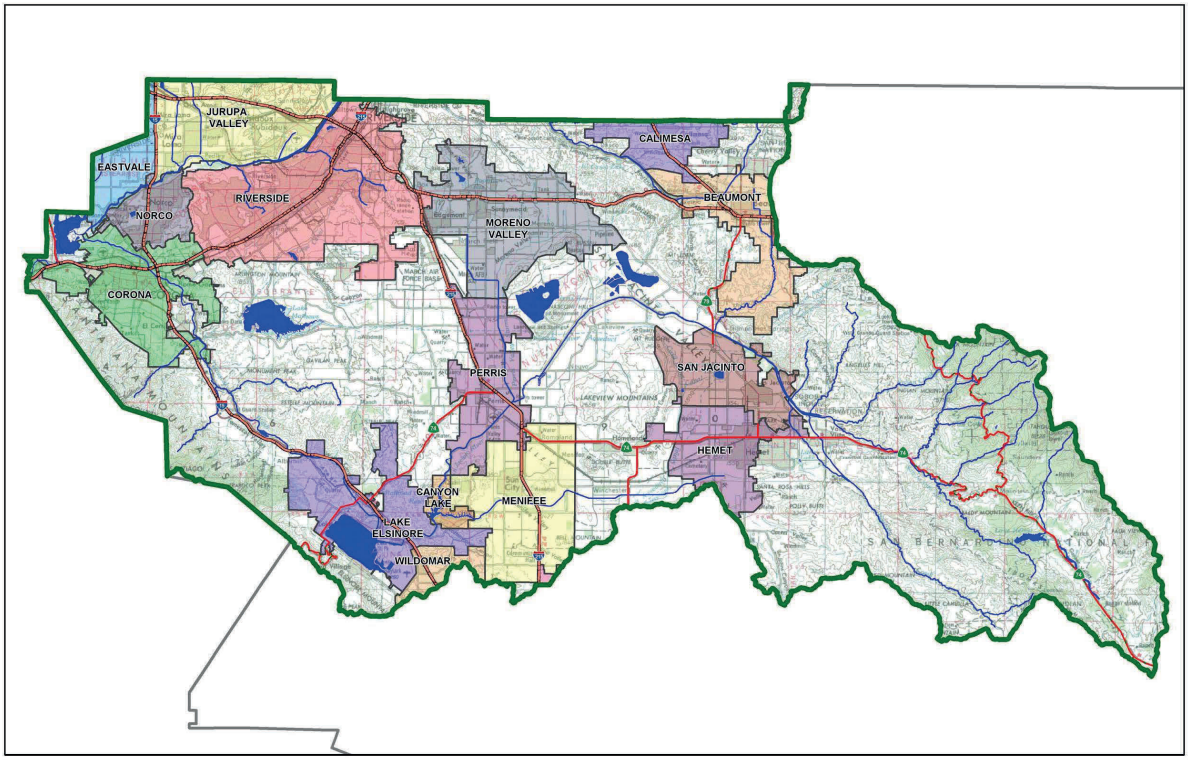
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: 2226 Fleetwood Drive

Public Works No:

Design Review/Case No: MA23090 (SDP23053)



Contact Information:

Prepared for: HYB Group, 1601 Hastings Heights Lane, Pasadena, CA 91107

Prepared by: Cannon Corporation, 16842 Von Karman Ave., #150, Irvine, CA 92606. 949-753-8111

☒ **Preliminary**
☐ **Final**

Original Date Prepared: 03/05/2023

Revision Date(s): 06/19/2024, 01/14/2025

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for HYB Group by Cannon Corporation for the 2226 Fleetwood Drive project.

This WQMP is intended to comply with the requirements of the City of Riverside for 2226 Fleetwood Drive, Planning Case No. MA23090 (SDP23053) which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City of Riverside Water Quality Ordinance (Municipal Code Section 14.12.315).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	Date
Samuel J. Jacoby	Principal Civil Engineer
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure:

Table of Contents

Section A: Project and Site Information 5

A.1 Maps and Site Plans 5
A.2 Receiving Waters 6
A.3 Additional Permits/Approvals required for the Project: 6

Section B: Optimize Site Utilization (LID Principles) 7

Section C: Delineate Drainage Management Areas (DMAs) 8

Section D: Implement LID BMPs 9

D.1 Infiltration Applicability 9
D.2 Harvest and Use Assessment 10
D.3 Bioretention and Biotreatment Assessment 11
D.4 Feasibility Assessment Summaries 12
D.5 LID BMP Sizing 13

Section E: Alternative Compliance (LID Waiver Program) 15

E.1 Pollutants of Concern 16
E.2 Stormwater Credits 17
E.3 Sizing Criteria 17
E.4 Treatment Control BMP Selection 18

Section F: Hydromodification 19

F.1 Hydrologic Conditions of Concern (HCOC) Analysis 19
F.2 HCOC Mitigation 20

Section G: Source Control BMPs 21

Section H: Construction Plan Checklist 21

Section I: Operation, Maintenance and Funding 22

List of Tables

Table A.1 Identification of Receiving Waters 6
Table A.2 Other Applicable Permits 6
Table C.1 DMA Classifications 8
Table C.2 Type 'A', Self-Treating Areas 8
Table C.3 Type 'B', Self-Retaining Areas 8
Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas 8
Table C.5 Type 'D', Areas Draining to BMPs 8
Table D.1 Infiltration Feasibility 9
Table D.2 LID Prioritization Summary Matrix 12
Table D.3 DCV Calculations for LID BMPs 13
Table E.1 Potential Pollutants by Land Use Type 16
Table E.2 Water Quality Credits 17
Table E.3 Treatment Control BMP Sizing 17
Table E.4 Treatment Control BMP Selection 18
Table F.1 Hydrologic Conditions of Concern Summary 19
Table G.1 Permanent and Operational Source Control Measures 21
Table H.1 Construction Plan Cross-reference 21

List of Appendices

Appendix 1: Maps and Site Plans 23
Appendix 2: Construction Plans 24
Appendix 3: Soils Information 25
Appendix 4: Historical Site Conditions 26
Appendix 5: LID Infeasibility 27
Appendix 6: BMP Design Details 28
Appendix 7: Hydromodification 29
Appendix 8: Source Control 30
Appendix 9: O&M 31
Appendix 10: Educational Materials ..... - 32 -

Section A: Project and Site Information

The project proposes to redevelop the site to fit a 84,000 square foot industrial building with related loading docks and parking.

PROJECT INFORMATION			
Type of Project:	Industrial		
Ward Area:			
Community Name:	City of Jurupa		
Development Name:	2226 Fleetwood Drive		
PROJECT LOCATION			
Latitude & Longitude (DMS):	34.016822°, -117.375821°		
Project Watershed and Sub-Watershed:	Santa Ana; Santa Ana River; Reach 3 and Reach 4		
PIN:	178350024, 178350026, 178350029, 178350030		
Map Book and Page No.:	PIN: 178350024 - 13;49-52, PIN: 178350026 – 9;34, PIN: 178350029- 247;69-71 PIN: 178350030- 247;69-71		
PROJECT CHARACTERISTICS: INDUSTRIAL			
Proposed or Potential SIC Code(s):		1541	
Area of Impervious Project Footprint (SF)		250,227	
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement		250,227	
Does the project consist of offsite road improvements?		☐ Y	☒ N
Does the project propose to construct unpaved roads?		☐ Y	☒ N
Is the project part of a larger common plan of development (phased project)?		☐ Y	☒ N
EXISTING SITE CHARACTERISTICS			
Total area of existing Impervious Surfaces within the project limits (SF)		O SF	
Is the project located within any MSHCP Criteria Cell?		☐ Y	☒ N
If so, identify the Cell number:			
Are there any natural hydrologic features on the project site?		☐ Y	☒ N
Is a Geotechnical Report attached?		☒ Y	☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)			
What is the Water Quality Design Storm Depth for the project?		0.65	

A.1 Maps and Site Plans

Appendix 1 includes a map of the local vicinity and existing site. In addition, the WQMP Site Plan located in Appendix 1 includes the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

A.2 Receiving Waters

In order of upstream to downstream, the receiving waters that the project site is tributary to are as follows. A map of the receiving waters is included in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	Hydrologic Unit	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Santa Ana River, Reach 4	801.21	Indicator Bacteria	GWR, REC1, REC2, WARM, WILD, RARE, SPWN	N/A
Santa Ana River, Reach 3	801.21	Copper (78216) , Lead (100184) , Indicator Bacteria (97066)	AGR, GWR,REC1,,REC2, ARM, WILD, RARE SPWN	N/A

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)*		
City of Riverside Conditional Use Permit	☐ Y	☐ N
City of Riverside Design Review	☐ Y	☐ N
City of Riverside Building Permit	☐ Y	☐ N
City of Riverside Grading Permit	☐ Y	☐ N
City of Riverside Construction Permit	☐ Y	☐ N

Section B: Optimize Site Utilization (LID Principles)

Site Optimization

Does the project identify and preserve existing drainage patterns? If so, how? If not, why?

The existing site is sloped from northwest to southeast, and the surface is composed of compacted gravel and bare earth. The current use is for a truck driving school with the southern gravel lot having numerous WB-67 trailers parked onsite while the northern gravel lot is vacant. Along the eastern property boundary, there is an abrupt grade change that outlines the hinge line of the Santa Ana River. The existing drainage pattern is being preserved, since the site runoff is still draining from northwest to southeast towards an existing outfall in the proposed condition.

Does the project identify and protect existing vegetation? If so, how? If not, why?

There is no existing vegetation within the existing property lines.

Does the project identify and preserve natural infiltration capacity? If so, how? If not, why?

Approximately 50% of the site will be undeveloped and remain pervious. Further, all runoff from the proposed improvements will be captured and conveyed to the three (3) onsite infiltration chambers.

Does the project identify and minimize impervious area? If so, how? If not, why?

Yes, due to steep slope constraints along the east side of property, approximately 50% of site will remain undeveloped. Further, this proposal meets the landscape buffer requirements within the surface parking lots.

Does the project identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes. If the infiltration chambers are at or exceed capacity, this proposal includes overflow pipes at each chamber that discharge to the adjacent pervious areas onsite to the south and east.

Delineate Drainage Management Areas (DMAs)

Table B.1 DMA Classifications

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
DMA - 1	Commercial building, asphalt, concrete, landscaping, pervious	221,237	D
DMA - 2	Asphalt, concrete, landscaping, pervious	84,316	D
DMA - 3	Undeveloped	118,175	A

Table B.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
DMA - 3	118,175	None, natural grade	None

Table B.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]
N/A						

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table B.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					**Receiving Self-Retaining DMA**		
DMA Name/ ID	Area (square feet) [A]	Post-project surface type	Runoff factor [B]	Product [C] = [A] x [B]	DMA name /ID	Area (square feet) [D]	Ratio [C]/[D]
N/A							

Table B.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA-1	BMP-1 Infiltration Chambers
DMA-2	BMP-2 Infiltration Chambers

Section C: Implement LID BMPs

C.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (ref: Chapter 2.4.4 of the WQMP Guidance Document)? ☐ Y ☒ N

Geotechnical Report

A Geotechnical Report is required by the City of Riverside to confirm present and past site characteristics that may affect the use of Infiltration BMPs, see Appendix 3.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table C.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?		X
If Yes, list affected DMAs:		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identifies other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

C.2 Harvest and Use Assessment

The following conditions apply*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐ Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verified with the City of Riverside).

☒ The Design Capture Volume will be addressed using Infiltration Only BMPs. (Harvest and Use BMPs are still encouraged but are not required as the Design Capture Volume will be infiltrated or evapotranspired).

☐ None of the above.

Harvest and Use BMPs need NOT be assessed for the site.

Irrigation Use Feasibility

Step 1: *Total Area of Irrigated Landscape*:

Type of Landscaping (Conservation Design or Active Turf):

Step 2: *Total Area of Impervious Surfaces:*

Step 3: *The project EIATIA factor*:

Step 4: *Minimum required irrigated area*:

Step 5:

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)

Toilet Use Feasibility

Step 1: *Projected Number of Daily Toilet Users:*

Project Type:

Step 2: *Total Area of Impervious Surfaces:*

Step 3: *The project TUTIA factor:*

Step 4: *Minimum number of toilet users:*

Step 5:

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)

Other Non-Potable Use Feasibility

N/A

Step 1: *Average Daily Demand: N/A*

Step 2: *Total Area of Impervious Surfaces: N/A*

Step 3: *The project factor: N/A*

Step 4: *Minimum required use: N/A*

Step 5:

Minimum required non-potable use (Step 4)	Projected average daily use (Step 1)
N/A	N/A

C.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

For the project, the following applies:

☐ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5.

☒ None of the above.

C.4 Feasibility Assessment Summaries

Table C.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA-1	☒	☐	☐	☐	☐
DMA-2	☒	☐	☐	☐	☐
DMA-3	☐	☐	☐	☐	☒
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

C.5 LID BMP Sizing

Table C.3 DCV Calculations for LID BMPs – DMA 1

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* **BMP-1**		
	[A]		[B]	[C]	[A] x [C]			
1	*221,237*	*Roof, pavement*	*1*	*0.89*	*197,343*	*Design Storm Depth (in)*	*Design Capture Volume,* $\mathbf{V_{BMP}}$ *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	A_T = 221,237				Σ= [D]= 197,343	[E]=0.65	$[F] = \frac{[D]x[E]}{12} = 10,689$	[G] ***12,111***

[B], [C] are obtained from Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A of the WQMP Guidance Document
[G] is obtained from LID BMP design procedure sheet, placed in Appendix 6

Table C.4 DCV Calculations for LID BMPs – DMA 2

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* **BMP-2**		
	[A]		[B]	[C]	[A] x [C]			
2	*84,316*	*Roof, pavement*	*1*	*0.89*	*75,210*	*Design Storm Depth (in)*	*Design Capture Volume,* $\mathbf{V_{BMP}}$ *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	A_T = 84,316				Σ= [D]= 75,210	[E]=0.65	$[F] = \frac{[D]x[E]}{12} = 4,074$	[G] ***4,742***

[B], [C] are obtained from Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A of the WQMP Guidance Document
[G] is obtained from LID BMP design procedure sheet, placed in Appendix 6

Table C.5 DCV Calculations for LID BMPs – DMA 3

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* *N/A*		
	[A]		[B]	[C]	[A] x [C]			
3	*118,175*	*Natural Ground*	*0.3*	*0.23*	*26,609*	*Design Storm Depth (in)*	*Design Capture Volume,* $\mathbf{V_{BMP}}$ *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	A_T = 118,175				Σ= [D]= 26,609	[E]=0.65	$[F] = \frac{[D]x[E]}{12} = 1{,}441$	0

[B], [C] are obtained from Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A of the WQMP Guidance Document

[G] is obtained from LID BMP design procedure sheet, placed in Appendix 6

Section D: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to confirmation of LID waiver approval by the Regional Board). For the project, the following applies:

☐ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

D.1 Pollutants of Concern

Table D.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☒ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☒ Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☐ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☒	☒	☒	☐	☐	☒	☒	☒

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

D.2 Stormwater Credits

N/A

Table D.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
N/A	
Total Credit Percentage[1]	

[1]Cannot Exceed 50%

[2]Obtain corresponding data from Table 3-8 in the WQMP Guidance Document

D.3 Sizing Criteria

Table D.3 Treatment Control BMP Sizing

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Area x Runoff Factor		*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]				
						Design Storm Depth (in)	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
Not Applicable									
	A_T = Σ[A]				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12

[H] is from the Total Credit Percentage as Calculated from Table E.2 above

[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

D.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Table D.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
Infiltration #1	Bacterial Indicators, Metals, Nutrients, Sediments, trash and debris, oil and grease	80%
Infiltration #2	Bacterial Indicators, Metals, Nutrients, Sediments, trash and debris, oil and grease	80%

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.

[2] Cross Referenced from Table E.1 above.

[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section E: Hydromodification

E.1 Hydrologic Conditions of Concern (HCOC) Analysis

The project does not create a Hydrologic Condition of Concern, meeting the criteria for HCOC Exemption as shown below:

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The City of Riverside has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the City of Riverside

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

Results included in Table F.1 below and hydrologic analysis included in Appendix 7.

Table E.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration			
Flow (CFS)			
Volume (Cubic Feet)			

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (Prado Dam, Santa Ana River) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

E.2 HCOC Mitigation

As an alternative to the HCOC Exemption Criteria above, HCOC criteria is considered mitigated if the project meets one of the following conditions, as indicated:

☐ a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

☒ b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

☐ c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

☐ d. None of the above.

Section F: Source Control BMPs

The following table identifies the potential sources of runoff pollutants for this project and specifies how they are addressed through permanent controls and operational BMPs:

Table F.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
Building roof		
Paving throughout site	All paving to be swept at least every 2 weeks and before all rainstorms.	
Refuse area	Signage and all trash enclosures to be covered from storm water	

Section G: Construction Plan Checklist

Table G.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Plan Sheet Number(s)	Latitude / Longitude
	Provided at final WQMP		

Section H: Operation, Maintenance and Funding

As required by the City of Riverside, the following Operation, Maintenance and Funding details are provided as summarized:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred.
3. An outline of general maintenance requirements for the Stormwater BMPs selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance.

See Appendix 9 for a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on site, and an agreement assigning responsibility for maintenance and providing for inspections and certification.

Maintenance Mechanism: COVENANT

Will the proposed BMPs be maintained by a Homeowners' Association (HOA) or Property Owners Association (POA)?

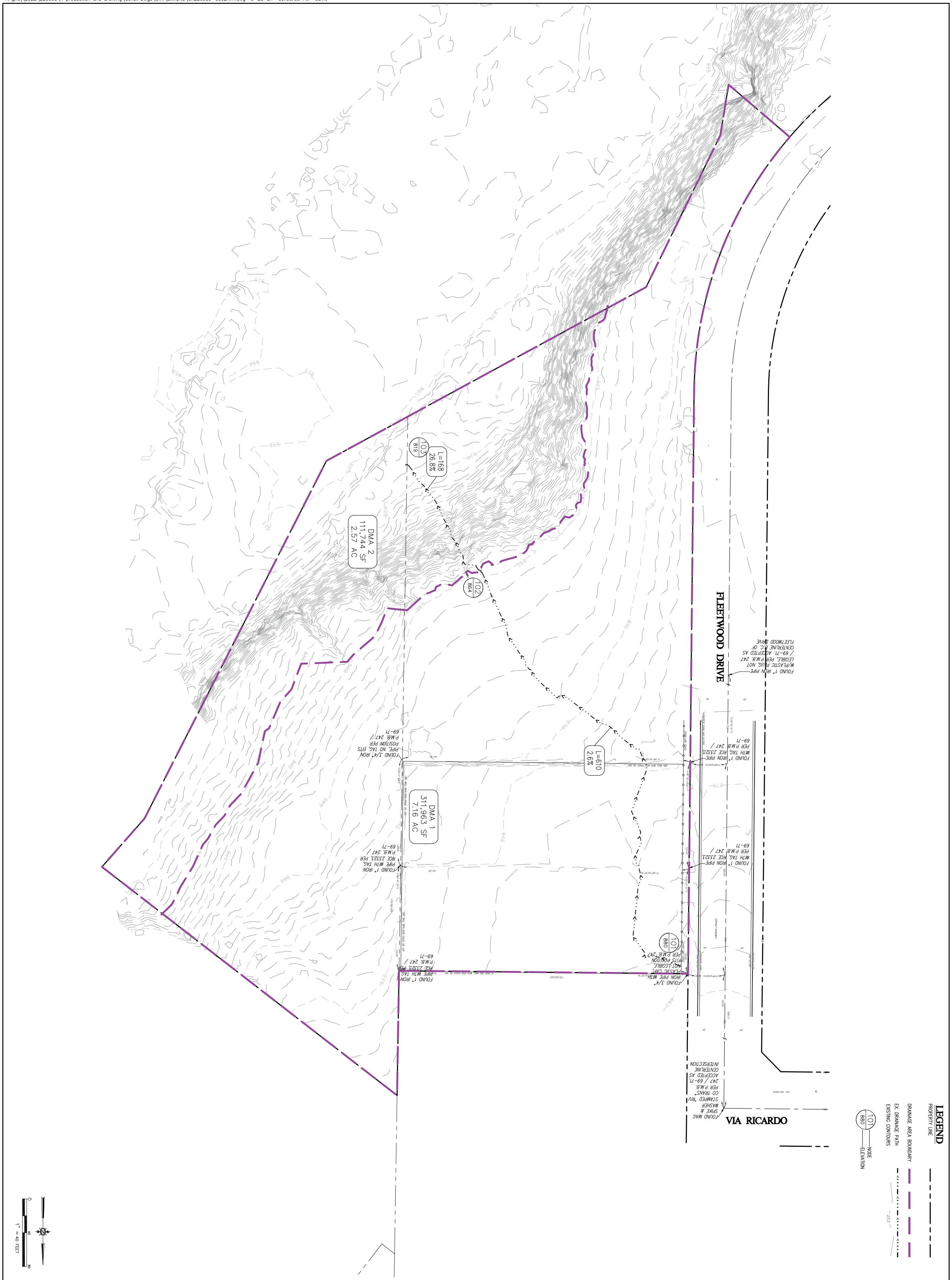
☐ Y ☒ N

Operation and Maintenance Plan and Maintenance Mechanism is included in Appendix 9. Educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP are included in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

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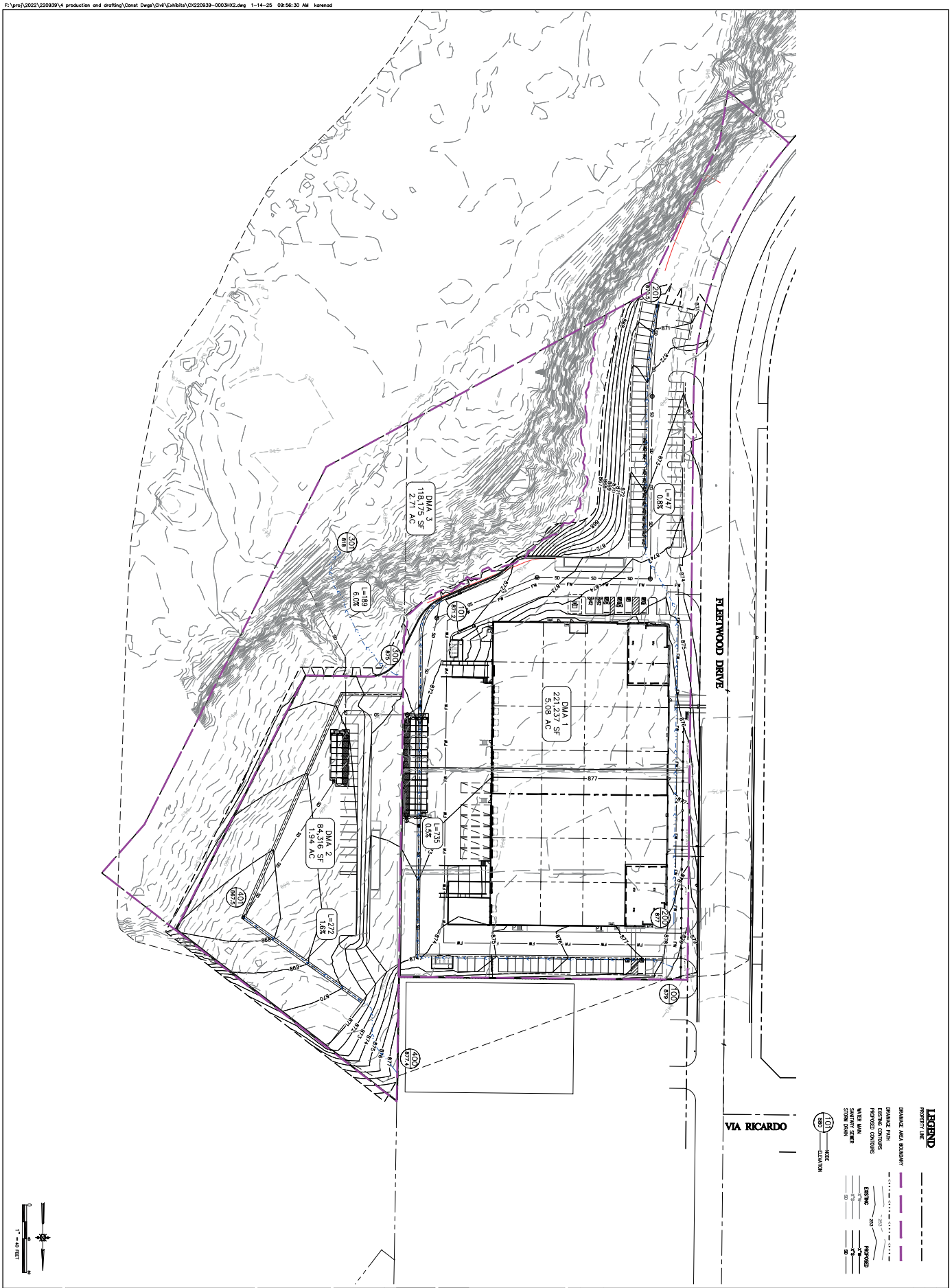
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		CHECKED BY: SJ	SCALE: AS SHOWN
			CA JOB NO.: 220939

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11900 Olympic Blvd, Suite 530
Los Angeles, CA 90064
P 310.664.1166 F 310.664.8877

REV. NO	DATE	REVISED	DESTROY ALL PRINTS BEARING EARLIER DATE	REV. BY	CKD. BY	APRD BY

F:\proj\2022\220939\4 production and drafting\Const Dwgs\Civil\Exhibits\CX220939-0003HX2.dwg 1-14-25 09:56:30 AM karenad



SHEET HX2

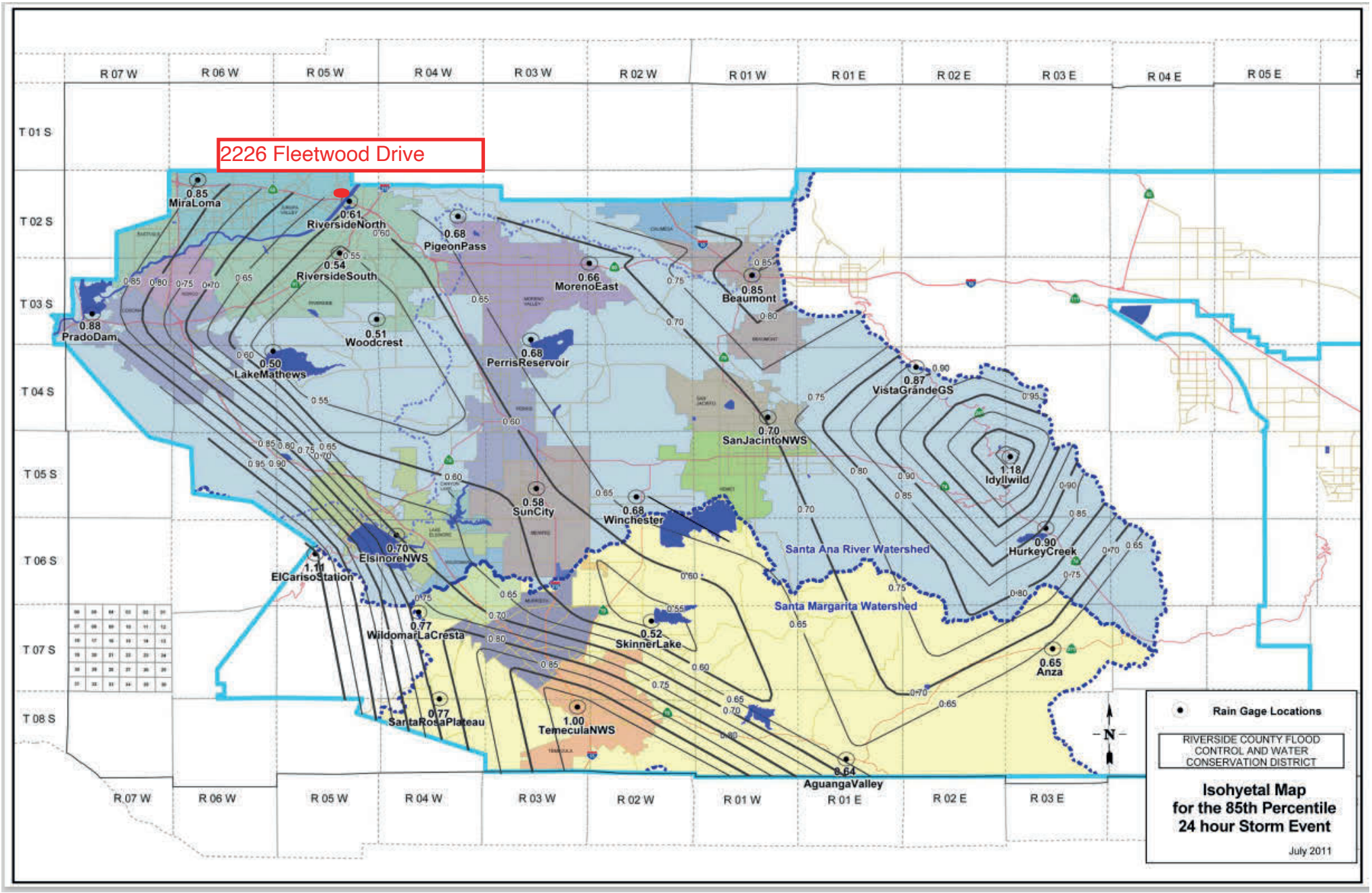
HYB, LLC
FLEETWOOD INDUSTRIAL
PR. HYDROLOGY EXHIBIT
JURUPA VALLEY, CA

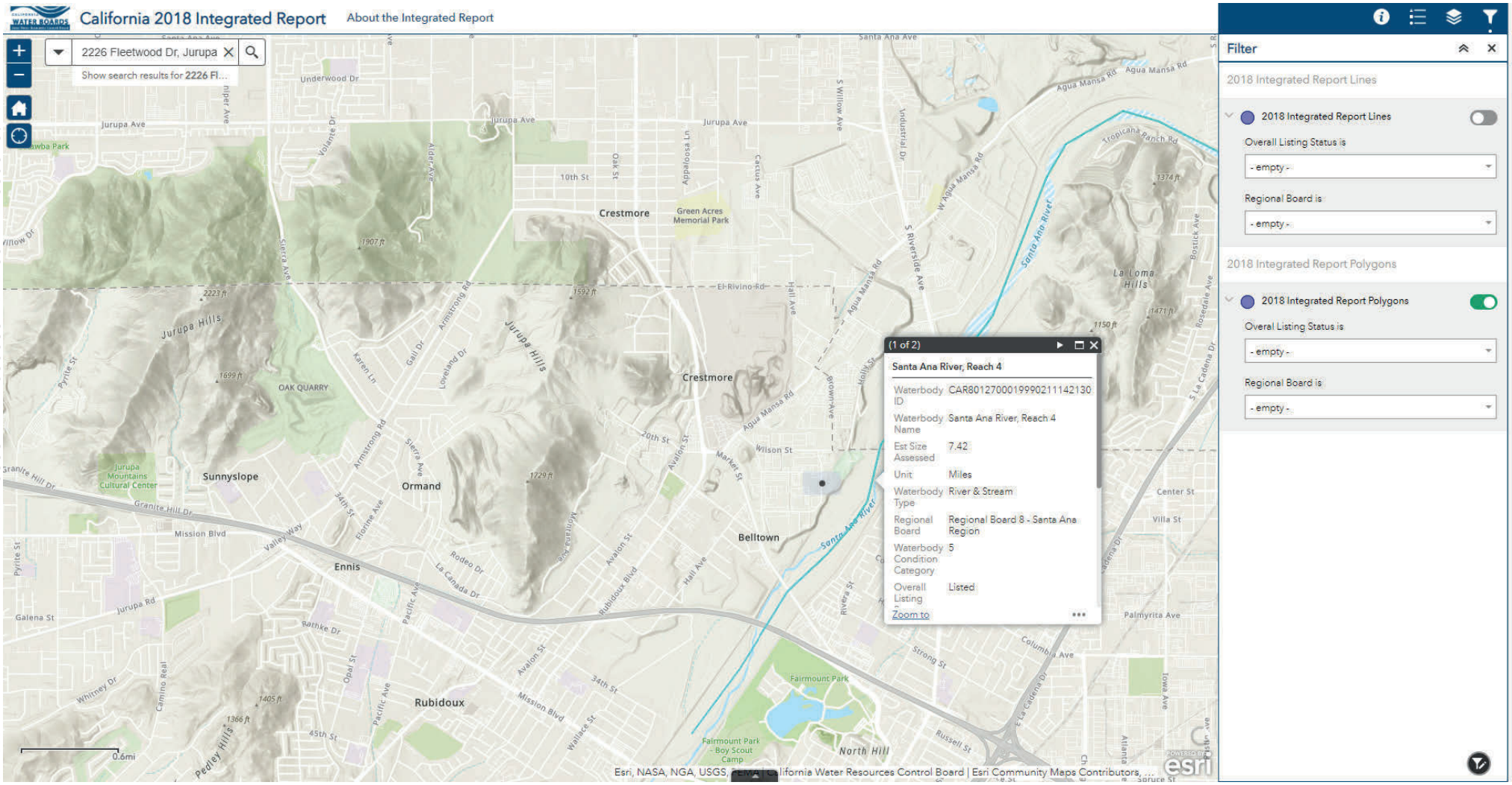
DRAWN BY	DATE
CP	1/14/2025
CHECKED BY	SCALE
SJ	AS SHOWN
	CA JOB NO. 220939

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REV. NO	DATE	REVISED	DESTROY ALL PRINTS BEARING EARLIER DATE	REV. BY	CKD BY	APPD BY


2226 Fleetwood Drive
R 07 W
R 06 W
R 05 W
R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
R 04 E
R 05 E
T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S
0.85 MiraLoma
0.61 RiversideNorth
0.68 PigeonPass
0.54 RiversideSouth
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.68 PerrisReservoir
0.50 LakeMathews
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
Santa Ana River Watershed
Santa Margarita Watershed
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley
N
Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map for the 85th Percentile 24 hour Storm Event
July 2011


California 2018 Integrated Report
About the Integrated Report
2226 Fleetwood Dr, Jurupa
Show search results for 2226 Fl...
Filter
2018 Integrated Report Lines
2018 Integrated Report Lines
Overall Listing Status is
- empty -
Regional Board is
- empty -
2018 Integrated Report Polygons
2018 Integrated Report Polygons
Overal Listing Status is
- empty -
Regional Board is
- empty -
(1 of 2)
Santa Ana River, Reach 4
Waterbody ID CAR8012700019990211142130
Waterbody Name Santa Ana River, Reach 4
Est Size Assessed 7.42
Unit Miles
Waterbody Type River & Stream
Regional Board Regional Board 8 - Santa Ana Region
Waterbody Condition Category 5
Overall Listing Listed
Zoom to
Crestmore
Green Acres Memorial Park
Jurupa Hills
OAK QUARRY
Sunnyslope
Ormand
Ennis
Belltown
Rubidoux
North Hill
La Loma Hills
Fairmount Park
Fairmount Park - Boy Scout Camp
Jurupa Mountains Cultural Center
Santa Ana River
Esri, NASA, NGA, USGS, FEMA | California Water Resources Control Board | Esri Community Maps Contributors, ...
0.6mi

Appendix 2: Construction Plans

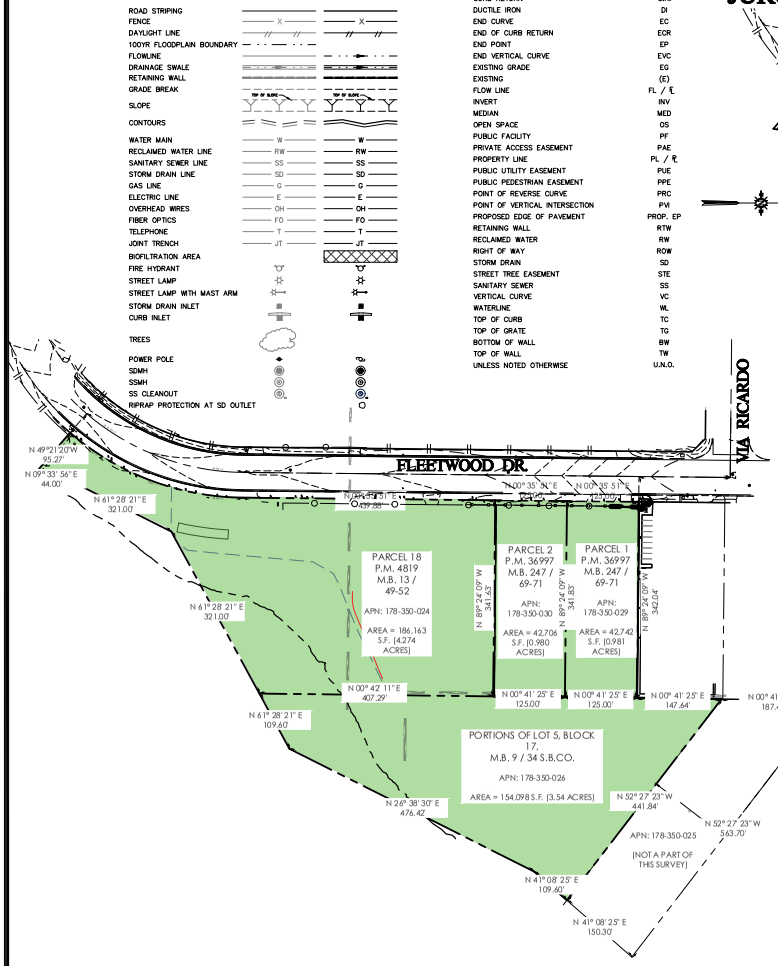
Grading and Drainage Plans

FLEETWOOD INDUSTRIAL
PRELIMINARY GRADING PLAN
2240 FLEETWOOD DRIVE
JURUPA VALLEY, RIVERSIDE COUNTY, CALIFORNIA

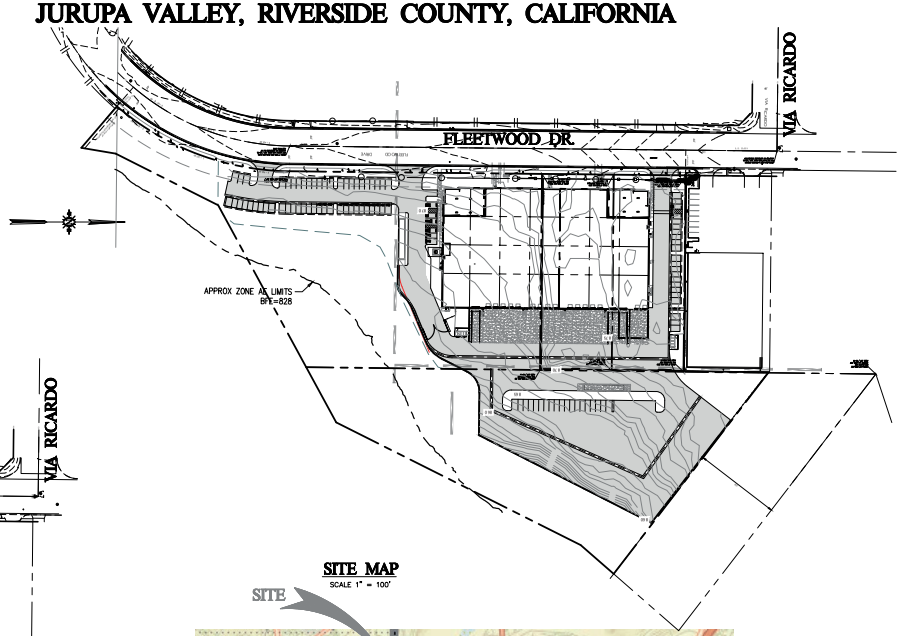
LEGEND AND ABBREVIATIONS

	EXISTING	PROPOSED
TRACT BOUNDARY		
PROPERTY LINE		
RIGHT-OF-WAY		
EASEMENT/SETBACK		
STREET CENTERLINE		
CURB		
CURB & GUTTER		
ROAD STRIPING		
FENCE	X	X
DAYLIGHT LINE		
100YR FLOODPLAIN BOUNDARY		
FLOWLINE		
DRAINAGE SWALE		
RETAINING WALL		
GRADE BREAK		
SLOPE		
CONTOURS		
WATER MAIN	W	W
RECLAIMED WATER LINE	RW	RW
SANITARY SEWER LINE	SS	SS
STORM DRAIN LINE	SD	SD
GAS LINE	G	G
ELECTRIC LINE	E	E
OVERHEAD WIRES	OH	OH
FIBER OPTICS	FO	FO
TELEPHONE	T	T
JOINT TRENCH	JT	JT
BIOFILTRATION AREA		
FIRE HYDRANT		
STREET LAMP		
STREET LAMP WITH MAST ARM		
STORM DRAIN INLET		
CURB INLET		
TREES		
POWER POLE		
SDMH		
SSMH		
SS CLEANOUT		
RIPRAP PROTECTION AT SD OUTLET		

ASPHALT CONCRETE	AC
BEGINNING CURVE	BC
BEGINNING OF CURB RETURN	BCR
BEGINNING POINT	BP
BEGIN VERTICAL CURVE	BVC
BOTTOM FACE OF CURB	BFC
CENTERLINE	CL / ℄
CURB RETURN	C.R.
DUCTILE IRON	DI
END CURVE	EC
END OF CURB RETURN	EOR
END POINT	EP
END VERTICAL CURVE	EVC
EXISTING GRADE	EG
EXISTING	(E)
FLOW LINE	FL / ℄
INVERT	INV
MEDIAN	MED
OPEN SPACE	OS
PUBLIC FACILITY	PF
PRIVATE ACCESS EASEMENT	PAE
PROPERTY LINE	PL / ℄
PUBLIC UTILITY EASEMENT	PUE
PUBLIC PEDESTRIAN EASEMENT	PPE
POINT OF REVERSE CURVE	PRC
POINT OF VERTICAL INTERSECTION	PVI
PROPOSED EDGE OF PAVEMENT	PROP. EP
RETAINING WALL	RTW
RECLAIMED WATER	RW
RIGHT OF WAY	ROW
STORM DRAIN	SD
STREET TREE EASEMENT	STE
SANITARY SEWER	SS
VERTICAL CURVE	VC
WATERLINE	WL
TOP OF CURB	TC
TOP OF GRATE	TG
BOTTOM OF WALL	BW
TOP OF WALL	TW
UNLESS NOTED OTHERWISE	U.N.O.



PARCEL MERGER MAP
SCALE 1" = 100'



SITE MAP
SCALE 1" = 100'



VICINITY MAP
NOT TO SCALE

OWNER/DEVELOPER:
HYB, LLC
ATTENTION: HOVEL BABIKIAN
1601 HASTINGS HEIGHTS LANE
PASADENA, CA 91107
PHONE: 626-825-1817

ENGINEER/SURVEYOR:
CANNON
ATTENTION: SAMUEL JACOBY
16842 VON KARMAN AVENUE, SUITE 150
IRVINE, CA 92606
PHONE: 949-681-0255

UTILITIES:
WATER: EMWD
STORM DRAINAGE: CITY OF JURUPA VALLEY

APN:
178-350-022, -029, -030, -024

BASIS OF ELEVATION:
PROVIDED BY OWNER

BASIS OF BEARINGS:
PROVIDE BY OWNER

GEOTECHNICAL REPORT:
ENVIORMENTAL GEOTECHNOLOGY LABORATORY, INC
11819 GOLDRING ROAD, SUITE A
ARCADIA, CA 91006
626-263-3588
RYAN JONES, GE 2852

REPORT DATE 10/31/22
EGL PROJECT: 22-257-004L

FLOOD MAPPING:
LAND DESCRIBED HEREIN IS WITHIN ZONE X, BY GRAPHIC PLOT, ACCORDING TO FIRM PANEL 06065C0045G, EFFECTIVE DATE: 8/28/2008

SITE AREA:
6.37 ACRES

EARTHWORK QUANTITIES:

CUT	3,379 CY
FILL	15,753 CY
IMPORT	12,403 CY
OVEREXCAVATION	7,979 CY
SHRINKAGE (10% ASSUMED)	797 CY
NET CUT	11,358 CY
NET FILL	24,529 CY
NET EXPORT	13,171 CY

Sheet List Table

Sheet Number	Sheet Title
1	PRELIMINARY GRADING TITLE SHEET
2	PRELIMINARY GRADING – NORTH
3	PRELIMINARY GRADING – SOUTH
4	PRELIMINARY GRADING – EAST
5	PRELIMINARY CROSS SECTIONS
6	FLEETWOOD DRIVE – STA 1+00 TO 10+87.81
7	DETAILS AND TYPICAL SECTION

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TWO WORKING DAYS BEFORE YOU DIG

8930 LIMONITE AVE
JURUPA VALLEY, CA 92509
TEL: (951) 332-6464
EMAIL: ENGINEERING@JURUPAVALLEY.ORG

IMPORTANT NOTE:
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MARK	DATE	INITIAL	DESCRIPTION	REC.	APPR	DATE
		E.O.R.	REVISION			

BENCHMARK:
B.M. NO. M.L.-4-64 NAVD 1988 COUNTY OF RIVERSIDE AT THE NE CORNER OF THE HALL AVE BRIDGE #56-415, OVER HWY #60, 246.0' SW OF 28TH AVE, 15.0' S. OF HALL AVE AT THE NE END OF THE RAIL ABUTMENT AND 2.0' HIGHER THAN THE SIDEWALK, A BRASS DISK SET IN THE TOP OF A 1.0' X 2.0' CONCRETE POST AND MARKED M.L.-4-64.
ELEVATION = 857.288 FEET

BASIS OF BEARING:
THE BEARING OF N 00°35'51" E ALONG THE CENTERLINE OF FLEETWOOD AVENUE PER PMB 247/69-71, CITY OF JURUPA VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

REGISTERED PROFESSIONAL ENGINEER SAMUEL J. JACOBY C74309 EXP.6/30/25 CIVIL STATE OF CALIFORNIA

Cannon
16842 Von Karman Avenue, Suite 150
Irvine, CA 92606
P 949.753.8111 F 949.753.0775

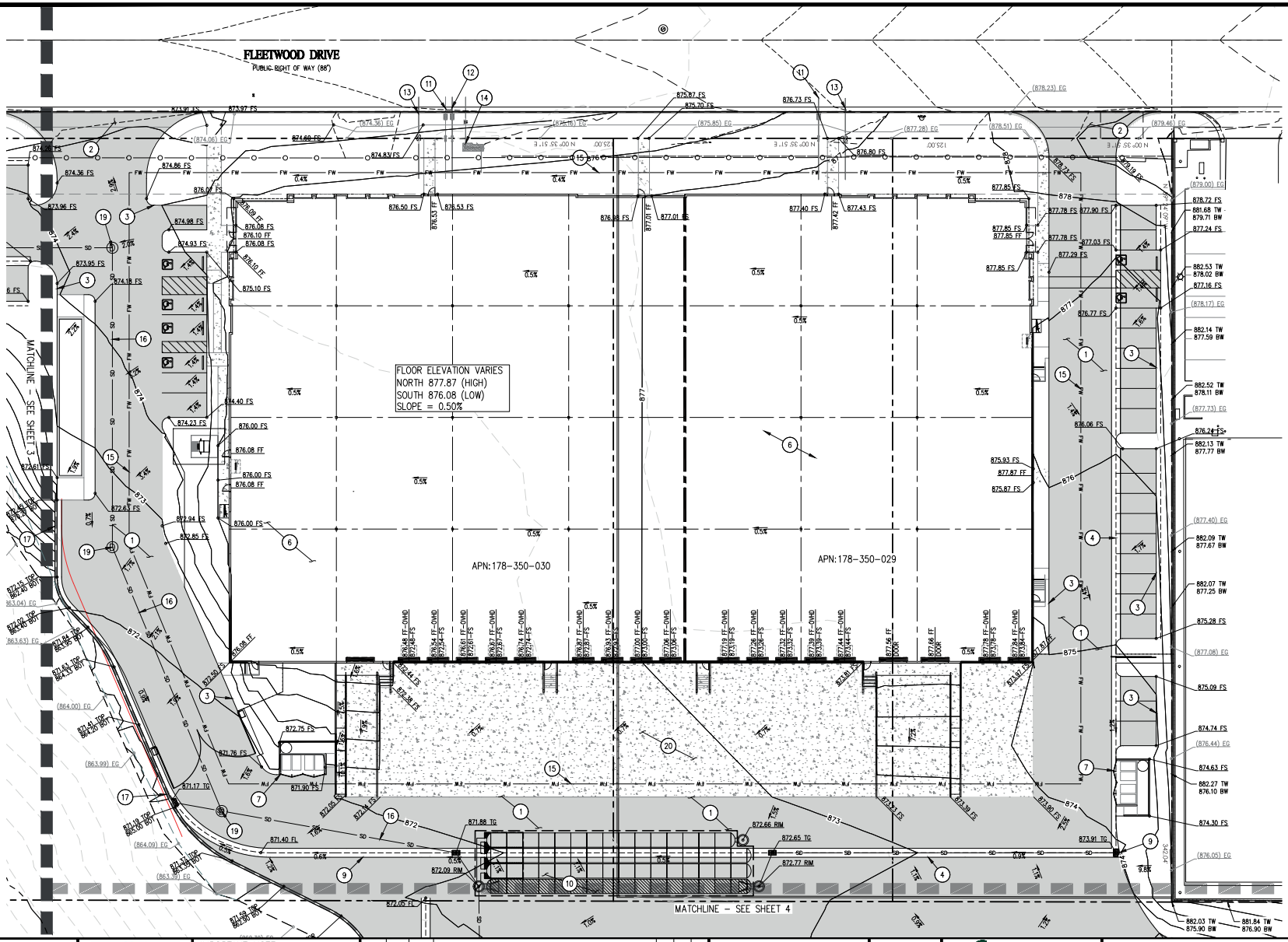
PLANS PREPARED UNDER THE SUPERVISION OF:
SAMUEL JOHN JACOBY, P.E.
R.C.E. #C74309 (EXP. 6/30/23)
4/30/2025
DATE

CITY OF JURUPA VALLEY
PRELIMINARY GRADING PLANS
HYB, LLC, – FLEETWOOD INDUSTRIAL
2240 FLEETWOOD DR.
PRELIMINARY GRADING TITLE SHEET

ACCT. NO.

SHEET 1 OF 7

FOR: | W.O | CITY I. D. NO.



CONSTRUCTION NOTES

1. CONSTRUCT ASPHALT CONCRETE (AC) PAVEMENT, 0.40' AC OVER 0.50' AGGREGATE BASE COURSE
2. CONSTRUCT DRIVEWAY
3. CONSTRUCT CURB
4. CONSTRUCT LONGITUDINAL GUTTER
5. TRUCK SCALE PER BUILDING PLAN
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15. FIRE LINE, CONCEPTUAL
16. STORM DRAIN
17. RETAINING WALL
18. STORM DRAIN WITH ENERGY DISSIPATER AT BOTTOM OF EXIST BLUFF
19. STORM DRAIN MANHOLE
20. CONSTRUCT PORTLAND CEMENT CONCRETE PAVEMENT (PCC), 6" PCC OVER 6" AGGREGATE BASE COURSE

LEGEND

	EXISTING	PROPOSED
EXISTING CONTOURS		
PROPOSED CONTOURS		
WATER MAIN	X"W	X"W
SANITARY SEWER	X"S	X"S
STORM DRAIN	SD	SD
FENCE		
IRON FENCE		
AC PAVING		
CONCRETE WALKWAY		
STRUCTURAL LOADING DOCK CONCRETE		

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JURUPA VALLEY, CA 92509
TEL: (951) 332-6464
EMAIL: ENGINEERING@JURUPAVALLEY.ORG

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C74309
EXP.6/30/25
REGISTERED PROFESSIONAL ENGINEER
SAMUEL J. JACOBY
CIVIL
STATE OF CALIFORNIA

Cannon
19842 MacArthur Boulevard, Suite 150
Irvine, CA 92606
P 949.753.8111 F 949.753.0775

PLANS PREPARED UNDER THE SUPERVISION OF:
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R.C.E. #C74309 (EXP: 6/30/23)
4/30/2025
DATE

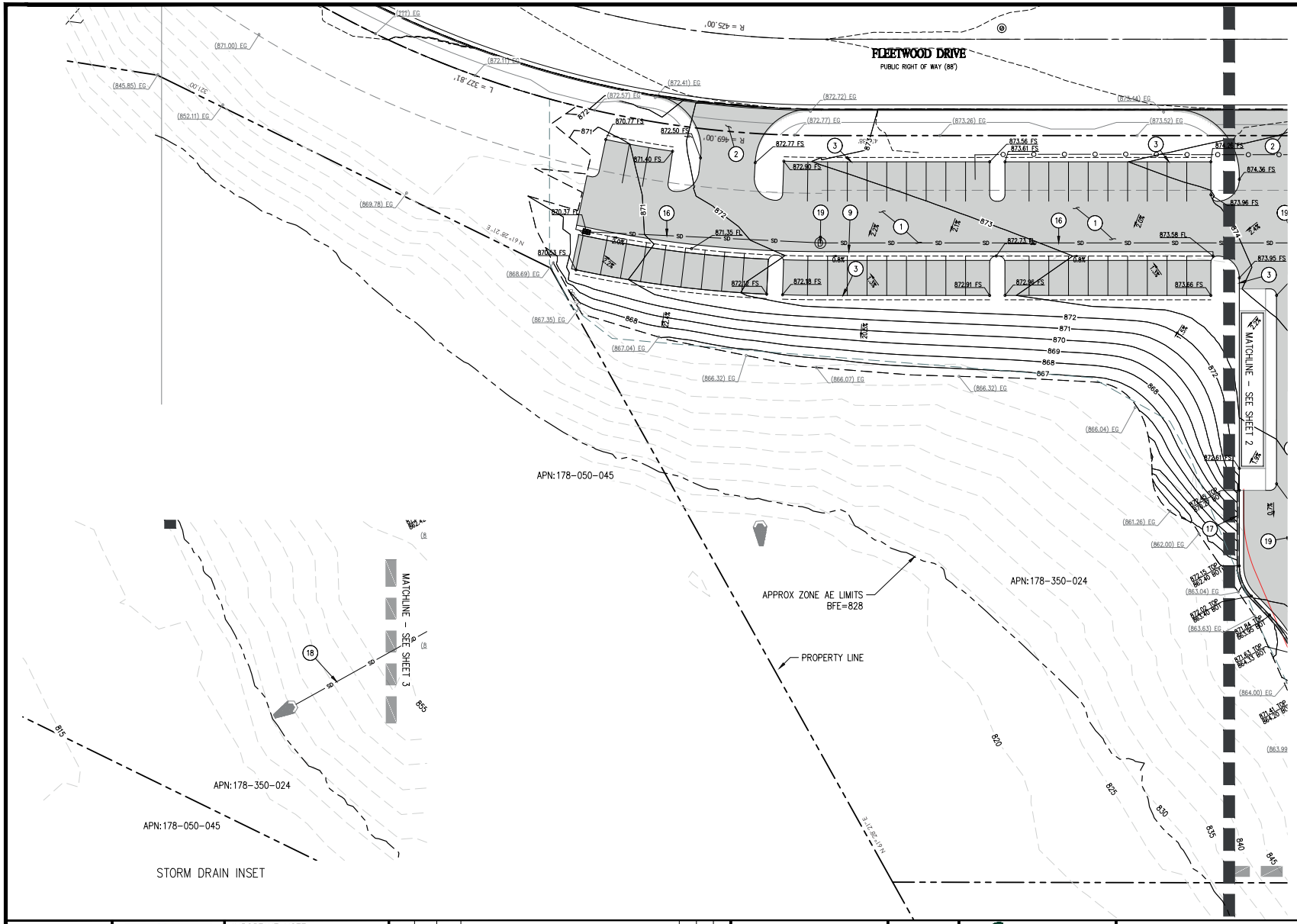
CITY OF JURUPA VALLEY

PRELIMINARY GRADING PLANS
HYB, LLC, - FLEETWOOD INDUSTRIAL
2240 FLEETWOOD DR.
PRELIMINARY GRADING - NORTH

ACCT. NO.

SHEET 2 OF 7

FOR:
W.O
CITY I. D. NO.



CONSTRUCTION NOTES

1. CONSTRUCT ASPHALT CONCRETE (AC) PAVEMENT, 0.40' AC OVER 0.50' AGGREGATE BASE COURSE
2. CONSTRUCT DRIVEWAY
3. CONSTRUCT CURB
4. CONSTRUCT LONGITUDINAL GUTTER
5. TRUCK SCALE PER BUILDING PLAN
6. BUILDING PER BUILDING PLANS
7. TRASH ENCLOSURE PER BUILDING PLANS
8. LANDSCAPE SWALE
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19. STORM DRAIN MANHOLE
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LEGEND

EXISTING CONTOURS
PROPOSED CONTOURS

	EXISTING	PROPOSED
WATER MAIN	X"W	X"W
SANITARY SEWER	X"S	X"S
STORM DRAIN	SD	SD
FENCE		
IRON FENCE		

AC PAVING
CONCRETE WALKWAY
STRUCTURAL LOADING DOCK CONCRETE

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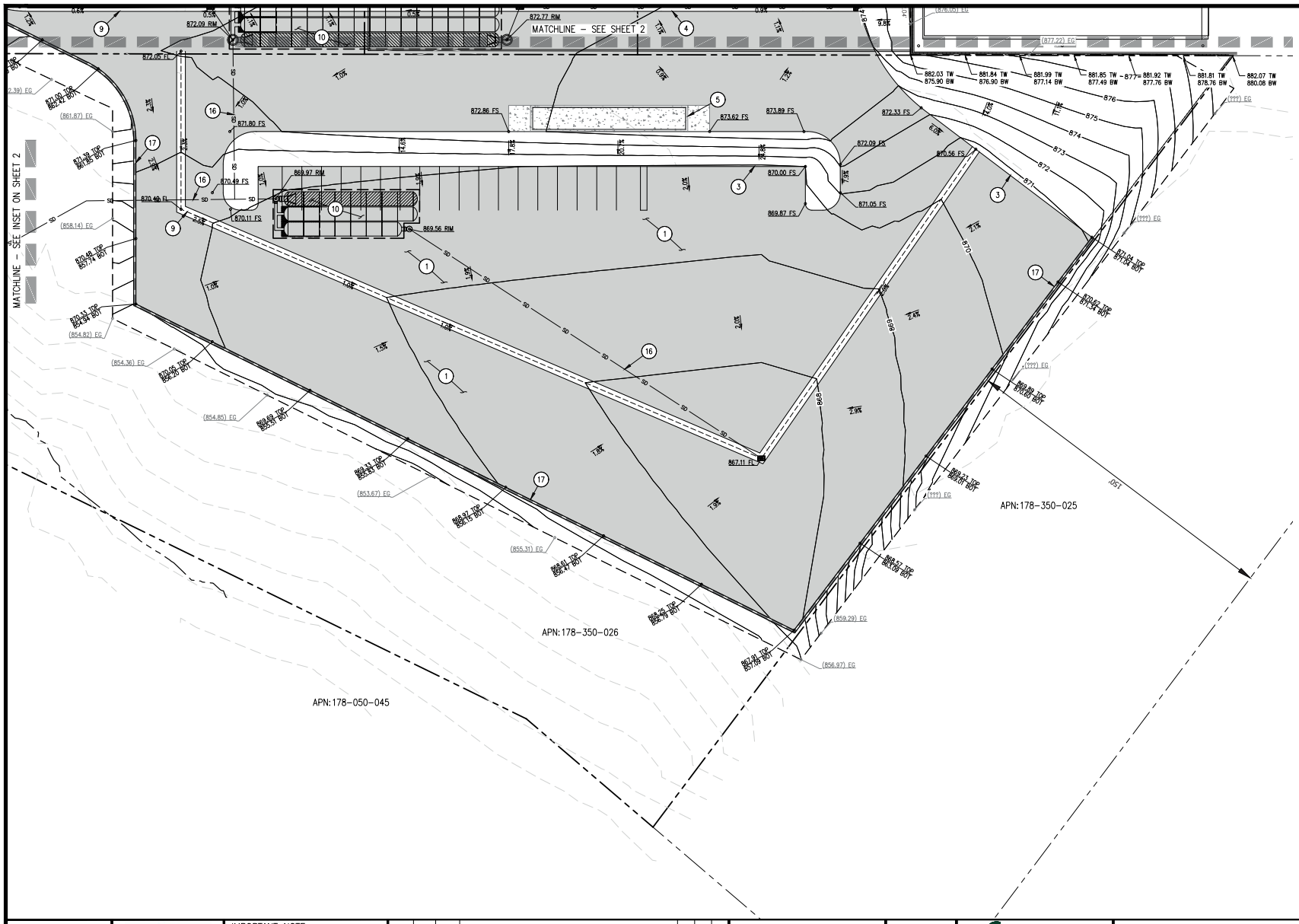
CITY OF JURUPA VALLEY

PRELIMINARY GRADING PLANS
HYB, LLC, – FLEETWOOD INDUSTRIAL
2240 FLEETWOOD DR.
PRELIMINARY GRADING – SOUTH

ACCT. NO.

SHEET 3 OF 7

FOR:
W.O
CITY I. D. NO.



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LEGEND

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EXISTING CONTOURS		
PROPOSED CONTOURS		
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ELEVATION = 857.288 FEET

BASIS OF BEARING:
THE BEARING OF N 00°35'51" E ALONG THE CENTERLINE OF FLEETWOOD AVENUE PER PMB 247/69–71, CITY OF JURUPA VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

REGISTERED PROFESSIONAL ENGINEER SAMUEL J. JACOBY CIVIL STATE OF CALIFORNIA
C74309
EXP.6/30/25

Cannon
19842 Von Karman Avenue, Suite 150
Irvine, CA 92606
P 949.753.8111 F 949.753.0775

PLANS PREPARED UNDER THE SUPERVISION OF:
SAMUEL JOHN JACOBY, P.E.
R.C.E. #C74309 (EXP. 6/30/25)
4/30/2025
DATE

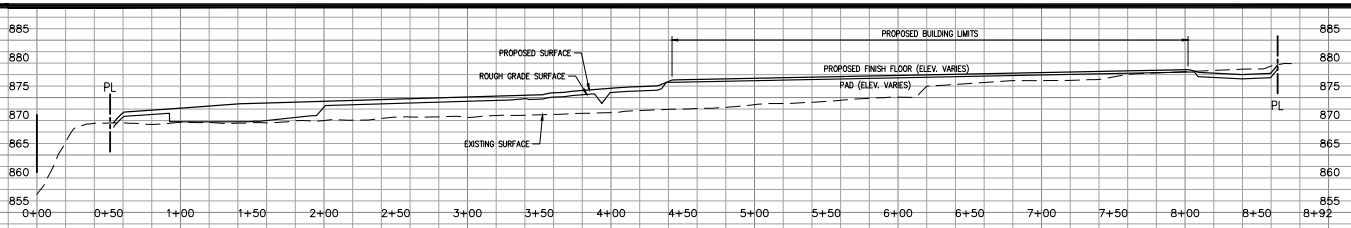
CITY OF JURUPA VALLEY

PRELIMINARY GRADING PLANS
HYB, LLC, – FLEETWOOD INDUSTRIAL
2240 FLEETWOOD DR.
PRELIMINARY GRADING – EAST

ACCT. NO.

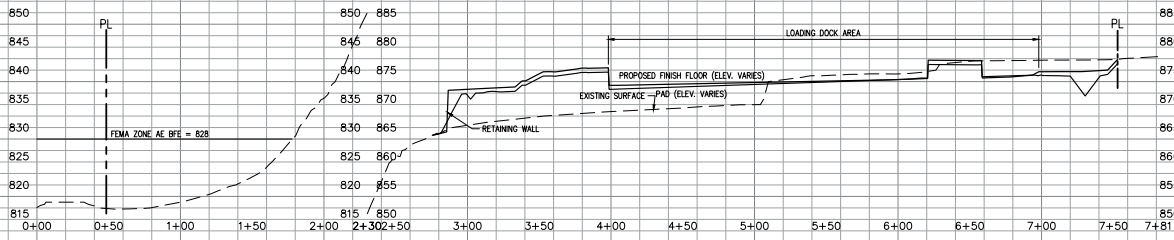
SHEET 4 OF 7

FOR:
W.O
CITY I. D. NO.



A – SECTION VIEW

SCALE: HORIZ. 1" = 40'; VERT. 1" = 10'

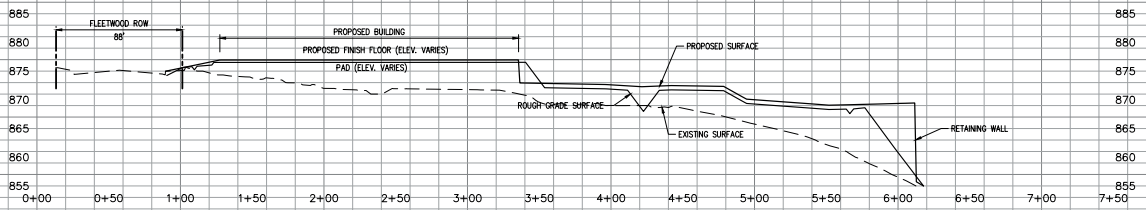


B – PROFILE VIEW

SCALE: HORIZ. 1" = 40'; VERT. 1" = 10'

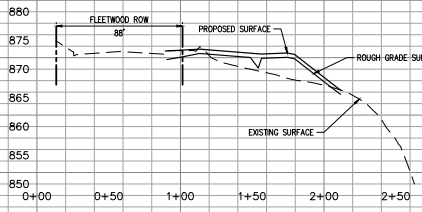
B – SECTION VIEWB – PROFILE VIEW

SCALE: HORIZ. 1" = 40'; VERT. 1" = 10'



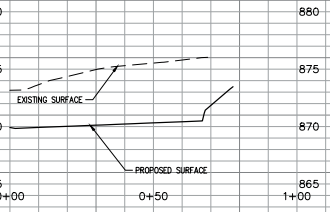
C – SECTION VIEW

SCALE: HORIZ. 1" = 40'; VERT. 1" = 10'



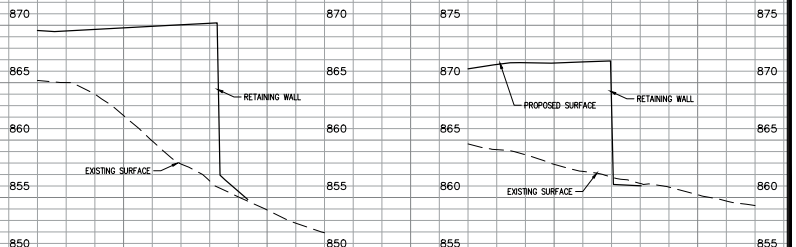
D – SECTION VIEW

SCALE: HORIZ. 1" = 40'; VERT. 1" = 10'



E – SECTION VIEW

SCALE: HORIZ. 1" = 40'; VERT. 1" = 10'

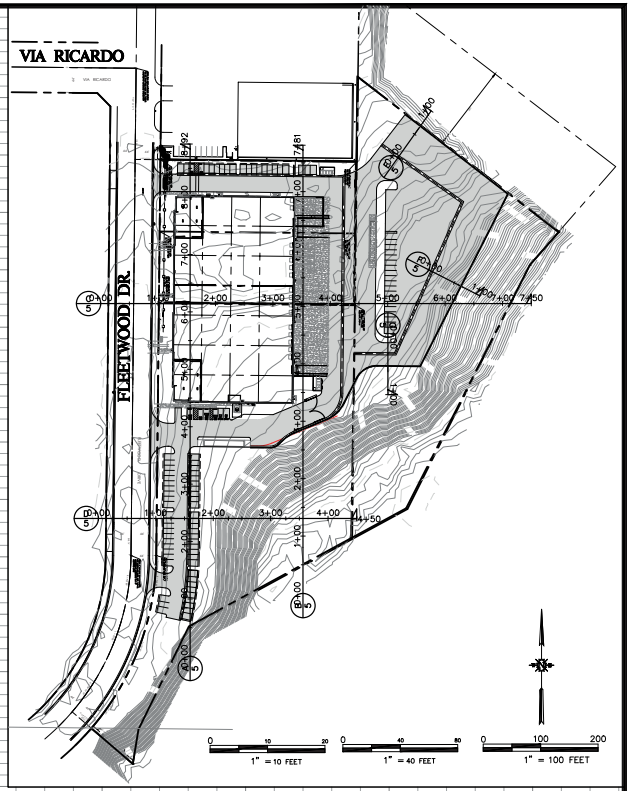


F – SECTION VIEW

SCALE: HORIZ. 1" = 40'; VERT. 1" = 10'

G – SECTION VIEW

SCALE: HORIZ. 1" = 40'; VERT. 1" = 10'



NO WORK SHALL BE DONE ON THIS SITE UNTIL BELOW AGENCY IS NOTIFIED OF INTENTION TO GRADE OR EXCAVATE.
Underground Service Alert
Call: TOLL FREE
1-800
227-2600
TWO WORKING DAYS BEFORE YOU DIG

8930 LIMONITE AVE
JURUPA VALLEY, CA 92509
TEL: (951) 332-6464
EMAIL: ENGINEERING@JURUPAVALLEY.ORG

IMPORTANT NOTE:
THE GRADING AND/OR IMPROVEMENT PLANS ARE APPROVED FOR A PERIOD OF TWO (2) YEARS FROM THE DATE SIGNED BY THE CITY ENGINEER. AFTER THE TWO (2) YEAR PERIOD HAS LAPSED, THE ENGINEER OF RECORD MAY BE REQUIRED TO SUBMIT AND PROCESS FOR CITY ENGINEER APPROVAL, UPDATED PLANS THAT COMPLY WITH THE MOST CURRENT CITY STANDARDS, PRACTICES, AND POLICIES.

MARK	DATE	INITIAL	DESCRIPTION	REC.	APPR	DATE
		E.O.R.	REVISION			

BENCHMARK:
B.M. NO. M.L.-4-64 NAVD 1988 COUNTY OF RIVERSIDE AT THE NE CORNER OF THE HALL AVE BRIDGE #56-415, OVER HWY #60, 246.0' SW OF 28TH AVE, 15.0' S. OF HALL AVE AT THE NE END OF THE RAIL ABUTMENT AND 2.0' HIGHER THAN THE SIDEWALK, A BRASS DISK SET IN THE TOP OF A 1.0' X 2.0' CONCRETE POST AND MARKED M.L.-4-64.
ELEVATION = 857.288 FEET

BASIS OF BEARING:
THE BEARING OF N 00°35'51" E ALONG THE CENTERLINE OF FLEETWOOD AVENUE PER PMB 247/69-71, CITY OF JURUPA VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

REGISTERED PROFESSIONAL ENGINEER
SAMUEL J. JACOBY
C74309
EXP.6/30/25
CIVIL
STATE OF CALIFORNIA

Cannon
19842 Von Karman Avenue, Suite 150
Irvine, CA 92606
P 949.753.8111 F 949.753.0775

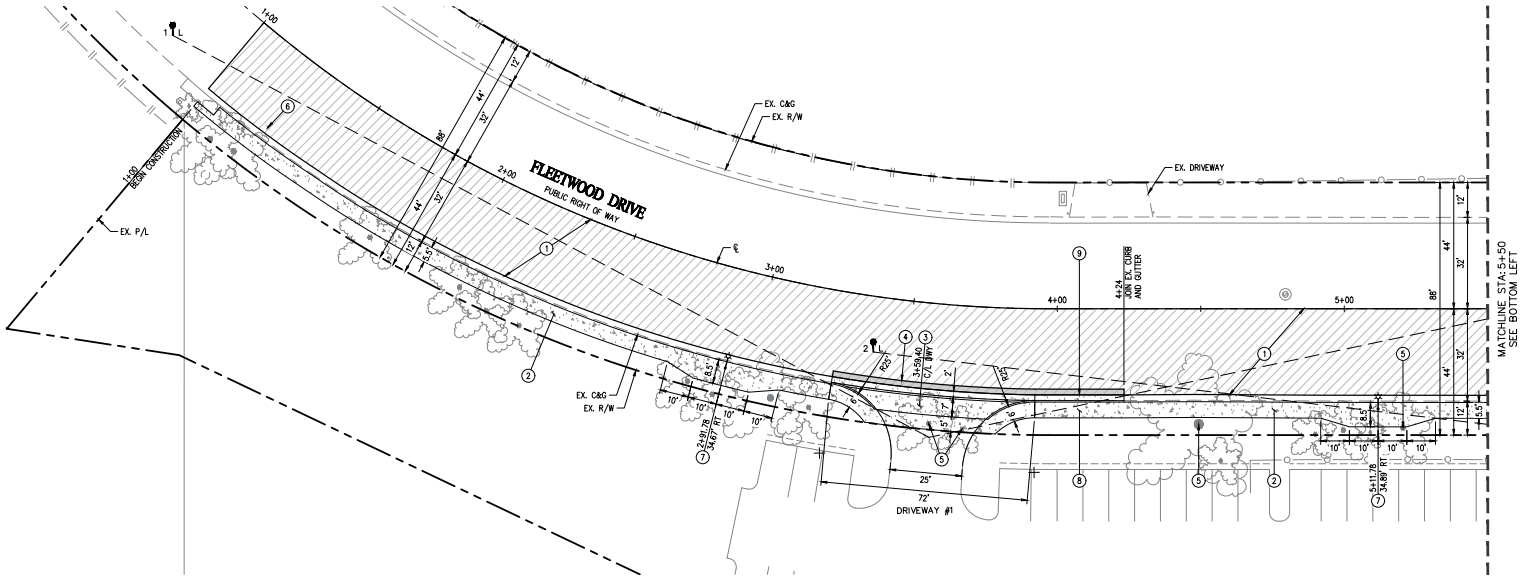
PLANS PREPARED UNDER THE SUPERVISION OF:
SAMUEL JOHN JACOBY, P.E.
R.C.E. #C74309 (EXP. 6/30/23)
4/30/2025
DATE

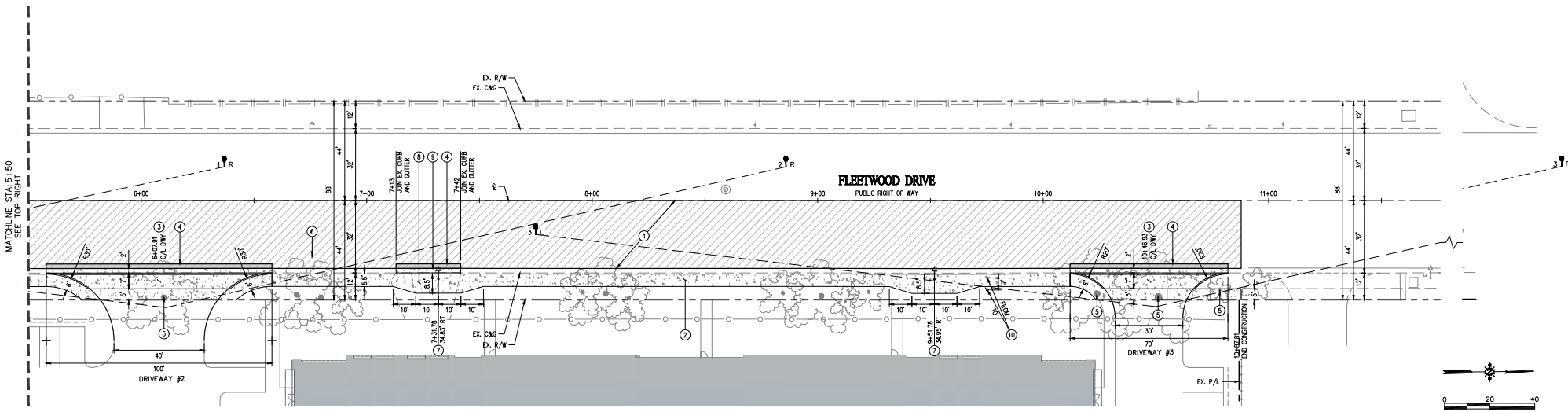
CITY OF JURUPA VALLEY
PRELIMINARY GRADING PLANS
HYB, LLC, – FLEETWOOD INDUSTRIAL
2240 FLEETWOOD DR.
PRELIMINARY CROSS SECTIONS

ACCT. NO.

SHEET 5 OF 7

FOR:
W.O
CITY I. D. NO.





CONSTRUCTION NOTES

1. COLD MILL ASPHALT CONCRETE PAVEMENT TO DEPTH OF 2" AND INSTALL 2" ASPHALT CONCRETE PAVEMENT CLASS C2-PG-64-10.
2. CONSTRUCT 4" PCC SIDEWALK PER SPPWC STD. PLAN 112-2 AND 113-2.
3. CONSTRUCT 8" PCC COMMERCIAL DRIVEWAY PER COUNTY OF RIVERSIDE STD. NO. 207A, L AND R PER PLAN.
4. CONSTRUCT 2' WIDE FULL DEPTH ASPHALT CONCRETE PAVEMENT PER DETAIL 1 SHEET 7.
5. REMOVE EXISTING TREE.
6. ADJUST WATER VALVE TO GRADE.
7. INSTALL STREET LIGHT PER COUNTY OF RIVERSIDE STD. NO. 400 AND 1000.
8. REMOVE EXISTING DRIVEWAY.
9. CONSTRUCT 8" PCC CURB AND GUTTER PER COUNTY OF RIVERSIDE STD. NO. 201, TYPE A-8.
10. RELOCATE FIRE HYDRANT PER COUNTY OF RIVERSIDE STD. NO. 400 AND 701.

LEGEND

- COLD MILL AND OVERLAY PAVEMENT PER CN 1
- PCC PAVEMENT
- ASPHALT CONCRETE PAVEMENT
- SIGHT LINE
- #T L/R — DRIVEWAY # / LEFT SIGHT POINT OR RIGHT SIGHT POINT

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MARK	DATE	INITIAL	DESCRIPTION	REC.	APPR	DATE
		E.O.R.	REVISION			

BENCHMARK:
CITY OF RIVERSIDE BM ID GPS-51; ELEVATION = 816.084 FEET NAVD 88
DESCRIPTION: 2-1/2" BRASS DISK STAMPED "CITY OF RIVERSIDE GPS STATION 51 1991 CADMC" SET IN THE TOP OF A CATCH BASIN ALONG THE NORTHERLY CURB OF COLUMBIA AVENUE, 4 FEET EAST OF THE BCR OF THE NORTHEAST OF VAN STREET AT COLUMBIA AVENUE.
BASIS OF BEARING:
THE CENTERLINE OF FLEETWOOD DRIVE SHOWN AS NORTH 00°35'51" EAST PER PM NO. 36997 FILED IN BOOK 247, PAGES 89 THROUGH 91, INCLUSIVE, OF PARCEL MAPS IN THE OFFICE OF THE RIVERSIDE COUNTY RECORDER. ALL DISTANCES SHOWN ARE GROUND, UNLESS OTHERWISE NOTED. TO OBTAIN GRID DISTANCES DIVIDE BY A COMBINED SCALE FACTOR OF 1.00005180 DETERMINED LOCALLY AT "POINT 1"
"POINT 1"
N = 2315574.96, E = 6220241.76
ORTHOMETRIC ELEVATION 880.13 FEET

C74309
EXP.6/30/25
CIVIL

Cannon
16792 Von Karman Avenue, Suite 150
Irvine, CA 92606
P 949.753.8111 F 949.753.0775

PLANS PREPARED UNDER THE SUPERVISION OF:
SAMUEL JOHN JACOBY, P.E.
R.C.E. #C74309 (EXP. 6/30/23)
4/30/2025
DATE

CITY OF JURUPA VALLEY

PRELIMINARY STREET IMPROVEMENT PLAN
HYB, LLC, – FLEETWOOD INDUSTRIAL
2240 FLEETWOOD DR.
FLEETWOOD DRIVE – STA 1+00 TO 10+87.81

ACCT. NO.

SHEET 6 OF 7

FOR:
W.O
CITY I. D. NO.

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

UPDATED SOIL MEMORADUM

Dated: February 3, 2025

**ENVIRONMENTAL
GEOTECHNOLOGY
LABORATORY, INC.**

February 3, 2025

HYB Group, Inc.
Mr. Hovel Babikian
1601 Hasting Heights Lane
Pasadena, California 91107

Subject: **Update Soil Report & Response to the Ninyo & Moore Geotechnical Review Sheet for GP22-036, Project No. 208829001 dated December 14, 2022; Proposed Industrial Warehouse Building, APN: 178-350-024, 026, 029 & 030, 2240 Fleetwood Drive, City of Jurupa Valley, County of Riverside, California; EGL Project No.: 22-257-004UR**

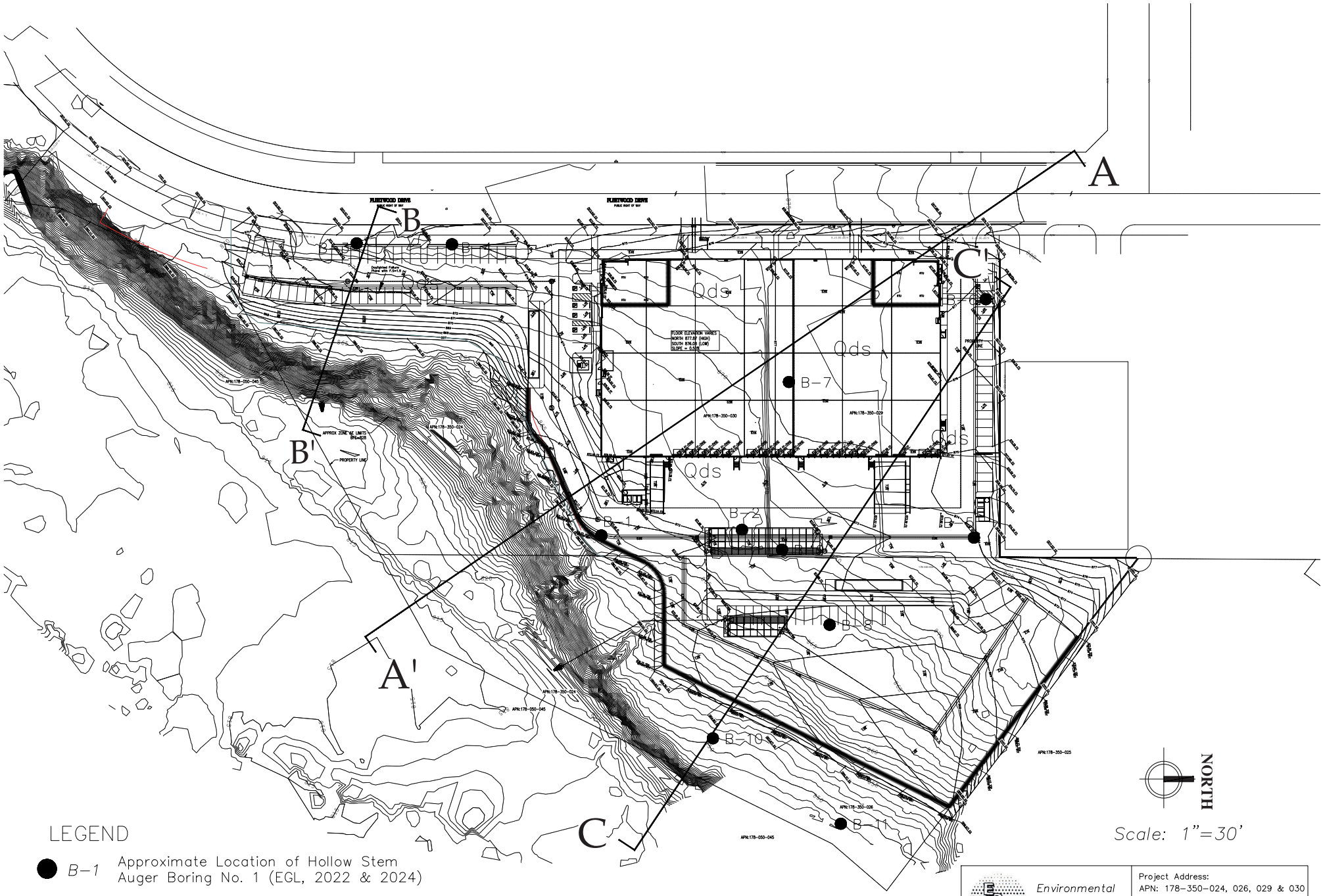
Ladies and Gentlemen:

This update report provides additional information regarding the proposed development at the subject site. It also provides EGL's response to the Ninyo & Moore Geotechnical Review Sheet for GP22-036, Project No. 208829001 dated December 14, 2022. Based on the current Grading Plan provided by Cannon (Reference #5), EGL understands that the proposed development now includes the property to the east of the original site, APN 178-350-026. A parking lot, retaining walls, a truck scale and rainwater infiltration systems will be constructed on the easterly portion of the property. The retaining walls along the east side will be a maximum of 15.5' high. EGL has revised the Site Plan and Cross Section A-A' and has added new Cross Sections B-B' and C-C' based on the updated Grading Plan. It is concluded that the subject site's proposed development is feasible from a geotechnical engineering viewpoint. Detailed configurations of the existing and proposed site are presented on the Site Plan (Figure 1) and Cross Sections A-A', B-B' and C-C' (Figure 2). The following should be considered in the design phase of the proposed structure and except for changes made herein, all other conclusions and recommendations in the referenced report remain valid and applicable. For your convenience, review sheets are attached and the responses are presented below.

FIELD EXPLORATION AND LABORATORY TESTING

Field Exploration

EGL performed the initial and secondary subsurficial explorations with the aid of a hollow-stem drill rig on October 13, 2022 and November 29, 2024, respectively. A total of eleven (11) 8" diameter borings were drilled to a maximum depth of 51 feet below existing ground surface at selective locations to verify the subsurficial earth materials with respect to the proposed development. The exploratory auger borings were excavated at approximate locations shown on



LEGEND

● B-1 Approximate Location of Hollow Stem Auger Boring No. 1 (EGL, 2022 & 2024)

Qds Dune Sand– unconsolidated grayish to tannish massive fine-granined sand forming stabilized dunes. May include some deposits of Pleistocene age.

A A' Cross Section A–A'

Scale: 1"=30'

Environmental Geotechnology Laboratory, Inc.

Project Address:
APN: 178–350–024, 026, 029 & 030
2240 Fleetwood Drive
Jurupa Valley, California
EGL Project No.: 22–257–004UR

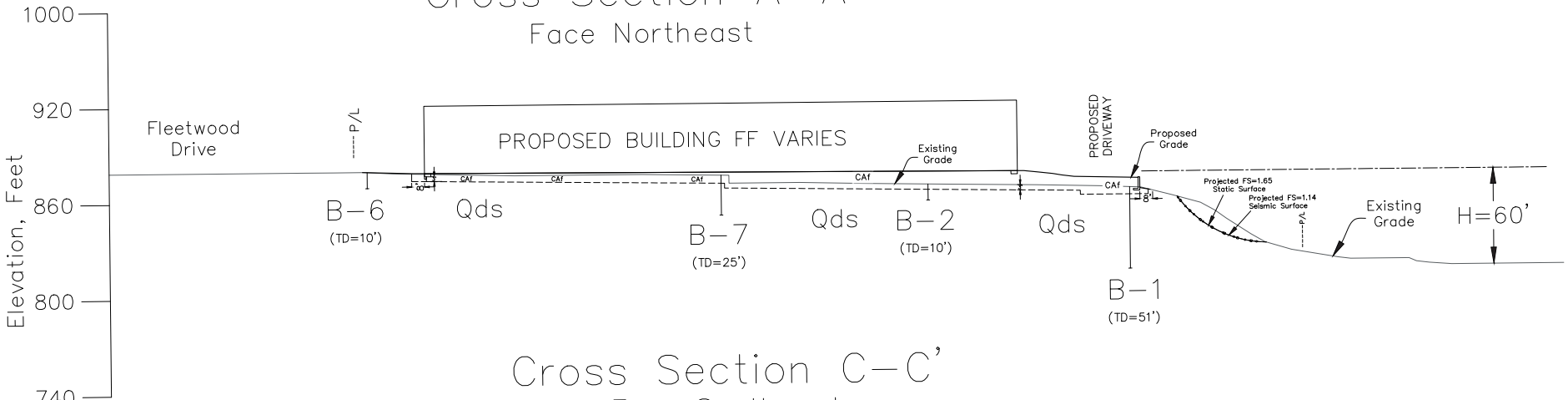
Site Plan

2/3/2025

FIGURE 1

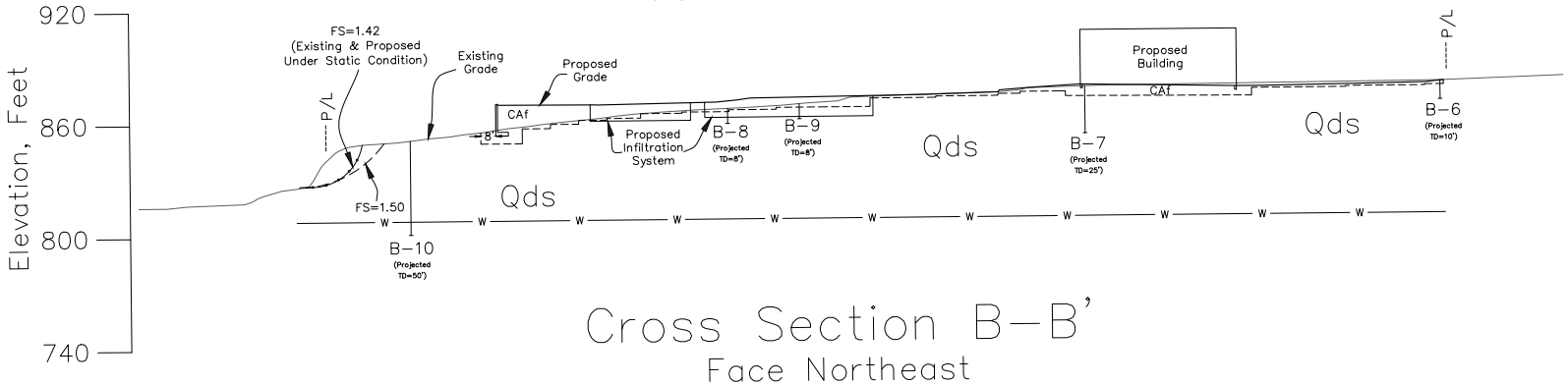
Cross Section A–A'

Face Northeast



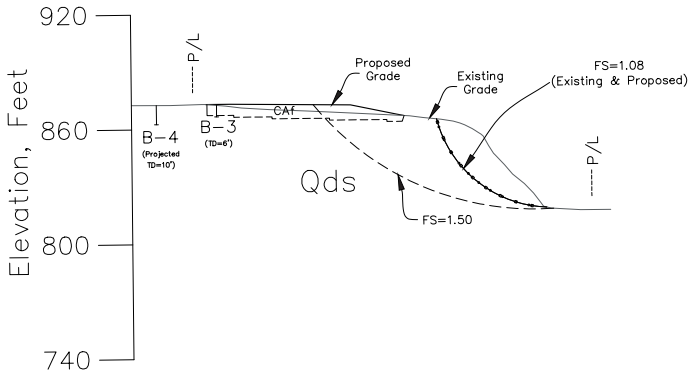
Cross Section C–C'

Face Southwest



Cross Section B–B'

Face Northeast



LEGEND

Qds Natural Soils

CAf Compacted Fill

Cross Sections A–A', B–B' and C–C'

Scale: 1"=30'

Site: 2240 Fleetwood Drive
Jurupa Valley, California
Date: 2–3–2025

EGL Project No.: 22–257–004UR
Environmental Geotechnology Laboratory, Inc.

Figure 2

the enclosed Site Plan, Figure 1. Upon completion of drilling, sampling, logging, and percolation testing, all borings were backfilled with onsite soil removed from excavations and tamped. Exploratory boring logs are presented in Appendix A.

EGL's field engineer supervised and logged all borings. Relatively undisturbed ring samples and bulk samples were collected during drilling for laboratory testing. Ring and SPT samples were taken at frequent intervals. The samples taken by a hollow stem auger were obtained by driving a sampler with successive blows of a 140-pound hammer dropping from a height of 30 inches.

Laboratory Testing

Representative samples were tested for the following parameters: in-situ moisture content and density, direct shear strength and consolidation. The results of our laboratory testing along with a summary of the testing procedures are presented in Appendix B. In-situ moisture and density test results are presented on the boring logs (Appendix A).

SEISMIC DESIGN

Based on our studies on seismicity, there are no known active faults crossing the property. However, the subject site is located in Southern California, which is a tectonically active area. The following CBC 2022 (Chapter 16) & ASCE 7-16 seismic related values may be used:

Site Classification: (ASCE, Table 20.3-1)	D
Spectral Response Accelerations (g):	
(CBC, Figure 1613.2.1 (1) 0.2-Second, S_S	1.500
(CBC, Figure 1613.2.1 (3)) 1-Second, S_1	0.600
Site Coefficient:	
(CBC, Table 1613.2.3 (1)) F_a	1.0
(CBC, Table 1613.2.3 (2)) F_v	1.7

Based on the U.S. Seismic Design Maps (SEAOC & OSHPD, 2024), the proposed structures may be designed to accommodate up to a site modified horizontal acceleration of 0.664g with 2% probability of being exceeded in 50 years. However, Project Structural Engineer should be aware of the information provided to determine if any additional structural strengthening is warranted.

Item 1

Fill was not encountered within all drilled borings during our field explorations. Major or deep fill was also not observed during our site visit. Any fill onsite is anticipated to be minor and localized. An approximately 5 feet high retaining wall separates the northerly higher pad from the southerly lower pad of the subject site; therefore, retaining wall backfill soil is anticipated to exist behind the wall.

Item 2

The proposed parking lot will be located in the southwest portion of the site and will require approximately 0 to 4 feet of fill. Additionally, a fill slope with a 5:1 (horizontal to vertical) gradient will be constructed along the easterly edge of the parking lot and the top of the easterly-southeasterly descending slope in this area.

Additional Cross Section B-B' is drawn transect through the southwest portion of the subject site where the boring B-3 was drilled previously (EGL, 2022) down to the bottom of the southeasterly-easterly descending slope toe of the subject site. The new Section B-B' includes surficial gradients, approximate subsurface soil conditions and contacts within the proposed grading and parking lot area. EGL has also performed slope stability analyses of Cross Section B-B' for the existing and proposed conditions. Lowest ultimate soil shear values were used for static condition for existing and proposed slope conditions, while peak shear values were only used under seismic condition for the existing and proposed slope conditions. Seismic coefficient of 0.2 g (g: gravity) was used in the seismic condition. No deep-seated failures were observed during our field investigation. Stability calculations and sections are presented on the plates following the report and the results of EGL's slope stability analyses of existing and proposed slope conditions are briefly described in the following sections. Analytical results are presented in Appendix C.

Earth Materials	Unit Weight (pcf)	Friction Angle (Degree)	Cohesion (psf)
Soil, Ultimate^{+} (Qds; B-1 @ 25.0')	120.0	29	168
Soil, Peak (Qds; B-1 @ 25.0')	120.0	29	389
Soil, Ultimate (Qds; B-4 @ 10.0')	120.0	24	279
Soil, Peak (Qds; B-4 @ 10.0')	120.0	24	461
Proposed Compacted Fill, Ultimate (CAf; Assumed)	125.0	35	200

Simplified Bishop's method was used to perform the slope stability analyses for the subject site's existing slope and proposed development conditions. Based on our slope stability analyses results, it is EGL's opinion that existing and proposed slopes within the subject site are considered stable however they possess factors of safety against instabilities less than the code required. The factor of safety did not change with proposed conditions. Therefore, proposed development does not impact slope stability. Due to the unsatisfactory results of the slope stability analyses for Section B-B' the limit of the failure plane was forced inward until satisfactory factors of safety, FS=1.5 and FS=1.1 were achieved, under static and seismic condition, respectively. Based on the results of our slope stability analysis the proposed development does not significantly impact the existing slope or significantly change the factors of safety for the existing slope conditions. Due to the low factor of safety no building or retaining walls should be built east of the daylighted failure plan with F.S. of 1.5. However, the parking lot is acceptable if allowed by the City.

Analyzed Section	Calculated Condition	Factors of Safety (Static / Seismic)
B - B'	Existing approximately 50 feet high slope	1.08 / 1.01
B - B'	Proposed slope with assumed building (parking lot) Loads	1.08 / 1.01
B - B'	Modified existing slope with safety layback line	1.50 / 1.10
B - B'	Modified proposed slope with safety layback line	1.50 / 1.10

Under similar analytical conditions used above, EGL has revised the slope stability analysis for Cross Section A-A' and conducted a new slope stability analysis for Cross Section C-C'. Water level depth used in the analysis was assumed based on the location of the LID feature and a 1:1 downward path of effluent. Based on EGL's field observations and the results of the slope stability analysis for Cross Section A-A', both the existing and proposed slopes are considered geotechnically and geologically stable (FS ≥ 1.5 & FS ≥ 1.1). The proposed development does not significantly impact the existing slope or significantly change the factors of safety for the existing slope conditions.

For the slope stability analysis results of Cross Section C-C', the factor of safety did not change with proposed conditions. Therefore, proposed development does not impact slope stability. Due to the factor of safety against instability for the proposed slope under static condition is less than the code requirement, in the analyses of Section C-C' the limit of the failure plane was forced inward until satisfactory factor of safety, FS=1.5 was achieved. Based on the results of our slope

stability analysis the foundation of the proposed retaining wall should be setback from the Projected Static Critical Failure Plane as shown on Cross Section C-C' (Figure 2). Results of slope stability analyses are described below and are presented in Slope Stability Analyses, Appendix C.

Analyzed Section	Calculated Condition	Factors of Safety (Static / Seismic)
A - A'	Existing approximately 60 feet high slope	1.65 / 1.14
A - A'	Proposed slope with assumed building Loads, including effluent from proposed infiltration system	1.65 / 1.14
C - C'	Existing approximately 35 feet high slope	1.42 / 1.15
C - C'	Proposed slope with assumed building loads, including effluent from proposed infiltration system	1.42 / 1.15
C - C'	Modified proposed slope with safety layback line	1.50 / ---

Item 3

Based on our review of current Grading and Drainage Plan provided by Cannon (Reference #5), the proposed development at site consists of an industrial warehouse building and associated structures. The proposed building is anticipated to be one and/or two-story masonry and wood frame structures with a concrete slab-on-grade. The floor elevation of the new warehouse will vary, with a high point of 877.87 feet on the north side and a low point of 876.08 feet on the south side. As a result, the southerly half of the pad will need to be raised by approximately 2 to 9 feet, while the northerly half will require approximately 0 to 2 feet of fill. Additional site improvements will include a parking lot, retaining walls, a truck scale, and rainwater infiltration systems, all to be constructed on the easterly portion of the property. The retaining walls along the east side will reach a maximum height of 15.5 feet. Additionally, a fill slope with a 5:1 (horizontal to vertical) gradient will be constructed along the top of the easterly-southeasterly descending slope within the southwest portion of the site.

Cut and fill grading sequences, including removal and recompaction, footing excavations and retaining wall backfill, are anticipated to reach the desired grades. Based on the subsurface conditions exposed during field investigation and laboratory testing program, it is recommended that the following recommendations be incorporated in the design and construction phases of the project.

Site Preparation

Prior to initiating grading operations, any existing footings, vegetation, trash, debris, over-sized materials (greater than 6 inches), and other deleterious materials within fill areas should be removed from the site.

Surficial Soil Removals

Based on our field exploration and laboratory data obtained to date, it is recommended that the building pad for the new warehouse be removed and recompacted. The removal depth should be 3 feet below existing grade or 3 feet beneath proposed footing bottom whichever is deeper. The recommended removal should be extended at least 8 feet beyond proposed building lines or to a distance equal to the depth of fill below the proposed footings, whichever is greater. Existing near surface soils should also be removed at least one foot within proposed concrete slab and driveway areas. The construction areas should be excavated and then observed by a representative of this office to verify the soil conditions for any potential needs of removal of loose soils and replacement with compacted fill. This may also be necessary due to difference in expansion characteristics of foundation materials beneath a structure.

During the grading of the proposed slab area if expansive material is encountered it should be removed and replaced with sandy import material (EI < 20). If import is mixed with onsite material EGL should provide inspections to verify the soils are mixed uniformly and testing of the mixed fill material to determine the expansion potential. The expansion index of the mixed soil should be less than 20. Some preliminary testing of the import and onsite should be performed to determine the soil mixture ratio prior to backfilling the building pad.

Locally deeper removals may be necessary to expose competent natural ground. The actual removal depths should be determined in the field as conditions are exposed. Visual inspection and/or testing may be used to define removal requirements.

Treatment of Removal Bottoms

Soils exposed within areas approved for fill placement should be scarified to a depth of 6 inches, conditioned to near optimum moisture content, and then compacted to minimum project standards.

Structural Backfill

The onsite soils may be used as compacted fill provided they are free of organic materials and debris. During the grading of the proposed slab area if expansive material is encountered it should

be removed and replaced with sandy import material (EI < 20). If import is mixed with onsite material EGL should provide inspections to verify the soils are mixed uniformly and testing of the mixed fill material to determine the expansion potential. The expansion index of the mixed soil should be less than 20. Some preliminary testing of the import and onsite should be performed to determine the soil mixture ratio prior to backfilling the building pad. Fills should be placed in relatively thin lifts; brought to near optimum moisture content, then compacted to obtain at least 90 percent relative compaction based on laboratory standard ASTM D-1557-12.

Fill Slopes

Permanent fill slopes should be constructed no steeper than 2:1 (horizontal to vertical) and should be keyed and benches into competent natural soils if existing grade is steeper than 5: 1 (horizontal to vertical). 3 feet of soil should be removed and recompacted before adding fill. Clean, cohesionless sand should not be used for fill slopes; some selective grading may be required in this regard. Minimum of 90 percent relative compaction is recommended for competent fill slope construction.

Cut Slopes

Permanent cut slopes should be no steeper than 2:1 (H:V) slope gradient, which is anticipated to be grossly stable. However, field observation will be necessary during grading, by the project geologist, to determine the need for slope stabilization.

Fill Key

Fill key's dimension should be a minimum of ten (10) feet wide and excavated a minimum of three (3) feet into competent natural soils, measured from the downslope side. Fill key bottom should also be constructed with a minimum inclined slope of two (2) percent dipping upslope. Subdrains consisting of perforated pipe should be installed in the heel of the key or bench and sloped to discharge to a suitable collection facility. Project engineering geologist and/or geotechnical engineer representatives should observe and approved all fill key excavation and subdrain system prior to fill placement.

Benching

Fills placed on slopes steeper than 5:1 should be keyed and benched into competent natural soils as the fill is placed. Project geotechnical engineer and engineering geologist should observe all fill keys and bench cut excavations. Removal and deep benching on side hill slopes may be necessary prior to placement of fills on slopes where creep or slopewash exist.

Item 4

Based on the current grading plan provided by Cannon, the proposed fill slope in the southeast area of the site has been revised from 2:1 and 3:1 (Horizontal: Vertical) to 5:1, as shown on the Site Plan, see Figure 1. EGL has drafted Cross Section B-B', which extends through the southwest portion of the site continuing down to the toe of the easterly-southeasterly descending slope. The new Section B-B' incorporates surficial gradients, approximate subsurface soil conditions and contacts within the proposed grading and parking lot area. Additionally, EGL has conducted slope stability analyses for Cross Section B-B' under both existing and proposed conditions, as discussed in Item 2. Based on our analysis the proposed grading won't change the factor of safety of the slope. Due to the low factor of safety no building or retaining walls should be built east of the daylighted failure plan with F.S. of 1.5. However, the parking lot is acceptable if allowed by the City.

Item 5

During grading of the proposed slab areas, if expansive material is encountered, sandy import material (EI < 20) should be used within the top 12 inches. However, sandy import material is not required beyond the lateral extent of the slabs.

Item 6

In accordance with the updated grading and drainage plan provided by Cannon (Reference #5), the proposed locations for the infiltration systems have been revised. As a result, EGL performed two additional percolation tests within the vicinity of the newly designated infiltration system areas. The tests were performed within borings B-8 and B-9 at a depth of 8 feet below existing ground surface. Approximate locations of the test borings are shown on the Site Plan, Figure 1. The test borings B-8 and B-9 were presoaked and tested on November 29, 2024. The test procedures are described as following:

- 3"-diameter perforated pipe surrounded with gravel was placed in the test borings so that caving would not occur during the percolation testing. The bottoms of test borings were also covered with 2 inches of gravel.
- The test borings were filled with a minimum depth of 20 inches water multiple times for presoak and allowed to completely drain prior to refilling for the infiltration test.
- For the percolation test of borings B-8 and B-9, a minimum depth of 20 inches of water was placed within the test borings. The test time interval between readings used for borings was 10 minutes due to at least 6 inches of water drop two consecutive times less than 25 minutes during the first two tests.

- Additional six (6) 10-minute increment percolation tests were performed for test borings B-8 and B-9. Field data of two (2) 25 minutes readings and six (6) 10 minutes readings are presented in Appendix D. The last measured drop was used to calculate the design infiltration rate of the soil. Design Infiltration rate calculations are presented in Appendix D.

Based on the results of our preliminary percolation test of the material, the minimum design infiltration rate is 8.35 in/hr. Reduction factor of 3.0 has been applied to our design infiltration rate. Due to the high percentage of sandy material encountered within test borings and percolation test results, it is our opinion that dispersal of on-site storm water runoff by infiltration systems are considered feasible from a geotechnical engineering standpoint. The infiltration systems and the final plumbing plans should be designed and prepared by the project Civil Engineer.

Based on the consolidation test results presented in the Appendix B all the samples collected below 5 feet showed a deformation of less than 1.0% at the time of saturation. It is EGL's opinion that hydro-consolidation of the soil due to the proposed infiltration systems are negligible and should not impact the proposed structure.

Based on our review of the "*Public Safety Element, City of Riverside General Plan, Liquefaction Zones" (*Reference #12*),* it is concluded that the site is located within a "Moderate to Very High" potential liquefaction area. However, based on our liquefaction evaluation in the referenced report (EGL, 2022; Reference #8), liquefaction is not expected to occur within the soil at the subject site. It is EGL's opinion that the proposed infiltration systems will not increase the potential for liquefaction to occur at the site. Based on the historically high groundwater depth map prepared by Wildermuth Environmental Inc. the historic groundwater is approximately greater than 50 feet below ground surface at the subject site (Ref. # 19). Static ground water was encountered during our secondary subsurface investigation within the boring B-10 at a depth of 43 feet below the existing ground surface. Groundwater is not expected to be within 10 feet from the point of discharge in the infiltration system. It is EGL's opinion that the proposed infiltration system will not have any impact on groundwater below the subject site.

Based on the results of our preliminary percolation test of the material, it is EGL's opinion that infiltration system may be placed at the site. The infiltration system should be a minimum of 10 feet away from the building foundation and should not be surcharged by the building foundation. It is also recommended that the infiltration system be placed within natural soil and not compacted fill material. The infiltration system should also have an overflow or bypass to protect the site from flooding.

Item 7

Based on recent review the USCS soil types shown on the direct shear and consolidation test results match the USCS soil types shown on the boring logs in the referenced soil report (EGL, 2022).

Item 8

Acknowledge and comply.

We appreciate this opportunity to be of services. Should you have any questions pertaining to this letter, please do not hesitate to contact EGL.

Respectfully submitted,

Environmental Geotechnology Laboratory, Inc.



Ryan Jones, GE 2852
Senior Engineer

Dist: (4) Addressee
RJ/ky

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APPENDIX A
FIELD INVESTIGATION

EGL performed the initial and secondary subsurficial explorations with the aid of a hollow-stem drill rig on October 13, 2022 and November 29, 2024, respectively. A total of eleven (11) 8" diameter borings were drilled to a maximum depth of 51 feet below existing ground surface at selective locations to verify the subsurficial earth materials with respect to the proposed development. The exploratory auger borings were excavated at approximate locations shown on the enclosed Site Plan, Figure 1. Upon completion of drilling, sampling, logging, and percolation testing, all borings were backfilled with onsite soil removed from excavations and tamped.

EGL's field engineer supervised and logged all borings. Relatively undisturbed ring samples and bulk samples were collected during drilling for laboratory testing. Approximate locations of these borings are shown on the Site Plan, Figure 2. Ring and SPT samples were taken at frequent intervals. The samples taken by a hollow stem auger were obtained by driving a sampler with successive blows of a 140-pound hammer dropping from a height of 30 inches.

Representative undisturbed samples of the subsurface soils were retained in a series of brass rings, each having an inside diameter of 2.42 inches and a height of 1.00 inch. All ring samples were transported to our laboratory. Bulk surface soil samples were also collected for additional classification and testing.

EGL

BORING LOG: B-1

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/6"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	19/12"	SM	115.7	4.5	Silty sand, dark olive brown to dark yellowish brown, fine to
	B	S	11,12,13	SM	-	2.6	medium grained, dry to slightly moist, medium dense, trace of clay
5		R	12/12"	SP-SM	102.2	2.5	Poorly graded sand with silt, dark yellowish brown, fine to medium
		S	3,7,10	SP-SM	-	2.8	grained, dry, medium dense
10		R	17/12"	SM	106.4	2.6	Silty sand, fine to medium grained, dark yellowish brown, dry,
		S	7,14,14	SM	-	2.8	medium dense, trace of clay
15		R	29/12"	SP-SM	112.6	6.3	Poorly graded sand with silt, yellowish brown, fine to medium
		S	6,10,10	SP-SM	-	3.0	grained, dry to slightly moist, medium dense
20		R	12/12"	SP-SM	101.6	2.5	Poorly graded sand with silt, olive brown, fine to medium grained,
		S	5,9,11	SP-SM	-	6.7	dry to slightly moist, medium dense
25		R	40/12"	SM	104.4	8.1	Silty sand, olive brown, fine grained, slightly moist to moist,
		S	9,10,12	SM	-	4.9	medium dense, trace of clay
30		R	35/12"	SP-SM	106.0	1.4	Poorly graded sand with silt, olive brown, fine to coarse grained,
		S	12,12,16	SP-SM	-	2.5	dry, medium dense
35		R	32/12"	ML	103.4	9.6	Sandy clayey silt, grayish brown, slightly moist, very stiff
		S	5,12,14	CL/SM	-	23.6/16.5	Sandy clay to silty sand, fine grained, grayish brown to olive gray, very moist, very stiff to medium dense
40		R	50/6"	SW-SM	86.6	9.1	Well graded sand with silt, fine to coarse grained, grayish brown
		S	25,35,47	SW- SM	-	2.5	to olive brown, slightly moist to moist, very dense, little gravels were encountered

Plate A-1

11819 Goldring Road, Unit A, Arcadia, California, 91006; Phone: (626) 263-3588; Email: ryan@eglab.com

EGL

BORING LOG: B-1 (Cont.)

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/6"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
45		R	50/7"	SW-SM	115.6	2.0	Well graded sand with silt, fine to coarse grained, olive brown, dry,
		S	50/5"	SW-SM	-	3.6	very dense, little gravels were encountered
50		R	50/5"	SW	No Recovery		Well graded sand, fine to coarse grained, light olive brown, dry,
		S	50/6"	SW	-	1.6	very dense, little gravels were encountered
55							Total Depth = 51 feet No Caving No Groundwater Boring Backfilled and Tamped After Groundwater Observation Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
60							
65							
70							
75							
80							

Plate A-2

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EGL

BORING LOG: B-2

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	17	SM	108.5	3.1	Silty sand, dark yellowish brown, fine to medium grained, dry to slightly moist, medium dense, few fine gravel and trace of clay
5		R	25	SM	108.2	3.2	Silty sand, dark yellowish brown, fine to medium grained, dry to slightly moist, medium dense
10		R	15	SM	105.2	5.6	Silty sand, dark yellowish brown, fine to medium grained, slightly moist, medium dense
15							Total Depth = 10 feet No Caving No Groundwater Boring Backfilled and Tamped Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
20							

Plate A-3

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EGL

BORING LOG: B-3

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	18	CL	94.8	7.0	Sandy clay, dark yellowish brown, slightly moist, stiff to very stiff
5		R	41	CL	95.4	18.2	Sandy clay, brown, very moist, hard
10							Total Depth = 6 feet No Caving No Groundwater Boring Backfilled and Tamped After Percolation Test Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
15							
20							

Plate A-4

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EGL

BORING LOG: B-4

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	26	CL	104.3	6.0	Sandy clay, yellowish brown, slightly moist, very stiff
5		R	38	CL	95.1	15.1	Sandy clay, brown, slightly moist to moist, very stiff to hard
10		R	38	CL/ML	81.3	22.0	Sandy clay to sandy clayey silt, brown to light gray, very moist, very stiff to hard
15							Total Depth = 10 feet No Caving No Groundwater Boring Backfilled and Tamped
20							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches

Plate A-5

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EGL

BORING LOG: B-5

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2	B	R	36	CL	113.8	10.3	Sandy clay, dark yellowish brown, slightly moist, very stiff to hard
5		R	40	CL	102.8	7.0	Sandy clay, brown to light brown, slightly moist, very stiff to hard
10							Total Depth = 6 feet No Caving No Groundwater Boring Backfilled and Tamped After Percolation Test Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
15							
20							

Plate A-6

11819 Goldring Road, Unit A, Arcadia, California, 91006; Phone (626) 263-3588; Fax (626) 263-3599

EGL

BORING LOG: B-6

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	50/9"	SM	97.0	13.1	Silty sand, gray to olive, fine to coarse grained, very moist, very dense, with miscellaneous base and gravels up to 1" in size
5		R	17	SM	107.1	5.4	Silty sand, dark yellowish brown, fine to coarse grained, slightly moist, medium dense
10		R	33	CL	98.9	21.3	Sandy clay, brown, very moist, very stiff to hard
15							Total Depth = 10 feet No Caving No Groundwater Boring Backfilled and Tamped After Percolation Test Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
20							

Plate A-7

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EGL

BORING LOG: B-7

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
5		R	30	SM	119.4	3.3	Silty sand, dark yellowish brown, fine to coarse grained, dry, medium dense, trace of clay
10		R	17	SM	108.4	6.3	Silty sand, dark yellowish brown, fine to coarse grained, slightly moist, medium dense, trace of clay
15		R	21	CL	110.8	9.8	Sandy clay, brown, slightly moist, very stiff
20		R	40	CL	89.7	22.1	Sandy clay, brown to gray, very moist, very stiff to hard
25		R	38	CL	103.9	21.9	Sandy clay, light gray, very moist, very stiff to hard
30							Total Depth = 25 feet No Caving No Groundwater Boring Backfilled and Tamped Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
35							

Plate A-8

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EGL

BORING LOG: B-8

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004UR

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 11/29/2024
DATE LOGGED: 11/29/2024
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2	B	-	-	SM	-	-	@ 2.0' Silty sand, light yellowish brown, fine to medium grained, dry, medium dense
5		R	14	SM	107.6	3.2	@ 5.0' Silty sand, yellowish brown, fine to coarse grained, dry to slightly moist, medium dense
		R	17	SM	105.3	3.8	@ 7.0' Silty sand, yellowish brown, fine to coarse grained, dry to slightly moist, medium dense
10							Total Depth = 8 feet No Caving No Groundwater Boring Backfilled and Tamped
15							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches

BORING LOG: B-9

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 11/29/2024
DATE LOGGED: 11/29/2024
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		-	-	SM	-	-	@ 2.0' Silty sand, light yellowish brown, fine to medium grained, dry, medium dense
5		R	14	SM	105.4	3.0	@ 5.0' Silty sand, yellowish brown, fine to medium grained, dry to slightly moist, medium dense
		R	16	SM	105.7	4.1	@ 7.0' Silty sand, yellowish brown, fine to medium grained, dry to slightly moist, medium dense
10							Total Depth = 8 feet No Caving No Groundwater Boring Backfilled and Tamped
15							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches

Plate A-9

EGL

BORING LOG: B-10

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004UR

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 11/29/2024
DATE LOGGED: 11/29/2024
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	11	SM	101.5	1.6	@ 2.0' Silty sand, yellowish brown, fine to coarse grained, dry, medium dense
5		R	14	SM	104.7	1.6	@ 5.0' Silty sand, brownish yellow, fine to coarse grained, dry, medium dense
10		R	18	SM	106.2	2.6	@ 10.0' Silty sand, brownish yellow, fine to coarse grained, dry, medium dense
15		R	15	SM	106.4	3.4	@ 15.0' Silty sand, brownish yellow, fine to coarse grained, dry to slightly moist, medium dense
20		R	19	SM	100.5	4.2	@ 20.0' Silty sand, light brownish gray, fine grained, slightly moist, medium dense
25		R	50/11"	SM	89.8	2.1	@ 25.0' Silty sand, light brownish gray, fine grained, dry, very dense, little gravels were encountered
30		R	50/11"	CL-SW	105.9	8.3	@ 30.0' Silty clay to well-graded sand, olive gray to strong brown, fine to coarse grained, slightly moist to moist, very dense and hard, little gravels were encountered, rocky
35		R	50/4"	SW	No Recovery		@ 35.0' Well-graded sand, light olive brown, fine to coarse grained, moist, very dense, rocky
40		R	80/1"	SW	No Recovery		@ 40.0' Well-graded sand, light olive brown, fine to coarse grained, moist, very dense, rocky

Plate A-10

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EGL

BORING LOG: B-10 (Con't)

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004UR

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 11/29/2024
DATE LOGGED: 11/29/2024
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
45		R	CL/SM	50/11"	100.5	21.6	@ 45.0' Silty clay with silty sand, light brown, fine to coarse grained, wet, very dense and hard, little gravels were encountered
50		R	SW	50	No Recovery		@ 50.0' Well-graded sand, light olive brown, fine to coarse grained, wet, very dense, rocky
60							Total Depth = 50 feet No Caving Groundwater @ 43 feet Boring Backfilled and Tamped
65							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
70							
75							
80							
85							

Plate A-11

11819 Goldring Road, Unit A, Arcadia, California, 91006; Phone: (626) 263-3588; Email: ryan@eglab.com

EGL

BORING LOG: B-11

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004UR

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 11/29/2024
DATE LOGGED: 11/29/2024
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	14	SM	105.3	2.2	@ 2.0' Silty sand, brownish yellow, fine to coarse grained, dry, medium dense
5		R	12	SM	104.0	2.1	@ 5.0' Silty sand, yellowish brown, fine to coarse grained, dry, medium dense
10		R	15	SM	107.8	6.5	@ 10.0' Silty sand, yellowish brown, fine to coarse grained, slightly moist, medium dense
15		R	19	SM	106.0	4.8	@ 15.0' Silty sand, yellowish brown, fine to coarse grained, slightly moist, medium dense
20		R	40	CL	95.6	13.4	@ 20.0' Sandy clay, gray, slightly moist to moist, very stiff
25		R	50/6"	SW/SM	125.8	1.6	@ 25.0' Well-graded sand with silt, light gray to strong brown, fine to coarse grained, dry, very dense, little gravels were encountered
30		R	50/9"	SW/SM	106.7	1.5	@ 30.0' Well-graded sand with silt, light gray, fine to coarse grained, dry, very dense, little gravels were encountered
35		R	50/6"	SW/SM	No Recovery		@ 35.0' Well-graded sand with silt, light gray, fine to coarse grained, dry, very dense, little gravels were encountered
40							Total Depth = 35 feet No Caving; No Groundwater Boring Backfilled and Tamped Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches

Plate A-12

11819 Goldring Road, Unit A, Arcadia, California, 91006; Phone: (626) 263-3588; Email: ryan@eglab.com

APPENDIX B

LABORATORY TESTING

During the subsurface exploration, EGL personnel collected relatively undisturbed ring samples and bulk samples. The following tests were performed on selected soil samples:

Moisture-Density

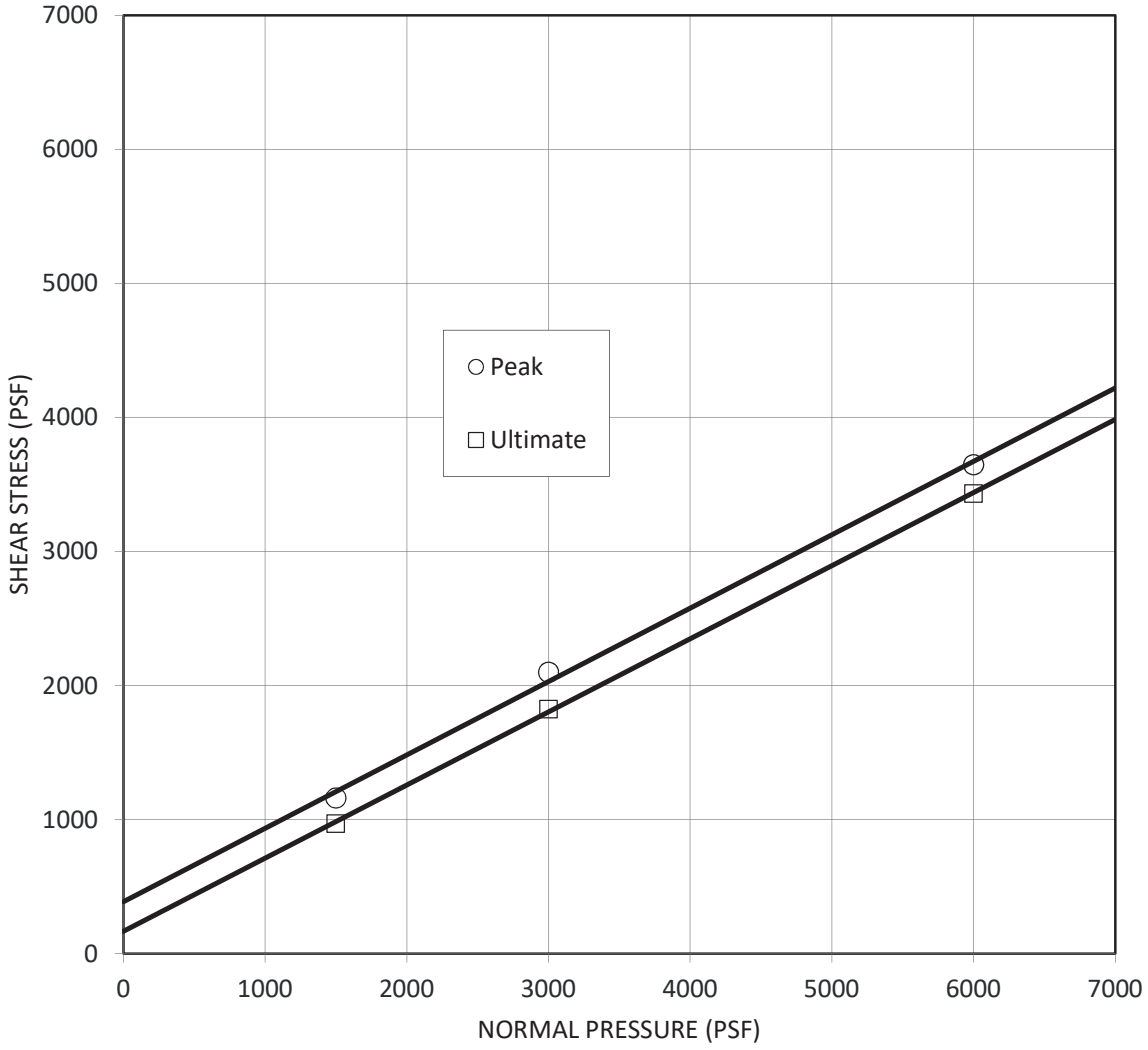
The moisture content and dry unit weight were determined for each relatively undisturbed soil sample obtained in the test borings in accordance with ASTM D2937 standard. The results of these tests are shown on the boring logs in Appendix A.

Shear Tests

Shear tests were performed in a direct shear machine of strain-control type in accordance with ASTM D3080 standard. The rate of deformation was 0.0125 inch per minute. Selected samples were sheared under varying confining loads in order to determine the Coulomb shear strength parameters: internal friction angle and cohesion. The shear test results are presented in the attached plates.

Consolidation Tests

Consolidation tests were performed on selected undisturbed soil samples in accordance with ASTM D2435 standard. The consolidation apparatus is designed for a one-inch high soil filled brass ring. Loads are applied in several increments in a geometric progression and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. The samples were inundated with water at a load of one kilo-pound (kips) per square foot, and the test results are shown on the attached Figures.



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-1	6	25.0	Ring	SM	○	389	29
					□	168	29

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
1500	8.1	22.6	104.7	100.0
3000	8.1	22.3	105.1	100.0
6000	8.1	21.8	106.0	100.0

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

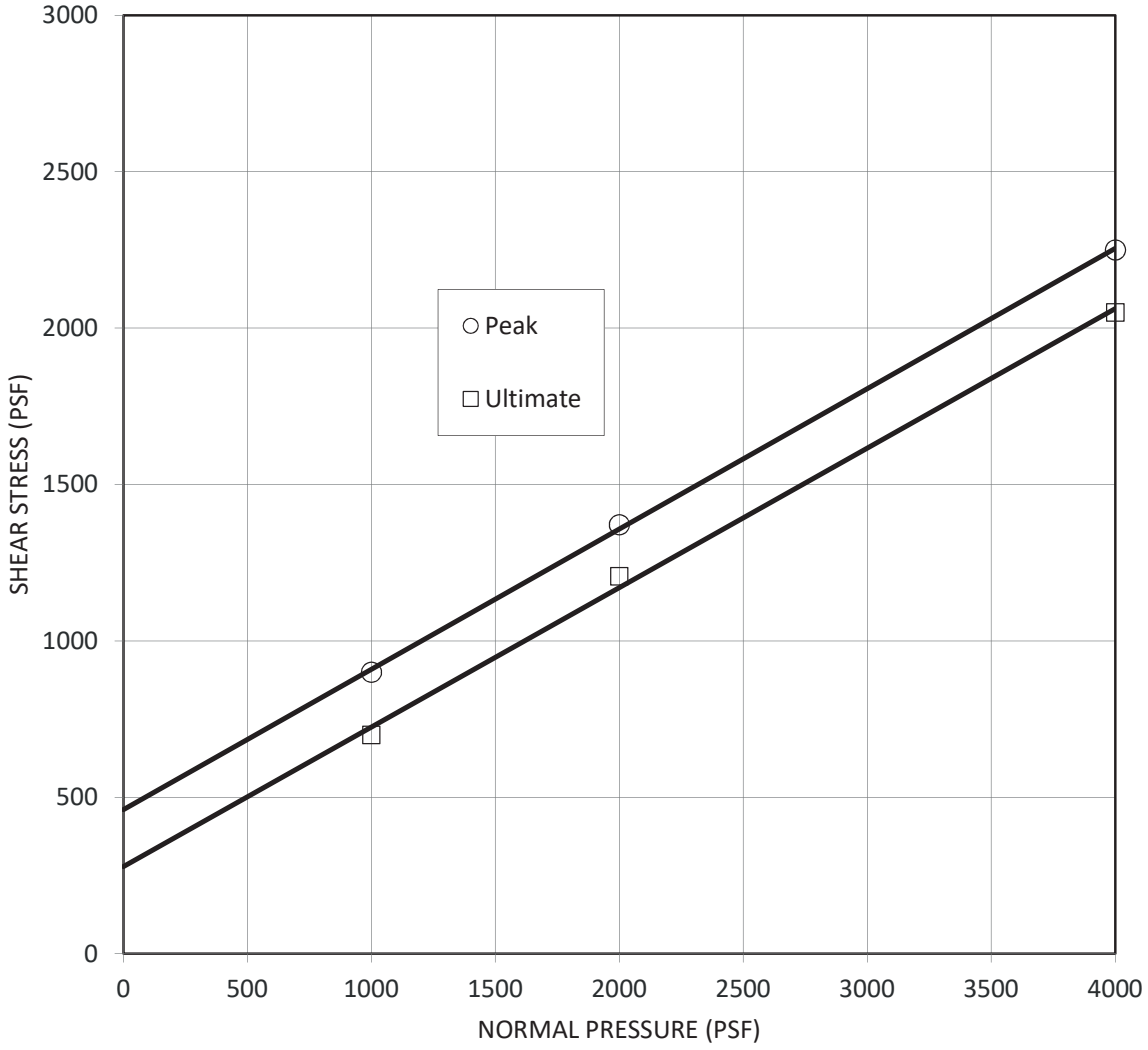
EGL Project No.: 22-257-004L

Address: 2240 Fleetwood Drive Jurupa Valley, California

DIRECT SHEAR

02/25 (ASTM D3080) Figure

11819 Goldring Road, Unit A, Arcadia, California 91006; Phone (626) 263-3588; Fax (626) 263-3599



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-4	3	10.0	Ring	CL/ML	○	461	24
					□	279	24

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
1000	22.0	45.1	75.7	99.4
2000	22.0	46.8	75.3	100.0
4000	22.0	43.6	78.6	100.0

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

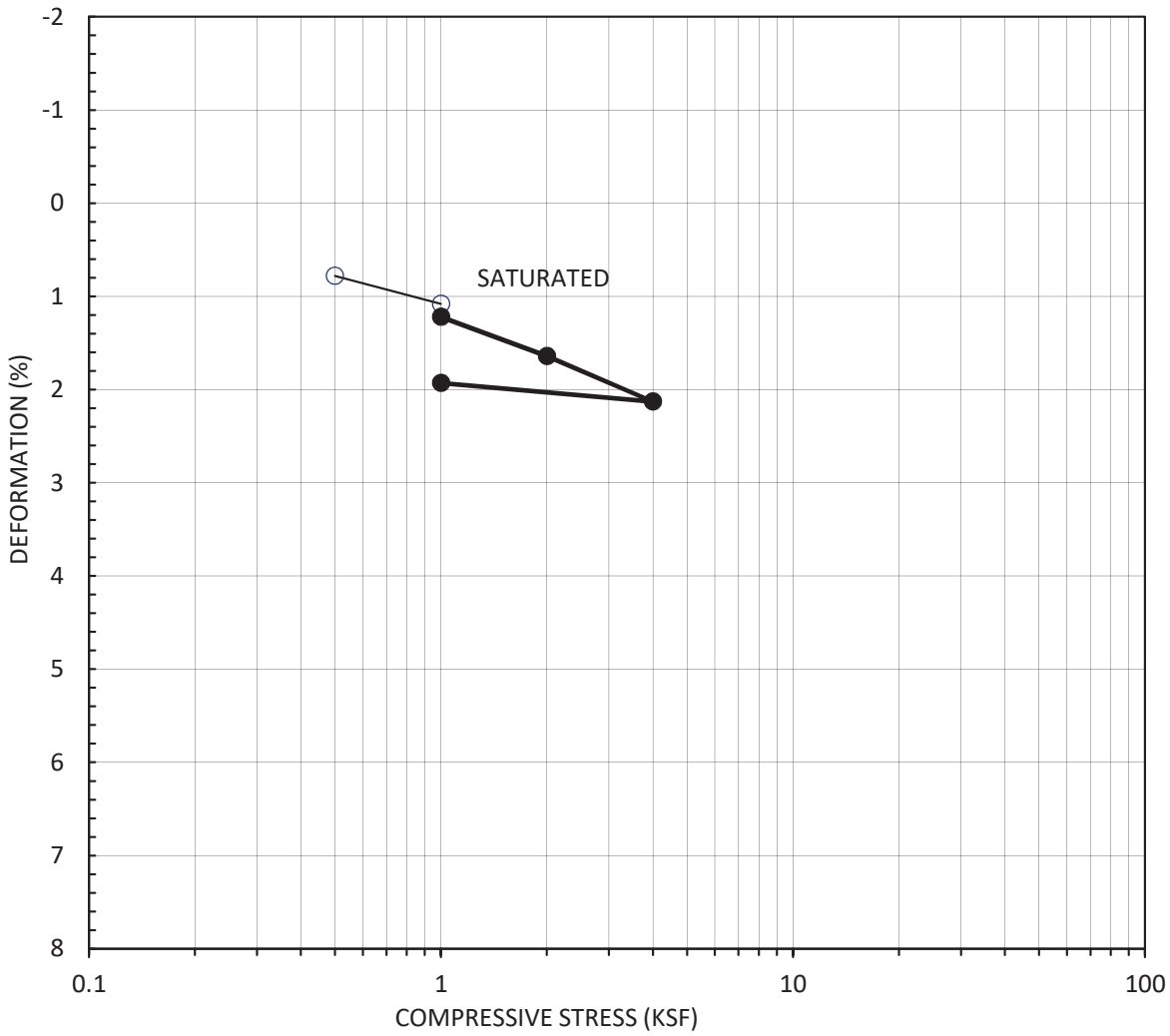
EGL Project No.: 22-257-004L

Address: 2240 Fleetwood Drive Jurupa Valley, California

DIRECT SHEAR

02/25 (ASTM D3080) Figure

11819 Goldring Road, Unit A, Arcadia, California 91006; Phone (626) 263-3588; Email: ryan@eglab.com



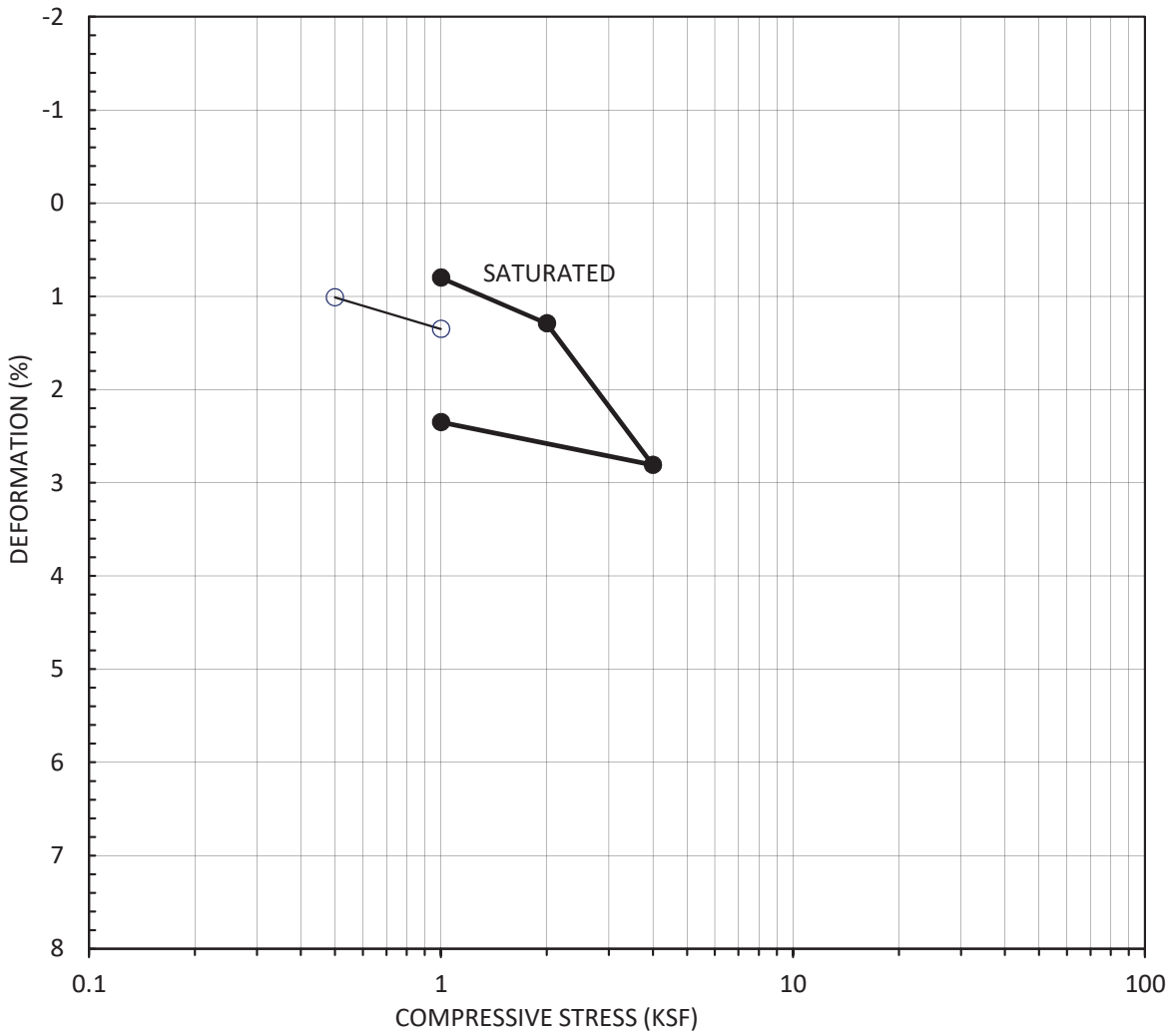
Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-1	2	5.0	SP-SM	2.5	102.6	0.642

ENVIRONMENTAL
GEOTECHNOLOGY
LABORATORY

Project Address:
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Jurupa Valley, California

CONSOLIDATION

02/25 (ASTM D2435) Figure



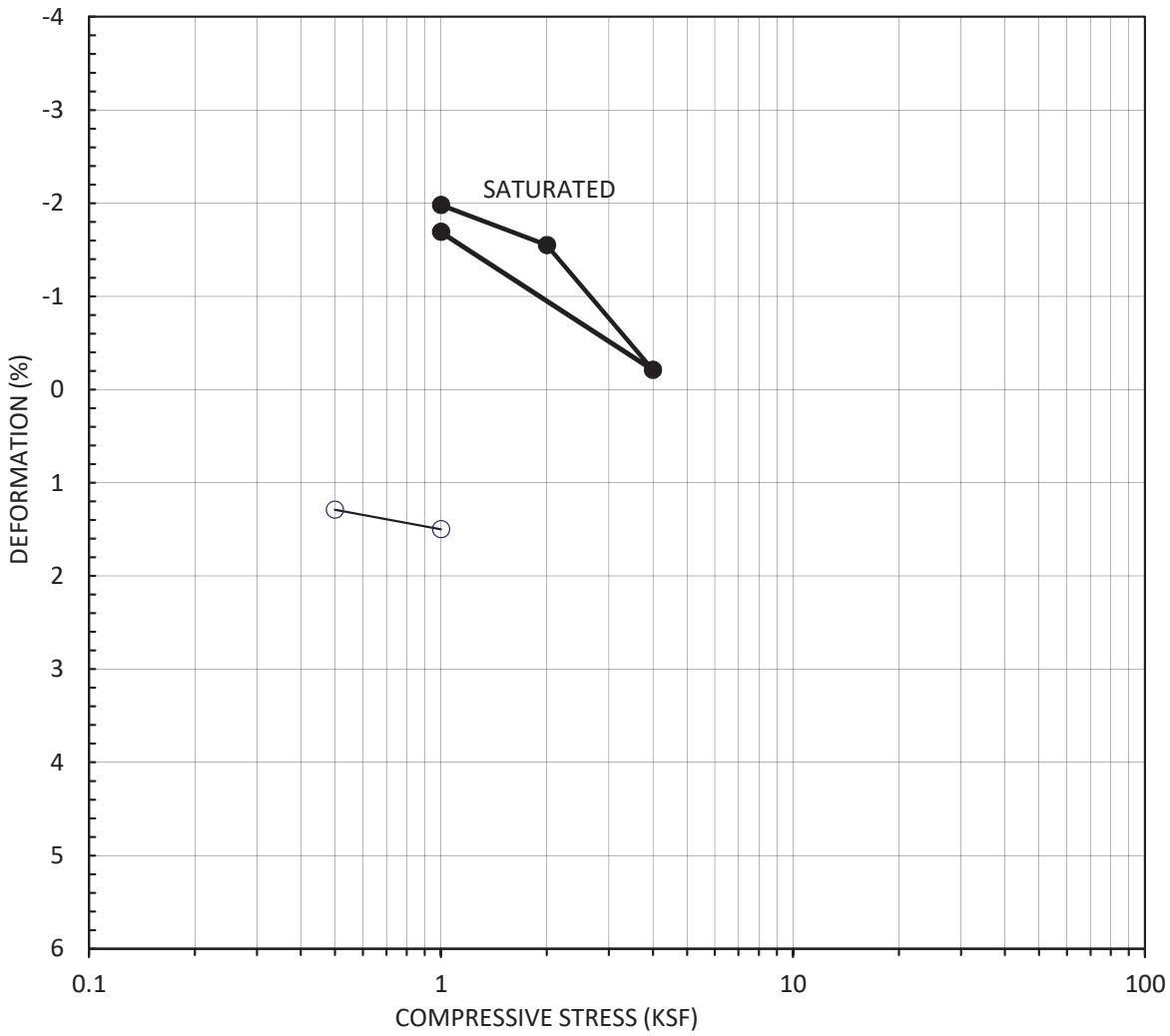
Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-4	1	2.0	CL	6.0	105.6	0.595

ENVIRONMENTAL
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CONSOLIDATION

02/25 (ASTM D2435) Figure



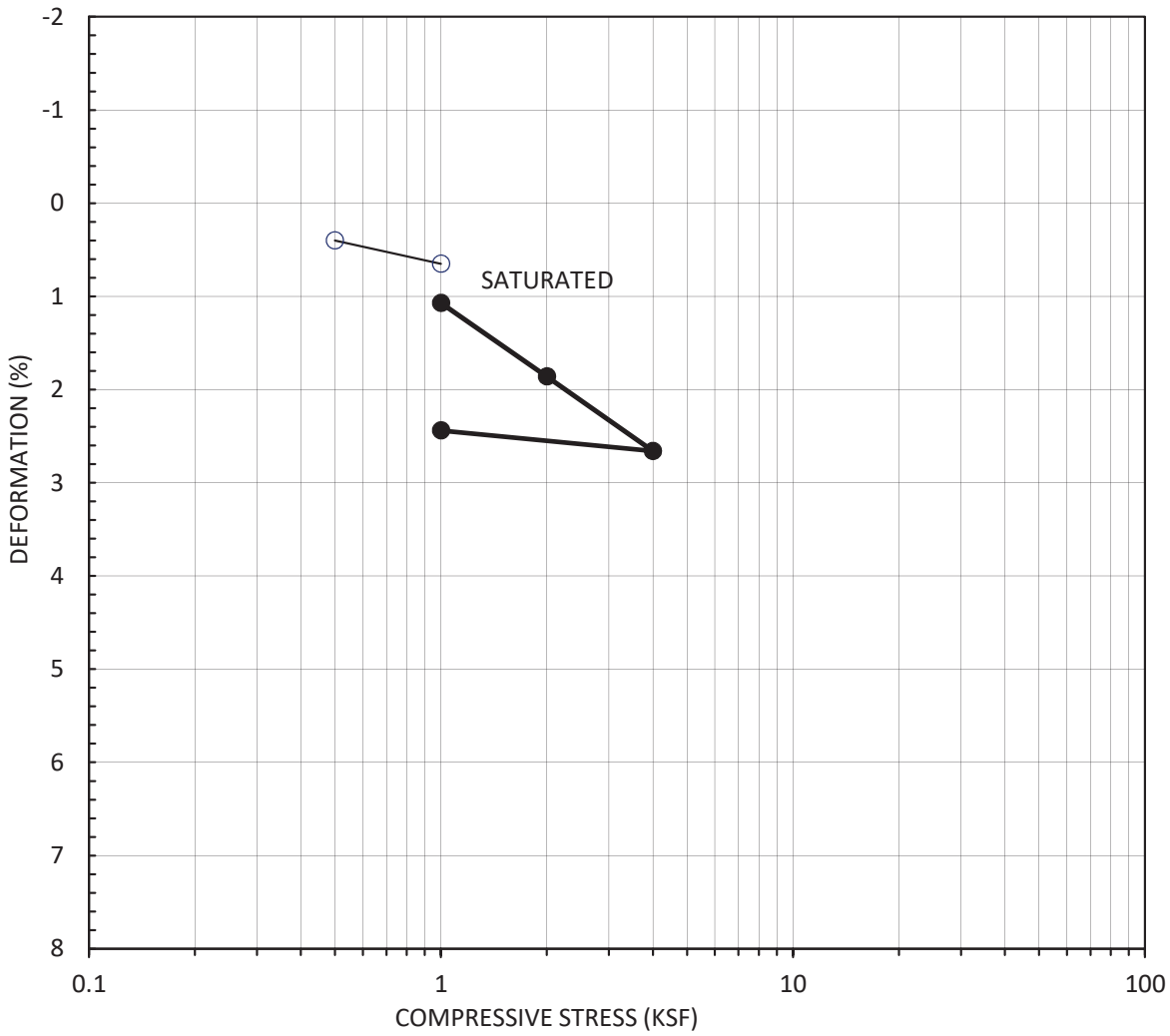
Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-6	3	10.0	CL	21.3	100.6	0.675

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02/25 (ASTM D2435) Figure



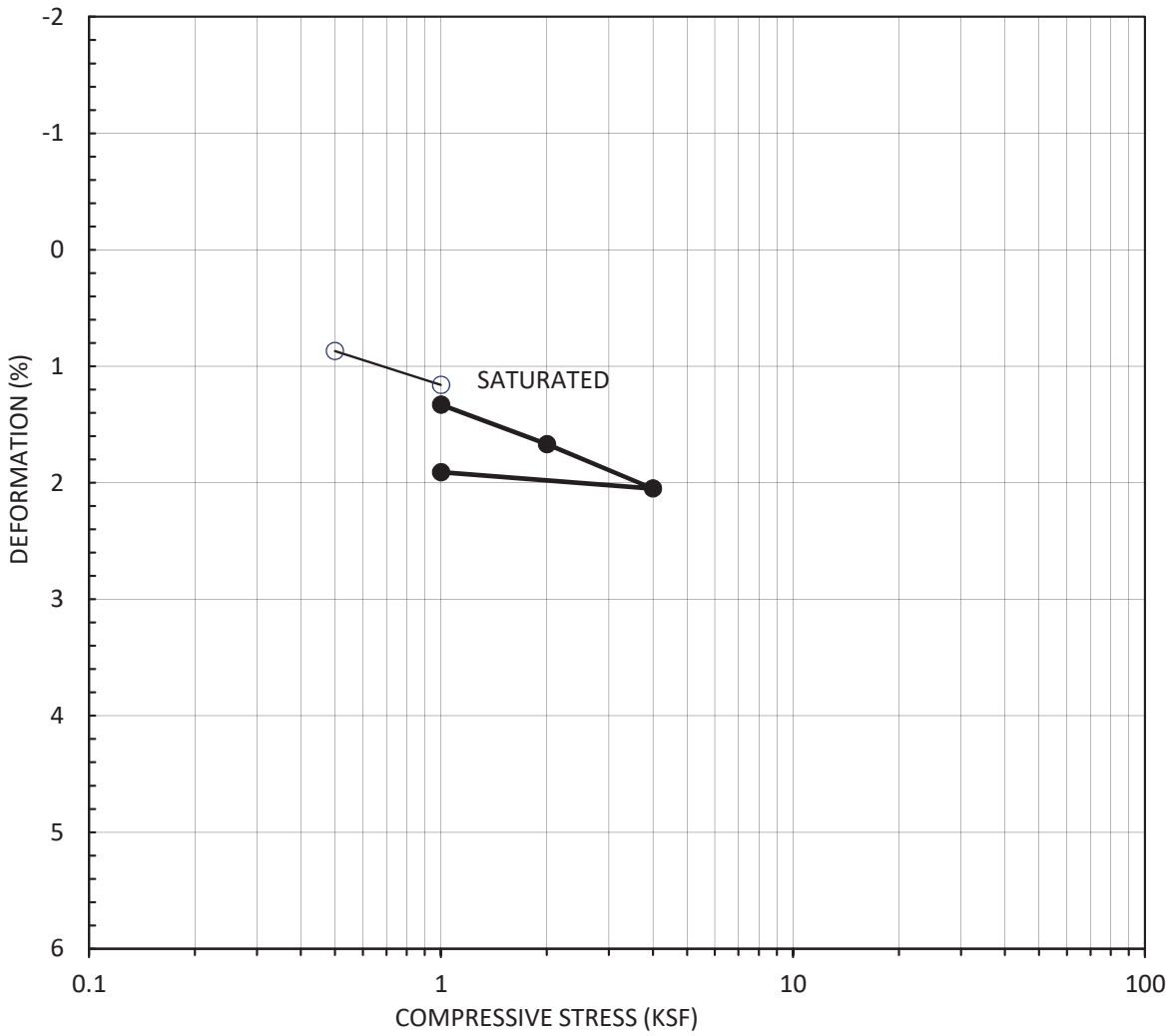
Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-7	1	5.0	SM	3.3	120.0	0.404

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02/25 (ASTM D2435) Figure



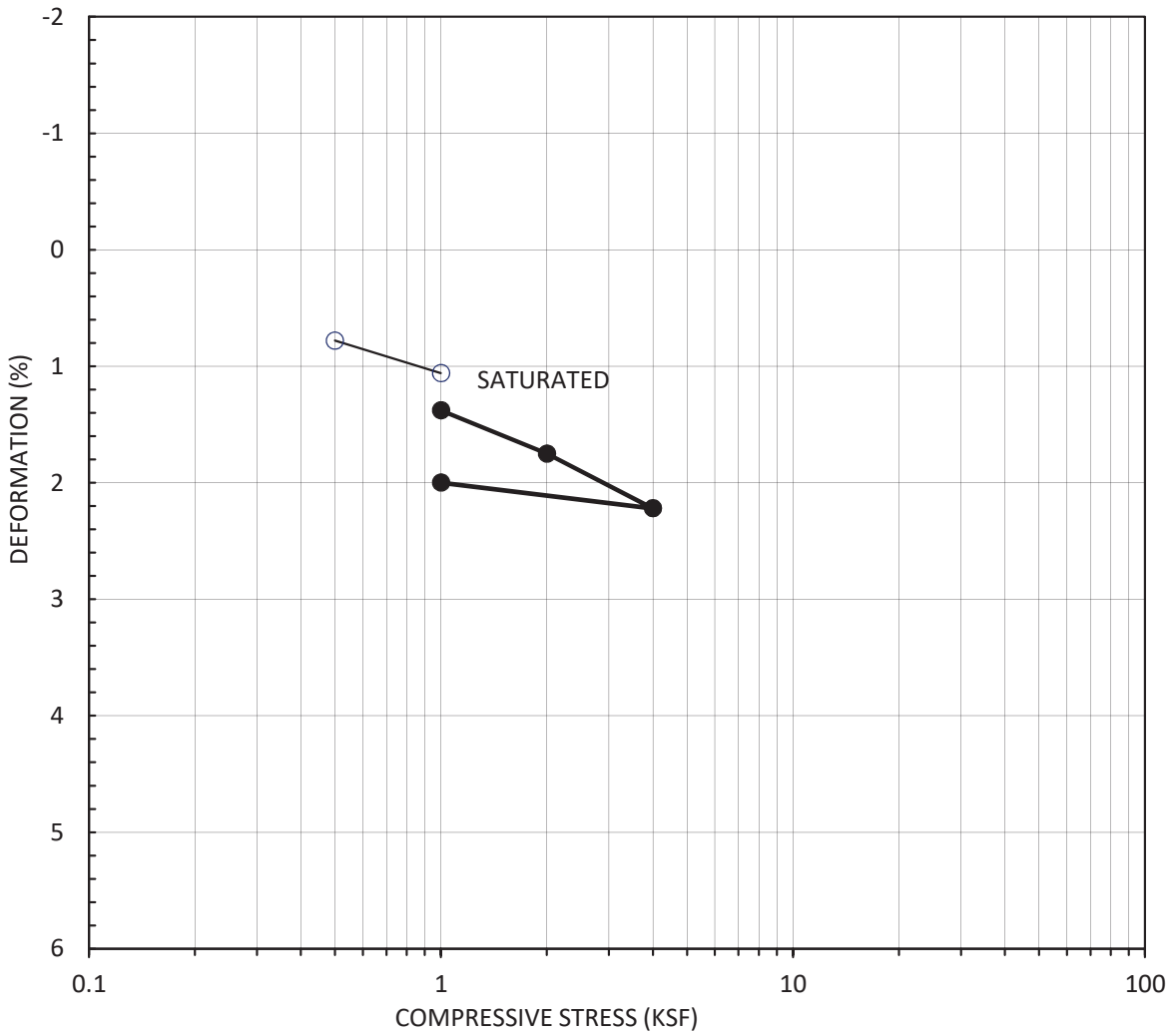
Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-8	2	7.0	SM	3.8	106.9	0.576

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02/25 (ASTM D2435) Figure



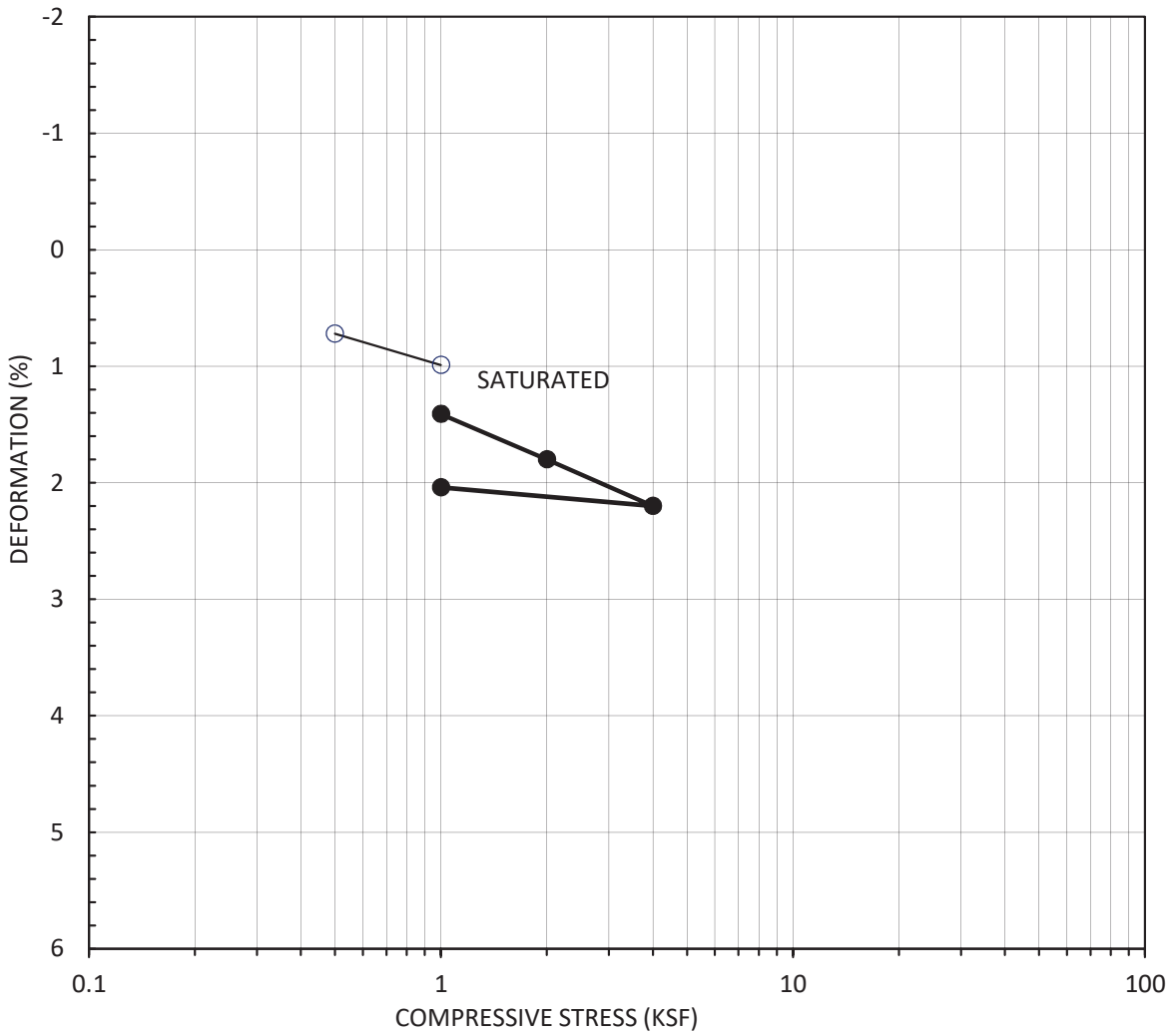
Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-10	2	5.0	SM	1.6	105.9	0.591

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02/25 (ASTM D2435) Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-11	1	2.0	SM	2.2	107.1	0.572

ENVIRONMENTAL
GEOTECHNOLOGY
LABORATORY

Project Address:
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Jurupa Valley, California

CONSOLIDATION

02/25 (ASTM D2435) Figure

APPENDIX C

SLOPE STABILITY ANALYSES

Simplified Bishop's method was used to analyze the existing and proposed slope conditions as depicted on the Cross Sections A-A', B-B' and C-C' (Figure 2). Seismic coefficient of 0.20 g (g: gravity) was used in the seismic condition. Stability calculations and sections are presented on the plates following the report and the results of EGL's slope stability analyses of existing and proposed slope conditions are briefly described with corresponding geotechnical recommendations.

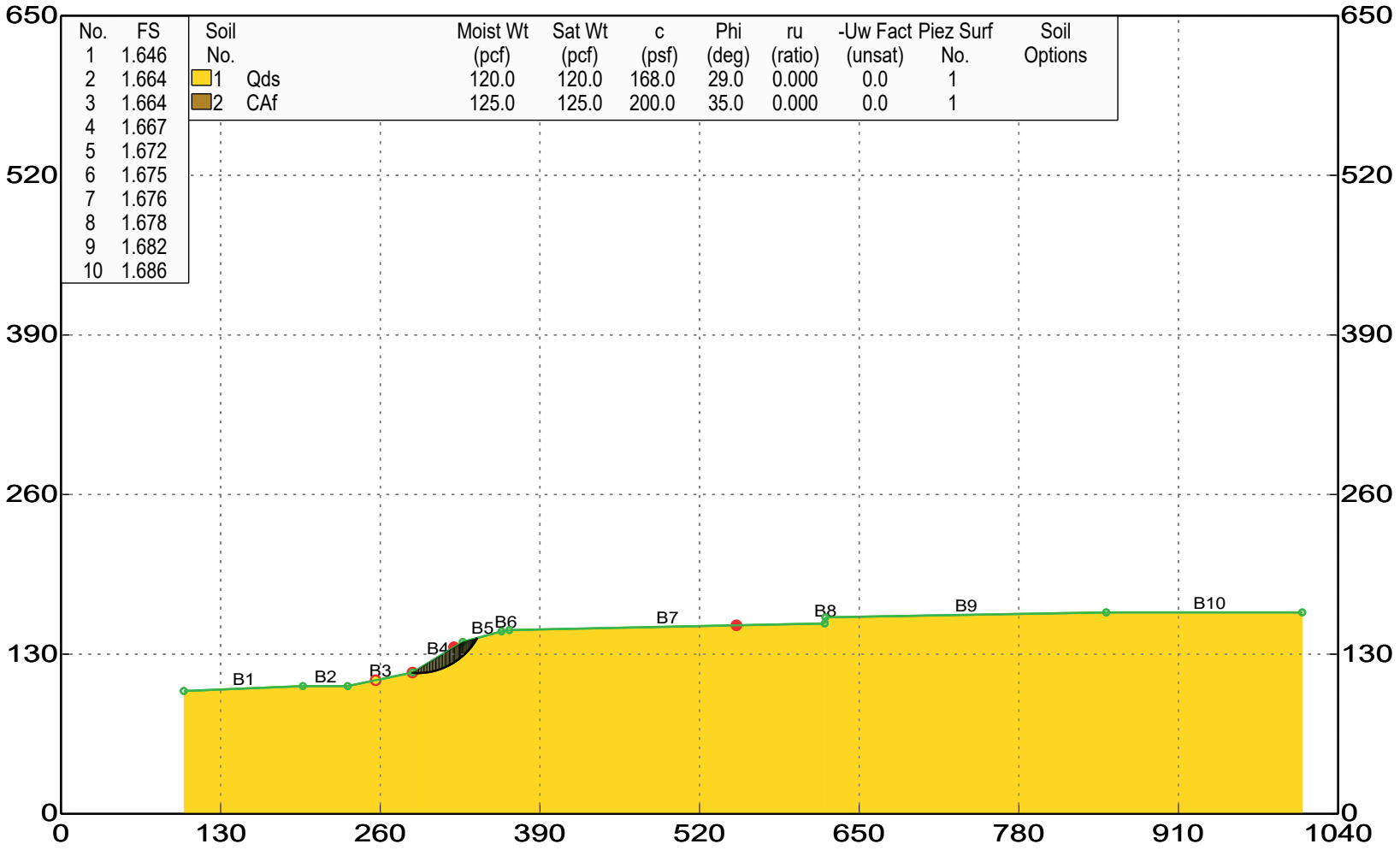
Earth Materials	Unit Weight (pcf)	Friction Angle (Degree)	Cohesion (psf)
Soil, Ultimate^{+} (Qds; B-1 @ 25.0')	120.0	29	168
Soil, Peak (Qds; B-1 @ 25.0')	120.0	29	389
Soil, Ultimate (Qds; B-4 @ 10.0')	120.0	24	279
Soil, Peak (Qds; B-4 @ 10.0')	120.0	24	461
Proposed Compacted Fill, Ultimate (CAf; Assumed)	125.0	35	200

Analyzed Section	Calculated Condition	Factors of Safety (Static / Seismic)
A - A'	Existing approximately 60 feet high slope	1.65 / 1.14
A - A'	Proposed slope with assumed building Loads, including effluent from proposed infiltration system	1.65 / 1.14
B - B'	Existing approximately 50 feet high slope	1.08 / 1.01
B - B'	Proposed slope with assumed building (parking lot) Loads	1.08 / 1.01
B - B'	Modified existing slope with safety layback line	1.50 / 1.10
B - B'	Modified proposed slope with safety layback line	1.50 / 1.10
C - C'	Existing approximately 35 feet high slope	1.42 / 1.15
C - C'	Proposed slope with assumed building loads, including effluent from proposed infiltration system	1.42 / 1.15
C - C'	Modified proposed slope with safety layback line	1.50 / ---

2240 Fleetwood Drive, Jurupa
Section AA - Existing - Static

EGL

\AA001.gsd



No.	FS
1	1.646
2	1.664
3	1.664
4	1.667
5	1.672
6	1.675
7	1.676
8	1.678
9	1.682
10	1.686

Soil No.		Moist Wt (pcf)	Sat Wt (pcf)	c (psf)	Phi (deg)	ru (ratio)	-Uw Fact (unsat)	Piez Surf No.	Soil Options
1	Qds	120.0	120.0	168.0	29.0	0.000	0.0	1	
2	CAf	125.0	125.0	200.0	35.0	0.000	0.0	1	

GEOSTASE FS = 1.646

Simplified Bishop Method

GEOSTASE
Slope Stability Analysis

PLATE D.1

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section AA\AA001.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section AA\AA001.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section AA - Existing - Static

PROFILE BOUNDARY DATA

10 Surface Boundaries
10 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	196.900	104.000	1
2	196.900	104.000	233.500	104.000	1
3	233.500	104.000	286.200	115.000	1
4	286.200	115.000	327.200	140.000	1
5	327.200	140.000	358.700	148.500	1
6	358.700	148.500	365.200	149.600	1
7	365.200	149.600	622.000	155.000	1
8	622.000	155.000	622.500	160.000	1
9	622.500	160.000	851.200	164.000	1
10	851.200	164.000	1010.800	164.000	1

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = 0.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	196.900	104.000
3	233.500	104.000
4	286.200	115.000
5	327.200	140.000
6	358.700	148.500

7	365.200	149.600
8	622.000	155.000
9	622.500	160.000
10	851.200	164.000
11	1010.800	164.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.041	2.364
2	0.000	0.000
3	0.209	11.790
4	0.610	31.373
5	0.270	15.101
6	0.169	9.605
7	0.021	1.205
8	10.000	84.289
9	0.017	1.002
10	0.000	0.000

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	168.00	29.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 4 Coordinate Points
Phreatic Adjustment Factor = 0.00

Point No.	X-Water (ft)	Y-Water (ft)
1	321.00	2160.00
2	546.00	2385.00
3	550.00	2385.00
4	700.00	2235.00

WATER SURFACE DATA HAS BEEN SUPPRESSED

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.3604(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 256.20(ft)
and X = 286.20(ft)

Each Surface ends within a Range Between X = 320.00(ft)

and X = 550.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 0.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 7.940 FS Min = 1.646 FS Ave = 3.440
Standard Deviation = 1.558 Coefficient of Variation = 45.28 %

Critical Surface is Sequence Number 971 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 290.123991(ft) ; Y = 170.657664(ft); and Radius = 56.044926(ft)

Circular Trial Failure Surface Generated With 66 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	285.32913	114.81822
2	286.32619	114.74156
3	287.32445	114.68270
4	288.32361	114.64166
5	289.32334	114.61846
6	290.32333	114.61309
7	291.32325	114.62557
8	292.32279	114.65589
9	293.32163	114.70403
10	294.31945	114.76999
11	295.31594	114.85374
12	296.31077	114.95526
13	297.30364	115.07452
14	298.29421	115.21146
15	299.28219	115.36606
16	300.26725	115.53827
17	301.24908	115.72802
18	302.22738	115.93526
19	303.20181	116.15992
20	304.17209	116.40193
21	305.13789	116.66121
22	306.09891	116.93769
23	307.05484	117.23127
24	308.00539	117.54185
25	308.95024	117.86935
26	309.88910	118.21365
27	310.82166	118.57465
28	311.74764	118.95223
29	312.66673	119.34628
30	313.57865	119.75665
31	314.48310	120.18324

32	315.37979	120.62589
33	316.26844	121.08447
34	317.14877	121.55884
35	318.02050	122.04883
36	318.88334	122.55430
37	319.73703	123.07509
38	320.58129	123.61102
39	321.41585	124.16193
40	322.24045	124.72765
41	323.05483	125.30798
42	323.85872	125.90276
43	324.65187	126.51178
44	325.43403	127.13486
45	326.20495	127.77179
46	326.96438	128.42238
47	327.71209	129.08641
48	328.44782	129.76368
49	329.17136	130.45397
50	329.88246	131.15706
51	330.58091	131.87272
52	331.26647	132.60073
53	331.93894	133.34086
54	332.59809	134.09287
55	333.24373	134.85652
56	333.87563	135.63156
57	334.49361	136.41776
58	335.09745	137.21486
59	335.68699	138.02260
60	336.26201	138.84074
61	336.82235	139.66900
62	337.36782	140.50713
63	337.89825	141.35486
64	338.41347	142.21192
65	338.91331	143.07804
66	338.96713	143.17526

Factor Of Safety For The Critical or Specified Surface = 1.646

Table 1 - Geometry Data on the 67 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	0.87	0.12	285.76	114.78	114.91	-4.40	11.79	0.87
2	0.13	0.29	286.26	114.75	115.04	-4.40	31.37	0.13
3	1.00	0.67	286.83	114.71	115.38	-3.37	31.37	1.00
4	1.00	1.33	287.82	114.66	115.99	-2.35	31.37	1.00
5	1.00	1.97	288.82	114.63	116.60	-1.33	31.37	1.00
6	1.00	2.59	289.82	114.62	117.21	-0.31	31.37	1.00
7	1.00	3.20	290.82	114.62	117.82	0.71	31.37	1.00
8	1.00	3.79	291.82	114.64	118.43	1.74	31.37	1.00
9	1.00	4.36	292.82	114.68	119.04	2.76	31.37	1.00
10	1.00	4.91	293.82	114.74	119.65	3.78	31.37	1.00
11	1.00	5.44	294.82	114.81	120.25	4.80	31.37	1.00
12	0.99	5.96	295.81	114.90	120.86	5.83	31.37	1.00
13	0.99	6.45	296.81	115.01	121.47	6.85	31.37	1.00
14	0.99	6.93	297.80	115.14	122.07	7.87	31.37	1.00
15	0.99	7.39	298.79	115.29	122.68	8.89	31.37	1.00
16	0.99	7.83	299.77	115.45	123.28	9.92	31.37	1.00
17	0.98	8.24	300.76	115.63	123.88	10.94	31.37	1.00
18	0.98	8.64	301.74	115.83	124.47	11.96	31.37	1.00
19	0.97	9.02	302.71	116.05	125.07	12.98	31.37	1.00
20	0.97	9.38	303.69	116.28	125.66	14.01	31.37	1.00
21	0.97	9.72	304.65	116.53	126.25	15.03	31.37	1.00
22	0.96	10.04	305.62	116.80	126.84	16.05	31.37	1.00
23	0.96	10.34	306.58	117.08	127.42	17.07	31.37	1.00
24	0.95	10.62	307.53	117.39	128.01	18.09	31.37	1.00

25	0.94	10.88	308.48	117.71	128.58	19.12	31.37	1.00
26	0.94	11.12	309.42	118.04	129.16	20.14	31.37	1.00
27	0.93	11.33	310.36	118.39	129.73	21.16	31.37	1.00
28	0.93	11.53	311.28	118.76	130.30	22.18	31.37	1.00
29	0.92	11.71	312.21	119.15	130.86	23.21	31.37	1.00
30	0.91	11.86	313.12	119.55	131.42	24.23	31.37	1.00
31	0.90	12.00	314.03	119.97	131.97	25.25	31.37	1.00
32	0.90	12.11	314.93	120.40	132.52	26.27	31.37	1.00
33	0.89	12.21	315.82	120.86	133.06	27.30	31.37	1.00
34	0.88	12.28	316.71	121.32	133.60	28.32	31.37	1.00
35	0.87	12.33	317.58	121.80	134.14	29.34	31.37	1.00
36	0.86	12.36	318.45	122.30	134.67	30.36	31.37	1.00
37	0.85	12.37	319.31	122.81	135.19	31.38	31.37	1.00
38	0.84	12.36	320.16	123.34	135.71	32.41	31.37	1.00
39	0.83	12.33	321.00	123.89	136.22	33.43	31.37	1.00
40	0.82	12.28	321.83	124.44	136.72	34.45	31.37	1.00
41	0.81	12.21	322.65	125.02	137.22	35.47	31.37	1.00
42	0.80	12.11	323.46	125.61	137.72	36.50	31.37	1.00
43	0.79	12.00	324.26	126.21	138.20	37.52	31.37	1.00
44	0.78	11.86	325.04	126.82	138.68	38.54	31.37	1.00
45	0.77	11.70	325.82	127.45	139.16	39.56	31.37	1.00
46	0.76	11.53	326.58	128.10	139.62	40.59	31.37	1.00
47	0.24	11.40	327.08	128.53	139.93	41.61	31.37	0.32
48	0.51	11.21	327.46	128.86	140.07	41.61	15.10	0.68
49	0.74	10.81	328.08	129.43	140.24	42.63	15.10	1.00
50	0.72	10.33	328.81	130.11	140.43	43.65	15.10	1.00
51	0.71	9.82	329.53	130.81	140.63	44.68	15.10	1.00
52	0.70	9.30	330.23	131.51	140.82	45.70	15.10	1.00
53	0.69	8.77	330.92	132.24	141.00	46.72	15.10	1.00
54	0.67	8.22	331.60	132.97	141.19	47.74	15.10	1.00
55	0.66	7.65	332.27	133.72	141.37	48.76	15.10	1.00
56	0.65	7.07	332.92	134.47	141.54	49.79	15.10	1.00
57	0.63	6.47	333.56	135.24	141.72	50.81	15.10	1.00
58	0.62	5.86	334.18	136.02	141.88	51.83	15.10	1.00
59	0.60	5.23	334.80	136.82	142.05	52.85	15.10	1.00
60	0.59	4.59	335.39	137.62	142.21	53.88	15.10	1.00
61	0.58	3.94	335.97	138.43	142.37	54.90	15.10	1.00
62	0.56	3.27	336.54	139.25	142.52	55.92	15.10	1.00
63	0.55	2.58	337.10	140.09	142.67	56.94	15.10	1.00
64	0.53	1.88	337.63	140.93	142.82	57.97	15.10	1.00
65	0.52	1.17	338.16	141.78	142.96	58.99	15.10	1.00
66	0.50	0.45	338.66	142.64	143.09	60.01	15.10	1.00
67	0.05	0.04	338.94	143.13	143.17	61.03	15.10	0.11

Table 2 - Force Data On The 67 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	13.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
2	4.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
3	80.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
4	159.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
5	236.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
6	311.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
7	383.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
8	454.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
9	522.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
10	587.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
11	650.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
12	711.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
13	768.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
14	823.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
15	875.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
16	925.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
17	971.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
18	1014.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
19	1055.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
20	1092.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

21	1126.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
22	1158.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
23	1186.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
24	1211.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
25	1233.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
26	1252.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
27	1268.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
28	1281.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
29	1291.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
30	1298.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
31	1302.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
32	1303.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
33	1301.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
34	1297.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
35	1290.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
36	1280.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
37	1267.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
38	1252.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
39	1235.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
40	1215.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
41	1192.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
42	1168.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
43	1141.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
44	1113.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
45	1082.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
46	1050.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
47	322.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
48	688.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
49	954.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
50	896.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
51	838.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
52	779.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
53	721.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
54	663.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
55	605.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
56	547.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
57	490.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
58	434.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
59	379.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
60	324.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
61	271.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
62	219.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
63	169.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
64	119.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
65	72.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
66	26.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
67	0.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 52971.59(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 52971.59(lbs)

TOTAL AREA OF SLIDING MASS = 441.43(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 67 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	168.00	29.00	
2	1	168.00	29.00	
3	1	168.00	29.00	
4	1	168.00	29.00	
5	1	168.00	29.00	
6	1	168.00	29.00	
7	1	168.00	29.00	
8	1	168.00	29.00	
9	1	168.00	29.00	
10	1	168.00	29.00	
11	1	168.00	29.00	
12	1	168.00	29.00	

13	1	168.00	29.00
14	1	168.00	29.00
15	1	168.00	29.00
16	1	168.00	29.00
17	1	168.00	29.00
18	1	168.00	29.00
19	1	168.00	29.00
20	1	168.00	29.00
21	1	168.00	29.00
22	1	168.00	29.00
23	1	168.00	29.00
24	1	168.00	29.00
25	1	168.00	29.00
26	1	168.00	29.00
27	1	168.00	29.00
28	1	168.00	29.00
29	1	168.00	29.00
30	1	168.00	29.00
31	1	168.00	29.00
32	1	168.00	29.00
33	1	168.00	29.00
34	1	168.00	29.00
35	1	168.00	29.00
36	1	168.00	29.00
37	1	168.00	29.00
38	1	168.00	29.00
39	1	168.00	29.00
40	1	168.00	29.00
41	1	168.00	29.00
42	1	168.00	29.00
43	1	168.00	29.00
44	1	168.00	29.00
45	1	168.00	29.00
46	1	168.00	29.00
47	1	168.00	29.00
48	1	168.00	29.00
49	1	168.00	29.00
50	1	168.00	29.00
51	1	168.00	29.00
52	1	168.00	29.00
53	1	168.00	29.00
54	1	168.00	29.00
55	1	168.00	29.00
56	1	168.00	29.00
57	1	168.00	29.00
58	1	168.00	29.00
59	1	168.00	29.00
60	1	168.00	29.00
61	1	168.00	29.00
62	1	168.00	29.00
63	1	168.00	29.00
64	1	168.00	29.00
65	1	168.00	29.00
66	1	168.00	29.00
67	1	168.00	29.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 67 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-4.40	285.76	0.87	23.38	180.96	109.96
2	-4.40	286.26	0.13	44.04	192.41	116.92
3	-3.37	286.83	1.00	88.07	216.82	131.75
4	-2.35	287.82	1.00	165.86	259.94	157.95
5	-1.33	288.82	1.00	240.61	301.37	183.13
6	-0.31	289.82	1.00	312.34	341.13	207.29
7	0.71	290.82	1.00	381.09	379.24	230.45
8	1.74	291.82	1.00	446.89	415.71	252.61
9	2.76	292.82	1.00	509.76	450.56	273.79
10	3.78	293.82	1.00	569.72	483.80	293.98
11	4.80	294.82	1.00	626.81	515.44	313.21
12	5.83	295.81	1.00	681.04	545.51	331.48
13	6.85	296.81	1.00	732.45	574.00	348.79
14	7.87	297.80	1.00	781.05	600.94	365.16
15	8.89	298.79	1.00	826.86	626.34	380.60
16	9.92	299.77	1.00	869.93	650.21	395.10
17	10.94	300.76	1.00	910.25	672.56	408.68
18	11.96	301.74	1.00	947.87	693.41	421.35
19	12.98	302.71	1.00	982.79	712.77	433.12
20	14.01	303.69	1.00	1015.05	730.65	443.98
21	15.03	304.65	1.00	1044.67	747.07	453.96
22	16.05	305.62	1.00	1071.67	762.04	463.05
23	17.07	306.58	1.00	1096.08	775.57	471.28
24	18.09	307.53	1.00	1117.92	787.67	478.63
25	19.12	308.48	1.00	1137.22	798.37	485.13
26	20.14	309.42	1.00	1153.99	807.67	490.78
27	21.16	310.36	1.00	1168.27	815.58	495.59
28	22.18	311.28	1.00	1180.09	822.13	499.57
29	23.21	312.21	1.00	1189.46	827.33	502.73
30	24.23	313.12	1.00	1196.43	831.19	505.07
31	25.25	314.03	1.00	1201.00	833.73	506.62
32	26.27	314.93	1.00	1203.23	834.96	507.36
33	27.30	315.82	1.00	1203.12	834.90	507.33
34	28.32	316.71	1.00	1200.73	833.57	506.52
35	29.34	317.58	1.00	1196.07	830.99	504.95
36	30.36	318.45	1.00	1189.18	827.17	502.63
37	31.38	319.31	1.00	1180.09	822.14	499.57
38	32.41	320.16	1.00	1168.85	815.90	495.78
39	33.43	321.00	1.00	1155.47	808.49	491.28
40	34.45	321.83	1.00	1140.01	799.92	486.07
41	35.47	322.65	1.00	1122.50	790.21	480.17
42	36.50	323.46	1.00	1102.97	779.39	473.60
43	37.52	324.26	1.00	1081.48	767.47	466.36
44	38.54	325.04	1.00	1058.05	754.49	458.47
45	39.56	325.82	1.00	1032.75	740.46	449.94
46	40.59	326.58	1.00	1005.60	725.42	440.80
47	41.61	327.08	0.32	983.25	713.03	433.27
48	41.61	327.46	0.68	965.60	703.24	427.33
49	42.63	328.08	1.00	918.60	677.19	411.49
50	43.65	328.81	1.00	863.94	646.89	393.08
51	44.68	329.53	1.00	808.42	616.12	374.38
52	45.70	330.23	1.00	752.11	584.90	355.42
53	46.72	330.92	1.00	695.06	553.28	336.20
54	47.74	331.60	1.00	637.35	521.29	316.76
55	48.76	332.27	1.00	579.04	488.97	297.12
56	49.79	332.92	1.00	520.21	456.35	277.30
57	50.81	333.56	1.00	460.93	423.50	257.34
58	51.83	334.18	1.00	401.29	390.44	237.25
59	52.85	334.80	1.00	341.38	357.23	217.07
60	53.88	335.39	1.00	281.27	323.91	196.83
61	54.90	335.97	1.00	221.07	290.54	176.55
62	55.92	336.54	1.00	160.87	257.17	156.27
63	56.94	337.10	1.00	100.78	223.86	136.03
64	57.97	337.63	1.00	40.90	190.67	115.86
65	58.99	338.16	1.00	0.00	168.00	102.09
66	60.01	338.66	1.00	0.00	168.00	102.09
67	61.03	338.94	0.11	0.00	168.00	102.09

Table 4A - Base Force Data on the 67 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-4.40	285.76	0.87	20.42	158.06	96.04
2	-4.40	286.26	0.13	5.57	24.35	14.80
3	-3.37	286.83	1.00	88.07	216.82	131.75
4	-2.35	287.82	1.00	165.86	259.94	157.95
5	-1.33	288.82	1.00	240.61	301.37	183.13
6	-0.31	289.82	1.00	312.34	341.13	207.29
7	0.71	290.82	1.00	381.09	379.24	230.45
8	1.74	291.82	1.00	446.89	415.71	252.61
9	2.76	292.82	1.00	509.76	450.56	273.79
10	3.78	293.82	1.00	569.72	483.80	293.98
11	4.80	294.82	1.00	626.81	515.44	313.21
12	5.83	295.81	1.00	681.04	545.51	331.48
13	6.85	296.81	1.00	732.45	574.00	348.79
14	7.87	297.80	1.00	781.05	600.94	365.16
15	8.89	298.79	1.00	826.86	626.34	380.60
16	9.92	299.77	1.00	869.93	650.21	395.10
17	10.94	300.76	1.00	910.25	672.56	408.68
18	11.96	301.74	1.00	947.87	693.41	421.35
19	12.98	302.71	1.00	982.79	712.77	433.12
20	14.01	303.69	1.00	1015.05	730.65	443.98
21	15.03	304.65	1.00	1044.67	747.07	453.96
22	16.05	305.62	1.00	1071.67	762.04	463.05
23	17.07	306.58	1.00	1096.08	775.57	471.28
24	18.09	307.53	1.00	1117.92	787.67	478.63
25	19.12	308.48	1.00	1137.22	798.37	485.13
26	20.14	309.42	1.00	1153.99	807.67	490.78
27	21.16	310.36	1.00	1168.27	815.58	495.59
28	22.18	311.28	1.00	1180.09	822.13	499.57
29	23.21	312.21	1.00	1189.46	827.33	502.73
30	24.23	313.12	1.00	1196.43	831.19	505.07
31	25.25	314.03	1.00	1201.00	833.73	506.62
32	26.27	314.93	1.00	1203.23	834.96	507.36
33	27.30	315.82	1.00	1203.12	834.90	507.33
34	28.32	316.71	1.00	1200.73	833.57	506.52
35	29.34	317.58	1.00	1196.07	830.99	504.95
36	30.36	318.45	1.00	1189.18	827.17	502.63
37	31.38	319.31	1.00	1180.09	822.14	499.57
38	32.41	320.16	1.00	1168.85	815.90	495.78
39	33.43	321.00	1.00	1155.47	808.49	491.28
40	34.45	321.83	1.00	1140.01	799.92	486.07
41	35.47	322.65	1.00	1122.50	790.21	480.17
42	36.50	323.46	1.00	1102.97	779.39	473.60
43	37.52	324.26	1.00	1081.48	767.47	466.36
44	38.54	325.04	1.00	1058.05	754.49	458.47
45	39.56	325.82	1.00	1032.75	740.46	449.94
46	40.59	326.58	1.00	1005.60	725.42	440.80
47	41.61	327.08	0.32	309.84	224.69	136.53
48	41.61	327.46	0.68	661.32	481.64	292.67
49	42.63	328.08	1.00	918.60	677.19	411.49
50	43.65	328.81	1.00	863.94	646.89	393.08
51	44.68	329.53	1.00	808.42	616.12	374.38
52	45.70	330.23	1.00	752.11	584.90	355.42
53	46.72	330.92	1.00	695.06	553.28	336.20
54	47.74	331.60	1.00	637.35	521.29	316.76
55	48.76	332.27	1.00	579.04	488.97	297.12
56	49.79	332.92	1.00	520.21	456.35	277.30
57	50.81	333.56	1.00	460.93	423.50	257.34
58	51.83	334.18	1.00	401.29	390.44	237.25
59	52.85	334.80	1.00	341.38	357.23	217.07
60	53.88	335.39	1.00	281.27	323.91	196.83
61	54.90	335.97	1.00	221.07	290.54	176.55
62	55.92	336.54	1.00	160.87	257.17	156.27
63	56.94	337.10	1.00	100.78	223.86	136.03

64	57.97	337.63	1.00	40.90	190.67	115.86
65	58.99	338.16	1.00	0.00	168.00	102.09
66	60.01	338.66	1.00	0.00	168.00	102.09
67	61.03	338.94	0.11	0.00	18.67	11.34

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 37.670
3D Depth (Vertical difference between ends of Slip Surface) = 28.36(ft)
L/D(1): L = 28.36(ft) L/D(2): L = 56.71(ft) L/D(3): L = 85.07(ft)
L/D(4): L = 113.43(ft) L/D(5): L = 141.79(ft) L/D(6): L = 170.14(ft)

SUM OF MOMENTS = -0.186932E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = -0.3528903E-05

Sum of the Resisting Forces = 38189.96 (lbs)

Average Available Shear Strength = 595.68(psf)

Average Effective Normal Stress = 771.56(psf)

Sum of the Driving Forces = 23206.20 (lbs)

Average Mobilized Shear Stress = 361.97(psf)

Total length of the failure surface = 64.11(ft)

Factor of Safety Balance Check: FS = 1.64568

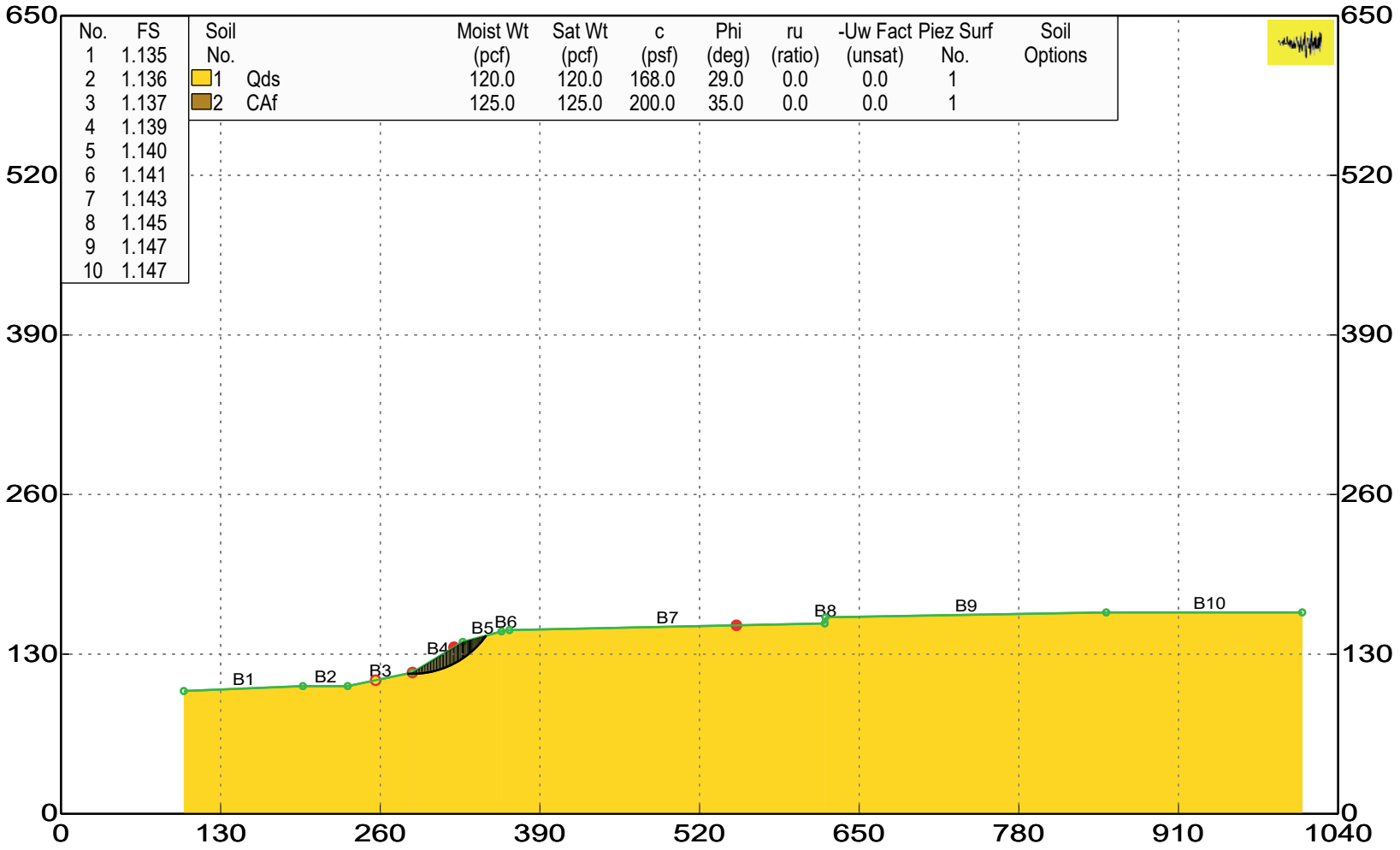
CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section AA - Existing - Seismic

EGL

\AA001s.gsd



No.	FS
1	1.135
2	1.136
3	1.137
4	1.139
5	1.140
6	1.141
7	1.143
8	1.145
9	1.147
10	1.147

Soil No.		Moist Wt (pcf)	Sat Wt (pcf)	c (psf)	Phi (deg)	ru (ratio)	-Uw Fact (unsat)	Piez Surf No.	Soil Options
1	Qds	120.0	120.0	168.0	29.0	0.0	0.0	1	
2	CAf	125.0	125.0	200.0	35.0	0.0	0.0	1	

GEOSTASE FS = 1.135

Simplified Bishop Method

kh = 0.20000

GEOSTASE Slope Stability Analysis

GEOSTASE® v4.30.32 by GREGORY GEOTECHNICAL SOFTWARE

PLATE D.1

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section AA\AA001s.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section AA\AA001s.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section AA - Existing - Seismic

PROFILE BOUNDARY DATA

10 Surface Boundaries
10 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	196.900	104.000	1
2	196.900	104.000	233.500	104.000	1
3	233.500	104.000	286.200	115.000	1
4	286.200	115.000	327.200	140.000	1
5	327.200	140.000	358.700	148.500	1
6	358.700	148.500	365.200	149.600	1
7	365.200	149.600	622.000	155.000	1
8	622.000	155.000	622.500	160.000	1
9	622.500	160.000	851.200	164.000	1
10	851.200	164.000	1010.800	164.000	1

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = 0.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	196.900	104.000
3	233.500	104.000
4	286.200	115.000
5	327.200	140.000
6	358.700	148.500

7	365.200	149.600
8	622.000	155.000
9	622.500	160.000
10	851.200	164.000
11	1010.800	164.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.041	2.364
2	0.000	0.000
3	0.209	11.790
4	0.610	31.373
5	0.270	15.101
6	0.169	9.605
7	0.021	1.205
8	10.000	84.289
9	0.017	1.002
10	0.000	0.000

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	168.00	29.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 4 Coordinate Points
Phreatic Adjustment Factor = 0.00

Point No.	X-Water (ft)	Y-Water (ft)
1	321.00	2160.00
2	546.00	2385.00
3	550.00	2385.00
4	700.00	2235.00

WATER SURFACE DATA HAS BEEN SUPPRESSED

SEISMIC (EARTHQUAKE) DATA

Specified Peak Ground Acceleration Coefficient (PGA) = 0.400(g)
Default Velocity = 2.000(ft) per second
Specified Horizontal Earthquake Coefficient (kh) = 0.20000(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
(NOTE:Input Velocity = 0.0 will result in default Peak
Velocity = 2 times(PGA) times 2.5 fps or 0.762 mps)
Specified Seismic Pore-Pressure Factor = 0.000
Horizontal Seismic Force is Applied at Center of Gravity of Slices

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.3604(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 256.20(ft)
and X = 286.20(ft)

Each Surface ends within a Range Between X = 320.00(ft)
and X = 550.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 0.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 2.813 FS Min = 1.135 FS Ave = 1.775
Standard Deviation = 0.433 Coefficient of Variation = 24.43 %

Critical Surface is Sequence Number 862 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 285.863516(ft) ; Y = 188.023300(ft); and Radius = 73.986346(ft)

Circular Trial Failure Surface Generated With 76 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	282.05586	114.13500
2	283.05486	114.09028
3	284.05437	114.05908
4	285.05421	114.04138
5	286.05420	114.03720
6	287.05416	114.04653
7	288.05390	114.06938
8	289.05324	114.10574
9	290.05199	114.15561
10	291.04998	114.21896
11	292.04703	114.29580
12	293.04294	114.38611
13	294.03754	114.48987
14	295.03065	114.60707
15	296.02209	114.73768
16	297.01167	114.88167
17	297.99921	115.03903
18	298.98453	115.20971
19	299.96746	115.39370
20	300.94781	115.59096

21	301.92541	115.80145
22	302.90007	116.02514
23	303.87162	116.26198
24	304.83988	116.51192
25	305.80467	116.77493
26	306.76582	117.05096
27	307.72315	117.33995
28	308.67649	117.64186
29	309.62566	117.95662
30	310.57049	118.28418
31	311.51081	118.62448
32	312.44644	118.97746
33	313.37721	119.34306
34	314.30296	119.72120
35	315.22351	120.11181
36	316.13870	120.51484
37	317.04836	120.93019
38	317.95232	121.35781
39	318.85042	121.79760
40	319.74250	122.24949
41	320.62838	122.71340
42	321.50792	123.18923
43	322.38094	123.67691
44	323.24729	124.17635
45	324.10681	124.68745
46	324.95934	125.21012
47	325.80474	125.74426
48	326.64283	126.28979
49	327.47348	126.84659
50	328.29653	127.41456
51	329.11182	127.99361
52	329.91921	128.58362
53	330.71856	129.18450
54	331.50971	129.79612
55	332.29252	130.41838
56	333.06685	131.05116
57	333.83256	131.69435
58	334.58950	132.34783
59	335.33754	133.01148
60	336.07655	133.68518
61	336.80638	134.36881
62	337.52690	135.06224
63	338.23799	135.76534
64	338.93951	136.47799
65	339.63133	137.20006
66	340.31333	137.93141
67	340.98538	138.67192
68	341.64737	139.42143
69	342.29916	140.17983
70	342.94064	140.94697
71	343.57170	141.72271
72	344.19221	142.50690
73	344.80207	143.29941
74	345.40116	144.10009
75	345.98938	144.90880
76	346.13032	145.10818

Factor Of Safety For The Critical or Specified Surface = 1.135

Table 1 - Geometry Data on the 77 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.13	282.56	114.11	114.24	-2.56	11.79	1.00
2	1.00	0.37	283.55	114.07	114.45	-1.79	11.79	1.00
3	1.00	0.61	284.55	114.05	114.66	-1.01	11.79	1.00

4	1.00	0.83	285.55	114.04	114.87	-0.24	11.79	1.00
5	0.15	0.95	286.13	114.04	114.98	0.53	11.79	0.15
6	0.85	1.22	286.63	114.04	115.26	0.53	31.37	0.85
7	1.00	1.77	287.55	114.06	115.83	1.31	31.37	1.00
8	1.00	2.35	288.55	114.09	116.44	2.08	31.37	1.00
9	1.00	2.91	289.55	114.13	117.04	2.86	31.37	1.00
10	1.00	3.47	290.55	114.19	117.65	3.63	31.37	1.00
11	1.00	4.00	291.55	114.26	118.26	4.41	31.37	1.00
12	1.00	4.53	292.54	114.34	118.87	5.18	31.37	1.00
13	0.99	5.04	293.54	114.44	119.48	5.96	31.37	1.00
14	0.99	5.53	294.53	114.55	120.08	6.73	31.37	1.00
15	0.99	6.01	295.53	114.67	120.69	7.50	31.37	1.00
16	0.99	6.48	296.52	114.81	121.29	8.28	31.37	1.00
17	0.99	6.93	297.51	114.96	121.89	9.05	31.37	1.00
18	0.99	7.37	298.49	115.12	122.50	9.83	31.37	1.00
19	0.98	7.79	299.48	115.30	123.10	10.60	31.37	1.00
20	0.98	8.20	300.46	115.49	123.69	11.38	31.37	1.00
21	0.98	8.59	301.44	115.70	124.29	12.15	31.37	1.00
22	0.97	8.97	302.41	115.91	124.89	12.93	31.37	1.00
23	0.97	9.34	303.39	116.14	125.48	13.70	31.37	1.00
24	0.97	9.68	304.36	116.39	126.07	14.47	31.37	1.00
25	0.96	10.02	305.32	116.64	126.66	15.25	31.37	1.00
26	0.96	10.33	306.29	116.91	127.25	16.02	31.37	1.00
27	0.96	10.64	307.24	117.20	127.83	16.80	31.37	1.00
28	0.95	10.92	308.20	117.49	128.41	17.57	31.37	1.00
29	0.95	11.20	309.15	117.80	128.99	18.35	31.37	1.00
30	0.94	11.45	310.10	118.12	129.57	19.12	31.37	1.00
31	0.94	11.69	311.04	118.45	130.15	19.90	31.37	1.00
32	0.94	11.92	311.98	118.80	130.72	20.67	31.37	1.00
33	0.93	12.13	312.91	119.16	131.29	21.44	31.37	1.00
34	0.93	12.32	313.84	119.53	131.85	22.22	31.37	1.00
35	0.92	12.50	314.76	119.92	132.42	22.99	31.37	1.00
36	0.92	12.66	315.68	120.31	132.98	23.77	31.37	1.00
37	0.91	12.81	316.59	120.72	133.53	24.54	31.37	1.00
38	0.90	12.94	317.50	121.14	134.09	25.32	31.37	1.00
39	0.90	13.06	318.40	121.58	134.63	26.09	31.37	1.00
40	0.89	13.16	319.30	122.02	135.18	26.87	31.37	1.00
41	0.89	13.24	320.19	122.48	135.72	27.64	31.37	1.00
42	0.88	13.31	321.07	122.95	136.26	28.41	31.37	1.00
43	0.87	13.36	321.94	123.43	136.80	29.19	31.37	1.00
44	0.87	13.40	322.81	123.93	137.33	29.96	31.37	1.00
45	0.86	13.42	323.68	124.43	137.85	30.74	31.37	1.00
46	0.85	13.43	324.53	124.95	138.37	31.51	31.37	1.00
47	0.85	13.41	325.38	125.48	138.89	32.29	31.37	1.00
48	0.84	13.39	326.22	126.02	139.40	33.06	31.37	1.00
49	0.56	13.35	326.92	126.48	139.83	33.83	31.37	0.67
50	0.27	13.28	327.34	126.75	140.04	33.83	15.10	0.33
51	0.82	13.05	327.89	127.13	140.18	34.61	15.10	1.00
52	0.82	12.70	328.70	127.70	140.41	35.38	15.10	1.00
53	0.81	12.34	329.52	128.29	140.62	36.16	15.10	1.00
54	0.80	11.96	330.32	128.88	140.84	36.93	15.10	1.00
55	0.79	11.57	331.11	129.49	141.06	37.71	15.10	1.00
56	0.78	11.16	331.90	130.11	141.27	38.48	15.10	1.00
57	0.77	10.74	332.68	130.73	141.48	39.26	15.10	1.00
58	0.77	10.31	333.45	131.37	141.69	40.03	15.10	1.00
59	0.76	9.87	334.21	132.02	141.89	40.80	15.10	1.00
60	0.75	9.42	334.96	132.68	142.09	41.58	15.10	1.00
61	0.74	8.95	335.71	133.35	142.30	42.35	15.10	1.00
62	0.73	8.47	336.44	134.03	142.49	43.13	15.10	1.00
63	0.72	7.97	337.17	134.72	142.69	43.90	15.10	1.00
64	0.71	7.47	337.88	135.41	142.88	44.68	15.10	1.00
65	0.70	6.95	338.59	136.12	143.07	45.45	15.10	1.00
66	0.69	6.42	339.29	136.84	143.26	46.23	15.10	1.00
67	0.68	5.88	339.97	137.57	143.45	47.00	15.10	1.00
68	0.67	5.33	340.65	138.30	143.63	47.77	15.10	1.00
69	0.66	4.76	341.32	139.05	143.81	48.55	15.10	1.00
70	0.65	4.19	341.97	139.80	143.99	49.32	15.10	1.00
71	0.64	3.60	342.62	140.56	144.16	50.10	15.10	1.00
72	0.63	3.00	343.26	141.33	144.33	50.87	15.10	1.00
73	0.62	2.39	343.88	142.11	144.50	51.65	15.10	1.00
74	0.61	1.76	344.50	142.90	144.67	52.42	15.10	1.00
75	0.60	1.13	345.10	143.70	144.83	53.20	15.10	1.00

76	0.59	0.49	345.70	144.50	144.99	53.97	15.10	1.00
77	0.14	0.08	346.06	145.01	145.09	54.74	15.10	0.24

Table 2 - Force Data On The 77 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	15.2	0.0	0.0	0.0	0.00	0.00	3.0	0.0	0.00
2	44.8	0.0	0.0	0.0	0.00	0.00	9.0	0.0	0.00
3	72.7	0.0	0.0	0.0	0.00	0.00	14.5	0.0	0.00
4	99.1	0.0	0.0	0.0	0.00	0.00	19.8	0.0	0.00
5	16.6	0.0	0.0	0.0	0.00	0.00	3.3	0.0	0.00
6	124.8	0.0	0.0	0.0	0.00	0.00	25.0	0.0	0.00
7	212.1	0.0	0.0	0.0	0.00	0.00	42.4	0.0	0.00
8	281.5	0.0	0.0	0.0	0.00	0.00	56.3	0.0	0.00
9	349.2	0.0	0.0	0.0	0.00	0.00	69.8	0.0	0.00
10	415.1	0.0	0.0	0.0	0.00	0.00	83.0	0.0	0.00
11	479.0	0.0	0.0	0.0	0.00	0.00	95.8	0.0	0.00
12	541.1	0.0	0.0	0.0	0.00	0.00	108.2	0.0	0.00
13	601.3	0.0	0.0	0.0	0.00	0.00	120.3	0.0	0.00
14	659.4	0.0	0.0	0.0	0.00	0.00	131.9	0.0	0.00
15	715.6	0.0	0.0	0.0	0.00	0.00	143.1	0.0	0.00
16	769.6	0.0	0.0	0.0	0.00	0.00	153.9	0.0	0.00
17	821.6	0.0	0.0	0.0	0.00	0.00	164.3	0.0	0.00
18	871.5	0.0	0.0	0.0	0.00	0.00	174.3	0.0	0.00
19	919.2	0.0	0.0	0.0	0.00	0.00	183.8	0.0	0.00
20	964.8	0.0	0.0	0.0	0.00	0.00	193.0	0.0	0.00
21	1008.2	0.0	0.0	0.0	0.00	0.00	201.6	0.0	0.00
22	1049.4	0.0	0.0	0.0	0.00	0.00	209.9	0.0	0.00
23	1088.4	0.0	0.0	0.0	0.00	0.00	217.7	0.0	0.00
24	1125.2	0.0	0.0	0.0	0.00	0.00	225.0	0.0	0.00
25	1159.7	0.0	0.0	0.0	0.00	0.00	231.9	0.0	0.00
26	1191.9	0.0	0.0	0.0	0.00	0.00	238.4	0.0	0.00
27	1221.9	0.0	0.0	0.0	0.00	0.00	244.4	0.0	0.00
28	1249.7	0.0	0.0	0.0	0.00	0.00	249.9	0.0	0.00
29	1275.2	0.0	0.0	0.0	0.00	0.00	255.0	0.0	0.00
30	1298.4	0.0	0.0	0.0	0.00	0.00	259.7	0.0	0.00
31	1319.3	0.0	0.0	0.0	0.00	0.00	263.9	0.0	0.00
32	1338.1	0.0	0.0	0.0	0.00	0.00	267.6	0.0	0.00
33	1354.5	0.0	0.0	0.0	0.00	0.00	270.9	0.0	0.00
34	1368.8	0.0	0.0	0.0	0.00	0.00	273.8	0.0	0.00
35	1380.8	0.0	0.0	0.0	0.00	0.00	276.2	0.0	0.00
36	1390.7	0.0	0.0	0.0	0.00	0.00	278.1	0.0	0.00
37	1398.3	0.0	0.0	0.0	0.00	0.00	279.7	0.0	0.00
38	1403.8	0.0	0.0	0.0	0.00	0.00	280.8	0.0	0.00
39	1407.2	0.0	0.0	0.0	0.00	0.00	281.4	0.0	0.00
40	1408.5	0.0	0.0	0.0	0.00	0.00	281.7	0.0	0.00
41	1407.6	0.0	0.0	0.0	0.00	0.00	281.5	0.0	0.00
42	1404.8	0.0	0.0	0.0	0.00	0.00	281.0	0.0	0.00
43	1399.9	0.0	0.0	0.0	0.00	0.00	280.0	0.0	0.00
44	1393.0	0.0	0.0	0.0	0.00	0.00	278.6	0.0	0.00
45	1384.2	0.0	0.0	0.0	0.00	0.00	276.8	0.0	0.00
46	1373.4	0.0	0.0	0.0	0.00	0.00	274.7	0.0	0.00
47	1360.8	0.0	0.0	0.0	0.00	0.00	272.2	0.0	0.00
48	1346.4	0.0	0.0	0.0	0.00	0.00	269.3	0.0	0.00
49	892.8	0.0	0.0	0.0	0.00	0.00	178.6	0.0	0.00
50	435.9	0.0	0.0	0.0	0.00	0.00	87.2	0.0	0.00
51	1289.3	0.0	0.0	0.0	0.00	0.00	257.9	0.0	0.00
52	1242.7	0.0	0.0	0.0	0.00	0.00	248.5	0.0	0.00
53	1195.2	0.0	0.0	0.0	0.00	0.00	239.0	0.0	0.00
54	1147.0	0.0	0.0	0.0	0.00	0.00	229.4	0.0	0.00
55	1098.0	0.0	0.0	0.0	0.00	0.00	219.6	0.0	0.00
56	1048.5	0.0	0.0	0.0	0.00	0.00	209.7	0.0	0.00
57	998.3	0.0	0.0	0.0	0.00	0.00	199.7	0.0	0.00
58	947.7	0.0	0.0	0.0	0.00	0.00	189.5	0.0	0.00
59	896.6	0.0	0.0	0.0	0.00	0.00	179.3	0.0	0.00
60	845.2	0.0	0.0	0.0	0.00	0.00	169.0	0.0	0.00
61	793.4	0.0	0.0	0.0	0.00	0.00	158.7	0.0	0.00

62	741.5	0.0	0.0	0.0	0.00	0.00	148.3	0.0	0.00
63	689.4	0.0	0.0	0.0	0.00	0.00	137.9	0.0	0.00
64	637.3	0.0	0.0	0.0	0.00	0.00	127.5	0.0	0.00
65	585.2	0.0	0.0	0.0	0.00	0.00	117.0	0.0	0.00
66	533.2	0.0	0.0	0.0	0.00	0.00	106.6	0.0	0.00
67	481.3	0.0	0.0	0.0	0.00	0.00	96.3	0.0	0.00
68	429.6	0.0	0.0	0.0	0.00	0.00	85.9	0.0	0.00
69	378.3	0.0	0.0	0.0	0.00	0.00	75.7	0.0	0.00
70	327.4	0.0	0.0	0.0	0.00	0.00	65.5	0.0	0.00
71	276.9	0.0	0.0	0.0	0.00	0.00	55.4	0.0	0.00
72	227.0	0.0	0.0	0.0	0.00	0.00	45.4	0.0	0.00
73	177.7	0.0	0.0	0.0	0.00	0.00	35.5	0.0	0.00
74	129.1	0.0	0.0	0.0	0.00	0.00	25.8	0.0	0.00
75	81.3	0.0	0.0	0.0	0.00	0.00	16.3	0.0	0.00
76	34.3	0.0	0.0	0.0	0.00	0.00	6.9	0.0	0.00
77	1.4	0.0	0.0	0.0	0.00	0.00	0.3	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 64044.07(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 64044.07(lbs)

TOTAL AREA OF SLIDING MASS = 533.70(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 77 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	168.00	29.00	
2	1	168.00	29.00	
3	1	168.00	29.00	
4	1	168.00	29.00	
5	1	168.00	29.00	
6	1	168.00	29.00	
7	1	168.00	29.00	
8	1	168.00	29.00	
9	1	168.00	29.00	
10	1	168.00	29.00	
11	1	168.00	29.00	
12	1	168.00	29.00	
13	1	168.00	29.00	
14	1	168.00	29.00	
15	1	168.00	29.00	
16	1	168.00	29.00	
17	1	168.00	29.00	
18	1	168.00	29.00	
19	1	168.00	29.00	
20	1	168.00	29.00	
21	1	168.00	29.00	
22	1	168.00	29.00	
23	1	168.00	29.00	
24	1	168.00	29.00	
25	1	168.00	29.00	
26	1	168.00	29.00	
27	1	168.00	29.00	
28	1	168.00	29.00	
29	1	168.00	29.00	
30	1	168.00	29.00	
31	1	168.00	29.00	
32	1	168.00	29.00	
33	1	168.00	29.00	
34	1	168.00	29.00	
35	1	168.00	29.00	
36	1	168.00	29.00	
37	1	168.00	29.00	
38	1	168.00	29.00	
39	1	168.00	29.00	
40	1	168.00	29.00	
41	1	168.00	29.00	
42	1	168.00	29.00	
43	1	168.00	29.00	

44	1	168.00	29.00
45	1	168.00	29.00
46	1	168.00	29.00
47	1	168.00	29.00
48	1	168.00	29.00
49	1	168.00	29.00
50	1	168.00	29.00
51	1	168.00	29.00
52	1	168.00	29.00
53	1	168.00	29.00
54	1	168.00	29.00
55	1	168.00	29.00
56	1	168.00	29.00
57	1	168.00	29.00
58	1	168.00	29.00
59	1	168.00	29.00
60	1	168.00	29.00
61	1	168.00	29.00
62	1	168.00	29.00
63	1	168.00	29.00
64	1	168.00	29.00
65	1	168.00	29.00
66	1	168.00	29.00
67	1	168.00	29.00
68	1	168.00	29.00
69	1	168.00	29.00
70	1	168.00	29.00
71	1	168.00	29.00
72	1	168.00	29.00
73	1	168.00	29.00
74	1	168.00	29.00
75	1	168.00	29.00
76	1	168.00	29.00
77	1	168.00	29.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 77 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-2.56	282.56	1.00	22.03	180.21	158.75
2	-1.79	283.55	1.00	49.96	195.69	172.39
3	-1.01	284.55	1.00	75.90	210.07	185.06
4	-0.24	285.55	1.00	99.90	223.38	196.77
5	0.53	286.13	0.15	111.81	229.98	202.59
6	0.53	286.63	0.85	144.18	247.92	218.40
7	1.31	287.55	1.00	206.65	282.55	248.90
8	2.08	288.55	1.00	271.88	318.70	280.75
9	2.86	289.55	1.00	334.67	353.51	311.41
10	3.63	290.55	1.00	395.07	386.99	340.90
11	4.41	291.55	1.00	453.09	419.15	369.24
12	5.18	292.54	1.00	508.77	450.01	396.42
13	5.96	293.54	1.00	562.13	479.59	422.48
14	6.73	294.53	1.00	613.20	507.90	447.42
15	7.50	295.53	1.00	662.00	534.96	471.25
16	8.28	296.52	1.00	708.57	560.77	493.99
17	9.05	297.51	1.00	752.93	585.36	515.65

18	9.83	298.49	1.00	795.11	608.73	536.24
19	10.60	299.48	1.00	835.12	630.91	555.78
20	11.38	300.46	1.00	872.99	651.91	574.27
21	12.15	301.44	1.00	908.75	671.73	591.73
22	12.93	302.41	1.00	942.41	690.39	608.17
23	13.70	303.39	1.00	974.01	707.91	623.60
24	14.47	304.36	1.00	1003.57	724.29	638.03
25	15.25	305.32	1.00	1031.11	739.55	651.48
26	16.02	306.29	1.00	1056.65	753.71	663.95
27	16.80	307.24	1.00	1080.21	766.77	675.46
28	17.57	308.20	1.00	1101.82	778.75	686.01
29	18.35	309.15	1.00	1121.50	789.66	695.62
30	19.12	310.10	1.00	1139.27	799.51	704.30
31	19.90	311.04	1.00	1155.16	808.31	712.05
32	20.67	311.98	1.00	1169.18	816.09	718.90
33	21.44	312.91	1.00	1181.37	822.84	724.85
34	22.22	313.84	1.00	1191.74	828.59	729.91
35	22.99	314.76	1.00	1200.31	833.34	734.10
36	23.77	315.68	1.00	1207.11	837.11	737.42
37	24.54	316.59	1.00	1212.17	839.92	739.89
38	25.32	317.50	1.00	1215.50	841.76	741.52
39	26.09	318.40	1.00	1217.14	842.67	742.32
40	26.87	319.30	1.00	1217.09	842.64	742.30
41	27.64	320.19	1.00	1215.39	841.70	741.47
42	28.41	321.07	1.00	1212.07	839.86	739.84
43	29.19	321.94	1.00	1207.14	837.13	737.44
44	29.96	322.81	1.00	1200.63	833.52	734.26
45	30.74	323.68	1.00	1192.57	829.05	730.32
46	31.51	324.53	1.00	1182.98	823.74	725.64
47	32.29	325.38	1.00	1171.89	817.59	720.23
48	33.06	326.22	1.00	1159.33	810.63	714.09
49	33.83	326.92	0.67	1146.07	803.28	707.62
50	33.83	327.34	0.33	1139.53	799.65	704.42
51	34.61	327.89	1.00	1108.78	782.61	689.41
52	35.38	328.70	1.00	1067.05	759.47	669.03
53	36.16	329.52	1.00	1024.55	735.92	648.28
54	36.93	330.32	1.00	981.32	711.95	627.17
55	37.71	331.11	1.00	937.38	687.60	605.71
56	38.48	331.90	1.00	892.77	662.87	583.93
57	39.26	332.68	1.00	847.52	637.79	561.84
58	40.03	333.45	1.00	801.67	612.37	539.45
59	40.80	334.21	1.00	755.25	586.64	516.78
60	41.58	334.96	1.00	708.29	560.61	493.85
61	42.35	335.71	1.00	660.83	534.31	470.68
62	43.13	336.44	1.00	612.92	507.74	447.28
63	43.90	337.17	1.00	564.57	480.95	423.67
64	44.68	337.88	1.00	515.84	453.94	399.88
65	45.45	338.59	1.00	466.76	426.73	375.91
66	46.23	339.29	1.00	417.38	399.36	351.80
67	47.00	339.97	1.00	367.74	371.84	327.56
68	47.77	340.65	1.00	317.87	344.20	303.21
69	48.55	341.32	1.00	267.82	316.46	278.77
70	49.32	341.97	1.00	217.65	288.64	254.27
71	50.10	342.62	1.00	167.38	260.78	229.73
72	50.87	343.26	1.00	117.08	232.90	205.16
73	51.65	343.88	1.00	66.80	205.03	180.61
74	52.42	344.50	1.00	16.57	177.19	156.08
75	53.20	345.10	1.00	0.00	168.00	147.99
76	53.97	345.70	1.00	0.00	168.00	147.99
77	54.74	346.06	0.24	0.00	168.00	147.99

Table 4A - Base Force Data on the 77 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-2.56	282.56	1.00	22.03	180.21	158.75
2	-1.79	283.55	1.00	49.96	195.69	172.39

3	-1.01	284.55	1.00	75.90	210.07	185.06
4	-0.24	285.55	1.00	99.90	223.38	196.77
5	0.53	286.13	0.15	16.30	33.53	29.54
6	0.53	286.63	0.85	123.16	211.77	186.55
7	1.31	287.55	1.00	206.65	282.55	248.90
8	2.08	288.55	1.00	271.88	318.70	280.75
9	2.86	289.55	1.00	334.67	353.51	311.41
10	3.63	290.55	1.00	395.07	386.99	340.90
11	4.41	291.55	1.00	453.09	419.15	369.24
12	5.18	292.54	1.00	508.77	450.01	396.42
13	5.96	293.54	1.00	562.13	479.59	422.48
14	6.73	294.53	1.00	613.20	507.90	447.42
15	7.50	295.53	1.00	662.00	534.96	471.25
16	8.28	296.52	1.00	708.57	560.77	493.99
17	9.05	297.51	1.00	752.93	585.36	515.65
18	9.83	298.49	1.00	795.11	608.73	536.24
19	10.60	299.48	1.00	835.12	630.91	555.78
20	11.38	300.46	1.00	872.99	651.91	574.27
21	12.15	301.44	1.00	908.75	671.73	591.73
22	12.93	302.41	1.00	942.41	690.39	608.17
23	13.70	303.39	1.00	974.01	707.91	623.60
24	14.47	304.36	1.00	1003.57	724.29	638.03
25	15.25	305.32	1.00	1031.11	739.55	651.48
26	16.02	306.29	1.00	1056.65	753.71	663.95
27	16.80	307.24	1.00	1080.21	766.77	675.46
28	17.57	308.20	1.00	1101.82	778.75	686.01
29	18.35	309.15	1.00	1121.50	789.66	695.62
30	19.12	310.10	1.00	1139.27	799.51	704.30
31	19.90	311.04	1.00	1155.16	808.31	712.05
32	20.67	311.98	1.00	1169.18	816.09	718.90
33	21.44	312.91	1.00	1181.37	822.84	724.85
34	22.22	313.84	1.00	1191.74	828.59	729.91
35	22.99	314.76	1.00	1200.31	833.34	734.10
36	23.77	315.68	1.00	1207.11	837.11	737.42
37	24.54	316.59	1.00	1212.17	839.92	739.89
38	25.32	317.50	1.00	1215.50	841.76	741.52
39	26.09	318.40	1.00	1217.14	842.67	742.32
40	26.87	319.30	1.00	1217.09	842.64	742.30
41	27.64	320.19	1.00	1215.39	841.70	741.47
42	28.41	321.07	1.00	1212.07	839.86	739.84
43	29.19	321.94	1.00	1207.14	837.13	737.44
44	29.96	322.81	1.00	1200.63	833.52	734.26
45	30.74	323.68	1.00	1192.57	829.05	730.32
46	31.51	324.53	1.00	1182.98	823.74	725.64
47	32.29	325.38	1.00	1171.89	817.59	720.23
48	33.06	326.22	1.00	1159.33	810.63	714.09
49	33.83	326.92	0.67	768.74	538.81	474.64
50	33.83	327.34	0.33	375.18	263.28	231.92
51	34.61	327.89	1.00	1108.78	782.61	689.41
52	35.38	328.70	1.00	1067.05	759.47	669.03
53	36.16	329.52	1.00	1024.55	735.92	648.28
54	36.93	330.32	1.00	981.32	711.95	627.17
55	37.71	331.11	1.00	937.38	687.60	605.71
56	38.48	331.90	1.00	892.77	662.87	583.93
57	39.26	332.68	1.00	847.52	637.79	561.84
58	40.03	333.45	1.00	801.67	612.37	539.45
59	40.80	334.21	1.00	755.25	586.64	516.78
60	41.58	334.96	1.00	708.29	560.61	493.85
61	42.35	335.71	1.00	660.83	534.31	470.68
62	43.13	336.44	1.00	612.92	507.74	447.28
63	43.90	337.17	1.00	564.57	480.95	423.67
64	44.68	337.88	1.00	515.84	453.94	399.88
65	45.45	338.59	1.00	466.76	426.73	375.91
66	46.23	339.29	1.00	417.38	399.36	351.80
67	47.00	339.97	1.00	367.74	371.84	327.56
68	47.77	340.65	1.00	317.87	344.20	303.21
69	48.55	341.32	1.00	267.82	316.46	278.77
70	49.32	341.97	1.00	217.65	288.64	254.27
71	50.10	342.62	1.00	167.38	260.78	229.73
72	50.87	343.26	1.00	117.08	232.90	205.16
73	51.65	343.88	1.00	66.80	205.03	180.61
74	52.42	344.50	1.00	16.57	177.19	156.08

75	53.20	345.10	1.00	0.00	168.00	147.99
76	53.97	345.70	1.00	0.00	168.00	147.99
77	54.74	346.06	0.24	0.00	41.02	36.14

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 37.953
3D Depth (Vertical difference between ends of Slip Surface) = 30.97(ft)
L/D(1): L = 30.97(ft) L/D(2): L = 61.95(ft) L/D(3): L = 92.92(ft)
L/D(4): L = 123.89(ft) L/D(5): L = 154.87(ft) L/D(6): L = 185.84(ft)

SUM OF MOMENTS = 0.205853E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.3214237E-05

Sum of the Resisting Forces = 43111.45 (lbs)

Average Available Shear Strength = 580.67(psf)

Average Effective Normal Stress = 744.48(psf)

Sum of the Driving Forces = 37977.41 (lbs)

Average Mobilized Shear Stress = 511.52(psf)

Total length of the failure surface = 74.24(ft)

Factor of Safety Balance Check: FS = 1.13519

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

*** SEISMIC SLOPE DISPLACEMENT DATA ***
(Note: kv is set = zero for displacement calculations)
Seismic Yield Coefficient (ky) = 0.31392(g)
Calculated Newmark Seismic Displacement = 0.252(ft)

Average Elevation of Point of Application of kh on Sliding Mass = 128.357(ft)

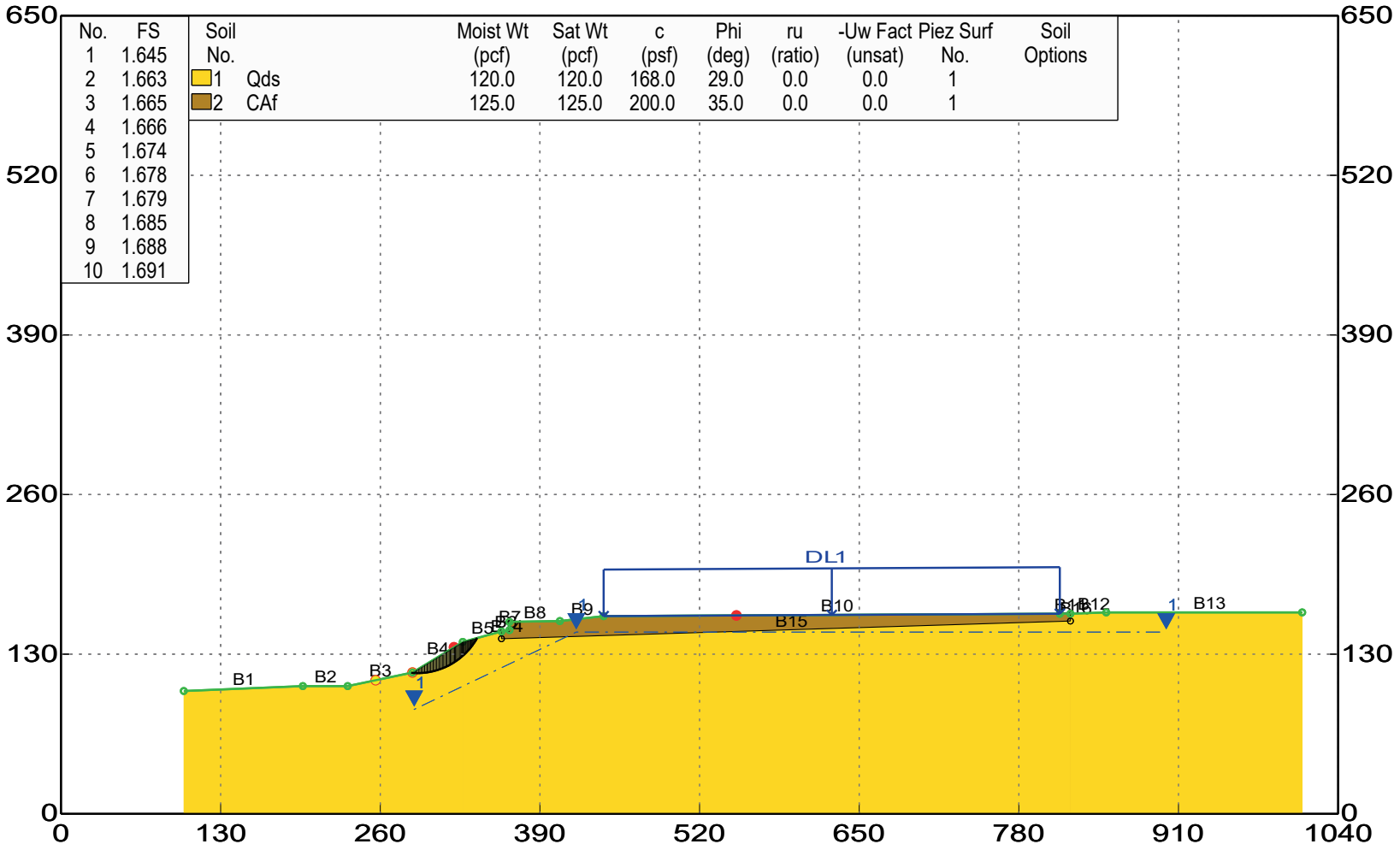
Non-Symmetrical Sliding Resistance Has Been Specified
for Downhill Sliding.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section AA - Proposed- Static

EGL

\AA101.gsd



No.	FS
1	1.645
2	1.663
3	1.665
4	1.666
5	1.674
6	1.678
7	1.679
8	1.685
9	1.688
10	1.691

Soil No.		Moist Wt (pcf)	Sat Wt (pcf)	c (psf)	Phi (deg)	ru (ratio)	-Uw Fact (unsat)	Piez Surf No.	Soil Options
1	Qds	120.0	120.0	168.0	29.0	0.0	0.0	1	
2	CAf	125.0	125.0	200.0	35.0	0.0	0.0	1	

GEOSTASE FS = 1.645

Simplified Bishop Method

GEOSTASE
Slope Stability Analysis

PLATE D.2

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section AA\AA101.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section AA\AA101.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section AA - Proposed- Static

PROFILE BOUNDARY DATA

13 Surface Boundaries
16 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	196.900	104.000	1
2	196.900	104.000	233.500	104.000	1
3	233.500	104.000	286.200	115.000	1
4	286.200	115.000	327.200	140.000	1
5	327.200	140.000	358.700	148.500	1
6	358.700	148.500	365.200	149.600	2
7	365.200	149.600	365.200	156.300	2
8	365.200	156.300	406.300	157.000	2
9	406.300	157.000	441.900	161.000	2
10	441.900	161.000	813.400	162.900	2
11	813.400	162.900	822.000	162.900	2
12	822.000	162.900	851.200	164.000	1
13	851.200	164.000	1010.800	164.000	1
14	358.700	148.500	358.700	142.500	1
15	358.700	142.500	822.000	157.000	1
16	822.000	157.000	822.000	162.900	1

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = 0.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD

1	100.000	100.000
2	196.900	104.000
3	233.500	104.000
4	286.200	115.000
5	327.200	140.000
6	358.700	148.500
7	365.200	149.600
8	365.200	156.300
9	406.300	157.000
10	441.900	161.000
11	813.400	162.900
12	822.000	162.900
13	851.200	164.000
14	1010.800	164.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
Surface boundary point 6 and Subsurface boundary point 15 are duplicate points.		
15	358.700	148.500
16	358.700	142.500
17	822.000	157.000
Surface boundary point 12 and Subsurface boundary point 18 are duplicate points.		
18	822.000	162.900

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.041	2.364
2	0.000	0.000
3	0.209	11.790
4	0.610	31.373
5	0.270	15.101
6	0.169	9.605
7	Vertical	Vertical
8	0.017	0.976
9	0.112	6.411
10	0.005	0.293
11	0.000	0.000
12	0.038	2.157
13	0.000	0.000
14	Vertical	Vertical
15	0.031	1.793
16	Vertical	Vertical

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	168.00	29.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 3 Coordinate Points
Phreatic Adjustment Factor = 0.00

Point No.	X-Water (ft)	Y-Water (ft)
1	287.60	85.00
2	419.60	148.00

3 900.00 148.00

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load No.	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	Deflection (deg from Vert)
1	10	441.900	161.000	2000.000	813.400	162.900	2000.000	0.00

NOTE - Load Stress Varies Linearly Within Specified Range.
For Multi-Stage Analysis, Refer to Detailed Output for Distributed Loads Applied to Each Stage.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.3604(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 256.20(ft)
and X = 286.20(ft)

Each Surface ends within a Range Between X = 320.00(ft)
and X = 550.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 0.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 3.493 FS Min = 1.645 FS Ave = 2.486
Standard Deviation = 0.475 Coefficient of Variation = 19.10 %

Critical Surface is Sequence Number 965 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 289.949915(ft) ; Y = 170.699441(ft); and Radius = 56.124543(ft)

Circular Trial Failure Surface Generated With 66 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)

1	285.14895	114.78062
2	286.14601	114.70395
3	287.14427	114.64507
4	288.14343	114.60398
5	289.14316	114.58070
6	290.14314	114.57523
7	291.14306	114.58758
8	292.14261	114.61775
9	293.14146	114.66572
10	294.13929	114.73147
11	295.13580	114.81500
12	296.13066	114.91627
13	297.12356	115.03524
14	298.11418	115.17189
15	299.10220	115.32616
16	300.08733	115.49802
17	301.06923	115.68740
18	302.04760	115.89424
19	303.02214	116.11848
20	303.99252	116.36005
21	304.95845	116.61887
22	305.91961	116.89486
23	306.87570	117.18793
24	307.82642	117.49798
25	308.77146	117.82493
26	309.71053	118.16866
27	310.64332	118.52907
28	311.56955	118.90605
29	312.48891	119.29946
30	313.40111	119.70919
31	314.30587	120.13511
32	315.20290	120.57708
33	316.09192	121.03497
34	316.97263	121.50862
35	317.84476	121.99788
36	318.70804	122.50261
37	319.56219	123.02264
38	320.40694	123.55780
39	321.24202	124.10793
40	322.06716	124.67285
41	322.88211	125.25239
42	323.68661	125.84635
43	324.48039	126.45455
44	325.26321	127.07679
45	326.03482	127.71289
46	326.79498	128.36263
47	327.54344	129.02581
48	328.27996	129.70222
49	329.00432	130.39165
50	329.71627	131.09387
51	330.41561	131.80867
52	331.10209	132.53581
53	331.77551	133.27507
54	332.43566	134.02621
55	333.08231	134.78899
56	333.71528	135.56317
57	334.33435	136.34851
58	334.93932	137.14475
59	335.53002	137.95164
60	336.10625	138.76893
61	336.66782	139.59636
62	337.21456	140.43366
63	337.74630	141.28057
64	338.26286	142.13682
65	338.76409	143.00214
66	338.84144	143.14134

Factor Of Safety For The Critical or Specified Surface = 1.645

Table 1 - Geometry Data on the 67 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.14	285.65	114.74	114.88	-4.40	11.79	1.00
2	0.05	0.29	286.17	114.70	114.99	-3.38	11.79	0.05
3	0.94	0.61	286.67	114.67	115.29	-3.38	31.37	0.95
4	1.00	1.26	287.64	114.62	115.88	-2.35	31.37	1.00
5	1.00	1.90	288.64	114.59	116.49	-1.33	31.37	1.00
6	1.00	2.52	289.64	114.58	117.10	-0.31	31.37	1.00
7	1.00	3.13	290.64	114.58	117.71	0.71	31.37	1.00
8	1.00	3.72	291.64	114.60	118.32	1.73	31.37	1.00
9	1.00	4.29	292.64	114.64	118.93	2.75	31.37	1.00
10	1.00	4.84	293.64	114.70	119.54	3.77	31.37	1.00
11	1.00	5.37	294.64	114.77	120.14	4.79	31.37	1.00
12	0.99	5.89	295.63	114.87	120.75	5.81	31.37	1.00
13	0.99	6.38	296.63	114.98	121.36	6.83	31.37	1.00
14	0.99	6.86	297.62	115.10	121.96	7.85	31.37	1.00
15	0.99	7.32	298.61	115.25	122.57	8.87	31.37	1.00
16	0.99	7.76	299.59	115.41	123.17	9.90	31.37	1.00
17	0.98	8.17	300.58	115.59	123.77	10.92	31.37	1.00
18	0.98	8.57	301.56	115.79	124.36	11.94	31.37	1.00
19	0.97	8.95	302.53	116.01	124.96	12.96	31.37	1.00
20	0.97	9.31	303.51	116.24	125.55	13.98	31.37	1.00
21	0.97	9.65	304.48	116.49	126.14	15.00	31.37	1.00
22	0.96	9.97	305.44	116.76	126.73	16.02	31.37	1.00
23	0.96	10.27	306.40	117.04	127.32	17.04	31.37	1.00
24	0.95	10.55	307.35	117.34	127.90	18.06	31.37	1.00
25	0.95	10.81	308.30	117.66	128.47	19.08	31.37	1.00
26	0.94	11.05	309.24	118.00	129.05	20.10	31.37	1.00
27	0.93	11.27	310.18	118.35	129.62	21.13	31.37	1.00
28	0.93	11.47	311.11	118.72	130.19	22.15	31.37	1.00
29	0.92	11.65	312.03	119.10	130.75	23.17	31.37	1.00
30	0.91	11.80	312.95	119.50	131.31	24.19	31.37	1.00
31	0.90	11.94	313.85	119.92	131.86	25.21	31.37	1.00
32	0.90	12.06	314.75	120.36	132.41	26.23	31.37	1.00
33	0.89	12.15	315.65	120.81	132.96	27.25	31.37	1.00
34	0.88	12.22	316.53	121.27	133.50	28.27	31.37	1.00
35	0.87	12.28	317.41	121.75	134.03	29.29	31.37	1.00
36	0.86	12.31	318.28	122.25	134.56	30.31	31.37	1.00
37	0.85	12.32	319.14	122.76	135.08	31.33	31.37	1.00
38	0.84	12.31	319.98	123.29	135.60	32.36	31.37	1.00
39	0.84	12.28	320.82	123.83	136.11	33.38	31.37	1.00
40	0.83	12.23	321.65	124.39	136.62	34.40	31.37	1.00
41	0.81	12.16	322.47	124.96	137.12	35.42	31.37	1.00
42	0.80	12.06	323.28	125.55	137.61	36.44	31.37	1.00
43	0.79	11.95	324.08	126.15	138.10	37.46	31.37	1.00
44	0.78	11.81	324.87	126.77	138.58	38.48	31.37	1.00
45	0.77	11.66	325.65	127.39	139.05	39.50	31.37	1.00
46	0.76	11.48	326.41	128.04	139.52	40.52	31.37	1.00
47	0.41	11.33	327.00	128.54	139.88	41.54	31.37	0.54
48	0.34	11.17	327.37	128.87	140.05	41.54	15.10	0.46
49	0.74	10.83	327.91	129.36	140.19	42.56	15.10	1.00
50	0.72	10.34	328.64	130.05	140.39	43.58	15.10	1.00
51	0.71	9.84	329.36	130.74	140.58	44.61	15.10	1.00
52	0.70	9.32	330.07	131.45	140.77	45.63	15.10	1.00
53	0.69	8.79	330.76	132.17	140.96	46.65	15.10	1.00
54	0.67	8.24	331.44	132.91	141.14	47.67	15.10	1.00
55	0.66	7.67	332.11	133.65	141.32	48.69	15.10	1.00
56	0.65	7.09	332.76	134.41	141.50	49.71	15.10	1.00
57	0.63	6.50	333.40	135.18	141.67	50.73	15.10	1.00
58	0.62	5.89	334.02	135.96	141.84	51.75	15.10	1.00
59	0.60	5.26	334.64	136.75	142.01	52.77	15.10	1.00
60	0.59	4.62	335.23	137.55	142.17	53.79	15.10	1.00
61	0.58	3.97	335.82	138.36	142.33	54.81	15.10	1.00
62	0.56	3.30	336.39	139.18	142.48	55.84	15.10	1.00
63	0.55	2.61	336.94	140.02	142.63	56.86	15.10	1.00
64	0.53	1.92	337.48	140.86	142.77	57.88	15.10	1.00
65	0.52	1.21	338.00	141.71	142.92	58.90	15.10	1.00

66	0.50	0.48	338.51	142.57	143.05	59.92	15.10	1.00
67	0.08	0.06	338.80	143.07	143.13	60.94	15.10	0.16

Table 2 - Force Data On The 67 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	17.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
2	1.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
3	69.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
4	150.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
5	227.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
6	302.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
7	375.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
8	445.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
9	513.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
10	579.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
11	642.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
12	702.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
13	760.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
14	815.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
15	867.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
16	916.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
17	963.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
18	1006.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
19	1047.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
20	1084.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
21	1119.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
22	1150.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
23	1178.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
24	1204.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
25	1226.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
26	1245.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
27	1261.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
28	1274.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
29	1284.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
30	1292.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
31	1296.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
32	1297.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
33	1296.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
34	1291.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
35	1284.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
36	1275.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
37	1262.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
38	1247.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
39	1230.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
40	1210.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
41	1188.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
42	1164.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
43	1138.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
44	1109.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
45	1079.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
46	1047.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
47	550.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
48	460.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
49	957.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
50	899.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
51	840.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
52	782.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
53	723.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
54	665.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
55	607.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
56	550.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
57	493.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
58	437.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
59	381.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
60	327.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
61	274.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

62	222.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
63	171.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
64	122.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
65	74.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
66	29.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
67	0.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 52722.92(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 52722.92(lbs)

TOTAL AREA OF SLIDING MASS = 439.36(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 67 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	168.00	29.00	
2	1	168.00	29.00	
3	1	168.00	29.00	
4	1	168.00	29.00	
5	1	168.00	29.00	
6	1	168.00	29.00	
7	1	168.00	29.00	
8	1	168.00	29.00	
9	1	168.00	29.00	
10	1	168.00	29.00	
11	1	168.00	29.00	
12	1	168.00	29.00	
13	1	168.00	29.00	
14	1	168.00	29.00	
15	1	168.00	29.00	
16	1	168.00	29.00	
17	1	168.00	29.00	
18	1	168.00	29.00	
19	1	168.00	29.00	
20	1	168.00	29.00	
21	1	168.00	29.00	
22	1	168.00	29.00	
23	1	168.00	29.00	
24	1	168.00	29.00	
25	1	168.00	29.00	
26	1	168.00	29.00	
27	1	168.00	29.00	
28	1	168.00	29.00	
29	1	168.00	29.00	
30	1	168.00	29.00	
31	1	168.00	29.00	
32	1	168.00	29.00	
33	1	168.00	29.00	
34	1	168.00	29.00	
35	1	168.00	29.00	
36	1	168.00	29.00	
37	1	168.00	29.00	
38	1	168.00	29.00	
39	1	168.00	29.00	
40	1	168.00	29.00	
41	1	168.00	29.00	
42	1	168.00	29.00	
43	1	168.00	29.00	
44	1	168.00	29.00	
45	1	168.00	29.00	
46	1	168.00	29.00	
47	1	168.00	29.00	
48	1	168.00	29.00	
49	1	168.00	29.00	
50	1	168.00	29.00	
51	1	168.00	29.00	
52	1	168.00	29.00	
53	1	168.00	29.00	

54	1	168.00	29.00
55	1	168.00	29.00
56	1	168.00	29.00
57	1	168.00	29.00
58	1	168.00	29.00
59	1	168.00	29.00
60	1	168.00	29.00
61	1	168.00	29.00
62	1	168.00	29.00
63	1	168.00	29.00
64	1	168.00	29.00
65	1	168.00	29.00
66	1	168.00	29.00
67	1	168.00	29.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 67 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-4.40	285.65	1.00	25.60	182.19	110.74
2	-3.38	286.17	0.05	41.90	191.22	116.23
3	-3.38	286.67	0.95	81.44	213.14	129.55
4	-2.35	287.64	1.00	157.08	255.07	155.03
5	-1.33	288.64	1.00	231.90	296.54	180.24
6	-0.31	289.64	1.00	303.70	336.34	204.43
7	0.71	290.64	1.00	372.52	374.49	227.62
8	1.73	291.64	1.00	438.40	411.01	249.81
9	2.75	292.64	1.00	501.34	445.90	271.02
10	3.77	293.64	1.00	561.39	479.18	291.25
11	4.79	294.64	1.00	618.56	510.87	310.51
12	5.81	295.63	1.00	672.88	540.98	328.81
13	6.83	296.63	1.00	724.38	569.53	346.16
14	7.85	297.62	1.00	773.07	596.52	362.57
15	8.87	298.61	1.00	818.99	621.97	378.04
16	9.90	299.59	1.00	862.15	645.90	392.58
17	10.92	300.58	1.00	902.58	668.31	406.20
18	11.94	301.56	1.00	940.30	689.22	418.91
19	12.96	302.53	1.00	975.34	708.64	430.71
20	13.98	303.51	1.00	1007.71	726.58	441.62
21	15.00	304.48	1.00	1037.45	743.07	451.64
22	16.02	305.44	1.00	1064.57	758.10	460.78
23	17.04	306.40	1.00	1089.10	771.70	469.04
24	18.06	307.35	1.00	1111.06	783.87	476.44
25	19.08	308.30	1.00	1130.48	794.64	482.98
26	20.10	309.24	1.00	1147.39	804.01	488.68
27	21.13	310.18	1.00	1161.80	812.00	493.54
28	22.15	311.11	1.00	1173.75	818.62	497.56
29	23.17	312.03	1.00	1183.27	823.90	500.77
30	24.19	312.95	1.00	1190.37	827.83	503.16
31	25.21	313.85	1.00	1195.09	830.45	504.75
32	26.23	314.75	1.00	1197.46	831.76	505.55
33	27.25	315.65	1.00	1197.51	831.79	505.57
34	28.27	316.53	1.00	1195.26	830.54	504.81
35	29.29	317.41	1.00	1190.75	828.05	503.29
36	30.31	318.28	1.00	1184.02	824.31	501.02
37	31.33	319.14	1.00	1175.09	819.36	498.01

38	32.36	319.98	1.00	1164.00	813.22	494.28
39	33.38	320.82	1.00	1150.79	805.89	489.82
40	34.40	321.65	1.00	1135.48	797.41	484.67
41	35.42	322.47	1.00	1118.13	787.79	478.82
42	36.44	323.28	1.00	1098.77	777.06	472.30
43	37.46	324.08	1.00	1077.44	765.24	465.12
44	38.48	324.87	1.00	1054.19	752.35	457.28
45	39.50	325.65	1.00	1029.05	738.41	448.81
46	40.52	326.41	1.00	1002.07	723.46	439.72
47	41.54	327.00	0.54	977.69	709.94	431.51
48	41.54	327.37	0.46	962.74	701.66	426.47
49	42.56	327.91	1.00	920.63	678.31	412.28
50	43.58	328.64	1.00	866.06	648.07	393.90
51	44.61	329.36	1.00	810.63	617.34	375.22
52	45.63	330.07	1.00	754.40	586.17	356.28
53	46.65	330.76	1.00	697.43	554.59	337.08
54	47.67	331.44	1.00	639.79	522.64	317.66
55	48.69	332.11	1.00	581.56	490.36	298.04
56	49.71	332.76	1.00	522.79	457.79	278.25
57	50.73	333.40	1.00	463.58	424.97	258.30
58	51.75	334.02	1.00	404.01	391.94	238.23
59	52.77	334.64	1.00	344.14	358.76	218.06
60	53.79	335.23	1.00	284.09	325.47	197.82
61	54.81	335.82	1.00	223.93	292.13	177.56
62	55.84	336.39	1.00	163.76	258.77	157.28
63	56.86	336.94	1.00	103.69	225.48	137.05
64	57.88	337.48	1.00	43.83	192.30	116.88
65	58.90	338.00	1.00	0.00	168.00	102.11
66	59.92	338.51	1.00	0.00	168.00	102.11
67	60.94	338.80	0.16	0.00	168.00	102.11

Table 4A - Base Force Data on the 67 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-4.40	285.65	1.00	25.60	182.19	110.74
2	-3.38	286.17	0.05	2.27	10.34	6.29
3	-3.38	286.67	0.95	77.04	201.61	122.54
4	-2.35	287.64	1.00	157.08	255.07	155.03
5	-1.33	288.64	1.00	231.90	296.54	180.24
6	-0.31	289.64	1.00	303.70	336.34	204.43
7	0.71	290.64	1.00	372.52	374.49	227.62
8	1.73	291.64	1.00	438.40	411.01	249.81
9	2.75	292.64	1.00	501.34	445.90	271.02
10	3.77	293.64	1.00	561.39	479.18	291.25
11	4.79	294.64	1.00	618.56	510.87	310.51
12	5.81	295.63	1.00	672.88	540.98	328.81
13	6.83	296.63	1.00	724.38	569.53	346.16
14	7.85	297.62	1.00	773.07	596.52	362.57
15	8.87	298.61	1.00	818.99	621.97	378.04
16	9.90	299.59	1.00	862.15	645.90	392.58
17	10.92	300.58	1.00	902.58	668.31	406.20
18	11.94	301.56	1.00	940.30	689.22	418.91
19	12.96	302.53	1.00	975.34	708.64	430.71
20	13.98	303.51	1.00	1007.71	726.58	441.62
21	15.00	304.48	1.00	1037.45	743.07	451.64
22	16.02	305.44	1.00	1064.57	758.10	460.78
23	17.04	306.40	1.00	1089.10	771.70	469.04
24	18.06	307.35	1.00	1111.06	783.87	476.44
25	19.08	308.30	1.00	1130.48	794.64	482.98
26	20.10	309.24	1.00	1147.39	804.01	488.68
27	21.13	310.18	1.00	1161.80	812.00	493.54
28	22.15	311.11	1.00	1173.75	818.62	497.56
29	23.17	312.03	1.00	1183.27	823.90	500.77
30	24.19	312.95	1.00	1190.37	827.83	503.16
31	25.21	313.85	1.00	1195.09	830.45	504.75
32	26.23	314.75	1.00	1197.46	831.76	505.55

33	27.25	315.65	1.00	1197.51	831.79	505.57
34	28.27	316.53	1.00	1195.26	830.54	504.81
35	29.29	317.41	1.00	1190.75	828.05	503.29
36	30.31	318.28	1.00	1184.02	824.31	501.02
37	31.33	319.14	1.00	1175.09	819.36	498.01
38	32.36	319.98	1.00	1164.00	813.22	494.28
39	33.38	320.82	1.00	1150.79	805.89	489.82
40	34.40	321.65	1.00	1135.48	797.41	484.67
41	35.42	322.47	1.00	1118.13	787.79	478.82
42	36.44	323.28	1.00	1098.77	777.06	472.30
43	37.46	324.08	1.00	1077.44	765.24	465.12
44	38.48	324.87	1.00	1054.19	752.35	457.28
45	39.50	325.65	1.00	1029.05	738.41	448.81
46	40.52	326.41	1.00	1002.07	723.46	439.72
47	41.54	327.00	0.54	529.07	384.18	233.51
48	41.54	327.37	0.46	441.76	321.96	195.69
49	42.56	327.91	1.00	920.63	678.31	412.28
50	43.58	328.64	1.00	866.06	648.07	393.90
51	44.61	329.36	1.00	810.63	617.34	375.22
52	45.63	330.07	1.00	754.40	586.17	356.28
53	46.65	330.76	1.00	697.43	554.59	337.08
54	47.67	331.44	1.00	639.79	522.64	317.66
55	48.69	332.11	1.00	581.56	490.36	298.04
56	49.71	332.76	1.00	522.79	457.79	278.25
57	50.73	333.40	1.00	463.58	424.97	258.30
58	51.75	334.02	1.00	404.01	391.94	238.23
59	52.77	334.64	1.00	344.14	358.76	218.06
60	53.79	335.23	1.00	284.09	325.47	197.82
61	54.81	335.82	1.00	223.93	292.13	177.56
62	55.84	336.39	1.00	163.76	258.77	157.28
63	56.86	336.94	1.00	103.69	225.48	137.05
64	57.88	337.48	1.00	43.83	192.30	116.88
65	58.90	338.00	1.00	0.00	168.00	102.11
66	59.92	338.51	1.00	0.00	168.00	102.11
67	60.94	338.80	0.16	0.00	26.75	16.26

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 37.715
3D Depth (Vertical difference between ends of Slip Surface) = 28.36(ft)
L/D(1): L = 28.36(ft) L/D(2): L = 56.72(ft) L/D(3): L = 85.08(ft)
L/D(4): L = 113.44(ft) L/D(5): L = 141.80(ft) L/D(6): L = 170.16(ft)

SUM OF MOMENTS = -0.643119E-02 (ft/lbs);Imbalance (Fraction of Total Weight) = -0.1219808E-06

Sum of the Resisting Forces = 38060.03 (lbs)

Average Available Shear Strength = 593.21(psf)

Average Effective Normal Stress = 767.10(psf)

Sum of the Driving Forces = 23133.10 (lbs)

Average Mobilized Shear Stress = 360.56(psf)

Total length of the failure surface = 64.16(ft)

Factor of Safety Balance Check: FS = 1.64526

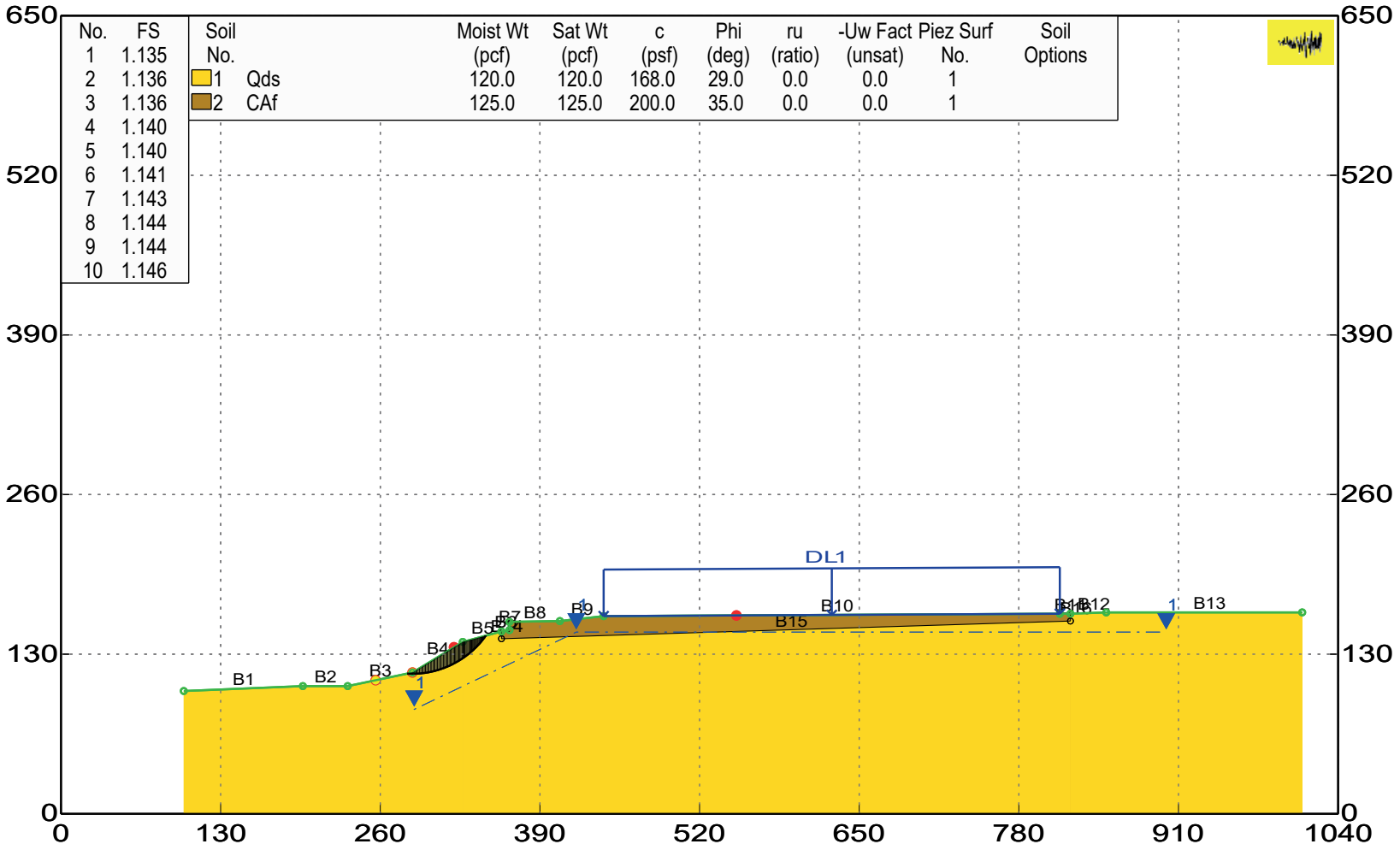
CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section AA - Proposed- Seismic

EGL

\AA101s.gsd



No.	FS
1	1.135
2	1.136
3	1.136
4	1.140
5	1.140
6	1.141
7	1.143
8	1.144
9	1.144
10	1.146

Soil No.		Moist Wt (pcf)	Sat Wt (pcf)	c (psf)	Phi (deg)	ru (ratio)	-Uw Fact (unsat)	Piez Surf No.	Soil Options
1	Qds	120.0	120.0	168.0	29.0	0.0	0.0	1	
2	CAf	125.0	125.0	200.0	35.0	0.0	0.0	1	

GEOSTASE FS = 1.135

Simplified Bishop Method

kh = 0.20000

GEOSTASE Slope Stability Analysis

GEOSTASE® v4.30.32 by GREGORY GEOTECHNICAL SOFTWARE

PLATE D.2s

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section AA\AA101s.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section AA\AA101s.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section AA - Proposed- Seismic

PROFILE BOUNDARY DATA

13 Surface Boundaries
16 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	196.900	104.000	1
2	196.900	104.000	233.500	104.000	1
3	233.500	104.000	286.200	115.000	1
4	286.200	115.000	327.200	140.000	1
5	327.200	140.000	358.700	148.500	1
6	358.700	148.500	365.200	149.600	2
7	365.200	149.600	365.200	156.300	2
8	365.200	156.300	406.300	157.000	2
9	406.300	157.000	441.900	161.000	2
10	441.900	161.000	813.400	162.900	2
11	813.400	162.900	822.000	162.900	2
12	822.000	162.900	851.200	164.000	1
13	851.200	164.000	1010.800	164.000	1
14	358.700	148.500	358.700	142.500	1
15	358.700	142.500	822.000	157.000	1
16	822.000	157.000	822.000	162.900	1

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = 0.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD

1	100.000	100.000
2	196.900	104.000
3	233.500	104.000
4	286.200	115.000
5	327.200	140.000
6	358.700	148.500
7	365.200	149.600
8	365.200	156.300
9	406.300	157.000
10	441.900	161.000
11	813.400	162.900
12	822.000	162.900
13	851.200	164.000
14	1010.800	164.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
Surface boundary point 6 and Subsurface boundary point 15 are duplicate points.		
15	358.700	148.500
16	358.700	142.500
17	822.000	157.000
Surface boundary point 12 and Subsurface boundary point 18 are duplicate points.		
18	822.000	162.900

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.041	2.364
2	0.000	0.000
3	0.209	11.790
4	0.610	31.373
5	0.270	15.101
6	0.169	9.605
7	Vertical	Vertical
8	0.017	0.976
9	0.112	6.411
10	0.005	0.293
11	0.000	0.000
12	0.038	2.157
13	0.000	0.000
14	Vertical	Vertical
15	0.031	1.793
16	Vertical	Vertical

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	168.00	29.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 3 Coordinate Points
Phreatic Adjustment Factor = 0.00

Point No.	X-Water (ft)	Y-Water (ft)
1	287.60	85.00
2	419.60	148.00

3 900.00 148.00

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load No.	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	Deflection (deg from Vert)
1	10	441.900	161.000	2000.000	813.400	162.900	2000.000	0.00

NOTE - Load Stress Varies Linearly Within Specified Range.
For Multi-Stage Analysis, Refer to Detailed Output for Distributed Loads Applied to Each Stage.

SEISMIC (EARTHQUAKE) DATA

Specified Peak Ground Acceleration Coefficient (PGA) = 0.400(g)
Default Velocity = 2.000(ft) per second
Specified Horizontal Earthquake Coefficient (kh) = 0.20000(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
(NOTE:Input Velocity = 0.0 will result in default Peak
Velocity = 2 times(PGA) times 2.5 fps or 0.762 mps)
Specified Seismic Pore-Pressure Factor = 0.000
Horizontal Seismic Force is Applied at Center of Gravity of Slices

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.3604(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 256.20(ft)
and X = 286.20(ft)

Each Surface ends within a Range Between X = 320.00(ft)
and X = 550.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 0.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 2.136 FS Min = 1.135 FS Ave = 1.533
Standard Deviation = 0.220 Coefficient of Variation = 14.38 %

Critical Surface is Sequence Number 857 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 285.705216(ft) ; Y = 187.809887(ft); and Radius = 73.804095(ft)

Circular Trial Failure Surface Generated With 76 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	281.90571	114.10366
2	282.90471	114.05894
3	283.90422	114.02777
4	284.90406	114.01014
5	285.90406	114.00606
6	286.90401	114.01553
7	287.90375	114.03854
8	288.90308	114.07510
9	289.90182	114.12520
10	290.89980	114.18882
11	291.89682	114.26596
12	292.89270	114.35661
13	293.88726	114.46073
14	294.88033	114.57832
15	295.87170	114.70936
16	296.86121	114.85382
17	297.84868	115.01167
18	298.83391	115.18288
19	299.81673	115.36743
20	300.79697	115.56528
21	301.77443	115.77639
22	302.74894	116.00072
23	303.72032	116.23824
24	304.68840	116.48890
25	305.65299	116.75265
26	306.61392	117.02945
27	307.57101	117.31924
28	308.52409	117.62197
29	309.47297	117.93759
30	310.41750	118.26603
31	311.35748	118.60724
32	312.29276	118.96116
33	313.22315	119.32772
34	314.14850	119.70685
35	315.06862	120.09848
36	315.98335	120.50254
37	316.89252	120.91896
38	317.79597	121.34766
39	318.69353	121.78856
40	319.58503	122.24158
41	320.47031	122.70664
42	321.34921	123.18365
43	322.22156	123.67252
44	323.08721	124.17317
45	323.94600	124.68551
46	324.79776	125.20943
47	325.64235	125.74484
48	326.47961	126.29165
49	327.30938	126.84975
50	328.13152	127.41905
51	328.94586	127.99943
52	329.75227	128.59079
53	330.55059	129.19302
54	331.34068	129.80601
55	332.12239	130.42966
56	332.89558	131.06383
57	333.66010	131.70843
58	334.41582	132.36332
59	335.16260	133.02840
60	335.90030	133.70353
61	336.62878	134.38859

62	337.34792	135.08346
63	338.05757	135.78801
64	338.75761	136.50211
65	339.44791	137.22563
66	340.12835	137.95844
67	340.79880	138.70040
68	341.45913	139.45137
69	342.10922	140.21123
70	342.74896	140.97982
71	343.37823	141.75701
72	343.99691	142.54265
73	344.60489	143.33660
74	345.20205	144.13872
75	345.78830	144.94886
76	345.84647	145.03159

Factor Of Safety For The Critical or Specified Surface = 1.135

Table 1 - Geometry Data on the 77 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.13	282.41	114.08	114.21	-2.56	11.79	1.00
2	1.00	0.37	283.40	114.04	114.42	-1.79	11.79	1.00
3	1.00	0.61	284.40	114.02	114.63	-1.01	11.79	1.00
4	1.00	0.83	285.40	114.01	114.83	-0.23	11.79	1.00
5	0.30	0.96	286.05	114.01	114.97	0.54	11.79	0.30
6	0.70	1.20	286.55	114.01	115.21	0.54	31.37	0.70
7	1.00	1.71	287.40	114.03	115.73	1.32	31.37	1.00
8	1.00	2.29	288.40	114.06	116.34	2.10	31.37	1.00
9	1.00	2.85	289.40	114.10	116.95	2.87	31.37	1.00
10	1.00	3.40	290.40	114.16	117.56	3.65	31.37	1.00
11	1.00	3.94	291.40	114.23	118.17	4.42	31.37	1.00
12	1.00	4.47	292.39	114.31	118.78	5.20	31.37	1.00
13	0.99	4.98	293.39	114.41	119.38	5.98	31.37	1.00
14	0.99	5.47	294.38	114.52	119.99	6.75	31.37	1.00
15	0.99	5.95	295.38	114.64	120.60	7.53	31.37	1.00
16	0.99	6.42	296.37	114.78	121.20	8.31	31.37	1.00
17	0.99	6.87	297.35	114.93	121.80	9.08	31.37	1.00
18	0.99	7.31	298.34	115.10	122.40	9.86	31.37	1.00
19	0.98	7.73	299.33	115.28	123.00	10.63	31.37	1.00
20	0.98	8.14	300.31	115.47	123.60	11.41	31.37	1.00
21	0.98	8.53	301.29	115.67	124.20	12.19	31.37	1.00
22	0.97	8.91	302.26	115.89	124.79	12.96	31.37	1.00
23	0.97	9.27	303.23	116.12	125.39	13.74	31.37	1.00
24	0.97	9.61	304.20	116.36	125.98	14.52	31.37	1.00
25	0.96	9.95	305.17	116.62	126.57	15.29	31.37	1.00
26	0.96	10.26	306.13	116.89	127.15	16.07	31.37	1.00
27	0.96	10.56	307.09	117.17	127.74	16.85	31.37	1.00
28	0.95	10.85	308.05	117.47	128.32	17.62	31.37	1.00
29	0.95	11.12	309.00	117.78	128.90	18.40	31.37	1.00
30	0.94	11.38	309.95	118.10	129.48	19.17	31.37	1.00
31	0.94	11.62	310.89	118.44	130.05	19.95	31.37	1.00
32	0.94	11.84	311.83	118.78	130.63	20.73	31.37	1.00
33	0.93	12.05	312.76	119.14	131.19	21.50	31.37	1.00
34	0.93	12.24	313.69	119.52	131.76	22.28	31.37	1.00
35	0.92	12.42	314.61	119.90	132.32	23.06	31.37	1.00
36	0.91	12.58	315.53	120.30	132.88	23.83	31.37	1.00
37	0.91	12.73	316.44	120.71	133.44	24.61	31.37	1.00
38	0.90	12.86	317.34	121.13	133.99	25.39	31.37	1.00
39	0.90	12.97	318.24	121.57	134.54	26.16	31.37	1.00
40	0.89	13.07	319.14	122.02	135.08	26.94	31.37	1.00
41	0.89	13.15	320.03	122.47	135.63	27.71	31.37	1.00
42	0.88	13.22	320.91	122.95	136.16	28.49	31.37	1.00
43	0.87	13.27	321.79	123.43	136.70	29.27	31.37	1.00
44	0.87	13.31	322.65	123.92	137.23	30.04	31.37	1.00

45	0.86	13.32	323.52	124.43	137.75	30.82	31.37	1.00
46	0.85	13.33	324.37	124.95	138.28	31.60	31.37	1.00
47	0.84	13.32	325.22	125.48	138.79	32.37	31.37	1.00
48	0.84	13.29	326.06	126.02	139.31	33.15	31.37	1.00
49	0.72	13.25	326.84	126.53	139.78	33.92	31.37	0.87
50	0.11	13.20	327.25	126.81	140.01	33.92	15.10	0.13
51	0.82	13.01	327.72	127.13	140.14	34.70	15.10	1.00
52	0.81	12.65	328.54	127.71	140.36	35.48	15.10	1.00
53	0.81	12.28	329.35	128.30	140.58	36.25	15.10	1.00
54	0.80	11.90	330.15	128.89	140.80	37.03	15.10	1.00
55	0.79	11.51	330.95	129.50	141.01	37.81	15.10	1.00
56	0.78	11.10	331.73	130.12	141.22	38.58	15.10	1.00
57	0.77	10.69	332.51	130.75	141.43	39.36	15.10	1.00
58	0.76	10.25	333.28	131.39	141.64	40.14	15.10	1.00
59	0.76	9.81	334.04	132.04	141.85	40.91	15.10	1.00
60	0.75	9.35	334.79	132.70	142.05	41.69	15.10	1.00
61	0.74	8.88	335.53	133.37	142.25	42.46	15.10	1.00
62	0.73	8.40	336.26	134.05	142.45	43.24	15.10	1.00
63	0.72	7.91	336.99	134.74	142.64	44.02	15.10	1.00
64	0.71	7.40	337.70	135.44	142.83	44.79	15.10	1.00
65	0.70	6.88	338.41	136.15	143.02	45.57	15.10	1.00
66	0.69	6.35	339.10	136.86	143.21	46.35	15.10	1.00
67	0.68	5.80	339.79	137.59	143.40	47.12	15.10	1.00
68	0.67	5.25	340.46	138.33	143.58	47.90	15.10	1.00
69	0.66	4.68	341.13	139.08	143.76	48.67	15.10	1.00
70	0.65	4.10	341.78	139.83	143.94	49.45	15.10	1.00
71	0.64	3.51	342.43	140.60	144.11	50.23	15.10	1.00
72	0.63	2.91	343.06	141.37	144.28	51.00	15.10	1.00
73	0.62	2.30	343.69	142.15	144.45	51.78	15.10	1.00
74	0.61	1.67	344.30	142.94	144.61	52.56	15.10	1.00
75	0.60	1.04	344.90	143.74	144.78	53.33	15.10	1.00
76	0.59	0.39	345.50	144.54	144.94	54.11	15.10	1.00
77	0.06	0.03	345.82	144.99	145.02	54.89	15.10	0.10

Table 2 - Force Data On The 77 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	15.2	0.0	0.0	0.0	0.00	0.00	3.0	0.0	0.00
2	44.8	0.0	0.0	0.0	0.00	0.00	9.0	0.0	0.00
3	72.7	0.0	0.0	0.0	0.00	0.00	14.5	0.0	0.00
4	99.1	0.0	0.0	0.0	0.00	0.00	19.8	0.0	0.00
5	34.2	0.0	0.0	0.0	0.00	0.00	6.8	0.0	0.00
6	101.6	0.0	0.0	0.0	0.00	0.00	20.3	0.0	0.00
7	204.8	0.0	0.0	0.0	0.00	0.00	41.0	0.0	0.00
8	274.2	0.0	0.0	0.0	0.00	0.00	54.8	0.0	0.00
9	341.9	0.0	0.0	0.0	0.00	0.00	68.4	0.0	0.00
10	407.7	0.0	0.0	0.0	0.00	0.00	81.5	0.0	0.00
11	471.7	0.0	0.0	0.0	0.00	0.00	94.3	0.0	0.00
12	533.7	0.0	0.0	0.0	0.00	0.00	106.7	0.0	0.00
13	593.8	0.0	0.0	0.0	0.00	0.00	118.8	0.0	0.00
14	651.9	0.0	0.0	0.0	0.00	0.00	130.4	0.0	0.00
15	708.0	0.0	0.0	0.0	0.00	0.00	141.6	0.0	0.00
16	762.0	0.0	0.0	0.0	0.00	0.00	152.4	0.0	0.00
17	814.0	0.0	0.0	0.0	0.00	0.00	162.8	0.0	0.00
18	863.8	0.0	0.0	0.0	0.00	0.00	172.8	0.0	0.00
19	911.4	0.0	0.0	0.0	0.00	0.00	182.3	0.0	0.00
20	956.9	0.0	0.0	0.0	0.00	0.00	191.4	0.0	0.00
21	1000.3	0.0	0.0	0.0	0.00	0.00	200.1	0.0	0.00
22	1041.4	0.0	0.0	0.0	0.00	0.00	208.3	0.0	0.00
23	1080.3	0.0	0.0	0.0	0.00	0.00	216.1	0.0	0.00
24	1116.9	0.0	0.0	0.0	0.00	0.00	223.4	0.0	0.00
25	1151.3	0.0	0.0	0.0	0.00	0.00	230.3	0.0	0.00
26	1183.5	0.0	0.0	0.0	0.00	0.00	236.7	0.0	0.00
27	1213.4	0.0	0.0	0.0	0.00	0.00	242.7	0.0	0.00
28	1241.0	0.0	0.0	0.0	0.00	0.00	248.2	0.0	0.00
29	1266.4	0.0	0.0	0.0	0.00	0.00	253.3	0.0	0.00
30	1289.5	0.0	0.0	0.0	0.00	0.00	257.9	0.0	0.00

31	1310.3	0.0	0.0	0.0	0.00	0.00	262.1	0.0	0.00
32	1328.9	0.0	0.0	0.0	0.00	0.00	265.8	0.0	0.00
33	1345.3	0.0	0.0	0.0	0.00	0.00	269.1	0.0	0.00
34	1359.4	0.0	0.0	0.0	0.00	0.00	271.9	0.0	0.00
35	1371.3	0.0	0.0	0.0	0.00	0.00	274.3	0.0	0.00
36	1381.0	0.0	0.0	0.0	0.00	0.00	276.2	0.0	0.00
37	1388.5	0.0	0.0	0.0	0.00	0.00	277.7	0.0	0.00
38	1393.9	0.0	0.0	0.0	0.00	0.00	278.8	0.0	0.00
39	1397.1	0.0	0.0	0.0	0.00	0.00	279.4	0.0	0.00
40	1398.2	0.0	0.0	0.0	0.00	0.00	279.6	0.0	0.00
41	1397.2	0.0	0.0	0.0	0.00	0.00	279.4	0.0	0.00
42	1394.2	0.0	0.0	0.0	0.00	0.00	278.8	0.0	0.00
43	1389.2	0.0	0.0	0.0	0.00	0.00	277.8	0.0	0.00
44	1382.1	0.0	0.0	0.0	0.00	0.00	276.4	0.0	0.00
45	1373.2	0.0	0.0	0.0	0.00	0.00	274.6	0.0	0.00
46	1362.3	0.0	0.0	0.0	0.00	0.00	272.5	0.0	0.00
47	1349.5	0.0	0.0	0.0	0.00	0.00	269.9	0.0	0.00
48	1335.0	0.0	0.0	0.0	0.00	0.00	267.0	0.0	0.00
49	1145.1	0.0	0.0	0.0	0.00	0.00	229.0	0.0	0.00
50	173.3	0.0	0.0	0.0	0.00	0.00	34.7	0.0	0.00
51	1283.1	0.0	0.0	0.0	0.00	0.00	256.6	0.0	0.00
52	1236.4	0.0	0.0	0.0	0.00	0.00	247.3	0.0	0.00
53	1188.8	0.0	0.0	0.0	0.00	0.00	237.8	0.0	0.00
54	1140.4	0.0	0.0	0.0	0.00	0.00	228.1	0.0	0.00
55	1091.4	0.0	0.0	0.0	0.00	0.00	218.3	0.0	0.00
56	1041.7	0.0	0.0	0.0	0.00	0.00	208.3	0.0	0.00
57	991.5	0.0	0.0	0.0	0.00	0.00	198.3	0.0	0.00
58	940.7	0.0	0.0	0.0	0.00	0.00	188.1	0.0	0.00
59	889.6	0.0	0.0	0.0	0.00	0.00	177.9	0.0	0.00
60	838.1	0.0	0.0	0.0	0.00	0.00	167.6	0.0	0.00
61	786.3	0.0	0.0	0.0	0.00	0.00	157.3	0.0	0.00
62	734.3	0.0	0.0	0.0	0.00	0.00	146.9	0.0	0.00
63	682.2	0.0	0.0	0.0	0.00	0.00	136.4	0.0	0.00
64	630.0	0.0	0.0	0.0	0.00	0.00	126.0	0.0	0.00
65	577.9	0.0	0.0	0.0	0.00	0.00	115.6	0.0	0.00
66	525.8	0.0	0.0	0.0	0.00	0.00	105.2	0.0	0.00
67	474.0	0.0	0.0	0.0	0.00	0.00	94.8	0.0	0.00
68	422.4	0.0	0.0	0.0	0.00	0.00	84.5	0.0	0.00
69	371.1	0.0	0.0	0.0	0.00	0.00	74.2	0.0	0.00
70	320.2	0.0	0.0	0.0	0.00	0.00	64.0	0.0	0.00
71	269.8	0.0	0.0	0.0	0.00	0.00	54.0	0.0	0.00
72	219.9	0.0	0.0	0.0	0.00	0.00	44.0	0.0	0.00
73	170.7	0.0	0.0	0.0	0.00	0.00	34.1	0.0	0.00
74	122.2	0.0	0.0	0.0	0.00	0.00	24.4	0.0	0.00
75	74.5	0.0	0.0	0.0	0.00	0.00	14.9	0.0	0.00
76	27.6	0.0	0.0	0.0	0.00	0.00	5.5	0.0	0.00
77	0.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 63473.17(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 63473.17(lbs)

TOTAL AREA OF SLIDING MASS = 528.94(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 77 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	168.00	29.00	
2	1	168.00	29.00	
3	1	168.00	29.00	
4	1	168.00	29.00	
5	1	168.00	29.00	
6	1	168.00	29.00	
7	1	168.00	29.00	
8	1	168.00	29.00	
9	1	168.00	29.00	
10	1	168.00	29.00	
11	1	168.00	29.00	
12	1	168.00	29.00	

13	1	168.00	29.00
14	1	168.00	29.00
15	1	168.00	29.00
16	1	168.00	29.00
17	1	168.00	29.00
18	1	168.00	29.00
19	1	168.00	29.00
20	1	168.00	29.00
21	1	168.00	29.00
22	1	168.00	29.00
23	1	168.00	29.00
24	1	168.00	29.00
25	1	168.00	29.00
26	1	168.00	29.00
27	1	168.00	29.00
28	1	168.00	29.00
29	1	168.00	29.00
30	1	168.00	29.00
31	1	168.00	29.00
32	1	168.00	29.00
33	1	168.00	29.00
34	1	168.00	29.00
35	1	168.00	29.00
36	1	168.00	29.00
37	1	168.00	29.00
38	1	168.00	29.00
39	1	168.00	29.00
40	1	168.00	29.00
41	1	168.00	29.00
42	1	168.00	29.00
43	1	168.00	29.00
44	1	168.00	29.00
45	1	168.00	29.00
46	1	168.00	29.00
47	1	168.00	29.00
48	1	168.00	29.00
49	1	168.00	29.00
50	1	168.00	29.00
51	1	168.00	29.00
52	1	168.00	29.00
53	1	168.00	29.00
54	1	168.00	29.00
55	1	168.00	29.00
56	1	168.00	29.00
57	1	168.00	29.00
58	1	168.00	29.00
59	1	168.00	29.00
60	1	168.00	29.00
61	1	168.00	29.00
62	1	168.00	29.00
63	1	168.00	29.00
64	1	168.00	29.00
65	1	168.00	29.00
66	1	168.00	29.00
67	1	168.00	29.00
68	1	168.00	29.00
69	1	168.00	29.00
70	1	168.00	29.00
71	1	168.00	29.00
72	1	168.00	29.00
73	1	168.00	29.00
74	1	168.00	29.00
75	1	168.00	29.00
76	1	168.00	29.00
77	1	168.00	29.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH

R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 77 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-2.56	282.41	1.00	22.50	180.47	158.96
2	-1.79	283.40	1.00	50.30	195.88	172.53
3	-1.01	284.40	1.00	76.10	210.18	185.13
4	-0.23	285.40	1.00	99.92	223.38	196.76
5	0.54	286.05	0.30	113.42	230.87	203.35
6	0.54	286.55	0.70	142.18	246.81	217.39
7	1.32	287.40	1.00	199.05	278.33	245.16
8	2.10	288.40	1.00	264.00	314.34	276.87
9	2.87	289.40	1.00	326.47	348.97	307.37
10	3.65	290.40	1.00	386.49	382.24	336.67
11	4.42	291.40	1.00	444.09	414.16	364.80
12	5.20	292.39	1.00	499.30	444.77	391.75
13	5.98	293.39	1.00	552.16	474.07	417.56
14	6.75	294.38	1.00	602.69	502.08	442.23
15	7.53	295.38	1.00	650.93	528.82	465.78
16	8.31	296.37	1.00	696.90	554.30	488.23
17	9.08	297.35	1.00	740.63	578.54	509.58
18	9.86	298.34	1.00	782.15	601.56	529.85
19	10.63	299.33	1.00	821.49	623.36	549.06
20	11.41	300.31	1.00	858.68	643.97	567.21
21	12.19	301.29	1.00	893.73	663.40	584.33
22	12.96	302.26	1.00	926.68	681.67	600.41
23	13.74	303.23	1.00	957.55	698.78	615.48
24	14.52	304.20	1.00	986.36	714.75	629.55
25	15.29	305.17	1.00	1013.15	729.60	642.63
26	16.07	306.13	1.00	1037.94	743.34	654.73
27	16.85	307.09	1.00	1060.75	755.98	665.87
28	17.62	308.05	1.00	1081.60	767.54	676.05
29	18.40	309.00	1.00	1100.53	778.03	685.29
30	19.17	309.95	1.00	1117.55	787.47	693.60
31	19.95	310.89	1.00	1132.69	795.86	700.99
32	20.73	311.83	1.00	1145.97	803.22	707.48
33	21.50	312.76	1.00	1157.42	809.57	713.07
34	22.28	313.69	1.00	1167.07	814.92	717.78
35	23.06	314.61	1.00	1174.93	819.28	721.62
36	23.83	315.53	1.00	1181.04	822.66	724.60
37	24.61	316.44	1.00	1185.41	825.08	726.74
38	25.39	317.34	1.00	1188.07	826.56	728.04
39	26.16	318.24	1.00	1189.05	827.10	728.51
40	26.94	319.14	1.00	1188.38	826.73	728.18
41	27.71	320.03	1.00	1186.07	825.45	727.06
42	28.49	320.91	1.00	1182.15	823.28	725.14
43	29.27	321.79	1.00	1176.65	820.23	722.46
44	30.04	322.65	1.00	1169.60	816.32	719.02
45	30.82	323.52	1.00	1161.02	811.56	714.83
46	31.60	324.37	1.00	1150.94	805.97	709.90
47	32.37	325.22	1.00	1139.38	799.57	704.26
48	33.15	326.06	1.00	1126.38	792.36	697.91
49	33.92	326.84	0.87	1112.27	784.54	691.02
50	33.92	327.25	0.13	1108.26	782.32	689.07
51	34.70	327.72	1.00	1080.39	766.87	675.46
52	35.48	328.54	1.00	1038.75	743.79	655.13
53	36.25	329.35	1.00	996.38	720.30	634.44
54	37.03	330.15	1.00	953.32	696.43	613.42
55	37.81	330.95	1.00	909.60	672.20	592.07
56	38.58	331.73	1.00	865.25	647.62	570.42
57	39.36	332.51	1.00	820.31	622.70	548.48
58	40.14	333.28	1.00	774.80	597.48	526.26

59	40.91	334.04	1.00	728.77	571.97	503.79
60	41.69	334.79	1.00	682.25	546.18	481.08
61	42.46	335.53	1.00	635.28	520.14	458.14
62	43.24	336.26	1.00	587.89	493.87	435.00
63	44.02	336.99	1.00	540.12	467.39	411.68
64	44.79	337.70	1.00	492.01	440.73	388.19
65	45.57	338.41	1.00	443.60	413.89	364.56
66	46.35	339.10	1.00	394.93	386.92	340.80
67	47.12	339.79	1.00	346.05	359.82	316.93
68	47.90	340.46	1.00	296.99	332.62	292.98
69	48.67	341.13	1.00	247.80	305.36	268.96
70	49.45	341.78	1.00	198.53	278.05	244.90
71	50.23	342.43	1.00	149.21	250.71	220.83
72	51.00	343.06	1.00	99.91	223.38	196.76
73	51.78	343.69	1.00	50.67	196.09	172.71
74	52.56	344.30	1.00	1.54	168.85	148.72
75	53.33	344.90	1.00	0.00	168.00	147.97
76	54.11	345.50	1.00	0.00	168.00	147.97
77	54.89	345.82	0.10	0.00	168.00	147.97

Table 4A - Base Force Data on the 77 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-2.56	282.41	1.00	22.50	180.47	158.96
2	-1.79	283.40	1.00	50.30	195.88	172.53
3	-1.01	284.40	1.00	76.10	210.18	185.13
4	-0.23	285.40	1.00	99.92	223.38	196.76
5	0.54	286.05	0.30	33.57	68.33	60.18
6	0.54	286.55	0.70	100.10	173.77	153.05
7	1.32	287.40	1.00	199.05	278.33	245.16
8	2.10	288.40	1.00	264.00	314.34	276.87
9	2.87	289.40	1.00	326.47	348.97	307.37
10	3.65	290.40	1.00	386.49	382.24	336.67
11	4.42	291.40	1.00	444.09	414.16	364.80
12	5.20	292.39	1.00	499.30	444.77	391.75
13	5.98	293.39	1.00	552.16	474.07	417.56
14	6.75	294.38	1.00	602.69	502.08	442.23
15	7.53	295.38	1.00	650.93	528.82	465.78
16	8.31	296.37	1.00	696.90	554.30	488.23
17	9.08	297.35	1.00	740.63	578.54	509.58
18	9.86	298.34	1.00	782.15	601.56	529.85
19	10.63	299.33	1.00	821.49	623.36	549.06
20	11.41	300.31	1.00	858.68	643.97	567.21
21	12.19	301.29	1.00	893.73	663.40	584.33
22	12.96	302.26	1.00	926.68	681.67	600.41
23	13.74	303.23	1.00	957.55	698.78	615.48
24	14.52	304.20	1.00	986.36	714.75	629.55
25	15.29	305.17	1.00	1013.15	729.60	642.63
26	16.07	306.13	1.00	1037.94	743.34	654.73
27	16.85	307.09	1.00	1060.75	755.98	665.87
28	17.62	308.05	1.00	1081.60	767.54	676.05
29	18.40	309.00	1.00	1100.53	778.03	685.29
30	19.17	309.95	1.00	1117.55	787.47	693.60
31	19.95	310.89	1.00	1132.69	795.86	700.99
32	20.73	311.83	1.00	1145.97	803.22	707.48
33	21.50	312.76	1.00	1157.42	809.57	713.07
34	22.28	313.69	1.00	1167.07	814.92	717.78
35	23.06	314.61	1.00	1174.93	819.28	721.62
36	23.83	315.53	1.00	1181.04	822.66	724.60
37	24.61	316.44	1.00	1185.41	825.08	726.74
38	25.39	317.34	1.00	1188.07	826.56	728.04
39	26.16	318.24	1.00	1189.05	827.10	728.51
40	26.94	319.14	1.00	1188.38	826.73	728.18
41	27.71	320.03	1.00	1186.07	825.45	727.06
42	28.49	320.91	1.00	1182.15	823.28	725.14
43	29.27	321.79	1.00	1176.65	820.23	722.46

44	30.04	322.65	1.00	1169.60	816.32	719.02
45	30.82	323.52	1.00	1161.02	811.56	714.83
46	31.60	324.37	1.00	1150.94	805.97	709.90
47	32.37	325.22	1.00	1139.38	799.57	704.26
48	33.15	326.06	1.00	1126.38	792.36	697.91
49	33.92	326.84	0.87	965.64	681.12	599.93
50	33.92	327.25	0.13	146.09	103.13	90.83
51	34.70	327.72	1.00	1080.39	766.87	675.46
52	35.48	328.54	1.00	1038.75	743.79	655.13
53	36.25	329.35	1.00	996.38	720.30	634.44
54	37.03	330.15	1.00	953.32	696.43	613.42
55	37.81	330.95	1.00	909.60	672.20	592.07
56	38.58	331.73	1.00	865.25	647.62	570.42
57	39.36	332.51	1.00	820.31	622.70	548.48
58	40.14	333.28	1.00	774.80	597.48	526.26
59	40.91	334.04	1.00	728.77	571.97	503.79
60	41.69	334.79	1.00	682.25	546.18	481.08
61	42.46	335.53	1.00	635.28	520.14	458.14
62	43.24	336.26	1.00	587.89	493.87	435.00
63	44.02	336.99	1.00	540.12	467.39	411.68
64	44.79	337.70	1.00	492.01	440.73	388.19
65	45.57	338.41	1.00	443.60	413.89	364.56
66	46.35	339.10	1.00	394.93	386.92	340.80
67	47.12	339.79	1.00	346.05	359.82	316.93
68	47.90	340.46	1.00	296.99	332.62	292.98
69	48.67	341.13	1.00	247.80	305.36	268.96
70	49.45	341.78	1.00	198.53	278.05	244.90
71	50.23	342.43	1.00	149.21	250.71	220.83
72	51.00	343.06	1.00	99.91	223.38	196.76
73	51.78	343.69	1.00	50.67	196.09	172.71
74	52.56	344.30	1.00	1.54	168.85	148.72
75	53.33	344.90	1.00	0.00	168.00	147.97
76	54.11	345.50	1.00	0.00	168.00	147.97
77	54.89	345.82	0.10	0.00	16.99	14.97

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 38.152
3D Depth (Vertical difference between ends of Slip Surface) = 30.93(ft)
L/D(1): L = 30.93(ft) L/D(2): L = 61.86(ft) L/D(3): L = 92.78(ft)
L/D(4): L = 123.71(ft) L/D(5): L = 154.64(ft) L/D(6): L = 185.57(ft)

SUM OF MOMENTS = 0.111154E-01 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.1751193E-06

Sum of the Resisting Forces = 42288.38 (lbs)

Average Available Shear Strength = 570.68(psf)

Average Effective Normal Stress = 726.46(psf)

Sum of the Driving Forces = 37247.69 (lbs)

Average Mobilized Shear Stress = 502.66(psf)

Total length of the failure surface = 74.10(ft)

Factor of Safety Balance Check: FS = 1.13533

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

*** SEISMIC SLOPE DISPLACEMENT DATA ***
(Note: kv is set = zero for displacement calculations)
Seismic Yield Coefficient (ky) = 0.25796(g)
Calculated Newmark Seismic Displacement = 0.373(ft)

Average Elevation of Point of Application of kh on Sliding Mass = 128.319(ft)

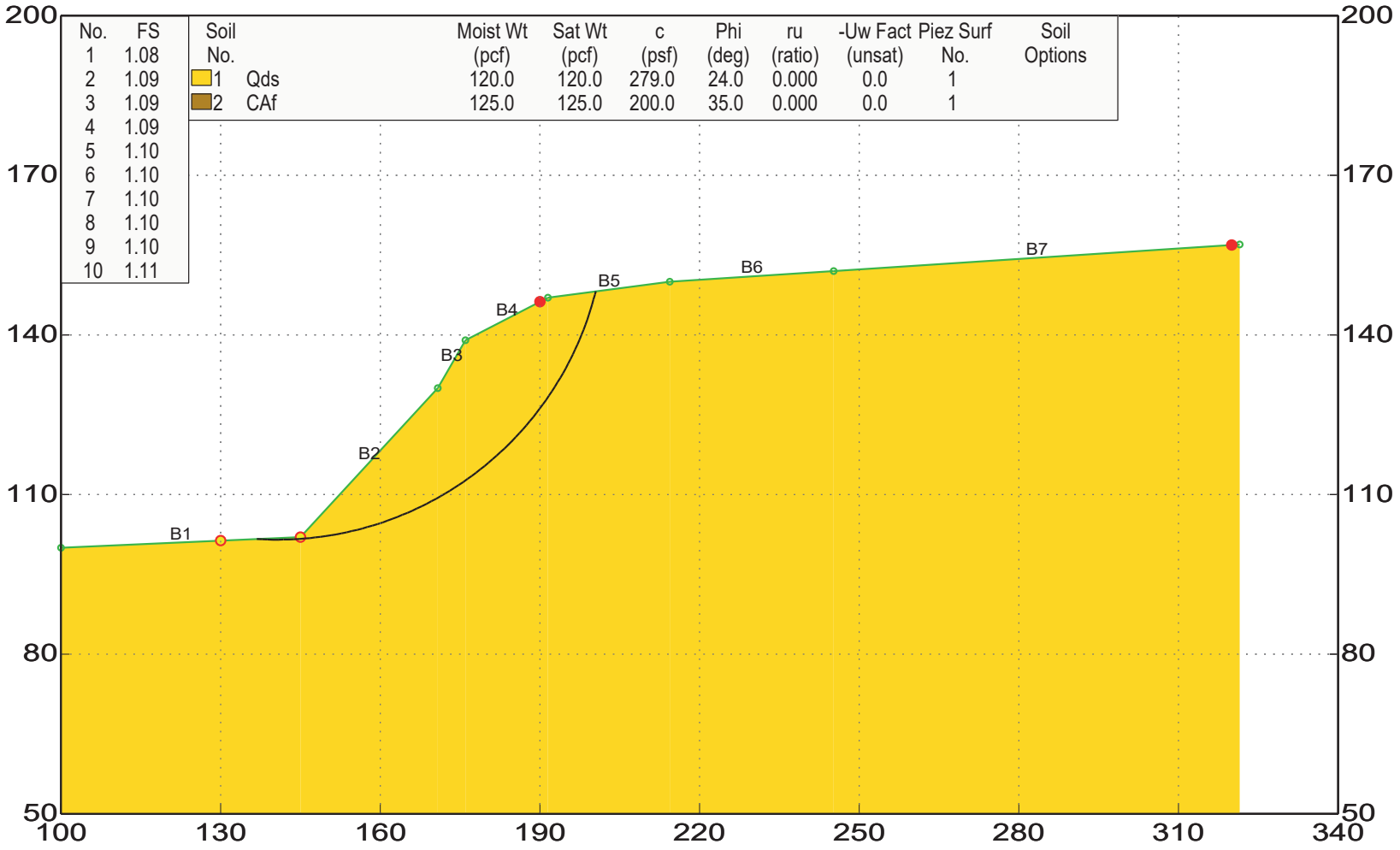
Non-Symmetrical Sliding Resistance Has Been Specified
for Downhill Sliding.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section BB - Existing - Static

EGL

\BB001.gsd



No.	FS
1	1.08
2	1.09
3	1.09
4	1.09
5	1.10
6	1.10
7	1.10
8	1.10
9	1.10
10	1.11

Soil No.		Moist Wt (pcf)	Sat Wt (pcf)	c (psf)	Phi (deg)	ru (ratio)	-Uw Fact (unsat)	Piez Surf No.	Soil Options
1	Qds	120.0	120.0	279.0	24.0	0.000	0.0	1	
2	CAf	125.0	125.0	200.0	35.0	0.000	0.0	1	

GEOSTASE FS = 1.08

Simplified Bishop Method

GEOSTASE
Slope Stability Analysis

PLATE D.3

*** GEOSTASE(R) ***

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** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB001.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB001.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section BB - Existing - Static

PROFILE BOUNDARY DATA

7 Surface Boundaries
7 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	145.000	102.000	1
2	145.000	102.000	170.800	130.000	1
3	170.800	130.000	176.000	139.000	1
4	176.000	139.000	191.500	147.000	1
5	191.500	147.000	214.400	150.000	1
6	214.400	150.000	245.200	152.000	1
7	245.200	152.000	321.500	157.000	1

User Specified X-Origin = 100.000(ft)

User Specified Y-Origin = 50.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	145.000	102.000
3	170.800	130.000
4	176.000	139.000
5	191.500	147.000
6	214.400	150.000
7	245.200	152.000
8	321.500	157.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)
Point No. X-COORD Y-COORD

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.044	2.545
2	1.085	47.342
3	1.731	59.982
4	0.516	27.300
5	0.131	7.463
6	0.065	3.715
7	0.066	3.749

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

	Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1	Qds	120.0	120.0	279.00	24.00	0.000	0.0	1	0
2	CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.1802(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 130.00(ft)
and X = 145.00(ft)

Each Surface ends within a Range Between X = 190.00(ft)
and X = 320.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 50.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 3.705 FS Min = 1.078 FS Ave = 2.346
Standard Deviation = 0.667 Coefficient of Variation = 28.41 %

Critical Surface is Sequence Number 453 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 140.646593(ft) ; Y = 163.210200(ft); and Radius = 61.696088(ft)

Circular Trial Failure Surface Generated With 87 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	136.78679	101.63497
2	137.78530	101.58050
3	138.78457	101.54222
4	139.78433	101.52014
5	140.78431	101.51427
6	141.78425	101.52460
7	142.78390	101.55114
8	143.78299	101.59388
9	144.78125	101.65281
10	145.77843	101.72791
11	146.77425	101.81917
12	147.76847	101.92655
13	148.76082	102.05003
14	149.75103	102.18958
15	150.73886	102.34516
16	151.72403	102.51673
17	152.70629	102.70424
18	153.68539	102.90765
19	154.66105	103.12691
20	155.63304	103.36194
21	156.60109	103.61271
22	157.56495	103.87912
23	158.52436	104.16113
24	159.47907	104.45865
25	160.42884	104.77160
26	161.37341	105.09991
27	162.31254	105.44348
28	163.24597	105.80223
29	164.17347	106.17606
30	165.09479	106.56487
31	166.00968	106.96857
32	166.91791	107.38704
33	167.81924	107.82018
34	168.71343	108.26787
35	169.60024	108.72999
36	170.47945	109.20643
37	171.35083	109.69705
38	172.21413	110.20173
39	173.06914	110.72034
40	173.91564	111.25274
41	174.75339	111.79879
42	175.58218	112.35834
43	176.40180	112.93125
44	177.21202	113.51738
45	178.01264	114.11656
46	178.80344	114.72863
47	179.58421	115.35344
48	180.35476	115.99083
49	181.11487	116.64062
50	181.86435	117.30264
51	182.60300	117.97673
52	183.33063	118.66270
53	184.04705	119.36037
54	184.75207	120.06956
55	185.44549	120.79009
56	186.12715	121.52176
57	186.79686	122.26438
58	187.45445	123.01776
59	188.09974	123.78170
60	188.73256	124.55600
61	189.35275	125.34045
62	189.96014	126.13485

63	190.55458	126.93900
64	191.13590	127.75267
65	191.70397	128.57565
66	192.25861	129.40774
67	192.79970	130.24870
68	193.32709	131.09833
69	193.84064	131.95639
70	194.34021	132.82266
71	194.82568	133.69692
72	195.29691	134.57892
73	195.75379	135.46846
74	196.19618	136.36527
75	196.62399	137.26915
76	197.03709	138.17983
77	197.43537	139.09709
78	197.81874	140.02069
79	198.18708	140.95038
80	198.54031	141.88592
81	198.87833	142.82706
82	199.20105	143.77355
83	199.50838	144.72515
84	199.80026	145.68161
85	200.07659	146.64267
86	200.33731	147.60809
87	200.48098	148.17655

Factor Of Safety For The Critical or Specified Surface = 1.078

Table 1 - Geometry Data on the 90 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.05	137.29	101.61	101.66	-3.12	2.54	1.00
2	1.00	0.14	138.28	101.56	101.70	-2.19	2.54	1.00
3	1.00	0.21	139.28	101.53	101.75	-1.27	2.54	1.00
4	1.00	0.27	140.28	101.52	101.79	-0.34	2.54	1.00
5	1.00	0.32	141.28	101.52	101.83	0.59	2.54	1.00
6	1.00	0.34	142.28	101.54	101.88	1.52	2.54	1.00
7	1.00	0.35	143.28	101.57	101.92	2.45	2.54	1.00
8	1.00	0.34	144.28	101.62	101.97	3.38	2.54	1.00
9	0.22	0.33	144.89	101.66	102.00	4.31	2.54	0.22
10	0.78	0.72	145.39	101.70	102.42	4.31	47.34	0.78
11	1.00	1.61	146.28	101.77	103.39	5.24	47.34	1.00
12	0.99	2.59	147.27	101.87	104.47	6.16	47.34	1.00
13	0.99	3.55	148.26	101.99	105.54	7.09	47.34	1.00
14	0.99	4.50	149.26	102.12	106.62	8.02	47.34	1.00
15	0.99	5.42	150.24	102.27	107.69	8.95	47.34	1.00
16	0.99	6.33	151.23	102.43	108.76	9.88	47.34	1.00
17	0.98	7.22	152.22	102.61	109.83	10.81	47.34	1.00
18	0.98	8.09	153.20	102.81	110.89	11.74	47.34	1.00
19	0.98	8.94	154.17	103.02	111.96	12.67	47.34	1.00
20	0.97	9.77	155.15	103.24	113.01	13.59	47.34	1.00
21	0.97	10.58	156.12	103.49	114.07	14.52	47.34	1.00
22	0.96	11.37	157.08	103.75	115.11	15.45	47.34	1.00
23	0.96	12.14	158.04	104.02	116.16	16.38	47.34	1.00
24	0.95	12.89	159.00	104.31	117.20	17.31	47.34	1.00
25	0.95	13.61	159.95	104.62	118.23	18.24	47.34	1.00
26	0.94	14.32	160.90	104.94	119.26	19.17	47.34	1.00
27	0.94	15.01	161.84	105.27	120.28	20.09	47.34	1.00
28	0.93	15.67	162.78	105.62	121.30	21.02	47.34	1.00
29	0.93	16.32	163.71	105.99	122.31	21.95	47.34	1.00
30	0.92	16.94	164.63	106.37	123.31	22.88	47.34	1.00
31	0.91	17.54	165.55	106.77	124.30	23.81	47.34	1.00
32	0.91	18.12	166.46	107.18	125.29	24.74	47.34	1.00
33	0.90	18.67	167.37	107.60	126.28	25.67	47.34	1.00
34	0.89	19.21	168.27	108.04	127.25	26.60	47.34	1.00

35	0.89	19.72	169.16	108.50	128.22	27.52	47.34	1.00
36	0.88	20.21	170.04	108.97	129.18	28.45	47.34	1.00
37	0.32	20.53	170.64	109.30	129.83	29.38	47.34	0.37
38	0.55	20.93	171.08	109.54	130.48	29.38	59.98	0.63
39	0.86	21.75	171.78	109.95	131.70	30.31	59.98	1.00
40	0.86	22.73	172.64	110.46	133.19	31.24	59.98	1.00
41	0.85	23.67	173.49	110.99	134.66	32.17	59.98	1.00
42	0.84	24.59	174.33	111.53	136.12	33.10	59.98	1.00
43	0.83	25.48	175.17	112.08	137.56	34.03	59.98	1.00
44	0.42	26.13	175.79	112.50	138.64	34.95	59.98	0.51
45	0.40	26.31	176.20	112.79	139.10	34.95	27.30	0.49
46	0.81	26.19	176.81	113.22	139.42	35.88	27.30	1.00
47	0.80	26.02	177.61	113.82	139.83	36.81	27.30	1.00
48	0.79	25.82	178.41	114.42	140.24	37.74	27.30	1.00
49	0.78	25.61	179.19	115.04	140.65	38.67	27.30	1.00
50	0.77	25.38	179.97	115.67	141.05	39.60	27.30	1.00
51	0.76	25.13	180.73	116.32	141.44	40.53	27.30	1.00
52	0.75	24.86	181.49	116.97	141.83	41.45	27.30	1.00
53	0.74	24.58	182.23	117.64	142.22	42.38	27.30	1.00
54	0.73	24.28	182.97	118.32	142.60	43.31	27.30	1.00
55	0.72	23.96	183.69	119.01	142.97	44.24	27.30	1.00
56	0.71	23.62	184.40	119.71	143.34	45.17	27.30	1.00
57	0.69	23.27	185.10	120.43	143.70	46.10	27.30	1.00
58	0.68	22.90	185.79	121.16	144.05	47.03	27.30	1.00
59	0.67	22.51	186.46	121.89	144.40	47.96	27.30	1.00
60	0.66	22.10	187.13	122.64	144.74	48.88	27.30	1.00
61	0.65	21.68	187.78	123.40	145.08	49.81	27.30	1.00
62	0.63	21.24	188.42	124.17	145.41	50.74	27.30	1.00
63	0.62	20.78	189.04	124.95	145.73	51.67	27.30	1.00
64	0.61	20.31	189.66	125.74	146.05	52.60	27.30	1.00
65	0.59	19.82	190.26	126.54	146.36	53.53	27.30	1.00
66	0.58	19.32	190.85	127.35	146.66	54.46	27.30	1.00
67	0.36	18.89	191.32	128.02	146.91	55.38	27.30	0.64
68	0.20	18.59	191.60	128.43	147.01	55.38	7.46	0.36
69	0.55	18.07	191.98	128.99	147.06	56.31	7.46	1.00
70	0.54	17.31	192.53	129.83	147.13	57.24	7.46	1.00
71	0.53	16.53	193.06	130.67	147.20	58.17	7.46	1.00
72	0.51	15.75	193.58	131.53	147.27	59.10	7.46	1.00
73	0.50	14.95	194.09	132.39	147.34	60.03	7.46	1.00
74	0.49	14.14	194.58	133.26	147.40	60.96	7.46	1.00
75	0.47	13.33	195.06	134.14	147.47	61.89	7.46	1.00
76	0.46	12.50	195.53	135.02	147.53	62.81	7.46	1.00
77	0.44	11.67	195.97	135.92	147.59	63.74	7.46	1.00
78	0.43	10.83	196.41	136.82	147.64	64.67	7.46	1.00
79	0.41	9.97	196.83	137.72	147.70	65.60	7.46	1.00
80	0.40	9.11	197.24	138.64	147.75	66.53	7.46	1.00
81	0.38	8.24	197.63	139.56	147.80	67.46	7.46	1.00
82	0.37	7.37	198.00	140.49	147.85	68.39	7.46	1.00
83	0.35	6.48	198.36	141.42	147.90	69.32	7.46	1.00
84	0.34	5.59	198.71	142.36	147.94	70.24	7.46	1.00
85	0.32	4.69	199.04	143.30	147.99	71.17	7.46	1.00
86	0.31	3.78	199.35	144.25	148.03	72.10	7.46	1.00
87	0.29	2.86	199.65	145.20	148.07	73.03	7.46	1.00
88	0.28	1.94	199.94	146.16	148.11	73.96	7.46	1.00
89	0.26	1.02	200.21	147.13	148.14	74.89	7.46	1.00
90	0.14	0.27	200.41	147.89	148.17	75.82	7.46	0.59

Table 2 - Force Data On The 90 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	5.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
2	16.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
3	25.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
4	32.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
5	37.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
6	41.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
7	42.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

8	41.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
9	8.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
10	67.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
11	192.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
12	309.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
13	423.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
14	534.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
15	643.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
16	748.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
17	851.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
18	950.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
19	1046.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
20	1139.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
21	1228.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
22	1314.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
23	1397.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
24	1476.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
25	1551.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
26	1623.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
27	1691.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
28	1755.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
29	1816.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
30	1872.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
31	1925.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
32	1974.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
33	2019.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
34	2060.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
35	2098.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
36	2131.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
37	789.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
38	1383.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
39	2253.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
40	2331.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
41	2404.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
42	2472.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
43	2534.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
44	1310.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
45	1268.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
46	2546.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
47	2499.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
48	2450.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
49	2399.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
50	2346.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
51	2292.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
52	2236.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
53	2178.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
54	2119.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
55	2059.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
56	1998.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
57	1936.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
58	1872.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
59	1808.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
60	1744.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
61	1678.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
62	1612.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
63	1546.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
64	1480.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
65	1413.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
66	1347.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
67	825.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
68	454.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
69	1202.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
70	1123.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
71	1046.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
72	970.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
73	896.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
74	824.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
75	753.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
76	685.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
77	619.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
78	555.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
79	494.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

80	435.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
81	379.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
82	325.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
83	274.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
84	226.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
85	181.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
86	139.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
87	100.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
88	64.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
89	31.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
90	4.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 106029.27(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 106029.27(lbs)

TOTAL AREA OF SLIDING MASS = 883.58(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 90 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	279.00	24.00	
2	1	279.00	24.00	
3	1	279.00	24.00	
4	1	279.00	24.00	
5	1	279.00	24.00	
6	1	279.00	24.00	
7	1	279.00	24.00	
8	1	279.00	24.00	
9	1	279.00	24.00	
10	1	279.00	24.00	
11	1	279.00	24.00	
12	1	279.00	24.00	
13	1	279.00	24.00	
14	1	279.00	24.00	
15	1	279.00	24.00	
16	1	279.00	24.00	
17	1	279.00	24.00	
18	1	279.00	24.00	
19	1	279.00	24.00	
20	1	279.00	24.00	
21	1	279.00	24.00	
22	1	279.00	24.00	
23	1	279.00	24.00	
24	1	279.00	24.00	
25	1	279.00	24.00	
26	1	279.00	24.00	
27	1	279.00	24.00	
28	1	279.00	24.00	
29	1	279.00	24.00	
30	1	279.00	24.00	
31	1	279.00	24.00	
32	1	279.00	24.00	
33	1	279.00	24.00	
34	1	279.00	24.00	
35	1	279.00	24.00	
36	1	279.00	24.00	
37	1	279.00	24.00	
38	1	279.00	24.00	
39	1	279.00	24.00	
40	1	279.00	24.00	
41	1	279.00	24.00	
42	1	279.00	24.00	
43	1	279.00	24.00	
44	1	279.00	24.00	
45	1	279.00	24.00	
46	1	279.00	24.00	
47	1	279.00	24.00	
48	1	279.00	24.00	

49	1	279.00	24.00
50	1	279.00	24.00
51	1	279.00	24.00
52	1	279.00	24.00
53	1	279.00	24.00
54	1	279.00	24.00
55	1	279.00	24.00
56	1	279.00	24.00
57	1	279.00	24.00
58	1	279.00	24.00
59	1	279.00	24.00
60	1	279.00	24.00
61	1	279.00	24.00
62	1	279.00	24.00
63	1	279.00	24.00
64	1	279.00	24.00
65	1	279.00	24.00
66	1	279.00	24.00
67	1	279.00	24.00
68	1	279.00	24.00
69	1	279.00	24.00
70	1	279.00	24.00
71	1	279.00	24.00
72	1	279.00	24.00
73	1	279.00	24.00
74	1	279.00	24.00
75	1	279.00	24.00
76	1	279.00	24.00
77	1	279.00	24.00
78	1	279.00	24.00
79	1	279.00	24.00
80	1	279.00	24.00
81	1	279.00	24.00
82	1	279.00	24.00
83	1	279.00	24.00
84	1	279.00	24.00
85	1	279.00	24.00
86	1	279.00	24.00
87	1	279.00	24.00
88	1	279.00	24.00
89	1	279.00	24.00
90	1	279.00	24.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 90 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-3.12	137.29	1.00	20.50	288.13	267.27
2	-2.19	138.28	1.00	27.16	291.09	270.02
3	-1.27	139.28	1.00	31.78	293.15	271.93
4	-0.34	140.28	1.00	34.39	294.31	273.00
5	0.59	141.28	1.00	35.03	294.60	273.27
6	1.52	142.28	1.00	33.73	294.02	272.73
7	2.45	143.28	1.00	30.54	292.60	271.42
8	3.38	144.28	1.00	25.48	290.34	269.33
9	4.31	144.89	0.22	19.99	287.90	267.06

10	4.31	145.39	0.78	65.34	308.09	285.79
11	5.24	146.28	1.00	163.51	351.80	326.33
12	6.16	147.27	1.00	271.04	399.68	370.74
13	7.09	148.26	1.00	375.12	446.01	413.73
14	8.02	149.26	1.00	475.76	490.82	455.29
15	8.95	150.24	1.00	572.99	534.11	495.45
16	9.88	151.23	1.00	666.84	575.90	534.21
17	10.81	152.22	1.00	757.34	616.19	571.58
18	11.74	153.20	1.00	844.50	654.99	607.58
19	12.67	154.17	1.00	928.34	692.33	642.21
20	13.59	155.15	1.00	1008.90	728.19	675.48
21	14.52	156.12	1.00	1086.19	762.60	707.40
22	15.45	157.08	1.00	1160.23	795.57	737.97
23	16.38	158.04	1.00	1231.04	827.09	767.22
24	17.31	159.00	1.00	1298.65	857.19	795.14
25	18.24	159.95	1.00	1363.06	885.88	821.75
26	19.17	160.90	1.00	1424.32	913.15	847.04
27	20.09	161.84	1.00	1482.42	939.02	871.04
28	21.02	162.78	1.00	1537.40	963.49	893.75
29	21.95	163.71	1.00	1589.27	986.59	915.17
30	22.88	164.63	1.00	1638.05	1008.31	935.32
31	23.81	165.55	1.00	1683.77	1028.66	954.20
32	24.74	166.46	1.00	1726.44	1047.66	971.82
33	25.67	167.37	1.00	1766.08	1065.31	988.19
34	26.60	168.27	1.00	1802.71	1081.62	1003.32
35	27.52	169.16	1.00	1836.36	1096.60	1017.22
36	28.45	170.04	1.00	1867.05	1110.26	1029.89
37	29.38	170.64	0.37	1880.79	1116.38	1035.57
38	29.38	171.08	0.63	1920.26	1133.95	1051.86
39	30.31	171.78	1.00	1980.93	1160.97	1076.92
40	31.24	172.64	1.00	2055.63	1194.23	1107.78
41	32.17	173.49	1.00	2126.17	1225.63	1136.91
42	33.10	174.33	1.00	2192.54	1255.18	1164.32
43	34.03	175.17	1.00	2254.76	1282.88	1190.01
44	34.95	175.79	0.51	2293.55	1300.15	1206.03
45	34.95	176.20	0.49	2310.20	1307.57	1212.91
46	35.88	176.81	1.00	2276.26	1292.46	1198.90
47	36.81	177.61	1.00	2237.17	1275.05	1182.75
48	37.74	178.41	1.00	2196.51	1256.95	1165.96
49	38.67	179.19	1.00	2154.31	1238.16	1148.53
50	39.60	179.97	1.00	2110.61	1218.71	1130.48
51	40.53	180.73	1.00	2065.45	1198.60	1111.83
52	41.45	181.49	1.00	2018.87	1177.86	1092.59
53	42.38	182.23	1.00	1970.89	1156.50	1072.78
54	43.31	182.97	1.00	1921.55	1134.53	1052.40
55	44.24	183.69	1.00	1870.91	1111.98	1031.49
56	45.17	184.40	1.00	1818.99	1088.87	1010.04
57	46.10	185.10	1.00	1765.84	1065.20	988.09
58	47.03	185.79	1.00	1711.51	1041.01	965.65
59	47.96	186.46	1.00	1656.03	1016.31	942.74
60	48.88	187.13	1.00	1599.45	991.12	919.37
61	49.81	187.78	1.00	1541.82	965.46	895.57
62	50.74	188.42	1.00	1483.19	939.36	871.36
63	51.67	189.04	1.00	1423.61	912.83	846.75
64	52.60	189.66	1.00	1363.13	885.91	821.77
65	53.53	190.26	1.00	1301.81	858.60	796.45
66	54.46	190.85	1.00	1239.70	830.95	770.80
67	55.38	191.32	0.64	1184.00	806.15	747.79
68	55.38	191.60	0.36	1161.16	795.98	738.36
69	56.31	191.98	1.00	1099.62	768.58	712.94
70	57.24	192.53	1.00	1020.27	733.25	680.17
71	58.17	193.06	1.00	941.20	698.05	647.52
72	59.10	193.58	1.00	862.48	663.00	615.01
73	60.03	194.09	1.00	784.19	628.15	582.67
74	60.96	194.58	1.00	706.41	593.51	550.55
75	61.89	195.06	1.00	629.21	559.14	518.66
76	62.81	195.53	1.00	552.68	525.07	487.06
77	63.74	195.97	1.00	476.93	491.34	455.77
78	64.67	196.41	1.00	402.03	458.00	424.84
79	65.60	196.83	1.00	328.10	425.08	394.31
80	66.53	197.24	1.00	255.24	392.64	364.22
81	67.46	197.63	1.00	183.57	360.73	334.62

82	68.39	198.00	1.00	113.20	329.40	305.55
83	69.32	198.36	1.00	44.27	298.71	277.09
84	70.24	198.71	1.00	0.00	279.00	258.80
85	71.17	199.04	1.00	0.00	279.00	258.80
86	72.10	199.35	1.00	0.00	279.00	258.80
87	73.03	199.65	1.00	0.00	279.00	258.80
88	73.96	199.94	1.00	0.00	279.00	258.80
89	74.89	200.21	1.00	0.00	279.00	258.80
90	75.82	200.41	0.59	0.00	279.00	258.80

Table 4A - Base Force Data on the 90 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-3.12	137.29	1.00	20.50	288.13	267.27
2	-2.19	138.28	1.00	27.16	291.09	270.02
3	-1.27	139.28	1.00	31.78	293.15	271.93
4	-0.34	140.28	1.00	34.39	294.31	273.00
5	0.59	141.28	1.00	35.03	294.60	273.27
6	1.52	142.28	1.00	33.73	294.02	272.73
7	2.45	143.28	1.00	30.54	292.60	271.42
8	3.38	144.28	1.00	25.48	290.34	269.33
9	4.31	144.89	0.22	4.39	63.16	58.58
10	4.31	145.39	0.78	51.01	240.51	223.10
11	5.24	146.28	1.00	163.51	351.80	326.33
12	6.16	147.27	1.00	271.04	399.68	370.74
13	7.09	148.26	1.00	375.12	446.01	413.73
14	8.02	149.26	1.00	475.76	490.82	455.29
15	8.95	150.24	1.00	572.99	534.11	495.45
16	9.88	151.23	1.00	666.84	575.90	534.21
17	10.81	152.22	1.00	757.34	616.19	571.58
18	11.74	153.20	1.00	844.50	654.99	607.58
19	12.67	154.17	1.00	928.34	692.33	642.21
20	13.59	155.15	1.00	1008.90	728.19	675.48
21	14.52	156.12	1.00	1086.19	762.60	707.40
22	15.45	157.08	1.00	1160.23	795.57	737.97
23	16.38	158.04	1.00	1231.04	827.09	767.22
24	17.31	159.00	1.00	1298.65	857.19	795.14
25	18.24	159.95	1.00	1363.06	885.88	821.75
26	19.17	160.90	1.00	1424.32	913.15	847.04
27	20.09	161.84	1.00	1482.42	939.02	871.04
28	21.02	162.78	1.00	1537.40	963.49	893.75
29	21.95	163.71	1.00	1589.27	986.59	915.17
30	22.88	164.63	1.00	1638.05	1008.31	935.32
31	23.81	165.55	1.00	1683.77	1028.66	954.20
32	24.74	166.46	1.00	1726.44	1047.66	971.82
33	25.67	167.37	1.00	1766.08	1065.31	988.19
34	26.60	168.27	1.00	1802.71	1081.62	1003.32
35	27.52	169.16	1.00	1836.36	1096.60	1017.22
36	28.45	170.04	1.00	1867.05	1110.26	1029.89
37	29.38	170.64	0.37	691.88	410.68	380.95
38	29.38	171.08	0.63	1213.86	716.81	664.92
39	30.31	171.78	1.00	1980.93	1160.97	1076.92
40	31.24	172.64	1.00	2055.63	1194.23	1107.78
41	32.17	173.49	1.00	2126.17	1225.63	1136.91
42	33.10	174.33	1.00	2192.54	1255.18	1164.32
43	34.03	175.17	1.00	2254.76	1282.88	1190.01
44	34.95	175.79	0.51	1169.18	662.78	614.80
45	34.95	176.20	0.49	1132.53	641.01	594.61
46	35.88	176.81	1.00	2276.26	1292.46	1198.90
47	36.81	177.61	1.00	2237.17	1275.05	1182.75
48	37.74	178.41	1.00	2196.51	1256.95	1165.96
49	38.67	179.19	1.00	2154.31	1238.16	1148.53
50	39.60	179.97	1.00	2110.61	1218.71	1130.48
51	40.53	180.73	1.00	2065.45	1198.60	1111.83
52	41.45	181.49	1.00	2018.87	1177.86	1092.59
53	42.38	182.23	1.00	1970.89	1156.50	1072.78

54	43.31	182.97	1.00	1921.55	1134.53	1052.40
55	44.24	183.69	1.00	1870.91	1111.98	1031.49
56	45.17	184.40	1.00	1818.99	1088.87	1010.04
57	46.10	185.10	1.00	1765.84	1065.20	988.09
58	47.03	185.79	1.00	1711.51	1041.01	965.65
59	47.96	186.46	1.00	1656.03	1016.31	942.74
60	48.88	187.13	1.00	1599.45	991.12	919.37
61	49.81	187.78	1.00	1541.82	965.46	895.57
62	50.74	188.42	1.00	1483.19	939.36	871.36
63	51.67	189.04	1.00	1423.61	912.83	846.75
64	52.60	189.66	1.00	1363.13	885.91	821.77
65	53.53	190.26	1.00	1301.81	858.60	796.45
66	54.46	190.85	1.00	1239.70	830.95	770.80
67	55.38	191.32	0.64	758.88	516.70	479.29
68	55.38	191.60	0.36	416.92	285.80	265.11
69	56.31	191.98	1.00	1099.62	768.58	712.94
70	57.24	192.53	1.00	1020.27	733.25	680.17
71	58.17	193.06	1.00	941.20	698.05	647.52
72	59.10	193.58	1.00	862.48	663.00	615.01
73	60.03	194.09	1.00	784.19	628.15	582.67
74	60.96	194.58	1.00	706.41	593.51	550.55
75	61.89	195.06	1.00	629.21	559.14	518.66
76	62.81	195.53	1.00	552.68	525.07	487.06
77	63.74	195.97	1.00	476.93	491.34	455.77
78	64.67	196.41	1.00	402.03	458.00	424.84
79	65.60	196.83	1.00	328.10	425.08	394.31
80	66.53	197.24	1.00	255.24	392.64	364.22
81	67.46	197.63	1.00	183.57	360.73	334.62
82	68.39	198.00	1.00	113.20	329.40	305.55
83	69.32	198.36	1.00	44.27	298.71	277.09
84	70.24	198.71	1.00	0.00	279.00	258.80
85	71.17	199.04	1.00	0.00	279.00	258.80
86	72.10	199.35	1.00	0.00	279.00	258.80
87	73.03	199.65	1.00	0.00	279.00	258.80
88	73.96	199.94	1.00	0.00	279.00	258.80
89	74.89	200.21	1.00	0.00	279.00	258.80
90	75.82	200.41	0.59	0.00	163.59	151.75

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 35.071
3D Depth (Vertical difference between ends of Slip Surface) = 46.54(ft)
L/D(1): L = 46.54(ft) L/D(2): L = 93.08(ft) L/D(3): L = 139.62(ft)
L/D(4): L = 186.17(ft) L/D(5): L = 232.71(ft) L/D(6): L = 279.25(ft)

SUM OF MOMENTS = 0.143879E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.1356971E-05

Sum of the Resisting Forces = 65272.25 (lbs)

Average Available Shear Strength = 762.65(psf)

Average Effective Normal Stress = 1086.29(psf)

Sum of the Driving Forces = 60547.12 (lbs)

Average Mobilized Shear Stress = 707.44(psf)

Total length of the failure surface = 85.59(ft)

Factor of Safety Balance Check: FS = 1.07804

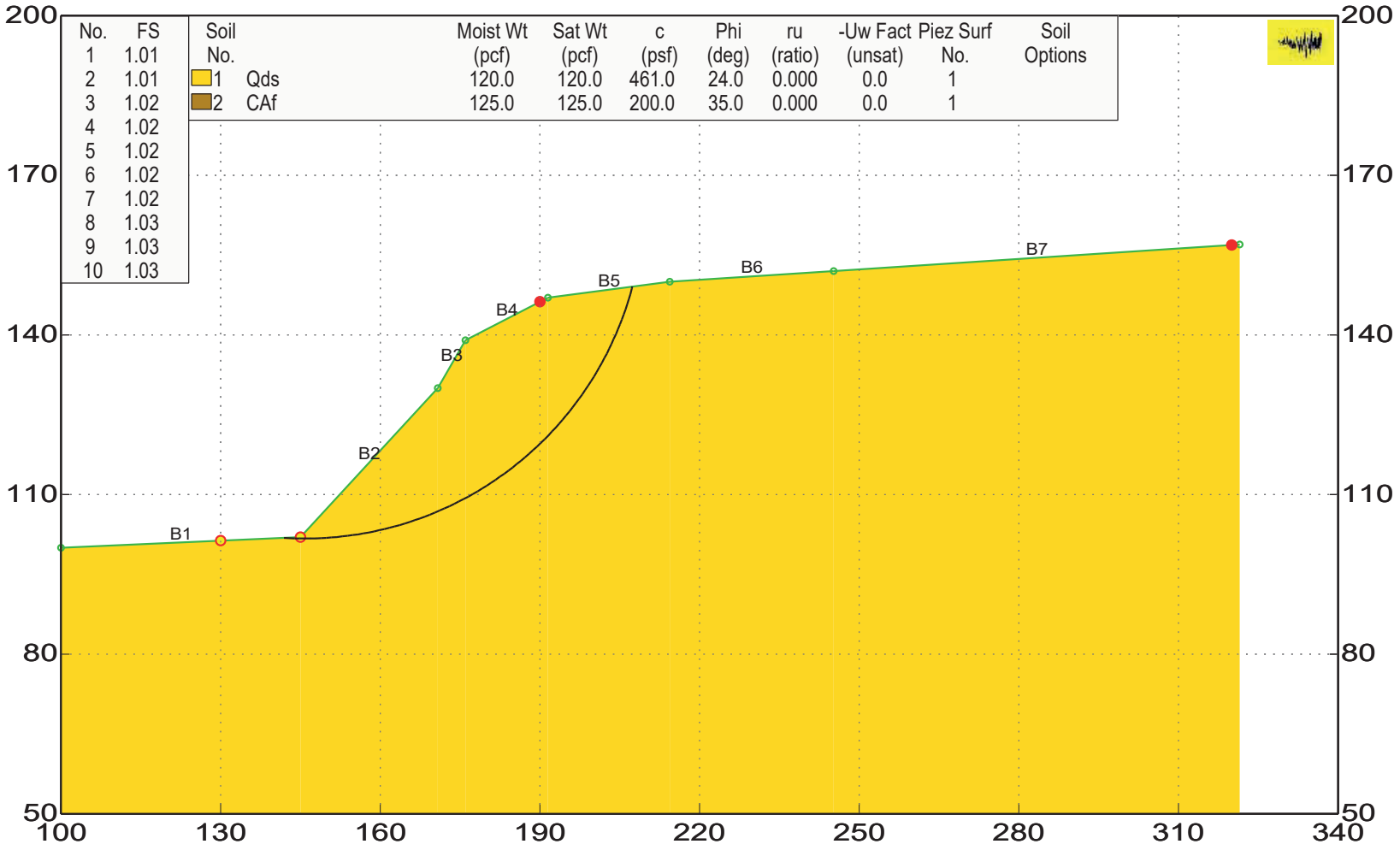
CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section BB - Existing - Seismic

EGL

\BB001s.gsd



No.	FS
1	1.01
2	1.01
3	1.02
4	1.02
5	1.02
6	1.02
7	1.02
8	1.03
9	1.03
10	1.03

Soil No.		Moist Wt (pcf)	Sat Wt (pcf)	c (psf)	Phi (deg)	ru (ratio)	-Uw Fact (unsat)	Piez Surf No.	Soil Options
1	Qds	120.0	120.0	461.0	24.0	0.000	0.0	1	
2	CAf	125.0	125.0	200.0	35.0	0.000	0.0	1	

GEOSTASE FS = 1.01

Simplified Bishop Method

kh = 0.20000

GEOSTASE Slope Stability Analysis

GEOSTASE® v4.30.32 by GREGORY GEOTECHNICAL SOFTWARE

PLATE D.3

*** GEOSTASE(R) ***

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** Current Version 4.30.32-Double Precision, Sept 2023 **
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SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
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Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB001s.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB001s.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section BB - Existing - Seismic

PROFILE BOUNDARY DATA

7 Surface Boundaries
7 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	145.000	102.000	1
2	145.000	102.000	170.800	130.000	1
3	170.800	130.000	176.000	139.000	1
4	176.000	139.000	191.500	147.000	1
5	191.500	147.000	214.400	150.000	1
6	214.400	150.000	245.200	152.000	1
7	245.200	152.000	321.500	157.000	1

User Specified X-Origin = 100.000(ft)

User Specified Y-Origin = 50.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	145.000	102.000
3	170.800	130.000
4	176.000	139.000
5	191.500	147.000
6	214.400	150.000
7	245.200	152.000
8	321.500	157.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)
Point No. X-COORD Y-COORD

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.044	2.545
2	1.085	47.342
3	1.731	59.982
4	0.516	27.300
5	0.131	7.463
6	0.065	3.715
7	0.066	3.749

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	461.00	24.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

SEISMIC (EARTHQUAKE) DATA

Specified Peak Ground Acceleration Coefficient (PGA) = 0.400(g)
Default Velocity = 2.000(ft) per second
Specified Horizontal Earthquake Coefficient (kh) = 0.20000(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
(NOTE:Input Velocity = 0.0 will result in default Peak
Velocity = 2 times(PGA) times 2.5 fps or 0.762 mps)
Specified Seismic Pore-Pressure Factor = 0.000
Horizontal Seismic Force is Applied at Center of Gravity of Slices

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.1802(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 130.00(ft)
and X = 145.00(ft)

Each Surface ends within a Range Between X = 190.00(ft)
and X = 320.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 50.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 2.169 FS Min = 1.009 FS Ave = 1.584
Standard Deviation = 0.313 Coefficient of Variation = 19.73 %

Critical Surface is Sequence Number 792 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 145.864821(ft) ; Y = 165.365207(ft); and Radius = 63.629107(ft)

Circular Trial Failure Surface Generated With 89 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	141.87688	101.86119
2	142.87537	101.80636
3	143.87461	101.76723
4	144.87433	101.74381
5	145.87430	101.73610
6	146.87427	101.74411
7	147.87399	101.76783
8	148.87321	101.80726
9	149.87169	101.86239
10	150.86918	101.93320
11	151.86543	102.01968
12	152.86021	102.12181
13	153.85325	102.23955
14	154.84432	102.37289
15	155.83317	102.52179
16	156.81956	102.68621
17	157.80325	102.86611
18	158.78398	103.06145
19	159.76153	103.27217
20	160.73564	103.49824
21	161.70608	103.73958
22	162.67261	103.99615
23	163.63498	104.26787
24	164.59297	104.55468
25	165.54633	104.85652
26	166.49483	105.17330
27	167.43823	105.50494
28	168.37631	105.85137
29	169.30882	106.21251
30	170.23555	106.58825
31	171.15625	106.97851
32	172.07071	107.38319
33	172.97870	107.80219
34	173.87998	108.23541
35	174.77435	108.68274
36	175.66158	109.14407
37	176.54145	109.61929
38	177.41374	110.10827
39	178.27824	110.61091
40	179.13473	111.12706
41	179.98301	111.65662
42	180.82286	112.19944
43	181.65407	112.75539
44	182.47645	113.32434
45	183.28978	113.90614
46	184.09387	114.50065
47	184.88851	115.10772
48	185.67352	115.72721
49	186.44869	116.35896
50	187.21384	117.00281
51	187.96878	117.65861

52	188.71332	118.32619
53	189.44727	119.00539
54	190.17046	119.69603
55	190.88271	120.39796
56	191.58384	121.11100
57	192.27367	121.83497
58	192.95204	122.56969
59	193.61879	123.31497
60	194.27373	124.07065
61	194.91672	124.83652
62	195.54760	125.61241
63	196.16620	126.39811
64	196.77238	127.19344
65	197.36598	127.99820
66	197.94687	128.81218
67	198.51489	129.63520
68	199.06991	130.46704
69	199.61178	131.30750
70	200.14038	132.15637
71	200.65557	133.01344
72	201.15723	133.87851
73	201.64524	134.75135
74	202.11946	135.63175
75	202.57980	136.51950
76	203.02612	137.41437
77	203.45832	138.31615
78	203.87630	139.22460
79	204.27995	140.13951
80	204.66918	141.06066
81	205.04387	141.98781
82	205.40396	142.92073
83	205.74933	143.85919
84	206.07992	144.80297
85	206.39563	145.75182
86	206.69639	146.70552
87	206.98212	147.66383
88	207.25276	148.62651
89	207.37242	149.07936

Factor Of Safety For The Critical or Specified Surface = 1.009

Table 1 - Geometry Data on the 92 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.05	142.38	101.83	101.88	-3.14	2.54	1.00
2	1.00	0.14	143.37	101.79	101.93	-2.24	2.54	1.00
3	1.00	0.22	144.37	101.76	101.97	-1.34	2.54	1.00
4	0.13	0.25	144.94	101.74	102.00	-0.44	2.54	0.13
5	0.87	0.73	145.44	101.74	102.47	-0.44	47.34	0.87
6	1.00	1.75	146.37	101.74	103.49	0.46	47.34	1.00
7	1.00	2.82	147.37	101.76	104.58	1.36	47.34	1.00
8	1.00	3.87	148.37	101.79	105.66	2.26	47.34	1.00
9	1.00	4.91	149.37	101.83	106.75	3.16	47.34	1.00
10	1.00	5.93	150.37	101.90	107.83	4.06	47.34	1.00
11	1.00	6.93	151.37	101.98	108.91	4.96	47.34	1.00
12	0.99	7.92	152.36	102.07	109.99	5.86	47.34	1.00
13	0.99	8.89	153.36	102.18	111.07	6.76	47.34	1.00
14	0.99	9.84	154.35	102.31	112.15	7.66	47.34	1.00
15	0.99	10.77	155.34	102.45	113.22	8.56	47.34	1.00
16	0.99	11.69	156.33	102.60	114.29	9.46	47.34	1.00
17	0.98	12.59	157.31	102.78	115.36	10.36	47.34	1.00
18	0.98	13.46	158.29	102.96	116.43	11.26	47.34	1.00
19	0.98	14.32	159.27	103.17	117.49	12.16	47.34	1.00
20	0.97	15.16	160.25	103.39	118.55	13.07	47.34	1.00
21	0.97	15.99	161.22	103.62	119.60	13.97	47.34	1.00

22	0.97	16.79	162.19	103.87	120.66	14.87	47.34	1.00
23	0.96	17.57	163.15	104.13	121.70	15.77	47.34	1.00
24	0.96	18.33	164.11	104.41	122.74	16.67	47.34	1.00
25	0.95	19.08	165.07	104.71	123.78	17.57	47.34	1.00
26	0.95	19.80	166.02	105.01	124.81	18.47	47.34	1.00
27	0.94	20.50	166.97	105.34	125.84	19.37	47.34	1.00
28	0.94	21.18	167.91	105.68	126.86	20.27	47.34	1.00
29	0.93	21.84	168.84	106.03	127.88	21.17	47.34	1.00
30	0.93	22.48	169.77	106.40	128.88	22.07	47.34	1.00
31	0.56	22.99	170.52	106.71	129.69	22.97	47.34	0.61
32	0.36	23.41	170.98	106.90	130.31	22.97	59.98	0.39
33	0.91	24.23	171.61	107.18	131.41	23.87	59.98	1.00
34	0.91	25.39	172.52	107.59	132.99	24.77	59.98	1.00
35	0.90	26.53	173.43	108.02	134.55	25.67	59.98	1.00
36	0.89	27.65	174.33	108.46	136.10	26.57	59.98	1.00
37	0.89	28.73	175.22	108.91	137.65	27.47	59.98	1.00
38	0.34	29.47	175.83	109.24	138.71	28.37	59.98	0.38
39	0.54	29.67	176.27	109.47	139.14	28.37	27.30	0.62
40	0.87	29.64	176.98	109.86	139.50	29.27	27.30	1.00
41	0.86	29.59	177.85	110.36	139.95	30.17	27.30	1.00
42	0.86	29.53	178.71	110.87	140.40	31.07	27.30	1.00
43	0.85	29.44	179.56	111.39	140.84	31.98	27.30	1.00
44	0.84	29.34	180.40	111.93	141.27	32.88	27.30	1.00
45	0.83	29.23	181.24	112.48	141.70	33.78	27.30	1.00
46	0.82	29.09	182.07	113.04	142.13	34.68	27.30	1.00
47	0.81	28.94	182.88	113.62	142.55	35.58	27.30	1.00
48	0.80	28.77	183.69	114.20	142.97	36.48	27.30	1.00
49	0.79	28.58	184.49	114.80	143.38	37.38	27.30	1.00
50	0.79	28.37	185.28	115.42	143.79	38.28	27.30	1.00
51	0.78	28.15	186.06	116.04	144.19	39.18	27.30	1.00
52	0.77	27.91	186.83	116.68	144.59	40.08	27.30	1.00
53	0.75	27.65	187.59	117.33	144.98	40.98	27.30	1.00
54	0.74	27.38	188.34	117.99	145.37	41.88	27.30	1.00
55	0.73	27.09	189.08	118.67	145.75	42.78	27.30	1.00
56	0.72	26.78	189.81	119.35	146.13	43.68	27.30	1.00
57	0.71	26.45	190.53	120.05	146.50	44.58	27.30	1.00
58	0.62	26.13	191.19	120.71	146.84	45.48	27.30	0.88
59	0.08	25.94	191.54	121.07	147.01	45.48	7.46	0.12
60	0.69	25.58	191.93	121.47	147.06	46.38	7.46	1.00
61	0.68	24.94	192.61	122.20	147.15	47.28	7.46	1.00
62	0.67	24.29	193.29	122.94	147.23	48.18	7.46	1.00
63	0.65	23.63	193.95	123.69	147.32	49.08	7.46	1.00
64	0.64	22.95	194.60	124.45	147.41	49.98	7.46	1.00
65	0.63	22.26	195.23	125.22	147.49	50.89	7.46	1.00
66	0.62	21.57	195.86	126.01	147.57	51.79	7.46	1.00
67	0.61	20.86	196.47	126.80	147.65	52.69	7.46	1.00
68	0.59	20.13	197.07	127.60	147.73	53.59	7.46	1.00
69	0.58	19.40	197.66	128.41	147.81	54.49	7.46	1.00
70	0.57	18.66	198.23	129.22	147.88	55.39	7.46	1.00
71	0.56	17.90	198.79	130.05	147.96	56.29	7.46	1.00
72	0.54	17.14	199.34	130.89	148.03	57.19	7.46	1.00
73	0.53	16.37	199.88	131.73	148.10	58.09	7.46	1.00
74	0.52	15.58	200.40	132.58	148.17	58.99	7.46	1.00
75	0.50	14.79	200.91	133.45	148.23	59.89	7.46	1.00
76	0.49	13.98	201.40	134.31	148.30	60.79	7.46	1.00
77	0.47	13.17	201.88	135.19	148.36	61.69	7.46	1.00
78	0.46	12.35	202.35	136.08	148.42	62.59	7.46	1.00
79	0.45	11.51	202.80	136.97	148.48	63.49	7.46	1.00
80	0.43	10.67	203.24	137.87	148.54	64.39	7.46	1.00
81	0.42	9.82	203.67	138.77	148.59	65.29	7.46	1.00
82	0.40	8.97	204.08	139.68	148.65	66.19	7.46	1.00
83	0.39	8.10	204.47	140.60	148.70	67.09	7.46	1.00
84	0.37	7.23	204.86	141.52	148.75	67.99	7.46	1.00
85	0.36	6.34	205.22	142.45	148.80	68.89	7.46	1.00
86	0.35	5.45	205.58	143.39	148.84	69.80	7.46	1.00
87	0.33	4.56	205.91	144.33	148.89	70.70	7.46	1.00
88	0.32	3.65	206.24	145.28	148.93	71.60	7.46	1.00
89	0.30	2.74	206.55	146.23	148.97	72.50	7.46	1.00
90	0.29	1.82	206.84	147.18	149.01	73.40	7.46	1.00
91	0.27	0.90	207.12	148.15	149.05	74.30	7.46	1.00
92	0.12	0.22	207.31	148.85	149.07	75.20	7.46	0.47

Table 2 - Force Data On The 92 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	5.9	0.0	0.0	0.0	0.00	0.00	1.2	0.0	0.00
2	16.9	0.0	0.0	0.0	0.00	0.00	3.4	0.0	0.00
3	26.0	0.0	0.0	0.0	0.00	0.00	5.2	0.0	0.00
4	3.8	0.0	0.0	0.0	0.00	0.00	0.8	0.0	0.00
5	77.1	0.0	0.0	0.0	0.00	0.00	15.4	0.0	0.00
6	210.2	0.0	0.0	0.0	0.00	0.00	42.0	0.0	0.00
7	338.4	0.0	0.0	0.0	0.00	0.00	67.7	0.0	0.00
8	464.5	0.0	0.0	0.0	0.00	0.00	92.9	0.0	0.00
9	588.4	0.0	0.0	0.0	0.00	0.00	117.7	0.0	0.00
10	709.9	0.0	0.0	0.0	0.00	0.00	142.0	0.0	0.00
11	828.9	0.0	0.0	0.0	0.00	0.00	165.8	0.0	0.00
12	945.4	0.0	0.0	0.0	0.00	0.00	189.1	0.0	0.00
13	1059.2	0.0	0.0	0.0	0.00	0.00	211.8	0.0	0.00
14	1170.2	0.0	0.0	0.0	0.00	0.00	234.0	0.0	0.00
15	1278.3	0.0	0.0	0.0	0.00	0.00	255.7	0.0	0.00
16	1383.5	0.0	0.0	0.0	0.00	0.00	276.7	0.0	0.00
17	1485.6	0.0	0.0	0.0	0.00	0.00	297.1	0.0	0.00
18	1584.5	0.0	0.0	0.0	0.00	0.00	316.9	0.0	0.00
19	1680.2	0.0	0.0	0.0	0.00	0.00	336.0	0.0	0.00
20	1772.5	0.0	0.0	0.0	0.00	0.00	354.5	0.0	0.00
21	1861.5	0.0	0.0	0.0	0.00	0.00	372.3	0.0	0.00
22	1947.0	0.0	0.0	0.0	0.00	0.00	389.4	0.0	0.00
23	2029.0	0.0	0.0	0.0	0.00	0.00	405.8	0.0	0.00
24	2107.5	0.0	0.0	0.0	0.00	0.00	421.5	0.0	0.00
25	2182.3	0.0	0.0	0.0	0.00	0.00	436.5	0.0	0.00
26	2253.4	0.0	0.0	0.0	0.00	0.00	450.7	0.0	0.00
27	2320.8	0.0	0.0	0.0	0.00	0.00	464.2	0.0	0.00
28	2384.5	0.0	0.0	0.0	0.00	0.00	476.9	0.0	0.00
29	2444.4	0.0	0.0	0.0	0.00	0.00	488.9	0.0	0.00
30	2500.4	0.0	0.0	0.0	0.00	0.00	500.1	0.0	0.00
31	1556.9	0.0	0.0	0.0	0.00	0.00	311.4	0.0	0.00
32	1000.6	0.0	0.0	0.0	0.00	0.00	200.1	0.0	0.00
33	2658.6	0.0	0.0	0.0	0.00	0.00	531.7	0.0	0.00
34	2766.7	0.0	0.0	0.0	0.00	0.00	553.3	0.0	0.00
35	2869.6	0.0	0.0	0.0	0.00	0.00	573.9	0.0	0.00
36	2967.0	0.0	0.0	0.0	0.00	0.00	593.4	0.0	0.00
37	3059.1	0.0	0.0	0.0	0.00	0.00	611.8	0.0	0.00
38	1196.9	0.0	0.0	0.0	0.00	0.00	239.4	0.0	0.00
39	1927.6	0.0	0.0	0.0	0.00	0.00	385.5	0.0	0.00
40	3102.6	0.0	0.0	0.0	0.00	0.00	620.5	0.0	0.00
41	3070.0	0.0	0.0	0.0	0.00	0.00	614.0	0.0	0.00
42	3034.9	0.0	0.0	0.0	0.00	0.00	607.0	0.0	0.00
43	2997.3	0.0	0.0	0.0	0.00	0.00	599.5	0.0	0.00
44	2957.4	0.0	0.0	0.0	0.00	0.00	591.5	0.0	0.00
45	2915.2	0.0	0.0	0.0	0.00	0.00	583.0	0.0	0.00
46	2870.8	0.0	0.0	0.0	0.00	0.00	574.2	0.0	0.00
47	2824.3	0.0	0.0	0.0	0.00	0.00	564.9	0.0	0.00
48	2775.7	0.0	0.0	0.0	0.00	0.00	555.1	0.0	0.00
49	2725.2	0.0	0.0	0.0	0.00	0.00	545.0	0.0	0.00
50	2672.7	0.0	0.0	0.0	0.00	0.00	534.5	0.0	0.00
51	2618.5	0.0	0.0	0.0	0.00	0.00	523.7	0.0	0.00
52	2562.6	0.0	0.0	0.0	0.00	0.00	512.5	0.0	0.00
53	2505.1	0.0	0.0	0.0	0.00	0.00	501.0	0.0	0.00
54	2446.0	0.0	0.0	0.0	0.00	0.00	489.2	0.0	0.00
55	2385.5	0.0	0.0	0.0	0.00	0.00	477.1	0.0	0.00
56	2323.7	0.0	0.0	0.0	0.00	0.00	464.7	0.0	0.00
57	2260.7	0.0	0.0	0.0	0.00	0.00	452.1	0.0	0.00
58	1935.5	0.0	0.0	0.0	0.00	0.00	387.1	0.0	0.00
59	260.9	0.0	0.0	0.0	0.00	0.00	52.2	0.0	0.00
60	2117.8	0.0	0.0	0.0	0.00	0.00	423.6	0.0	0.00
61	2030.5	0.0	0.0	0.0	0.00	0.00	406.1	0.0	0.00
62	1943.5	0.0	0.0	0.0	0.00	0.00	388.7	0.0	0.00
63	1857.0	0.0	0.0	0.0	0.00	0.00	371.4	0.0	0.00
64	1770.9	0.0	0.0	0.0	0.00	0.00	354.2	0.0	0.00

65	1685.5	0.0	0.0	0.0	0.00	0.00	337.1	0.0	0.00
66	1600.9	0.0	0.0	0.0	0.00	0.00	320.2	0.0	0.00
67	1517.0	0.0	0.0	0.0	0.00	0.00	303.4	0.0	0.00
68	1434.2	0.0	0.0	0.0	0.00	0.00	286.8	0.0	0.00
69	1352.4	0.0	0.0	0.0	0.00	0.00	270.5	0.0	0.00
70	1271.8	0.0	0.0	0.0	0.00	0.00	254.4	0.0	0.00
71	1192.5	0.0	0.0	0.0	0.00	0.00	238.5	0.0	0.00
72	1114.5	0.0	0.0	0.0	0.00	0.00	222.9	0.0	0.00
73	1038.1	0.0	0.0	0.0	0.00	0.00	207.6	0.0	0.00
74	963.3	0.0	0.0	0.0	0.00	0.00	192.7	0.0	0.00
75	890.1	0.0	0.0	0.0	0.00	0.00	178.0	0.0	0.00
76	818.8	0.0	0.0	0.0	0.00	0.00	163.8	0.0	0.00
77	749.4	0.0	0.0	0.0	0.00	0.00	149.9	0.0	0.00
78	682.0	0.0	0.0	0.0	0.00	0.00	136.4	0.0	0.00
79	616.7	0.0	0.0	0.0	0.00	0.00	123.3	0.0	0.00
80	553.6	0.0	0.0	0.0	0.00	0.00	110.7	0.0	0.00
81	492.7	0.0	0.0	0.0	0.00	0.00	98.5	0.0	0.00
82	434.3	0.0	0.0	0.0	0.00	0.00	86.9	0.0	0.00
83	378.3	0.0	0.0	0.0	0.00	0.00	75.7	0.0	0.00
84	324.9	0.0	0.0	0.0	0.00	0.00	65.0	0.0	0.00
85	274.1	0.0	0.0	0.0	0.00	0.00	54.8	0.0	0.00
86	226.0	0.0	0.0	0.0	0.00	0.00	45.2	0.0	0.00
87	180.8	0.0	0.0	0.0	0.00	0.00	36.2	0.0	0.00
88	138.4	0.0	0.0	0.0	0.00	0.00	27.7	0.0	0.00
89	99.0	0.0	0.0	0.0	0.00	0.00	19.8	0.0	0.00
90	62.6	0.0	0.0	0.0	0.00	0.00	12.5	0.0	0.00
91	29.3	0.0	0.0	0.0	0.00	0.00	5.9	0.0	0.00
92	3.1	0.0	0.0	0.0	0.00	0.00	0.6	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 138751.74(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 138751.74(lbs)

TOTAL AREA OF SLIDING MASS = 1156.26(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 92 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	461.00	24.00	
2	1	461.00	24.00	
3	1	461.00	24.00	
4	1	461.00	24.00	
5	1	461.00	24.00	
6	1	461.00	24.00	
7	1	461.00	24.00	
8	1	461.00	24.00	
9	1	461.00	24.00	
10	1	461.00	24.00	
11	1	461.00	24.00	
12	1	461.00	24.00	
13	1	461.00	24.00	
14	1	461.00	24.00	
15	1	461.00	24.00	
16	1	461.00	24.00	
17	1	461.00	24.00	
18	1	461.00	24.00	
19	1	461.00	24.00	
20	1	461.00	24.00	
21	1	461.00	24.00	
22	1	461.00	24.00	
23	1	461.00	24.00	
24	1	461.00	24.00	
25	1	461.00	24.00	
26	1	461.00	24.00	
27	1	461.00	24.00	
28	1	461.00	24.00	
29	1	461.00	24.00	
30	1	461.00	24.00	
31	1	461.00	24.00	

32	1	461.00	24.00
33	1	461.00	24.00
34	1	461.00	24.00
35	1	461.00	24.00
36	1	461.00	24.00
37	1	461.00	24.00
38	1	461.00	24.00
39	1	461.00	24.00
40	1	461.00	24.00
41	1	461.00	24.00
42	1	461.00	24.00
43	1	461.00	24.00
44	1	461.00	24.00
45	1	461.00	24.00
46	1	461.00	24.00
47	1	461.00	24.00
48	1	461.00	24.00
49	1	461.00	24.00
50	1	461.00	24.00
51	1	461.00	24.00
52	1	461.00	24.00
53	1	461.00	24.00
54	1	461.00	24.00
55	1	461.00	24.00
56	1	461.00	24.00
57	1	461.00	24.00
58	1	461.00	24.00
59	1	461.00	24.00
60	1	461.00	24.00
61	1	461.00	24.00
62	1	461.00	24.00
63	1	461.00	24.00
64	1	461.00	24.00
65	1	461.00	24.00
66	1	461.00	24.00
67	1	461.00	24.00
68	1	461.00	24.00
69	1	461.00	24.00
70	1	461.00	24.00
71	1	461.00	24.00
72	1	461.00	24.00
73	1	461.00	24.00
74	1	461.00	24.00
75	1	461.00	24.00
76	1	461.00	24.00
77	1	461.00	24.00
78	1	461.00	24.00
79	1	461.00	24.00
80	1	461.00	24.00
81	1	461.00	24.00
82	1	461.00	24.00
83	1	461.00	24.00
84	1	461.00	24.00
85	1	461.00	24.00
86	1	461.00	24.00
87	1	461.00	24.00
88	1	461.00	24.00
89	1	461.00	24.00
90	1	461.00	24.00
91	1	461.00	24.00
92	1	461.00	24.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 92 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-3.14	142.38	1.00	33.16	475.77	471.57
2	-2.24	143.37	1.00	36.38	477.20	472.99
3	-1.34	144.37	1.00	37.66	477.77	473.55
4	-0.44	144.94	0.13	34.29	476.27	472.06
5	-0.44	145.44	0.87	92.23	502.06	497.63
6	0.46	146.37	1.00	205.56	552.52	547.64
7	1.36	147.37	1.00	323.52	605.04	599.70
8	2.26	148.37	1.00	437.89	655.96	650.17
9	3.16	149.37	1.00	548.70	705.30	699.07
10	4.06	150.37	1.00	655.99	753.06	746.42
11	4.96	151.37	1.00	759.79	799.28	792.23
12	5.86	152.36	1.00	860.14	843.96	836.51
13	6.76	153.36	1.00	957.08	887.12	879.29
14	7.66	154.35	1.00	1050.62	928.76	920.57
15	8.56	155.34	1.00	1140.80	968.92	960.37
16	9.46	156.33	1.00	1227.65	1007.58	998.69
17	10.36	157.31	1.00	1311.19	1044.78	1035.56
18	11.26	158.29	1.00	1391.45	1080.51	1070.98
19	12.16	159.27	1.00	1468.45	1114.80	1104.96
20	13.07	160.25	1.00	1542.23	1147.64	1137.52
21	13.97	161.22	1.00	1612.79	1179.06	1168.66
22	14.87	162.19	1.00	1680.18	1209.06	1198.39
23	15.77	163.15	1.00	1744.40	1237.65	1226.73
24	16.67	164.11	1.00	1805.47	1264.85	1253.69
25	17.57	165.07	1.00	1863.44	1290.66	1279.27
26	18.47	166.02	1.00	1918.30	1315.08	1303.48
27	19.37	166.97	1.00	1970.09	1338.14	1326.33
28	20.27	167.91	1.00	2018.82	1359.84	1347.84
29	21.17	168.84	1.00	2064.52	1380.18	1368.00
30	22.07	169.77	1.00	2107.21	1399.19	1386.84
31	22.97	170.52	0.61	2135.08	1411.60	1399.14
32	22.97	170.98	0.39	2177.15	1430.33	1417.71
33	23.87	171.61	1.00	2235.90	1456.49	1443.63
34	24.77	172.52	1.00	2327.43	1497.24	1484.03
35	25.67	173.43	1.00	2414.77	1536.12	1522.57
36	26.57	174.33	1.00	2497.93	1573.15	1559.27
37	27.47	175.22	1.00	2576.92	1608.32	1594.13
38	28.37	175.83	0.38	2620.83	1627.87	1613.50
39	28.37	176.27	0.62	2639.54	1636.20	1621.76
40	29.27	176.98	1.00	2609.38	1622.77	1608.45
41	30.17	177.85	1.00	2577.13	1608.41	1594.22
42	31.07	178.71	1.00	2543.22	1593.32	1579.25
43	31.98	179.56	1.00	2507.67	1577.49	1563.56
44	32.88	180.40	1.00	2470.50	1560.94	1547.16
45	33.78	181.24	1.00	2431.74	1543.68	1530.06
46	34.68	182.07	1.00	2391.42	1525.73	1512.27
47	35.58	182.88	1.00	2349.58	1507.10	1493.80
48	36.48	183.69	1.00	2306.23	1487.80	1474.67
49	37.38	184.49	1.00	2261.41	1467.84	1454.89
50	38.28	185.28	1.00	2215.14	1447.25	1434.47
51	39.18	186.06	1.00	2167.47	1426.02	1413.44
52	40.08	186.83	1.00	2118.42	1404.18	1391.79
53	40.98	187.59	1.00	2068.02	1381.74	1369.55
54	41.88	188.34	1.00	2016.32	1358.72	1346.73
55	42.78	189.08	1.00	1963.33	1335.13	1323.35
56	43.68	189.81	1.00	1909.11	1310.99	1299.42
57	44.58	190.53	1.00	1853.68	1286.31	1274.96
58	45.48	191.19	0.88	1798.79	1261.87	1250.74
59	45.48	191.54	0.12	1783.16	1254.91	1243.84
60	46.38	191.93	1.00	1726.02	1229.47	1218.62
61	47.28	192.61	1.00	1646.29	1193.98	1183.44
62	48.18	193.29	1.00	1566.31	1158.37	1148.14

63	49.08	193.95	1.00	1486.13	1122.67	1112.76
64	49.98	194.60	1.00	1405.78	1086.89	1077.30
65	50.89	195.23	1.00	1325.32	1051.07	1041.79
66	51.79	195.86	1.00	1244.79	1015.22	1006.26
67	52.69	196.47	1.00	1164.24	979.35	970.71
68	53.59	197.07	1.00	1083.73	943.51	935.18
69	54.49	197.66	1.00	1003.31	907.70	899.69
70	55.39	198.23	1.00	923.03	871.96	864.27
71	56.29	198.79	1.00	842.95	836.31	828.93
72	57.19	199.34	1.00	763.13	800.77	793.70
73	58.09	199.88	1.00	683.63	765.37	758.62
74	58.99	200.40	1.00	604.51	730.15	723.70
75	59.89	200.91	1.00	525.84	695.12	688.99
76	60.79	201.40	1.00	447.69	660.33	654.50
77	61.69	201.88	1.00	370.13	625.79	620.27
78	62.59	202.35	1.00	293.23	591.56	586.34
79	63.49	202.80	1.00	217.08	557.65	552.73
80	64.39	203.24	1.00	141.75	524.11	519.49
81	65.29	203.67	1.00	67.34	490.98	486.65
82	66.19	204.08	1.00	0.00	461.00	456.93
83	67.09	204.47	1.00	0.00	461.00	456.93
84	67.99	204.86	1.00	0.00	461.00	456.93
85	68.89	205.22	1.00	0.00	461.00	456.93
86	69.80	205.58	1.00	0.00	461.00	456.93
87	70.70	205.91	1.00	0.00	461.00	456.93
88	71.60	206.24	1.00	0.00	461.00	456.93
89	72.50	206.55	1.00	0.00	461.00	456.93
90	73.40	206.84	1.00	0.00	461.00	456.93
91	74.30	207.12	1.00	0.00	461.00	456.93
92	75.20	207.31	0.47	0.00	461.00	456.93

Table 4A - Base Force Data on the 92 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-3.14	142.38	1.00	33.16	475.77	471.57
2	-2.24	143.37	1.00	36.38	477.20	472.99
3	-1.34	144.37	1.00	37.66	477.77	473.55
4	-0.44	144.94	0.13	4.31	59.85	59.32
5	-0.44	145.44	0.87	80.64	438.97	435.09
6	0.46	146.37	1.00	205.56	552.52	547.64
7	1.36	147.37	1.00	323.52	605.04	599.70
8	2.26	148.37	1.00	437.89	655.96	650.17
9	3.16	149.37	1.00	548.70	705.30	699.07
10	4.06	150.37	1.00	655.99	753.06	746.42
11	4.96	151.37	1.00	759.79	799.28	792.23
12	5.86	152.36	1.00	860.14	843.96	836.51
13	6.76	153.36	1.00	957.08	887.12	879.29
14	7.66	154.35	1.00	1050.62	928.76	920.57
15	8.56	155.34	1.00	1140.80	968.92	960.37
16	9.46	156.33	1.00	1227.65	1007.58	998.69
17	10.36	157.31	1.00	1311.19	1044.78	1035.56
18	11.26	158.29	1.00	1391.45	1080.51	1070.98
19	12.16	159.27	1.00	1468.45	1114.80	1104.96
20	13.07	160.25	1.00	1542.23	1147.64	1137.52
21	13.97	161.22	1.00	1612.79	1179.06	1168.66
22	14.87	162.19	1.00	1680.18	1209.06	1198.39
23	15.77	163.15	1.00	1744.40	1237.65	1226.73
24	16.67	164.11	1.00	1805.47	1264.85	1253.69
25	17.57	165.07	1.00	1863.44	1290.66	1279.27
26	18.47	166.02	1.00	1918.30	1315.08	1303.48
27	19.37	166.97	1.00	1970.09	1338.14	1326.33
28	20.27	167.91	1.00	2018.82	1359.84	1347.84
29	21.17	168.84	1.00	2064.52	1380.18	1368.00
30	22.07	169.77	1.00	2107.21	1399.19	1386.84
31	22.97	170.52	0.61	1308.95	865.40	857.77
32	22.97	170.98	0.39	842.41	553.44	548.56

33	23.87	171.61	1.00	2235.90	1456.49	1443.63
34	24.77	172.52	1.00	2327.43	1497.24	1484.03
35	25.67	173.43	1.00	2414.77	1536.12	1522.57
36	26.57	174.33	1.00	2497.93	1573.15	1559.27
37	27.47	175.22	1.00	2576.92	1608.32	1594.13
38	28.37	175.83	0.38	1008.03	626.12	620.59
39	28.37	176.27	0.62	1624.31	1006.88	997.99
40	29.27	176.98	1.00	2609.38	1622.77	1608.45
41	30.17	177.85	1.00	2577.13	1608.41	1594.22
42	31.07	178.71	1.00	2543.22	1593.32	1579.25
43	31.98	179.56	1.00	2507.67	1577.49	1563.56
44	32.88	180.40	1.00	2470.50	1560.94	1547.16
45	33.78	181.24	1.00	2431.74	1543.68	1530.06
46	34.68	182.07	1.00	2391.42	1525.73	1512.27
47	35.58	182.88	1.00	2349.58	1507.10	1493.80
48	36.48	183.69	1.00	2306.23	1487.80	1474.67
49	37.38	184.49	1.00	2261.41	1467.84	1454.89
50	38.28	185.28	1.00	2215.14	1447.25	1434.47
51	39.18	186.06	1.00	2167.47	1426.02	1413.44
52	40.08	186.83	1.00	2118.42	1404.18	1391.79
53	40.98	187.59	1.00	2068.02	1381.74	1369.55
54	41.88	188.34	1.00	2016.32	1358.72	1346.73
55	42.78	189.08	1.00	1963.33	1335.13	1323.35
56	43.68	189.81	1.00	1909.11	1310.99	1299.42
57	44.58	190.53	1.00	1853.68	1286.31	1274.96
58	45.48	191.19	0.88	1583.70	1110.98	1101.18
59	45.48	191.54	0.12	213.22	150.06	148.73
60	46.38	191.93	1.00	1726.02	1229.47	1218.62
61	47.28	192.61	1.00	1646.29	1193.98	1183.44
62	48.18	193.29	1.00	1566.31	1158.37	1148.14
63	49.08	193.95	1.00	1486.13	1122.67	1112.76
64	49.98	194.60	1.00	1405.78	1086.89	1077.30
65	50.89	195.23	1.00	1325.32	1051.07	1041.79
66	51.79	195.86	1.00	1244.79	1015.22	1006.26
67	52.69	196.47	1.00	1164.24	979.35	970.71
68	53.59	197.07	1.00	1083.73	943.51	935.18
69	54.49	197.66	1.00	1003.31	907.70	899.69
70	55.39	198.23	1.00	923.03	871.96	864.27
71	56.29	198.79	1.00	842.95	836.31	828.93
72	57.19	199.34	1.00	763.13	800.77	793.70
73	58.09	199.88	1.00	683.63	765.37	758.62
74	58.99	200.40	1.00	604.51	730.15	723.70
75	59.89	200.91	1.00	525.84	695.12	688.99
76	60.79	201.40	1.00	447.69	660.33	654.50
77	61.69	201.88	1.00	370.13	625.79	620.27
78	62.59	202.35	1.00	293.23	591.56	586.34
79	63.49	202.80	1.00	217.08	557.65	552.73
80	64.39	203.24	1.00	141.75	524.11	519.49
81	65.29	203.67	1.00	67.34	490.98	486.65
82	66.19	204.08	1.00	0.00	461.00	456.93
83	67.09	204.47	1.00	0.00	461.00	456.93
84	67.99	204.86	1.00	0.00	461.00	456.93
85	68.89	205.22	1.00	0.00	461.00	456.93
86	69.80	205.58	1.00	0.00	461.00	456.93
87	70.70	205.91	1.00	0.00	461.00	456.93
88	71.60	206.24	1.00	0.00	461.00	456.93
89	72.50	206.55	1.00	0.00	461.00	456.93
90	73.40	206.84	1.00	0.00	461.00	456.93
91	74.30	207.12	1.00	0.00	461.00	456.93
92	75.20	207.31	0.47	0.00	215.93	214.02

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 38.867
3D Depth (Vertical difference between ends of Slip Surface) = 47.22(ft)
L/D(1): L = 47.22(ft) L/D(2): L = 94.44(ft) L/D(3): L = 141.65(ft)
L/D(4): L = 188.87(ft) L/D(5): L = 236.09(ft) L/D(6): L = 283.31(ft)

SUM OF MOMENTS = 0.237159E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.1709236E-05

Sum of the Resisting Forces = 90092.36 (lbs)

Average Available Shear Strength = 1030.00(psf)

Average Effective Normal Stress = 1277.99(psf)

Sum of the Driving Forces = 89297.32 (lbs)

Average Mobilized Shear Stress = 1020.91(psf)

Total length of the failure surface = 87.47(ft)

Factor of Safety Balance Check: FS = 1.00890

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

*** SEISMIC SLOPE DISPLACEMENT DATA ***
(Note: kv is set = zero for displacement calculations)
Seismic Yield Coefficient (ky) = 0.17151(g)
Calculated Newmark Seismic Displacement = 0.845(ft)

Average Elevation of Point of Application of kh on Sliding Mass = 126.115(ft)

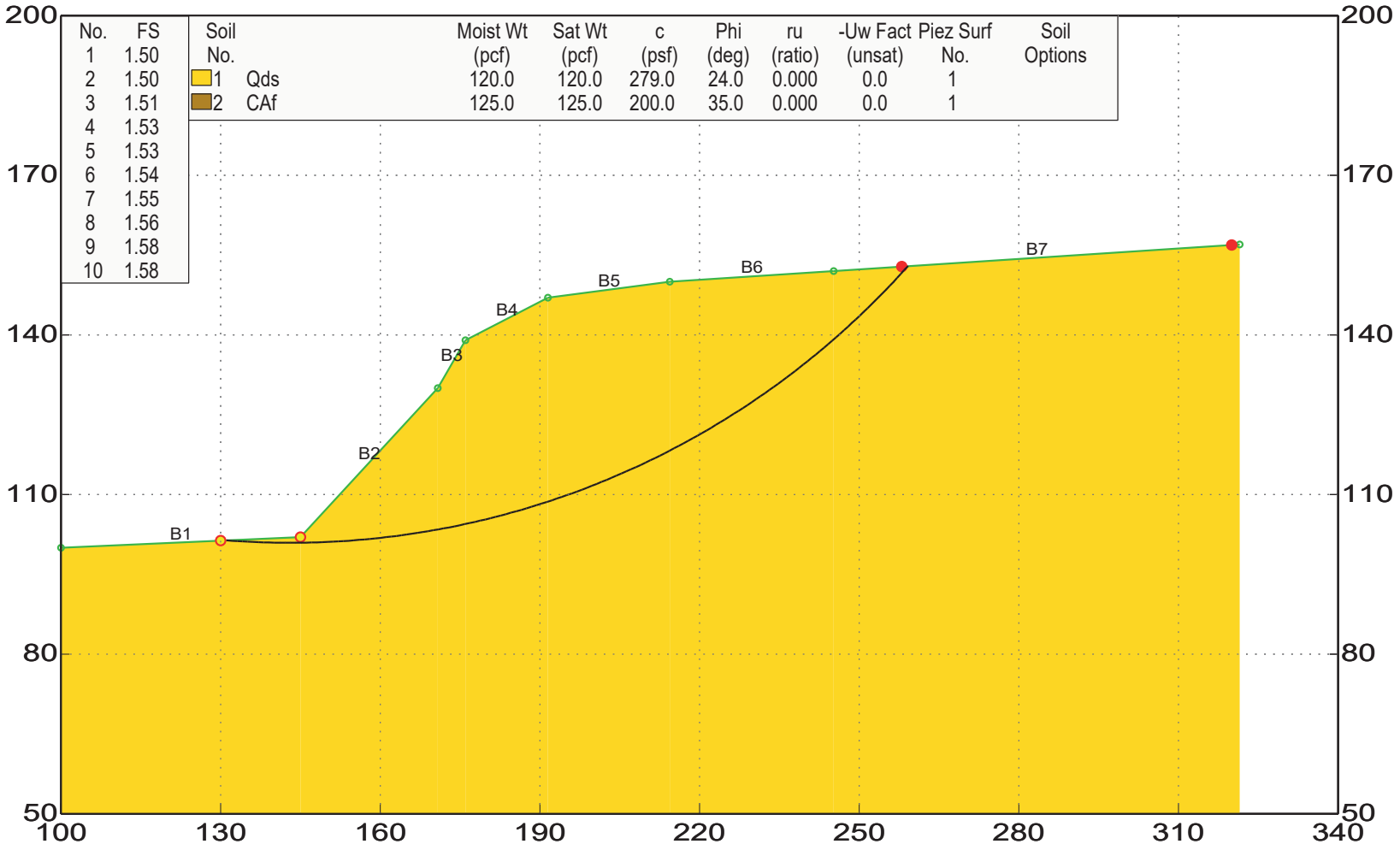
Non-Symmetrical Sliding Resistance Has Been Specified
for Downhill Sliding.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section BB - Existing - Static FS 1.5

EGL

\BB002.gsd



GEOSTASE FS = 1.50

Simplified Bishop Method

GEOSTASE Slope Stability Analysis

PLATE D.3

*** GEOSTASE(R) ***

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** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB002.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB002.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section BB - Existing - Static FS 1.5

PROFILE BOUNDARY DATA

7 Surface Boundaries
7 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	145.000	102.000	1
2	145.000	102.000	170.800	130.000	1
3	170.800	130.000	176.000	139.000	1
4	176.000	139.000	191.500	147.000	1
5	191.500	147.000	214.400	150.000	1
6	214.400	150.000	245.200	152.000	1
7	245.200	152.000	321.500	157.000	1

User Specified X-Origin = 100.000(ft)

User Specified Y-Origin = 50.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	145.000	102.000
3	170.800	130.000
4	176.000	139.000
5	191.500	147.000
6	214.400	150.000
7	245.200	152.000
8	321.500	157.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)
Point No. X-COORD Y-COORD

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.044	2.545
2	1.085	47.342
3	1.731	59.982
4	0.516	27.300
5	0.131	7.463
6	0.065	3.715
7	0.066	3.749

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

	Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1	Qds	120.0	120.0	279.00	24.00	0.000	0.0	1	0
2	CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.1802(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 130.00(ft)
and X = 145.00(ft)

Each Surface ends within a Range Between X = 258.00(ft)
and X = 320.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 50.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 3.739 FS Min = 1.501 FS Ave = 2.510
Standard Deviation = 0.504 Coefficient of Variation = 20.09 %

Critical Surface is Sequence Number 74 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 143.017057(ft) ; Y = 256.600653(ft); and Radius = 155.675702(ft)

Circular Trial Failure Surface Generated With144 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	131.09610	101.38205
2	132.09340	101.30868
3	133.09116	101.24171
4	134.08932	101.18116
5	135.08785	101.12701
6	136.08671	101.07929
7	137.08586	101.03798
8	138.08525	101.00309
9	139.08485	100.97462
10	140.08460	100.95257
11	141.08448	100.93695
12	142.08444	100.92774
13	143.08444	100.92496
14	144.08443	100.92861
15	145.08438	100.93868
16	146.08424	100.95517
17	147.08398	100.97808
18	148.08355	101.00742
19	149.08291	101.04317
20	150.08202	101.08535
21	151.08084	101.13394
22	152.07932	101.18894
23	153.07744	101.25036
24	154.07513	101.31819
25	155.07237	101.39243
26	156.06912	101.47307
27	157.06532	101.56011
28	158.06095	101.65355
29	159.05595	101.75338
30	160.05029	101.85960
31	161.04393	101.97221
32	162.03683	102.09119
33	163.02894	102.21656
34	164.02023	102.34829
35	165.01064	102.48639
36	166.00016	102.63085
37	166.98872	102.78166
38	167.97629	102.93881
39	168.96284	103.10231
40	169.94831	103.27214
41	170.93267	103.44830
42	171.91588	103.63078
43	172.89790	103.81957
44	173.87868	104.01466
45	174.85819	104.21605
46	175.83639	104.42373
47	176.81323	104.63769
48	177.78868	104.85792
49	178.76270	105.08440
50	179.73524	105.31714
51	180.70626	105.55613
52	181.67573	105.80134
53	182.64360	106.05278
54	183.60984	106.31043
55	184.57440	106.57428
56	185.53725	106.84433
57	186.49834	107.12055
58	187.45764	107.40294
59	188.41511	107.69148
60	189.37070	107.98617
61	190.32438	108.28699
62	191.27611	108.59394

63	192.22585	108.90699
64	193.17356	109.22613
65	194.11919	109.55135
66	195.06272	109.88265
67	196.00410	110.21999
68	196.94330	110.56338
69	197.88026	110.91279
70	198.81497	111.26822
71	199.74737	111.62964
72	200.67743	111.99704
73	201.60512	112.37041
74	202.53038	112.74973
75	203.45319	113.13498
76	204.37351	113.52616
77	205.29129	113.92324
78	206.20651	114.32621
79	207.11911	114.73505
80	208.02908	115.14974
81	208.93636	115.57026
82	209.84092	115.99661
83	210.74272	116.42876
84	211.64172	116.86669
85	212.53790	117.31039
86	213.43121	117.75984
87	214.32161	118.21501
88	215.20907	118.67590
89	216.09355	119.14248
90	216.97502	119.61472
91	217.85343	120.09263
92	218.72876	120.57616
93	219.60096	121.06531
94	220.47000	121.56004
95	221.33585	122.06035
96	222.19846	122.56622
97	223.05781	123.07761
98	223.91385	123.59451
99	224.76656	124.11690
100	225.61589	124.64476
101	226.46181	125.17806
102	227.30430	125.71679
103	228.14330	126.26092
104	228.97879	126.81042
105	229.81073	127.36528
106	230.63910	127.92547
107	231.46384	128.49097
108	232.28494	129.06176
109	233.10236	129.63781
110	233.91605	130.21910
111	234.72600	130.80560
112	235.53216	131.39730
113	236.33451	131.99416
114	237.13300	132.59616
115	237.92761	133.20328
116	238.71830	133.81549
117	239.50505	134.43277
118	240.28781	135.05509
119	241.06656	135.68242
120	241.84127	136.31475
121	242.61190	136.95203
122	243.37841	137.59426
123	244.14079	138.24139
124	244.89899	138.89341
125	245.65299	139.55028
126	246.40276	140.21199
127	247.14826	140.87850
128	247.88946	141.54978
129	248.62633	142.22581
130	249.35885	142.90656
131	250.08698	143.59200
132	250.81069	144.28210
133	251.52995	144.97684
134	252.24474	145.67618

135	252.95502	146.38010
136	253.66076	147.08857
137	254.36193	147.80156
138	255.05852	148.51904
139	255.75047	149.24097
140	256.43778	149.96734
141	257.12041	150.69811
142	257.79833	151.43324
143	258.47151	152.17272
144	259.13706	152.91331

Factor Of Safety For The Critical or Specified Surface = 1.501

Table 1 - Geometry Data on the 149 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.06	131.59	101.35	101.40	-4.21	2.54	1.00
2	1.00	0.17	132.59	101.28	101.45	-3.84	2.54	1.00
3	1.00	0.28	133.59	101.21	101.49	-3.47	2.54	1.00
4	1.00	0.38	134.59	101.15	101.54	-3.10	2.54	1.00
5	1.00	0.48	135.59	101.10	101.58	-2.74	2.54	1.00
6	1.00	0.57	136.59	101.06	101.63	-2.37	2.54	1.00
7	1.00	0.65	137.59	101.02	101.67	-2.00	2.54	1.00
8	1.00	0.73	138.59	100.99	101.71	-1.63	2.54	1.00
9	1.00	0.80	139.58	100.96	101.76	-1.26	2.54	1.00
10	1.00	0.86	140.58	100.94	101.80	-0.90	2.54	1.00
11	1.00	0.92	141.58	100.93	101.85	-0.53	2.54	1.00
12	1.00	0.97	142.58	100.93	101.89	-0.16	2.54	1.00
13	1.00	1.01	143.58	100.93	101.94	0.21	2.54	1.00
14	0.92	1.05	144.54	100.93	101.98	0.58	2.54	0.92
15	0.08	1.11	145.04	100.94	102.05	0.58	47.34	0.08
16	1.00	1.69	145.58	100.95	102.63	0.94	47.34	1.00
17	1.00	2.75	146.58	100.97	103.72	1.31	47.34	1.00
18	1.00	3.81	147.58	100.99	104.80	1.68	47.34	1.00
19	1.00	4.86	148.58	101.03	105.89	2.05	47.34	1.00
20	1.00	5.91	149.58	101.06	106.97	2.42	47.34	1.00
21	1.00	6.95	150.58	101.11	108.06	2.79	47.34	1.00
22	1.00	7.98	151.58	101.16	109.14	3.15	47.34	1.00
23	1.00	9.00	152.58	101.22	110.22	3.52	47.34	1.00
24	1.00	10.02	153.58	101.28	111.31	3.89	47.34	1.00
25	1.00	11.03	154.57	101.36	112.39	4.26	47.34	1.00
26	1.00	12.04	155.57	101.43	113.47	4.63	47.34	1.00
27	1.00	13.04	156.57	101.52	114.55	4.99	47.34	1.00
28	1.00	14.03	157.56	101.61	115.63	5.36	47.34	1.00
29	1.00	15.01	158.56	101.70	116.71	5.73	47.34	1.00
30	0.99	15.99	159.55	101.81	117.79	6.10	47.34	1.00
31	0.99	16.96	160.55	101.92	118.87	6.47	47.34	1.00
32	0.99	17.92	161.54	102.03	119.95	6.83	47.34	1.00
33	0.99	18.87	162.53	102.15	121.03	7.20	47.34	1.00
34	0.99	19.82	163.52	102.28	122.10	7.57	47.34	1.00
35	0.99	20.76	164.52	102.42	123.18	7.94	47.34	1.00
36	0.99	21.70	165.51	102.56	124.25	8.31	47.34	1.00
37	0.99	22.62	166.49	102.71	125.33	8.67	47.34	1.00
38	0.99	23.54	167.48	102.86	126.40	9.04	47.34	1.00
39	0.99	24.45	168.47	103.02	127.47	9.41	47.34	1.00
40	0.99	25.35	169.46	103.19	128.54	9.78	47.34	1.00
41	0.85	26.19	170.37	103.35	129.54	10.15	47.34	0.87
42	0.13	26.68	170.87	103.44	130.11	10.15	59.98	0.13
43	0.98	27.54	171.42	103.54	131.08	10.51	59.98	1.00
44	0.98	29.06	172.41	103.73	132.78	10.88	59.98	1.00
45	0.98	30.56	173.39	103.92	134.48	11.25	59.98	1.00
46	0.98	32.06	174.37	104.12	136.18	11.62	59.98	1.00
47	0.98	33.55	175.35	104.32	137.87	11.99	59.98	1.00
48	0.16	34.42	175.92	104.44	138.86	12.35	59.98	0.17
49	0.81	34.66	176.41	104.55	139.21	12.35	27.30	0.83

50	0.98	34.92	177.30	104.75	139.67	12.72	27.30	1.00
51	0.97	35.20	178.28	104.97	140.17	13.09	27.30	1.00
52	0.97	35.48	179.25	105.20	140.68	13.46	27.30	1.00
53	0.97	35.74	180.22	105.44	141.18	13.83	27.30	1.00
54	0.97	36.00	181.19	105.68	141.68	14.19	27.30	1.00
55	0.97	36.25	182.16	105.93	142.18	14.56	27.30	1.00
56	0.97	36.50	183.13	106.18	142.68	14.93	27.30	1.00
57	0.96	36.73	184.09	106.44	143.18	15.30	27.30	1.00
58	0.96	36.96	185.06	106.71	143.67	15.67	27.30	1.00
59	0.96	37.19	186.02	106.98	144.17	16.03	27.30	1.00
60	0.96	37.40	186.98	107.26	144.67	16.40	27.30	1.00
61	0.96	37.61	187.94	107.55	145.16	16.77	27.30	1.00
62	0.96	37.82	188.89	107.84	145.65	17.14	27.30	1.00
63	0.95	38.01	189.85	108.14	146.15	17.51	27.30	1.00
64	0.95	38.20	190.80	108.44	146.64	17.88	27.30	1.00
65	0.22	38.31	191.39	108.63	146.94	18.24	27.30	0.24
66	0.73	38.26	191.86	108.79	147.05	18.24	7.46	0.76
67	0.95	38.09	192.70	109.07	147.16	18.61	7.46	1.00
68	0.95	37.89	193.65	109.39	147.28	18.98	7.46	1.00
69	0.94	37.69	194.59	109.72	147.40	19.35	7.46	1.00
70	0.94	37.48	195.53	110.05	147.53	19.72	7.46	1.00
71	0.94	37.26	196.47	110.39	147.65	20.08	7.46	1.00
72	0.94	37.04	197.41	110.74	147.77	20.45	7.46	1.00
73	0.93	36.81	198.35	111.09	147.90	20.82	7.46	1.00
74	0.93	36.57	199.28	111.45	148.02	21.19	7.46	1.00
75	0.93	36.33	200.21	111.81	148.14	21.56	7.46	1.00
76	0.93	36.08	201.14	112.18	148.26	21.92	7.46	1.00
77	0.93	35.82	202.07	112.56	148.38	22.29	7.46	1.00
78	0.92	35.56	202.99	112.94	148.51	22.66	7.46	1.00
79	0.92	35.30	203.91	113.33	148.63	23.03	7.46	1.00
80	0.92	35.02	204.83	113.72	148.75	23.40	7.46	1.00
81	0.92	34.74	205.75	114.12	148.87	23.76	7.46	1.00
82	0.91	34.46	206.66	114.53	148.99	24.13	7.46	1.00
83	0.91	34.16	207.57	114.94	149.11	24.50	7.46	1.00
84	0.91	33.86	208.48	115.36	149.22	24.87	7.46	1.00
85	0.90	33.56	209.39	115.78	149.34	25.24	7.46	1.00
86	0.90	33.25	210.29	116.21	149.46	25.60	7.46	1.00
87	0.90	32.93	211.19	116.65	149.58	25.97	7.46	1.00
88	0.90	32.61	212.09	117.09	149.70	26.34	7.46	1.00
89	0.89	32.28	212.98	117.54	149.81	26.71	7.46	1.00
90	0.89	31.94	213.88	117.99	149.93	27.08	7.46	1.00
91	0.08	31.76	214.36	118.24	149.99	27.44	7.46	0.09
92	0.81	31.56	214.80	118.47	150.03	27.44	3.72	0.91
93	0.88	31.17	215.65	118.91	150.08	27.81	3.72	1.00
94	0.88	30.76	216.53	119.38	150.14	28.18	3.72	1.00
95	0.88	30.34	217.41	119.85	150.20	28.55	3.72	1.00
96	0.88	29.92	218.29	120.33	150.25	28.92	3.72	1.00
97	0.87	29.49	219.16	120.82	150.31	29.28	3.72	1.00
98	0.87	29.05	220.04	121.31	150.37	29.65	3.72	1.00
99	0.87	28.61	220.90	121.81	150.42	30.02	3.72	1.00
100	0.86	28.17	221.77	122.31	150.48	30.39	3.72	1.00
101	0.86	27.71	222.63	122.82	150.53	30.76	3.72	1.00
102	0.86	27.25	223.49	123.34	150.59	31.12	3.72	1.00
103	0.85	26.79	224.34	123.86	150.65	31.49	3.72	1.00
104	0.85	26.32	225.19	124.38	150.70	31.86	3.72	1.00
105	0.85	25.84	226.04	124.91	150.76	32.23	3.72	1.00
106	0.84	25.36	226.88	125.45	150.81	32.60	3.72	1.00
107	0.84	24.88	227.72	125.99	150.87	32.96	3.72	1.00
108	0.84	24.38	228.56	126.54	150.92	33.33	3.72	1.00
109	0.83	23.89	229.39	127.09	150.97	33.70	3.72	1.00
110	0.83	23.38	230.22	127.65	151.03	34.07	3.72	1.00
111	0.82	22.87	231.05	128.21	151.08	34.44	3.72	1.00
112	0.82	22.36	231.87	128.78	151.13	34.81	3.72	1.00
113	0.82	21.84	232.69	129.35	151.19	35.17	3.72	1.00
114	0.81	21.31	233.51	129.93	151.24	35.54	3.72	1.00
115	0.81	20.78	234.32	130.51	151.29	35.91	3.72	1.00
116	0.81	20.24	235.13	131.10	151.35	36.28	3.72	1.00
117	0.80	19.70	235.93	131.70	151.40	36.65	3.72	1.00
118	0.80	19.16	236.73	132.30	151.45	37.01	3.72	1.00
119	0.79	18.60	237.53	132.90	151.50	37.38	3.72	1.00
120	0.79	18.04	238.32	133.51	151.55	37.75	3.72	1.00
121	0.79	17.48	239.11	134.12	151.60	38.12	3.72	1.00

122	0.78	16.91	239.90	134.74	151.66	38.49	3.72	1.00
123	0.78	16.34	240.68	135.37	151.71	38.85	3.72	1.00
124	0.77	15.76	241.45	136.00	151.76	39.22	3.72	1.00
125	0.77	15.17	242.23	136.63	151.81	39.59	3.72	1.00
126	0.77	14.58	243.00	137.27	151.86	39.96	3.72	1.00
127	0.76	13.99	243.76	137.92	151.91	40.33	3.72	1.00
128	0.76	13.39	244.52	138.57	151.96	40.69	3.72	1.00
129	0.30	12.97	245.05	139.02	151.99	41.06	3.72	0.40
130	0.45	12.66	245.43	139.35	152.01	41.06	3.75	0.60
131	0.75	12.17	246.03	139.88	152.05	41.43	3.75	1.00
132	0.75	11.56	246.78	140.55	152.10	41.80	3.75	1.00
133	0.74	10.94	247.52	141.21	152.15	42.17	3.75	1.00
134	0.74	10.31	248.26	141.89	152.20	42.53	3.75	1.00
135	0.73	9.68	248.99	142.57	152.25	42.90	3.75	1.00
136	0.73	9.05	249.72	143.25	152.30	43.27	3.75	1.00
137	0.72	8.41	250.45	143.94	152.34	43.64	3.75	1.00
138	0.72	7.76	251.17	144.63	152.39	44.01	3.75	1.00
139	0.71	7.11	251.89	145.33	152.44	44.37	3.75	1.00
140	0.71	6.46	252.60	146.03	152.48	44.74	3.75	1.00
141	0.71	5.80	253.31	146.73	152.53	45.11	3.75	1.00
142	0.70	5.13	254.01	147.45	152.58	45.48	3.75	1.00
143	0.70	4.46	254.71	148.16	152.62	45.85	3.75	1.00
144	0.69	3.79	255.40	148.88	152.67	46.21	3.75	1.00
145	0.69	3.11	256.09	149.60	152.71	46.58	3.75	1.00
146	0.68	2.43	256.78	150.33	152.76	46.95	3.75	1.00
147	0.68	1.74	257.46	151.07	152.80	47.32	3.75	1.00
148	0.67	1.04	258.13	151.80	152.85	47.69	3.75	1.00
149	0.67	0.35	258.80	152.54	152.89	48.05	3.75	1.00

Table 2 - Force Data On The 149 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	7.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
2	20.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
3	33.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
4	45.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
5	57.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
6	68.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
7	77.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
8	87.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
9	95.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
10	103.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
11	109.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
12	116.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
13	121.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
14	115.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
15	11.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
16	202.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
17	330.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
18	457.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
19	583.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
20	708.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
21	832.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
22	956.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
23	1078.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
24	1200.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
25	1320.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
26	1440.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
27	1558.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
28	1675.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
29	1792.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
30	1907.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
31	2021.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
32	2135.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
33	2247.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
34	2357.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
35	2467.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

36	2576.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
37	2683.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
38	2789.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
39	2894.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
40	2998.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
41	2676.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
42	424.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
43	3249.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
44	3424.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
45	3597.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
46	3768.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
47	3938.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
48	675.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
49	3382.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
50	4087.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
51	4114.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
52	4140.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
53	4164.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
54	4188.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
55	4210.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
56	4231.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
57	4251.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
58	4271.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
59	4288.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
60	4305.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
61	4321.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
62	4336.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
63	4350.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
64	4362.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
65	1029.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
66	3332.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
67	4331.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
68	4299.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
69	4267.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
70	4233.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
71	4199.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
72	4164.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
73	4128.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
74	4091.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
75	4054.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
76	4016.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
77	3977.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
78	3938.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
79	3898.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
80	3857.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
81	3815.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
82	3773.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
83	3730.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
84	3687.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
85	3642.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
86	3598.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
87	3552.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
88	3506.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
89	3460.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
90	3413.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
91	298.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
92	3064.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
93	3308.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
94	3253.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
95	3198.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
96	3142.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
97	3086.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
98	3029.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
99	2972.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
100	2915.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
101	2857.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
102	2799.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
103	2741.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
104	2682.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
105	2623.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
106	2564.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
107	2504.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

108	2444.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
109	2384.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
110	2324.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
111	2263.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
112	2203.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
113	2142.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
114	2081.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
115	2019.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
116	1958.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
117	1897.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
118	1835.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
119	1773.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
120	1712.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
121	1650.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
122	1588.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
123	1526.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
124	1465.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
125	1403.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
126	1341.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
127	1279.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
128	1218.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
129	468.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
130	688.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
131	1095.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
132	1034.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
133	972.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
134	911.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
135	851.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
136	790.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
137	730.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
138	669.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
139	610.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
140	550.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
141	490.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
142	431.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
143	373.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
144	314.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
145	256.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
146	198.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
147	141.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
148	84.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
149	27.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 326296.87(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 326296.87(lbs)

TOTAL AREA OF SLIDING MASS = 2719.14(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 149 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	279.00	24.00	
2	1	279.00	24.00	
3	1	279.00	24.00	
4	1	279.00	24.00	
5	1	279.00	24.00	
6	1	279.00	24.00	
7	1	279.00	24.00	
8	1	279.00	24.00	
9	1	279.00	24.00	
10	1	279.00	24.00	
11	1	279.00	24.00	
12	1	279.00	24.00	
13	1	279.00	24.00	
14	1	279.00	24.00	
15	1	279.00	24.00	
16	1	279.00	24.00	
17	1	279.00	24.00	

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139	1	279.00	24.00
140	1	279.00	24.00
141	1	279.00	24.00
142	1	279.00	24.00
143	1	279.00	24.00
144	1	279.00	24.00
145	1	279.00	24.00
146	1	279.00	24.00
147	1	279.00	24.00
148	1	279.00	24.00
149	1	279.00	24.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 149 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-4.21	131.59	1.00	21.20	288.44	192.13
2	-3.84	132.59	1.00	33.95	294.12	195.91
3	-3.47	133.59	1.00	45.88	299.43	199.45
4	-3.10	134.59	1.00	56.98	304.37	202.74
5	-2.74	135.59	1.00	67.25	308.94	205.79
6	-2.37	136.59	1.00	76.72	313.16	208.59
7	-2.00	137.59	1.00	85.36	317.01	211.16
8	-1.63	138.59	1.00	93.21	320.50	213.48
9	-1.26	139.58	1.00	100.24	323.63	215.57
10	-0.90	140.58	1.00	106.48	326.41	217.42
11	-0.53	141.58	1.00	111.92	328.83	219.03
12	-0.16	142.58	1.00	116.57	330.90	220.41
13	0.21	143.58	1.00	120.43	332.62	221.55
14	0.58	144.54	0.92	123.33	333.91	222.42
15	0.58	145.04	0.08	130.64	337.17	224.58
16	0.94	145.58	1.00	198.43	367.35	244.69
17	1.31	146.58	1.00	323.85	423.19	281.88
18	1.68	147.58	1.00	448.01	478.47	318.70
19	2.05	148.58	1.00	570.91	533.19	355.15
20	2.42	149.58	1.00	692.56	587.35	391.23
21	2.79	150.58	1.00	812.96	640.95	426.93
22	3.15	151.58	1.00	932.10	694.00	462.27
23	3.52	152.58	1.00	1049.99	746.49	497.23
24	3.89	153.58	1.00	1166.64	798.42	531.82
25	4.26	154.57	1.00	1282.04	849.80	566.05
26	4.63	155.57	1.00	1396.19	900.62	599.90
27	4.99	156.57	1.00	1509.09	950.89	633.38
28	5.36	157.56	1.00	1620.75	1000.61	666.50
29	5.73	158.56	1.00	1731.17	1049.77	699.24
30	6.10	159.55	1.00	1840.35	1098.38	731.62
31	6.47	160.55	1.00	1948.28	1146.43	763.63
32	6.83	161.54	1.00	2054.98	1193.94	795.27
33	7.20	162.53	1.00	2160.44	1240.89	826.55
34	7.57	163.52	1.00	2264.66	1287.29	857.45
35	7.94	164.52	1.00	2367.64	1333.14	888.00
36	8.31	165.51	1.00	2469.38	1378.44	918.17
37	8.67	166.49	1.00	2569.89	1423.19	947.98
38	9.04	167.48	1.00	2669.17	1467.39	977.42
39	9.41	168.47	1.00	2767.22	1511.04	1006.50
40	9.78	169.46	1.00	2864.03	1554.15	1035.21
41	10.15	170.37	0.87	2952.76	1593.65	1061.52
42	10.15	170.87	0.13	3008.47	1618.46	1078.04
43	10.51	171.42	1.00	3099.79	1659.12	1105.13
44	10.88	172.41	1.00	3264.83	1732.60	1154.07
45	11.25	173.39	1.00	3428.29	1805.37	1202.55
46	11.62	174.37	1.00	3590.16	1877.44	1250.55
47	11.99	175.35	1.00	3750.44	1948.80	1298.08
48	12.35	175.92	0.17	3839.86	1988.62	1324.60
49	12.35	176.41	0.83	3867.41	2000.88	1332.77
50	12.72	177.30	1.00	3888.50	2010.27	1339.03
51	13.09	178.28	1.00	3911.43	2020.48	1345.83
52	13.46	179.25	1.00	3933.47	2030.29	1352.36
53	13.83	180.22	1.00	3954.61	2039.71	1358.63
54	14.19	181.19	1.00	3974.86	2048.72	1364.64
55	14.56	182.16	1.00	3994.22	2057.34	1370.38
56	14.93	183.13	1.00	4012.70	2065.57	1375.86
57	15.30	184.09	1.00	4030.29	2073.40	1381.08
58	15.67	185.06	1.00	4047.00	2080.84	1386.03
59	16.03	186.02	1.00	4062.83	2087.89	1390.73
60	16.40	186.98	1.00	4077.79	2094.55	1395.16
61	16.77	187.94	1.00	4091.87	2100.82	1399.34
62	17.14	188.89	1.00	4105.09	2106.70	1403.26
63	17.51	189.85	1.00	4117.44	2112.20	1406.92

64	17.88	190.80	1.00	4128.92	2117.31	1410.33
65	18.24	191.39	0.24	4132.14	2118.75	1411.28
66	18.24	191.86	0.76	4126.55	2116.26	1409.62
67	18.61	192.70	1.00	4098.90	2103.95	1401.42
68	18.98	193.65	1.00	4068.20	2090.28	1392.32
69	19.35	194.59	1.00	4036.90	2076.34	1383.04
70	19.72	195.53	1.00	4004.98	2062.13	1373.57
71	20.08	196.47	1.00	3972.47	2047.66	1363.93
72	20.45	197.41	1.00	3939.35	2032.91	1354.11
73	20.82	198.35	1.00	3905.64	2017.90	1344.11
74	21.19	199.28	1.00	3871.34	2002.63	1333.94
75	21.56	200.21	1.00	3836.46	1987.10	1323.60
76	21.92	201.14	1.00	3800.99	1971.31	1313.08
77	22.29	202.07	1.00	3764.95	1955.26	1302.39
78	22.66	202.99	1.00	3728.34	1938.96	1291.53
79	23.03	203.91	1.00	3691.16	1922.41	1280.50
80	23.40	204.83	1.00	3653.42	1905.61	1269.31
81	23.76	205.75	1.00	3615.11	1888.55	1257.95
82	24.13	206.66	1.00	3576.26	1871.25	1246.43
83	24.50	207.57	1.00	3536.86	1853.71	1234.74
84	24.87	208.48	1.00	3496.91	1835.93	1222.90
85	25.24	209.39	1.00	3456.43	1817.90	1210.89
86	25.60	210.29	1.00	3415.41	1799.64	1198.73
87	25.97	211.19	1.00	3373.86	1781.14	1186.41
88	26.34	212.09	1.00	3331.79	1762.41	1173.93
89	26.71	212.98	1.00	3289.21	1743.45	1161.30
90	27.08	213.88	1.00	3246.11	1724.26	1148.52
91	27.44	214.36	0.09	3218.83	1712.12	1140.43
92	27.44	214.80	0.91	3198.13	1702.90	1134.29
93	27.81	215.65	1.00	3149.81	1681.38	1119.96
94	28.18	216.53	1.00	3099.17	1658.84	1104.94
95	28.55	217.41	1.00	3048.10	1636.10	1089.79
96	28.92	218.29	1.00	2996.58	1613.16	1074.52
97	29.28	219.16	1.00	2944.62	1590.03	1059.11
98	29.65	220.04	1.00	2892.24	1566.71	1043.57
99	30.02	220.90	1.00	2839.44	1543.20	1027.91
100	30.39	221.77	1.00	2786.22	1519.50	1012.13
101	30.76	222.63	1.00	2732.59	1495.63	996.23
102	31.12	223.49	1.00	2678.55	1471.57	980.20
103	31.49	224.34	1.00	2624.11	1447.33	964.06
104	31.86	225.19	1.00	2569.29	1422.92	947.80
105	32.23	226.04	1.00	2514.07	1398.34	931.42
106	32.60	226.88	1.00	2458.48	1373.58	914.93
107	32.96	227.72	1.00	2402.51	1348.66	898.34
108	33.33	228.56	1.00	2346.17	1323.58	881.63
109	33.70	229.39	1.00	2289.47	1298.34	864.81
110	34.07	230.22	1.00	2232.42	1272.94	847.89
111	34.44	231.05	1.00	2175.02	1247.38	830.87
112	34.81	231.87	1.00	2117.28	1221.67	813.75
113	35.17	232.69	1.00	2059.20	1195.81	796.52
114	35.54	233.51	1.00	2000.79	1169.81	779.20
115	35.91	234.32	1.00	1942.07	1143.67	761.79
116	36.28	235.13	1.00	1883.03	1117.38	744.28
117	36.65	235.93	1.00	1823.69	1090.96	726.68
118	37.01	236.73	1.00	1764.04	1064.40	708.99
119	37.38	237.53	1.00	1704.11	1037.72	691.22
120	37.75	238.32	1.00	1643.88	1010.90	673.36
121	38.12	239.11	1.00	1583.38	983.97	655.41
122	38.49	239.90	1.00	1522.62	956.91	637.39
123	38.85	240.68	1.00	1461.58	929.74	619.29
124	39.22	241.45	1.00	1400.30	902.45	601.12
125	39.59	242.23	1.00	1338.77	875.06	582.87
126	39.96	243.00	1.00	1277.00	847.56	564.55
127	40.33	243.76	1.00	1214.99	819.95	546.16
128	40.69	244.52	1.00	1152.77	792.25	527.71
129	41.06	245.05	0.40	1107.75	772.20	514.36
130	41.06	245.43	0.60	1078.77	759.30	505.77
131	41.43	246.03	1.00	1027.73	736.58	490.63
132	41.80	246.78	1.00	964.93	708.62	472.00
133	42.17	247.52	1.00	901.94	680.57	453.32
134	42.53	248.26	1.00	838.77	652.45	434.59
135	42.90	248.99	1.00	775.43	624.24	415.80

136	43.27	249.72	1.00	711.93	595.97	396.97
137	43.64	250.45	1.00	648.27	567.63	378.09
138	44.01	251.17	1.00	584.46	539.22	359.17
139	44.37	251.89	1.00	520.52	510.75	340.21
140	44.74	252.60	1.00	456.45	482.23	321.21
141	45.11	253.31	1.00	392.27	453.65	302.17
142	45.48	254.01	1.00	327.98	425.03	283.11
143	45.85	254.71	1.00	263.60	396.36	264.01
144	46.21	255.40	1.00	199.12	367.65	244.89
145	46.58	256.09	1.00	134.57	338.92	225.75
146	46.95	256.78	1.00	69.95	310.15	206.59
147	47.32	257.46	1.00	5.28	281.35	187.41
148	47.69	258.13	1.00	0.00	279.00	185.84
149	48.05	258.80	1.00	0.00	279.00	185.84

Table 4A - Base Force Data on the 149 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-4.21	131.59	1.00	21.20	288.44	192.13
2	-3.84	132.59	1.00	33.95	294.12	195.91
3	-3.47	133.59	1.00	45.88	299.43	199.45
4	-3.10	134.59	1.00	56.98	304.37	202.74
5	-2.74	135.59	1.00	67.25	308.94	205.79
6	-2.37	136.59	1.00	76.72	313.16	208.59
7	-2.00	137.59	1.00	85.36	317.01	211.16
8	-1.63	138.59	1.00	93.21	320.50	213.48
9	-1.26	139.58	1.00	100.24	323.63	215.57
10	-0.90	140.58	1.00	106.48	326.41	217.42
11	-0.53	141.58	1.00	111.92	328.83	219.03
12	-0.16	142.58	1.00	116.57	330.90	220.41
13	0.21	143.58	1.00	120.43	332.62	221.55
14	0.58	144.54	0.92	112.93	305.73	203.65
15	0.58	145.04	0.08	11.02	28.45	18.95
16	0.94	145.58	1.00	198.43	367.35	244.69
17	1.31	146.58	1.00	323.85	423.19	281.88
18	1.68	147.58	1.00	448.01	478.47	318.70
19	2.05	148.58	1.00	570.91	533.19	355.15
20	2.42	149.58	1.00	692.56	587.35	391.23
21	2.79	150.58	1.00	812.96	640.95	426.93
22	3.15	151.58	1.00	932.10	694.00	462.27
23	3.52	152.58	1.00	1049.99	746.49	497.23
24	3.89	153.58	1.00	1166.64	798.42	531.82
25	4.26	154.57	1.00	1282.04	849.80	566.05
26	4.63	155.57	1.00	1396.19	900.62	599.90
27	4.99	156.57	1.00	1509.09	950.89	633.38
28	5.36	157.56	1.00	1620.75	1000.61	666.50
29	5.73	158.56	1.00	1731.17	1049.77	699.24
30	6.10	159.55	1.00	1840.35	1098.38	731.62
31	6.47	160.55	1.00	1948.28	1146.43	763.63
32	6.83	161.54	1.00	2054.98	1193.94	795.27
33	7.20	162.53	1.00	2160.44	1240.89	826.55
34	7.57	163.52	1.00	2264.66	1287.29	857.45
35	7.94	164.52	1.00	2367.64	1333.14	888.00
36	8.31	165.51	1.00	2469.38	1378.44	918.17
37	8.67	166.49	1.00	2569.89	1423.19	947.98
38	9.04	167.48	1.00	2669.17	1467.39	977.42
39	9.41	168.47	1.00	2767.22	1511.04	1006.50
40	9.78	169.46	1.00	2864.03	1554.15	1035.21
41	10.15	170.37	0.87	2554.79	1378.86	918.45
42	10.15	170.87	0.13	405.48	218.13	145.30
43	10.51	171.42	1.00	3099.79	1659.12	1105.13
44	10.88	172.41	1.00	3264.83	1732.60	1154.07
45	11.25	173.39	1.00	3428.29	1805.37	1202.55
46	11.62	174.37	1.00	3590.16	1877.44	1250.55
47	11.99	175.35	1.00	3750.44	1948.80	1298.08
48	12.35	175.92	0.17	643.13	333.07	221.85

49	12.35	176.41	0.83	3219.67	1665.76	1109.55
50	12.72	177.30	1.00	3888.50	2010.27	1339.03
51	13.09	178.28	1.00	3911.43	2020.48	1345.83
52	13.46	179.25	1.00	3933.47	2030.29	1352.36
53	13.83	180.22	1.00	3954.61	2039.71	1358.63
54	14.19	181.19	1.00	3974.86	2048.72	1364.64
55	14.56	182.16	1.00	3994.22	2057.34	1370.38
56	14.93	183.13	1.00	4012.70	2065.57	1375.86
57	15.30	184.09	1.00	4030.29	2073.40	1381.08
58	15.67	185.06	1.00	4047.00	2080.84	1386.03
59	16.03	186.02	1.00	4062.83	2087.89	1390.73
60	16.40	186.98	1.00	4077.79	2094.55	1395.16
61	16.77	187.94	1.00	4091.87	2100.82	1399.34
62	17.14	188.89	1.00	4105.09	2106.70	1403.26
63	17.51	189.85	1.00	4117.44	2112.20	1406.92
64	17.88	190.80	1.00	4128.92	2117.31	1410.33
65	18.24	191.39	0.24	974.10	499.47	332.69
66	18.24	191.86	0.76	3153.77	1617.38	1077.32
67	18.61	192.70	1.00	4098.90	2103.95	1401.42
68	18.98	193.65	1.00	4068.20	2090.28	1392.32
69	19.35	194.59	1.00	4036.90	2076.34	1383.04
70	19.72	195.53	1.00	4004.98	2062.13	1373.57
71	20.08	196.47	1.00	3972.47	2047.66	1363.93
72	20.45	197.41	1.00	3939.35	2032.91	1354.11
73	20.82	198.35	1.00	3905.64	2017.90	1344.11
74	21.19	199.28	1.00	3871.34	2002.63	1333.94
75	21.56	200.21	1.00	3836.46	1987.10	1323.60
76	21.92	201.14	1.00	3800.99	1971.31	1313.08
77	22.29	202.07	1.00	3764.95	1955.26	1302.39
78	22.66	202.99	1.00	3728.34	1938.96	1291.53
79	23.03	203.91	1.00	3691.16	1922.41	1280.50
80	23.40	204.83	1.00	3653.42	1905.61	1269.31
81	23.76	205.75	1.00	3615.11	1888.55	1257.95
82	24.13	206.66	1.00	3576.26	1871.25	1246.43
83	24.50	207.57	1.00	3536.86	1853.71	1234.74
84	24.87	208.48	1.00	3496.91	1835.93	1222.90
85	25.24	209.39	1.00	3456.43	1817.90	1210.89
86	25.60	210.29	1.00	3415.41	1799.64	1198.73
87	25.97	211.19	1.00	3373.86	1781.14	1186.41
88	26.34	212.09	1.00	3331.79	1762.41	1173.93
89	26.71	212.98	1.00	3289.21	1743.45	1161.30
90	27.08	213.88	1.00	3246.11	1724.26	1148.52
91	27.44	214.36	0.09	284.32	151.23	100.73
92	27.44	214.80	0.91	2915.64	1552.48	1034.10
93	27.81	215.65	1.00	3149.81	1681.38	1119.96
94	28.18	216.53	1.00	3099.17	1658.84	1104.94
95	28.55	217.41	1.00	3048.10	1636.10	1089.79
96	28.92	218.29	1.00	2996.58	1613.16	1074.52
97	29.28	219.16	1.00	2944.62	1590.03	1059.11
98	29.65	220.04	1.00	2892.24	1566.71	1043.57
99	30.02	220.90	1.00	2839.44	1543.20	1027.91
100	30.39	221.77	1.00	2786.22	1519.50	1012.13
101	30.76	222.63	1.00	2732.59	1495.63	996.23
102	31.12	223.49	1.00	2678.55	1471.57	980.20
103	31.49	224.34	1.00	2624.11	1447.33	964.06
104	31.86	225.19	1.00	2569.29	1422.92	947.80
105	32.23	226.04	1.00	2514.07	1398.34	931.42
106	32.60	226.88	1.00	2458.48	1373.58	914.93
107	32.96	227.72	1.00	2402.51	1348.66	898.34
108	33.33	228.56	1.00	2346.17	1323.58	881.63
109	33.70	229.39	1.00	2289.47	1298.34	864.81
110	34.07	230.22	1.00	2232.42	1272.94	847.89
111	34.44	231.05	1.00	2175.02	1247.38	830.87
112	34.81	231.87	1.00	2117.28	1221.67	813.75
113	35.17	232.69	1.00	2059.20	1195.81	796.52
114	35.54	233.51	1.00	2000.79	1169.81	779.20
115	35.91	234.32	1.00	1942.07	1143.67	761.79
116	36.28	235.13	1.00	1883.03	1117.38	744.28
117	36.65	235.93	1.00	1823.69	1090.96	726.68
118	37.01	236.73	1.00	1764.04	1064.40	708.99
119	37.38	237.53	1.00	1704.11	1037.72	691.22
120	37.75	238.32	1.00	1643.88	1010.90	673.36

121	38.12	239.11	1.00	1583.38	983.97	655.41
122	38.49	239.90	1.00	1522.62	956.91	637.39
123	38.85	240.68	1.00	1461.58	929.74	619.29
124	39.22	241.45	1.00	1400.30	902.45	601.12
125	39.59	242.23	1.00	1338.77	875.06	582.87
126	39.96	243.00	1.00	1277.00	847.56	564.55
127	40.33	243.76	1.00	1214.99	819.95	546.16
128	40.69	244.52	1.00	1152.77	792.25	527.71
129	41.06	245.05	0.40	442.23	308.27	205.34
130	41.06	245.43	0.60	648.11	456.18	303.86
131	41.43	246.03	1.00	1027.73	736.58	490.63
132	41.80	246.78	1.00	964.93	708.62	472.00
133	42.17	247.52	1.00	901.94	680.57	453.32
134	42.53	248.26	1.00	838.77	652.45	434.59
135	42.90	248.99	1.00	775.43	624.24	415.80
136	43.27	249.72	1.00	711.93	595.97	396.97
137	43.64	250.45	1.00	648.27	567.63	378.09
138	44.01	251.17	1.00	584.46	539.22	359.17
139	44.37	251.89	1.00	520.52	510.75	340.21
140	44.74	252.60	1.00	456.45	482.23	321.21
141	45.11	253.31	1.00	392.27	453.65	302.17
142	45.48	254.01	1.00	327.98	425.03	283.11
143	45.85	254.71	1.00	263.60	396.36	264.01
144	46.21	255.40	1.00	199.12	367.65	244.89
145	46.58	256.09	1.00	134.57	338.92	225.75
146	46.95	256.78	1.00	69.95	310.15	206.59
147	47.32	257.46	1.00	5.28	281.35	187.41
148	47.69	258.13	1.00	0.00	279.00	185.84
149	48.05	258.80	1.00	0.00	277.80	185.04

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 29.857
3D Depth (Vertical difference between ends of Slip Surface) = 51.53(ft)
L/D(1): L = 51.53(ft) L/D(2): L = 103.06(ft) L/D(3): L = 154.59(ft)
L/D(4): L = 206.13(ft) L/D(5): L = 257.66(ft) L/D(6): L = 309.19(ft)

SUM OF MOMENTS = -0.543194E-01 (ft/lbs);Imbalance (Fraction of Total Weight) = -0.1664722E-06

Sum of the Resisting Forces = 177818.40 (lbs)

Average Available Shear Strength = 1243.52(psf)

Average Effective Normal Stress = 2166.35(psf)

Sum of the Driving Forces = 118443.62 (lbs)

Average Mobilized Shear Stress = 828.30(psf)

Total length of the failure surface = 143.00(ft)

Factor of Safety Balance Check: FS = 1.50129

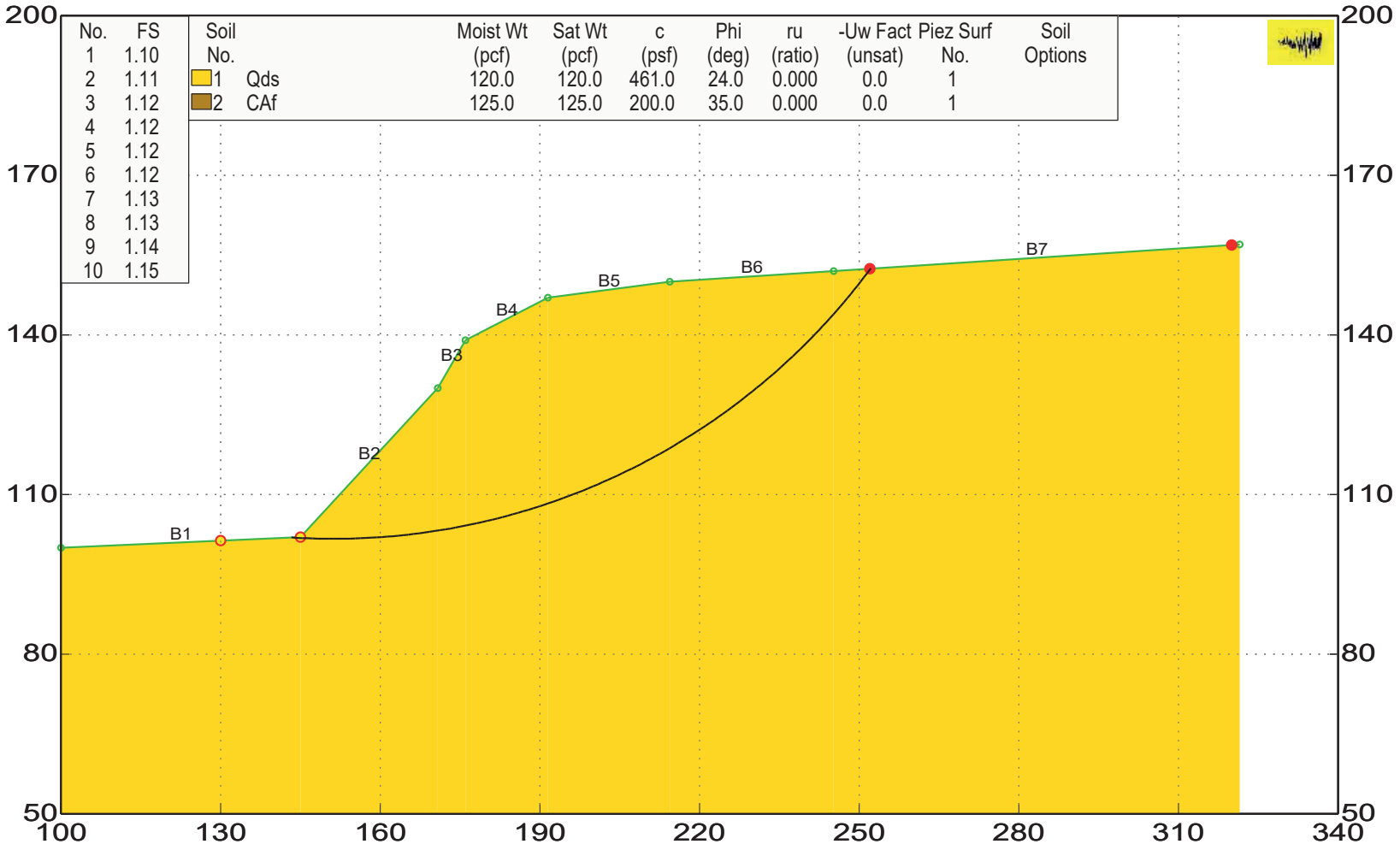
CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section BB - Existing - Seismic FS 1.1

EGL

\BB002s.gsd



No.	FS
1	1.10
2	1.11
3	1.12
4	1.12
5	1.12
6	1.12
7	1.13
8	1.13
9	1.14
10	1.15

Soil No.		Moist Wt (pcf)	Sat Wt (pcf)	c (psf)	Phi (deg)	ru (ratio)	-Uw Fact (unsat)	Piez Surf No.	Soil Options
1	Qds	120.0	120.0	461.0	24.0	0.000	0.0	1	
2	CAf	125.0	125.0	200.0	35.0	0.000	0.0	1	

GEOSTASE FS = 1.10

Simplified Bishop Method

kh = 0.20000

GEOSTASE Slope Stability Analysis

GEOSTASE® v4.30.32 by GREGORY GEOTECHNICAL SOFTWARE

PLATE D.3

*** GEOSTASE(R) ***

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** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB002s.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB002s.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section BB - Existing - Seismic FS 1.1

PROFILE BOUNDARY DATA

7 Surface Boundaries
7 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	145.000	102.000	1
2	145.000	102.000	170.800	130.000	1
3	170.800	130.000	176.000	139.000	1
4	176.000	139.000	191.500	147.000	1
5	191.500	147.000	214.400	150.000	1
6	214.400	150.000	245.200	152.000	1
7	245.200	152.000	321.500	157.000	1

User Specified X-Origin = 100.000(ft)

User Specified Y-Origin = 50.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	145.000	102.000
3	170.800	130.000
4	176.000	139.000
5	191.500	147.000
6	214.400	150.000
7	245.200	152.000
8	321.500	157.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)
Point No. X-COORD Y-COORD

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.044	2.545
2	1.085	47.342
3	1.731	59.982
4	0.516	27.300
5	0.131	7.463
6	0.065	3.715
7	0.066	3.749

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	461.00	24.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

SEISMIC (EARTHQUAKE) DATA

Specified Peak Ground Acceleration Coefficient (PGA) = 0.400(g)
Default Velocity = 2.000(ft) per second
Specified Horizontal Earthquake Coefficient (kh) = 0.20000(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
(NOTE:Input Velocity = 0.0 will result in default Peak
Velocity = 2 times(PGA) times 2.5 fps or 0.762 mps)
Specified Seismic Pore-Pressure Factor = 0.000
Horizontal Seismic Force is Applied at Center of Gravity of Slices

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.1802(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 130.00(ft)
and X = 145.00(ft)

Each Surface ends within a Range Between X = 252.00(ft)
and X = 320.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 50.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 2.172 FS Min = 1.101 FS Ave = 1.622
Standard Deviation = 0.270 Coefficient of Variation = 16.66 %

Critical Surface is Sequence Number 887 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 151.191905(ft) ; Y = 227.403589(ft); and Radius = 125.726723(ft)

Circular Trial Failure Surface Generated With127 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	143.30330	101.92459
2	144.30157	101.86582
3	145.30028	101.81498
4	146.29936	101.77210
5	147.29875	101.73716
6	148.29839	101.71017
7	149.29821	101.69113
8	150.29814	101.68004
9	151.29814	101.67691
10	152.29813	101.68173
11	153.29805	101.69451
12	154.29783	101.71524
13	155.29742	101.74392
14	156.29675	101.78054
15	157.29575	101.82512
16	158.29437	101.87764
17	159.29255	101.93810
18	160.29020	102.00650
19	161.28729	102.08283
20	162.28373	102.16709
21	163.27947	102.25927
22	164.27445	102.35937
23	165.26860	102.46738
24	166.26186	102.58330
25	167.25416	102.70711
26	168.24545	102.83881
27	169.23566	102.97838
28	170.22473	103.12583
29	171.21260	103.28115
30	172.19920	103.44431
31	173.18447	103.61532
32	174.16835	103.79416
33	175.15077	103.98081
34	176.13168	104.17528
35	177.11101	104.37754
36	178.08871	104.58758
37	179.06470	104.80540
38	180.03892	105.03097
39	181.01132	105.26428
40	181.98184	105.50532
41	182.95041	105.75407
42	183.91697	106.01051
43	184.88146	106.27464
44	185.84381	106.54642
45	186.80398	106.82586
46	187.76189	107.11292
47	188.71749	107.40759
48	189.67071	107.70985
49	190.62150	108.01969
50	191.56980	108.33708
51	192.51554	108.66200

52	193.45867	108.99443
53	194.39912	109.33435
54	195.33684	109.68174
55	196.27177	110.03658
56	197.20384	110.39884
57	198.13301	110.76851
58	199.05920	111.14555
59	199.98237	111.52995
60	200.90245	111.92168
61	201.81939	112.32072
62	202.73312	112.72704
63	203.64359	113.14061
64	204.55075	113.56140
65	205.45452	113.98941
66	206.35487	114.42458
67	207.25173	114.86690
68	208.14503	115.31635
69	209.03474	115.77288
70	209.92079	116.23648
71	210.80312	116.70710
72	211.68168	117.18473
73	212.55641	117.66934
74	213.42727	118.16088
75	214.29418	118.65934
76	215.15710	119.16468
77	216.01598	119.67686
78	216.87075	120.19586
79	217.72138	120.72164
80	218.56779	121.25417
81	219.40994	121.79341
82	220.24777	122.33934
83	221.08123	122.89191
84	221.91028	123.45110
85	222.73485	124.01686
86	223.55489	124.58916
87	224.37036	125.16796
88	225.18119	125.75324
89	225.98735	126.34494
90	226.78877	126.94304
91	227.58541	127.54749
92	228.37722	128.15826
93	229.16415	128.77531
94	229.94614	129.39859
95	230.72315	130.02808
96	231.49513	130.66373
97	232.26203	131.30550
98	233.02380	131.95334
99	233.78039	132.60723
100	234.53176	133.26711
101	235.27786	133.93295
102	236.01864	134.60470
103	236.75405	135.28232
104	237.48405	135.96577
105	238.20859	136.65500
106	238.92762	137.34998
107	239.64110	138.05065
108	240.34899	138.75697
109	241.05124	139.46890
110	241.74780	140.18640
111	242.43864	140.90941
112	243.12370	141.63790
113	243.80295	142.37181
114	244.47633	143.11110
115	245.14382	143.85572
116	245.80536	144.60563
117	246.46092	145.36077
118	247.11045	146.12111
119	247.75391	146.88659
120	248.39127	147.65716
121	249.02247	148.43278
122	249.64749	149.21339
123	250.26627	149.99895

124	250.87879	150.78940
125	251.48500	151.58471
126	252.08487	152.38480
127	252.13629	152.45454

Factor Of Safety For The Critical or Specified Surface = 1.101

Table 1 - Geometry Data on the 132 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.05	143.80	101.90	101.95	-3.37	2.54	1.00
2	0.70	0.14	144.65	101.85	101.98	-2.91	2.54	0.70
3	0.30	0.34	145.15	101.82	102.16	-2.91	47.34	0.30
4	1.00	1.07	145.80	101.79	102.87	-2.46	47.34	1.00
5	1.00	2.20	146.80	101.75	103.95	-2.00	47.34	1.00
6	1.00	3.31	147.80	101.72	105.04	-1.55	47.34	1.00
7	1.00	4.42	148.80	101.70	106.12	-1.09	47.34	1.00
8	1.00	5.52	149.80	101.69	107.21	-0.64	47.34	1.00
9	1.00	6.61	150.80	101.68	108.29	-0.18	47.34	1.00
10	1.00	7.70	151.80	101.68	109.38	0.28	47.34	1.00
11	1.00	8.77	152.80	101.69	110.46	0.73	47.34	1.00
12	1.00	9.84	153.80	101.70	111.55	1.19	47.34	1.00
13	1.00	10.90	154.80	101.73	112.63	1.64	47.34	1.00
14	1.00	11.96	155.80	101.76	113.72	2.10	47.34	1.00
15	1.00	13.00	156.80	101.80	114.80	2.55	47.34	1.00
16	1.00	14.03	157.80	101.85	115.89	3.01	47.34	1.00
17	1.00	15.06	158.79	101.91	116.97	3.47	47.34	1.00
18	1.00	16.08	159.79	101.97	118.05	3.92	47.34	1.00
19	1.00	17.09	160.79	102.04	119.14	4.38	47.34	1.00
20	1.00	18.09	161.79	102.12	120.22	4.83	47.34	1.00
21	1.00	19.08	162.78	102.21	121.30	5.29	47.34	1.00
22	0.99	20.07	163.78	102.31	122.38	5.74	47.34	1.00
23	0.99	21.04	164.77	102.41	123.46	6.20	47.34	1.00
24	0.99	22.01	165.77	102.53	124.54	6.66	47.34	1.00
25	0.99	22.97	166.76	102.65	125.61	7.11	47.34	1.00
26	0.99	23.92	167.75	102.77	126.69	7.57	47.34	1.00
27	0.99	24.86	168.74	102.91	127.76	8.02	47.34	1.00
28	0.99	25.79	169.73	103.05	128.84	8.48	47.34	1.00
29	0.58	26.52	170.51	103.17	129.69	8.93	47.34	0.58
30	0.41	27.11	171.01	103.25	130.36	8.93	59.98	0.42
31	0.99	28.21	171.71	103.36	131.57	9.39	59.98	1.00
32	0.99	29.74	172.69	103.53	133.27	9.85	59.98	1.00
33	0.98	31.27	173.68	103.70	134.98	10.30	59.98	1.00
34	0.98	32.79	174.66	103.89	136.68	10.76	59.98	1.00
35	0.85	34.20	175.58	104.06	138.27	11.21	59.98	0.87
36	0.13	34.87	176.07	104.16	139.03	11.21	27.30	0.13
37	0.98	35.04	176.62	104.28	139.32	11.67	27.30	1.00
38	0.98	35.34	177.60	104.48	139.83	12.12	27.30	1.00
39	0.98	35.63	178.58	104.70	140.33	12.58	27.30	1.00
40	0.97	35.92	179.55	104.92	140.83	13.04	27.30	1.00
41	0.97	36.19	180.53	105.15	141.34	13.49	27.30	1.00
42	0.97	36.45	181.50	105.38	141.84	13.95	27.30	1.00
43	0.97	36.71	182.47	105.63	142.34	14.40	27.30	1.00
44	0.97	36.95	183.43	105.88	142.84	14.86	27.30	1.00
45	0.96	37.19	184.40	106.14	143.34	15.31	27.30	1.00
46	0.96	37.42	185.36	106.41	143.83	15.77	27.30	1.00
47	0.96	37.64	186.32	106.69	144.33	16.23	27.30	1.00
48	0.96	37.85	187.28	106.97	144.82	16.68	27.30	1.00
49	0.96	38.06	188.24	107.26	145.32	17.14	27.30	1.00
50	0.95	38.25	189.19	107.56	145.81	17.59	27.30	1.00
51	0.95	38.44	190.15	107.86	146.30	18.05	27.30	1.00
52	0.88	38.61	191.06	108.17	146.77	18.50	27.30	0.93
53	0.07	38.68	191.53	108.33	147.00	18.50	7.46	0.07
54	0.95	38.57	192.04	108.50	147.07	18.96	7.46	1.00
55	0.94	38.37	192.99	108.83	147.19	19.42	7.46	1.00

56	0.94	38.15	193.93	109.16	147.32	19.87	7.46	1.00
57	0.94	37.93	194.87	109.51	147.44	20.33	7.46	1.00
58	0.93	37.70	195.80	109.86	147.56	20.78	7.46	1.00
59	0.93	37.47	196.74	110.22	147.69	21.24	7.46	1.00
60	0.93	37.22	197.67	110.58	147.81	21.70	7.46	1.00
61	0.93	36.97	198.60	110.96	147.93	22.15	7.46	1.00
62	0.92	36.71	199.52	111.34	148.05	22.61	7.46	1.00
63	0.92	36.45	200.44	111.73	148.17	23.06	7.46	1.00
64	0.92	36.17	201.36	112.12	148.29	23.52	7.46	1.00
65	0.91	35.89	202.28	112.52	148.41	23.97	7.46	1.00
66	0.91	35.60	203.19	112.93	148.53	24.43	7.46	1.00
67	0.91	35.30	204.10	113.35	148.65	24.89	7.46	1.00
68	0.90	34.99	205.00	113.78	148.77	25.34	7.46	1.00
69	0.90	34.68	205.90	114.21	148.89	25.80	7.46	1.00
70	0.90	34.36	206.80	114.65	149.00	26.25	7.46	1.00
71	0.89	34.03	207.70	115.09	149.12	26.71	7.46	1.00
72	0.89	33.69	208.59	115.54	149.24	27.16	7.46	1.00
73	0.89	33.35	209.48	116.00	149.36	27.62	7.46	1.00
74	0.88	33.00	210.36	116.47	149.47	28.08	7.46	1.00
75	0.88	32.64	211.24	116.95	149.59	28.53	7.46	1.00
76	0.87	32.27	212.12	117.43	149.70	28.99	7.46	1.00
77	0.87	31.90	212.99	117.92	149.82	29.44	7.46	1.00
78	0.87	31.52	213.86	118.41	149.93	29.90	7.46	1.00
79	0.11	31.30	214.35	118.69	149.99	30.35	7.46	0.12
80	0.76	31.08	214.78	118.94	150.02	30.35	3.72	0.88
81	0.86	30.66	215.59	119.42	150.08	30.81	3.72	1.00
82	0.85	30.20	216.44	119.94	150.13	31.27	3.72	1.00
83	0.85	29.73	217.30	120.46	150.19	31.72	3.72	1.00
84	0.85	29.26	218.14	120.99	150.24	32.18	3.72	1.00
85	0.84	28.77	218.99	121.52	150.30	32.63	3.72	1.00
86	0.84	28.29	219.83	122.07	150.35	33.09	3.72	1.00
87	0.83	27.79	220.66	122.62	150.41	33.54	3.72	1.00
88	0.83	27.29	221.50	123.17	150.46	34.00	3.72	1.00
89	0.82	26.78	222.32	123.73	150.51	34.46	3.72	1.00
90	0.82	26.26	223.14	124.30	150.57	34.91	3.72	1.00
91	0.82	25.74	223.96	124.88	150.62	35.37	3.72	1.00
92	0.81	25.21	224.78	125.46	150.67	35.82	3.72	1.00
93	0.81	24.68	225.58	126.05	150.73	36.28	3.72	1.00
94	0.80	24.13	226.39	126.64	150.78	36.73	3.72	1.00
95	0.80	23.59	227.19	127.25	150.83	37.19	3.72	1.00
96	0.79	23.03	227.98	127.85	150.88	37.65	3.72	1.00
97	0.79	22.47	228.77	128.47	150.93	38.10	3.72	1.00
98	0.78	21.90	229.56	129.09	150.98	38.56	3.72	1.00
99	0.78	21.32	230.33	129.71	151.03	39.01	3.72	1.00
100	0.77	20.74	231.11	130.35	151.09	39.47	3.72	1.00
101	0.77	20.15	231.88	130.98	151.13	39.92	3.72	1.00
102	0.76	19.56	232.64	131.63	151.18	40.38	3.72	1.00
103	0.76	18.95	233.40	132.28	151.23	40.84	3.72	1.00
104	0.75	18.35	234.16	132.94	151.28	41.29	3.72	1.00
105	0.75	17.73	234.90	133.60	151.33	41.75	3.72	1.00
106	0.74	17.11	235.65	134.27	151.38	42.20	3.72	1.00
107	0.74	16.48	236.39	134.94	151.43	42.66	3.72	1.00
108	0.73	15.85	237.12	135.62	151.48	43.11	3.72	1.00
109	0.72	15.21	237.85	136.31	151.52	43.57	3.72	1.00
110	0.72	14.57	238.57	137.00	151.57	44.03	3.72	1.00
111	0.71	13.92	239.28	137.70	151.62	44.48	3.72	1.00
112	0.71	13.26	240.00	138.40	151.66	44.94	3.72	1.00
113	0.70	12.59	240.70	139.11	151.71	45.39	3.72	1.00
114	0.70	11.93	241.40	139.83	151.75	45.85	3.72	1.00
115	0.69	11.25	242.09	140.55	151.80	46.30	3.72	1.00
116	0.69	10.57	242.78	141.27	151.84	46.76	3.72	1.00
117	0.68	9.88	243.46	142.00	151.89	47.22	3.72	1.00
118	0.67	9.19	244.14	142.74	151.93	47.67	3.72	1.00
119	0.67	8.49	244.81	143.48	151.97	48.13	3.72	1.00
120	0.06	8.11	245.17	143.89	152.00	48.58	3.72	0.08
121	0.61	7.76	245.50	144.26	152.02	48.58	3.75	0.92
122	0.66	7.08	246.13	144.98	152.06	49.04	3.75	1.00
123	0.65	6.36	246.79	145.74	152.10	49.49	3.75	1.00
124	0.64	5.64	247.43	146.50	152.15	49.95	3.75	1.00
125	0.64	4.92	248.07	147.27	152.19	50.41	3.75	1.00
126	0.63	4.18	248.71	148.04	152.23	50.86	3.75	1.00
127	0.63	3.45	249.33	148.82	152.27	51.32	3.75	1.00

128	0.62	2.71	249.96	149.61	152.31	51.77	3.75	1.00
129	0.61	1.96	250.57	150.39	152.35	52.23	3.75	1.00
130	0.61	1.20	251.18	151.19	152.39	52.68	3.75	1.00
131	0.60	0.45	251.78	151.98	152.43	53.14	3.75	1.00
132	0.05	0.03	252.11	152.42	152.45	53.60	3.75	0.09

Table 2 - Force Data On The 132 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	6.2	0.0	0.0	0.0	0.00	0.00	1.2	0.0	0.00
2	11.4	0.0	0.0	0.0	0.00	0.00	2.3	0.0	0.00
3	12.3	0.0	0.0	0.0	0.00	0.00	2.5	0.0	0.00
4	128.8	0.0	0.0	0.0	0.00	0.00	25.8	0.0	0.00
5	263.6	0.0	0.0	0.0	0.00	0.00	52.7	0.0	0.00
6	397.5	0.0	0.0	0.0	0.00	0.00	79.5	0.0	0.00
7	530.5	0.0	0.0	0.0	0.00	0.00	106.1	0.0	0.00
8	662.6	0.0	0.0	0.0	0.00	0.00	132.5	0.0	0.00
9	793.7	0.0	0.0	0.0	0.00	0.00	158.7	0.0	0.00
10	923.8	0.0	0.0	0.0	0.00	0.00	184.8	0.0	0.00
11	1052.9	0.0	0.0	0.0	0.00	0.00	210.6	0.0	0.00
12	1180.9	0.0	0.0	0.0	0.00	0.00	236.2	0.0	0.00
13	1307.9	0.0	0.0	0.0	0.00	0.00	261.6	0.0	0.00
14	1433.7	0.0	0.0	0.0	0.00	0.00	286.7	0.0	0.00
15	1558.4	0.0	0.0	0.0	0.00	0.00	311.7	0.0	0.00
16	1681.8	0.0	0.0	0.0	0.00	0.00	336.4	0.0	0.00
17	1804.1	0.0	0.0	0.0	0.00	0.00	360.8	0.0	0.00
18	1925.1	0.0	0.0	0.0	0.00	0.00	385.0	0.0	0.00
19	2044.9	0.0	0.0	0.0	0.00	0.00	409.0	0.0	0.00
20	2163.3	0.0	0.0	0.0	0.00	0.00	432.7	0.0	0.00
21	2280.4	0.0	0.0	0.0	0.00	0.00	456.1	0.0	0.00
22	2396.2	0.0	0.0	0.0	0.00	0.00	479.2	0.0	0.00
23	2510.5	0.0	0.0	0.0	0.00	0.00	502.1	0.0	0.00
24	2623.5	0.0	0.0	0.0	0.00	0.00	524.7	0.0	0.00
25	2735.0	0.0	0.0	0.0	0.00	0.00	547.0	0.0	0.00
26	2845.0	0.0	0.0	0.0	0.00	0.00	569.0	0.0	0.00
27	2953.6	0.0	0.0	0.0	0.00	0.00	590.7	0.0	0.00
28	3060.6	0.0	0.0	0.0	0.00	0.00	612.1	0.0	0.00
29	1830.5	0.0	0.0	0.0	0.00	0.00	366.1	0.0	0.00
30	1342.2	0.0	0.0	0.0	0.00	0.00	268.4	0.0	0.00
31	3339.3	0.0	0.0	0.0	0.00	0.00	667.9	0.0	0.00
32	3516.8	0.0	0.0	0.0	0.00	0.00	703.4	0.0	0.00
33	3692.3	0.0	0.0	0.0	0.00	0.00	738.5	0.0	0.00
34	3865.9	0.0	0.0	0.0	0.00	0.00	773.2	0.0	0.00
35	3485.2	0.0	0.0	0.0	0.00	0.00	697.0	0.0	0.00
36	551.0	0.0	0.0	0.0	0.00	0.00	110.2	0.0	0.00
37	4118.4	0.0	0.0	0.0	0.00	0.00	823.7	0.0	0.00
38	4146.6	0.0	0.0	0.0	0.00	0.00	829.3	0.0	0.00
39	4173.3	0.0	0.0	0.0	0.00	0.00	834.7	0.0	0.00
40	4198.7	0.0	0.0	0.0	0.00	0.00	839.7	0.0	0.00
41	4222.7	0.0	0.0	0.0	0.00	0.00	844.5	0.0	0.00
42	4245.3	0.0	0.0	0.0	0.00	0.00	849.1	0.0	0.00
43	4266.5	0.0	0.0	0.0	0.00	0.00	853.3	0.0	0.00
44	4286.2	0.0	0.0	0.0	0.00	0.00	857.2	0.0	0.00
45	4304.6	0.0	0.0	0.0	0.00	0.00	860.9	0.0	0.00
46	4321.6	0.0	0.0	0.0	0.00	0.00	864.3	0.0	0.00
47	4337.1	0.0	0.0	0.0	0.00	0.00	867.4	0.0	0.00
48	4351.3	0.0	0.0	0.0	0.00	0.00	870.3	0.0	0.00
49	4364.1	0.0	0.0	0.0	0.00	0.00	872.8	0.0	0.00
50	4375.4	0.0	0.0	0.0	0.00	0.00	875.1	0.0	0.00
51	4385.4	0.0	0.0	0.0	0.00	0.00	877.1	0.0	0.00
52	4069.9	0.0	0.0	0.0	0.00	0.00	814.0	0.0	0.00
53	324.0	0.0	0.0	0.0	0.00	0.00	64.8	0.0	0.00
54	4377.4	0.0	0.0	0.0	0.00	0.00	875.5	0.0	0.00
55	4342.2	0.0	0.0	0.0	0.00	0.00	868.4	0.0	0.00
56	4305.8	0.0	0.0	0.0	0.00	0.00	861.2	0.0	0.00
57	4268.5	0.0	0.0	0.0	0.00	0.00	853.7	0.0	0.00
58	4230.1	0.0	0.0	0.0	0.00	0.00	846.0	0.0	0.00

59	4190.8	0.0	0.0	0.0	0.00	0.00	838.2	0.0	0.00
60	4150.5	0.0	0.0	0.0	0.00	0.00	830.1	0.0	0.00
61	4109.3	0.0	0.0	0.0	0.00	0.00	821.9	0.0	0.00
62	4067.1	0.0	0.0	0.0	0.00	0.00	813.4	0.0	0.00
63	4024.0	0.0	0.0	0.0	0.00	0.00	804.8	0.0	0.00
64	3979.9	0.0	0.0	0.0	0.00	0.00	796.0	0.0	0.00
65	3935.0	0.0	0.0	0.0	0.00	0.00	787.0	0.0	0.00
66	3889.3	0.0	0.0	0.0	0.00	0.00	777.9	0.0	0.00
67	3842.6	0.0	0.0	0.0	0.00	0.00	768.5	0.0	0.00
68	3795.2	0.0	0.0	0.0	0.00	0.00	759.0	0.0	0.00
69	3746.9	0.0	0.0	0.0	0.00	0.00	749.4	0.0	0.00
70	3697.8	0.0	0.0	0.0	0.00	0.00	739.6	0.0	0.00
71	3648.0	0.0	0.0	0.0	0.00	0.00	729.6	0.0	0.00
72	3597.4	0.0	0.0	0.0	0.00	0.00	719.5	0.0	0.00
73	3546.0	0.0	0.0	0.0	0.00	0.00	709.2	0.0	0.00
74	3493.9	0.0	0.0	0.0	0.00	0.00	698.8	0.0	0.00
75	3441.2	0.0	0.0	0.0	0.00	0.00	688.2	0.0	0.00
76	3387.8	0.0	0.0	0.0	0.00	0.00	677.6	0.0	0.00
77	3333.7	0.0	0.0	0.0	0.00	0.00	666.7	0.0	0.00
78	3278.9	0.0	0.0	0.0	0.00	0.00	655.8	0.0	0.00
79	397.5	0.0	0.0	0.0	0.00	0.00	79.5	0.0	0.00
80	2823.8	0.0	0.0	0.0	0.00	0.00	564.8	0.0	0.00
81	3159.6	0.0	0.0	0.0	0.00	0.00	631.9	0.0	0.00
82	3097.3	0.0	0.0	0.0	0.00	0.00	619.5	0.0	0.00
83	3034.6	0.0	0.0	0.0	0.00	0.00	606.9	0.0	0.00
84	2971.4	0.0	0.0	0.0	0.00	0.00	594.3	0.0	0.00
85	2907.9	0.0	0.0	0.0	0.00	0.00	581.6	0.0	0.00
86	2843.9	0.0	0.0	0.0	0.00	0.00	568.8	0.0	0.00
87	2779.6	0.0	0.0	0.0	0.00	0.00	555.9	0.0	0.00
88	2714.9	0.0	0.0	0.0	0.00	0.00	543.0	0.0	0.00
89	2649.9	0.0	0.0	0.0	0.00	0.00	530.0	0.0	0.00
90	2584.6	0.0	0.0	0.0	0.00	0.00	516.9	0.0	0.00
91	2519.0	0.0	0.0	0.0	0.00	0.00	503.8	0.0	0.00
92	2453.2	0.0	0.0	0.0	0.00	0.00	490.6	0.0	0.00
93	2387.2	0.0	0.0	0.0	0.00	0.00	477.4	0.0	0.00
94	2321.0	0.0	0.0	0.0	0.00	0.00	464.2	0.0	0.00
95	2254.7	0.0	0.0	0.0	0.00	0.00	450.9	0.0	0.00
96	2188.2	0.0	0.0	0.0	0.00	0.00	437.6	0.0	0.00
97	2121.5	0.0	0.0	0.0	0.00	0.00	424.3	0.0	0.00
98	2054.8	0.0	0.0	0.0	0.00	0.00	411.0	0.0	0.00
99	1988.0	0.0	0.0	0.0	0.00	0.00	397.6	0.0	0.00
100	1921.2	0.0	0.0	0.0	0.00	0.00	384.2	0.0	0.00
101	1854.4	0.0	0.0	0.0	0.00	0.00	370.9	0.0	0.00
102	1787.6	0.0	0.0	0.0	0.00	0.00	357.5	0.0	0.00
103	1720.8	0.0	0.0	0.0	0.00	0.00	344.2	0.0	0.00
104	1654.1	0.0	0.0	0.0	0.00	0.00	330.8	0.0	0.00
105	1587.5	0.0	0.0	0.0	0.00	0.00	317.5	0.0	0.00
106	1521.0	0.0	0.0	0.0	0.00	0.00	304.2	0.0	0.00
107	1454.7	0.0	0.0	0.0	0.00	0.00	290.9	0.0	0.00
108	1388.6	0.0	0.0	0.0	0.00	0.00	277.7	0.0	0.00
109	1322.6	0.0	0.0	0.0	0.00	0.00	264.5	0.0	0.00
110	1256.9	0.0	0.0	0.0	0.00	0.00	251.4	0.0	0.00
111	1191.4	0.0	0.0	0.0	0.00	0.00	238.3	0.0	0.00
112	1126.2	0.0	0.0	0.0	0.00	0.00	225.2	0.0	0.00
113	1061.4	0.0	0.0	0.0	0.00	0.00	212.3	0.0	0.00
114	996.8	0.0	0.0	0.0	0.00	0.00	199.4	0.0	0.00
115	932.7	0.0	0.0	0.0	0.00	0.00	186.5	0.0	0.00
116	868.9	0.0	0.0	0.0	0.00	0.00	173.8	0.0	0.00
117	805.5	0.0	0.0	0.0	0.00	0.00	161.1	0.0	0.00
118	742.6	0.0	0.0	0.0	0.00	0.00	148.5	0.0	0.00
119	680.1	0.0	0.0	0.0	0.00	0.00	136.0	0.0	0.00
120	54.7	0.0	0.0	0.0	0.00	0.00	10.9	0.0	0.00
121	563.5	0.0	0.0	0.0	0.00	0.00	112.7	0.0	0.00
122	556.8	0.0	0.0	0.0	0.00	0.00	111.4	0.0	0.00
123	496.0	0.0	0.0	0.0	0.00	0.00	99.2	0.0	0.00
124	435.7	0.0	0.0	0.0	0.00	0.00	87.1	0.0	0.00
125	376.0	0.0	0.0	0.0	0.00	0.00	75.2	0.0	0.00
126	317.0	0.0	0.0	0.0	0.00	0.00	63.4	0.0	0.00
127	258.6	0.0	0.0	0.0	0.00	0.00	51.7	0.0	0.00
128	200.9	0.0	0.0	0.0	0.00	0.00	40.2	0.0	0.00
129	143.9	0.0	0.0	0.0	0.00	0.00	28.8	0.0	0.00
130	87.7	0.0	0.0	0.0	0.00	0.00	17.5	0.0	0.00

131	32.2	0.0	0.0	0.0	0.00	0.00	6.4	0.0	0.00
132	0.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 309732.50(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 309732.50(lbs)

TOTAL AREA OF SLIDING MASS = 2581.10(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 132 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	461.00	24.00	
2	1	461.00	24.00	
3	1	461.00	24.00	
4	1	461.00	24.00	
5	1	461.00	24.00	
6	1	461.00	24.00	
7	1	461.00	24.00	
8	1	461.00	24.00	
9	1	461.00	24.00	
10	1	461.00	24.00	
11	1	461.00	24.00	
12	1	461.00	24.00	
13	1	461.00	24.00	
14	1	461.00	24.00	
15	1	461.00	24.00	
16	1	461.00	24.00	
17	1	461.00	24.00	
18	1	461.00	24.00	
19	1	461.00	24.00	
20	1	461.00	24.00	
21	1	461.00	24.00	
22	1	461.00	24.00	
23	1	461.00	24.00	
24	1	461.00	24.00	
25	1	461.00	24.00	
26	1	461.00	24.00	
27	1	461.00	24.00	
28	1	461.00	24.00	
29	1	461.00	24.00	
30	1	461.00	24.00	
31	1	461.00	24.00	
32	1	461.00	24.00	
33	1	461.00	24.00	
34	1	461.00	24.00	
35	1	461.00	24.00	
36	1	461.00	24.00	
37	1	461.00	24.00	
38	1	461.00	24.00	
39	1	461.00	24.00	
40	1	461.00	24.00	
41	1	461.00	24.00	
42	1	461.00	24.00	
43	1	461.00	24.00	
44	1	461.00	24.00	
45	1	461.00	24.00	
46	1	461.00	24.00	
47	1	461.00	24.00	
48	1	461.00	24.00	
49	1	461.00	24.00	
50	1	461.00	24.00	
51	1	461.00	24.00	
52	1	461.00	24.00	
53	1	461.00	24.00	
54	1	461.00	24.00	
55	1	461.00	24.00	
56	1	461.00	24.00	
57	1	461.00	24.00	

58	1	461.00	24.00
59	1	461.00	24.00
60	1	461.00	24.00
61	1	461.00	24.00
62	1	461.00	24.00
63	1	461.00	24.00
64	1	461.00	24.00
65	1	461.00	24.00
66	1	461.00	24.00
67	1	461.00	24.00
68	1	461.00	24.00
69	1	461.00	24.00
70	1	461.00	24.00
71	1	461.00	24.00
72	1	461.00	24.00
73	1	461.00	24.00
74	1	461.00	24.00
75	1	461.00	24.00
76	1	461.00	24.00
77	1	461.00	24.00
78	1	461.00	24.00
79	1	461.00	24.00
80	1	461.00	24.00
81	1	461.00	24.00
82	1	461.00	24.00
83	1	461.00	24.00
84	1	461.00	24.00
85	1	461.00	24.00
86	1	461.00	24.00
87	1	461.00	24.00
88	1	461.00	24.00
89	1	461.00	24.00
90	1	461.00	24.00
91	1	461.00	24.00
92	1	461.00	24.00
93	1	461.00	24.00
94	1	461.00	24.00
95	1	461.00	24.00
96	1	461.00	24.00
97	1	461.00	24.00
98	1	461.00	24.00
99	1	461.00	24.00
100	1	461.00	24.00
101	1	461.00	24.00
102	1	461.00	24.00
103	1	461.00	24.00
104	1	461.00	24.00
105	1	461.00	24.00
106	1	461.00	24.00
107	1	461.00	24.00
108	1	461.00	24.00
109	1	461.00	24.00
110	1	461.00	24.00
111	1	461.00	24.00
112	1	461.00	24.00
113	1	461.00	24.00
114	1	461.00	24.00
115	1	461.00	24.00
116	1	461.00	24.00
117	1	461.00	24.00
118	1	461.00	24.00
119	1	461.00	24.00
120	1	461.00	24.00
121	1	461.00	24.00
122	1	461.00	24.00
123	1	461.00	24.00
124	1	461.00	24.00
125	1	461.00	24.00
126	1	461.00	24.00
127	1	461.00	24.00
128	1	461.00	24.00
129	1	461.00	24.00

130	1	461.00	24.00
131	1	461.00	24.00
132	1	461.00	24.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 132 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-3.37	143.80	1.00	32.16	475.32	431.82
2	-2.91	144.65	0.70	38.97	478.35	434.57
3	-2.91	145.15	0.30	63.96	489.48	444.68
4	-2.46	145.80	1.00	149.97	527.77	479.47
5	-2.00	146.80	1.00	282.79	586.90	533.19
6	-1.55	147.80	1.00	413.80	645.23	586.18
7	-1.09	148.80	1.00	543.00	702.76	638.45
8	-0.64	149.80	1.00	670.42	759.49	689.99
9	-0.18	150.80	1.00	796.06	815.43	740.80
10	0.28	151.80	1.00	919.92	870.58	790.90
11	0.73	152.80	1.00	1042.02	924.94	840.29
12	1.19	153.80	1.00	1162.36	978.52	888.97
13	1.64	154.80	1.00	1280.96	1031.32	936.94
14	2.10	155.80	1.00	1397.81	1083.34	984.20
15	2.55	156.80	1.00	1512.93	1134.60	1030.76
16	3.01	157.80	1.00	1626.32	1185.08	1076.63
17	3.47	158.79	1.00	1737.99	1234.80	1121.80
18	3.92	159.79	1.00	1847.95	1283.76	1166.28
19	4.38	160.79	1.00	1956.20	1331.96	1210.06
20	4.83	161.79	1.00	2062.76	1379.40	1253.16
21	5.29	162.78	1.00	2167.62	1426.09	1295.58
22	5.74	163.78	1.00	2270.80	1472.02	1337.31
23	6.20	164.77	1.00	2372.29	1517.21	1378.36
24	6.66	165.77	1.00	2472.11	1561.66	1418.74
25	7.11	166.76	1.00	2570.26	1605.36	1458.44
26	7.57	167.75	1.00	2666.75	1648.31	1497.47
27	8.02	168.74	1.00	2761.58	1690.54	1535.83
28	8.48	169.73	1.00	2854.76	1732.02	1573.51
29	8.93	170.51	0.58	2924.72	1763.17	1601.81
30	8.93	171.01	0.42	2991.38	1792.85	1628.77
31	9.39	171.71	1.00	3101.86	1842.04	1673.46
32	9.85	172.69	1.00	3261.17	1912.97	1737.90
33	10.30	173.68	1.00	3418.30	1982.92	1801.45
34	10.76	174.66	1.00	3573.25	2051.91	1864.13
35	11.21	175.58	0.87	3714.84	2114.95	1921.40
36	11.21	176.07	0.13	3789.33	2148.12	1951.53
37	11.67	176.62	1.00	3793.20	2149.84	1953.10
38	12.12	177.60	1.00	3810.92	2157.73	1960.26
39	12.58	178.58	1.00	3827.52	2165.12	1966.98
40	13.04	179.55	1.00	3843.02	2172.02	1973.25
41	13.49	180.53	1.00	3857.42	2178.43	1979.07
42	13.95	181.50	1.00	3870.72	2184.35	1984.45
43	14.40	182.47	1.00	3882.93	2189.79	1989.39
44	14.86	183.43	1.00	3894.05	2194.74	1993.89
45	15.31	184.40	1.00	3904.10	2199.22	1997.96
46	15.77	185.36	1.00	3913.08	2203.21	2001.59
47	16.23	186.32	1.00	3920.99	2206.74	2004.79
48	16.68	187.28	1.00	3927.84	2209.79	2007.56

49	17.14	188.24	1.00	3933.63	2212.36	2009.90
50	17.59	189.19	1.00	3938.37	2214.48	2011.82
51	18.05	190.15	1.00	3942.07	2216.12	2013.31
52	18.50	191.06	0.93	3944.07	2217.01	2014.12
53	18.50	191.53	0.07	3951.72	2220.42	2017.22
54	18.96	192.04	1.00	3924.41	2208.26	2006.17
55	19.42	192.99	1.00	3886.99	2191.60	1991.03
56	19.87	193.93	1.00	3848.90	2174.64	1975.63
57	20.33	194.87	1.00	3810.15	2157.39	1959.95
58	20.78	195.80	1.00	3770.75	2139.85	1944.02
59	21.24	196.74	1.00	3730.70	2122.02	1927.82
60	21.70	197.67	1.00	3690.02	2103.90	1911.36
61	22.15	198.60	1.00	3648.70	2085.51	1894.65
62	22.61	199.52	1.00	3606.76	2066.83	1877.69
63	23.06	200.44	1.00	3564.21	2047.89	1860.47
64	23.52	201.36	1.00	3521.04	2028.67	1843.01
65	23.97	202.28	1.00	3477.28	2009.18	1825.31
66	24.43	203.19	1.00	3432.92	1989.43	1807.37
67	24.89	204.10	1.00	3387.98	1969.43	1789.19
68	25.34	205.00	1.00	3342.46	1949.16	1770.78
69	25.80	205.90	1.00	3296.37	1928.64	1752.14
70	26.25	206.80	1.00	3249.72	1907.87	1733.27
71	26.71	207.70	1.00	3202.52	1886.85	1714.18
72	27.16	208.59	1.00	3154.78	1865.60	1694.87
73	27.62	209.48	1.00	3106.50	1844.10	1675.34
74	28.08	210.36	1.00	3057.69	1822.37	1655.59
75	28.53	211.24	1.00	3008.36	1800.41	1635.64
76	28.99	212.12	1.00	2958.52	1778.22	1615.48
77	29.44	212.99	1.00	2908.18	1755.81	1595.12
78	29.90	213.86	1.00	2857.35	1733.17	1574.56
79	30.35	214.35	0.12	2822.66	1717.73	1560.53
80	30.35	214.78	0.88	2801.29	1708.22	1551.89
81	30.81	215.59	1.00	2746.70	1683.91	1529.80
82	31.27	216.44	1.00	2689.04	1658.24	1506.48
83	31.72	217.30	1.00	2630.99	1632.39	1483.00
84	32.18	218.14	1.00	2572.55	1606.37	1459.37
85	32.63	218.99	1.00	2513.75	1580.19	1435.58
86	33.09	219.83	1.00	2454.58	1553.85	1411.65
87	33.54	220.66	1.00	2395.06	1527.35	1387.57
88	34.00	221.50	1.00	2335.20	1500.70	1363.36
89	34.46	222.32	1.00	2275.01	1473.90	1339.01
90	34.91	223.14	1.00	2214.50	1446.96	1314.54
91	35.37	223.96	1.00	2153.67	1419.87	1289.93
92	35.82	224.78	1.00	2092.54	1392.66	1265.21
93	36.28	225.58	1.00	2031.12	1365.31	1240.37
94	36.73	226.39	1.00	1969.43	1337.84	1215.41
95	37.19	227.19	1.00	1907.46	1310.26	1190.35
96	37.65	227.98	1.00	1845.23	1282.55	1165.18
97	38.10	228.77	1.00	1782.76	1254.74	1139.91
98	38.56	229.56	1.00	1720.06	1226.82	1114.55
99	39.01	230.33	1.00	1657.13	1198.80	1089.09
100	39.47	231.11	1.00	1593.99	1170.69	1063.55
101	39.92	231.88	1.00	1530.64	1142.49	1037.93
102	40.38	232.64	1.00	1467.11	1114.20	1012.23
103	40.84	233.40	1.00	1403.41	1085.84	986.47
104	41.29	234.16	1.00	1339.54	1057.40	960.63
105	41.75	234.90	1.00	1275.51	1028.89	934.73
106	42.20	235.65	1.00	1211.35	1000.33	908.78
107	42.66	236.39	1.00	1147.06	971.71	882.78
108	43.11	237.12	1.00	1082.66	943.03	856.73
109	43.57	237.85	1.00	1018.16	914.32	830.64
110	44.03	238.57	1.00	953.58	885.56	804.52
111	44.48	239.28	1.00	888.92	856.77	778.36
112	44.94	240.00	1.00	824.20	827.96	752.18
113	45.39	240.70	1.00	759.43	799.12	725.99
114	45.85	241.40	1.00	694.64	770.27	699.78
115	46.30	242.09	1.00	629.83	741.42	673.57
116	46.76	242.78	1.00	565.01	712.56	647.35
117	47.22	243.46	1.00	500.21	683.71	621.14
118	47.67	244.14	1.00	435.44	654.87	594.94
119	48.13	244.81	1.00	370.72	626.05	568.76
120	48.58	245.17	0.08	332.48	609.03	553.29

121	48.58	245.50	0.92	303.61	596.18	541.62
122	49.04	246.13	1.00	241.50	568.52	516.49
123	49.49	246.79	1.00	177.03	539.82	490.42
124	49.95	247.43	1.00	112.67	511.17	464.39
125	50.41	248.07	1.00	48.44	482.57	438.40
126	50.86	248.71	1.00	0.00	461.00	418.81
127	51.32	249.33	1.00	0.00	461.00	418.81
128	51.77	249.96	1.00	0.00	461.00	418.81
129	52.23	250.57	1.00	0.00	461.00	418.81
130	52.68	251.18	1.00	0.00	461.00	418.81
131	53.14	251.78	1.00	0.00	461.00	418.81
132	53.60	252.11	0.09	0.00	461.00	418.81

Table 4A - Base Force Data on the 132 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-3.37	143.80	1.00	32.16	475.32	431.82
2	-2.91	144.65	0.70	27.25	334.52	303.91
3	-2.91	145.15	0.30	19.23	147.17	133.70
4	-2.46	145.80	1.00	149.97	527.77	479.47
5	-2.00	146.80	1.00	282.79	586.90	533.19
6	-1.55	147.80	1.00	413.80	645.23	586.18
7	-1.09	148.80	1.00	543.00	702.76	638.45
8	-0.64	149.80	1.00	670.42	759.49	689.99
9	-0.18	150.80	1.00	796.06	815.43	740.80
10	0.28	151.80	1.00	919.92	870.58	790.90
11	0.73	152.80	1.00	1042.02	924.94	840.29
12	1.19	153.80	1.00	1162.36	978.52	888.97
13	1.64	154.80	1.00	1280.96	1031.32	936.94
14	2.10	155.80	1.00	1397.81	1083.34	984.20
15	2.55	156.80	1.00	1512.93	1134.60	1030.76
16	3.01	157.80	1.00	1626.32	1185.08	1076.63
17	3.47	158.79	1.00	1737.99	1234.80	1121.80
18	3.92	159.79	1.00	1847.95	1283.76	1166.28
19	4.38	160.79	1.00	1956.20	1331.96	1210.06
20	4.83	161.79	1.00	2062.76	1379.40	1253.16
21	5.29	162.78	1.00	2167.62	1426.09	1295.58
22	5.74	163.78	1.00	2270.80	1472.02	1337.31
23	6.20	164.77	1.00	2372.29	1517.21	1378.36
24	6.66	165.77	1.00	2472.11	1561.66	1418.74
25	7.11	166.76	1.00	2570.26	1605.36	1458.44
26	7.57	167.75	1.00	2666.75	1648.31	1497.47
27	8.02	168.74	1.00	2761.58	1690.54	1535.83
28	8.48	169.73	1.00	2854.76	1732.02	1573.51
29	8.93	170.51	0.58	1703.16	1026.75	932.79
30	8.93	171.01	0.42	1249.40	748.81	680.29
31	9.39	171.71	1.00	3101.86	1842.04	1673.46
32	9.85	172.69	1.00	3261.17	1912.97	1737.90
33	10.30	173.68	1.00	3418.30	1982.92	1801.45
34	10.76	174.66	1.00	3573.25	2051.91	1864.13
35	11.21	175.58	0.87	3216.14	1831.03	1663.46
36	11.21	176.07	0.13	508.70	288.37	261.98
37	11.67	176.62	1.00	3793.20	2149.84	1953.10
38	12.12	177.60	1.00	3810.92	2157.73	1960.26
39	12.58	178.58	1.00	3827.52	2165.12	1966.98
40	13.04	179.55	1.00	3843.02	2172.02	1973.25
41	13.49	180.53	1.00	3857.42	2178.43	1979.07
42	13.95	181.50	1.00	3870.72	2184.35	1984.45
43	14.40	182.47	1.00	3882.93	2189.79	1989.39
44	14.86	183.43	1.00	3894.05	2194.74	1993.89
45	15.31	184.40	1.00	3904.10	2199.22	1997.96
46	15.77	185.36	1.00	3913.08	2203.21	2001.59
47	16.23	186.32	1.00	3920.99	2206.74	2004.79
48	16.68	187.28	1.00	3927.84	2209.79	2007.56
49	17.14	188.24	1.00	3933.63	2212.36	2009.90
50	17.59	189.19	1.00	3938.37	2214.48	2011.82

51	18.05	190.15	1.00	3942.07	2216.12	2013.31
52	18.50	191.06	0.93	3653.77	2053.83	1865.87
53	18.50	191.53	0.07	290.87	163.43	148.48
54	18.96	192.04	1.00	3924.41	2208.26	2006.17
55	19.42	192.99	1.00	3886.99	2191.60	1991.03
56	19.87	193.93	1.00	3848.90	2174.64	1975.63
57	20.33	194.87	1.00	3810.15	2157.39	1959.95
58	20.78	195.80	1.00	3770.75	2139.85	1944.02
59	21.24	196.74	1.00	3730.70	2122.02	1927.82
60	21.70	197.67	1.00	3690.02	2103.90	1911.36
61	22.15	198.60	1.00	3648.70	2085.51	1894.65
62	22.61	199.52	1.00	3606.76	2066.83	1877.69
63	23.06	200.44	1.00	3564.21	2047.89	1860.47
64	23.52	201.36	1.00	3521.04	2028.67	1843.01
65	23.97	202.28	1.00	3477.28	2009.18	1825.31
66	24.43	203.19	1.00	3432.92	1989.43	1807.37
67	24.89	204.10	1.00	3387.98	1969.43	1789.19
68	25.34	205.00	1.00	3342.46	1949.16	1770.78
69	25.80	205.90	1.00	3296.37	1928.64	1752.14
70	26.25	206.80	1.00	3249.72	1907.87	1733.27
71	26.71	207.70	1.00	3202.52	1886.85	1714.18
72	27.16	208.59	1.00	3154.78	1865.60	1694.87
73	27.62	209.48	1.00	3106.50	1844.10	1675.34
74	28.08	210.36	1.00	3057.69	1822.37	1655.59
75	28.53	211.24	1.00	3008.36	1800.41	1635.64
76	28.99	212.12	1.00	2958.52	1778.22	1615.48
77	29.44	212.99	1.00	2908.18	1755.81	1595.12
78	29.90	213.86	1.00	2857.35	1733.17	1574.56
79	30.35	214.35	0.12	346.14	210.64	191.37
80	30.35	214.78	0.88	2457.78	1498.74	1361.58
81	30.81	215.59	1.00	2746.70	1683.91	1529.80
82	31.27	216.44	1.00	2689.04	1658.24	1506.48
83	31.72	217.30	1.00	2630.99	1632.39	1483.00
84	32.18	218.14	1.00	2572.55	1606.37	1459.37
85	32.63	218.99	1.00	2513.75	1580.19	1435.58
86	33.09	219.83	1.00	2454.58	1553.85	1411.65
87	33.54	220.66	1.00	2395.06	1527.35	1387.57
88	34.00	221.50	1.00	2335.20	1500.70	1363.36
89	34.46	222.32	1.00	2275.01	1473.90	1339.01
90	34.91	223.14	1.00	2214.50	1446.96	1314.54
91	35.37	223.96	1.00	2153.67	1419.87	1289.93
92	35.82	224.78	1.00	2092.54	1392.66	1265.21
93	36.28	225.58	1.00	2031.12	1365.31	1240.37
94	36.73	226.39	1.00	1969.43	1337.84	1215.41
95	37.19	227.19	1.00	1907.46	1310.26	1190.35
96	37.65	227.98	1.00	1845.23	1282.55	1165.18
97	38.10	228.77	1.00	1782.76	1254.74	1139.91
98	38.56	229.56	1.00	1720.06	1226.82	1114.55
99	39.01	230.33	1.00	1657.13	1198.80	1089.09
100	39.47	231.11	1.00	1593.99	1170.69	1063.55
101	39.92	231.88	1.00	1530.64	1142.49	1037.93
102	40.38	232.64	1.00	1467.11	1114.20	1012.23
103	40.84	233.40	1.00	1403.41	1085.84	986.47
104	41.29	234.16	1.00	1339.54	1057.40	960.63
105	41.75	234.90	1.00	1275.51	1028.89	934.73
106	42.20	235.65	1.00	1211.35	1000.33	908.78
107	42.66	236.39	1.00	1147.06	971.71	882.78
108	43.11	237.12	1.00	1082.66	943.03	856.73
109	43.57	237.85	1.00	1018.16	914.32	830.64
110	44.03	238.57	1.00	953.58	885.56	804.52
111	44.48	239.28	1.00	888.92	856.77	778.36
112	44.94	240.00	1.00	824.20	827.96	752.18
113	45.39	240.70	1.00	759.43	799.12	725.99
114	45.85	241.40	1.00	694.64	770.27	699.78
115	46.30	242.09	1.00	629.83	741.42	673.57
116	46.76	242.78	1.00	565.01	712.56	647.35
117	47.22	243.46	1.00	500.21	683.71	621.14
118	47.67	244.14	1.00	435.44	654.87	594.94
119	48.13	244.81	1.00	370.72	626.05	568.76
120	48.58	245.17	0.08	28.24	51.72	46.99
121	48.58	245.50	0.92	277.83	545.55	495.62
122	49.04	246.13	1.00	241.50	568.52	516.49

123	49.49	246.79	1.00	177.03	539.82	490.42
124	49.95	247.43	1.00	112.67	511.17	464.39
125	50.41	248.07	1.00	48.44	482.57	438.40
126	50.86	248.71	1.00	0.00	461.00	418.81
127	51.32	249.33	1.00	0.00	461.00	418.81
128	51.77	249.96	1.00	0.00	461.00	418.81
129	52.23	250.57	1.00	0.00	461.00	418.81
130	52.68	251.18	1.00	0.00	461.00	418.81
131	53.14	251.78	1.00	0.00	461.00	418.81
132	53.60	252.11	0.09	0.00	39.94	36.29

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 33.293
3D Depth (Vertical difference between ends of Slip Surface) = 50.53(ft)
L/D(1): L = 50.53(ft) L/D(2): L = 101.06(ft) L/D(3): L = 151.59(ft)
L/D(4): L = 202.12(ft) L/D(5): L = 252.65(ft) L/D(6): L = 303.18(ft)

SUM OF MOMENTS = 0.526432E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.1699635E-05

Sum of the Resisting Forces = 179063.50 (lbs)

Average Available Shear Strength = 1431.52(psf)

Average Effective Normal Stress = 2179.81(psf)

Sum of the Driving Forces = 162676.36 (lbs)

Average Mobilized Shear Stress = 1300.51(psf)

Total length of the failure surface = 125.09(ft)

Factor of Safety Balance Check: FS = 1.10073

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

*** SEISMIC SLOPE DISPLACEMENT DATA ***
(Note: kv is set = zero for displacement calculations)
Seismic Yield Coefficient (ky) = 0.24171(g)
Calculated Newmark Seismic Displacement = 0.425(ft)

Average Elevation of Point of Application of kh on Sliding Mass = 129.462(ft)

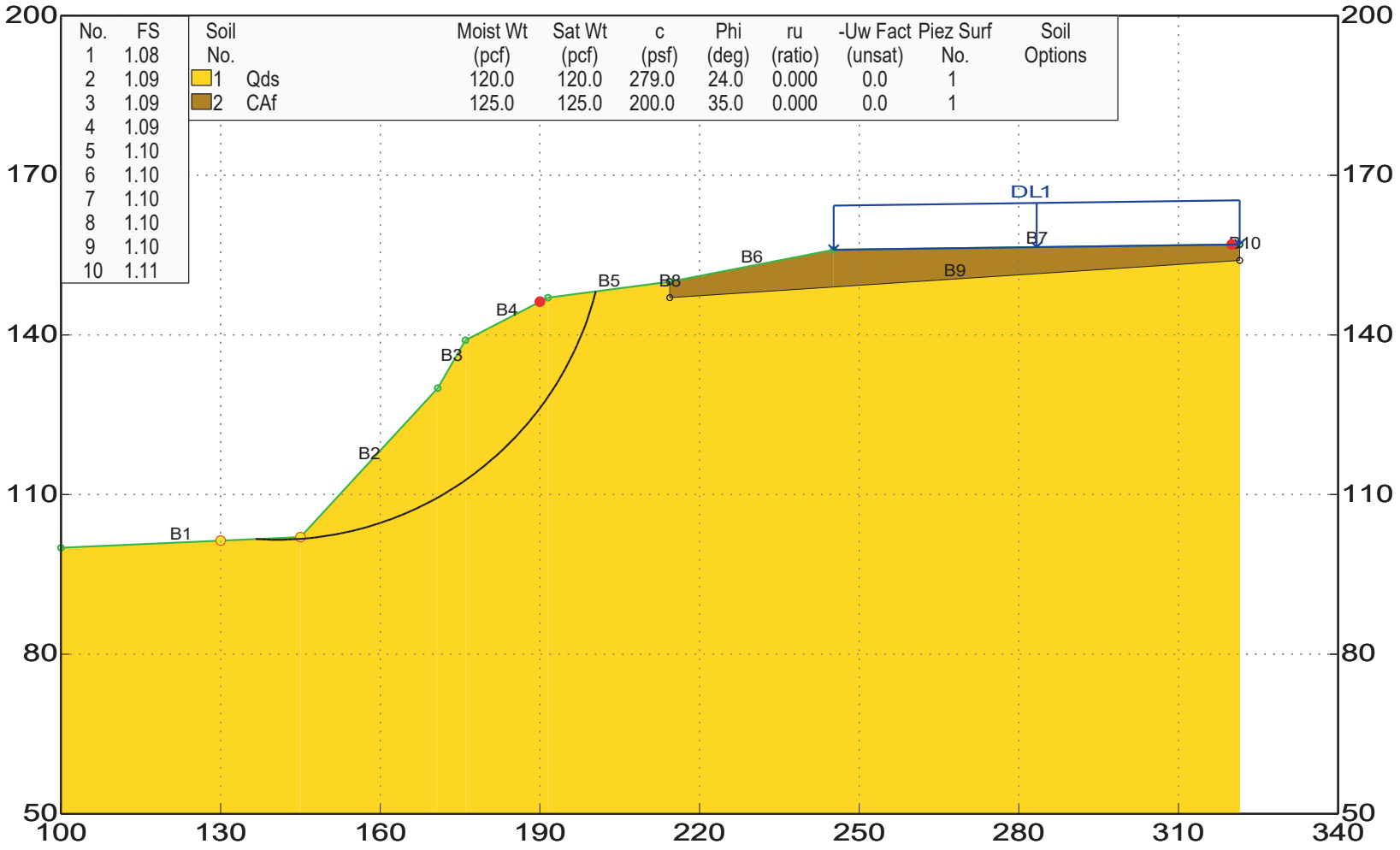
Non-Symmetrical Sliding Resistance Has Been Specified
for Downhill Sliding.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section BB - Proposed - Static

EGL

\BB101.gsd



GEOSTASE FS = 1.08

Simplified Bishop Method

GEOSTASE Slope Stability Analysis

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB101.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB101.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section BB - Proposed - Static

PROFILE BOUNDARY DATA

7 Surface Boundaries
10 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	145.000	102.000	1
2	145.000	102.000	170.800	130.000	1
3	170.800	130.000	176.000	139.000	1
4	176.000	139.000	191.500	147.000	1
5	191.500	147.000	214.400	150.000	1
6	214.400	150.000	245.200	156.000	2
7	245.200	156.000	321.500	157.000	2
8	214.400	150.000	214.400	147.000	1
9	214.400	147.000	321.500	154.000	1
10	321.500	154.000	321.500	157.000	1

User Specified X-Origin = 100.000(ft)

User Specified Y-Origin = 50.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	145.000	102.000
3	170.800	130.000
4	176.000	139.000
5	191.500	147.000
6	214.400	150.000

7	245.200	156.000
8	321.500	157.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
Surface boundary point 6 and Subsurface boundary point 9 are duplicate points.		
9	214.400	150.000
10	214.400	147.000
11	321.500	154.000
12	321.500	157.000

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.044	2.545
2	1.085	47.342
3	1.731	59.982
4	0.516	27.300
5	0.131	7.463
6	0.195	11.023
7	0.013	0.751
8	Vertical	Vertical
9	0.065	3.740
10	Vertical	Vertical

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	279.00	24.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load No.	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	Deflection (deg from Vert)
1	7	245.200	156.000	1000.000	321.500	157.000	1000.000	0.00

NOTE - Load Stress Varies Linearly Within Specified Range.
For Multi-Stage Analysis, Refer to Detailed Output for Distributed Loads Applied to Each Stage.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.1802(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 130.00(ft)
and X = 145.00(ft)

Each Surface ends within a Range Between X = 190.00(ft)
and X = 320.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 50.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 3.063 FS Min = 1.078 FS Ave = 2.060
Standard Deviation = 0.486 Coefficient of Variation = 23.60 %

Critical Surface is Sequence Number 442 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 140.492516(ft) ; Y = 163.406123(ft); and Radius = 61.899647(ft)

Circular Trial Failure Surface Generated With 87 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	136.62162	101.62763
2	137.62014	101.57316
3	138.61940	101.53482
4	139.61916	101.51264
5	140.61914	101.50661
6	141.61909	101.51673
7	142.61874	101.54300
8	143.61784	101.58543
9	144.61613	101.64398
10	145.61333	101.71866
11	146.60920	101.80943
12	147.60348	101.91628
13	148.59590	102.03918
14	149.58620	102.17810
15	150.57413	102.33299
16	151.55943	102.50383
17	152.54184	102.69056
18	153.52111	102.89313
19	154.49698	103.11150
20	155.46919	103.34561
21	156.43749	103.59539
22	157.40163	103.86078
23	158.36136	104.14171
24	159.31642	104.43811
25	160.26658	104.74990
26	161.21157	105.07699
27	162.15115	105.41932
28	163.08508	105.77677
29	164.01311	106.14927
30	164.93501	106.53670
31	165.85053	106.93899
32	166.75942	107.35600
33	167.66147	107.78765
34	168.55642	108.23381
35	169.44405	108.69438
36	170.32412	109.16922
37	171.19640	109.65821

38	172.06067	110.16124
39	172.91671	110.67816
40	173.76428	111.20884
41	174.60317	111.75315
42	175.43315	112.31093
43	176.25402	112.88206
44	177.06555	113.46636
45	177.86753	114.06370
46	178.65977	114.67392
47	179.44204	115.29686
48	180.21414	115.93236
49	180.97588	116.58024
50	181.72706	117.24035
51	182.46747	117.91250
52	183.19692	118.59653
53	183.91523	119.29225
54	184.62221	119.99949
55	185.31767	120.71805
56	186.00143	121.44776
57	186.67332	122.18841
58	187.33315	122.93982
59	187.98076	123.70180
60	188.61597	124.47414
61	189.23862	125.25664
62	189.84855	126.04909
63	190.44560	126.85129
64	191.02961	127.66304
65	191.60044	128.48411
66	192.15792	129.31430
67	192.70192	130.15339
68	193.23229	131.00115
69	193.74890	131.85737
70	194.25161	132.72183
71	194.74029	133.59429
72	195.21481	134.47454
73	195.67505	135.36233
74	196.12089	136.25745
75	196.55220	137.15965
76	196.96889	138.06870
77	197.37084	138.98436
78	197.75794	139.90639
79	198.13010	140.83456
80	198.48721	141.76862
81	198.82919	142.70833
82	199.15595	143.65344
83	199.46739	144.60371
84	199.76344	145.55888
85	200.04402	146.51871
86	200.30906	147.48295
87	200.48794	148.17746

Factor Of Safety For The Critical or Specified Surface = 1.078

Table 1 - Geometry Data on the 90 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.05	137.12	101.60	101.65	-3.12	2.54	1.00
2	1.00	0.14	138.12	101.55	101.69	-2.20	2.54	1.00
3	1.00	0.21	139.12	101.52	101.74	-1.27	2.54	1.00
4	1.00	0.27	140.12	101.51	101.78	-0.35	2.54	1.00
5	1.00	0.32	141.12	101.51	101.83	0.58	2.54	1.00
6	1.00	0.34	142.12	101.53	101.87	1.51	2.54	1.00
7	1.00	0.35	143.12	101.56	101.92	2.43	2.54	1.00
8	1.00	0.35	144.12	101.61	101.96	3.36	2.54	1.00
9	0.38	0.33	144.81	101.66	101.99	4.28	2.54	0.38

10	0.61	0.64	145.31	101.70	102.33	4.28	47.34	0.62
11	1.00	1.44	146.11	101.76	103.21	5.21	47.34	1.00
12	0.99	2.42	147.11	101.86	104.29	6.13	47.34	1.00
13	0.99	3.39	148.10	101.98	105.36	7.06	47.34	1.00
14	0.99	4.33	149.09	102.11	106.44	7.99	47.34	1.00
15	0.99	5.26	150.08	102.26	107.51	8.91	47.34	1.00
16	0.99	6.17	151.07	102.42	108.58	9.84	47.34	1.00
17	0.98	7.05	152.05	102.60	109.65	10.76	47.34	1.00
18	0.98	7.92	153.03	102.79	110.72	11.69	47.34	1.00
19	0.98	8.77	154.01	103.00	111.78	12.61	47.34	1.00
20	0.97	9.61	154.98	103.23	112.83	13.54	47.34	1.00
21	0.97	10.42	155.95	103.47	113.89	14.46	47.34	1.00
22	0.96	11.21	156.92	103.73	114.94	15.39	47.34	1.00
23	0.96	11.98	157.88	104.00	115.98	16.32	47.34	1.00
24	0.96	12.73	158.84	104.29	117.02	17.24	47.34	1.00
25	0.95	13.46	159.79	104.59	118.05	18.17	47.34	1.00
26	0.94	14.17	160.74	104.91	119.08	19.09	47.34	1.00
27	0.94	14.86	161.68	105.25	120.10	20.02	47.34	1.00
28	0.93	15.52	162.62	105.60	121.12	20.94	47.34	1.00
29	0.93	16.17	163.55	105.96	122.13	21.87	47.34	1.00
30	0.92	16.79	164.47	106.34	123.13	22.80	47.34	1.00
31	0.92	17.39	165.39	106.74	124.13	23.72	47.34	1.00
32	0.91	17.97	166.30	107.15	125.12	24.65	47.34	1.00
33	0.90	18.53	167.21	107.57	126.10	25.57	47.34	1.00
34	0.89	19.07	168.11	108.01	127.08	26.50	47.34	1.00
35	0.89	19.58	169.00	108.46	128.05	27.42	47.34	1.00
36	0.88	20.07	169.88	108.93	129.01	28.35	47.34	1.00
37	0.48	20.44	170.56	109.30	129.74	29.27	47.34	0.55
38	0.40	20.80	171.00	109.55	130.34	29.27	59.98	0.45
39	0.86	21.52	171.63	109.91	131.43	30.20	59.98	1.00
40	0.86	22.50	172.49	110.42	132.92	31.13	59.98	1.00
41	0.85	23.45	173.34	110.94	134.40	32.05	59.98	1.00
42	0.84	24.38	174.18	111.48	135.86	32.98	59.98	1.00
43	0.83	25.27	175.02	112.03	137.30	33.90	59.98	1.00
44	0.57	26.00	175.72	112.51	138.51	34.83	59.98	0.69
45	0.25	26.27	176.13	112.79	139.07	34.83	27.30	0.31
46	0.81	26.17	176.66	113.17	139.34	35.75	27.30	1.00
47	0.80	25.99	177.47	113.77	139.76	36.68	27.30	1.00
48	0.79	25.80	178.26	114.37	140.17	37.61	27.30	1.00
49	0.78	25.59	179.05	114.99	140.57	38.53	27.30	1.00
50	0.77	25.36	179.83	115.61	140.98	39.46	27.30	1.00
51	0.76	25.12	180.60	116.26	141.37	40.38	27.30	1.00
52	0.75	24.85	181.35	116.91	141.76	41.31	27.30	1.00
53	0.74	24.57	182.10	117.58	142.15	42.23	27.30	1.00
54	0.73	24.27	182.83	118.25	142.53	43.16	27.30	1.00
55	0.72	23.96	183.56	118.94	142.90	44.08	27.30	1.00
56	0.71	23.62	184.27	119.65	143.27	45.01	27.30	1.00
57	0.70	23.27	184.97	120.36	143.63	45.94	27.30	1.00
58	0.68	22.90	185.66	121.08	143.99	46.86	27.30	1.00
59	0.67	22.52	186.34	121.82	144.34	47.79	27.30	1.00
60	0.66	22.11	187.00	122.56	144.68	48.71	27.30	1.00
61	0.65	21.70	187.66	123.32	145.02	49.64	27.30	1.00
62	0.64	21.26	188.30	124.09	145.35	50.56	27.30	1.00
63	0.62	20.81	188.93	124.87	145.67	51.49	27.30	1.00
64	0.61	20.34	189.54	125.65	145.99	52.42	27.30	1.00
65	0.60	19.85	190.15	126.45	146.30	53.34	27.30	1.00
66	0.58	19.35	190.74	127.26	146.61	54.27	27.30	1.00
67	0.47	18.88	191.26	128.00	146.88	55.19	27.30	0.82
68	0.10	18.59	191.55	128.41	147.01	55.19	7.46	0.18
69	0.56	18.15	191.88	128.90	147.05	56.12	7.46	1.00
70	0.54	17.39	192.43	129.73	147.12	57.04	7.46	1.00
71	0.53	16.61	192.97	130.58	147.19	57.97	7.46	1.00
72	0.52	15.83	193.49	131.43	147.26	58.89	7.46	1.00
73	0.50	15.04	194.00	132.29	147.33	59.82	7.46	1.00
74	0.49	14.23	194.50	133.16	147.39	60.75	7.46	1.00
75	0.47	13.42	194.98	134.03	147.46	61.67	7.46	1.00
76	0.46	12.60	195.44	134.92	147.52	62.60	7.46	1.00
77	0.45	11.77	195.90	135.81	147.58	63.52	7.46	1.00
78	0.43	10.93	196.34	136.71	147.63	64.45	7.46	1.00
79	0.42	10.07	196.76	137.61	147.69	65.37	7.46	1.00
80	0.40	9.22	197.17	138.53	147.74	66.30	7.46	1.00
81	0.39	8.35	197.56	139.45	147.79	67.23	7.46	1.00

82	0.37	7.47	197.94	140.37	147.84	68.15	7.46	1.00
83	0.36	6.59	198.31	141.30	147.89	69.08	7.46	1.00
84	0.34	5.70	198.66	142.24	147.94	70.00	7.46	1.00
85	0.33	4.80	198.99	143.18	147.98	70.93	7.46	1.00
86	0.31	3.89	199.31	144.13	148.02	71.85	7.46	1.00
87	0.30	2.98	199.62	145.08	148.06	72.78	7.46	1.00
88	0.28	2.06	199.90	146.04	148.10	73.71	7.46	1.00
89	0.27	1.14	200.18	147.00	148.14	74.63	7.46	1.00
90	0.18	0.34	200.40	147.83	148.17	75.56	7.46	0.72

Table 2 - Force Data On The 90 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	5.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
2	16.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
3	25.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
4	32.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
5	37.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
6	41.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
7	42.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
8	41.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
9	15.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
10	46.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
11	172.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
12	289.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
13	403.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
14	514.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
15	623.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
16	729.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
17	831.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
18	931.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
19	1027.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
20	1120.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
21	1210.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
22	1296.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
23	1379.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
24	1458.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
25	1534.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
26	1606.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
27	1675.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
28	1739.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
29	1800.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
30	1857.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
31	1910.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
32	1960.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
33	2006.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
34	2047.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
35	2085.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
36	2120.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
37	1167.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
38	989.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
39	2232.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
40	2311.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
41	2385.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
42	2453.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
43	2516.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
44	1768.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
45	800.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
46	2548.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
47	2501.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
48	2452.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
49	2402.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
50	2349.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
51	2295.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
52	2240.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
53	2183.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
54	2124.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

55	2064.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
56	2004.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
57	1942.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
58	1879.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
59	1815.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
60	1751.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
61	1686.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
62	1620.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
63	1554.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
64	1488.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
65	1422.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
66	1356.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
67	1065.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
68	224.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
69	1214.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
70	1135.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
71	1057.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
72	981.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
73	907.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
74	834.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
75	764.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
76	695.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
77	629.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
78	565.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
79	503.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
80	444.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
81	387.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
82	333.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
83	282.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
84	233.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
85	188.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
86	145.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
87	105.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
88	69.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
89	36.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
90	7.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 105761.39(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 105761.39(lbs)

TOTAL AREA OF SLIDING MASS = 881.34(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 90 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	279.00	24.00	
2	1	279.00	24.00	
3	1	279.00	24.00	
4	1	279.00	24.00	
5	1	279.00	24.00	
6	1	279.00	24.00	
7	1	279.00	24.00	
8	1	279.00	24.00	
9	1	279.00	24.00	
10	1	279.00	24.00	
11	1	279.00	24.00	
12	1	279.00	24.00	
13	1	279.00	24.00	
14	1	279.00	24.00	
15	1	279.00	24.00	
16	1	279.00	24.00	
17	1	279.00	24.00	
18	1	279.00	24.00	
19	1	279.00	24.00	
20	1	279.00	24.00	
21	1	279.00	24.00	
22	1	279.00	24.00	
23	1	279.00	24.00	

24	1	279.00	24.00
25	1	279.00	24.00
26	1	279.00	24.00
27	1	279.00	24.00
28	1	279.00	24.00
29	1	279.00	24.00
30	1	279.00	24.00
31	1	279.00	24.00
32	1	279.00	24.00
33	1	279.00	24.00
34	1	279.00	24.00
35	1	279.00	24.00
36	1	279.00	24.00
37	1	279.00	24.00
38	1	279.00	24.00
39	1	279.00	24.00
40	1	279.00	24.00
41	1	279.00	24.00
42	1	279.00	24.00
43	1	279.00	24.00
44	1	279.00	24.00
45	1	279.00	24.00
46	1	279.00	24.00
47	1	279.00	24.00
48	1	279.00	24.00
49	1	279.00	24.00
50	1	279.00	24.00
51	1	279.00	24.00
52	1	279.00	24.00
53	1	279.00	24.00
54	1	279.00	24.00
55	1	279.00	24.00
56	1	279.00	24.00
57	1	279.00	24.00
58	1	279.00	24.00
59	1	279.00	24.00
60	1	279.00	24.00
61	1	279.00	24.00
62	1	279.00	24.00
63	1	279.00	24.00
64	1	279.00	24.00
65	1	279.00	24.00
66	1	279.00	24.00
67	1	279.00	24.00
68	1	279.00	24.00
69	1	279.00	24.00
70	1	279.00	24.00
71	1	279.00	24.00
72	1	279.00	24.00
73	1	279.00	24.00
74	1	279.00	24.00
75	1	279.00	24.00
76	1	279.00	24.00
77	1	279.00	24.00
78	1	279.00	24.00
79	1	279.00	24.00
80	1	279.00	24.00
81	1	279.00	24.00
82	1	279.00	24.00
83	1	279.00	24.00
84	1	279.00	24.00
85	1	279.00	24.00
86	1	279.00	24.00
87	1	279.00	24.00
88	1	279.00	24.00
89	1	279.00	24.00
90	1	279.00	24.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)

M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 90 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-3.12	137.12	1.00	20.50	288.13	267.17
2	-2.20	138.12	1.00	27.18	291.10	269.93
3	-1.27	139.12	1.00	31.82	293.17	271.84
4	-0.35	140.12	1.00	34.46	294.34	272.93
5	0.58	141.12	1.00	35.14	294.64	273.21
6	1.51	142.12	1.00	33.89	294.09	272.70
7	2.43	143.12	1.00	30.74	292.69	271.40
8	3.36	144.12	1.00	25.74	290.46	269.33
9	4.28	144.81	0.38	19.99	287.90	266.96
10	4.28	145.31	0.62	55.38	303.66	281.57
11	5.21	146.11	1.00	144.05	343.14	318.18
12	6.13	147.11	1.00	251.82	391.12	362.67
13	7.06	148.10	1.00	356.14	437.56	405.74
14	7.99	149.09	1.00	457.03	482.48	447.39
15	8.91	150.08	1.00	554.53	525.89	487.64
16	9.84	151.07	1.00	648.65	567.80	526.50
17	10.76	152.05	1.00	739.43	608.21	563.97
18	11.69	153.03	1.00	826.88	647.15	600.08
19	12.61	154.01	1.00	911.02	684.61	634.82
20	13.54	154.98	1.00	991.89	720.62	668.20
21	14.46	155.95	1.00	1069.49	755.17	700.24
22	15.39	156.92	1.00	1143.86	788.28	730.94
23	16.32	157.88	1.00	1215.01	819.96	760.32
24	17.24	158.84	1.00	1282.96	850.21	788.37
25	18.17	159.79	1.00	1347.73	879.05	815.11
26	19.09	160.74	1.00	1409.35	906.48	840.55
27	20.02	161.68	1.00	1467.82	932.52	864.69
28	20.94	162.62	1.00	1523.18	957.16	887.54
29	21.87	163.55	1.00	1575.44	980.43	909.12
30	22.80	164.47	1.00	1624.62	1002.33	929.42
31	23.72	165.39	1.00	1670.74	1022.86	948.46
32	24.65	166.30	1.00	1713.82	1042.04	966.25
33	25.57	167.21	1.00	1753.89	1059.88	982.79
34	26.50	168.11	1.00	1790.95	1076.38	998.09
35	27.42	169.00	1.00	1825.04	1091.56	1012.16
36	28.35	169.88	1.00	1856.17	1105.42	1025.02
37	29.27	170.56	0.55	1874.24	1113.46	1032.47
38	29.27	171.00	0.45	1909.01	1128.94	1046.83
39	30.20	171.63	1.00	1961.40	1152.27	1068.46
40	31.13	172.49	1.00	2036.76	1185.83	1099.57
41	32.05	173.34	1.00	2107.96	1217.52	1128.97
42	32.98	174.18	1.00	2175.01	1247.37	1156.65
43	33.90	175.02	1.00	2237.92	1275.39	1182.62
44	34.83	175.72	0.69	2284.46	1296.11	1201.83
45	34.83	176.13	0.31	2309.68	1307.34	1212.25
46	35.75	176.66	1.00	2277.27	1292.90	1198.86
47	36.68	177.47	1.00	2238.51	1275.65	1182.86
48	37.61	178.26	1.00	2198.18	1257.69	1166.21
49	38.53	179.05	1.00	2156.32	1239.06	1148.93
50	39.46	179.83	1.00	2112.96	1219.75	1131.03
51	40.38	180.60	1.00	2068.14	1199.80	1112.53
52	41.31	181.35	1.00	2021.89	1179.20	1093.43
53	42.23	182.10	1.00	1974.25	1157.99	1073.76
54	43.16	182.83	1.00	1925.26	1136.18	1053.54
55	44.08	183.56	1.00	1874.95	1113.78	1032.77
56	45.01	184.27	1.00	1823.36	1090.81	1011.47

57	45.94	184.97	1.00	1770.55	1067.30	989.67
58	46.86	185.66	1.00	1716.54	1043.25	967.37
59	47.79	186.34	1.00	1661.39	1018.70	944.60
60	48.71	187.00	1.00	1605.14	993.65	921.38
61	49.64	187.66	1.00	1547.83	968.14	897.72
62	50.56	188.30	1.00	1489.52	942.18	873.65
63	51.49	188.93	1.00	1430.25	915.79	849.18
64	52.42	189.54	1.00	1370.08	889.00	824.34
65	53.34	190.15	1.00	1309.06	861.83	799.14
66	54.27	190.74	1.00	1247.24	834.31	773.62
67	55.19	191.26	0.82	1188.18	808.01	749.24
68	55.19	191.55	0.18	1166.90	798.54	740.46
69	56.12	191.88	1.00	1110.61	773.48	717.22
70	57.04	192.43	1.00	1031.37	738.19	684.50
71	57.97	192.97	1.00	952.39	703.03	651.89
72	58.89	193.49	1.00	873.74	668.02	619.43
73	59.82	194.00	1.00	795.51	633.18	587.13
74	60.75	194.50	1.00	717.77	598.57	555.03
75	61.67	194.98	1.00	640.60	564.21	523.17
76	62.60	195.44	1.00	564.09	530.15	491.59
77	63.52	195.90	1.00	488.32	496.41	460.31
78	64.45	196.34	1.00	413.39	463.05	429.37
79	65.37	196.76	1.00	339.41	430.11	398.83
80	66.30	197.17	1.00	266.47	397.64	368.72
81	67.23	197.56	1.00	194.69	365.68	339.08
82	68.15	197.94	1.00	124.19	334.29	309.98
83	69.08	198.31	1.00	55.10	303.53	281.45
84	70.00	198.66	1.00	0.00	279.00	258.71
85	70.93	198.99	1.00	0.00	279.00	258.71
86	71.85	199.31	1.00	0.00	279.00	258.71
87	72.78	199.62	1.00	0.00	279.00	258.71
88	73.71	199.90	1.00	0.00	279.00	258.71
89	74.63	200.18	1.00	0.00	279.00	258.71
90	75.56	200.40	0.72	0.00	279.00	258.71

Table 4A - Base Force Data on the 90 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-3.12	137.12	1.00	20.50	288.13	267.17
2	-2.20	138.12	1.00	27.18	291.10	269.93
3	-1.27	139.12	1.00	31.82	293.17	271.84
4	-0.35	140.12	1.00	34.46	294.34	272.93
5	0.58	141.12	1.00	35.14	294.64	273.21
6	1.51	142.12	1.00	33.89	294.09	272.70
7	2.43	143.12	1.00	30.74	292.69	271.40
8	3.36	144.12	1.00	25.74	290.46	269.33
9	4.28	144.81	0.38	7.70	110.83	102.77
10	4.28	145.31	0.62	34.06	186.76	173.18
11	5.21	146.11	1.00	144.05	343.14	318.18
12	6.13	147.11	1.00	251.82	391.12	362.67
13	7.06	148.10	1.00	356.14	437.56	405.74
14	7.99	149.09	1.00	457.03	482.48	447.39
15	8.91	150.08	1.00	554.53	525.89	487.64
16	9.84	151.07	1.00	648.65	567.80	526.50
17	10.76	152.05	1.00	739.43	608.21	563.97
18	11.69	153.03	1.00	826.88	647.15	600.08
19	12.61	154.01	1.00	911.02	684.61	634.82
20	13.54	154.98	1.00	991.89	720.62	668.20
21	14.46	155.95	1.00	1069.49	755.17	700.24
22	15.39	156.92	1.00	1143.86	788.28	730.94
23	16.32	157.88	1.00	1215.01	819.96	760.32
24	17.24	158.84	1.00	1282.96	850.21	788.37
25	18.17	159.79	1.00	1347.73	879.05	815.11
26	19.09	160.74	1.00	1409.35	906.48	840.55
27	20.02	161.68	1.00	1467.82	932.52	864.69
28	20.94	162.62	1.00	1523.18	957.16	887.54

29	21.87	163.55	1.00	1575.44	980.43	909.12
30	22.80	164.47	1.00	1624.62	1002.33	929.42
31	23.72	165.39	1.00	1670.74	1022.86	948.46
32	24.65	166.30	1.00	1713.82	1042.04	966.25
33	25.57	167.21	1.00	1753.89	1059.88	982.79
34	26.50	168.11	1.00	1790.95	1076.38	998.09
35	27.42	169.00	1.00	1825.04	1091.56	1012.16
36	28.35	169.88	1.00	1856.17	1105.42	1025.02
37	29.27	170.56	0.55	1022.51	607.46	563.28
38	29.27	171.00	0.45	867.53	513.04	475.72
39	30.20	171.63	1.00	1961.40	1152.27	1068.46
40	31.13	172.49	1.00	2036.76	1185.83	1099.57
41	32.05	173.34	1.00	2107.96	1217.52	1128.97
42	32.98	174.18	1.00	2175.01	1247.37	1156.65
43	33.90	175.02	1.00	2237.92	1275.39	1182.62
44	34.83	175.72	0.69	1577.54	895.03	829.93
45	34.83	176.13	0.31	714.73	404.55	375.13
46	35.75	176.66	1.00	2277.27	1292.90	1198.86
47	36.68	177.47	1.00	2238.51	1275.65	1182.86
48	37.61	178.26	1.00	2198.18	1257.69	1166.21
49	38.53	179.05	1.00	2156.32	1239.06	1148.93
50	39.46	179.83	1.00	2112.96	1219.75	1131.03
51	40.38	180.60	1.00	2068.14	1199.80	1112.53
52	41.31	181.35	1.00	2021.89	1179.20	1093.43
53	42.23	182.10	1.00	1974.25	1157.99	1073.76
54	43.16	182.83	1.00	1925.26	1136.18	1053.54
55	44.08	183.56	1.00	1874.95	1113.78	1032.77
56	45.01	184.27	1.00	1823.36	1090.81	1011.47
57	45.94	184.97	1.00	1770.55	1067.30	989.67
58	46.86	185.66	1.00	1716.54	1043.25	967.37
59	47.79	186.34	1.00	1661.39	1018.70	944.60
60	48.71	187.00	1.00	1605.14	993.65	921.38
61	49.64	187.66	1.00	1547.83	968.14	897.72
62	50.56	188.30	1.00	1489.52	942.18	873.65
63	51.49	188.93	1.00	1430.25	915.79	849.18
64	52.42	189.54	1.00	1370.08	889.00	824.34
65	53.34	190.15	1.00	1309.06	861.83	799.14
66	54.27	190.74	1.00	1247.24	834.31	773.62
67	55.19	191.26	0.82	979.12	665.84	617.41
68	55.19	191.55	0.18	205.32	140.50	130.28
69	56.12	191.88	1.00	1110.61	773.48	717.22
70	57.04	192.43	1.00	1031.37	738.19	684.50
71	57.97	192.97	1.00	952.39	703.03	651.89
72	58.89	193.49	1.00	873.74	668.02	619.43
73	59.82	194.00	1.00	795.51	633.18	587.13
74	60.75	194.50	1.00	717.77	598.57	555.03
75	61.67	194.98	1.00	640.60	564.21	523.17
76	62.60	195.44	1.00	564.09	530.15	491.59
77	63.52	195.90	1.00	488.32	496.41	460.31
78	64.45	196.34	1.00	413.39	463.05	429.37
79	65.37	196.76	1.00	339.41	430.11	398.83
80	66.30	197.17	1.00	266.47	397.64	368.72
81	67.23	197.56	1.00	194.69	365.68	339.08
82	68.15	197.94	1.00	124.19	334.29	309.98
83	69.08	198.31	1.00	55.10	303.53	281.45
84	70.00	198.66	1.00	0.00	279.00	258.71
85	70.93	198.99	1.00	0.00	279.00	258.71
86	71.85	199.31	1.00	0.00	279.00	258.71
87	72.78	199.62	1.00	0.00	279.00	258.71
88	73.71	199.90	1.00	0.00	279.00	258.71
89	74.63	200.18	1.00	0.00	279.00	258.71
90	75.56	200.40	0.72	0.00	200.09	185.54

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 35.115
3D Depth (Vertical difference between ends of Slip Surface) = 46.55(ft)
L/D(1): L = 46.55(ft) L/D(2): L = 93.10(ft) L/D(3): L = 139.65(ft)
L/D(4): L = 186.20(ft) L/D(5): L = 232.75(ft) L/D(6): L = 279.30(ft)

SUM OF MOMENTS = 0.333412E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.3152488E-05

Sum of the Resisting Forces = 65189.96 (lbs)

Average Available Shear Strength = 760.52(psf)

Average Effective Normal Stress = 1081.52(psf)

Sum of the Driving Forces = 60448.27 (lbs)

Average Mobilized Shear Stress = 705.21(psf)

Total length of the failure surface = 85.72(ft)

Factor of Safety Balance Check: FS = 1.07844

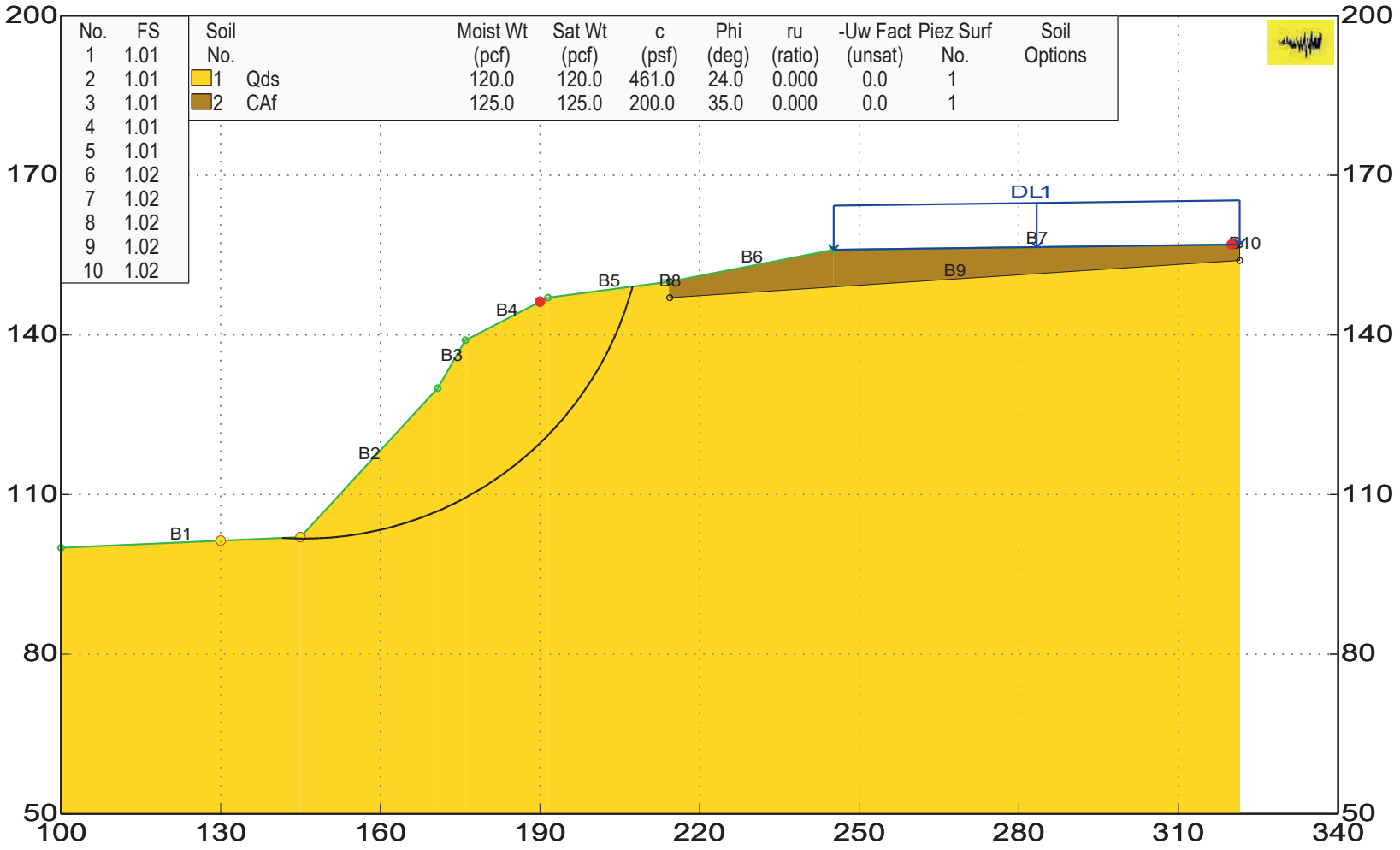
CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section BB - Proposed - Seismic

EGL

\BB101s.gsd



GEOSTASE FS = 1.01

Simplified Bishop Method

kh = 0.20000

GEOSTASE Slope Stability Analysis

GEOSTASE® v4.30.32 by GREGORY GEOTECHNICAL SOFTWARE

PLATE D.3ps

*** GEOSTASE(R) ***

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** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB101s.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB101s.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section BB - Proposed - Seismic

PROFILE BOUNDARY DATA

7 Surface Boundaries
10 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	145.000	102.000	1
2	145.000	102.000	170.800	130.000	1
3	170.800	130.000	176.000	139.000	1
4	176.000	139.000	191.500	147.000	1
5	191.500	147.000	214.400	150.000	1
6	214.400	150.000	245.200	156.000	2
7	245.200	156.000	321.500	157.000	2
8	214.400	150.000	214.400	147.000	1
9	214.400	147.000	321.500	154.000	1
10	321.500	154.000	321.500	157.000	1

User Specified X-Origin = 100.000(ft)

User Specified Y-Origin = 50.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	145.000	102.000
3	170.800	130.000
4	176.000	139.000
5	191.500	147.000
6	214.400	150.000

7	245.200	156.000
8	321.500	157.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
Surface boundary point 6 and Subsurface boundary point 9 are duplicate points.		
9	214.400	150.000
10	214.400	147.000
11	321.500	154.000
12	321.500	157.000

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.044	2.545
2	1.085	47.342
3	1.731	59.982
4	0.516	27.300
5	0.131	7.463
6	0.195	11.023
7	0.013	0.751
8	Vertical	Vertical
9	0.065	3.740
10	Vertical	Vertical

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	461.00	24.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load No.	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	Deflection (deg from Vert)
1	7	245.200	156.000	1000.000	321.500	157.000	1000.000	0.00

NOTE - Load Stress Varies Linearly Within Specified Range.
For Multi-Stage Analysis, Refer to Detailed Output for Distributed Loads Applied to Each Stage.

SEISMIC (EARTHQUAKE) DATA

Specified Peak Ground Acceleration Coefficient (PGA) = 0.400(g)
Default Velocity = 2.000(ft) per second
Specified Horizontal Earthquake Coefficient (kh) = 0.20000(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
(NOTE:Input Velocity = 0.0 will result in default Peak
Velocity = 2 times(PGA) times 2.5 fps or 0.762 mps)
Specified Seismic Pore-Pressure Factor = 0.000
Horizontal Seismic Force is Applied at Center of Gravity of Slices

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.1802(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 130.00(ft)
                                and X = 145.00(ft)

Each Surface ends within a Range Between   X = 190.00(ft)
                                      and   X = 320.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y =   50.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
   FS Max =   1.977   FS Min =   1.009   FS Ave =   1.473
   Standard Deviation =   0.257   Coefficient of Variation =   17.44 %

Critical Surface is Sequence Number   770 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X =   145.557615(ft) ; Y =   165.771631(ft); and Radius =   64.050834(ft)

Circular Trial Failure Surface Generated With 89 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	141.54655	101.84651
2	142.54504	101.79168
3	143.54427	101.75245
4	144.54399	101.72882
5	145.54396	101.72080
6	146.54393	101.72839
7	147.54366	101.75160
8	148.54291	101.79040
9	149.54143	101.84481
10	150.53898	101.91480
11	151.53531	102.00035
12	152.53019	102.10144
13	153.52336	102.21806
14	154.51460	102.35017
15	155.50365	102.49774
16	156.49028	102.66073
17	157.47424	102.83910
18	158.45530	103.03281
19	159.43321	103.24182
20	160.40775	103.46607
21	161.37866	103.70551
22	162.34571	103.96007
23	163.30868	104.22970
24	164.26731	104.51433
25	165.22139	104.81390
26	166.17067	105.12832

27	167.11493	105.45752
28	168.05394	105.80143
29	168.98746	106.15996
30	169.91527	106.53301
31	170.83714	106.92050
32	171.75285	107.32234
33	172.66217	107.73843
34	173.56489	108.16866
35	174.46078	108.61294
36	175.34963	109.07114
37	176.23121	109.54317
38	177.10532	110.02890
39	177.97174	110.52822
40	178.83025	111.04101
41	179.68066	111.56714
42	180.52275	112.10648
43	181.35631	112.65890
44	182.18115	113.22426
45	182.99707	113.80244
46	183.80385	114.39328
47	184.60132	114.99665
48	185.38926	115.61239
49	186.16750	116.24036
50	186.93584	116.88041
51	187.69409	117.53237
52	188.44207	118.19609
53	189.17960	118.87140
54	189.90650	119.55815
55	190.62258	120.25616
56	191.32768	120.96527
57	192.02163	121.68530
58	192.70425	122.41607
59	193.37537	123.15742
60	194.03484	123.90915
61	194.68250	124.67108
62	195.31818	125.44303
63	195.94173	126.22482
64	196.55300	127.01624
65	197.15184	127.81711
66	197.73810	128.62723
67	198.31164	129.44641
68	198.87233	130.27443
69	199.42001	131.11112
70	199.95457	131.95625
71	200.47587	132.80962
72	200.98379	133.67103
73	201.47819	134.54026
74	201.95896	135.41711
75	202.42599	136.30135
76	202.87915	137.19278
77	203.31834	138.09117
78	203.74345	138.99631
79	204.15438	139.90798
80	204.55103	140.82595
81	204.93329	141.75001
82	205.30108	142.67992
83	205.65431	143.61545
84	205.99289	144.55639
85	206.31674	145.50250
86	206.62578	146.45355
87	206.91993	147.40931
88	207.19913	148.36954
89	207.39434	149.08223

Factor Of Safety For The Critical or Specified Surface = 1.009

Table 1 - Geometry Data on the 92 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.05	142.05	101.82	101.87	-3.14	2.54	1.00
2	1.00	0.14	143.04	101.77	101.91	-2.25	2.54	1.00
3	1.00	0.22	144.04	101.74	101.96	-1.35	2.54	1.00
4	0.46	0.26	144.77	101.73	101.99	-0.46	2.54	0.46
5	0.54	0.57	145.27	101.72	102.30	-0.46	47.34	0.54
6	1.00	1.41	146.04	101.72	103.13	0.44	47.34	1.00
7	1.00	2.48	147.04	101.74	104.22	1.33	47.34	1.00
8	1.00	3.53	148.04	101.77	105.30	2.22	47.34	1.00
9	1.00	4.57	149.04	101.82	106.39	3.12	47.34	1.00
10	1.00	5.59	150.04	101.88	107.47	4.01	47.34	1.00
11	1.00	6.59	151.04	101.96	108.55	4.91	47.34	1.00
12	0.99	7.58	152.03	102.05	109.63	5.80	47.34	1.00
13	0.99	8.55	153.03	102.16	110.71	6.70	47.34	1.00
14	0.99	9.50	154.02	102.28	111.79	7.59	47.34	1.00
15	0.99	10.44	155.01	102.42	112.86	8.49	47.34	1.00
16	0.99	11.36	156.00	102.58	113.93	9.38	47.34	1.00
17	0.98	12.25	156.98	102.75	115.00	10.28	47.34	1.00
18	0.98	13.13	157.96	102.94	116.07	11.17	47.34	1.00
19	0.98	14.00	158.94	103.14	117.13	12.06	47.34	1.00
20	0.97	14.84	159.92	103.35	118.19	12.96	47.34	1.00
21	0.97	15.66	160.89	103.59	119.25	13.85	47.34	1.00
22	0.97	16.47	161.86	103.83	120.30	14.75	47.34	1.00
23	0.96	17.25	162.83	104.09	121.35	15.64	47.34	1.00
24	0.96	18.02	163.79	104.37	122.39	16.54	47.34	1.00
25	0.95	18.76	164.74	104.66	123.43	17.43	47.34	1.00
26	0.95	19.49	165.70	104.97	124.46	18.33	47.34	1.00
27	0.94	20.20	166.64	105.29	125.49	19.22	47.34	1.00
28	0.94	20.88	167.58	105.63	126.51	20.12	47.34	1.00
29	0.93	21.55	168.52	105.98	127.53	21.01	47.34	1.00
30	0.93	22.19	169.45	106.35	128.54	21.90	47.34	1.00
31	0.88	22.80	170.36	106.72	129.52	22.80	47.34	0.96
32	0.04	23.12	170.82	106.91	130.03	22.80	59.98	0.04
33	0.92	23.74	171.29	107.12	130.86	23.69	59.98	1.00
34	0.91	24.91	172.21	107.53	132.44	24.59	59.98	1.00
35	0.90	26.05	173.11	107.95	134.00	25.48	59.98	1.00
36	0.90	27.17	174.01	108.39	135.56	26.38	59.98	1.00
37	0.89	28.26	174.91	108.84	137.11	27.27	59.98	1.00
38	0.65	29.19	175.67	109.25	138.44	28.17	59.98	0.74
39	0.23	29.58	176.12	109.48	139.06	28.17	27.30	0.26
40	0.87	29.56	176.67	109.79	139.34	29.06	27.30	1.00
41	0.87	29.52	177.54	110.28	139.79	29.96	27.30	1.00
42	0.86	29.45	178.40	110.78	140.24	30.85	27.30	1.00
43	0.85	29.38	179.26	111.30	140.68	31.74	27.30	1.00
44	0.84	29.28	180.10	111.84	141.12	32.64	27.30	1.00
45	0.83	29.17	180.94	112.38	141.55	33.53	27.30	1.00
46	0.82	29.04	181.77	112.94	141.98	34.43	27.30	1.00
47	0.82	28.89	182.59	113.51	142.40	35.32	27.30	1.00
48	0.81	28.72	183.40	114.10	142.82	36.22	27.30	1.00
49	0.80	28.54	184.20	114.69	143.23	37.11	27.30	1.00
50	0.79	28.34	185.00	115.30	143.64	38.01	27.30	1.00
51	0.78	28.12	185.78	115.93	144.05	38.90	27.30	1.00
52	0.77	27.89	186.55	116.56	144.45	39.80	27.30	1.00
53	0.76	27.63	187.31	117.21	144.84	40.69	27.30	1.00
54	0.75	27.36	188.07	117.86	145.23	41.58	27.30	1.00
55	0.74	27.08	188.81	118.53	145.61	42.48	27.30	1.00
56	0.73	26.78	189.54	119.21	145.99	43.37	27.30	1.00
57	0.72	26.46	190.26	119.91	146.36	44.27	27.30	1.00
58	0.71	26.12	190.98	120.61	146.73	45.16	27.30	1.00
59	0.17	25.90	191.41	121.05	146.96	46.06	27.30	0.25
60	0.52	25.62	191.76	121.41	147.03	46.06	7.46	0.75
61	0.68	25.06	192.36	122.05	147.11	46.95	7.46	1.00
62	0.67	24.41	193.04	122.79	147.20	47.85	7.46	1.00
63	0.66	23.76	193.71	123.53	147.29	48.74	7.46	1.00
64	0.65	23.08	194.36	124.29	147.37	49.64	7.46	1.00
65	0.64	22.40	195.00	125.06	147.46	50.53	7.46	1.00
66	0.62	21.71	195.63	125.83	147.54	51.42	7.46	1.00
67	0.61	21.00	196.25	126.62	147.62	52.32	7.46	1.00
68	0.60	20.28	196.85	127.42	147.70	53.21	7.46	1.00

69	0.59	19.56	197.44	128.22	147.78	54.11	7.46	1.00
70	0.57	18.82	198.02	129.04	147.85	55.00	7.46	1.00
71	0.56	18.07	198.59	129.86	147.93	55.90	7.46	1.00
72	0.55	17.31	199.15	130.69	148.00	56.79	7.46	1.00
73	0.53	16.54	199.69	131.53	148.07	57.69	7.46	1.00
74	0.52	15.76	200.22	132.38	148.14	58.58	7.46	1.00
75	0.51	14.97	200.73	133.24	148.21	59.48	7.46	1.00
76	0.49	14.17	201.23	134.11	148.27	60.37	7.46	1.00
77	0.48	13.36	201.72	134.98	148.34	61.26	7.46	1.00
78	0.47	12.54	202.19	135.86	148.40	62.16	7.46	1.00
79	0.45	11.71	202.65	136.75	148.46	63.05	7.46	1.00
80	0.44	10.88	203.10	137.64	148.52	63.95	7.46	1.00
81	0.43	10.03	203.53	138.54	148.58	64.84	7.46	1.00
82	0.41	9.18	203.95	139.45	148.63	65.74	7.46	1.00
83	0.40	8.32	204.35	140.37	148.68	66.63	7.46	1.00
84	0.38	7.45	204.74	141.29	148.73	67.53	7.46	1.00
85	0.37	6.57	205.12	142.21	148.78	68.42	7.46	1.00
86	0.35	5.68	205.48	143.15	148.83	69.32	7.46	1.00
87	0.34	4.79	205.82	144.09	148.88	70.21	7.46	1.00
88	0.32	3.89	206.15	145.03	148.92	71.10	7.46	1.00
89	0.31	2.98	206.47	145.98	148.96	72.00	7.46	1.00
90	0.29	2.07	206.77	146.93	149.00	72.89	7.46	1.00
91	0.28	1.15	207.06	147.89	149.04	73.79	7.46	1.00
92	0.20	0.34	207.30	148.73	149.07	74.68	7.46	0.74

Table 2 - Force Data On The 92 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	5.9	0.0	0.0	0.0	0.00	0.00	1.2	0.0	0.00
2	16.9	0.0	0.0	0.0	0.00	0.00	3.4	0.0	0.00
3	26.0	0.0	0.0	0.0	0.00	0.00	5.2	0.0	0.00
4	14.4	0.0	0.0	0.0	0.00	0.00	2.9	0.0	0.00
5	37.4	0.0	0.0	0.0	0.00	0.00	7.5	0.0	0.00
6	169.0	0.0	0.0	0.0	0.00	0.00	33.8	0.0	0.00
7	297.3	0.0	0.0	0.0	0.00	0.00	59.5	0.0	0.00
8	423.5	0.0	0.0	0.0	0.00	0.00	84.7	0.0	0.00
9	547.5	0.0	0.0	0.0	0.00	0.00	109.5	0.0	0.00
10	669.2	0.0	0.0	0.0	0.00	0.00	133.8	0.0	0.00
11	788.4	0.0	0.0	0.0	0.00	0.00	157.7	0.0	0.00
12	905.1	0.0	0.0	0.0	0.00	0.00	181.0	0.0	0.00
13	1019.2	0.0	0.0	0.0	0.00	0.00	203.8	0.0	0.00
14	1130.5	0.0	0.0	0.0	0.00	0.00	226.1	0.0	0.00
15	1238.9	0.0	0.0	0.0	0.00	0.00	247.8	0.0	0.00
16	1344.4	0.0	0.0	0.0	0.00	0.00	268.9	0.0	0.00
17	1446.9	0.0	0.0	0.0	0.00	0.00	289.4	0.0	0.00
18	1546.3	0.0	0.0	0.0	0.00	0.00	309.3	0.0	0.00
19	1642.4	0.0	0.0	0.0	0.00	0.00	328.5	0.0	0.00
20	1735.3	0.0	0.0	0.0	0.00	0.00	347.1	0.0	0.00
21	1824.8	0.0	0.0	0.0	0.00	0.00	365.0	0.0	0.00
22	1911.0	0.0	0.0	0.0	0.00	0.00	382.2	0.0	0.00
23	1993.6	0.0	0.0	0.0	0.00	0.00	398.7	0.0	0.00
24	2072.7	0.0	0.0	0.0	0.00	0.00	414.5	0.0	0.00
25	2148.3	0.0	0.0	0.0	0.00	0.00	429.7	0.0	0.00
26	2220.1	0.0	0.0	0.0	0.00	0.00	444.0	0.0	0.00
27	2288.4	0.0	0.0	0.0	0.00	0.00	457.7	0.0	0.00
28	2352.9	0.0	0.0	0.0	0.00	0.00	470.6	0.0	0.00
29	2413.6	0.0	0.0	0.0	0.00	0.00	482.7	0.0	0.00
30	2470.6	0.0	0.0	0.0	0.00	0.00	494.1	0.0	0.00
31	2420.7	0.0	0.0	0.0	0.00	0.00	484.1	0.0	0.00
32	103.0	0.0	0.0	0.0	0.00	0.00	20.6	0.0	0.00
33	2608.2	0.0	0.0	0.0	0.00	0.00	521.6	0.0	0.00
34	2717.7	0.0	0.0	0.0	0.00	0.00	543.5	0.0	0.00
35	2822.0	0.0	0.0	0.0	0.00	0.00	564.4	0.0	0.00
36	2921.0	0.0	0.0	0.0	0.00	0.00	584.2	0.0	0.00
37	3014.6	0.0	0.0	0.0	0.00	0.00	602.9	0.0	0.00
38	2278.3	0.0	0.0	0.0	0.00	0.00	455.7	0.0	0.00
39	820.7	0.0	0.0	0.0	0.00	0.00	164.1	0.0	0.00

40	3100.5	0.0	0.0	0.0	0.00	0.00	620.1	0.0	0.00
41	3068.7	0.0	0.0	0.0	0.00	0.00	613.7	0.0	0.00
42	3034.5	0.0	0.0	0.0	0.00	0.00	606.9	0.0	0.00
43	2997.8	0.0	0.0	0.0	0.00	0.00	599.6	0.0	0.00
44	2958.8	0.0	0.0	0.0	0.00	0.00	591.8	0.0	0.00
45	2917.5	0.0	0.0	0.0	0.00	0.00	583.5	0.0	0.00
46	2874.0	0.0	0.0	0.0	0.00	0.00	574.8	0.0	0.00
47	2828.4	0.0	0.0	0.0	0.00	0.00	565.7	0.0	0.00
48	2780.7	0.0	0.0	0.0	0.00	0.00	556.1	0.0	0.00
49	2731.0	0.0	0.0	0.0	0.00	0.00	546.2	0.0	0.00
50	2679.5	0.0	0.0	0.0	0.00	0.00	535.9	0.0	0.00
51	2626.1	0.0	0.0	0.0	0.00	0.00	525.2	0.0	0.00
52	2571.1	0.0	0.0	0.0	0.00	0.00	514.2	0.0	0.00
53	2514.4	0.0	0.0	0.0	0.00	0.00	502.9	0.0	0.00
54	2456.2	0.0	0.0	0.0	0.00	0.00	491.2	0.0	0.00
55	2396.5	0.0	0.0	0.0	0.00	0.00	479.3	0.0	0.00
56	2335.5	0.0	0.0	0.0	0.00	0.00	467.1	0.0	0.00
57	2273.3	0.0	0.0	0.0	0.00	0.00	454.7	0.0	0.00
58	2209.9	0.0	0.0	0.0	0.00	0.00	442.0	0.0	0.00
59	535.6	0.0	0.0	0.0	0.00	0.00	107.1	0.0	0.00
60	1603.7	0.0	0.0	0.0	0.00	0.00	320.7	0.0	0.00
61	2053.0	0.0	0.0	0.0	0.00	0.00	410.6	0.0	0.00
62	1966.3	0.0	0.0	0.0	0.00	0.00	393.3	0.0	0.00
63	1879.9	0.0	0.0	0.0	0.00	0.00	376.0	0.0	0.00
64	1794.1	0.0	0.0	0.0	0.00	0.00	358.8	0.0	0.00
65	1708.8	0.0	0.0	0.0	0.00	0.00	341.8	0.0	0.00
66	1624.3	0.0	0.0	0.0	0.00	0.00	324.9	0.0	0.00
67	1540.5	0.0	0.0	0.0	0.00	0.00	308.1	0.0	0.00
68	1457.7	0.0	0.0	0.0	0.00	0.00	291.5	0.0	0.00
69	1375.8	0.0	0.0	0.0	0.00	0.00	275.2	0.0	0.00
70	1295.2	0.0	0.0	0.0	0.00	0.00	259.0	0.0	0.00
71	1215.7	0.0	0.0	0.0	0.00	0.00	243.1	0.0	0.00
72	1137.6	0.0	0.0	0.0	0.00	0.00	227.5	0.0	0.00
73	1060.9	0.0	0.0	0.0	0.00	0.00	212.2	0.0	0.00
74	985.8	0.0	0.0	0.0	0.00	0.00	197.2	0.0	0.00
75	912.3	0.0	0.0	0.0	0.00	0.00	182.5	0.0	0.00
76	840.6	0.0	0.0	0.0	0.00	0.00	168.1	0.0	0.00
77	770.8	0.0	0.0	0.0	0.00	0.00	154.2	0.0	0.00
78	702.9	0.0	0.0	0.0	0.00	0.00	140.6	0.0	0.00
79	637.0	0.0	0.0	0.0	0.00	0.00	127.4	0.0	0.00
80	573.3	0.0	0.0	0.0	0.00	0.00	114.7	0.0	0.00
81	511.8	0.0	0.0	0.0	0.00	0.00	102.4	0.0	0.00
82	452.6	0.0	0.0	0.0	0.00	0.00	90.5	0.0	0.00
83	395.9	0.0	0.0	0.0	0.00	0.00	79.2	0.0	0.00
84	341.6	0.0	0.0	0.0	0.00	0.00	68.3	0.0	0.00
85	289.9	0.0	0.0	0.0	0.00	0.00	58.0	0.0	0.00
86	240.9	0.0	0.0	0.0	0.00	0.00	48.2	0.0	0.00
87	194.6	0.0	0.0	0.0	0.00	0.00	38.9	0.0	0.00
88	151.2	0.0	0.0	0.0	0.00	0.00	30.2	0.0	0.00
89	110.6	0.0	0.0	0.0	0.00	0.00	22.1	0.0	0.00
90	73.0	0.0	0.0	0.0	0.00	0.00	14.6	0.0	0.00
91	38.5	0.0	0.0	0.0	0.00	0.00	7.7	0.0	0.00
92	8.0	0.0	0.0	0.0	0.00	0.00	1.6	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 138241.25(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 138241.25(lbs)

TOTAL AREA OF SLIDING MASS = 1152.01(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 92 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	461.00	24.00	
2	1	461.00	24.00	
3	1	461.00	24.00	
4	1	461.00	24.00	
5	1	461.00	24.00	
6	1	461.00	24.00	

7	1	461.00	24.00
8	1	461.00	24.00
9	1	461.00	24.00
10	1	461.00	24.00
11	1	461.00	24.00
12	1	461.00	24.00
13	1	461.00	24.00
14	1	461.00	24.00
15	1	461.00	24.00
16	1	461.00	24.00
17	1	461.00	24.00
18	1	461.00	24.00
19	1	461.00	24.00
20	1	461.00	24.00
21	1	461.00	24.00
22	1	461.00	24.00
23	1	461.00	24.00
24	1	461.00	24.00
25	1	461.00	24.00
26	1	461.00	24.00
27	1	461.00	24.00
28	1	461.00	24.00
29	1	461.00	24.00
30	1	461.00	24.00
31	1	461.00	24.00
32	1	461.00	24.00
33	1	461.00	24.00
34	1	461.00	24.00
35	1	461.00	24.00
36	1	461.00	24.00
37	1	461.00	24.00
38	1	461.00	24.00
39	1	461.00	24.00
40	1	461.00	24.00
41	1	461.00	24.00
42	1	461.00	24.00
43	1	461.00	24.00
44	1	461.00	24.00
45	1	461.00	24.00
46	1	461.00	24.00
47	1	461.00	24.00
48	1	461.00	24.00
49	1	461.00	24.00
50	1	461.00	24.00
51	1	461.00	24.00
52	1	461.00	24.00
53	1	461.00	24.00
54	1	461.00	24.00
55	1	461.00	24.00
56	1	461.00	24.00
57	1	461.00	24.00
58	1	461.00	24.00
59	1	461.00	24.00
60	1	461.00	24.00
61	1	461.00	24.00
62	1	461.00	24.00
63	1	461.00	24.00
64	1	461.00	24.00
65	1	461.00	24.00
66	1	461.00	24.00
67	1	461.00	24.00
68	1	461.00	24.00
69	1	461.00	24.00
70	1	461.00	24.00
71	1	461.00	24.00
72	1	461.00	24.00
73	1	461.00	24.00
74	1	461.00	24.00
75	1	461.00	24.00
76	1	461.00	24.00
77	1	461.00	24.00
78	1	461.00	24.00

79	1	461.00	24.00
80	1	461.00	24.00
81	1	461.00	24.00
82	1	461.00	24.00
83	1	461.00	24.00
84	1	461.00	24.00
85	1	461.00	24.00
86	1	461.00	24.00
87	1	461.00	24.00
88	1	461.00	24.00
89	1	461.00	24.00
90	1	461.00	24.00
91	1	461.00	24.00
92	1	461.00	24.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 92 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-3.14	142.05	1.00	32.49	475.47	471.13
2	-2.25	143.04	1.00	35.96	477.01	472.66
3	-1.35	144.04	1.00	37.50	477.70	473.34
4	-0.46	144.77	0.46	35.43	476.78	472.43
5	-0.46	145.27	0.54	72.69	493.36	488.86
6	0.44	146.04	1.00	164.88	534.41	529.54
7	1.33	147.04	1.00	283.51	587.23	581.88
8	2.22	148.04	1.00	398.61	638.47	632.65
9	3.12	149.04	1.00	510.19	688.15	681.88
10	4.01	150.04	1.00	618.31	736.29	729.58
11	4.91	151.04	1.00	722.99	782.89	775.76
12	5.80	152.03	1.00	824.25	827.98	820.43
13	6.70	153.03	1.00	922.14	871.57	863.62
14	7.59	154.02	1.00	1016.69	913.66	905.33
15	8.49	155.01	1.00	1107.90	954.27	945.57
16	9.38	156.00	1.00	1195.83	993.42	984.36
17	10.28	156.98	1.00	1280.48	1031.10	1021.70
18	11.17	157.96	1.00	1361.88	1067.35	1057.62
19	12.06	158.94	1.00	1440.06	1102.15	1092.11
20	12.96	159.92	1.00	1515.03	1135.54	1125.18
21	13.85	160.89	1.00	1586.83	1167.50	1156.86
22	14.75	161.86	1.00	1655.47	1198.06	1187.14
23	15.64	162.83	1.00	1720.98	1227.23	1216.04
24	16.54	163.79	1.00	1783.37	1255.01	1243.56
25	17.43	164.74	1.00	1842.66	1281.41	1269.72
26	18.33	165.70	1.00	1898.88	1306.43	1294.53
27	19.22	166.64	1.00	1952.04	1330.10	1317.98
28	20.12	167.58	1.00	2002.17	1352.42	1340.09
29	21.01	168.52	1.00	2049.28	1373.40	1360.88
30	21.90	169.45	1.00	2093.39	1393.04	1380.34
31	22.80	170.36	0.96	2133.29	1410.80	1397.94
32	22.80	170.82	0.04	2165.39	1425.10	1412.10
33	23.69	171.29	1.00	2204.70	1442.59	1429.44
34	24.59	172.21	1.00	2298.27	1484.26	1470.73
35	25.48	173.11	1.00	2387.68	1524.06	1510.17
36	26.38	174.01	1.00	2472.94	1562.03	1547.79
37	27.27	174.91	1.00	2554.07	1598.15	1583.58

38	28.17	175.67	0.74	2617.73	1626.49	1611.66
39	28.17	176.12	0.26	2655.06	1643.11	1628.13
40	29.06	176.67	1.00	2626.15	1630.24	1615.38
41	29.96	177.54	1.00	2594.93	1616.34	1601.60
42	30.85	178.40	1.00	2562.03	1601.69	1587.09
43	31.74	179.26	1.00	2527.47	1586.30	1571.84
44	32.64	180.10	1.00	2491.29	1570.19	1555.88
45	33.53	180.94	1.00	2453.51	1553.37	1539.21
46	34.43	181.77	1.00	2414.15	1535.85	1521.85
47	35.32	182.59	1.00	2373.25	1517.64	1503.80
48	36.22	183.40	1.00	2330.83	1498.75	1485.09
49	37.11	184.20	1.00	2286.92	1479.20	1465.72
50	38.01	185.00	1.00	2241.56	1459.01	1445.70
51	38.90	185.78	1.00	2194.76	1438.17	1425.06
52	39.80	186.55	1.00	2146.57	1416.72	1403.80
53	40.69	187.31	1.00	2097.02	1394.65	1381.94
54	41.58	188.07	1.00	2046.13	1372.00	1359.49
55	42.48	188.81	1.00	1993.95	1348.76	1336.47
56	43.37	189.54	1.00	1940.50	1324.97	1312.89
57	44.27	190.26	1.00	1885.83	1300.62	1288.77
58	45.16	190.98	1.00	1829.96	1275.75	1264.12
59	46.06	191.41	0.25	1784.04	1255.31	1243.86
60	46.06	191.76	0.75	1761.06	1245.08	1233.73
61	46.95	192.36	1.00	1687.93	1212.51	1201.46
62	47.85	193.04	1.00	1608.13	1176.99	1166.26
63	48.74	193.71	1.00	1528.10	1141.35	1130.95
64	49.64	194.36	1.00	1447.86	1105.63	1095.55
65	50.53	195.00	1.00	1367.48	1069.84	1060.09
66	51.42	195.63	1.00	1286.99	1034.00	1024.58
67	52.32	196.25	1.00	1206.45	998.14	989.04
68	53.21	196.85	1.00	1125.90	962.28	953.51
69	54.11	197.44	1.00	1045.40	926.44	918.00
70	55.00	198.02	1.00	965.00	890.65	882.53
71	55.90	198.59	1.00	884.76	854.92	847.13
72	56.79	199.15	1.00	804.74	819.29	811.82
73	57.69	199.69	1.00	724.99	783.79	776.64
74	58.58	200.22	1.00	645.58	748.43	741.61
75	59.48	200.73	1.00	566.57	713.25	706.75
76	60.37	201.23	1.00	488.03	678.28	672.10
77	61.26	201.72	1.00	410.03	643.56	637.69
78	62.16	202.19	1.00	332.64	609.10	603.55
79	63.05	202.65	1.00	255.94	574.95	569.71
80	63.95	203.10	1.00	180.01	541.15	536.21
81	64.84	203.53	1.00	104.94	507.72	503.09
82	65.74	203.95	1.00	30.81	474.72	470.39
83	66.63	204.35	1.00	0.00	461.00	456.80
84	67.53	204.74	1.00	0.00	461.00	456.80
85	68.42	205.12	1.00	0.00	461.00	456.80
86	69.32	205.48	1.00	0.00	461.00	456.80
87	70.21	205.82	1.00	0.00	461.00	456.80
88	71.10	206.15	1.00	0.00	461.00	456.80
89	72.00	206.47	1.00	0.00	461.00	456.80
90	72.89	206.77	1.00	0.00	461.00	456.80
91	73.79	207.06	1.00	0.00	461.00	456.80
92	74.68	207.30	0.74	0.00	461.00	456.80

Table 4A - Base Force Data on the 92 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-3.14	142.05	1.00	32.49	475.47	471.13
2	-2.25	143.04	1.00	35.96	477.01	472.66
3	-1.35	144.04	1.00	37.50	477.70	473.34
4	-0.46	144.77	0.46	16.16	217.42	215.44
5	-0.46	145.27	0.54	39.54	268.38	265.93
6	0.44	146.04	1.00	164.88	534.41	529.54
7	1.33	147.04	1.00	283.51	587.23	581.88

8	2.22	148.04	1.00	398.61	638.47	632.65
9	3.12	149.04	1.00	510.19	688.15	681.88
10	4.01	150.04	1.00	618.31	736.29	729.58
11	4.91	151.04	1.00	722.99	782.89	775.76
12	5.80	152.03	1.00	824.25	827.98	820.43
13	6.70	153.03	1.00	922.14	871.57	863.62
14	7.59	154.02	1.00	1016.69	913.66	905.33
15	8.49	155.01	1.00	1107.90	954.27	945.57
16	9.38	156.00	1.00	1195.83	993.42	984.36
17	10.28	156.98	1.00	1280.48	1031.10	1021.70
18	11.17	157.96	1.00	1361.88	1067.35	1057.62
19	12.06	158.94	1.00	1440.06	1102.15	1092.11
20	12.96	159.92	1.00	1515.03	1135.54	1125.18
21	13.85	160.89	1.00	1586.83	1167.50	1156.86
22	14.75	161.86	1.00	1655.47	1198.06	1187.14
23	15.64	162.83	1.00	1720.98	1227.23	1216.04
24	16.54	163.79	1.00	1783.37	1255.01	1243.56
25	17.43	164.74	1.00	1842.66	1281.41	1269.72
26	18.33	165.70	1.00	1898.88	1306.43	1294.53
27	19.22	166.64	1.00	1952.04	1330.10	1317.98
28	20.12	167.58	1.00	2002.17	1352.42	1340.09
29	21.01	168.52	1.00	2049.28	1373.40	1360.88
30	21.90	169.45	1.00	2093.39	1393.04	1380.34
31	22.80	170.36	0.96	2047.35	1353.97	1341.62
32	22.80	170.82	0.04	87.23	57.41	56.89
33	23.69	171.29	1.00	2204.70	1442.59	1429.44
34	24.59	172.21	1.00	2298.27	1484.26	1470.73
35	25.48	173.11	1.00	2387.68	1524.06	1510.17
36	26.38	174.01	1.00	2472.94	1562.03	1547.79
37	27.27	174.91	1.00	2554.07	1598.15	1583.58
38	28.17	175.67	0.74	1931.18	1199.91	1188.97
39	28.17	176.12	0.26	696.34	430.94	427.01
40	29.06	176.67	1.00	2626.15	1630.24	1615.38
41	29.96	177.54	1.00	2594.93	1616.34	1601.60
42	30.85	178.40	1.00	2562.03	1601.69	1587.09
43	31.74	179.26	1.00	2527.47	1586.30	1571.84
44	32.64	180.10	1.00	2491.29	1570.19	1555.88
45	33.53	180.94	1.00	2453.51	1553.37	1539.21
46	34.43	181.77	1.00	2414.15	1535.85	1521.85
47	35.32	182.59	1.00	2373.25	1517.64	1503.80
48	36.22	183.40	1.00	2330.83	1498.75	1485.09
49	37.11	184.20	1.00	2286.92	1479.20	1465.72
50	38.01	185.00	1.00	2241.56	1459.01	1445.70
51	38.90	185.78	1.00	2194.76	1438.17	1425.06
52	39.80	186.55	1.00	2146.57	1416.72	1403.80
53	40.69	187.31	1.00	2097.02	1394.65	1381.94
54	41.58	188.07	1.00	2046.13	1372.00	1359.49
55	42.48	188.81	1.00	1993.95	1348.76	1336.47
56	43.37	189.54	1.00	1940.50	1324.97	1312.89
57	44.27	190.26	1.00	1885.83	1300.62	1288.77
58	45.16	190.98	1.00	1829.96	1275.75	1264.12
59	46.06	191.41	0.25	443.00	311.71	308.87
60	46.06	191.76	0.75	1323.77	935.91	927.37
61	46.95	192.36	1.00	1687.93	1212.51	1201.46
62	47.85	193.04	1.00	1608.13	1176.99	1166.26
63	48.74	193.71	1.00	1528.10	1141.35	1130.95
64	49.64	194.36	1.00	1447.86	1105.63	1095.55
65	50.53	195.00	1.00	1367.48	1069.84	1060.09
66	51.42	195.63	1.00	1286.99	1034.00	1024.58
67	52.32	196.25	1.00	1206.45	998.14	989.04
68	53.21	196.85	1.00	1125.90	962.28	953.51
69	54.11	197.44	1.00	1045.40	926.44	918.00
70	55.00	198.02	1.00	965.00	890.65	882.53
71	55.90	198.59	1.00	884.76	854.92	847.13
72	56.79	199.15	1.00	804.74	819.29	811.82
73	57.69	199.69	1.00	724.99	783.79	776.64
74	58.58	200.22	1.00	645.58	748.43	741.61
75	59.48	200.73	1.00	566.57	713.25	706.75
76	60.37	201.23	1.00	488.03	678.28	672.10
77	61.26	201.72	1.00	410.03	643.56	637.69
78	62.16	202.19	1.00	332.64	609.10	603.55
79	63.05	202.65	1.00	255.94	574.95	569.71

80	63.95	203.10	1.00	180.01	541.15	536.21
81	64.84	203.53	1.00	104.94	507.72	503.09
82	65.74	203.95	1.00	30.81	474.72	470.39
83	66.63	204.35	1.00	0.00	461.00	456.80
84	67.53	204.74	1.00	0.00	461.00	456.80
85	68.42	205.12	1.00	0.00	461.00	456.80
86	69.32	205.48	1.00	0.00	461.00	456.80
87	70.21	205.82	1.00	0.00	461.00	456.80
88	71.10	206.15	1.00	0.00	461.00	456.80
89	72.00	206.47	1.00	0.00	461.00	456.80
90	72.89	206.77	1.00	0.00	461.00	456.80
91	73.79	207.06	1.00	0.00	461.00	456.80
92	74.68	207.30	0.74	0.00	340.65	337.55

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 38.849
3D Depth (Vertical difference between ends of Slip Surface) = 47.24(ft)
L/D(1): L = 47.24(ft) L/D(2): L = 94.47(ft) L/D(3): L = 141.71(ft)
L/D(4): L = 188.94(ft) L/D(5): L = 236.18(ft) L/D(6): L = 283.41(ft)

SUM OF MOMENTS = 0.491499E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.3555374E-05

Sum of the Resisting Forces = 90442.87 (lbs)

Average Available Shear Strength = 1030.82(psf)

Average Effective Normal Stress = 1279.83(psf)

Sum of the Driving Forces = 89618.37 (lbs)

Average Mobilized Shear Stress = 1021.42(psf)

Total length of the failure surface = 87.74(ft)

Factor of Safety Balance Check: FS = 1.00920

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

*** SEISMIC SLOPE DISPLACEMENT DATA ***
(Note: kv is set = zero for displacement calculations)
Seismic Yield Coefficient (ky) = 0.18735(g)
Calculated Newmark Seismic Displacement = 0.708(ft)

Average Elevation of Point of Application of kh on Sliding Mass = 125.974(ft)

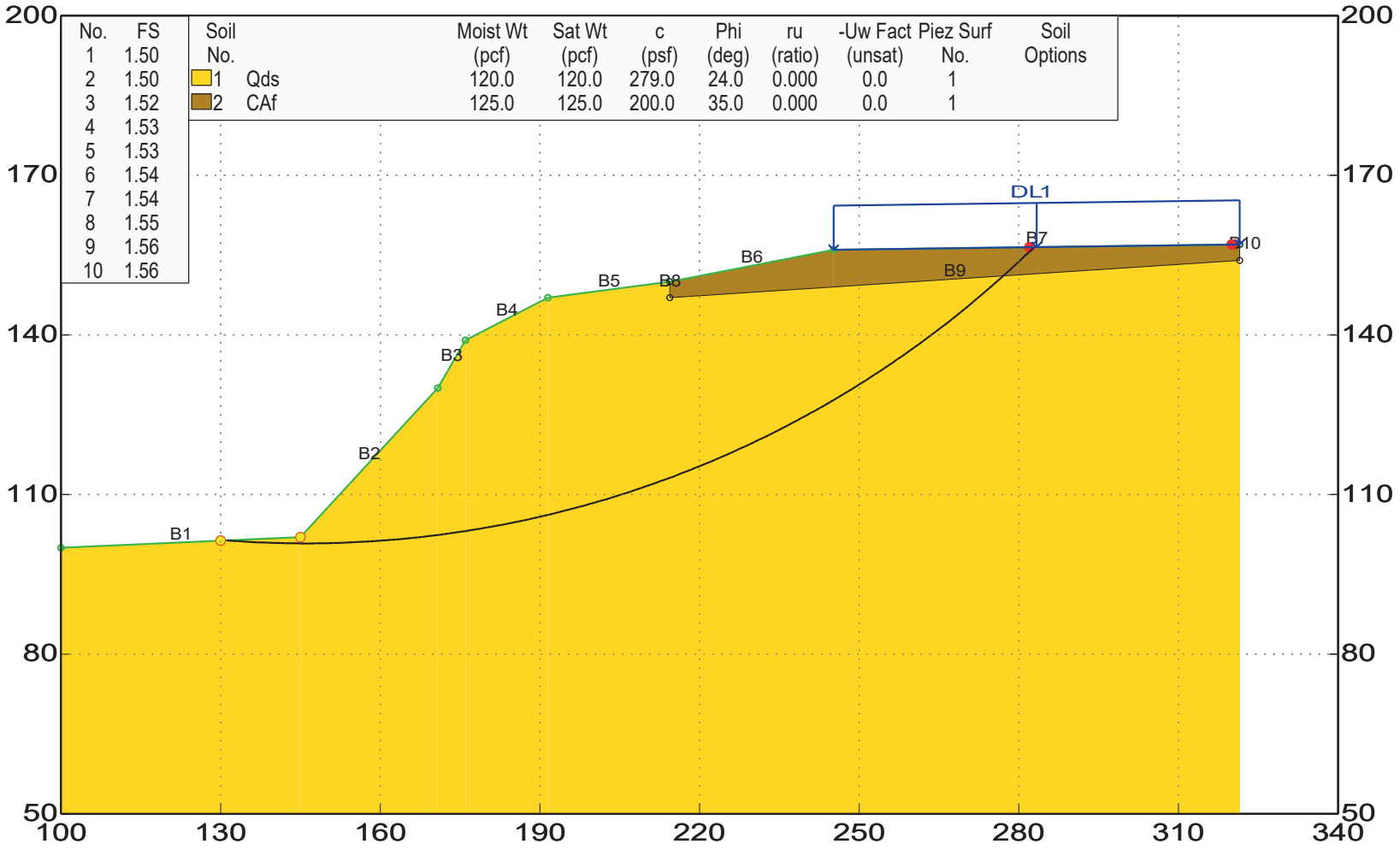
Non-Symmetrical Sliding Resistance Has Been Specified
for Downhill Sliding.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section BB - Proposed - Static FS 1.5

EGL

\BB102.gsd



No.	FS
1	1.50
2	1.50
3	1.52
4	1.53
5	1.53
6	1.54
7	1.54
8	1.55
9	1.56
10	1.56

Soil No.		Moist Wt (pcf)	Sat Wt (pcf)	c (psf)	Phi (deg)	ru (ratio)	-Uw Fact (unsat)	Piez Surf No.	Soil Options
1	Qds	120.0	120.0	279.0	24.0	0.000	0.0	1	
2	CAf	125.0	125.0	200.0	35.0	0.000	0.0	1	

GEOSTASE FS = 1.50

Simplified Bishop Method

GEOSTASE
Slope Stability Analysis

PLATE D.3pb

*** GEOSTASE(R) ***

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** Current Version 4.30.32-Double Precision, Sept 2023 **

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SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)

Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB102.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB102.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section BB - Proposed - Static FS 1.5

PROFILE BOUNDARY DATA

7 Surface Boundaries
10 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	145.000	102.000	1
2	145.000	102.000	170.800	130.000	1
3	170.800	130.000	176.000	139.000	1
4	176.000	139.000	191.500	147.000	1
5	191.500	147.000	214.400	150.000	1
6	214.400	150.000	245.200	156.000	2
7	245.200	156.000	321.500	157.000	2
8	214.400	150.000	214.400	147.000	1
9	214.400	147.000	321.500	154.000	1
10	321.500	154.000	321.500	157.000	1

User Specified X-Origin = 100.000(ft)

User Specified Y-Origin = 50.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	145.000	102.000
3	170.800	130.000
4	176.000	139.000
5	191.500	147.000
6	214.400	150.000

7	245.200	156.000
8	321.500	157.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
Surface boundary point 6 and Subsurface boundary point 9 are duplicate points.		
9	214.400	150.000
10	214.400	147.000
11	321.500	154.000
12	321.500	157.000

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.044	2.545
2	1.085	47.342
3	1.731	59.982
4	0.516	27.300
5	0.131	7.463
6	0.195	11.023
7	0.013	0.751
8	Vertical	Vertical
9	0.065	3.740
10	Vertical	Vertical

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	279.00	24.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load No.	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	Deflection (deg from Vert)
1	7	245.200	156.000	1000.000	321.500	157.000	1000.000	0.00

NOTE - Load Stress Varies Linearly Within Specified Range.
For Multi-Stage Analysis, Refer to Detailed Output for Distributed Loads Applied to Each Stage.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.1802(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 130.00(ft)
and X = 145.00(ft)

Each Surface ends within a Range Between X = 282.00(ft)
and X = 320.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 50.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 3.037 FS Min = 1.503 FS Ave = 2.216
Standard Deviation = 0.369 Coefficient of Variation = 16.67 %

Critical Surface is Sequence Number 74 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 145.980530(ft) ; Y = 296.881030(ft); and Radius = 196.064780(ft)

Circular Trial Failure Surface Generated With168 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	131.09610	101.38205
2	132.09340	101.30868
3	133.09107	101.24039
4	134.08907	101.17719
5	135.08738	101.11909
6	136.08597	101.06608
7	137.08482	101.01816
8	138.08391	100.97533
9	139.08319	100.93761
10	140.08266	100.90498
11	141.08228	100.87745
12	142.08203	100.85501
13	143.08188	100.83768
14	144.08181	100.82544
15	145.08178	100.81831
16	146.08178	100.81628
17	147.08177	100.81934
18	148.08174	100.82751
19	149.08165	100.84078
20	150.08148	100.85914
21	151.08121	100.88261
22	152.08080	100.91117
23	153.08023	100.94484
24	154.07948	100.98360
25	155.07852	101.02745
26	156.07732	101.07640
27	157.07586	101.13044
28	158.07411	101.18958
29	159.07204	101.25381
30	160.06964	101.32312
31	161.06687	101.39753
32	162.06370	101.47701
33	163.06012	101.56158
34	164.05609	101.65124
35	165.05160	101.74597
36	166.04660	101.84577
37	167.04109	101.95066

38	168.03503	102.06061
39	169.02839	102.17563
40	170.02115	102.29571
41	171.01329	102.42086
42	172.00478	102.55106
43	172.99559	102.68632
44	173.98570	102.82663
45	174.97507	102.97199
46	175.96370	103.12240
47	176.95154	103.27784
48	177.93858	103.43832
49	178.92479	103.60384
50	179.91014	103.77438
51	180.89461	103.94994
52	181.87817	104.13052
53	182.86079	104.31612
54	183.84246	104.50673
55	184.82314	104.70234
56	185.80281	104.90295
57	186.78145	105.10855
58	187.75902	105.31915
59	188.73551	105.53472
60	189.71088	105.75528
61	190.68512	105.98080
62	191.65820	106.21129
63	192.63008	106.44674
64	193.60075	106.68715
65	194.57019	106.93250
66	195.53836	107.18280
67	196.50524	107.43803
68	197.47081	107.69818
69	198.43503	107.96326
70	199.39789	108.23325
71	200.35937	108.50815
72	201.31943	108.78796
73	202.27804	109.07265
74	203.23520	109.36223
75	204.19086	109.65669
76	205.14501	109.95601
77	206.09762	110.26020
78	207.04867	110.56925
79	207.99813	110.88314
80	208.94598	111.20187
81	209.89218	111.52543
82	210.83673	111.85381
83	211.77959	112.18701
84	212.72073	112.52501
85	213.66014	112.86780
86	214.59779	113.21538
87	215.53366	113.56774
88	216.46771	113.92487
89	217.39993	114.28676
90	218.33030	114.65340
91	219.25878	115.02478
92	220.18535	115.40089
93	221.11000	115.78172
94	222.03269	116.16726
95	222.95340	116.55750
96	223.87211	116.95243
97	224.78880	117.35205
98	225.70343	117.75633
99	226.61599	118.16528
100	227.52645	118.57887
101	228.43479	118.99710
102	229.34099	119.41996
103	230.24501	119.84743
104	231.14685	120.27951
105	232.04647	120.71619
106	232.94385	121.15744
107	233.83897	121.60327
108	234.73180	122.05366
109	235.62233	122.50859

110	236.51052	122.96807
111	237.39636	123.43206
112	238.27982	123.90057
113	239.16087	124.37358
114	240.03951	124.85107
115	240.91570	125.33304
116	241.78941	125.81947
117	242.66064	126.31036
118	243.52935	126.80568
119	244.39552	127.30542
120	245.25914	127.80958
121	246.12017	128.31813
122	246.97859	128.83107
123	247.83439	129.34838
124	248.68754	129.87005
125	249.53802	130.39606
126	250.38580	130.92640
127	251.23087	131.46106
128	252.07319	132.00003
129	252.91276	132.54328
130	253.74955	133.09081
131	254.58353	133.64260
132	255.41469	134.19863
133	256.24300	134.75890
134	257.06845	135.32339
135	257.89100	135.89207
136	258.71064	136.46495
137	259.52735	137.04200
138	260.34111	137.62320
139	261.15189	138.20855
140	261.95968	138.79803
141	262.76445	139.39162
142	263.56618	139.98930
143	264.36485	140.59107
144	265.16044	141.19690
145	265.95293	141.80679
146	266.74230	142.42070
147	267.52853	143.03864
148	268.31160	143.66058
149	269.09148	144.28650
150	269.86817	144.91639
151	270.64163	145.55024
152	271.41184	146.18802
153	272.17880	146.82972
154	272.94247	147.47533
155	273.70284	148.12482
156	274.45988	148.77818
157	275.21359	149.43539
158	275.96393	150.09644
159	276.71089	150.76131
160	277.45445	151.42998
161	278.19459	152.10244
162	278.93129	152.77866
163	279.66453	153.45862
164	280.39429	154.14232
165	281.12056	154.82974
166	281.84331	155.52084
167	282.56253	156.21563
168	282.84716	156.49341

Factor Of Safety For The Critical or Specified Surface = 1.503

Table 1 - Geometry Data on the 174 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)

1	1.00	0.06	131.59	101.35	101.40	-4.21	2.54	1.00
2	1.00	0.17	132.59	101.27	101.45	-3.92	2.54	1.00
3	1.00	0.28	133.59	101.21	101.49	-3.62	2.54	1.00
4	1.00	0.39	134.59	101.15	101.54	-3.33	2.54	1.00
5	1.00	0.49	135.59	101.09	101.58	-3.04	2.54	1.00
6	1.00	0.58	136.59	101.04	101.63	-2.75	2.54	1.00
7	1.00	0.67	137.58	101.00	101.67	-2.45	2.54	1.00
8	1.00	0.76	138.58	100.96	101.71	-2.16	2.54	1.00
9	1.00	0.84	139.58	100.92	101.76	-1.87	2.54	1.00
10	1.00	0.91	140.58	100.89	101.80	-1.58	2.54	1.00
11	1.00	0.98	141.58	100.87	101.85	-1.29	2.54	1.00
12	1.00	1.05	142.58	100.85	101.89	-0.99	2.54	1.00
13	1.00	1.11	143.58	100.83	101.94	-0.70	2.54	1.00
14	0.92	1.16	144.54	100.82	101.98	-0.41	2.54	0.92
15	0.08	1.23	145.04	100.82	102.04	-0.41	47.34	0.08
16	1.00	1.81	145.58	100.82	102.63	-0.12	47.34	1.00
17	1.00	2.90	146.58	100.82	103.72	0.18	47.34	1.00
18	1.00	3.98	147.58	100.82	104.80	0.47	47.34	1.00
19	1.00	5.05	148.58	100.83	105.89	0.76	47.34	1.00
20	1.00	6.12	149.58	100.85	106.97	1.05	47.34	1.00
21	1.00	7.19	150.58	100.87	108.06	1.34	47.34	1.00
22	1.00	8.25	151.58	100.90	109.14	1.64	47.34	1.00
23	1.00	9.30	152.58	100.93	110.23	1.93	47.34	1.00
24	1.00	10.35	153.58	100.96	111.31	2.22	47.34	1.00
25	1.00	11.39	154.58	101.01	112.40	2.51	47.34	1.00
26	1.00	12.43	155.58	101.05	113.48	2.81	47.34	1.00
27	1.00	13.46	156.58	101.10	114.56	3.10	47.34	1.00
28	1.00	14.49	157.57	101.16	115.65	3.39	47.34	1.00
29	1.00	15.51	158.57	101.22	116.73	3.68	47.34	1.00
30	1.00	16.52	159.57	101.29	117.81	3.97	47.34	1.00
31	1.00	17.54	160.57	101.36	118.90	4.27	47.34	1.00
32	1.00	18.54	161.57	101.44	119.98	4.56	47.34	1.00
33	1.00	19.54	162.56	101.52	121.06	4.85	47.34	1.00
34	1.00	20.53	163.56	101.61	122.14	5.14	47.34	1.00
35	1.00	21.52	164.55	101.70	123.22	5.44	47.34	1.00
36	1.00	22.51	165.55	101.80	124.30	5.73	47.34	1.00
37	0.99	23.48	166.54	101.90	125.38	6.02	47.34	1.00
38	0.99	24.45	167.54	102.01	126.46	6.31	47.34	1.00
39	0.99	25.42	168.53	102.12	127.54	6.60	47.34	1.00
40	0.99	26.38	169.52	102.24	128.62	6.90	47.34	1.00
41	0.78	27.23	170.41	102.34	129.58	7.19	47.34	0.79
42	0.21	27.78	170.91	102.41	130.18	7.19	59.98	0.21
43	0.99	28.74	171.51	102.49	131.23	7.48	59.98	1.00
44	0.99	30.32	172.50	102.62	132.94	7.77	59.98	1.00
45	0.99	31.90	173.49	102.76	134.66	8.07	59.98	1.00
46	0.99	33.47	174.48	102.90	136.37	8.36	59.98	1.00
47	0.99	35.03	175.47	103.05	138.08	8.65	59.98	1.00
48	0.04	35.84	175.98	103.13	138.97	8.94	59.98	0.04
49	0.95	36.04	176.48	103.20	139.25	8.94	27.30	0.96
50	0.99	36.39	177.45	103.36	139.75	9.23	27.30	1.00
51	0.99	36.73	178.43	103.52	140.26	9.53	27.30	1.00
52	0.99	37.07	179.42	103.69	140.76	9.82	27.30	1.00
53	0.98	37.41	180.40	103.86	141.27	10.11	27.30	1.00
54	0.98	37.74	181.39	104.04	141.78	10.40	27.30	1.00
55	0.98	38.06	182.37	104.22	142.29	10.70	27.30	1.00
56	0.98	38.38	183.35	104.41	142.79	10.99	27.30	1.00
57	0.98	38.70	184.33	104.60	143.30	11.28	27.30	1.00
58	0.98	39.00	185.31	104.80	143.81	11.57	27.30	1.00
59	0.98	39.31	186.29	105.01	144.31	11.86	27.30	1.00
60	0.98	39.60	187.27	105.21	144.82	12.16	27.30	1.00
61	0.98	39.89	188.25	105.43	145.32	12.45	27.30	1.00
62	0.98	40.18	189.22	105.64	145.82	12.74	27.30	1.00
63	0.97	40.46	190.20	105.87	146.33	13.03	27.30	1.00
64	0.81	40.71	191.09	106.08	146.79	13.33	27.30	0.84
65	0.16	40.82	191.58	106.19	147.01	13.33	7.46	0.16
66	0.97	40.76	192.14	106.33	147.08	13.62	7.46	1.00
67	0.97	40.64	193.12	106.57	147.21	13.91	7.46	1.00
68	0.97	40.53	194.09	106.81	147.34	14.20	7.46	1.00
69	0.97	40.41	195.05	107.06	147.47	14.49	7.46	1.00
70	0.97	40.28	196.02	107.31	147.59	14.79	7.46	1.00
71	0.97	40.15	196.99	107.57	147.72	15.08	7.46	1.00
72	0.96	40.01	197.95	107.83	147.85	15.37	7.46	1.00

73	0.96	39.87	198.92	108.10	147.97	15.66	7.46	1.00
74	0.96	39.73	199.88	108.37	148.10	15.96	7.46	1.00
75	0.96	39.58	200.84	108.65	148.22	16.25	7.46	1.00
76	0.96	39.42	201.80	108.93	148.35	16.54	7.46	1.00
77	0.96	39.26	202.76	109.22	148.47	16.83	7.46	1.00
78	0.96	39.09	203.71	109.51	148.60	17.12	7.46	1.00
79	0.95	38.92	204.67	109.81	148.73	17.42	7.46	1.00
80	0.95	38.74	205.62	110.11	148.85	17.71	7.46	1.00
81	0.95	38.56	206.57	110.41	148.97	18.00	7.46	1.00
82	0.95	38.37	207.52	110.73	149.10	18.29	7.46	1.00
83	0.95	38.18	208.47	111.04	149.22	18.59	7.46	1.00
84	0.95	37.98	209.42	111.36	149.35	18.88	7.46	1.00
85	0.94	37.78	210.36	111.69	149.47	19.17	7.46	1.00
86	0.94	37.57	211.31	112.02	149.59	19.46	7.46	1.00
87	0.94	37.36	212.25	112.36	149.72	19.76	7.46	1.00
88	0.94	37.15	213.19	112.70	149.84	20.05	7.46	1.00
89	0.74	36.95	214.03	113.00	149.95	20.34	7.46	0.79
90	0.20	36.84	214.50	113.18	150.02	20.34	11.02	0.21
91	0.94	36.74	215.07	113.39	150.13	20.63	11.02	1.00
92	0.93	36.57	216.00	113.75	150.31	20.92	11.02	1.00
93	0.93	36.39	216.93	114.11	150.49	21.22	11.02	1.00
94	0.93	36.20	217.87	114.47	150.68	21.51	11.02	1.00
95	0.93	36.02	218.79	114.84	150.86	21.80	11.02	1.00
96	0.93	35.82	219.72	115.21	151.04	22.09	11.02	1.00
97	0.92	35.63	220.65	115.59	151.22	22.39	11.02	1.00
98	0.92	35.42	221.57	115.97	151.40	22.68	11.02	1.00
99	0.92	35.21	222.49	116.36	151.58	22.97	11.02	1.00
100	0.92	35.00	223.41	116.75	151.76	23.26	11.02	1.00
101	0.92	34.78	224.33	117.15	151.93	23.55	11.02	1.00
102	0.91	34.56	225.25	117.55	152.11	23.85	11.02	1.00
103	0.91	34.33	226.16	117.96	152.29	24.14	11.02	1.00
104	0.91	34.10	227.07	118.37	152.47	24.43	11.02	1.00
105	0.91	33.86	227.98	118.79	152.65	24.72	11.02	1.00
106	0.91	33.61	228.89	119.21	152.82	25.02	11.02	1.00
107	0.90	33.36	229.79	119.63	153.00	25.31	11.02	1.00
108	0.90	33.11	230.70	120.06	153.17	25.60	11.02	1.00
109	0.90	32.85	231.60	120.50	153.35	25.89	11.02	1.00
110	0.90	32.59	232.50	120.94	153.53	26.18	11.02	1.00
111	0.90	32.32	233.39	121.38	153.70	26.48	11.02	1.00
112	0.89	32.05	234.29	121.83	153.87	26.77	11.02	1.00
113	0.89	31.77	235.18	122.28	154.05	27.06	11.02	1.00
114	0.89	31.48	236.07	122.74	154.22	27.35	11.02	1.00
115	0.89	31.19	236.95	123.20	154.39	27.65	11.02	1.00
116	0.88	30.90	237.84	123.67	154.57	27.94	11.02	1.00
117	0.88	30.60	238.72	124.14	154.74	28.23	11.02	1.00
118	0.88	30.30	239.60	124.61	154.91	28.52	11.02	1.00
119	0.88	29.99	240.48	125.09	155.08	28.81	11.02	1.00
120	0.87	29.67	241.35	125.58	155.25	29.11	11.02	1.00
121	0.87	29.36	242.23	126.06	155.42	29.40	11.02	1.00
122	0.87	29.03	243.09	126.56	155.59	29.69	11.02	1.00
123	0.87	28.70	243.96	127.06	155.76	29.98	11.02	1.00
124	0.80	28.38	244.80	127.54	155.92	30.28	11.02	0.93
125	0.06	28.21	245.23	127.79	156.00	30.28	0.75	0.07
126	0.86	27.94	245.69	128.06	156.01	30.57	0.75	1.00
127	0.86	27.44	246.55	128.57	156.02	30.86	0.75	1.00
128	0.86	26.94	247.41	129.09	156.03	31.15	0.75	1.00
129	0.85	26.43	248.26	129.61	156.04	31.44	0.75	1.00
130	0.85	25.92	249.11	130.13	156.05	31.74	0.75	1.00
131	0.85	25.40	249.96	130.66	156.06	32.03	0.75	1.00
132	0.85	24.88	250.81	131.19	156.07	32.32	0.75	1.00
133	0.84	24.35	251.65	131.73	156.08	32.61	0.75	1.00
134	0.84	23.82	252.49	132.27	156.10	32.91	0.75	1.00
135	0.84	23.29	253.33	132.82	156.11	33.20	0.75	1.00
136	0.83	22.75	254.17	133.37	156.12	33.49	0.75	1.00
137	0.83	22.21	255.00	133.92	156.13	33.78	0.75	1.00
138	0.83	21.66	255.83	134.48	156.14	34.07	0.75	1.00
139	0.83	21.11	256.66	135.04	156.15	34.37	0.75	1.00
140	0.82	20.55	257.48	135.61	156.16	34.66	0.75	1.00
141	0.82	19.99	258.30	136.18	156.17	34.95	0.75	1.00
142	0.82	19.43	259.12	136.75	156.18	35.24	0.75	1.00
143	0.81	18.86	259.93	137.33	156.19	35.54	0.75	1.00
144	0.81	18.29	260.75	137.92	156.20	35.83	0.75	1.00

145	0.81	17.71	261.56	138.50	156.21	36.12	0.75	1.00
146	0.80	17.13	262.36	139.09	156.22	36.41	0.75	1.00
147	0.80	16.54	263.17	139.69	156.24	36.70	0.75	1.00
148	0.80	15.96	263.97	140.29	156.25	37.00	0.75	1.00
149	0.80	15.36	264.76	140.89	156.26	37.29	0.75	1.00
150	0.79	14.76	265.56	141.50	156.27	37.58	0.75	1.00
151	0.79	14.16	266.35	142.11	156.28	37.87	0.75	1.00
152	0.79	13.56	267.14	142.73	156.29	38.17	0.75	1.00
153	0.78	12.95	267.92	143.35	156.30	38.46	0.75	1.00
154	0.78	12.33	268.70	143.97	156.31	38.75	0.75	1.00
155	0.78	11.72	269.48	144.60	156.32	39.04	0.75	1.00
156	0.77	11.10	270.25	145.23	156.33	39.33	0.75	1.00
157	0.77	10.47	271.03	145.87	156.34	39.63	0.75	1.00
158	0.77	9.84	271.80	146.51	156.35	39.92	0.75	1.00
159	0.76	9.21	272.56	147.15	156.36	40.21	0.75	1.00
160	0.76	8.57	273.32	147.80	156.37	40.50	0.75	1.00
161	0.76	7.93	274.08	148.45	156.38	40.80	0.75	1.00
162	0.75	7.28	274.84	149.11	156.39	41.09	0.75	1.00
163	0.75	6.63	275.59	149.77	156.40	41.38	0.75	1.00
164	0.75	5.98	276.34	150.43	156.41	41.67	0.75	1.00
165	0.37	5.49	276.90	150.93	156.42	41.96	0.75	0.50
166	0.37	5.16	277.27	151.26	156.42	41.96	0.75	0.50
167	0.74	4.66	277.82	151.77	156.43	42.26	0.75	1.00
168	0.74	4.00	278.56	152.44	156.44	42.55	0.75	1.00
169	0.73	3.33	279.30	153.12	156.45	42.84	0.75	1.00
170	0.73	2.66	280.03	153.80	156.46	43.13	0.75	1.00
171	0.73	1.98	280.76	154.49	156.47	43.43	0.75	1.00
172	0.72	1.30	281.48	155.18	156.48	43.72	0.75	1.00
173	0.72	0.62	282.20	155.87	156.48	44.01	0.75	1.00
174	0.28	0.14	282.70	156.35	156.49	44.30	0.75	0.40

Table 2 - Force Data On The 174 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	7.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
2	20.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
3	34.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
4	46.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
5	58.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
6	70.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
7	80.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
8	90.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
9	100.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
10	109.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
11	117.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
12	125.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
13	132.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
14	127.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
15	12.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
16	217.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
17	347.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
18	477.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
19	606.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
20	734.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
21	862.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
22	989.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
23	1115.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
24	1240.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
25	1365.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
26	1489.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
27	1612.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
28	1735.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
29	1857.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
30	1978.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
31	2098.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
32	2217.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
33	2336.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

34	2454.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
35	2571.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
36	2687.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
37	2802.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
38	2916.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
39	3030.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
40	3142.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
41	2545.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
42	711.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
43	3419.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
44	3605.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
45	3790.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
46	3973.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
47	4156.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
48	156.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
49	4115.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
50	4309.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
51	4347.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
52	4383.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
53	4419.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
54	4454.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
55	4488.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
56	4521.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
57	4553.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
58	4585.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
59	4616.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
60	4645.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
61	4674.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
62	4702.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
63	4730.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
64	3981.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
65	774.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
66	4753.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
67	4734.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
68	4714.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
69	4694.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
70	4673.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
71	4652.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
72	4630.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
73	4607.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
74	4583.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
75	4559.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
76	4534.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
77	4509.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
78	4482.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
79	4456.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
80	4428.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
81	4400.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
82	4372.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
83	4342.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
84	4312.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
85	4282.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
86	4251.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
87	4219.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
88	4187.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
89	3280.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
90	877.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
91	4140.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
92	4113.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
93	4086.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
94	4058.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
95	4029.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
96	4000.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
97	3970.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
98	3940.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
99	3909.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
100	3877.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
101	3845.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
102	3813.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
103	3780.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
104	3746.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
105	3712.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

106	3677.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
107	3642.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
108	3606.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
109	3570.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
110	3533.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
111	3496.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
112	3458.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
113	3420.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
114	3381.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
115	3342.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
116	3302.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
117	3262.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
118	3221.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
119	3180.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
120	3139.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
121	3097.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
122	3055.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
123	3013.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
124	2767.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
125	202.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	59.14
126	2917.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	861.10
127	2856.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	858.50
128	2795.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	855.87
129	2735.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	853.22
130	2674.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	850.55
131	2612.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	847.86
132	2551.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	845.14
133	2489.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	842.40
134	2428.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	839.64
135	2366.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	836.86
136	2304.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	834.06
137	2241.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	831.23
138	2179.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	828.38
139	2117.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	825.51
140	2054.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	822.62
141	1992.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	819.71
142	1929.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	816.78
143	1867.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	813.83
144	1804.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	810.85
145	1741.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	807.85
146	1678.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	804.84
147	1616.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	801.80
148	1553.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	798.74
149	1490.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	795.66
150	1427.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	792.56
151	1364.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	789.44
152	1302.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	786.30
153	1239.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	783.13
154	1176.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	779.95
155	1114.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	776.75
156	1051.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	773.53
157	989.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	770.28
158	927.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	767.02
159	864.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	763.74
160	802.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	760.43
161	740.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	757.11
162	679.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	753.77
163	617.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	750.41
164	556.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	747.02
165	255.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	373.32
166	238.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	370.30
167	431.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	740.20
168	368.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	736.76
169	305.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	733.30
170	242.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	729.83
171	179.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	726.33
172	117.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	722.81
173	55.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	719.28
174	4.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	284.66

TOTAL WEIGHT OF SLIDING MASS = 438667.80(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 438667.80(lbs)

TOTAL AREA OF SLIDING MASS = 3640.33(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 174 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	279.00	24.00	
2	1	279.00	24.00	
3	1	279.00	24.00	
4	1	279.00	24.00	
5	1	279.00	24.00	
6	1	279.00	24.00	
7	1	279.00	24.00	
8	1	279.00	24.00	
9	1	279.00	24.00	
10	1	279.00	24.00	
11	1	279.00	24.00	
12	1	279.00	24.00	
13	1	279.00	24.00	
14	1	279.00	24.00	
15	1	279.00	24.00	
16	1	279.00	24.00	
17	1	279.00	24.00	
18	1	279.00	24.00	
19	1	279.00	24.00	
20	1	279.00	24.00	
21	1	279.00	24.00	
22	1	279.00	24.00	
23	1	279.00	24.00	
24	1	279.00	24.00	
25	1	279.00	24.00	
26	1	279.00	24.00	
27	1	279.00	24.00	
28	1	279.00	24.00	
29	1	279.00	24.00	
30	1	279.00	24.00	
31	1	279.00	24.00	
32	1	279.00	24.00	
33	1	279.00	24.00	
34	1	279.00	24.00	
35	1	279.00	24.00	
36	1	279.00	24.00	
37	1	279.00	24.00	
38	1	279.00	24.00	
39	1	279.00	24.00	
40	1	279.00	24.00	
41	1	279.00	24.00	
42	1	279.00	24.00	
43	1	279.00	24.00	
44	1	279.00	24.00	
45	1	279.00	24.00	
46	1	279.00	24.00	
47	1	279.00	24.00	
48	1	279.00	24.00	
49	1	279.00	24.00	
50	1	279.00	24.00	
51	1	279.00	24.00	
52	1	279.00	24.00	
53	1	279.00	24.00	
54	1	279.00	24.00	
55	1	279.00	24.00	
56	1	279.00	24.00	
57	1	279.00	24.00	
58	1	279.00	24.00	
59	1	279.00	24.00	
60	1	279.00	24.00	
61	1	279.00	24.00	
62	1	279.00	24.00	

63	1	279.00	24.00
64	1	279.00	24.00
65	1	279.00	24.00
66	1	279.00	24.00
67	1	279.00	24.00
68	1	279.00	24.00
69	1	279.00	24.00
70	1	279.00	24.00
71	1	279.00	24.00
72	1	279.00	24.00
73	1	279.00	24.00
74	1	279.00	24.00
75	1	279.00	24.00
76	1	279.00	24.00
77	1	279.00	24.00
78	1	279.00	24.00
79	1	279.00	24.00
80	1	279.00	24.00
81	1	279.00	24.00
82	1	279.00	24.00
83	1	279.00	24.00
84	1	279.00	24.00
85	1	279.00	24.00
86	1	279.00	24.00
87	1	279.00	24.00
88	1	279.00	24.00
89	1	279.00	24.00
90	1	279.00	24.00
91	1	279.00	24.00
92	1	279.00	24.00
93	1	279.00	24.00
94	1	279.00	24.00
95	1	279.00	24.00
96	1	279.00	24.00
97	1	279.00	24.00
98	1	279.00	24.00
99	1	279.00	24.00
100	1	279.00	24.00
101	1	279.00	24.00
102	1	279.00	24.00
103	1	279.00	24.00
104	1	279.00	24.00
105	1	279.00	24.00
106	1	279.00	24.00
107	1	279.00	24.00
108	1	279.00	24.00
109	1	279.00	24.00
110	1	279.00	24.00
111	1	279.00	24.00
112	1	279.00	24.00
113	1	279.00	24.00
114	1	279.00	24.00
115	1	279.00	24.00
116	1	279.00	24.00
117	1	279.00	24.00
118	1	279.00	24.00
119	1	279.00	24.00
120	1	279.00	24.00
121	1	279.00	24.00
122	1	279.00	24.00
123	1	279.00	24.00
124	1	279.00	24.00
125	1	279.00	24.00
126	1	279.00	24.00
127	1	279.00	24.00
128	1	279.00	24.00
129	1	279.00	24.00
130	1	279.00	24.00
131	1	279.00	24.00
132	1	279.00	24.00
133	1	279.00	24.00
134	1	279.00	24.00

135	1	279.00	24.00
136	1	279.00	24.00
137	1	279.00	24.00
138	1	279.00	24.00
139	1	279.00	24.00
140	1	279.00	24.00
141	1	279.00	24.00
142	1	279.00	24.00
143	1	279.00	24.00
144	1	279.00	24.00
145	1	279.00	24.00
146	1	279.00	24.00
147	1	279.00	24.00
148	1	279.00	24.00
149	1	279.00	24.00
150	1	279.00	24.00
151	1	279.00	24.00
152	1	279.00	24.00
153	1	279.00	24.00
154	1	279.00	24.00
155	1	279.00	24.00
156	1	279.00	24.00
157	1	279.00	24.00
158	1	279.00	24.00
159	1	279.00	24.00
160	1	279.00	24.00
161	1	279.00	24.00
162	1	279.00	24.00
163	1	279.00	24.00
164	1	279.00	24.00
165	1	279.00	24.00
166	2	200.00	35.00
167	2	200.00	35.00
168	2	200.00	35.00
169	2	200.00	35.00
170	2	200.00	35.00
171	2	200.00	35.00
172	2	200.00	35.00
173	2	200.00	35.00
174	2	200.00	35.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 174 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-4.21	131.59	1.00	24.35	289.84	192.78
2	-3.92	132.59	1.00	37.28	295.60	196.62
3	-3.62	133.59	1.00	49.54	301.06	200.25
4	-3.33	134.59	1.00	61.14	306.22	203.68
5	-3.04	135.59	1.00	72.07	311.09	206.92
6	-2.75	136.59	1.00	82.34	315.66	209.96
7	-2.45	137.58	1.00	91.96	319.94	212.81
8	-2.16	138.58	1.00	100.92	323.93	215.46
9	-1.87	139.58	1.00	109.22	327.63	217.92
10	-1.58	140.58	1.00	116.89	331.04	220.19
11	-1.29	141.58	1.00	123.90	334.16	222.27

12	-0.99	142.58	1.00	130.28	337.00	224.16
13	-0.70	143.58	1.00	136.02	339.56	225.85
14	-0.41	144.54	0.92	140.87	341.72	227.29
15	-0.41	145.04	0.08	149.09	345.38	229.73
16	-0.12	145.58	1.00	218.31	376.20	250.23
17	0.18	146.58	1.00	346.78	433.40	288.27
18	0.47	147.58	1.00	474.17	490.12	326.00
19	0.76	148.58	1.00	600.48	546.35	363.40
20	1.05	149.58	1.00	725.71	602.11	400.49
21	1.34	150.58	1.00	849.86	657.38	437.25
22	1.64	151.58	1.00	972.94	712.18	473.70
23	1.93	152.58	1.00	1094.94	766.50	509.83
24	2.22	153.58	1.00	1215.88	820.34	545.65
25	2.51	154.58	1.00	1335.75	873.71	581.14
26	2.81	155.58	1.00	1454.55	926.61	616.33
27	3.10	156.58	1.00	1572.29	979.03	651.19
28	3.39	157.57	1.00	1688.97	1030.98	685.75
29	3.68	158.57	1.00	1804.58	1082.45	719.99
30	3.97	159.57	1.00	1919.15	1133.46	753.91
31	4.27	160.57	1.00	2032.65	1183.99	787.52
32	4.56	161.57	1.00	2145.10	1234.06	820.83
33	4.85	162.56	1.00	2256.50	1283.66	853.82
34	5.14	163.56	1.00	2366.86	1332.79	886.50
35	5.44	164.55	1.00	2476.16	1381.46	918.87
36	5.73	165.55	1.00	2584.42	1429.66	950.93
37	6.02	166.54	1.00	2691.63	1477.39	982.68
38	6.31	167.54	1.00	2797.80	1524.66	1014.12
39	6.60	168.53	1.00	2902.93	1571.47	1045.25
40	6.90	169.52	1.00	3007.02	1617.81	1076.08
41	7.19	170.41	0.79	3098.34	1658.47	1103.12
42	7.19	170.91	0.21	3160.85	1686.30	1121.63
43	7.48	171.51	1.00	3264.53	1732.46	1152.33
44	7.77	172.50	1.00	3438.59	1809.96	1203.88
45	8.07	173.49	1.00	3611.31	1886.86	1255.03
46	8.36	174.48	1.00	3782.68	1963.16	1305.78
47	8.65	175.47	1.00	3952.71	2038.86	1356.13
48	8.94	175.98	0.04	4036.39	2076.12	1380.91
49	8.94	176.48	0.96	4059.02	2086.19	1387.61
50	9.23	177.45	1.00	4089.79	2099.89	1396.73
51	9.53	178.43	1.00	4120.55	2113.59	1405.84
52	9.82	179.42	1.00	4150.58	2126.96	1414.73
53	10.11	180.40	1.00	4179.86	2139.99	1423.40
54	10.40	181.39	1.00	4208.41	2152.71	1431.86
55	10.70	182.37	1.00	4236.22	2165.09	1440.09
56	10.99	183.35	1.00	4263.30	2177.15	1448.11
57	11.28	184.33	1.00	4289.66	2188.88	1455.92
58	11.57	185.31	1.00	4315.28	2200.29	1463.50
59	11.86	186.29	1.00	4340.17	2211.37	1470.88
60	12.16	187.27	1.00	4364.35	2222.13	1478.03
61	12.45	188.25	1.00	4387.80	2232.57	1484.98
62	12.74	189.22	1.00	4410.53	2242.69	1491.71
63	13.03	190.20	1.00	4432.54	2252.49	1498.23
64	13.33	191.09	0.84	4451.40	2260.89	1503.81
65	13.33	191.58	0.16	4463.05	2266.08	1507.26
66	13.62	192.14	1.00	4447.05	2258.95	1502.53
67	13.91	193.12	1.00	4425.77	2249.48	1496.22
68	14.20	194.09	1.00	4403.98	2239.78	1489.77
69	14.49	195.05	1.00	4381.69	2229.85	1483.17
70	14.79	196.02	1.00	4358.89	2219.70	1476.42
71	15.08	196.99	1.00	4335.59	2209.33	1469.52
72	15.37	197.95	1.00	4311.80	2198.74	1462.47
73	15.66	198.92	1.00	4287.51	2187.92	1455.28
74	15.96	199.88	1.00	4262.73	2176.89	1447.94
75	16.25	200.84	1.00	4237.46	2165.64	1440.46
76	16.54	201.80	1.00	4211.70	2154.17	1432.83
77	16.83	202.76	1.00	4185.46	2142.49	1425.06
78	17.12	203.71	1.00	4158.74	2130.59	1417.15
79	17.42	204.67	1.00	4131.55	2118.48	1409.09
80	17.71	205.62	1.00	4103.88	2106.16	1400.90
81	18.00	206.57	1.00	4075.73	2093.63	1392.56
82	18.29	207.52	1.00	4047.13	2080.90	1384.09
83	18.59	208.47	1.00	4018.05	2067.95	1375.48

84	18.88	209.42	1.00	3988.51	2054.80	1366.73
85	19.17	210.36	1.00	3958.52	2041.45	1357.85
86	19.46	211.31	1.00	3928.06	2027.89	1348.83
87	19.76	212.25	1.00	3897.16	2014.13	1339.68
88	20.05	213.19	1.00	3865.80	2000.17	1330.40
89	20.34	214.03	0.79	3836.51	1987.13	1321.72
90	20.34	214.50	0.21	3838.57	1988.04	1322.33
91	20.63	215.07	1.00	3819.83	1979.70	1316.78
92	20.92	216.00	1.00	3793.93	1968.17	1309.11
93	21.22	216.93	1.00	3767.56	1956.43	1301.30
94	21.51	217.87	1.00	3740.71	1944.47	1293.35
95	21.80	218.79	1.00	3713.40	1932.31	1285.26
96	22.09	219.72	1.00	3685.62	1919.94	1277.03
97	22.39	220.65	1.00	3657.37	1907.37	1268.67
98	22.68	221.57	1.00	3628.66	1894.58	1260.17
99	22.97	222.49	1.00	3599.50	1881.60	1251.53
100	23.26	223.41	1.00	3569.88	1868.41	1242.76
101	23.55	224.33	1.00	3539.82	1855.03	1233.86
102	23.85	225.25	1.00	3509.30	1841.44	1224.82
103	24.14	226.16	1.00	3478.34	1827.66	1215.65
104	24.43	227.07	1.00	3446.94	1813.68	1206.35
105	24.72	227.98	1.00	3415.10	1799.50	1196.92
106	25.02	228.89	1.00	3382.83	1785.13	1187.37
107	25.31	229.79	1.00	3350.13	1770.57	1177.68
108	25.60	230.70	1.00	3316.99	1755.82	1167.87
109	25.89	231.60	1.00	3283.44	1740.88	1157.93
110	26.18	232.50	1.00	3249.46	1725.75	1147.87
111	26.48	233.39	1.00	3215.07	1710.44	1137.69
112	26.77	234.29	1.00	3180.26	1694.94	1127.38
113	27.06	235.18	1.00	3145.04	1679.26	1116.95
114	27.35	236.07	1.00	3109.42	1663.40	1106.40
115	27.65	236.95	1.00	3073.39	1647.36	1095.73
116	27.94	237.84	1.00	3036.96	1631.14	1084.94
117	28.23	238.72	1.00	3000.14	1614.75	1074.04
118	28.52	239.60	1.00	2962.92	1598.18	1063.02
119	28.81	240.48	1.00	2925.31	1581.43	1051.88
120	29.11	241.35	1.00	2887.32	1564.52	1040.63
121	29.40	242.23	1.00	2848.95	1547.43	1029.26
122	29.69	243.09	1.00	2810.20	1530.18	1017.79
123	29.98	243.96	1.00	2771.07	1512.76	1006.20
124	30.28	244.80	0.93	2732.70	1495.68	994.84
125	30.28	245.23	0.07	3541.79	1855.90	1234.44
126	30.57	245.69	1.00	3506.92	1840.38	1224.11
127	30.86	246.55	1.00	3448.96	1814.58	1206.95
128	31.15	247.41	1.00	3390.76	1788.66	1189.71
129	31.44	248.26	1.00	3332.31	1762.64	1172.41
130	31.74	249.11	1.00	3273.62	1736.51	1155.03
131	32.03	249.96	1.00	3214.70	1710.28	1137.58
132	32.32	250.81	1.00	3155.54	1683.94	1120.06
133	32.61	251.65	1.00	3096.16	1657.50	1102.47
134	32.91	252.49	1.00	3036.56	1630.96	1084.82
135	33.20	253.33	1.00	2976.74	1604.33	1067.11
136	33.49	254.17	1.00	2916.71	1577.60	1049.33
137	33.78	255.00	1.00	2856.47	1550.78	1031.49
138	34.07	255.83	1.00	2796.02	1523.87	1013.59
139	34.37	256.66	1.00	2735.37	1496.87	995.63
140	34.66	257.48	1.00	2674.53	1469.78	977.61
141	34.95	258.30	1.00	2613.50	1442.60	959.54
142	35.24	259.12	1.00	2552.28	1415.35	941.41
143	35.54	259.93	1.00	2490.87	1388.01	923.22
144	35.83	260.75	1.00	2429.29	1360.59	904.99
145	36.12	261.56	1.00	2367.54	1333.10	886.70
146	36.41	262.36	1.00	2305.62	1305.53	868.36
147	36.70	263.17	1.00	2243.53	1277.88	849.98
148	37.00	263.97	1.00	2181.29	1250.17	831.54
149	37.29	264.76	1.00	2118.89	1222.39	813.06
150	37.58	265.56	1.00	2056.35	1194.54	794.54
151	37.87	266.35	1.00	1993.66	1166.63	775.98
152	38.17	267.14	1.00	1930.83	1138.66	757.37
153	38.46	267.92	1.00	1867.86	1110.63	738.72
154	38.75	268.70	1.00	1804.77	1082.54	720.04
155	39.04	269.48	1.00	1741.56	1054.39	701.32

156	39.33	270.25	1.00	1678.22	1026.19	682.57
157	39.63	271.03	1.00	1614.78	997.95	663.78
158	39.92	271.80	1.00	1551.22	969.65	644.95
159	40.21	272.56	1.00	1487.57	941.31	626.10
160	40.50	273.32	1.00	1423.81	912.92	607.22
161	40.80	274.08	1.00	1359.96	884.50	588.32
162	41.09	274.84	1.00	1296.03	856.03	569.38
163	41.38	275.59	1.00	1232.02	827.53	550.42
164	41.67	276.34	1.00	1167.93	798.99	531.44
165	41.96	276.90	0.50	1118.67	777.06	516.86
166	41.96	277.27	0.50	992.38	894.88	595.22
167	42.26	277.82	1.00	947.09	863.16	574.12
168	42.55	278.56	1.00	888.16	821.90	546.68
169	42.84	279.30	1.00	829.30	780.68	519.26
170	43.13	280.03	1.00	770.50	739.51	491.88
171	43.43	280.76	1.00	711.78	698.39	464.53
172	43.72	281.48	1.00	653.13	657.33	437.22
173	44.01	282.20	1.00	594.57	616.33	409.94
174	44.30	282.70	0.40	552.80	587.07	390.49

Table 4A - Base Force Data on the 174 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-4.21	131.59	1.00	24.35	289.84	192.78
2	-3.92	132.59	1.00	37.28	295.60	196.62
3	-3.62	133.59	1.00	49.54	301.06	200.25
4	-3.33	134.59	1.00	61.14	306.22	203.68
5	-3.04	135.59	1.00	72.07	311.09	206.92
6	-2.75	136.59	1.00	82.34	315.66	209.96
7	-2.45	137.58	1.00	91.96	319.94	212.81
8	-2.16	138.58	1.00	100.92	323.93	215.46
9	-1.87	139.58	1.00	109.22	327.63	217.92
10	-1.58	140.58	1.00	116.89	331.04	220.19
11	-1.29	141.58	1.00	123.90	334.16	222.27
12	-0.99	142.58	1.00	130.28	337.00	224.16
13	-0.70	143.58	1.00	136.02	339.56	225.85
14	-0.41	144.54	0.92	129.35	313.77	208.70
15	-0.41	145.04	0.08	12.19	28.25	18.79
16	-0.12	145.58	1.00	218.31	376.20	250.23
17	0.18	146.58	1.00	346.78	433.40	288.27
18	0.47	147.58	1.00	474.17	490.12	326.00
19	0.76	148.58	1.00	600.48	546.35	363.40
20	1.05	149.58	1.00	725.71	602.11	400.49
21	1.34	150.58	1.00	849.86	657.38	437.25
22	1.64	151.58	1.00	972.94	712.18	473.70
23	1.93	152.58	1.00	1094.94	766.50	509.83
24	2.22	153.58	1.00	1215.88	820.34	545.65
25	2.51	154.58	1.00	1335.75	873.71	581.14
26	2.81	155.58	1.00	1454.55	926.61	616.33
27	3.10	156.58	1.00	1572.29	979.03	651.19
28	3.39	157.57	1.00	1688.97	1030.98	685.75
29	3.68	158.57	1.00	1804.58	1082.45	719.99
30	3.97	159.57	1.00	1919.15	1133.46	753.91
31	4.27	160.57	1.00	2032.65	1183.99	787.52
32	4.56	161.57	1.00	2145.10	1234.06	820.83
33	4.85	162.56	1.00	2256.50	1283.66	853.82
34	5.14	163.56	1.00	2366.86	1332.79	886.50
35	5.44	164.55	1.00	2476.16	1381.46	918.87
36	5.73	165.55	1.00	2584.42	1429.66	950.93
37	6.02	166.54	1.00	2691.63	1477.39	982.68
38	6.31	167.54	1.00	2797.80	1524.66	1014.12
39	6.60	168.53	1.00	2902.93	1571.47	1045.25
40	6.90	169.52	1.00	3007.02	1617.81	1076.08
41	7.19	170.41	0.79	2432.25	1301.93	865.97
42	7.19	170.91	0.21	679.52	362.52	241.13
43	7.48	171.51	1.00	3264.53	1732.46	1152.33

44	7.77	172.50	1.00	3438.59	1809.96	1203.88
45	8.07	173.49	1.00	3611.31	1886.86	1255.03
46	8.36	174.48	1.00	3782.68	1963.16	1305.78
47	8.65	175.47	1.00	3952.71	2038.86	1356.13
48	8.94	175.98	0.04	148.33	76.29	50.75
49	8.94	176.48	0.96	3909.86	2009.53	1336.62
50	9.23	177.45	1.00	4089.79	2099.89	1396.73
51	9.53	178.43	1.00	4120.55	2113.59	1405.84
52	9.82	179.42	1.00	4150.58	2126.96	1414.73
53	10.11	180.40	1.00	4179.86	2139.99	1423.40
54	10.40	181.39	1.00	4208.41	2152.71	1431.86
55	10.70	182.37	1.00	4236.22	2165.09	1440.09
56	10.99	183.35	1.00	4263.30	2177.15	1448.11
57	11.28	184.33	1.00	4289.66	2188.88	1455.92
58	11.57	185.31	1.00	4315.28	2200.29	1463.50
59	11.86	186.29	1.00	4340.17	2211.37	1470.88
60	12.16	187.27	1.00	4364.35	2222.13	1478.03
61	12.45	188.25	1.00	4387.80	2232.57	1484.98
62	12.74	189.22	1.00	4410.53	2242.69	1491.71
63	13.03	190.20	1.00	4432.54	2252.49	1498.23
64	13.33	191.09	0.84	3727.72	1893.33	1259.33
65	13.33	191.58	0.16	725.57	368.40	245.04
66	13.62	192.14	1.00	4447.05	2258.95	1502.53
67	13.91	193.12	1.00	4425.77	2249.48	1496.22
68	14.20	194.09	1.00	4403.98	2239.78	1489.77
69	14.49	195.05	1.00	4381.69	2229.85	1483.17
70	14.79	196.02	1.00	4358.89	2219.70	1476.42
71	15.08	196.99	1.00	4335.59	2209.33	1469.52
72	15.37	197.95	1.00	4311.80	2198.74	1462.47
73	15.66	198.92	1.00	4287.51	2187.92	1455.28
74	15.96	199.88	1.00	4262.73	2176.89	1447.94
75	16.25	200.84	1.00	4237.46	2165.64	1440.46
76	16.54	201.80	1.00	4211.70	2154.17	1432.83
77	16.83	202.76	1.00	4185.46	2142.49	1425.06
78	17.12	203.71	1.00	4158.74	2130.59	1417.15
79	17.42	204.67	1.00	4131.55	2118.48	1409.09
80	17.71	205.62	1.00	4103.88	2106.16	1400.90
81	18.00	206.57	1.00	4075.73	2093.63	1392.56
82	18.29	207.52	1.00	4047.13	2080.90	1384.09
83	18.59	208.47	1.00	4018.05	2067.95	1375.48
84	18.88	209.42	1.00	3988.51	2054.80	1366.73
85	19.17	210.36	1.00	3958.52	2041.45	1357.85
86	19.46	211.31	1.00	3928.06	2027.89	1348.83
87	19.76	212.25	1.00	3897.16	2014.13	1339.68
88	20.05	213.19	1.00	3865.80	2000.17	1330.40
89	20.34	214.03	0.79	3027.22	1567.95	1042.91
90	20.34	214.50	0.21	809.73	419.37	278.94
91	20.63	215.07	1.00	3819.83	1979.70	1316.78
92	20.92	216.00	1.00	3793.93	1968.17	1309.11
93	21.22	216.93	1.00	3767.56	1956.43	1301.30
94	21.51	217.87	1.00	3740.71	1944.47	1293.35
95	21.80	218.79	1.00	3713.40	1932.31	1285.26
96	22.09	219.72	1.00	3685.62	1919.94	1277.03
97	22.39	220.65	1.00	3657.37	1907.37	1268.67
98	22.68	221.57	1.00	3628.66	1894.58	1260.17
99	22.97	222.49	1.00	3599.50	1881.60	1251.53
100	23.26	223.41	1.00	3569.88	1868.41	1242.76
101	23.55	224.33	1.00	3539.82	1855.03	1233.86
102	23.85	225.25	1.00	3509.30	1841.44	1224.82
103	24.14	226.16	1.00	3478.34	1827.66	1215.65
104	24.43	227.07	1.00	3446.94	1813.68	1206.35
105	24.72	227.98	1.00	3415.10	1799.50	1196.92
106	25.02	228.89	1.00	3382.83	1785.13	1187.37
107	25.31	229.79	1.00	3350.13	1770.57	1177.68
108	25.60	230.70	1.00	3316.99	1755.82	1167.87
109	25.89	231.60	1.00	3283.44	1740.88	1157.93
110	26.18	232.50	1.00	3249.46	1725.75	1147.87
111	26.48	233.39	1.00	3215.07	1710.44	1137.69
112	26.77	234.29	1.00	3180.26	1694.94	1127.38
113	27.06	235.18	1.00	3145.04	1679.26	1116.95
114	27.35	236.07	1.00	3109.42	1663.40	1106.40
115	27.65	236.95	1.00	3073.39	1647.36	1095.73

116	27.94	237.84	1.00	3036.96	1631.14	1084.94
117	28.23	238.72	1.00	3000.14	1614.75	1074.04
118	28.52	239.60	1.00	2962.92	1598.18	1063.02
119	28.81	240.48	1.00	2925.31	1581.43	1051.88
120	29.11	241.35	1.00	2887.32	1564.52	1040.63
121	29.40	242.23	1.00	2848.95	1547.43	1029.26
122	29.69	243.09	1.00	2810.20	1530.18	1017.79
123	29.98	243.96	1.00	2771.07	1512.76	1006.20
124	30.28	244.80	0.93	2545.58	1393.26	926.72
125	30.28	245.23	0.07	242.53	127.08	84.53
126	30.57	245.69	1.00	3506.92	1840.38	1224.11
127	30.86	246.55	1.00	3448.96	1814.58	1206.95
128	31.15	247.41	1.00	3390.76	1788.66	1189.71
129	31.44	248.26	1.00	3332.31	1762.64	1172.41
130	31.74	249.11	1.00	3273.62	1736.51	1155.03
131	32.03	249.96	1.00	3214.70	1710.28	1137.58
132	32.32	250.81	1.00	3155.54	1683.94	1120.06
133	32.61	251.65	1.00	3096.16	1657.50	1102.47
134	32.91	252.49	1.00	3036.56	1630.96	1084.82
135	33.20	253.33	1.00	2976.74	1604.33	1067.11
136	33.49	254.17	1.00	2916.71	1577.60	1049.33
137	33.78	255.00	1.00	2856.47	1550.78	1031.49
138	34.07	255.83	1.00	2796.02	1523.87	1013.59
139	34.37	256.66	1.00	2735.37	1496.87	995.63
140	34.66	257.48	1.00	2674.53	1469.78	977.61
141	34.95	258.30	1.00	2613.50	1442.60	959.54
142	35.24	259.12	1.00	2552.28	1415.35	941.41
143	35.54	259.93	1.00	2490.87	1388.01	923.22
144	35.83	260.75	1.00	2429.29	1360.59	904.99
145	36.12	261.56	1.00	2367.54	1333.10	886.70
146	36.41	262.36	1.00	2305.62	1305.53	868.36
147	36.70	263.17	1.00	2243.53	1277.88	849.98
148	37.00	263.97	1.00	2181.29	1250.17	831.54
149	37.29	264.76	1.00	2118.89	1222.39	813.06
150	37.58	265.56	1.00	2056.35	1194.54	794.54
151	37.87	266.35	1.00	1993.66	1166.63	775.98
152	38.17	267.14	1.00	1930.83	1138.66	757.37
153	38.46	267.92	1.00	1867.86	1110.63	738.72
154	38.75	268.70	1.00	1804.77	1082.54	720.04
155	39.04	269.48	1.00	1741.56	1054.39	701.32
156	39.33	270.25	1.00	1678.22	1026.19	682.57
157	39.63	271.03	1.00	1614.78	997.95	663.78
158	39.92	271.80	1.00	1551.22	969.65	644.95
159	40.21	272.56	1.00	1487.57	941.31	626.10
160	40.50	273.32	1.00	1423.81	912.92	607.22
161	40.80	274.08	1.00	1359.96	884.50	588.32
162	41.09	274.84	1.00	1296.03	856.03	569.38
163	41.38	275.59	1.00	1232.02	827.53	550.42
164	41.67	276.34	1.00	1167.93	798.99	531.44
165	41.96	276.90	0.50	561.60	390.11	259.48
166	41.96	277.27	0.50	494.18	445.62	296.40
167	42.26	277.82	1.00	947.09	863.16	574.12
168	42.55	278.56	1.00	888.16	821.90	546.68
169	42.84	279.30	1.00	829.30	780.68	519.26
170	43.13	280.03	1.00	770.50	739.51	491.88
171	43.43	280.76	1.00	711.78	698.39	464.53
172	43.72	281.48	1.00	653.13	657.33	437.22
173	44.01	282.20	1.00	594.57	616.33	409.94
174	44.30	282.70	0.40	219.86	233.49	155.30

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 28.900
3D Depth (Vertical difference between ends of Slip Surface) = 55.11(ft)
L/D(1): L = 55.11(ft) L/D(2): L = 110.22(ft) L/D(3): L = 165.33(ft)
L/D(4): L = 220.45(ft) L/D(5): L = 275.56(ft) L/D(6): L = 330.67(ft)

SUM OF MOMENTS = 0.698346E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.1591970E-05

Sum of the Resisting Forces = 244785.88 (lbs)

Average Available Shear Strength = 1471.09(psf)

Average Effective Normal Stress =   2664.87(psf)

Sum of the Driving Forces =   162817.46 (lbs)

Average Mobilized Shear Stress =   978.48(psf)

Total length of the failure surface =   166.40(ft)

Factor of Safety Balance Check: FS = 1.50344

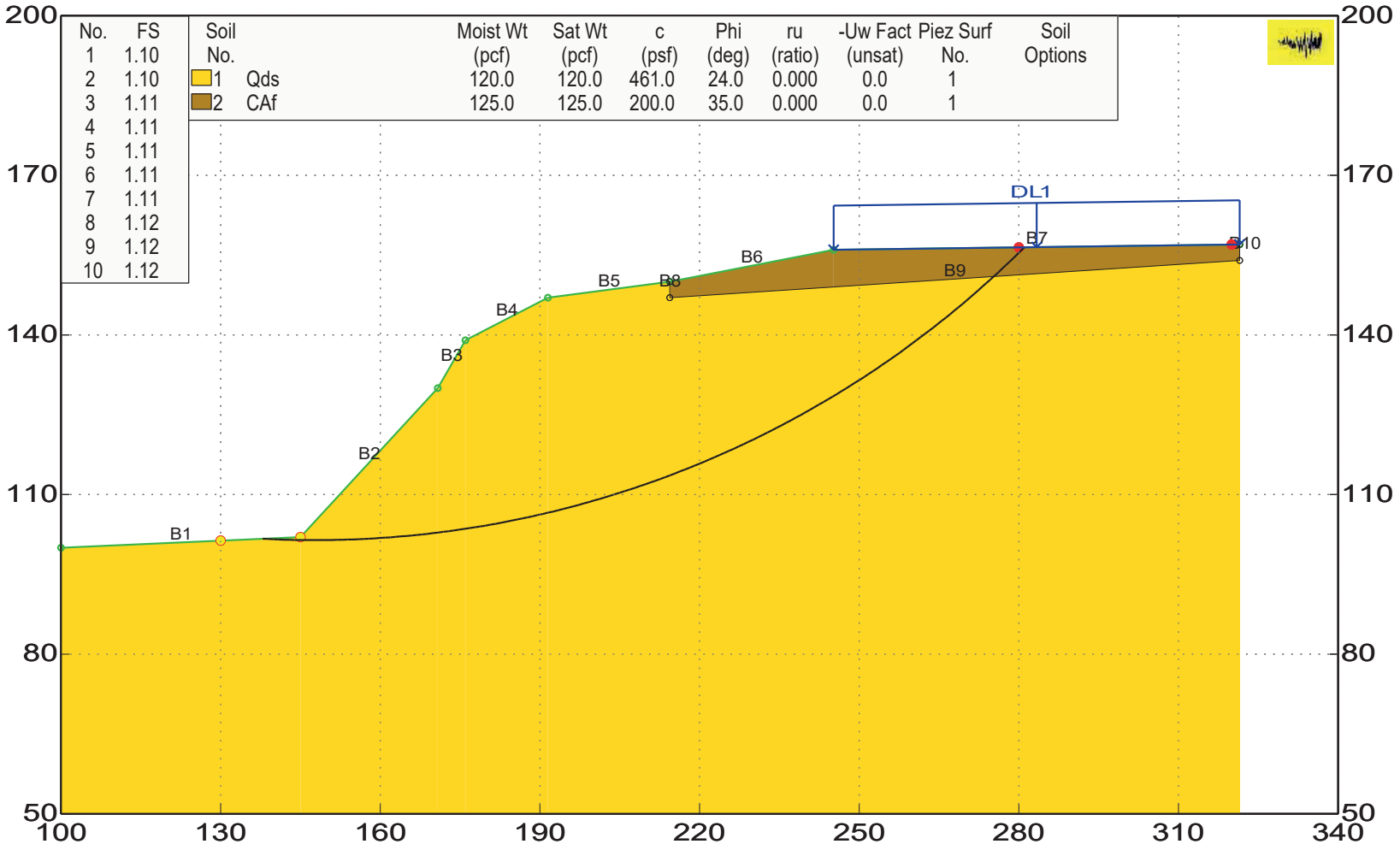
CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section BB - Proposed - Seismic FS 1.1

EGL

\BB102s.gsd



No.	FS
1	1.10
2	1.10
3	1.11
4	1.11
5	1.11
6	1.11
7	1.11
8	1.12
9	1.12
10	1.12

Soil No.		Moist Wt (pcf)	Sat Wt (pcf)	c (psf)	Phi (deg)	ru (ratio)	-Uw Fact (unsat)	Piez Surf No.	Soil Options
1	Qds	120.0	120.0	461.0	24.0	0.000	0.0	1	
2	CAf	125.0	125.0	200.0	35.0	0.000	0.0	1	

GEOSTASE FS = 1.10

Simplified Bishop Method

kh = 0.20000

GEOSTASE Slope Stability Analysis

GEOSTASE® v4.30.32 by GREGORY GEOTECHNICAL SOFTWARE

PLATE D.3pbs

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB102s.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section BB\BB102s.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section BB - Proposed - Seismic FS 1.1

PROFILE BOUNDARY DATA

7 Surface Boundaries
10 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	145.000	102.000	1
2	145.000	102.000	170.800	130.000	1
3	170.800	130.000	176.000	139.000	1
4	176.000	139.000	191.500	147.000	1
5	191.500	147.000	214.400	150.000	1
6	214.400	150.000	245.200	156.000	2
7	245.200	156.000	321.500	157.000	2
8	214.400	150.000	214.400	147.000	1
9	214.400	147.000	321.500	154.000	1
10	321.500	154.000	321.500	157.000	1

User Specified X-Origin = 100.000(ft)

User Specified Y-Origin = 50.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	145.000	102.000
3	170.800	130.000
4	176.000	139.000
5	191.500	147.000
6	214.400	150.000

7	245.200	156.000
8	321.500	157.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
Surface boundary point 6 and Subsurface boundary point 9 are duplicate points.		
9	214.400	150.000
10	214.400	147.000
11	321.500	154.000
12	321.500	157.000

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.044	2.545
2	1.085	47.342
3	1.731	59.982
4	0.516	27.300
5	0.131	7.463
6	0.195	11.023
7	0.013	0.751
8	Vertical	Vertical
9	0.065	3.740
10	Vertical	Vertical

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	461.00	24.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load No.	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	Deflection (deg from Vert)
1	7	245.200	156.000	1000.000	321.500	157.000	1000.000	0.00

NOTE - Load Stress Varies Linearly Within Specified Range.
For Multi-Stage Analysis, Refer to Detailed Output for Distributed Loads Applied to Each Stage.

SEISMIC (EARTHQUAKE) DATA

Specified Peak Ground Acceleration Coefficient (PGA) = 0.400(g)
Default Velocity = 2.000(ft) per second
Specified Horizontal Earthquake Coefficient (kh) = 0.20000(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
(NOTE:Input Velocity = 0.0 will result in default Peak
Velocity = 2 times(PGA) times 2.5 fps or 0.762 mps)
Specified Seismic Pore-Pressure Factor = 0.000
Horizontal Seismic Force is Applied at Center of Gravity of Slices

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.1802(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 130.00(ft)
                                and X = 145.00(ft)

Each Surface ends within a Range Between   X = 280.00(ft)
                                      and   X = 320.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y =   50.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
   FS Max =   1.965   FS Min =   1.096   FS Ave =   1.510
   Standard Deviation =   0.231   Coefficient of Variation =   15.30 %

Critical Surface is Sequence Number   528 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X =   147.690259(ft) ; Y =   290.497986(ft); and Radius =   189.065950(ft)

Circular Trial Failure Surface Generated With159 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	137.91291	101.68502
2	138.91171	101.63595
3	139.91075	101.59216
4	140.91001	101.55365
5	141.90946	101.52043
6	142.90907	101.49250
7	143.90881	101.46986
8	144.90866	101.45250
9	145.90859	101.44043
10	146.90856	101.43365
11	147.90856	101.43216
12	148.90855	101.43596
13	149.90851	101.44505
14	150.90841	101.45943
15	151.90822	101.47909
16	152.90790	101.50405
17	153.90745	101.53429
18	154.90682	101.56981
19	155.90598	101.61063
20	156.90492	101.65672
21	157.90360	101.70810
22	158.90199	101.76476
23	159.90007	101.82670
24	160.89781	101.89392
25	161.89518	101.96641
26	162.89215	102.04418

27	163.88870	102.12722
28	164.88479	102.21554
29	165.88040	102.30911
30	166.87551	102.40796
31	167.87007	102.51206
32	168.86407	102.62142
33	169.85748	102.73604
34	170.85027	102.85591
35	171.84241	102.98104
36	172.83388	103.11140
37	173.82464	103.24701
38	174.81467	103.38786
39	175.80395	103.53394
40	176.79243	103.68525
41	177.78010	103.84179
42	178.76693	104.00355
43	179.75289	104.17053
44	180.73796	104.34272
45	181.72210	104.52012
46	182.70528	104.70272
47	183.68749	104.89052
48	184.66869	105.08351
49	185.64886	105.28169
50	186.62796	105.48504
51	187.60598	105.69358
52	188.58288	105.90728
53	189.55863	106.12615
54	190.53321	106.35018
55	191.50660	106.57936
56	192.47876	106.81368
57	193.44966	107.05314
58	194.41929	107.29774
59	195.38761	107.54746
60	196.35459	107.80229
61	197.32021	108.06224
62	198.28445	108.32729
63	199.24727	108.59744
64	200.20864	108.87268
65	201.16855	109.15300
66	202.12696	109.43839
67	203.08385	109.72884
68	204.03919	110.02436
69	204.99295	110.32492
70	205.94511	110.63052
71	206.89564	110.94115
72	207.84451	111.25681
73	208.79170	111.57748
74	209.73718	111.90316
75	210.68093	112.23383
76	211.62291	112.56949
77	212.56311	112.91013
78	213.50149	113.25574
79	214.43803	113.60630
80	215.37270	113.96181
81	216.30548	114.32226
82	217.23633	114.68764
83	218.16525	115.05794
84	219.09219	115.43315
85	220.01713	115.81325
86	220.94005	116.19824
87	221.86092	116.58811
88	222.77972	116.98284
89	223.69642	117.38243
90	224.61099	117.78685
91	225.52340	118.19611
92	226.43364	118.61020
93	227.34168	119.02908
94	228.24749	119.45277
95	229.15105	119.88124
96	230.05232	120.31449
97	230.95129	120.75249
98	231.84794	121.19524

99	232.74223	121.64273
100	233.63414	122.09495
101	234.52364	122.55187
102	235.41072	123.01350
103	236.29534	123.47981
104	237.17748	123.95079
105	238.05712	124.42643
106	238.93424	124.90671
107	239.80879	125.39163
108	240.68078	125.88117
109	241.55016	126.37531
110	242.41691	126.87404
111	243.28102	127.37736
112	244.14245	127.88523
113	245.00118	128.39765
114	245.85719	128.91461
115	246.71046	129.43609
116	247.56095	129.96208
117	248.40865	130.49255
118	249.25353	131.02750
119	250.09557	131.56692
120	250.93475	132.11078
121	251.77104	132.65907
122	252.60442	133.21177
123	253.43486	133.76888
124	254.26234	134.33037
125	255.08684	134.89623
126	255.90834	135.46644
127	256.72681	136.04099
128	257.54223	136.61986
129	258.35458	137.20303
130	259.16383	137.79050
131	259.96996	138.38223
132	260.77295	138.97822
133	261.57278	139.57845
134	262.36942	140.18291
135	263.16285	140.79156
136	263.95306	141.40441
137	264.74001	142.02142
138	265.52368	142.64259
139	266.30406	143.26790
140	267.08112	143.89732
141	267.85485	144.53085
142	268.62521	145.16846
143	269.39218	145.81013
144	270.15576	146.45586
145	270.91590	147.10561
146	271.67260	147.75937
147	272.42583	148.41713
148	273.17557	149.07886
149	273.92180	149.74455
150	274.66450	150.41417
151	275.40365	151.08772
152	276.13922	151.76516
153	276.87120	152.44649
154	277.59957	153.13167
155	278.32430	153.82070
156	279.04538	154.51356
157	279.76278	155.21021
158	280.47649	155.91066
159	281.04016	156.46973

Factor Of Safety For The Critical or Specified Surface = 1.096

Table 1 - Geometry Data on the 165 Slices

Slice	Width	Height	X-Cntr	Y-Cntr-Base	Y-Cntr-Top	Alpha	Beta	Base Length

No.	(ft)	(ft)	(ft)	(ft)	(ft)	(deg)	(deg)	(ft)
1	1.00	0.05	138.41	101.66	101.71	-2.81	2.54	1.00
2	1.00	0.14	139.41	101.61	101.75	-2.51	2.54	1.00
3	1.00	0.22	140.41	101.57	101.80	-2.21	2.54	1.00
4	1.00	0.30	141.41	101.54	101.84	-1.90	2.54	1.00
5	1.00	0.38	142.41	101.51	101.88	-1.60	2.54	1.00
6	1.00	0.45	143.41	101.48	101.93	-1.30	2.54	1.00
7	1.00	0.51	144.41	101.46	101.97	-0.99	2.54	1.00
8	0.09	0.55	144.95	101.45	102.00	-0.69	2.54	0.09
9	0.91	1.05	145.45	101.45	102.49	-0.69	47.34	0.91
10	1.00	2.09	146.41	101.44	103.53	-0.39	47.34	1.00
11	1.00	3.18	147.41	101.43	104.61	-0.09	47.34	1.00
12	1.00	4.27	148.41	101.43	105.70	0.22	47.34	1.00
13	1.00	5.34	149.41	101.44	106.78	0.52	47.34	1.00
14	1.00	6.42	150.41	101.45	107.87	0.82	47.34	1.00
15	1.00	7.49	151.41	101.47	108.95	1.13	47.34	1.00
16	1.00	8.55	152.41	101.49	110.04	1.43	47.34	1.00
17	1.00	9.61	153.41	101.52	111.12	1.73	47.34	1.00
18	1.00	10.66	154.41	101.55	112.21	2.04	47.34	1.00
19	1.00	11.70	155.41	101.59	113.29	2.34	47.34	1.00
20	1.00	12.74	156.41	101.63	114.38	2.64	47.34	1.00
21	1.00	13.78	157.40	101.68	115.46	2.95	47.34	1.00
22	1.00	14.81	158.40	101.74	116.55	3.25	47.34	1.00
23	1.00	15.83	159.40	101.80	117.63	3.55	47.34	1.00
24	1.00	16.85	160.40	101.86	118.71	3.85	47.34	1.00
25	1.00	17.86	161.40	101.93	119.79	4.16	47.34	1.00
26	1.00	18.87	162.39	102.01	120.88	4.46	47.34	1.00
27	1.00	19.87	163.39	102.09	121.96	4.76	47.34	1.00
28	1.00	20.87	164.39	102.17	123.04	5.07	47.34	1.00
29	1.00	21.86	165.38	102.26	124.12	5.37	47.34	1.00
30	1.00	22.84	166.38	102.36	125.20	5.67	47.34	1.00
31	0.99	23.82	167.37	102.46	126.28	5.98	47.34	1.00
32	0.99	24.79	168.37	102.57	127.36	6.28	47.34	1.00
33	0.99	25.76	169.36	102.68	128.44	6.58	47.34	1.00
34	0.94	26.70	170.33	102.79	129.49	6.88	47.34	0.95
35	0.05	27.19	170.83	102.85	130.04	6.88	59.98	0.05
36	0.99	28.03	171.35	102.92	130.95	7.19	59.98	1.00
37	0.99	29.62	172.34	103.05	132.66	7.49	59.98	1.00
38	0.99	31.20	173.33	103.18	134.38	7.79	59.98	1.00
39	0.99	32.77	174.32	103.32	136.09	8.10	59.98	1.00
40	0.99	34.34	175.31	103.46	137.80	8.40	59.98	1.00
41	0.20	35.28	175.90	103.55	138.83	8.70	59.98	0.20
42	0.79	35.58	176.40	103.62	139.20	8.70	27.30	0.80
43	0.99	35.90	177.29	103.76	139.66	9.01	27.30	1.00
44	0.99	36.25	178.27	103.92	140.17	9.31	27.30	1.00
45	0.99	36.60	179.26	104.09	140.68	9.61	27.30	1.00
46	0.99	36.93	180.25	104.26	141.19	9.92	27.30	1.00
47	0.98	37.27	181.23	104.43	141.70	10.22	27.30	1.00
48	0.98	37.60	182.21	104.61	142.21	10.52	27.30	1.00
49	0.98	37.92	183.20	104.80	142.71	10.82	27.30	1.00
50	0.98	38.23	184.18	104.99	143.22	11.13	27.30	1.00
51	0.98	38.54	185.16	105.18	143.73	11.43	27.30	1.00
52	0.98	38.85	186.14	105.38	144.23	11.73	27.30	1.00
53	0.98	39.15	187.12	105.59	144.74	12.04	27.30	1.00
54	0.98	39.44	188.09	105.80	145.24	12.34	27.30	1.00
55	0.98	39.73	189.07	106.02	145.75	12.64	27.30	1.00
56	0.97	40.01	190.05	106.24	146.25	12.95	27.30	1.00
57	0.97	40.29	191.02	106.46	146.75	13.25	27.30	0.99
58	0.01	40.42	191.50	106.58	147.00	13.25	7.46	0.01
59	0.97	40.37	191.99	106.70	147.06	13.55	7.46	1.00
60	0.97	40.26	192.96	106.93	147.19	13.85	7.46	1.00
61	0.97	40.14	193.93	107.18	147.32	14.16	7.46	1.00
62	0.97	40.02	194.90	107.42	147.45	14.46	7.46	1.00
63	0.97	39.90	195.87	107.67	147.57	14.76	7.46	1.00
64	0.97	39.77	196.84	107.93	147.70	15.07	7.46	1.00
65	0.96	39.63	197.80	108.19	147.83	15.37	7.46	1.00
66	0.96	39.49	198.77	108.46	147.95	15.67	7.46	1.00
67	0.96	39.34	199.73	108.74	148.08	15.98	7.46	1.00
68	0.96	39.19	200.69	109.01	148.20	16.28	7.46	1.00
69	0.96	39.03	201.65	109.30	148.33	16.58	7.46	1.00
70	0.96	38.87	202.61	109.58	148.45	16.89	7.46	1.00

71	0.96	38.70	203.56	109.88	148.58	17.19	7.46	1.00
72	0.95	38.53	204.52	110.17	148.71	17.49	7.46	1.00
73	0.95	38.35	205.47	110.48	148.83	17.79	7.46	1.00
74	0.95	38.17	206.42	110.79	148.95	18.10	7.46	1.00
75	0.95	37.98	207.37	111.10	149.08	18.40	7.46	1.00
76	0.95	37.79	208.32	111.42	149.20	18.70	7.46	1.00
77	0.95	37.59	209.26	111.74	149.33	19.01	7.46	1.00
78	0.94	37.38	210.21	112.07	149.45	19.31	7.46	1.00
79	0.94	37.17	211.15	112.40	149.57	19.61	7.46	1.00
80	0.94	36.96	212.09	112.74	149.70	19.92	7.46	1.00
81	0.94	36.74	213.03	113.08	149.82	20.22	7.46	1.00
82	0.90	36.52	213.95	113.42	149.94	20.52	7.46	0.96
83	0.04	36.40	214.42	113.60	150.00	20.52	11.02	0.04
84	0.93	36.31	214.91	113.78	150.10	20.82	11.02	1.00
85	0.93	36.14	215.84	114.14	150.28	21.13	11.02	1.00
86	0.93	35.96	216.77	114.50	150.46	21.43	11.02	1.00
87	0.93	35.77	217.70	114.87	150.64	21.73	11.02	1.00
88	0.93	35.58	218.63	115.25	150.82	22.04	11.02	1.00
89	0.92	35.38	219.55	115.62	151.00	22.34	11.02	1.00
90	0.92	35.18	220.48	116.01	151.18	22.64	11.02	1.00
91	0.92	34.97	221.40	116.39	151.36	22.95	11.02	1.00
92	0.92	34.76	222.32	116.79	151.54	23.25	11.02	1.00
93	0.92	34.54	223.24	117.18	151.72	23.55	11.02	1.00
94	0.91	34.32	224.15	117.58	151.90	23.86	11.02	1.00
95	0.91	34.09	225.07	117.99	152.08	24.16	11.02	1.00
96	0.91	33.85	225.98	118.40	152.26	24.46	11.02	1.00
97	0.91	33.61	226.89	118.82	152.43	24.76	11.02	1.00
98	0.91	33.37	227.79	119.24	152.61	25.07	11.02	1.00
99	0.90	33.12	228.70	119.67	152.79	25.37	11.02	1.00
100	0.90	32.86	229.60	120.10	152.96	25.67	11.02	1.00
101	0.90	32.60	230.50	120.53	153.14	25.98	11.02	1.00
102	0.90	32.34	231.40	120.97	153.31	26.28	11.02	1.00
103	0.89	32.07	232.30	121.42	153.49	26.58	11.02	1.00
104	0.89	31.79	233.19	121.87	153.66	26.89	11.02	1.00
105	0.89	31.51	234.08	122.32	153.83	27.19	11.02	1.00
106	0.89	31.22	234.97	122.78	154.01	27.49	11.02	1.00
107	0.88	30.93	235.85	123.25	154.18	27.79	11.02	1.00
108	0.88	30.64	236.74	123.72	154.35	28.10	11.02	1.00
109	0.88	30.33	237.62	124.19	154.52	28.40	11.02	1.00
110	0.88	30.03	238.50	124.67	154.69	28.70	11.02	1.00
111	0.87	29.72	239.37	125.15	154.86	29.01	11.02	1.00
112	0.87	29.40	240.24	125.64	155.03	29.31	11.02	1.00
113	0.87	29.08	241.12	126.13	155.20	29.61	11.02	1.00
114	0.87	28.75	241.98	126.62	155.37	29.92	11.02	1.00
115	0.86	28.42	242.85	127.13	155.54	30.22	11.02	1.00
116	0.86	28.08	243.71	127.63	155.71	30.52	11.02	1.00
117	0.86	27.74	244.57	128.14	155.88	30.83	11.02	1.00
118	0.20	27.52	245.10	128.46	155.98	31.13	11.02	0.23
119	0.66	27.29	245.53	128.72	156.00	31.13	0.75	0.77
120	0.85	26.84	246.28	129.18	156.01	31.43	0.75	1.00
121	0.85	26.33	247.14	129.70	156.03	31.73	0.75	1.00
122	0.85	25.81	247.98	130.23	156.04	32.04	0.75	1.00
123	0.84	25.29	248.83	130.76	156.05	32.34	0.75	1.00
124	0.84	24.76	249.67	131.30	156.06	32.64	0.75	1.00
125	0.84	24.23	250.52	131.84	156.07	32.95	0.75	1.00
126	0.84	23.70	251.35	132.38	156.08	33.25	0.75	1.00
127	0.83	23.16	252.19	132.94	156.09	33.55	0.75	1.00
128	0.83	22.61	253.02	133.49	156.10	33.86	0.75	1.00
129	0.83	22.06	253.85	134.05	156.11	34.16	0.75	1.00
130	0.82	21.51	254.67	134.61	156.12	34.46	0.75	1.00
131	0.82	20.95	255.50	135.18	156.13	34.77	0.75	1.00
132	0.82	20.39	256.32	135.75	156.15	35.07	0.75	1.00
133	0.82	19.83	257.13	136.33	156.16	35.37	0.75	1.00
134	0.81	19.26	257.95	136.91	156.17	35.67	0.75	1.00
135	0.81	18.68	258.76	137.50	156.18	35.98	0.75	1.00
136	0.81	18.10	259.57	138.09	156.19	36.28	0.75	1.00
137	0.80	17.52	260.37	138.68	156.20	36.58	0.75	1.00
138	0.80	16.93	261.17	139.28	156.21	36.89	0.75	1.00
139	0.80	16.34	261.97	139.88	156.22	37.19	0.75	1.00
140	0.79	15.74	262.77	140.49	156.23	37.49	0.75	1.00
141	0.79	15.14	263.56	141.10	156.24	37.80	0.75	1.00
142	0.79	14.54	264.35	141.71	156.25	38.10	0.75	1.00

143	0.78	13.93	265.13	142.33	156.26	38.40	0.75	1.00
144	0.78	13.32	265.91	142.96	156.27	38.70	0.75	1.00
145	0.78	12.70	266.69	143.58	156.28	39.01	0.75	1.00
146	0.77	12.08	267.47	144.21	156.29	39.31	0.75	1.00
147	0.77	11.45	268.24	144.85	156.30	39.61	0.75	1.00
148	0.77	10.82	269.01	145.49	156.31	39.92	0.75	1.00
149	0.76	10.19	269.77	146.13	156.32	40.22	0.75	1.00
150	0.76	9.55	270.54	146.78	156.33	40.52	0.75	1.00
151	0.76	8.91	271.29	147.43	156.34	40.83	0.75	1.00
152	0.75	8.26	272.05	148.09	156.35	41.13	0.75	1.00
153	0.75	7.61	272.80	148.75	156.36	41.43	0.75	1.00
154	0.75	6.96	273.55	149.41	156.37	41.74	0.75	1.00
155	0.74	6.30	274.29	150.08	156.38	42.04	0.75	1.00
156	0.62	5.69	274.97	150.70	156.39	42.34	0.75	0.84
157	0.12	5.36	275.34	151.03	156.40	42.34	0.75	0.16
158	0.74	4.97	275.77	151.43	156.40	42.64	0.75	1.00
159	0.73	4.30	276.51	152.11	156.41	42.95	0.75	1.00
160	0.73	3.63	277.24	152.79	156.42	43.25	0.75	1.00
161	0.72	2.95	277.96	153.48	156.43	43.55	0.75	1.00
162	0.72	2.27	278.68	154.17	156.44	43.86	0.75	1.00
163	0.72	1.59	279.40	154.86	156.45	44.16	0.75	1.00
164	0.71	0.90	280.12	155.56	156.46	44.46	0.75	1.00
165	0.56	0.28	280.76	156.19	156.47	44.77	0.75	0.79

Table 2 - Force Data On The 165 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	5.6	0.0	0.0	0.0	0.00	0.00	1.1	0.0	0.00
2	16.5	0.0	0.0	0.0	0.00	0.00	3.3	0.0	0.00
3	26.8	0.0	0.0	0.0	0.00	0.00	5.4	0.0	0.00
4	36.4	0.0	0.0	0.0	0.00	0.00	7.3	0.0	0.00
5	45.4	0.0	0.0	0.0	0.00	0.00	9.1	0.0	0.00
6	53.8	0.0	0.0	0.0	0.00	0.00	10.8	0.0	0.00
7	61.5	0.0	0.0	0.0	0.00	0.00	12.3	0.0	0.00
8	6.0	0.0	0.0	0.0	0.00	0.00	1.2	0.0	0.00
9	114.2	0.0	0.0	0.0	0.00	0.00	22.8	0.0	0.00
10	251.0	0.0	0.0	0.0	0.00	0.00	50.2	0.0	0.00
11	381.7	0.0	0.0	0.0	0.00	0.00	76.3	0.0	0.00
12	511.8	0.0	0.0	0.0	0.00	0.00	102.4	0.0	0.00
13	641.2	0.0	0.0	0.0	0.00	0.00	128.2	0.0	0.00
14	770.0	0.0	0.0	0.0	0.00	0.00	154.0	0.0	0.00
15	898.1	0.0	0.0	0.0	0.00	0.00	179.6	0.0	0.00
16	1025.5	0.0	0.0	0.0	0.00	0.00	205.1	0.0	0.00
17	1152.1	0.0	0.0	0.0	0.00	0.00	230.4	0.0	0.00
18	1278.1	0.0	0.0	0.0	0.00	0.00	255.6	0.0	0.00
19	1403.3	0.0	0.0	0.0	0.00	0.00	280.7	0.0	0.00
20	1527.7	0.0	0.0	0.0	0.00	0.00	305.5	0.0	0.00
21	1651.4	0.0	0.0	0.0	0.00	0.00	330.3	0.0	0.00
22	1774.3	0.0	0.0	0.0	0.00	0.00	354.9	0.0	0.00
23	1896.3	0.0	0.0	0.0	0.00	0.00	379.3	0.0	0.00
24	2017.6	0.0	0.0	0.0	0.00	0.00	403.5	0.0	0.00
25	2138.1	0.0	0.0	0.0	0.00	0.00	427.6	0.0	0.00
26	2257.7	0.0	0.0	0.0	0.00	0.00	451.5	0.0	0.00
27	2376.5	0.0	0.0	0.0	0.00	0.00	475.3	0.0	0.00
28	2494.4	0.0	0.0	0.0	0.00	0.00	498.9	0.0	0.00
29	2611.5	0.0	0.0	0.0	0.00	0.00	522.3	0.0	0.00
30	2727.7	0.0	0.0	0.0	0.00	0.00	545.5	0.0	0.00
31	2842.9	0.0	0.0	0.0	0.00	0.00	568.6	0.0	0.00
32	2957.3	0.0	0.0	0.0	0.00	0.00	591.5	0.0	0.00
33	3070.7	0.0	0.0	0.0	0.00	0.00	614.1	0.0	0.00
34	3019.3	0.0	0.0	0.0	0.00	0.00	603.9	0.0	0.00
35	164.0	0.0	0.0	0.0	0.00	0.00	32.8	0.0	0.00
36	3336.8	0.0	0.0	0.0	0.00	0.00	667.4	0.0	0.00
37	3523.6	0.0	0.0	0.0	0.00	0.00	704.7	0.0	0.00
38	3709.2	0.0	0.0	0.0	0.00	0.00	741.8	0.0	0.00
39	3893.7	0.0	0.0	0.0	0.00	0.00	778.7	0.0	0.00
40	4077.0	0.0	0.0	0.0	0.00	0.00	815.4	0.0	0.00

41	830.0	0.0	0.0	0.0	0.00	0.00	166.0	0.0	0.00
42	3383.4	0.0	0.0	0.0	0.00	0.00	676.7	0.0	0.00
43	4254.9	0.0	0.0	0.0	0.00	0.00	851.0	0.0	0.00
44	4292.8	0.0	0.0	0.0	0.00	0.00	858.6	0.0	0.00
45	4329.8	0.0	0.0	0.0	0.00	0.00	866.0	0.0	0.00
46	4365.9	0.0	0.0	0.0	0.00	0.00	873.2	0.0	0.00
47	4401.2	0.0	0.0	0.0	0.00	0.00	880.2	0.0	0.00
48	4435.6	0.0	0.0	0.0	0.00	0.00	887.1	0.0	0.00
49	4469.2	0.0	0.0	0.0	0.00	0.00	893.8	0.0	0.00
50	4501.8	0.0	0.0	0.0	0.00	0.00	900.4	0.0	0.00
51	4533.6	0.0	0.0	0.0	0.00	0.00	906.7	0.0	0.00
52	4564.5	0.0	0.0	0.0	0.00	0.00	912.9	0.0	0.00
53	4594.5	0.0	0.0	0.0	0.00	0.00	918.9	0.0	0.00
54	4623.7	0.0	0.0	0.0	0.00	0.00	924.7	0.0	0.00
55	4651.9	0.0	0.0	0.0	0.00	0.00	930.4	0.0	0.00
56	4679.3	0.0	0.0	0.0	0.00	0.00	935.9	0.0	0.00
57	4673.8	0.0	0.0	0.0	0.00	0.00	934.8	0.0	0.00
58	32.0	0.0	0.0	0.0	0.00	0.00	6.4	0.0	0.00
59	4709.3	0.0	0.0	0.0	0.00	0.00	941.9	0.0	0.00
60	4690.5	0.0	0.0	0.0	0.00	0.00	938.1	0.0	0.00
61	4670.9	0.0	0.0	0.0	0.00	0.00	934.2	0.0	0.00
62	4650.6	0.0	0.0	0.0	0.00	0.00	930.1	0.0	0.00
63	4629.7	0.0	0.0	0.0	0.00	0.00	925.9	0.0	0.00
64	4608.0	0.0	0.0	0.0	0.00	0.00	921.6	0.0	0.00
65	4585.6	0.0	0.0	0.0	0.00	0.00	917.1	0.0	0.00
66	4562.5	0.0	0.0	0.0	0.00	0.00	912.5	0.0	0.00
67	4538.8	0.0	0.0	0.0	0.00	0.00	907.8	0.0	0.00
68	4514.4	0.0	0.0	0.0	0.00	0.00	902.9	0.0	0.00
69	4489.2	0.0	0.0	0.0	0.00	0.00	897.8	0.0	0.00
70	4463.5	0.0	0.0	0.0	0.00	0.00	892.7	0.0	0.00
71	4437.0	0.0	0.0	0.0	0.00	0.00	887.4	0.0	0.00
72	4409.9	0.0	0.0	0.0	0.00	0.00	882.0	0.0	0.00
73	4382.1	0.0	0.0	0.0	0.00	0.00	876.4	0.0	0.00
74	4353.7	0.0	0.0	0.0	0.00	0.00	870.7	0.0	0.00
75	4324.6	0.0	0.0	0.0	0.00	0.00	864.9	0.0	0.00
76	4294.9	0.0	0.0	0.0	0.00	0.00	859.0	0.0	0.00
77	4264.5	0.0	0.0	0.0	0.00	0.00	852.9	0.0	0.00
78	4233.5	0.0	0.0	0.0	0.00	0.00	846.7	0.0	0.00
79	4201.9	0.0	0.0	0.0	0.00	0.00	840.4	0.0	0.00
80	4169.7	0.0	0.0	0.0	0.00	0.00	833.9	0.0	0.00
81	4136.9	0.0	0.0	0.0	0.00	0.00	827.4	0.0	0.00
82	3937.3	0.0	0.0	0.0	0.00	0.00	787.5	0.0	0.00
83	166.7	0.0	0.0	0.0	0.00	0.00	33.3	0.0	0.00
84	4087.4	0.0	0.0	0.0	0.00	0.00	817.5	0.0	0.00
85	4059.9	0.0	0.0	0.0	0.00	0.00	812.0	0.0	0.00
86	4031.9	0.0	0.0	0.0	0.00	0.00	806.4	0.0	0.00
87	4003.2	0.0	0.0	0.0	0.00	0.00	800.6	0.0	0.00
88	3973.9	0.0	0.0	0.0	0.00	0.00	794.8	0.0	0.00
89	3944.0	0.0	0.0	0.0	0.00	0.00	788.8	0.0	0.00
90	3913.5	0.0	0.0	0.0	0.00	0.00	782.7	0.0	0.00
91	3882.4	0.0	0.0	0.0	0.00	0.00	776.5	0.0	0.00
92	3850.7	0.0	0.0	0.0	0.00	0.00	770.1	0.0	0.00
93	3818.4	0.0	0.0	0.0	0.00	0.00	763.7	0.0	0.00
94	3785.6	0.0	0.0	0.0	0.00	0.00	757.1	0.0	0.00
95	3752.1	0.0	0.0	0.0	0.00	0.00	750.4	0.0	0.00
96	3718.1	0.0	0.0	0.0	0.00	0.00	743.6	0.0	0.00
97	3683.6	0.0	0.0	0.0	0.00	0.00	736.7	0.0	0.00
98	3648.5	0.0	0.0	0.0	0.00	0.00	729.7	0.0	0.00
99	3612.9	0.0	0.0	0.0	0.00	0.00	722.6	0.0	0.00
100	3576.7	0.0	0.0	0.0	0.00	0.00	715.3	0.0	0.00
101	3540.0	0.0	0.0	0.0	0.00	0.00	708.0	0.0	0.00
102	3502.8	0.0	0.0	0.0	0.00	0.00	700.6	0.0	0.00
103	3465.0	0.0	0.0	0.0	0.00	0.00	693.0	0.0	0.00
104	3426.8	0.0	0.0	0.0	0.00	0.00	685.4	0.0	0.00
105	3388.1	0.0	0.0	0.0	0.00	0.00	677.6	0.0	0.00
106	3348.9	0.0	0.0	0.0	0.00	0.00	669.8	0.0	0.00
107	3309.2	0.0	0.0	0.0	0.00	0.00	661.8	0.0	0.00
108	3269.0	0.0	0.0	0.0	0.00	0.00	653.8	0.0	0.00
109	3228.4	0.0	0.0	0.0	0.00	0.00	645.7	0.0	0.00
110	3187.3	0.0	0.0	0.0	0.00	0.00	637.5	0.0	0.00
111	3145.8	0.0	0.0	0.0	0.00	0.00	629.2	0.0	0.00
112	3103.8	0.0	0.0	0.0	0.00	0.00	620.8	0.0	0.00

113	3061.5	0.0	0.0	0.0	0.00	0.00	612.3	0.0	0.00
114	3018.6	0.0	0.0	0.0	0.00	0.00	603.7	0.0	0.00
115	2975.4	0.0	0.0	0.0	0.00	0.00	595.1	0.0	0.00
116	2931.8	0.0	0.0	0.0	0.00	0.00	586.4	0.0	0.00
117	2887.8	0.0	0.0	0.0	0.00	0.00	577.6	0.0	0.00
118	663.6	0.0	0.0	0.0	0.00	0.00	132.7	0.0	0.00
119	2174.9	0.0	0.0	0.0	0.00	0.00	435.0	0.0	657.25
120	2777.6	0.0	0.0	0.0	0.00	0.00	555.5	0.0	853.34
121	2716.1	0.0	0.0	0.0	0.00	0.00	543.2	0.0	850.57
122	2654.4	0.0	0.0	0.0	0.00	0.00	530.9	0.0	847.77
123	2592.5	0.0	0.0	0.0	0.00	0.00	518.5	0.0	844.96
124	2530.4	0.0	0.0	0.0	0.00	0.00	506.1	0.0	842.11
125	2468.2	0.0	0.0	0.0	0.00	0.00	493.6	0.0	839.25
126	2405.8	0.0	0.0	0.0	0.00	0.00	481.2	0.0	836.36
127	2343.3	0.0	0.0	0.0	0.00	0.00	468.7	0.0	833.45
128	2280.7	0.0	0.0	0.0	0.00	0.00	456.1	0.0	830.51
129	2217.9	0.0	0.0	0.0	0.00	0.00	443.6	0.0	827.55
130	2155.1	0.0	0.0	0.0	0.00	0.00	431.0	0.0	824.57
131	2092.1	0.0	0.0	0.0	0.00	0.00	418.4	0.0	821.57
132	2029.0	0.0	0.0	0.0	0.00	0.00	405.8	0.0	818.54
133	1965.9	0.0	0.0	0.0	0.00	0.00	393.2	0.0	815.49
134	1902.7	0.0	0.0	0.0	0.00	0.00	380.5	0.0	812.42
135	1839.5	0.0	0.0	0.0	0.00	0.00	367.9	0.0	809.32
136	1776.2	0.0	0.0	0.0	0.00	0.00	355.2	0.0	806.20
137	1712.9	0.0	0.0	0.0	0.00	0.00	342.6	0.0	803.06
138	1649.6	0.0	0.0	0.0	0.00	0.00	329.9	0.0	799.90
139	1586.3	0.0	0.0	0.0	0.00	0.00	317.3	0.0	796.71
140	1523.0	0.0	0.0	0.0	0.00	0.00	304.6	0.0	793.50
141	1459.7	0.0	0.0	0.0	0.00	0.00	291.9	0.0	790.27
142	1396.4	0.0	0.0	0.0	0.00	0.00	279.3	0.0	787.02
143	1333.2	0.0	0.0	0.0	0.00	0.00	266.6	0.0	783.74
144	1270.0	0.0	0.0	0.0	0.00	0.00	254.0	0.0	780.45
145	1206.9	0.0	0.0	0.0	0.00	0.00	241.4	0.0	777.13
146	1143.9	0.0	0.0	0.0	0.00	0.00	228.8	0.0	773.79
147	1081.0	0.0	0.0	0.0	0.00	0.00	216.2	0.0	770.43
148	1018.1	0.0	0.0	0.0	0.00	0.00	203.6	0.0	767.04
149	955.4	0.0	0.0	0.0	0.00	0.00	191.1	0.0	763.64
150	892.8	0.0	0.0	0.0	0.00	0.00	178.6	0.0	760.21
151	830.3	0.0	0.0	0.0	0.00	0.00	166.1	0.0	756.76
152	768.0	0.0	0.0	0.0	0.00	0.00	153.6	0.0	753.30
153	705.8	0.0	0.0	0.0	0.00	0.00	141.2	0.0	749.81
154	643.8	0.0	0.0	0.0	0.00	0.00	128.8	0.0	746.29
155	582.0	0.0	0.0	0.0	0.00	0.00	116.4	0.0	742.76
156	440.6	0.0	0.0	0.0	0.00	0.00	88.1	0.0	620.33
157	79.7	0.0	0.0	0.0	0.00	0.00	15.9	0.0	118.88
158	457.4	0.0	0.0	0.0	0.00	0.00	91.5	0.0	735.64
159	393.8	0.0	0.0	0.0	0.00	0.00	78.8	0.0	732.04
160	330.6	0.0	0.0	0.0	0.00	0.00	66.1	0.0	728.43
161	267.5	0.0	0.0	0.0	0.00	0.00	53.5	0.0	724.79
162	204.8	0.0	0.0	0.0	0.00	0.00	41.0	0.0	721.14
163	142.3	0.0	0.0	0.0	0.00	0.00	28.5	0.0	717.47
164	80.0	0.0	0.0	0.0	0.00	0.00	16.0	0.0	713.77
165	19.4	0.0	0.0	0.0	0.00	0.00	3.9	0.0	563.71

TOTAL WEIGHT OF SLIDING MASS = 426685.10(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 426685.10(lbs)

TOTAL AREA OF SLIDING MASS = 3540.87(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 165 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	461.00	24.00	
2	1	461.00	24.00	
3	1	461.00	24.00	
4	1	461.00	24.00	
5	1	461.00	24.00	
6	1	461.00	24.00	

7	1	461.00	24.00
8	1	461.00	24.00
9	1	461.00	24.00
10	1	461.00	24.00
11	1	461.00	24.00
12	1	461.00	24.00
13	1	461.00	24.00
14	1	461.00	24.00
15	1	461.00	24.00
16	1	461.00	24.00
17	1	461.00	24.00
18	1	461.00	24.00
19	1	461.00	24.00
20	1	461.00	24.00
21	1	461.00	24.00
22	1	461.00	24.00
23	1	461.00	24.00
24	1	461.00	24.00
25	1	461.00	24.00
26	1	461.00	24.00
27	1	461.00	24.00
28	1	461.00	24.00
29	1	461.00	24.00
30	1	461.00	24.00
31	1	461.00	24.00
32	1	461.00	24.00
33	1	461.00	24.00
34	1	461.00	24.00
35	1	461.00	24.00
36	1	461.00	24.00
37	1	461.00	24.00
38	1	461.00	24.00
39	1	461.00	24.00
40	1	461.00	24.00
41	1	461.00	24.00
42	1	461.00	24.00
43	1	461.00	24.00
44	1	461.00	24.00
45	1	461.00	24.00
46	1	461.00	24.00
47	1	461.00	24.00
48	1	461.00	24.00
49	1	461.00	24.00
50	1	461.00	24.00
51	1	461.00	24.00
52	1	461.00	24.00
53	1	461.00	24.00
54	1	461.00	24.00
55	1	461.00	24.00
56	1	461.00	24.00
57	1	461.00	24.00
58	1	461.00	24.00
59	1	461.00	24.00
60	1	461.00	24.00
61	1	461.00	24.00
62	1	461.00	24.00
63	1	461.00	24.00
64	1	461.00	24.00
65	1	461.00	24.00
66	1	461.00	24.00
67	1	461.00	24.00
68	1	461.00	24.00
69	1	461.00	24.00
70	1	461.00	24.00
71	1	461.00	24.00
72	1	461.00	24.00
73	1	461.00	24.00
74	1	461.00	24.00
75	1	461.00	24.00
76	1	461.00	24.00
77	1	461.00	24.00
78	1	461.00	24.00

79	1	461.00	24.00
80	1	461.00	24.00
81	1	461.00	24.00
82	1	461.00	24.00
83	1	461.00	24.00
84	1	461.00	24.00
85	1	461.00	24.00
86	1	461.00	24.00
87	1	461.00	24.00
88	1	461.00	24.00
89	1	461.00	24.00
90	1	461.00	24.00
91	1	461.00	24.00
92	1	461.00	24.00
93	1	461.00	24.00
94	1	461.00	24.00
95	1	461.00	24.00
96	1	461.00	24.00
97	1	461.00	24.00
98	1	461.00	24.00
99	1	461.00	24.00
100	1	461.00	24.00
101	1	461.00	24.00
102	1	461.00	24.00
103	1	461.00	24.00
104	1	461.00	24.00
105	1	461.00	24.00
106	1	461.00	24.00
107	1	461.00	24.00
108	1	461.00	24.00
109	1	461.00	24.00
110	1	461.00	24.00
111	1	461.00	24.00
112	1	461.00	24.00
113	1	461.00	24.00
114	1	461.00	24.00
115	1	461.00	24.00
116	1	461.00	24.00
117	1	461.00	24.00
118	1	461.00	24.00
119	1	461.00	24.00
120	1	461.00	24.00
121	1	461.00	24.00
122	1	461.00	24.00
123	1	461.00	24.00
124	1	461.00	24.00
125	1	461.00	24.00
126	1	461.00	24.00
127	1	461.00	24.00
128	1	461.00	24.00
129	1	461.00	24.00
130	1	461.00	24.00
131	1	461.00	24.00
132	1	461.00	24.00
133	1	461.00	24.00
134	1	461.00	24.00
135	1	461.00	24.00
136	1	461.00	24.00
137	1	461.00	24.00
138	1	461.00	24.00
139	1	461.00	24.00
140	1	461.00	24.00
141	1	461.00	24.00
142	1	461.00	24.00
143	1	461.00	24.00
144	1	461.00	24.00
145	1	461.00	24.00
146	1	461.00	24.00
147	1	461.00	24.00
148	1	461.00	24.00
149	1	461.00	24.00
150	1	461.00	24.00

151	1	461.00	24.00
152	1	461.00	24.00
153	1	461.00	24.00
154	1	461.00	24.00
155	1	461.00	24.00
156	1	461.00	24.00
157	2	200.00	35.00
158	2	200.00	35.00
159	2	200.00	35.00
160	2	200.00	35.00
161	2	200.00	35.00
162	2	200.00	35.00
163	2	200.00	35.00
164	2	200.00	35.00
165	2	200.00	35.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 165 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-2.81	138.41	1.00	28.96	473.89	432.44
2	-2.51	139.41	1.00	37.51	477.70	435.92
3	-2.21	140.41	1.00	45.37	481.20	439.11
4	-1.90	141.41	1.00	52.55	484.40	442.03
5	-1.60	142.41	1.00	59.06	487.30	444.67
6	-1.30	143.41	1.00	64.90	489.90	447.05
7	-0.99	144.41	1.00	70.07	492.20	449.15
8	-0.69	144.95	0.09	71.49	492.83	449.72
9	-0.69	145.45	0.91	131.94	519.75	474.29
10	-0.39	146.41	1.00	254.90	574.49	524.24
11	-0.09	147.41	1.00	382.67	631.37	576.15
12	0.22	148.41	1.00	509.20	687.71	627.56
13	0.52	149.41	1.00	634.50	743.50	678.47
14	0.82	150.41	1.00	758.57	798.74	728.87
15	1.13	151.41	1.00	881.42	853.44	778.79
16	1.43	152.41	1.00	1003.06	907.59	828.21
17	1.73	153.41	1.00	1123.49	961.21	877.14
18	2.04	154.41	1.00	1242.71	1014.29	925.57
19	2.34	155.41	1.00	1360.72	1066.83	973.52
20	2.64	156.41	1.00	1477.54	1118.84	1020.98
21	2.95	157.40	1.00	1593.16	1170.32	1067.96
22	3.25	158.40	1.00	1707.60	1221.27	1114.45
23	3.55	159.40	1.00	1820.85	1271.69	1160.46
24	3.85	160.40	1.00	1932.91	1321.59	1205.99
25	4.16	161.40	1.00	2043.80	1370.96	1251.05
26	4.46	162.39	1.00	2153.51	1419.81	1295.62
27	4.76	163.39	1.00	2262.06	1468.13	1339.72
28	5.07	164.39	1.00	2369.43	1515.94	1383.35
29	5.37	165.38	1.00	2475.64	1563.23	1426.50
30	5.67	166.38	1.00	2580.70	1610.00	1469.18
31	5.98	167.37	1.00	2684.60	1656.26	1511.39
32	6.28	168.37	1.00	2787.34	1702.00	1553.14
33	6.58	169.36	1.00	2888.94	1747.24	1594.41
34	6.88	170.33	0.95	2986.63	1790.73	1634.10
35	6.88	170.83	0.05	3042.99	1815.83	1657.00
36	7.19	171.35	1.00	3128.76	1854.01	1691.85

37	7.49	172.34	1.00	3299.41	1929.99	1761.18
38	7.79	173.33	1.00	3468.54	2005.29	1829.90
39	8.10	174.32	1.00	3636.15	2079.92	1898.00
40	8.40	175.31	1.00	3802.26	2153.88	1965.48
41	8.70	175.90	0.20	3896.65	2195.90	2003.83
42	8.70	176.40	0.80	3930.18	2210.83	2017.46
43	9.01	177.29	1.00	3954.88	2221.83	2027.49
44	9.31	178.27	1.00	3982.79	2234.25	2038.83
45	9.61	179.26	1.00	4009.93	2246.33	2049.86
46	9.92	180.25	1.00	4036.29	2258.07	2060.57
47	10.22	181.23	1.00	4061.88	2269.47	2070.96
48	10.52	182.21	1.00	4086.70	2280.52	2081.05
49	10.82	183.20	1.00	4110.76	2291.23	2090.82
50	11.13	184.18	1.00	4134.06	2301.60	2100.29
51	11.43	185.16	1.00	4156.60	2311.64	2109.45
52	11.73	186.14	1.00	4178.39	2321.34	2118.30
53	12.04	187.12	1.00	4199.42	2330.70	2126.84
54	12.34	188.09	1.00	4219.70	2339.73	2135.08
55	12.64	189.07	1.00	4239.24	2348.43	2143.02
56	12.95	190.05	1.00	4258.03	2356.80	2150.66
57	13.25	191.02	0.99	4275.99	2364.79	2157.95
58	13.25	191.50	0.01	4290.68	2371.34	2163.92
59	13.55	191.99	1.00	4272.85	2363.40	2156.68
60	13.85	192.96	1.00	4249.04	2352.79	2147.00
61	14.16	193.93	1.00	4224.73	2341.97	2137.13
62	14.46	194.90	1.00	4199.93	2330.93	2127.05
63	14.76	195.87	1.00	4174.64	2319.67	2116.78
64	15.07	196.84	1.00	4148.86	2308.19	2106.30
65	15.37	197.80	1.00	4122.60	2296.50	2095.63
66	15.67	198.77	1.00	4095.87	2284.60	2084.77
67	15.98	199.73	1.00	4068.65	2272.48	2073.72
68	16.28	200.69	1.00	4040.97	2260.16	2062.47
69	16.58	201.65	1.00	4012.82	2247.62	2051.03
70	16.89	202.61	1.00	3984.20	2234.88	2039.40
71	17.19	203.56	1.00	3955.12	2221.93	2027.59
72	17.49	204.52	1.00	3925.58	2208.78	2015.59
73	17.79	205.47	1.00	3895.59	2195.43	2003.40
74	18.10	206.42	1.00	3865.15	2181.88	1991.03
75	18.40	207.37	1.00	3834.26	2168.12	1978.48
76	18.70	208.32	1.00	3802.92	2154.17	1965.75
77	19.01	209.26	1.00	3771.15	2140.02	1952.84
78	19.31	210.21	1.00	3738.93	2125.68	1939.75
79	19.61	211.15	1.00	3706.29	2111.14	1926.49
80	19.92	212.09	1.00	3673.21	2096.42	1913.05
81	20.22	213.03	1.00	3639.71	2081.50	1899.44
82	20.52	213.95	0.96	3606.26	2066.61	1885.85
83	20.52	214.42	0.04	3607.53	2067.17	1886.37
84	20.82	214.91	1.00	3587.84	2058.41	1878.37
85	21.13	215.84	1.00	3559.66	2045.86	1866.92
86	21.43	216.77	1.00	3531.01	2033.11	1855.28
87	21.73	217.70	1.00	3501.92	2020.16	1843.46
88	22.04	218.63	1.00	3472.38	2007.00	1831.46
89	22.34	219.55	1.00	3442.39	1993.65	1819.27
90	22.64	220.48	1.00	3411.96	1980.10	1806.91
91	22.95	221.40	1.00	3381.09	1966.36	1794.37
92	23.25	222.32	1.00	3349.79	1952.42	1781.65
93	23.55	223.24	1.00	3318.06	1938.30	1768.76
94	23.86	224.15	1.00	3285.90	1923.98	1755.69
95	24.16	225.07	1.00	3253.32	1909.47	1742.46
96	24.46	225.98	1.00	3220.32	1894.78	1729.05
97	24.76	226.89	1.00	3186.91	1879.90	1715.47
98	25.07	227.79	1.00	3153.08	1864.84	1701.73
99	25.37	228.70	1.00	3118.85	1849.60	1687.82
100	25.67	229.60	1.00	3084.21	1834.18	1673.75
101	25.98	230.50	1.00	3049.17	1818.58	1659.52
102	26.28	231.40	1.00	3013.74	1802.80	1645.12
103	26.58	232.30	1.00	2977.92	1786.85	1630.57
104	26.89	233.19	1.00	2941.71	1770.73	1615.85
105	27.19	234.08	1.00	2905.11	1754.44	1600.98
106	27.49	234.97	1.00	2868.14	1737.98	1585.96
107	27.79	235.85	1.00	2830.79	1721.35	1570.79
108	28.10	236.74	1.00	2793.06	1704.55	1555.46

109	28.40	237.62	1.00	2754.97	1687.59	1539.99
110	28.70	238.50	1.00	2716.52	1670.47	1524.36
111	29.01	239.37	1.00	2677.70	1653.19	1508.59
112	29.31	240.24	1.00	2638.54	1635.75	1492.68
113	29.61	241.12	1.00	2599.02	1618.16	1476.62
114	29.92	241.98	1.00	2559.15	1600.41	1460.43
115	30.22	242.85	1.00	2518.94	1582.51	1444.09
116	30.52	243.71	1.00	2478.39	1564.45	1427.62
117	30.83	244.57	1.00	2437.51	1546.25	1411.01
118	31.13	245.10	0.23	2408.84	1533.49	1399.36
119	31.13	245.53	0.77	3174.31	1874.29	1710.36
120	31.43	246.28	1.00	3121.11	1850.61	1688.74
121	31.73	247.14	1.00	3062.13	1824.35	1664.78
122	32.04	247.98	1.00	3002.97	1798.01	1640.74
123	32.34	248.83	1.00	2943.62	1771.58	1616.63
124	32.64	249.67	1.00	2884.08	1745.08	1592.44
125	32.95	250.52	1.00	2824.37	1718.49	1568.18
126	33.25	251.35	1.00	2764.48	1691.83	1543.85
127	33.55	252.19	1.00	2704.42	1665.09	1519.45
128	33.86	253.02	1.00	2644.20	1638.28	1494.98
129	34.16	253.85	1.00	2583.82	1611.39	1470.45
130	34.46	254.67	1.00	2523.29	1584.44	1445.86
131	34.77	255.50	1.00	2462.60	1557.42	1421.20
132	35.07	256.32	1.00	2401.77	1530.34	1396.49
133	35.37	257.13	1.00	2340.80	1503.19	1371.71
134	35.67	257.95	1.00	2279.70	1475.99	1346.89
135	35.98	258.76	1.00	2218.46	1448.72	1322.01
136	36.28	259.57	1.00	2157.10	1421.40	1297.08
137	36.58	260.37	1.00	2095.62	1394.03	1272.10
138	36.89	261.17	1.00	2034.03	1366.61	1247.07
139	37.19	261.97	1.00	1972.32	1339.13	1222.00
140	37.49	262.77	1.00	1910.51	1311.61	1196.89
141	37.80	263.56	1.00	1848.60	1284.05	1171.74
142	38.10	264.35	1.00	1786.60	1256.44	1146.55
143	38.40	265.13	1.00	1724.51	1228.80	1121.32
144	38.70	265.91	1.00	1662.33	1201.12	1096.06
145	39.01	266.69	1.00	1600.08	1173.40	1070.77
146	39.31	267.47	1.00	1537.75	1145.65	1045.44
147	39.61	268.24	1.00	1475.36	1117.87	1020.10
148	39.92	269.01	1.00	1412.90	1090.07	994.72
149	40.22	269.77	1.00	1350.39	1062.23	969.32
150	40.52	270.54	1.00	1287.84	1034.38	943.91
151	40.83	271.29	1.00	1225.23	1006.51	918.47
152	41.13	272.05	1.00	1162.59	978.62	893.02
153	41.43	272.80	1.00	1099.91	950.71	867.56
154	41.74	273.55	1.00	1037.21	922.80	842.08
155	42.04	274.29	1.00	974.49	894.87	816.60
156	42.34	274.97	0.84	916.31	868.97	792.96
157	42.34	275.34	0.16	907.06	835.13	762.08
158	42.64	275.77	1.00	872.71	811.08	740.14
159	42.95	276.51	1.00	817.25	772.25	704.70
160	43.25	277.24	1.00	761.92	733.50	669.34
161	43.55	277.96	1.00	706.71	694.84	634.07
162	43.86	278.68	1.00	651.63	656.28	598.88
163	44.16	279.40	1.00	596.70	617.81	563.77
164	44.46	280.12	1.00	541.91	579.45	528.77
165	44.77	280.76	0.79	492.55	544.89	497.23

Table 4A - Base Force Data on the 165 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-2.81	138.41	1.00	28.96	473.89	432.44
2	-2.51	139.41	1.00	37.51	477.70	435.92
3	-2.21	140.41	1.00	45.37	481.20	439.11
4	-1.90	141.41	1.00	52.55	484.40	442.03
5	-1.60	142.41	1.00	59.06	487.30	444.67

6	-1.30	143.41	1.00	64.90	489.90	447.05
7	-0.99	144.41	1.00	70.07	492.20	449.15
8	-0.69	144.95	0.09	6.53	45.02	41.08
9	-0.69	145.45	0.91	119.89	472.27	430.96
10	-0.39	146.41	1.00	254.90	574.49	524.24
11	-0.09	147.41	1.00	382.67	631.37	576.15
12	0.22	148.41	1.00	509.20	687.71	627.56
13	0.52	149.41	1.00	634.50	743.50	678.47
14	0.82	150.41	1.00	758.57	798.74	728.87
15	1.13	151.41	1.00	881.42	853.44	778.79
16	1.43	152.41	1.00	1003.06	907.59	828.21
17	1.73	153.41	1.00	1123.49	961.21	877.14
18	2.04	154.41	1.00	1242.71	1014.29	925.57
19	2.34	155.41	1.00	1360.72	1066.83	973.52
20	2.64	156.41	1.00	1477.54	1118.84	1020.98
21	2.95	157.40	1.00	1593.16	1170.32	1067.96
22	3.25	158.40	1.00	1707.60	1221.27	1114.45
23	3.55	159.40	1.00	1820.85	1271.69	1160.46
24	3.85	160.40	1.00	1932.91	1321.59	1205.99
25	4.16	161.40	1.00	2043.80	1370.96	1251.05
26	4.46	162.39	1.00	2153.51	1419.81	1295.62
27	4.76	163.39	1.00	2262.06	1468.13	1339.72
28	5.07	164.39	1.00	2369.43	1515.94	1383.35
29	5.37	165.38	1.00	2475.64	1563.23	1426.50
30	5.67	166.38	1.00	2580.70	1610.00	1469.18
31	5.98	167.37	1.00	2684.60	1656.26	1511.39
32	6.28	168.37	1.00	2787.34	1702.00	1553.14
33	6.58	169.36	1.00	2888.94	1747.24	1594.41
34	6.88	170.33	0.95	2835.39	1700.05	1551.36
35	6.88	170.83	0.05	154.09	91.95	83.91
36	7.19	171.35	1.00	3128.76	1854.01	1691.85
37	7.49	172.34	1.00	3299.41	1929.99	1761.18
38	7.79	173.33	1.00	3468.54	2005.29	1829.90
39	8.10	174.32	1.00	3636.15	2079.92	1898.00
40	8.40	175.31	1.00	3802.26	2153.88	1965.48
41	8.70	175.90	0.20	772.85	435.53	397.44
42	8.70	176.40	0.80	3150.68	1772.34	1617.32
43	9.01	177.29	1.00	3954.88	2221.83	2027.49
44	9.31	178.27	1.00	3982.79	2234.25	2038.83
45	9.61	179.26	1.00	4009.93	2246.33	2049.86
46	9.92	180.25	1.00	4036.29	2258.07	2060.57
47	10.22	181.23	1.00	4061.88	2269.47	2070.96
48	10.52	182.21	1.00	4086.70	2280.52	2081.05
49	10.82	183.20	1.00	4110.76	2291.23	2090.82
50	11.13	184.18	1.00	4134.06	2301.60	2100.29
51	11.43	185.16	1.00	4156.60	2311.64	2109.45
52	11.73	186.14	1.00	4178.39	2321.34	2118.30
53	12.04	187.12	1.00	4199.42	2330.70	2126.84
54	12.34	188.09	1.00	4219.70	2339.73	2135.08
55	12.64	189.07	1.00	4239.24	2348.43	2143.02
56	12.95	190.05	1.00	4258.03	2356.80	2150.66
57	13.25	191.02	0.99	4247.01	2348.76	2143.33
58	13.25	191.50	0.01	29.08	16.07	14.67
59	13.55	191.99	1.00	4272.85	2363.40	2156.68
60	13.85	192.96	1.00	4249.04	2352.79	2147.00
61	14.16	193.93	1.00	4224.73	2341.97	2137.13
62	14.46	194.90	1.00	4199.93	2330.93	2127.05
63	14.76	195.87	1.00	4174.64	2319.67	2116.78
64	15.07	196.84	1.00	4148.86	2308.19	2106.30
65	15.37	197.80	1.00	4122.60	2296.50	2095.63
66	15.67	198.77	1.00	4095.87	2284.60	2084.77
67	15.98	199.73	1.00	4068.65	2272.48	2073.72
68	16.28	200.69	1.00	4040.97	2260.16	2062.47
69	16.58	201.65	1.00	4012.82	2247.62	2051.03
70	16.89	202.61	1.00	3984.20	2234.88	2039.40
71	17.19	203.56	1.00	3955.12	2221.93	2027.59
72	17.49	204.52	1.00	3925.58	2208.78	2015.59
73	17.79	205.47	1.00	3895.59	2195.43	2003.40
74	18.10	206.42	1.00	3865.15	2181.88	1991.03
75	18.40	207.37	1.00	3834.26	2168.12	1978.48
76	18.70	208.32	1.00	3802.92	2154.17	1965.75
77	19.01	209.26	1.00	3771.15	2140.02	1952.84

78	19.31	210.21	1.00	3738.93	2125.68	1939.75
79	19.61	211.15	1.00	3706.29	2111.14	1926.49
80	19.92	212.09	1.00	3673.21	2096.42	1913.05
81	20.22	213.03	1.00	3639.71	2081.50	1899.44
82	20.52	213.95	0.96	3459.83	1982.70	1809.28
83	20.52	214.42	0.04	146.48	83.93	76.59
84	20.82	214.91	1.00	3587.84	2058.41	1878.37
85	21.13	215.84	1.00	3559.66	2045.86	1866.92
86	21.43	216.77	1.00	3531.01	2033.11	1855.28
87	21.73	217.70	1.00	3501.92	2020.16	1843.46
88	22.04	218.63	1.00	3472.38	2007.00	1831.46
89	22.34	219.55	1.00	3442.39	1993.65	1819.27
90	22.64	220.48	1.00	3411.96	1980.10	1806.91
91	22.95	221.40	1.00	3381.09	1966.36	1794.37
92	23.25	222.32	1.00	3349.79	1952.42	1781.65
93	23.55	223.24	1.00	3318.06	1938.30	1768.76
94	23.86	224.15	1.00	3285.90	1923.98	1755.69
95	24.16	225.07	1.00	3253.32	1909.47	1742.46
96	24.46	225.98	1.00	3220.32	1894.78	1729.05
97	24.76	226.89	1.00	3186.91	1879.90	1715.47
98	25.07	227.79	1.00	3153.08	1864.84	1701.73
99	25.37	228.70	1.00	3118.85	1849.60	1687.82
100	25.67	229.60	1.00	3084.21	1834.18	1673.75
101	25.98	230.50	1.00	3049.17	1818.58	1659.52
102	26.28	231.40	1.00	3013.74	1802.80	1645.12
103	26.58	232.30	1.00	2977.92	1786.85	1630.57
104	26.89	233.19	1.00	2941.71	1770.73	1615.85
105	27.19	234.08	1.00	2905.11	1754.44	1600.98
106	27.49	234.97	1.00	2868.14	1737.98	1585.96
107	27.79	235.85	1.00	2830.79	1721.35	1570.79
108	28.10	236.74	1.00	2793.06	1704.55	1555.46
109	28.40	237.62	1.00	2754.97	1687.59	1539.99
110	28.70	238.50	1.00	2716.52	1670.47	1524.36
111	29.01	239.37	1.00	2677.70	1653.19	1508.59
112	29.31	240.24	1.00	2638.54	1635.75	1492.68
113	29.61	241.12	1.00	2599.02	1618.16	1476.62
114	29.92	241.98	1.00	2559.15	1600.41	1460.43
115	30.22	242.85	1.00	2518.94	1582.51	1444.09
116	30.52	243.71	1.00	2478.39	1564.45	1427.62
117	30.83	244.57	1.00	2437.51	1546.25	1411.01
118	31.13	245.10	0.23	559.48	356.17	325.02
119	31.13	245.53	0.77	2437.04	1438.97	1313.11
120	31.43	246.28	1.00	3121.11	1850.61	1688.74
121	31.73	247.14	1.00	3062.13	1824.35	1664.78
122	32.04	247.98	1.00	3002.97	1798.01	1640.74
123	32.34	248.83	1.00	2943.62	1771.58	1616.63
124	32.64	249.67	1.00	2884.08	1745.08	1592.44
125	32.95	250.52	1.00	2824.37	1718.49	1568.18
126	33.25	251.35	1.00	2764.48	1691.83	1543.85
127	33.55	252.19	1.00	2704.42	1665.09	1519.45
128	33.86	253.02	1.00	2644.20	1638.28	1494.98
129	34.16	253.85	1.00	2583.82	1611.39	1470.45
130	34.46	254.67	1.00	2523.29	1584.44	1445.86
131	34.77	255.50	1.00	2462.60	1557.42	1421.20
132	35.07	256.32	1.00	2401.77	1530.34	1396.49
133	35.37	257.13	1.00	2340.80	1503.19	1371.71
134	35.67	257.95	1.00	2279.70	1475.99	1346.89
135	35.98	258.76	1.00	2218.46	1448.72	1322.01
136	36.28	259.57	1.00	2157.10	1421.40	1297.08
137	36.58	260.37	1.00	2095.62	1394.03	1272.10
138	36.89	261.17	1.00	2034.03	1366.61	1247.07
139	37.19	261.97	1.00	1972.32	1339.13	1222.00
140	37.49	262.77	1.00	1910.51	1311.61	1196.89
141	37.80	263.56	1.00	1848.60	1284.05	1171.74
142	38.10	264.35	1.00	1786.60	1256.44	1146.55
143	38.40	265.13	1.00	1724.51	1228.80	1121.32
144	38.70	265.91	1.00	1662.33	1201.12	1096.06
145	39.01	266.69	1.00	1600.08	1173.40	1070.77
146	39.31	267.47	1.00	1537.75	1145.65	1045.44
147	39.61	268.24	1.00	1475.36	1117.87	1020.10
148	39.92	269.01	1.00	1412.90	1090.07	994.72
149	40.22	269.77	1.00	1350.39	1062.23	969.32

150	40.52	270.54	1.00	1287.84	1034.38	943.91
151	40.83	271.29	1.00	1225.23	1006.51	918.47
152	41.13	272.05	1.00	1162.59	978.62	893.02
153	41.43	272.80	1.00	1099.91	950.71	867.56
154	41.74	273.55	1.00	1037.21	922.80	842.08
155	42.04	274.29	1.00	974.49	894.87	816.60
156	42.34	274.97	0.84	768.95	729.22	665.44
157	42.34	275.34	0.16	145.87	134.31	122.56
158	42.64	275.77	1.00	872.71	811.08	740.14
159	42.95	276.51	1.00	817.25	772.25	704.70
160	43.25	277.24	1.00	761.92	733.50	669.34
161	43.55	277.96	1.00	706.71	694.84	634.07
162	43.86	278.68	1.00	651.63	656.28	598.88
163	44.16	279.40	1.00	596.70	617.81	563.77
164	44.46	280.12	1.00	541.91	579.45	528.77
165	44.77	280.76	0.79	391.04	432.59	394.75

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 31.884
3D Depth (Vertical difference between ends of Slip Surface) = 54.78(ft)
L/D(1): L = 54.78(ft) L/D(2): L = 109.57(ft) L/D(3): L = 164.35(ft)
L/D(4): L = 219.14(ft) L/D(5): L = 273.92(ft) L/D(6): L = 328.71(ft)

SUM OF MOMENTS = 0.280168E+01 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.6566155E-05

Sum of the Resisting Forces = 253524.71 (lbs)

Average Available Shear Strength = 1606.68(psf)

Average Effective Normal Stress = 2582.89(psf)

Sum of the Driving Forces = 231349.82 (lbs)

Average Mobilized Shear Stress = 1466.15(psf)

Total length of the failure surface = 157.79(ft)

Factor of Safety Balance Check: FS = 1.09585

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

*** SEISMIC SLOPE DISPLACEMENT DATA ***
(Note: kv is set = zero for displacement calculations)
Seismic Yield Coefficient (ky) = 0.19740(g)
Calculated Newmark Seismic Displacement = 0.638(ft)

Average Elevation of Point of Application of kh on Sliding Mass = 131.069(ft)

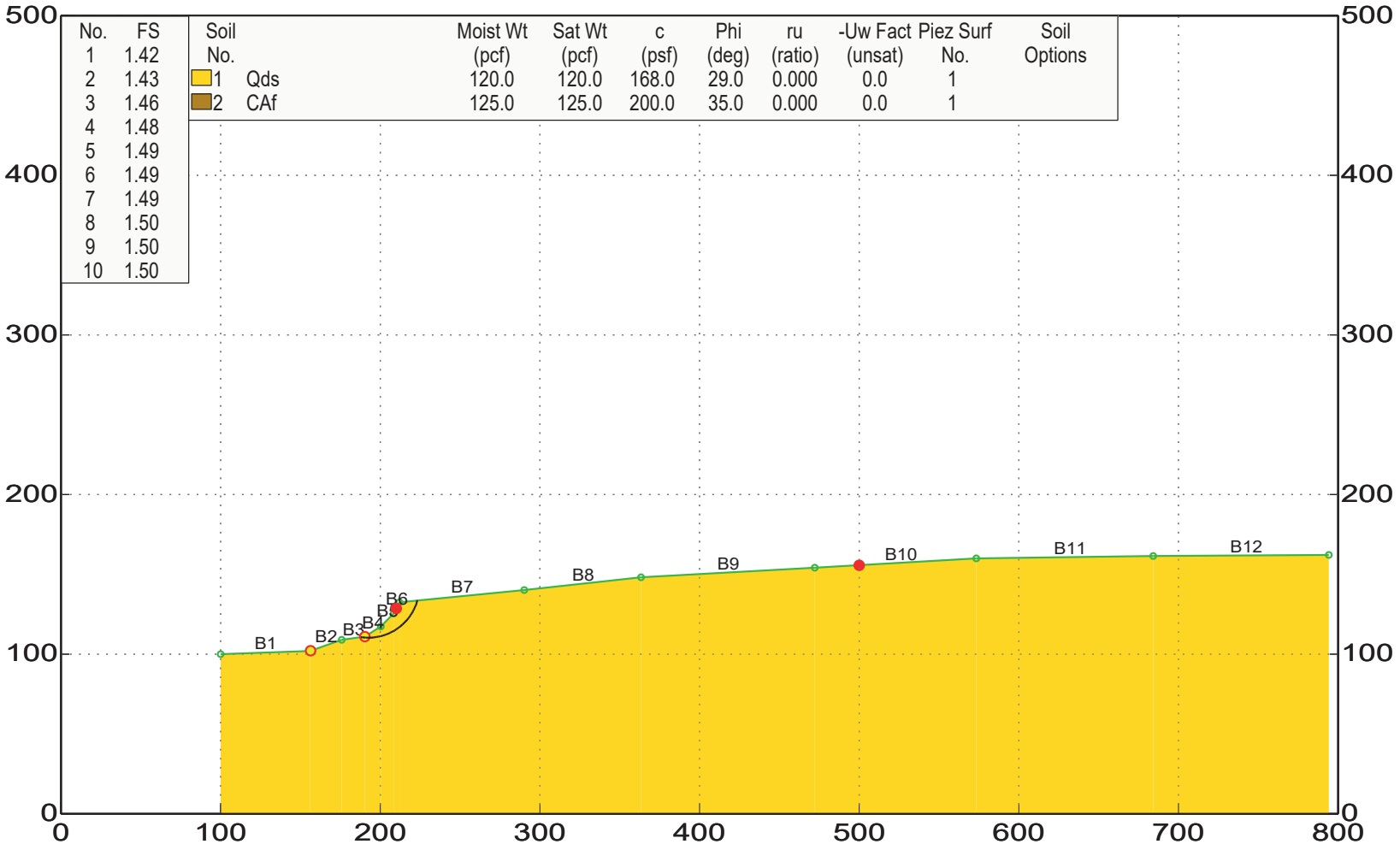
Non-Symmetrical Sliding Resistance Has Been Specified
for Downhill Sliding.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section CC - Existing - Static

EGL

\CC001.gsd



GEOSTASE FS = 1.42

Simplified Bishop Method

GEOSTASE Slope Stability Analysis

PLATE D.4

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC001.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC001.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section CC - Existing - Static

PROFILE BOUNDARY DATA

12 Surface Boundaries
12 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	156.000	102.000	1
2	156.000	102.000	175.900	109.000	1
3	175.900	109.000	190.400	111.000	1
4	190.400	111.000	200.400	117.300	1
5	200.400	117.300	208.400	125.500	1
6	208.400	125.500	212.000	132.500	1
7	212.000	132.500	290.200	140.100	1
8	290.200	140.100	363.400	148.100	1
9	363.400	148.100	472.200	154.100	1
10	472.200	154.100	573.400	160.000	1
11	573.400	160.000	684.100	161.500	1
12	684.100	161.500	794.100	162.100	1

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = 0.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	156.000	102.000
3	175.900	109.000
4	190.400	111.000

5	200.400	117.300
6	208.400	125.500
7	212.000	132.500
8	290.200	140.100
9	363.400	148.100
10	472.200	154.100
11	573.400	160.000
12	684.100	161.500
13	794.100	162.100

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.036	2.045
2	0.352	19.380
3	0.138	7.853
4	0.630	32.211
5	1.025	45.707
6	1.944	62.784
7	0.097	5.551
8	0.109	6.237
9	0.055	3.156
10	0.058	3.337
11	0.014	0.776
12	0.005	0.313

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1 Qds	120.0	120.0	168.00	29.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 4 Coordinate Points
Phreatic Adjustment Factor = 0.00

Point No.	X-Water (ft)	Y-Water (ft)
1	321.00	2160.00
2	546.00	2385.00
3	550.00	2385.00
4	700.00	2235.00

WATER SURFACE DATA HAS BEEN SUPPRESSED

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.4084(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 156.40(ft)
and X = 190.40(ft)

Each Surface ends within a Range Between X = 210.00(ft)
and X = 500.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 0.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 7.899 FS Min = 1.416 FS Ave = 3.618
Standard Deviation = 1.541 Coefficient of Variation = 42.59 %

Critical Surface is Sequence Number 925 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 192.498173(ft) ; Y = 142.215289(ft); and Radius = 31.908115(ft)

Circular Trial Failure Surface Generated With 48 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	187.84745	110.64792
2	188.83893	110.51769
3	189.83401	110.41859
4	190.83170	110.35072
5	191.83103	110.31415
6	192.83102	110.30891
7	193.83068	110.33501
8	194.82903	110.39242
9	195.82509	110.48109
10	196.81788	110.60093
11	197.80644	110.75182
12	198.78977	110.93361
13	199.76693	111.14612
14	200.73695	111.38916
15	201.69887	111.66247
16	202.65176	111.96579
17	203.59468	112.29882
18	204.52670	112.66123
19	205.44690	113.05267
20	206.35438	113.47276
21	207.24826	113.92107
22	208.12765	114.39718
23	208.99168	114.90061
24	209.83952	115.43086
25	210.67033	115.98743

26	211.48328	116.56975
27	212.27759	117.17727
28	213.05247	117.80938
29	213.80716	118.46545
30	214.54093	119.14486
31	215.25304	119.84692
32	215.94280	120.57096
33	216.60954	121.31625
34	217.25259	122.08207
35	217.87133	122.86767
36	218.46515	123.67227
37	219.03347	124.49508
38	219.57572	125.33529
39	220.09138	126.19209
40	220.57993	127.06462
41	221.04090	127.95204
42	221.47384	128.85346
43	221.87832	129.76801
44	222.25394	130.69478
45	222.60034	131.63287
46	222.91716	132.58135
47	223.20412	133.53930
48	223.21764	133.59021

Factor Of Safety For The Critical or Specified Surface = 1.416

Table 1 - Geometry Data on the 51 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	0.99	0.13	188.34	110.58	110.72	-7.48	7.85	1.00
2	1.00	0.39	189.34	110.47	110.85	-5.69	7.85	1.00
3	0.57	0.56	190.12	110.40	110.96	-3.89	7.85	0.57
4	0.43	0.77	190.62	110.37	111.14	-3.89	32.21	0.43
5	1.00	1.25	191.33	110.33	111.59	-2.10	32.21	1.00
6	1.00	1.91	192.33	110.31	112.22	-0.30	32.21	1.00
7	1.00	2.52	193.33	110.32	112.85	1.50	32.21	1.00
8	1.00	3.11	194.33	110.36	113.48	3.29	32.21	1.00
9	1.00	3.67	195.33	110.44	114.10	5.09	32.21	1.00
10	0.99	4.19	196.32	110.54	114.73	6.88	32.21	1.00
11	0.99	4.68	197.31	110.68	115.35	8.68	32.21	1.00
12	0.98	5.13	198.30	110.84	115.98	10.47	32.21	1.00
13	0.98	5.55	199.28	111.04	116.59	12.27	32.21	1.00
14	0.63	5.88	200.08	111.23	117.10	14.07	32.21	0.65
15	0.34	6.13	200.57	111.35	117.47	14.07	45.71	0.35
16	0.96	6.61	201.22	111.53	118.14	15.86	45.71	1.00
17	0.95	7.31	202.18	111.81	119.12	17.66	45.71	1.00
18	0.94	7.96	203.12	112.13	120.09	19.45	45.71	1.00
19	0.93	8.57	204.06	112.48	121.05	21.25	45.71	1.00
20	0.92	9.14	204.99	112.86	122.00	23.04	45.71	1.00
21	0.91	9.68	205.90	113.26	122.94	24.84	45.71	1.00
22	0.89	10.16	206.80	113.70	123.86	26.64	45.71	1.00
23	0.88	10.61	207.69	114.16	124.77	28.43	45.71	1.00
24	0.27	10.88	208.26	114.48	125.36	30.23	45.71	0.32
25	0.59	11.35	208.70	114.73	126.08	30.23	62.78	0.68
26	0.85	12.31	209.42	115.17	127.47	32.02	62.78	1.00
27	0.83	13.40	210.25	115.71	129.11	33.82	62.78	1.00
28	0.81	14.43	211.08	116.28	130.70	35.61	62.78	1.00
29	0.52	15.23	211.74	116.77	132.00	37.41	62.78	0.65
30	0.28	15.44	212.14	117.07	132.51	37.41	5.55	0.35
31	0.77	15.07	212.67	117.49	132.56	39.21	5.55	1.00
32	0.75	14.50	213.43	118.14	132.64	41.00	5.55	1.00
33	0.73	13.91	214.17	118.81	132.71	42.80	5.55	1.00
34	0.71	13.29	214.90	119.50	132.78	44.59	5.55	1.00
35	0.69	12.64	215.60	120.21	132.85	46.39	5.55	1.00
36	0.67	11.97	216.28	120.94	132.92	48.18	5.55	1.00

37	0.64	11.28	216.93	121.70	132.98	49.98	5.55	1.00
38	0.62	10.57	217.56	122.47	133.04	51.78	5.55	1.00
39	0.59	9.83	218.17	123.27	133.10	53.57	5.55	1.00
40	0.57	9.07	218.75	124.08	133.16	55.37	5.55	1.00
41	0.54	8.29	219.30	124.92	133.21	57.16	5.55	1.00
42	0.52	7.50	219.83	125.76	133.26	58.96	5.55	1.00
43	0.49	6.68	220.34	126.63	133.31	60.75	5.55	1.00
44	0.46	5.85	220.81	127.51	133.36	62.55	5.55	1.00
45	0.43	5.00	221.26	128.40	133.40	64.35	5.55	1.00
46	0.40	4.13	221.68	129.31	133.44	66.14	5.55	1.00
47	0.38	3.25	222.07	130.23	133.48	67.94	5.55	1.00
48	0.35	2.35	222.43	131.16	133.51	69.73	5.55	1.00
49	0.32	1.44	222.76	132.11	133.55	71.53	5.55	1.00
50	0.29	0.51	223.06	133.06	133.57	73.32	5.55	1.00
51	0.01	0.02	223.21	133.56	133.59	75.12	5.55	0.05

Table 2 - Force Data On The 51 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	15.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
2	46.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
3	38.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
4	39.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
5	150.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
6	228.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
7	302.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
8	372.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
9	438.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
10	499.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
11	555.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
12	605.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
13	651.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
14	446.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
15	247.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
16	763.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
17	835.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
18	900.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
19	958.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
20	1009.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
21	1053.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
22	1090.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
23	1119.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
24	355.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
25	805.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
26	1252.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
27	1335.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
28	1407.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
29	944.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
30	514.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
31	1401.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
32	1313.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
33	1224.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
34	1135.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
35	1046.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
36	957.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
37	870.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
38	784.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
39	700.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
40	618.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
41	539.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
42	463.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
43	391.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
44	323.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
45	259.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
46	200.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
47	146.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
48	97.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

49	54.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
50	17.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
51	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 31533.03(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 31533.03(lbs)

TOTAL AREA OF SLIDING MASS = 262.78(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 51 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	168.00	29.00	
2	1	168.00	29.00	
3	1	168.00	29.00	
4	1	168.00	29.00	
5	1	168.00	29.00	
6	1	168.00	29.00	
7	1	168.00	29.00	
8	1	168.00	29.00	
9	1	168.00	29.00	
10	1	168.00	29.00	
11	1	168.00	29.00	
12	1	168.00	29.00	
13	1	168.00	29.00	
14	1	168.00	29.00	
15	1	168.00	29.00	
16	1	168.00	29.00	
17	1	168.00	29.00	
18	1	168.00	29.00	
19	1	168.00	29.00	
20	1	168.00	29.00	
21	1	168.00	29.00	
22	1	168.00	29.00	
23	1	168.00	29.00	
24	1	168.00	29.00	
25	1	168.00	29.00	
26	1	168.00	29.00	
27	1	168.00	29.00	
28	1	168.00	29.00	
29	1	168.00	29.00	
30	1	168.00	29.00	
31	1	168.00	29.00	
32	1	168.00	29.00	
33	1	168.00	29.00	
34	1	168.00	29.00	
35	1	168.00	29.00	
36	1	168.00	29.00	
37	1	168.00	29.00	
38	1	168.00	29.00	
39	1	168.00	29.00	
40	1	168.00	29.00	
41	1	168.00	29.00	
42	1	168.00	29.00	
43	1	168.00	29.00	
44	1	168.00	29.00	
45	1	168.00	29.00	
46	1	168.00	29.00	
47	1	168.00	29.00	
48	1	168.00	29.00	
49	1	168.00	29.00	
50	1	168.00	29.00	
51	1	168.00	29.00	

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)

M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 51 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-7.48	188.34	1.00	33.31	186.46	131.67
2	-5.69	189.34	1.00	60.38	201.47	142.27
3	-3.89	190.12	0.57	77.53	210.97	148.98
4	-3.89	190.62	0.43	103.29	225.25	159.06
5	-2.10	191.33	1.00	157.11	255.09	180.13
6	-0.30	192.33	1.00	229.69	295.32	208.54
7	1.50	193.33	1.00	296.81	332.52	234.81
8	3.29	194.33	1.00	358.56	366.75	258.98
9	5.09	195.33	1.00	415.06	398.07	281.09
10	6.88	196.32	1.00	466.40	426.53	301.19
11	8.68	197.31	1.00	512.68	452.18	319.30
12	10.47	198.30	1.00	553.97	475.07	335.47
13	12.27	199.28	1.00	590.39	495.26	349.72
14	14.07	200.08	0.65	615.02	508.91	359.36
15	14.07	200.57	0.35	642.40	524.09	370.08
16	15.86	201.22	1.00	683.79	547.03	386.28
17	17.66	202.18	1.00	746.01	581.52	410.63
18	19.45	203.12	1.00	802.32	612.73	432.67
19	21.25	204.06	1.00	852.80	640.71	452.43
20	23.04	204.99	1.00	897.51	665.50	469.93
21	24.84	205.90	1.00	936.53	687.13	485.20
22	26.64	206.80	1.00	969.92	705.63	498.27
23	28.43	207.69	1.00	997.75	721.06	509.17
24	30.23	208.26	0.32	1007.33	726.37	512.92
25	30.23	208.70	0.68	1052.58	751.46	530.63
26	32.02	209.42	1.00	1127.10	792.76	559.80
27	33.82	210.25	1.00	1210.88	839.20	592.59
28	35.61	211.08	1.00	1285.83	880.75	621.93
29	37.41	211.74	0.65	1336.86	909.03	641.90
30	37.41	212.14	0.35	1356.45	919.89	649.57
31	39.21	212.67	1.00	1297.64	887.29	626.55
32	41.00	213.43	1.00	1221.57	845.13	596.78
33	42.80	214.17	1.00	1144.35	802.32	566.55
34	44.59	214.90	1.00	1066.11	758.95	535.92
35	46.39	215.60	1.00	987.02	715.11	504.97
36	48.18	216.28	1.00	907.26	670.90	473.75
37	49.98	216.93	1.00	827.01	626.42	442.34
38	51.78	217.56	1.00	746.47	581.78	410.81
39	53.57	218.17	1.00	665.85	537.09	379.26
40	55.37	218.75	1.00	585.37	492.48	347.76
41	57.16	219.30	1.00	505.28	448.08	316.40
42	58.96	219.83	1.00	425.83	404.04	285.31
43	60.75	220.34	1.00	347.31	360.52	254.58
44	62.55	220.81	1.00	270.05	317.69	224.33
45	64.35	221.26	1.00	194.37	275.74	194.71
46	66.14	221.68	1.00	120.67	234.89	165.86
47	67.94	222.07	1.00	49.37	195.37	137.96
48	69.73	222.43	1.00	0.00	168.00	118.63
49	71.53	222.76	1.00	0.00	168.00	118.63
50	73.32	223.06	1.00	0.00	168.00	118.63
51	75.12	223.21	0.05	0.00	168.00	118.63

Table 4A - Base Force Data on the 51 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-7.48	188.34	1.00	33.31	186.46	131.67
2	-5.69	189.34	1.00	60.38	201.47	142.27
3	-3.89	190.12	0.57	43.98	119.69	84.51
4	-3.89	190.62	0.43	44.69	97.47	68.82
5	-2.10	191.33	1.00	157.11	255.09	180.13
6	-0.30	192.33	1.00	229.69	295.32	208.54
7	1.50	193.33	1.00	296.81	332.52	234.81
8	3.29	194.33	1.00	358.56	366.75	258.98
9	5.09	195.33	1.00	415.06	398.07	281.09
10	6.88	196.32	1.00	466.40	426.53	301.19
11	8.68	197.31	1.00	512.68	452.18	319.30
12	10.47	198.30	1.00	553.97	475.07	335.47
13	12.27	199.28	1.00	590.39	495.26	349.72
14	14.07	200.08	0.65	401.38	332.13	234.53
15	14.07	200.57	0.35	223.15	182.05	128.55
16	15.86	201.22	1.00	683.79	547.03	386.28
17	17.66	202.18	1.00	746.01	581.52	410.63
18	19.45	203.12	1.00	802.32	612.73	432.67
19	21.25	204.06	1.00	852.80	640.71	452.43
20	23.04	204.99	1.00	897.51	665.50	469.93
21	24.84	205.90	1.00	936.53	687.13	485.20
22	26.64	206.80	1.00	969.92	705.63	498.27
23	28.43	207.69	1.00	997.75	721.06	509.17
24	30.23	208.26	0.32	317.52	228.96	161.68
25	30.23	208.70	0.68	720.80	514.59	363.37
26	32.02	209.42	1.00	1127.10	792.76	559.80
27	33.82	210.25	1.00	1210.88	839.20	592.59
28	35.61	211.08	1.00	1285.83	880.75	621.93
29	37.41	211.74	0.65	869.66	591.35	417.57
30	37.41	212.14	0.35	474.04	321.48	227.01
31	39.21	212.67	1.00	1297.64	887.29	626.55
32	41.00	213.43	1.00	1221.57	845.13	596.78
33	42.80	214.17	1.00	1144.35	802.32	566.55
34	44.59	214.90	1.00	1066.11	758.95	535.92
35	46.39	215.60	1.00	987.02	715.11	504.97
36	48.18	216.28	1.00	907.26	670.90	473.75
37	49.98	216.93	1.00	827.01	626.42	442.34
38	51.78	217.56	1.00	746.47	581.78	410.81
39	53.57	218.17	1.00	665.85	537.09	379.26
40	55.37	218.75	1.00	585.37	492.48	347.76
41	57.16	219.30	1.00	505.28	448.08	316.40
42	58.96	219.83	1.00	425.83	404.04	285.31
43	60.75	220.34	1.00	347.31	360.52	254.58
44	62.55	220.81	1.00	270.05	317.69	224.33
45	64.35	221.26	1.00	194.37	275.74	194.71
46	66.14	221.68	1.00	120.67	234.89	165.86
47	67.94	222.07	1.00	49.37	195.37	137.96
48	69.73	222.43	1.00	0.00	168.00	118.63
49	71.53	222.76	1.00	0.00	168.00	118.63
50	73.32	223.06	1.00	0.00	168.00	118.63
51	75.12	223.21	0.05	0.00	8.85	6.25

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 39.503
3D Depth (Vertical difference between ends of Slip Surface) = 22.94(ft)
L/D(1): L = 22.94(ft) L/D(2): L = 45.88(ft) L/D(3): L = 68.83(ft)
L/D(4): L = 91.77(ft) L/D(5): L = 114.71(ft) L/D(6): L = 137.65(ft)

SUM OF MOMENTS = 0.456653E-01 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.1448173E-05

Sum of the Resisting Forces = 23613.11 (lbs)

Average Available Shear Strength = 512.74(psf)

Average Effective Normal Stress = 621.93(psf)

Sum of the Driving Forces =   16674.09 (lbs)

Average Mobilized Shear Stress =   362.07(psf)

Total length of the failure surface =   46.05(ft)

Factor of Safety Balance Check: FS = 1.41616

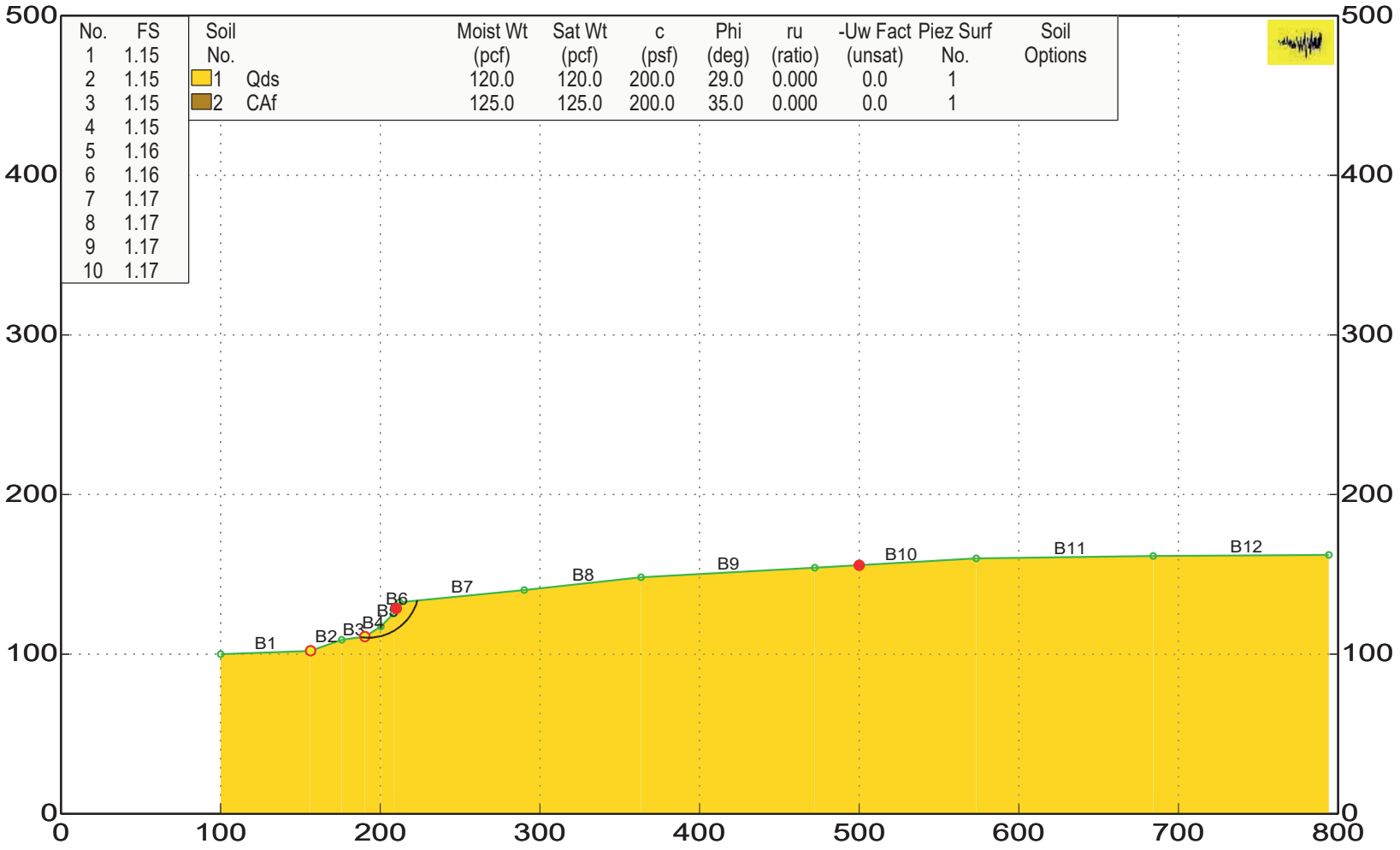
CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section CC - Existing - Seismic

EGL

\CC001s.gsd



GEOSTASE FS = 1.15

Simplified Bishop Method

kh = 0.20000

GEOSTASE Slope Stability Analysis

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **

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SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)

Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC001s.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC001s.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section CC - Existing - Seismic

PROFILE BOUNDARY DATA

12 Surface Boundaries
12 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	156.000	102.000	1
2	156.000	102.000	175.900	109.000	1
3	175.900	109.000	190.400	111.000	1
4	190.400	111.000	200.400	117.300	1
5	200.400	117.300	208.400	125.500	1
6	208.400	125.500	212.000	132.500	1
7	212.000	132.500	290.200	140.100	1
8	290.200	140.100	363.400	148.100	1
9	363.400	148.100	472.200	154.100	1
10	472.200	154.100	573.400	160.000	1
11	573.400	160.000	684.100	161.500	1
12	684.100	161.500	794.100	162.100	1

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = 0.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	156.000	102.000
3	175.900	109.000
4	190.400	111.000

5	200.400	117.300
6	208.400	125.500
7	212.000	132.500
8	290.200	140.100
9	363.400	148.100
10	472.200	154.100
11	573.400	160.000
12	684.100	161.500
13	794.100	162.100

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.036	2.045
2	0.352	19.380
3	0.138	7.853
4	0.630	32.211
5	1.025	45.707
6	1.944	62.784
7	0.097	5.551
8	0.109	6.237
9	0.055	3.156
10	0.058	3.337
11	0.014	0.776
12	0.005	0.313

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

	Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option
1	Qds	120.0	120.0	200.00	29.00	0.000	0.0	1	0
2	CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 4 Coordinate Points
Phreatic Adjustment Factor = 0.00

Point No.	X-Water (ft)	Y-Water (ft)
1	321.00	2160.00
2	546.00	2385.00
3	550.00	2385.00
4	700.00	2235.00

WATER SURFACE DATA HAS BEEN SUPPRESSED

SEISMIC (EARTHQUAKE) DATA

Specified Peak Ground Acceleration Coefficient (PGA) = 0.400(g)
Default Velocity = 2.000(ft) per second
Specified Horizontal Earthquake Coefficient (kh) = 0.20000(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
(NOTE:Input Velocity = 0.0 will result in default Peak
Velocity = 2 times(PGA) times 2.5 fps or 0.762 mps)
Specified Seismic Pore-Pressure Factor = 0.000

Horizontal Seismic Force is Applied at Center of Gravity of Slices

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.4084(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 156.40(ft)
and X = 190.40(ft)

Each Surface ends within a Range Between X = 210.00(ft)
and X = 500.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 0.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 3.343 FS Min = 1.145 FS Ave = 1.880
Standard Deviation = 0.414 Coefficient of Variation = 22.04 %

Critical Surface is Sequence Number 925 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 192.498173(ft) ; Y = 142.215289(ft); and Radius = 31.908115(ft)

Circular Trial Failure Surface Generated With 48 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	187.84745	110.64792
2	188.83893	110.51769
3	189.83401	110.41859
4	190.83170	110.35072
5	191.83103	110.31415
6	192.83102	110.30891
7	193.83068	110.33501
8	194.82903	110.39242
9	195.82509	110.48109
10	196.81788	110.60093
11	197.80644	110.75182
12	198.78977	110.93361
13	199.76693	111.14612
14	200.73695	111.38916

15	201.69887	111.66247
16	202.65176	111.96579
17	203.59468	112.29882
18	204.52670	112.66123
19	205.44690	113.05267
20	206.35438	113.47276
21	207.24826	113.92107
22	208.12765	114.39718
23	208.99168	114.90061
24	209.83952	115.43086
25	210.67033	115.98743
26	211.48328	116.56975
27	212.27759	117.17727
28	213.05247	117.80938
29	213.80716	118.46545
30	214.54093	119.14486
31	215.25304	119.84692
32	215.94280	120.57096
33	216.60954	121.31625
34	217.25259	122.08207
35	217.87133	122.86767
36	218.46515	123.67227
37	219.03347	124.49508
38	219.57572	125.33529
39	220.09138	126.19209
40	220.57993	127.06462
41	221.04090	127.95204
42	221.47384	128.85346
43	221.87832	129.76801
44	222.25394	130.69478
45	222.60034	131.63287
46	222.91716	132.58135
47	223.20412	133.53930
48	223.21764	133.59021

Factor Of Safety For The Critical or Specified Surface = 1.145

Table 1 - Geometry Data on the 51 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	0.99	0.13	188.34	110.58	110.72	-7.48	7.85	1.00
2	1.00	0.39	189.34	110.47	110.85	-5.69	7.85	1.00
3	0.57	0.56	190.12	110.40	110.96	-3.89	7.85	0.57
4	0.43	0.77	190.62	110.37	111.14	-3.89	32.21	0.43
5	1.00	1.25	191.33	110.33	111.59	-2.10	32.21	1.00
6	1.00	1.91	192.33	110.31	112.22	-0.30	32.21	1.00
7	1.00	2.52	193.33	110.32	112.85	1.50	32.21	1.00
8	1.00	3.11	194.33	110.36	113.48	3.29	32.21	1.00
9	1.00	3.67	195.33	110.44	114.10	5.09	32.21	1.00
10	0.99	4.19	196.32	110.54	114.73	6.88	32.21	1.00
11	0.99	4.68	197.31	110.68	115.35	8.68	32.21	1.00
12	0.98	5.13	198.30	110.84	115.98	10.47	32.21	1.00
13	0.98	5.55	199.28	111.04	116.59	12.27	32.21	1.00
14	0.63	5.88	200.08	111.23	117.10	14.07	32.21	0.65
15	0.34	6.13	200.57	111.35	117.47	14.07	45.71	0.35
16	0.96	6.61	201.22	111.53	118.14	15.86	45.71	1.00
17	0.95	7.31	202.18	111.81	119.12	17.66	45.71	1.00
18	0.94	7.96	203.12	112.13	120.09	19.45	45.71	1.00
19	0.93	8.57	204.06	112.48	121.05	21.25	45.71	1.00
20	0.92	9.14	204.99	112.86	122.00	23.04	45.71	1.00
21	0.91	9.68	205.90	113.26	122.94	24.84	45.71	1.00
22	0.89	10.16	206.80	113.70	123.86	26.64	45.71	1.00
23	0.88	10.61	207.69	114.16	124.77	28.43	45.71	1.00
24	0.27	10.88	208.26	114.48	125.36	30.23	45.71	0.32
25	0.59	11.35	208.70	114.73	126.08	30.23	62.78	0.68

26	0.85	12.31	209.42	115.17	127.47	32.02	62.78	1.00
27	0.83	13.40	210.25	115.71	129.11	33.82	62.78	1.00
28	0.81	14.43	211.08	116.28	130.70	35.61	62.78	1.00
29	0.52	15.23	211.74	116.77	132.00	37.41	62.78	0.65
30	0.28	15.44	212.14	117.07	132.51	37.41	5.55	0.35
31	0.77	15.07	212.67	117.49	132.56	39.21	5.55	1.00
32	0.75	14.50	213.43	118.14	132.64	41.00	5.55	1.00
33	0.73	13.91	214.17	118.81	132.71	42.80	5.55	1.00
34	0.71	13.29	214.90	119.50	132.78	44.59	5.55	1.00
35	0.69	12.64	215.60	120.21	132.85	46.39	5.55	1.00
36	0.67	11.97	216.28	120.94	132.92	48.18	5.55	1.00
37	0.64	11.28	216.93	121.70	132.98	49.98	5.55	1.00
38	0.62	10.57	217.56	122.47	133.04	51.78	5.55	1.00
39	0.59	9.83	218.17	123.27	133.10	53.57	5.55	1.00
40	0.57	9.07	218.75	124.08	133.16	55.37	5.55	1.00
41	0.54	8.29	219.30	124.92	133.21	57.16	5.55	1.00
42	0.52	7.50	219.83	125.76	133.26	58.96	5.55	1.00
43	0.49	6.68	220.34	126.63	133.31	60.75	5.55	1.00
44	0.46	5.85	220.81	127.51	133.36	62.55	5.55	1.00
45	0.43	5.00	221.26	128.40	133.40	64.35	5.55	1.00
46	0.40	4.13	221.68	129.31	133.44	66.14	5.55	1.00
47	0.38	3.25	222.07	130.23	133.48	67.94	5.55	1.00
48	0.35	2.35	222.43	131.16	133.51	69.73	5.55	1.00
49	0.32	1.44	222.76	132.11	133.55	71.53	5.55	1.00
50	0.29	0.51	223.06	133.06	133.57	73.32	5.55	1.00
51	0.01	0.02	223.21	133.56	133.59	75.12	5.55	0.05

Table 2 - Force Data On The 51 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	15.9	0.0	0.0	0.0	0.00	0.00	3.2	0.0	0.00
2	46.0	0.0	0.0	0.0	0.00	0.00	9.2	0.0	0.00
3	38.1	0.0	0.0	0.0	0.00	0.00	7.6	0.0	0.00
4	39.9	0.0	0.0	0.0	0.00	0.00	8.0	0.0	0.00
5	150.4	0.0	0.0	0.0	0.00	0.00	30.1	0.0	0.00
6	228.6	0.0	0.0	0.0	0.00	0.00	45.7	0.0	0.00
7	302.8	0.0	0.0	0.0	0.00	0.00	60.6	0.0	0.00
8	372.8	0.0	0.0	0.0	0.00	0.00	74.6	0.0	0.00
9	438.3	0.0	0.0	0.0	0.00	0.00	87.7	0.0	0.00
10	499.1	0.0	0.0	0.0	0.00	0.00	99.8	0.0	0.00
11	555.0	0.0	0.0	0.0	0.00	0.00	111.0	0.0	0.00
12	605.7	0.0	0.0	0.0	0.00	0.00	121.1	0.0	0.00
13	651.2	0.0	0.0	0.0	0.00	0.00	130.2	0.0	0.00
14	446.3	0.0	0.0	0.0	0.00	0.00	89.3	0.0	0.00
15	247.7	0.0	0.0	0.0	0.00	0.00	49.5	0.0	0.00
16	763.3	0.0	0.0	0.0	0.00	0.00	152.7	0.0	0.00
17	835.4	0.0	0.0	0.0	0.00	0.00	167.1	0.0	0.00
18	900.6	0.0	0.0	0.0	0.00	0.00	180.1	0.0	0.00
19	958.7	0.0	0.0	0.0	0.00	0.00	191.7	0.0	0.00
20	1009.8	0.0	0.0	0.0	0.00	0.00	202.0	0.0	0.00
21	1053.6	0.0	0.0	0.0	0.00	0.00	210.7	0.0	0.00
22	1090.3	0.0	0.0	0.0	0.00	0.00	218.1	0.0	0.00
23	1119.7	0.0	0.0	0.0	0.00	0.00	223.9	0.0	0.00
24	355.7	0.0	0.0	0.0	0.00	0.00	71.1	0.0	0.00
25	805.7	0.0	0.0	0.0	0.00	0.00	161.1	0.0	0.00
26	1252.3	0.0	0.0	0.0	0.00	0.00	250.5	0.0	0.00
27	1335.7	0.0	0.0	0.0	0.00	0.00	267.1	0.0	0.00
28	1407.4	0.0	0.0	0.0	0.00	0.00	281.5	0.0	0.00
29	944.4	0.0	0.0	0.0	0.00	0.00	188.9	0.0	0.00
30	514.4	0.0	0.0	0.0	0.00	0.00	102.9	0.0	0.00
31	1401.4	0.0	0.0	0.0	0.00	0.00	280.3	0.0	0.00
32	1313.3	0.0	0.0	0.0	0.00	0.00	262.7	0.0	0.00
33	1224.5	0.0	0.0	0.0	0.00	0.00	244.9	0.0	0.00
34	1135.3	0.0	0.0	0.0	0.00	0.00	227.1	0.0	0.00
35	1046.3	0.0	0.0	0.0	0.00	0.00	209.3	0.0	0.00
36	957.9	0.0	0.0	0.0	0.00	0.00	191.6	0.0	0.00
37	870.4	0.0	0.0	0.0	0.00	0.00	174.1	0.0	0.00

38	784.5	0.0	0.0	0.0	0.00	0.00	156.9	0.0	0.00
39	700.4	0.0	0.0	0.0	0.00	0.00	140.1	0.0	0.00
40	618.7	0.0	0.0	0.0	0.00	0.00	123.7	0.0	0.00
41	539.7	0.0	0.0	0.0	0.00	0.00	107.9	0.0	0.00
42	463.9	0.0	0.0	0.0	0.00	0.00	92.8	0.0	0.00
43	391.7	0.0	0.0	0.0	0.00	0.00	78.3	0.0	0.00
44	323.5	0.0	0.0	0.0	0.00	0.00	64.7	0.0	0.00
45	259.6	0.0	0.0	0.0	0.00	0.00	51.9	0.0	0.00
46	200.4	0.0	0.0	0.0	0.00	0.00	40.1	0.0	0.00
47	146.4	0.0	0.0	0.0	0.00	0.00	29.3	0.0	0.00
48	97.7	0.0	0.0	0.0	0.00	0.00	19.5	0.0	0.00
49	54.7	0.0	0.0	0.0	0.00	0.00	10.9	0.0	0.00
50	17.7	0.0	0.0	0.0	0.00	0.00	3.5	0.0	0.00
51	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 31533.03(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 31533.03(lbs)

TOTAL AREA OF SLIDING MASS = 262.78(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 51 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	200.00	29.00	
2	1	200.00	29.00	
3	1	200.00	29.00	
4	1	200.00	29.00	
5	1	200.00	29.00	
6	1	200.00	29.00	
7	1	200.00	29.00	
8	1	200.00	29.00	
9	1	200.00	29.00	
10	1	200.00	29.00	
11	1	200.00	29.00	
12	1	200.00	29.00	
13	1	200.00	29.00	
14	1	200.00	29.00	
15	1	200.00	29.00	
16	1	200.00	29.00	
17	1	200.00	29.00	
18	1	200.00	29.00	
19	1	200.00	29.00	
20	1	200.00	29.00	
21	1	200.00	29.00	
22	1	200.00	29.00	
23	1	200.00	29.00	
24	1	200.00	29.00	
25	1	200.00	29.00	
26	1	200.00	29.00	
27	1	200.00	29.00	
28	1	200.00	29.00	
29	1	200.00	29.00	
30	1	200.00	29.00	
31	1	200.00	29.00	
32	1	200.00	29.00	
33	1	200.00	29.00	
34	1	200.00	29.00	
35	1	200.00	29.00	
36	1	200.00	29.00	
37	1	200.00	29.00	
38	1	200.00	29.00	
39	1	200.00	29.00	
40	1	200.00	29.00	
41	1	200.00	29.00	
42	1	200.00	29.00	
43	1	200.00	29.00	
44	1	200.00	29.00	
45	1	200.00	29.00	

46	1	200.00	29.00
47	1	200.00	29.00
48	1	200.00	29.00
49	1	200.00	29.00
50	1	200.00	29.00
51	1	200.00	29.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 51 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-7.48	188.34	1.00	42.89	223.77	195.42
2	-5.69	189.34	1.00	67.85	237.61	207.50
3	-3.89	190.12	0.57	82.68	245.83	214.68
4	-3.89	190.62	0.43	108.65	260.23	227.25
5	-2.10	191.33	1.00	160.18	288.79	252.19
6	-0.30	192.33	1.00	230.17	327.59	286.07
7	1.50	193.33	1.00	294.27	363.12	317.10
8	3.29	194.33	1.00	352.66	395.48	345.37
9	5.09	195.33	1.00	405.51	424.78	370.95
10	6.88	196.32	1.00	452.97	451.08	393.92
11	8.68	197.31	1.00	495.19	474.49	414.36
12	10.47	198.30	1.00	532.30	495.06	432.33
13	12.27	199.28	1.00	564.45	512.88	447.89
14	14.07	200.08	0.65	584.94	524.24	457.81
15	14.07	200.57	0.35	611.63	539.03	470.72
16	15.86	201.22	1.00	648.22	559.32	488.44
17	17.66	202.18	1.00	704.78	590.67	515.82
18	19.45	203.12	1.00	755.32	618.68	540.28
19	21.25	204.06	1.00	799.94	643.41	561.88
20	23.04	204.99	1.00	838.76	664.93	580.67
21	24.84	205.90	1.00	871.89	683.30	596.71
22	26.64	206.80	1.00	899.44	698.57	610.04
23	28.43	207.69	1.00	921.51	710.80	620.73
24	30.23	208.26	0.32	926.10	713.35	622.95
25	30.23	208.70	0.68	969.01	737.13	643.72
26	32.02	209.42	1.00	1034.78	773.59	675.56
27	33.82	210.25	1.00	1108.82	814.63	711.40
28	35.61	211.08	1.00	1174.03	850.78	742.97
29	37.41	211.74	0.65	1216.36	874.24	763.46
30	37.41	212.14	0.35	1234.70	884.41	772.34
31	39.21	212.67	1.00	1174.07	850.80	742.99
32	41.00	213.43	1.00	1097.68	808.45	706.01
33	42.80	214.17	1.00	1020.58	765.72	668.69
34	44.59	214.90	1.00	942.93	722.68	631.10
35	46.39	215.60	1.00	864.90	679.42	593.33
36	48.18	216.28	1.00	786.65	636.05	555.45
37	49.98	216.93	1.00	708.37	592.66	517.56
38	51.78	217.56	1.00	630.24	549.35	479.74
39	53.57	218.17	1.00	552.47	506.24	442.09
40	55.37	218.75	1.00	475.27	463.44	404.72
41	57.16	219.30	1.00	398.87	421.10	367.74
42	58.96	219.83	1.00	323.52	379.33	331.26
43	60.75	220.34	1.00	249.48	338.29	295.42
44	62.55	220.81	1.00	177.05	298.14	260.36
45	64.35	221.26	1.00	106.54	259.05	226.23

46	66.14	221.68	1.00	38.28	221.22	193.19
47	67.94	222.07	1.00	0.00	200.00	174.66
48	69.73	222.43	1.00	0.00	200.00	174.66
49	71.53	222.76	1.00	0.00	200.00	174.66
50	73.32	223.06	1.00	0.00	200.00	174.66
51	75.12	223.21	0.05	0.00	200.00	174.66

Table 4A - Base Force Data on the 51 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-7.48	188.34	1.00	42.89	223.77	195.42
2	-5.69	189.34	1.00	67.85	237.61	207.50
3	-3.89	190.12	0.57	46.91	139.46	121.79
4	-3.89	190.62	0.43	47.01	112.60	98.33
5	-2.10	191.33	1.00	160.18	288.79	252.19
6	-0.30	192.33	1.00	230.17	327.59	286.07
7	1.50	193.33	1.00	294.27	363.12	317.10
8	3.29	194.33	1.00	352.66	395.48	345.37
9	5.09	195.33	1.00	405.51	424.78	370.95
10	6.88	196.32	1.00	452.97	451.08	393.92
11	8.68	197.31	1.00	495.19	474.49	414.36
12	10.47	198.30	1.00	532.30	495.06	432.33
13	12.27	199.28	1.00	564.45	512.88	447.89
14	14.07	200.08	0.65	381.76	342.14	298.78
15	14.07	200.57	0.35	212.46	187.24	163.51
16	15.86	201.22	1.00	648.22	559.32	488.44
17	17.66	202.18	1.00	704.78	590.67	515.82
18	19.45	203.12	1.00	755.32	618.68	540.28
19	21.25	204.06	1.00	799.94	643.41	561.88
20	23.04	204.99	1.00	838.76	664.93	580.67
21	24.84	205.90	1.00	871.89	683.30	596.71
22	26.64	206.80	1.00	899.44	698.57	610.04
23	28.43	207.69	1.00	921.51	710.80	620.73
24	30.23	208.26	0.32	291.92	224.85	196.36
25	30.23	208.70	0.68	663.57	504.78	440.81
26	32.02	209.42	1.00	1034.78	773.59	675.56
27	33.82	210.25	1.00	1108.82	814.63	711.40
28	35.61	211.08	1.00	1174.03	850.78	742.97
29	37.41	211.74	0.65	791.27	568.72	496.65
30	37.41	212.14	0.35	431.50	309.08	269.91
31	39.21	212.67	1.00	1174.07	850.80	742.99
32	41.00	213.43	1.00	1097.68	808.45	706.01
33	42.80	214.17	1.00	1020.58	765.72	668.69
34	44.59	214.90	1.00	942.93	722.68	631.10
35	46.39	215.60	1.00	864.90	679.42	593.33
36	48.18	216.28	1.00	786.65	636.05	555.45
37	49.98	216.93	1.00	708.37	592.66	517.56
38	51.78	217.56	1.00	630.24	549.35	479.74
39	53.57	218.17	1.00	552.47	506.24	442.09
40	55.37	218.75	1.00	475.27	463.44	404.72
41	57.16	219.30	1.00	398.87	421.10	367.74
42	58.96	219.83	1.00	323.52	379.33	331.26
43	60.75	220.34	1.00	249.48	338.29	295.42
44	62.55	220.81	1.00	177.05	298.14	260.36
45	64.35	221.26	1.00	106.54	259.05	226.23
46	66.14	221.68	1.00	38.28	221.22	193.19
47	67.94	222.07	1.00	0.00	200.00	174.66
48	69.73	222.43	1.00	0.00	200.00	174.66
49	71.53	222.76	1.00	0.00	200.00	174.66
50	73.32	223.06	1.00	0.00	200.00	174.66
51	75.12	223.21	0.05	0.00	10.53	9.20

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 42.356
3D Depth (Vertical difference between ends of Slip Surface) = 22.94(ft)

L/D(1): L = 22.94(ft) L/D(2): L = 45.88(ft) L/D(3): L = 68.83(ft)
L/D(4): L = 91.77(ft) L/D(5): L = 114.71(ft) L/D(6): L = 137.65(ft)

SUM OF MOMENTS = 0.956104E-01 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.3032071E-05

Sum of the Resisting Forces = 23494.65 (lbs)

Average Available Shear Strength = 510.17(psf)

Average Effective Normal Stress = 559.56(psf)

Sum of the Driving Forces = 20517.43 (lbs)

Average Mobilized Shear Stress = 445.52(psf)

Total length of the failure surface = 46.05(ft)

Factor of Safety Balance Check: FS = 1.14511

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop
Method. This Method Is Valid Only If The Failure Surface
Approximates A Circular Arc.

*** SEISMIC SLOPE DISPLACEMENT DATA ***
(Note: kv is set = zero for displacement calculations)
Seismic Yield Coefficient (ky) = 0.26317(g)
Calculated Newmark Seismic Displacement = 0.359(ft)

Average Elevation of Point of Application of kh on Sliding Mass = 121.347(ft)

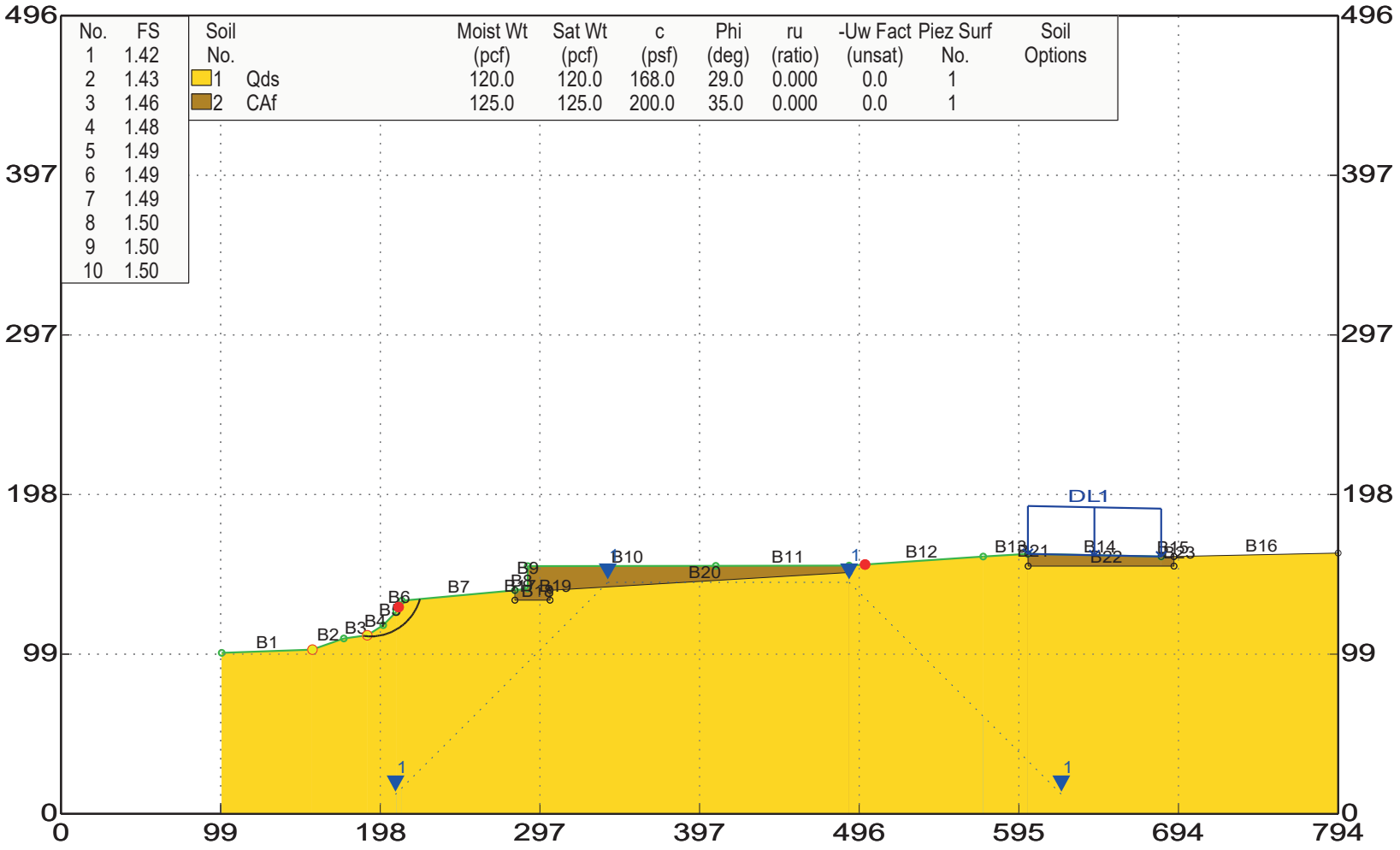
Non-Symmetrical Sliding Resistance Has Been Specified
for Downhill Sliding.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section CC - Proposed- Static

EGL

\CC101.gsd



GEOSTASE FS = 1.42

Simplified Bishop Method

GEOSTASE Slope Stability Analysis

PLATE D.5

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC101.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC101.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section CC - Proposed- Static

PROFILE BOUNDARY DATA

14 Surface Boundaries
23 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	156.000	102.000	1
2	156.000	102.000	175.900	109.000	1
3	175.900	109.000	190.400	111.000	1
4	190.400	111.000	200.400	117.300	1
5	200.400	117.300	208.400	125.500	1
6	208.400	125.500	212.000	132.500	1
7	212.000	132.500	282.200	138.900	1
8	282.200	138.900	290.200	140.100	2
9	290.200	140.100	290.200	154.000	2
10	290.200	154.000	407.200	154.100	2
11	407.200	154.100	490.000	154.400	2
12	490.000	154.400	573.400	160.000	1
13	573.400	160.000	601.200	161.700	1
14	601.200	161.700	684.100	160.000	2
15	684.100	160.000	692.000	160.000	2
16	692.000	160.000	794.100	162.100	1
17	282.200	138.900	282.200	132.900	1
18	282.200	132.900	304.000	132.900	1
19	304.000	132.900	304.000	138.900	1
20	304.000	138.900	490.000	150.000	1
21	601.200	161.700	601.300	154.000	1
22	601.300	154.000	692.000	154.000	1
23	692.000	154.000	692.000	160.000	1

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = 0.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	156.000	102.000
3	175.900	109.000
4	190.400	111.000
5	200.400	117.300
6	208.400	125.500
7	212.000	132.500
8	282.200	138.900
9	290.200	140.100
10	290.200	154.000
11	407.200	154.100
12	490.000	154.400
13	573.400	160.000
14	601.200	161.700
15	684.100	160.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
16	684.100	160.000
17	692.000	160.000
18	794.100	162.100
19	282.200	132.900
20	304.000	132.900
21	304.000	138.900
22	490.000	150.000
23	601.300	154.000
24	692.000	154.000
25	692.000	160.000

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.036	2.045
2	0.352	19.380
3	0.138	7.853
4	0.630	32.211
5	1.025	45.707
6	1.944	62.784
7	0.091	5.209
8	0.150	8.531
9	Vertical	Vertical
10	0.001	0.049
11	0.004	0.208
12	0.067	3.841
13	0.061	3.499
14	-0.021	-1.175
15	0.000	0.000
16	0.021	1.178
17	Vertical	Vertical
18	0.000	0.000
19	Vertical	Vertical
20	0.060	3.415
21	-77.000	-89.256
22	0.000	0.000
23	Vertical	Vertical

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option

1 Qds	120.0	120.0	168.00	29.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 4 Coordinate Points
Phreatic Adjustment Factor = 0.00

Point No.	X-Water (ft)	Y-Water (ft)
1	208.00	12.00
2	340.00	144.00
3	490.00	144.00
4	622.00	12.00

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load No.	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	Deflection (deg from Vert)
1	14	601.200	161.700	2000.000	684.100	160.000	2000.000	0.00

NOTE - Load Stress Varies Linearly Within Specified Range.
For Multi-Stage Analysis, Refer to Detailed Output for Distributed Loads Applied to Each Stage.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.4084(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 156.40(ft)
and X = 190.40(ft)

Each Surface ends within a Range Between X = 210.00(ft)
and X = 500.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 0.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 7.684 FS Min = 1.417 FS Ave = 3.279
Standard Deviation = 1.312 Coefficient of Variation = 39.99 %

Critical Surface is Sequence Number 926 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 192.526230(ft) ; Y = 142.174482(ft); and Radius = 31.862228(ft)

Circular Trial Failure Surface Generated With 47 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	187.88148	110.65262
2	188.87296	110.52239
3	189.86805	110.42333
4	190.86575	110.35555
5	191.86508	110.31911
6	192.86507	110.31406
7	193.86472	110.34038
8	194.86306	110.39806
9	195.85909	110.48705
10	196.85184	110.60724
11	197.84033	110.75853
12	198.82359	110.94077
13	199.80064	111.15377
14	200.77052	111.39733
15	201.73229	111.67120
16	202.68499	111.97512
17	203.62768	112.30879
18	204.55943	112.67188
19	205.47934	113.06403
20	206.38648	113.48485
21	207.27997	113.93393
22	208.15893	114.41083
23	209.02249	114.91508
24	209.86980	115.44618
25	210.70002	116.00360
26	211.51235	116.58681
27	212.30597	117.19522
28	213.08011	117.82824
29	213.83400	118.48523
30	214.56690	119.16556
31	215.27810	119.86856
32	215.96688	120.59353
33	216.63257	121.33976
34	217.27452	122.10650
35	217.89209	122.89302
36	218.48467	123.69853
37	219.05169	124.52224
38	219.59257	125.36333
39	220.10680	126.22099
40	220.59385	127.09436
41	221.05326	127.98258
42	221.48457	128.88479
43	221.88736	129.80008
44	222.26122	130.72757
45	222.60580	131.66633
46	222.92074	132.61544
47	223.18974	133.52015

Factor Of Safety For The Critical or Specified Surface = 1.417

Table 1 - Geometry Data on the 50 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	0.99	0.13	188.38	110.59	110.72	-7.48	7.85	1.00
2	1.00	0.39	189.37	110.47	110.86	-5.68	7.85	1.00
3	0.53	0.56	190.13	110.41	110.96	-3.89	7.85	0.53
4	0.47	0.78	190.63	110.37	111.15	-3.89	32.21	0.47
5	1.00	1.27	191.37	110.34	111.61	-2.09	32.21	1.00
6	1.00	1.92	192.37	110.32	112.24	-0.29	32.21	1.00
7	1.00	2.54	193.36	110.33	112.87	1.51	32.21	1.00
8	1.00	3.13	194.36	110.37	113.50	3.31	32.21	1.00
9	1.00	3.68	195.36	110.44	114.13	5.11	32.21	1.00
10	0.99	4.20	196.36	110.55	114.75	6.90	32.21	1.00
11	0.99	4.69	197.35	110.68	115.38	8.70	32.21	1.00
12	0.98	5.15	198.33	110.85	116.00	10.50	32.21	1.00
13	0.98	5.57	199.31	111.05	116.61	12.30	32.21	1.00
14	0.60	5.88	200.10	111.23	117.11	14.10	32.21	0.62
15	0.37	6.14	200.59	111.35	117.49	14.10	45.71	0.38
16	0.96	6.64	201.25	111.53	118.17	15.89	45.71	1.00
17	0.95	7.33	202.21	111.82	119.15	17.69	45.71	1.00
18	0.94	7.98	203.16	112.14	120.13	19.49	45.71	1.00
19	0.93	8.60	204.09	112.49	121.09	21.29	45.71	1.00
20	0.92	9.17	205.02	112.87	122.03	23.09	45.71	1.00
21	0.91	9.70	205.93	113.27	122.97	24.89	45.71	1.00
22	0.89	10.18	206.83	113.71	123.89	26.68	45.71	1.00
23	0.88	10.63	207.72	114.17	124.80	28.48	45.71	1.00
24	0.24	10.90	208.28	114.48	125.38	30.28	45.71	0.28
25	0.62	11.37	208.71	114.73	126.11	30.28	62.78	0.72
26	0.85	12.35	209.45	115.18	127.53	32.08	62.78	1.00
27	0.83	13.44	210.28	115.72	129.17	33.88	62.78	1.00
28	0.81	14.47	211.11	116.30	130.76	35.68	62.78	1.00
29	0.49	15.25	211.76	116.77	132.03	37.47	62.78	0.61
30	0.31	15.44	212.15	117.08	132.51	37.47	5.21	0.39
31	0.77	15.05	212.69	117.51	132.56	39.27	5.21	1.00
32	0.75	14.48	213.46	118.16	132.63	41.07	5.21	1.00
33	0.73	13.88	214.20	118.83	132.70	42.87	5.21	1.00
34	0.71	13.25	214.92	119.52	132.77	44.67	5.21	1.00
35	0.69	12.60	215.62	120.23	132.83	46.47	5.21	1.00
36	0.67	11.93	216.30	120.97	132.89	48.26	5.21	1.00
37	0.64	11.23	216.95	121.72	132.95	50.06	5.21	1.00
38	0.62	10.51	217.58	122.50	133.01	51.86	5.21	1.00
39	0.59	9.77	218.19	123.30	133.06	53.66	5.21	1.00
40	0.57	9.01	218.77	124.11	133.12	55.46	5.21	1.00
41	0.54	8.22	219.32	124.94	133.17	57.26	5.21	1.00
42	0.51	7.42	219.85	125.79	133.22	59.05	5.21	1.00
43	0.49	6.60	220.35	126.66	133.26	60.85	5.21	1.00
44	0.46	5.77	220.82	127.54	133.30	62.65	5.21	1.00
45	0.43	4.91	221.27	128.43	133.35	64.45	5.21	1.00
46	0.40	4.04	221.69	129.34	133.38	66.25	5.21	1.00
47	0.37	3.15	222.07	130.26	133.42	68.05	5.21	1.00
48	0.34	2.25	222.43	131.20	133.45	69.84	5.21	1.00
49	0.31	1.34	222.76	132.14	133.48	71.64	5.21	1.00
50	0.27	0.44	223.06	133.07	133.51	73.44	5.21	0.94

Table 2 - Force Data On The 50 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	15.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
2	46.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
3	35.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
4	43.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
5	152.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

6	230.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
7	304.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
8	374.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
9	440.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
10	500.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
11	556.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
12	607.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
13	652.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
14	423.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
15	273.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
16	766.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
17	838.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
18	903.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
19	961.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
20	1011.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
21	1055.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
22	1092.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
23	1121.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
24	315.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
25	849.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
26	1256.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
27	1339.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
28	1410.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
29	892.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
30	566.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
31	1398.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
32	1309.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
33	1220.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
34	1130.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
35	1041.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
36	952.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
37	865.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
38	778.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
39	694.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
40	612.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
41	533.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
42	458.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
43	386.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
44	317.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
45	254.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
46	195.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
47	141.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
48	93.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
49	50.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
50	14.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 31484.55(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 31484.55(lbs)

TOTAL AREA OF SLIDING MASS = 262.37(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 50 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	168.00	29.00	
2	1	168.00	29.00	
3	1	168.00	29.00	
4	1	168.00	29.00	
5	1	168.00	29.00	
6	1	168.00	29.00	
7	1	168.00	29.00	
8	1	168.00	29.00	
9	1	168.00	29.00	
10	1	168.00	29.00	
11	1	168.00	29.00	
12	1	168.00	29.00	
13	1	168.00	29.00	
14	1	168.00	29.00	

15	1	168.00	29.00
16	1	168.00	29.00
17	1	168.00	29.00
18	1	168.00	29.00
19	1	168.00	29.00
20	1	168.00	29.00
21	1	168.00	29.00
22	1	168.00	29.00
23	1	168.00	29.00
24	1	168.00	29.00
25	1	168.00	29.00
26	1	168.00	29.00
27	1	168.00	29.00
28	1	168.00	29.00
29	1	168.00	29.00
30	1	168.00	29.00
31	1	168.00	29.00
32	1	168.00	29.00
33	1	168.00	29.00
34	1	168.00	29.00
35	1	168.00	29.00
36	1	168.00	29.00
37	1	168.00	29.00
38	1	168.00	29.00
39	1	168.00	29.00
40	1	168.00	29.00
41	1	168.00	29.00
42	1	168.00	29.00
43	1	168.00	29.00
44	1	168.00	29.00
45	1	168.00	29.00
46	1	168.00	29.00
47	1	168.00	29.00
48	1	168.00	29.00
49	1	168.00	29.00
50	1	168.00	29.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 50 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-7.48	188.38	1.00	33.29	186.45	131.55
2	-5.68	189.37	1.00	60.36	201.46	142.13
3	-3.89	190.13	0.53	77.06	210.72	148.66
4	-3.89	190.63	0.47	103.85	225.56	159.14
5	-2.09	191.37	1.00	159.09	256.19	180.74
6	-0.29	192.37	1.00	231.63	296.39	209.11
7	1.51	193.36	1.00	298.68	333.56	235.33
8	3.31	194.36	1.00	360.38	367.76	259.46
9	5.11	195.36	1.00	416.81	399.04	281.53
10	6.90	196.36	1.00	468.08	427.46	301.58
11	8.70	197.35	1.00	514.27	453.07	319.65
12	10.50	198.33	1.00	555.49	475.91	335.76
13	12.30	199.31	1.00	591.82	496.05	349.97
14	14.10	200.10	0.62	615.67	509.27	359.30
15	14.10	200.59	0.38	643.74	524.83	370.28

16	15.89	201.25	1.00	686.45	548.51	386.98
17	17.69	202.21	1.00	748.53	582.92	411.26
18	19.49	203.16	1.00	804.71	614.06	433.23
19	21.29	204.09	1.00	855.04	641.96	452.91
20	23.09	205.02	1.00	899.60	666.66	470.34
21	24.89	205.93	1.00	938.46	688.20	485.53
22	26.68	206.83	1.00	971.68	706.61	498.53
23	28.48	207.72	1.00	999.35	721.95	509.34
24	30.28	208.28	0.28	1008.12	726.81	512.77
25	30.28	208.71	0.72	1054.68	752.62	530.98
26	32.08	209.45	1.00	1131.01	794.93	560.84
27	33.88	210.28	1.00	1214.49	841.20	593.48
28	35.68	211.11	1.00	1289.13	882.58	622.67
29	37.47	211.76	0.61	1338.33	909.85	641.91
30	37.47	212.15	0.39	1355.30	919.26	648.55
31	39.27	212.69	1.00	1295.24	885.96	625.06
32	41.07	213.46	1.00	1218.68	843.53	595.12
33	42.87	214.20	1.00	1140.98	800.46	564.74
34	44.67	214.92	1.00	1062.30	756.84	533.96
35	46.47	215.62	1.00	982.80	712.77	502.87
36	48.26	216.30	1.00	902.65	668.35	471.53
37	50.06	216.95	1.00	822.05	623.67	440.01
38	51.86	217.58	1.00	741.19	578.85	408.39
39	53.66	218.19	1.00	660.28	534.00	376.74
40	55.46	218.77	1.00	579.54	489.25	345.17
41	57.26	219.32	1.00	499.23	444.73	313.76
42	59.05	219.85	1.00	419.61	400.59	282.62
43	60.85	220.35	1.00	340.96	357.00	251.87
44	62.65	220.82	1.00	263.60	314.11	221.61
45	64.45	221.27	1.00	187.88	272.14	192.00
46	66.25	221.69	1.00	114.19	231.29	163.18
47	68.05	222.07	1.00	42.96	191.81	135.33
48	69.84	222.43	1.00	0.00	168.00	118.53
49	71.64	222.76	1.00	0.00	168.00	118.53
50	73.44	223.06	0.94	0.00	168.00	118.53

Table 4A - Base Force Data on the 50 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-7.48	188.38	1.00	33.29	186.45	131.55
2	-5.68	189.37	1.00	60.36	201.46	142.13
3	-3.89	190.13	0.53	41.09	112.35	79.26
4	-3.89	190.63	0.47	48.48	105.30	74.29
5	-2.09	191.37	1.00	159.09	256.19	180.74
6	-0.29	192.37	1.00	231.63	296.39	209.11
7	1.51	193.36	1.00	298.68	333.56	235.33
8	3.31	194.36	1.00	360.38	367.76	259.46
9	5.11	195.36	1.00	416.81	399.04	281.53
10	6.90	196.36	1.00	468.08	427.46	301.58
11	8.70	197.35	1.00	514.27	453.07	319.65
12	10.50	198.33	1.00	555.49	475.91	335.76
13	12.30	199.31	1.00	591.82	496.05	349.97
14	14.10	200.10	0.62	380.46	314.71	222.04
15	14.10	200.59	0.38	245.93	200.50	141.46
16	15.89	201.25	1.00	686.45	548.51	386.98
17	17.69	202.21	1.00	748.53	582.92	411.26
18	19.49	203.16	1.00	804.71	614.06	433.23
19	21.29	204.09	1.00	855.04	641.96	452.91
20	23.09	205.02	1.00	899.60	666.66	470.34
21	24.89	205.93	1.00	938.46	688.20	485.53
22	26.68	206.83	1.00	971.68	706.61	498.53
23	28.48	207.72	1.00	999.35	721.95	509.34
24	30.28	208.28	0.28	281.43	202.90	143.15
25	30.28	208.71	0.72	760.25	542.52	382.75
26	32.08	209.45	1.00	1131.01	794.93	560.84
27	33.88	210.28	1.00	1214.49	841.20	593.48

28	35.68	211.11	1.00	1289.13	882.58	622.67
29	37.47	211.76	0.61	822.36	559.07	394.43
30	37.47	212.15	0.39	522.52	354.40	250.04
31	39.27	212.69	1.00	1295.24	885.96	625.06
32	41.07	213.46	1.00	1218.68	843.53	595.12
33	42.87	214.20	1.00	1140.98	800.46	564.74
34	44.67	214.92	1.00	1062.30	756.84	533.96
35	46.47	215.62	1.00	982.80	712.77	502.87
36	48.26	216.30	1.00	902.65	668.35	471.53
37	50.06	216.95	1.00	822.05	623.67	440.01
38	51.86	217.58	1.00	741.19	578.85	408.39
39	53.66	218.19	1.00	660.28	534.00	376.74
40	55.46	218.77	1.00	579.54	489.25	345.17
41	57.26	219.32	1.00	499.23	444.73	313.76
42	59.05	219.85	1.00	419.61	400.59	282.62
43	60.85	220.35	1.00	340.96	357.00	251.87
44	62.65	220.82	1.00	263.60	314.11	221.61
45	64.45	221.27	1.00	187.88	272.14	192.00
46	66.25	221.69	1.00	114.19	231.29	163.18
47	68.05	222.07	1.00	42.96	191.81	135.33
48	69.84	222.43	1.00	0.00	168.00	118.53
49	71.64	222.76	1.00	0.00	168.00	118.53
50	73.44	223.06	0.94	0.00	158.57	111.87

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 39.493
3D Depth (Vertical difference between ends of Slip Surface) = 22.87(ft)
L/D(1): L = 22.87(ft) L/D(2): L = 45.74(ft) L/D(3): L = 68.60(ft)
L/D(4): L = 91.47(ft) L/D(5): L = 114.34(ft) L/D(6): L = 137.21(ft)

SUM OF MOMENTS = 0.125221E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.3977221E-05

Sum of the Resisting Forces = 23574.58 (lbs)

Average Available Shear Strength = 513.12(psf)

Average Effective Normal Stress = 622.61(psf)

Sum of the Driving Forces = 16632.23 (lbs)

Average Mobilized Shear Stress = 362.01(psf)

Total length of the failure surface = 45.94(ft)

Factor of Safety Balance Check: FS = 1.41740

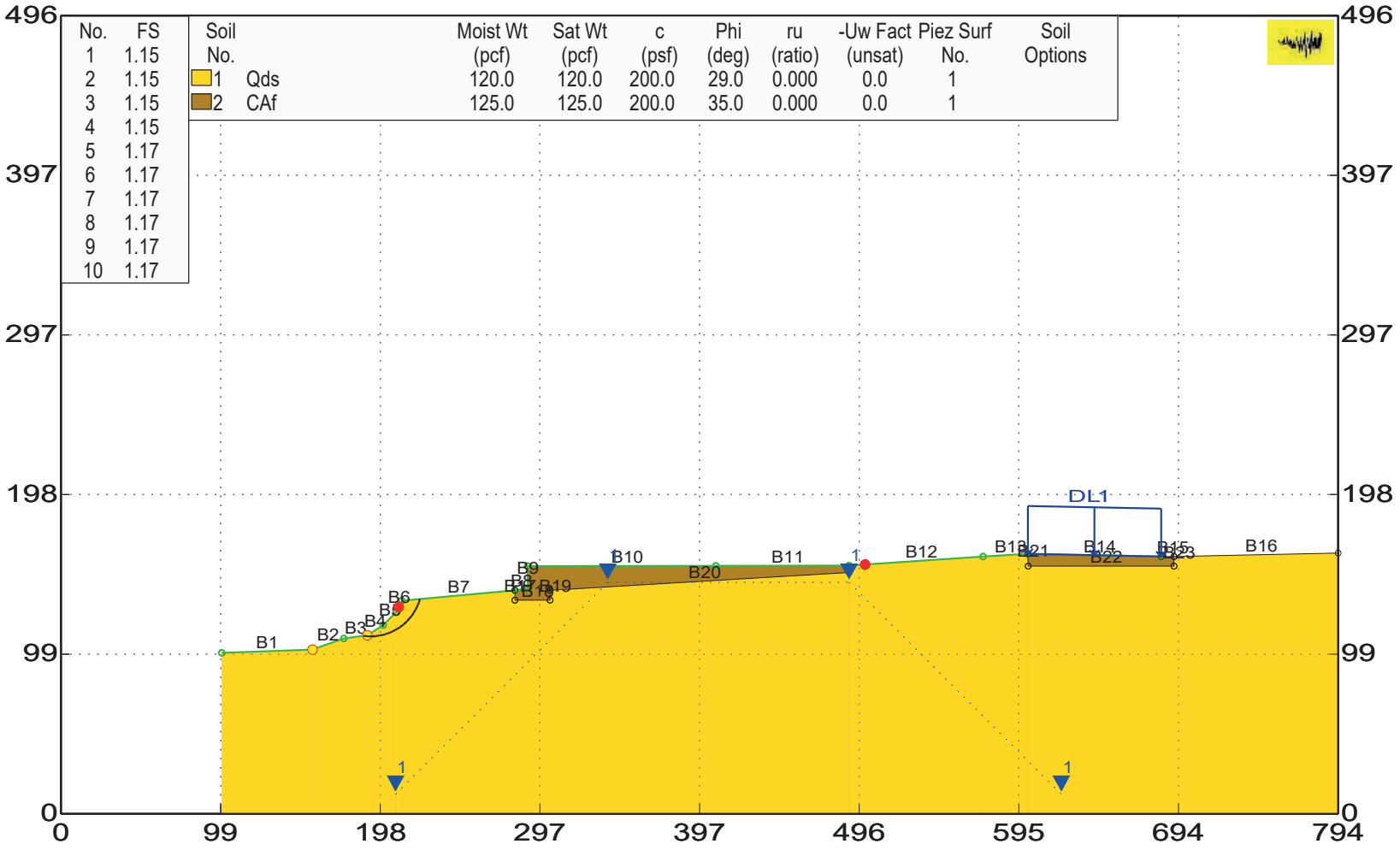
CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section CC - Proposed- Seismic

EGL

\CC101s.gsd



GEOSTASE FS = 1.15

Simplified Bishop Method

kh = 0.20000

GEOSTASE Slope Stability Analysis

GEOSTASE® v4.30.32 by GREGORY GEOTECHNICAL SOFTWARE

PLATE D.5s

*** GEOSTASE(R) ***

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** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC101s.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC101s.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section CC - Proposed- Seismic

PROFILE BOUNDARY DATA

14 Surface Boundaries
23 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	156.000	102.000	1
2	156.000	102.000	175.900	109.000	1
3	175.900	109.000	190.400	111.000	1
4	190.400	111.000	200.400	117.300	1
5	200.400	117.300	208.400	125.500	1
6	208.400	125.500	212.000	132.500	1
7	212.000	132.500	282.200	138.900	1
8	282.200	138.900	290.200	140.100	2
9	290.200	140.100	290.200	154.000	2
10	290.200	154.000	407.200	154.100	2
11	407.200	154.100	490.000	154.400	2
12	490.000	154.400	573.400	160.000	1
13	573.400	160.000	601.200	161.700	1
14	601.200	161.700	684.100	160.000	2
15	684.100	160.000	692.000	160.000	2
16	692.000	160.000	794.100	162.100	1
17	282.200	138.900	282.200	132.900	1
18	282.200	132.900	304.000	132.900	1
19	304.000	132.900	304.000	138.900	1
20	304.000	138.900	490.000	150.000	1
21	601.200	161.700	601.300	154.000	1
22	601.300	154.000	692.000	154.000	1
23	692.000	154.000	692.000	160.000	1

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = 0.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	156.000	102.000
3	175.900	109.000
4	190.400	111.000
5	200.400	117.300
6	208.400	125.500
7	212.000	132.500
8	282.200	138.900
9	290.200	140.100
10	290.200	154.000
11	407.200	154.100
12	490.000	154.400
13	573.400	160.000
14	601.200	161.700
15	684.100	160.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
16	684.100	160.000
17	692.000	160.000
18	794.100	162.100
19	282.200	132.900
20	304.000	132.900
21	304.000	138.900
22	490.000	150.000
23	601.300	154.000
24	692.000	154.000
25	692.000	160.000

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.036	2.045
2	0.352	19.380
3	0.138	7.853
4	0.630	32.211
5	1.025	45.707
6	1.944	62.784
7	0.091	5.209
8	0.150	8.531
9	Vertical	Vertical
10	0.001	0.049
11	0.004	0.208
12	0.067	3.841
13	0.061	3.499
14	-0.021	-1.175
15	0.000	0.000
16	0.021	1.178
17	Vertical	Vertical
18	0.000	0.000
19	Vertical	Vertical
20	0.060	3.415
21	-77.000	-89.256
22	0.000	0.000
23	Vertical	Vertical

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option

1 Qds	120.0	120.0	200.00	29.00	0.000	0.0	1	0
2 CAf	125.0	125.0	200.00	35.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 4 Coordinate Points
Phreatic Adjustment Factor = 0.00

Point No.	X-Water (ft)	Y-Water (ft)
1	208.00	12.00
2	340.00	144.00
3	490.00	144.00
4	622.00	12.00

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load No.	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	Deflection (deg from Vert)
1	14	601.200	161.700	2000.000	684.100	160.000	2000.000	0.00

NOTE - Load Stress Varies Linearly Within Specified Range.
For Multi-Stage Analysis, Refer to Detailed Output for Distributed Loads Applied to Each Stage.

SEISMIC (EARTHQUAKE) DATA

Specified Peak Ground Acceleration Coefficient (PGA) = 0.400(g)
Default Velocity = 2.000(ft) per second
Specified Horizontal Earthquake Coefficient (kh) = 0.20000(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
(NOTE:Input Velocity = 0.0 will result in default Peak
Velocity = 2 times(PGA) times 2.5 fps or 0.762 mps)
Specified Seismic Pore-Pressure Factor = 0.000
Horizontal Seismic Force is Applied at Center of Gravity of Slices

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.4084(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 156.40(ft)
and X = 190.40(ft)

Each Surface ends within a Range Between X = 210.00(ft)
and X = 500.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 0.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 3.326 FS Min = 1.146 FS Ave = 1.802
Standard Deviation = 0.373 Coefficient of Variation = 20.72 %

Critical Surface is Sequence Number 926 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 192.526230(ft) ; Y = 142.174482(ft); and Radius = 31.862228(ft)

Circular Trial Failure Surface Generated With 47 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	187.88148	110.65262
2	188.87296	110.52239
3	189.86805	110.42333
4	190.86575	110.35555
5	191.86508	110.31911
6	192.86507	110.31406
7	193.86472	110.34038
8	194.86306	110.39806
9	195.85909	110.48705
10	196.85184	110.60724
11	197.84033	110.75853
12	198.82359	110.94077
13	199.80064	111.15377
14	200.77052	111.39733
15	201.73229	111.67120
16	202.68499	111.97512
17	203.62768	112.30879
18	204.55943	112.67188
19	205.47934	113.06403
20	206.38648	113.48485
21	207.27997	113.93393
22	208.15893	114.41083
23	209.02249	114.91508
24	209.86980	115.44618
25	210.70002	116.00360
26	211.51235	116.58681
27	212.30597	117.19522
28	213.08011	117.82824
29	213.83400	118.48523
30	214.56690	119.16556
31	215.27810	119.86856
32	215.96688	120.59353
33	216.63257	121.33976
34	217.27452	122.10650
35	217.89209	122.89302
36	218.48467	123.69853
37	219.05169	124.52224
38	219.59257	125.36333
39	220.10680	126.22099
40	220.59385	127.09436
41	221.05326	127.98258

42	221.48457	128.88479
43	221.88736	129.80008
44	222.26122	130.72757
45	222.60580	131.66633
46	222.92074	132.61544
47	223.18974	133.52015

Factor Of Safety For The Critical or Specified Surface = 1.146

Table 1 - Geometry Data on the 50 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	0.99	0.13	188.38	110.59	110.72	-7.48	7.85	1.00
2	1.00	0.39	189.37	110.47	110.86	-5.68	7.85	1.00
3	0.53	0.56	190.13	110.41	110.96	-3.89	7.85	0.53
4	0.47	0.78	190.63	110.37	111.15	-3.89	32.21	0.47
5	1.00	1.27	191.37	110.34	111.61	-2.09	32.21	1.00
6	1.00	1.92	192.37	110.32	112.24	-0.29	32.21	1.00
7	1.00	2.54	193.36	110.33	112.87	1.51	32.21	1.00
8	1.00	3.13	194.36	110.37	113.50	3.31	32.21	1.00
9	1.00	3.68	195.36	110.44	114.13	5.11	32.21	1.00
10	0.99	4.20	196.36	110.55	114.75	6.90	32.21	1.00
11	0.99	4.69	197.35	110.68	115.38	8.70	32.21	1.00
12	0.98	5.15	198.33	110.85	116.00	10.50	32.21	1.00
13	0.98	5.57	199.31	111.05	116.61	12.30	32.21	1.00
14	0.60	5.88	200.10	111.23	117.11	14.10	32.21	0.62
15	0.37	6.14	200.59	111.35	117.49	14.10	45.71	0.38
16	0.96	6.64	201.25	111.53	118.17	15.89	45.71	1.00
17	0.95	7.33	202.21	111.82	119.15	17.69	45.71	1.00
18	0.94	7.98	203.16	112.14	120.13	19.49	45.71	1.00
19	0.93	8.60	204.09	112.49	121.09	21.29	45.71	1.00
20	0.92	9.17	205.02	112.87	122.03	23.09	45.71	1.00
21	0.91	9.70	205.93	113.27	122.97	24.89	45.71	1.00
22	0.89	10.18	206.83	113.71	123.89	26.68	45.71	1.00
23	0.88	10.63	207.72	114.17	124.80	28.48	45.71	1.00
24	0.24	10.90	208.28	114.48	125.38	30.28	45.71	0.28
25	0.62	11.37	208.71	114.73	126.11	30.28	62.78	0.72
26	0.85	12.35	209.45	115.18	127.53	32.08	62.78	1.00
27	0.83	13.44	210.28	115.72	129.17	33.88	62.78	1.00
28	0.81	14.47	211.11	116.30	130.76	35.68	62.78	1.00
29	0.49	15.25	211.76	116.77	132.03	37.47	62.78	0.61
30	0.31	15.44	212.15	117.08	132.51	37.47	5.21	0.39
31	0.77	15.05	212.69	117.51	132.56	39.27	5.21	1.00
32	0.75	14.48	213.46	118.16	132.63	41.07	5.21	1.00
33	0.73	13.88	214.20	118.83	132.70	42.87	5.21	1.00
34	0.71	13.25	214.92	119.52	132.77	44.67	5.21	1.00
35	0.69	12.60	215.62	120.23	132.83	46.47	5.21	1.00
36	0.67	11.93	216.30	120.97	132.89	48.26	5.21	1.00
37	0.64	11.23	216.95	121.72	132.95	50.06	5.21	1.00
38	0.62	10.51	217.58	122.50	133.01	51.86	5.21	1.00
39	0.59	9.77	218.19	123.30	133.06	53.66	5.21	1.00
40	0.57	9.01	218.77	124.11	133.12	55.46	5.21	1.00
41	0.54	8.22	219.32	124.94	133.17	57.26	5.21	1.00
42	0.51	7.42	219.85	125.79	133.22	59.05	5.21	1.00
43	0.49	6.60	220.35	126.66	133.26	60.85	5.21	1.00
44	0.46	5.77	220.82	127.54	133.30	62.65	5.21	1.00
45	0.43	4.91	221.27	128.43	133.35	64.45	5.21	1.00
46	0.40	4.04	221.69	129.34	133.38	66.25	5.21	1.00
47	0.37	3.15	222.07	130.26	133.42	68.05	5.21	1.00
48	0.34	2.25	222.43	131.20	133.45	69.84	5.21	1.00
49	0.31	1.34	222.76	132.14	133.48	71.64	5.21	1.00
50	0.27	0.44	223.06	133.07	133.51	73.44	5.21	0.94

Table 2 - Force Data On The 50 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	15.9	0.0	0.0	0.0	0.00	0.00	3.2	0.0	0.00
2	46.0	0.0	0.0	0.0	0.00	0.00	9.2	0.0	0.00
3	35.6	0.0	0.0	0.0	0.00	0.00	7.1	0.0	0.00
4	43.3	0.0	0.0	0.0	0.00	0.00	8.7	0.0	0.00
5	152.4	0.0	0.0	0.0	0.00	0.00	30.5	0.0	0.00
6	230.6	0.0	0.0	0.0	0.00	0.00	46.1	0.0	0.00
7	304.8	0.0	0.0	0.0	0.00	0.00	61.0	0.0	0.00
8	374.7	0.0	0.0	0.0	0.00	0.00	74.9	0.0	0.00
9	440.2	0.0	0.0	0.0	0.00	0.00	88.0	0.0	0.00
10	500.9	0.0	0.0	0.0	0.00	0.00	100.2	0.0	0.00
11	556.7	0.0	0.0	0.0	0.00	0.00	111.3	0.0	0.00
12	607.4	0.0	0.0	0.0	0.00	0.00	121.5	0.0	0.00
13	652.8	0.0	0.0	0.0	0.00	0.00	130.6	0.0	0.00
14	423.1	0.0	0.0	0.0	0.00	0.00	84.6	0.0	0.00
15	273.0	0.0	0.0	0.0	0.00	0.00	54.6	0.0	0.00
16	766.2	0.0	0.0	0.0	0.00	0.00	153.2	0.0	0.00
17	838.1	0.0	0.0	0.0	0.00	0.00	167.6	0.0	0.00
18	903.1	0.0	0.0	0.0	0.00	0.00	180.6	0.0	0.00
19	961.1	0.0	0.0	0.0	0.00	0.00	192.2	0.0	0.00
20	1011.9	0.0	0.0	0.0	0.00	0.00	202.4	0.0	0.00
21	1055.6	0.0	0.0	0.0	0.00	0.00	211.1	0.0	0.00
22	1092.0	0.0	0.0	0.0	0.00	0.00	218.4	0.0	0.00
23	1121.2	0.0	0.0	0.0	0.00	0.00	224.2	0.0	0.00
24	315.2	0.0	0.0	0.0	0.00	0.00	63.0	0.0	0.00
25	849.5	0.0	0.0	0.0	0.00	0.00	169.9	0.0	0.00
26	1256.1	0.0	0.0	0.0	0.00	0.00	251.2	0.0	0.00
27	1339.0	0.0	0.0	0.0	0.00	0.00	267.8	0.0	0.00
28	1410.2	0.0	0.0	0.0	0.00	0.00	282.0	0.0	0.00
29	892.5	0.0	0.0	0.0	0.00	0.00	178.5	0.0	0.00
30	566.8	0.0	0.0	0.0	0.00	0.00	113.4	0.0	0.00
31	1398.2	0.0	0.0	0.0	0.00	0.00	279.6	0.0	0.00
32	1309.6	0.0	0.0	0.0	0.00	0.00	261.9	0.0	0.00
33	1220.3	0.0	0.0	0.0	0.00	0.00	244.1	0.0	0.00
34	1130.7	0.0	0.0	0.0	0.00	0.00	226.1	0.0	0.00
35	1041.4	0.0	0.0	0.0	0.00	0.00	208.3	0.0	0.00
36	952.6	0.0	0.0	0.0	0.00	0.00	190.5	0.0	0.00
37	865.0	0.0	0.0	0.0	0.00	0.00	173.0	0.0	0.00
38	778.8	0.0	0.0	0.0	0.00	0.00	155.8	0.0	0.00
39	694.6	0.0	0.0	0.0	0.00	0.00	138.9	0.0	0.00
40	612.8	0.0	0.0	0.0	0.00	0.00	122.6	0.0	0.00
41	533.8	0.0	0.0	0.0	0.00	0.00	106.8	0.0	0.00
42	458.1	0.0	0.0	0.0	0.00	0.00	91.6	0.0	0.00
43	386.0	0.0	0.0	0.0	0.00	0.00	77.2	0.0	0.00
44	317.9	0.0	0.0	0.0	0.00	0.00	63.6	0.0	0.00
45	254.2	0.0	0.0	0.0	0.00	0.00	50.8	0.0	0.00
46	195.3	0.0	0.0	0.0	0.00	0.00	39.1	0.0	0.00
47	141.5	0.0	0.0	0.0	0.00	0.00	28.3	0.0	0.00
48	93.2	0.0	0.0	0.0	0.00	0.00	18.6	0.0	0.00
49	50.7	0.0	0.0	0.0	0.00	0.00	10.1	0.0	0.00
50	14.2	0.0	0.0	0.0	0.00	0.00	2.8	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 31484.55(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 31484.55(lbs)

TOTAL AREA OF SLIDING MASS = 262.37(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 50 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	200.00	29.00	
2	1	200.00	29.00	
3	1	200.00	29.00	

4	1	200.00	29.00
5	1	200.00	29.00
6	1	200.00	29.00
7	1	200.00	29.00
8	1	200.00	29.00
9	1	200.00	29.00
10	1	200.00	29.00
11	1	200.00	29.00
12	1	200.00	29.00
13	1	200.00	29.00
14	1	200.00	29.00
15	1	200.00	29.00
16	1	200.00	29.00
17	1	200.00	29.00
18	1	200.00	29.00
19	1	200.00	29.00
20	1	200.00	29.00
21	1	200.00	29.00
22	1	200.00	29.00
23	1	200.00	29.00
24	1	200.00	29.00
25	1	200.00	29.00
26	1	200.00	29.00
27	1	200.00	29.00
28	1	200.00	29.00
29	1	200.00	29.00
30	1	200.00	29.00
31	1	200.00	29.00
32	1	200.00	29.00
33	1	200.00	29.00
34	1	200.00	29.00
35	1	200.00	29.00
36	1	200.00	29.00
37	1	200.00	29.00
38	1	200.00	29.00
39	1	200.00	29.00
40	1	200.00	29.00
41	1	200.00	29.00
42	1	200.00	29.00
43	1	200.00	29.00
44	1	200.00	29.00
45	1	200.00	29.00
46	1	200.00	29.00
47	1	200.00	29.00
48	1	200.00	29.00
49	1	200.00	29.00
50	1	200.00	29.00

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified
Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 50 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-7.48	188.38	1.00	42.12	223.35	194.92
2	-5.68	189.37	1.00	67.23	237.27	207.07
3	-3.89	190.13	0.53	81.80	245.34	214.11
4	-3.89	190.63	0.47	108.78	260.30	227.17

5	-2.09	191.37	1.00	161.91	289.75	252.87
6	-0.29	192.37	1.00	232.05	328.63	286.80
7	1.51	193.36	1.00	296.34	364.27	317.90
8	3.31	194.36	1.00	354.97	396.76	346.26
9	5.11	195.36	1.00	408.07	426.20	371.95
10	6.90	196.36	1.00	455.81	452.66	395.05
11	8.70	197.35	1.00	498.32	476.22	415.61
12	10.50	198.33	1.00	535.74	496.97	433.71
13	12.30	199.31	1.00	568.19	514.95	449.41
14	14.10	200.10	0.62	588.30	526.10	459.14
15	14.10	200.59	0.38	615.74	541.31	472.41
16	15.89	201.25	1.00	654.07	562.56	490.96
17	17.69	202.21	1.00	711.03	594.13	518.51
18	19.49	203.16	1.00	761.98	622.37	543.16
19	21.29	204.09	1.00	807.01	647.33	564.94
20	23.09	205.02	1.00	846.24	669.08	583.92
21	24.89	205.93	1.00	879.76	687.66	600.14
22	26.68	206.83	1.00	907.69	703.14	613.65
23	28.48	207.72	1.00	930.13	715.58	624.50
24	30.28	208.28	0.28	934.40	717.95	626.57
25	30.28	208.71	0.72	978.80	742.56	648.05
26	32.08	209.45	1.00	1047.14	780.44	681.11
27	33.88	210.28	1.00	1121.83	821.84	717.24
28	35.68	211.11	1.00	1187.68	858.34	749.09
29	37.47	211.76	0.61	1229.08	881.29	769.12
30	37.47	212.15	0.39	1245.09	890.17	776.87
31	39.27	212.69	1.00	1183.38	855.96	747.01
32	41.07	213.46	1.00	1106.45	813.31	709.80
33	42.87	214.20	1.00	1028.79	770.27	672.23
34	44.67	214.92	1.00	950.57	726.91	634.39
35	46.47	215.62	1.00	871.93	683.32	596.35
36	48.26	216.30	1.00	793.06	639.60	558.20
37	50.06	216.95	1.00	714.14	595.85	520.02
38	51.86	217.58	1.00	635.36	552.18	481.90
39	53.66	218.19	1.00	556.91	508.70	443.96
40	55.46	218.77	1.00	479.03	465.53	406.28
41	57.26	219.32	1.00	401.94	422.80	368.99
42	59.05	219.85	1.00	325.90	380.65	332.20
43	60.85	220.35	1.00	251.17	339.23	296.05
44	62.65	220.82	1.00	178.05	298.69	260.68
45	64.45	221.27	1.00	106.86	259.23	226.24
46	66.25	221.69	1.00	37.94	221.03	192.90
47	68.05	222.07	1.00	0.00	200.00	174.54
48	69.84	222.43	1.00	0.00	200.00	174.54
49	71.64	222.76	1.00	0.00	200.00	174.54
50	73.44	223.06	0.94	0.00	200.00	174.54

Table 4A - Base Force Data on the 50 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-7.48	188.38	1.00	42.12	223.35	194.92
2	-5.68	189.37	1.00	67.23	237.27	207.07
3	-3.89	190.13	0.53	43.61	130.81	114.16
4	-3.89	190.63	0.47	50.78	121.51	106.05
5	-2.09	191.37	1.00	161.91	289.75	252.87
6	-0.29	192.37	1.00	232.05	328.63	286.80
7	1.51	193.36	1.00	296.34	364.27	317.90
8	3.31	194.36	1.00	354.97	396.76	346.26
9	5.11	195.36	1.00	408.07	426.20	371.95
10	6.90	196.36	1.00	455.81	452.66	395.05
11	8.70	197.35	1.00	498.32	476.22	415.61
12	10.50	198.33	1.00	535.74	496.97	433.71
13	12.30	199.31	1.00	568.19	514.95	449.41
14	14.10	200.10	0.62	363.55	325.12	283.74
15	14.10	200.59	0.38	235.23	206.80	180.48
16	15.89	201.25	1.00	654.07	562.56	490.96

17	17.69	202.21	1.00	711.03	594.13	518.51
18	19.49	203.16	1.00	761.98	622.37	543.16
19	21.29	204.09	1.00	807.01	647.33	564.94
20	23.09	205.02	1.00	846.24	669.08	583.92
21	24.89	205.93	1.00	879.76	687.66	600.14
22	26.68	206.83	1.00	907.69	703.14	613.65
23	28.48	207.72	1.00	930.13	715.58	624.50
24	30.28	208.28	0.28	260.85	200.42	174.91
25	30.28	208.71	0.72	705.56	535.27	467.14
26	32.08	209.45	1.00	1047.14	780.44	681.11
27	33.88	210.28	1.00	1121.83	821.84	717.24
28	35.68	211.11	1.00	1187.68	858.34	749.09
29	37.47	211.76	0.61	755.23	541.52	472.60
30	37.47	212.15	0.39	480.03	343.19	299.51
31	39.27	212.69	1.00	1183.38	855.96	747.01
32	41.07	213.46	1.00	1106.45	813.31	709.80
33	42.87	214.20	1.00	1028.79	770.27	672.23
34	44.67	214.92	1.00	950.57	726.91	634.39
35	46.47	215.62	1.00	871.93	683.32	596.35
36	48.26	216.30	1.00	793.06	639.60	558.20
37	50.06	216.95	1.00	714.14	595.85	520.02
38	51.86	217.58	1.00	635.36	552.18	481.90
39	53.66	218.19	1.00	556.91	508.70	443.96
40	55.46	218.77	1.00	479.03	465.53	406.28
41	57.26	219.32	1.00	401.94	422.80	368.99
42	59.05	219.85	1.00	325.90	380.65	332.20
43	60.85	220.35	1.00	251.17	339.23	296.05
44	62.65	220.82	1.00	178.05	298.69	260.68
45	64.45	221.27	1.00	106.86	259.23	226.24
46	66.25	221.69	1.00	37.94	221.03	192.90
47	68.05	222.07	1.00	0.00	200.00	174.54
48	69.84	222.43	1.00	0.00	200.00	174.54
49	71.64	222.76	1.00	0.00	200.00	174.54
50	73.44	223.06	0.94	0.00	188.77	164.75

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 42.234
3D Depth (Vertical difference between ends of Slip Surface) = 22.87(ft)
L/D(1): L = 22.87(ft) L/D(2): L = 45.74(ft) L/D(3): L = 68.60(ft)
L/D(4): L = 91.47(ft) L/D(5): L = 114.34(ft) L/D(6): L = 137.21(ft)

SUM OF MOMENTS = 0.227201E+00 (ft/lbs);Imbalance (Fraction of Total Weight) = 0.7216255E-05

Sum of the Resisting Forces = 23596.17 (lbs)

Average Available Shear Strength = 513.59(psf)

Average Effective Normal Stress = 565.73(psf)

Sum of the Driving Forces = 20592.95 (lbs)

Average Mobilized Shear Stress = 448.22(psf)

Total length of the failure surface = 45.94(ft)

Factor of Safety Balance Check: FS = 1.14584

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

*** SEISMIC SLOPE DISPLACEMENT DATA ***
(Note: kv is set = zero for displacement calculations)
Seismic Yield Coefficient (ky) = 0.28980(g)
Calculated Newmark Seismic Displacement = 0.296(ft)

Average Elevation of Point of Application of kh on Sliding Mass = 121.110(ft)

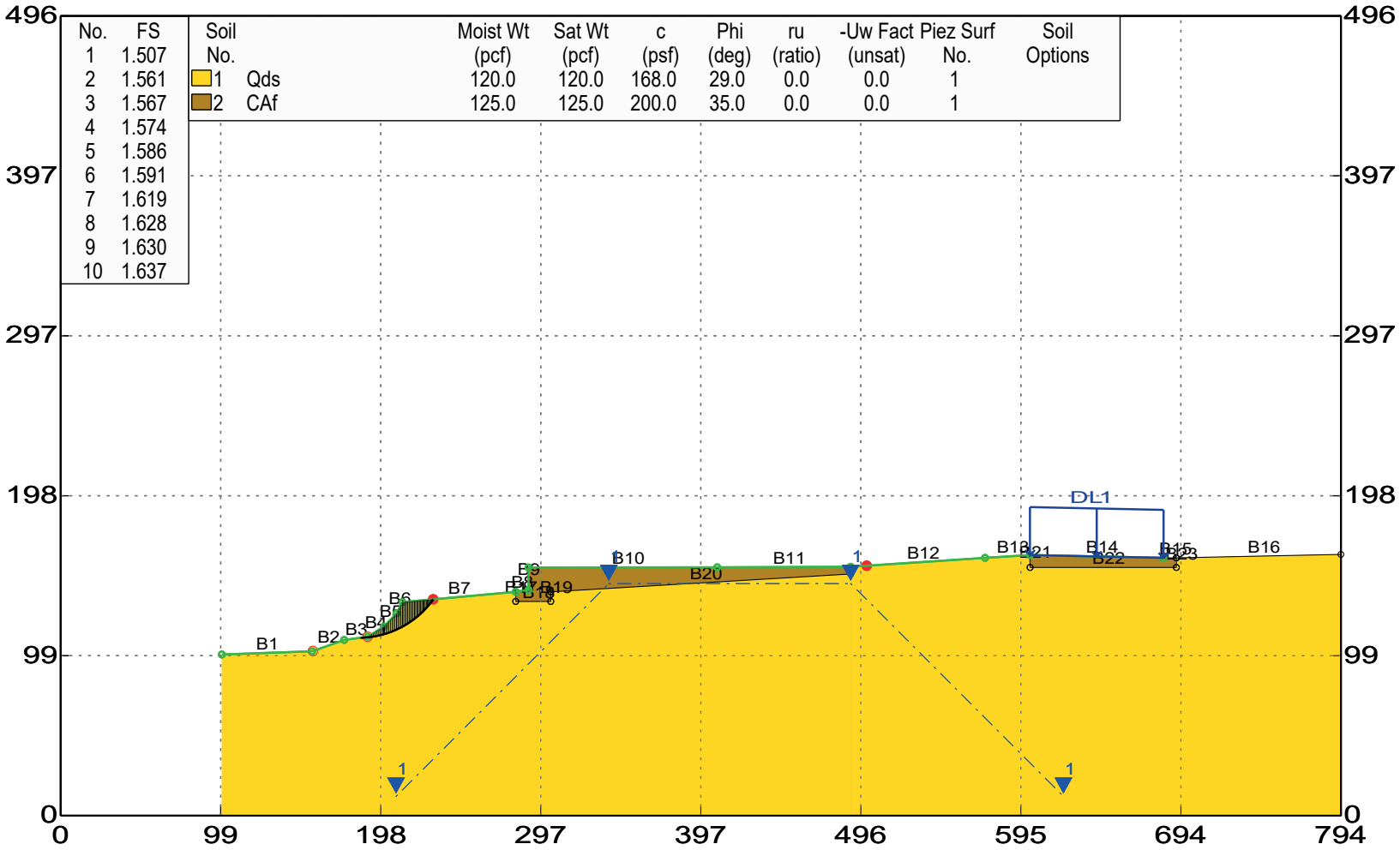
Non-Symmetrical Sliding Resistance Has Been Specified
for Downhill Sliding.

**** END OF GEOSTASE OUTPUT ****

2240 Fleetwood Drive, Jurupa
Section CC - Proposed- Static FS 1.5

EGL

\CC102.gsd



GEOSTASE FS = 1.507

Simplified Bishop Method

GEOSTASE Slope Stability Analysis

*** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D.,P.E.,S.E.,BC.GE **

** Current Version 4.30.32-Double Precision, Sept 2023 **
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****
SLOPE STABILITY ANALYSIS SOFTWARE (2D & 3D)
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.
****

Analysis Date:
Analysis Time:
Analysis By: EGL

Input File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC102.gsd

Output File Name: Z:\HANK\REPORT\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\Response\Stable\Section CC\CC102.OUT

Unit System: English

PROJECT: 2240 Fleetwood Drive, Jurupa

DESCRIPTION: Section CC - Proposed- Static FS 1.5

PROFILE BOUNDARY DATA

14 Surface Boundaries
23 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	100.000	100.000	156.000	102.000	1
2	156.000	102.000	175.900	109.000	1
3	175.900	109.000	190.400	111.000	1
4	190.400	111.000	200.400	117.300	1
5	200.400	117.300	208.400	125.500	1
6	208.400	125.500	212.000	132.500	1
7	212.000	132.500	282.200	138.900	1
8	282.200	138.900	290.200	140.100	2
9	290.200	140.100	290.200	154.000	2
10	290.200	154.000	407.200	154.100	2
11	407.200	154.100	490.000	154.400	2
12	490.000	154.400	573.400	160.000	1
13	573.400	160.000	601.200	161.700	1
14	601.200	161.700	684.100	160.000	2
15	684.100	160.000	692.000	160.000	2
16	692.000	160.000	794.100	162.100	1
17	282.200	138.900	282.200	132.900	1
18	282.200	132.900	304.000	132.900	1
19	304.000	132.900	304.000	138.900	1
20	304.000	138.900	490.000	150.000	1
21	601.200	161.700	601.300	154.000	1
22	601.300	154.000	692.000	154.000	1
23	692.000	154.000	692.000	160.000	1

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = 0.000(ft)

SURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
1	100.000	100.000
2	156.000	102.000
3	175.900	109.000
4	190.400	111.000
5	200.400	117.300
6	208.400	125.500
7	212.000	132.500
8	282.200	138.900
9	290.200	140.100
10	290.200	154.000
11	407.200	154.100
12	490.000	154.400
13	573.400	160.000
14	601.200	161.700
15	684.100	160.000

SUBSURFACE BOUNDARY POINT COORDINATES
(Information Only-Not Used Directly)

Point No.	X-COORD	Y-COORD
16	684.100	160.000
17	692.000	160.000
18	794.100	162.100
19	282.200	132.900
20	304.000	132.900
21	304.000	138.900
22	490.000	150.000
23	601.300	154.000
24	692.000	154.000
25	692.000	160.000

PROFILE BOUNDARY SLOPES AND ANGLES

BND No.	Slope	Angle(Deg.)
1	0.036	2.045
2	0.352	19.380
3	0.138	7.853
4	0.630	32.211
5	1.025	45.707
6	1.944	62.784
7	0.091	5.209
8	0.150	8.531
9	Vertical	Vertical
10	0.001	0.049
11	0.004	0.208
12	0.067	3.841
13	0.061	3.499
14	-0.021	-1.175
15	0.000	0.000
16	0.021	1.178
17	Vertical	Vertical
18	0.000	0.000
19	Vertical	Vertical
20	0.060	3.415
21	-77.000	-89.256
22	0.000	0.000
23	Vertical	Vertical

MOHR-COULOMB SOIL PARAMETERS

2 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	(-Uw) Fact.	Water Surface No.	Water Option

1 Qds		120.0	120.0	168.00	29.00	0.000	0.0	1	0
2 CAf		125.0	125.0	200.00	35.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 4 Coordinate Points
Phreatic Adjustment Factor = 0.00

Point No.	X-Water (ft)	Y-Water (ft)
1	208.00	12.00
2	340.00	144.00
3	490.00	144.00
4	622.00	12.00

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load No.	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	Deflection (deg from Vert)
1	14	601.200	161.700	2000.000	684.100	160.000	2000.000	0.00

NOTE - Load Stress Varies Linearly Within Specified Range.
For Multi-Stage Analysis, Refer to Detailed Output for Distributed Loads Applied to Each Stage.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.4084(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 156.40(ft)
and X = 190.40(ft)

Each Surface ends within a Range Between X = 231.00(ft)
and X = 500.00(ft)

All surfaces are generated left to right for both a left and right sliding slope.

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = 0.00(ft)

Specified Maximum Radius = 100000.000(ft)

1.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:
FS Max = 7.887 FS Min = 1.507 FS Ave = 3.393
Standard Deviation = 1.296 Coefficient of Variation = 38.19 %

Critical Surface is Sequence Number 872 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 184.728380(ft) ; Y = 167.379204(ft); and Radius = 56.995258(ft)

Circular Trial Failure Surface Generated With 54 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	186.04364	110.39912
2	187.04314	110.43097
3	188.04192	110.48035
4	189.03968	110.54724
5	190.03611	110.63163
6	191.03091	110.73348
7	192.02377	110.85278
8	193.01438	110.98947
9	194.00244	111.14353
10	194.98765	111.31489
11	195.96970	111.50352
12	196.94829	111.70934
13	197.92312	111.93231
14	198.89388	112.17234
15	199.86029	112.42936
16	200.82203	112.70331
17	201.77882	112.99408
18	202.73037	113.30159
19	203.67637	113.62576
20	204.61654	113.96646
21	205.55058	114.32362
22	206.47822	114.69710
23	207.39916	115.08680
24	208.31312	115.49260
25	209.21982	115.91437
26	210.11899	116.35199
27	211.01033	116.80531
28	211.89359	117.27420
29	212.76848	117.75852
30	213.63474	118.25811
31	214.49211	118.77282
32	215.34031	119.30250
33	216.17908	119.84698
34	217.00818	120.40608
35	217.82734	120.97965
36	218.63631	121.56750
37	219.43484	122.16946
38	220.22268	122.78533
39	220.99960	123.41493
40	221.76536	124.05806
41	222.51971	124.71453
42	223.26243	125.38413
43	223.99329	126.06666
44	224.71206	126.76191
45	225.41852	127.46966
46	226.11246	128.18969
47	226.79365	128.92180
48	227.46190	129.66574
49	228.11699	130.42128
50	228.75873	131.18821
51	229.38691	131.96628
52	230.00134	132.75525

53	230.60184	133.55487
54	231.09865	134.24119

Factor Of Safety For The Critical or Specified Surface = 1.507

Table 1 - Geometry Data on the 57 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.00	0.05	186.54	110.42	110.47	1.82	7.85	1.00
2	1.00	0.15	187.54	110.46	110.61	2.83	7.85	1.00
3	1.00	0.23	188.54	110.51	110.74	3.84	7.85	1.00
4	1.00	0.29	189.54	110.59	110.88	4.84	7.85	1.00
5	0.36	0.32	190.22	110.65	110.97	5.85	7.85	0.37
6	0.63	0.50	190.72	110.70	111.20	5.85	32.21	0.63
7	0.99	0.92	191.53	110.79	111.71	6.85	32.21	1.00
8	0.99	1.41	192.52	110.92	112.34	7.86	32.21	1.00
9	0.99	1.89	193.51	111.07	112.96	8.86	32.21	1.00
10	0.99	2.35	194.50	111.23	113.58	9.87	32.21	1.00
11	0.98	2.79	195.48	111.41	114.20	10.87	32.21	1.00
12	0.98	3.21	196.46	111.61	114.82	11.88	32.21	1.00
13	0.97	3.61	197.44	111.82	115.43	12.88	32.21	1.00
14	0.97	3.99	198.41	112.05	116.05	13.89	32.21	1.00
15	0.97	4.35	199.38	112.30	116.66	14.89	32.21	1.00
16	0.54	4.62	200.13	112.51	117.13	15.90	32.21	0.56
17	0.42	4.87	200.61	112.64	117.52	15.90	45.71	0.44
18	0.96	5.37	201.30	112.85	118.22	16.90	45.71	1.00
19	0.95	6.05	202.25	113.15	119.20	17.91	45.71	1.00
20	0.95	6.71	203.20	113.46	120.17	18.91	45.71	1.00
21	0.94	7.34	204.15	113.80	121.14	19.92	45.71	1.00
22	0.93	7.96	205.08	114.15	122.10	20.93	45.71	1.00
23	0.93	8.54	206.01	114.51	123.05	21.93	45.71	1.00
24	0.92	9.11	206.94	114.89	124.00	22.94	45.71	1.00
25	0.91	9.65	207.86	115.29	124.94	23.94	45.71	1.00
26	0.09	9.94	208.36	115.51	125.46	24.95	45.71	0.10
27	0.82	10.57	208.81	115.72	126.30	24.95	62.78	0.90
28	0.90	11.84	209.67	116.13	127.97	25.95	62.78	1.00
29	0.89	13.13	210.56	116.58	129.71	26.96	62.78	1.00
30	0.88	14.39	211.45	117.04	131.43	27.96	62.78	1.00
31	0.11	15.09	211.95	117.30	132.40	28.97	62.78	0.12
32	0.77	14.99	212.38	117.55	132.54	28.97	5.21	0.88
33	0.87	14.60	213.20	118.01	132.61	29.97	5.21	1.00
34	0.86	14.17	214.06	118.52	132.69	30.98	5.21	1.00
35	0.85	13.73	214.92	119.04	132.77	31.98	5.21	1.00
36	0.84	13.27	215.76	119.57	132.84	32.99	5.21	1.00
37	0.83	12.79	216.59	120.13	132.92	33.99	5.21	1.00
38	0.82	12.30	217.42	120.69	132.99	35.00	5.21	1.00
39	0.81	11.79	218.23	121.27	133.07	36.00	5.21	1.00
40	0.80	11.27	219.04	121.87	133.14	37.01	5.21	1.00
41	0.79	10.74	219.83	122.48	133.21	38.02	5.21	1.00
42	0.78	10.18	220.61	123.10	133.29	39.02	5.21	1.00
43	0.77	9.62	221.38	123.74	133.36	40.03	5.21	1.00
44	0.75	9.04	222.14	124.39	133.42	41.03	5.21	1.00
45	0.74	8.44	222.89	125.05	133.49	42.04	5.21	1.00
46	0.73	7.83	223.63	125.73	133.56	43.04	5.21	1.00
47	0.72	7.21	224.35	126.41	133.63	44.05	5.21	1.00
48	0.71	6.58	225.07	127.12	133.69	45.05	5.21	1.00
49	0.69	5.93	225.77	127.83	133.75	46.06	5.21	1.00
50	0.68	5.26	226.45	128.56	133.82	47.06	5.21	1.00
51	0.67	4.59	227.13	129.29	133.88	48.07	5.21	1.00
52	0.66	3.90	227.79	130.04	133.94	49.07	5.21	1.00
53	0.64	3.19	228.44	130.80	134.00	50.08	5.21	1.00
54	0.63	2.48	229.07	131.58	134.06	51.08	5.21	1.00
55	0.61	1.75	229.69	132.36	134.11	52.09	5.21	1.00
56	0.60	1.01	230.30	133.16	134.17	53.09	5.21	1.00
57	0.50	0.32	230.85	133.90	134.22	54.10	5.21	0.85

Table 2 - Force Data On The 57 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ubeta Stress Top (psf)	Ualpha Force Bot (lbs)	Pore Pressure (psf)	-Uw (psf)	Earthquake Force Horiz (lbs)	Earthquake Force Vert (lbs)	Distributed Load (psf)
1	6.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
2	18.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
3	27.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
4	34.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
5	14.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
6	37.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
7	109.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
8	168.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
9	224.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
10	277.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
11	328.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
12	377.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
13	422.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
14	465.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
15	505.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
16	299.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
17	246.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
18	617.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
19	691.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
20	761.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
21	828.6	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
22	891.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
23	951.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
24	1006.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
25	1058.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
26	103.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
27	1040.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
28	1277.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
29	1404.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
30	1525.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
31	192.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
32	1382.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
33	1517.8	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
34	1458.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
35	1397.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
36	1335.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
37	1272.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
38	1209.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
39	1145.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
40	1080.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
41	1015.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
42	949.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
43	883.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
44	818.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
45	752.5	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
46	687.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
47	622.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
48	557.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
49	493.4	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
50	430.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
51	367.7	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
52	306.3	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
53	246.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
54	186.9	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
55	129.2	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
56	73.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00
57	19.1	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00

TOTAL WEIGHT OF SLIDING MASS = 36249.01(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 36249.01(lbs)

TOTAL AREA OF SLIDING MASS = 302.08(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 57 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	168.00	29.00	
2	1	168.00	29.00	
3	1	168.00	29.00	
4	1	168.00	29.00	
5	1	168.00	29.00	
6	1	168.00	29.00	
7	1	168.00	29.00	
8	1	168.00	29.00	
9	1	168.00	29.00	
10	1	168.00	29.00	
11	1	168.00	29.00	
12	1	168.00	29.00	
13	1	168.00	29.00	
14	1	168.00	29.00	
15	1	168.00	29.00	
16	1	168.00	29.00	
17	1	168.00	29.00	
18	1	168.00	29.00	
19	1	168.00	29.00	
20	1	168.00	29.00	
21	1	168.00	29.00	
22	1	168.00	29.00	
23	1	168.00	29.00	
24	1	168.00	29.00	
25	1	168.00	29.00	
26	1	168.00	29.00	
27	1	168.00	29.00	
28	1	168.00	29.00	
29	1	168.00	29.00	
30	1	168.00	29.00	
31	1	168.00	29.00	
32	1	168.00	29.00	
33	1	168.00	29.00	
34	1	168.00	29.00	
35	1	168.00	29.00	
36	1	168.00	29.00	
37	1	168.00	29.00	
38	1	168.00	29.00	
39	1	168.00	29.00	
40	1	168.00	29.00	
41	1	168.00	29.00	
42	1	168.00	29.00	
43	1	168.00	29.00	
44	1	168.00	29.00	
45	1	168.00	29.00	
46	1	168.00	29.00	
47	1	168.00	29.00	
48	1	168.00	29.00	
49	1	168.00	29.00	
50	1	168.00	29.00	
51	1	168.00	29.00	
52	1	168.00	29.00	
53	1	168.00	29.00	
54	1	168.00	29.00	
55	1	168.00	29.00	
56	1	168.00	29.00	
57	1	168.00	29.00	

SOIL OPTIONS:
A = ANISOTROPIC SHEAR STRENGTH
C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C)
F = FIBER-REINFORCED SOIL (FRS)
M = INDEPENDENT MULTI-STAGE SHEAR STRENGTH
N = NONLINEAR UNDRAINED SHEAR STRENGTH
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH

S = SHANSEP UNDRAINED SHEAR STRENGTH
NOTE: Phi and C in Table 2A are modified values based on specified Soil Options (if any).

TABLE 4 - Effective and Base Shear Stress Data on the 57 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	1.82	186.54	1.00	2.78	169.54	112.47
2	2.83	187.54	1.00	12.29	174.81	115.97
3	3.84	188.54	1.00	19.62	178.87	118.67
4	4.84	189.54	1.00	24.79	181.74	120.57
5	5.85	190.22	0.37	26.55	182.71	121.22
6	5.85	190.72	0.63	46.54	193.80	128.57
7	6.85	191.53	1.00	92.57	219.31	145.49
8	7.86	192.52	1.00	146.83	249.39	165.45
9	8.86	193.51	1.00	198.27	277.90	184.36
10	9.87	194.50	1.00	246.90	304.86	202.25
11	10.87	195.48	1.00	292.75	330.28	219.11
12	11.88	196.46	1.00	335.86	354.17	234.96
13	12.88	197.44	1.00	376.26	376.56	249.82
14	13.89	198.41	1.00	413.96	397.46	263.68
15	14.89	199.38	1.00	449.00	416.89	276.57
16	15.90	200.13	0.56	473.50	430.46	285.58
17	15.90	200.61	0.44	500.58	445.48	295.54
18	16.90	201.30	1.00	549.61	472.65	313.56
19	17.91	202.25	1.00	617.02	510.02	338.35
20	18.91	203.20	1.00	681.14	545.56	361.93
21	19.92	204.15	1.00	741.99	579.29	384.31
22	20.93	205.08	1.00	799.60	611.23	405.50
23	21.93	206.01	1.00	853.99	641.38	425.50
24	22.94	206.94	1.00	905.18	669.75	444.32
25	23.94	207.86	1.00	953.20	696.37	461.98
26	24.95	208.36	0.10	974.54	708.20	469.83
27	24.95	208.81	0.90	1039.17	744.02	493.59
28	25.95	209.67	1.00	1158.58	810.21	537.51
29	26.96	210.56	1.00	1279.61	877.30	582.01
30	27.96	211.45	1.00	1395.68	941.64	624.70
31	28.97	211.95	0.12	1453.52	973.70	645.96
32	28.97	212.38	0.88	1443.18	967.97	642.16
33	29.97	213.20	1.00	1392.50	939.88	623.53
34	30.98	214.06	1.00	1338.31	909.84	603.60
35	31.98	214.92	1.00	1283.09	879.23	583.29
36	32.99	215.76	1.00	1226.90	848.08	562.63
37	33.99	216.59	1.00	1169.78	816.42	541.62
38	35.00	217.42	1.00	1111.78	784.27	520.29
39	36.00	218.23	1.00	1052.95	751.66	498.66
40	37.01	219.04	1.00	993.33	718.61	476.74
41	38.02	219.83	1.00	932.99	685.17	454.55
42	39.02	220.61	1.00	871.98	651.35	432.11
43	40.03	221.38	1.00	810.35	617.18	409.45
44	41.03	222.14	1.00	748.15	582.71	386.58
45	42.04	222.89	1.00	685.46	547.96	363.52
46	43.04	223.63	1.00	622.32	512.96	340.30
47	44.05	224.35	1.00	558.81	477.76	316.95
48	45.05	225.07	1.00	494.99	442.38	293.48
49	46.06	225.77	1.00	430.93	406.87	269.92
50	47.06	226.45	1.00	366.69	371.26	246.30
51	48.07	227.13	1.00	302.36	335.60	222.64
52	49.07	227.79	1.00	238.00	299.93	198.98
53	50.08	228.44	1.00	173.70	264.29	175.33
54	51.08	229.07	1.00	109.55	228.72	151.74
55	52.09	229.69	1.00	45.61	193.28	128.23
56	53.09	230.30	1.00	0.00	168.00	111.45
57	54.10	230.85	0.85	0.00	168.00	111.45

Table 4A - Base Force Data on the 57 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	1.82	186.54	1.00	2.78	169.54	112.47
2	2.83	187.54	1.00	12.29	174.81	115.97
3	3.84	188.54	1.00	19.62	178.87	118.67
4	4.84	189.54	1.00	24.79	181.74	120.57
5	5.85	190.22	0.37	9.71	66.84	44.34
6	5.85	190.72	0.63	29.52	122.91	81.54
7	6.85	191.53	1.00	92.57	219.31	145.49
8	7.86	192.52	1.00	146.83	249.39	165.45
9	8.86	193.51	1.00	198.27	277.90	184.36
10	9.87	194.50	1.00	246.90	304.86	202.25
11	10.87	195.48	1.00	292.75	330.28	219.11
12	11.88	196.46	1.00	335.86	354.17	234.96
13	12.88	197.44	1.00	376.26	376.56	249.82
14	13.89	198.41	1.00	413.96	397.46	263.68
15	14.89	199.38	1.00	449.00	416.89	276.57
16	15.90	200.13	0.56	265.72	241.57	160.26
17	15.90	200.61	0.44	219.66	195.48	129.69
18	16.90	201.30	1.00	549.61	472.65	313.56
19	17.91	202.25	1.00	617.02	510.02	338.35
20	18.91	203.20	1.00	681.14	545.56	361.93
21	19.92	204.15	1.00	741.99	579.29	384.31
22	20.93	205.08	1.00	799.60	611.23	405.50
23	21.93	206.01	1.00	853.99	641.38	425.50
24	22.94	206.94	1.00	905.18	669.75	444.32
25	23.94	207.86	1.00	953.20	696.37	461.98
26	24.95	208.36	0.10	93.38	67.86	45.02
27	24.95	208.81	0.90	939.60	672.73	446.30
28	25.95	209.67	1.00	1158.58	810.21	537.51
29	26.96	210.56	1.00	1279.61	877.30	582.01
30	27.96	211.45	1.00	1395.68	941.64	624.70
31	28.97	211.95	0.12	176.79	118.43	78.57
32	28.97	212.38	0.88	1267.65	850.24	564.06
33	29.97	213.20	1.00	1392.50	939.88	623.53
34	30.98	214.06	1.00	1338.31	909.84	603.60
35	31.98	214.92	1.00	1283.09	879.23	583.29
36	32.99	215.76	1.00	1226.90	848.08	562.63
37	33.99	216.59	1.00	1169.78	816.42	541.62
38	35.00	217.42	1.00	1111.78	784.27	520.29
39	36.00	218.23	1.00	1052.95	751.66	498.66
40	37.01	219.04	1.00	993.33	718.61	476.74
41	38.02	219.83	1.00	932.99	685.17	454.55
42	39.02	220.61	1.00	871.98	651.35	432.11
43	40.03	221.38	1.00	810.35	617.18	409.45
44	41.03	222.14	1.00	748.15	582.71	386.58
45	42.04	222.89	1.00	685.46	547.96	363.52
46	43.04	223.63	1.00	622.32	512.96	340.30
47	44.05	224.35	1.00	558.81	477.76	316.95
48	45.05	225.07	1.00	494.99	442.38	293.48
49	46.06	225.77	1.00	430.93	406.87	269.92
50	47.06	226.45	1.00	366.69	371.26	246.30
51	48.07	227.13	1.00	302.36	335.60	222.64
52	49.07	227.79	1.00	238.00	299.93	198.98
53	50.08	228.44	1.00	173.70	264.29	175.33
54	51.08	229.07	1.00	109.55	228.72	151.74
55	52.09	229.69	1.00	45.61	193.28	128.23
56	53.09	230.30	1.00	0.00	168.00	111.45
57	54.10	230.85	0.85	0.00	142.34	94.43

INPUT PARAMETERS FOR SIMPLIFIED 3D ANALYSIS

Composite Phi (deg)= 39.605
3D Depth (Vertical difference between ends of Slip Surface) = 23.84(ft)
L/D(1): L = 23.84(ft) L/D(2): L = 47.68(ft) L/D(3): L = 71.53(ft)
L/D(4): L = 95.37(ft) L/D(5): L = 119.21(ft) L/D(6): L = 143.05(ft)

SUM OF MOMENTS = -0.453706E-01 (ft/lbs);Imbalance (Fraction of Total Weight) = -0.1251637E-05

Sum of the Resisting Forces =   26898.96 (lbs)

Average Available Shear Strength =   508.99(psf)

Average Effective Normal Stress =   615.17(psf)

Sum of the Driving Forces =   17845.14 (lbs)

Average Mobilized Shear Stress =   337.67(psf)

Total length of the failure surface =   52.85(ft)

Factor of Safety Balance Check: FS = 1.50735

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

APPENDIX D: PERCOLATION TEST RESULTS

Infiltration Testing per Riverside County Technical Guidance Document

r (in) = radius hole
t_i (hr:min) = intial time after filling or refilling
t_f (hr:min) = final time
d_b (ft) = depth to bottom
d_i (ft) = depth to water surface at ti
d_f (ft) = depth to water surface at tf
ΔH (in) = change in height over time
Havg = average head height over the time interval
t (hr) = Time reading interval
It (in/hr) = $(\Delta Hxr)/(\Delta t(r+2Havg))$ tested infiltration rate

B-8									
(Date Presoaked: 11/29/2024; Date Tested: 11/29/2024)									
Boring was filled with 5 gallons of water for presoak and allowed to completely drain prior to refilling for the infiltration test.									
r (in)	t_i (hr:min)	t_f (hr:min)	Δt (hr)	d_b (in)	d_i (in)	d_f (in)	ΔH (in)	H_{avg} (in)	It (in/hr)
4	8:00	8:07	0.117	96.0	76.0	96.0	20.0	10.0	28.49
4	8:10	8:17	0.117	96.0	76.0	96.0	20.0	10.0	28.49
4	8:20	8:28	0.133	96.0	76.0	96.0	20.0	10.0	25.06
4	8:30	8:38	0.133	96.0	76.0	96.0	20.0	10.0	25.06
4	8:40	8:48	0.133	96.0	76.0	96.0	20.0	10.0	25.06
4	8:49	8:57	0.133	96.0	76.0	96.0	20.0	10.0	25.06
4	9:00	9:08	0.133	96.0	76.0	96.0	20.0	10.0	25.06
4	9:10	9:18	0.133	96.0	76.0	96.0	20.0	10.0	25.06

Factor of Safety based on the Low Impact Development BMP Design Handbook FS = 3

Design Infiltration Rate = Tested Infiltration Rate / FS (in/hour) = **8.35**

B-9									
(Date Presoaked: 11/29/2024; Date Tested: 11/29/2024)									
Boring was filled with 5 gallons of water for presoak and allowed to completely drain prior to refilling for the infiltration test.									
r (in)	t_i (hr:min)	t_f (hr:min)	Δt (hr)	d_b (in)	d_i (in)	d_f (in)	ΔH (in)	H_{ave} (in)	It (in/hr)
4	8:45	8:50	0.083	96.0	76.0	92.0	16.0	12.0	27.43
4	8:54	8:59	0.083	96.0	76.0	92.0	16.0	12.0	27.43
4	9:02	9:09	0.117	96.0	76.0	95.0	19.0	10.5	26.06
4	9:13	9:21	0.133	96.0	76.0	96.0	20.0	10.0	25.06
4	9:25	9:33	0.133	96.0	76.0	96.0	20.0	10.0	25.06
4	9:35	9:43	0.133	96.0	76.0	96.0	20.0	10.0	25.06
4	9:45	9:53	0.133	96.0	76.0	96.0	20.0	10.0	25.06
4	9:55	10:03	0.133	96.0	76.0	96.0	20.0	10.0	25.06

Factor of Safety based on the Low Impact Development BMP Design Handbook FS = 3

Design Infiltration Rate = Tested Infiltration Rate / FS (in/hour) = **8.35**

Site: 2240 Fleetwood Dr Jurupa Valley, CA 92509
Project No: 22-257-004UR

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

35+ YEARS

December 14, 2022
Project No. 208829001

Ms. Shelby Gonzales
HR Green
1260 Corona Pointe Court, Suite 305
Corona, California 92879

Subject: Geotechnical Review for GP22-036
Proposed Industrial Warehouse Building
2240 Fleetwood Drive
City of Jurupa Valley, California

References: Cannon, 2022, Rough Grading Plans for 2240 Fleetwood Drive, HYB, LLC, - Fleetwood Industrial, Sheets 1-5, dated November 28.

Environmental Geotechnology Laboratory, Inc., (EGL) 2022, Report of Geotechnical Engineering Investigation, Proposed Industrial Warehouse Building and Associated Structures, APN: 178-350-024, 029 & 030, 2240 Fleetwood Drive, City of Jurupa Valley, County of Riverside, California, EGL Project No.: 22-257-004L, dated October 31.

Dear Ms. Gonzales:

In accordance with your request, we have performed a geotechnical review of the referenced geotechnical report prepared by Environmental Geotechnology Laboratory, Inc. (EGL, 2022) and grading plans prepared by Cannon (2022), pertaining to the proposed industrial warehouse development project in the city of Jurupa Valley, California. Our review is based generally on the standards presented in the 2019 California Building Code, the County of Riverside Technical Guidelines for Review of Geotechnical and Geologic Reports, the Riverside County Flood Control Water Conservation District Design Handbook for Low Impact Development Best Management Practices, and current standards of practice.

We have noted items that should be addressed by the geotechnical consultant for the project. Our comments are presented below:

1. The consultant described the soils encountered in the borings, but did not indicate if any fill was observed either in the borings or elsewhere on the site. If fill materials were encountered in the borings, the contacts between the fill and native soils should be shown on the boring logs. If fill was observed in areas that did not have exploratory borings, the consultant should describe the fill and show where it was observed on the Site Plan.

2. The consultant prepared geologic Cross Section A-A', performed a slope stability analysis of the cross section, and the analyses indicated adequate factors of safety under static and pseudo-static conditions. The cross section was drawn in a northwest-southeast direction and through the corner of the proposed warehouse building that will be in close proximity to the adjacent slope that descends to the Santa Ana River. The consultant should describe the planned grading and construction in the area to the south of the proposed warehouse building near the area where

boring B-3 was drilled. The consultant should address the stability of the easterly descending slope that appears to be much steeper than the slope that was evaluated and if the stability of the slope could have an impact to the proposed improvements in this area, if any.

3. In Section 8.1.2 the consultant stated that a detailed grading plan was not available at the time they prepared their report. The consultant should review the referenced grading plans prepared by Cannon and provide an updated description of the planned grading and construction, including a summary of the proposed cut and fill depths, and the heights and slope ratios of new slopes cut and fill slopes. Updated conclusions and recommendations should be provided, as appropriate.

4. The grading plans indicate that 2:1 and 3:1 (horizontal to vertical) slopes are proposed in the southeast area of the site, portions of which are in close proximity to the existing slope that descends to the Santa Ana River. The proposed slope grading should be incorporated into the slope stability analyses and the consultant should provide recommendations for slope grading, including construction of fill keys and slope face compaction.

5. In Sections 8.1.2 and 8.1.4, the consultant recommends that if expansive materials are encountered in slab area that the expansive material be replaced with sandy import material. The consultant should provide a recommendation for the depth below and the lateral distance beyond the slabs that the expansive material should be removed and replaced with granular soils.

6. In Section 13.0 the consultant states that an infiltration basin within the natural soil is not feasible due to poor infiltration rates in the clayey soil. The consultant suggested that the granular materials encountered in borings B-1 and B-2 may be more suitable for infiltration, but that additional percolation testing would be needed. The area where boring B-1 was drilled is relatively close to the approximately 60 feet high slope that descends to the Santa Ana River. In addition to the additional percolation testing, the consultant should address what impact stormwater infiltration may have on the adjacent slope that descends to the river and provide a recommendation for how far away the basin should be setback from the slope. Updates to the slope stability analyses should be provided, as appropriate.

7. Some of the USCS soil types shown on the direct shear and consolidation test result pages do not match the USCS soil types shown on the boring logs. The boring logs and/or lab test result should be updated accordingly.

8. The consultant should review future development plans including the grading plans that were submitted to the City and any updates to the plans, and provide updated recommendations if needed. The consultant should also review the foundation plans and the landscape structure plans and provide updated geotechnical recommendations, as appropriate.

Sincerely,
NINYO & MOORE

Michael L. Putt, PG, CEG
Principal Geologist

CERTIFIED ENGINEERING GEOLOGIST
MICHAEL LEWIS PUTT
No. 2341
STATE OF CALIFORNIA

Madan Chirumalla, PE, GE
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
MADAN CHIRUMALLA
No. 3047
GEOTECHNICAL
STATE OF CALIFORNIA

MLP/MAC/mlc

Environmental Geotechnology Laboratory, Inc.

October 31, 2022

HYB Group, Inc.
Mr. Hovel Babikian
1601 Hasting Heights Lane
Pasadena, California 91107

Subject: **Report of Geotechnical Engineering Investigation, Proposed Industrial Warehouse Building and Associated Structures, APN: 178-350-024, 029 & 030, 2240 Fleetwood Drive, City of Jurupa Valley, County of Riverside, California, EGL Project No.: 22-257-004L**

Ladies and Gentlemen:

In accordance with your request, Environmental Geotechnology Laboratory, Inc. (EGL) is pleased to submit this Geotechnical Engineering Report for the subject site. The purpose of this report was to evaluate the subsurface conditions and provide recommendations for foundation designs and other relevant parameters of the proposed construction.

Based on the findings and observations during our investigation, the proposed construction of the subject site for the intended use is considered feasible from the geotechnical engineering viewpoints, provided that specific recommendations set forth herein are followed.

This opportunity to be of service is sincerely appreciated. If you have any questions pertaining to this report, please call the undersigned.

Respectfully submitted,

Environmental Geotechnology Laboratory, Inc.

REGISTERED PROFESSIONAL ENGINEER
RYAN KEITH JONES
No. 2852
GEOTECHNICAL
STATE OF CALIFORNIA

Ryan Jones, GE 2852
Senior Engineer

Dist: (4) Addressee
RJ/ky

11819 Goldring Road, Suite A, Arcadia, CA 91006 • Tel.: (626) 263-3588, Fax: (626) 263-3599
E-MAIL: MAIL@EGLAB.COM

REPORT OF GEOTECHNICAL ENGINEERING INVESTIGATION

Proposed Industrial Warehouse Building
and Associated Structures

APN: 178-350-024, 029 & 030

at

2240 Fleetwood Drive
City of Jurupa Valley, County of Riverside, California

Prepared by
ENVIRONMENTAL GEOTECHNOLOGY LABORATORY, INC.
Project No.: 22-257-004L
October 31, 2022

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 PURPOSE 1
1.2 SCOPE OF SERVICES 1
1.3 SITE LOCATION 1
1.4 PROPOSED CONSTRUCTION 2

2.0 SUBSURFACE EXPLORATION AND LABORATORY TESTING 2

2.1 FIELD EXPLORATION 2
2.2 LABORATORY TESTING 3

3.0 SUMMARY OF GEOTECHNICAL CONDITIONS 3

3.1 SOIL CONDITIONS 3
3.2 GROUNDWATER 3

4.0 SEISMICITY 4

4.1 FAULTING 4
4.2 ESTIMATED EARTHQUAKE GROUND MOTIONS 4

5.0 SEISMIC HAZARDS 4

5.1 LIQUEFACTION 4
5.2 EARTHQUAKE INDUCED SETTLEMENT 5
5.3 LANDSLIDING 6
5.4 LURCHING 6
5.5 SURFACE RUPTURE 6
5.6 GROUND SHAKING 6
5.7 LATERAL SPREAD 6

6.0 SLOPE STABILITY 7

6.1 GENERAL 7
6.2 EXISTING SLOPE 7
6.3 PROPOSED CONDITION 8
6.4 SURFICIAL SLOPE STABILITY 8

7.0 CONCLUSIONS 9

7.1 SEISMICITY 9
7.2 LIQUEFACTION POTENTIAL 9
7.3 EXCAVATABILITY 9
7.4 SURFICIAL SOILS REMOVAL 9
7.5 GROUNDWATER 10

8.0 RECOMMENDATIONS 10

8.1 GRADING 10
8.1.1 Site Preparation 10
8.1.2 Surficial Soil Removals 10
8.1.3 Treatment of Removal Bottoms 11
8.1.4 Structural Backfill 11
8.1.5 Sloped Excavation 11
8.2 FOUNDATION DESIGN 12
8.2.1 Bearing Value 12

8.2.2 Settlement *12*
8.2.3 Lateral Pressures *12*
8.2.4 Foundation Construction *13*
8.2.5 Concrete Slabs *13*
8.2.6 Retaining Wall *13*
8.3 TEMPORARY EXCAVATION AND BACKFILL OF UTILITY TRENCHES 14
9.0 SEISMIC DESIGN **14**
10.0 CORROSION POTENTIAL **14**
11.0 INSPECTION **15**
12.0 106 STATEMENT **15**
13.0 DRAINAGE **15**
14.0 REMARKS **16**
REFERENCES
APPENDIX A FIELD INVESTIGATION
APPENDIX B LABORATORY TESTING
APPENDIX C LIQUEFACTION INDUCED SETTLEMENT AND ANALYSIS
APPENDIX D SLOPE STABILITY ANALYSES
APPENDIX E PERCOLATION TEST RESULTS

1.0 INTRODUCTION

1.1 Purpose

This report presents a summary of our preliminary geotechnical engineering investigation for the proposed development at 2240 Fleetwood Drive, City of Jurupa Valley, County of Riverside, California. The approximate regional location is shown on the Site (Location) Map, Figure 1. The purposes of this investigation were to evaluate the subsurface conditions at the area of proposed construction and to provide recommendations pertinent to grading, foundation design and other relevant parameters of the proposed development.

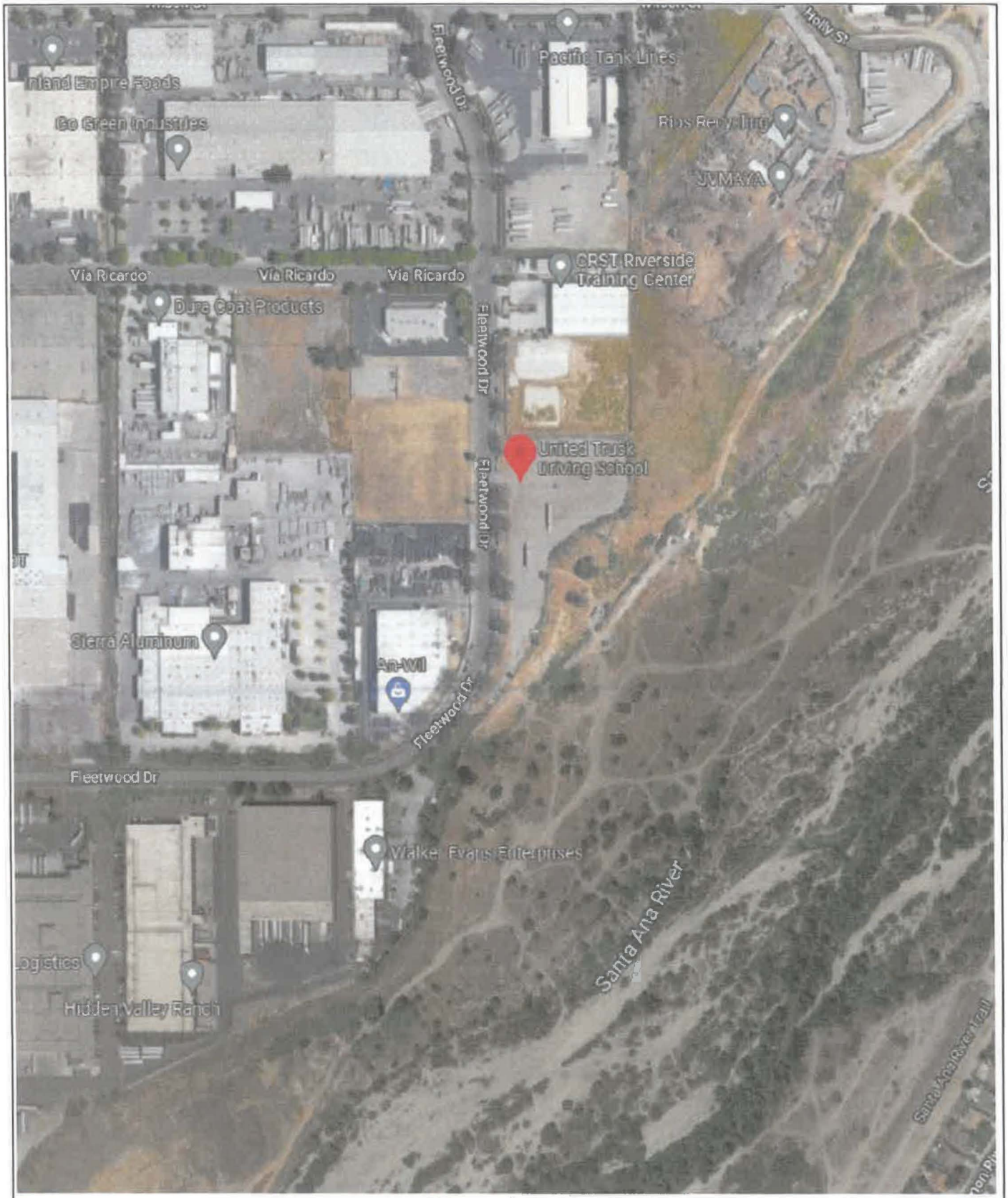
1.2 Scope of Services

Our scope of services included:

- Review of available soil engineering data of the area.
- Subsurface exploration consisting of logging and sampling of seven (7) 8-inch diameter hollow-stem auger borings. Borings were extended to a maximum depth of 51.0 feet below the existing ground surface. The boring logs are presented in Appendix A.
- Perform laboratory testing on representative onsite samples to establish soil-engineering characteristics. Field moisture and density are presented on boring logs in Appendix A. Laboratory test results are presented in Appendix B.
- Engineering analyses of the geotechnical data obtained from our background studies, field investigation, and laboratory testing.
- Perform percolation tests on boring B-3, B-5 and B-6 at the depths of 6', 6' and 10', respectively to determine the design infiltration rate of the soil at the site. Infiltration test results are presented in Appendix E.
- Preparation of this report presenting our findings, conclusions, and recommendations for the proposed construction.

1.3 Site Location

The subject site is located on the east side of Fleetwood Drive and at a relatively short distance southeast of the intersection of the Fleetwood Drive and Via Ricardo, and bounded easterly-southeasterly by Santa Ana River in the City of Jurupa Valley, County of Riverside, California. The approximate location of the site is presented in the Site Location Map (Figure1). The project site consists of three vacant lots (APN: 178-350-024, 029 & 030) and currently used for truck driving school. Topographically, the subject property is comprised of two relatively flat pads separated by an approximate 5 feet high retaining wall, and flanked on the southeast by



Scale: 1" = 1,000'

Base map adopted from County of San Bernardino and Riverside, USGS , USDA/ FPAC/ GEO, Map data @ 2022,, Google Earth.

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

EGL Proj. No.: 22-257-004
2240 Fleetwood Drive
Jurupa Valley, California

SITE (LOCATION) MAP

10/22

Figure 1

11819 Goldring Road, Unit A, Arcadia, California 91006; Phone (626) 263-3588; Fax (626) 263-3599

descending slopes. This descending slope has an overall slope ratio approximately of 2.9: 1 (Horizontal: Vertical) and locally as steep as 1.5: 1 (H: V) with a total relief of approximately 60 feet. Maximum relief is measured from anticipated proposed building pad elevation to the southeasterly descending slope toe. Tall trees with moderately wide bushes occupied near the top of slope area and scattered down in the southeasterly descending slope faces. Detailed configuration of the site is shown on the Site Plan, Figure 2a. Cross-Section A-A', Figure 2b, depicts surficial gradients and approximate subsurface soil conditions and contacts within the proposed development area.

1.4 Proposed Construction

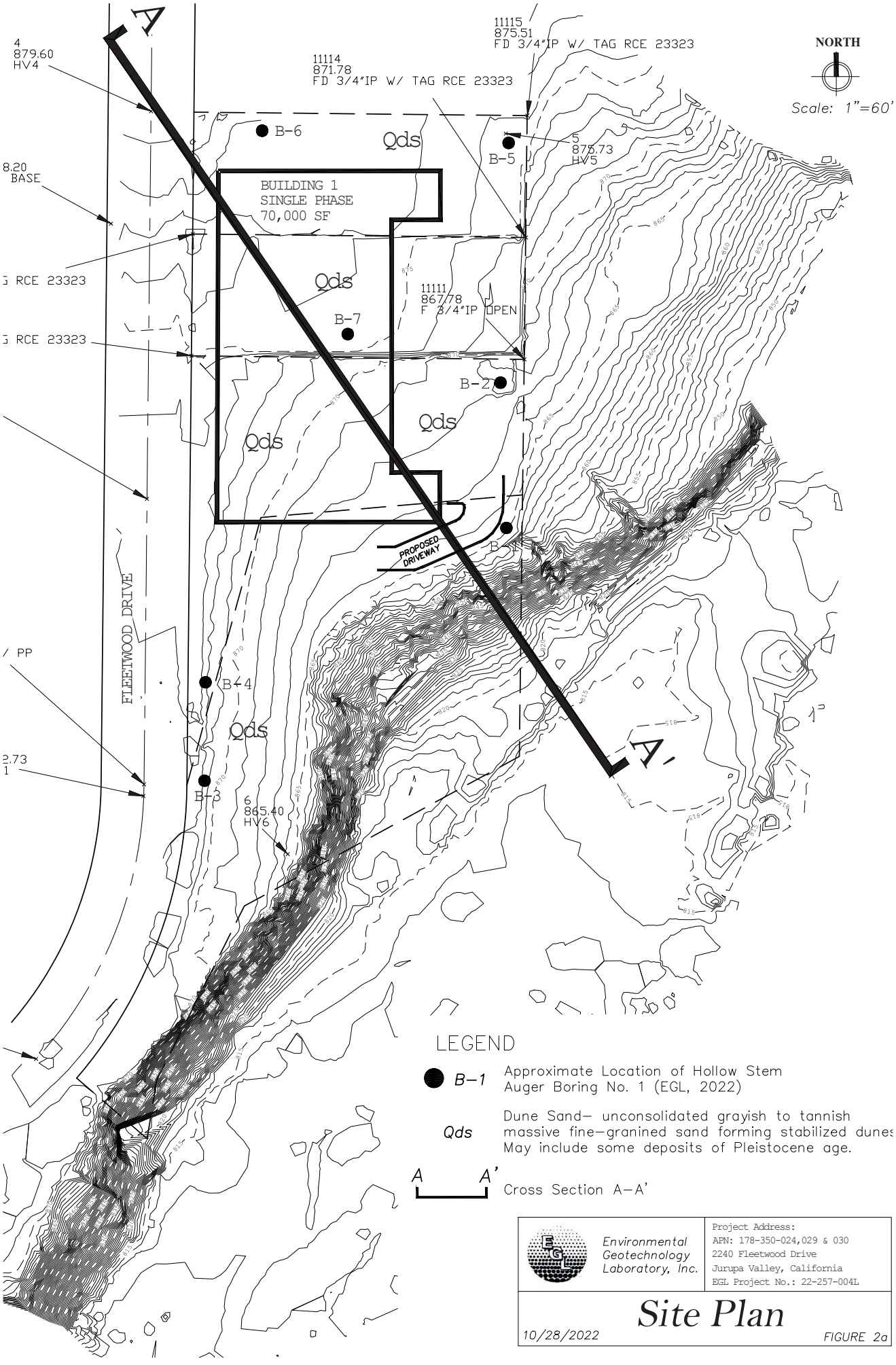
Based on the referenced *Conceptual Site Plan* provided by the project architect, it is our understanding that the proposed development at the site consists of a warehouse building and associated structures. The proposed building is anticipated to be one and/or two-story masonry and wood frame structures with a concrete slab-on-grade. Column loads are unknown at this time, but are expected to be light to medium. Cut and/or fill is anticipated to reach the desired grades.

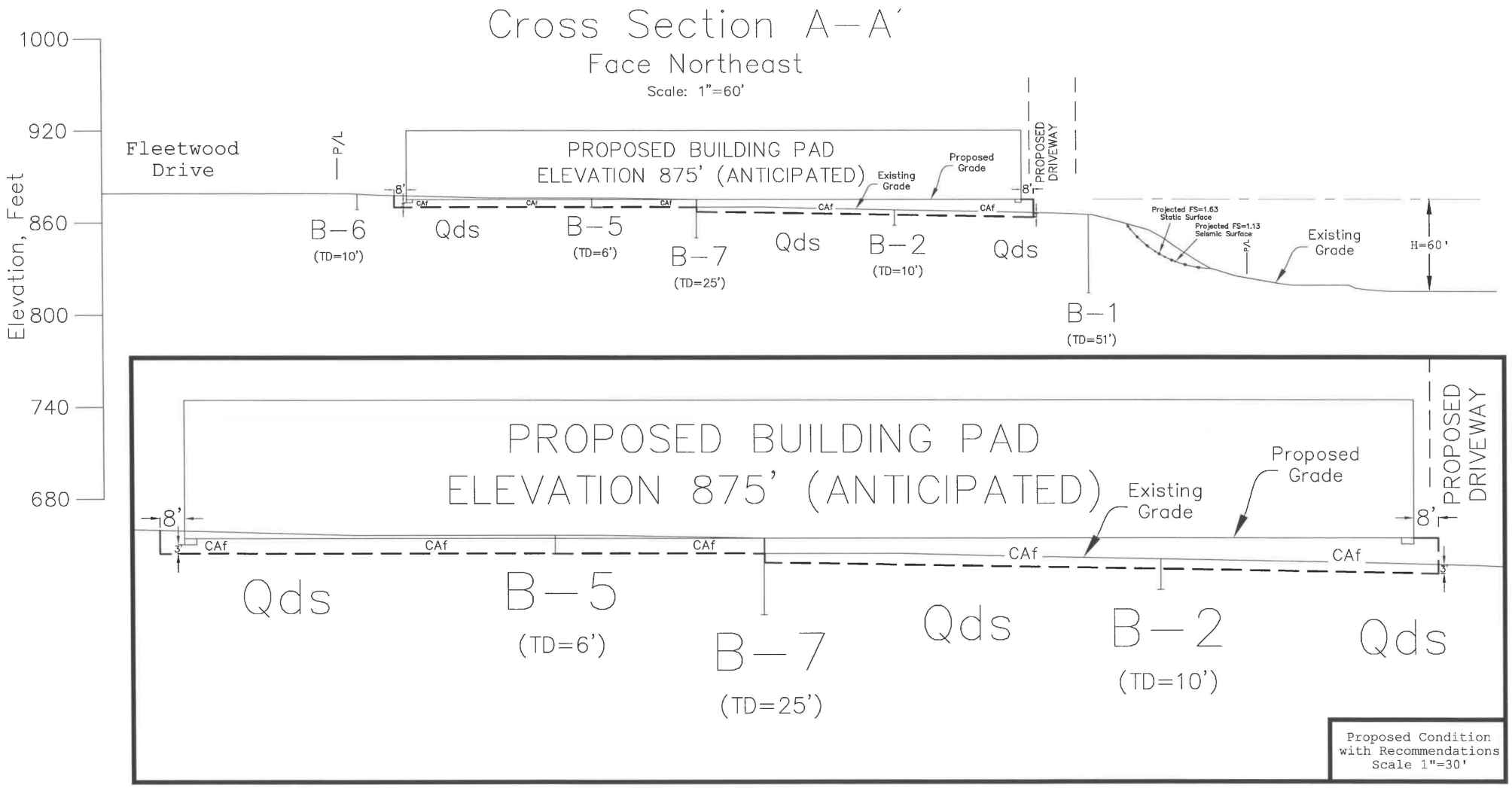
2.0 SUBSURFACE EXPLORATION AND LABORATORY TESTING

2.1 Field Exploration

Subsurface conditions were explored on October 13, 2022 with the aid of a hollow-stem drill rig of 2R Drilling Services. A total of seven (7) 8-inch diameter hollow-stem auger borings were drilled to a maximum depth of 51.0 feet below the existing ground surface. Upon completion of drilling and percolation testing, all borings were backfilled with onsite soil removed from excavations and tamped. The purpose of the excavation was to investigate the engineering characteristics of the onsite soils with respect to the proposed development.

EGL's field engineer supervised and logged all borings. Relatively undisturbed ring samples and bulk samples were collected during drilling for laboratory testing. Approximate locations of these borings are shown on the Site Plan, Figure 2. Exploratory boring logs are presented in Appendix A. Ring and SPT samples were taken at frequent intervals. The samples taken by a hollow stem auger were obtained by driving a sampler with successive blows of a 140-pound hammer dropping from a height of 30 inches.


NORTH
Scale: 1"=60'
11115
875.51
FD 3/4"IP W/ TAG RCE 23323
11114
871.78
FD 3/4"IP W/ TAG RCE 23323
4
879.60
HV4
5
875.73
HV5
6
865.40
HV6
8.20
BASE
B-6
B-5
B-7
B-2
B-4
B-3
Qds
BUILDING 1
SINGLE PHASE
70,000 SF
11111
867.78
F 3/4"IP OPEN
PROPOSED
DRIVEWAY
FLEETWOOD DRIVE
A
A'
LEGEND
B-1
Approximate Location of Hollow Stem Auger Boring No. 1 (EGL, 2022)
Qds
Dune Sand- unconsolidated grayish to tannish massive fine-granined sand forming stabilized dunes May include some deposits of Pleistocene age.
A A'
Cross Section A-A'
Environmental Geotechnology Laboratory, Inc.
Project Address:
APN: 178-350-024,029 & 030
2240 Fleetwood Drive
Jurupa Valley, California
EGL Project No.: 22-257-004L
Site Plan
10/28/2022
FIGURE 2a



LEGEND

Qds	Natural Soils
CAf	Future Compacted Fill

Cross Section A-A'
Site:2240 Fleetwood Drive
Jurupa Valley, California
Date: 11-1-2022

EGL Project No.:22-257-004L
Environmental Geotechnology Laboratory, Inc.

Figure 2b

2.2 Laboratory Testing

Representative samples were tested for the following parameters: in-situ moisture content and density, direct shear strength, consolidation, percent of fine, corrosion potential and expansion index. The results of our laboratory testing along with a summary of the testing procedures are presented in Appendix B. In-situ moisture and density test results are presented on the boring logs (Appendix A).

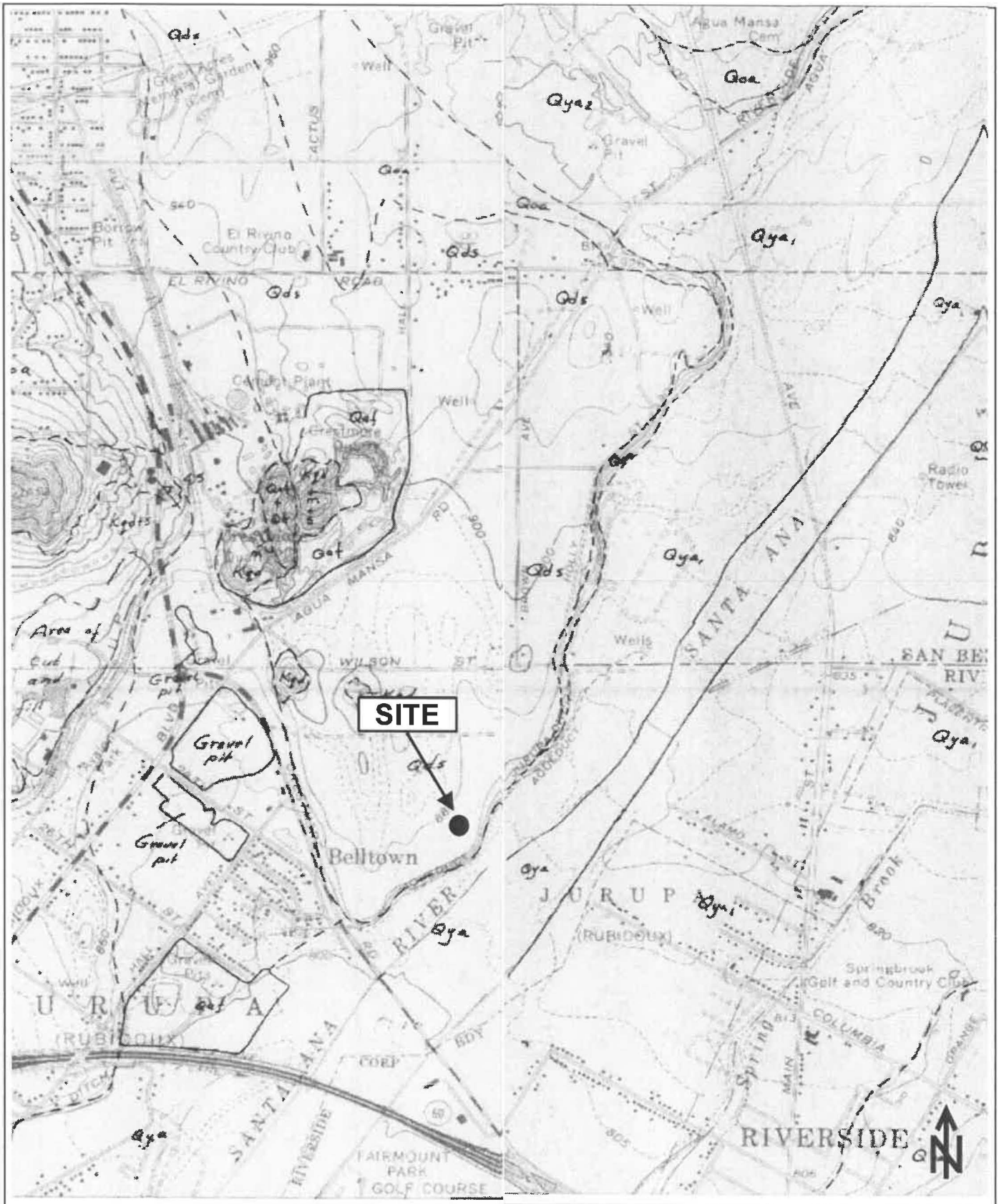
3.0 SUMMARY OF GEOTECHNICAL CONDITIONS

3.1 Soil Conditions

The onsite soils consist predominantly of silty sand (SM), poorly graded sand (SP), well-graded sand (SW) and sandy clay (CL) materials. The near surface soils at boring B-1 consist of dark olive brown to dark yellowish brown silty sand (SM) with trace of clay. These soils exist in a fine to medium grained, dry to slightly moist, and medium dense condition to a depth of approximately 4 feet. Below 4 feet, our boring B-1 encountered layers of dark yellowish brown to olive brown, fine and fine to medium grained, dry to moist, and medium dense silty sand (SM) and poorly graded sand (SP) to a depth of approximately 34 feet. Below this, a thin layer of grayish brown, slightly moist and very stiff sandy clayey silt (ML) and sandy clay (CL) was encountered to a depth of approximately 36 feet. This was followed by layers of grayish brown to olive brown, fine to coarse grained, dry to moist, and very dense well-graded sand (SW) to the maximum explored depth of 51 feet below the existing ground surface. Dark yellowish brown to brown, slightly moist, and stiff to hard sandy clay (CL) were encountered in the near surface at borings B-3, B-4 and B-5 to the depths of approximately 6 feet to 10 feet below the existing ground surface. Borings B-6 & B-7 also encountered sandy clay material at the depths of 9' & 14', respectively. Based on USGS by Douglas M. Morton (1978) the site is underlain by unconsolidated grayish to tannish massive fine grained sand forming stabilized dunes. May include some deposits of Pleistocene age (Qds; see Figure 3).

3.2 Groundwater

Static ground water levels were not encountered during our subsurface investigations to the maximum explored depth of 51 feet below the existing ground surface. Based on the historically high groundwater depth map prepared by Wildermuth Environmental Inc. the historic groundwater is approximately greater than 50 feet below ground surface at the subject site (Ref. # 16) Groundwater is therefore not expected to be a significant constraint during the construction. However, groundwater may be a significant constraint if grading is completed during the rainy season when perched water is more likely to occur.



Qds	DUNE SAND--- Unconsolidated grayish to tannish massive fine-grained sand forming stabilized dunes. May include some deposits of Pleistocene age.

Base map adopted from USGS "Geologic Maps of Fontana and San Bernardino South 7.5' Quads, San Bernardino and Riverside Countties, California"; dated 1978, Scale 1"=24,000'

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

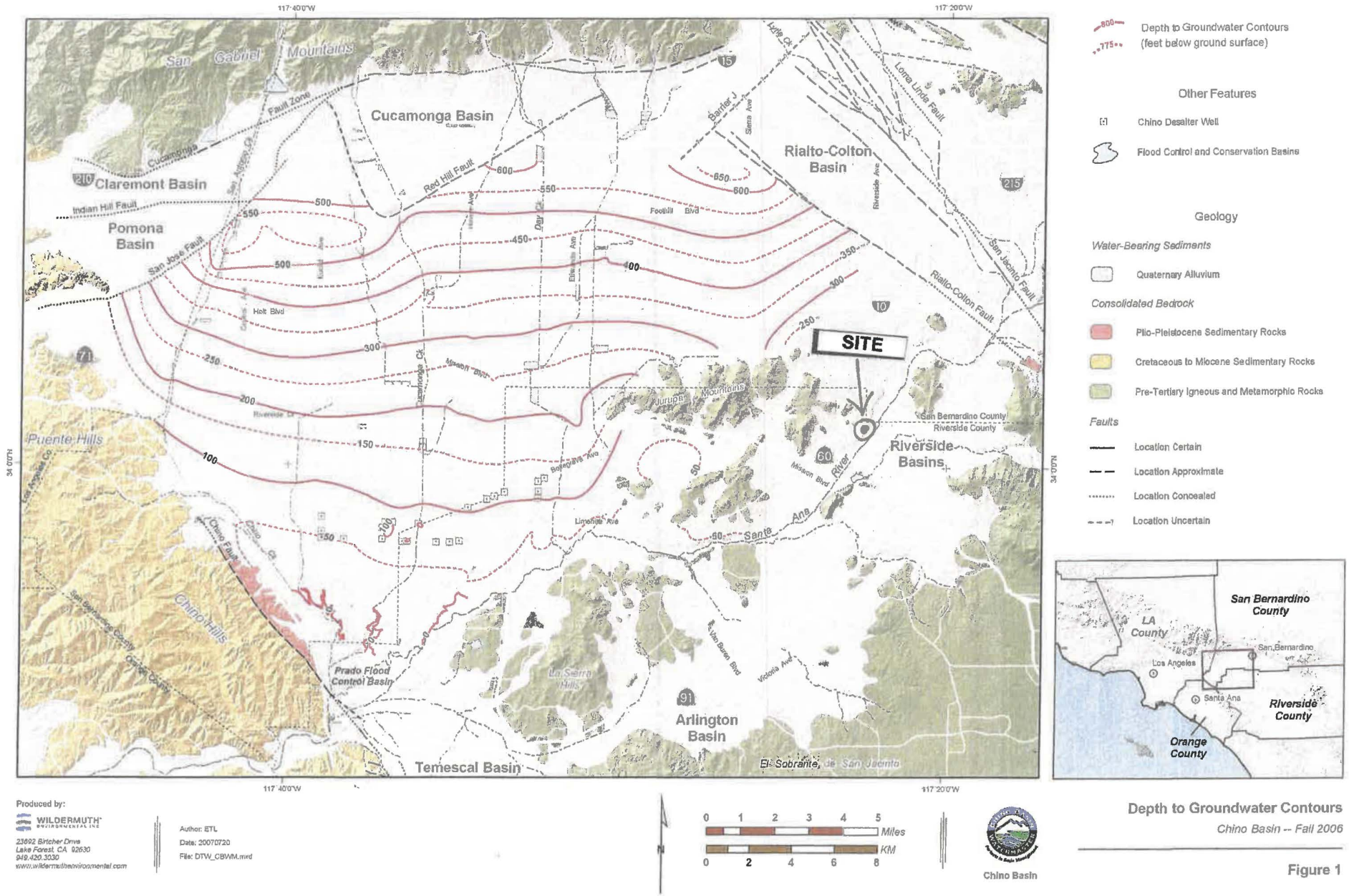
EGL Proj. No.: 22-257-004
2240 Fleetwood Drive
Jurupa Valley, California

REGIONAL (GEOLOGY) MAP

10/22

Figure 3

11819 Goldring Road, Unit A, Arcadia, California 91006; Phone (626) 263-3588; Fax (626) 263-3599



800 Depth to Groundwater Contours
775 (feet below ground surface)

Other Features

Chino Desalter Well

Flood Control and Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Plio-Pleistocene Sedimentary Rocks

Cretaceous to Miocene Sedimentary Rocks

Pre-Tertiary Igneous and Metamorphic Rocks

Faults

Location Certain

Location Approximate

Location Concealed

Location Uncertain

Produced by:

WILDERMUTH ENVIRONMENTAL INC

23692 Bircher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com

Author: ETL
Date: 20070720
File: DTW_CBWM.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 KM

Chino Basin

Depth to Groundwater Contours

Chino Basin -- Fall 2006

Figure 1

4.0 SEISMICITY

4.1 Faulting

By definition of the California Mining and Geology Board, an active fault is a fault that has had surface displacement within Holocene time (about the last 11,000 years). A potentially active fault is defined by the State Geologist as any fault that has been active during Quaternary time (the last 1,600,000 years).

EGL's studies of regional and local seismicity indicate that there are no known active faults crossing subject property. However, site locates in a seismically active region and is subject to seismically induced ground shaking from nearby and distant faults, which is a characteristic of all Southern California communities. Based on our review of the "*Public Safety Element, Riverside County General Plan, Liquefaction Zones*" it is concluded that the site is located within a "Moderate" potential liquefaction area.

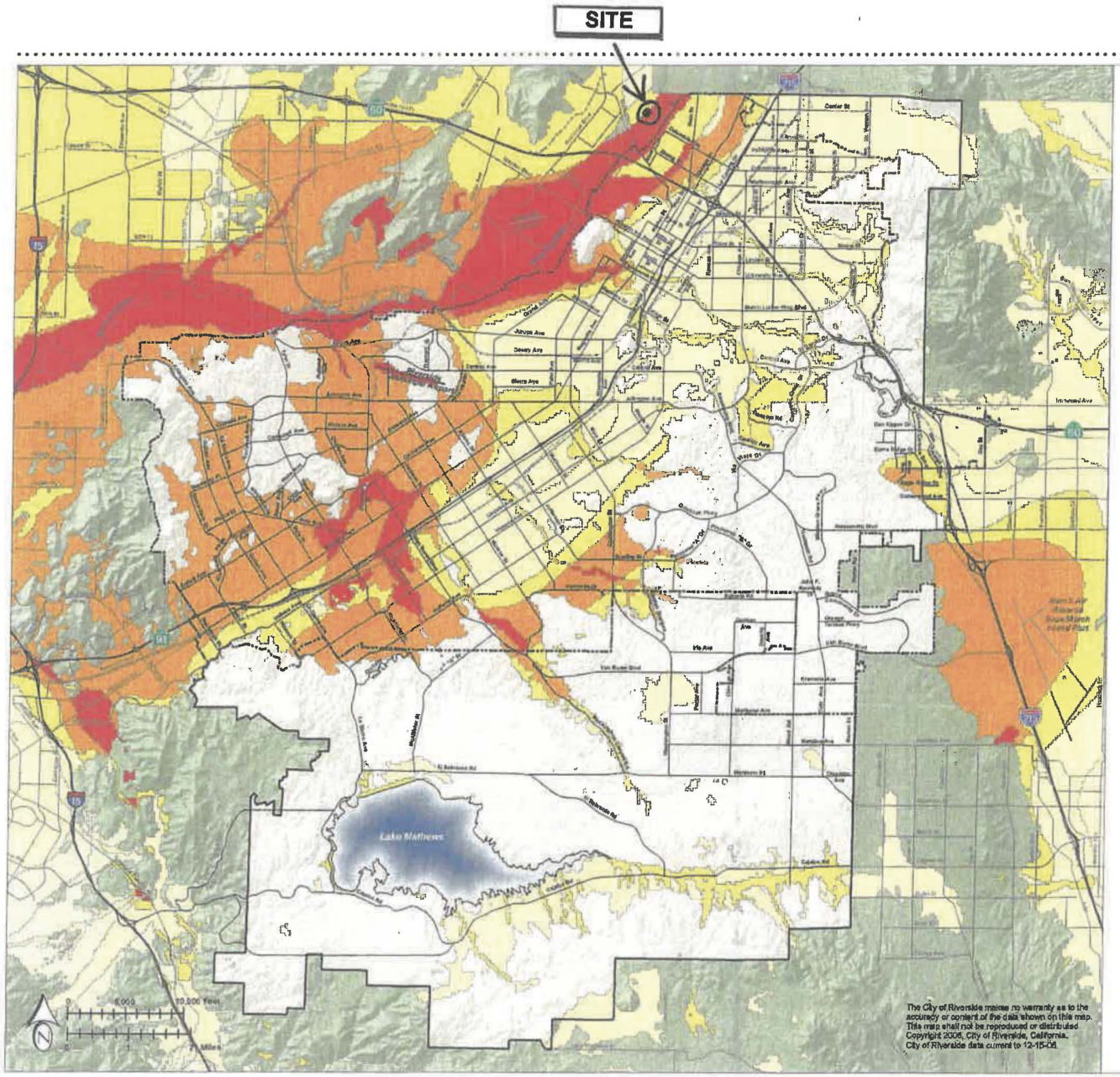
4.2 Estimated Earthquake Ground Motions

In order to estimate the seismic ground motions at the subject site, EGL has utilized the U.S. Seismic Design Maps website prepared by United States Geological Survey USGS and the Unified Hazard Tool website. According to U.S. Seismic Design Maps, the peak ground acceleration corresponding to the PGA_M was used in our analyses. A PGA_M of 0.668g was obtained from the USGS, U.S. Seismic Design Maps website, (https://earthquake.usgs.gov/ws/designmaps/asce7-16.html). The earthquake magnitude (M) of 6.98 was obtained from the USGS, Unified Hazard Tool website (https://earthquake.usgs.gov/hazards/interactive/). Based on a 2% probability of exceedance in 50 years (2475-year return period) a magnitude of 6.98 was used with PGA_M and a factor of safety of 1.3 when calculating the seismic settlement. Seismic design map detail reports and the liquefaction analyses are presented in Appendix C.

5.0 SEISMIC HAZARDS

5.1 Liquefaction

Liquefaction is the transformation of a granular material from a solid to a liquid state as a result of increasing pore-water pressure. The material then loses strength and can flow as if unrestrained, thus leading to ground failure. Liquefaction can be triggered in saturated cohesionless material by short-term cyclic loading, such as shaking due to an earthquake. Ground failure that results from liquefaction can be manifested as flow landsliding, lateral spread, loss of bearing capacity, or settlement.



CITY OF RIVERSIDE
GENERAL PLAN 2025

LEGEND

- VERY LOW
- LOW
- MODERATE
- HIGH
- VERY HIGH
- RIVERSIDE CITY BOUNDARY
- RIVERSIDE PROPOSED SPHERE OF INFLUENCE

SOURCE: TRANSPORTATION AND LAND MANAGEMENT AGENCY (TLMA) GEOGRAPHIC INFORMATION SERVICES COUNTY OF RIVERSIDE, JANUARY 1, 2005
http://www.tlma.co.riverside.ca.us/index.html

Figure PS-2
LIQUEFACTION ZONES

The ground water table is located at least 50 feet below the existing ground surface at the subject site. The potential for liquefaction at the subject site was evaluated using the procedures suggested by Seed and others (1983 and 1985), based on data obtained from Boring B-1. The design earthquake magnitudes (M) of 6.98 and peak ground accelerations (PGA_M) of 0.668g are discussed in the previous Section. Based on the historically high groundwater depth map prepared by Wildermuth Environmental Inc. the historic groundwater is approximately greater than 50 feet below ground surface at the subject site. A ground water level was assumed to be at the depth of 50 feet below the existing ground surface, for the calculation purposes. The analyses presented in the enclosed Appendix C indicated that the existing onsite sandy soils for boring B-1 will not liquefy under the design earthquake events, based on calculation procedures of Seed, et. al. 1985. Due to the historic groundwater table and presence of high blow counts of the earth materials present in boring B-1, liquefaction is not expected to occur within the soil at the subject site. The summary of the total and differential settlements are as follows:

Return Period	Acceleration (PGA_M)(g)	Magnitude	Unsaturated Settlement (in)	Saturated Settlement (in)	Total Settlement (in)	Differential Settlement (in)
2475 years	0.668	6.98	0.63	0	0.63	0.315

5.2 Earthquake Induced Settlement

The sandy soils tend to settle and densify when they are subjected to earthquake shaking. Should the sand be saturated and there is no possibility for drainage so that constant volume conditions are maintained, the primary effect of the shaking is the generation of excess pore water pressures. Settlement then occurs as the excess pore pressures dissipate. The primary factors controlling seismic induced settlement are the cyclic stress ratio, maximum shear strain induced by earthquake, the strength and density of the sand, and the magnitude of the earthquake.

Based on the procedures developed by Tokimatsu and Seed (1987), it is estimated that liquefaction induced settlement of dense soil or clayey soil is negligible. Due to the high groundwater and the presence of dense sandy soil it is EGL's opinion that settlement of saturated sandy soil under the design earthquake conditions can be negligible. The unsaturated soil between 0 feet and 50 feet below the ground surface may settle during seismic activity

approximately 0.63 inches. It is estimated that the maximum total settlement of saturated and unsaturated sandy soil due to seismic activity that may occur at the subject site is approximately 0.63 inches.

5.3 Landsliding

A potential for landsliding is often suggested in areas of moderate to steep terrain that is underlain by weak or un-favorably oriented geological conditions. Neither of these conditions exists at the site. Due to the relatively flat nature of the site, it is our opinion that the potential for landslide is remote.

5.4 Lurching

Soil lurching refers to the rolling motion on the surface due to the passage of seismic surface waves. Effects of this nature are not considered significant on the subject site where the thickness of alluvium does not vary appreciably under structures.

5.5 Surface Rupture

Surface rupture is a break in the ground surface during or as a consequence of seismic activity. The potential for surface rupture on the subject site is considered low due to the absence of known active faults at the site.

5.6 Ground Shaking

Throughout southern California, ground shaking, as a result of earthquakes, is a constant potential hazard. The relative potential for damage from this hazard is a function of the type and magnitude of earthquake events and the distance of the subject site from the event. Accordingly, proposed structures should be designed and constructed in accordance with applicable portions of the building code.

5.7 Lateral Spread

Lateral spread is a type of liquefaction-induced ground surface failure. Generally, lateral spread occurs in surficial soils on a gentle slope or near a free face. A shear zone is formed within liquefied soils and causes the upper soil to become displaced or spread. Deformations due to lateral spread can range from inches to several feet and can cause significant damage to structures and lifelines. Based on the paper published in ASCE Journal of Geotechnical Engineering, "Empirical Prediction of Liquefaction-Induced Lateral Spread," by Bartlett and Youd

(1995) lateral spreading will not occur at the site. According to the study presented by Bartlett & Youd, the site needs to be sloped or near a free face for lateral displacement to occur. Due to the lack of high groundwater at the site, it is our opinion that the potential for lateral spreading is remote.

6.0 SLOPE STABILITY

6.1 General

Stability of the existing southeasterly descending slope with an average slope ratio approximately of 2.9: 1 (Horizontal: Vertical) and locally as steep as 1.5: 1 (H: V) with a total relief of approximately 60 feet high, has been considered and calculations are presented in Appendix D. Shear strength parameters were derived using in-place ultimate shear strengths of soils obtained from this and past investigations and evaluated in light of past experience in similar soil condition. Based on EGL's field observation, the existing slopes and proposed development are considered geotechnically stable for the current and proposed conditions. Simplified Bishop's method was used to analyze the entire slope for the critical area depicted in Cross Section A-A' extending to the top and bottom of the existing and proposed slope conditions.

Lowest ultimate soil shear values were used for static and seismic conditions for existing and proposed slope conditions. Seismic coefficient of 0.2 g (g: gravity) was used in the seismic condition. No deep-seated failures were observed during our field investigation. Stability calculations and sections are presented on the plates following the report and the results of EGL's slope stability analyses of existing and proposed slope conditions are briefly described in the following sections. Analytical results are presented in Appendix D.

Earth Materials	Unit Weight (pcf)	Friction Angle (Degree)	Cohesion (psf)
Soil, Ultimate^{+} (Qds; B-1 @ 25.0')	120.0	29	168
Proposed Compacted Fill, Ultimate (CAf; Assumed)	125.0	35	200

Noted: $^{+}$Lowest ultimate soil shear values were used for static and seismic conditions for existing and proposed slope conditions.

6.2 Existing Slope

Existing southeasterly descending slope with an average slope ratio approximately of 2.9: 1 (Horizontal: Vertical) and locally as steep as 1.5: 1 (H: V) with a total relief of approximately 60 feet high was analyzed. Deep-seated failures were not encountered and/or observed during EGL's field investigation the existing slopes within the subject site. It is EGL's opinion that existing

slopes within the subject site considered satisfactory and possess adequate factors of safety against instabilities.

Analyzed Section	Calculated Condition	Factors of Safety (Static / Seismic)
A – A '	Existing southeasterly descending slope, approximately 60 feet high	1.63 / 1.13

Slope stability analyses utilizing Simplified Bishop's method was performed for the existing descending slope conditions. Existing southeasterly slope under static condition have a factor of safety, FS=1.63. Under seismic condition, FS=1.13. Analyzed slope is greater than the minimum required of FS=1.5 and FS=1.1, under static and seismic conditions, respectively. Therefore, the existing slope may be considered stable.

6.3 Proposed Condition

Under similar analytical condition used above, proposed slope with building loads, under static condition has a factor of safety, FS=1.63, and under seismic condition, FS=1.13. Both conditions are greater than the minimum required of FS=1.50 and FS=1.1, under static and seismic conditions, respectively. Based on the slope stability analyses results, the proposed development does not significantly impact the existing slope or significantly change the factors of safety of the existing slope conditions. Therefore, the proposed permanent slope condition may be considered stable. Results of slope stability analyses are presented in Slope Stability Analyses, Appendix D.

Analyzed Section	Calculated Condition	Factors of Safety (Static / Seismic)
A – A'	Proposed Slope with Building Loads	1.63 / 1.13

6.4 Surficial Slope Stability

Existing natural soil materials located on the existing descending slopes are subjected to sloughing under saturated conditions. Surficial slope stability of the existing descending slopes at slope gradient of 2.9: 1 to 1.5:1 (Horizontal: Vertical) possess factors of safety FS=1.20 and FS=0.69, respectively. The factor of safety is less than the minimum required factor of safety, FS=1.50, for an assumed saturated depth of four (4) feet (see Figure 4). However, it is EGL's opinion that the surficial soils at the existing descending slopes will not significantly adversely affect the subject property or neighbor's property due to medium to heavy vegetation growth in the descending slope area, and should remain in the current condition.

SURFICIAL SLOPE STABILITY
INFINITE SLOPE W/ PARALLEL SEEPAGE

$$F.S. = \frac{C + (\gamma t - \gamma w) \times H \times \cos^2\alpha \times \tan\phi}{\gamma t \times H \times \cos\alpha \times \sin\alpha}$$

Soil Properties and Slope Ratio:

2.9: 1 Slope, Horizontal to Vertical
Direct Shear Test Results, from B-2 @ 5'

C =	54	psf
α =	19	degrees
ϕ =	31	degrees
H =	4	ft
γt =	120.0	pcf
γw =	62.4	pcf

$\cos\alpha$ = 0.945519
$\cos^2\alpha$ = 0.894005
$\sin\alpha$ = 0.325568
$\tan\phi$ = 0.600861

F.S. = 1.20 (< 1.5)

Soil Properties and Slope Ratio:

1.5: 1 Slope, Horizontal to Vertical
Direct Shear Test Results, from B-2 @ 5'

C =	54	psf
α =	33	degrees
ϕ =	31	degrees
H =	4	ft
γt =	120.0	pcf
γw =	62.4	pcf

$\cos\alpha$ = 0.838671
$\cos^2\alpha$ = 0.703368
$\sin\alpha$ = 0.544639
$\tan\phi$ = 0.600861

F.S. = 0.69 (< 1.5)

Therefore, existing 2.9:1 and 1.5: 1 descending slopes located at the subject site do not have adequate factor of safety against surficial instability under saturated 4.0 feet thick soil conditions.

EGL Project No.: 22-257-004L
Site: 2240 Fleetwood Drive, Jurupa Valley, CA

Figure 4

All slopes will be subject to surficial erosion. Therefore, slopes should be protected from surface runoff by means of top-of-slope compacted earth berms or concrete interceptor drains. All slopes should be landscaped with suitable plants requiring minimal cultivation and irrigation water in order to thrive. Irrigation system should be installed and properly maintained. Over-watering and subsequent saturation of slope surface should be avoided.

7.0 CONCLUSIONS

Based on the results of our subsurface investigation, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided the recommendations contained herein are incorporated in the design and construction. The following is a summary of the geotechnical design and construction factors that may affect the development of the site:

7.1 Seismicity

Based on our studies on seismicity, there are no known active faults crossing the property. However, the site is located in a seismically active region and is subject to seismically induced ground shaking from nearby and distant faults, which is characteristic of all Southern California.

7.2 Liquefaction Potential

Based on our liquefaction evaluation, it is concluded that the existing on-site sandy soils for boring B-1 are not potentially liquefiable soil under the design earthquake event. The soils are considered non-liquefiable due to the fact that they are either above ground water, contain high clay content or have high blow counts. The estimated potential settlement induced by the underlying potentially liquefiable soils is negligible.

7.3 Excavatability

Based on our subsurface investigation, excavation of the subsurface materials should be able to be accomplished with conventional earthwork equipment.

7.4 Surficial Soils Removal

Based on our field investigation and laboratory testing program, it is concluded that the existing near surface soils are relatively dense/stiff but may be unsuitable for support of the new structures as they presently exist and will require remedial works as discussed herein.

7.5 Groundwater

Static ground water levels were not encountered during our subsurface investigations to the maximum explored depth of 51 feet below the existing ground surface. Based on the historically high groundwater depth map prepared by Wildermuth Environmental Inc. the historic groundwater is approximately greater than 50 feet below ground surface at the subject site (Ref. # 16) Groundwater is therefore not expected to be a significant constraint during the construction. However, groundwater may be a significant constraint if grading is completed during the rainy season when perched water is more likely to occur.

8.0 RECOMMENDATIONS

Based on the subsurface conditions exposed during field investigation and laboratory testing program, it is recommended that the following recommendations be incorporated in the design and construction phases of the project.

8.1 Grading

8.1.1 Site Preparation

Prior to initiating grading operations, any existing footings, vegetation, trash, debris, over-sized materials (greater than 6 inches), and other deleterious materials within fill areas should be removed from the site.

8.1.2 Surficial Soil Removals

No detailed grading plan was available at the time of preparing this report however, based on our field exploration and laboratory data obtained to date, it is recommended that the building pad for the new warehouse be removed and recompacted. The removal depth should be 3 feet below existing grade or 3 feet beneath proposed footing bottom whichever is deeper. The recommended removal should be extended at least 8 feet beyond proposed building lines or to a distance equal to the depth of fill below the proposed footings, whichever is greater. Existing near surface soils should also be removed at least one foot within proposed concrete slab and driveway areas. The construction areas should be excavated and then observed by a representative of this office to verify the soil conditions for any potential needs of removal of loose soils and replacement with compacted fill. This may also be necessary due to difference in expansion characteristics of foundation materials beneath a structure.

During the grading of the proposed slab area if expansive material is encountered it should be removed and replaced with sandy import material (EI < 20). If import is mixed with onsite material EGL should provide inspections to verify the soils are mixed uniformly and testing of the mixed fill material to determine the expansion potential. The expansion index of the mixed soil should be less than 20. Some preliminary testing of the import and onsite should be performed to determine the soil mixture ratio prior to backfilling the building pad.

Locally deeper removals may be necessary to expose competent natural ground. The actual removal depths should be determined in the field as conditions are exposed. Visual inspection and/or testing may be used to define removal requirements.

8.1.3 Treatment of Removal Bottoms

Soils exposed within areas approved for fill placement should be scarified to a depth of 6 inches, conditioned to near optimum moisture content, and then compacted to minimum project standards.

8.1.4 Structural Backfill

The onsite soils may be used as compacted fill provided they are free of organic materials and debris. During the grading of the proposed slab area if expansive material is encountered it should be removed and replaced with sandy import material (EI < 20). If import is mixed with onsite material EGL should provide inspections to verify the soils are mixed uniformly and testing of the mixed fill material to determine the expansion potential. The expansion index of the mixed soil should be less than 20. Some preliminary testing of the import and onsite should be performed to determine the soil mixture ratio prior to backfilling the building pad. Fills should be placed in relatively thin lifts; brought to near optimum moisture content, then compacted to obtain at least 90 percent relative compaction based on laboratory standard ASTM D-1557-12.

8.1.5 Sloped Excavation

Sloping excavation should be used provided the space is available and adjacent structures are located a horizontal distance away from the excavation equal or greater than the depth of excavation. Based on materials encountered at the subject site and the depth of the proposed excavation, it is EGL's opinion that sloped excavations may be considered to the depths and slope ratios tabulated below:

Height of Cut (feet)	Maximum Slope Ratio
0 – 5.0	Vertical
Higher than 5.0	1: 1

The existing adjacent structures should be protected during construction so no damage is done to the structures. No heavy construction vehicle loading or additional surcharge loading should be permitted at the top of the slope. A representative of this office should inspect the temporary excavation to make any necessary modification.

8.2 Foundation Design

8.2.1 Bearing Value

An allowable bearing value of 1800 pounds per square foot (psf) may be used for design of the footings placed at a depth of at least 18 inches below the lowest adjacent ground and founded on the new certified compacted fill. Single spread footings should be at least 24 inches square and continuous footings should be at least 12 inches wide. These bearing values may be increased by 200 psf for each additional foot of depth or width to a maximum value of 3500 psf. The above recommended value may be increased by one third (1/3) when considering short duration seismic or wind loads.

8.2.2 Settlement

Settlement of the footings placed as recommended and subject to no more than allowable loads is not anticipated to exceed 1/2 inch. Differential settlement between adjacent columns is not anticipated to exceed 1/4 inch. The potential total combined settlement (seismic plus static) and total combined differential settlement (seismic plus static) is approximately 1.13 inches and 0.565 inches under the design earthquake events, respectively.

8.2.3 Lateral Pressures

Passive earth pressure may be computed as an equivalent fluid pressure of 300 pounds per cubic foot, with a maximum earth pressure of 2500 pounds per square foot. An allowable coefficient of friction between soil and concrete of 0.35 may be used with the dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one third (1/3).

Active earth pressure from horizontal backfill may be computed as an equivalent fluid weighting of 35 pounds per cubic foot. An at-rest fluid weighting of 55 pounds per cubic foot may be used for free-draining, level backfill. For basement (restrained) walls greater than 6' with level backfill, an

additional seismic lateral force of $16H^2$ plf should be applied at 0.37H from the base of the wall (H = retained height). For cantilever (unrestrained) walls greater than 6' with level backfill, an additional seismic lateral force of $10H^2$ plf should be applied at 0.37H from the base of the wall (H = retained height). The above value assumes free-draining conditions.

8.2.4 Foundation Construction

It is anticipated that the entire structure will be underlain by onsite soils of high expansion potential. The following presents our recommendations for the foundation construction. All footings should be founded at a minimum depth of 18" below the lowest adjacent ground surface and founded into new certified compacted fill. Proposed footings should include surcharge from adjacent neighboring structures, including structural footings and/or walls. All continuous footings should have at least two No. 4 reinforcing bar placed both at the top and two No. 4 reinforcing bar placed at the bottom of the footings. A grade beam of at least 12" square, reinforced as recommended above for footings, should be utilized across the garage entrance. Base of the reinforced beam should be at the same elevation as the bottom of the adjoining footings.

8.2.5 Concrete Slabs

Concrete slabs should be a minimum of 5" thick, underlain with 2" of sand and reinforced with a minimum of #3 rebar spaced at 18" on center each way, or its equivalent. If heavy machinery or equipment is to be used within the warehouse than the structural engineer should design a thicker slab with appropriate reinforcement. All slab reinforcement should be supported to ensure proper positioning during placement of concrete. A positive separation should be maintained with expansive joint material to permit relative movement. Concrete slabs in moisture sensitive areas should be underlain with a vapor barrier consisting of a minimum of six-mil polyethylene membrane with all laps sealed. A minimum of 2" of sand should be placed over the membrane to aid in uniform curing of concrete.

8.2.6 Retaining Wall

Wall should be provided with subdrains to reduce the potential for the buildup of hydrostatic pressure. Backdrains may consist of free drainage materials (SE of 30 or greater) or CalTrans Class 2 permeable materials immediately behind the wall and extending to within 18" of the ground surface. A 4"-diameter perforated pipe wrapped in gravel and geofabric should be installed at the base of the wall and sloped to discharge to a suitable collection facility or through weep holes. Alternatively, drainage fabric could be used. The fabric manufacturer's recommendations should be followed in the installation of the drainage fabric backdrain.

8.3 Temporary Excavation and Backfill of Utility Trenches

All trench excavations should conform to CAL-OSHA and local safety codes. All utilities trench backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of ASTM D-1557-12. All temporary excavations should be observed by a field engineer of this office so as to evaluate the suitability of the excavation to the exposed soil conditions.

9.0 SEISMIC DESIGN

Based on our studies on seismicity, there are no known active faults crossing the property. However, the subject site is located in Southern California, which is a tectonically active area. The following CBC 2019 (Chapter 16) & ASCE 7-16 seismic related values may be used:

Site Classification: (ASCE, Table 20.3-1)	D
Spectral Response Accelerations (g):	
(CBC, Figure 1613.2.1 (1) 0.2-Second, S_S	1.500
(CBC, Figure 1613.2.1 (2)) 1-Second, S_1	0.600
Site Coefficient:	
(CBC, Table 1613.2.3 (1)) F_a	1.0
(CBC, Table 1613.2.3 (2)) F_v	1.7

Based on the U.S. Seismic Design Maps (USGS, updated January 2019), the proposed structures may be designed to accommodate up to a maximum site horizontal acceleration of 0.668g with 2% probability of being exceeded in 50 years. However, the Project Structural Engineer should be aware of the information provided to determine if any additional structural strengthening is warranted.

10.0 CORROSION POTENTIAL

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during EGL's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate in the soils. The test results are presented in the Appendix B.

According to ACI 318-14 Table 19.3.1.1, a sulfate content of 0.007 – 0.030 percent by weight in soils is assigned to Class "S0" and the severity of exposure to sulfate for concrete placed in contact with the onsite soil is considered "Not Applicable". Based on the testing results and ACI 318-14 Table 19.3.2.1, it is concluded that there is no restriction on the type of cement ("No Type Restriction") to be used at the site; however EGL recommends that Type II cement be used.

Based on the minimum resistivity test results, the subsurface soils are corrosive to moderately corrosive buried metal pipe. Any underground steel utilities should be blasted and given protective coating. Should additional protective measures be warranted, a corrosion specialist should be consulted.

11.0 INSPECTION

As a necessary requisite to the use of this report, it is recommended that the following construction activities be observed by a representative of this office:

- Removal of surficial and unsuitable soils,
- Backfill placement and compaction,
- Foundation Excavation and
- Utility trench excavation and backfill.

The geotechnical engineer should be notified at least 1 day in advance of the start of construction. A joint meeting between the client, the contractor, and the geotechnical engineer is recommended prior to the start of construction to discuss specific procedures and scheduling.

12.0 106 STATEMENT

Based on our field investigation and the laboratory testing results, it is our opinion that the grading and proposed structures will be safe against hazard from landslide, settlement, or slippage and the proposed construction will have no adverse effect on the geologic stability of the adjacent properties provided our recommendations are followed.

13.0 DRAINAGE

Building pads should be properly drained toward the street away from the slope and structure via swales or area drains. Positive pad drainage shall be incorporated into the final plans. In no cases should water be allowed to pond within the site, impound against structures or flow in a concentrated and/or uncontrolled manner down the descending slope areas.

In order to evaluate the feasibility of the infiltration system, EGL has evaluated the soil conditions at the subject site based on the *Low Impact Development BMP Design Handbook* (Riverside County, 2011). The tests were performed within borings B-3, B-5 and B-6 at the depths of 6', 6' and 10' below existing ground surface, respectively. Approximate locations of the test borings are shown on the Site Plan, Figure 2a. The test borings B-3 and B-5 were presoaked and tested on

October 13 and October 14, 2022, respectively. The test boring B-6 was presoaked and tested on October 14, 2022. The test procedures are described as following:

- 3"-diameter perforated pipe surrounded with gravel was placed in the test borings so that caving would not occur during the percolation testing. The bottoms of test borings were also covered with 2 inches of gravel.
- The test borings were filled with a minimum depth of 20 inches water multiple times for presoak and allowed to completely drain prior to refilling for the infiltration test.
- For the percolation test of borings B-3 and B-5, a minimum depth of 20 inches of water was placed within the test borings. The test time interval between readings used for boring B-3 was 10 minutes due to at least 6 inches of water drop two consecutive times in 25 minutes during the first two tests. The test time interval between readings used for boring B-5 was 30 minutes due to less than 6 inches of water drop two consecutive times in 25 minutes during the first two tests.
- The test boring B-6 was filled with a depth of 20 inches water for the presoak. However, only approximately 1.5 inches of water drained in 60 mins time interval. Therefore, no additional testing was able to be performed.
- Additional six (6) 10-minute increment percolation tests were performed for test borings B-3 and B-5. Field data of two (2) 25 minutes readings and six (6) 10 minutes and/or 30 minutes readings are presented in Appendix E. The last measured drop was used to calculate the design infiltration rate of the soil. Design Infiltration rate calculations are presented in Appendix E.

Based on the results of our preliminary percolation test of the material, the minimum design infiltration rate is 0.16 in/hr. Reduction factor of 3.0 has been applied to our design infiltration rate. Due to the high percentage of clay material encountered within test borings and percolation test results, it is EGL's opinion that an infiltration basin within the natural soil is not feasible due to the very stiff/hard clayey material. Borings B-1 & B-2 encountered sandier material and may provide a better percolation rate; however, additional testing would be required. An infiltration system using planter boxes or approved equivalent may be used. If planter boxes are used, they should be waterproofed and designed with an overflow to the street.

14.0 REMARKS

The conclusions and recommendations contained herein are based on the findings and observations at the exploratory locations. However, soil materials may vary in characteristics

between locations of the exploratory locations. If conditions are encountered during construction, which appear to be different from those disclosed by the exploratory work, this office should be notified so as to recommend the need for modifications.

This report has been prepared in accordance with generally accepted professional engineering principles and practice. No warranty is expressed or implied. This report is subject to review by controlling public agencies having jurisdiction.

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APPENDIX A
FIELD INVESTIGATION

Subsurface conditions were explored on October 13, 2022 with the aid of a hollow-stem drill rig of 2R Drilling Services. A total of seven (7) 8-inch diameter hollow-stem auger borings were drilled to a maximum depth of 51.0 feet below the existing ground surface. Upon completion of drilling and percolation testing, all borings were backfilled with onsite soil removed from excavations and tamped. The purpose of the excavation was to investigate the engineering characteristics of the onsite soils with respect to the proposed development.

EGL's field engineer supervised and logged all borings. Relatively undisturbed ring samples and bulk samples were collected during drilling for laboratory testing. Approximate locations of these borings are shown on the Site Plan, Figure 2. Ring and SPT samples were taken at frequent intervals. The samples taken by a hollow stem auger were obtained by driving a sampler with successive blows of a 140-pound hammer dropping from a height of 30 inches.

Representative undisturbed samples of the subsurface soils were retained in a series of brass rings, each having an inside diameter of 2.42 inches and a height of 1.00 inch. All ring samples were transported to our laboratory. Bulk surface soil samples were also collected for additional classification and testing.

EGL

BORING LOG: B-1

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/6"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	19/12"	SM	115.7	4.5	Silty sand, dark olive brown to dark yellowish brown, fine to
	B	S	11,12,13	SM	-	2.6	medium grained, dry to slightly moist, medium dense, trace of clay
5		R	12/12"	SP-SM	102.2	2.5	Poorly graded sand with silt, dark yellowish brown, fine to
		S	3,7,10	SP-SM	-	2.8	medium grained, dry, medium dense
10		R	17/12"	SM	106.4	2.6	Silty sand, fine to medium grained, dark yellowish brown, dry,
		S	7,14,14	SM	-	2.8	medium dense, trace of clay
15		R	29/12"	SP-SM	112.6	6.3	Poorly graded sand with silt, yellowish brown, fine to medium
		S	6,10,10	SP-SM	-	3.0	grained, dry to slightly moist, medium dense
20		R	12/12"	SP-SM	101.6	2.5	Poorly graded sand with silt, olive brown, fine to medium grained,
		S	5,9,11	SP-SM	-	6.7	dry to slightly moist, medium dense
25		R	40/12"	SM	104.4	8.1	Silty sand, olive brown, fine grained, slightly moist to moist,
		S	9,10,12	SM	-	4.9	medium dense, trace of clay
30		R	35/12"	SP-SM	106.0	1.4	Poorly graded sand with silt, olive brown, fine to coarse grained,
		S	12,12,16	SP-SM	-	2.5	dry, medium dense
35		R	32/12"	ML	103.4	9.6	Sandy clayey silt, grayish brown, slightly moist, very stiff
		S	5,12,14	CL/SM	-	23.6/16.5	Sandy clay to silty sand, fine grained, grayish brown to olive gray, very moist, very stiff to medium dense
40		R	50/6"	SW-SM	86.6	9.1	Well graded sand with silt, fine to coarse grained, grayish brown
		S	25,35,47	SW- SM	-	2.5	to olive brown, slightly moist to moist, very dense, little gravels were encountered

Plate A-1

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EGL

BORING LOG: B-1 (Cont.)

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/6"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
45		R	50/7"	SW-SM	115.6	2.0	Well graded sand with silt, fine to coarse grained, olive brown,
		S	50/5"	SW-SM		3.6	dry, very dense, little gravels were encountered
50		R	50/5"	SW	No Recovery		Well graded sand, fine to coarse grained, light olive brown, dry,
		S	50/6"	SW	-	1.6	very dense, little gravels were encountered
55							Total Depth = 51 feet No Caving No Groundwater Boring Backfilled and Tamped After Groundwater Observation
60							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
65							
70							
75							
80							

Plate A-2

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BORING LOG: B-2

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	17	SM	108.5	3.1	Silty sand, dark yellowish brown, fine to medium grained, dry to slightly moist, medium dense, few fine gravel and trace of clay
5		R	25	SM	108.2	3.2	Silty sand, dark yellowish brown, fine to medium grained, dry to slightly moist, medium dense
10		R	15	SM	105.2	5.6	Silty sand, dark yellowish brown, fine to medium grained, slightly moist, medium dense
15							Total Depth = 10 feet No Caving No Groundwater Boring Backfilled and Tamped
20							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches

Plate A-3

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EGL

BORING LOG: B-3

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	18	CL	94.8	7.0	Sandy clay, dark yellowish brown, slightly moist, stiff to very stiff
5		R	41	CL	95.4	18.2	Sandy clay, brown, very moist, hard
10							Total Depth = 6 feet No Caving No Groundwater Boring Backfilled and Tamped After Percolation Test Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
15							
20							

Plate A-4

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EGL

BORING LOG: B-4

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	26	CL	104.3	6.0	Sandy clay, yellowish brown, slightly moist, very stiff
5		R	38	CL	95.1	15.1	Sandy clay, brown, slightly moist to moist, very stiff to hard
10		R	38	CL/ML	81.3	22.0	Sandy clay to sandy clayey silt, brown to light gray, very moist, very stiff to hard
15							Total Depth = 10 feet No Caving No Groundwater Boring Backfilled and Tamped
20							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches

Plate A-5

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EGL

BORING LOG: B-5

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2	B	R	36	CL	113.8	10.3	Sandy clay, dark yellowish brown, slightly moist, very stiff to hard
5		R	40	CL	102.8	7.0	Sandy clay, brown to light brown, slightly moist, very stiff to hard
10							Total Depth = 6 feet No Caving No Groundwater Boring Backfilled and Tamped After Percolation Test Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
15							
20							

Plate A-6

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EGL

BORING LOG: B-6

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
2		R	50/9"	SM	97.0	13.1	Silty sand, gray to olive, fine to coarse grained, very moist, very dense, with miscellaneous base and gravels up to 1" in size
5		R	17	SM	107.1	5.4	Silty sand, dark yellowish brown, fine to coarse grained, slightly moist, medium dense
10		R	33	CL	98.9	21.3	Sandy clay, brown, very moist, very stiff to hard
15							Total Depth = 10 feet No Caving No Groundwater Boring Backfilled and Tamped After Percolation Test
20							Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches

Plate A-7

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EGL

BORING LOG: B-7

PROJECT LOCATION: 2240 Fleetwood Drive, Jurupa Valley

PROJECT NO: 22-257-004L

EXCAVATION SERVICE: 2R Drilling
DATE EXCAVATED: 10/13/2022
DATE LOGGED: 10/13/2022
EXCAVATION METHOD: Hollow-Stem
SAMPLE METHOD: Split-Tube
ELEVATION: N/A
LOGGED BY: KY

S: Standard Penetration Test
B: Bulk Sample
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
5		R	30	SM	119.4	3.3	Silty sand, dark yellowish brown, fine to coarse grained, dry, medium dense, trace of clay
10		R	17	SM	108.4	6.3	Silty sand, dark yellowish brown, fine to coarse grained, slightly moist, medium dense, trace of clay
15		R	21	CL	110.8	9.8	Sandy clay, brown, slightly moist, very stiff
20		R	40	CL	89.7	22.1	Sandy clay, brown to gray, very moist, very stiff to hard
25		R	38	CL	103.9	21.9	Sandy clay, light gray, very moist, very stiff to hard
30							Total Depth = 25 feet No Caving No Groundwater Boring Backfilled and Tamped Hammer Driving Weight = 140 lbs. Hammer Driving Height = 30 inches
35							

Plate A-8

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APPENDIX B

LABORATORY TESTING

During the subsurface exploration, EGL personnel collected relatively undisturbed ring samples and bulk samples. The following tests were performed on selected soil samples:

Moisture-Density

The moisture content and dry unit weight were determined for each relatively undisturbed soil sample obtained in the test borings in accordance with ASTM D2937 standard. The results of these tests are shown on the boring logs in Appendix A.

Shear Tests

Shear tests were performed in a direct shear machine of strain-control type in accordance with ASTM D3080 standard. The rate of deformation was 0.0125 inch per minute. Selected samples were sheared under varying confining loads in order to determine the Coulomb shear strength parameters: internal friction angle and cohesion. The shear test results are presented in the attached plates.

Consolidation Tests

Consolidation tests were performed on selected undisturbed soil samples in accordance with ASTM D2435 standard. The consolidation apparatus is designed for a one-inch high soil filled brass ring. Loads are applied in several increments in a geometric progression and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. The samples were inundated with water at a load of one kilo-pound (kips) per square foot, and the test results are shown on the attached Figures.

Corrosion Potential

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during EGL's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate soils. These tests are performed in accordance with California Test Method 417, 422, 532, and 643. The testing results are presented below:

Sample Location	PH	Chloride (ppm)	Sulfate (% by weight)	Min. Resistivity (ohm-cm)
B-1 @ 0'-5'	8.29	160	0.007	4200
B-5 @ 0'-5'	9.38	120	0.030	1200

Expansion Index

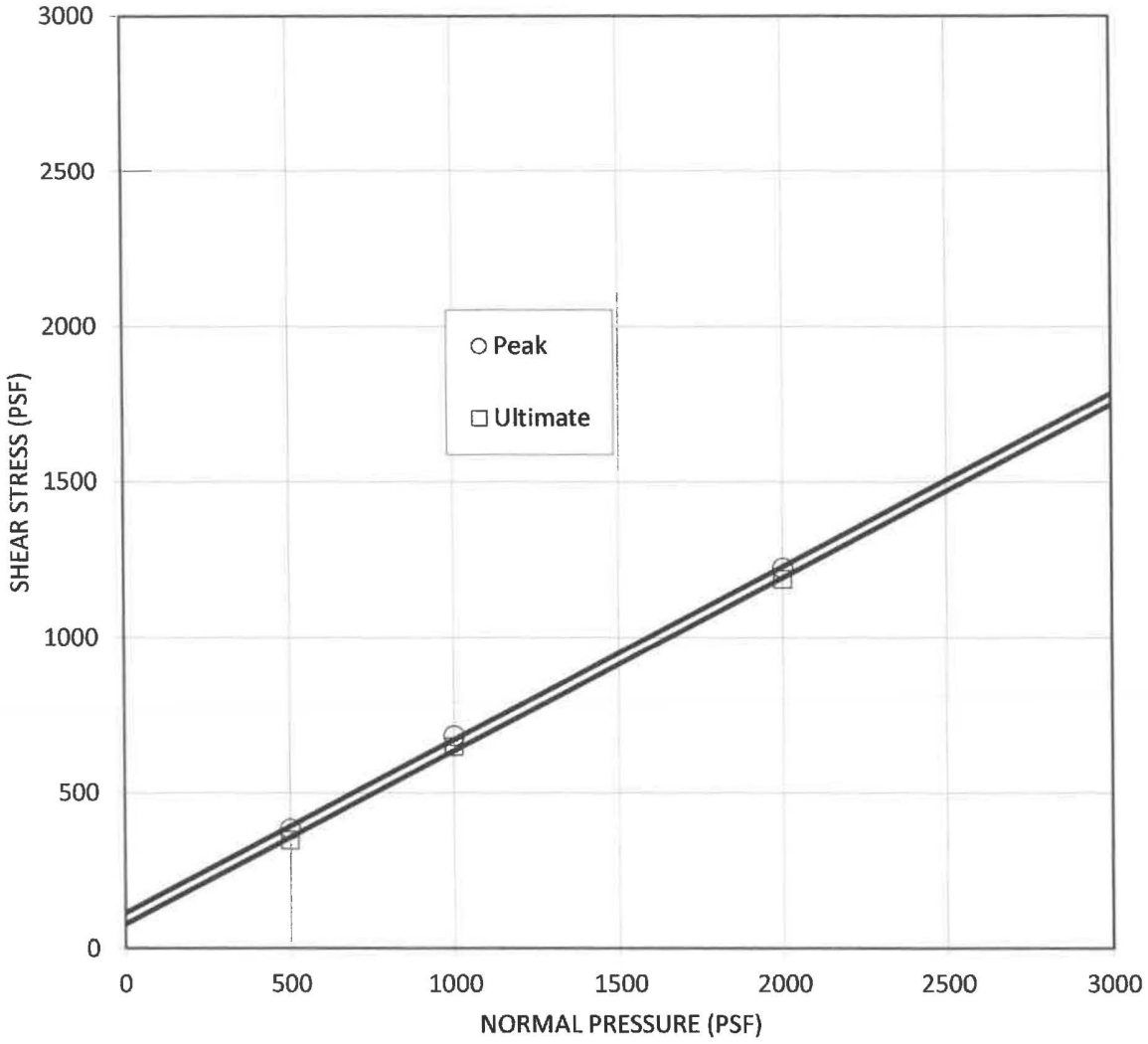
The Expansion Index was determined for the typical site material encountered in the borings. The laboratory standard used was ASTM D4829-95 and the test results are as follows:

Sample Location	Expansion Index	UBC Classification
B-5 @ 0-5'	94	High

Percent Passing #200 Sieve

Percent of soil passing #200 sieve were determined for selected soil samples in accordance with ASTM D422 and California Test Method CT-203 standard. The test results are presented in the following table.

Sample Location	% Passing #200
B-1 @ 3'	12.1
B-1 @ 6'	8.9
B-1 @ 11'	18.1
B-1 @ 19'	11.3
B-1 @ 21'	6.7
B-1 @ 26'	19.1
B-1 @ 31'	9.0
B-1 @ 36'	58.8 (top) 42.5 (bottom)
B-1 @ 41'	6.4
B-1 @ 46'	7.3
B-1 @ 51'	4.2



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-1	3	10.0	Ring	SM	○	114	29
					□	78	29

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
500	2.6	20.9	106.2	96.4
1000	2.6	20.3	106.7	94.9
2000	2.6	20.1	107.0	94.4

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

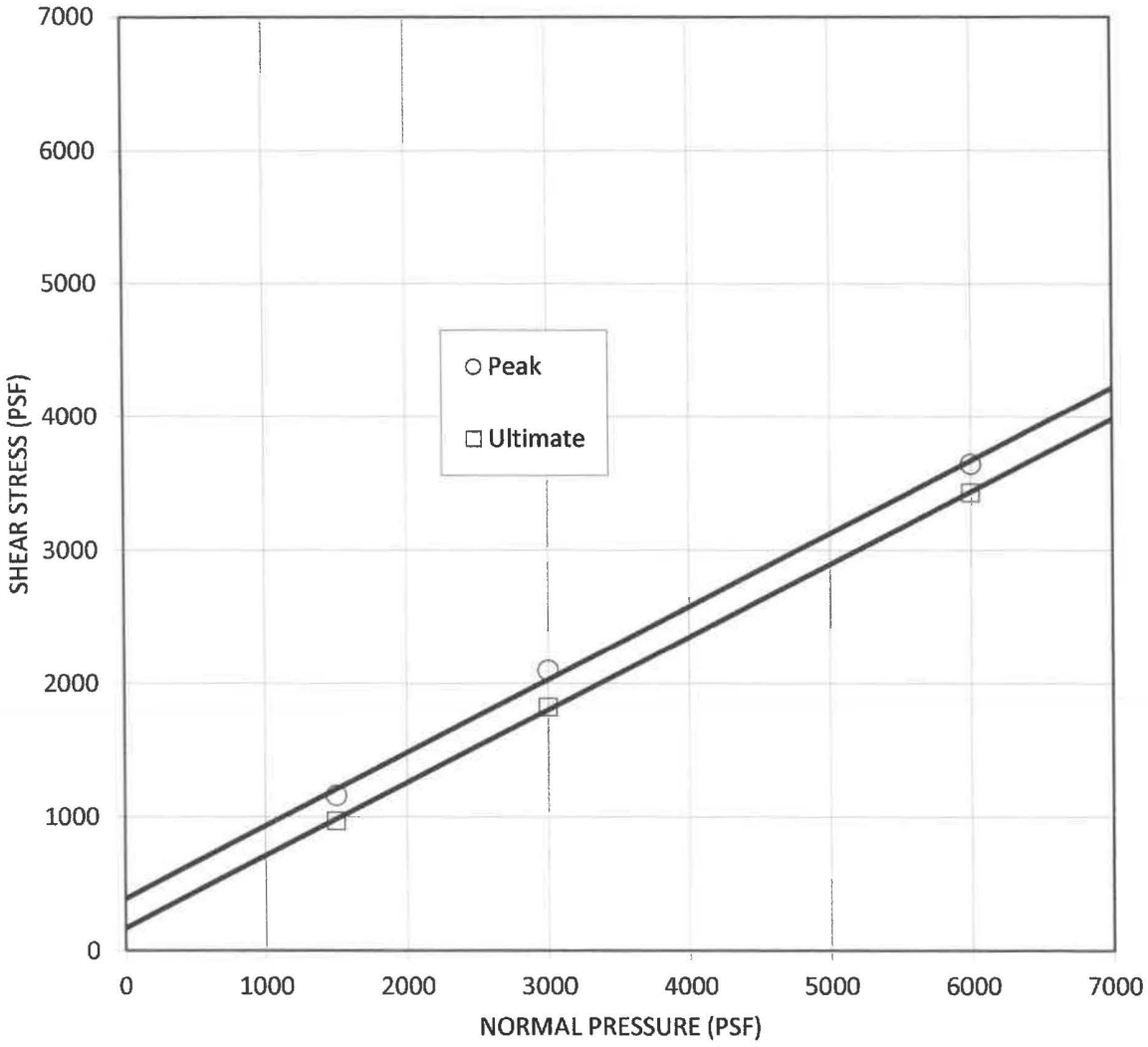
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DIRECT SHEAR

10/22 (ASTM D3080) Figure

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Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-1	6	25.0	Ring	SM	○	389	29
					□	168	29

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
1500	8.1	22.6	104.7	100.0
3000	8.1	22.3	105.1	100.0
6000	8.1	21.8	106.0	100.0

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

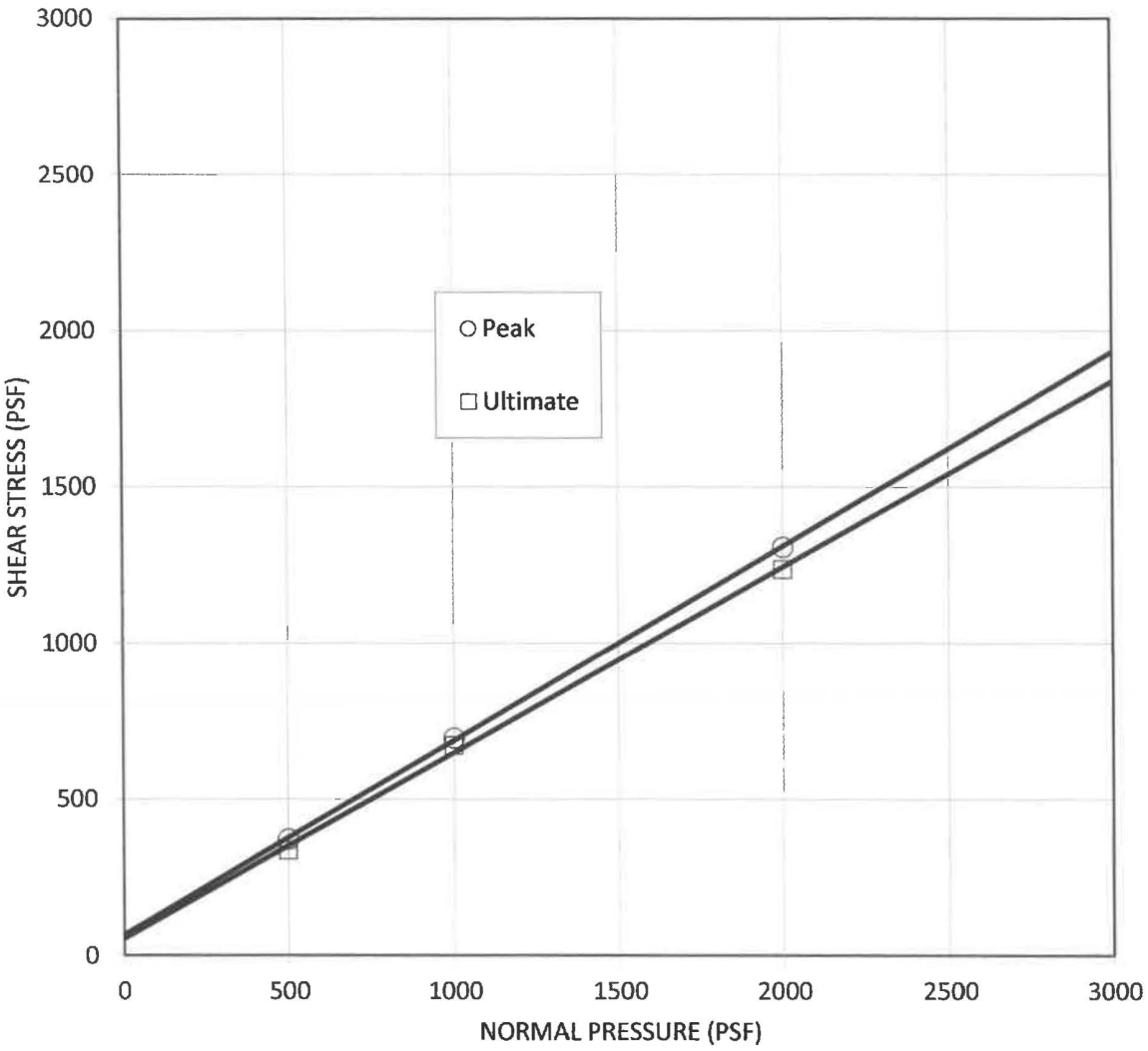
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DIRECT SHEAR

11/22 (ASTM D3080) Figure

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Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-2	2	5.0	Ring	SM	○	66	32
					□	54	31

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
500	3.2	19.6	107.9	94.4
1000	3.2	19.5	108.3	94.9
2000	3.2	19.3	108.7	94.7

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

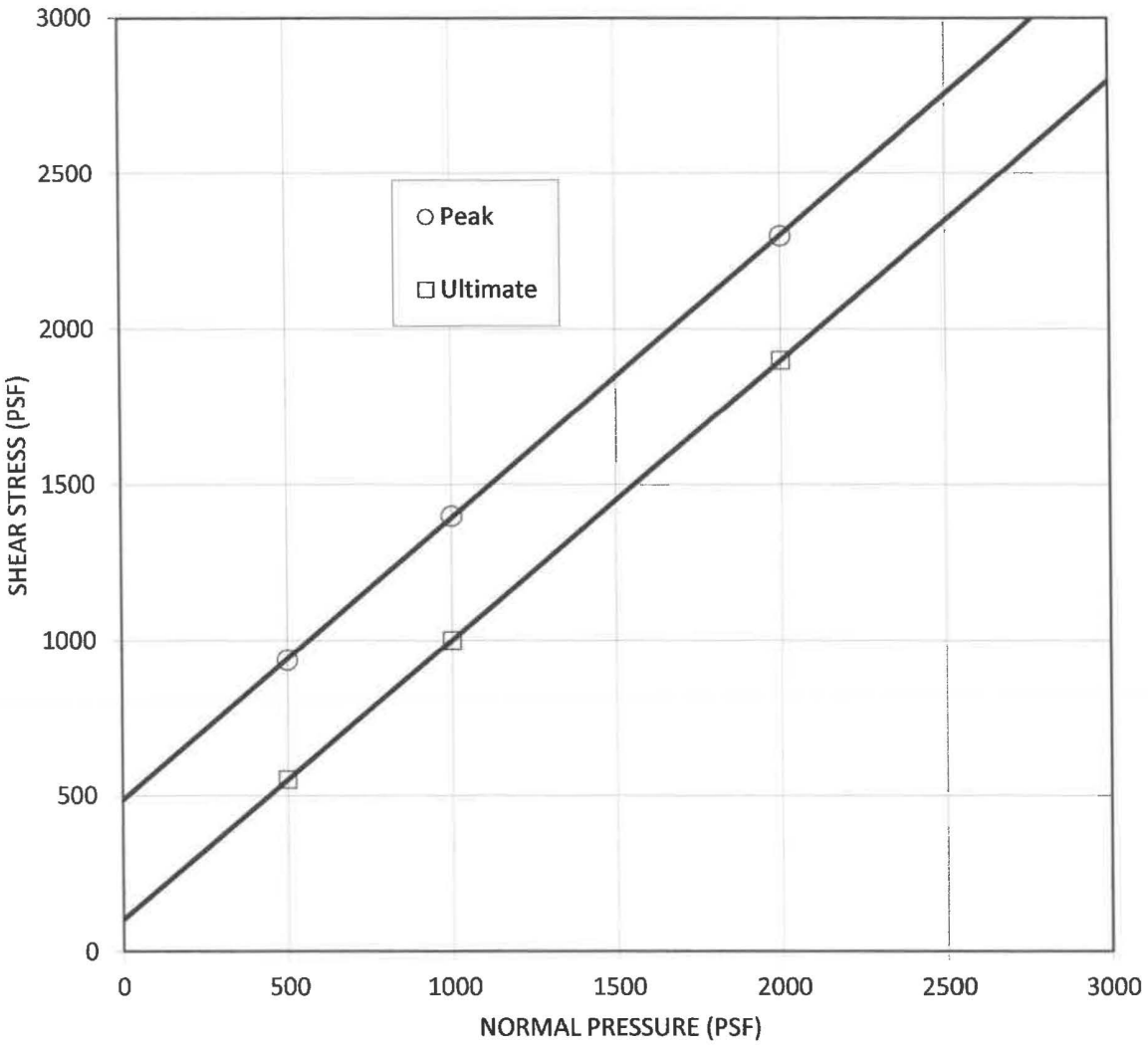
EGL Project No.: 22-257-004L

Address: 2240 Fleetwood Drive Jurupa Valley, California

DIRECT SHEAR

10/22 (ASTM D3080) Figure

11819 Goldring Road, Unit A, Arcadia, California 91006; Phone (626) 263-3588; Fax (626) 263-3599



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-6	1	2.0	Ring	SM	○	486	42
					□	102	42

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)	γ_d (pcf)	S (%)
500	13.1	35.4	94.2	100.0
1000	13.1	32.5	96.5	100.0
2000	13.1	27.7	97.6	100.0

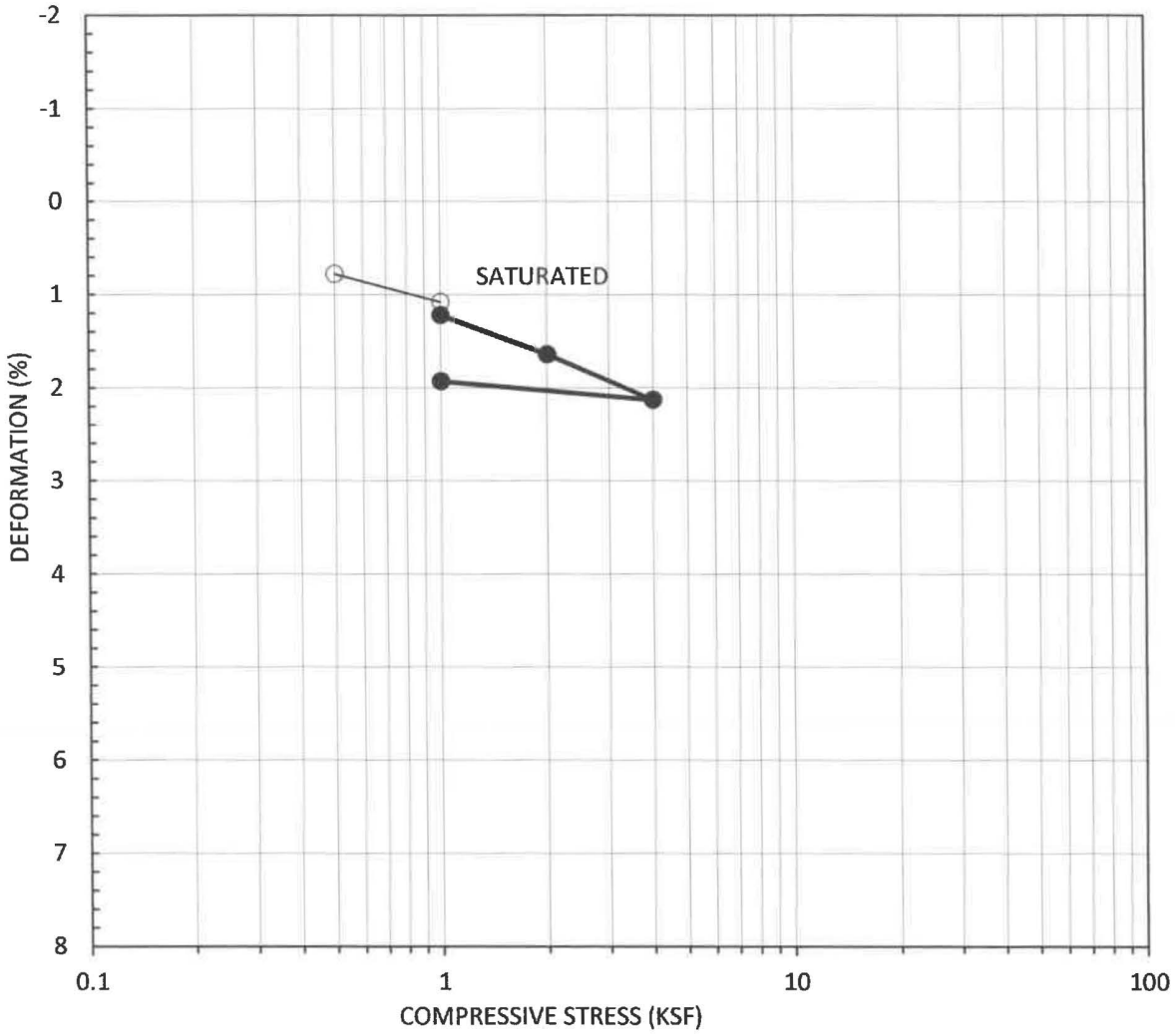
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Jurupa Valley, California

DIRECT SHEAR

10/22 (ASTM D3080) Figure

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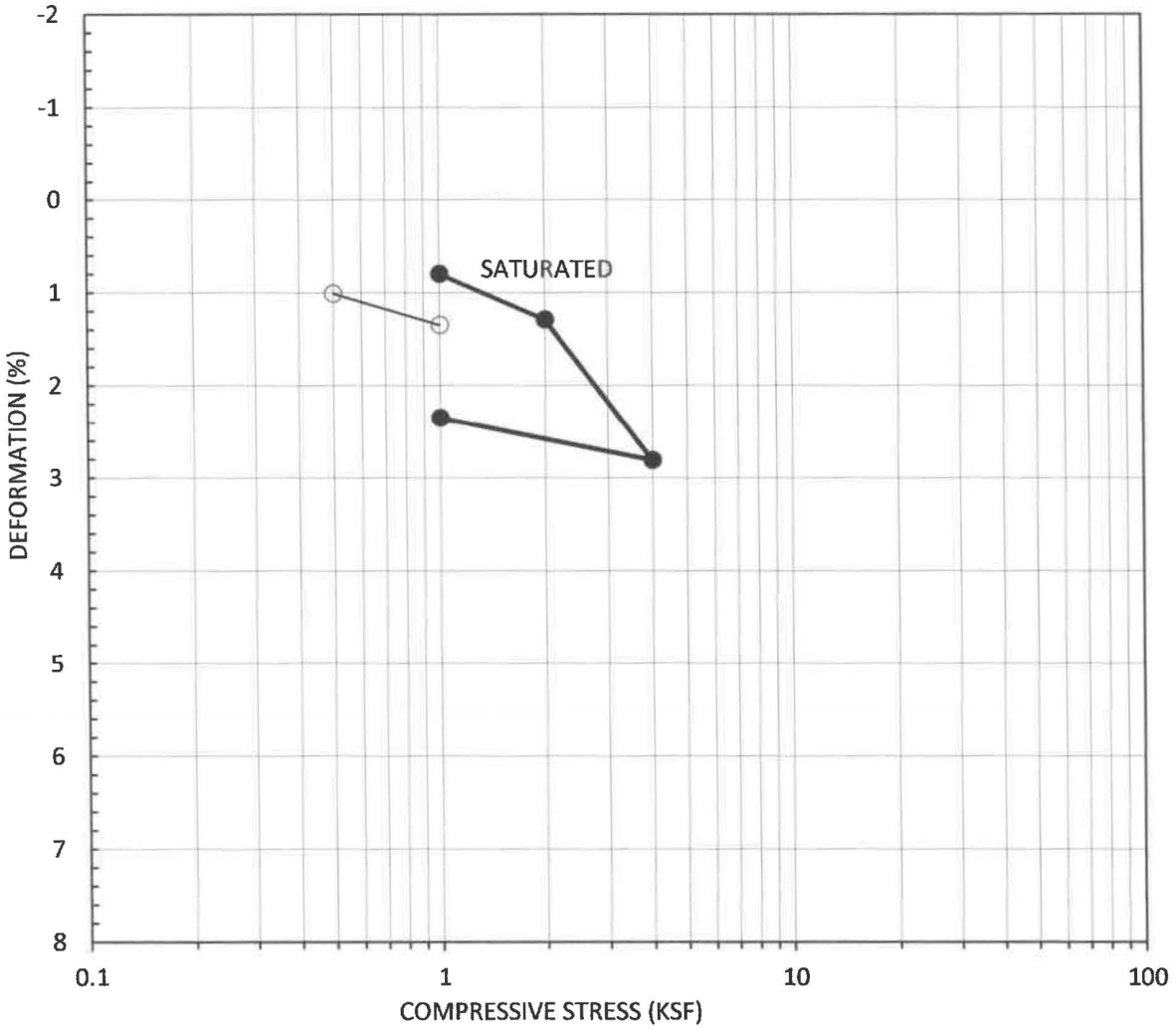
Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-1	2	5.0	SP-SM	2.5	102.6	0.642

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Project Address:
2240 Fleeetwood Drive
Jurupa Valley, California

CONSOLIDATION

10/22 (ASTM D2435) Figure



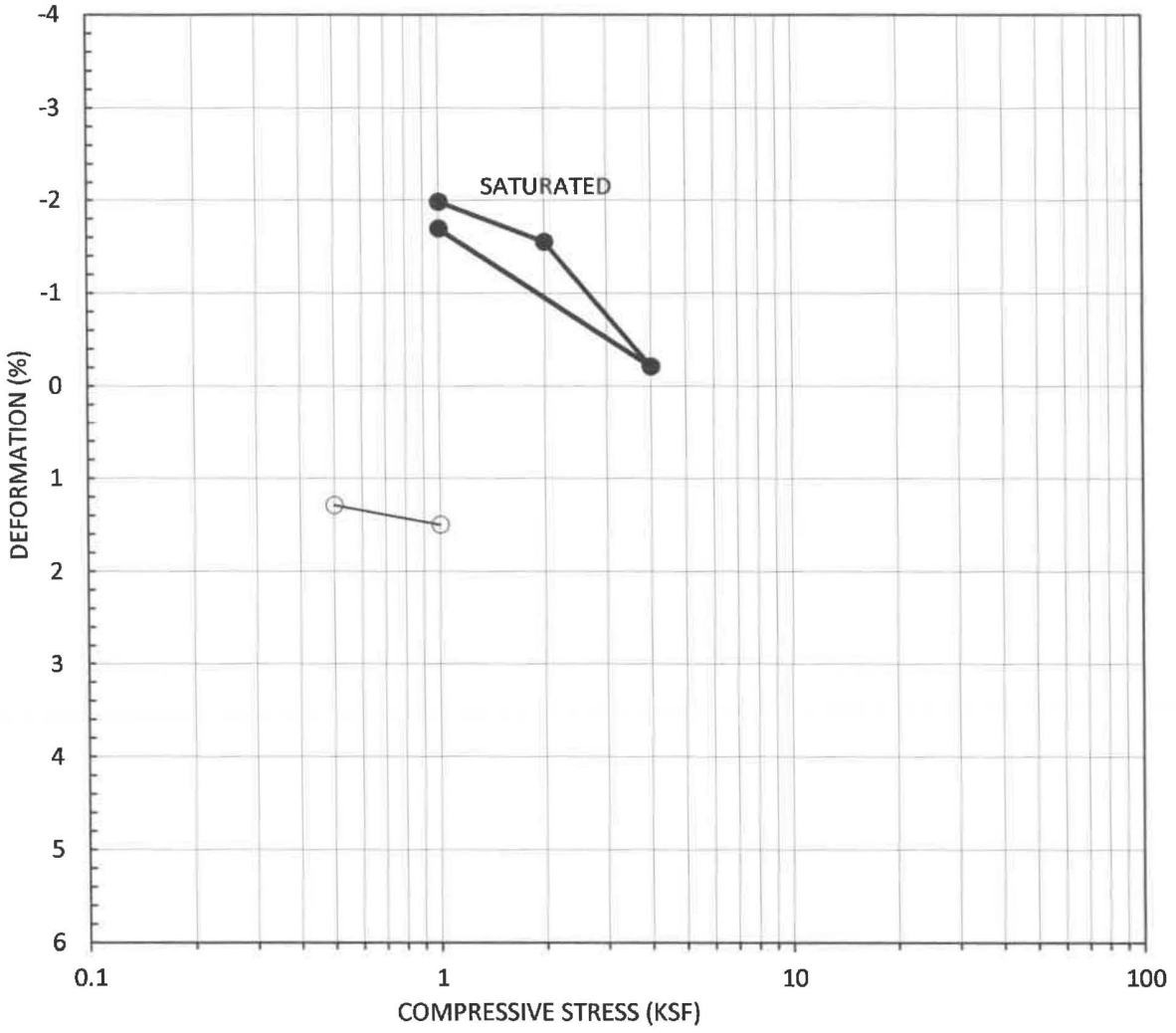
Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-4	1	2.0	CL	6.0	105.6	0.595

ENVIRONMENTAL
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CONSOLIDATION

10/22 (ASTM D2435) Figure



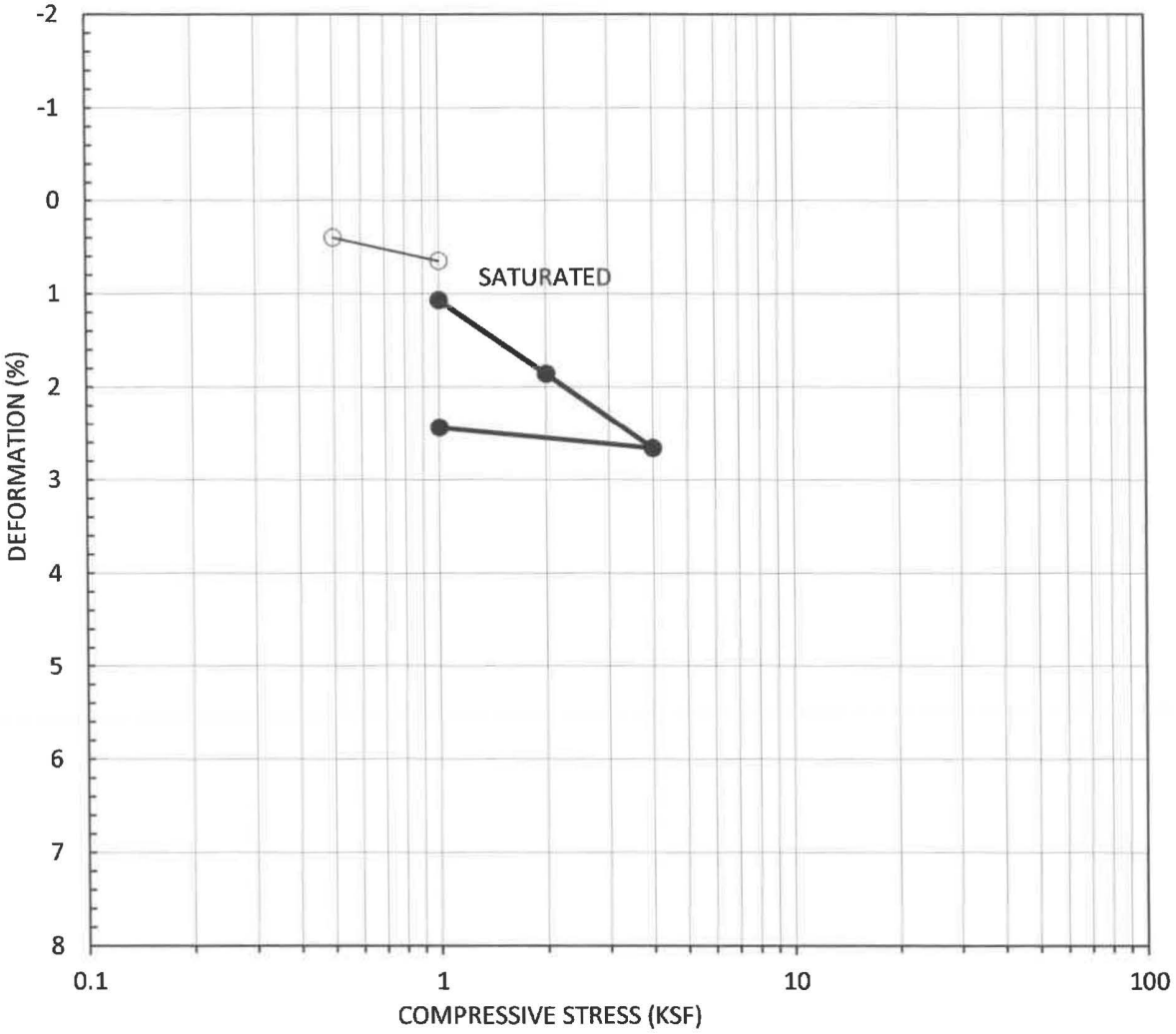
Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-6	3	10.0	CL	21.3	100.6	0.675

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Jurupa Valley, California

CONSOLIDATION

10/22 (ASTM D2435) Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density	Init. Void Ratio
○	B-7	1	5.0	SM	3.3	120.0	0.404

ENVIRONMENTAL
GEOTECHNOLOGY
LABORATORY

Project Address:
2240 Fleeetwood Drive
Jurupa Valley, California

CONSOLIDATION

10/22 (ASTM D2435) Figure

APPENDIX C

LIQUEFACTION INDUCED SETTLEMENT AND ANALYSIS

References:

1. "Evaluation of Settlement in Sands Due to Earthquake Shaking", Seed, et. al., ASCE Journal of Geotechnical Engineering, Page 861 – 878, Vol. 113, No. 8, August 1987
2. Civil Tech, (2012), "Liquefy Pro", Version 5.8n with USB key.

Settlement Due to Liquefaction

(Calculations shown on following sheets)

Boring B-1:

Saturated Settlement = 0 inches

Dry Sand Settlement: = 0.63 inches

Total Settlement: 0 +0.63 = 0.63 inches

Differential Settlement: 50% x total settlement: = 0.50 x 0.63 = 0.315 inches

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      "ssdPercentileFactor": 1
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U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Input

Edition

Dynamic: Conterminous U.S. 2014 (u…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

34.016

Time Horizon

Return period in years

2475

Longitude

Decimal degrees, negative values for western longitudes

-117.375

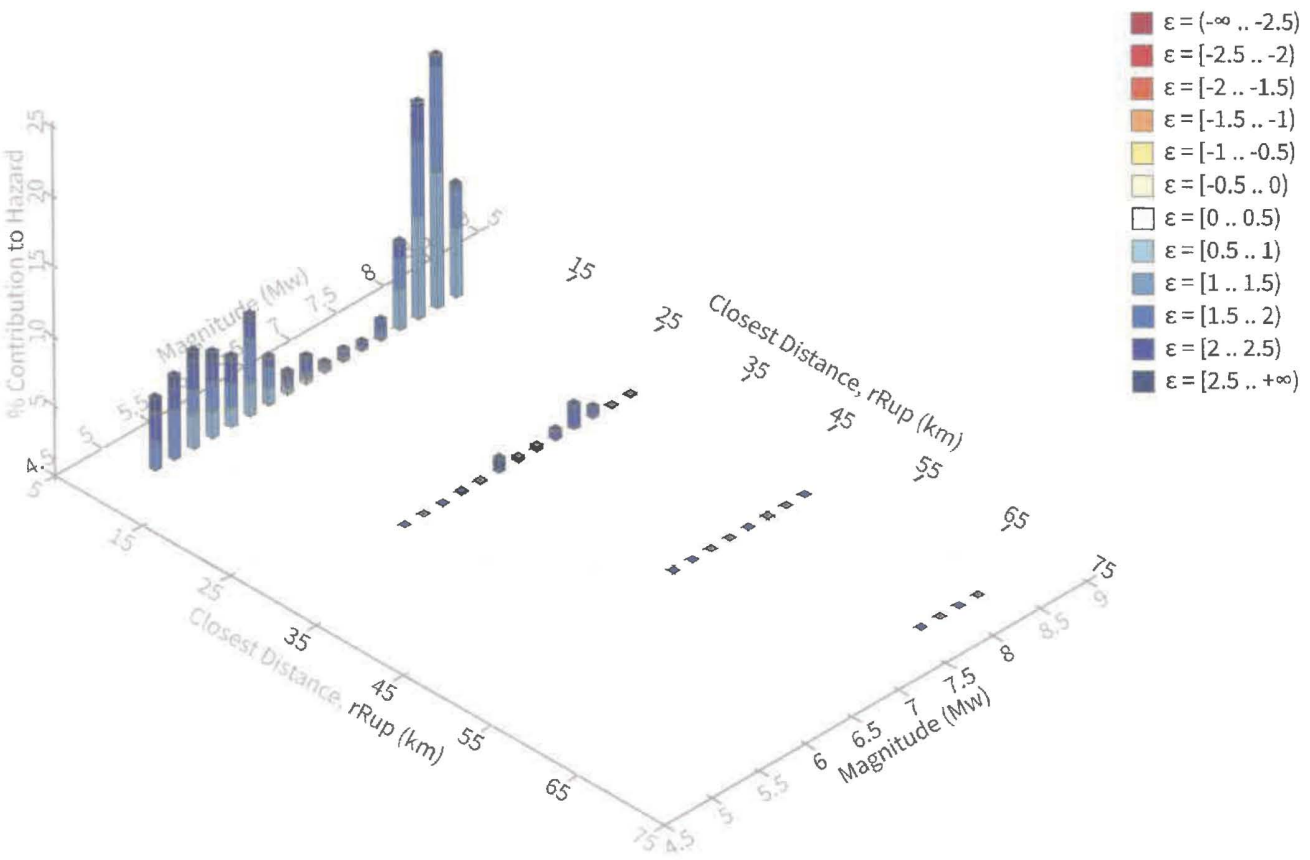
Site Class

259 m/s (Site class D)

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.85942265 g

Recovered targets

Return period: 3219.5924 yrs
Exceedance rate: 0.00031059832 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.05 %

Mean (over all sources)

m: 6.98
r: 11.45 km
ε₀: 1.75 σ

Mode (largest m-r bin)

m: 8.1
r: 12.55 km
ε₀: 1.51 σ
Contribution: 18.12 %

Mode (largest m-r-ε₀ bin)

m: 8.1
r: 9.75 km
ε₀: 1.27 σ
Contribution: 9.64 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

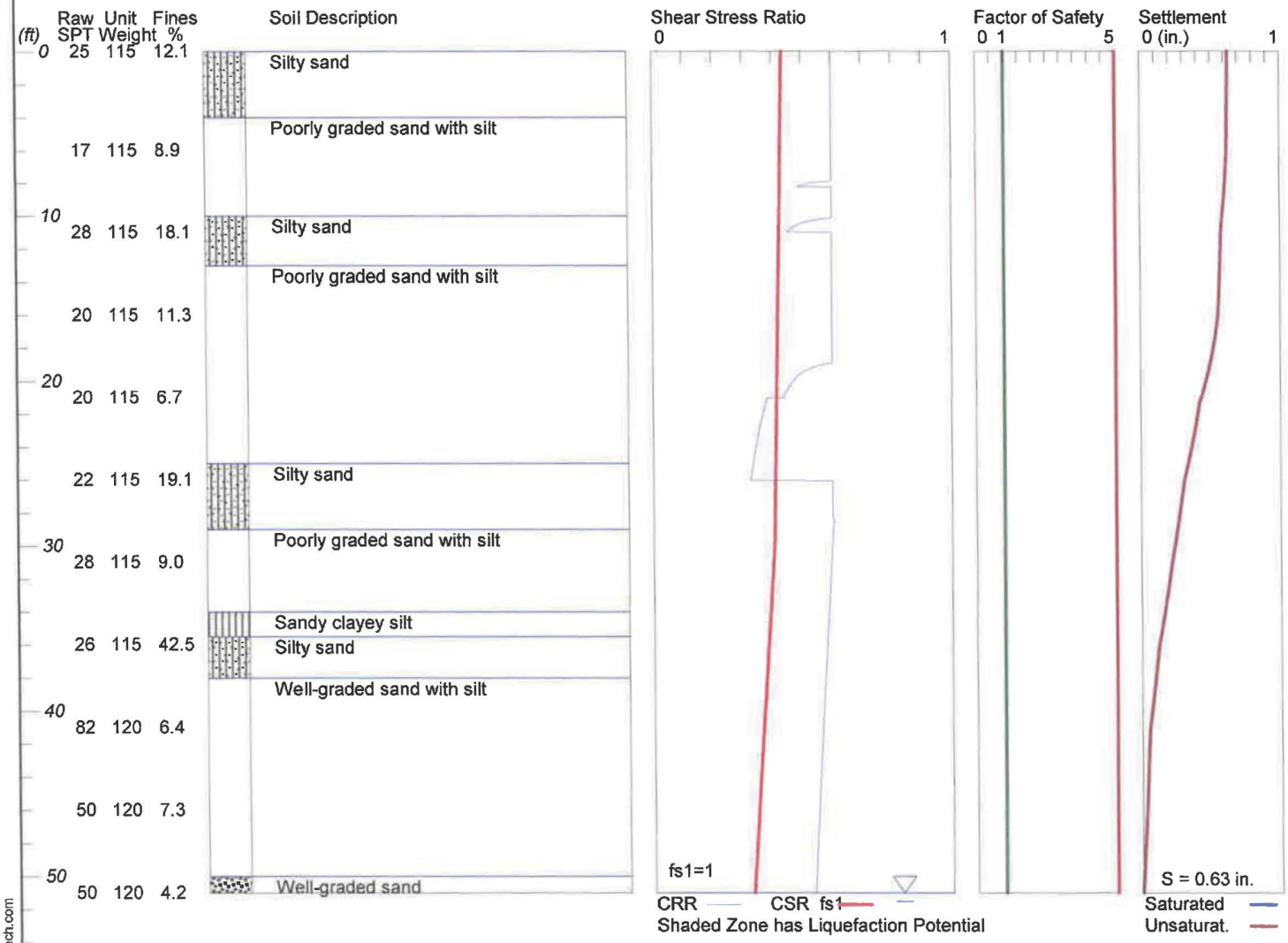
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UC33brAvg_FM31	System							28.64
San Jacinto (San Bernardino) [3]		9.73	8.03	1.40	117.296°W	34.074°N	48.59	16.50
San Andreas (San Bernardino N) [5]		19.79	7.88	1.98	117.269°W	34.171°N	29.51	6.14
San Andreas (North Branch Mill Creek) [0]		19.24	8.01	1.77	117.270°W	34.171°N	29.12	1.49
UC33brAvg_FM32	System							28.57
San Jacinto (San Bernardino) [3]		9.73	8.02	1.40	117.296°W	34.074°N	48.59	16.43
San Andreas (San Bernardino N) [5]		19.79	7.88	1.98	117.269°W	34.171°N	29.51	6.19
San Andreas (North Branch Mill Creek) [0]		19.24	8.01	1.77	117.270°W	34.171°N	29.12	1.55
UC33brAvg_FM31 (opt)	Grid							21.40
PointSourceFinite: -117.375, 34.038		5.66	5.66	1.58	117.375°W	34.038°N	0.00	5.35
PointSourceFinite: -117.375, 34.038		5.66	5.66	1.58	117.375°W	34.038°N	0.00	5.35
PointSourceFinite: -117.375, 34.083		8.70	5.73	2.02	117.375°W	34.083°N	0.00	2.62
PointSourceFinite: -117.375, 34.083		8.70	5.73	2.02	117.375°W	34.083°N	0.00	2.62
PointSourceFinite: -117.375, 34.101		10.24	5.75	2.21	117.375°W	34.101°N	0.00	1.05
PointSourceFinite: -117.375, 34.101		10.24	5.75	2.21	117.375°W	34.101°N	0.00	1.05
UC33brAvg_FM32 (opt)	Grid							21.38
PointSourceFinite: -117.375, 34.038		5.66	5.66	1.58	117.375°W	34.038°N	0.00	5.35
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PointSourceFinite: -117.375, 34.083		8.70	5.73	2.02	117.375°W	34.083°N	0.00	2.62
PointSourceFinite: -117.375, 34.083		8.70	5.73	2.02	117.375°W	34.083°N	0.00	2.62
PointSourceFinite: -117.375, 34.101		10.24	5.75	2.21	117.375°W	34.101°N	0.00	1.05
PointSourceFinite: -117.375, 34.101		10.24	5.75	2.21	117.375°W	34.101°N	0.00	1.05

LIQUEFACTION ANALYSIS

2240 Fleetwood Drive, Jurupa Valley

Hole No.=B-1 Water Depth=51 ft

Magnitude=6.98
Acceleration=0.668g



LiquefyPro CivilTech Software USA www.civiltech.com

****

LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Font: Courier New, Regular, Size 8 is recommended for this report.

Licensed to , 10/27/2022 3:41:45 PM

Input File Name: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\data & figs\22257004L.liq

Title: 2240 Fleetwood Drive, Jurupa Valley

Subtitle:

Input Data:

Surface Elev.=

Hole No.=B-1

Depth of Hole=51.00 ft

Water Table during Earthquake= 51.00 ft

Water Table during In-Situ Testing= 51.00 ft

Max. Acceleration=0.67 g

Earthquake Magnitude=6.98

No-Liquefiable Soils: Based on Analysis

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.3
7. Borehole Diameter, Cb= 1.15
8. Sampling Method, Cs= 1
9. User request factor of safety (apply to CSR) , User= 1.3
   Plot one CSR curve (fs1=1)
10. Average two input data between two Depths: No

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	25.00	115.00	12.10
6.00	17.00	115.00	8.90
11.00	28.00	115.00	18.10
16.00	20.00	115.00	11.30
21.00	20.00	115.00	6.70
26.00	22.00	115.00	19.10
31.00	28.00	115.00	9.00
36.00	26.00	115.00	42.50
41.00	82.00	120.00	6.40
46.00	50.00	120.00	7.30
51.00	50.00	120.00	4.20

Output Results:

Calculation segment, dz=0.050 ft

User defined Print Interval, dp=1.00 ft

Peak Ground Acceleration (PGA), a_max = 0.67g

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x fs1	=CSRfs
0.00	115.00	0.000	115.00	0.000	1.00	0.000	0.668	0.43	1.00	0.43
1.00	115.00	0.054	115.00	0.054	1.00	0.000	0.668	0.43	1.00	0.43

2.00	115.00	0.109	115.00	0.109	1.00	0.000	0.668	0.43	1.00	0.43
3.00	115.00	0.163	115.00	0.163	0.99	0.000	0.668	0.43	1.00	0.43
4.00	115.00	0.217	115.00	0.217	0.99	0.000	0.668	0.43	1.00	0.43
5.00	115.00	0.272	115.00	0.272	0.99	0.000	0.668	0.43	1.00	0.43
6.00	115.00	0.326	115.00	0.326	0.99	0.000	0.668	0.43	1.00	0.43
7.00	115.00	0.380	115.00	0.380	0.98	0.000	0.668	0.43	1.00	0.43
8.00	115.00	0.435	115.00	0.435	0.98	0.000	0.668	0.43	1.00	0.43
9.00	115.00	0.489	115.00	0.489	0.98	0.000	0.668	0.43	1.00	0.43
10.00	115.00	0.543	115.00	0.543	0.98	0.000	0.668	0.42	1.00	0.42
11.00	115.00	0.598	115.00	0.598	0.97	0.000	0.668	0.42	1.00	0.42
12.00	115.00	0.652	115.00	0.652	0.97	0.000	0.668	0.42	1.00	0.42
13.00	115.00	0.706	115.00	0.706	0.97	0.000	0.668	0.42	1.00	0.42
14.00	115.00	0.761	115.00	0.761	0.97	0.000	0.668	0.42	1.00	0.42
15.00	115.00	0.815	115.00	0.815	0.97	0.000	0.668	0.42	1.00	0.42
16.00	115.00	0.869	115.00	0.869	0.96	0.000	0.668	0.42	1.00	0.42
17.00	115.00	0.924	115.00	0.924	0.96	0.000	0.668	0.42	1.00	0.42
18.00	115.00	0.978	115.00	0.978	0.96	0.000	0.668	0.42	1.00	0.42
19.00	115.00	1.033	115.00	1.033	0.96	0.000	0.668	0.41	1.00	0.41
20.00	115.00	1.087	115.00	1.087	0.95	0.000	0.668	0.41	1.00	0.41
21.00	115.00	1.141	115.00	1.141	0.95	0.000	0.668	0.41	1.00	0.41
22.00	115.00	1.196	115.00	1.196	0.95	0.000	0.668	0.41	1.00	0.41
23.00	115.00	1.250	115.00	1.250	0.95	0.000	0.668	0.41	1.00	0.41
24.00	115.00	1.304	115.00	1.304	0.94	0.000	0.668	0.41	1.00	0.41
25.00	115.00	1.359	115.00	1.359	0.94	0.000	0.668	0.41	1.00	0.41
26.00	115.00	1.413	115.00	1.413	0.94	0.000	0.668	0.41	1.00	0.41
27.00	115.00	1.467	115.00	1.467	0.94	0.000	0.668	0.41	1.00	0.41
28.00	115.00	1.522	115.00	1.522	0.93	0.000	0.668	0.41	1.00	0.41
29.00	115.00	1.576	115.00	1.576	0.93	0.000	0.668	0.40	1.00	0.40
30.00	115.00	1.630	115.00	1.630	0.93	0.000	0.668	0.40	1.00	0.40
31.00	115.00	1.685	115.00	1.685	0.92	0.000	0.668	0.40	1.00	0.40
32.00	115.00	1.739	115.00	1.739	0.91	0.000	0.668	0.40	1.00	0.40
33.00	115.00	1.793	115.00	1.793	0.91	0.000	0.668	0.39	1.00	0.39
34.00	115.00	1.848	115.00	1.848	0.90	0.000	0.668	0.39	1.00	0.39
35.00	115.00	1.902	115.00	1.902	0.89	0.000	0.668	0.39	1.00	0.39
36.00	115.00	1.956	115.00	1.956	0.88	0.000	0.668	0.38	1.00	0.38
37.00	115.00	2.011	115.00	2.011	0.87	0.000	0.668	0.38	1.00	0.38
38.00	115.00	2.065	115.00	2.065	0.86	0.000	0.668	0.38	1.00	0.38
39.00	115.00	2.119	115.00	2.119	0.86	0.000	0.668	0.37	1.00	0.37
40.00	115.00	2.174	115.00	2.174	0.85	0.000	0.668	0.37	1.00	0.37
41.00	115.00	2.228	115.00	2.228	0.84	0.000	0.668	0.36	1.00	0.36
42.00	120.00	2.285	120.00	2.285	0.83	0.000	0.668	0.36	1.00	0.36
43.00	120.00	2.341	120.00	2.341	0.82	0.000	0.668	0.36	1.00	0.36
44.00	120.00	2.398	120.00	2.398	0.82	0.000	0.668	0.35	1.00	0.35
45.00	120.00	2.455	120.00	2.455	0.81	0.000	0.668	0.35	1.00	0.35
46.00	120.00	2.511	120.00	2.511	0.80	0.000	0.668	0.35	1.00	0.35
47.00	120.00	2.568	120.00	2.568	0.79	0.000	0.668	0.34	1.00	0.34
48.00	120.00	2.625	120.00	2.625	0.78	0.000	0.668	0.34	1.00	0.34
49.00	120.00	2.682	120.00	2.682	0.78	0.000	0.668	0.34	1.00	0.34
50.00	120.00	2.738	120.00	2.738	0.77	0.000	0.668	0.33	1.00	0.33
51.00	120.00	2.795	120.00	2.795	0.76	0.000	0.668	0.33	1.00	0.33

CSR is based on water table at 51.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	25.00	1.49	0.75	0.000	1.70	47.65	12.10	3.12	50.77	0.50
1.00	25.00	1.49	0.75	0.054	1.70	47.65	12.10	3.12	50.77	0.50
2.00	25.00	1.49	0.75	0.109	1.70	47.65	12.10	3.12	50.77	0.50
3.00	25.00	1.49	0.75	0.163	1.70	47.65	12.10	3.12	50.77	0.50
4.00	25.00	1.49	0.75	0.217	1.70	47.65	12.10	3.12	50.77	0.50
5.00	25.00	1.49	0.75	0.272	1.70	47.65	12.10	3.12	50.77	0.50
6.00	17.00	1.49	0.75	0.326	1.70	32.40	8.90	1.06	33.47	0.50

7.00	17.00	1.49	0.75	0.380	1.62	30.90	8.90	1.04	31.94	0.50
8.00	17.00	1.49	0.75	0.435	1.52	28.91	8.90	1.01	29.92	0.44
9.00	17.00	1.49	0.85	0.489	1.43	30.89	8.90	1.04	31.93	0.50
10.00	17.00	1.49	0.85	0.543	1.36	29.30	8.90	1.01	30.32	0.50
11.00	28.00	1.49	0.85	0.598	1.29	46.02	18.10	6.34	52.36	0.50
12.00	28.00	1.49	0.85	0.652	1.24	44.06	18.10	6.21	50.27	0.50
13.00	28.00	1.49	0.85	0.706	1.19	42.33	18.10	6.09	48.42	0.50
14.00	28.00	1.49	0.85	0.761	1.15	40.79	18.10	5.99	46.78	0.50
15.00	28.00	1.49	0.95	0.815	1.11	44.05	18.10	6.21	50.25	0.50
16.00	20.00	1.49	0.95	0.869	1.07	30.46	11.30	2.17	32.63	0.50
17.00	20.00	1.49	0.95	0.924	1.04	29.55	11.30	2.14	31.69	0.50
18.00	20.00	1.49	0.95	0.978	1.01	28.72	11.30	2.12	30.84	0.50
19.00	20.00	1.49	0.95	1.033	0.98	27.95	11.30	2.09	30.05	0.47
20.00	20.00	1.49	0.95	1.087	0.96	27.25	11.30	2.08	29.32	0.39
21.00	20.00	1.49	0.95	1.141	0.94	26.59	11.30	2.06	28.65	0.36
22.00	20.00	1.49	0.95	1.196	0.91	25.98	6.70	0.28	26.25	0.30
23.00	20.00	1.49	0.95	1.250	0.89	25.41	6.70	0.27	25.68	0.29
24.00	20.00	1.49	0.95	1.304	0.88	24.87	6.70	0.27	25.14	0.28
25.00	20.00	1.49	0.95	1.359	0.86	24.37	6.70	0.26	24.63	0.28
26.00	20.00	1.49	0.95	1.413	0.84	23.90	6.70	0.26	24.16	0.27
27.00	22.00	1.49	0.95	1.467	0.83	25.79	19.10	5.35	31.14	0.50
28.00	22.00	1.49	1.00	1.522	0.81	26.66	19.10	5.41	32.08	0.50
29.00	22.00	1.49	1.00	1.576	0.80	26.20	19.10	5.38	31.58	0.50
30.00	22.00	1.49	1.00	1.630	0.78	25.76	19.10	5.35	31.10	0.50
31.00	22.00	1.49	1.00	1.685	0.77	25.34	19.10	5.31	30.65	0.50
32.00	28.00	1.49	1.00	1.739	0.76	31.74	9.00	1.10	32.84	0.50
33.00	28.00	1.49	1.00	1.793	0.75	31.26	9.00	1.09	32.35	0.50
34.00	28.00	1.49	1.00	1.848	0.74	30.80	9.00	1.08	31.88	0.50
35.00	28.00	1.49	1.00	1.902	0.73	30.35	9.00	1.07	31.43	0.50
36.00	28.00	1.49	1.00	1.956	0.71	29.93	9.00	1.07	30.99	0.50
37.00	26.00	1.49	1.00	2.011	0.71	27.41	42.50	10.48	37.89	0.50
38.00	26.00	1.49	1.00	2.065	0.70	27.05	42.50	10.41	37.46	0.50
39.00	26.00	1.49	1.00	2.119	0.69	26.70	42.50	10.34	37.04	0.50
40.00	26.00	1.49	1.00	2.174	0.68	26.36	42.50	10.27	36.64	0.50
41.00	26.00	1.49	1.00	2.228	0.67	26.04	42.50	10.21	36.25	0.50
42.00	82.00	1.49	1.00	2.285	0.66	81.10	6.40	0.56	81.66	0.50
43.00	82.00	1.49	1.00	2.341	0.65	80.12	6.40	0.55	80.67	0.50
44.00	82.00	1.49	1.00	2.398	0.65	79.16	6.40	0.55	79.71	0.50
45.00	82.00	1.49	1.00	2.455	0.64	78.24	6.40	0.54	78.78	0.50
46.00	82.00	1.49	1.00	2.511	0.63	77.36	6.40	0.54	77.89	0.50
47.00	50.00	1.49	1.00	2.568	0.62	46.64	7.30	0.62	47.26	0.50
48.00	50.00	1.49	1.00	2.625	0.62	46.14	7.30	0.61	46.75	0.50
49.00	50.00	1.49	1.00	2.682	0.61	45.65	7.30	0.61	46.26	0.50
50.00	50.00	1.49	1.00	2.738	0.60	45.17	7.30	0.60	45.78	0.50
51.00	50.00	1.49	1.00	2.795	0.60	44.71	7.30	0.60	45.31	0.50

CRR is based on water table at 51.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 6.98:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	0.50	1.00	0.50	1.20	0.60	0.43	5.00
1.00	0.04	0.50	1.00	0.50	1.20	0.60	0.43	5.00
2.00	0.07	0.50	1.00	0.50	1.20	0.60	0.43	5.00
3.00	0.11	0.50	1.00	0.50	1.20	0.60	0.43	5.00
4.00	0.14	0.50	1.00	0.50	1.20	0.60	0.43	5.00
5.00	0.18	0.50	1.00	0.50	1.20	0.60	0.43	5.00
6.00	0.21	0.50	1.00	0.50	1.20	0.60	0.43	5.00
7.00	0.25	0.50	1.00	0.50	1.20	0.60	0.43	5.00
8.00	0.28	0.44	1.00	0.44	1.20	0.53	0.43	5.00
9.00	0.32	0.50	1.00	0.50	1.20	0.60	0.43	5.00
10.00	0.35	0.50	1.00	0.50	1.20	0.60	0.42	5.00
11.00	0.39	0.50	1.00	0.50	1.20	0.60	0.42	5.00

12.00	0.42	0.50	1.00	0.50	1.20	0.60	0.42	5.00
13.00	0.46	0.50	1.00	0.50	1.20	0.60	0.42	5.00
14.00	0.49	0.50	1.00	0.50	1.20	0.60	0.42	5.00
15.00	0.53	0.50	1.00	0.50	1.20	0.60	0.42	5.00
16.00	0.57	0.50	1.00	0.50	1.20	0.60	0.42	5.00
17.00	0.60	0.50	1.00	0.50	1.20	0.60	0.42	5.00
18.00	0.64	0.50	1.00	0.50	1.20	0.60	0.42	5.00
19.00	0.67	0.47	1.00	0.47	1.20	0.57	0.41	5.00
20.00	0.71	0.39	1.00	0.39	1.20	0.47	0.41	5.00
21.00	0.74	0.36	1.00	0.36	1.20	0.43	0.41	5.00
22.00	0.78	0.30	1.00	0.30	1.20	0.37	0.41	5.00
23.00	0.81	0.29	1.00	0.29	1.20	0.35	0.41	5.00
24.00	0.85	0.28	1.00	0.28	1.20	0.34	0.41	5.00
25.00	0.88	0.28	1.00	0.28	1.20	0.33	0.41	5.00
26.00	0.92	0.27	1.00	0.27	1.20	0.32	0.41	5.00
27.00	0.95	0.50	1.00	0.50	1.20	0.60	0.41	5.00
28.00	0.99	0.50	1.00	0.50	1.20	0.60	0.41	5.00
29.00	1.02	0.50	1.00	0.50	1.20	0.60	0.40	5.00
30.00	1.06	0.50	1.00	0.50	1.20	0.60	0.40	5.00
31.00	1.10	0.50	0.99	0.50	1.20	0.60	0.40	5.00
32.00	1.13	0.50	0.99	0.49	1.20	0.59	0.40	5.00
33.00	1.17	0.50	0.98	0.49	1.20	0.59	0.39	5.00
34.00	1.20	0.50	0.98	0.49	1.20	0.59	0.39	5.00
35.00	1.24	0.50	0.97	0.48	1.20	0.58	0.39	5.00
36.00	1.27	0.50	0.96	0.48	1.20	0.58	0.38	5.00
37.00	1.31	0.50	0.96	0.48	1.20	0.58	0.38	5.00
38.00	1.34	0.50	0.95	0.48	1.20	0.57	0.38	5.00
39.00	1.38	0.50	0.95	0.47	1.20	0.57	0.37	5.00
40.00	1.41	0.50	0.94	0.47	1.20	0.57	0.37	5.00
41.00	1.45	0.50	0.94	0.47	1.20	0.56	0.36	5.00
42.00	1.49	0.50	0.93	0.47	1.20	0.56	0.36	5.00
43.00	1.52	0.50	0.93	0.46	1.20	0.56	0.36	5.00
44.00	1.56	0.50	0.93	0.46	1.20	0.56	0.35	5.00
45.00	1.60	0.50	0.92	0.46	1.20	0.55	0.35	5.00
46.00	1.63	0.50	0.92	0.46	1.20	0.55	0.35	5.00
47.00	1.67	0.50	0.91	0.46	1.20	0.55	0.34	5.00
48.00	1.71	0.50	0.91	0.45	1.20	0.54	0.34	5.00
49.00	1.74	0.50	0.90	0.45	1.20	0.54	0.34	5.00
50.00	1.78	0.50	0.90	0.45	1.20	0.54	0.33	5.00
51.00	1.82	0.50	0.89	0.45	1.20	0.54	0.33	5.00

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	50.77	12.10	0.00	50.77
1.00	-	-	-	50.77	12.10	0.00	50.77
2.00	-	-	-	50.77	12.10	0.00	50.77
3.00	-	-	-	50.77	12.10	0.00	50.77
4.00	-	-	-	50.77	12.10	0.00	50.77
5.00	-	-	-	50.77	12.10	0.00	50.77
6.00	-	-	-	33.47	8.90	0.00	33.47
7.00	-	-	-	31.94	8.90	0.00	31.94
8.00	-	-	-	29.92	8.90	0.00	29.92
9.00	-	-	-	31.93	8.90	0.00	31.93
10.00	-	-	-	30.32	8.90	0.00	30.32
11.00	-	-	-	52.36	18.10	0.00	52.36
12.00	-	-	-	50.27	18.10	0.00	50.27

13.00	-	-	-	48.42	18.10	0.00	48.42
14.00	-	-	-	46.78	18.10	0.00	46.78
15.00	-	-	-	50.25	18.10	0.00	50.25
16.00	-	-	-	32.63	11.30	0.00	32.63
17.00	-	-	-	31.69	11.30	0.00	31.69
18.00	-	-	-	30.84	11.30	0.00	30.84
19.00	-	-	-	30.05	11.30	0.00	30.05
20.00	-	-	-	29.32	11.30	0.00	29.32
21.00	-	-	-	28.65	11.30	0.00	28.65
22.00	-	-	-	26.25	6.70	0.00	26.25
23.00	-	-	-	25.68	6.70	0.00	25.68
24.00	-	-	-	25.14	6.70	0.00	25.14
25.00	-	-	-	24.63	6.70	0.00	24.63
26.00	-	-	-	24.16	6.70	0.00	24.16
27.00	-	-	-	31.14	19.10	0.00	31.14
28.00	-	-	-	32.08	19.10	0.00	32.08
29.00	-	-	-	31.58	19.10	0.00	31.58
30.00	-	-	-	31.10	19.10	0.00	31.10
31.00	-	-	-	30.65	19.10	0.00	30.65
32.00	-	-	-	32.84	9.00	0.00	32.84
33.00	-	-	-	32.35	9.00	0.00	32.35
34.00	-	-	-	31.88	9.00	0.00	31.88
35.00	-	-	-	31.43	9.00	0.00	31.43
36.00	-	-	-	30.99	9.00	0.00	30.99
37.00	-	-	-	37.89	42.50	0.00	37.89
38.00	-	-	-	37.46	42.50	0.00	37.46
39.00	-	-	-	37.04	42.50	0.00	37.04
40.00	-	-	-	36.64	42.50	0.00	36.64
41.00	-	-	-	36.25	42.50	0.00	36.25
42.00	-	-	-	81.66	6.40	0.00	81.66
43.00	-	-	-	80.67	6.40	0.00	80.67
44.00	-	-	-	79.71	6.40	0.00	79.71
45.00	-	-	-	78.78	6.40	0.00	78.78
46.00	-	-	-	77.89	6.40	0.00	77.89
47.00	-	-	-	47.26	7.30	0.00	47.26
48.00	-	-	-	46.75	7.30	0.00	46.75
49.00	-	-	-	46.26	7.30	0.00	46.26
50.00	-	-	-	45.78	7.30	0.00	45.78
51.00	-	-	-	45.31	7.30	0.00	45.31

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.

No Settlement of Saturated Sands

Settlement of Saturated Sands=0.000 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth ft	sigma' atm	sigC' atm	(N1)60s	CSRsf	Gmax atm	g*Ge/Gm	g_eff	ec7.5 %	Cec	ec %	dsz in.	dsp in.	S in.
50.95	2.79	1.81	45.33	0.33	2145.51	4.3E-4	0.0908	0.0287	0.92	0.0265	3.18E-4	0.000	0.000
50.00	2.74	1.78	45.78	0.33	2131.59	4.3E-4	0.0903	0.0285	0.92	0.0263	3.16E-4	0.006	0.006
49.00	2.68	1.74	46.26	0.34	2116.74	4.3E-4	0.0896	0.0283	0.92	0.0262	3.14E-4	0.006	0.013

48.00	2.62	1.71	46.75	0.34	2101.68	4.2E-4	0.0889	0.0281	0.92	0.0260	3.11E-4	0.006	0.019
47.00	2.57	1.67	47.26	0.34	2086.40	4.2E-4	0.0881	0.0279	0.92	0.0257	3.09E-4	0.006	0.025
46.00	2.51	1.63	77.89	0.35	2436.69	3.6E-4	0.0634	0.0200	0.92	0.0185	2.22E-4	0.006	0.031
45.00	2.45	1.60	78.78	0.35	2418.19	3.6E-4	0.0628	0.0199	0.92	0.0183	2.20E-4	0.004	0.036
44.00	2.40	1.56	79.71	0.35	2399.41	3.5E-4	0.0622	0.0197	0.92	0.0181	2.18E-4	0.004	0.040
43.00	2.34	1.52	80.67	0.36	2380.33	3.5E-4	0.0615	0.0194	0.92	0.0180	2.15E-4	0.004	0.044
42.00	2.28	1.49	81.66	0.36	2360.94	3.5E-4	0.0808	0.0256	0.92	0.0236	2.83E-4	0.005	0.049
41.00	2.23	1.45	36.25	0.36	1779.01	4.6E-4	0.1640	0.0664	0.92	0.0613	7.35E-4	0.006	0.055
40.00	2.17	1.41	36.64	0.37	1763.43	4.5E-4	0.1609	0.0636	0.92	0.0587	7.04E-4	0.014	0.070
39.00	2.12	1.38	37.04	0.37	1747.60	4.5E-4	0.1576	0.0608	0.92	0.0561	6.73E-4	0.014	0.083
38.00	2.07	1.34	37.46	0.38	1731.52	4.5E-4	0.1542	0.0579	0.92	0.0534	6.41E-4	0.013	0.097
37.00	2.01	1.31	37.89	0.38	1715.18	4.4E-4	0.1507	0.0550	0.92	0.0508	6.09E-4	0.012	0.109
36.00	1.96	1.27	30.99	0.38	1582.29	4.7E-4	0.1825	0.0987	0.92	0.0911	1.09E-3	0.012	0.121
35.00	1.90	1.24	31.43	0.39	1567.37	4.7E-4	0.1771	0.0937	0.92	0.0865	1.04E-3	0.021	0.143
34.00	1.85	1.20	31.88	0.39	1552.16	4.6E-4	0.1716	0.0887	0.92	0.0819	9.82E-4	0.020	0.163
33.00	1.79	1.17	32.35	0.39	1536.65	4.6E-4	0.1660	0.0837	0.92	0.0772	9.27E-4	0.019	0.182
32.00	1.74	1.13	32.84	0.40	1520.83	4.5E-4	0.1603	0.0787	0.92	0.0727	8.72E-4	0.018	0.200
31.00	1.68	1.10	30.65	0.40	1462.95	4.6E-4	0.1683	0.0926	0.92	0.0855	1.03E-3	0.017	0.217
30.00	1.63	1.06	31.10	0.40	1446.15	4.6E-4	0.1621	0.0872	0.92	0.0805	9.66E-4	0.020	0.237
29.00	1.58	1.02	31.58	0.40	1429.01	4.5E-4	0.1529	0.0802	0.92	0.0741	8.89E-4	0.018	0.255
28.00	1.52	0.99	32.08	0.41	1411.49	4.4E-4	0.1441	0.0737	0.92	0.0680	8.16E-4	0.017	0.272
27.00	1.47	0.95	31.14	0.41	1372.51	4.3E-4	0.1416	0.0760	0.92	0.0702	8.42E-4	0.017	0.290
26.00	1.41	0.92	24.16	0.41	1237.60	4.7E-4	0.1738	0.1338	0.92	0.1235	1.48E-3	0.017	0.306
25.00	1.36	0.88	24.63	0.41	1221.49	4.5E-4	0.1616	0.1212	0.92	0.1119	1.34E-3	0.028	0.335
24.00	1.30	0.85	25.14	0.41	1204.95	4.4E-4	0.1501	0.1096	0.92	0.1011	1.21E-3	0.025	0.360
23.00	1.25	0.81	25.68	0.41	1187.94	4.3E-4	0.1392	0.0988	0.92	0.0912	1.09E-3	0.023	0.383
22.00	1.20	0.78	26.25	0.41	1170.43	4.2E-4	0.1290	0.0888	0.92	0.0820	9.84E-4	0.021	0.404
21.00	1.14	0.74	28.65	0.41	1177.22	4.0E-4	0.2826	0.1723	0.92	0.1590	1.91E-3	0.026	0.429
20.00	1.09	0.71	29.32	0.41	1157.80	3.9E-4	0.2445	0.1440	0.92	0.1330	1.60E-3	0.035	0.464
19.00	1.03	0.67	30.05	0.41	1137.73	3.8E-4	0.2113	0.1199	0.92	0.1107	1.33E-3	0.029	0.493
18.00	0.98	0.64	30.84	0.42	1116.96	3.6E-4	0.1823	0.0994	0.92	0.0917	1.10E-3	0.024	0.517
17.00	0.92	0.60	31.69	0.42	1095.44	3.5E-4	0.1570	0.0819	0.92	0.0756	9.07E-4	0.020	0.537
16.00	0.87	0.57	32.63	0.42	1073.07	3.4E-4	0.1351	0.0671	0.92	0.0619	7.43E-4	0.016	0.554
15.00	0.82	0.53	50.25	0.42	1199.70	2.8E-4	0.0746	0.0236	0.92	0.0218	2.61E-4	0.006	0.559
14.00	0.76	0.49	46.78	0.42	1131.72	2.8E-4	0.0728	0.0230	0.92	0.0213	2.55E-4	0.005	0.564
13.00	0.71	0.46	48.42	0.42	1103.16	2.7E-4	0.0639	0.0202	0.92	0.0186	2.24E-4	0.005	0.569
12.00	0.65	0.42	50.27	0.42	1073.16	2.6E-4	0.0560	0.0177	0.92	0.0163	1.96E-4	0.004	0.573
11.00	0.60	0.39	52.36	0.42	1041.51	2.4E-4	0.0490	0.0155	0.92	0.0143	1.72E-4	0.004	0.577
10.00	0.54	0.35	30.32	0.42	827.85	2.8E-4	0.0699	0.0391	0.92	0.0361	4.33E-4	0.010	0.587
9.00	0.49	0.32	31.93	0.43	799.03	2.6E-4	0.0948	0.0489	0.92	0.0451	5.41E-4	0.014	0.601
8.00	0.43	0.28	29.92	0.43	737.17	2.5E-4	0.0772	0.0441	0.92	0.0407	4.89E-4	0.009	0.610
7.00	0.38	0.25	31.94	0.43	704.79	2.3E-4	0.0533	0.0274	0.92	0.0253	3.04E-4	0.008	0.618
6.00	0.33	0.21	33.47	0.43	662.72	2.1E-4	0.0423	0.0201	0.92	0.0185	2.22E-4	0.005	0.623
5.00	0.27	0.18	50.77	0.43	695.03	1.7E-4	0.0308	0.0097	0.92	0.0090	1.08E-4	0.002	0.625
4.00	0.22	0.14	50.77	0.43	621.66	1.5E-4	0.0295	0.0093	0.92	0.0086	1.03E-4	0.002	0.627
3.00	0.16	0.11	50.77	0.43	538.37	1.3E-4	0.0242	0.0076	0.92	0.0071	8.47E-5	0.002	0.629
2.00	0.11	0.07	50.77	0.43	439.59	1.1E-4	0.0221	0.0070	0.92	0.0064	7.74E-5	0.002	0.631
1.00	0.05	0.04	50.77	0.43	310.85	7.6E-5	0.0129	0.0041	0.92	0.0038	4.52E-5	0.001	0.632
0.00	0.00	0.00	50.77	0.43	4.22	1.0E-6	0.0010	0.0003	0.92	0.0003	3.56E-6	0.001	0.632

Settlement of Unsaturated Sands=0.632 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=1.00 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=0.632 in.
Differential Settlement=0.316 to 0.417 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)
SPT Field data from Standard Penetration Test (SPT)
BPT Field data from Becker Penetration Test (BPT)

qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022. SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center,

Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

APPENDIX D

SLOPE STABILITY ANALYSES

Simplified Bishop's method was used to analyze the existing and proposed slope conditions as depicted on the Cross Section A-A' (Figure 2b). Conditions analyzed for slope stability analyses were performed for search ranges. Seismic coefficient of 0.20 g (g: gravity) was used in the seismic condition. Stability calculations and sections are presented on the plates following the report and the results of EGL's slope stability analyses of existing and proposed slope conditions are briefly described with corresponding geotechnical recommendations.

Earth Materials	Unit Weight (pcf)	Friction Angle (Degree)	Cohesion (psf)
Soil, Ultimate[+] (Qds; B-1 @ 25.0')	120.0	29	168
Proposed Compacted Fill, Ultimate (CAf; Assumed)	125.0	35	200

Noted: [+]Lowest ultimate soil shear values were used for static and seismic conditions for existing and proposed slope conditions.

EXISTING SLOPE CONDITION

Calculated Conditions	Analyzed Method	Factor of Safety (Static/Seismic)	Preliminary Geotechnical Recommendation
existing descending slope at 60 feet high	Simplified Bishop's	1.63 / 1.13	Stable as Exists

PROPOSED SLOPE CONDITION

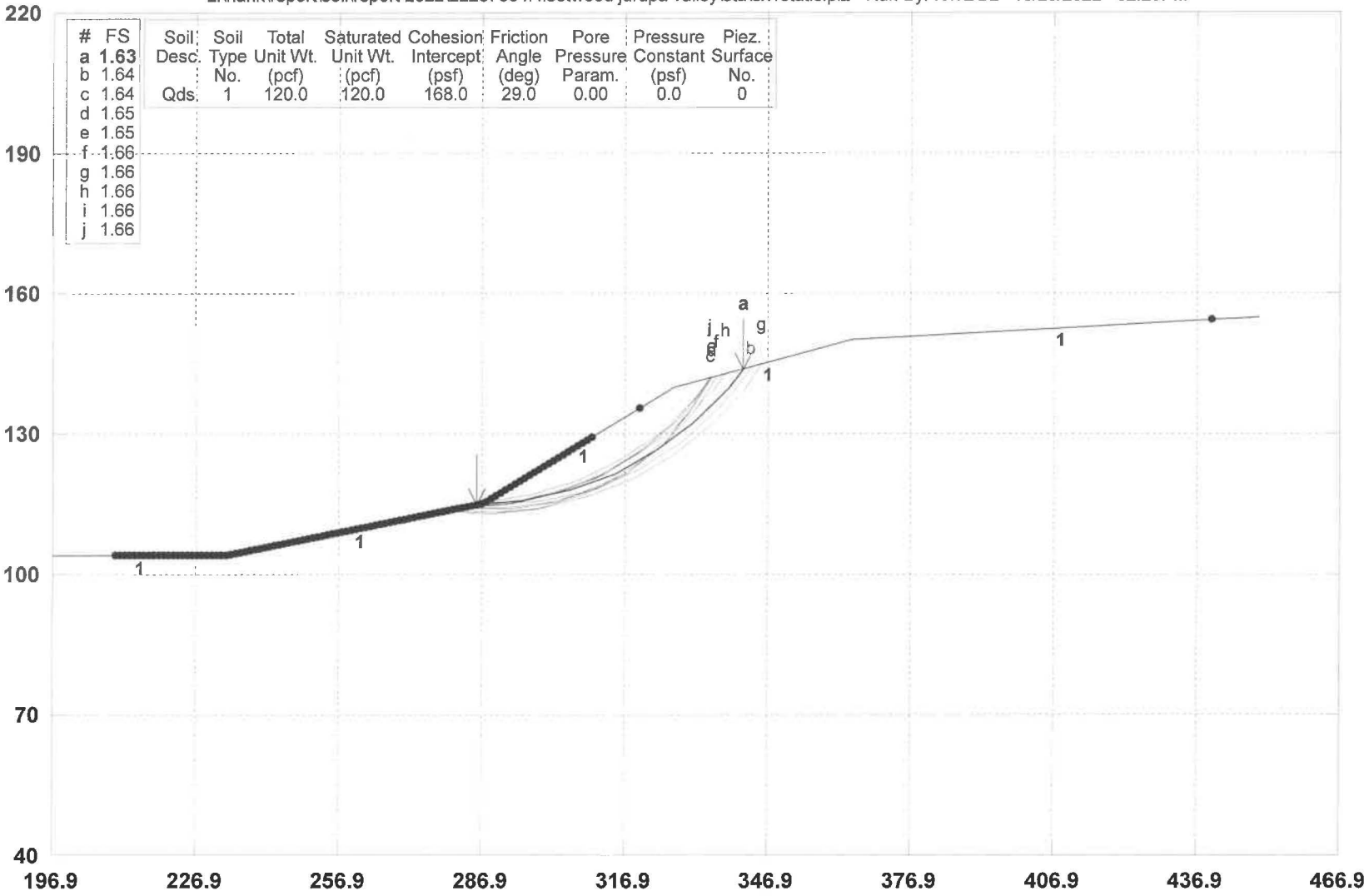
Calculated Conditions	Analyzed Method	Factor of Safety (Static/Seismic)	Preliminary Geotechnical Recommendation
Proposed slope with building loads	Simplified Bishop's	1.63 / 1.13	Stable as Proposed

SURFICIAL SLOPE STABILITY

Calculated Conditions	Factor of Safety (Static/Seismic)	Conclusions and Preliminary Geotechnical Recommendation
Natural Soils on Existing 1.5:1 – 2.9:1 (H: V) Slopes	1.20 / ----- 0.69 / -----	Unstable as Existed (see Section 6.4 for Recommendation)

2240 Fleetwood Drive, Jurupa Valley, Section A-A', Exisiting Slope_Static

z:\hank\report\soil\report 2022\22257004l fleetwood jurupa valley\sta\ex1static.pl2 Run By: KY/EGL 10/28/2022 02:29PM



#	FS
a	1.63
b	1.64
c	1.64
d	1.65
e	1.65
f	1.66
g	1.66
h	1.66
i	1.66
j	1.66

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qds.	1	120.0	120.0	168.0	29.0	0.00	0.0	0

GSTABL7 v.2 FSmin=1.63

Safety Factors Are Calculated By The Modified Bishop Method

*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

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****

SLOPE STABILITY ANALYSIS SYSTEM Modified Bishop, Simplified Janbu, or GLE Method of Slices. (Includes Spencer & Morgenstern-Price Type Analysis) Including Pier/Pile, Reinforcement, Soil Nail, Tieback, Nonlinear Undrained Shear Strength, Curved Phi Envelope, Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/28/2022
Time of Run: 02:29PM
Run By: KY/EGL
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Output Filename: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\sta\ex1static.OUT
Unit System: English
Plotted Output Filename: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\sta\ex1static.PLT

PROBLEM DESCRIPTION: 2240 Fleetwood Drive, Jurupa Valley, Section A-A', Exisiting Slope_Static

BOUNDARY COORDINATES
5 Top Boundaries
5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	196.90	104.00	233.50	104.00	1
2	233.50	104.00	287.20	115.00	1
3	287.20	115.00	327.20	140.00	1
4	327.20	140.00	364.70	150.00	1
5	364.70	150.00	450.00	155.00	1

User Specified Y-Origin = 40.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
1 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	168.0	29.0	0.00		0.0

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

5000 Trial Surfaces Have Been Generated.

50 Surface(s) Initiate(s) From Each Of 100 Points Equally Spaced Along The Ground Surface Between X = 210.00(ft) and X = 310.00(ft)

Each Surface Terminates Between X = 320.00(ft) and X = 440.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00(ft)

10.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Evaluated. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Total Number of Trial Surfaces Attempted = 5000

Number of Trial Surfaces With Valid FS = 5000

Statistical Data On All Valid FS Values:
FS Max = 6.131 FS Min = 1.634 FS Ave = 2.823
Standard Deviation = 0.753 Coefficient of Variation = 26.66 %

Failure Surface Specified By 8 Coordinate Points

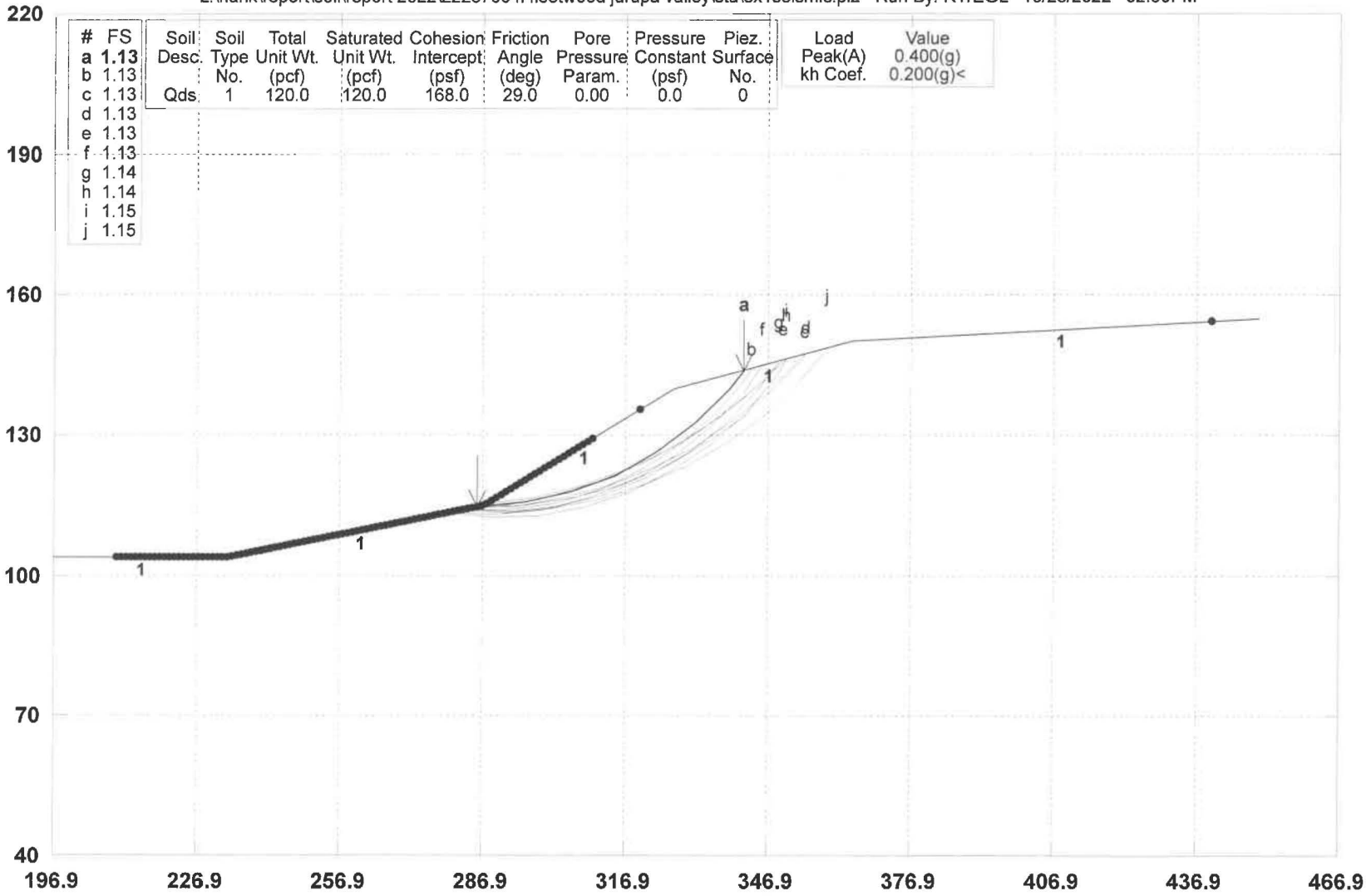
Point No.	X-Surf (ft)	Y-Surf (ft)
1	285.758	114.705
2	295.719	115.580
3	305.459	117.845
4	314.785	121.454
5	323.512	126.338
6	331.467	132.397
7	338.492	139.514
8	341.725	143.873

Circle Center At X = 284.714 ; Y = 184.985 ; and Radius = 70.288

Factor of Safety
*** 1.634 ***

2240 Fleetwood Drive, Jurupa Valley, Section A-A', Exisiting Slope_Seismic

z:\hank\report\soil\report 2022\22257004l fleetwood jurupa valley\sta\ex1seismic.pl2 Run By: KY/EGL 10/28/2022 02:30PM



#	FS
a	1.13
b	1.13
c	1.13
d	1.13
e	1.13
f	1.13
g	1.14
h	1.14
i	1.15
j	1.15

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qds	1	120.0	120.0	168.0	29.0	0.00	0.0	0

Load	Value
Peak(A)	0.400(g)
kh Coef.	0.200(g)<

GSTABL7 v.2 FSmin=1.13

Safety Factors Are Calculated By The Modified Bishop Method

*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

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****

SLOPE STABILITY ANALYSIS SYSTEM Modified Bishop, Simplified Janbu, or GLE Method of Slices. (Includes Spencer & Morgenstern-Price Type Analysis) Including Pier/Pile, Reinforcement, Soil Nail, Tieback, Nonlinear Undrained Shear Strength, Curved Phi Envelope, Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

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Time of Run: 02:30PM
Run By: KY/EGL
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Output Filename: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\sta\ex1seismic.OUT
Unit System: English

Plotted Output Filename: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\sta\ex1seismic.PLT

PROBLEM DESCRIPTION: 2240 Fleetwood Drive, Jurupa Valley, Section A-A', Exisiting Slope_Seismic

BOUNDARY COORDINATES
5 Top Boundaries
5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	196.90	104.00	233.50	104.00	1
2	233.50	104.00	287.20	115.00	1
3	287.20	115.00	327.20	140.00	1
4	327.20	140.00	364.70	150.00	1
5	364.70	150.00	450.00	155.00	1

User Specified Y-Origin = 40.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
1 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	168.0	29.0	0.00	0.0	0

Specified Peak Ground Acceleration Coefficient (A) = 0.400(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.200(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

5000 Trial Surfaces Have Been Generated.

50 Surface(s) Initiate(s) From Each Of 100 Points Equally Spaced Along The Ground Surface Between X = 210.00(ft) and X = 310.00(ft)

Each Surface Terminates Between X = 320.00(ft) and X = 440.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00(ft)

10.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Evaluated. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Total Number of Trial Surfaces Attempted = 5000

Number of Trial Surfaces With Valid FS = 5000

Statistical Data On All Valid FS Values:
FS Max = 3.765 FS Min = 1.126 FS Ave = 1.696
Standard Deviation = 0.347 Coefficient of Variation = 20.44 %

Failure Surface Specified By 8 Coordinate Points

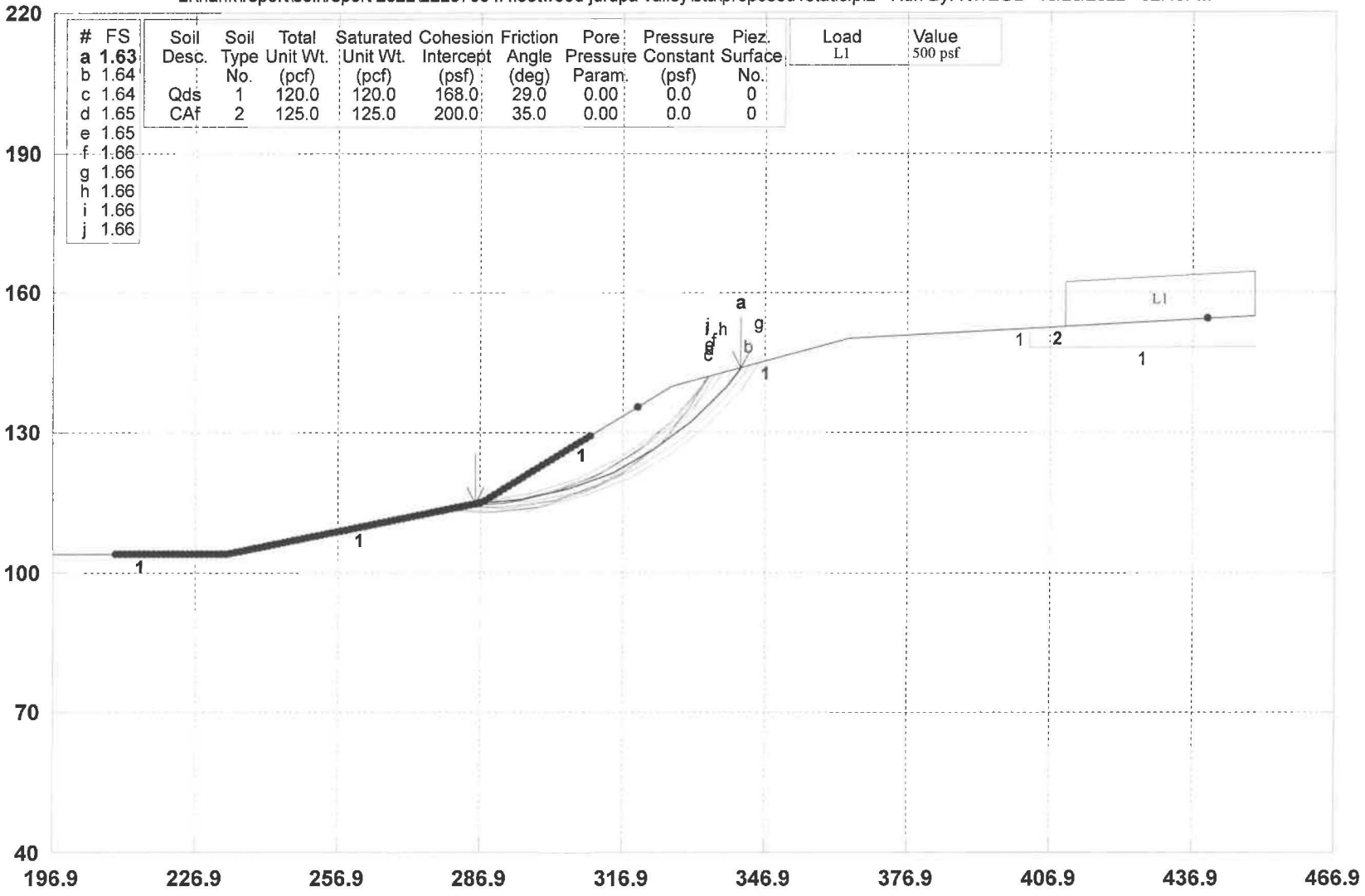
Point No.	X-Surf (ft)	Y-Surf (ft)
1	285.758	114.705
2	295.719	115.580
3	305.459	117.845
4	314.785	121.454
5	323.512	126.338
6	331.467	132.397
7	338.492	139.514
8	341.725	143.873

Circle Center At X = 284.714 ; Y = 184.985 ; and Radius = 70.288

Factor of Safety
*** 1.126 ***

2240 Fleetwood Drive, Jurupa Valley, Section A-A', Proposed Slope_Static

z:\hank\report\soil\report 2022\22257004l fleetwood jurupa valley\sta\proposed1static.pl2 Run By: KY/EGL 10/28/2022 02:43PM



#	FS
a	**1.63**
b	1.64
c	1.64
d	1.65
e	1.65
f	1.66
g	1.66
h	1.66
i	1.66
j	1.66

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qds	1	120.0	120.0	168.0	29.0	0.00	0.0	0
CAf	2	125.0	125.0	200.0	35.0	0.00	0.0	0

Load	Value
L1	500 psf

GSTABL7 v.2 FSmin=1.63

Safety Factors Are Calculated By The Modified Bishop Method

*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

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SLOPE STABILITY ANALYSIS SYSTEM Modified Bishop, Simplified Janbu, or GLE Method of Slices. (Includes Spencer & Morgenstern-Price Type Analysis) Including Pier/Pile, Reinforcement, Soil Nail, Tieback, Nonlinear Undrained Shear Strength, Curved Phi Envelope, Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

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Time of Run: 02:43PM
Run By: KY/EGL
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Output Filename: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\sta\proposed1static.OUT
Unit System: English

Plotted Output Filename: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\sta\proposed1static.PLT

PROBLEM DESCRIPTION: 2240 Fleetwood Drive, Jurupa Valley, Section A-A', Proposed Slope_Static

BOUNDARY COORDINATES
5 Top Boundaries
7 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	196.90	104.00	233.50	104.00	1
2	233.50	104.00	287.20	115.00	1
3	287.20	115.00	327.20	140.00	1
4	327.20	140.00	364.70	150.00	1
5	364.70	150.00	450.00	155.00	2
6	402.40	151.30	402.50	148.30	1
7	402.50	148.30	450.00	148.30	1

User Specified Y-Origin = 40.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
2 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	168.0	29.0	0.00	0.0	0
2	125.0	125.0	200.0	35.0	0.00	0.0	0

BOUNDARY LOAD(S)
1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	410.00	450.00	500.0	0.0

NOTE - Intensity Is Specified As A Uniformly Distributed Force Acting On A Horizontally Projected Surface.

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

5000 Trial Surfaces Have Been Generated.

50 Surface(s) Initiate(s) From Each Of 100 Points Equally Spaced Along The Ground Surface Between X = 210.00(ft) and X = 310.00(ft)

Each Surface Terminates Between X = 320.00(ft) and X = 440.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00(ft)

10.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Evaluated. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Total Number of Trial Surfaces Attempted = 5000

Number of Trial Surfaces With Valid FS = 5000

Statistical Data On All Valid FS Values:
FS Max = 5.664 FS Min = 1.634 FS Ave = 2.853
Standard Deviation = 0.742 Coefficient of Variation = 25.99 %

Failure Surface Specified By 8 Coordinate Points

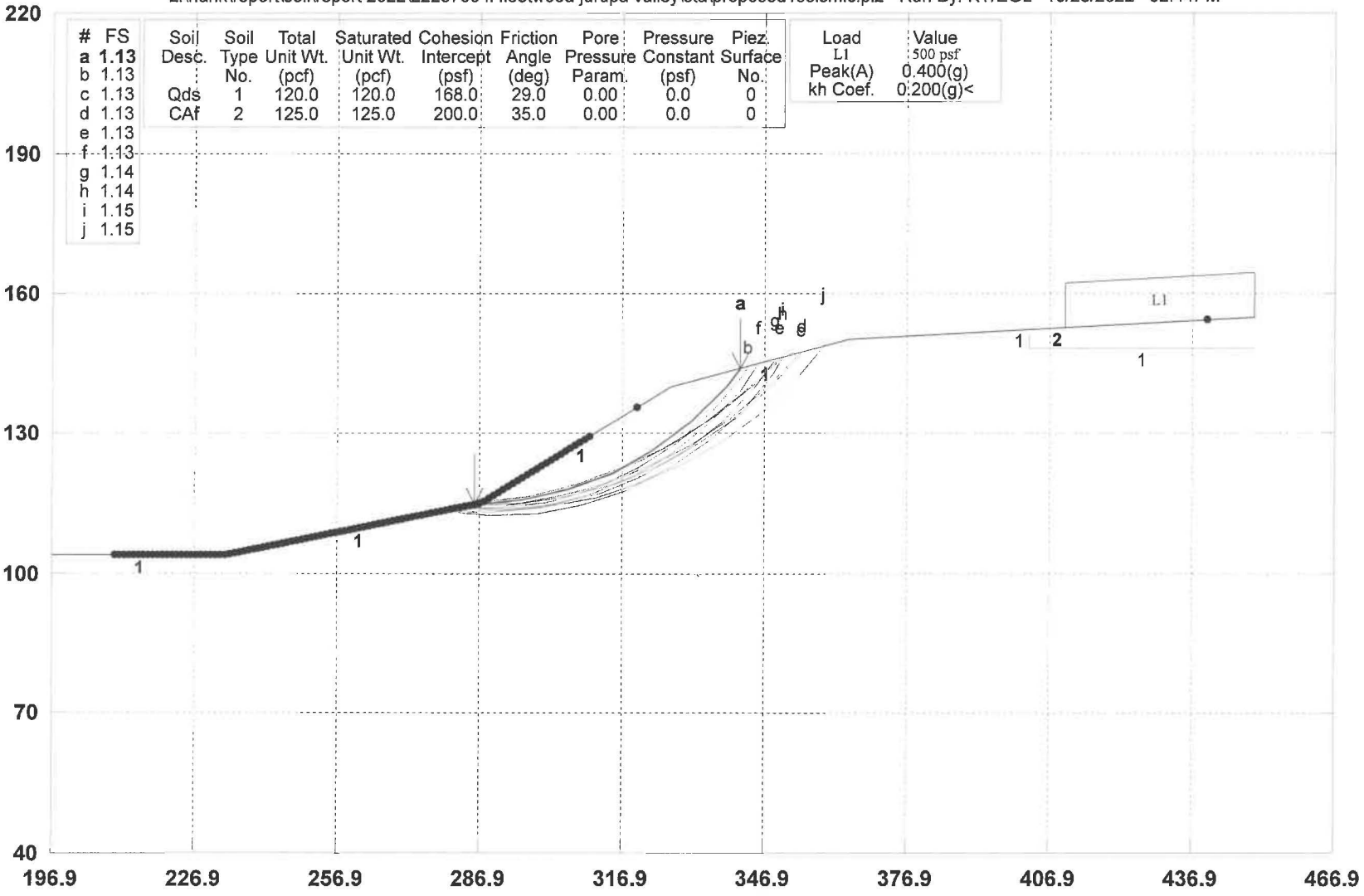
Point No.	X-Surf (ft)	Y-Surf (ft)
1	285.758	114.705
2	295.719	115.580
3	305.459	117.845
4	314.785	121.454
5	323.512	126.338
6	331.467	132.397
7	338.492	139.514
8	341.725	143.873

Circle Center At X = 284.714 ; Y = 184.985 ; and Radius = 70.288

Factor of Safety
*** 1.634 ***

2240 Fleetwood Drive, Jurupa Valley, Section A-A', Proposed Slope_Seismic

z:\hank\report\soil\report 2022\22257004l fleetwood jurupa valley\sta\proposed1seismic.pl2 Run By: KY/EGL 10/28/2022 02:44PM



#	FS
a	1.13
b	1.13
c	1.13
d	1.13
e	1.13
f	1.13
g	1.14
h	1.14
i	1.15
j	1.15

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qds	1	120.0	120.0	168.0	29.0	0.00	0.0	0
CAf	2	125.0	125.0	200.0	35.0	0.00	0.0	0

Load	Value
L1	500 psf
Peak(A)	0.400(g)
kh Coef.	0.200(g)<

GSTABL7 v.2 FSmin=1.13

Safety Factors Are Calculated By The Modified Bishop Method

*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

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****

SLOPE STABILITY ANALYSIS SYSTEM Modified Bishop, Simplified Janbu, or GLE Method of Slices. (Includes Spencer & Morgenstern-Price Type Analysis) Including Pier/Pile, Reinforcement, Soil Nail, Tieback, Nonlinear Undrained Shear Strength, Curved Phi Envelope, Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/28/2022
Time of Run: 03:00PM
Run By: KY/EGL
Input Data Filename: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\sta\proposed1seismic.in
Output Filename: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\sta\proposed1seismic.OUT
Unit System: English
Plotted Output Filename: Z:\Hank\Report\Soil\Report 2022\22257004L Fleetwood Jurupa Valley\sta\proposed1seismic.PLT

PROBLEM DESCRIPTION: 2240 Fleetwood Drive, Jurupa Valley, Section A-A', Proposed Slope_Seismic

BOUNDARY COORDINATES
5 Top Boundaries
7 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	196.90	104.00	233.50	104.00	1
2	233.50	104.00	287.20	115.00	1
3	287.20	115.00	327.20	140.00	1
4	327.20	140.00	364.70	150.00	1
5	364.70	150.00	450.00	155.00	2
6	402.40	151.30	402.50	148.30	1
7	402.50	148.30	450.00	148.30	1

User Specified Y-Origin = 40.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
2 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	168.0	29.0	0.00	0.0	0
2	125.0	125.0	200.0	35.0	0.00	0.0	0

BOUNDARY LOAD(S)
1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	410.00	450.00	500.0	0.0

NOTE - Intensity Is Specified As A Uniformly Distributed Force Acting On A Horizontally Projected Surface.

Specified Peak Ground Acceleration Coefficient (A) = 0.400(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.200(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

5000 Trial Surfaces Have Been Generated.

50 Surface(s) Initiate(s) From Each Of 100 Points Equally Spaced Along The Ground Surface Between X = 210.00(ft) and X = 310.00(ft)

Each Surface Terminates Between X = 320.00(ft) and X = 440.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00(ft)

10.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Evaluated. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Total Number of Trial Surfaces Attempted = 5000
Number of Trial Surfaces With Valid FS = 5000

Statistical Data On All Valid FS Values:
FS Max = 3.765 FS Min = 1.126 FS Ave = 1.733
Standard Deviation = 0.364 Coefficient of Variation = 21.02 %

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	285.758	114.705
2	295.719	115.580
3	305.459	117.845
4	314.785	121.454
5	323.512	126.338
6	331.467	132.397
7	338.492	139.514
8	341.725	143.873

Circle Center At X = 284.714 ; Y = 184.985 ; and Radius = 70.288

Factor of Safety
*** 1.126 ***

APPENDIX E: PERCOLATION TEST RESULTS

Infiltration Testing per Riverside County Technical Guidance Document

r (in) = radius hole

t_i (hr:min) = intial time after filling or refilling

t_f (hr:min) = final time

d_b (ft) = depth to bottom

d_i (ft) = depth to water surface at ti

d_f (ft) = depth to water surface at tf

ΔH (in) = change in height over time

Havg = average head height over the time interval

t (hr) = Time reading interval

It (in/hr) = (ΔHxr)/(Δt(r+2Havg)) tested infiltration rate

B-3									
(Date Presoaked: 10/13/2022; Date Tested: 10/14/2022)									
r (in)	t_i (hr:min)	t_f (hr:min)	Δt (hr)	d_b (in)	d_i (in)	d_f (in)	ΔH (in)	H_{avg} (in)	It (in/hr)
4	8:46	9:11	0.42	72.0	52.0	58.0	6.0	17.0	1.50
4	9:15	9:40	0.42	72.0	47.0	53.5	6.5	21.8	1.30
4	9:42	9:52	0.17	72.0	51.5	52.5	1.0	20.0	0.53
4	9:55	10:05	0.17	72.0	52.0	53.0	1.0	19.5	0.55
4	10:10	10:20	0.17	72.0	52.0	53.0	1.0	19.5	0.55
4	10:28	10:38	0.17	72.0	52.0	53.0	1.0	19.5	0.55
4	10:41	10:51	0.17	72.0	50.8	51.8	1.0	20.8	0.52
4	10:55	11:05	0.17	72.0	52.0	53.1	1.1	19.4	0.62
4	11:10	11:20	0.17	72.0	50.0	51.3	1.3	21.4	0.63
4	11:25	11:35	0.17	72.0	50.0	51.3	1.3	21.4	0.63

Factor of Safety based on the Low Impact Development BMP Design Handbook FS = 3

Design Infiltration Rate = Tested Infiltration Rate / FS (in/hour) = **0.21**

B-5									
(Date Presoaked: 10/13/2022; Date Tested: 10/14/2022)									
r (in)	t_i (hr:min)	t_f (hr:min)	Δt (hr)	d_b (in)	d_i (in)	d_f (in)	ΔH (in)	H_{ave} (in)	It (in/hr)
4	8:53	9:18	0.42	72.0	49.0	54.0	5.0	20.5	1.06
4	9:20	9:45	0.42	72.0	50.0	53.0	3.0	20.5	0.63
4	9:46	10:16	0.5	72.0	52.0	55.0	3.0	18.5	0.59
4	10:20	10:50	0.5	72.0	52.0	54.0	2.0	19.0	0.38
4	10:57	11:27	0.5	72.0	50.0	52.5	2.5	20.8	0.44
4	11:35	12:05	0.5	72.0	51.5	54.5	3.0	19.0	0.57
4	12:15	12:45	0.5	72.0	51.0	54.0	3.0	19.5	0.56
4	12:48	1:18	0.5	72.0	49.5	52.5	3.0	21.0	0.52
4	1:20	1:50	0.5	72.0	52.0	55.0	3.0	18.5	0.59
4	1:54	2:24	0.5	72.0	49.5	52.3	2.8	21.1	0.48

Factor of Safety based on the Low Impact Development BMP Design Handbook FS = 3

Design Infiltration Rate = Tested Infiltration Rate / FS (in/hour) = **0.16**

Site: 2240 Fleetwood Dr Jurupa Valley, CA 92509

Project No: 22-257-004

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

NOT APPLICABLE

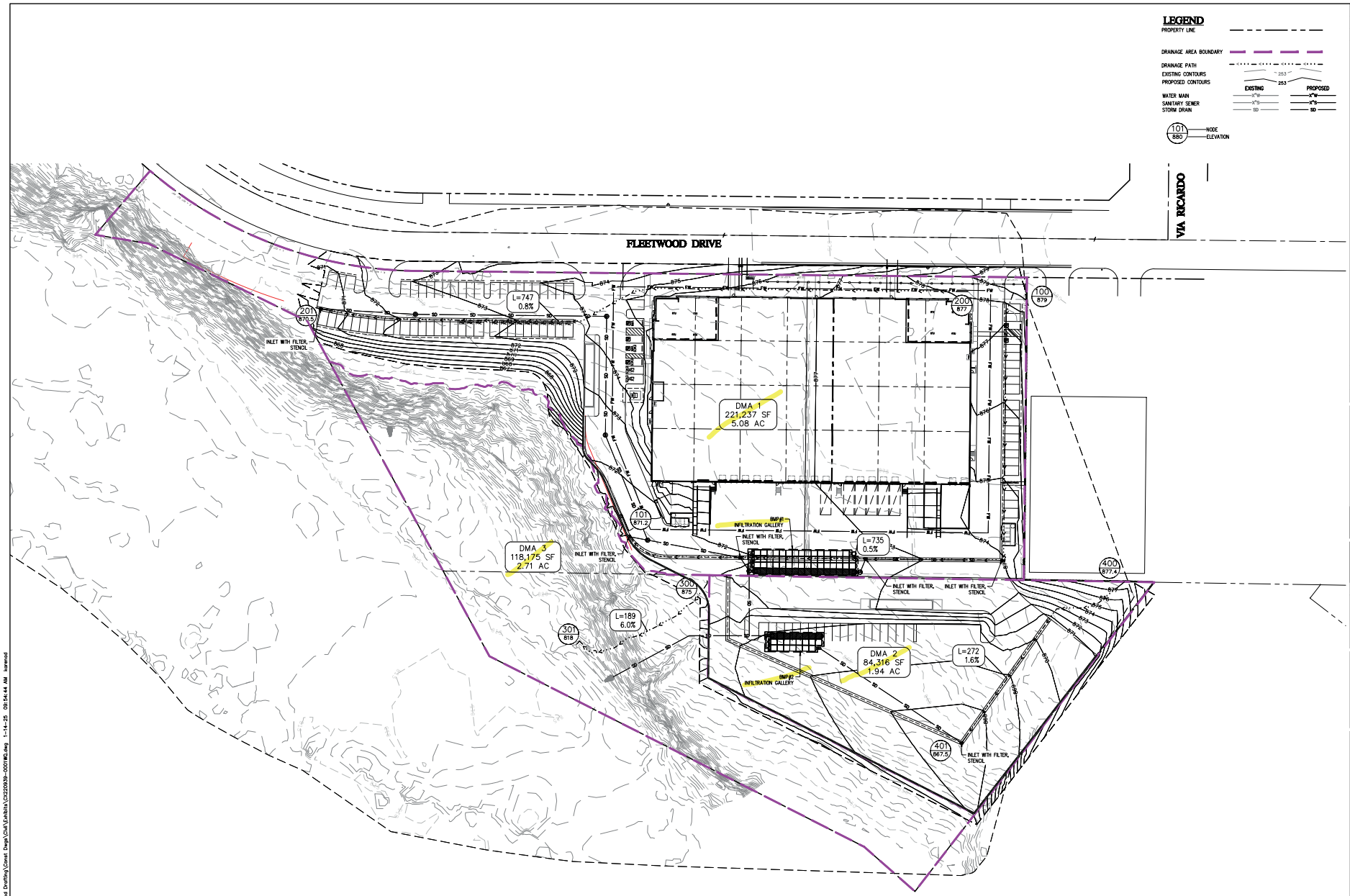
Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

NOT APPLICABLE

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation



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REV NO	DATE	REVISED	REV BY	CKD/APPD BY

DESTROY ALL PRINTS BEARING EARLIER DATE

Cannon

1990 Olympic Blvd, Suite 500
Walnut Creek, CA 94596
P 310.954.1100 F 310.954.0977

DRAWN BY: CP
CHECKED BY: SJ
DATE: 1/14/2025
SCALE: AS SHOWN
CA JOB NO. 220939

THESE DRAWINGS ARE INSTRUMENTS OF SERVICE PREPARED BY CANNON CORPORATION AND ARE THE PROPERTY OF CANNON CORPORATION. ALL REPRODUCTIONS OF THESE PLANS MUST BE MADE IN ACCORDANCE WITH AGREEMENT WITH CANNON CORPORATION.

HYB, LLC
FLEETWOOD INDUSTRIAL
WATER QUALITY EXHIBIT
JURUPA VALLEY, CA

SHEET
WQ1

Description of filter opening	Percent Open (Based on Screen Dimensions)	Total Square Inches per Unit	Square Inches of Total Unobstructed Openings	Flow Rate (Cubic Feet per Second)
Skimmer protected By-Pass	100%	381.5	381.5	13.4 cfs
Coarse Screen 3/4" x 1-3/4" stainless steel flattened expanded	62%	231.0	143.2	6.2 cfs
Medium Screen 10x10 mesh stainless steel	56%	231.0	129.3	6.4 cfs
Fine screen 14 x 18 mesh stainless steel	68%	283.5	192.8	10.8
MAXIMUM THROAT FLOW RATE Total: 18.8 cfs		SCREEN TREATED FLOW RATE Total: 23.4 cfs		

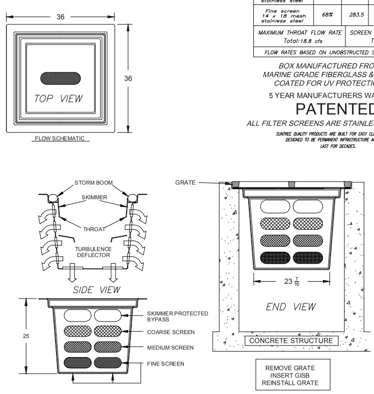
Flow Specifications

FLOW RATES BASED ON UNOBSTRUCTED SCREEN OPENINGS

EXCLUSIVE CALIFORNIA DISTRIBUTOR:
BIO CLEAN ENVIRONMENTAL SERVICE
P.O. BOX 869, OCEANSIDE, CA. 92049
TEL. 760-433-7640 FAX:760-433-3176
Email: info@biocleanenvironmental.net

SUNTREE TECHNOLOGIES
798 CLEARLAKE RD. SUITE #2
COCOA FL. 32922
TEL. 321-637-7552 FAX 321-637-7554
GRATE INLET SKIMMER BOX FOR FLORIDA DOT INLET STRUCTURES.
DATE: | SCALE: SF = 15
DRAFTER: N.R.B. | UNITS = INCHES

BOX MANUFACTURED FROM
MARINE GRADE FIBERGLASS & GEL
COATED FOR UV PROTECTION
5 YEAR MANUFACTURERS WARRANTY
PATENTED
ALL FILTER SCREENS ARE STAINLESS STEEL
SUNTREE QUALITY PRODUCTS ARE BUILT FOR EASY CLEANING AND ARE DESIGNED TO BE PERMANENT INFRASTRUCTURE AND SHOULD LAST FOR DECADES.



REMOVE GRATE
INSERT GISB
REINSTALL GRATE

INLET FILTER — NTS (1)



NOTE:

ALL DRAIN INLETS THAT DISCHARGE INTO AN EXISTING OR PROPOSED STORM DRAIN MUST BE LABELED TO DISCOURAGE ILLEGAL DUMPING OF POLLUTANTS WITH THE STENCIL ABOVE IN A VISIBLE AREA. 2 COATS MINIMIMUM.

STORM INLET STENCIL — NTS (2)

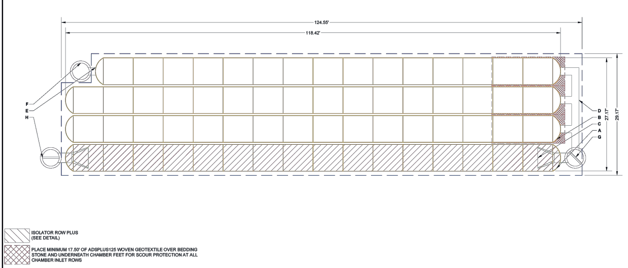
220939-DMA1 — StormTech Chamber System — SHEET 2 OF 5

PROPOSED LAYOUT	
63	STORMTECH MC-3500 CHAMBERS
8	STORMTECH MC-3500 END CAPS
12	STONE ABOVE (in)
9	STONE BELOW (in)
40	STONE VOID
12111	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
3583	SYSTEM AREA (SF)
307.4	SYSTEM PERIMETER (ft)

CONCEPTUAL ELEVATIONS:	
MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	12.50
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	6.50
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	6.00
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	6.00
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	6.00
TOP OF STONE:	5.50
TOP OF MC-3500 CHAMBER:	4.50
24" ISOLATOR ROW PLUS INVERT:	2.56
24" ISOLATOR ROW PLUS INVERT:	0.92
18" x 18" BOTTOM MANIFOLD INVERT:	0.92
18" BOTTOM CONNECTION INVERT:	0.90
BOTTOM OF MC-3500 CHAMBER:	0.75
BOTTOM OF STONE:	0.00

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	24" BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.06"	
PREFABRICATED END CAP	B	18" BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP18BC / TYP OF ALL 18" BOTTOM CONNECTIONS	1.77"	
FLAMP	C	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP (TYP 2 PLACES)		
MANIFOLD	D	18" x 18" BOTTOM MANIFOLD, ADS N-12	1.77"	
PIPE CONNECTION	E	18" BOTTOM CONNECTION	1.77"	
CONCRETE STRUCTURE	F	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		4.0 CFS OUT
CONCRETE STRUCTURE W/WEIR	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		16.5 CFS IN
CONCRETE STRUCTURE W/WEIR	H	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		

*INVERT ABOVE BASE OF CHAMBER



ISOLATOR ROW PLUS (SEE DETAIL)

PLACE MINIMUM 17.50' OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

4640 TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473 | 1-800-821-6710 | WWW.STORMTECH.COM | DATE: 01/13/2025 | DRAWN: KD | CHECKED: N/A | JURUPA VALLEY, CA, USA

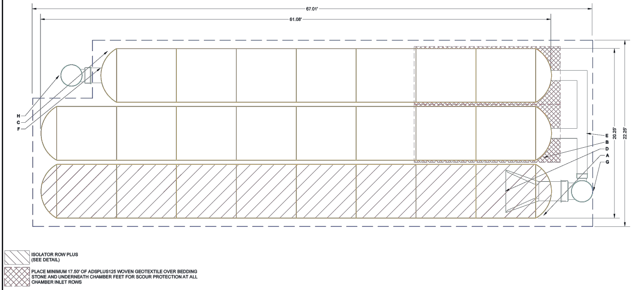
220939-DMA2 — StormTech Chamber System — SHEET 2 OF 6

PROPOSED LAYOUT	
23	STORMTECH MC-3500 CHAMBERS
6	STORMTECH MC-3500 END CAPS
12	STONE ABOVE (in)
9	STONE BELOW (in)
40	STONE VOID
4742	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)
1442	SYSTEM AREA (SF)
178.6	SYSTEM PERIMETER (ft)

CONCEPTUAL ELEVATIONS:	
MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	12.50
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	6.50
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	6.00
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	6.00
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	6.00
TOP OF STONE:	5.50
TOP OF MC-3500 CHAMBER:	4.50
12" x 12" TOP MANIFOLD INVERT:	2.56
24" ISOLATOR ROW PLUS INVERT:	0.92
18" BOTTOM CONNECTION INVERT:	0.90
BOTTOM OF MC-3500 CHAMBER:	0.75
BOTTOM OF STONE:	0.00

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	24" BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.06"	
PREFABRICATED END CAP	B	12" TOP PRE-CORED END CAP, PART#: MC3500IEPP12T / TYP OF ALL 12" TOP CONNECTIONS	26.36"	
PREFABRICATED END CAP	C	18" BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP18BC / TYP OF ALL 18" BOTTOM CONNECTIONS	1.77"	
FLAMP	D	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	E	12" x 12" TOP MANIFOLD, ADS N-12	26.36"	
PIPE CONNECTION	F	18" BOTTOM CONNECTION	1.77"	
NYLOPLAST (INLET W/ ISO PLUS ROW)	G	30" DIAMETER (24.00" SUMP MIN)		5.0 CFS IN
NYLOPLAST (OUTLET)	H	30" DIAMETER (DESIGN BY ENGINEER)		4.0 CFS OUT

*INVERT ABOVE BASE OF CHAMBER



ISOLATOR ROW PLUS (SEE DETAIL)

PLACE MINIMUM 17.50' OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

4640 TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473 | 1-800-821-6710 | WWW.STORMTECH.COM | DATE: 01/10/2025 | DRAWN: NN | CHECKED: N/A | JURUPA VALLEY, CA, USA

ADS Advanced Drainage Systems, Inc.

FLEETWOOD 1
JURUPA VALLEY, CA, USA

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

ADS SiteAssist FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

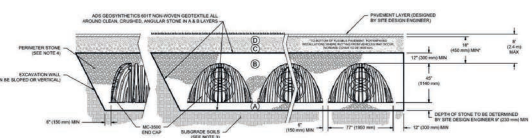
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS — FLEETWOOD 1 — SHEET 3 OF 6

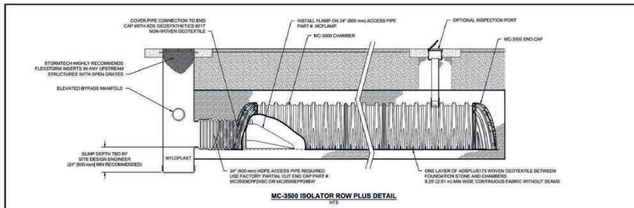
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145¹ A-1, A-2-4, A-3 OR AASHTO M43¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43¹ 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43¹ 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.²,³

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

MC-3500 ISOLATOR ROW PLUS DETAIL — NTS — FLEETWOOD 1 — SHEET 4 OF 6



INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

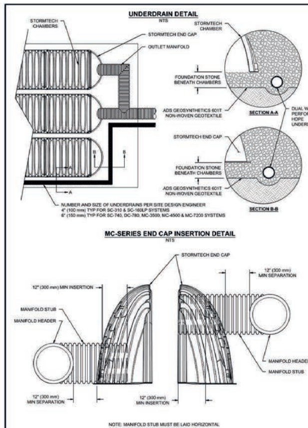
STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

FLEETWOOD 1 — SHEET 5 OF 6

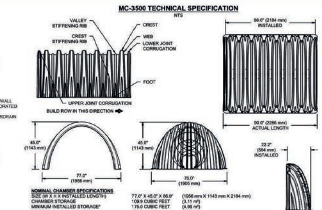
UNDERDRAIN DETAIL — NTS

MC-SERIES END CAP INSERTION DETAIL — NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-3500 TECHNICAL SPECIFICATION — NTS



NOMINAL CHAMBER SPECIFICATIONS
SIZE (W X H X INSTALLED LENGTH) 77.0" X 45.0" X 86.0" (1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE 109.9 CUBIC FEET (3.11 m³)
MINIMUM INSTALLED STORAGE* 175.0 CUBIC FEET (4.96 m³)
WEIGHT 134 lbs. (60.8 kg)

NOMINAL END CAP SPECIFICATIONS
SIZE (W X H X INSTALLED LENGTH) 75.0" X 45.0" X 22.2" (1905 mm X 1143 mm X 564 mm)
END CAP STORAGE 14.9 CUBIC FEET (0.42 m³)
MINIMUM INSTALLED STORAGE* 45.1 CUBIC FEET (1.28 m³)
WEIGHT 49 lbs. (22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" SPACING BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

4640 TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473 | 888-892-2694 | WWW.STORMTECH.COM | DRAWN: SJ | CHECKED: N/A | JURUPA VALLEY, CA, USA

REV. NO	DATE	REVISED	REV. BY	CKD. BY	APPD BY

DESTROY ALL PRINTS BEARING EARLIER DATE

Cannon
11900 Olympic Blvd, Suite 530
Los Angeles, CA 90064
P 310.664.1166 F 310.664.8877

DRAWN BY: CP | DATE: 1/14/2025
CHECKED BY: SJ | SCALE: AS SHOWN
CA JOB NO. 220939

THESE DRAWINGS ARE INSTRUMENTS OF SERVICE AND ARE THE PROPERTY OF CANNON. ALL DESIGNS AND INFORMATION ON THESE DRAWINGS ARE FOR USE OF THE SPECIFIED PROJECT AND SHALL NOT BE USED OTHERWISE OR REPRODUCED WITHOUT THE EXPRESSED WRITTEN PERMISSION OF CANNON.

HYB, LLC
FLEETWOOD INDUSTRIAL
WATER QUALITY DETAILS
JURUPA VALLEY, CA

SHEET WQ2

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Infiltration Trench - Design Procedure	BMP ID: 1	Legend:	Required Entries / Calculated Cells
Company Name:	CANNON ENGINEERING	Date:	1/14/2025
Designed by:	SDM	County/City Case No.:	RIVERSIDE

Design Volume

Enter the area tributary to this feature, Max = 10 acres	A_t =	5	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP} =	12,111	ft^3

Calculate Maximum Depth of the Reservoir Layer

Enter Infiltration rate	I =	25.1	in/hr
Enter Factor of Safety, FS (unitless)	FS =	3	
Obtain from Table 1, Appendix A: "Infiltration Testing" of this BMP Handbook			
	n =	40	%
Calculate D_1. $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times (n/100) \times FS}$	D_1 =	125.25	ft
Enter depth to historic high groundwater mark (measured from finished grade)		54	ft
Enter depth to top of bedrock or impermeable layer (measured from finished grade)		100	ft
D_2 is the smaller of: Depth to groundwater - 11 ft; & Depth to impermeable layer - 6 ft	D_2 =	43.0	ft
D_{MAX} is the smaller value of D_1 and D_2, must be less than or equal to 8 feet.	D_{MAX} =	8.0	ft

Trench Sizing

Enter proposed reservoir layer depth D_R, must be ≤ D_{MAX}	D_R =	5.50	ft
Calculate the design depth of water, d_W			
Design $d_W = (D_R) \times (n/100)$	Design d_W =	2.20	ft
Minimum Surface Area, A_S $A_S = \frac{V_{BMP}}{d_W}$	A_S =	5,505	ft^2
Proposed Design Surface Area — Error, minimum area is not provided	A_D =	3,583	ft^2
Minimum Width = D_R + 1 foot pea gravel		6.50	ft
Sediment Control Provided? (Use pulldown)		Yes	
Geotechnical report attached? (Use pulldown)		Yes	

If the trench has been designed correctly, there should be no error messages on the spreadsheet.

Notes: CLOSEST SUBSURFACE IS B-5. This worksheet was used for general guidance. BMP is proprietary device with drawdown of less than 5 hours.

Infiltration Trench - Design Procedure	BMP ID: 2	Legend:	Required Entries / Calculated Cells
Company Name:	CANNON ENGINEERING	Date:	1/14/2025
Designed by:	SDM	County/City Case No.:	RIVERSIDE

Design Volume

Enter the area tributary to this feature, Max = 10 acres	A_t =	2	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP} =	4,742	ft^3

Calculate Maximum Depth of the Reservoir Layer

Enter Infiltration rate	I =	25.1	in/hr
Enter Factor of Safety, FS (unitless)	FS =	3	
Obtain from Table 1, Appendix A: "Infiltration Testing" of this BMP Handbook			
	n =	40	%
Calculate D_1. $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times (n/100) \times FS}$	D_1 =	125.25	ft
Enter depth to historic high groundwater mark (measured from finished grade)		54	ft
Enter depth to top of bedrock or impermeable layer (measured from finished grade)		100	ft
D_2 is the smaller of: Depth to groundwater - 11 ft; & Depth to impermeable layer - 6 ft	D_2 =	43.0	ft
D_{MAX} is the smaller value of D_1 and D_2, must be less than or equal to 8 feet.	D_{MAX} =	8.0	ft

Trench Sizing

Enter proposed reservoir layer depth D_R, must be ≤ D_{MAX}	D_R =	5.50	ft
Calculate the design depth of water, d_W			
Design $d_W = (D_R) \times (n/100)$	Design d_W =	2.20	ft
Minimum Surface Area, A_S $A_S = \frac{V_{BMP}}{d_W}$	A_S =	2,155	ft^2
Proposed Design Surface Area — Error, minimum area is not provided	A_D =	1,442	ft^2
Minimum Width = D_R + 1 foot pea gravel		6.50	ft
Sediment Control Provided? (Use pulldown)		Yes	
Geotechnical report attached? (Use pulldown)		Yes	

If the trench has been designed correctly, there should be no error messages on the spreadsheet.

Notes: CLOSEST SUBSURFACE IS B-5. This worksheet was used for general guidance. BMP is proprietary device with drawdown of less than 5 hours.

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Cannon	Date	1/14/2025
Designed by	SJ/CP	Case No	
Company Project Number/Name	Fleetwood		

BMP Identification

BMP NAME / ID: BMP 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.65 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
1	*221,237*	*Concrete or Asphalt*	*1*	*0.89*	*197343.4*			
	221237	***Total***			**197343.4**	**0.65**	***10689.4***	***12111***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries; Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Cannon	Date	1/14/2025
Designed by	SJ/CP	Case No	
Company Project Number/Name	Fleetwood		

BMP Identification

BMP NAME / ID: BMP 2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.65 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
2	*84,316*	*Concrete or Asphalt*	*1*	*0.89*	*75209.9*			
	84316	***Total***			**75209.9**	**0.65**	***4073.9***	***4742***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Cannon	Date	1/14/2025
Designed by	SJ/CP	Case No	
Company Project Number/Name	Fleetwood		

BMP Identification

BMP NAME / ID

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.65 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
3	*118175*	*Natural (C Soil)*	*0.3*	*0.23*	*26609*			
	118175		***Total***		**26609**	**0.65**	***1441.3***	**0**

Proposed Volume must be greater than the Design Capture Volume

Notes:

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	Cannon	Date	1/14/2025
Designed by	SJ/CP	Case No	
Company Project Number/Name	Fleetwood		

BMP Identification

BMP NAME / ID

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity I = 0.65 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

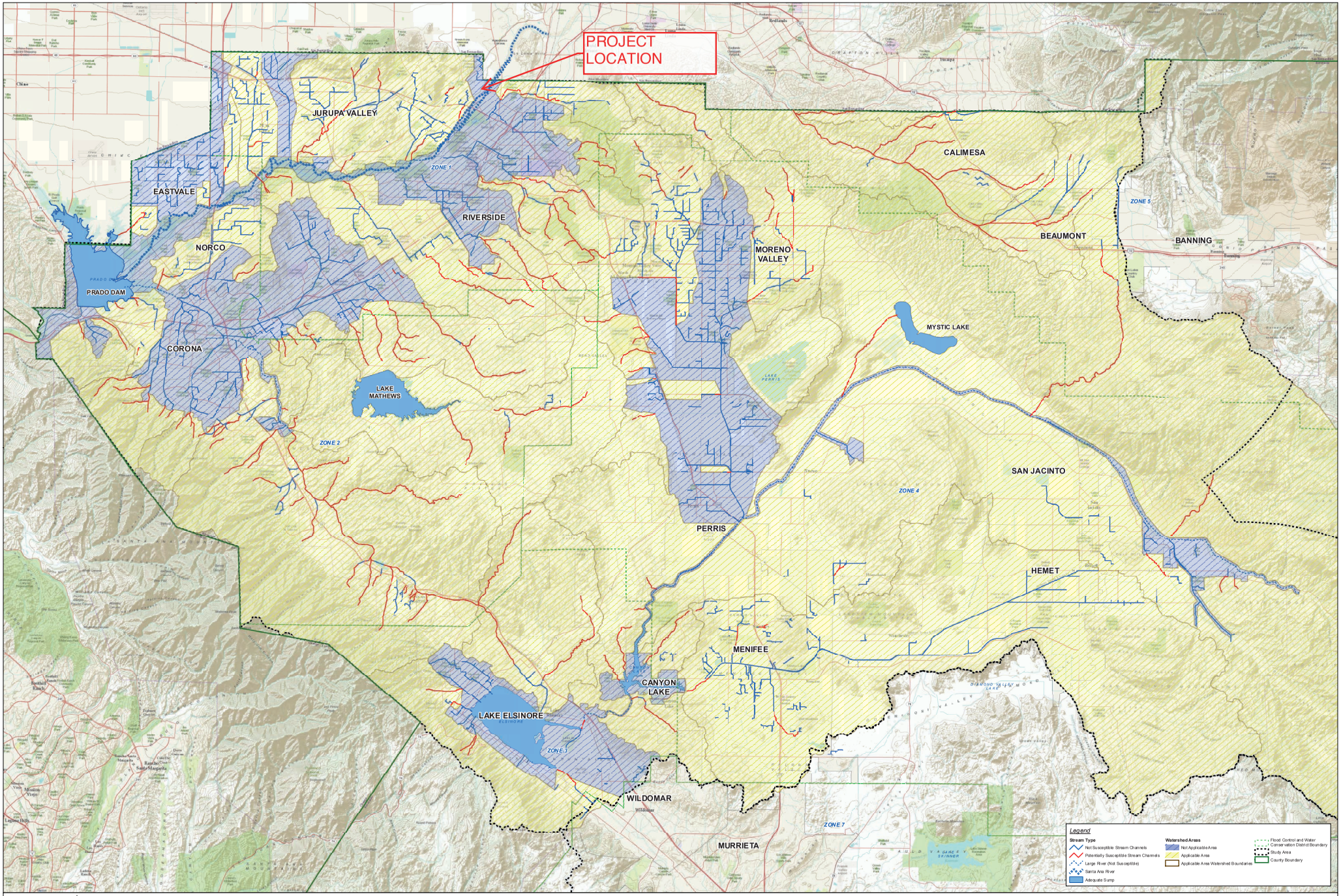
DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Rainfall Intensity (in/hr)	Design Flow Rate (cfs)	Proposed Flow Rate (cfs)
1	221,237	Concrete or Asphalt	1	0.89	197343.4			
2	84,316	Concrete or Asphalt	1	0.892	75209.9			
3	118175	Natural (C Soil)	0.3	0.22517	26609			
	423728	Total			299162.3	0.65	4.5	N/A

Notes:

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern



HCOC Applicability Map

Hydromodification Susceptibility Documentation Report and Mapping
Riverside County Flood Control and Water Conservation District

Map 2

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **E.** Pools, spas, ponds, decorative fountains, and other water features.	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
❑ **F.** Food service	❑ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	❑ See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.
❑ **G.** Refuse areas	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ❑ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	❑ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
❑ **H.** Industrial processes.	❑ Show process area.	❑ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for: ▪ □Hazardous Waste Generation ▪ □Hazardous Materials Release Response and Inventory ▪ □California Accidental Release (CalARP) ▪ □Aboveground Storage Tank ▪ □Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ □Underground Storage Tank www.cchealth.org/groups/hazmat/	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
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❑ **J.** Vehicle and Equipment Cleaning	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ❑Car dealerships and similar may rinse cars with water only.

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❑ **K.** Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

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❑ **L.** Fuel Dispensing Areas	❑ Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ❑ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		❑ The property owner shall dry sweep the fueling area routinely. ❑ See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[6] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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☑ **M.** Loading Docks	☑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. ☐ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ☐ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		☑ Move loaded and unloaded items indoors as soon as possible. ☑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

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☑ **N.** Fire Sprinkler Test Water		☑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	☑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources ☐ Boiler drain lines ☐ Condensate drain lines ☐ Rooftop equipment ☐ Drainage sumps ☐ Roofing, gutters, and trim. ☐ Other sources		☐ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ☐ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ☐ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ☐ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ☐ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. Include controls for other sources as specified by local reviewer.	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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☒ **P.** Plazas, sidewalks, and parking lots.			☒ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

PROVIDED AT FINAL WQMP

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

Non-Stormwater Discharges SC-10



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, air conditioner condensate, etc. However there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains. They can generally be detected through a combination of detection and elimination. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of pollutants on streets and into the storm drain system and creeks.

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Approach

Initially the industry must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is in the elimination of non-stormwater discharges.

Pollution Prevention

- Ensure that used oil, used antifreeze, and hazardous chemical recycling programs are being implemented. Encourage litter control.

Suggested Protocols

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms
  - Educational materials

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled or demarcated next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

- See SC44 Stormwater Drainage System Maintenance for additional information.

Illicit Connections

- Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Isolate problem areas and plug illicit discharge points.
- Locate and evaluate all discharges to the industrial storm drain system.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.
- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Drainage System

- TV Cameras can be employed to visually identify illicit connections to the industrial storm drainage system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Once a site has been cleaned:

- Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.
- See fact sheet SC11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Document and report annually the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Training

- Training of technical staff in identifying and documenting illegal dumping incidents is required.
- Consider posting the quick reference table near storm drains to reinforce training.
- Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.
- Conduct spill response drills annually (if no events occurred to evaluate your plan) in cooperation with other industries.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

Spill Response and Prevention

- See SC11 Spill Prevention Control and Cleanup.

Other Considerations

- Many facilities do not have accurate, up-to-date schematic drawings.

Requirements

Costs (including capital and operation & maintenance)

- The primary cost is for staff time and depends on how aggressively a program is implemented.
- Cost for containment and disposal is borne by the discharger.
- Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- Indoor floor drains may require re-plumbing if cross-connections to storm drains are detected.

Maintenance (including administrative and staffing)

- Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

Supplemental Information

Further Detail of the BMP

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. All of these wastes cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots

- Types and quantities (in some cases) of wastes
- Patterns in time of occurrence (time of day/night, month, or year)
- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges to the stormwater collection system may include any water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Facilities subject to stormwater permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The State's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Performance Evaluation

- Review annually internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Spill Prevention, Control & Cleanup SC-11



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Objectives

- ■□Cover
- ■□Contain
- ■□Educate
- ■□Reduce/Minimize
- ■□Product Substitution

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental or illegal spills. Preparation for accidental or illegal spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling procedures, describe spill response procedures, and provide spill clean-up equipment. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills.

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Approach

Pollution Prevention

- ■□ Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- ■□ Develop a Spill Prevention Control and Countermeasure (SPCC) Plan. The plan should include:

- Description of the facility, owner and address, activities and chemicals present
- Facility map
- Notification and evacuation procedures
- Cleanup instructions
- Identification of responsible departments
- Identify key spill response personnel

- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Suggested Protocols (including equipment needs)

Spill Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- If consistent illegal dumping is observed at the facility:
  - Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - Landscaping and beautification efforts may also discourage illegal dumping.
  - Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

- Store and contain liquid materials in such a manner that if the tank is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

- If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

- Routine maintenance:
  - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
  - Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
  - Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

- Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- Label all containers according to their contents (e.g., solvent, gasoline).
- Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
- Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- Identify key spill response personnel.

Spill Control and Cleanup Activities

- Follow the Spill Prevention Control and Countermeasure Plan.
- Clean up leaks and spills immediately.
- Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to local agencies, such as the fire department; they can assist in cleanup.
- Establish a system for tracking incidents. The system should be designed to identify the following:

  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)

- Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

Training

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.
- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- A Spill Prevention Control and Countermeasure Plan (SPCC) is required for facilities that are subject to the oil pollution regulations specified in Part 112 of Title 40 of the Code of Federal Regulations or if they have a storage capacity of 10,000 gallons or more of petroleum. (Health and Safety Code 6.67)
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from

tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- External corrosion and structural failure
- Spills and overfills due to operator error
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.

- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.
- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:
  - Cover fueling area if possible.
  - Use a perimeter drain or slope pavement inward with drainage to a sump.
  - Pave fueling area with concrete rather than asphalt.
- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off' of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities. The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department)
- Develop procedures to prevent/mitigate spills to storm drain systems
- Identify responsible departments
- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures
- Address spills at municipal facilities, as well as public areas

- Provide training concerning spill prevention, response and cleanup to all appropriate personnel

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net/

Safer Alternative Products SC-35

Description

Promote the use of less harmful products and products that contain little or no TMDL pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests by methods that pose a lower risk to employees, the public, and the environment.
- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies

Objectives

- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

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- Procedures
  - Standard operating procedures (SOPs)
  - Purchasing guidelines and procedures
  - Bid packages (services and supplies)
- Materials
  - Preferred or approved product and supplier lists
  - Product and supplier evaluation criteria
  - Training sessions and manuals
  - Fact sheets for employees

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC20 – SC22) and SC41, Building and Grounds Maintenance.

Training

- Employees who handle potentially harmful materials in the use of safer alternatives.
- Purchasing departments should be encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.

Regulations

This BMP has no regulatory requirements. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements,
- Storm water runoff sampling requirements,
- Training and licensing requirements, and
- Record keeping and reporting requirements.

Equipment

- There are no major equipment requirements to this BMP.

Limitations

- Alternative products may not be available, suitable, or effective in every case.

Requirements

Cost Considerations

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.

- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources listed below.

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Rerefined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps. All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.
- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control (www.dtsc.ca.gov)

California Integrated Waste Management Board (www.ciwmb.ca.gov)

City of Santa Monica (www.santa-monica.org/environment)

City of Palo Alto (www.city.palo-alto.ca.us/cleanbay)

City and County of San Francisco, Department of the Environment (www.ci.sf.ca.us/sfenvironment)

Earth 911 (www.earth911.org/master.asp)

Environmental Finance Center Region IX (www.greenstart.org/efc9)

Flex Your Power (www.flexyourpower.ca.gov)

GreenBiz.com (www.greenbiz.com)

Green Business Program (www.abag.org/bayarea/enviro/gbus/gb.html)

Pacific Industrial and Business Association (www.piba.org)

Sacramento Clean Water Business Partners (www.sacstormwater.org)

USEPA BMP fact sheet – Alternative products (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/poll_2.cfm)

USEPA Region IX Pollution Prevention Program (www.epa.gov/region09/p2)

Western Regional Pollution Prevention Network (www.westp2net.org)

Metals (mercury, copper)

National Electrical Manufacturers Association - Environment, Health and Safety (www.nema.org)

Sustainable Conservation (www.suscon.org)

Auto Recycling Project

Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center (www.birc.org)

California Department of Pesticide Regulation (www.cdpr.ca.gov)

University of California Statewide IPM Program (www.ipm.ucdavis.edu/default.html)

Dioxins

Bay Area Dioxins Project (http://dioxin.abag.ca.gov/)

Building & Grounds Maintenance SC-41



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

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- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Other Considerations

Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Cost will vary depending on the type and size of facility.
- Overall costs should be low in comparison to other BMPs.

Maintenance

Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Parking/Storage Area Maintenance SC-43



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas and storage areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook)
- Keep accurate maintenance logs to evaluate BMP implementation.

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SC-43 Parking/Storage Area Maintenance

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out, or wash area with drain.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Follow the procedures below if water is used to clean surfaces:
  - Block the storm drain or contain runoff.
  - Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below when cleaning heavy oily deposits:
  - Clean oily spots with absorbent materials.
  - Use a screen or filter fabric over inlet, then wash surfaces.

- Do not allow discharges to the storm drain.
- Vacuum/pump discharges to a tank or discharge to sanitary sewer.
- Appropriately dispose of spilled materials and absorbents.

Surface Repair

- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Other Considerations

Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

SC-43 Parking/Storage Area Maintenance

Requirements

Costs

Cleaning/sweeping costs can be quite large. Construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot regularly to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities regularly to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Only use only as much water as is necessary for dust control to avoid runoff.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Drainage System Maintenance SC-44



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
  - Purchase and installation of signs.
  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

S-1: Storm Drain Message and Signage

Purpose

Waste material dumped into storm drain inlets can adversely impact surface and ground waters. In fact, any material discharged into the storm drain system has the potential to significantly impact downstream receiving waters. Storm drain messages have become a popular method of alerting and reminding the public about the effects of and the prohibitions against waste disposal into the storm drain system. The signs are typically stenciled or affixed near the storm drain inlet or catch basin. The message simply informs the public that dumping of wastes into storm drain inlets is prohibited and/or that the drain ultimately discharges into receiving waters.

General Guidance

- The signs must be placed so they are easily visible to the public.
- Be aware that signs placed on sidewalk will be worn by foot traffic.

Design Specifications

- Signs with language and/or graphical icons that prohibit illegal dumping, must be posted at designated public access points along channels and streams within the project area. Consult with Los Angeles County Department of Public Works (LACDPW) staff to determine specific signage requirements for channels and streams.
- Storm drain message markers, placards, concrete stamps, or stenciled language/icons (e.g., "No Dumping – Drains to the Ocean") are required at all storm drain inlets and catch basins within the project area to discourage illegal or inadvertent dumping. Signs should be placed in clear sight facing anyone approaching the storm drain inlet or catch basin from either side (see Figure D-1 and Figure D-2). LACDPW staff should be contacted to determine specific requirements for types of signs and methods of application. A stencil can be purchased for a nominal fee from LACDPW Building and Safety Office by calling (626) 458-3171. All storm drain inlet and catch basin locations must be identified on the project site map.

Maintenance Requirements

Legibility and visibility of markers and signs should be maintained (e.g., signs should be repainted or replaced as necessary). If required by LACDPW, the owner/operator or homeowner's association shall enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards and signs.

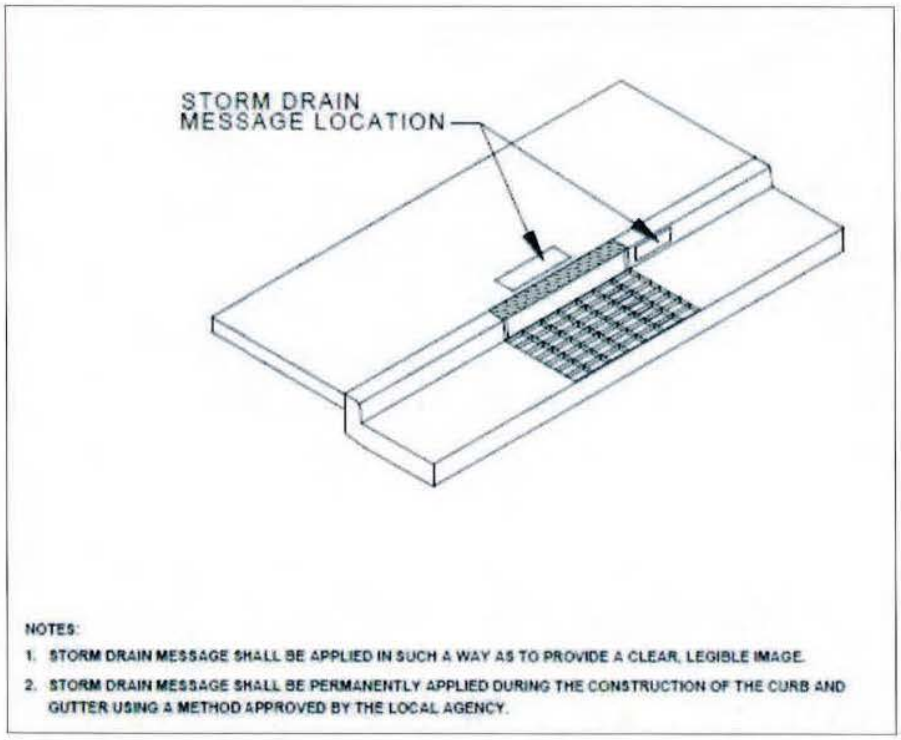


Figure D-1. Storm Drain Message Location – Curb Type Inlet

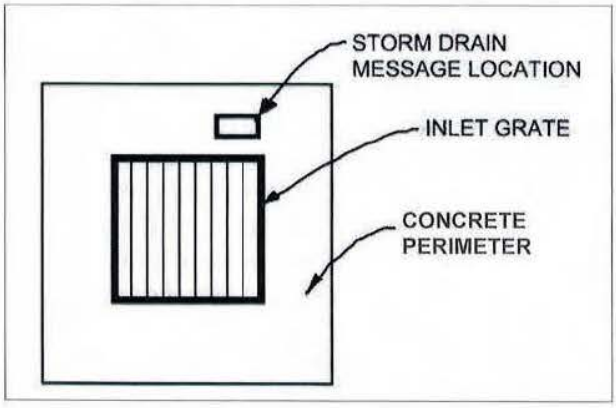


Figure D-2. Storm Drain Message Location – Catch Basin/Area Type Inlet

S-4: Outdoor Loading/Unloading Dock Area

Purpose

Materials spilled, leaked, or lost during loading or unloading may collect on impervious surfaces or in the soil and be carried away by stormwater runoff or when the area is cleaned. Precipitation may also wash pollutants from machinery used to load or unload materials. In particular, loading docks have the potential to contribute heavy metals, nutrients, suspended solids, oils, and grease to stormwater runoff due to the heavy truck traffic and loading and unloading activities. Depressed loading docks (e.g., truck wells) are contained areas that can also accumulate water.

Design Specifications

Design specifications for outdoor loading/unloading dock areas are regulated by local building and fire codes and by current County ordinances and zoning requirements. Additionally, individual businesses may have their own design or access requirements for loading docks. Design specifications presented in this fact sheet are intended to enhance and be consistent with these code and ordinance requirements while addressing stormwater runoff concerns. The design specifications presented in Table D-4 are not intended to conflict with requirements established by individual businesses, but should be followed to the maximum extent practicable.

Accumulated Water

Stormwater runoff, non-stormwater runoff, and spills will accumulate in containment areas and sumps with impervious surfaces, such as depressed loading docks. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without appropriate permitting. Contact LACDPW (1-888-CLEAN-LA) for information regarding discharge of contaminated accumulated water.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., covers, signs) must be maintained by the owner/operator as required by local codes and ordinances. If a water quality inlet or infiltration system is installed, it must be maintained as indicated by the manufacturer or installer. Outdoor loading/unloading dock areas must be checked periodically to ensure containment of accumulated water and prevention of stormwater run-on. Maintenance agreements between LACDPW and the owner/operator may be required. Failure to properly maintain building and property may subject the property owner to citation.

Table D-4. Design Specifications for Outdoor Loading/Unloading Dock Area

Design Feature	Design Specifications
Surfacing	• Construct/pave outdoor loading/unloading dock areas with Portland cement concrete or an equivalent impervious surface. Ensure that the surfacing material is chemically-resistant to materials being handled in the loading/unloading dock area.
Covers	• Cover outdoor loading/unloading dock areas to a distance of at least 10 feet beyond the loading dock or building face if there is no raised dock. If the cover or roof structure does not include sidewalls, then the roof overhang must extend beyond the grade break. The overhang must extend a minimum of 20 percent of the roof height. • For interior transfer bays, provide a minimum 10-foot 'No Obstruction Zone" to allow trucks or trailers to extend at least 5 feet inside the building. Identify "No Obstruction Zone" clearly on site plans and paint zone with high visibility floor paint. • If covers or interior transfer bays are not feasible, install a seal or door skirt and provide a cover to shield all material transfers between trailers and building. • LACDPW may grant waivers for covers on a case-by-case basis.
Hydraulic Isolation/Drainage	• For outdoor loading/unloading dock areas, hydraulically-isolate the first six feet of paved area measured from the building or dock face with grading, berms, or drains to prevent stormwater run-on from surrounding areas or roof drains. Direct stormwater runoff (e.g., from downspouts/roofs) and drainage from surrounding areas away from hydraulically-isolated areas to a stormwater runoff discharge point that meets all applicable LID Standards Manual requirements. • For interior transfer bays or bay doors, prevent stormwater runoff from surrounding areas from entering the building with grading or drains. Do not install interior floor drains in the "No Obstruction Zone". Hydraulically-isolate the "No Obstruction Zone" from any interior floor drains. • Do not install direct connections to storm drains from depressed loading docks. Connect drains or direct drainage from hydraulically-isolated loading/unloading dock area to an approved sediment/oil/water separator system connected a discharge location as determined by LACDPW. Provide a manual emergency spill diversion valve upstream of separator system to direct flow, in the event of a spill, to an approved spill containment vault sized to contain a volume equal to 125% of largest container handled at the facility. Provide additional emergency means, such as drain plugs or drain covers, to prevent spills or contaminated stormwater runoff from entering the storm drain system.

S-8: Landscape Irrigation Practices

Purpose

Irrigation runoff provides a pathway for pollutants (i.e., nutrients, bacteria, organics, sediment) to enter the storm drain system. By effectively irrigating, less runoff is produced resulting in less potential for pollutants to enter the storm drain system.

General Guidance

- Do not allow irrigation runoff from the landscaped area to drain directly to storm drain system.
- Minimize use of fertilizer, pesticides, and herbicides on landscaped areas.
- Plan sites with sufficient landscaped area and dispersal capacity (e.g., ability to receive irrigation water without generating runoff).
- Consult a landscape professional regarding appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Design Specifications

- Choose plants that minimize the need for fertilizer and pesticides.
- Group plants with similar water requirements and water accordingly.
- Use mulch to minimize evaporation and erosion.
- Include a vegetative boundary around project site to act as a filter.
- Design the irrigation system to only water areas that need it.
- Install an approved subsurface drip, pop-up, or other irrigation system.[1] The irrigation system should employ effective energy dissipation and uniform flow spreading methods to prevent erosion and facilitate efficient dispersion.
- Install rain sensors to shut off the irrigation system during and after storm events.
- Include pressure sensors to shut off flow-through system in case of sudden pressure drop. A sudden pressure drop may indicate a broken irrigation head or water line.
- If the hydraulic conductivity in the soil is not sufficient for the necessary water application rate, implement soil amendments to avoid potential geotechnical hazards (i.e., liquefaction, landslide, collapsible soils, and expansive soils).

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[1] If alternative distribution systems (e.g., spray irrigation) are approved, the County will establish guidelines to implement these new systems.

- For sites located on or within 50 feet of a steep slope (15% or greater), do not irrigate landscape within three days of a storm event to avoid potential geotechnical instability.[2]
- Implement Integrated Pest Management practices.

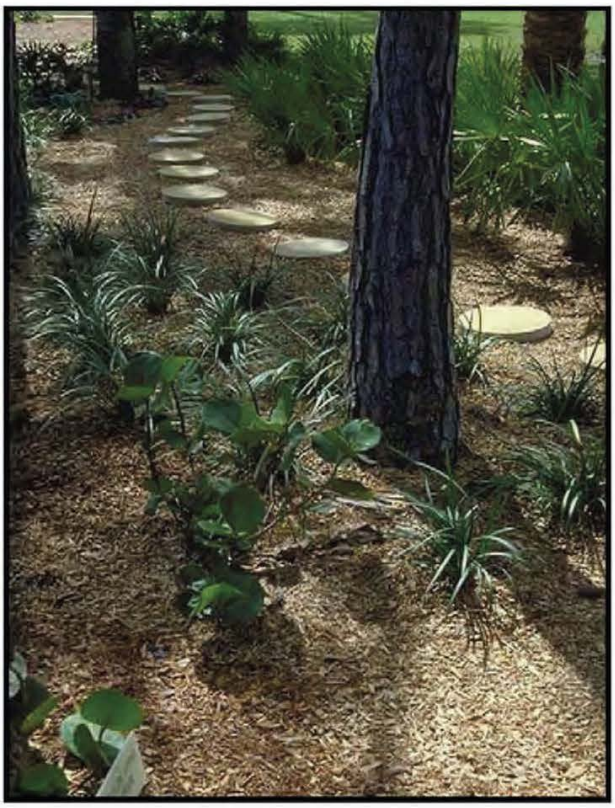
For additional guidelines and requirements, refer to the Los Angeles County Department of Health Services.

Maintenance Requirements

Maintain irrigation areas to remove trash and debris and loose vegetation. Rehabilitate areas of bare soil. If a rain or pressure sensor is installed, it should be checked periodically to ensure proper function. Inspect and maintain irrigation equipment and components to ensure proper functionality. Clean equipment as necessary to prevent algae growth and vector breeding. Maintenance agreements between LACDPW and the owner/operator may be required. Failure to properly maintain building and property may subject the property owner to citation.

[2] As determined by the City of Los Angeles, Building and Safety Division

Site Design & Landscape Planning SD-10



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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SD-10 Site Design & Landscape Planning

Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

SD-10 Site Design & Landscape Planning

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Efficient Irrigation SD-12



Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include "NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.
- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Media Filter TC-40



Maintenance Concerns, Objectives, and Goals

- Pollutant Breakthrough
- Clogged of Sand Media
- Trash and Debris Accumulation

General Description

Stormwater media filters are usually two-chambered including a pretreatment settling basin and a filter bed filled with sand or other absorptive filtering media. As stormwater flows into the first chamber, large particles settle out, and then finer particles and other pollutants are removed as stormwater flows through the filtering media in the second chamber. There are a number of design variations including the Austin sand filter, Delaware sand filter, and multi-chambered treatment train (MCTT).

Targeted Constituents

✓	Sediment	■
✓	Nutrients	●
✓	Trash	■
✓	Metals	■
✓	Bacteria	▲
✓	Oil and Grease	■
✓	Organics	■

Legend *(Removal Effectiveness)*

● Low ■ High

▲ Medium

Inspection/Maintenance Considerations

Media filters may exhibit decreased effectiveness after a few years of operation, depending on the activities occurring in the drainage area. Media filters clog easily when subjected to high sediment loads. Sediment reducing pretreatment practices, such as vegetated buffer strips or vegetated swales, placed upstream of the filter should be maintained properly to reduce sediment loads into filter. Media filters can become a nuisance due to mosquito or midge breeding if not properly designed and maintained. Installations should dewater completely (recommended 72 hour or less residence time) to prevent creating mosquito and other vector habitats. Maintenance efforts will need to focus on basic housekeeping practices such as removal of debris accumulations and vegetation management (in filter media) to prevent clogs and/or pods of standing water. To minimize the potential for clogging, frequent maintenance and inspection practices are required. Waste sand, gravel, filter cloth, or filter media must be disposed of properly and in accordance with all applicable laws.

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Inspection Activities	Suggested Frequency
■ During the first year of operation, inspect chambers quarterly to ensure that the system is functioning properly. ■ Inspect sand filters after every major storm in the first few months after construction to ensure that the system is functioning properly.	Post construction
■ Ensure that filter surface, inlets, and outlets are clear of debris. ■ Ensure that the contributing area is stabilized and mowed, with clippings removed. ■ Check to ensure that the filter surface is not clogging. ■ Ensure that activities in the drainage area minimize oil/grease and sediment entry to the system. ■ Inspect the facility once during the wet season after a large rain event to determine whether the facility is draining completely within 72 hr.	Quarterly, and after major storms
■ Inspect for standing water, sediment, trash and debris, structural damage, and to identify potential problems.	Semi-annual
■ Check to see that the filter bed is clean of sediments and the sediment chamber contains no more than six inches of sediment. ■ Make sure that there is no evidence of deterioration of concrete structures. ■ Inspect grates (if used). ■ Inspect inlets, outlets, and overflow spillway to ensure good condition and no evidence of erosion. ■ Ensure that flow is not bypassing the facility. ■ Ensure that no noticeable odors are detected outside the facility.	Annual
Maintenance Activities	**Suggested Frequency**
■ Remove trash and debris from the sedimentation basin (Austin design), the riser pipe, and the filter bed as needed. ■ Prevent grass clippings from washing into the filter. ■ Remove trash from inlet grates to maintain the inflow capacity of the media filter. ■ Upstream vegetation should be maintained as needed.	Frequently (as needed)
■ Clean filter surface semiannually; or more often if watershed is excessively erosive. ■ Replace sorbent pillows (Multi-Chamber Treatment Train only).	Semi-annual
■ Repair or replace any damaged structural parts. ■ Stabilize any eroded areas.	Annual
■ Remove accumulated sediment in the sedimentation chamber every 10 years or when the sediment occupies 10-20% of the basin volume or accumulates to a depth of six inches, whichever is less. ■ Remove top 2 in. of media filter and landfill if facility drain time exceeds 72 hr. Restore media depth to 18 in. when overall media depth drops to 12 in.).	As needed

Inspection Activities	Suggested Frequency
■ During the first year of operation, inspect chambers quarterly to ensure that the system is functioning properly. ■ Inspect sand filters after every major storm in the first few months after construction to ensure that the system is functioning properly.	Post construction
■ Ensure that filter surface, inlets, and outlets are clear of debris. ■ Ensure that the contributing area is stabilized and mowed, with clippings removed. ■ Check to ensure that the filter surface is not clogging. ■ Ensure that activities in the drainage area minimize oil/grease and sediment entry to the system. ■ Inspect the facility once during the wet season after a large rain event to determine whether the facility is draining completely within 72 hr.	Quarterly, and after major storms
■ Inspect for standing water, sediment, trash and debris, structural damage, and to identify potential problems.	Semi-annual
■ Check to see that the filter bed is clean of sediments and the sediment chamber contains no more than six inches of sediment. ■ Make sure that there is no evidence of deterioration of concrete structures. ■ Inspect grates (if used). ■ Inspect inlets, outlets, and overflow spillway to ensure good condition and no evidence of erosion. ■ Ensure that flow is not bypassing the facility. ■ Ensure that no noticeable odors are detected outside the facility.	Annual
Maintenance Activities	**Suggested Frequency**
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■ Clean filter surface semiannually; or more often if watershed is excessively erosive. ■ Replace sorbent pillows (Multi-Chamber Treatment Train only).	Semi-annual
■ Repair or replace any damaged structural parts. ■ Stabilize any eroded areas.	Annual
■ Remove accumulated sediment in the sedimentation chamber every 10 years or when the sediment occupies 10-20% of the basin volume or accumulates to a depth of six inches, whichever is less. ■ Remove top 2 in. of media filter and landfill if facility drain time exceeds 72 hr. Restore media depth to 18 in. when overall media depth drops to 12 in.).	As needed

Water Quality Inlet TC-50

General Description

Water quality inlets (WQIs), also commonly called trapping catch basins, oil/grit separators or oil/water separators, consist of one or more chambers that promote sedimentation of coarse materials and separation of free oil (as opposed to emulsified or dissolved oil) from stormwater. Some WQIs also contain screens to help retain larger or floating debris, and many of the newer designs also include a coalescing unit that helps promote oil/water separation.

These devices are appropriate for capturing hydrocarbon spills, but provide very marginal sediment removal and are not very effective for treatment of stormwater runoff. WQIs typically capture only the first portion of runoff for treatment and are generally used for pretreatment before discharging to other best management practices (BMPs).

Inspection/Maintenance Considerations

High sediment loads can interfere with the ability of the WQI to effectively separate oil and grease from the runoff. During periods of high flow, sediment can be resuspended and released from the WQI into surface waters. Maintenance of WQIs can be easily neglected because they are underground. Establishment of a maintenance schedule is helpful for ensuring proper maintenance occurs. The required maintenance effort will be site-specific due to variations in sediment and hydrocarbon loading. Since WQI residuals contain hydrocarbon by-products, they may require disposal as hazardous waste. Many WQI owners coordinate with waste haulers to collect and dispose of these residuals.

Maintenance Concerns, Objectives, and Goals

- High Sediment Loads
- Hazardous Waste
- Vector Control

Targeted Constituents

✓	Sediment	●
✓	Nutrients	●
✓	Trash	▲
✓	Metals	●
✓	Bacteria	●
✓	Oil and Grease	▲
✓	Organics	●

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Inspection Activities	Suggested Frequency
■ Inspect after every storm event to determine if maintenance is required.	Monthly during the wet season, or after significant rain events

Maintenance Activities	Suggested Frequency
■ Clean out and dispose of accumulated oil, grease, and sediments. Remove accumulated trash and debris. The clean out and disposal techniques should be environmentally acceptable and in accordance with local regulations.	Annual, before the wet season, or more frequent as needed

Additional Information

Since WQIs can be relatively deep, they may be designated as confined spaces. Caution should be exercised to comply with confined space entry safety regulations if it is required.

References

http://www.co.pierce.wa.us/pc/services/home/environ/water/swm/sppman/bmpt1.htm