LAVENDER
EXCAVATION PLAN
TRACT 19307 SD IMPROVEMENT

REV #0

DESIGN CALCULATIONS
March 7, 2025

PREPARED BY:
SCOTT F CANNON, PE

MZB ENGINEERING, INC

TEL:949.254.4792 engineering@mzbinc.com www.mzbinc.com

1192 Athlone Lane Corona, CA 92882

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PLANS FOR CONSTRUCTION ON

TRACT NO. 19307

IN ORANGE COUNTY

-

LAVENDER

-

EXCAVATION PLAN
REVISION 0

March 7, 2025

INDEX TO PLANS

LOCATION MAP

Underground Service Alert

Call: TOLL FREE
1-800-422-4133

TWO WORKING DAYS BEFORE YOU DIG

REGISTERED PROFESSIONAL ENGINEER
SCOTT T. CANNON
84327
Exp. 09-30-25
CIVIL
STATE OF CALIFORNIA

DESCRIPTION	DATE	REV.
RELEASED FOR CONSTRUCTION	3-7-25	0

DESIGN BY: SCANNON
DRAWN BY: SCANNON
SCALE: AS SHOWN

MZB
ENGINEERING INC.
1192 ATHLONE LANE
CORONA, CA 92882
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MZB ENGINEERING

SEWER & WATER IMPROVEMENT

COVER

PROJECT: TENTATIVE TRACT NO. 19307

CONTRACTOR: -

CONTRACT NO: -

SHEET NUMBER:
1
OF 3 SHEETS

Lavender File

GENERAL NOTES:
1. ALL EXCAVATIONS SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH OSHA CFR 29, PART 1926, SUBPART P, AND CAL/OSHA SAFETY ORDERS TITLE 8, SECTION 1504, AND 1539–1547.

2. THE DESIGN OF THIS TEMPORARY EXCAVATION IS IN ACCORDANCE WITH OCTA CONTRACT C–5–3843 AND TP SECTION 13 GEOTECHNICAL AND 22.4.5 EXCAVATIONS AND TRENCHES.

3. THE DESIGN OF THIS EXCAVATION IS IN ACCORDANCE WITH THE 2018 CALTRANS STANDARD SPECIFICATIONS AND THE 2011 CT TRENCHING AND SHORING MANUAL

LOCATION AND PROTECTION OF EXISTING UTILITIES:
1. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, OTHER OBSTACLES, DIMENSIONS, OFFSETS, ELEVATIONS AND CONDITIONS IN THE FIELD PRIOR TO STARTING ANY WORK. ALL EXISTING UTILITIES SHOWN ON THE CONTRACT PLANS WITHIN THE WORK ZONE SHALL BE POSITIVELY IDENTIFIED PRIOR TO STARTING WORK. THE CONTRACTOR IS RESPONSIBLE TO POTHOLE ALL UTILITIES (AS NEEDED) BEFORE SHORING WALL CONSTRUCTION IS TO BEGIN. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES BEFORE PROCEEDING FURTHER WITH THE WORK.

SURVEYING AND GROUND ELEVATION INFORMATION:
1. EXISTING GROUND ELEVATIONS AND CONSEQUENTIAL ELEVATION HEIGHTS HAVE BEEN DETERMINED BASED ON TOPOGRAPHICAL INFORMATION PROVIDED BY THE PLANS AND OR ACTUAL FIELD DATA.

COMPETENT PERSONS:
1. A COMPETENT PERSON IS CAPABLE OF IDENTIFYING EXISTING AND PREDICTABLE HAZARDS IN THE SURROUNDINGS, OR WORKING CONDITIONS WHICH ARE UNSANITARY, HAZARDOUS, OR DANGEROUS TO EMPLOYEES AND WHO HAS AUTHORIZATION TO TAKE PROMPT CORRECTIVE MEASURES TO ELIMINATE THEM.

2. BEFORE COMMENCING ANY EXCAVATION, THE CONTRACTOR SHALL OBTAIN UNDERGROUND SERVICE ALERT (USA) INQUIRY I.D. NUMBER. A MINIMUM OF 3 DAYS SHALL BE ALLOWED AFTER THE I.D. NUMBER IS OBTAINED AND BEFORE THE EXCAVATION WORK IS STARTED TO NOTIFY UTILITY OWNERS. IF THE UTILITY OWNER IS THE CITY, A CONFIRMATION NUMBER INDICATING THE CITY HAS BEEN NOTIFIED SHALL BE OBTAINED BY USA AND/OR THE CONTRACTOR FROM THE APPROPRIATE CITY DEPARTMENT. THE I.D. NUMBER TOGETHER WITH THE DATE ACQUIRED SHALL BE REPORTED TO THE INSPECTOR WHEN CALLING FOR INSPECTION. USA I.D. NUMBERS WILL NOT BE GIVEN MORE THAN TEN (10) WORK DAYS BEFORE STARTING EXCAVATION WORK.

3. THE CONTRACTORS COMPETENT PERSON SHALL BE ON–SITE OBSERVING THE EXCAVATION PROCESS AND SHALL BE THE RESPONSIBLE PARTY IN THE DETERMINATION OF THE SOIL TYPE EXPOSED IN THE EXCAVATION WALLS. IF THE SOIL TYPE ENCOUNTERED IS DIFFERENT THAN THAT SPECIFIED ON THE PLANS, THE DESIGN ENGINEER MUST BE NOTIFIED.

4. THE COMPETENT PERSON SHALL INSPECT THE TRENCH OR EXCAVATION AT THE BEGINNING OF EACH SHIFT PRIOR TO WORKERS ENTERING THE TRENCH OR EXCAVATION AND/OR IF WEATHER HAS CHANGED OR EFFECTED THE WORK AREA.

ENVIRONMENTAL/SWPPP COMPLIANCE:
1. DESIGN OF EXCAVATIONS IS BASED ON ASSUMPTIONS THAT SOIL PROPERTIES AND GROUND CONDITIONS REMAIN CONSTANT THROUGH THE LIFE OF THE EXCAVATION. WATER CAN EFFECT THE STRENGTH OF SOILS AND GREAT CARE SHOULD BE TAKEN TO PREVENT CHANGES FROM EXISTING SOIL CONDITIONS. SLOPES MUST BE PROTECTED FROM EXCESSIVE SOIL SATURATION AND EROSION DURING CONSTRUCTION. WATER PONDING IN THE BASE OF EXCAVATIONS IS UNACCEPTABLE AND SHOULD BE DIVERTED OR REMOVED. PROPER SWPPP AND BMP MEASURES SHALL BE USED TO PREVENT ENVIRONMENTAL INDUCED SLOPE INSTABILITY.

CAL/OSHA REQUIREMENTS:
1. A CAL/OSHA EXCAVATION PERMIT MUST BE OBTAINED PRIOR TO ANY EXCAVATION.

2. A COPY OF THIS SHORING PLAN MUST BE AT THE JOB SITE DURING CONSTRUCTION.

3. INGRESS AND EGRESS TO THE EXCAVATION SHALL CONFORM TO ALL OSHA REQUIREMENTS INCLUDING: HANDRAILS, LADDER ACCESS AND FALL PROTECTION AS REQUIRED.

4. CONTINGENCY PLANS FOR EMERGENCY SITUATIONS SHALL BE ADDRESSED IN JHA.

CONSTRUCTION REQUIREMENTS:
1. CONTACT THE DESIGN ENGINEER IF EXCAVATION SHOWS SIGNS OF SLOUGHING, SWELLING OR PUMPING.

2. CAUTION SHALL BE TAKEN WHEN EXCAVATIONS ARE ADJACENT TO TRAFFIC AND THE TRAVELING PUBLIC.

CONTROLLING FIELD DIMENSIONS
1. THE FIELD SUPERINTENDENT WILL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING, FABRICATING, OR INSTALLING SHORING. UPON APPROVAL BY THE DESIGN ENGINEER DIMENSIONS OF THE SHORING WILL BE ADJUSTED TO FIT THE ACTUAL DIMENSIONS.

2. IF AT ANY POINT THE EXCAVATION EXCEEDS THE DEPTH SHOWN ON THE PLANS BY MORE THAN 1FT, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.

LAVENDER

SOIL LAYER DESCRIPTIONS:
1. THE FOLLOWING SOIL DESCRIPTIONS ARE ASSUMED TO BE PRESENT DURING EXCAVATION. IF SOILS DIFFER FROM THOSE DESCRIBED BELOW, STOP THE EXCAVATION AND CONSULT WITH THE DESIGN ENGINEER.
   SOIL TYPES & DESCRIPTIONS:
   520.0' TO 475.0' – (SM) SILTY SANDSTONE

DESIGN PARAMETERS:
EXCAVATION SLOPE DESIGN BASED ON DH 5 & 7, TP 17 & 18 OF THE INFORMATION PROVIDED IN THE REPORT OF GEOTECHNICAL STUDIES & REVIEW OF ROUGH GRADING PLANS, RMV PLANNING AREA 3, SUB–AREA 3.4, RANCHO MISSION VIEJO DATED JUNE 26, 2023.

SOIL PARAMETERS:
520.0' TO 475.0'
γ = 115 PCF
Φ = 19°
Su = 210 PSF

DESIGN SURCHARGE PARAMETERS:
1. IF K–RAIL IS LESS THAN 2FT FROM TOP OF SLOPE IT MUST BE PINNED. SEE 2015 CALTRANS STANDARD PLAN T3B.

2. K–RAIL MAY NOT BE PLACED CLOSER THAN 3" FROM TOP OF SLOPE. (200PSF).

3. SLOPES WERE DESIGNED WITH A HS20–44 TRAFFIC SURCHARGE (300PSF) PLACED 2FT FROM TOP OF SLOPE OR AS SHOWN IN THE SURCHARGE TABLE(S) IN THESE PLANS.

4. FOR SURCHARGE OFFSETS REFER TO "ASSUMED SURCHARGES & MIN. OFFSETS" TABLES ON SECTION VIEWS.

5. CRANES MUST USE PROPER CRANE MAT TO CREATE AN OUTRIGGER PRESSURE OF 2000PSF MAX.

6. IF HIGHER GROUND PRESSURE IS ANTICIPATED, CONSULT WITH THE DESIGN ENGINEER.

March 7, 2025

REGISTERED PROFESSIONAL ENGINEER
SCOTT F. CANNON
C 84327
Exp. 09-30-25
CIVIL
STATE OF CALIFORNIA

NOTES

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0	3-7-25	RELEASED FOR CONSTRUCTION

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SCALE: AS SHOWN

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CORONA, CA 92882
(949) 254–4792

MZB ENGINEERING

SEWER & WATER IMPROVEMENT

NOTES

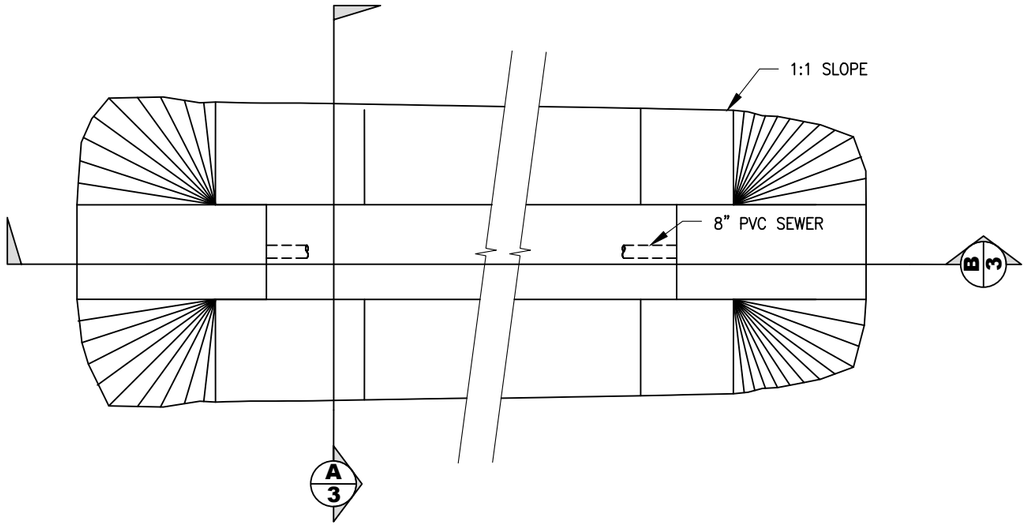
PROJECT: TENTATIVE TRACT NO. 19307
CONTRACT NO: -
CONTRACTOR: -

SHEET NUMBER: 2
OF 3 SHEETS

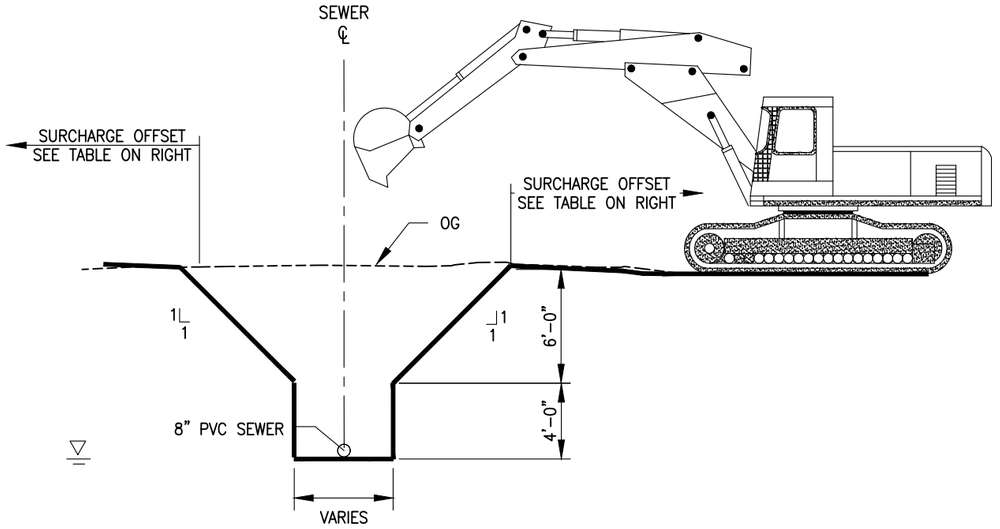
Lavender File

Underground Service Alert
Call: TOLL FREE
1-800-422-4133
TWO WORKING DAYS BEFORE YOU DIG

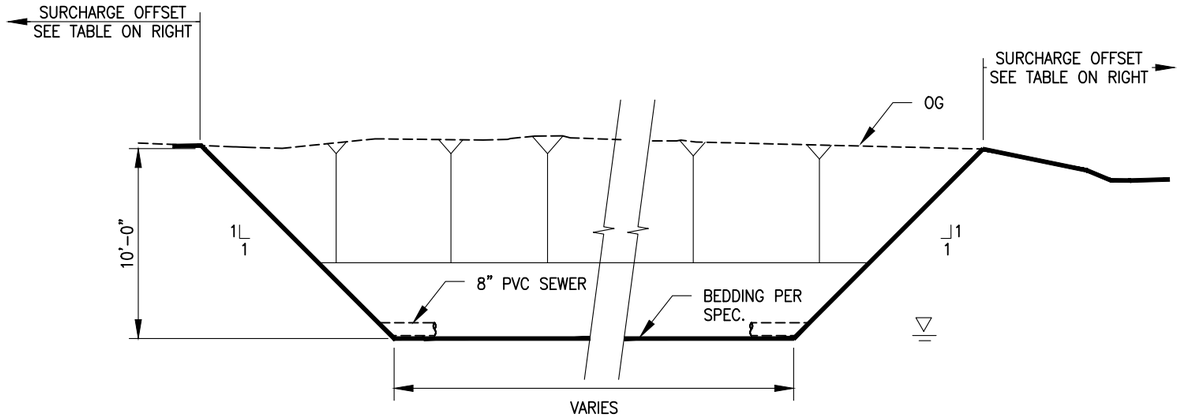
March 7, 2025



SITE PLAN
SCALE: 1:8
ELARA



SECTION VIEW A
SCALE: 1:8
ELARA



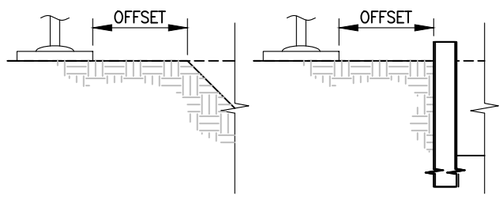
SECTION VIEW B
SCALE: 1:8
ELARA

ASSUMED MINIMUM OFFSETS	
SURCHARGE	OFFSET
HS 20-44 TRAFFIC	5 FT
CAT 330 EXCAVATOR	4 FT
3 CY LOADER	11 FT
K-RAIL	2 FT
CONCRETE TRUCK	15 FT
SPOIL PILE*	3 FT

*SPOIL PILE HT = 8 FT W/ 1:1 SLOPE

LEGEND

= BEDDING PER SPECIFICATIONS



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SEWER & WATER IMPROVEMENT

LAVENDER SECTION VIEW

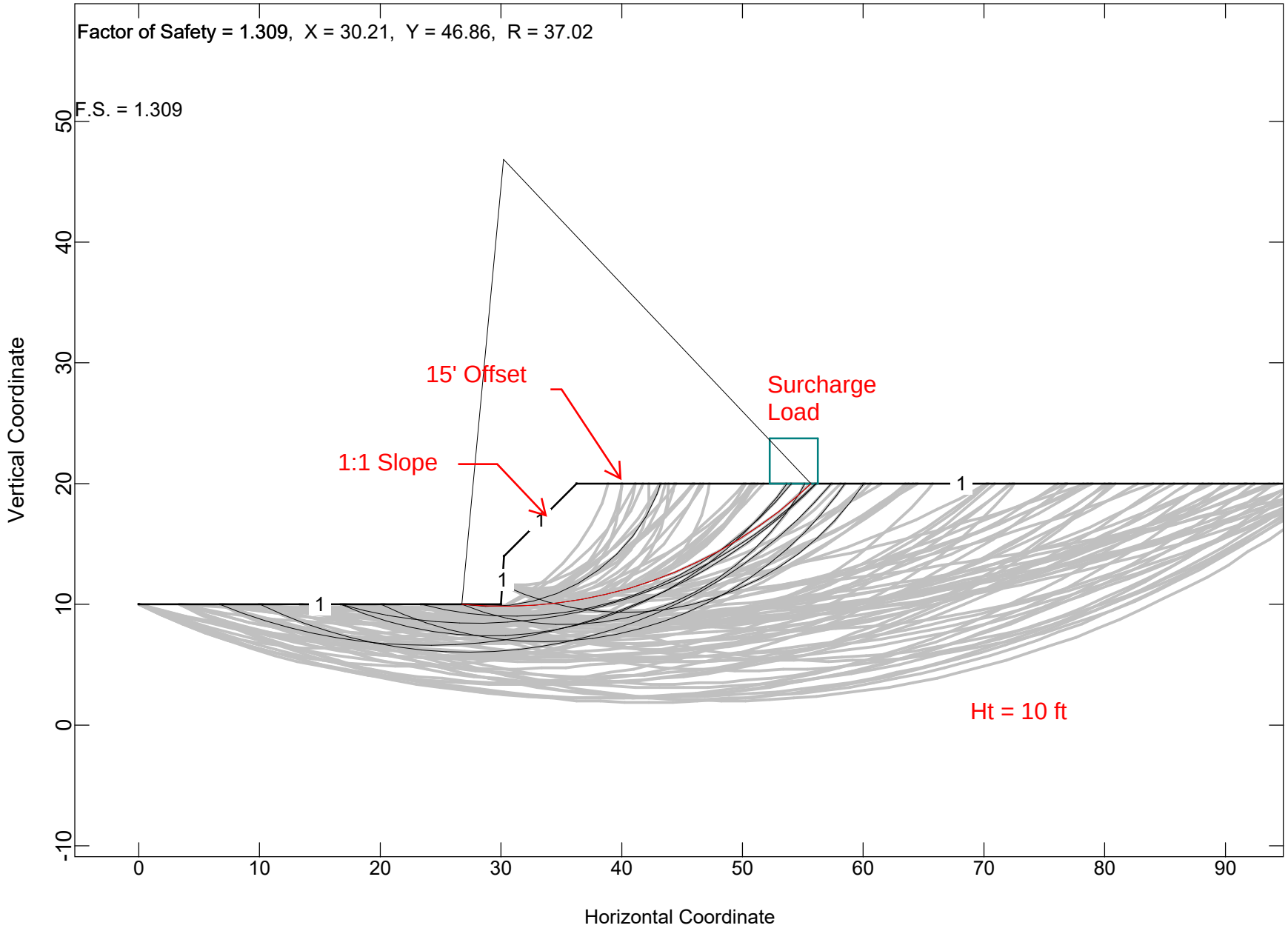
PROJECT: TENTATIVE TRACT NO. 19307
CONTRACT NO: -
CONTRACTOR: -

SHEET NUMBER: 3
OF 3 SHEETS

Lavender File

Slope Stability Analysis

Lavender
Concrete Truck Surcharge



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     ============================================================================

                     STABLPro for Windows, Version 2015.4.5

                            Upgraded from:
                            FHWA-PCSTABLE

                      Serial Number :  357267753

                         --Slope Stability Analysis--
                       Simplified Janbu, Simplified Bishop
                         or Spencer Method of Slices

     ============================================================================


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     Korpi Cannon Engineering PLLC
     Las Vegas, NV, USA

     Path to file locations      :
D:\Dropbox\Korpi_Cannon_Engineering\Projects\KC-0119 - MZB Engineering\Design\Excav
- Shoring\2.0 Elara_Luna\Elara\Design\
     Name of input data file     : Concrete Truck - Vert.sl4d
     Name of output file         : Concrete Truck - Vert.sl4o
     Name of plot output file    : Concrete Truck - Vert.sl4p

     ----------------------------------------------------------------------------
                          Time and Date of Analysis
     ----------------------------------------------------------------------------

               Date:  March 04, 2025     Time:  05:47:38




1
          PROBLEM DESCRIPTION   New Slope




          BOUNDARY COORDINATES

              4 Top   Boundaries
              4 Total Boundaries
```

Boundary No.	X-Left ft.	Y-Left ft.	X-Right ft.	Y-Right ft.	Soil Type Below Bnd
1	0.00	10.00	30.00	10.00	1
2	30.00	10.00	30.25	14.00	1
3	30.25	14.00	36.25	20.00	1
4	36.25	20.00	100.00	20.00	1

1

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	115.0	115.0	210.0	19.0	0.00	0.0	0

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left ft.	X-Right ft.	Intensity psf	Deflection (deg)
1	52.25	56.25	3361.0	0.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

1

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 0.00 ft.

and X = 30.10 ft.

Each Surface Terminates Between X = 36.00 ft.
and X = 100.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00 ft.

2.00 ft. Line Segments Define Each Trial Failure Surface.

Restrictions Have Been Imposed Upon The Angle Of Initiation.
The Angle Has Been Restricted Between The Angles Of -25.0
And 0.0 deg.

1

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.75	9.87
3	30.75	9.84
4	32.75	9.93
5	34.74	10.12
6	36.72	10.42
7	38.68	10.82
8	40.61	11.33
9	42.51	11.94
10	44.38	12.66
11	46.21	13.48
12	47.99	14.39
13	49.72	15.40
14	51.39	16.50
15	52.99	17.68

16	54.54	18.96
17	55.67	20.00

Circle Center At X = 30.2 ; Y = 46.9 and Radius, 37.0

*** 1.309 ***

Individual data on the 20 slices

Slice No.	Width Ft	Weight Lbs	Water Force Top Lbs	Water Force Bot Lbs	Tie Force Norm Lbs	Tie Force Tan Lbs	Earthquake Force Hor Lbs	Earthquake Force Ver Lbs	Surcharge Load Lbs
1	2.0	0.15E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	1.2	0.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3	0.2	0.62E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	0.5	0.25E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	2.0	0.13E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6	2.0	0.17E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7	1.5	0.16E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	0.5	0.52E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	2.0	0.21E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10	1.9	0.20E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	1.9	0.18E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12	1.9	0.17E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
13	1.8	0.15E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
14	1.8	0.12E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
15	1.7	0.10E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
16	1.7	0.78E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
17	0.9	0.32E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
18	0.7	0.22E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.25E+04
19	1.5	0.30E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.52E+04
20	1.1	0.68E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.38E+04

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.64	9.33
3	30.57	8.82

4	32.55	8.49
5	34.54	8.33
6	36.54	8.35
7	38.53	8.55
8	40.50	8.91
9	42.42	9.45
10	44.29	10.16
11	46.10	11.03
12	47.81	12.05
13	49.43	13.23
14	50.95	14.53
15	52.34	15.97
16	53.60	17.52
17	54.72	19.18
18	55.17	20.00

Circle Center At X = 35.3 ; Y = 31.0 and Radius, 22.7

*** 1.366 ***

1

Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	16.72	10.00
2	18.66	9.50
3	20.62	9.09
4	22.59	8.78
5	24.58	8.57
6	26.58	8.46
7	28.58	8.45
8	30.58	8.53
9	32.57	8.72
10	34.55	9.00
11	36.51	9.39
12	38.45	9.87
13	40.37	10.44
14	42.25	11.11
15	44.10	11.87
16	45.91	12.73
17	47.67	13.67
18	49.39	14.70
19	51.05	15.81
20	52.66	17.00

21	54.20	18.28
22	55.68	19.62
23	56.05	20.00

Circle Center At X = 27.8 ; Y = 48.7 and Radius, 40.3

*** 1.404 ***

Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	20.07	10.00
2	21.89	9.18
3	23.77	8.48
4	25.68	7.91
5	27.63	7.47
6	29.61	7.15
7	31.60	6.96
8	33.60	6.90
9	35.60	6.98
10	37.59	7.19
11	39.56	7.52
12	41.50	7.99
13	43.41	8.58
14	45.28	9.29
15	47.10	10.13
16	48.86	11.08
17	50.55	12.14
18	52.17	13.32
19	53.71	14.60
20	55.16	15.97
21	56.52	17.44
22	57.77	19.00
23	58.48	20.00

Circle Center At X = 33.5 ; Y = 37.4 and Radius, 30.5

*** 1.454 ***

1

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.36	9.56
3	27.34	9.25
4	29.33	9.07
5	31.33	9.02
6	33.33	9.12
7	35.31	9.34
8	37.28	9.70
9	39.22	10.19
10	41.12	10.81
11	42.98	11.55
12	44.78	12.42
13	46.52	13.40
14	48.19	14.51
15	49.78	15.72
16	51.29	17.03
17	52.70	18.45
18	54.02	19.95
19	54.06	20.00

Circle Center At X = 31.0 ; Y = 38.8 and Radius, 29.8

*** 1.530 ***

Failure Surface Specified By 28 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	10.03	10.00
2	11.85	9.17
3	13.72	8.44
4	15.61	7.80
5	17.54	7.26
6	19.49	6.81
7	21.46	6.47
8	23.44	6.23
9	25.44	6.08
10	27.44	6.04
11	29.43	6.10
12	31.43	6.26

13	33.41	6.53
14	35.38	6.89
15	37.32	7.35
16	39.24	7.91
17	41.13	8.56
18	42.99	9.31
19	44.80	10.16
20	46.57	11.09
21	48.29	12.12
22	49.95	13.22
23	51.56	14.42
24	53.10	15.69
25	54.58	17.04
26	55.99	18.46
27	57.32	19.95
28	57.36	20.00

Circle Center At X = 27.3 ; Y = 45.5 and Radius, 39.4

*** 1.535 ***

1

Failure Surface Specified By 28 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	6.69	10.00
2	8.56	9.28
3	10.45	8.65
4	12.38	8.10
5	14.32	7.63
6	16.29	7.26
7	18.26	6.96
8	20.25	6.76
9	22.25	6.64
10	24.25	6.61
11	26.25	6.67
12	28.24	6.82
13	30.23	7.05
14	32.20	7.37
15	34.16	7.78
16	36.10	8.27
17	38.01	8.85
18	39.90	9.51
19	41.76	10.26

20	43.58	11.08
21	45.36	11.98
22	47.11	12.97
23	48.80	14.02
24	50.45	15.16
25	52.05	16.36
26	53.60	17.63
27	55.08	18.97
28	56.13	20.00

Circle Center At X = 23.9 ; Y = 52.1 and Radius, 45.5

*** 1.580 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	16.72	10.00
2	18.58	9.25
3	20.48	8.63
4	22.41	8.13
5	24.38	7.75
6	26.36	7.51
7	28.36	7.40
8	30.36	7.42
9	32.36	7.58
10	34.33	7.86
11	36.29	8.27
12	38.22	8.81
13	40.10	9.48
14	41.94	10.27
15	43.72	11.17
16	45.44	12.20
17	47.09	13.33
18	48.66	14.57
19	50.15	15.91
20	51.54	17.34
21	52.84	18.87
22	53.68	20.00

Circle Center At X = 29.0 ; Y = 37.8 and Radius, 30.4

*** 1.710 ***

1

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.75	9.83
3	30.75	9.92
4	32.71	10.28
5	34.62	10.90
6	36.42	11.76
7	38.09	12.86
8	39.60	14.17
9	40.93	15.67
10	42.04	17.33
11	42.92	19.12
12	43.22	20.00

Circle Center At X = 29.0 ; Y = 24.8 and Radius, 15.0

*** 1.736 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	30.10	11.61
2	31.94	10.83
3	33.84	10.21
4	35.79	9.75
5	37.77	9.46
6	39.77	9.33
7	41.77	9.38
8	43.75	9.59
9	45.72	9.97
10	47.64	10.51
11	49.51	11.22
12	51.32	12.08
13	53.05	13.08
14	54.68	14.23

```
   15         56.22       15.52
   16         57.64       16.93
   17         58.93       18.45
   18         60.04       20.00

Circle Center At X =   40.2 ; Y =   33.0  and Radius,   23.7


      ***     1.794   ***


1

                Y            A     X     I     S            F     T


               0.00     12.50     25.00     37.50     50.00     62.50

X       0.00 +-------*-+---------+---------+---------+---------+
             -      ..
             -      ..
             -     ..7
             -    ..7.
             -    ..76
        12.50 +   ..76.
             -   ..66.
             -   ..6.3
             -  ..6783
             -  ..6.34
             -  ..6.35
A       25.00 + ...6435
             - ...6431
             - ...642*0
             - ...64210 *
             - ...6421..
             - ....4219...   *
X       37.50 + ....421.9... .
             - ....4231.9.....
             - ....46231..99..
             - .....4231....99
             - .....46231.....
             - ......44231....
I       50.00 + .......04215...
             - ........046115./1
             - .........044212
             - ..........0.4611/
             - ............044
             - ........... ..0
S       62.50 +  ........... ..
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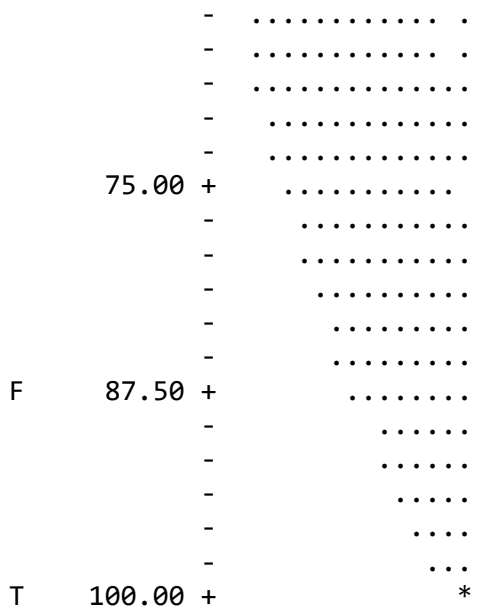
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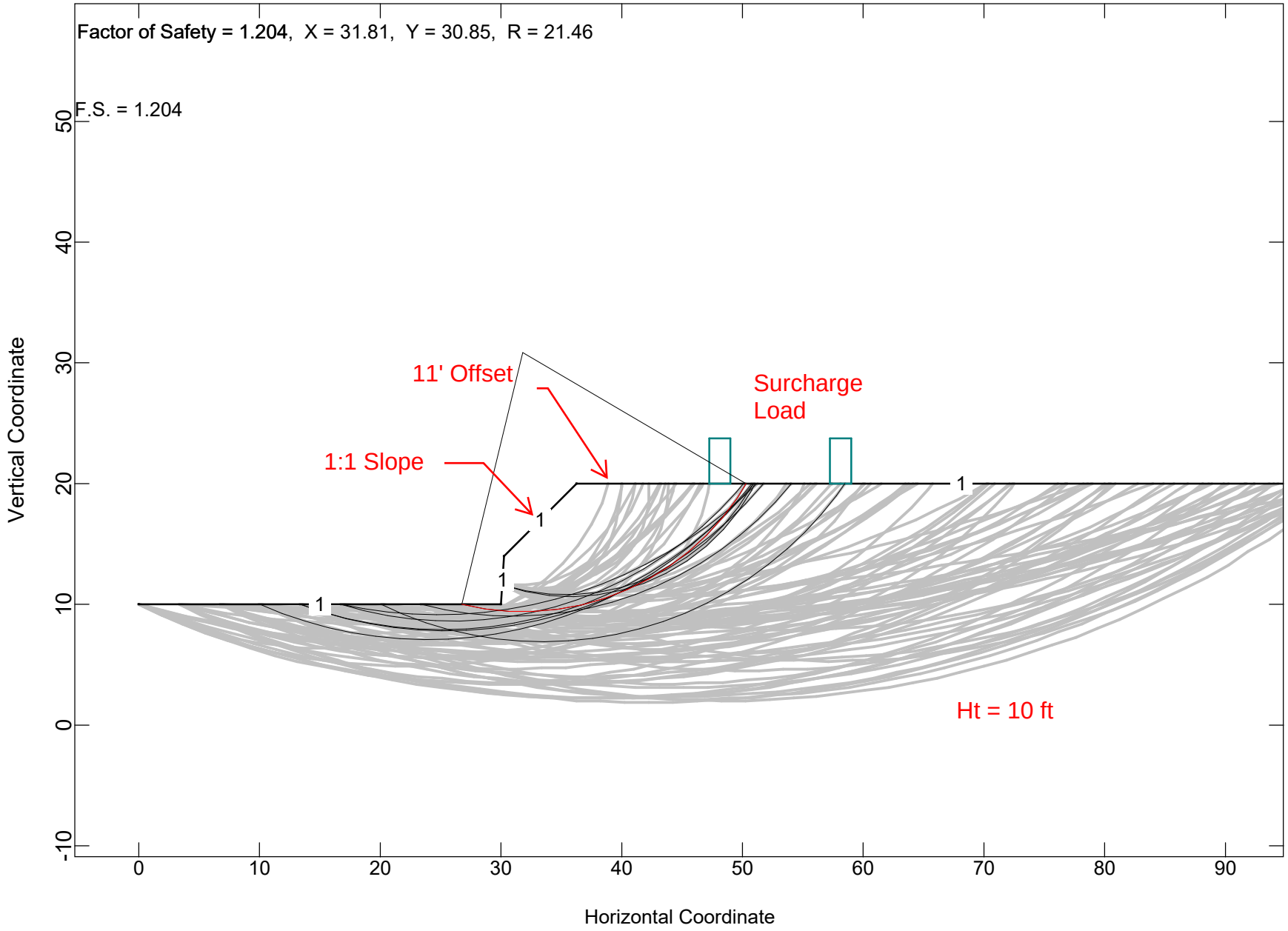
Lavender
3 CY Loader Surcharge



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                      STABLPro for Windows, Version 2015.4.5

                              Upgraded from:
                              FHWA-PCSTABLE

                       Serial Number :  357267753

                          --Slope Stability Analysis--
                         Simplified Janbu, Simplified Bishop
                           or Spencer Method of Slices

     ============================================================================


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     Korpi Cannon Engineering PLLC
     Las Vegas, NV, USA

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     ----------------------------------------------------------------------------
                           Time and Date of Analysis
     ----------------------------------------------------------------------------

               Date:  March 04, 2025     Time:  05:52:02




1
          PROBLEM DESCRIPTION   New Slope




          BOUNDARY COORDINATES

              4 Top   Boundaries
              4 Total Boundaries
```

Boundary No.	X-Left ft.	Y-Left ft.	X-Right ft.	Y-Right ft.	Soil Type Below Bnd
1	0.00	10.00	30.00	10.00	1
2	30.00	10.00	30.25	14.00	1
3	30.25	14.00	36.25	20.00	1
4	36.25	20.00	100.00	20.00	1

1

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	115.0	115.0	210.0	19.0	0.00	0.0	0

1

BOUNDARY LOAD(S)

2 Load(s) Specified

Load No.	X-Left ft.	X-Right ft.	Intensity psf	Deflection (deg)
1	47.25	49.00	4700.0	0.0
2	57.25	59.00	4700.0	0.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

1

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced

Along The Ground Surface Between X = 0.00 ft.
and X = 30.10 ft.

Each Surface Terminates Between X = 36.00 ft.
and X = 100.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00 ft.

2.00 ft. Line Segments Define Each Trial Failure Surface.

Restrictions Have Been Imposed Upon The Angle Of Initiation.
The Angle Has Been Restricted Between The Angles Of -25.0
And 0.0 deg.

1

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.72	9.62
3	30.71	9.42
4	32.71	9.42
5	34.70	9.59
6	36.67	9.95
7	38.59	10.50
8	40.46	11.22
9	42.25	12.11
10	43.95	13.16
11	45.54	14.37
12	47.02	15.72
13	48.36	17.20
14	49.56	18.80

15 50.30 20.00

Circle Center At X = 31.8 ; Y = 30.9 and Radius, 21.5

*** 1.204 ***

Individual data on the 19 slices

Slice No.	Width Ft	Weight Lbs	Water Force Top Lbs	Water Force Bot Lbs	Tie Force Norm Lbs	Tie Force Tan Lbs	Earthquake Force Hor Lbs	Earthquake Force Ver Lbs	Surcharge Load Lbs
1	2.0	0.43E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	1.3	0.65E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3	0.2	0.72E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	0.5	0.25E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	2.0	0.14E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6	2.0	0.18E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7	1.5	0.17E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	0.4	0.49E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	1.9	0.22E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10	1.9	0.20E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	1.8	0.17E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12	1.7	0.14E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
13	1.6	0.11E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
14	1.5	0.84E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
15	0.2	0.11E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
16	1.1	0.44E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.52E+04
17	0.6	0.17E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.30E+04
18	0.6	0.10E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
19	0.7	0.51E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	30.10	11.61
2	32.04	11.12
3	34.02	10.85
4	36.02	10.81
5	38.01	11.00

6	39.97	11.41
7	41.87	12.03
8	43.69	12.87
9	45.39	13.91
10	46.98	15.14
11	48.41	16.53
12	49.67	18.08
13	50.76	19.76
14	50.87	20.00

Circle Center At X = 35.4 ; Y = 28.5 and Radius, 17.7

*** 1.365 ***

1

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	16.72	10.00
2	18.65	9.47
3	20.61	9.07
4	22.59	8.79
5	24.59	8.64
6	26.59	8.62
7	28.58	8.73
8	30.57	8.96
9	32.54	9.32
10	34.48	9.80
11	36.38	10.41
12	38.25	11.13
13	40.06	11.98
14	41.82	12.94
15	43.51	14.00
16	45.13	15.18
17	46.67	16.45
18	48.12	17.82
19	49.49	19.29
20	50.08	20.00

Circle Center At X = 25.9 ; Y = 39.9 and Radius, 31.3

*** 1.385 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	30.10	11.61
2	32.02	11.06
3	34.00	10.73
4	35.99	10.64
5	37.99	10.78
6	39.95	11.16
7	41.86	11.76
8	43.69	12.58
9	45.40	13.60
10	46.99	14.82
11	48.42	16.21
12	49.69	17.77
13	50.76	19.46
14	51.02	20.00

Circle Center At X = 35.8 ; Y = 27.8 and Radius, 17.1

*** 1.398 ***

1

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	16.72	10.00
2	18.69	9.63
3	20.67	9.36
4	22.66	9.20
5	24.66	9.14
6	26.66	9.19
7	28.66	9.34
8	30.64	9.61
9	32.60	9.97
10	34.55	10.44
11	36.47	11.01
12	38.35	11.68
13	40.19	12.46

14	42.00	13.32
15	43.75	14.29
16	45.45	15.34
17	47.09	16.48
18	48.67	17.71
19	50.18	19.02
20	51.20	20.00

Circle Center At X = 24.7 ; Y = 46.9 and Radius, 37.7

*** 1.507 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	13.38	10.00
2	15.27	9.36
3	17.20	8.84
4	19.16	8.43
5	21.14	8.14
6	23.13	7.96
7	25.13	7.91
8	27.13	7.97
9	29.12	8.15
10	31.10	8.45
11	33.06	8.86
12	34.99	9.39
13	36.88	10.04
14	38.73	10.79
15	40.54	11.65
16	42.29	12.62
17	43.98	13.69
18	45.60	14.86
19	47.15	16.12
20	48.62	17.47
21	50.01	18.91
22	50.95	20.00

Circle Center At X = 25.1 ; Y = 41.7 and Radius, 33.7

*** 1.512 ***

1

Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	20.07	10.00
2	21.89	9.18
3	23.77	8.48
4	25.68	7.91
5	27.63	7.47
6	29.61	7.15
7	31.60	6.96
8	33.60	6.90
9	35.60	6.98
10	37.59	7.19
11	39.56	7.52
12	41.50	7.99
13	43.41	8.58
14	45.28	9.29
15	47.10	10.13
16	48.86	11.08
17	50.55	12.14
18	52.17	13.32
19	53.71	14.60
20	55.16	15.97
21	56.52	17.44
22	57.77	19.00
23	58.48	20.00

Circle Center At X = 33.5 ; Y = 37.4 and Radius, 30.5

*** 1.522 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.36	9.56
3	27.34	9.25
4	29.33	9.07
5	31.33	9.02

6	33.33	9.12
7	35.31	9.34
8	37.28	9.70
9	39.22	10.19
10	41.12	10.81
11	42.98	11.55
12	44.78	12.42
13	46.52	13.40
14	48.19	14.51
15	49.78	15.72
16	51.29	17.03
17	52.70	18.45
18	54.02	19.95
19	54.06	20.00

Circle Center At X = 31.0 ; Y = 38.8 and Radius, 29.8

*** 1.544 ***

1

Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	13.38	10.00
2	15.27	9.35
3	17.20	8.82
4	19.15	8.40
5	21.13	8.09
6	23.12	7.89
7	25.12	7.82
8	27.12	7.86
9	29.11	8.01
10	31.09	8.28
11	33.06	8.66
12	34.99	9.16
13	36.90	9.77
14	38.77	10.49
15	40.59	11.32
16	42.36	12.24
17	44.07	13.28
18	45.72	14.40
19	47.31	15.63
20	48.81	16.94
21	50.25	18.34

22	51.59	19.81
23	51.74	20.00

Circle Center At X = 25.5 ; Y = 42.3 and Radius, 34.5

*** 1.558 ***

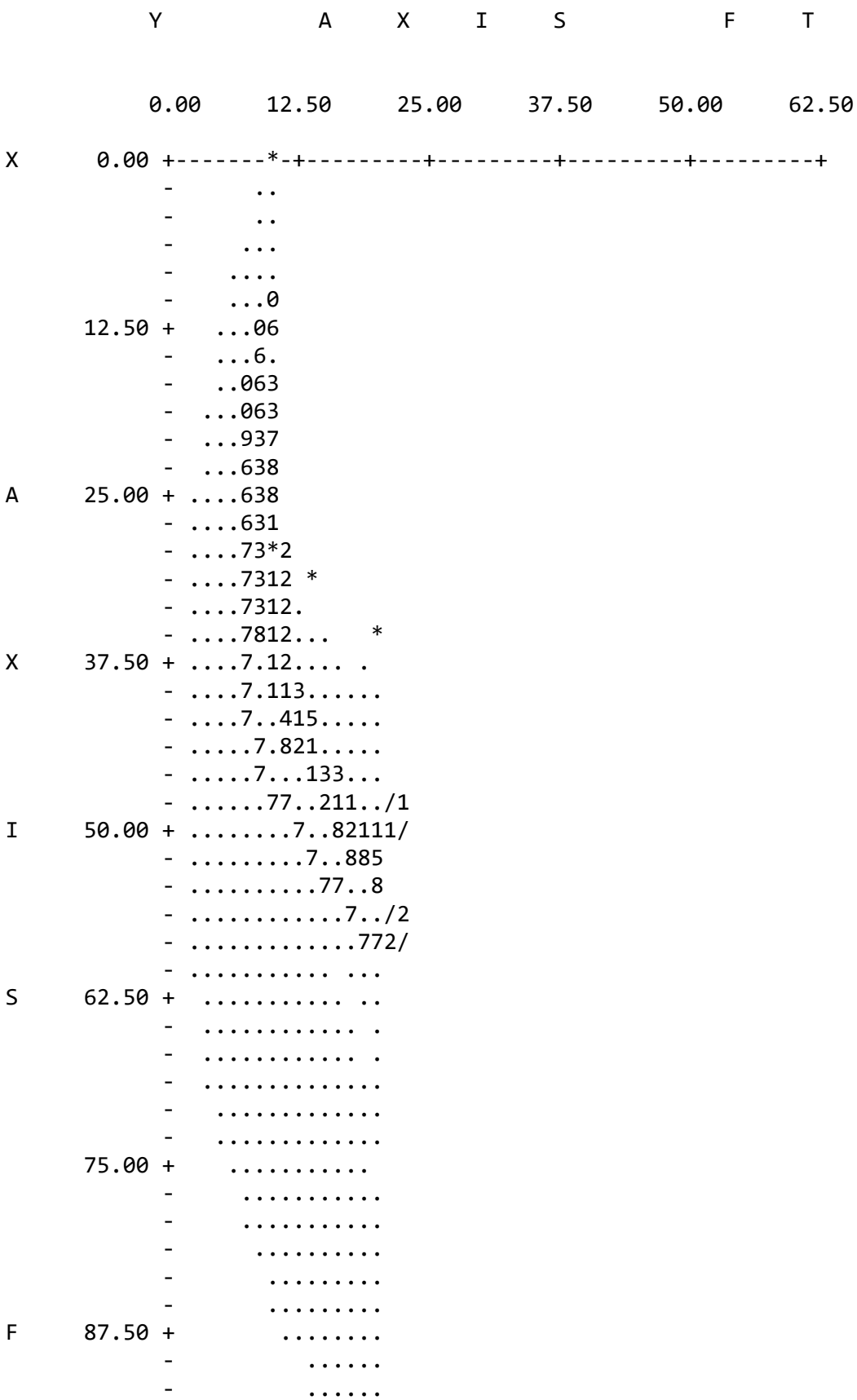
Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	10.03	10.00
2	11.89	9.25
3	13.78	8.60
4	15.71	8.07
5	17.66	7.65
6	19.64	7.35
7	21.63	7.16
8	23.63	7.08
9	25.63	7.12
10	27.62	7.28
11	29.60	7.56
12	31.57	7.94
13	33.50	8.45
14	35.41	9.06
15	37.27	9.78
16	39.09	10.61
17	40.86	11.54
18	42.57	12.58
19	44.22	13.71
20	45.80	14.94
21	47.31	16.25
22	48.73	17.65
23	50.08	19.13
24	50.78	20.00

Circle Center At X = 23.9 ; Y = 41.5 and Radius, 34.4

*** 1.584 ***

1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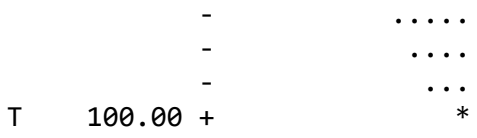
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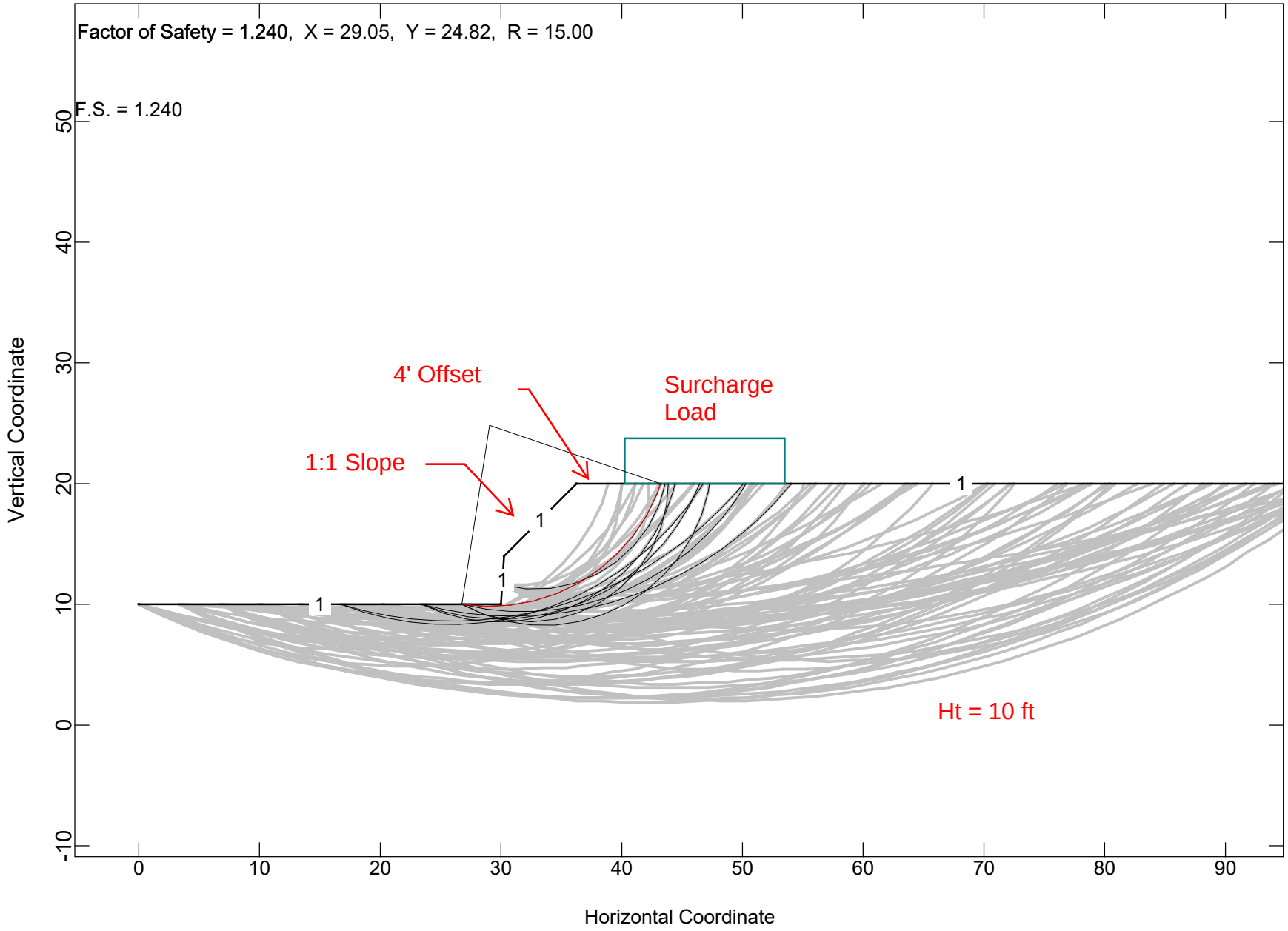
Lavender
Excavator Surcharge



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                     STABLPro for Windows, Version 2015.4.5

                             Upgraded from:
                             FHWA-PCSTABLE

                      Serial Number :  357267753

                         --Slope Stability Analysis--
                       Simplified Janbu, Simplified Bishop
                         or Spencer Method of Slices

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     Las Vegas, NV, USA

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                          Time and Date of Analysis
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1
          PROBLEM DESCRIPTION   New Slope




          BOUNDARY COORDINATES

              4 Top   Boundaries
              4 Total Boundaries
```

Boundary No.	X-Left ft.	Y-Left ft.	X-Right ft.	Y-Right ft.	Soil Type Below Bnd
1	0.00	10.00	30.00	10.00	1
2	30.00	10.00	30.25	14.00	1
3	30.25	14.00	36.25	20.00	1
4	36.25	20.00	100.00	20.00	1

1

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	115.0	115.0	210.0	19.0	0.00	0.0	0

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left ft.	X-Right ft.	Intensity psf	Deflection (deg)
1	40.25	53.50	999.0	0.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

1

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 0.00 ft.

and X = 30.10 ft.

Each Surface Terminates Between X = 36.00 ft.
and X = 100.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00 ft.

2.00 ft. Line Segments Define Each Trial Failure Surface.

Restrictions Have Been Imposed Upon The Angle Of Initiation.
The Angle Has Been Restricted Between The Angles Of -25.0
And 0.0 deg.

1

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.75	9.83
3	30.75	9.92
4	32.71	10.28
5	34.62	10.90
6	36.42	11.76
7	38.09	12.86
8	39.60	14.17
9	40.93	15.67
10	42.04	17.33
11	42.92	19.12
12	43.22	20.00

Circle Center At X = 29.0 ; Y = 24.8 and Radius, 15.0

*** 1.240 ***

Individual data on the 15 slices

Slice No.	Width Ft	Weight Lbs	Water Force Top Lbs	Water Force Bot Lbs	Tie Force Norm Lbs	Tie Force Tan Lbs	Earthquake Force Hor Lbs	Earthquake Force Ver Lbs	Surcharge Load Lbs
1	2.0	0.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	1.3	0.21E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3	0.2	0.61E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	0.5	0.25E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	2.0	0.12E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6	1.9	0.15E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7	1.6	0.15E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	0.2	0.16E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	1.7	0.15E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10	1.5	0.11E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	0.6	0.41E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12	0.7	0.37E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.68E+03
13	1.1	0.45E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.11E+04
14	0.9	0.18E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.88E+03
15	0.3	0.15E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.29E+03

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.72	9.62
3	30.71	9.42
4	32.71	9.42
5	34.70	9.59
6	36.67	9.95
7	38.59	10.50
8	40.46	11.22
9	42.25	12.11
10	43.95	13.16
11	45.54	14.37
12	47.02	15.72
13	48.36	17.20

14	49.56	18.80
15	50.30	20.00

Circle Center At X = 31.8 ; Y = 30.9 and Radius, 21.5

*** 1.244 ***

1

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.31	9.38
3	27.27	8.98
4	29.26	8.79
5	31.26	8.83
6	33.25	9.10
7	35.19	9.58
8	37.06	10.28
9	38.84	11.19
10	40.52	12.28
11	42.05	13.56
12	43.44	15.00
13	44.66	16.59
14	45.69	18.31
15	46.46	20.00

Circle Center At X = 29.9 ; Y = 26.6 and Radius, 17.9

*** 1.251 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.27	9.26
3	27.21	8.78
4	29.20	8.55

5	31.20	8.60
6	33.17	8.91
7	35.09	9.48
8	36.91	10.30
9	38.61	11.35
10	40.16	12.63
11	41.52	14.09
12	42.67	15.73
13	43.59	17.50
14	44.27	19.38
15	44.41	20.00

Circle Center At X = 29.9 ; Y = 23.5 and Radius, 15.0

*** 1.317 ***

1

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.57	9.16
3	30.49	8.59
4	32.47	8.30
5	34.47	8.29
6	36.45	8.57
7	38.37	9.13
8	40.19	9.96
9	41.87	11.03
10	43.38	12.34
11	44.69	13.86
12	45.77	15.54
13	46.60	17.36
14	47.16	19.28
15	47.26	20.00

Circle Center At X = 33.5 ; Y = 22.2 and Radius, 14.0

*** 1.337 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	30.10	11.61
2	32.07	11.29
3	34.07	11.33
4	36.03	11.73
5	37.89	12.48
6	39.58	13.55
7	41.04	14.91
8	42.24	16.51
9	43.13	18.30
10	43.61	20.00

Circle Center At X = 32.9 ; Y = 22.3 and Radius, 11.0

*** 1.355 ***

1

Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.58	9.19
3	30.52	8.70
4	32.52	8.56
5	34.51	8.77
6	36.43	9.31
7	38.23	10.18
8	39.86	11.35
9	41.26	12.78
10	42.38	14.43
11	43.21	16.25
12	43.71	18.19
13	43.86	20.00

Circle Center At X = 32.3 ; Y = 20.1 and Radius, 11.5

*** 1.387 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.36	9.56
3	27.34	9.25
4	29.33	9.07
5	31.33	9.02
6	33.33	9.12
7	35.31	9.34
8	37.28	9.70
9	39.22	10.19
10	41.12	10.81
11	42.98	11.55
12	44.78	12.42
13	46.52	13.40
14	48.19	14.51
15	49.78	15.72
16	51.29	17.03
17	52.70	18.45
18	54.02	19.95
19	54.06	20.00

Circle Center At X = 31.0 ; Y = 38.8 and Radius, 29.8

*** 1.395 ***

1

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	16.72	10.00
2	18.65	9.47
3	20.61	9.07
4	22.59	8.79
5	24.59	8.64
6	26.59	8.62
7	28.58	8.73
8	30.57	8.96
9	32.54	9.32

10	34.48	9.80
11	36.38	10.41
12	38.25	11.13
13	40.06	11.98
14	41.82	12.94
15	43.51	14.00
16	45.13	15.18
17	46.67	16.45
18	48.12	17.82
19	49.49	19.29
20	50.08	20.00

Circle Center At X = 25.9 ; Y = 39.9 and Radius, 31.3

*** 1.398 ***

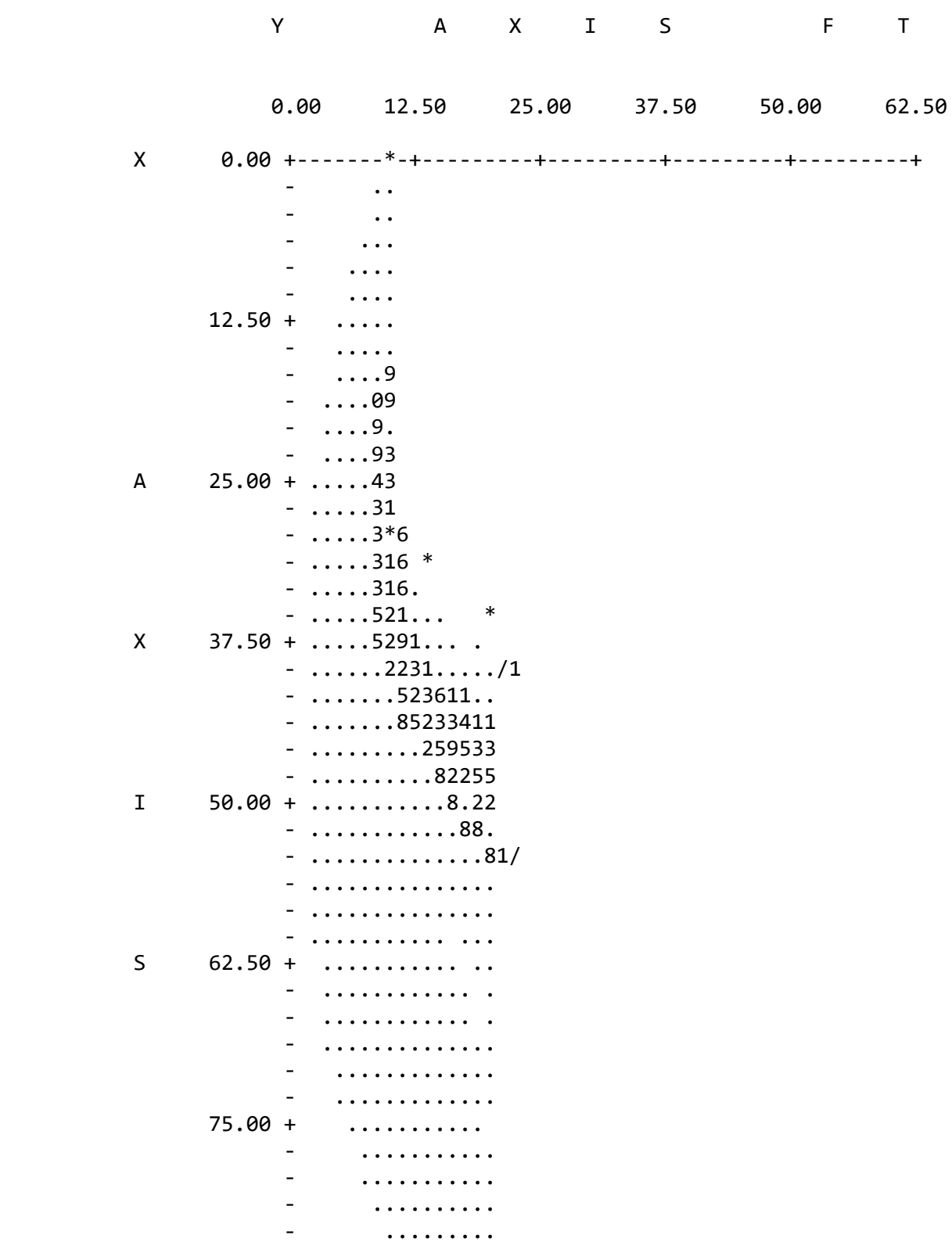
Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	16.72	10.00
2	18.62	9.35
3	20.55	8.86
4	22.53	8.53
5	24.52	8.35
6	26.52	8.34
7	28.51	8.49
8	30.49	8.80
9	32.43	9.26
10	34.34	9.88
11	36.18	10.65
12	37.96	11.57
13	39.66	12.63
14	41.26	13.82
15	42.77	15.13
16	44.17	16.57
17	45.44	18.11
18	46.59	19.74
19	46.74	20.00

Circle Center At X = 25.7 ; Y = 33.2 and Radius, 24.8

*** 1.401 ***

1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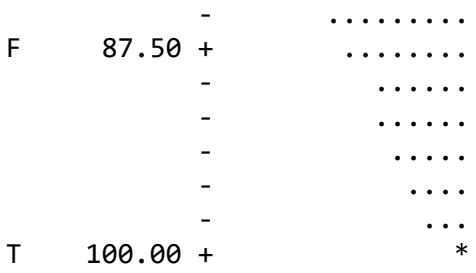
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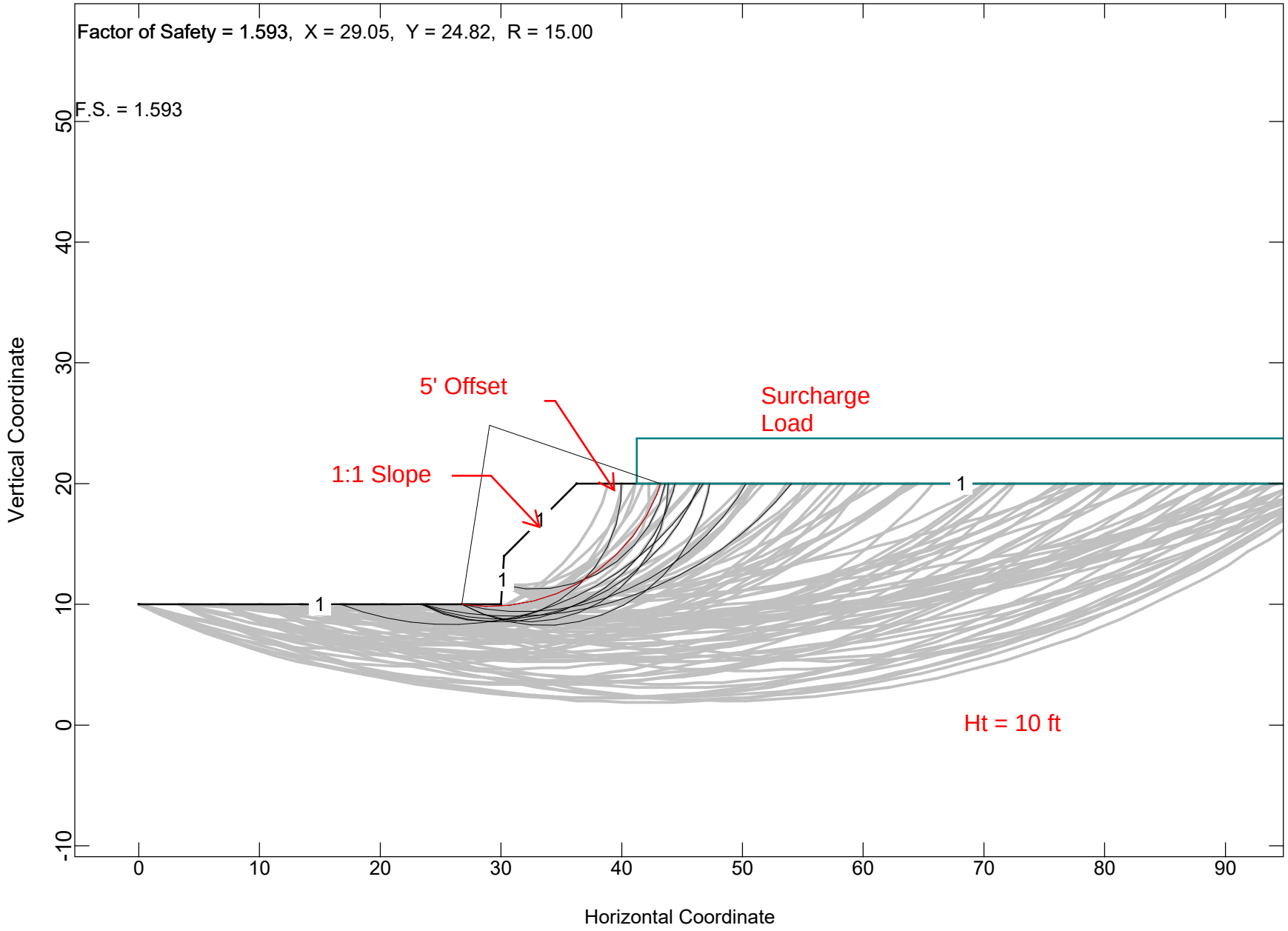
Lavender
Traffic Surcharge



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                     STABLPro for Windows, Version 2015.4.5

                             Upgraded from:
                             FHWA-PCSTABLE

                      Serial Number :  357267753

                         --Slope Stability Analysis--
                       Simplified Janbu, Simplified Bishop
                         or Spencer Method of Slices

     ============================================================================


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     ----------------------------------------------------------------------------
                           Time and Date of Analysis
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               Date:  March 04, 2025     Time:  06:01:32




1
          PROBLEM DESCRIPTION   New Slope




          BOUNDARY COORDINATES

              4 Top   Boundaries
              4 Total Boundaries
```

Boundary No.	X-Left ft.	Y-Left ft.	X-Right ft.	Y-Right ft.	Soil Type Below Bnd
1	0.00	10.00	30.00	10.00	1
2	30.00	10.00	30.25	14.00	1
3	30.25	14.00	36.25	20.00	1
4	36.25	20.00	100.00	20.00	1

1

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	115.0	115.0	210.0	19.0	0.00	0.0	0

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left ft.	X-Right ft.	Intensity psf	Deflection (deg)
1	41.25	100.00	300.0	0.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

1

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 0.00 ft.

and X = 30.10 ft.

Each Surface Terminates Between X = 36.00 ft.
and X = 100.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00 ft.

2.00 ft. Line Segments Define Each Trial Failure Surface.

Restrictions Have Been Imposed Upon The Angle Of Initiation.
The Angle Has Been Restricted Between The Angles Of -25.0
And 0.0 deg.

1

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.75	9.83
3	30.75	9.92
4	32.71	10.28
5	34.62	10.90
6	36.42	11.76
7	38.09	12.86
8	39.60	14.17
9	40.93	15.67
10	42.04	17.33
11	42.92	19.12
12	43.22	20.00

Circle Center At X = 29.0 ; Y = 24.8 and Radius, 15.0

*** 1.593 ***

Individual data on the 15 slices

Slice No.	Width Ft	Weight Lbs	Water Force Top Lbs	Water Force Bot Lbs	Tie Force Norm Lbs	Tie Force Tan Lbs	Earthquake Force Hor Lbs	Earthquake Force Ver Lbs	Surcharge Load Lbs
1	2.0	0.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	1.3	0.21E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3	0.2	0.61E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	0.5	0.25E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	2.0	0.12E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6	1.9	0.15E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7	1.6	0.15E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	0.2	0.16E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	1.7	0.15E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10	1.5	0.11E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	1.3	0.77E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12	0.3	0.15E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
13	0.8	0.30E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.24E+03
14	0.9	0.18E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.26E+03
15	0.3	0.15E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.88E+02

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.31	9.38
3	27.27	8.98
4	29.26	8.79
5	31.26	8.83
6	33.25	9.10
7	35.19	9.58
8	37.06	10.28
9	38.84	11.19
10	40.52	12.28
11	42.05	13.56
12	43.44	15.00
13	44.66	16.59

14	45.69	18.31
15	46.46	20.00

Circle Center At X = 29.9 ; Y = 26.6 and Radius, 17.9

*** 1.671 ***

1

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.27	9.26
3	27.21	8.78
4	29.20	8.55
5	31.20	8.60
6	33.17	8.91
7	35.09	9.48
8	36.91	10.30
9	38.61	11.35
10	40.16	12.63
11	41.52	14.09
12	42.67	15.73
13	43.59	17.50
14	44.27	19.38
15	44.41	20.00

Circle Center At X = 29.9 ; Y = 23.5 and Radius, 15.0

*** 1.699 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.72	9.62
3	30.71	9.42
4	32.71	9.42

5	34.70	9.59
6	36.67	9.95
7	38.59	10.50
8	40.46	11.22
9	42.25	12.11
10	43.95	13.16
11	45.54	14.37
12	47.02	15.72
13	48.36	17.20
14	49.56	18.80
15	50.30	20.00

Circle Center At X = 31.8 ; Y = 30.9 and Radius, 21.5

*** 1.711 ***

1

Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.58	9.19
3	30.52	8.70
4	32.52	8.56
5	34.51	8.77
6	36.43	9.31
7	38.23	10.18
8	39.86	11.35
9	41.26	12.78
10	42.38	14.43
11	43.21	16.25
12	43.71	18.19
13	43.86	20.00

Circle Center At X = 32.3 ; Y = 20.1 and Radius, 11.5

*** 1.781 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.57	9.16
3	30.49	8.59
4	32.47	8.30
5	34.47	8.29
6	36.45	8.57
7	38.37	9.13
8	40.19	9.96
9	41.87	11.03
10	43.38	12.34
11	44.69	13.86
12	45.77	15.54
13	46.60	17.36
14	47.16	19.28
15	47.26	20.00

Circle Center At X = 33.5 ; Y = 22.2 and Radius, 14.0

*** 1.814 ***

1

Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.24	9.19
3	27.18	8.71
4	29.18	8.59
5	31.16	8.83
6	33.07	9.42
7	34.85	10.35
8	36.43	11.57
9	37.77	13.06
10	38.82	14.76
11	39.54	16.62
12	39.93	18.59
13	39.95	20.00

Circle Center At X = 28.8 ; Y = 19.7 and Radius, 11.1

*** 1.836 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.36	9.56
3	27.34	9.25
4	29.33	9.07
5	31.33	9.02
6	33.33	9.12
7	35.31	9.34
8	37.28	9.70
9	39.22	10.19
10	41.12	10.81
11	42.98	11.55
12	44.78	12.42
13	46.52	13.40
14	48.19	14.51
15	49.78	15.72
16	51.29	17.03
17	52.70	18.45
18	54.02	19.95
19	54.06	20.00

Circle Center At X = 31.0 ; Y = 38.8 and Radius, 29.8

*** 1.868 ***

1

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	16.72	10.00
2	18.62	9.35
3	20.55	8.86
4	22.53	8.53
5	24.52	8.35
6	26.52	8.34

7	28.51	8.49
8	30.49	8.80
9	32.43	9.26
10	34.34	9.88
11	36.18	10.65
12	37.96	11.57
13	39.66	12.63
14	41.26	13.82
15	42.77	15.13
16	44.17	16.57
17	45.44	18.11
18	46.59	19.74
19	46.74	20.00

Circle Center At X = 25.7 ; Y = 33.2 and Radius, 24.8

*** 1.879 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	30.10	11.61
2	32.07	11.29
3	34.07	11.33
4	36.03	11.73
5	37.89	12.48
6	39.58	13.55
7	41.04	14.91
8	42.24	16.51
9	43.13	18.30
10	43.61	20.00

Circle Center At X = 32.9 ; Y = 22.3 and Radius, 11.0

*** 1.888 ***

1

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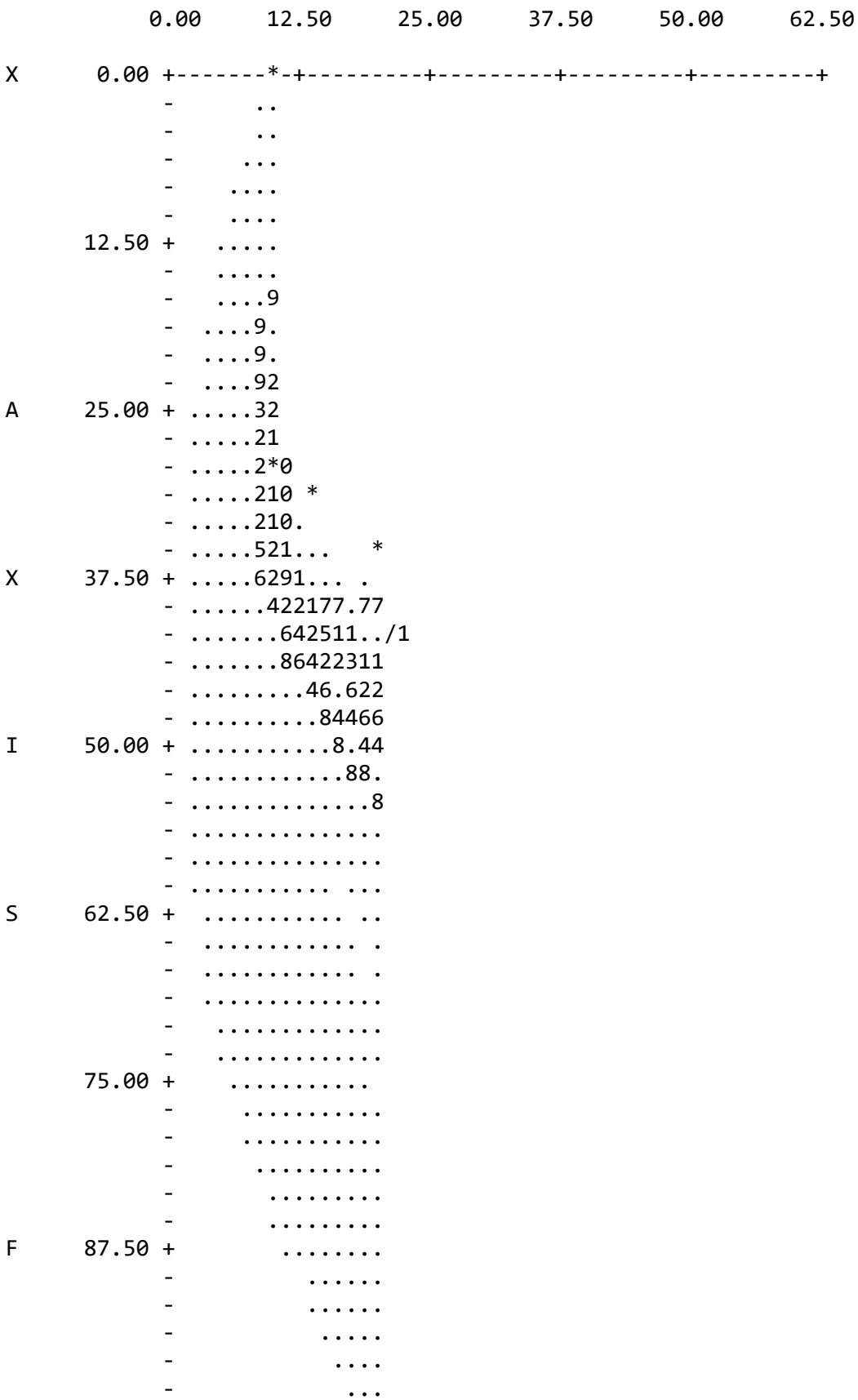
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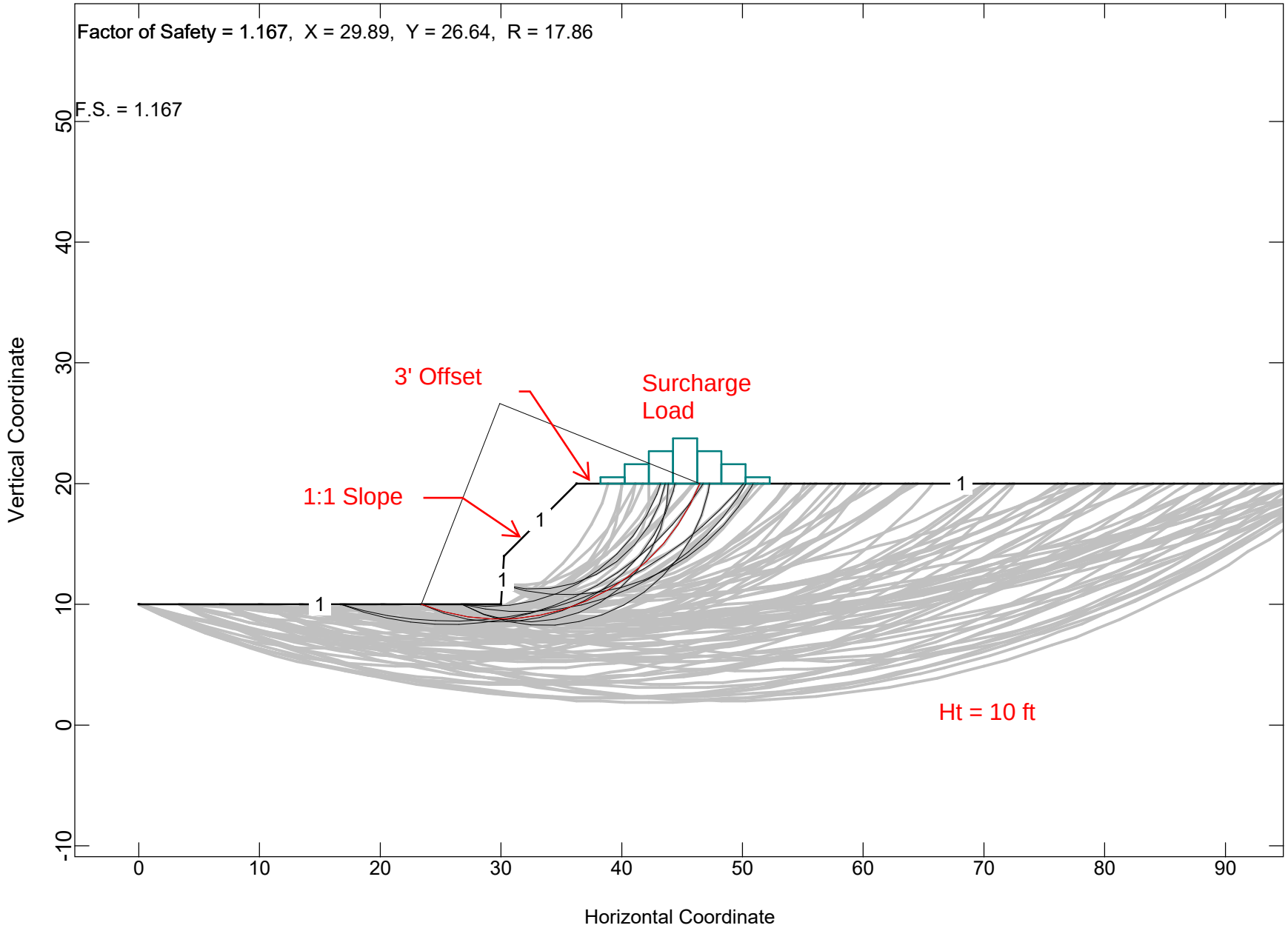
Lavender
Spoils Surcharge



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                     STABLPro for Windows, Version 2015.4.5

                            Upgraded from:
                            FHWA-PCSTABLE

                      Serial Number :  357267753

                         --Slope Stability Analysis--
                       Simplified Janbu, Simplified Bishop
                         or Spencer Method of Slices

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     Las Vegas, NV, USA

     Path to file locations      :
D:\Dropbox\Korpi_Cannon_Engineering\Projects\KC-0119 - MZB Engineering\Design\Excav
- Shoring\2.0 Elara_Luna\Elara\Design\
     Name of input data file     : Spoil - Vert.sl4d
     Name of output file         : Spoil - Vert.sl4o
     Name of plot output file    : Spoil - Vert.sl4p

     ----------------------------------------------------------------------------
                          Time and Date of Analysis
     ----------------------------------------------------------------------------

               Date:  March 06, 2025     Time:  06:35:37




1
          PROBLEM DESCRIPTION   New Slope




          BOUNDARY COORDINATES

              4 Top   Boundaries
              4 Total Boundaries
```

Boundary No.	X-Left ft.	Y-Left ft.	X-Right ft.	Y-Right ft.	Soil Type Below Bnd
1	0.00	10.00	30.00	10.00	1
2	30.00	10.00	30.25	14.00	1
3	30.25	14.00	36.25	20.00	1
4	36.25	20.00	100.00	20.00	1

1

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	115.0	115.0	210.0	19.0	0.00	0.0	0

1

BOUNDARY LOAD(S)

7 Load(s) Specified

Load No.	X-Left ft.	X-Right ft.	Intensity psf	Deflection (deg)
1	38.25	40.25	230.0	0.0
2	40.25	42.25	690.0	0.0
3	42.25	44.25	1150.0	0.0
4	44.25	46.25	1610.0	0.0
5	46.25	48.25	1150.0	0.0
6	48.25	50.25	690.0	0.0
7	50.25	52.25	230.0	0.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

1

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 0.00 ft.
and X = 30.10 ft.

Each Surface Terminates Between X = 36.00 ft.
and X = 100.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00 ft.

2.00 ft. Line Segments Define Each Trial Failure Surface.

Restrictions Have Been Imposed Upon The Angle Of Initiation.
The Angle Has Been Restricted Between The Angles Of -25.0
And 0.0 deg.

1

Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Examined. They Are Ordered - Most Critical
First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.31	9.38
3	27.27	8.98
4	29.26	8.79
5	31.26	8.83
6	33.25	9.10
7	35.19	9.58
8	37.06	10.28
9	38.84	11.19

10	40.52	12.28
11	42.05	13.56
12	43.44	15.00
13	44.66	16.59
14	45.69	18.31
15	46.46	20.00

Circle Center At X = 29.9 ; Y = 26.6 and Radius, 17.9

*** 1.167 ***

Individual data on the 22 slices

Slice No.	Width Ft	Weight Lbs	Water Force Top Lbs	Water Force Bot Lbs	Tie Force Norm Lbs	Tie Force Tan Lbs	Earthquake Force Hor Lbs	Earthquake Force Ver Lbs	Surcharge Load Lbs
1	1.9	0.68E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	2.0	0.19E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3	2.0	0.26E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	0.7	0.10E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	0.2	0.92E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6	1.0	0.66E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7	2.0	0.16E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	1.9	0.19E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	1.1	0.12E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10	0.8	0.92E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	1.2	0.13E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12	0.6	0.61E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.14E+03
13	1.4	0.14E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.32E+03
14	0.3	0.24E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.18E+03
15	1.5	0.13E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.11E+04
16	0.2	0.14E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.14E+03
17	1.2	0.77E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.14E+04
18	0.8	0.42E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.93E+03
19	0.4	0.17E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.65E+03
20	1.0	0.30E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.17E+04
21	0.6	0.70E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.91E+03
22	0.2	0.57E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.24E+03

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.72	9.62
3	30.71	9.42
4	32.71	9.42
5	34.70	9.59
6	36.67	9.95
7	38.59	10.50
8	40.46	11.22
9	42.25	12.11
10	43.95	13.16
11	45.54	14.37
12	47.02	15.72
13	48.36	17.20
14	49.56	18.80
15	50.30	20.00

Circle Center At X = 31.8 ; Y = 30.9 and Radius, 21.5

*** 1.215 ***

1

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.57	9.16
3	30.49	8.59
4	32.47	8.30
5	34.47	8.29
6	36.45	8.57
7	38.37	9.13
8	40.19	9.96
9	41.87	11.03
10	43.38	12.34
11	44.69	13.86
12	45.77	15.54
13	46.60	17.36
14	47.16	19.28
15	47.26	20.00

Circle Center At X = 33.5 ; Y = 22.2 and Radius, 14.0

*** 1.245 ***

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.75	9.83
3	30.75	9.92
4	32.71	10.28
5	34.62	10.90
6	36.42	11.76
7	38.09	12.86
8	39.60	14.17
9	40.93	15.67
10	42.04	17.33
11	42.92	19.12
12	43.22	20.00

Circle Center At X = 29.0 ; Y = 24.8 and Radius, 15.0

*** 1.249 ***

1

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	23.41	10.00
2	25.27	9.26
3	27.21	8.78
4	29.20	8.55
5	31.20	8.60
6	33.17	8.91
7	35.09	9.48
8	36.91	10.30
9	38.61	11.35
10	40.16	12.63
11	41.52	14.09

12	42.67	15.73
13	43.59	17.50
14	44.27	19.38
15	44.41	20.00

Circle Center At X = 29.9 ; Y = 23.5 and Radius, 15.0

*** 1.305 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	16.72	10.00
2	18.62	9.35
3	20.55	8.86
4	22.53	8.53
5	24.52	8.35
6	26.52	8.34
7	28.51	8.49
8	30.49	8.80
9	32.43	9.26
10	34.34	9.88
11	36.18	10.65
12	37.96	11.57
13	39.66	12.63
14	41.26	13.82
15	42.77	15.13
16	44.17	16.57
17	45.44	18.11
18	46.59	19.74
19	46.74	20.00

Circle Center At X = 25.7 ; Y = 33.2 and Radius, 24.8

*** 1.307 ***

1

Failure Surface Specified By 20 Coordinate Points

Point	X-Surf	Y-Surf

Point No.	X-Surf ft.	Y-Surf ft.
1	16.72	10.00
2	18.65	9.47
3	20.61	9.07
4	22.59	8.79
5	24.59	8.64
6	26.59	8.62
7	28.58	8.73
8	30.57	8.96
9	32.54	9.32
10	34.48	9.80
11	36.38	10.41
12	38.25	11.13
13	40.06	11.98
14	41.82	12.94
15	43.51	14.00
16	45.13	15.18
17	46.67	16.45
18	48.12	17.82
19	49.49	19.29
20	50.08	20.00

Circle Center At X = 25.9 ; Y = 39.9 and Radius, 31.3

*** 1.357 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	30.10	11.61
2	32.07	11.29
3	34.07	11.33
4	36.03	11.73
5	37.89	12.48
6	39.58	13.55
7	41.04	14.91
8	42.24	16.51
9	43.13	18.30
10	43.61	20.00

Circle Center At X = 32.9 ; Y = 22.3 and Radius, 11.0

*** 1.363 ***

1

Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	26.76	10.00
2	28.58	9.19
3	30.52	8.70
4	32.52	8.56
5	34.51	8.77
6	36.43	9.31
7	38.23	10.18
8	39.86	11.35
9	41.26	12.78
10	42.38	14.43
11	43.21	16.25
12	43.71	18.19
13	43.86	20.00

Circle Center At X = 32.3 ; Y = 20.1 and Radius, 11.5

*** 1.391 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf ft.	Y-Surf ft.
1	30.10	11.61
2	32.04	11.12
3	34.02	10.85
4	36.02	10.81
5	38.01	11.00
6	39.97	11.41
7	41.87	12.03
8	43.69	12.87
9	45.39	13.91
10	46.98	15.14
11	48.41	16.53
12	49.67	18.08

```
   13         50.76       19.76
   14         50.87       20.00

Circle Center At X =   35.4 ; Y =   28.5  and Radius,   17.7


      ***     1.430   ***


1

            Y            A     X     I     S            F     T


            0.00     12.50     25.00     37.50     50.00     62.50

X      0.00 +-------*-+---------+---------+---------+---------+
            -      ..
            -      ..
            -     ...
            -    ....
            -    ....
      12.50 +   .....
            -   .....
            -   ....6
            -  ....67
            -  ....6.
            -  ....61
A     25.00 + .....51
            - .....12
            - .....1*8
            - .....128 *
            - .....128.
            - .....314...   *
X     37.50 + .....3164... . /1
            - ......2114.....1/2
            - .......321844..2/3
            - ........32115443/4
            - .........2373114/5
            - ..........022335/6
I     50.00 + ............0226/7
            - ..............7/
            - ..............
            - ..............
            - ..............
            - ........... ...
S     62.50 +  ........... ..
            -  ............ .
            -  ............ .
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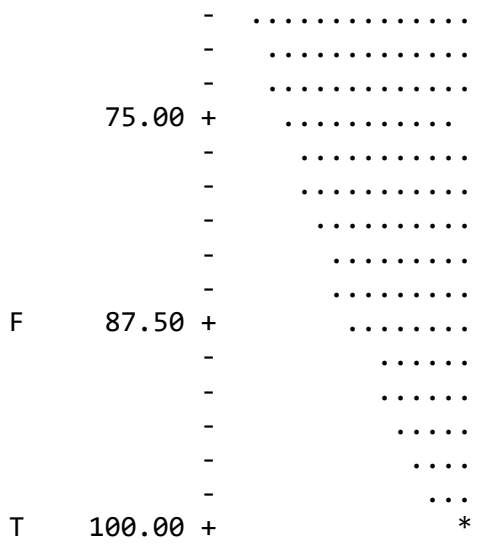
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Reference Documents

Geotechnical Review of
Production Precise Grading Plan,
Lots 1 through 39, "K", "L" & "C-J", Tract No. 19308,
AQ40 Site, Planning Area 3.4,
Rienda Development, Rancho Mission Viejo,
County of Orange, California

Prepared For

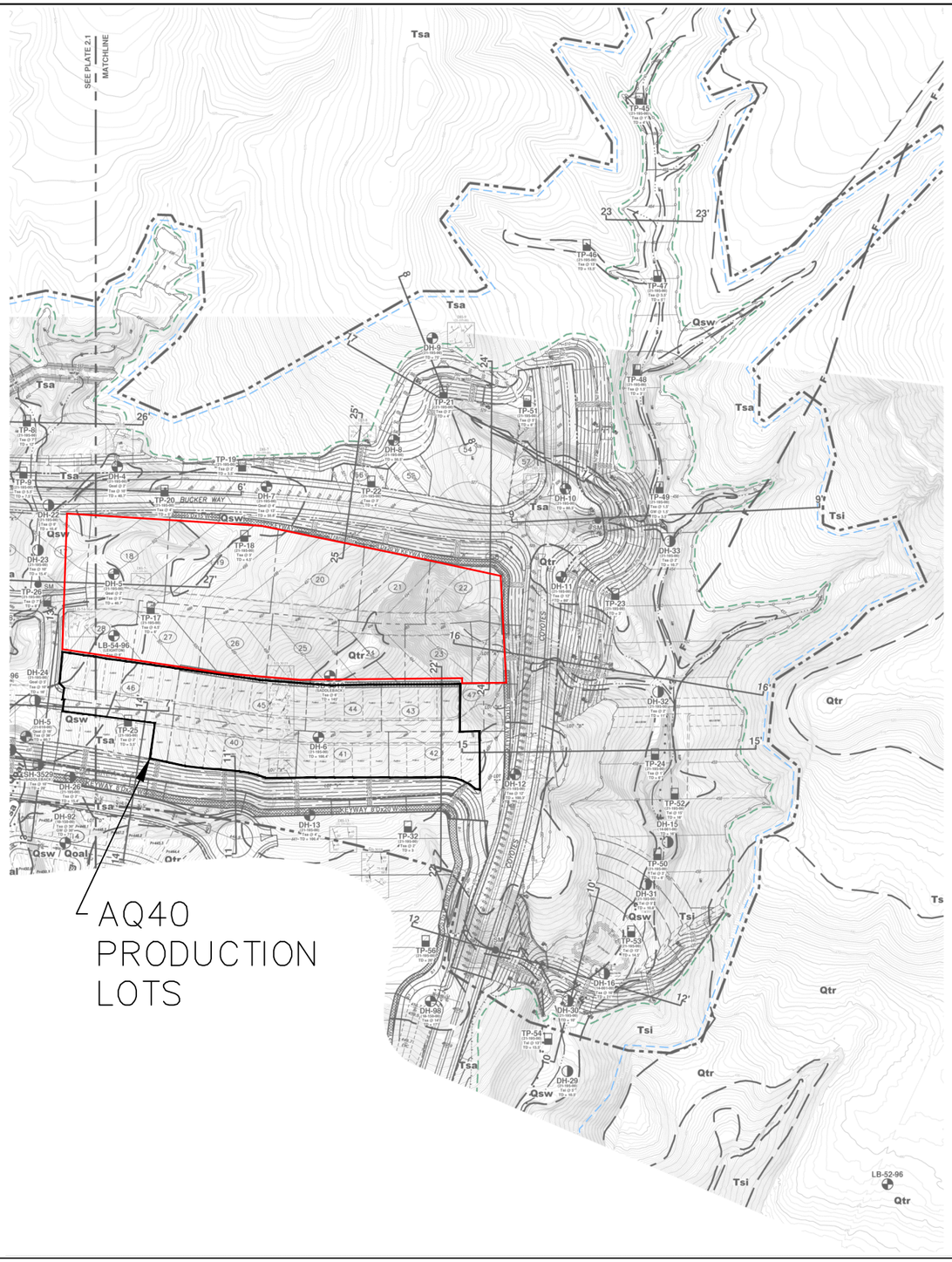
PULTE GROUP

June 24, 2024

GMU Project No. 23-184-00

Design Shear Strength Parameters

Material	Proposed Shear Strength Parameters							
	Static			Pseudo-static			Post-Earthquake	
	Phi (degrees)	Cohesion (psf)	Strength Type	Phi (degrees)	Cohesion (psf)	Strength Type	Liquefied Condition	Strength Type
Engineered Fill (Qafc)	29	310	Peak Strength	29	310	Peak Strength	Not Applicable	Not Applicable
Reinforced Soil Backfill (for MSE Wall)	31	0	Peak Strength	31	0	Peak Strength	Not Applicable	Not Applicable
Slopewash (Qsw)	30	450	Peak Strength	30	450	Peak Strength	S_r/σ'_v=0.05 to 0.35	CPT and SPT data correlations
Santiago Formation, Across Bedding (Tsa)	38	530	Peak Strength	38	530	Peak Strength	Not Applicable	Not Applicable
Santiago Formation, Along Bedding (Tsa)	19	210	Residual Strength (Lower Bound)	23	210	Residual Strength (Best-Fit Line)	Not Applicable	Not Applicable



NOT TO SCALE

GEOTECHNICAL LEGEND

- Qafc — ENGINEERED ARTIFICIAL FILL
- Qafu — UNDOCUMENTED FILL
- Qsw — SLOPEWASH, CIRCLED WHERE BURIED
- Qtr — TERRACE DEPOSITS, CIRCLED WHERE BURIED
- Tsa — SANTIAGO FORMATION
- Tsi — SILVERADO FORMATION
- TYPICAL BEDDING, DASHED WHERE APPROXIMATE
- TYPICAL CONTACT BED, DASHED WHERE APPROXIMATE
- TYPICAL FAULT, DASHED WHERE APPROXIMATE
- TYPICAL JOINT, DASHED WHERE APPROXIMATE
- GEOLOGIC CONTACT
- BURIED GEOLOGIC CONTACT
- F — FAULT LINE
- F — FAULT LINE
- PROPOSED PERFORATED SUBDRAIN
- 1 — 1' — GEOTECHNICAL SECTION
- DH-13 (21-150-00) — BUCKET AUGER DRILL HOLE BY GMU GEOTECHNICAL, INC.
- DH-5 (21-010-00) — BUCKET AUGER DRILL HOLE BY GMU GEOTECHNICAL, INC.; PROJECT NO. 21-010-00
- DH-105 (18-150-00) — BUCKET AUGER DRILL HOLE BY GMU GEOTECHNICAL, INC.; PROJECT NO. 18-150-00
- DH-55 (14-044-01) — BUCKET AUGER DRILL HOLE BY GMU GEOTECHNICAL, INC.; PROJECT NO. 14-044-01
- LB-57-96 (09/96) — BUCKET AUGER DRILL HOLE BY LEIGHTON
- SB-3019 (09/19) — BUCKET AUGER DRILL HOLE BY SADDLEBACK CONSTRUCTORS
- DH-35 (21-150-00) — ROTARY WASH / HOLLOW STEM DRILL HOLE BY GMU GEOTECHNICAL, INC.
- DH-35 (21-010-00) — HOLLOW STEM DRILL HOLE BY GMU GEOTECHNICAL, INC.; PROJECT NO. 21-010-00
- DH-61 (18-150-00) — HOLLOW STEM DRILL HOLE BY GMU GEOTECHNICAL, INC.; PROJECT NO. 18-150-00
- DH-16 (14-001-00) — HOLLOW STEM DRILL HOLE BY GMU GEOTECHNICAL, INC.; PROJECT NO. 14-001-00
- LH-3531 — HOLLOW STEM AUGER DRILL HOLE BY LEIGHTON
- TP-56 (21-150-00) — TEST PIT BY GMU GEOTECHNICAL, INC.
- TP-42 (21-010-00) — TEST PIT BY GMU GEOTECHNICAL, INC.; PROJECT NO. 21-010-00
- TP-77 (18-150-00) — TEST PIT BY GMU GEOTECHNICAL, INC.; PROJECT NO. 18-150-00
- SM — PROPOSED SETTLEMENT MONUMENT
- PRELIMINARY OPEN SPACE DEDICATION LINE
- REMEDIAL GRADING LIMIT LINE
- 93% COMPACTION AREAS
- REPORT LIMITS

GEOTECHNICAL MAP

GMU ENGINEERS & GEOLOGISTS

Date:	June 24, 2024
Project No.:	23-184-00

Plate 2

DRAWING: q:\2023\23-184-00\dwg\2318400_aq40_3.4_plate 2_geo map production.dwg PLOTTED: 6/14/2024 1:24 PM BY: Joseph Huynh

Project: RMV PA-3.3/3.4
Project Location: Rancho Mission Viejo
Project Number: 21-195-00

Log of Test Pit TP-17

Sheet 1 of 1

Date(s) Excavated	**11/11/21**	Logged By	**WD/ER**	Checked By	**DW**
Excavation Equipment	**Backhoe**	Excavation Contractor	**RMV**	Total Depth of Test Pit	**6.0 feet**
Sampling Method(s)	**Bulk**			Approx. Surface Elevation, ft MSL	**499.0**
Groundwater Depth [Elevation], feet	**N/A []**	Test Pit Dimensions	**Width: 2 ft; Length: 15 ft; Depth: 6 ft**		
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	SAMPLE	TEST DATA: MOISTURE CONTENT, %	TEST DATA: DRY UNIT WEIGHT, pcf	TEST DATA: MAXIMUM DENSITY, pcf	TEST DATA: ADDITIONAL TESTS
	ARTIFICIAL FILL/ DISTURBED SLOPEWASH (Qaf/ Qsw) Disturbed due to road use, gravel up to 1" in diameter	SILTY SAND to SANDY SILT (SM-ML); dark brown to dark grayish brown, dry to damp, loose to medium dense, fine- to medium-grained sand, abundant fine to coarse gravel	498							
2	**SLOPEWASH (Qsw)** Angular to subangular rock fragments up to 1" in diameter, scattered roots	SILTY SAND to SANDY SILT (SM-ML); dark brown to dark grayish brown, dry to damp, loose to medium dense, fine- to medium-grained sand, abundant fine to coarse gravel	496	2						
4	**SANTIAGO FORMATION (Tsa)** No bedding observed, mottled	SANDSTONE; pale brown and pale yellowish brown, damp, moderately hard to hard, fine- to coarse-grained sand	494	4						
6		Total Depth = 6' No Groundwater No Caving		6						

TP_REV1 21-195-00.GPJ GM&U.GDT 3/23/22

Project: RMV PA-3.3/3.4
Project Location: Rancho Mission Viejo
Project Number: 21-195-00

Log of Test Pit TP-18

Sheet 1 of 1

Date(s) Excavated	**11/11/21**	Logged By	**WD/ER**	Checked By	**DW**
Excavation Equipment	**Backhoe**	Excavation Contractor	**RMV**	Total Depth of Test Pit	**4.5 feet**
Sampling Method(s)	**Bulk**			Approx. Surface Elevation, ft MSL	**523.0**
Groundwater Depth [Elevation], feet	**N/A []**	Test Pit Dimensions	**Width: 2 ft; Length: 16 ft; Depth: 4.5 ft**		
Remarks					

DEPTH, feet	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ENGINEERING CLASSIFICATION AND DESCRIPTION	ELEVATION, feet	DEPTH, feet	SOIL SYMBOL	SAMPLE	TEST DATA: MOISTURE CONTENT, %	TEST DATA: DRY UNIT WEIGHT, pcf	TEST DATA: MAXIMUM DENSITY, pcf	TEST DATA: ADDITIONAL TESTS
	SLOPEWASH (Qsw) Abundant roots and rootlets, moderate porosity, gravel up to 1" in diameter	SANDY SILT (ML); dark brown to dark grayish brown, dry, soft, fine- to coarse-grained sand, rare fine to coarse gravel	522							
2				2						
	SANTIAGO FORMATION (Tsa) No bedding observed, tight, rare orange-brown mottles	SANDSTONE; pale brown to pale yellowish brown, damp to moist, moderately hard to hard, fine- to coarse-grained sand	520							
4				4						
		Total Depth = 4.5' No Groundwater No Caving								

TP_REV1 21-195-00.GPJ GM&U.GDT 3/23/22

Project: RMV PA-3.3/3.4
Project Location: Rancho Mission Viejo
Project Number: 21-195-00

Log of Drill Hole DH- 5

Sheet 1 of 2

Date(s) Drilled	**11/12/21**	Logged By	**RA/DW**	Checked By	**DW**
Drilling Method	**Bucket Auger**	Drilling Contractor	**Dave's Drilling**	Total Depth of Drill Hole	**40.7 feet**
Drill Rig Type	**EZ Bore**	Diameter(s) of Hole, inches	**30"**	Approx. Surface Elevation, ft MSL	**467.0**
Groundwater Depth [Elevation], feet	**N/A []**	Sampling Method(s)	**Open drive sampler with 6-inch sleeve, bulk**	Drill Hole Backfill	**Native**
Remarks				Driving Method and Drop	**Kelly**

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA: SAMPLE	SAMPLE DATA: NUMBER OF BLOWS / 6"	SAMPLE DATA: DRIVING WEIGHT, lbs	TEST DATA: MOISTURE CONTENT, %	TEST DATA: DRY UNIT WEIGHT, pcf	TEST DATA: ADDITIONAL TESTS
			SLOPE WASH (Qsw) Some rootlets and roots up to 1/2-inch in diameter, pinhole porosity, subround gravel up to 1/2-inch in diameter		SILTY SAND with SOME CLAY (SM); brown, loose to medium dense, fine- to coarse-grained sand, few gravel						
465			**OLDER ALLUVIUM (Qoal)** Oxidized sand grains, tight, subround gravel up to 1/2-inch in diameter, cross bedding		SILTY SAND with SOME CLAY (SM); light yellowish white, medium dense, fine- to coarse-grained sand, trace gravel						
	5		**SANTIAGO FORMATION (Tsa)** Subhorizontal moderately weathered highly scoured contact, on northwest wall observed a discontinuous bed of siltstone Moderately cemented silty sandstone, massive, no discernible bedding, subround gravel up to1/2-inch in diameter		SILTY SANDSTONE pale brownish yellow, dry, moderately hard, fine- to coarse-grained sand Trace gravel						
460											
	10		Massive, no discernible bedding		SILTY SANDSTONE; light brownish yellow with white staining, dry, moderately hard, fine- to coarse-grained sand		8/8"	4500	6	125	
			Trace siltstone rip-up clasts up to 1/2-inch in diameter								
455			Trace granitic clasts up to 3.5-inches in diameter, subround cobbles up to 6-inches in diameter, moderately cemented, slightly oxidized sand grains								
	15				Becomes grayish white with brown staining Trace gravel Few gravel						
			Trace siltstone rip-up clasts up to 1-inch in diameter, trace quartzite clasts up to 1/2-inch in diameter, subround gravel up to 1/2-inch in diameter Subround gravel up to 1-inch in diameter Subhorizontal irregular continuous lens of oxidized sand grains	B: ~N66°W, 14°SW						
450											

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Drill Hole DH- 5

Project: RMV PA-3.3/3.4
Project Location: Rancho Mission Viejo
Project Number: 21-195-00

Log of Drill Hole DH- 5

Sheet 2 of 2

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA: SAMPLE	SAMPLE DATA: NUMBER OF BLOWS / 6"	SAMPLE DATA: DRIVING WEIGHT, lbs	TEST DATA: MOISTURE CONTENT, %	TEST DATA: DRY UNIT WEIGHT, pcf	TEST DATA: ADDITIONAL TESTS
			SANTIAGO FORMATION (Tsa) Subround gravel up to 2-inches in diameter, trace siltstone rip-up clasts up to 1/2-inch in diameter, increase in coarse-grained sand abundance		SILTY SANDSTONE; pale yellowish white, dry, moderately hard, fine- to coarse-grained sand	■	8/8"	4500	6	123	
445			Increase in oxidized sand grains								
			Pockets of moderately oxidized sand grains Subhorizontal discontinuous highly oxidized lenses of sand	B: N46°W, 6°SW							
	25		Trace granitic and quartzite clasts up to 1-inch in diameter Gradational color change, massive, no discernible bedding		Becomes light brownish yellow, fine- to coarse-grained sand, trace gravel						
440			Slower drilling, moderately cemented, subround gravel up to 1/2-inch in diameter								
	30		Gradational fining upwards sequence		SILTY SANDSTONE; pale yellowish white, dry, moderately hard, fine- to coarse-grained sand	■	8/6"	3700	6	111	
435			Trace siltstone rip-up clasts up to 2-inches in diameter, trace quartzite clasts up to 3-inches in diameter								
	35		Gradational color change, increase in coarse-grained sand abundance		Becomes brownish yellow, fine- to coarse-grained sand						
430			Approximately 9-inch thick zone of siltstone rip-up clasts								
			Subround cobble up to 5-inches in diameter, massive, no discernible bedding, fining upward sequence Gradational color change		Becomes pale yellowish white						
	40				SILTY SANDSTONE; pale yellowish white, dry to damp, moderately hard, fine- to medium-grained sand, some coarse-grained sand	■	15/6"	3700	8	123	
					Total depth=40.7ft No Groundwater No Caving						

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Drill Hole DH- 5

Project: RMV PA-3.3/3.4 Project Location: Rancho Mission Viejo Project Number: 21-195-00	**Log of Drill Hole DH- 7** Sheet 1 of 3

Date(s) Drilled **11/18/21**	Logged By **RA/DW**	Checked By **DW**
Drilling Method **Bucket Auger**	Drilling Contractor **Dave's Drilling**	Total Depth of Drill Hole **50.6 feet**
Drill Rig Type **EZ Bore**	Diameter(s) of Hole, inches **30"**	Approx. Surface Elevation, ft MSL **525.0**
Groundwater Depth [Elevation], feet **N/A []**	Sampling Method(s) **Open drive sampler with 6-inch sleeve, bulk**	Drill Hole Backfill **Native**
Remarks		Driving Method and Drop **Kelly**

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA: SAMPLE	SAMPLE DATA: NUMBER OF BLOWS / 6"	SAMPLE DATA: DRIVING WEIGHT, lbs	TEST DATA: MOISTURE CONTENT, %	TEST DATA: DRY UNIT WEIGHT, pcf	TEST DATA: ADDITIONAL TESTS
			SLOPE WASH (Qsw) Pinhole porosity, some roots and rootlets		SILTY SAND with SOME CLAY (SM); pale brown, dry to damp, loose to medium dense, fine- to coarse-grained sand						
520	5		**OLDER ALLUVIUM (Qoal)** Slightly oxidized to moderately oxidized sand grains, slight increase in moisture		SANDY CLAY to CLAYEY SAND (CL-SC); yellowish brown, damp to moist, firm, fine- to coarse-grained sand						
			Slight increase in moisture		CLAYEY SAND (SC); pale yellowish brown, damp to moist, medium dense, fine- to coarse-grained sand						
515	10		Gradational increase in fine- to coarse-grained sand abundance, slightly oxidized sand grains				3/12"	4500	9	122	
			Trace siltstone rip-up clasts up to 2-inches in diameter		Some fine gravel						
510	15		**SANTIAGO FORMATION (Tsa)** Moderately defined subhorizontal irregular scoured contact with silty sandstone, moderately weathered, moderately cemented, friable, easy to pick, massive, no discernible bedding Decrease in moisture		SILTY SANDSTONE; pale yellowish white, dry, moderately hard, fine- to coarse-grained sand						
			Faint, subhorizontal, irregular, discontinuous lens of oxidized sand grains								

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Drill Hole DH- 7

Project: RMV PA-3.3/3.4
Project Location: Rancho Mission Viejo
Project Number: 21-195-00

Log of Drill Hole DH- 7

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA: SAMPLE	SAMPLE DATA: NUMBER OF BLOWS / 6"	SAMPLE DATA: DRIVING WEIGHT, lbs	TEST DATA: MOISTURE CONTENT, %	TEST DATA: DRY UNIT WEIGHT, pcf	TEST DATA: ADDITIONAL TESTS
			Trace subround gravel up to 1/2-inch in diameter, slightly oxidized sand grains **SANTIAGO FORMATION (Tsa)**		SILTY SANDSTONE; pale yellowish white, dry, moderately hard, fine- to coarse-grained sand, trace cobble		6/7"	4500	5	127	
			Trace subround granitic cobbles up to 4-inches in diameter								
500	25		Massive, no discernible bedding, moderately cemented, slightly oxidized sand grains,		Becomes pale grayish white						
			Several faint subhorizontal irregular slightly undulating lenses of oxidized sand grains	B: N35°E, 15°SE							
495	30				SILTY SANDSTONE; pale yellowish white, dry, moderately hard, fine- to coarse-grained sand, trace gravel, some cobble		10/7"	3700	6	116	
			Trace highly oxidized subround gravel up to 1/2-inch in diameter								
490	35		Gradational increase in coarse-grained sand abundance, decrease in fine-to medium-grained sand abundance								
			Massive, moderately cemented, slightly to moderately oxidized sand grains, no discernible bedding								
			Some subround granitic cobbles up to 6-inches in diameter, trace granitic clasts up to 3-inches in diameter								
485	40		Sandy siltstone rip-up clast within sampler tip, massive silty sandstone, moderately cemented, no discernible bedding		SILTY SANDSTONE; pale yellowish white, dry, moderately hard, fine- to coarse-grained sand		10/6"	3700	7	125	
			Slow drilling								

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Project: RMV PA-3.3/3.4
Project Location: Rancho Mission Viejo
Project Number: 21-195-00

Log of Drill Hole DH- 7

Sheet 3 of 3

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	GEOLOGICAL CLASSIFICATION AND DESCRIPTION	ORIENTATION DATA	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
						SAMPLE	NUMBER OF BLOWS / 6"	DRIVING WEIGHT, lbs	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
			SANTIAGO FORMATION (Tsa) Massive, no discernible bedding, moderately cemented, friable, easy to pick		SILTY SANDSTONE; pale yellowish white, dry, moderately hard, fine- to coarse-grained sand						
					Becomes pale grayish white						
			Subround gravel up to 1/2-inch in diameter, gradational increase in coarse grained sand abundance, decrease in fine-to medium-grained sand abundance		Trace gravel						
475	50				SILTY SANDSTONE; pale grayish white, dry, moderately hard, fine- to coarse-grained sand		11/7"	3700	6	119	
					Total Depth = 50.6' No Groundwater No Caving						

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Drill Hole DH- 7