - PAUSD, Hoover - MPR

PLM Report Number: B232776

FALI Job ID: L1161
Total Samples Submitted: 2
Total Samples Analyzed: 2

Sample Preparation and Analysis:

The NESHAP Final Rule does not define the preparation method for multi-layered samples. In order to determine the composite quantity of asbestos, the volume percent of each layer is determined, the asbestos containing layers are analyzed by point counting and the composite quantity of asbestos is calculated. The NESHAP Final Rule can not be applied to matrices that dissolve in refractive index liquid. This includes tar, mastic or adhesive typically found on the back of floor tiles. According to the NESHAP Final Rule, point count data is only necessary when the visual estimate of asbestos is below 10%.

Sample ID	Lab Number	Layer Description

Note: Point count results are reported to the nearest percent per EPA method.

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification (LOQ) = 1%. Trace denotes the presence of asbestos below the LOQ. ND = None Detected.

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VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 12/21/16

LOCATION: Hoover - MPR PROJECT NUMBER: 160003003

SAMPLED BY: JR CAC OR SST NO: 02-3244

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
MPR	A	01	VSF/MAS	OFF-WHITE/YELLOW		
MPR	A	02	↓	↓		
MPR	B	01	BASECOVE/MAS	2" WHITE/WHITE		
MPR	B	02	↓	↓		
MPR	C	01	AET	12" WHITE, NON UNIFORM HOLE		
MPR	C	02	↓	↓		
MPR	D	01	MASTIC	BLACK, SINK		
MPR	E	01	W.B/JC	WHITE/WHITE		
MPR	E	02	↓	↓		
MPR	F	01	PAINT/STUCCO	TAN/GRAY	EXTERIOR WALLS	

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1. Luis J Rocha — LUIS J ROCHA — 12/23/16
   TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME
2. _____ — _____ — _____
   TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME
3. _____ — S. HOLLISTER — DEC 27 2016
   TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

RECEIVED DEC 27 2016 DV

VISTA ENVIRONMENTAL CONSULTING

ASBESTOS BULK SAMPLE LOG

2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577

OFFICE 510.346.8860
FAX 888.653.8889

CLIENT: PAUSD

DATE: 12/21/16

LOCATION: Hoover - MPR

PROJECT NUMBER: 160003003

SAMPLED BY: JR

CAC OR SST NO: 02-3249

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
MPR	F	02	↓	↓		
MPR	G	01	PUTTY	WHITE, WINDOW		
MPR	G	02	↓	↓		
MPR	H	01	MASTIC	BROWN, ACT (C)		
MPR	I	01	ROOF FIELD	GRAY & BLACK	BUILT-UP	
MPR	I	02	↓	↓	↓	
MPR	J	01	FLASHING	GRAY & BLACK	BUILT-UP	
MPR	K	01	MASTIC	GRAY & BLACK	ROOF PENT.	
			18 SAMPLES			

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: 5 DAY TURNAROUND

CHAIN OF CUSTODY:

1.	Luis J Rocha	LUIS J ROCHA	12/22/16
	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
2.			
	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
3.		S. HOLLISTER	DEC 27 2016
	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME

PAGE 2 OF 2

MPR
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
148	INSIDE	WALL	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
149	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0.7	mg / cm ^2
150	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
151	INSIDE	BASE FLOOR TRIM	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
152	INSIDE	FLOOR	VINYL	WHITE	INTACT	Negative	0	mg / cm ^2
153	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
154	INSIDE	RISER	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
155	INSIDE	STRINGER	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
156	INSIDE	STAIRS	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
157	INSIDE	FLOOR	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
158	INSIDE	HAND RAIL	METAL	BEIGE	INTACT	Negative	0.06	mg / cm ^2
159	INSIDE	POLE	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
160	INSIDE	CEILING	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
161	INSIDE	WINDOW	WOOD	BEIGE	INTACT	Negative	0.07	mg / cm ^2
162	INSIDE	WINDOW CASING	WOOD	BEIGE	INTACT	Negative	0.02	mg / cm ^2
163	INSIDE	TRIM UPPER	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
164	INSIDE	DOOR	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
165	INSIDE	DOOR FRAME	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
166	INSIDE	CABINET	WOOD	BEIGE	INTACT	Negative	0.01	mg / cm ^2
167	INSIDE	FLOOR	DRYWALL	BEIGE	INTACT	Negative	0.26	mg / cm ^2
168	INSIDE	CEILING	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
169	INSIDE	FLOOR	CONCRETE	BROWN, LIGHT	INTACT	Negative	0	mg / cm ^2
170	INSIDE	TACKBOARD	WOOD	VARNISH	INTACT	Negative	0	mg / cm ^2
171	INSIDE	TACKBOARD	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
172	INSIDE	BEAM	WOOD	BEIGE	INTACT	Negative	0.12	mg / cm ^2
173	INSIDE	PIPE	METAL	BEIGE	INTACT	Negative	0.16	mg / cm ^2
174	OUTSIDE	DOOR	WOOD	GREEN, LIGHT	INTACT	Negative	0.4	mg / cm ^2
175	OUTSIDE	DOOR FRAME	WOOD	GRAY, DARK	INTACT	Negative	0.27	mg / cm ^2
176	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2
177	OUTSIDE	FOUNDATION	CONCRETE	BEIGE	INTACT	Negative	0	mg / cm ^2

MPR
XRF Sequential Report

READING NO.	ROOM	COMPONENT	SUBSTRATE	COLOR	CONDITION	RESULTS	PbC	UNITS
178	OUTSIDE	TRIM	WOOD	BEIGE	INTACT	Negative	0	mg / cm ^2
179	OUTSIDE	DOWNSPOUT	METAL	BEIGE	INTACT	Negative	0.05	mg / cm ^2
180	OUTSIDE	DOOR	WOOD	GREEN, LIGHT	DETERIORATED	Negative	0.3	mg / cm ^2
181	OUTSIDE	DOOR FRAME	WOOD	GREEN, DARK	INTACT	Negative	0.4	mg / cm ^2
182	OUTSIDE	FLOOR	CONCRETE	RED	INTACT	Negative	0	mg / cm ^2
183	OUTSIDE	FLOOR STRIPE	CONCRETE	YELLOW	INTACT	Negative	0.01	mg / cm ^2
184	OUTSIDE	WINDOW	WOOD	GREEN, DARK	INTACT	Negative	0.14	mg / cm ^2
185	OUTSIDE	WINDOW CASING	WOOD	GREEN, DARK	INTACT	Negative	0.23	mg / cm ^2
457	OUTSIDE	FLASHING	METAL	GREEN	INTACT	Negative	0	mg / cm ^2
458	OUTSIDE	FASCIA	WOOD	GREEN	INTACT	Negative	0.5	mg / cm ^2
459	OUTSIDE	WINDOW	WOOD	GREEN	INTACT	Negative	0.6	mg / cm ^2
460	OUTSIDE	WINDOW FRAME	WOOD	GREEN	INTACT	Negative	0.5	mg / cm ^2
461	OUTSIDE	WINDOW CASING	WOOD	GREEN	INTACT	Negative	0.28	mg / cm ^2
462	OUTSIDE	EAVE	WOOD	BLUE, LIGHT	INTACT	Negative	0.1	mg / cm ^2
463	OUTSIDE	BEAM	WOOD	BEIGE	INTACT	Negative	0.4	mg / cm ^2
464	OUTSIDE	WALL	STUCCO	BEIGE	INTACT	Negative	0	mg / cm ^2

VISTA ENVIRONMENTAL CONSULTING

10 YEARS

A STELLAR PAST • A BRIGHTER FUTURE

Pre-Demolition Hazardous Materials Survey Report
Herbert Hoover Elementary School
Palo Alto, CA



Prepared for:

Palo Alto Unified School District

25 Churchill Avenue, Unit D
Palo Alto, CA 94306

Prepared By:
Vista Environmental Consulting
2984 Teagarden Street
San Leandro, CA 94577

September 24, 2018
Project No. 180003005

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EXECUTIVE SUMMARY

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A. BUILDING DATA

Hazardous Materials Summary
Asbestos Sampling Inventory
Sample and Asbestos-Containing Materials Location Drawings
Asbestos Analytical Reports
Lead XRF Sequential Reports

EXECUTIVE SUMMARY

Vista Environmental Consulting (Vista) performed a pre-demolition hazardous materials survey at five portable buildings located at Hoover Elementary School, 445 E Charleston Rd., Palo Alto, CA 94306 (Project Site). The survey was performed to identify and sample accessible suspect asbestos-containing materials, to identify representative building components for the presence of lead-containing surface coatings/lead-based paints (LCSC/LBP), and to visually identify universal waste (UW) materials, polychlorinated biphenyls (PCBs) containing devices, devices which contain ozone depleting chemicals, and other hazardous materials. Vista performed the hazardous materials survey on August 8, 2018.

The following buildings were surveyed and contain the following hazardous materials:

Building	Asbestos	Lead-Based Paint	Universal Waste	Suspect PCBs
Portable 15	No	No	☑	☑
Portable 16	No	No	☑	☑
Portable 17	No	No	☑	☑
Portable 18	No	No	☑	☑
Portable 19	No	No	☑	☑

Subsurface asbestos utility piping is assumed throughout the Project Site.

The Hazardous Materials Summary, Asbestos Sampling Inventory, Sample and Asbestos-Containing Materials Location Drawings, Asbestos Analytical Reports, and Lead XRF Sequential Reports can be found in *Appendix A – Building Data.* They are arranged building by building in numerical order.

The documents found in the appendices are not stand-alone documents and should not be separated from this report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

All activities involving potential and identified lead-containing surfaces should be conducted in accordance with California Health & Safety Code sections 17920.10 and 10525, 10525.7, Title 8, California Code of Regulations (CCR), Section 1532.1.

Any welding, cutting or heating of metal surfaces containing surface coatings should be conducted in accordance with 8 CCR 1537 Welding, Cutting, and Heating of Coated Metals, which require surfaces covered with toxic preservatives, and in enclosed areas, be stripped of all toxic coatings for a distance of

at least 4 inches, in all directions, from the area of heat application prior to the initiation of such heat application, or 8 CCR 1536 Ventilation Requirements for Welding, Brazing, and Cutting.

Proper waste characterization and disposal of lead and other heavy metal contaminated debris or rinsate from mechanical equipment should be conducted in accordance with 22 CCR Division 4, Chapter 30, and the California Health and Safety Code, Section 25157.8.

All potential and identified Universal Waste materials (UW) impacted by the work should be removed and recycled or disposed of in accordance with the UW guidelines established by the DTSC, as stated in 22 CCR Sections 66261.9 and 66273.1 thru 66273.90.

All ballasts must be visually inspected prior to disposal to determine if they contain PCB's. Those ballasts marked No PCB's or PCB Free can be considered as such as should be treated as UW - electronic waste. All PCB-containing devices, including, but not limited to ballasts should be removed or have the oils removed and properly handled, collected, stored, transported and recycled or disposed of by an approved recycling or disposal facility in accordance with the requirements of Title 22 CCR 67426.1.

Should materials similar to those identified in this report, or if other forms of suspect hazardous materials are encountered, contractors should be instructed to immediately cease work activities which may initiate an exposure episode, and notify the appropriate management personnel.

Report prepared for the Company by:



Christopher R. Burns
Senior Project Manager
CAC #92-0224
LRCIA #663

1.0 INTRODUCTION

Vista Environmental Consulting, Inc. (Vista) has prepared this pre-demolition hazardous materials survey report of Portables at Hoover Elementary School, 445 E Charleston Rd., Palo Alto, CA 94306 (Project Site) for the Palo Alto Unified School District (PAUSD).

The hazardous materials survey of the Project Site was generally consistent with the Vista proposal dated July 26, 2018 and approved by PAUSD.

The following buildings were surveyed:

- Portable 15
- Portable 16
- Portable 17
- Portable 18
- Portable 19

The purpose of this survey was to identify hazardous building materials so they could be removed, waste characterized, and properly disposed of prior to being impacted by demolition activities. The data provided in this report can assist all parties involved in this project make informed decisions with regards to regulatory compliance and the health and safety of their employees. This survey included the following:

- Visible and accessible suspect asbestos-containing materials (ACM) were assessed and sampled to determine asbestos content.
- Representative painted and coated building components were assessed and categorized based upon standard selective demolition practices and sampled for lead content which can be used in preliminary waste stream characterization estimates.
- Visible and accessible materials commonly found in buildings which can potentially have hazardous properties that are regulated were assessed, but not sampled. These materials include, but are not limited to:
    - Universal Waste (UW) materials, such as non-incandescent lamps, batteries, mercury-containing devices, and electronic waste; Batteries include, but are not limited to those found in exit signs, emergency lights, fire alarm systems, and back-up power systems.
    - Polychlorinated biphenyls (PCBs) containing devices such as lamp ballasts, wet-type transformers, and hydraulic systems.

2.0 METHODOLOGY

Vista performed the hazardous materials survey on August 8, 2018. The asbestos survey was conducted under the direction of Christopher Elliott, a State of California Division of Occupational Safety and Health (Cal/OSHA) Certified Asbestos Consultant (CAC) #16-5606. The lead paint screening survey was also under the direction of Christopher Elliott, who has a Lead-Related Construction Certificate as Inspector/Assessor (LRCIA) #18373 issued by the State of California Department of Public Health (CDPH). Assisting on the survey were Jordan Toy, a Cal/OSHA Certified Site Surveillance Technician (CSST) #176119 and a CDPH Lead-Related Construction Sampling Technician (LRCST) #29776, Luis Rocha CDPH LRCST #25193, and Kirk Nakamoto.

The survey performed was not intrusive in nature, and did not include access of areas and sampling of materials which would have required demolition or large scale destructive testing. Vista's intent was to perform a thorough survey and made a good faith effort to access all building materials down to the structural components and/or interstitial spaces. Vista made every effort to access these areas, however because non-destructive techniques had to be employed to keep the facilities operational, not all interstitial spaces could be accessed.

Quantities and locations are based upon areas that were accessed. Materials similar to those in this report may be present in areas which were not accessed.

Sub-surface areas were not included as part of this survey, hence no excavation was conducted to discover buried asbestos utility piping concealed below the surface. The project site was not assessed for the presence of Naturally Occurring Asbestos in the soil.

2.1 *Asbestos*

The asbestos survey was performed generally in accordance with the AHERA protocol (40 CFR Part 763, Subpart E). Visual identification was performed by assessing visible and accessible structural, architectural, and mechanical components for the presence of suspect ACM at the Project Site.

This limited ACM survey was conducted in the following manner:

- Suspect ACM was categorized into homogeneous materials. A homogeneous material is defined as being a surfacing material, thermal system insulation, or miscellaneous material which is uniform in color and texture. It may also be additionally subcategorized using the date of installation, when available.
- A sampling scheme was developed based upon the location and quantity of the suspect homogeneous ACM. A rough order of magnitude estimate of each suspect homogenous ACM was calculated and recorded for future reference. A sampling scheme, including a specific number of samples per suspect homogeneous ACM, was calculated prior to sampling.

- Sampling guidelines established by the United States Environmental Protection Agency (USEPA) were utilized for sampling each suspected homogeneous ACM. Methods described in Appendix K of 8 California Code of Regulation (CCR) 1529 were utilized in the collection of each suspect homogeneous ACM sample.
- Trained California asbestos certified personnel, using appropriate sampling tools and sterile leak-tight Whirl-pak® containers, collected building materials that were suspected to contain ACM.
- Each suspect ACM sample was collected and sealed in its container and appropriately labeled with a unique sample identification number and recorded on an asbestos bulk sampling log. Each log contains a chain-of-custody to assure the proper transition of the samples from Vista to the analytical laboratory.
- Sampling tools were decontaminated, by using a clean wet cloth, between collection of each suspect sample to prevent the possibility of cross contamination of subsequent suspect ACM samples.

Suspect ACM samples were delivered, under proper chain-of-custody protocol, to Forensic Analytical Laboratories in Hayward, California. Forensic Analytical Laboratories is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) and the California Environmental Laboratory Accreditation Program (Cal-ELAP). The samples were submitted for analysis by Polarized Light Microscopy (PLM) utilizing dispersion staining techniques in accordance with the EPA's "Method for the Determination of Asbestos in Bulk Building Materials" U.S. EPA/600/R-93/116, Visual Area Estimate, dated July 1993 and adopted by the NVLAP as Test Method Code 18/A01.

Samples of wallboard/joint compound found to contain asbestos using PLM analysis were further analyzed by 400-point bulk asbestos point count utilizing National Emission Standards for Hazardous Air Pollutants (NESHAP) Final Rule, 40 CFR, Part 61 methodology.

2.2 *Lead*

Lead Paint

Vista's lead construction screening survey used an X-Ray Fluorescence (XRF) direct read spectrum analyzer device to take readings of representative painted and coated surfaces for evaluation of lead levels for worker health and safety and preliminary waste characterization prior to construction activities. The device used was a NITON Corporation XRF Spectrum Analyzer, Model XLp- 300 A. This device is a solid-state detector optimized for lead L-shell and K-shell X-ray detection and uses a 40 mCi 109Cd (1,480 Mbq) isotope for an excitation source.

This survey was a limited screening of paint for the purpose of characterizing the lead content in paint and coatings likely to be disturbed during work activities. For this purpose, XRF analysis was used to screen for lead levels and provides results that are generally representative of typical conditions but are not inclusive of all painted/coated surfaces present at the Project Site. This survey was not a surface by

surface inspection as outlined in the U.S. Department of Housing and Urban Development (HUD) Guidelines For the Evaluation and Control of Lead-Based Paint Hazards in Housing pursuant to Title X of the Housing and Community Development Act of 1992. These analytical data can be helpful in evaluation of lead-related environmental risks in general, but cannot be used to calculate worker exposures and is not a substitute for employee exposure monitoring or waste stream sampling.

Lead-Based Paint (LBP) is defined by CDPH as any paint containing lead levels exceeding 0.5 wt % (or 5000 parts per million) via paint chip sampling or 1.0 milligram per centimeter squared (mg/cm^2) or greater via X-Ray Fluorescence (XRF) direct read instrument sampling. Cal/OSHA rules apply to "any detectable concentration of lead" without a specified detection level.

2.3 *Devices with Potential Hazardous Materials*

Devices with potential hazardous materials were visually identified during the survey walk through and their quantities were estimated and recorded. No attempt was made to disassemble devices or sample suspect materials within the devices. For example, fluorescent light fixtures must be presumed to contain Universal Waste lamps and ballasts which contain PCB oil or are electronic waste, pending removal and disassembly of each unit to determine explicit product specific information that proves otherwise.

3.0 RESULTS

The following buildings were surveyed and contain the following hazardous materials:

Building	Asbestos	Lead-Based Paint	Universal Waste	Suspect PCBs
Portable 15	No	No	☑	☑
Portable 16	No	No	☑	☑
Portable 17	No	No	☑	☑
Portable 18	No	No	☑	☑
Portable 19	No	No	☑	☑

Subsurface asbestos utility piping is assumed throughout the Project Site.

The Hazardous Materials Summary, Asbestos Sampling Inventory, Sample and Asbestos-Containing Materials Location Drawings, Asbestos Analytical Reports, and Lead XRF Sequential Reports can be found in *Appendix A – Building Data.* They are arranged building by building in alphabetical order.

The documents found in the appendices are not stand-alone documents and should not be separated from this report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the

contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

BAAQMD classifications are based upon the material's condition at the time of the survey or as rendered as a result of standard manual removal/demolition techniques. The use of "mechanical means", non-standard or other aggressive removal/demolition techniques may result in a different classification.

4.0 RECOMMENDATIONS

4.1 *Lead*

At present there is no state or federal regulation requiring mandatory lead removal or abatement prior to disturbance of building materials with identified lead paint or coatings. However, there are applicable Cal/OSHA worker protection and training requirements, Cal/EPA waste disposal requirements, CDPH requirements for public and residential buildings, and SB 460 lead hazard regulations that apply to lead-related construction activities, abatement activities and their associated wastes. The following is a brief discussion and summary of applicable regulatory requirements:

♦ **Cal/OSHA:** Title 8, California Code of Regulation (CCR), Section 1532.1 (8 CCR 1532.1) governs occupational exposure to lead. This regulation requires that prior to initiation of certain activities, referred to as "trigger tasks", workers must be trained, medically evaluated, and properly fitted with respiratory protection, and protective clothing until statistically reliable personal eight-hour time weighted average (TWA) results indicate lead exposure levels below the Personal Exposure Limit (PEL) for each unique task which disturbs lead-based and lead-containing coatings. This process is known as a Negative Exposure Assessment or NEA.

If the result of the exposure assessment is above the Action Level (AL) additional monitoring is required and if the result is above the PEL additional exposure monitoring, worker protection (including respirator protection and PPE), training and medical requirements apply. However even where the NEA criteria is met, certain hazard communication training and work practice controls still apply where lead is disturbed. "Trigger tasks" are tasks that are assumed to exceed the PEL pending an exposure assessment and they encompass the majority of construction activities that disturb surface coatings. Examples of "trigger" tasks range from manual paint scraping as a lower expected exposure up to hot work and abrasive blasting as the highest expected exposures, and include any non-listed task that the employer determines may potentially expose employees to lead levels above the AL.

"OSHA does not consider any method that relies solely on the analysis of bulk materials or surface content of lead (or other toxic material) to be acceptable for safely predicting employee exposure to airborne contaminates. Without air monitoring results or without the benefit of historical or objective

data (including air sampling which clearly demonstrates that the employee can not be exposed above the action level during any process, operation, or activity) the analysis of bulk or surface samples can not be used to determine employee exposure."- OSHA Standard Interpretation May 8, 2000.

OSHA states that these rules apply to "any detectable concentration of lead" without a specified detection level. Due to the Consumer Product Safety Commission currently allowing paint to contain up to 90 parts per million (ppm) or 0.009 wt% of lead, the variation of lead content due to aging and weathering, and the variation of detection limits associated with analysis of bulk materials, such as paint chips and surface content analysis via XRF, it is recommended that all painted or coated surfaces be treated as potentially containing lead. Positive analytical results by either method can be used to indicate that detectable lead is present but negative results cannot be interpreted as conclusively demonstrating the absence of lead.

Analytical data from analysis of bulk materials or surface content of lead can be helpful in evaluation of lead-related environmental risks in general but cannot be used to calculate worker exposures and are not a substitute for employee exposure monitoring. As a result of the above, any employee that works around potential lead-based or lead-containing coatings must have HAZCOM training and personal exposure air monitoring is additionally required for employees that disturb such coatings. Significant additional certification, notification, and work practices are required for materials found to be lead-based.

Any welding, cutting or heating of metal surfaces containing surface coatings should be conducted in accordance with 29 CFR 1926.354 and 8 CCR 1537. These regulations require surfaces covered with toxic preservatives, and in enclosed areas, be stripped of all toxic coatings for a distance of at least 4 inches, in all directions, from the area of heat application prior to the initiation of such heat application.

♦ **Cal/EPA** through the Division of Toxic Substance Control (DTSC) regulates disposal of lead hazardous waste (22 CCR Division 4.5, Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes). DTSC has issued guidance indicating that architectural debris with intact lead paint is normally expected to be handled as general construction waste. However, waste stream segregation and analysis is still required for all lead painted or coated debris regardless if the paint or coating is intact on a building component or not. The resulting wastes may be hazardous under California and federal RCRA standards for lead and therefore require proper handling, packaging, labeling, and transportation under a proper manifest to a permitted hazardous waste storage, treatment and disposal facility.

♦ **CDPH**: The Department of Public Health (CDPH) has specific requirements (Title 17 Sections 35001 thru 36100 et. al.) for hazard assessment and work in public or residential structures in regards to lead-based paint. These regulations require special certifications, work practices, and notification for such activities.

♦ **Senate Bill 460 (SB 460)**: An act to amend Section 1941.1 of the Civil Code, and to amend Sections 17961, 17980, and 124130 of, and to add Sections 17920.10, 105251, 105252, 105253, 105254, 105255, 105256, and 105257 to, the Health and Safety Code, relating to lead abatement. This bill allows for fines and criminal penalties to be levied on any person who is found to have performed lead abatement without containment or created a measurable "lead hazard" based upon current CDPH standards. A "lead hazard" means deteriorated lead-based paint, lead contaminated dust, lead contaminated soil, disturbing lead-based paint or presumed lead-based paint without containment, or any other nuisance which may result in persistent and quantifiable lead exposure.
Vista recommends that all parties that come into contact with paint that has detectable lead content follow all applicable federal, state and local regulations relating to employee health and safety and proper disposal of generated wastes.

4.2 *Devices with Potential Hazardous Materials*

All potential and identified Universal Waste materials (UW) impacted by the work should be removed and recycled or disposed of in accordance with the UW guidelines established by the DTSC, as stated in 22 CCR Sections 66261.9 and 66273.1 thru 66273.90.

Vista's limited visual survey indicated that light fixtures with ballasts that may contain PCB oil are present. However, due to the limited nature of the random spot checks, Vista recommends that all ballasts be visually inspected prior to disposal to determine if they contain PCB's. Those ballasts marked No PCB's or PCB Free can be considered as such as should be treated as UW - electronic waste.

All PCB-containing devices, including, but not limited to ballasts should be removed or have the oils removed and properly handled, collected, stored, transported and recycled or disposed of by an approved recycling or disposal facility in accordance with the requirements of Title 22 CCR 67426.1.

All personnel who perform hazardous materials work must be trained and qualified to do so. They must also follow the most current OSHA regulations including 29 CFR 1910.120 and 8 CCR 5192, Hazardous Waste Operations and Emergency Response, as well as other applicable federal, state and local laws and regulations.

5.0 LIMITATIONS & EXCLUSIONS

Quantities and locations are based upon areas that were accessed. Materials similar those in this report may be present in areas which were not accessed. Because of this, Vista recommends including line item pricing, allowances, and/or additive/deductive wording to bid sheets for unforeseen conditions.

All material quantities reported herein are rough order of magnitude estimates and should not be used for bidding purposes. All contractors are responsible for accurately determining quantities and locations of materials identified in this report.

The survey performed was limited to representative rooms/areas, was not intrusive in nature, and did not include access of areas and sampling of materials which would have required demolition or large scale destructive testing. Vista made a good faith effort based on accepted industry standards to access all areas in order to assess their potential for having hazardous materials, however additional materials such as vinyl floor tile or mastics may be under carpeting or other floor finishes and fixtures, piping and elbows may be inside wall or ceiling voids, and additional layers of roofing may be under the first layer of hard substrate. Vista made every effort to access these areas, however because non-destructive techniques had to be employed to keep the facilities operational, not all interstitial spaces could be accessed.

Respectfully Submitted,
Vista Environmental Consulting

Reviewed and Approved





Christopher R. Burns
Senior Project Manager
CAC #92-0224
LRCIA #663

Charles R. Bove
Principal
CAC #92-0160

APPENDIX A - BUILDING DATA

PORTABLE 15



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

HOOVER ES
PORTABLE 15
HAZARDOUS MATERIALS SUMMARY

Asbestos

- No asbestos was detected in the 27 samples collected and analyzed for asbestos.

Lead

- No lead was detected in the 17 XRF readings.

Other Hazardous Materials

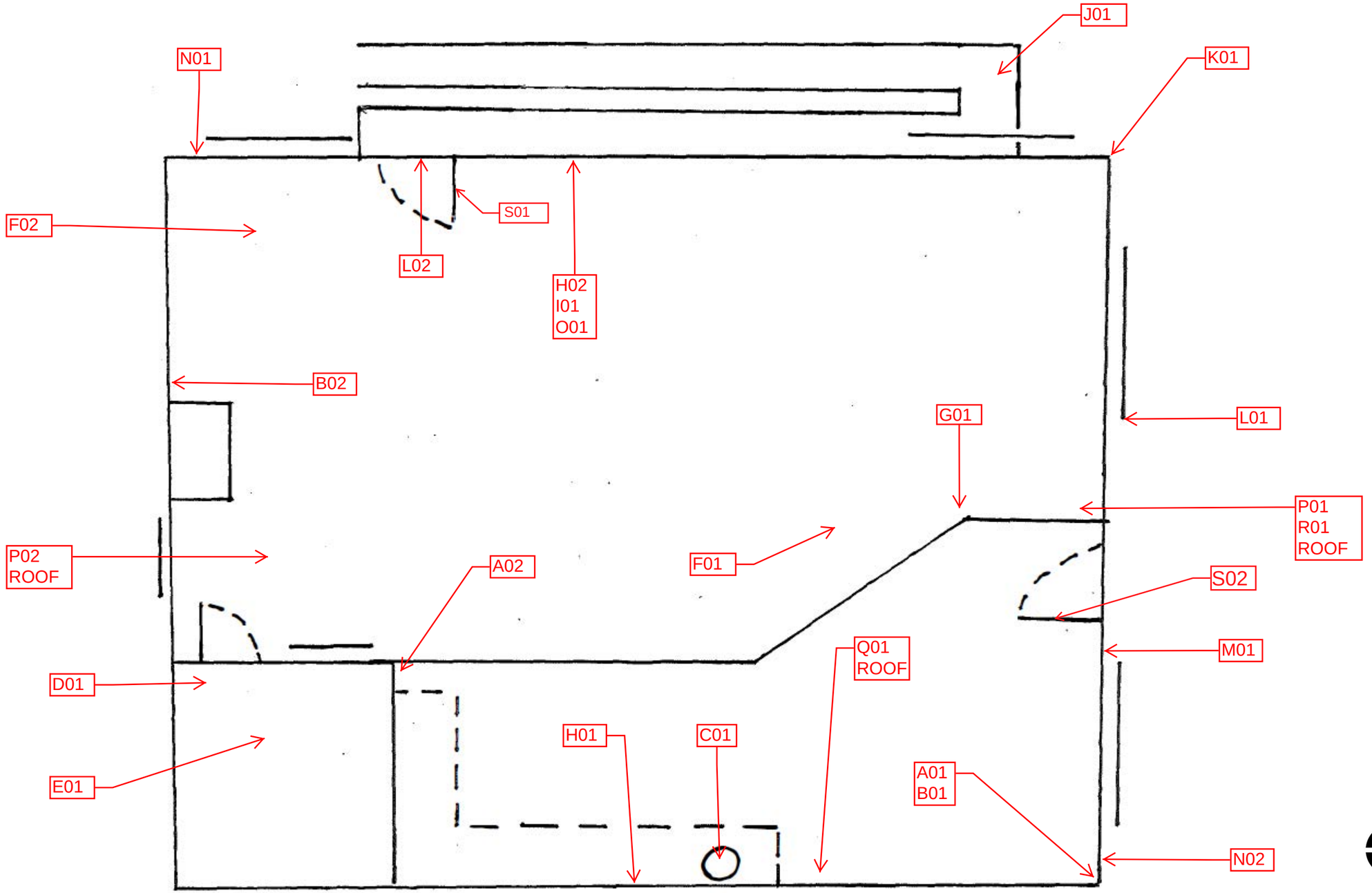
MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	60
Light Fixture Ballasts	Polychlorinated Biphenyls	30
HVAC Unit	Ozone Depleting Chemicals	1
Smoke Detectors	Low-Level Radiation	2
Exit Signs	Low-Level Radiation	2

HOOVER ES
PORTABLE 15
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Vinyl Floor Tile/Mastic	12" Off-White with White Specks/Yellow	2
B	Basecove/Mastic	4" Brown/Beige	2
C	Mastic	Gray, Sink Undercoat	1
D	Vinyl Floor Tile/Mastic	12" Yellow with White Specks/Yellow	1
E	Vinyl Floor Tile/Mastic	12" Tan with White Specks/Yellow	1
F	Acoustical Ceiling Panel	2'x4' White, Textured	2
G	Mastic	Yellow, Brown Carpet Tile	1
H	Wall Panel	White & Brown, Interior Walls	2
I	Wallboard	White, Behind Wall Panel, no Joint Compound	1
J	Coating	Gray, Ramp	1
K	Concrete	Gray, Foundation	1
L	Sealant	White, Exterior Windows, Doors, & Seams	2
M	Expansion Joint	Black, Exterior Floor	1
N	Paint	Beige, Exterior	2
O	Mastic	Beige, Wall, Between Wall Panel & Wallboard	1
P	Sealant	White & Tan, on Bolts & Roof Seams	2
Q	Mastic	Gray & Black, Pipe Penetrations	1
R	Sealant	Silver & Black, Seams, Roof	1
S	Insulation	Brown, Paper, Fire Door	2

LEGEND

Asbestos Sample



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510-346-8860

PROJECT TITLE

HERBERT HOOVER
ELEMENTARY SCHOOL

SHEET TITLE

PORTABLE # 15
SAMPLE LOCATION

SCALE:
DRAWN BY:
CHECKED BY:
PROJECT No.
DATE:
DRAWING No.

FIGURE

1

Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 40CFR, Part 763, Appendix E to Subpart E and EPA 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B263258
Date Received: 08/09/18
Date Analyzed: 08/10/18
Date Printed: 08/10/18
First Reported: 08/10/18

Job ID/Site: 180003005 - PAUSD, Hoover ES, 5 Portables 15

Date(s) Collected: 08/08/2018

FALI Job ID: L1161
Total Samples Submitted: 25
Total Samples Analyzed: 25

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
15-A01	12064949						
Layer: Off-White Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
15-A02	12064950						
Layer: Off-White Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
15-B01	12064951						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
15-B02	12064952						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
15-C01	12064953						
Layer: Grey Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %)		**Asbestos (ND)**					
15-D01	12064954						
Layer: Yellow Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
15-E01	12064955						
Layer: Tan Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263258

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
15-F01	12064956						
Layer: Yellow Fibrous Material			**ND**				
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Fibrous Glass (95 %)		**Asbestos (ND)**					
15-F02	12064957						
Layer: Yellow Fibrous Material			**ND**				
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Fibrous Glass (95 %)		**Asbestos (ND)**					
15-G01	12064958						
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
15-H01	12064959						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
15-H02	12064960						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
15-I01	12064961						
Layer: White Drywall			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %)		**Asbestos (ND)**					
15-J01	12064962						
Layer: Grey Cementitious Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Wollastonite (15 %)		**Asbestos (ND)**					
15-K01	12064963						
Layer: Grey Cementitious Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
15-L01	12064964						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Synthetic (5 %)		**Asbestos (ND)**					

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Report Number: B263258

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
15-L02	12064965						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Synthetic (5 %)		**Asbestos (ND)**					
15-M01	12064966						
Layer: Black Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (75 %)		**Asbestos (ND)**					
15-N01	12064967						
Layer: Beige Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (5 %)		**Asbestos (ND)**					
15-N02	12064968						
Layer: Beige Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (5 %)		**Asbestos (ND)**					
15-O01	12064969						
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (3 %)		**Asbestos (ND)**					
15-P01	12064970						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
15-P02	12064971						
Layer: White Non-Fibrous Material			**ND**				
Layer: Tan Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
15-Q01	12064972						
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
15-R01	12064973						
Layer: Black Non-Fibrous Material			**ND**				
Layer: Silver Coating			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263258

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

Analytical results and reports are generated by Forensic Analytical Laboratories Inc. (FALI) at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by FALI to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by FALI. The client is solely responsible for the use and interpretation of test results and reports requested from FALI. Forensic Analytical Laboratories Inc. is not able to assess the degree of hazard resulting from materials analyzed. FALI reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. All samples were received in acceptable condition unless otherwise noted.

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2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD

DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 15

PROJECT NUMBER: 180003005

SAMPLED BY: JR

CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
15	A	01	VFT/Mas	12" off-white w/ white specks /yellow		
15	A	02	↓	↓		
15	B	01	BC/Mas	4" Brown /Beige		
15	B	02	↓	↓		
15	C	01	Mastic	Gray, Sink undercoat		
15	D	01	VFT/Mas	12" Yellow w/ white specks /yellow		
15	E	01	VFT/Mas	12" Tan w/ white specks /yellow		
15	F	01	ACP	2'x4' white textured		
15	F	02	↓	↓		
15	G	01	Mastic	Yellow, Brown carpet tile		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

1. JR — TRANSFER SIGNATURE — Jonathan Rocha — PRINTED NAME — 08/09/18 0830 — DATE/TIME
2. [signature] — TRANSFER SIGNATURE — S. Hollister — PRINTED NAME — DATE/TIME
3. — TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

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PAGE 1 OF 3

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OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 15 PROJECT NUMBER: 180003005

SAMPLED BY: JR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
15	H	01	Wall Panel	White & Brown		
15	H	02	↓	↓		
15	I	01	Wallboard	White		
15	J	01	Coating	Gray, Ramp		
15	K	01	Concrete	Gray, Foundation		
15	L	01	Sealant	White		
15	L	02	↓	↓		
15	M	01	Expansion Joint	Black		
15	N	01	Paint	Beige		
15	N	02	↓	↓		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.		Jonathan Rocha	08/09/18 0830
2.		S. Hollister	
3.			

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FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/09/18

LOCATION: Hoover ES_5 Portables 15 PROJECT NUMBER: 180003005

SAMPLED BY: SR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
15	O	01	Mastic	Beige		
15	P	01	Sealant	White & tan		
15	P	02	↓	↓		
15	Q	01	Mastic	Gray & Black, Pipe Penetration		
15	R	01	Sealant	Silver & Black		
			25 Samples			

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

1. _____ TRANSFER SIGNATURE — Jonathan Rocha PRINTED NAME — 08/09/18 0830 DATE/TIME
2. _____ TRANSFER SIGNATURE — S. Hollister PRINTED NAME — DATE/TIME
3. _____ TRANSFER SIGNATURE — PRINTED NAME — DATE/TIME

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PAGE 3 OF 3

PORTABLE 16



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

HOOVER ES
PORTABLE 16
HAZARDOUS MATERIALS SUMMARY

Asbestos

- No asbestos was detected in the 27 samples collected and analyzed for asbestos.

Lead

Room	Component	Substrate	Color	Condition	Pb	Units
Inside	Beam	Metal	Brown	Intact	0.02	mg/cm^2

Other Hazardous Materials

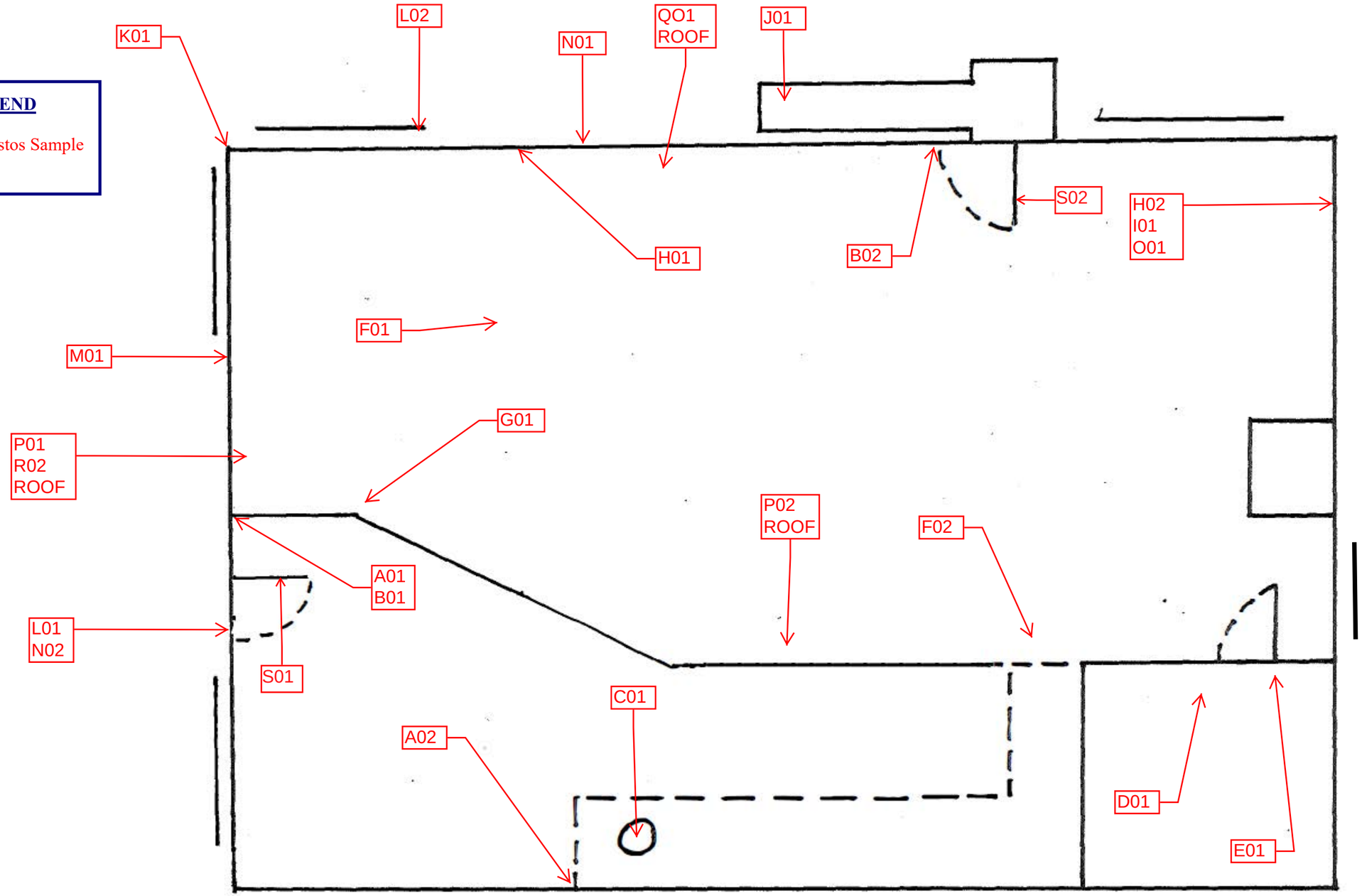
MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	60
Light Fixture Ballasts	Polychlorinated Biphenyls	30
HVAC Unit	Ozone Depleting Chemicals	1
Smoke Detectors	Low-Level Radiation	2
Exit Signs	Low-Level Radiation	2

HOOVER ES
PORTABLE 16
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Vinyl Floor Tile/Mastic	12" Off-White with White Specks/ Yellow	2
B	Basecove/Mastic	4" Brown/Beige	2
C	Mastic	Gray, Sink Undercoat	1
D	Vinyl Floor Tile/Mastic	12" Yellow with White Specks/Yellow	1
E	Vinyl Floor Tile/Mastic	12" Tan with White Specks/Yellow	1
F	Acoustical Ceiling Panel	2'x4' White, Textured	2
G	Mastic	Yellow, Brown Carpet Tile	1
H	Wall Panel	White & Brown, Interior Walls	2
I	Wallboard	White, Behind Wall Panel, no Joint Compound	1
J	Coating	Gray, Ramp	1
K	Concrete	Gray, Foundation	1
L	Sealant	White, Exterior Windows, Doors, & Seams	2
M	Expansion Joint	Black, Exterior Floor	1
N	Paint	Beige, Exterior	2
O	Mastic	Beige, Wall, Between Wall Panel & Wallboard	1
P	Sealant	White & Tan, on Bolts & Roof Seams	2
Q	Mastic	Gray & Black, Pipe Penetrations	1
R	Sealant	Silver & Black, Seams, Roof	1
S	Insulation	Brown, Paper, Fire Door	2

LEGEND

Asbestos Sample



VISTA ENVIRONMENTAL CONSULTING www.vista-env.com 2984 TEAGARDEN STREET SAN LEANDRO, CA 94577 510-346-8860		PROJECT TITLE HERBERT HOOVER ELEMENTARY SCHOOL	SHEET TITLE PORTABLE # 16 SAMPLE LOCATION	SCALE: DRAWN BY: CHECKED BY: PROJECT No. DATE: DRAWING No.	FIGURE 1

Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 40CFR, Part 763, Appendix E to Subpart E and EPA 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B263285
Date Received: 08/09/18
Date Analyzed: 08/10/18
Date Printed: 08/10/18
First Reported: 08/10/18

Job ID/Site: 180003005 - PAUSD, Hoover ES_5 Portables 16

Date(s) Collected: 08/08/2018

FALI Job ID: L1161
Total Samples Submitted: 25
Total Samples Analyzed: 25

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
16-A01	12065104						
Layer: Beige Tile			**ND**				
Layer: Tan Mastic			**ND**				
Layer: Grey Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
16-A02	12065105						
Layer: Beige Tile			**ND**				
Layer: Tan Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
16-B01	12065106						
Layer: Beige Non-Fibrous Material			**ND**				
Layer: Off-White Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
16-B02	12065107						
Layer: Beige Non-Fibrous Material			**ND**				
Layer: Off-White Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
16-C01	12065108						
Layer: Grey Semi-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %)		**Asbestos (ND)**					
16-D01	12065109						
Layer: Beige Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263285

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
16-E01	12065110						
Layer: Beige Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
16-F01	12065111						
Layer: Yellow Fibrous Tile			**ND**				
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Fibrous Glass (95 %)		**Asbestos (ND)**					
16-F02	12065112						
Layer: Yellow Fibrous Tile			**ND**				
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Fibrous Glass (95 %)		**Asbestos (ND)**					
16-G01	12065113						
Layer: Yellow/Grey Semi-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (5 %)		**Asbestos (ND)**					
16-H01	12065114						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %) Synthetic (2 %)		**Asbestos (ND)**					
16-H02	12065115						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %) Synthetic (2 %)		**Asbestos (ND)**					
16-I01	12065116						
Layer: White Drywall			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %)		**Asbestos (ND)**					
16-J01	12065117						
Layer: Grey Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
16-K01	12065118						
Layer: Grey Cementitious Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263285
Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
16-L01	12065119						
Layer: White Semi-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Synthetic (5 %)		**Asbestos (ND)**					
16-L02	12065120						
Layer: White Semi-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Synthetic (5 %)		**Asbestos (ND)**					
16-M01	12065121						
Layer: Black Semi-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (75 %)		**Asbestos (ND)**					
16-N01	12065122						
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
16-N02	12065123						
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
16-O01	12065124						
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Comment: Due to small sample size, this result may not be repeatable.		**Asbestos (ND)**					
16-P01	12065125						
Layer: White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
16-P02	12065126						
Layer: White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Synthetic (5 %)		**Asbestos (ND)**					
16-Q01	12065127						
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %)		**Asbestos (ND)**					

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Report Number: B263285

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
16-R01	12065128						
Layer: Black Non-Fibrous Material			**ND**				
Layer: Silver Foil			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 16 PROJECT NUMBER: 180003005

SAMPLED BY: JR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
16	A	01	VFT/Mas	12" off-white w/ white specks / yellow		
16	A	02	↓	↓		
16	B	01	BC/Mas	4" Brown /Beige		
16	B	02	↓	↓		
16	C	01	Mastic	Gray, Sink undercoat		
16	D	01	VFT/Mas	12" Yellow w/ white specks /yellow		
16	E	01	VFT/Mas	12" Tan w/ white specks /yellow		
16	F	01	ACP	2'x4' white textured		
16	F	02	↓	↓		
16	G	01	Mastic	Yellow, Brown carpet tile		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

1. JR (TRANSFER SIGNATURE) Jonathan Rocha (PRINTED NAME) 08/09/18 0830 (DATE/TIME)
2. (TRANSFER SIGNATURE) (PRINTED NAME) (DATE/TIME)
3. (TRANSFER SIGNATURE) (PRINTED NAME) (DATE/TIME)

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PAGE 1 OF 3

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2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 16 PROJECT NUMBER: 180003005

SAMPLED BY: JR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
16	H	01	Wall Panel	White & Brown		
16	H	02	↓	↓		
16	I	01	Wallboard	White		
16	J	01	Coating	Gray, Ramp		
16	K	01	Concrete	Gray, Foundation		
16	L	01	Sealant	White		
16	L	02	↓	↓		
16	M	01	Expansion Joint	Black		
16	N	01	Paint	Beige		
16	N	02	↓	↓		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

1. JR — TRANSFER SIGNATURE; Jonathan Rocha — PRINTED NAME; 08/09/18 0830 — DATE/TIME
2. _____ TRANSFER SIGNATURE; _____ PRINTED NAME; _____ DATE/TIME
3. _____ TRANSFER SIGNATURE; _____ PRINTED NAME; _____ DATE/TIME

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AUG 09 2018
By 1515

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ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD

DATE: 08/09/18

LOCATION: Hoover ES_5 Portables 16

PROJECT NUMBER: 180003005

SAMPLED BY: SR

CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
16	O	01	Mastic	Beige		
16	P	01	Sealant	white & tan		
16	P	02	↓	↓		
16	Q	01	Mastic	Gray & Black, Pipe Penetration		
16	R	01	Sealant	Silver & Black		
			25 Samples			

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	JR	Jonathan Rocha	08/09/18 0830
2.			
3.			

RECEIVED
AUG 09 2018
By 1515

EMSL Analytical, Inc.

464 McCormick Street San Leandro, CA 94577

Tel/Fax: (510) 895-3675 / (510) 895-3680

http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order:	091820668
Customer ID:	32VEOK25
Customer PO:	180003005
Project ID:	

Attention:	CHRIS BURNS	**Phone:**	(510) 346-8860
	Vista Environmental Consulting, Inc.	**Fax:**	
	2984 Teagarden St	**Received Date:**	09/21/2018 11:45 AM
	San Leandro, CA 94577	**Analysis Date:**	09/21/2018
		Collected Date:	09/20/2018

Project: 180003005 - HOOVER ES_ PORTABLES, PORTABLE 16

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
16-01 *091820668-0001*	INSULATION-BROWN, PAPER FIRE DOOR	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
16-02 *091820668-0002*	INSULATION-BROWN, PAPER FIRE DOOR	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected

Analyst(s)

Cecilia Yu (2)

Matthew Batongbacal
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from: 09/21/2018 20:53:53

OrderID: 091820668

#091820668

VISTA ENVIRONMENTAL CONSULTING

ASBESTOS BULK SAMPLE LOG

2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

CLIENT: PAUSD DATE: 9-20-18

LOCATION: Hoover ES_5 Portables, Portable 16 PROJECT NUMBER: 180003005

SAMPLED BY: CE CAC OR SST NO: 16-5606

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
16	S	01	Insulation,	Brown, Paper Fire Door		
16	S	02	↓	↓		
		2				
			Samples			

ANALYTICAL METHOD: (PLM) ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY (24HR) 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: _____

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.		Chris Elliott	9-20-18
2.			9/21/18 11:45am W1
3.			

PAGE 1 OF 1

PORTABLE 17



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

HOOVER ES
PORTABLE 17
HAZARDOUS MATERIALS SUMMARY

Asbestos

- No asbestos was detected in the 27 samples collected and analyzed for asbestos.

Lead

- No lead was detected .

Other Hazardous Materials

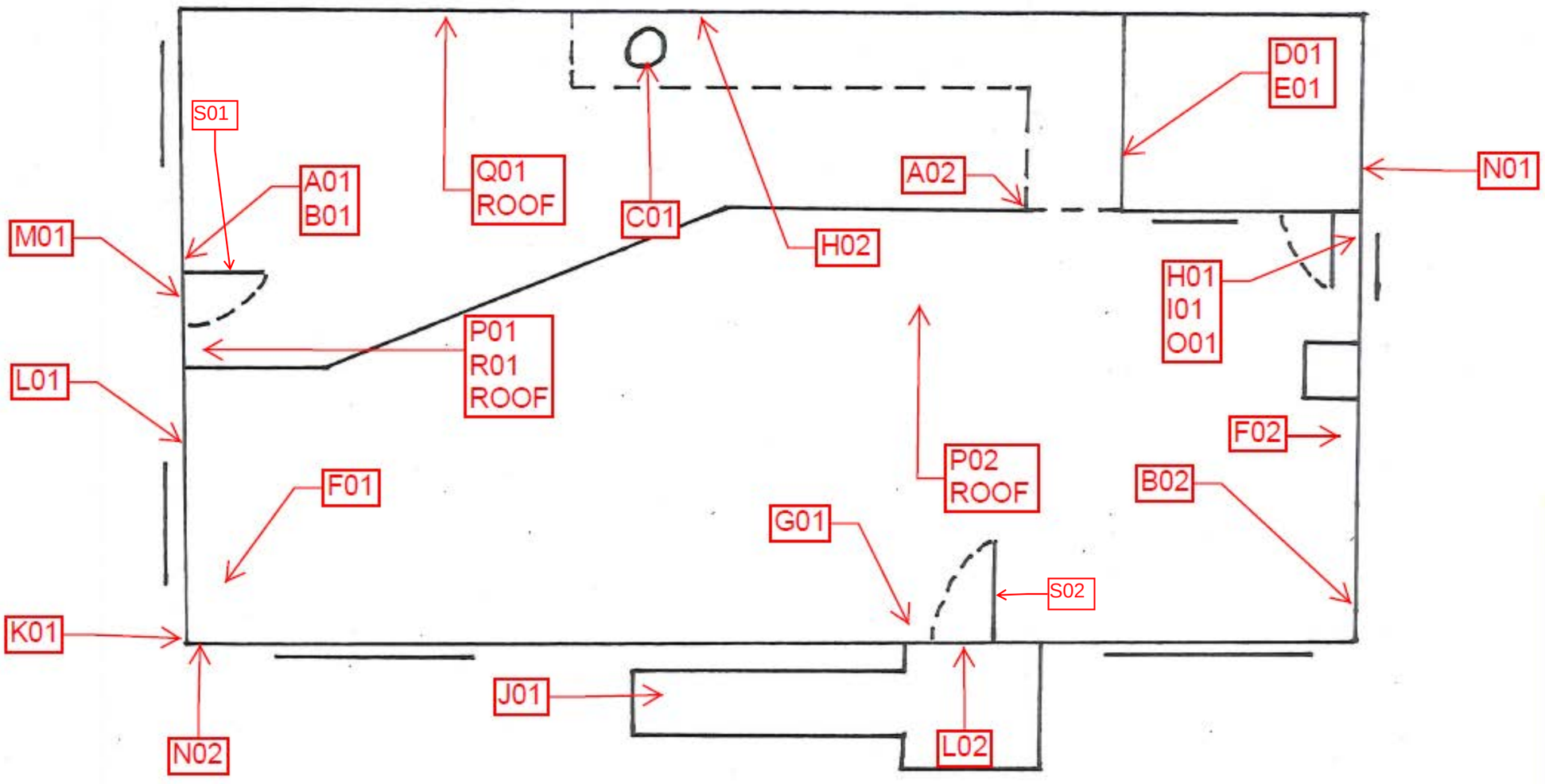
MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	60
Light Fixture Ballasts	Polychlorinated Biphenyls	30
HVAC Unit	Ozone Depleting Chemicals	1
Smoke Detectors	Low-Level Radiation	2
Exit Signs	Low-Level Radiation	2

HOOVER ES
PORTABLE 17
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Vinyl Floor Tile/Mastic	12" Off-White with White Specks/Yellow	2
B	Basecove/Mastic	4" Brown/Beige	2
C	Mastic	Gray, Sink Undercoat	1
D	Vinyl Floor Tile/Mastic	12" Yellow with White Specks/Yellow	1
E	Vinyl Floor Tile/Mastic	12" Tan with White Specks/Yellow	1
F	Acoustical Ceiling Panel	2'x4' White, Textured	2
G	Mastic	Yellow, Brown Carpet Tile	1
H	Wall Panel	White & Brown, Interior Walls	2
I	Wallboard	White, Behind Wall Panel, no Joint Compound	1
J	Coating	Gray, Ramp	1
K	Concrete	Gray, Foundation	1
L	Sealant	White, Exterior Windows, Doors, & Seams	2
M	Expansion Joint	Black, Exterior Floor	1
N	Paint	Beige, Exterior	2
O	Mastic	Beige, Wall, Between Wall Panel & Wallboard	1
P	Sealant	White & Tan, on Bolts & Roof Seams	2
Q	Mastic	Gray & Black, Pipe Penetrations	1
R	Sealant	Silver & Black, Seams, Roof	1
S	Insulation	Brown, Paper, Fire Door	2

LEGEND

Asbestos Sample



VISTA ENVIRONMENTAL CONSULTING www.vista-env.com 2984 TEAGARDEN STREET SAN LEANDRO, CA 94577 510-346-8860		PROJECT TITLE HERBERT HOOVER ELEMENTARY SCHOOL	SHEET TITLE PORTABLE # 17 SAMPLE LOCATION	SCALE: DRAWN BY: CHECKED BY: PROJECT No. DATE: DRAWING No.	FIGURE 1

Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 40CFR, Part 763, Appendix E to Subpart E and EPA 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B263257
Date Received: 08/09/18
Date Analyzed: 08/10/18
Date Printed: 08/10/18
First Reported: 08/10/18

Job ID/Site: 180003005 - PAUSD, Hoover ES, 5 Portables 17

Date(s) Collected: 08/08/2018

FALI Job ID: L1161
Total Samples Submitted: 25
Total Samples Analyzed: 25

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
17-A01	12064924						
Layer: White Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-A02	12064925						
Layer: White Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-B01	12064926						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-B02	12064927						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-C01	12064928						
Layer: Grey Coating			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Synthetic (10 %)		**Asbestos (ND)**					
17-D01	12064929						
Layer: Yellow Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-E01	12064930						
Layer: Yellow Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263257

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
17-F01	12064931						
Layer: Yellow Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Fibrous Glass (99 %)		**Asbestos (ND)**					
17-F02	12064932						
Layer: Yellow Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Fibrous Glass (99 %)		**Asbestos (ND)**					
17-G01	12064933						
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-H01	12064934						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
17-H02	12064935						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
17-I01	12064936						
Layer: White Drywall			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %) Fibrous Glass (10 %)		**Asbestos (ND)**					
17-J01	12064937						
Layer: Grey Coating			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-K01	12064938						
Layer: Grey Cementitious Material			**ND**				
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-L01	12064939						
Layer: White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263257

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
17-L02	12064940						
Layer: White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-M01	12064941						
Layer: Brown Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
17-N01	12064942						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
17-N02	12064943						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
17-O01	12064944						
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-P01	12064945						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-P02	12064946						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
17-Q01	12064947						
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %)		**Asbestos (ND)**					
17-R01	12064948						
Layer: Black Non-Fibrous Material			**ND**				
Layer: Silver Foil			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263257

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD

DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 17

PROJECT NUMBER: 180003005

SAMPLED BY: JR

CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
17	A	01	VFT/Mas	12" off-white w/ white specks /yellow		
17	A	02	↓	↓		
17	B	01	BC/Mas	4" Brown /Beige		
17	B	02	↓	↓		
17	C	01	Mastic	Gray, Sink undercoat		
17	D	01	VFT/Mas	12" Yellow w/ white specks /yellow		
17	E	01	VFT/Mas	12" Tan w/ white specks /yellow		
17	F	01	ACP	2'x4' white textured		
17	F	02	↓	↓		
17	G	01	Mastic	Yellow, Brown carpet tile		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	JR	Jonathan Rocha	08/09/18 0830
2.		S. HOLLISTER	
3.			

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VISTA ENVIRONMENTAL CONSULTING

ASBESTOS BULK SAMPLE LOG

2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577

OFFICE 510.346.8860
FAX 888.653.8889

CLIENT: PAUSD DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 17 PROJECT NUMBER: 180003005

SAMPLED BY: JR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
17	H	01	Wall Panel	White & Brown		
17	H	02	↓	↓		
17	I	01	Wallboard	White		
17	J	01	Coating	Gray, Ramp		
17	K	01	Concrete	Gray, Foundation		
17	L	01	Sealant	White		
17	L	02	↓	↓		
17	M	01	Expansion Joint	Black		
17	N	01	Paint	Beige		
17	N	02	↓	↓		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.		Jonathan Rocha	08/09/18 0830
2.		S. Hollister	08/09/18 1515
3.			

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VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/09/18

LOCATION: Hoover ES_5 Portables 17 PROJECT NUMBER: 180003005

SAMPLED BY: SR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
17	O	01	Mastic	Beige		
17	P	01	Sealant	White & tan		
17	P	02	↓	↓		
17	Q	01	Mastic	Grey & Black, Pipe Penetration		
17	R	01	Sealant	Silver & Black		
			25 Samples			

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.		Jonathan Rocha	08/09/18 0830
2.		S. Hollister	
3.			

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PAGE 3 OF 3

EMSL Analytical, Inc.

464 McCormick Street San Leandro, CA 94577

Tel/Fax: (510) 895-3675 / (510) 895-3680

http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order:	091820678
Customer ID:	32VEOK25
Customer PO:	180003005
Project ID:	

Attention:	CHRIS BURNS	**Phone:**	(510) 346-8860
	Vista Environmental Consulting, Inc.	**Fax:**	
	2984 Teagarden St	**Received Date:**	09/21/2018 11:45 AM
	San Leandro, CA 94577	**Analysis Date:**	09/21/2018
		Collected Date:	09/20/2018

Project: 180003005 - HOOVER ES_5 PORTABLES, PORTABLE 17

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
17-01 *091820678-0001*	INSULATION-BROWN, PAPER	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
17-02 *091820678-0002*	INSULATION-BROWN, PAPER	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected

Analyst(s)

Cecilia Yu (2)

Matthew Batongbacal
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from: 09/21/2018 20:46:21

OrderID: 091820678

#091820678

VISTA ENVIRONMENTAL CONSULTING

ASBESTOS BULK SAMPLE LOG

2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

CLIENT: PAUSD DATE: 9-20-18

LOCATION: Hoover ES 5 Portables Portable 17 PROJECT NUMBER: 180003005

SAMPLED BY: CE CAC OR SST NO: 16-560

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
17	S	01	Insulation	Brown, Paper		
17	S	02	↓	↓		

ANALYTICAL METHOD: (PLM) ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY (24HR) 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: _____

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	[signature]	Chris Elliott	9-20-18
2.	[signature]	[signature]	9/21/18 11:45 am WI
3.			

PAGE 1 OF 1

PORTABLE 18



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

HOOVER ES
PORTABLE 18
HAZARDOUS MATERIALS SUMMARY

Asbestos

- No asbestos was detected in the 27 samples collected and analyzed for asbestos.

Lead

Room	Component	Substrate	Color	Condition	Pb	Units
Inside	Beam	Metal	Brown	Intact	0.02	mg/cm^2

Other Hazardous Materials

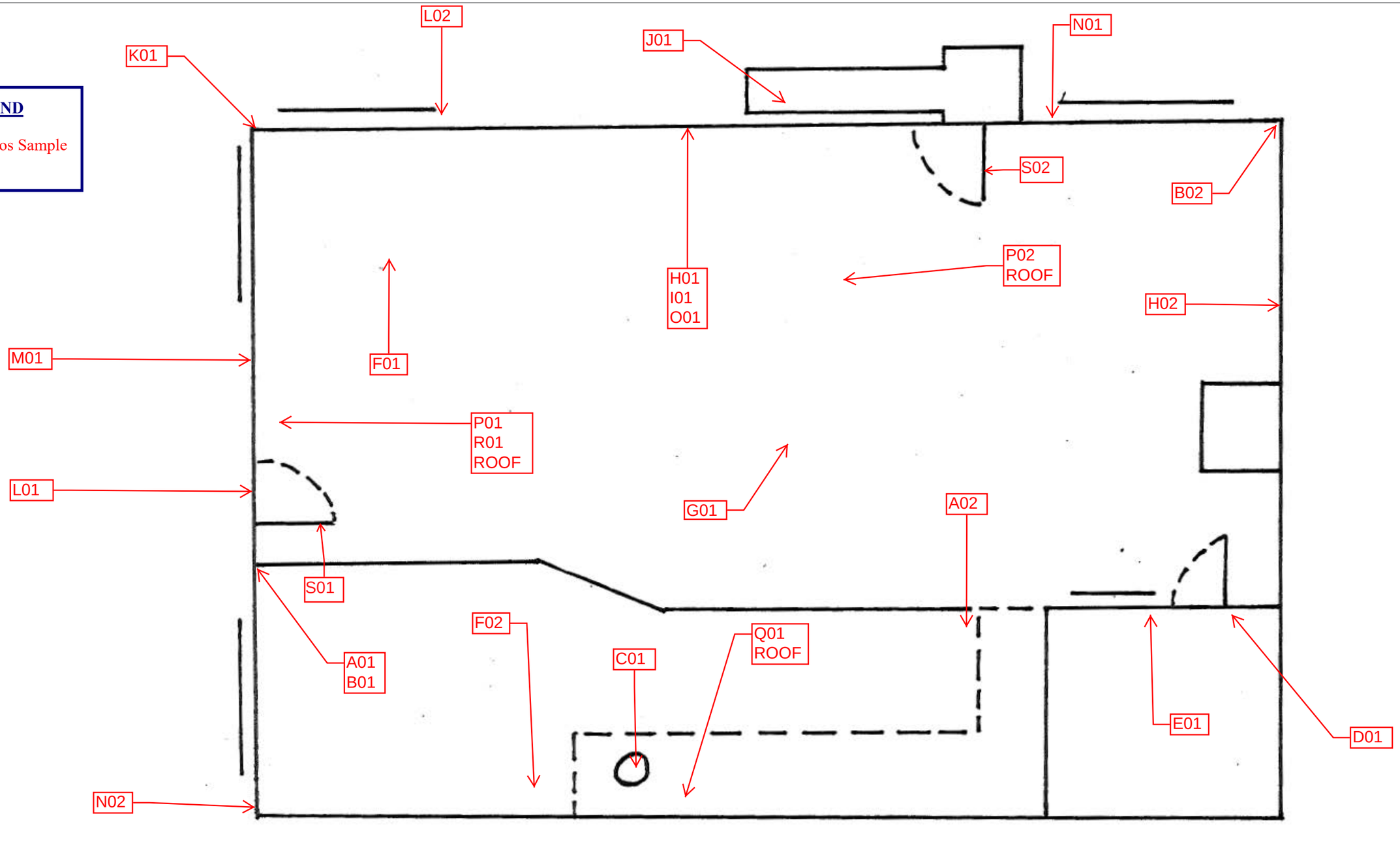
MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	60
Light Fixture Ballasts	Polychlorinated Biphenyls	30
HVAC Unit	Ozone Depleting Chemicals	1
Smoke Detectors	Low-Level Radiation	2
Exit Signs	Low-Level Radiation	2

HOOVER ES
PORTABLE 18
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Vinyl Floor Tile/Mastic	12" Off-White with White Specks/ Yellow	2
B	Basecove/Mastic	4" Brown/Beige	2
C	Mastic	Gray, Sink Undercoat	1
D	Vinyl Floor Tile/Mastic	12" Yellow with White Specks/Yellow	1
E	Vinyl Floor Tile/Mastic	12" Tan with White Specks/Yellow	1
F	Acoustical Ceiling Panel	2'x4' White, Textured	2
G	Mastic	Yellow, Brown Carpet Tile	1
H	Wall Panel	White & Brown, Interior Walls	2
I	Wallboard	White, Behind Wall Panel, no Joint Compound	1
J	Coating	Gray, Ramp	1
K	Concrete	Gray, Foundation	1
L	Sealant	White, Exterior Windows, Doors, & Seams	2
M	Expansion Joint	Black, Exterior Floor	1
N	Paint	Beige, Exterior	2
O	Mastic	Beige, Wall, Between Wall Panel & Wallboard	1
P	Sealant	White & Tan, on Bolts & Roof Seams	2
Q	Mastic	Gray & Black, Pipe Penetrations	1
R	Sealant	Silver & Black, Seams, Roof	1
S	Insulation	Brown, Paper, Fire Door	2

LEGEND

Asbestos Sample



VISTA ENVIRONMENTAL CONSULTING

www.vista-env.com
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
510-346-8860

PROJECT TITLE

HERBERT HOOVER
ELEMENTARY SCHOOL

SHEET TITLE

PORTABLE # 18
SAMPLE LOCATION

SCALE:
DRAWN BY:
CHECKED BY:
PROJECT No.
DATE:
DRAWING No.

FIGURE

1

Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 40CFR, Part 763, Appendix E to Subpart E and EPA 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B263259
Date Received: 08/09/18
Date Analyzed: 08/10/18
Date Printed: 08/10/18
First Reported: 08/10/18

Job ID/Site: 180003005 - PAUSD, Hoover ES_5 Portables 18

Date(s) Collected: 08/08/2018

FALI Job ID: L1161
Total Samples Submitted: 25
Total Samples Analyzed: 25

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
18-A01	12064978						
Layer: Off-White Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-A02	12064979						
Layer: Off-White Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-B01	12064980						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-B02	12064981						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-C01	12064982						
Layer: Grey Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (50 %)		**Asbestos (ND)**					
18-D01	12064983						
Layer: Yellow Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

3777 Depot Road, Suite 409, Hayward, CA 94545 / Telephone: (510) 887-8828 (800) 827-FASI / Fax: (510) 887-4218

Report Number: B263259

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
18-E01	12064984						
Layer: Tan Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-F01	12064985						
Layer: Yellow Fibrous Tile			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (2 %) Fibrous Glass (90 %)		**Asbestos (ND)**					
18-F02	12064986						
Layer: Yellow Fibrous Tile			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (2 %) Fibrous Glass (90 %)		**Asbestos (ND)**					
18-G01	12064987						
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (5 %) Synthetic (Trace)		**Asbestos (ND)**					
18-H01	12064988						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
18-H02	12064989						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
18-I01	12064990						
Layer: White Drywall			**ND**				
Total Composite Values of Fibrous Components: Cellulose (20 %)		**Asbestos (ND)**					
18-J01	12064991						
Layer: Grey Cementitious Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-K01	12064992						
Layer: Grey Cementitious Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263259

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
18-L01	12064993						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-L02	12064994						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-M01	12064995						
Layer: Black Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (75 %)		**Asbestos (ND)**					
18-N01	12064996						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
18-N02	12064997						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
18-O01	12064998						
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Fibrous Glass (3 %)		**Asbestos (ND)**					
18-P01	12064999						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-P02	12065000						
Layer: White Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
18-Q01	12065001						
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (50 %)		**Asbestos (ND)**					
18-R01	12065002						
Layer: Black Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263259

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

Analytical results and reports are generated by Forensic Analytical Laboratories Inc. (FALI) at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by FALI to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by FALI. The client is solely responsible for the use and interpretation of test results and reports requested from FALI. Forensic Analytical Laboratories Inc. is not able to assess the degree of hazard resulting from materials analyzed. FALI reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. All samples were received in acceptable condition unless otherwise noted.

3777 Depot Road, Suite 409, Hayward, CA 94545 / Telephone: (510) 887-8828 (800) 827-FASI / Fax: (510) 887-4218

VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 18 PROJECT NUMBER: 180003005

SAMPLED BY: JR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
18	A	01	VFT/Mas	12" off-white w/ white specks /yellow		
18	A	02	↓	↓		
18	B	01	BC/Mas	4" Brown /Beige		
18	B	02	↓	↓		
18	C	01	Mastic	Gray, Sink undercoat		
18	D	01	VFT/Mas	12" Yellow w/ white specks /yellow		
18	E	01	VFT/Mas	12" Tan w/ white specks /yellow		
18	F	01	ACP	2'x4' white textured		
18	F	02	↓	↓		
18	G	01	Mastic	Yellow, Brown carpet tile		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	JR	Jonathan Rocha	08/09/18 0830
2.			
3.			

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VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 18 PROJECT NUMBER: 180003005

SAMPLED BY: JR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
18	H	01	Wall Panel	White & Brown		
18	H	02	↓	↓		
18	I	01	Wallboard	White		
18	J	01	Coating	Gray, Ramp		
18	K	01	Concrete	Gray, Foundation		
18	L	01	Sealant	White		
18	L	02	↓	↓		
18	M	01	Expansion Joint	Black		
18	N	01	Paint	Beige		
18	N	02	↓	↓		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	JR	Jonathan Rocha	08/09/18 0830
2.			
3.			

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2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/09/18

LOCATION: Hoover ES_5 Portables 18 PROJECT NUMBER: 180003005

SAMPLED BY: SR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
18	O	01	Mastic	Beige		
18	P	01	Sealant	White & tan		
18	P	02	↓	↓		
18	Q	01	Mastic	Gray & Black / Pipe Penetration		
18	R	01	Sealant	Silver & Black		
			25 Samples			

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.		Jonathan Rocha	08/09/18 0930
2.			
3.			

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PAGE 3 OF 3

EMSL Analytical, Inc.

464 McCormick Street San Leandro, CA 94577

Tel/Fax: (510) 895-3675 / (510) 895-3680

http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order:	091820649
Customer ID:	32VEOK25
Customer PO:	180003005
Project ID:	

Attention:	CHRIS BURNS	**Phone:**	(510) 346-8860
	Vista Environmental Consulting, Inc.	**Fax:**	
	2984 Teagarden St	**Received Date:**	09/21/2018 11:45 AM
	San Leandro, CA 94577	**Analysis Date:**	09/21/2018
		Collected Date:	09/20/2018

Project: 180003005 - PAUSD - HOOVER ES_5 PORTABLES - PORTABLE 18 - 16-5606

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
S-01 *091820649-0001*	BUILDING 18 - INSULATION - BROWN PAPER, FIREDOOR	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
S-02 *091820649-0002*	BUILDING 18 - INSULATION - BROWN PAPER, FIREDOOR	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected

Analyst(s)

Cecilia Yu (2)

Matthew Batongbacal
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from: 09/21/2018 21:05:07

OrderID: 091820649

№091820649

VISTA ENVIRONMENTAL CONSULTING

ASBESTOS BULK SAMPLE LOG

2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577

OFFICE 510.346.8860
FAX 888.653.8889

CLIENT: PAUSD

DATE: 9-20-18

LOCATION: Hoover ES_5 Portables Portable 18

PROJECT NUMBER: 180003005

SAMPLED BY: CE

CAC OR SST NO: 16-5606

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
18	S	01	Insulation	Brown Paper, Fire door		
18	S	02	↓	↓		
	2					
		Samples				

ANALYTICAL METHOD: (PLM) ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY (24HR) 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: _____

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.		Chris Elliott	9-20-18
2.			9/21/18 11:45am WI
3.			

PAGE 1 OF 1

PORTABLE 19



The information contained in these appendices are not stand alone documents and should not be separated from this report. For specific regulatory requirements regarding these materials please refer to the information provided in the Main Report. Quantities and locations listed in the tables are order of magnitude estimates and are not to be used for bidding purposes. It is the sole responsibility of the contractor to verify quantities and locations of hazardous materials in the path of construction through site visits and contractual bid set documents, including, but not limited to all specifications, drawings, and addenda. Any discrepancies between the contractual bid set documentation and site visits must be submitted in writing to the Owner or Owner's representative, prior to bidding.

HOOVER ES
PORTABLE 19
HAZARDOUS MATERIALS SUMMARY

Asbestos

- No asbestos was detected in the 27 samples collected and analyzed for asbestos.

Lead

Room	Component	Substrate	Color	Condition	Pb	Units
Outside	Hand Rail	Metal	Green	Intact	0.01	mg/cm^2
Outside	Door	Metal	Green, Light	Intact	0.01	mg/cm^2

Other Hazardous Materials

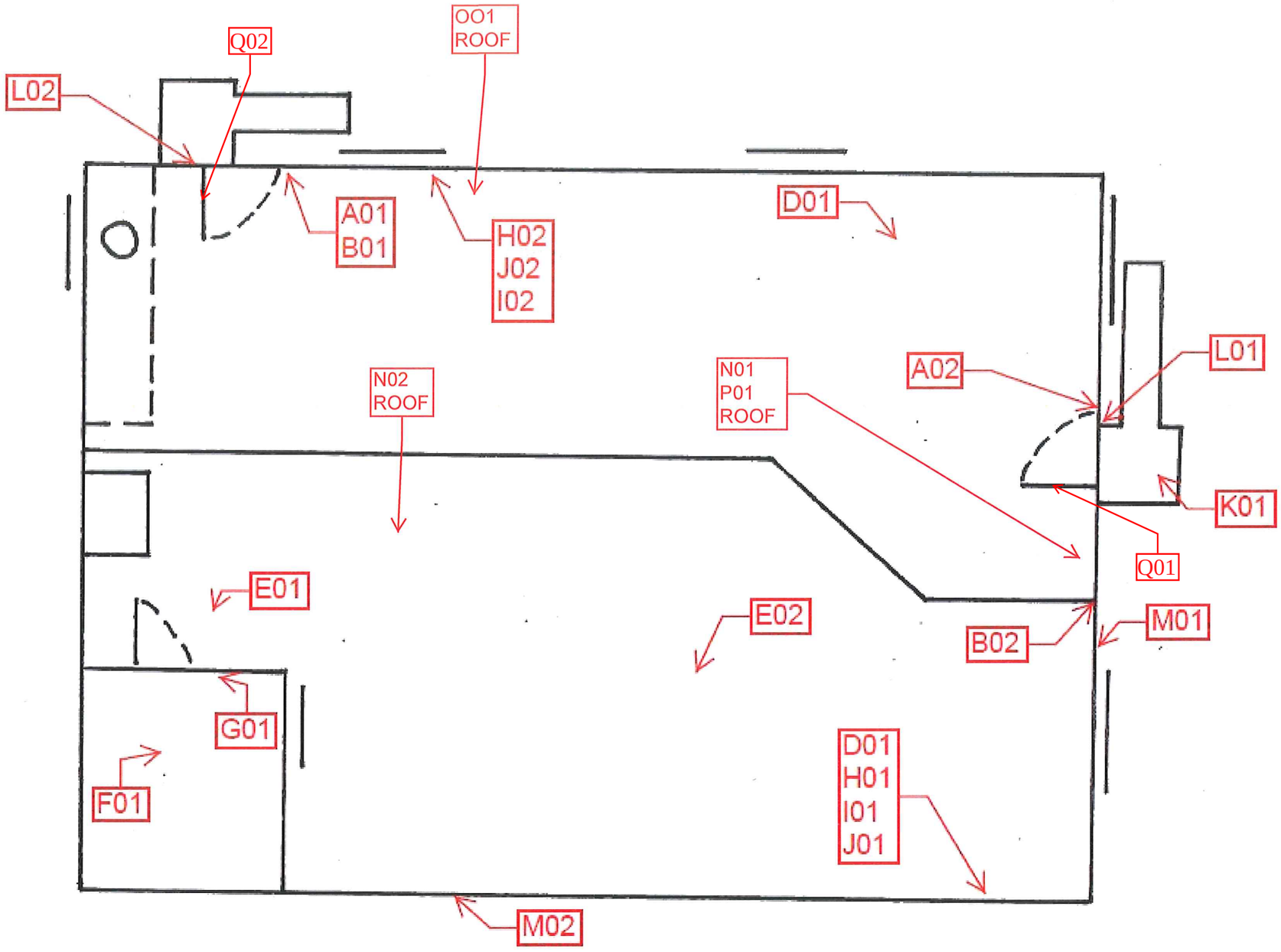
MATERIAL	CONTAMINANT	ESTIMATED QUANTITY
Fluorescent Tubes (4' Length)	Universal Waste	60
Light Fixture Ballasts	Polychlorinated Biphenyls	30
HVAC Unit	Ozone Depleting Chemicals	1
Smoke Detectors	Low-Level Radiation	2
Exit Signs	Low-Level Radiation	2

HOOVER ES
PORTABLE 19
ASBESTOS SAMPLING INVENTORY

HOMOGENEOUS ID	MATERIAL	DESCRIPTION	# OF SAMPLES
A	Vinyl Floor Tile/Mastic	12" Off-White with White Specks/Yellow	2
B	Basecove/Mastic	4" Brown/Beige	2
C	Mastic	Gray, Sink Undercoat	1
D	Acoustical Ceiling Panel	2'x4' White, Textured	2
E	Mastic/Float	Brown/Gray, Brown Carpet Tiles	2
F	Mastic	Yellow, Closet Carpet	1
G	Basecove/Mastic	4" Light Green/Beige	1
H	Wall Panel	White & Brown, Interior Wall	2
I	Wallboard	White, Behind Wall Panel, no Joint Compound	1
J	Mastic	Beige, Walls Between Wall Panel & Wallboard	2
K	Coating	Gray, Exterior Ramp	1
L	Sealant	White, Exterior Window & Door Frames & Seams	2
M	Paint	Beige, Exterior Walls	2
N	Sealant	White & Tan, Roof, on Bolts & Seams	2
O	Mastic	Gray & Black, Pipe Penetrations	1
P	Sealant	Silver & Gray, Roof Seams	1
Q	Insulation	Brown, Paper, Fire Door	2

LEGEND

Asbestos Sample



VISTA ENVIRONMENTAL CONSULTING www.vista-env.com 2984 TEAGARDEN STREET SAN LEANDRO, CA 94577 510-346-8860		PROJECT TITLE HERBERT HOOVER ELEMENTARY SCHOOL	SHEET TITLE PORTABLE # 19 SAMPLE LOCATION	SCALE: DRAWN BY: CHECKED BY: PROJECT No. DATE: DRAWING No.	FIGURE 1

Forensic Analytical LABORATORIES

Final Report

Bulk Asbestos Analysis

(EPA Method 40CFR, Part 763, Appendix E to Subpart E and EPA 600/R-93-116, Visual Area Estimation)

Vista Environmental Consultants
Project Manager
2984 Teagarden St.

San Leandro, CA 94577

Client ID: L1161
Report Number: B263263
Date Received: 08/09/18
Date Analyzed: 08/10/18
Date Printed: 08/10/18
First Reported: 08/10/18

Job ID/Site: 180003005 - PAUSD, Hoover ES_5 Portables 19

Date(s) Collected: 08/08/2018

FALI Job ID: L1161
Total Samples Submitted: 25
Total Samples Analyzed: 25

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
19-A01	12065014						
Layer: Off-White Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
19-A02	12065015						
Layer: Off-White Tile			**ND**				
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
19-B01	12065016						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Talc (Trace)		**Asbestos (ND)**					
19-B02	12065017						
Layer: Brown Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Talc (Trace)		**Asbestos (ND)**					
19-C01	12065018						
Layer: Grey Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (15 %)		**Asbestos (ND)**					
19-D01	12065019						
Layer: Yellow Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Fibrous Glass (95 %)		**Asbestos (ND)**					
19-D02	12065020						
Layer: Yellow Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Fibrous Glass (95 %)		**Asbestos (ND)**					

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Report Number: B263263
Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
19-E01	12065021						
Layer: Brown Mastic			**ND**				
Layer: Grey Semi-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %)		**Asbestos (ND)**					
19-E02	12065022						
Layer: Brown Mastic			**ND**				
Layer: Grey Semi-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %)		**Asbestos (ND)**					
19-F01	12065023						
Layer: Yellow Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %)		**Asbestos (ND)**					
19-G01	12065024						
Layer: Light Green Non-Fibrous Material			**ND**				
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
19-H01	12065025						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
19-H02	12065026						
Layer: Tan Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (95 %)		**Asbestos (ND)**					
19-I01	12065027						
Layer: White Drywall			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (15 %)		**Asbestos (ND)**					
19-J01	12065028						
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (15 %)		**Asbestos (ND)**					
19-J02	12065029						
Layer: Beige Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (15 %) Synthetic (Trace)		**Asbestos (ND)**					

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Report Number: B263263

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
19-K01	12065030						
Layer: Grey Coating			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace) Talc (10 %)		**Asbestos (ND)**					
19-L01	12065031						
Layer: White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
19-L02	12065032						
Layer: White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
19-M01	12065033						
Layer: Off-White Skimcoat/Joint Compound			**ND**				
Layer: Beige Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %) Talc (Trace)		**Asbestos (ND)**					
19-M02	12065034						
Layer: Off-White Skimcoat/Joint Compound			**ND**				
Layer: Beige Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (10 %) Talc (Trace)		**Asbestos (ND)**					
19-N01	12065035						
Layer: White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
19-N02	12065036						
Layer: White Non-Fibrous Material			**ND**				
Layer: Paint			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					
19-O01	12065037						
Layer: Black Mastic			**ND**				
Total Composite Values of Fibrous Components: Cellulose (25 %)		**Asbestos (ND)**					
19-P01	12065038						
Layer: Grey Non-Fibrous Material			**ND**				
Total Composite Values of Fibrous Components: Cellulose (Trace)		**Asbestos (ND)**					

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Report Number: B263263

Client Name: Vista Environmental Consultants **Date Printed:** 08/10/18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer

Tad Thrower, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 19 PROJECT NUMBER: 180003005

SAMPLED BY: JR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
19	A	01	VFT/MAS	12" off white w/ white speaks /yellow		
19	A	02	↓	↓		
19	B	01	BC/MAS	4" Brown/Beige		
19	B	02	↓	↓		
19	C	01	Mastic	Gray, Pink undercoat		
19	D	01	ACP	2'x4' white textured		
19	D	02	↓	↓		
19	E	01	Mastic/Float	Brown/Gray /Brown Carpet tiles		
19	E	02	↓			
19	F	01	Mastic	Yellow, closet carpet		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

1. JR (TRANSFER SIGNATURE) Jonathan Rocha (PRINTED NAME) 08/09/18 0830 (DATE/TIME)
2. (TRANSFER SIGNATURE) (PRINTED NAME) (DATE/TIME)
3. (TRANSFER SIGNATURE) (PRINTED NAME) (DATE/TIME)

RECEIVED 3:15pm AUG 09 2018 YR DO

VISTA ENVIRONMENTAL CONSULTING
2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577
OFFICE 510.346.8860
FAX 888.653.8889

ASBESTOS BULK SAMPLE LOG

CLIENT: PAUSD DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 19 PROJECT NUMBER: 180003005

SAMPLED BY: JR CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
19	G	01	BC/MAS	4" light Green /Beige		
19	H	01	Wall Panel	white & Brown		
19	H	02	↓	↓		
19	I	01	Wall board	White		
19	J	01	Mastic	Beige		
19	J	02	↓	↓		
19	K	01	Coating	Gray, Exit Ramp		
19	L	01	Sealant	White, Exit window & door frames		
19	L	02	↓	↓		
19	M	01	Paint	Beige, text walls		

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
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3. (TRANSFER SIGNATURE) (PRINTED NAME) (DATE/TIME)

RECEIVED 3:15pm AUG 09 2018

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ASBESTOS BULK SAMPLE LOG

2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577

OFFICE 510.346.8860
FAX 888.653.8889

CLIENT: PAUSD

DATE: 08/08/18

LOCATION: Hoover ES_5 Portables 19

PROJECT NUMBER: 180003005

SAMPLED BY: JR

CAC OR SST NO:

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
19	M	02	↓	↓		
19	N	01	Sealant	White & tan / Roof		
19	N	02	↓	↓		
19	O	01	Mastic	Gray & Black / Pipe Penetration		
19	P	01	Sealant	Silver & Gray / Roof, Seams		
			25 Samples			

ANALYTICAL METHOD: PLM 400 PT COUNT TURNAROUND TIME: SAME DAY 24HR 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS:

CHAIN OF CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.	JR	Jonathan Rocha	08/09/18 0830
2.			
3.			

RECEIVED
AUG 09 2018
3:15pm
JR

EMSL Analytical, Inc.

464 McCormick Street San Leandro, CA 94577

Tel/Fax: (510) 895-3675 / (510) 895-3680

http://www.EMSL.com / sanleandrolab@emsl.com

EMSL Order:	091820646
Customer ID:	32VEOK25
Customer PO:	180003005
Project ID:	

Attention:	CHRIS BURNS	**Phone:**	(510) 346-8860
	Vista Environmental Consulting, Inc.	**Fax:**	
	2984 Teagarden St	**Received Date:**	09/21/2018 11:45 AM
	San Leandro, CA 94577	**Analysis Date:**	09/21/2018
		Collected Date:	09/20/2018

Project: 180003005 - PAUSD - HOOVER ES_5 PORTABLES - 16-5606

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
Q-01 *091820646-0001*	BUILDING 19 - INSULATION - BROWN, PAPER FIREDOOR	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
Q-02 *091820646-0002*	BUILDING 19 - INSULATION - BROWN, PAPER FIREDOOR	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected

Analyst(s)

Cecilia Yu (2)

Matthew Batongbacal
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc San Leandro, CA NVLAP Lab Code 101048-3, WA C884

Initial report from: 09/21/2018 21:01:07

OrderID: 091820646

VISTA ENVIRONMENTAL CONSULTING

№091820646

ASBESTOS BULK SAMPLE LOG

2984 TEAGARDEN STREET
SAN LEANDRO, CA 94577

OFFICE 510.346.8860
FAX 888.653.8889

CLIENT: PAUSD DATE: 9-20-18

LOCATION: Hoover ES_5 Portables PROJECT NUMBER: 180003005

SAMPLED BY: CE CAC OR SST No: 16-5606

BUILDING	HOMO AREA ID	NUMBER	MATERIAL	DESCRIPTION	LOCATION	QUANTITY (SF/LF/EA)
19	Q	01	Insulation	Brown, Paper Fiberglass		
19	Q	02	↓	↓		

2 Samples

ANALYTICAL METHOD: PLM ~~400 PT COUNT~~ TURNAROUND TIME: SAME DAY (24HR) 48 HR 3 DAY

DATA SENT TO: CHRISTOPHER BURNS VIA E-MAIL: CHRISBURNS@VISTA-ENV.COM
QUESTIONS CALL: 510.658.8860

SPECIAL INSTRUCTIONS: _____

CHAIN ~~OF~~ CUSTODY:

	TRANSFER SIGNATURE	PRINTED NAME	DATE/TIME
1.		Chris Elliott	9-20-18
2.			9/21/18 11:45am W
3.			

PAGE 1 OF 1