Calculation Cover Sheet

Client:	Ohio Department of Transportation, District 10		
Project:	**MEG-33-13.96 (Task Order 10-5)** **PID 119143**		
HDR Project No:	10399410	Rev:	0
Calculation No:	1	Page:	1 of 431
Title:	Embankment Analyses and Design		
Purpose:	Prepare slope stability and settlement analyses for the widening of US Route 33 (US 33) in Meigs County, Ohio from a Super 2 to a 4-lane divided freeway.		
Originator:	AKB/MM	Date:	5/3/2024
Checked by:	MM/AKB/DCM	Date:	5/7/2024
QC Review by:	DMV	Date:	5/9/2024

Summary

1. ODOT is currently developing the plans for the widening of a portion of US 33 within Meigs County from a Super 2 to a 4-lane divided freeway. HDR was requested to provide slope stability analyses and embankment design for the widened embankments at Sta. 707+50 LT, Sta. 794+00 LT, Sta. 834+50 LT, and Sta. 904+50 LT. Settlement analyses were also requested for the proposed embankments at Sta. 794+00 and Sta. 834+50.

2. ODOT provided historic geotechnical information and plan sheets presenting the original groundline and embankment slopes from the Super 2 construction, as well as recently developed cross-sections depicting the proposed embankment slopes for the four-lane highway along with relatively recent borings performed at select locations in support of the MEG-33-13.96 project. The historic information was obtained from the MEG-124-22.72 (Prime Engineering & Architecture, 1999), MEG-124-26.66 (Resource International, 1999), and MEG-33-15.5 (ODOT, 2009) projects. The pertinent information from these project documents as well as the recent boring logs utilized in our analyses are provided in the reference materials attached.

3. In general accordance with ODOT Geotechnical Design Manual (GDM) recommendations, an initial set of soil strength parameters for the soil layers depicted on the attached Slope/W output plots were selected based on the data provided on the boring logs, the laboratory test results, published correlations of soil strength with SPT N_{60} values, and our engineering judgement. A statistical basis for selecting the initial soil parameters was performed and is included in the attached printed spreadsheets entitled "Soil Strength Parameter Determination." These initial parameters were then entered into the Slope/W slope stability modeling software to model the existing condition simulating a series of trial searches to determine the critical mode of failure based on a Morgenstern-Price stability model. Additionally, the Slope/W optimization feature was utilized, which generates a hybrid circular and translational failure shape. As all the analyses for the existing condition generated a FS of 1.0 or greater, the initial parameters were carried forward for design. The proposed embankment sections were added to the existing condition analyses, and where required, a special benching scheme, shear key, and/or rock fill was used to meet or exceed the minimum target factor of safety of 1.30 for both drained and undrained conditions. Additional slope stability analyses were performed as needed for constructability, with a minimum target factor of safety of 1.20 utilized for the undrained condition. Further discussion on the slope stability analyses at the individual design sections (Sta. 707+50 LT, Sta. 794+00 LT, Sta. 834+50 LT, and Sta. 904+50 LT) is provided below.

4. For the sections where settlement analyses were performed (Sta. 794+00 LT and Sta. 834+50 LT), the settlement parameters were determined from published correlations as no consolidation testing was available. Section 504 of the ODOT Geotechnical Design Manual (GDM) indicates settlement of 3 inches or less is considered reasonable if settlement does not influence a structure, utility, or other roadway infrastructure. As such, settlement times are reported for the time to 3 inches of settlement remaining, as well as 90% consolidation. Drainage was considered at the current ground surface, bottom of granular layers, and the bottom of the existing embankment material assuming rock fill (claystone, shale, and/or sandstone) was placed at the base of the embankment at the time of construction based on the percent gravel in the sampled embankment fill. Descriptions of specific considerations for the analyses at each of these design sections are presented in the following paragraphs where appropriate.

5. **Sta. 707+50 LT**

   A total of 3 borings were used in the analyses at Sta. 707+50: Historic Boring CU-01A from the MEG-124-22.72 project, and Borings B-001-0-23 (Sta. 707+72, 79' RT) and B-001-1-23 (Sta. 707+48, 176' LT) from ODOT's recent subsurface exploration program. Historic Boring CU-01A was conducted at Sta. 713+05, and was included in the analyses to supplement the subsurface profile information to the right of the US-33 centerline. This boring was selected based on its relative location on the side of a hill, similar to that of the design cross-section, with the elevations of the ground surface and various stratigraphic breaks as encountered in the historic boring and Boring B-001-0-23 adjusted to match that at their projected locations on the design cross-section. Groundwater was assumed to be at top of rock to the right of the alignment due to the lack of water encountered in the borings, and daylighting at the ground surface near the toe of the existing slope based on the presence of a nearby culvert/swale.

The slope stability analyses as presented in the attachments indicate the minimum target factor of safety of 1.30 was met without the need for a shear key or special benching for both the short-term (undrained) and long-term (drained) conditions.

6. Sta. 794+00 LT

A total of 6 borings were used in the analyses at Sta. 794+00: Historic Borings CU-07, CU-07A, and CU-07B as drilled at approximate Sta. 794+75 for the MEG-124-22.72 project, and Borings B-002-0-23 (Sta. 794+91, 12' RT), B-002-1-23 (Sta. 794+99, 93' LT), and B-002-2-23 (Sta. 794+16, 77' LT) from ODOT's recent explorations. The elevations of the ground surface and various stratigraphic breaks as encountered in the historic borings were adjusted to match the depths below existing grade at their respective projected locations on the design cross-section.

As most of the borings were performed between about 60 and 90 feet upstation of the design cross-section, top of rock elevations varied across the profile, with a local high point in Boring B-002-2-23 as this boring was closest to the design section at Sta. 794+16. As such, a matrix analyses was performed. The initial case was performed including this local high point, and a second case was considered assuming a more gradual slope in the top of rock elevation between Borings CU-07B and CU-07, lowering the top of rock as encountered in Boring B-002-2-23. Groundwater was assumed to be at the ground surface to the toe of the existing embankment based on the presence of a wetland mapped in the developed ORD files.

For both cases, modeling the proposed additional embankment without modification yielded a factor of safety less than the target minimum of 1.30. As such, a rock fill berm and shear key, as well as special benching, was required to achieve a factor of safety of 1.30 or greater. The top of the temporary 1H:1V slope ties into existing grade approximately 5 feet left of the baseline. The temporary 1H:1V slope extends to a 9-foot wide construction bench located at El. 714, and continues with 9-foot wide construction benches spaced at 12-foot vertical intervals with 1H:1V backslopes until reaching the bottom of the shear key at El. 630. The shear key extends 45 feet towards the left, and ties back into existing grade at a 2H:1V slope. The face of the embankment is sloped at 2H:1V, with rock fill up to El. 654. Item 203 embankment material continues at a 2H:1V slope to the crest of the embankment. If practical, it is recommended that the shear key be drained by the inclusion of a drainage gallery.

Upon establishing the criteria required to meet a global factor of safety greater than 1.30, analyses were performed to evaluate the constructability of the shear key and temporary benching scheme. The Factors of Safety were determined to be greater than the minimum target Factor of Safety of 1.20 under short term (undrained) conditions for the temporary slopes. However, a Factor of Safety below 1.0 was obtained under long term (drained) conditions for the temporary slopes if the excavation was to be left open for an extended period of time. As such, this temporary excavation shall not be left exposed any longer than necessary, with reconstruction of the slope to begin shortly after the excavation has been made. It is also recommended that when excavating for the shear key, no more than 50 to 100 feet along the back of the key should be excavated without replacing with dumped rock fill. Finally, drainage and run-off should also be diverted away from the excavation during construction.

Other cut-slope stability measures/configurations or sheet piling may be needed to maintain the slope during construction of the shear key and sidehill benches should a higher factor of safety be required during construction. Determination of temporary shoring (if necessary) is to be determined by the contractor.

Settlement analyses were performed considering top of rock elevations with the local high point at Boring B-002-0-23. In addition, a preconsolidation pressure of 18 ksf as determined in the attached analyses was applied to the existing embankment material. Finally, the settlement model as developed in the software program Settle3 included the portion of the existing profile that is to be removed and replaced with rock fill (shear key and special benching) to include the effects of replacing the compressible clay materials. As shown in the attached output, the total settlement is estimated to be about 13 to 14 inches, with less than 3 inches of settlement remaining after approximately 6 months, and 90% consolidation completed after roughly 11 months. These values do not consider any settlement of the new embankment material. Due to the anticipated settlement timeframes, it is recommended that a quarantine period be adopted following construction of the embankment and prior to paving to allow for consolidation of the underlying soils to occur.

7. <u>Sta. 834+50 LT</u>

A total of 9 borings were used in the analyses at Sta. 854+50: Historic Borings B-47, B-47EL, B-47ER, CU-10C, and SRB-3 from the MEG-124-22.72 project, Historic Borings B-001-0-09, B-002-0-09, and B-003-0-09 from the MEG-33-15.5 project, and Boring B-003-0-23 (Sta. 834+32, 84' LT) from ODOT's recent exploration program. For the analyses, the elevations of the ground surface and the various stratigraphic breaks as encountered in Historic Borings B-47EL, B-47, and B-47ER (drilled respectively at Sta. 833+83, Sta. 833+94, and Sta. 834+12) were adjusted to match the depths below existing grade at their projected locations on the design cross-section. The top of rock elevations were derived from the borings located within about 20 to 30 feet of the design cross section (B-47ER, CU-10C, SRB-3, and B-003-0-23) as the historic plans indicate a higher ground surface for the 2009 borings performed about 40 feet upstation of the design cross-section.

As shown in the reference material within the attachments, there is an existing service road (Service Road B) with the centerline located approximately 160 feet from the toe of the existing US-33 embankment, and about 70 feet from the toe of the proposed US-33 embankment. No information was available on the type of material used for the construction of the service road embankment, with Boring B-003-0-23, performed about 35 feet from the toe of the existing US-33 embankment, encountering predominantly granular materials. As this boring was located in close proximity to an existing culvert, it is unknown if this material is representative of the entirety of the backfill materials located between the US 33 and Service Road B embankments. As such, separate analyses were performed to consider:

- New embankment material comprised of either A-4a or A-7-6 materials. The existing embankment material is predominantly comprised of A-4a. However, A-7-6 materials were encountered on site in some of the historic borings. As the strength parameters for

new embankment materials presented in the GDM are the lowest for A-7-6 materials, these analyses were included as a lower bound.

- The existing embankment material for Service Road B being comprised of either granular fill materials where the same properties as Layer 3 (loose to medium dense embankment fill) were assumed, or cohesive fill materials assuming the same properties as Layer 1 (medium stiff to stiff embankment fill.)
- The materials at Boring B-003-0-23 to be comprised of cohesive fill rather than the granular fill as-encountered in the boring (Layer 3). For this case, the cohesive soils are assumed to match the properties of the cohesive materials assumed for the existing service road embankment fill.

The slope stability analyses, as presented in the attachments, indicate that the minimum target factor of safety of 1.30 is met without the need for a shear key or special benching for both the short-term (undrained) and long-term (drained) conditions.

Settlement analyses were performed considering:

- the existing fill material for Service Road B to be comprised of cohesive fill, as it would be more conservative than assuming granular material.
- the material in B-003-0-23 to be as-encountered (granular) during the exploration, as well as assuming the material to be comprised of cohesive embankment fill.

Initially, the existing cohesive embankment material for both US 33 and Service Road B was considered to have a preconsolidation pressure of 18 ksf. However, the settlement analyses under this condition indicate only about 6 to 7 inches of total settlement, the magnitude of which does not correlate well with the historic settlement issues reported by ODOT at this embankment location. Considering the borings performed within the existing embankment more closely, the embankment fill was noted to contain gravel and/or stone fragment percentages ranging from about 20 to 40 percent indicating the existing fill is likely comprised of locally derived claystone and shale from nearby rock cuts. and that the rock fill may not have been completely broken-down during placement and compaction. As such, analyses were also performed considering the existing embankment fill to be normally consolidated. The estimated settlement increased significantly under this condition to roughly 17 to 18 inches.

As shown in the attached output, the total settlement is estimated to be about 6 to 7 inches for the overconsolidated fill, with 3 inches of settlement remaining after approximately one month, and 90% consolidation reached after roughly 6 months. For the normally-consolidated embankment fill, the total settlement is estimated to be about 17 to 18 inches, with 3 inches of settlement remaining after roughly 6 months, and 90% consolidation reached after approximately 8 to 9 months. These values do not consider any settlement of the newly placed embankment material.

Due to the anticipated settlement timeframes, it is recommended a quarantine period be adopted following construction of the embankment and prior to paving to allow consolidation of the underlying soils to occur.

8. Sta. 904+50 LT

A total of 3 borings were used in the analyses at Sta. 904+50: Historic Borings B-26 and B-27 from the MEG-124-26.66 project, and Boring B-004-0-23 (Sta. 904+75, 121' LT) from ODOT's recent subsurface exploration. Borings B-26 and B-27 were conducted at Sta. 912+50, and were included in the analyses to supplement the subsurface profile information beneath the existing embankment. These borings were selected based on their relative locations along the bottom of an adjacent valley or swale similar to that of the design cross-section, with the elevations of the ground surface and various stratigraphic breaks as encountered in the historic borings adjusted to match that at its projected location on the design cross-section. Groundwater levels within the embankment were assumed based on the field observations obtained by HDR during the ATH/MEG-33-18.75/0.00 embankment inspections, which indicated seeps along the left embankment face.

The slope stability analyses as presented in the attachments yielded a factor of safety less than the minimum target safety factor of 1.30 under the long term (drained) soil conditions. As such, a rock fill shear key and special benching on the lower portion of the slope was required to achieve a factor of safety of 1.30 or greater. The top of the temporary 1H:1V slope ties into existing grade approximately 87 feet left of the baseline at the design section. The temporary 1H:1V slope extends to an 8-foot wide construction bench located at El. 686, and continues at a 1H:1V backslope until reaching the bottom of the shear key at El. 676. The shear key extends 10 feet towards the left, and ties back into existing grade at a 1.5H:1V slope. The rock fill extends from the bottom of the excavation to the bench at El. 686, with Item 203 embankment material utilized to fill the remainder of the excavation. If practical, it is recommended that the shear key be drained by the inclusion of a drainage gallery.

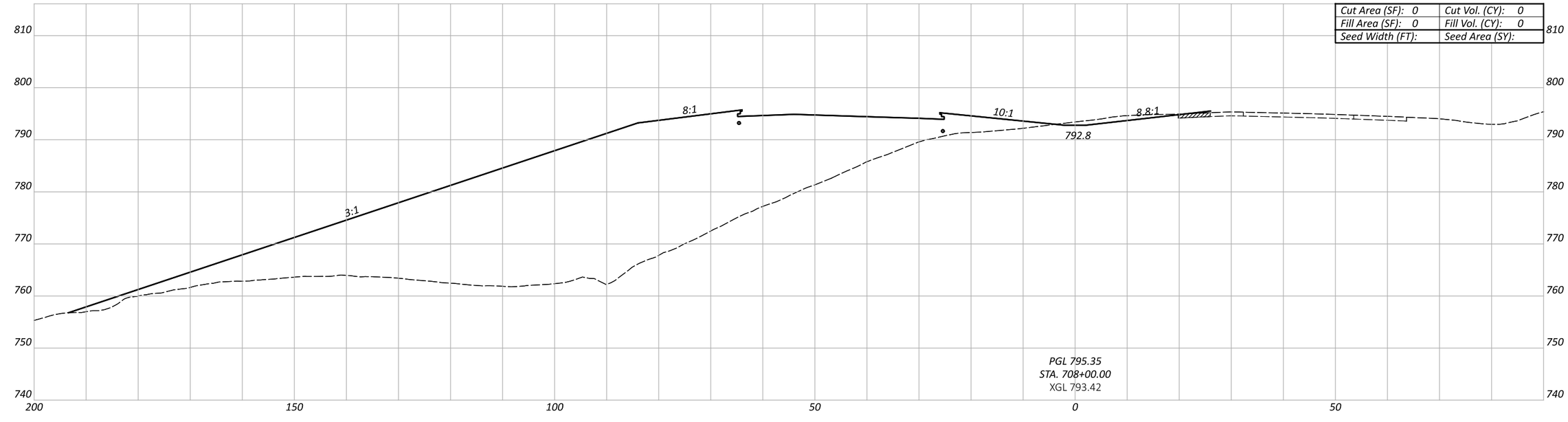
Upon establishing the criteria required to meet a global factor of safety greater than 1.30, analyses were performed to evaluate the constructability of the shear key and temporary benching scheme. The Factors of Safety were determined to be greater than the minimum target Factor of Safety of 1.20 under short term (undrained) conditions for the temporary slopes. However, a Factor of Safety below 1.0 was obtained under long term (drained) conditions for the temporary slopes if the excavation was to be left open for an extended period of time. As such, this temporary excavation shall not be left exposed any longer than necessary, with reconstruction of the slope to begin shortly after the excavation has been made. It is also recommended that when excavating for the shear key, no more than 50 to 100 feet along the back of the key be excavated without replacing with dumped rock fill. Finally, drainage and run-off should also be diverted away from the excavation during construction.

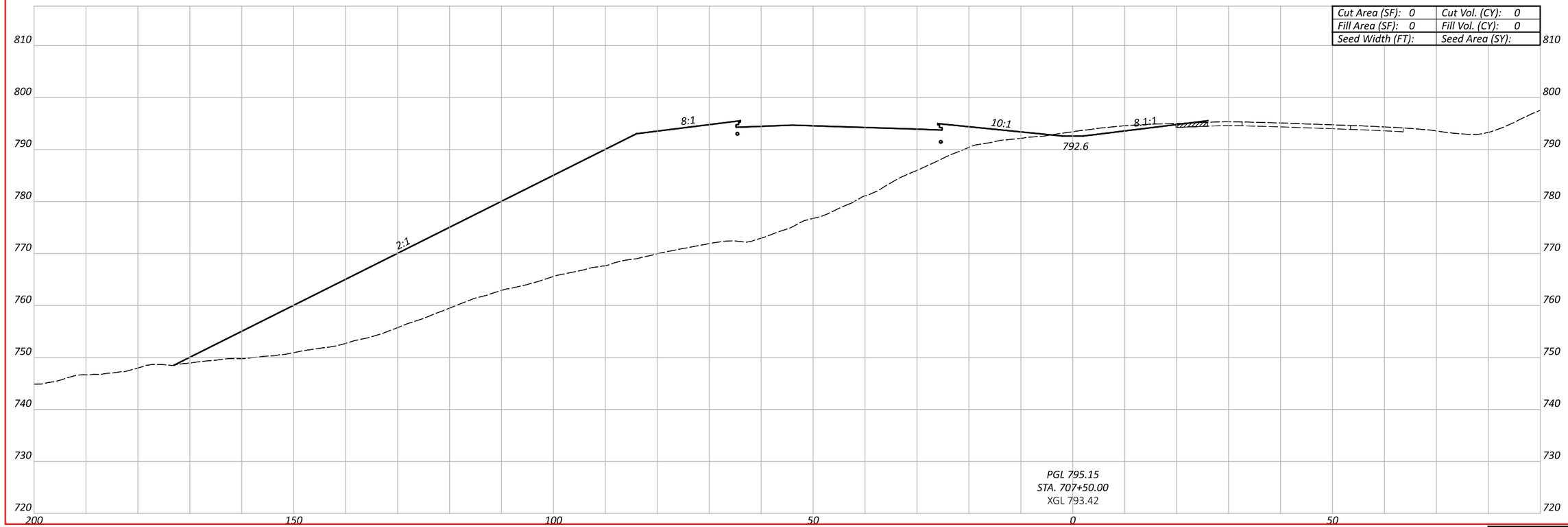
Other cut-slope stability measures/configurations or sheet piling may be needed to maintain the slope during construction of the shear key and sidehill benches should a higher factor of safety be required during construction. Determination of temporary shoring (if necessary) is to be determined by the contractor.

Sta. 707+50

References

Proposed cross-section at Sta. 707+50





CTY-RTE-SECTION

MODEL: CLK_RW_US33 - 707+50.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 3/7/2024 TIME: 2:48:50 PM USER: kzimmer
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 10\Melgs\119143\40D-Engineering\Roadway\Sheets\119143_XS001.dgn

SHEET TITLE
SHEET SUB-TITLE

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY

DESIGNER XXX

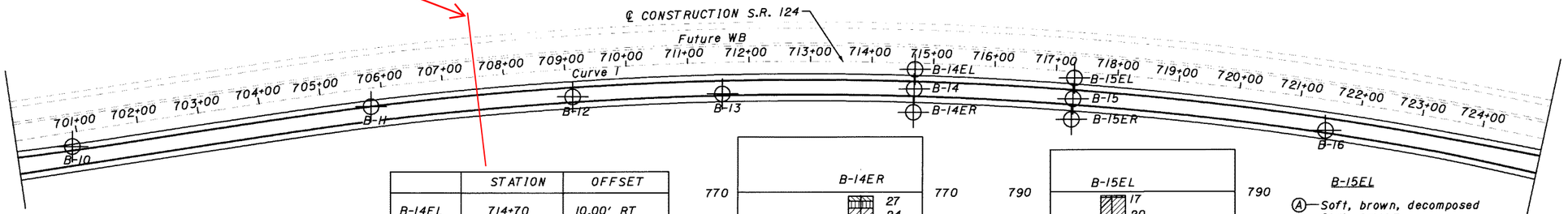
REVIEWER XXX MM-DD-YY

PROJECT ID 0

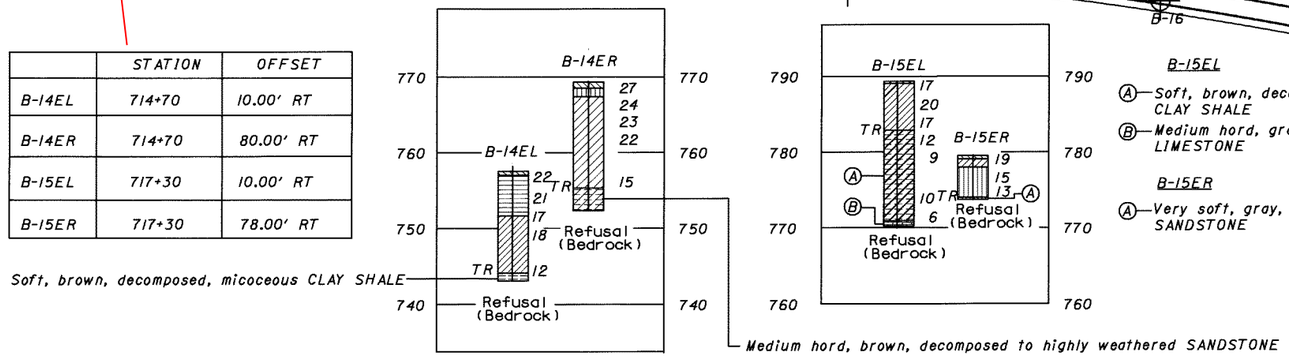
SHEET P.0 | TOTAL 0

Historic Subsurface Explorations

Sta. 707+50



	STATION	OFFSET
B-14EL	714+70	10.00' RT
B-14ER	714+70	80.00' RT
B-15EL	717+30	10.00' RT
B-15ER	717+30	78.00' RT



B-15EL

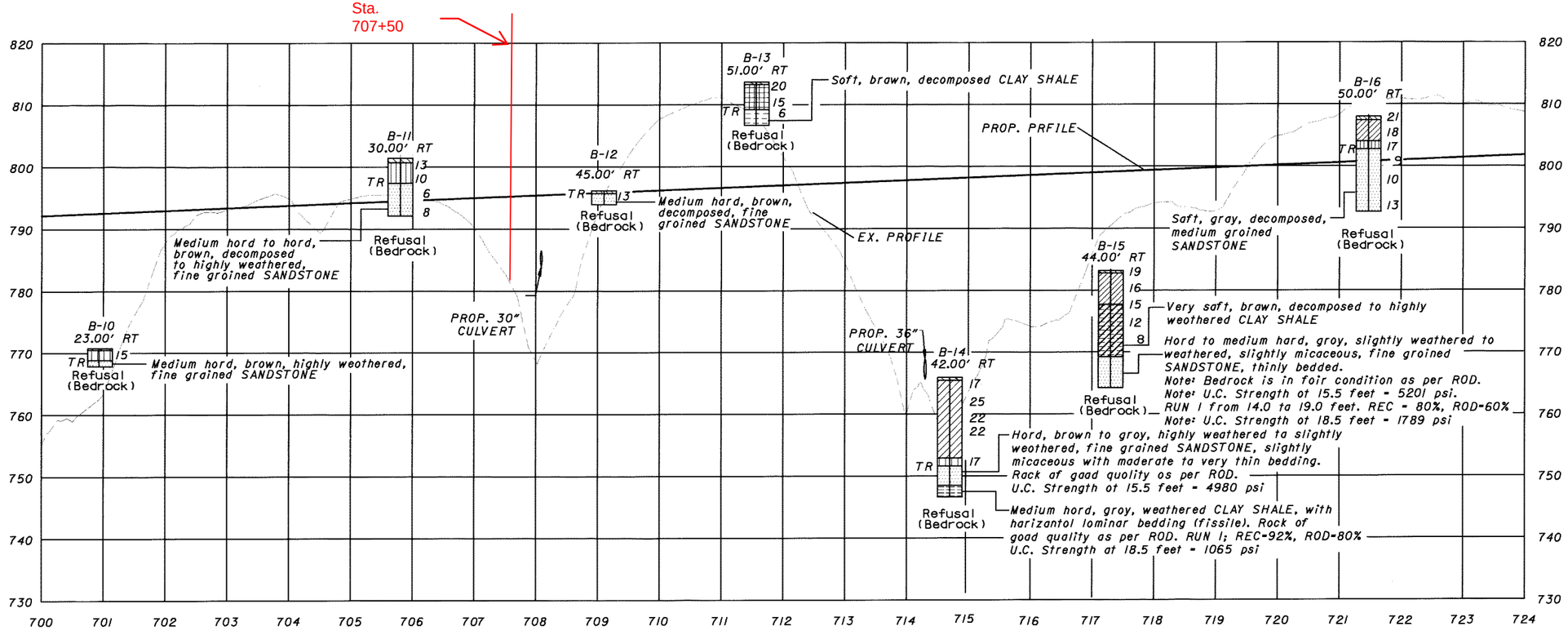
(A) Soft, brown, decomposed CLAY SHALE

(B) Medium hord, gray, decamposed LIMESTONE

B-15ER

(A) Very soft, gray, decomposed SANDSTONE

Sta. 707+50



SOIL PROFILE

MEG-124-22.72

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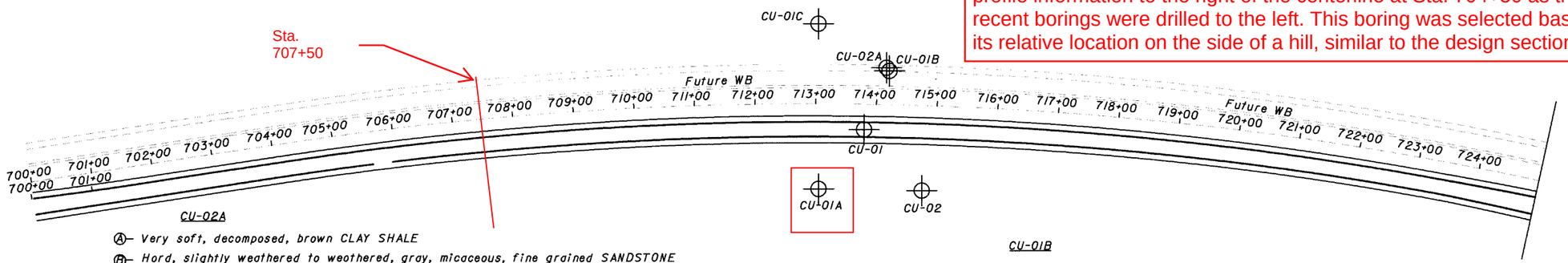
Historic Subsurface Explorations

Note: Historic Boring CU-01A was used to supplement the subsurface profile information to the right of the centerline at Sta. 704+50 as the recent borings were drilled to the left. This boring was selected based on its relative location on the side of a hill, similar to the design section.

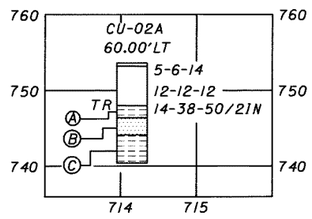


CU-02A

- (A) Very soft, decomposed, brown CLAY SHALE
- (B) Hard, slightly weathered to weathered, gray, micaceous, fine grained SANDSTONE with very thin to thick bedding
  Note: Calcareous cementotion present from 7.9 feet to 9.0 feet. effervesces freely with dilute HCL
  U.C. Strength at 7.9 feet = 6367 psi
- (C) Soft to medium hard, weathered to highly weathered, gray SILTY SHALE with laminar bedding (fissile).
  U.C. Strength at 10.2 feet = 2107 psi
  RUN 1 from 7.2' to 13.2'; REC=93%,ROD=75%.

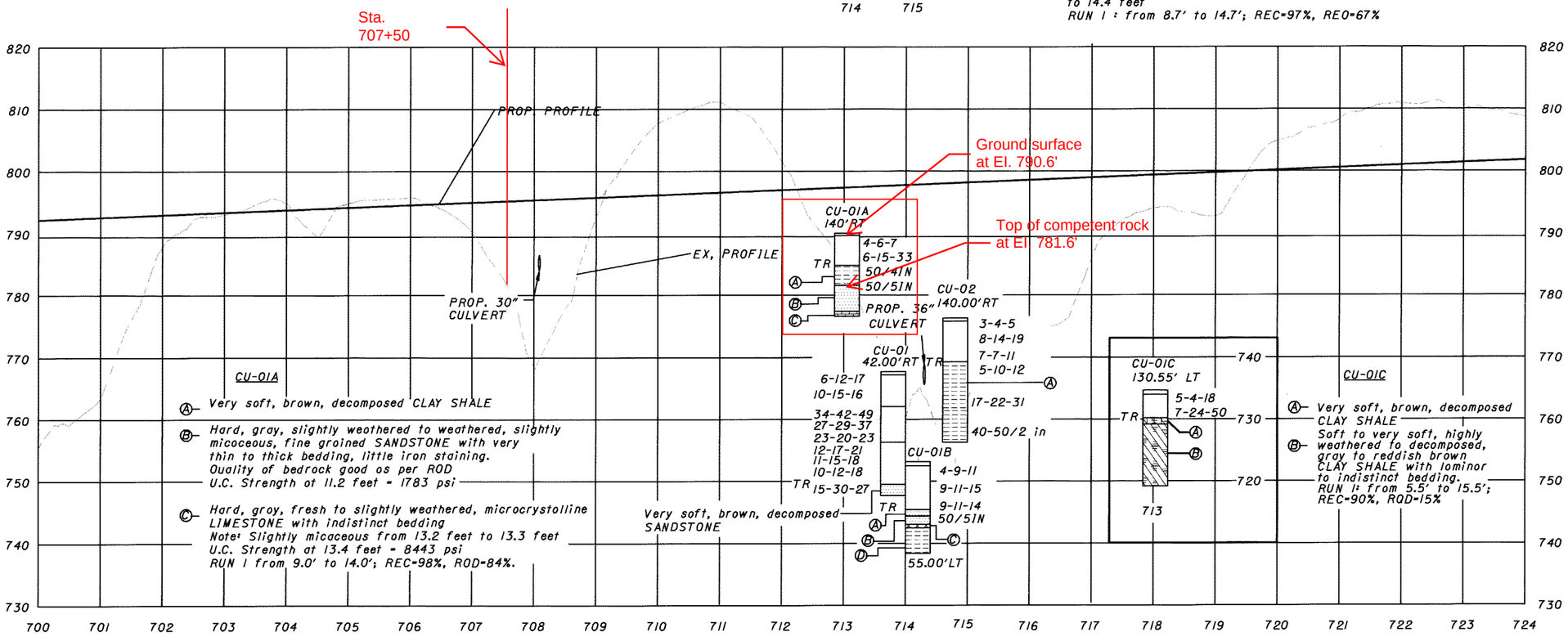
CU-02

- (A) Very soft, brown, decomposed CLAYSHALE
  Note: Bedrock wos so decomposed at 13.5 feet that soil testing was oble to performed.



CU-01B

- (A) Soft, brown, highly weathered SANDSTONE
- (B) Hard, brown to gray, slightly weathered to weothered, micaceous, fine grained SANDSTONE with very thin to thick bedding.
  U.C. Strength of 9.2 feet = 10975 psi
- (C) Hard, gray, weathered, micaceous SILTSTONE with indistinct to moderote bedding
- (D) Soft, groy to red, weathered CLAYSHALE with horizontal laminar bedding (fissile)
  Ouolity of bed rock foir as per ROD.
  U.C. Strength at 13.2 feet = 326 psi
  Note: Microfolding (slickensides) present from14.2 feet to 14.4 feet
  RUN 1 : from 8.7' to 14.7'; REC=97%, REO=67%



CU-01A

- (A) Very soft, brown, decomposed CLAY SHALE
- (B) Hard, gray, slightly weothered to weathered, slightly micoceous, fine groined SANDSTONE with very thin to thick bedding, little iron staining.
  Ouality of bedrock good os per ROD
  U.C. Strength of 11.2 feet = 1783 psi
- (C) Hard, groy, fresh to slightly weathered, microcrystolline LIMESTONE with indistinct bedding
  Note: Slightly micoceous from 13.2 feet to 13.3 feet
  U.C. Strength at 13.4 feet = 8443 psi
  RUN 1 from 9.0' to 14.0'; REC=98%, ROD=84%.

CU-01C

- (A) Very soft, brown, decomposed CLAY SHALE
- (B) Soft to very soft, highly weathered to decomposed, groy to reddish brown CLAY SHALE with laminor to indistinct bedding.
  RUN 1: from 5.5' to 15.5'; REC=90%, ROD=15%

SOIL PROFILE

MEG-124-22.72

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State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 3/18/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 3/18/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-01 Station & Offset 713+80.00, 42.00' RT Surface Elev. 767.72ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Lass (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
767.7	0														
767.2					TOPSOIL										
		6-12-17			Very stiff to hard, reddish brown SILT AND CLAY, some sand, trace rock fragments, moist.	1	--	--	--	--	--	--	--	19	VISUAL
		10-15-16				2	11	12	17	--	61*	28	11	15	A-6a
	5														
762.1		34-42-49			Hard, brown SANDY SILT, some clay, trace rock fragments, moist.	3	--	--	--	--	--	--	--	10	VISUAL
		27-29-37				4	--	--	--	--	--	--	--	13	VISUAL
	10	23-20-23				5	3	3	16	--	78*	29	10	15	A-4a
756.3		12-17-21			Hard, brown SILT AND CLAY, some sand, trace rock fragments, moist.	6	--	--	--	--	--	--	--	15	VISUAL
		11-15-18				7	--	--	--	--	--	--	--	17	VISUAL
	15	10-12-18				8	1	4	17	--	78*	36	14	19	A-6a
749.5		15-30-27			Very soft, brown, decomposed SANDSTONE.	9	--	--	--	--	--	--	--	13	VISUAL
747.7	20				TERMINATION DEPTH = 20.0 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 3/18/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 3/18/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-01A Station & Offset 713+05.00, 140.00' RT Surface Elev. 790.58ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Lass (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
790.6	0														
790.2					TOPSOIL										
		4-6-7			Stiff to hard, reddish brown CLAY, little rock fragments, trace sand, moist.	1	--	--	--	--	--	--	--	19	VISUAL
		6-15-33				2	19	2	2	--	77*	43	17	15	A-7-6
	5														
784.8		50/4in			Very soft, brown, decomposed CLAY SHALE.	3	--	--	--	--	--	--	--	10	VISUAL
781.6		50/5in ROD = 84%	4.9	0.1	Note: Auger refusal on bedrock at 9.0 feet. Began coring rock. Hard, gray, slightly weathered to weathered, slightly micaceous, fine grained SANDSTONE with very thin to thick bedding, little iron staining. Quality of bedrock good as per ROD. U.C. Strength at 11.2 feet = 1783 psi	4	--	--	--	--	--	--	--	12	VISUAL
	10														
777.4					Hard, gray, fresh to slightly weathered, microcrystalline LIMESTONE with indistinct bedding. Note: Slightly micaceous from 13.2 feet to 13.3 feet. U.C. Strength at 13.4 feet = 8443 psi										
776.6					TERMINATION DEPTH = 14.0 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

DRAWN	REVIEWED	DATE	CALCULATED	CHECKED
E.D.S.	B.M.	1/24/01	W.I.N.	S.S.S.

PRIME ENGINEERING & ARCHITECTURE, INC.
COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / CAREY	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 707+72, 79' LT.	EXPLORATION ID B-001-0-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / BENNING	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 763.8 (ft) EOB: 7.5 ft.	PAGE 1 OF 1
START: 11/27/23 END: 11/28/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.046812, -81.960492	

MATERIAL DESCRIPTION AND NOTES	ELEV. 763.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (18")	762.3	1																
STIFF, YELLOWISH BROWN, **SANDY SILT**, LITTLE STONE FRAGMENTS, LITTLE CLAY, DAMP	760.3	2 3	5 6 3	14	44	SS-1	2.00	17	1	42	24	16	23	20	3	13	A-4a (1)	
MEDIUM STIFF, REDDISH BROWN, BROWN AND GRAY, **SILT AND CLAY**, SOME SAND, TRACE STONE FRAGMENTS, MOIST	757.8	4 5	2 2 3	8	33	SS-2	1.00	3	1	23	33	40	30	19	11	19	A-6a (8)	
VERY STIFF, BROWN AND REDDISH BROWN, **SANDY SILT**, SOME CLAY, LITTLE STONE FRAGMENTS, DAMP	756.3 EOB	6 7	3 8 19	41	67	SS-3	3.00	17	0	38	21	24	24	19	5	13	A-4a (2)	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 12/28/23 14:38 - X:\GINT\PROJECTS\601102.GPJ

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / CAREY	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 707+48, 176' LT.	EXPLORATION ID B-001-1-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / LEWIS	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 748.3 (ft) EOB: 17.5 ft.	PAGE 1 OF 1
START: 11/20/23 END: 11/20/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.047069, -81.960369	

MATERIAL DESCRIPTION AND NOTES	ELEV. 748.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (18")	746.8	1																
STIFF, REDDISH BROWN, **SILT AND CLAY**, SOME SAND, LITTLE STONE FRAGMENTS, DAMP		2	4 7 7	21	44	SS-1	1.00	12	11	21	29	27	33	20	13	13	A-6a (5)	
@3.5'; VERY STIFF	742.3	3 4 5	7 11 8	29	33	SS-2	4.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
DENSE, REDDISH BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, DAMP	739.8	6 7	10 10 16	39	56	SS-3	-	35	11	21	18	15	26	17	9	12	A-2-4 (0)	
SHALE, OLIVE GRAY, MODERATELY WEATHERED, WEAK, LAMINATED.	737.3	TR 8 9 10	18 15 22	56	78	SS-4	-	-	-	-	-	-	-	-	-	12	Rock (V)	
CLAYSTONE, REDDISH BROWN, MODERATELY WEATHERED, VERY WEAK TO WEAK.	730.8	11 12 13	31 26 30	84	67	SS-5	-	-	-	-	-	-	-	-	-	10	Rock (V)	
		14 15	12 21 42	95	72	SS-6	-	-	-	-	-	-	-	-	-	13	Rock (V)	
		EOB 16 17	20 37 73	165	67	SS-7	-	-	-	-	-	-	-	-	-	12	Rock (V)	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 12/28/23 14:38 - X:\GINT\PROJECTS\601102.GPJ

From "MEG-19718_COMPLETE PLAN SET.pdf"

WESTBOUND CROSS SECTIONS - S.R. 124 STA. 707+50

MEG-124-22.72

CALCULATED SAC
CHECKED CMK

SEEDING	
END WIDTH	SQ. YDS.
	135
	669
669	SHEET TOTAL

END AREA		VOLUME	
CUT	FILL	CUT	FILL

Historic cross-section

240 220 200 180 160 140 120 100 80 60 40 20 0

830 820 810 800 790 780 770 760 750 740

LA-R/W

B-001-1-23

Ground surface at El. 748.3' (B-001-1-23)

Top of rock at El. 739.8' (B-001-1-23)

B-001-0-23

Adjusted ground surface from El. 763.8' to El 770.1' (B-001-0-23)

2:1 2:1 2:1 3:1 3:1

795.5 795.5 782.5 782.5

STA. 50.00

240 220 200 180 160 140 120 100 80 60 40 20 0

669 SHEET TOTAL

19718GXL.DGN

From "MEG-19718_COMPLETE PLAN SET.pdf"

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL
SHEET TOTAL		1123	619
		255	626
SHEET TOTAL		1123	619

CALCULATED SAC
CHECKED CMK

Historic cross-section

CU-01A

Adjusted ground surface from El. 790.6' to El. 813.7' (CU-01A)

Adjusted top of rock from El. 784.8 to El. 804.7' (CU-01A)

LA-R/W

8:1

2:1

792.5

792.6

795.15

707+50.00

782.78

0 20 40 60 80 100 120 140 160 180 200 220 240

830 820 810 800 790 780 770 760 750 740

EASTBOUND CROSS SECTIONS - S.R. 124
STA. 707+50

MEG-124-22.72

211
823

19718GXF.DGN

Soil Parameter Determination

9999 Carver Road, Suite 210, Cincinnati, OH 45242-5583
(513) 984-7500
hdrinc.com

ODOT D10
MEG-33-13.96

Soil Strength Parameter Determination

Computed By = MM
Checked By = AKB

Layer		Undrained Shear Strength (Su) (psf)				Dry Unit Weight (pcf)		Moist Unit Wt. (pcf)		Adopted Short Term Parameters		Long-Term Strength Values						Adopted Long Term Strength Parameters	
		PPR	N-values		Tested	Correlation	Tested	Correlation	Tested				N_{60} Value	ODOT GB-7 Correlations		Tested			
			Sowers	T and P	Values									Cohesion (psf)	phi (deg)	Cohesion (psf)	phi (deg)		
Layer 1 VERY STIFF TO HARD COHESIVE (A-4A, A-6A, A-7-6)	Max	4000	4000	4000		120		130		S_u= 3350 psf		Max	48	250	28			c' = 215 psf	
	Min	1000	3075	2793		105		125		Φ = 0 deg		Min	21	170	25			Φ' = 27 deg	
	Average	2667	3688	3663		111		126				Average	35	217	27				
	Std Dev	1528	436	584		8		3		Y_{dry} = 110 pcf		Std Dev	12	40	2			Y_{dry} = 110 pcf	
	Avg + Std	4194	4124	4246		119		129		Y_{moist} = 125 pcf		Avg + Std	47	257	28			Y_{moist} = 125 pcf	
	Avg - Std	1139	3251	3079		104		124				Avg - Std	23	177	25				
Layer 2 MEDIUM STIFF TO STIFF COHESIVE (A4A, A-6A, A-7-6)	Max	2000	3250	1862		100		120				Max	14	143	24				
	Min	1000	1050	1064		95		110		S_u = 1650 psf		Min	8	100	22			c' = 125 psf	
	Average	1500	1900	1552		98		117		Φ = 0 deg		Average	12	126	23			Φ' = 23 deg	
	Std Dev	707	1182	428		3		6				Std Dev	3	23	1				
	Avg + Std	2207	3082	1979		101		122		Y_{dry} = 100 pcf		Avg + Std	15	149	24			Y_{dry} = 100 pcf	
	Avg - Std	793	718	1124		95		111		Y_{moist} = 120 pcf		Avg - Std	8	103	22			Y_{moist} = 120 pcf	
Layer 3 DENSE GRANULAR (A-2-4)	Max	N/A	N/A	N/A		115		130				Max	39	N/A	35				
	Min	N/A	N/A	N/A		115		130		S_u = 0 psf		Min	39	N/A	35			c' = 0 psf	
	Average	N/A	N/A	N/A		115		130		Φ = 35 deg		Average	39	N/A	35			Φ' = 35 deg	
	Std Dev	N/A	N/A	N/A		N/A		N/A				Std Dev	N/A	N/A	N/A				
	Avg + Std	N/A	N/A	N/A		N/A		N/A		Y_{dry} = 115 pcf		Avg + Std	N/A	N/A	N/A			Y_{dry} = 115 pcf	
	Avg - Std	N/A	N/A	N/A		N/A		N/A		Y_{moist} = 130 pcf		Avg - Std	N/A	N/A	N/A			Y_{moist} = 130 pcf	

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 1

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
Max	48	67	4.0	19	11	38	77	27	43	26	17	15	Max	4000	4000	4000	250	28	7.0	786.6	120	130	0.297	2.72	0.616
Min	21	33	1.0	12	0	2	21	24	24	19	5	13	Min	1000	3075	2793	170	25	2.0	744.3	105	125	0.126	2.65	0.414
Average	35	48	2.7	16	4	20	42	26	33	22	12	14	Average	2667	3688	3663	217	27	4.3	758.5	111	126	0.210	2.70	0.521
Std Dev	12	17	1.5	4	6	18	30	2	10	4	6	1	Std Dev	1528	436	584	40	2	2.1	19.5	8	3	0.086	0.04	0.110
Avg + Std	47	65	4.2	20	10	38	73	28	43	25	18	15	Avg + Std	4194	4124	4246	257	28	6.3	778.0	119	129	0.296	2.74	0.632
Avg - Std	23	31	1.1	12	-2	2	12	23	24	18	6	13	Avg - Std	1139	3251	3079	177	25	2.2	739.0	104	124	0.124	2.67	0.411

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
US 33	763.8	B-001-0-23	6	-	7.5	SS-3	41	67	3	17	0	38	21	24	24	19	5	13	A-4A	Cohesive	1	3000	3075	4000	250	28	7.0	756.8	120	130	0.126	2.72	0.414
US 33	748.3	B-001-1-23	1.5	-	3	SS-1	21	44	1	12	11	21	29	27	33	20	13	13	A-6A	Cohesive	1	1000	3675	2793	170	25	2.0	746.3	105	125	0.207	2.72	0.616
US 33	748.3	B-001-1-23	3.5	-	5	SS-2	29	33	4	-	-	-	-	-	-	-	-	13	A-6A	Cohesive	1	4000	4000	3857	197	26	4.0	744.3	105	125		2.72	0.616
US 33	790.6	CU-01A	3.5	-	5	2	48	-	-	19	2	2	77		43	26	17	15	A-7-6	Cohesive	1	N/A	4000	4000	250	28	4.0	786.6	115	125	0.297	2.65	0.438

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 2

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
Max	14	44	2.0	17	1	42	33	40	30	20	11	19	Max	2000	3250	1862	143	24	4.0	788.6	100	120	0.180	2.72	0.787
Min	8	33	1.0	3	1	23	24	16	23	19	3	13	Min	1000	1050	1064	100	22	2.0	759.8	95	110	0.117	2.65	0.654
Average	12	39	1.5	10	1	33	29	28	27	20	7	17	Average	1500	1900	1552	126	23	2.7	770.1	98	117	0.149	2.70	0.712
Std Dev	3	8	0.7	10	0	13	6	17	5	1	6	3	Std Dev	707	1182	428	23	1	1.2	16.1	3	6	0.045	0.04	0.068
Avg + Std	15	46	2.2	20	1	46	35	45	31	20	13	20	Avg + Std	2207	3082	1979	149	24	3.8	786.1	101	122	0.193	2.74	0.780
Avg - Std	8	31	0.8	0	1	19	22	11	22	19	1	14	Avg - Std	793	718	1124	103	22	1.5	754.0	95	111	0.104	2.66	0.645

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
US 33	763.8	B-001-0-23	1.5	-	3	SS-1	14	44	2	17	1	42	24	16	23	20	3	13	A-4A	Cohesive	2	2000	1050	1862	143	24	2.0	761.8	100	120	0.117	2.72	0.697
US 33	763.8	B-001-0-23	3.5	-	5	SS-2	8	33	1	3	1	23	33	40	30	19	11	19	A-6A	Cohesive	2	1000	1400	1064	100	22	4.0	759.8	95	110	0.18	2.72	0.787
US 33	790.6	CU-01A	1	-	2.5	1	13	-	-	-	-	-	-	-	-	-	-	19	A-7-6	Cohesive	2	N/A	3250	1729	136	23	2.0	788.6	100	120		2.65	0.654

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 3

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
Max	39	56	N/A	35	11	21	18	15	26	17	9	12	Max	N/A	N/A	N/A	N/A	35	7.0	741.3	115	130	0.144	2.71	0.470
Min	39	56	N/A	35	11	21	18	15	26	17	9	12	Min	N/A	N/A	N/A	N/A	35	7.0	741.3	115	130	0.144	2.71	0.470
Average	39	56	N/A	35	11	21	18	15	26	17	9	12	Average	N/A	N/A	N/A	N/A	35	7.0	741.3	115	130	0.144	2.71	0.470
Std Dev	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Std Dev	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Avg + Std	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Avg + Std	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Avg - Std	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Avg - Std	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
US 33	748.3	B-001-1-23	6	-	7.5	SS-3	39	56	-	35	11	21	18	15	26	17	9	12	A-2-4	Granular	3	N/A				35	7.0	741.3	115	130	0.144	2.71	0.470

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 3/18/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 3/18/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-01 Station & Offset 713+80.00, 42.00' RT Surface Elev. 767.72ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Lass (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
767.7	0														
767.2		6-12-17			TOPSOIL Very stiff to hard, reddish brown SILT AND CLAY, some sand, trace rock fragments, moist.	1	--	--	--	--	--	--	--	19	VISUAL
		10-15-16				2	11	12	17	--	61*	28	11	15	A-6a
	5														
762.1		34-42-49			Hard, brown SANDY SILT, some clay, trace rock fragments, moist.	3	--	--	--	--	--	--	--	10	VISUAL
		27-29-37				4	--	--	--	--	--	--	--	13	VISUAL
	10	23-20-23				5	3	3	16	--	78*	29	10	15	A-4a
756.3		12-17-21			Hard, brown SILT AND CLAY, some sand, trace rock fragments, moist.	6	--	--	--	--	--	--	--	15	VISUAL
		11-15-18				7	--	--	--	--	--	--	--	17	VISUAL
	15	10-12-18				8	1	4	17	--	78*	36	14	19	A-6a
749.5		15-30-27			Very soft, brown, decomposed SANDSTONE.	9	--	--	--	--	--	--	--	13	VISUAL
747.7	20				TERMINATION DEPTH = 20.0 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 3/18/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 3/18/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-01A Station & Offset 713+05.00, 140.00' RT Surface Elev. 790.58ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Lass (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
790.6	0														
790.2		4-6-7			TOPSOIL Stiff to hard, reddish brown CLAY, little rock fragments, trace sand, moist.	1	--	--	--	--	--	--	--	19	VISUAL
788.1		6-15-33			Layer 2 Layer 1	2	19	2	2	--	77*	43	17	15	A-7-6
	5														
784.8		50/4in			Very soft, brown, decomposed CLAY SHALE.	3	--	--	--	--	--	--	--	10	VISUAL
					Omitted										
781.6		50/5in ROD = 84%	4.9	0.1	Note: Auger refusal on bedrock at 9.0 feet. Began coring rock. Hard, gray, slightly weathered to weathered, slightly micaceous, fine grained SANDSTONE with very thin to thick bedding, little iron staining. Quality of bedrock good as per ROD. U.C. Strength at 11.2 feet = 1783 psi	4	--	--	--	--	--	--	--	12	VISUAL
	10														
777.4					Hard, gray, fresh to slightly weathered, microcrystalline LIMESTONE with indistinct bedding. Note: Slightly micaceous from 13.2 feet to 13.3 feet. U.C. Strength at 13.4 feet = 8443 psi										
776.6					TERMINATION DEPTH = 14.0 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

33/67	MEG-124-22.72	SOIL PROFILE	DRAWN E.D.S.	REVIEWED B.M.	DATE 1/24/01	CALCULATED W.I.N. / CHECKED S.S.S.	PRIME ENGINEERING & ARCHITECTURE, INC. COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / CAREY	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 707+72, 79' LT.	EXPLORATION ID B-001-0-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / BENNING	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 763.8 (ft) EOB: 7.5 ft.	PAGE 1 OF 1
START: 11/27/23 END: 11/28/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.046812, -81.960492	

MATERIAL DESCRIPTION AND NOTES	ELEV. 763.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (18")	762.3	1																
STIFF, YELLOWISH BROWN, **SANDY SILT**, LITTLE STONE FRAGMENTS, LITTLE CLAY, DAMP Layer 2	760.3	2 3 4	5 6 3	14	44	SS-1	2.00	17	1	42	24	16	23	20	3	13	A-4a (1)	
MEDIUM STIFF, REDDISH BROWN, BROWN AND GRAY, **SILT AND CLAY**, SOME SAND, TRACE STONE FRAGMENTS, MOIST	757.8	5	2 2 3	8	33	SS-2	1.00	3	1	23	33	40	30	19	11	19	A-6a (8)	
VERY STIFF, BROWN AND REDDISH BROWN, **SANDY SILT**, SOME CLAY, LITTLE STONE FRAGMENTS, DAMP Layer 1	756.3	6 7 EOB	3 8 19	41	67	SS-3	3.00	17	0	38	21	24	24	19	5	13	A-4a (2)	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 12/28/23 14:38 - X:\GINT\PROJECTS\601102.GPJ

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / CAREY	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 707+48, 176' LT.	EXPLORATION ID B-001-1-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / LEWIS	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 748.3 (ft) EOB: 17.5 ft.	PAGE 1 OF 1
START: 11/20/23 END: 11/20/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.047069, -81.960369	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (18")	748.3																	
	746.8																	
STIFF, REDDISH BROWN, **SILT AND CLAY**, SOME SAND, LITTLE STONE FRAGMENTS, DAMP		1	4 7 7	21	44	SS-1	1.00	12	11	21	29	27	33	20	13	13	A-6a (5)	
@3.5'; VERY STIFF Layer 1		2 3 4	7 11 8	29	33	SS-2	4.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
	742.3	5 6																
DENSE, REDDISH BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, DAMP Layer 3		7	10 10 16	39	56	SS-3	-	35	11	21	18	15	26	17	9	12	A-2-4 (0)	
	739.8	8 TR																
SHALE, OLIVE GRAY, MODERATELY WEATHERED, WEAK, LAMINATED.		9 10	18 15 22	56	78	SS-4	-	-	-	-	-	-	-	-	-	12	Rock (V)	
	737.3	11																
CLAYSTONE, REDDISH BROWN, MODERATELY WEATHERED, VERY WEAK TO WEAK.		12 13	31 26 30	84	67	SS-5	-	-	-	-	-	-	-	-	-	10	Rock (V)	
Omitted		14 15	12 21 42	95	72	SS-6	-	-	-	-	-	-	-	-	-	13	Rock (V)	
	730.8	16 17 EOB	20 37 73	165	67	SS-7	-	-	-	-	-	-	-	-	-	12	Rock (V)	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 12/28/23 14:38 - X:\GINT\PROJECTS\601102.GPJ

Slope Stability

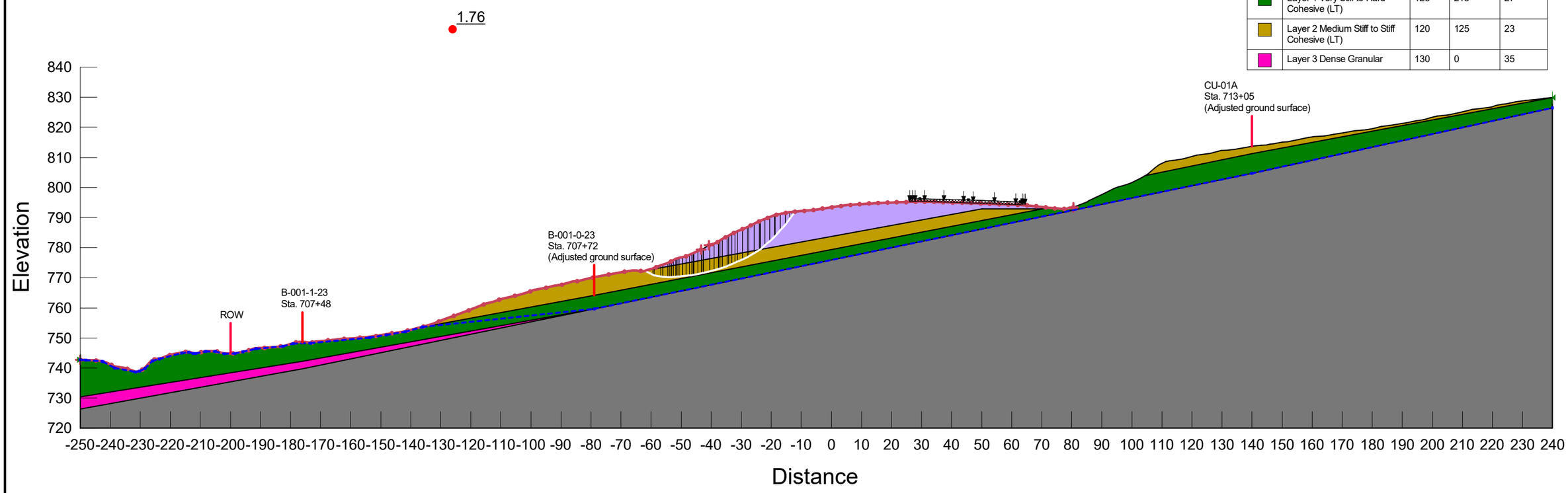
9999 Carver Road, Suite 210, Cincinnati, OH 45242-5583
(513) 984-7500
hdrinc.com

As the planned embankment fill material is not known, the assumed embankment fill properties for an A-7-6 material as presented in Table 500-2 from the ODOT Geotechnical Design Manual were assumed for conservatism.

Long Term (Drained) Condition

Table 500-2: Assumed Embankment Fill Properties

Borrow Source Soil Class	c (psf)	φ (deg)	c′ (psf)	φ′ (deg)	γ (pcf)
Granular	0	32	0	32	125
A-4a/A-4b	2000	0	200	30	125
A-6a	2500	0	250	28	125
A-6b	2500	0	250	28	125
A-7-6	2000	0	200	26	125
Unknown	2500	0	250	26	125

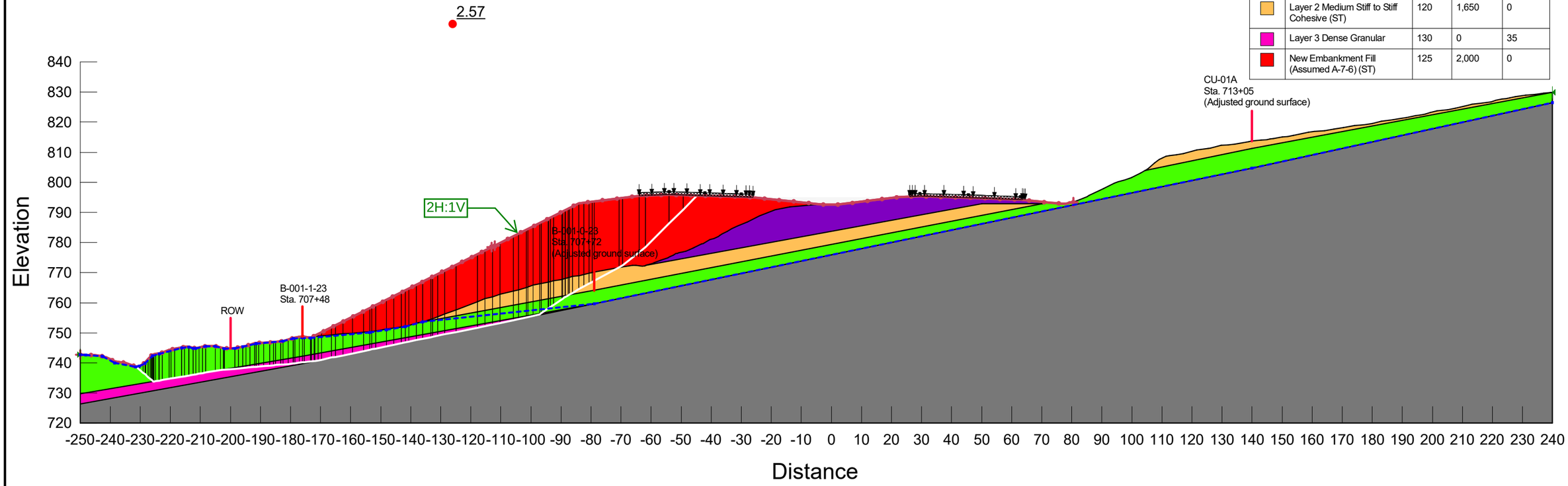


Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock			
	Existing Embankment Fill (Assumed A-7-6) (LT)	125	200	26
	Layer 1 Very Stiff to Hard Cohesive (LT)	125	215	27
	Layer 2 Medium Stiff to Stiff Cohesive (LT)	120	125	23
	Layer 3 Dense Granular	130	0	35

1. Existing	
Sta. 707+50 LT SlopeW.gsz	
05/06/2024	1:400

Short Term (Undrained) Condition

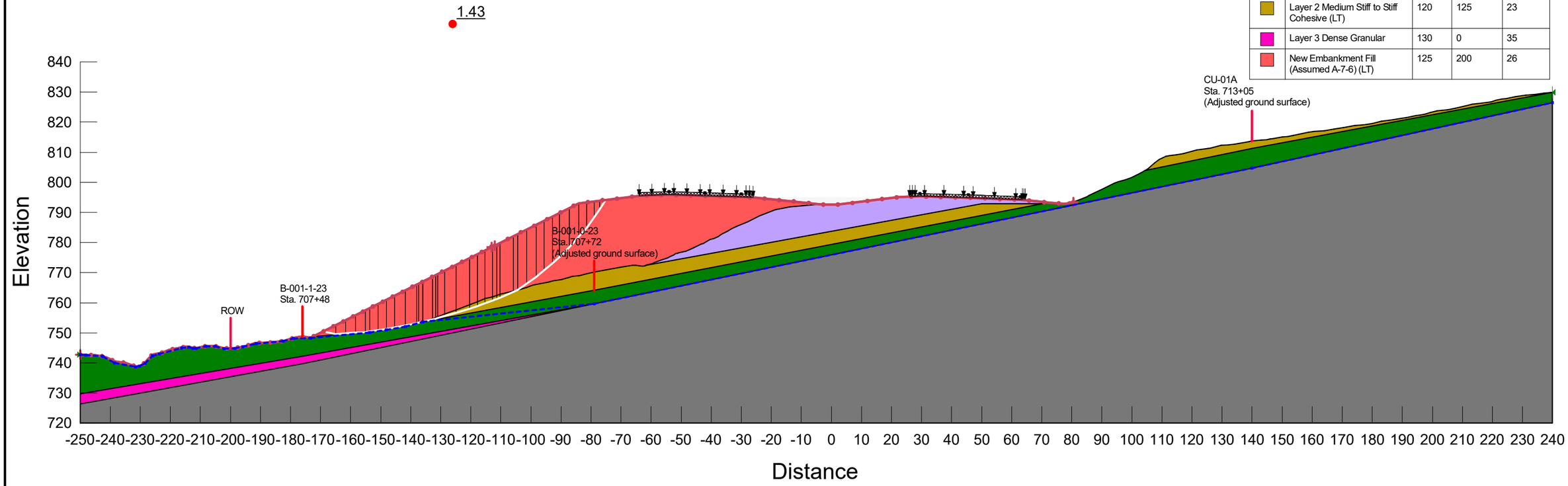
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock			
	Existing Embankment Fill (Assumed A-7-6) (ST)	125	2,000	0
	Layer 1 Very Stiff to Hard Cohesive (ST)	125	3,350	0
	Layer 2 Medium Stiff to Stiff Cohesive (ST)	120	1,650	0
	Layer 3 Dense Granular	130	0	35
	New Embankment Fill (Assumed A-7-6) (ST)	125	2,000	0



2a. Proposed (ST)	
Sta. 707+50 LT SlopeW.gsz	
05/06/2024	1:400

Long Term (Drained) Condition

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock			
	Existing Embankment Fill (Assumed A-7-6) (LT)	125	200	26
	Layer 1 Very Stiff to Hard Cohesive (LT)	125	215	27
	Layer 2 Medium Stiff to Stiff Cohesive (LT)	120	125	23
	Layer 3 Dense Granular	130	0	35
	New Embankment Fill (Assumed A-7-6) (LT)	125	200	26

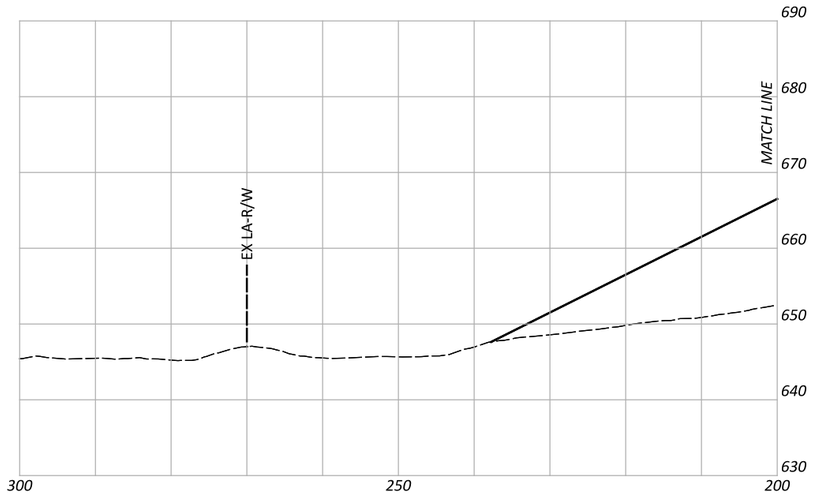


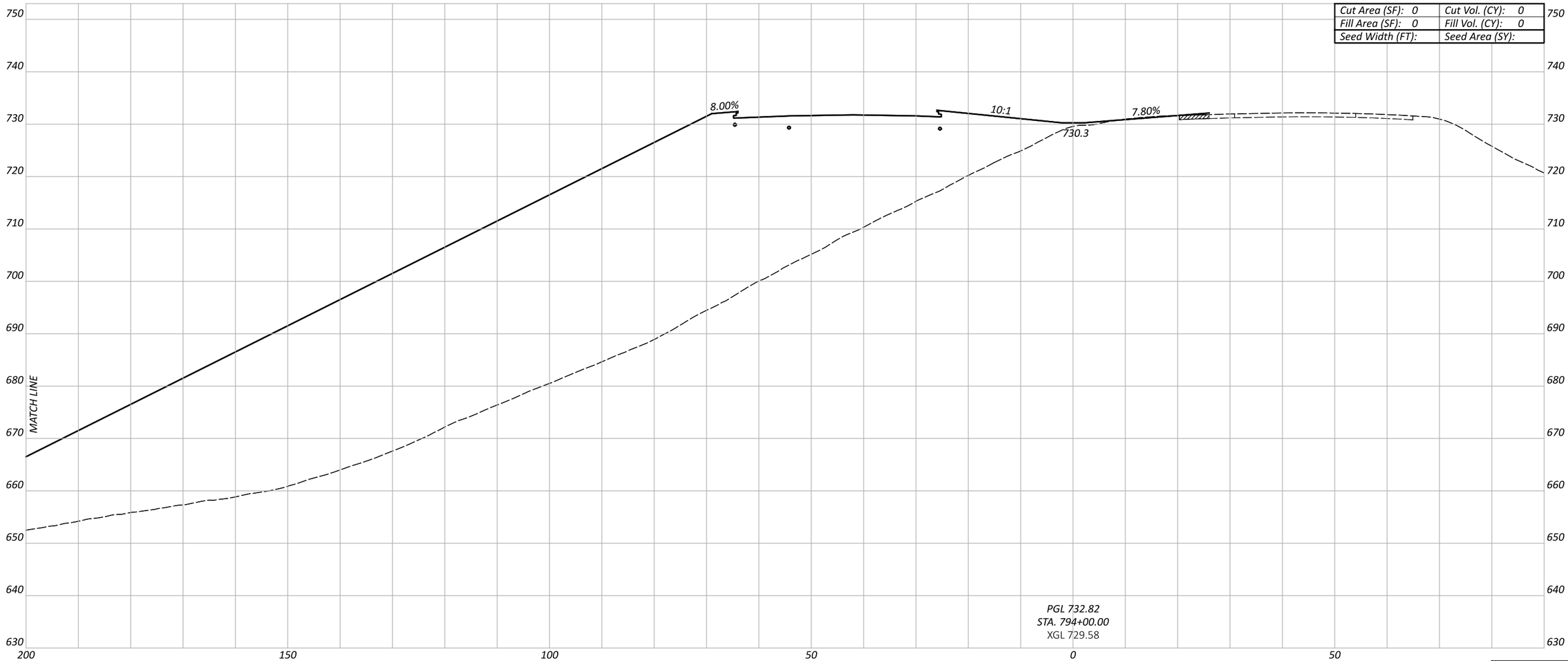
2b. Proposed (LT)	
Sta. 707+50 LT SlopeW.gsz	
05/06/2024	1:400

Sta. 794+00

References

Proposed cross-section at Sta. 794+00





Cut Area (SF): 0	Cut Vol. (CY): 0
Fill Area (SF): 0	Fill Vol. (CY): 0
Seed Width (FT):	Seed Area (SY):

PGL 732.82
STA. 794+00.00
XGL 729.58

Sheet Totals		
Seeding	Cut	Fill

CTY-RTE-SECTION

MODEL: CLX_RW_U533 - 794+00.00 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 3/7/2024 TIME: 2:51:17 PM USER: kzimmer
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 10\Meigs\119143\400-Engineering\Roadway\Sheets\119143_XS001.dgn

SHEET TITLE
SHEET SUB-TITLE

DESIGN AGENCY

DESIGNER XXX

REVIEWER XXX MM-DD-YY

PROJECT ID 0

SHEET P.0 | TOTAL 0

Sta. 794+00

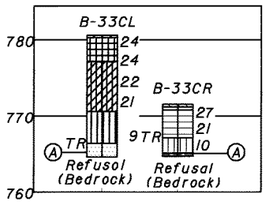
From "Geotech - 19718/Soil Profile Begin 5 pts.pdf"

℄ CONSTRUCTION S.R. 124

Future WB

776+00 777+00 778+00 779+00 780+00 781+00 782+00 783+00 784+00 785+00 786+00 787+00 788+00 789+00 790+00 791+00 792+00 793+00 794+00 795+00 796+00 797+00 798+00 799+00 800+00

B-32CL B-32 B-32CR B-33CL B-33 B-33CR B-34 B-35 B-36 B-38



	STATIONN	OFFSET
B-32CL	776+04.00	14.00'RT
B-32CR	775+68.00	83.00'RT
B-33CL	780+14.00	10.00'RT
B-33CR	779+92.00	94.00'RT

Ⓐ B-32CL
Soft, brown, decomposed CLAY SHALE

Ⓐ B-33CL
Soft, brown, decomposed, micaceous CLAY SHALE

Ⓐ B-33CL
Medium hord brown, decomposed SANDSTONE

Ⓐ B-33CR
Soft, brown, highly weathered CLAY SHALE

B-32 47.00' RT
4 9 11 11
TR
Refusol (Bedrock)
Very soft, brown, decomposed CLAY SHALE

B-33 49.00' RT
33 29 17 15
Refusol (Bedrock)

EXISTING GROUND

PROPOSED GRADE

B-34 42.00' RT
12 14 13 14
TR
Very soft to soft, brown, decomposed CLAY SHALE

B-35 42.00' RT
18 14
TR
Refusol (Bedrock)
Soft, reddish brown, decomposed CLAY SHALE

B-36 37.52' RT
14 15 16 11
TR
Refusol (Bedrock)
Soft, reddish brown, decomposed CLAY SHALE

B-38 42.00' RT
16 12 14
TR
Refusol (Bedrock)
Soft, brown, decomposed CLAY SHALE

PROP. 36" CULVERT

Approximate Thickness of Embankment Fill

73 ft

790 780 770 760 750 740 730 720 710 700 690 680 670 660 650 640

775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800

200' 100' 0' 50' HORIZONTAL SCALE IN FEET

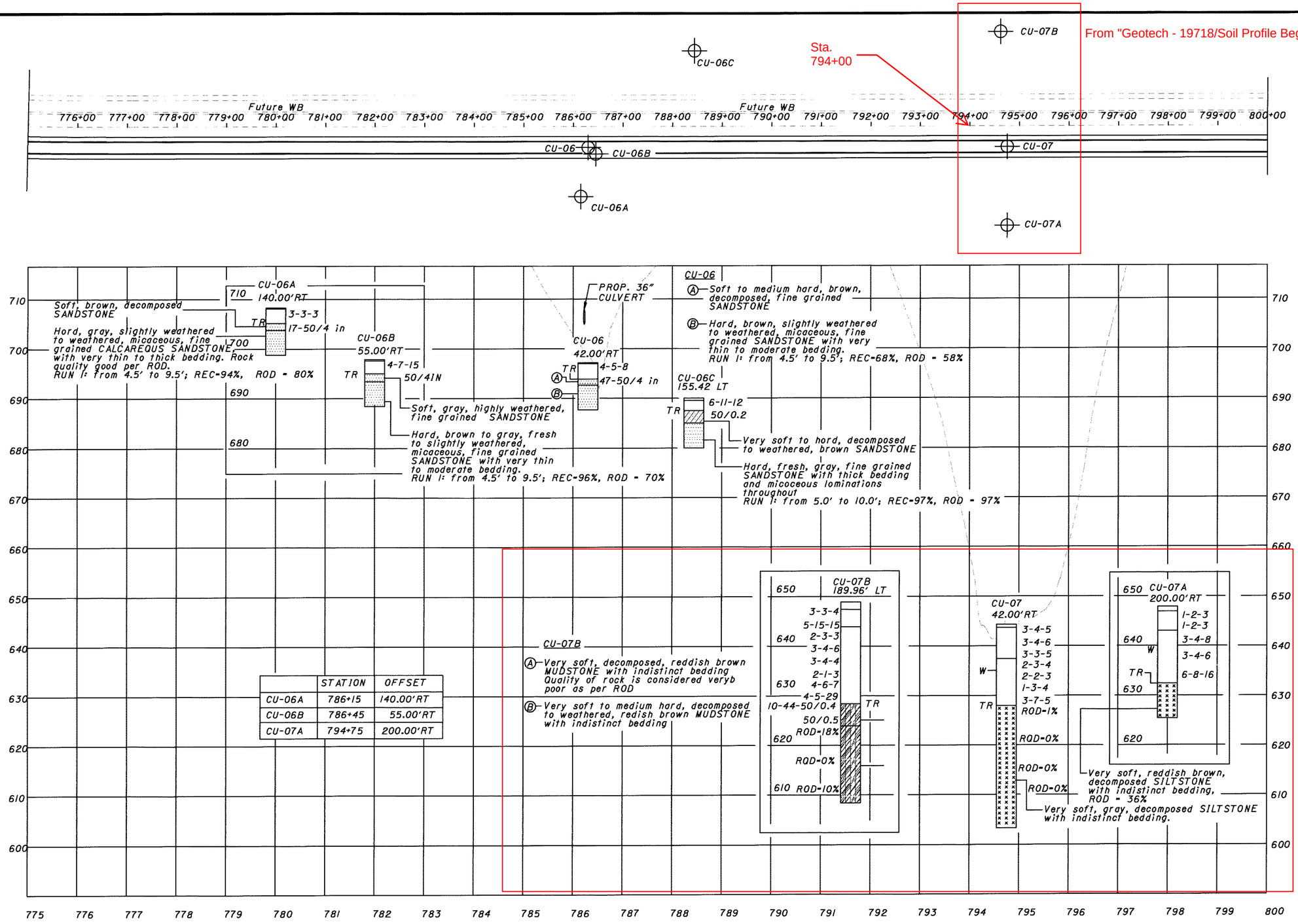
CALCULATED W.I.N.
CHECKED S.S.S.
DATE 1/24/01
REVIEWED B.M.
DRAWN E.D.S.

SOIL PROFILE

MEG-124-22.72

12 67

From "Geotech - 19718/Soil Profile Begin 5 pts.pdf"



	STATION	OFFSET
CU-06A	786+15	140.00'RT
CU-06B	786+45	55.00'RT
CU-07A	794+75	200.00'RT

Note: Historic Borings CU-07, CU-07A, and CU-07B were used along with the more recent borings designated as B-002-0-23, B-002-1-23, and B-002-2-23 to develop the subsurface profile along Sta. 794+00.

N

200' 100' 50' 0' HORIZONTAL SCALE IN FEET

CALCULATED W.I.N. CHECKED S.S.S.

DATE 1/24/01

REVIEWED B.M.

DRAWN E.D.S.

SOIL PROFILE

MEG-124-22.72

13 67

From "Geotech - 19718/Soil Profile Begin 5 pts.pdf"

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 5/13/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 5/14/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-07 Station & Offset 794+75.00, 42.00' RT Surface Elev. 644.33ft

Elev. (ft)	Depth (ft)	Std. Pen. / RQD	Rec. (ft)	Lass (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
644.3	0														
643.7					TOPSOIL										
		3-4-5			Stiff, brown SILTY CLAY, trace sand, moist.	1	--	--	--	--	--	--	--	19	VISUAL
		3-4-6				2	--	--	--	--	--	--	--	14	VISUAL
	5														
		3-3-5				3	0	1	3	--	97*	36	16	22	A-6b
637.4					Medium stiff to stiff, brown to gray SILT AND CLAY, moist.										
		2-3-4				4	--	--	--	--	--	--	--	21	VISUAL
		2-2-3				5	1	1	7	--	91*	31	12	22	A-6a
	10														
		1-3-4				6	--	--	--	--	--	--	--	18	VISUAL
		3-7-5				7	--	--	--	--	--	--	--	13	VISUAL
	15														
627.8		ROD = 1%	4.7	0.8	Note: Auger refusal on bedrock at 16.5 feet. Began coring rock. Very soft, gray, decomposed SILTSTONE, with indistinct bedding, very poor condition as per ROD.										
	20				RUN 1 FROM 16.5 FEET TO 22.0 FEET										
623.3					U.C. Strength at 20.5 feet = 100 psi										
		ROD = 0%	0.1	7.4											
	25				Note: Color change to reddish brown at 25.0 feet.										
					RUN 2 FROM 22.0 FEET TO 29.5 FEET Run 2 bedrock quality very poor as per ROD.										
	30				Note: Used roller bit method of drilling from 29.5 feet to 32.0 feet because core barrel locked at 29.5 feet. No rock sample recovery between these depths.										
		ROD = 0%	0.3	4.8											
	35				RUN 3 FROM 32.0 FEET TO 37.0 FEET Run 3 bedrock quality very poor as per ROD.										
		ROD = 0%	3.7	0.3											
	40				RUN 4 FROM 37.0 FEET TO 41.0 FEET Run 4 bedrock quality very poor as per ROD.										
603.3					TERMINATION DEPTH = 41.0 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coorse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

MEG-124-22.72 SOIL PROFILE

DRAWN	REVIEWED	DATE	CALCULATED	CHECKED
E.D.S.	B.M.	1/24/01	W.I.N.	S.S.S.

PRIME ENGINEERING & ARCHITECTURE, INC.
COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 4/14/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 4/14/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-07A Station & Offset 794+75.00, 200.00' RT Surface Elev. 647.87ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
647.9	0														
647.4					TOPSOIL										
		1-2-3			Medium stiff, brown SANDY SILT, some clay, moist.	1	--	--	--	--	--	--	--	24	VISUAL
		1-2-3				2	0	5	32	37	25	29	10	30	A-4a
643.0	5				Stiff to very stiff, brown SILT AND CLAY, trace sand, moist.										
		3-4-8				3	--	--	--	--	--	--	--	20	VISUAL
		3-4-6				4	0	1	9	--	90 *	36	16	23	A-6a
	10														
		6-8-16				5	--	--	--	--	--	--	--	15	VISUAL
632.4	15														
		ROD = 36%	6.9	0.1	Note: Auger refused on bedrock at 15.5 feet. Began coring rock. Very soft, reddish brown, decomposed SILTSTONE with indistinct bedding, very poor condition as per ROD.										
					Note: Siltstone changing to soft, weathered to highly weathered, and grey at 16.4 feet.										
	20														
					U.C. Strength at 21.2 feet = 196 psi										
625.4					TERMINATION DEPTH = 22.5 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 3/31/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 3/31/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-09 Station & Offset 813+30.00, 42.00' RT Surface Elev. 767.23ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
767.2	0														
766.6					TOPSOIL										
		6-16-18			Very soft, highly weathered to decomposed, brown CLAY SHALE.	1	--	--	--	--	--	--	--	11	VISUAL
		50/4in				2	--	--	--	--	--	--	--	6	VISUAL
	5														
		50/5in				3	--	--	--	--	--	--	--	7	VISUAL
		50/4in				4	--	--	--	--	--	--	--	6	VISUAL
757.2	10														
		ROD = 0%	5.0	0.0	Note: Auger refusal on bedrock at 10.0 feet. Began coring rock. Very soft, highly weathered to decomposed, brown CLAY SHALE with horizontal laminar bedding (fissile) to 11.5 feet; indistinct bedding from 11.5 feet to 15.0 feet. Rock in very poor condition as per ROD. U.C. Strength at 10.9 feet = 166 psi										
752.2	15				TERMINATION DEPTH = 15.0 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

MEG-124-22.72

SOIL PROFILE

DRAWN	REVIEWED	DATE	CALCULATED	CHECKED
E.D.S.	B.M.	1/24/01	W.J.N.	S.S.S.

PRIME ENGINEERING & ARCHITECTURE, INC.
COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

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State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/5/00 Sampler: Type SS Dia. 2.0" Water Elev. 632.6ft
Date Completed 7/6/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-07B Station & Offset 794+60.79 189.96' LT Surface Elev. 648.94ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
648.9	0														
647.4	2	3 - 3 - 4			TOPSOIL Medium stiff to very stiff, reddish brown SILTY CLAY (A-6b), little sand, trace to some rock fragments, trace roots, moist.	1	--	--	--	--	--	--	--	16	VISUAL
643.9	4	5 - 15 - 15			Note: Encountered a sandstone cobble at 4.5 feet.	2	--	--	--	--	--	--	--	9	VISUAL
	6				Soft to hard, brown and gray SANDY SILT (A-4a), some to little clay, no to little gravel and rock fragments, moist to wet.										
	8	2 - 3 - 3				3	--	--	--	--	--	--	--	19	VISUAL
	10	3 - 4 - 6				4	--	--	--	--	--	--	--	21	VISUAL
	12	3 - 4 - 4				5	--	--	--	--	--	--	--	21	VISUAL
	14	2 - 1 - 3			Note: Pushed a Shelby Tube from 14 to 16 feet next to original test boring.	6A 6B	0 --	1 --	12 --	48 --	40 --	30 --	10 --	21 21	A-4a VISUAL
	16 ▽	4 - 6 - 7			Note: Encountered groundwater at 16.3 feet during drilling.	7	--	--	--	--	--	--	--	14	VISUAL
	18														
	20	4 - 5 - 29				8A	1	6	11	--	82 *	31	10	24	A-4a
628.4						8B	--	--	--	--	--	--	--	14	VISUAL
	22	10-44-50/0.4			Very soft, decomposed, reddish brown MUDSTONE with indistinct bedding. The quality of the mudstone in all three runs is considered very poor as per ROD.	9	--	--	--	--	--	--	--	9	VISUAL
	24	50/0.5			Note: Augered to 25.0 feet and began coring.	10	--	--	--	--	--	--	--	10	VISUAL
623.9	26	ROD = 18%	4.7	0.8	Very soft to medium hard, decomposed to weathered, reddish brown MUDSTONE with indistinct bedding. U.C. Strength of dec. mudstone at 25.8 feet = 152 psi										
	28														
	30														
	32	ROD = 0%	4.0	1.0											
	34														
	36	ROD = 10%	3.5	1.5											
	38														
608.4	40														
					TERMINATION DEPTH = 40.5 FEET										

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/27/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/27/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-08 Station & Offset 812+63.51 128.85' RT Surface Elev. 775.52ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
775.5	0														
774.9	2	6 - 9 - 6			TOPSOIL Stiff, brown CLAY (A-7-6), some sand, trace rock fragments, trace roots, moist.	1	2	6	20	--	72 *	52	28	19	A-7-6
	4	4 - 4 - 6				2	--	--	--	--	--	--	--	19	VISUAL
	6														
769.0		5 - 11 - 16				3	--	--	--	--	--	--	--	12	VISUAL
	8				Medium dense, brown COARSE AND FINE SAND (A-3a), little silt, trace rock fragments, moist.										
767.0	10	7 - 11 - 17			Very stiff, brown CLAY (A-7-6), little sand, moist.	4	--	--	--	--	--	--	--	21	VISUAL
764.0	12	8 - 21 - 34				5	--	--	--	--	--	--	--	15	VISUAL
					Very soft, decomposed, brown and black SANDSTONE.										
761.5	14	15 - 43 - 22				6A	--	--	--	--	--	--	--	8	VISUAL
					Very soft, decomposed to highly weathered, brown CLAY SHALE.	6B	--	--	--	--	--	--	--	12	VISUAL
	16	60/0.5				7	--	--	--	--	--	--	--	9	VISUAL
	18														
	20	39 - 56				8	--	--	--	--	--	--	--	10	VISUAL
	22	24 - 31 - 48				9	--	--	--	--	--	--	--	11	VISUAL
753.0															
					TERMINATION DEPTH = 22.5 FEET										

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

19/67	MEG-124-22.72	SOIL PROFILE	DRAWN E.D.S.	REVIEWED B.M.	DATE 1/24/01	CALCULATED W.I.N. / CHECKED S.S.S.

PRIME ENGINEERING & ARCHITECTURE, INC.
COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

PROJECT: MEG-33-13.96
TYPE: ROADWAY
PID: 119143 SFN:
START: 11/7/23 END: 11/7/23

DRILLING FIRM / OPERATOR: ODOT / LEWIS
SAMPLING FIRM / LOGGER: ODOT / BINKLEY
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 55 TRUCK
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 11/7/23
ENERGY RATIO (%): 81

STATION / OFFSET: 794+91, 12' RT.
ALIGNMENT: US 33
ELEVATION: 732.6 (ft) EOB: 50.0 ft.
LAT / LONG: 39.029228, -81.940185

EXPLORATION ID B-002-0-23

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (3")	732.6																	
HARD, BROWN, **SILT AND CLAY**, SOME STONE FRAGMENTS, LITTLE SAND, DAMP	732.3		2 9 7	22	39	SS-1	4.50	29	4	15	29	23	30	18	12	14	A-6a (4)	
@3.5'; VERY STIFF, BROWN AND GRAY			2 2 4	8	33	SS-2	3.50	28	4	9	31	28	32	19	13	13	A-6a (6)	
			5 5 5	13	44	SS-3	3.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
@8.5'; HARD			0 3 3	8	39	SS-4	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	
	722.6																	
VERY STIFF, BROWN AND RED, **SANDY SILT**, SOME STONE FRAGMENTS, LITTLE CLAY, DAMP			6 30 34	86	61	SS-5	3.50	33	3	19	26	19	26	17	9	9	A-4a (2)	
@13.5'; HARD			3 4 6	13	56	SS-6	4.50	-	-	-	-	-	-	-	-	9	A-4a (V)	
@15.0'; VERY STIFF			4 11 8	26	61	SS-7	4.00	-	-	-	-	-	-	-	-	9	A-4a (V)	
@18.5'; HARD			5 10 8	24	56	SS-8	4.50	-	-	-	-	-	-	-	-	9	A-4a (V)	
	712.6																	
HARD, GRAY AND BROWN, **SILT AND CLAY**, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP			2 7 11	24	50	SS-9	4.50	47	4	9	25	15	28	17	11	6	A-6a (1)	
	709.1																	
VERY STIFF, BROWN AND BLACK, **CLAY**, SOME STONE FRAGMENTS, SOME SILT, LITTLE SAND, DAMP			4 4 8	16	67	SS-10	2.00	24	6	5	22	43	45	24	21	22	A-7-6 (11)	
@25.0'; REDDISH BROWN AND BROWN			6 9 13	30	67	SS-11	4.50	-	-	-	-	-	-	-	-	18	A-7-6 (V)	
	704.1																	
HARD, RED AND GRAY, **SILT AND CLAY**, SOME STONE FRAGMENTS, LITTLE SAND, DAMP			8 23 27	67	67	SS-12	4.50	26	3	8	34	29	31	18	13	10	A-6a (7)	
@33.5'; SPOON BLOCKED BY STONE FRAGMENTS			28 33 16	66	17	SS-13	4.50	-	-	-	-	-	-	-	-	4	A-6a (V)	
@38.5'; POOR RECOVERY			10 15 15	40	33	SS-14	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	
@43.5'; RED, POOR RECOVERY			4 15 19	46	39	SS-15	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
		▽ 685.5																
@48.5'; GRAY, POOR RECOVERY	682.6	EOB	5 11 8	26	22	SS-16	4.50	-	-	-	-	-	-	-	-	7	A-6a (V)	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS.
ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 100 LB. BENTONITE CHIPS

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / LEWIS	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 794+99, 93' LT.	EXPLORATION ID B-002-1-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / BINKLEY	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 683.8 (ft) EOB: 28.0 ft.	PAGE 1 OF 1
START: 11/8/23 END: 11/8/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.029453, -81.939948	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (2")	683.8																	
VERY STIFF, RED AND GRAY, **SILT AND CLAY**, SOME STONE FRAGMENTS, TRACE SAND, DAMP	683.7	1																
		2	2 2 2	6	17	SS-1	3.00	-	-	-	-	-	-	-	-	15	A-6a (V)	
		3																
		4	1 2 2	6	28	SS-2	1.00	25	3	5	32	35	33	18	15	16	A-6a (8)	
		5																
		6	5 3 4	11	33	SS-3	4.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
	675.3	7																
STIFF, BROWN AND GRAY, **SANDY SILT**, SOME CLAY, TRACE STONE FRAGMENTS, MOIST	672.8	8																
		9	1 3 5	12	61	SS-4	2.00	5	5	23	40	27	28	18	10	18	A-4a (6)	
		10																
VERY STIFF, GRAY, **SILT AND CLAY**, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP		11																
		12	5 5 3	12	67	SS-5	3.50	45	6	8	26	15	30	19	11	8	A-6a (1)	
		13																
@13.5'; STIFF, BROWN AND RED, SOME STONE FRAGMENTS, TRACE SAND		14	3 5 7	18	67	SS-6	1.00	25	3	6	37	29	33	21	12	14	A-6a (7)	
	667.8	15																
HARD, BROWN, **SANDY SILT**, SOME CLAY, SOME STONE FRAGMENTS, DAMP		16																
		17	5 4 12	24	78	SS-7	4.50	21	2	27	29	21	24	18	6	12	A-4a (3)	
	665.3	18																
VERY STIFF, BROWN AND GRAY, **SILT AND CLAY**, SOME STONE FRAGMENTS, LITTLE SAND, DAMP		19																
		20	4 6 7	20	78	SS-8	3.00	25	3	11	32	29	33	19	14	14	A-6a (7)	
		21																
		22																
		23																
		24	4 3 5	12	72	SS-9	2.50	-	-	-	-	-	-	-	-	16	A-6a (V)	
@28.0'; AUGER REFUSAL, ENCOUNTERED CULVERT	655.8	25																
	EOB	26																
		27																
		28																

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 12/28/23 14:39 - X:\GINT\PROJECTS\601102.GPJ

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / LEWIS	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 794+16, 77' LT.	EXPLORATION ID B-002-2-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / BENNING	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 690.1 (ft) EOB: 44.0 ft.	PAGE 1 OF 1
START: 11/28/23 END: 11/29/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.029548, -81.940218	

MATERIAL DESCRIPTION AND NOTES	ELEV. 690.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (18")	688.6	1																
VERY STIFF, DARK RED AND GRAY, **SILT AND CLAY**, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP		2	3 4 4	12	28	SS-1	2.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
@3.5'; STIFF		3 4	3 3 4	11	50	SS-2	1.50	40	3	8	27	22	31	20	11	9	A-6a (3)	
@6.0'; POOR RECOVERY, AUGER CUTTINGS TAKEN	681.6	6 7 8	10 4 3	11	6	SS-3	-	-	-	-	-	-	-	-	-	11	A-6a (V)	
MEDIUM STIFF, BROWN AND RED, **SANDY SILT**, SOME CLAY, LITTLE STONE FRAGMENTS, DAMP	679.1	9 10	2 2 2	6	39	SS-4	0.50	16	3	23	32	26	27	18	9	14	A-4a (5)	
MEDIUM STIFF, BROWN, **SILT AND CLAY**, SOME STONE FRAGMENTS, SOME SAND, POOR RECOVERY, AUGER CUTTINGS TAKEN, DAMP		11 12	5 2 3	8	11	SS-5	-	-	-	-	-	-	-	-	-	12	A-6a (V)	
@13.5'; VERY STIFF		13 14 15	2 3 5	12	67	SS-6	3.25	22	4	17	29	28	30	19	11	16	A-6a (5)	
@16.0'; HARD, TRACE ROOTS		16 17 18	9 9 11	30	78	SS-7	4.5+	-	-	-	-	-	-	-	-	12	A-6a (V)	
		19 20 21 22 23	5 8 9	26	39	SS-8	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
@23.5'; VERY STIFF, BROWN AND GRAY, "AND" STONE FRAGMENTS, LITTLE SAND		24 25 26 27 28	3 6 6	18	39	SS-9	3.00	38	1	16	20	25	32	18	14	11	A-6a (3)	
@28.5'; BROWN AND REDDISH BROWN, SOME STONE FRAGMENTS		29 30 31 32 33	4 40 60	150	100	SS-10	2.75	34	2	16	20	28	31	20	11	14	A-6a (3)	
		34 35 36 37 38	4 7 8	23	33	SS-11	3.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
SANDSTONE, BROWN, HIGHLY WEATHERED, WEAK, FINE GRAINED.	651.6 TR	39 40 41 42 43	5 29 101	195	100	SS-12	-	-	-	-	-	-	-	-	-	9	Rock (V)	
	646.1 EOB	44	82	-	100	SS-13	-	-	-	-	-	-	-	-	-	5	Rock (V)	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULAT'D SAC
CHECKED CMK

WESTBOUND CROSS SECTIONS - S.R. 124
STA. 794+00

MEG-124-22.72

346
823

Historic cross-section

240 220 200 180 160 140 120 100 80 60 40 20 0

660 650 730 720 710 700 690 680 670 660 650

LA-R/W
2% 3%
643.0
NEASE CREEK CHANNEL
MATCH LINE
2%
9.6%
730.1
732.82
704.00
651.6
MATCH LINE

B-002-2-23
Ground surface at El. 690.1' (B-002-2-23)
B-002-1-23
Ground surface at El. 683.8' (B-002-1-23)
Top of Rock at El. 651.6' (B-002-2-23)

CU-07B
Adjusted ground surface from El. 648.9' to El. 644.2' (CU-07B)
Adjusted Top of Rock from El. 628.4' to El. 623.7' (CU-07B)

506
2439
2439 SHEET TOTAL
SHEET TOTAL

19718CXK.DGN

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL

CALCULATED SAC

CHECKED CMK

Historic cross-section

B-002-0-23

Ground surface at El. 732.6' (B-002-0-23)

732.82

794+00.00

659.65

CU-07

Adjusted ground surface from El. 644.3' to El. 651.7' (CU-07)

Adjusted Top of Rock from El. 627.8' to El. 634.8' (CU-07)

NEASE CREEK CHANNEL

CU-07A

Adjusted ground surface from El. 647.9' to El. 644.8' (CU-07A)

Adjusted Top of Rock from El. 632.4' to El. 629.2' (CU-07A)

SHEET TOTAL

SHEET TOTAL

156 26217

156 26217

EASTBOUND CROSS SECTIONS - S.R. 124 STA. 794+00

MEG-124-22.72

347
823

19718GXL.DGN

Soil Parameter Determination

9999 Carver Road , Suite 210, Cincinnati, OH 45242-5583
(513) 984-7500
hdrinc.com

ODOT District 10
MEG-33-13.96

Soil Strength Parameter Determination

Computed By = AKB
Checked By = MM

Layer		Undrained Shear Strength (Su) (psf) PPR	N-values Sowers	N-values T and P	Tested Values	Dry Unit Weight (pcf) Correlation	Dry Unit Weight (pcf) Tested	Moist Unit Wt. (pcf) Correlation	Moist Unit Wt. (pcf) Tested	Adopted Short Term Parameters		Long-Term Strength Values N_{60} Value	ODOT GB-7 Correlations Cohesion (psf)	ODOT GB-7 Correlations phi (deg)	Tested Cohesion (psf)	Tested phi (deg)	Adopted Long Term Strength Parameters		Consolidation Values ODOT GB-7 Correlations eo	ODOT GB-7 Correlations Cc	Adopted Consolidation Parameters	
Layer 1 MEDIUM STIFF TO STIFF EMBANKMENT FILL	Max	4500	2275	1729		110		125				Max	13	136	23				Max	0.787	0.207		
	Min	500	450	798		95		110		S_u = 1400 psf		Min	6	75	21			c' = 110 psf	Min	0.543	0.153	eo = 0.681	Ko = 0.63
	Average	2865	1532	1321		101		120		Φ = 0 deg		Average	10	112	22			Φ' = 22 deg	Average	0.681	0.181	Cc = 0.181	Es = N/A ksf
	Std Dev	1285	559	350		6		6				Std Dev	3	23	1				Std Dev	0.100	0.019	Cr = 0.018	
										Y_{dry} = 100 pcf								Y_{dry} = 100 pcf				Cv = 0.13 ft²/day	
	Avg + Std	4151	2091	1671		107		126		Y_{moist} = 120 pcf		Avg + Std	13	134	23			Y_{moist} = 120 pcf	Avg + Std	0.781	0.200	σ_p' = 18 ksf	
	Avg - Std	1580	972	971		95		115				Avg - Std	7	89	22				Avg - Std	0.580	0.162		
Layer 2 VERY STIFF EMBANKMENT FILL	Max	4500	4000	3990		120		135				Max	30	200	26				Max	0.476	0.315		
	Min	1000	1800	2128		115		130		S_u = 3000 psf		Min	16	153	24			c' = 175 psf	Min	0.378	0.126	eo = 0.444	Ko = 0.58
	Average	3500	3025	3026		117		132		Φ = 0 deg		Average	23	176	25			Φ' = 25 deg	Average	0.444	0.203	Cc = 0.203	Es = N/A ksf
	Std Dev	1363	1018	602		3		3				Std Dev	5	15	1				Std Dev	0.046	0.071	Cr = 0.020	
										Y_{dry} = 115 pcf								Y_{dry} = 115 pcf				Cv = 0.11 ft²/day	
	Avg + Std	4863	4043	3628		119		134		Y_{moist} = 130 pcf		Avg + Std	27	191	26			Y_{moist} = 130 pcf	Avg + Std	0.490	0.274	σ_p' = 18 ksf	
	Avg - Std	2137	2007	2424		114		129				Avg - Std	18	161	24				Avg - Std	0.398	0.132		
Layer 3 VERY STIFF TO HARD EMBANKMENT FILL	Max	4500	4000	4000		135		145				Max	67	250	28				Max	0.476	0.198		
	Min	3000	3150	2394		115		130		S_u = 3700 psf		Min	18	160	24			c' = 215 psf	Min	0.257	0.189	eo = 0.362	Ko = 0.55
	Average	4313	3894	3663		125		138		Φ = 0 deg		Average	40	217	27			Φ' = 27 deg	Average	0.362	0.194	Cc = 0.194	Es = N/A ksf
	Std Dev	530	301	568		8		5				Std Dev	19	37	1				Std Dev	0.084	0.006	Cr = 0.019	
										Y_{dry} = 125 pcf								Y_{dry} = 125 pcf				Cv = 0.12 ft²/day	
	Avg + Std	4843	4194	4230		133		143		Y_{moist} = 140 pcf		Avg + Std	58	254	28			Y_{moist} = 140 pcf	Avg + Std	0.446	0.200	σ_p' = 18 ksf	
	Avg - Std	3782	3593	3095		117		132				Avg - Std	21	180	25				Avg - Std	0.278	0.187		
Layer 4 MEDIUM STIFF TO STIFF COHESIVE	Max	N/A	1750	1330		105		125				Max	10	114	23				Max	0.787	0.234		
	Min	N/A	300	532		95		110		S_u = 930 psf		Min	4	50	20			c' = 85 psf	Min	0.616	0.171	eo = 0.756	Ko = 0.64
	Average	N/A	933	931		97		118		Φ = 0 deg		Average	7	86	21			Φ' = 21 deg	Average	0.756	0.194	Cc = 0.194	Es = N/A ksf
	Std Dev	N/A	496	260		3		5				Std Dev	2	21	1				Std Dev	0.056	0.028	Cr = 0.019	
										Y_{dry} = 95 pcf								Y_{dry} = 95 pcf				Cv = 0.48 ft²/day	
	Avg + Std	N/A	1429	1191		100		123		Y_{moist} = 120 pcf		Avg + Std	9	107	22			Y_{moist} = 120 pcf	Avg + Std	0.812	0.221	OCR = 1	
	Avg - Std	N/A	436	671		93		113				Avg - Std	5	64	21				Avg - Std	0.700	0.166		
Layer 5 STIFF COHESIVE	Max	N/A	2100	1729		110		125				Max	13	136	23				Max	0.616	0.234		
	Min	N/A	975	1330		105		125		S_u = 1650 psf		Min	10	114	23			c' = 125 psf	Min	0.543	0.234	eo = 0.580	Ko = 0.61
	Average	N/A	1731	1563		108		125		Φ = 0 deg		Average	12	127	23			Φ' = 23 deg	Average	0.580	0.234	Cc = 0.234	Es = N/A ksf
	Std Dev	N/A	530	167		3		0				Std Dev	1	9	0				Std Dev	0.042	N/A	Cr = 0.023	
										Y_{dry} = 110 pcf								Y_{dry} = 110 pcf				Cv = 0.38 ft²/day	
	Avg + Std	N/A	2262	1730		110		125		Y_{moist} = 125 pcf		Avg + Std	13	136	23			Y_{moist} = 125 pcf	Avg + Std	0.622	N/A	OCR = 1	
	Avg - Std	N/A	1201	1395		105		125				Avg - Std	10	118	23				Avg - Std	0.537	N/A		
Layer 6 VERY STIFF TO HARD COHESIVE	Max	3000	4000	4000		125		135				Max	34	200	27				Max	0.476	0.189		
	Min	3000	2550	3059		115		130		S_u = 3300 psf		Min	23	177	25			c' = 185 psf	Min	0.358	0.189	eo = 0.416	Ko = 0.56
	Average	3000	3517	3417		120		133		Φ = 0 deg		Average	27	186	26			Φ' = 26 deg	Average	0.416	0.189	Cc = 0.189	Es = N/A ksf
	Std Dev	N/A	837	509		5		3				Std Dev	6	13	1				Std Dev	0.059	N/A	Cr = 0.019	
										Y_{dry} = 120 pcf								Y_{dry} = 120 pcf				Cv = 0.50 ft²/day	
	Avg + Std	N/A	4354	3926		125		136		Y_{moist} = 135 pcf		Avg + Std	33	198	27			Y_{moist} = 135 pcf	Avg + Std	0.475	N/A	OCR = 1	
	Avg - Std	N/A	2680	2908		115		130				Avg - Std	21	173	25				Avg - Std	0.357	N/A		

Ko = 1 - sin(phi)
Assumed Cc/Cr = 10
OCR selected as 1 considering the native materials to be normally consolidated. Preconsolidation pressure for existing fill selected based on correlations with LI in NAVFAC DM 7.1, Chapter 3, Figure 3. Cv values selected based on correlations with LL in USACE EM 1110-1-1904.

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 1

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	13	67	4.5	45	6	23	40	35	33	20	15	18	Max	4500	2275	1729	136	23	14.0	728.6	110	125	0.207	2.72	0.787	0.00
Min	6	6	0.5	5	3	5	26	15	27	18	9	8	Min	500	450	798	75	21	2.0	671.8	95	110	0.153	2.72	0.543	-1.00
Average	10	39	2.9	26	4	13	31	26	30	19	11	12	Average	2865	1532	1321	112	22	7.7	691.6	101	120	0.181	2.72	0.681	-0.47
Std Dev	3	19	1.3	14	1	8	5	6	2	1	2	3	Std Dev	1285	559	350	23	1	4.0	20.8	6	6	0.019	0.00	0.100	0.39
Avg + Std	13	58	4.2	40	5	21	36	32	32	19	13	15	Avg + Std	4151	2091	1671	134	23	11.8	712.4	107	126	0.200	2.72	0.781	-0.08
Avg - Std	7	19	1.6	12	3	6	26	20	28	18	9	9	Avg - Std	1580	972	971	89	22	3.7	670.8	95	115	0.162	2.72	0.580	-0.87

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	732.6	B-002-0-23	3.5	-	5	SS-2	8	33	3.5	28	4	9	31	28	32	19	13	13	A-6a	Cohesive	1	3500	1400	1064	100	22	4.0	728.6	95	110	0.198	2.72	0.787	-0.46
US 33	732.6	B-002-0-23	6	-	7.5	SS-3	13	44	3.5	-	-	-	-	-	-	-	-	10	A-6a	Cohesive	1	3500	2275	1729	136	23	7.0	725.6	105	125		2.72	0.616	
US 33	732.6	B-002-0-23	8.5	-	10	SS-4	8	39	4.5	-	-	-	-	-	-	-	-	12	A-6a	Cohesive	1	4500	1400	1064	100	22	9.0	723.6	95	120		2.72	0.787	
US 33	732.6	B-002-0-23	13.5	-	15	SS-6	13	56	4.5	-	-	-	-	-	-	-	-	9	A-4a	Cohesive	1	4500	975	1729	136	23	14.0	718.6	110	125		2.72	0.543	
US 33	683.8	B-002-1-23	1.5	-	3	SS-1	6	17	3	-	-	-	-	-	-	-	-	15	A-6a	Cohesive	1	3000	1050	798	75	21	2.0	681.8	95	110		2.72	0.787	
US 33	683.8	B-002-1-23	3.5	-	5	SS-2	6	28	1	25	3	5	32	35	33	18	15	16	A-6a	Cohesive	1	1000	1050	798	75	21	4.0	679.8	95	110	0.207	2.72	0.787	-0.13
US 33	683.8	B-002-1-23	6	-	7.5	SS-3	11	33	4	-	-	-	-	-	-	-	-	14	A-6a	Cohesive	1	4000	1925	1463	121	23	7.0	676.8	105	125		2.72	0.616	
US 33	683.8	B-002-1-23	8.5	-	10	SS-4	12	61	2	5	5	23	40	27	28	18	10	18	A-4a	Cohesive	1	2000	900	1596	129	23	9.0	674.8	105	125	0.162	2.72	0.616	0.00
US 33	683.8	B-002-1-23	11	-	12.5	SS-5	12	67	3.5	45	6	8	26	15	30	19	11	8	A-6a	Cohesive	1	3500	2100	1596	129	23	12.0	671.8	110	125	0.18	2.72	0.543	-1.00
US 33	690.1	B-002-2-23	1.5	-	3	SS-1	12	28	2.5	-	-	-	-	-	-	-	-	10	A-6a	Cohesive	1	2500	2100	1596	129	23	2.0	688.1	100	120		2.72	0.697	
US 33	690.1	B-002-2-23	3.5	-	5	SS-2	11	50	1.5	40	3	8	27	22	31	20	11	9	A-6a	Cohesive	1	1500	1925	1463	121	23	4.0	686.1	100	120	0.189	2.72	0.697	-1.00
US 33	690.1	B-002-2-23	6	-	7.5	SS-3	11	6	-	-	-	-	-	-	-	-	-	11	A-6a	Cohesive	1	N/A	1925	1463	121	23	7.0	683.1	105	125		2.72	0.616	
US 33	690.1	B-002-2-23	8.5	-	10	SS-4	6	39	0.5	16	3	23	32	26	27	18	9	14	A-4a	Cohesive	1	500	450	798	75	21	9.0	681.1	95	120	0.153	2.72	0.787	-0.44
US 33	690.1	B-002-2-23	11	-	12.5	SS-5	8	11	-	-	-	-	-	-	-	-	-	12	A-6a	Cohesive	1	N/A	1400	1064	100	22	12.0	678.1	95	120		2.72	0.787	
US 33	690.1	B-002-2-23	13.5	-	15	SS-6	12	67	3.25	22	4	17	29	28	30	19	11	16	A-6a	Cohesive	1	3250	2100	1596	129	23	14.0	676.1	110	125	0.18	2.72	0.543	-0.27

ODOT District 10
MEG-33-13.96

Soil Strength Parameter Determination

Computed By = AKB
Checked By = MM

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 2

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	30	78	4.5	47	6	27	37	43	45	24	21	22	Max	4500	4000	3990	200	26	26.0	716.6	120	135	0.315	2.72	0.476	-0.10
Min	16	50	1.0	21	2	5	22	15	24	17	6	6	Min	1000	1800	2128	153	24	14.0	664.8	115	130	0.126	2.65	0.378	-1.00
Average	23	66	3.5	28	4	12	29	27	33	20	13	13	Average	3500	3025	3026	176	25	19.5	694.8	117	132	0.203	2.70	0.444	-0.61
Std Dev	5	10	1.4	11	2	9	6	11	8	3	5	5	Std Dev	1363	1018	602	15	1	4.0	23.1	3	3	0.071	0.03	0.046	0.40
Avg + Std	27	75	4.9	39	5	21	35	38	40	23	18	18	Avg + Std	4863	4043	3628	191	26	23.5	717.9	119	134	0.274	2.73	0.490	-0.21
Avg - Std	18	56	2.1	18	2	3	23	17	25	17	7	8	Avg - Std	2137	2007	2424	161	24	15.5	671.7	114	129	0.132	2.67	0.398	-1.01

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	732.6	B-002-0-23	15	-	16.5	SS-7	26	61	4	-	-	-	-	-	-	-	-	9	A-4a	Cohesive	2	4000	1950	3458	187	25	16.0	716.6	115	130		2.72	0.476	
US 33	732.6	B-002-0-23	18.5	-	20	SS-8	24	56	4.5	-	-	-	-	-	-	-	-	9	A-4a	Cohesive	2	4500	1800	3192	180	25	19.0	713.6	115	130		2.72	0.476	
US 33	732.6	B-002-0-23	20	-	21.5	SS-9	24	50	4.5	47	4	9	25	15	28	17	11	6	A-6a	Cohesive	2	4500	4000	3192	180	25	21.0	711.6	120	135	0.162	2.72	0.414	-1.00
US 33	732.6	B-002-0-23	23.5	-	25	SS-10	16	67	2	24	6	5	22	43	45	24	21	22	A-7-6	Cohesive	2	2000	4000	2128	153	24	24.0	708.6	120	135	0.315	2.65	0.378	-0.10
US 33	732.6	B-002-0-23	25	-	26.5	SS-11	30	67	4.5	-	-	-	-	-	-	-	-	18	A-7-6	Cohesive	2	4500	4000	3990	200	26	26.0	706.6	120	135		2.65	0.378	
US 33	683.8	B-002-1-23	13.5	-	15	SS-6	18	67	1	25	3	6	37	29	33	21	12	14	A-6a	Cohesive	2	1000	3150	2394	160	24	14.0	669.8	115	130	0.207	2.72	0.476	-0.58
US 33	683.8	B-002-1-23	16	-	17.5	SS-7	24	78	4.5	21	2	27	29	21	24	18	6	12	A-4a	Cohesive	2	4500	1800	3192	180	25	17.0	666.8	115	130	0.126	2.72	0.476	-1.00
US 33	683.8	B-002-1-23	18.5	-	20	SS-8	20	78	3	25	3	11	32	29	33	19	14	14	A-6a	Cohesive	2	3000	3500	2660	167	25	19.0	664.8	115	130	0.207	2.72	0.476	-0.36

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 3

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	67	78	4.5	38	3	16	34	29	32	18	14	12	Max	4500	4000	4000	250	28	49.0	703.6	135	145	0.198	2.72	0.476	-0.50
Min	18	17	3.0	26	1	8	20	25	31	18	13	4	Min	3000	3150	2394	160	24	17.0	666.1	115	130	0.189	2.72	0.257	-0.62
Average	40	42	4.3	32	2	12	27	27	32	18	14	9	Average	4313	3894	3663	217	27	31.9	684.8	125	138	0.194	2.72	0.362	-0.56
Std Dev	19	21	0.5	8	1	6	10	3	1	0	1	3	Std Dev	530	301	568	37	1	11.7	13.7	8	5	0.006	0.00	0.084	0.08
Avg + Std	58	63	4.8	40	3	18	37	30	32	18	14	11	Avg + Std	4843	4194	4230	254	28	43.5	698.5	133	143	0.200	2.72	0.446	-0.48
Avg - Std	21	21	3.8	24	1	6	17	24	31	18	13	6	Avg - Std	3782	3593	3095	180	25	20.2	671.1	117	132	0.187	2.72	0.278	-0.64

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	732.6	B-002-0-23	28.5	-	30	SS-12	67	67	4.5	26	3	8	34	29	31	18	13	10	A-6a	Cohesive	3	4500	4000	4000	250	28	29.0	703.6	130	140	0.189	2.72	0.306	-0.62
US 33	732.6	B-002-0-23	33.5	-	35	SS-13	66	17	4.5	-	-	-	-	-	-	-	-	4	A-6a	Cohesive	3	4500	4000	4000	250	28	34.0	698.6	130	140		2.72	0.306	
US 33	732.6	B-002-0-23	38.5	-	40	SS-14	40	33	4.5	-	-	-	-	-	-	-	-	8	A-6a	Cohesive	3	4500	4000	4000	250	28	39.0	693.6	130	140		2.72	0.306	
US 33	732.6	B-002-0-23	43.5	-	45	SS-15	46	39	4.5	-	-	-	-	-	-	-	-	9	A-6a	Cohesive	3	4500	4000	4000	250	28	44.0	688.6	135	145		2.72	0.257	
US 33	732.6	B-002-0-23	48.5	-	50	SS-16	26	22	4.5	-	-	-	-	-	-	-	-	7	A-6a	Cohesive	3	4500	4000	3458	187	25	49.0	683.6	125	140		2.72	0.358	
US 33	690.1	B-002-2-23	16	-	17.5	SS-7	30	78	4.5	-	-	-	-	-	-	-	-	12	A-6a	Cohesive	3	4500	4000	3990	200	26	17.0	673.1	115	130		2.72	0.476	
US 33	690.1	B-002-2-23	18.5	-	20	SS-8	26	39	4.5	-	-	-	-	-	-	-	-	10	A-6a	Cohesive	3	4500	4000	3458	187	25	19.0	671.1	115	130		2.72	0.476	
US 33	690.1	B-002-2-23	23.5	-	25	SS-9	18	39	3	38	1	16	20	25	32	18	14	11	A-6a	Cohesive	3	3000	3150	2394	160	24	24.0	666.1	120	135	0.198	2.72	0.414	-0.50

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 4

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	10	N/A	N/A	1	5	32	97	40	36	20	16	30	Max	N/A	1750	1330	114	23	15.0	646.9	105	125	0.234	2.72	0.787	1.10
Min	4	N/A	N/A	0	1	3	37	25	29	19	10	14	Min	N/A	300	532	50	20	2.0	633.3	95	110	0.171	2.70	0.616	0.10
Average	7	N/A	N/A	0	2	14	68	33	32	20	12	21	Average	N/A	933	931	86	21	7.2	639.4	97	118	0.194	2.71	0.756	0.39
Std Dev	2	N/A	N/A	1	2	13	30	11	3	1	3	4	Std Dev	N/A	496	260	21	1	4.2	4.5	3	5	0.028	0.01	0.056	0.48
Avg + Std	9	N/A	N/A	1	4	26	98	43	35	20	15	24	Avg + Std	N/A	1429	1191	107	22	11.5	644.0	100	123	0.221	2.72	0.812	0.87
Avg - Std	5	N/A	N/A	0	0	1	38	22	28	19	9	17	Avg - Std	N/A	436	671	64	21	3.0	634.9	93	113	0.166	2.70	0.700	-0.08

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	644.3	CU-07	1	-	2.5	1	9	-	-	-	-	-	-	-	-	-	-	19	A-6b	Cohesive	4	N/A	1575	1197	107	22	2.0	642.3	100	120		2.70	0.685	
US 33	644.3	CU-07	3.5	-	5	2	10	-	-	-	-	-	-	-	-	-	-	14	A-6b	Cohesive	4	N/A	1750	1330	114	23	4.0	640.3	100	120		2.70	0.685	
US 33	644.3	CU-07	6	-	7.5	3	8	-	-	0	1	3	97		36	20	16	22	A-6b	Cohesive	4	N/A	1400	1064	100	22	7.0	637.3	95	120	0.234	2.70	0.773	0.13
US 33	644.3	CU-07	7.5	-	9	4	7	-	-	-	-	-	-	-	-	-	-	21	A-6a	Cohesive	4	N/A	1225	931	88	22	8.0	636.3	95	120		2.72	0.787	
US 33	644.3	CU-07	9	-	10.5	5	5	-	-	1	1	7	91		31	19	12	22	A-6a	Cohesive	4	N/A	875	665	63	21	10.0	634.3	95	120	0.189	2.72	0.787	0.25
US 33	644.3	CU-07	10.5	-	12	6	7	-	-	-	-	-	-	-	-	-	-	18	A-6a	Cohesive	4	N/A	1225	931	88	22	11.0	633.3	95	120		2.72	0.787	
US 33	647.9	CU-07A	1	-	2.5	1	5	-	-	-	-	-	-	-	-	-	-	24	A-4a	Cohesive	4	N/A	375	665	63	21	2.0	645.9	95	110		2.72	0.787	
US 33	647.9	CU-07A	3.5	-	5	2	5	-	-	0	5	32	37	25	29	19	10	30	A-4a	Cohesive	4	N/A	375	665	63	21	4.0	643.9	95	110	0.171	2.72	0.787	1.10
US 33	648.9	CU-07B	1.5	-	3	1	7	-	-	-	-	-	-	-	-	-	-	16	A-6b	Cohesive	4	N/A	1225	931	88	22	2.0	646.9	95	110		2.70	0.773	
US 33	648.9	CU-07B	6.5	-	8	3	6	-	-	-	-	-	-	-	-	-	-	19	A-4a	Cohesive	4	N/A	450	798	75	21	7.0	641.9	95	120		2.72	0.787	
US 33	648.9	CU-07B	9	-	10.5	4	10	-	-	-	-	-	-	-	-	-	-	21	A-4a	Cohesive	4	N/A	750	1330	114	23	10.0	638.9	105	125		2.72	0.616	
US 33	648.9	CU-07B	11.5	-	13	5	8	-	-	-	-	-	-	-	-	-	-	21	A-4a	Cohesive	4	N/A	600	1064	100	22	12.0	636.9	95	120		2.72	0.787	
US 33	648.9	CU-07B	14	-	15.5	6A	4	-	-	0	1	12	48	40	30	20	10	21	A-4a	Cohesive	4	N/A	300	532	50	20	15.0	633.9	95	115	0.18	2.72	0.787	0.10

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 5

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	13	N/A	N/A	0	1	9	90	N/A	36	20	16	23	Max	N/A	2100	1729	136	23	17.0	640.9	110	125	0.234	2.72	0.616	0.19
Min	10	N/A	N/A	0	1	9	90	N/A	36	20	16	13	Min	N/A	975	1330	114	23	7.0	630.3	105	125	0.234	2.72	0.543	0.19
Average	12	N/A	N/A	0	1	9	90	N/A	36	20	16	18	Average	N/A	1731	1563	127	23	11.8	635.5	108	125	0.234	2.72	0.580	0.19
Std Dev	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	Std Dev	N/A	530	167	9	0	4.6	5.2	3	0	N/A	0.00	0.042	N/A
Avg + Std	13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22	Avg + Std	N/A	2262	1730	136	23	16.3	640.7	110	125	N/A	2.72	0.622	N/A
Avg - Std	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	Avg - Std	N/A	1201	1395	118	23	7.2	630.4	105	125	N/A	2.72	0.537	N/A

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	644.3	CU-07	13.5	-	15	7	12	-	-	-	-	-	-	-	-	-	-	13	A-6a	Cohesive	5	N/A	2100	1596	129	23	14.0	630.3	110	125		2.72	0.543	
US 33	647.9	CU-07A	6	-	7.5	3	12	-	-	-	-	-	-	-	-	-	-	20	A-6a	Cohesive	5	N/A	2100	1596	129	23	7.0	640.9	105	125		2.72	0.616	
US 33	647.9	CU-07A	8.5	-	10	4	10	-	-	0	1	9	90		36	20	16	23	A-6a	Cohesive	5	N/A	1750	1330	114	23	9.0	638.9	105	125	0.234	2.72	0.616	0.19
US 33	648.9	CU-07B	16.5	-	18	7	13	-	-	-	-	-	-	-	-	-	-	14	A-4a	Cohesive	5	N/A	975	1729	136	23	17.0	631.9	110	125		2.72	0.543	

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 6

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	34	33	3.0	1	6	11	82	N/A	31	21	10	24	Max	3000	4000	4000	200	27	34.0	656.1	125	135	0.189	2.72	0.476	0.30
Min	23	33	3.0	1	6	11	82	N/A	31	21	10	12	Min	3000	2550	3059	177	25	14.0	628.9	115	130	0.189	2.72	0.358	0.30
Average	27	33	3.0	1	6	11	82	N/A	31	21	10	17	Average	3000	3517	3417	186	26	22.7	639.6	120	133	0.189	2.72	0.416	0.30
Std Dev	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	Std Dev	N/A	837	509	13	1	10.3	14.5	5	3	N/A	0.00	0.059	N/A
Avg + Std	33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	23	Avg + Std	N/A	4354	3926	198	27	32.9	654.1	125	136	N/A	2.72	0.475	N/A
Avg - Std	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11	Avg - Std	N/A	2680	2908	173	25	12.4	625.2	115	130	N/A	2.72	0.357	N/A

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	647.9	CU-07A	13.5	-	15	5	24	-	-	-	-	-	-	-	-	-	-	15	A-6a	Cohesive	6	N/A	4000	3192	180	25	14.0	633.9	115	130		2.72	0.476	
US 33	648.9	CU-07B	19	-	20.5	8A	34	-	-	1	6	11	82		31	21	10	24	A-4a	Cohesive	6	N/A	2550	4000	200	27	20.0	628.9	125	135	0.189	2.72	0.358	0.30
US 33	690.1	B-002-2-23	33.5	-	35	SS-11	23	33	3	-	-	-	-	-	-	-	-	12	A-6a	Cohesive	6	3000	4000	3059	177	25	34.0	656.1	120	135		2.72	0.414	

State of Ohio
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Testing Laboratory

LOG OF BORING

Date Started 5/13/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 5/14/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-07 Station & Offset 794+75.00, 42.00' RT Surface Elev. 644.33ft

Elev. (ft)	Depth (ft)	Std. Pen. / RQD	Rec. (ft)	Lass (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
644.3	0														
643.7					TOPSOIL										
		3-4-5			Stiff, brown SILTY CLAY, trace sand, moist.	1	--	--	--	--	--	--	--	19	VISUAL
		3-4-6				2	--	--	--	--	--	--	--	14	VISUAL
	5				Layer 4										
		3-3-5				3	0	1	3	--	97*	36	16	22	A-6b
637.4					Medium stiff to stiff, brown to gray SILT AND CLAY, moist.										
		2-3-4				4	--	--	--	--	--	--	--	21	VISUAL
		2-2-3				5	1	1	7	--	91*	31	12	22	A-6a
	10														
		1-3-4				6	--	--	--	--	--	--	--	18	VISUAL
		3-7-5				7	--	--	--	--	--	--	--	13	VISUAL
	15				Layer 5										
627.8		ROD = 1%	4.7	0.8	Note: Auger refusal on bedrock at 16.5 feet. Began coring rock. Very soft, gray, decomposed SILTSTONE, with indistinct bedding, very poor condition as per ROD.										
	20				RUN 1 FROM 16.5 FEET TO 22.0 FEET										
623.3					U.C. Strength at 20.5 feet = 100 psi										
		ROD = 0%	0.1	7.4											
	25				Note: Color change to reddish brown at 25.0 feet.										
					RUN 2 FROM 22.0 FEET TO 29.5 FEET Run 2 bedrock quality very poor as per ROD.										
	30				Note: Used roller bit method of drilling from 29.5 feet to 32.0 feet because core barrel locked at 29.5 feet. No rock sample recovery between these depths.										
		ROD = 0%	0.3	4.8											
	35				RUN 3 FROM 32.0 FEET TO 37.0 FEET Run 3 bedrock quality very poor as per ROD.										
		ROD = 0%	3.7	0.3											
	40				RUN 4 FROM 37.0 FEET TO 41.0 FEET Run 4 bedrock quality very poor as per ROD.										
603.3					TERMINATION DEPTH = 41.0 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coorse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

MEG-124-22.72

SOIL PROFILE

DRAWN	REVIEWED	DATE	CALCULATED
E.D.S.	B.M.	1/24/01	W.I.N.
			CHECKED S.S.S.

PRIME ENGINEERING & ARCHITECTURE, INC.
COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 4/14/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 4/14/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-07A Station & Offset 794+75.00, 200.00' RT Surface Elev. 647.87ft

Elev. (ft)	Depth (ft)	Std. Pen./ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	OOOT Class
647.9	0														
647.4					TOPSOIL										
		1-2-3			Medium stiff, brown SANDY SILT, some clay, moist.	1	--	--	--	--	--	--	--	24	VISUAL
		1-2-3			Layer 4	2	0	5	32	37	25	29	10	30	A-4a
643.0	5				Stiff to very stiff, brown SILT AND CLAY, trace sand, moist.										
		3-4-8				3	--	--	--	--	--	--	--	20	VISUAL
		3-4-6			Layer 5	4	0	1	9	--	90 *	36	16	23	A-6a
	10														
		6-8-16				5	--	--	--	--	--	--	--	15	VISUAL
					Layer 6										
632.4	15														
		ROD = 36%	6.9	0.1	Note: Auger refused on bedrock at 15.5 feet. Began coring rock. Very soft, reddish brown, decomposed SILTSTONE with indistinct bedding, very poor condition as per ROD.										
					Note: Siltstone changing to soft, weathered to highly weathered, and grey at 16.4 feet.										
	20														
					U.C. Strength at 21.2 feet = 196 psi										
625.4					TERMINATION DEPTH = 22.5 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 3/31/99 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 3/31/99 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-09 Station & Offset 813+30.00, 42.00' RT Surface Elev. 767.23ft

Elev. (ft)	Depth (ft)	Std. Pen./ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	OOOT Class
767.2	0														
766.6					TOPSOIL										
		6-16-18			Very soft, highly weathered to decomposed, brown CLAY SHALE.	1	--	--	--	--	--	--	--	11	VISUAL
		50/4in				2	--	--	--	--	--	--	--	6	VISUAL
	5														
		50/5in				3	--	--	--	--	--	--	--	7	VISUAL
		50/4in				4	--	--	--	--	--	--	--	6	VISUAL
757.2	10	ROD = 0%	5.0	0.0	Note: Auger refusal on bedrock at 10.0 feet. Began coring rock. Very soft, highly weathered to decomposed, brown CLAY SHALE with horizontal laminar bedding (fissile) to 11.5 feet; indistinct bedding from 11.5 feet to 15.0 feet. Rock in very poor condition as per ROD. U.C. Strength at 10.9 feet = 166 psi										
752.2	15				TERMINATION DEPTH = 15.0 FEET										

*Silt and clay combined

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm.

43/67	MEG-124-22.72	SOIL PROFILE	DRAWN E.D.S.	REVIEWED B.M.	DATE 1/24/01	CALCULATED W.J.N. / CHECKED S.S.S.	PRIME ENGINEERING & ARCHITECTURE, INC. COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/5/00 Sampler: Type SS Dia. 2.0" Water Elev. 632.6ft
Date Completed 7/6/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-07B Station & Offset 794+60.79 189.96' LT Surface Elev. 648.94ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
648.9	0														
647.4	2	3 - 3 - 4			TOPSOIL Medium stiff to very stiff, reddish brown SILTY CLAY (A-6b), little sand, trace to some rock fragments, trace roots, moist.	1	--	--	--	--	--	--	--	16	VISUAL
643.9	4	5 - 15 - 15			Note: Encountered a sandstone cobble at 4.5 feet. Soft to hard, brown and gray SANDY SILT (A-4a), some to little clay, no to little gravel and rock frogments, moist to wet.	2	--	--	--	--	--	--	--	9	VISUAL
	6														
	8	2 - 3 - 3				3	--	--	--	--	--	--	--	19	VISUAL
	10	3 - 4 - 6				4	--	--	--	--	--	--	--	21	VISUAL
	12	3 - 4 - 4				5	--	--	--	--	--	--	--	21	VISUAL
	14	2 - 1 - 3			Note: Pushed a Shelby Tube from 14 to 16 feet next to original test boring.	6A 6B	0 --	1 --	12 --	48 --	40 --	30 --	10 --	21 21	A-4a VISUAL
	16 ▽	4 - 6 - 7			Note: Encountered groundwater at 16.3 feet during drilling.	7	--	--	--	--	--	--	--	14	VISUAL
	18														
	20	4 - 5 - 29				8A 8B	1 --	6 --	11 --	-- --	82 * --	31 --	10 --	24 14	A-4a VISUAL
628.4		10-44-50/0.4			Very soft, decomposed, reddish brown MUDSTONE with indistinct bedding. The quality of the mudstone in all three runs is considered very poor as per ROD.	9	--	--	--	--	--	--	--	9	VISUAL
	22														
	24	50/0.5			Note: Augered to 25.0 feet and began coring.	10	--	--	--	--	--	--	--	10	VISUAL
623.9	26	ROD = 18%	4.7	0.8	Very soft to medium hard, decomposed to weathered, reddish brown MUDSTONE with indistinct bedding. U.C. Strength of dec. mudstone at 25.8 feet = 152 psi										
	28														
	30														
	32	ROD = 0%	4.0	1.0											
	34														
	36	ROD = 10%	3.5	1.5											
	38														
608.4	40				TERMINATION DEPTH = 40.5 FEET										

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

Omit

Layer 4

Layer 5

Layer 6

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Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/27/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/27/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-08 Station & Offset 812+63.51 128.85' RT Surface Elev. 775.52ft

Elev. (ft)	Depth (ft)	Std. Pen./ ROD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
775.5	0														
774.9	2	6 - 9 - 6			TOPSOIL Stiff, brown CLAY (A-7-6), some sand, trace rock fragments, trace roots, moist.	1	2	6	20	--	72 *	52	28	19	A-7-6
	4	4 - 4 - 6				2	--	--	--	--	--	--	--	19	VISUAL
	6														
769.0	8	5 - 11 - 16				3	--	--	--	--	--	--	--	12	VISUAL
					Medium dense, brown COARSE AND FINE SAND (A-3a), little silt, trace rock fragments, moist.										
767.0	10	7 - 11 - 17			Very stiff, brown CLAY (A-7-6), little sand, moist.	4	--	--	--	--	--	--	--	21	VISUAL
764.0	12	8 - 21 - 34				5	--	--	--	--	--	--	--	15	VISUAL
					Very soft, decomposed, brown and black SANDSTONE.										
761.5	14	15 - 43 - 22				6A 6B	-- --	-- --	-- --	-- --	-- --	-- --	-- --	8 12	VISUAL VISUAL
					Very soft, decomposed to highly weathered, brown CLAY SHALE.										
	16	60/0.5				7	--	--	--	--	--	--	--	9	VISUAL
	18														
	20	39 - 56				8	--	--	--	--	--	--	--	10	VISUAL
	22	24 - 31 - 48				9	--	--	--	--	--	--	--	11	VISUAL
753.0					TERMINATION DEPTH = 22.5 FEET										

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

61/67	MEG-124-22.72	SOIL PROFILE	DRAWN E.D.S.	REVIEWED B.M.	DATE 1/24/01	CALCULATED W.I.N. / CHECKED S.S.S.

PRIME ENGINEERING & ARCHITECTURE, INC.
COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / LEWIS	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 794+99, 93' LT.	EXPLORATION ID B-002-1-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / BINKLEY	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 683.8 (ft) EOB: 28.0 ft.	PAGE 1 OF 1
START: 11/8/23 END: 11/8/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.029453, -81.939948	

MATERIAL DESCRIPTION AND NOTES	ELEV. 683.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (2")	683.7	1																
VERY STIFF, RED AND GRAY, **SILT AND CLAY**, SOME STONE FRAGMENTS, TRACE SAND, DAMP		2	2 2	6	17	SS-1	3.00	-	-	-	-	-	-	-	-	15	A-6a (V)	
Layer 1		3 4	1 2 2	6	28	SS-2	1.00	25	3	5	32	35	33	18	15	16	A-6a (8)	
		5 6 7	5 3 4	11	33	SS-3	4.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
	675.3	8																
STIFF, BROWN AND GRAY, **SANDY SILT**, SOME CLAY, TRACE STONE FRAGMENTS, MOIST		9 10	1 3 5	12	61	SS-4	2.00	5	5	23	40	27	28	18	10	18	A-4a (6)	
	672.8	11																
VERY STIFF, GRAY, **SILT AND CLAY**, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP		12 13	5 5 3	12	67	SS-5	3.50	45	6	8	26	15	30	19	11	8	A-6a (1)	
@13.5'; STIFF, BROWN AND RED, SOME STONE FRAGMENTS, TRACE SAND		14 15	5 7	18	67	SS-6	1.00	25	3	6	37	29	33	21	12	14	A-6a (7)	
	667.8	16																
HARD, BROWN, **SANDY SILT**, SOME CLAY, SOME STONE FRAGMENTS, DAMP		17	5 4 12	24	78	SS-7	4.50	21	2	27	29	21	24	18	6	12	A-4a (3)	
Layer 2		18																
	665.3	19																
VERY STIFF, BROWN AND GRAY, **SILT AND CLAY**, SOME STONE FRAGMENTS, LITTLE SAND, DAMP		20 21 22 23	4 6 7	20	78	SS-8	3.00	25	3	11	32	29	33	19	14	14	A-6a (7)	
This layer was omitted on the design cross-section given the distance Boring B-002-1-23 is from the design cross section (99 feet) in comparison to Boring B-002-2-23 (16 feet) and that this layer was not encountered in B-002-2-23.	Omit	24 25 26 27	4 3 5	12	72	SS-9	2.50	-	-	-	-	-	-	-	-	16	A-6a (V)	
@28.0'; AUGER REFUSAL, ENCOUNTERED CULVERT	655.8	EOB 28																

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 12/28/23 14:39 - X:\GINT\PROJECTS\601102.GPJ

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / LEWIS	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 794+16, 77' LT.	EXPLORATION ID B-002-2-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / BENNING	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 690.1 (ft) EOB: 44.0 ft.	PAGE 1 OF 1
START: 11/28/23 END: 11/29/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.029548, -81.940218	

MATERIAL DESCRIPTION AND NOTES	ELEV. 690.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (18")	688.6	1																
VERY STIFF, DARK RED AND GRAY, **SILT AND CLAY**, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP		2	3 4 4	12	28	SS-1	2.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
@3.5'; STIFF		3																
Layer 1		4	3 3 4	11	50	SS-2	1.50	40	3	8	27	22	31	20	11	9	A-6a (3)	
@6.0'; POOR RECOVERY, AUGER CUTTINGS TAKEN		5																
		6																
		7	10 4 3	11	6	SS-3	-	-	-	-	-	-	-	-	-	11	A-6a (V)	
	681.6	8																
MEDIUM STIFF, BROWN AND RED, **SANDY SILT**, SOME CLAY, LITTLE STONE FRAGMENTS, DAMP		9	2 2 2	6	39	SS-4	0.50	16	3	23	32	26	27	18	9	14	A-4a (5)	
	679.1	10																
MEDIUM STIFF, BROWN, **SILT AND CLAY**, SOME STONE FRAGMENTS, SOME SAND, POOR RECOVERY, AUGER CUTTINGS TAKEN, DAMP		11	5 2 3	8	11	SS-5	-	-	-	-	-	-	-	-	-	12	A-6a (V)	
@13.5'; VERY STIFF		12																
		13																
		14	2 3 5	12	67	SS-6	3.25	22	4	17	29	28	30	19	11	16	A-6a (5)	
		15																
@16.0'; HARD, TRACE ROOTS		16																
		17	9 9 11	30	78	SS-7	4.5+	-	-	-	-	-	-	-	-	12	A-6a (V)	
		18																
Layer 3		19	5 8 9	26	39	SS-8	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
		20																
		21																
		22																
		23																
@23.5'; VERY STIFF, BROWN AND GRAY, "AND" STONE FRAGMENTS, LITTLE SAND		24	3 6 6	18	39	SS-9	3.00	38	1	16	20	25	32	18	14	11	A-6a (3)	
		25																
		26																
Original Grade from Cross-Section at 794+00 = ~663.5, or 26.6' depth. Considered to be the bottom of existing embankment fill material.		27																
		28																
@28.5'; BROWN AND REDDISH BROWN, SOME STONE FRAGMENTS		29	4 40 60	150	100	SS-10	2.75	34	2	16	20	28	31	20	11	14	A-6a (3)	
Omit		30																
Layer 6		31																
		32																
		33																
		34	4 7 8	23	33	SS-11	3.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
		35																
		36																
		37																
	651.6	38																
SANDSTONE, BROWN, HIGHLY WEATHERED, WEAK, FINE GRAINED.	TR	39	5 29 101	195	100	SS-12	-	-	-	-	-	-	-	-	-	9	Rock (V)	
		40																
		41																
		42																
		43																
	646.1	44	82	-	100	SS-13	-	-	-	-	-	-	-	-	-	5	Rock (V)	
	EOB																	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

Source: NAVFAC DM 7.1

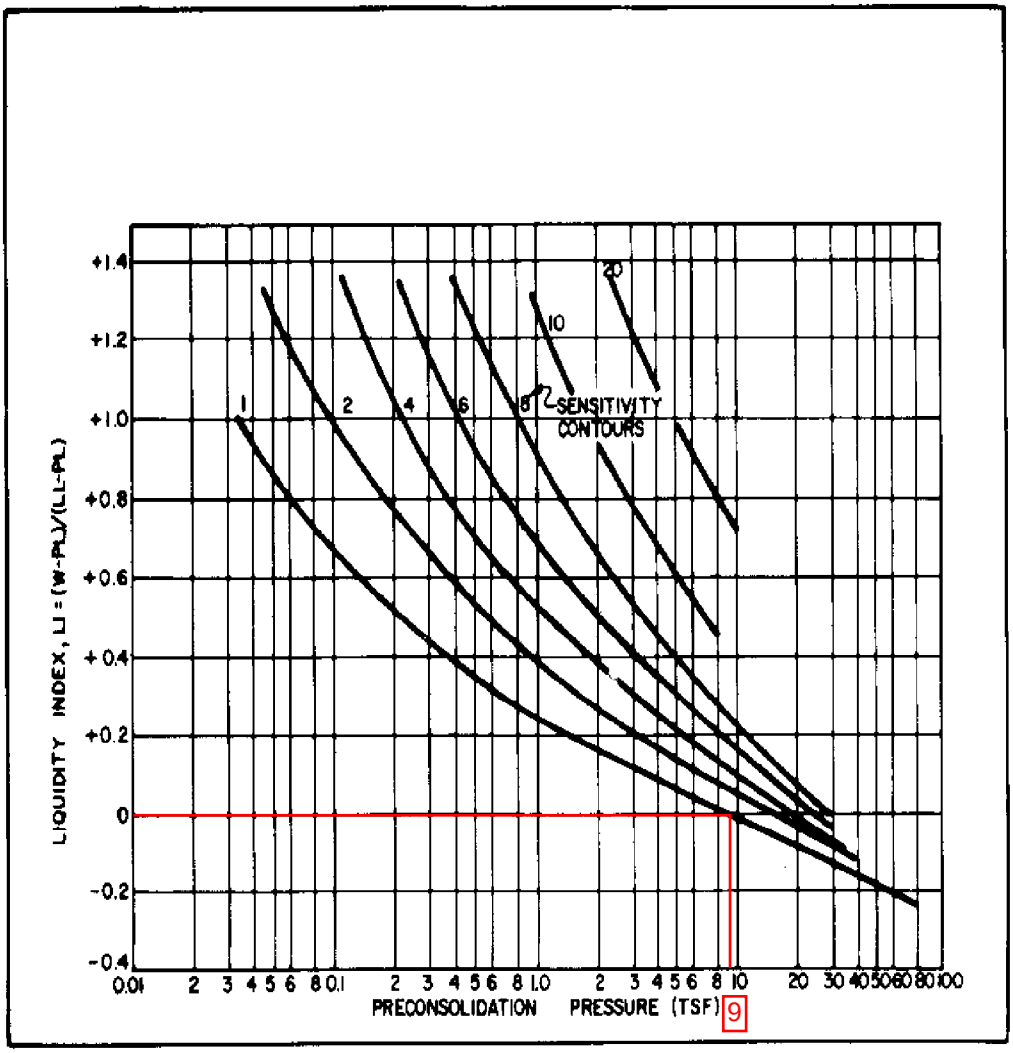


FIGURE 3
Preconsolidation Pressure vs. Liquidity Index

As LI values for the fill are all negative (moisture contents below the plastic limit), the fill was considered to be overconsolidated. Considering a LI of 0, a preconsolidation pressure of 9 tsf (18 ksf) was used in analyses. The underlying native soils were considered to be normally consolidated.

Cv values

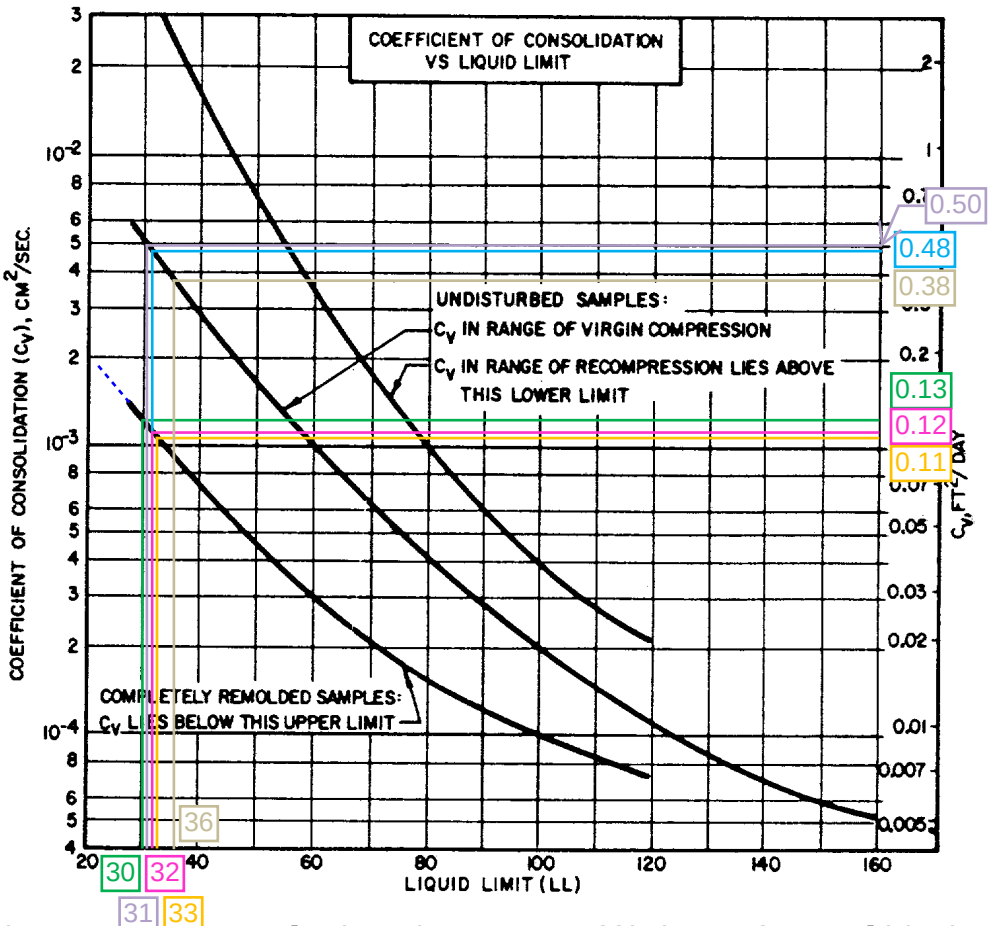
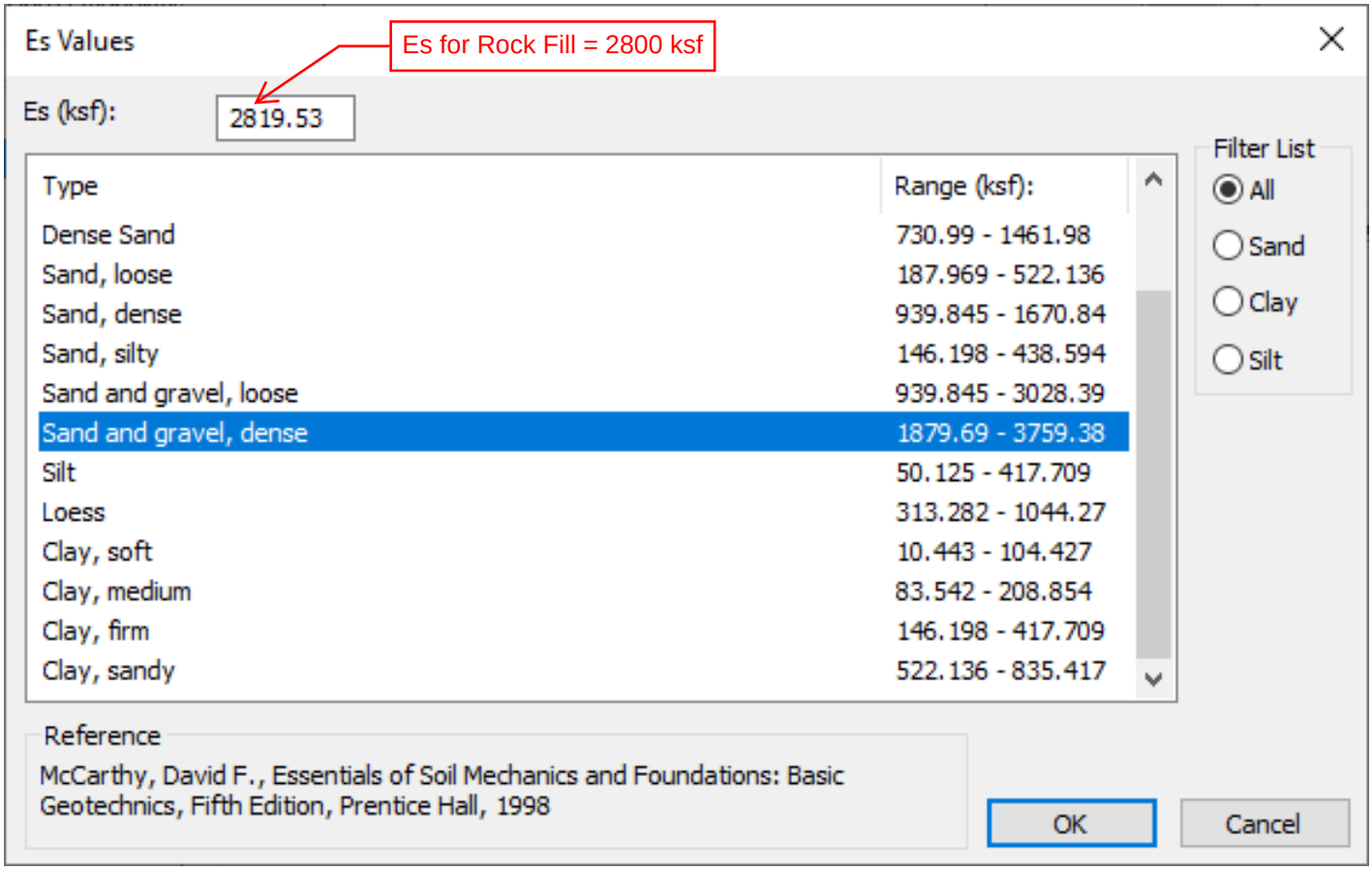


Figure 3-18. Correlations between coefficient of consolidation and liquid limit (NAVFAC DM 7.1)

Layer 1: LL = 30, Cv = 0.13 ft^2/day
Layer 2: LL = 33, Cv = 0.11 ft^2/day
Layer 3: LL = 32, Cv = 0.12 ft^2/day
Layer 4: LL = 32, Cv = 0.48 ft^2/day
Layer 5: LL = 36, Cv = 0.38 ft^2/day
Layer 6: LL = 31, Cv = 0.50 ft^2/day

Source: Settle3 Software

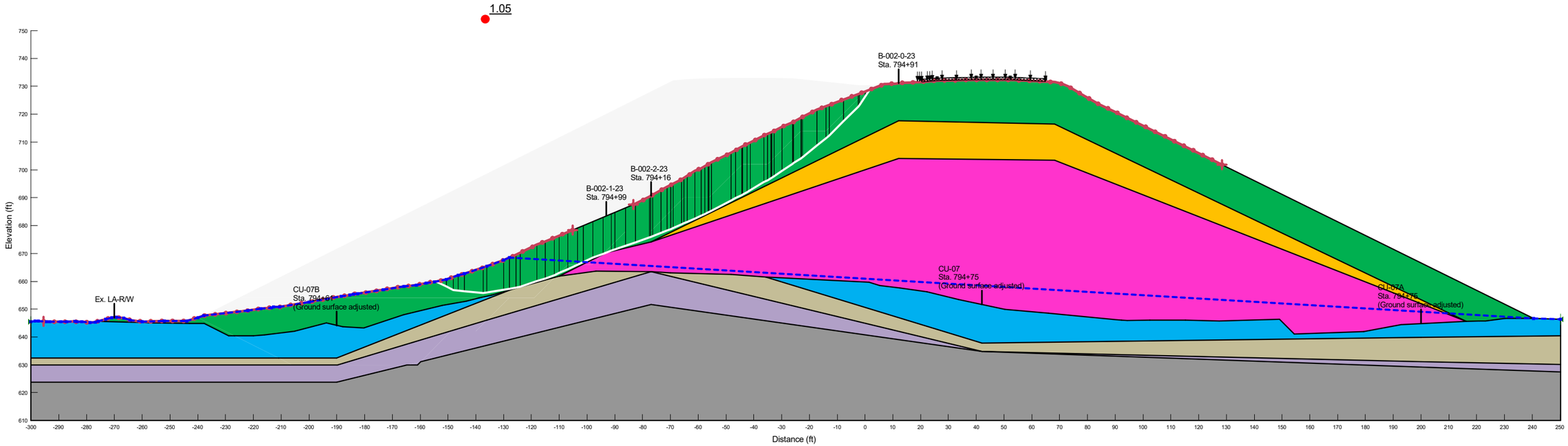


Elastic settlement parameters included in Settle3 for granular layers with "immediate" settlement. This is reflected in the estimated settlement at time = 0 days.

Slope Stability (Rock Surface as Encountered in Boring B-002-2-23)

Long Term (Drained) Condition

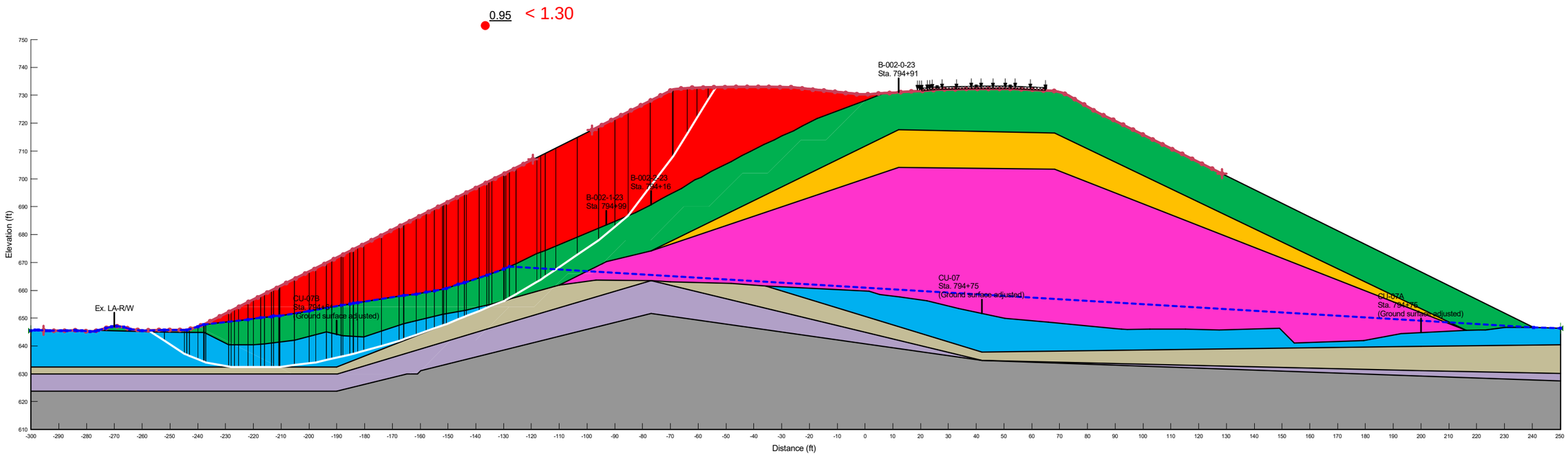
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			



01. Sta. 794+00 Existing	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Long Term (Drained) Condition

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (LT)	Mohr-Coulomb	125	250	28



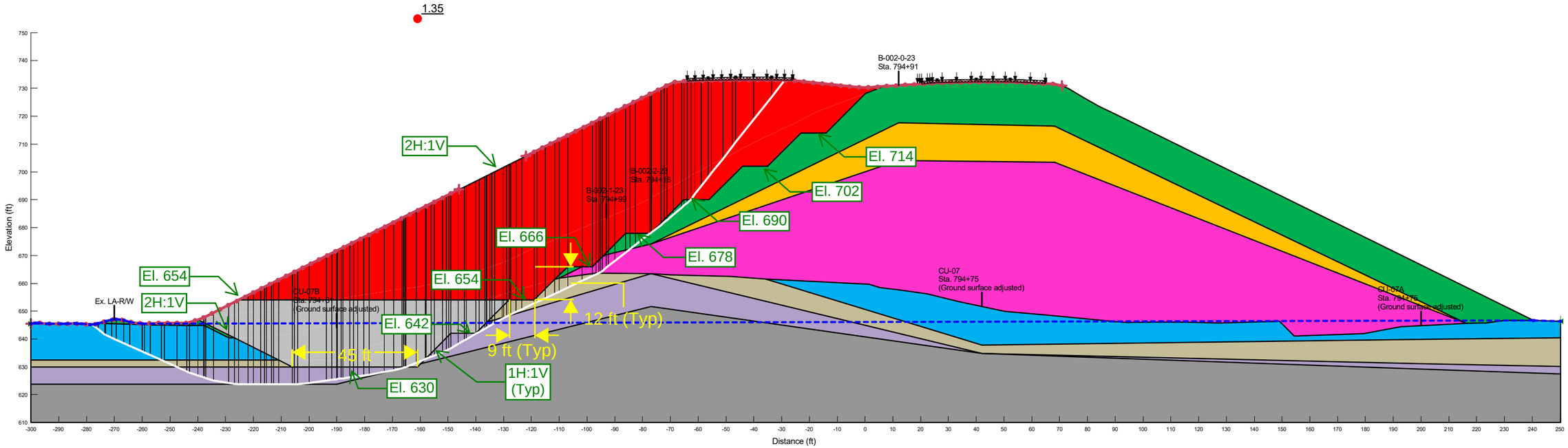
Embankment fill properties for an A-6a material as presented in Table 500-2 from the ODOT Geotechnical Design Manual were assumed for the new embankment material based on the majority of the soil types encountered in the surrounding borings.

Table 500-2: Assumed Embankment Fill Properties

Borrow Source Soil Class	c (psf)	φ (deg)	c′ (psf)	φ′ (deg)	γ (pcf)
Granular	0	32	0	32	125
A-4a/A-4b	2000	0	200	30	125
A-6a	2500	0	250	28	125
A-6b	2500	0	250	28	125
A-7-6	2000	0	200	26	125
Unknown	2500	0	250	26	125

02. Sta. 794+00 Proposed No Benching	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

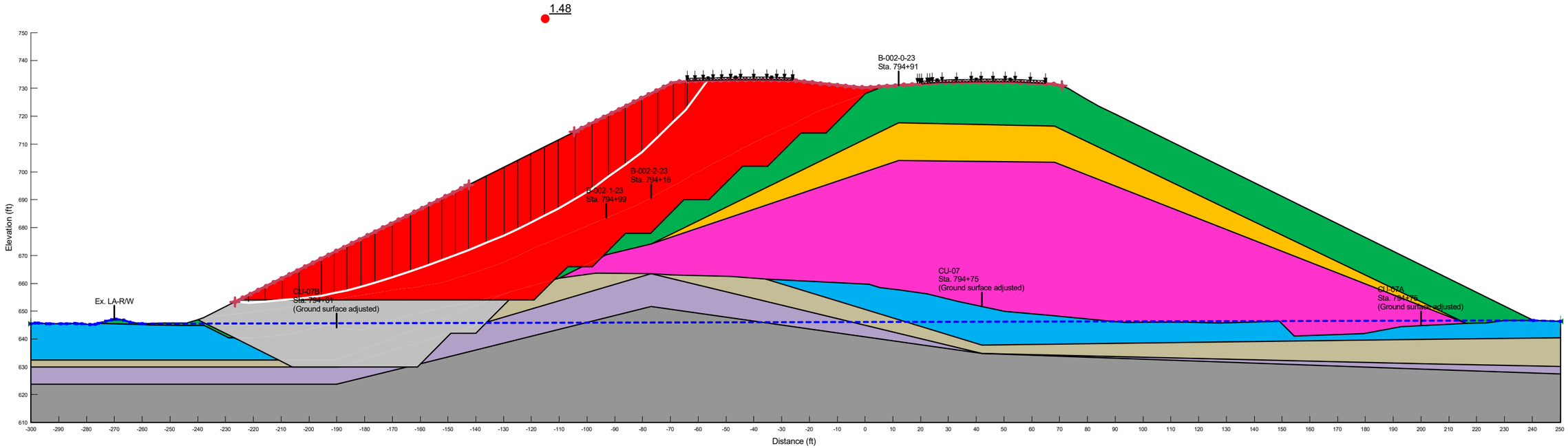
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (LT)	Mohr-Coulomb	125	250	28
	Rock Fill	Mohr-Coulomb	135	0	38



03. Sta. 794+00 Proposed Overall	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Long Term (Drained) Condition

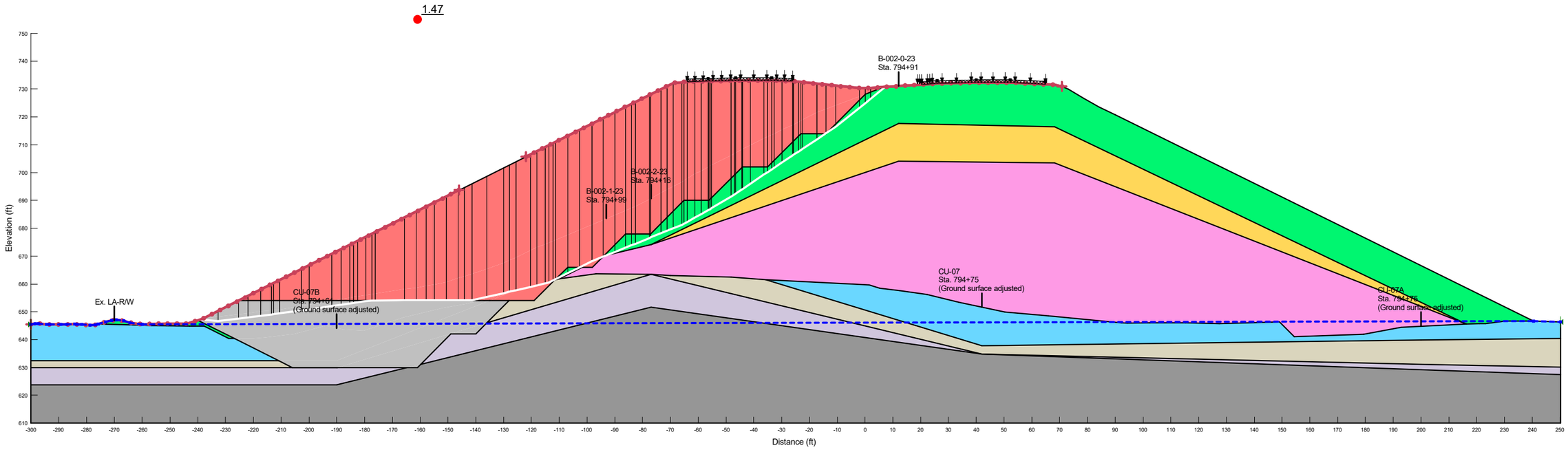
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (LT)	Mohr-Coulomb	125	250	28
	Rock Fill	Mohr-Coulomb	135	0	38



04. Sta. 794+00 Proposed Upper Slope (LT)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

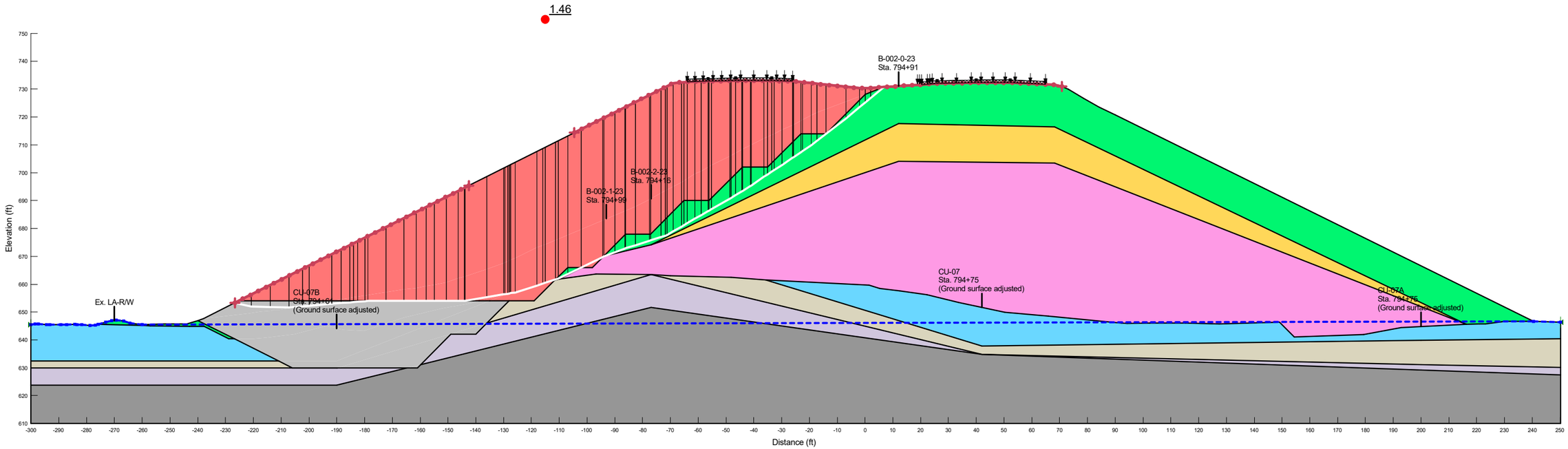
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (ST)	Mohr-Coulomb	125	2,500	0
	Rock Fill	Mohr-Coulomb	135	0	38



05. Sta. 794+00 Proposed Overall (ST)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

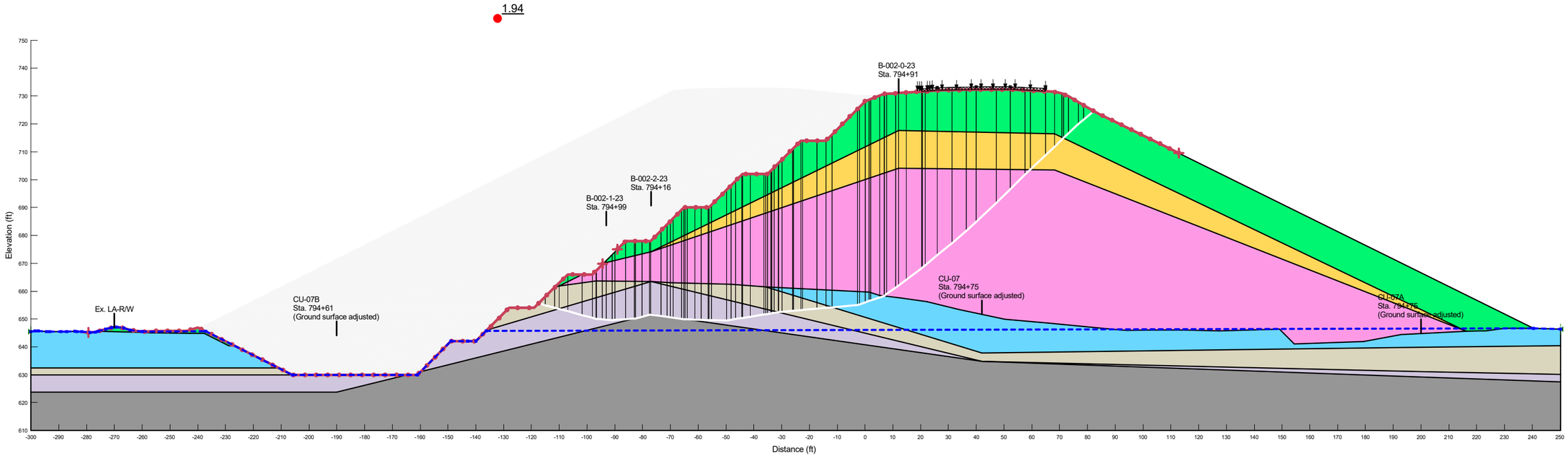
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (ST)	Mohr-Coulomb	125	2,500	0
	Rock Fill	Mohr-Coulomb	135	0	38



06. Sta. 794+00 Proposed Upper Slope (ST)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

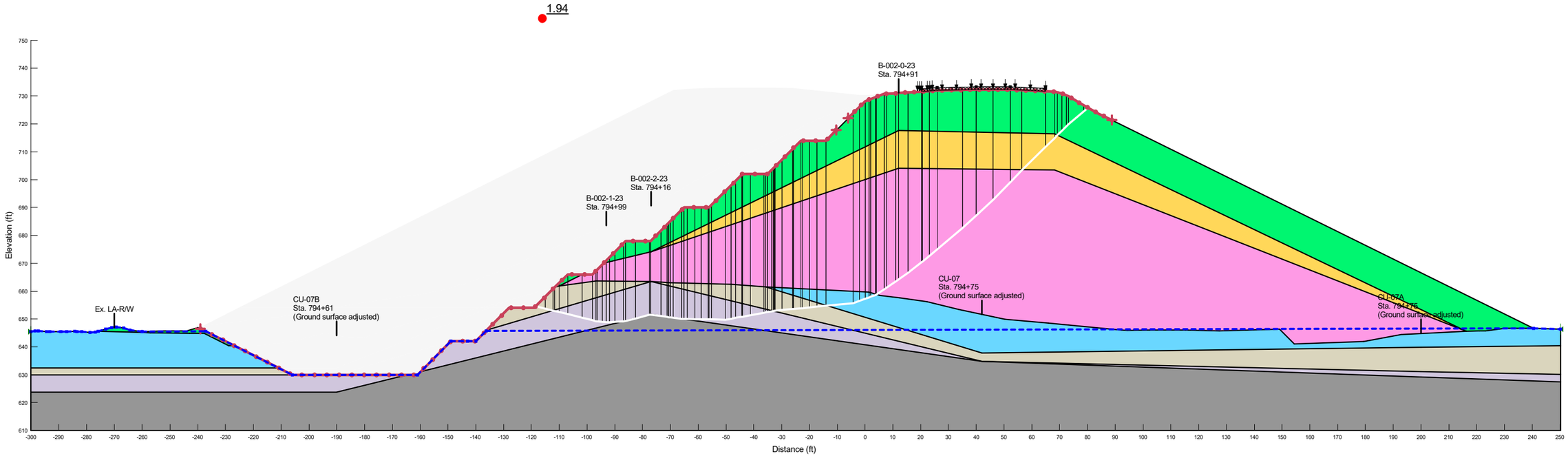
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			



07. Sta. 794+00 Proposed Overall (Constructability) (ST)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

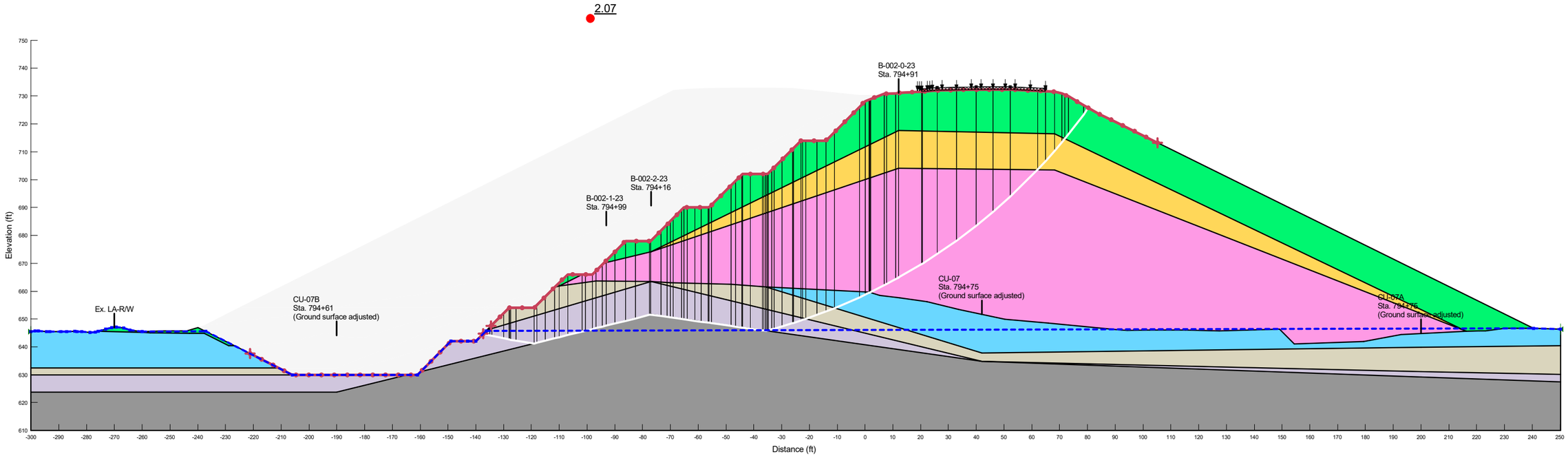
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			



08. Sta. 794+00 Proposed Upper Benches (Constructability) (ST)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

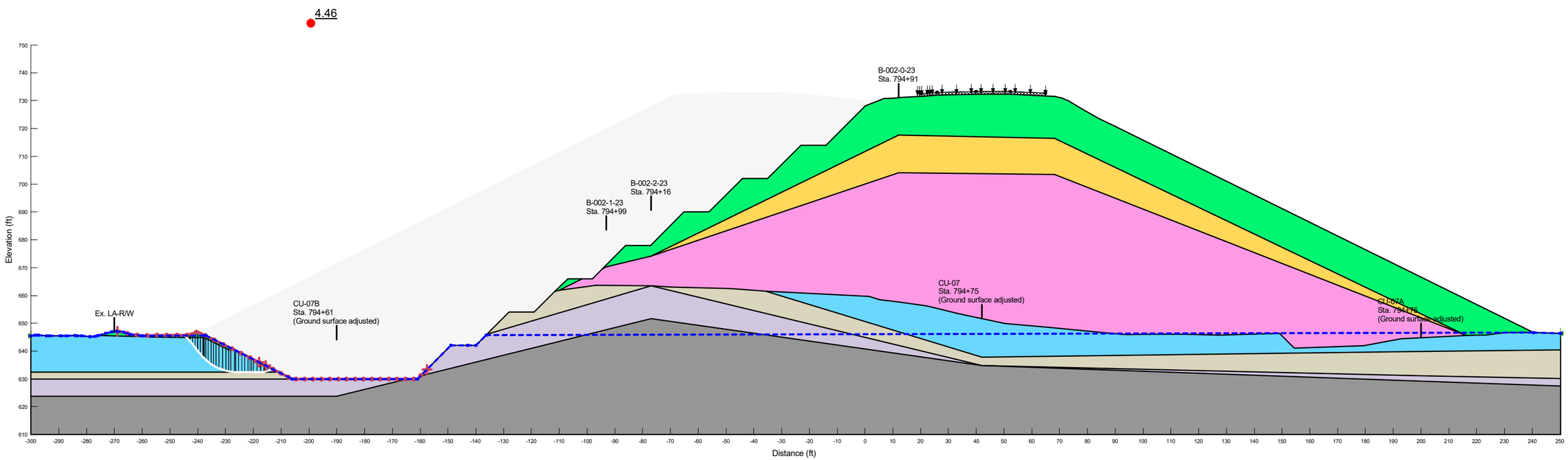
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			



09. Sta. 794+00 Proposed Lower Benches (Constructability) (ST)	
Sta. 794+00 LT Slope Stability.gsz	
05/10/2024	1:450

Short Term (Undrained) Condition

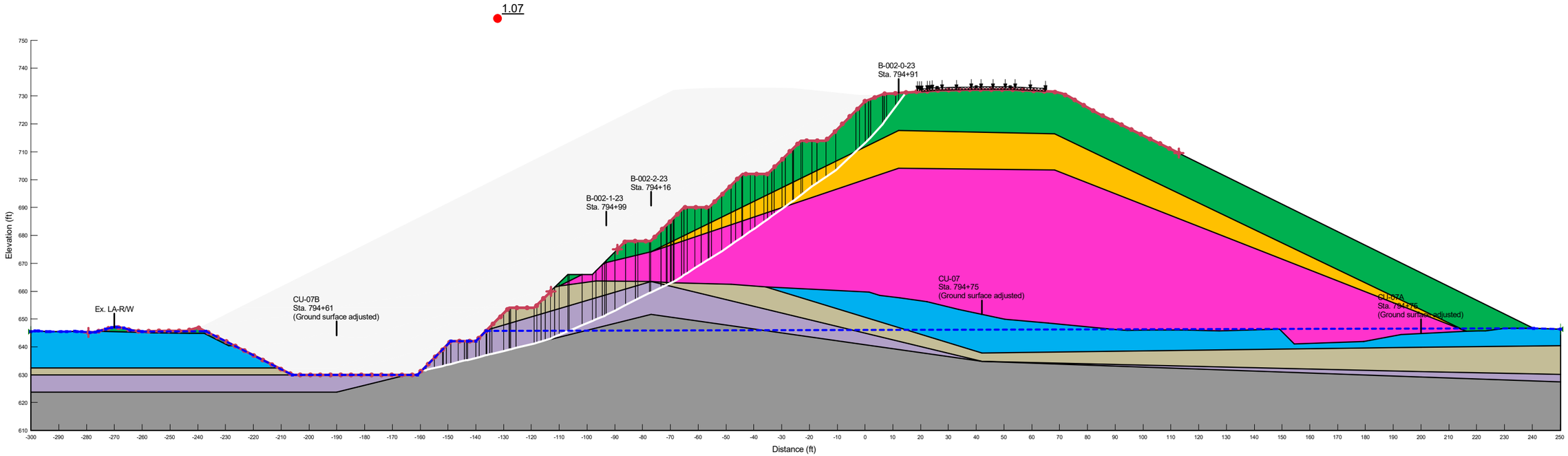
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			



10. Sta. 794+00 Proposed Shear Key (Constructability) (ST)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Long Term (Drained) Condition

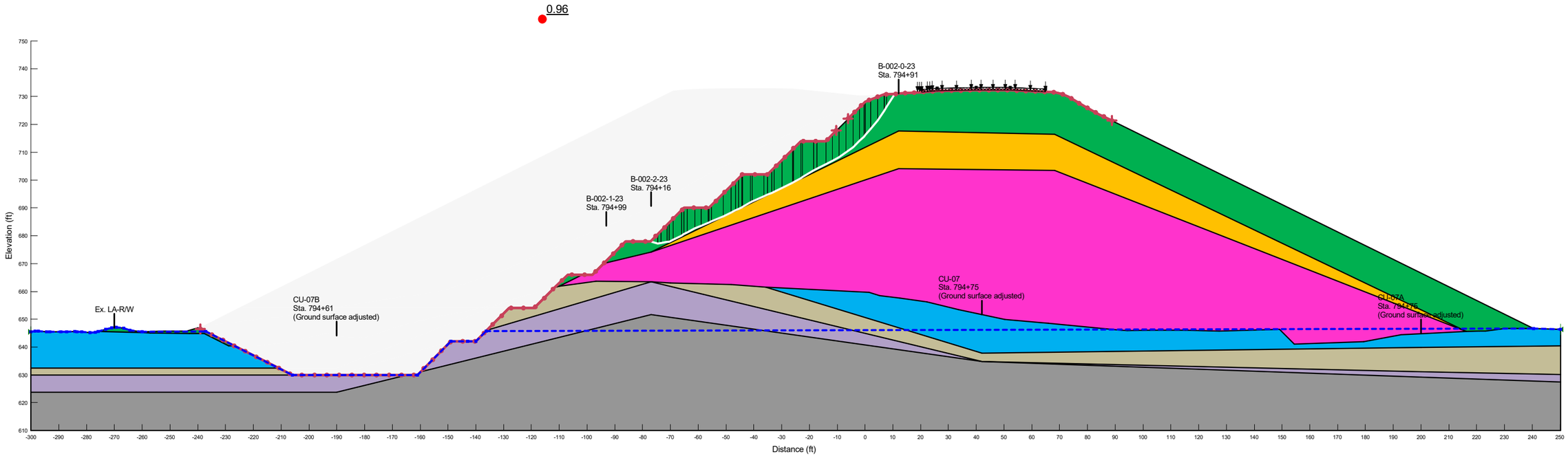
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			



11. Sta. 794+00 Proposed Overall (Constructability) (LT)	
Sta. 794+00 LT Slope Stability.gsz	
05/10/2024	1:450

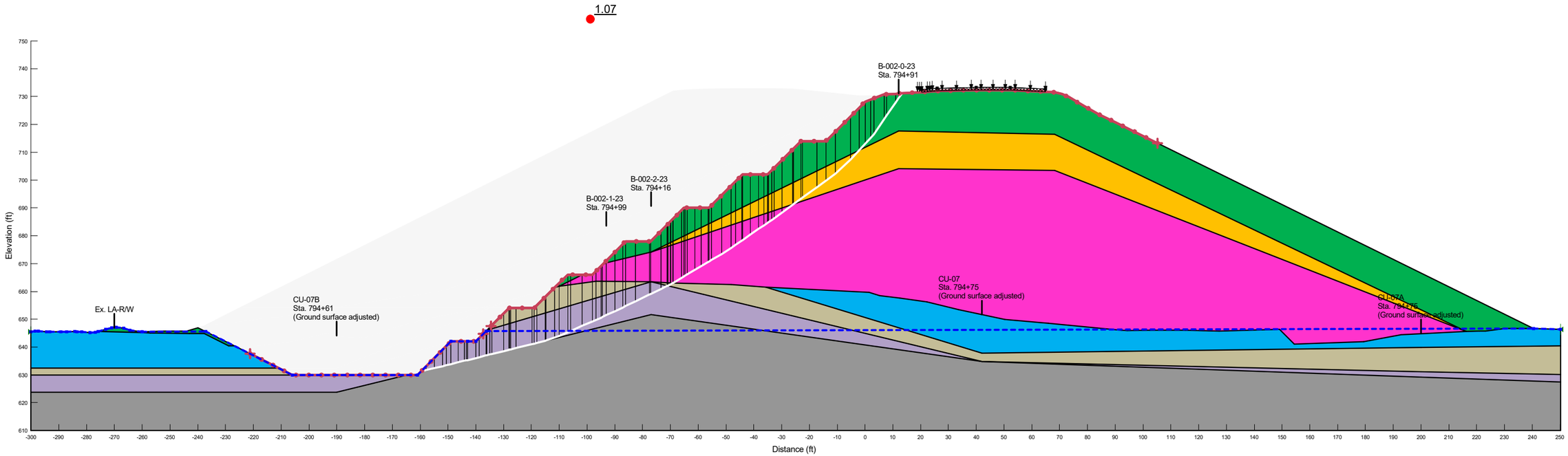
Long Term (Drained) Condition

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			



12. Sta. 794+00 Proposed Upper Benches (Constructability) (LT)
Sta. 794+00 LT Slope Stability.gsz
05/09/2024 1:450

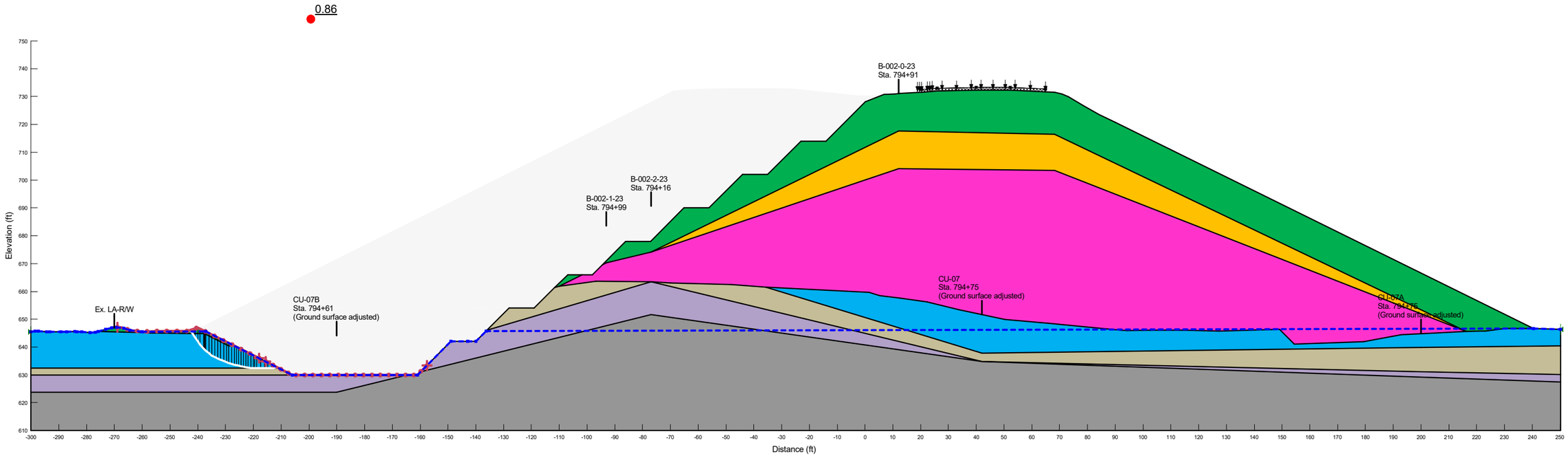
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			



13. Sta. 794+00 Proposed Lower Benches (Constructability) (LT)	
Sta. 794+00 LT Slope Stability.gsz	
05/10/2024	1:450

Long Term (Drained) Condition

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			

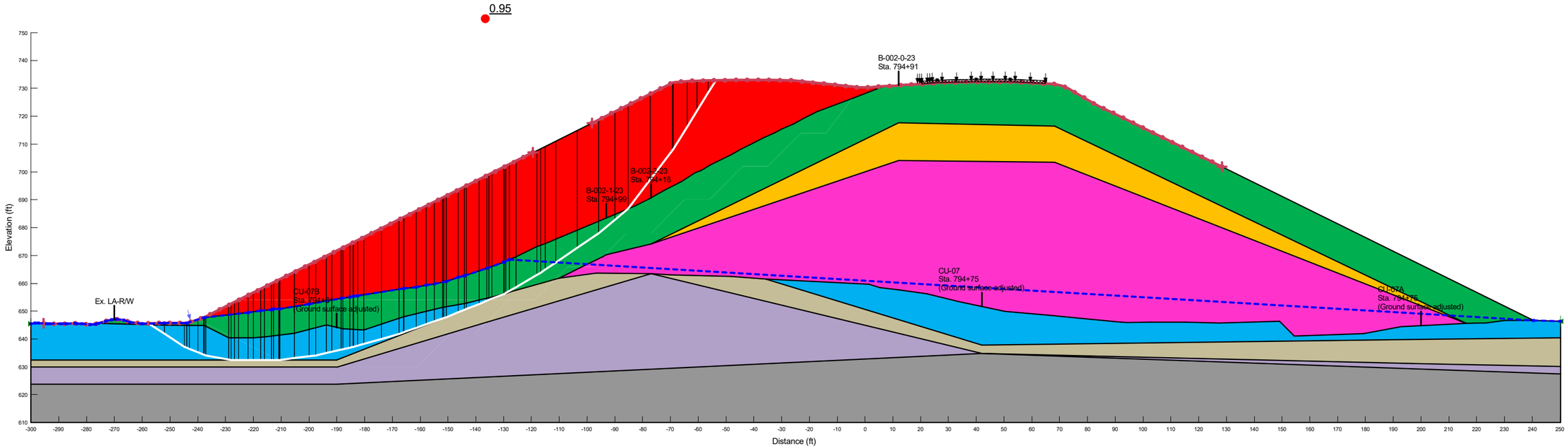


14. Sta. 794+00 Proposed Shear Key (Constructability) (LT)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Slope Stability (Lowered Rock Surface at Boring B-002-2-23)

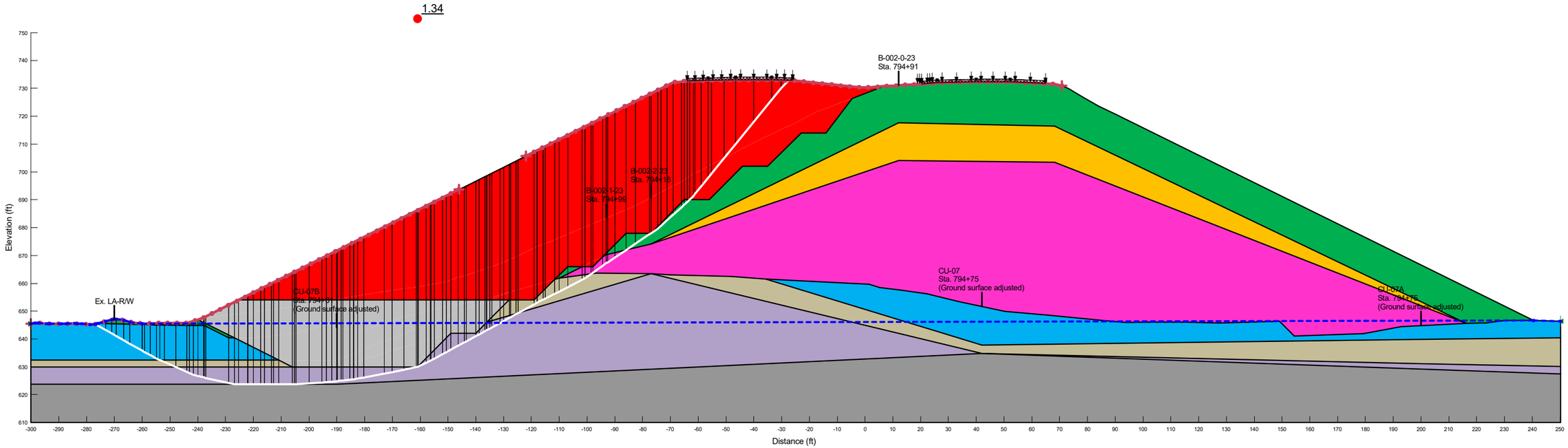
Long Term (Drained) Condition

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (LT)	Mohr-Coulomb	125	250	28



02. Sta. 794+00 Proposed No Benching (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

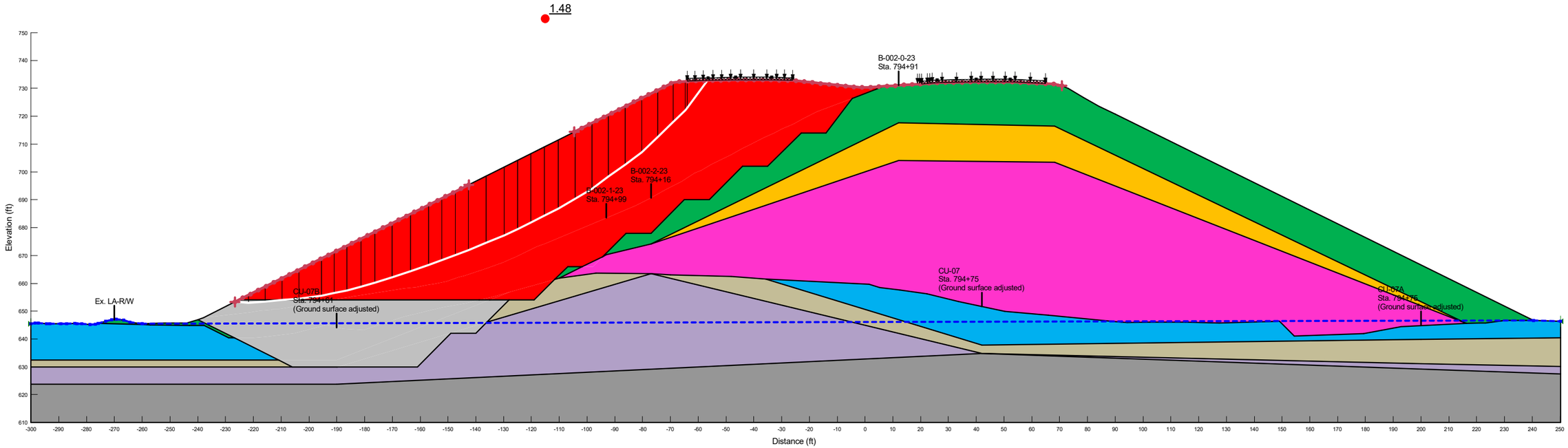
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (LT)	Mohr-Coulomb	125	250	28
	Rock Fill	Mohr-Coulomb	135	0	38



03. Sta. 794+00 Proposed Overall (LT) (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Long Term (Drained) Condition

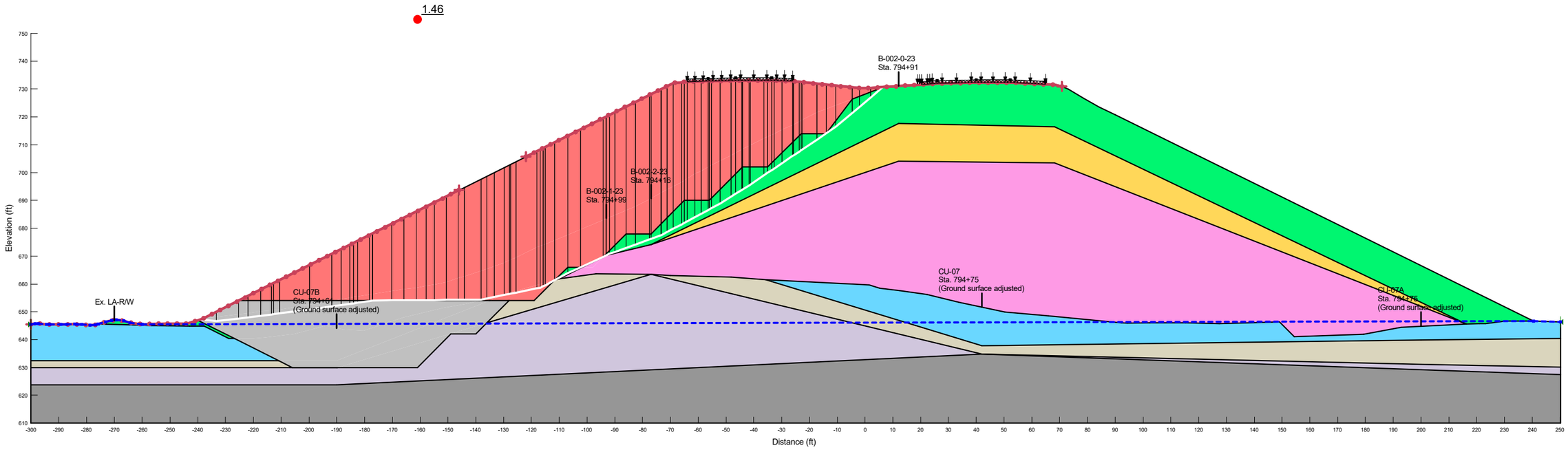
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (LT)	Mohr-Coulomb	125	250	28
	Rock Fill	Mohr-Coulomb	135	0	38



04. Sta. 794+00 Proposed Upper Slope (LT) (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

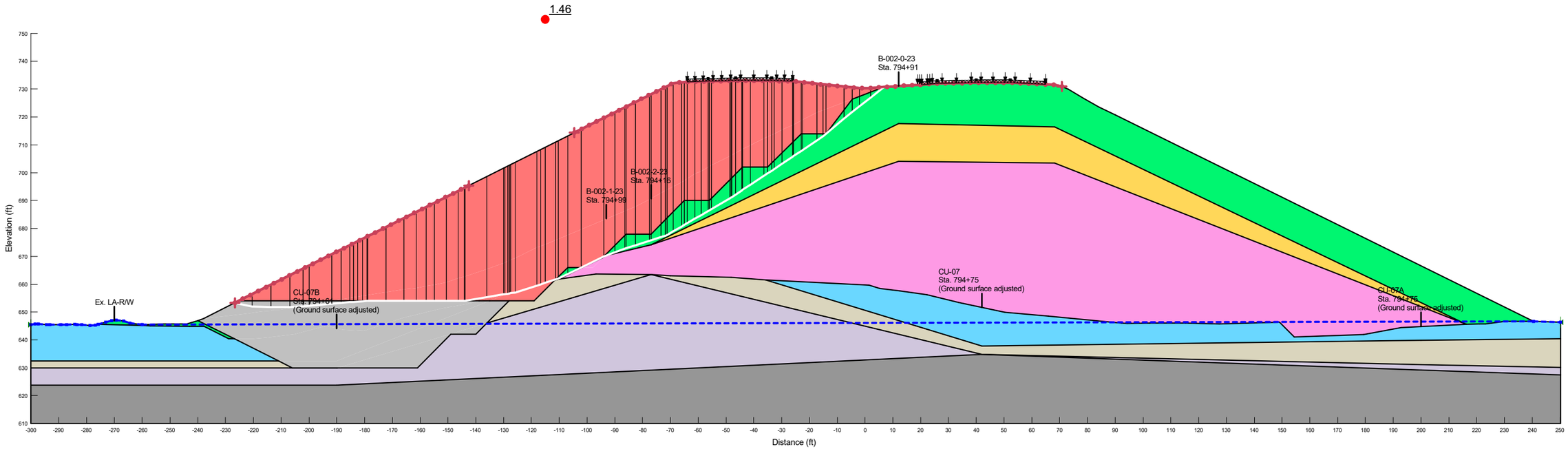
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (ST)	Mohr-Coulomb	125	2,500	0
	Rock Fill	Mohr-Coulomb	135	0	38



05. Sta. 794+00 Proposed Overall (ST) (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

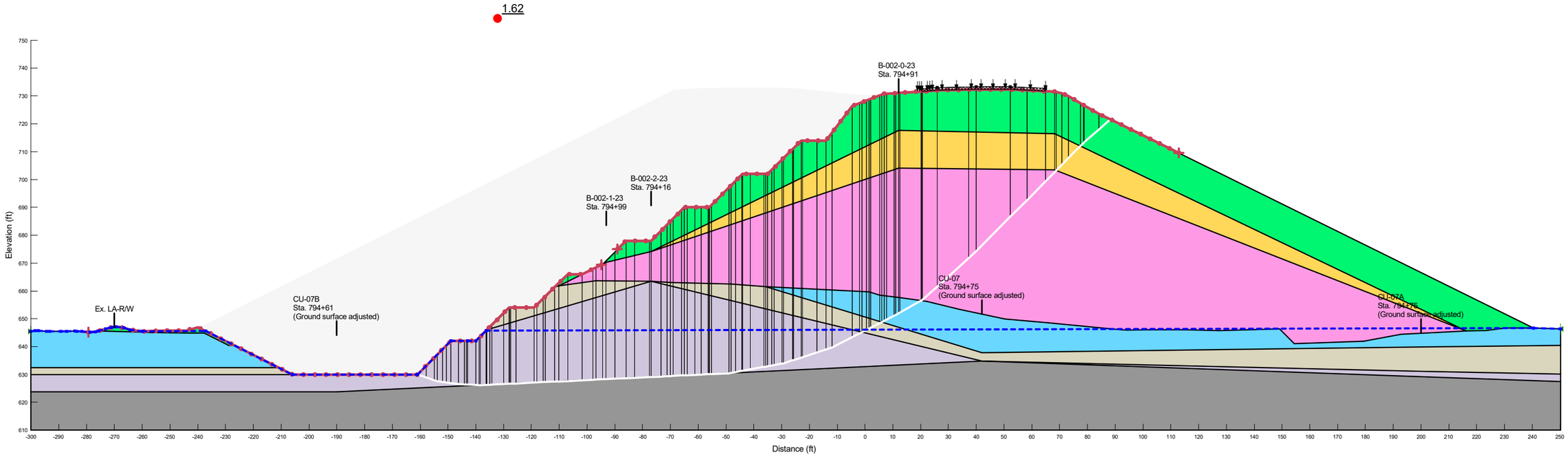
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-6a) (ST)	Mohr-Coulomb	125	2,500	0
	Rock Fill	Mohr-Coulomb	135	0	38



06. Sta. 794+00 Proposed Upper Slope (ST) (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

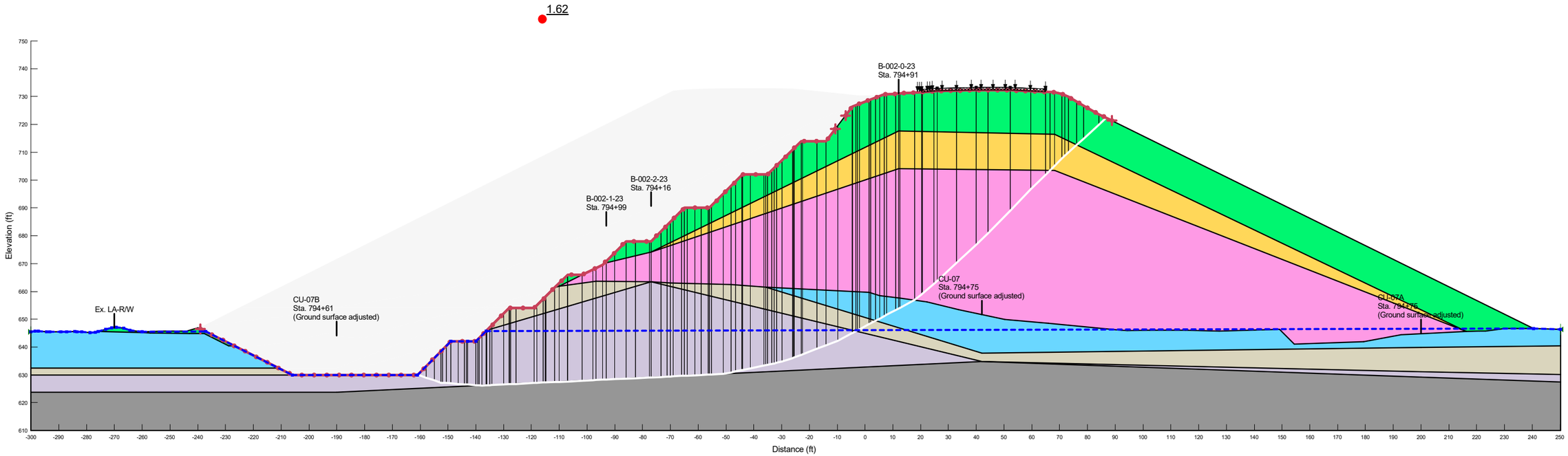
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			



07. Sta. 794+00 Proposed Overall (Constructability) (ST) (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

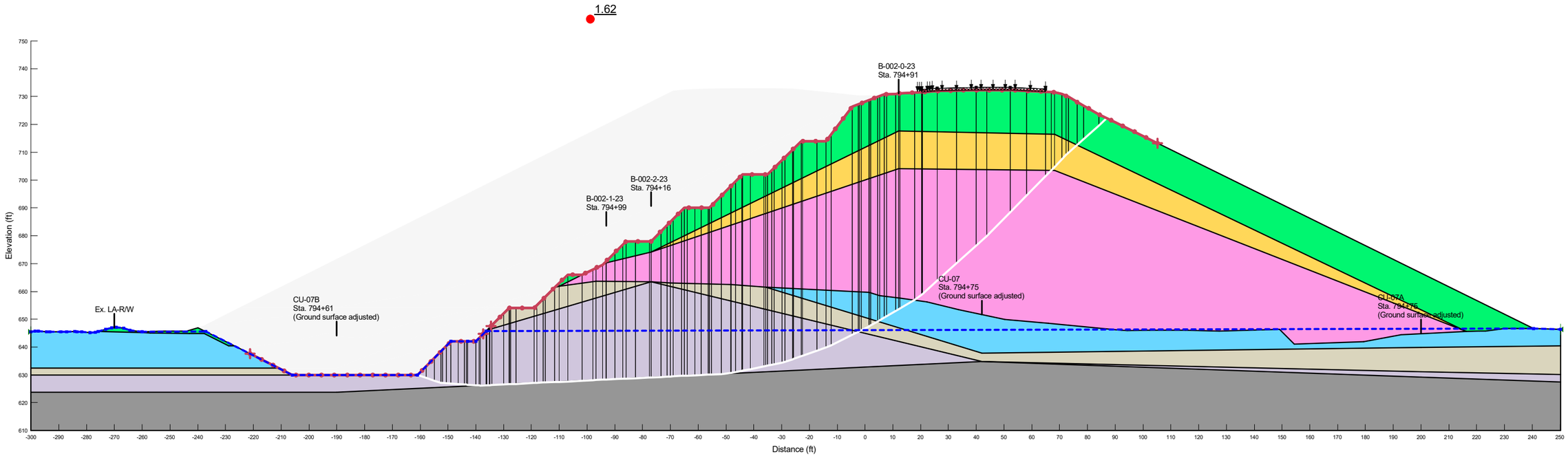
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			



08. Sta. 794+00 Proposed Upper Benches (Constructability) (ST) (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Short Term (Undrained) Condition

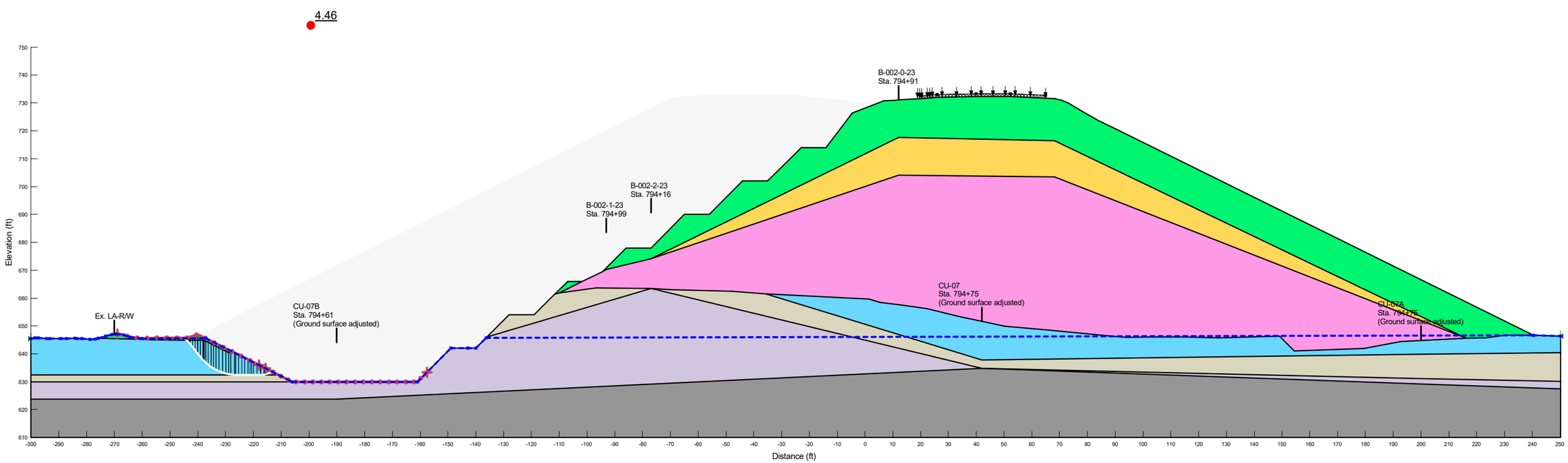
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			



09. Sta. 794+00 Proposed Lower Benches (Constructability) (ST) (Lowered Rock)
Sta. 794+00 LT Slope Stability.gsz
05/10/2024 1:450

Short Term (Undrained) Condition

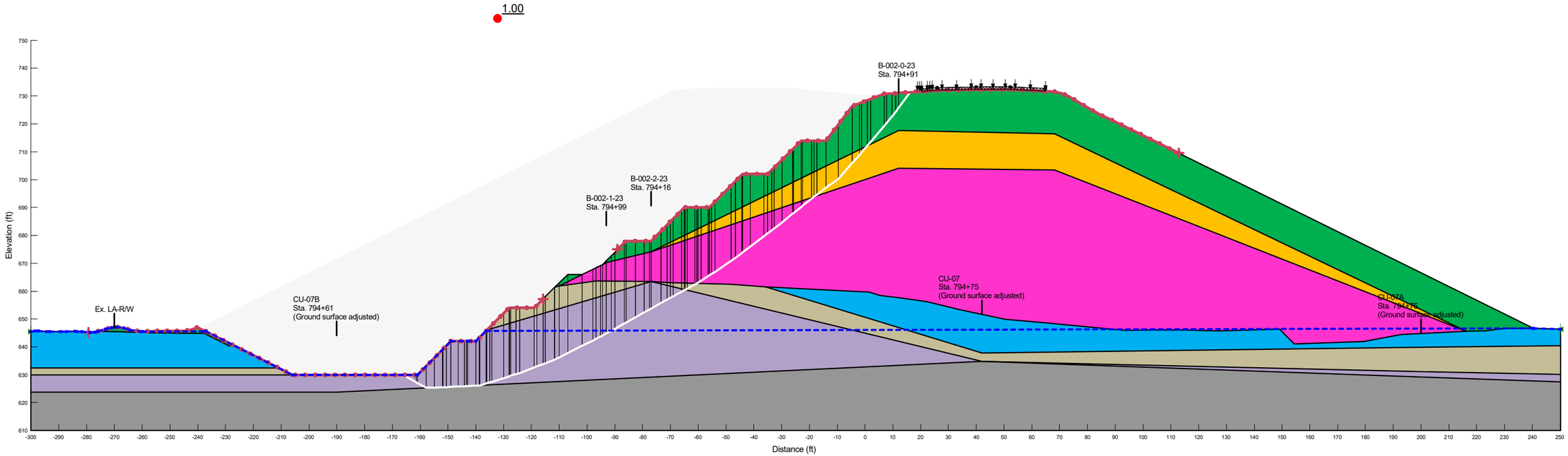
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	120	1,400	0
	2. V. Stiff Embankment Fill (ST)	Mohr-Coulomb	130	3,000	0
	3. V. Stiff to Hard Embankment Fill (ST)	Mohr-Coulomb	140	3,700	0
	4. M. Stiff to Stiff Cohesive (ST)	Mohr-Coulomb	120	930	0
	5. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,650	0
	6. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	135	3,300	0
	Bedrock	Bedrock (Impenetrable)			



10. Sta. 794+00 Proposed Shear Key (Constructability) (ST) (Lowered Rock)
Sta. 794+00 LT Slope Stability.gsz
05/09/2024 1:450

Long Term (Drained) Condition

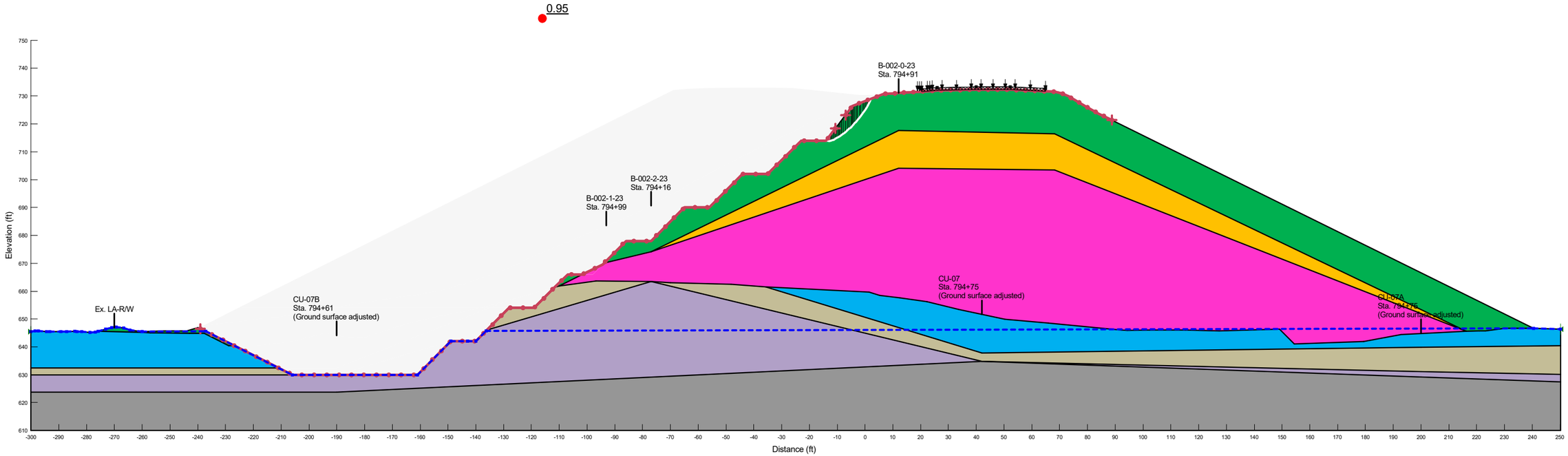
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			



11. Sta. 794+00 Proposed Overall (Constructability) (LT) (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/10/2024	1:450

Long Term (Drained) Condition

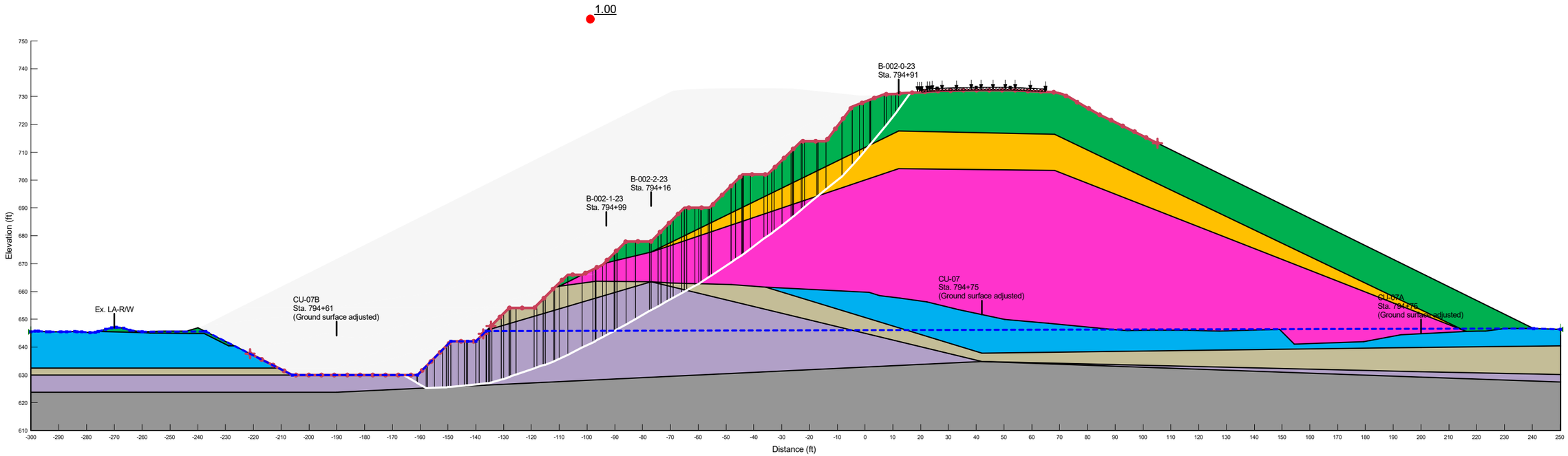
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			



12. Sta. 794+00 Proposed Upper Benches (Constructability) (LT) (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Long Term (Drained) Condition

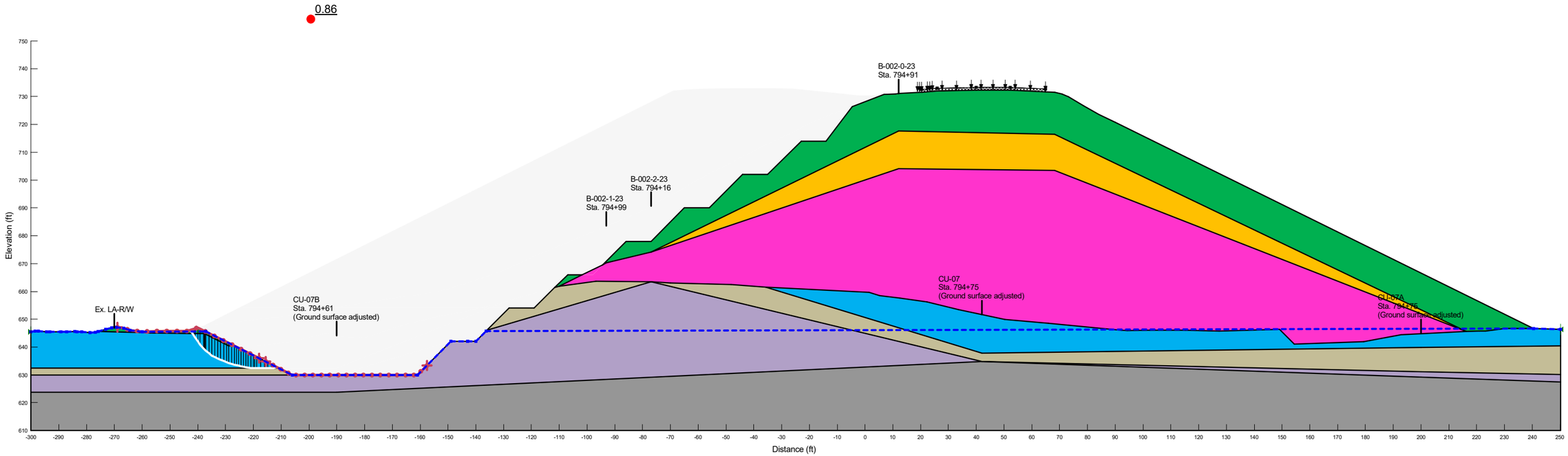
Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			



13. Sta. 794+00 Proposed Lower Benches (Constructability) (LT) (Lowered Rock)
Sta. 794+00 LT Slope Stability.gsz
05/10/2024 1:450

Long Term (Drained) Condition

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	120	110	22
	2. V. Stiff Embankment Fill (LT)	Mohr-Coulomb	130	175	25
	3. V. Stiff to Hard Embankment Fill (LT)	Mohr-Coulomb	140	215	27
	4. M. Stiff to Stiff Cohesive (LT)	Mohr-Coulomb	120	85	21
	5. Stiff Cohesive (LT)	Mohr-Coulomb	125	125	23
	6. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	135	185	26
	Bedrock	Bedrock (Impenetrable)			



14. Sta. 794+00 Proposed Shear Key (Constructability) (LT) (Lowered Rock)	
Sta. 794+00 LT Slope Stability.gsz	
05/09/2024	1:450

Settlement

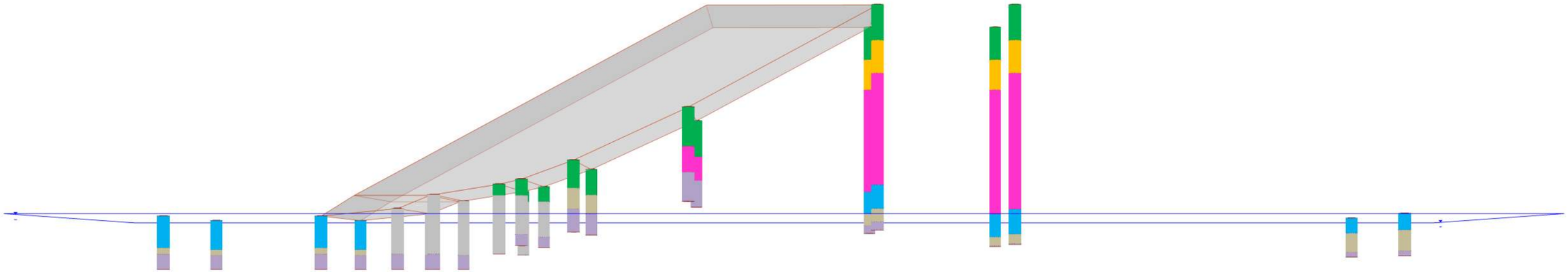
Project: MEG-33-13.96
Client: ODOT D10
Task: Settlement Analysis Summary

Calculated By: AKB **Date:** 5/1/2024
Checked By: DCM **Date:** 5/3/2024

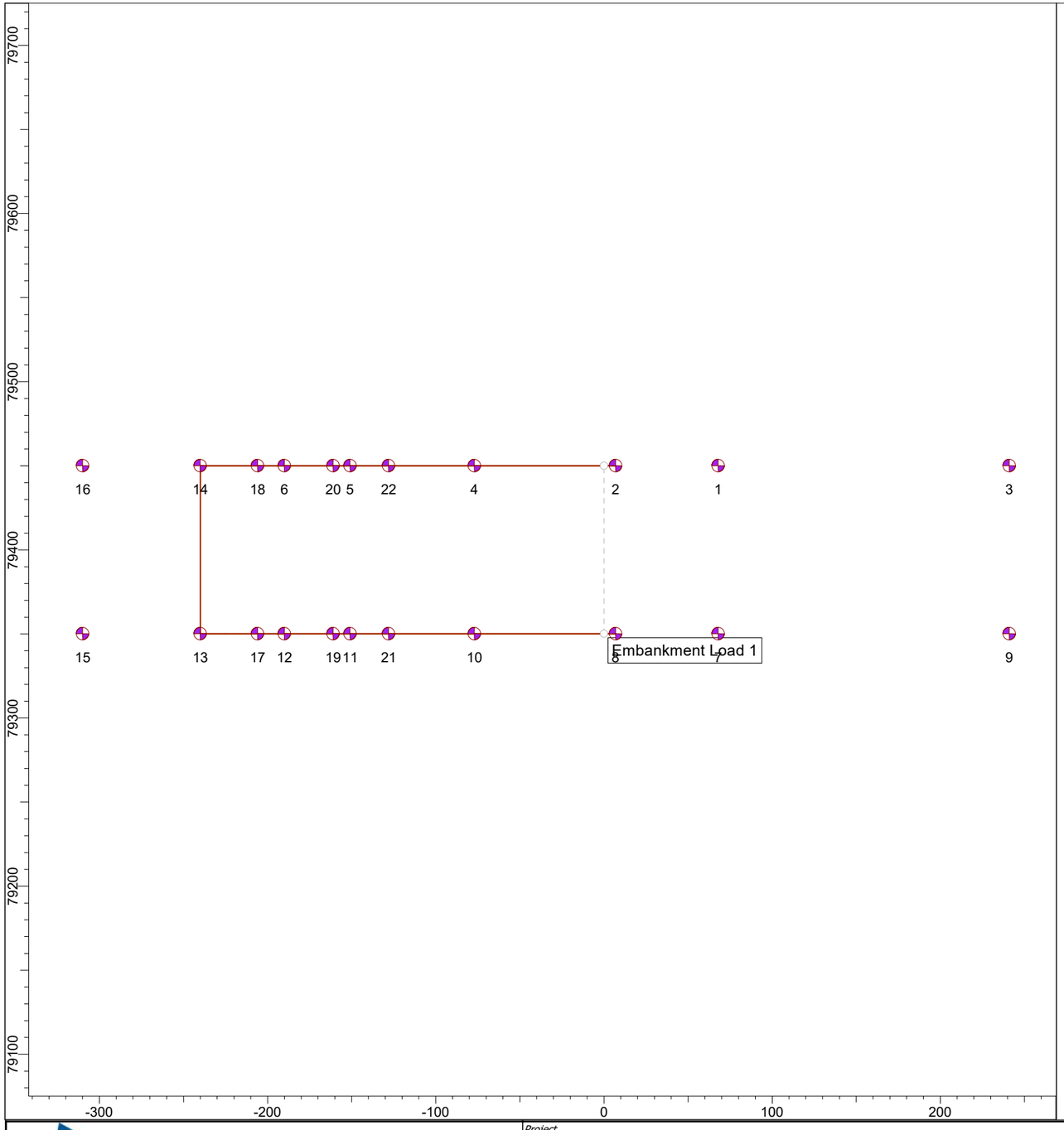
Analyses	Maximum Settlement (in.)	<3-in. Remaining (in.)	Time to <3-in. Remaining	90% Complete (in.)	Time to 90% Complete
Sta. 794+00	13.58	Target: 10.58 Actual: 10.79	6 months	Target: 12.22 Actual: 12.40	11 months

Per ODOT Geotechnical Design Manual Section 504, 3 inches of settlement of less is considered reasonable if settlement does not influence structure, utility, or other roadway infrastructure. As such, analyses highlight time required to reach 3 inches of remaining settlement.

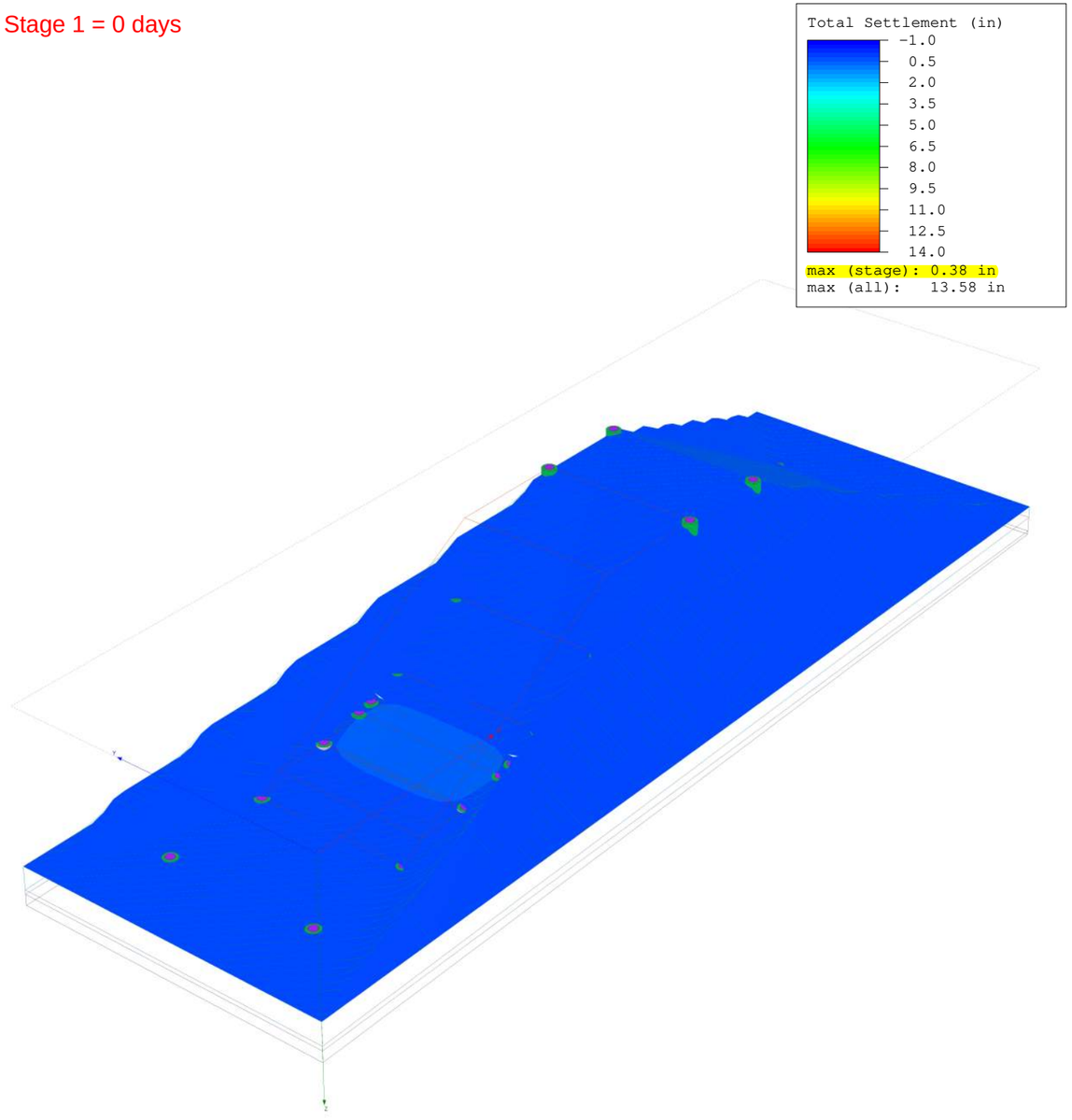
3D Model Front View



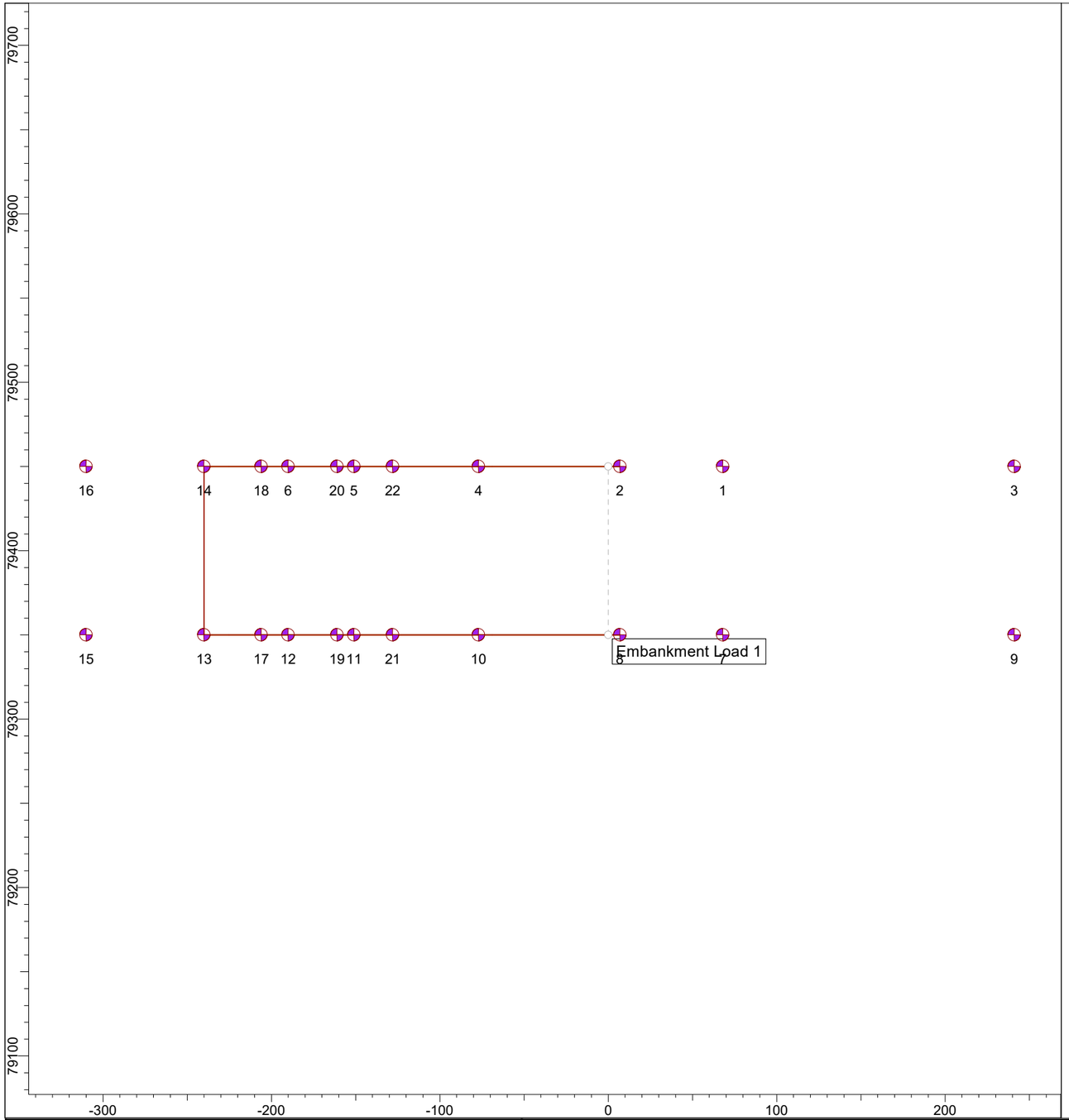
	Project	MEG-33-13.96	
	Analysis Description	Sta. 794+00	
	Drawn By	A. Baratta	Company HDR
SETTLE3 5.007	Date	4/23/2024, 2:17:24 PM	File Name Sta. 794+00 Settlement.s3z



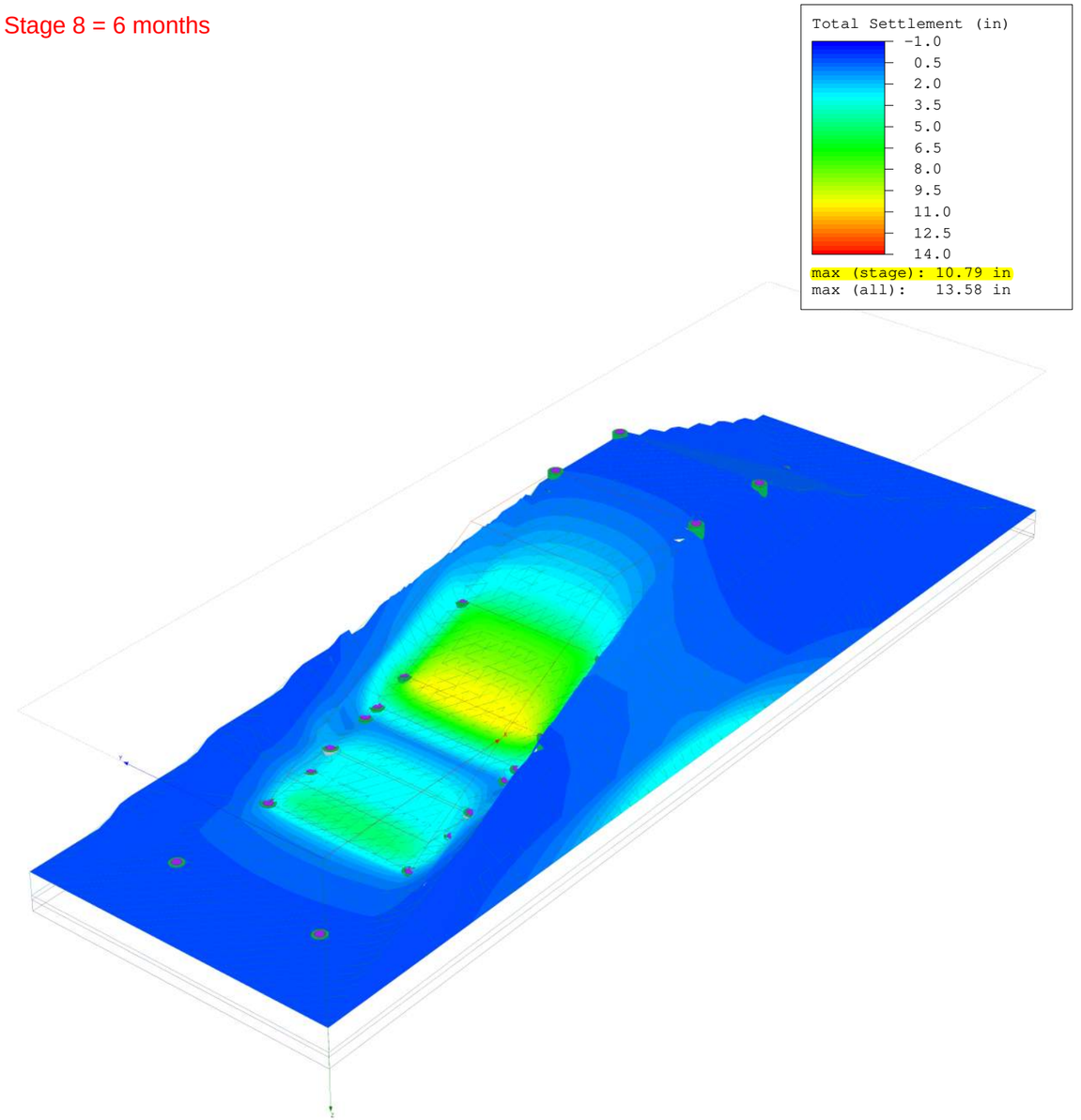
Stage 1 = 0 days



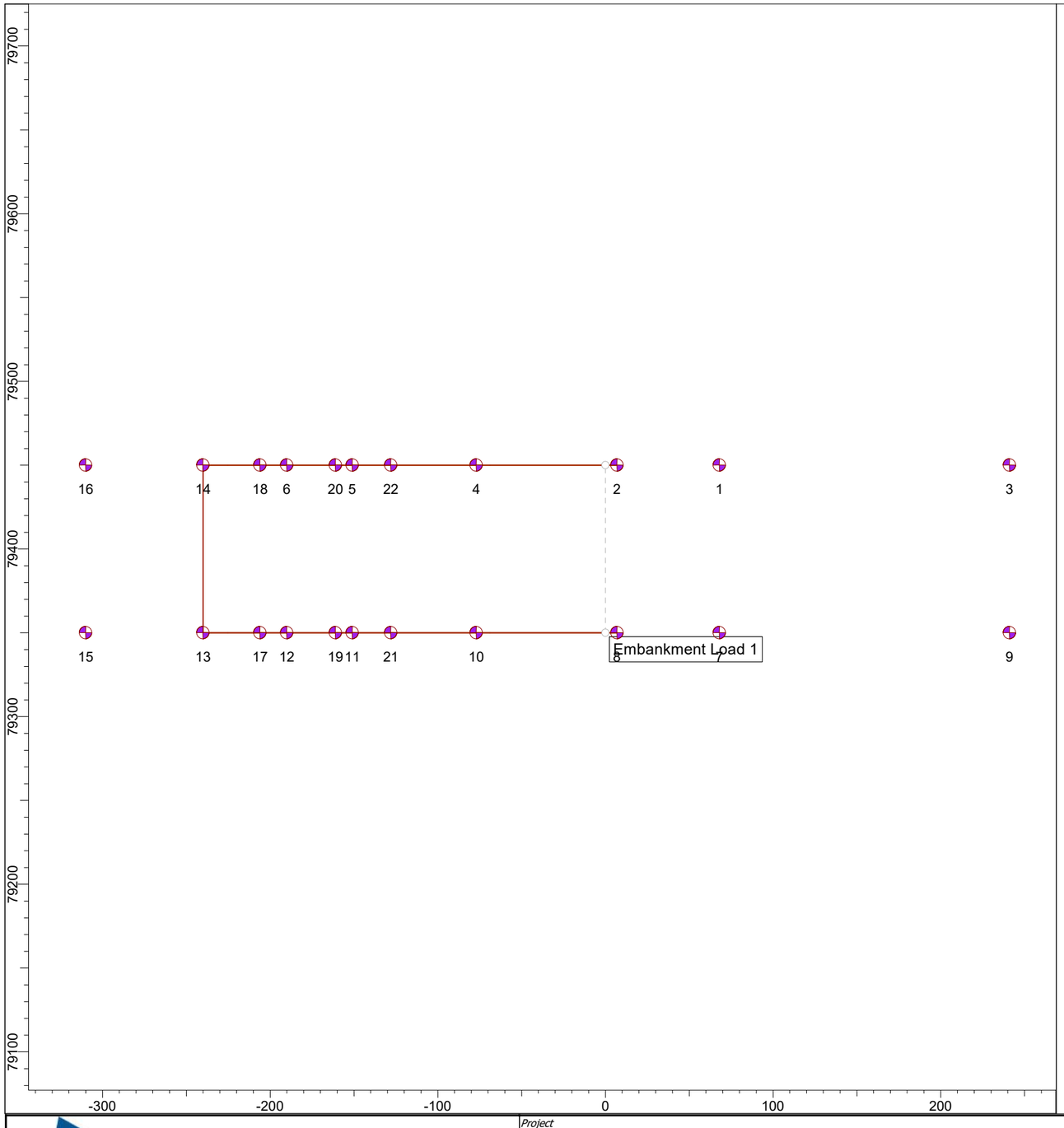
SETTLE3 5.007	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 794+00	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/23/2024, 2:17:24 PM	*File Name* Sta. 794+00 Settlement.s3z



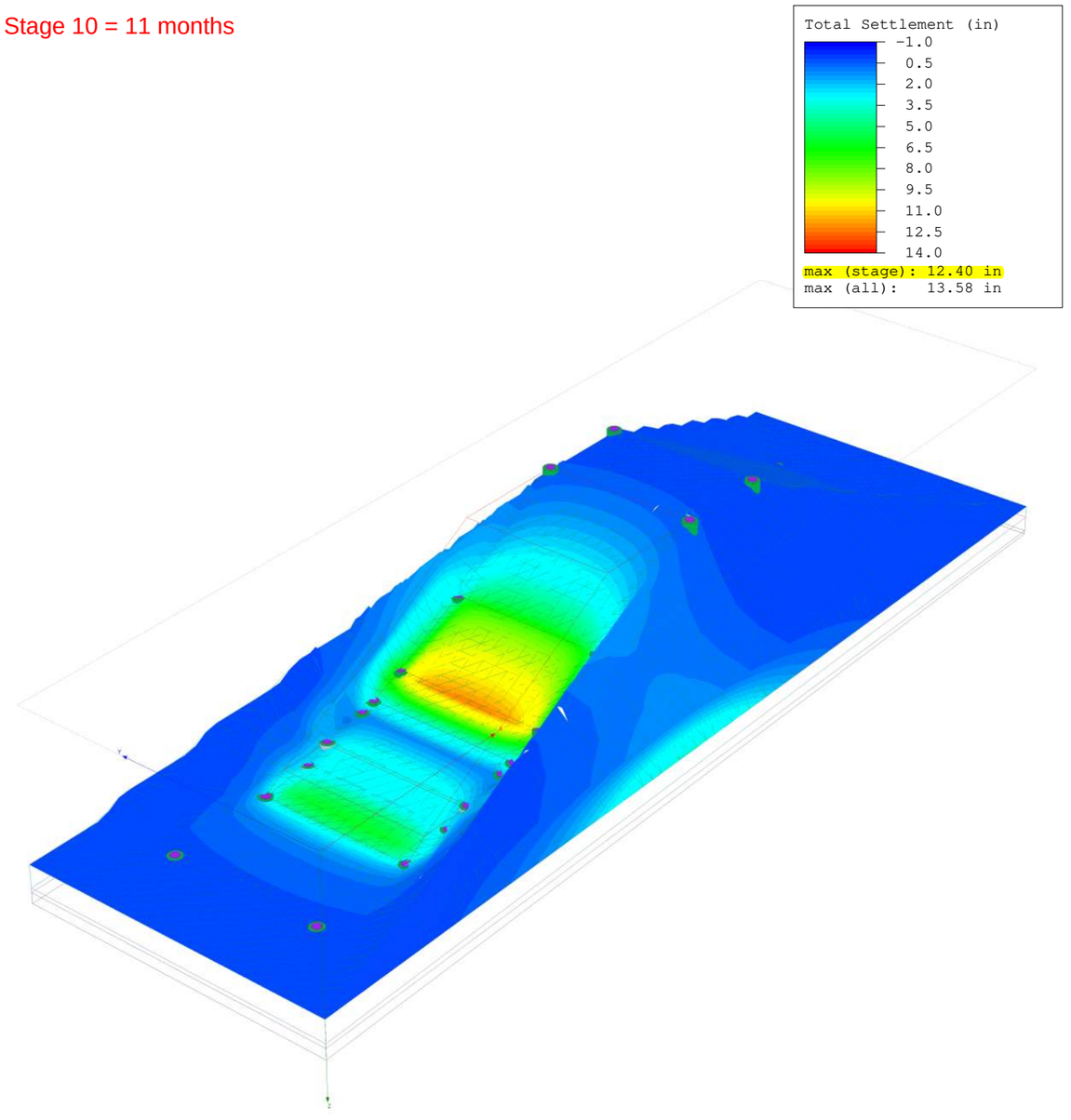
Stage 8 = 6 months



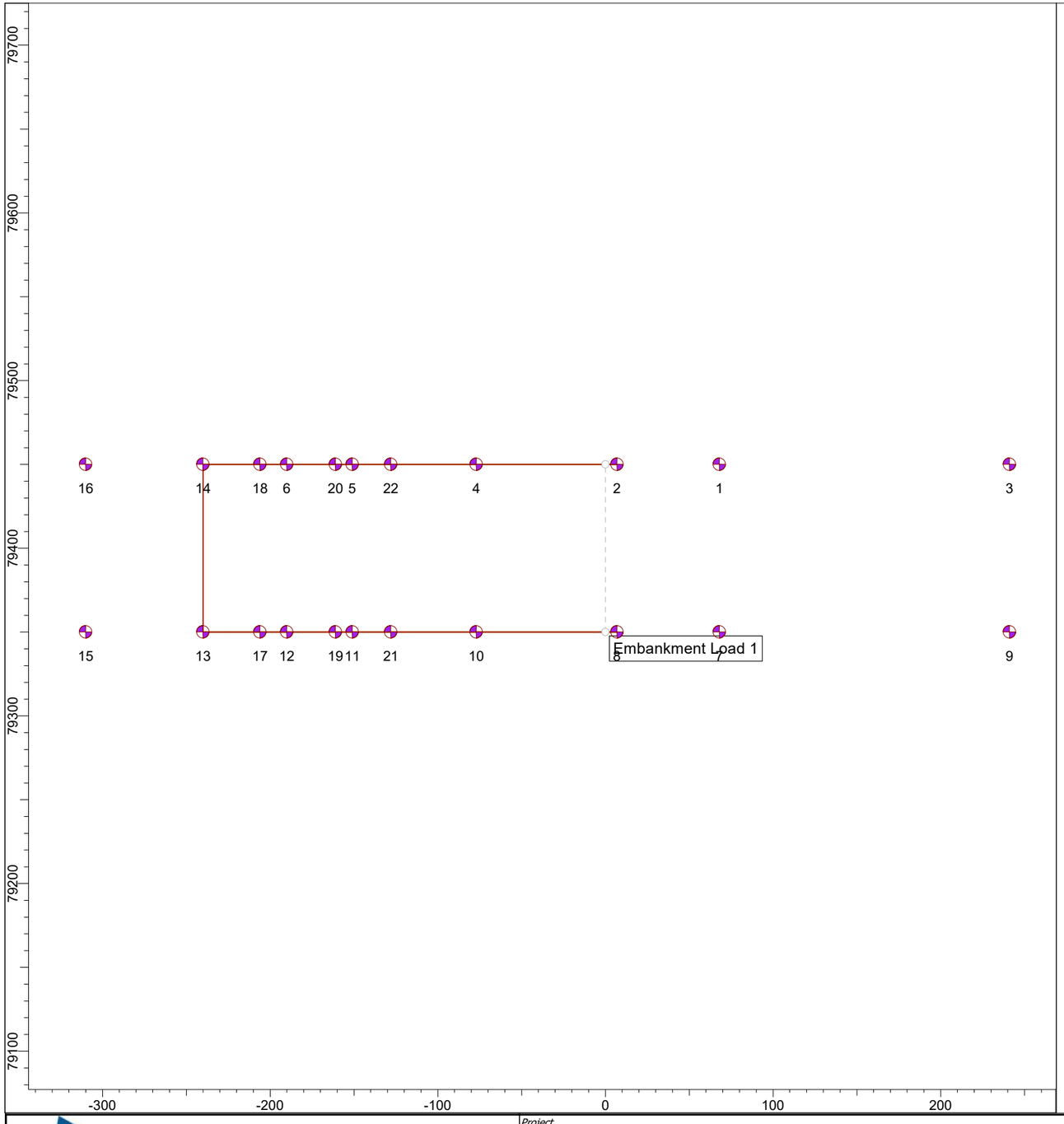
SETTLE3 5.007	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 794+00	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/23/2024, 2:17:24 PM	*File Name* Sta. 794+00 Settlement.s3z



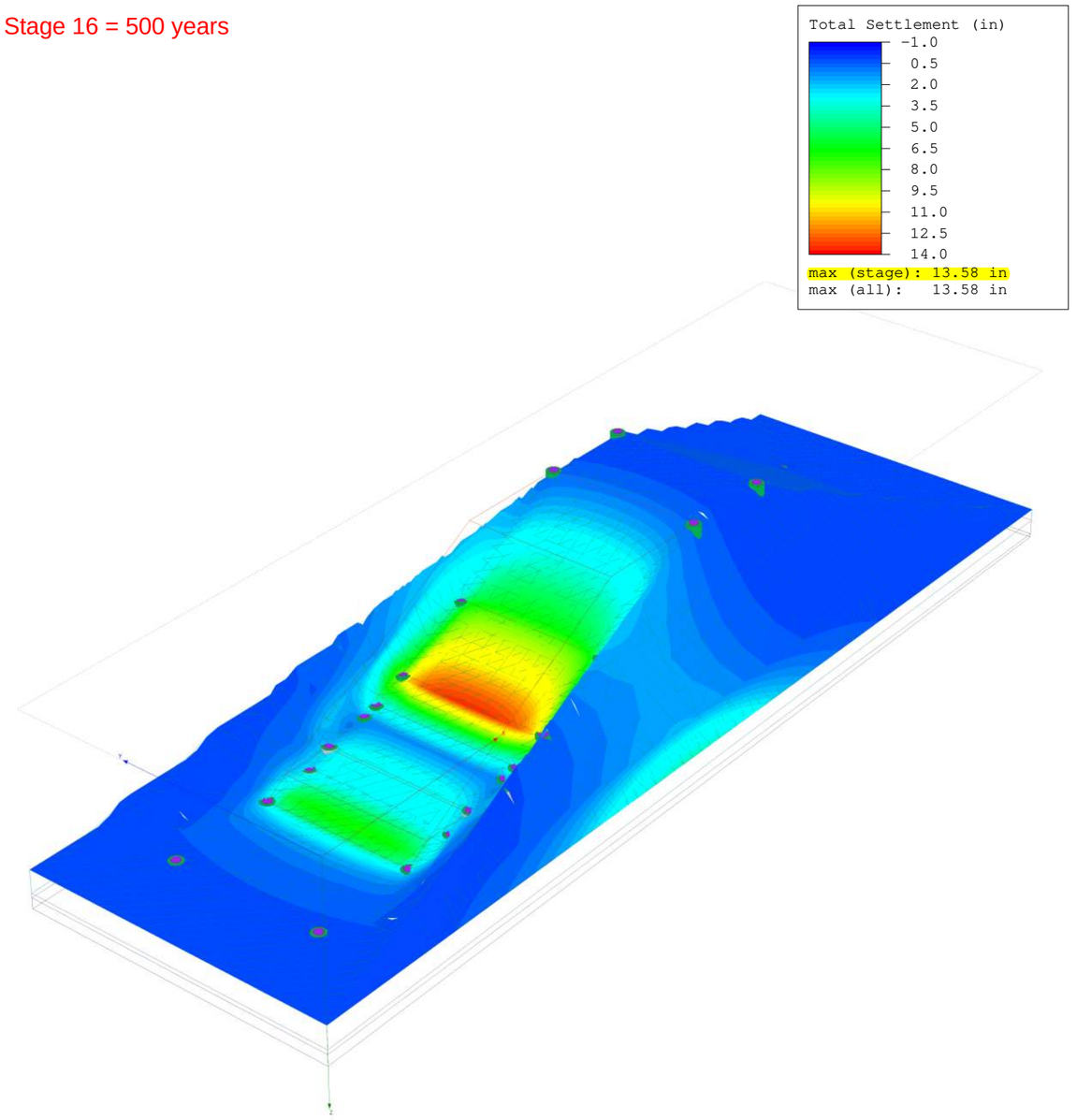
Stage 10 = 11 months



SETTLE3 5.007	Project	MEG-33-13.96	
	Analysis Description	Sta. 794+00	
	Drawn By	A. Baratta	Company HDR
	Date	4/23/2024, 2:17:24 PM	File Name Sta. 794+00 Settlement.s3z



Stage 16 = 500 years



SETTLE3 5.007	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 794+00	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/23/2024, 2:17:24 PM	*File Name* Sta. 794+00 Settlement.s3z

MEG-33-13.96
HDR
Date Created: 2024/05/09, 14:07:54

Table of Contents

Settle3 Analysis Information

MEG-33-13.96

Project Settings

Document Name	Sta. 794+00 Settlement.s3z
Project Title	MEG-33-13.96
Analysis	Sta. 794+00
Author	A. Baratta
Company	HDR
Date Created	4/23/2024, 2:17:24 PM
Stress Computation Method	Boussinesq
Time-dependent Consolidation Analysis	
Time Units	days
Permeability Units	feet/day
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

Stage #	Name	Time [days]
1	0 d	0
2	7 d	7
3	14 d	14
4	21 d	21
5	30 d (1 m)	30
6	60 d (2 m)	60
7	90 d (3 m)	90
8	183 d (6 m)	183
9	274 d (9 m)	274
10	335 d (11 m)	334
11	365 d (1 y)	365
12	1825 d (5 y)	1825
13	3650 d (10 y)	3650
14	18,250 (50 y)	18250
15	36,500 d (100 y)	36500
16	182,500 d (500 y)	182500

Results

Time taken to compute: 99.4831 seconds

Stage: 0 d = 0 d

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.380254
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.3715
Effective Stress XX [ksf]	-0.862419	7.86682
Effective Stress YY [ksf]	-0.317717	7.76451
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00182858
Pore Water Pressure [ksf]	0	6.48287
Excess Pore Water Pressure [ksf]	0	6.48287
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.0006	18
Over-consolidation Ratio	1	28434.4
Void Ratio	0	0.756
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-4.44089e-16	1.11022e-16

Stage: 7 d = 7 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.00911844	2.89298
Total Consolidation Settlement [in]	-0.00911844	2.85903
Virgin Consolidation Settlement [in]	0	2.57192
Recompression Consolidation Settlement [in]	-0.0136661	0.487973
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.3762
Effective Stress XX [ksf]	-0.846641	12.3369
Effective Stress YY [ksf]	-0.30915	10.205
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0142169	0.170466
Pore Water Pressure [ksf]	-2.68821e-37	5.97279
Excess Pore Water Pressure [ksf]	-2.68821e-37	5.97279
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993003	18
Over-consolidation Ratio	1	13082.9
Void Ratio	0	0.756027
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00233238	0.840417

Stage: 14 d = 14 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.0176544	3.89824
Total Consolidation Settlement [in]	-0.0176544	3.86429
Virgin Consolidation Settlement [in]	0	3.49984
Recompression Consolidation Settlement [in]	-0.0176544	0.633441
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.3781
Effective Stress XX [ksf]	-0.830624	12.3369
Effective Stress YY [ksf]	-0.470148	10.205
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0103725	0.170471
Pore Water Pressure [ksf]	-1.18478e-38	5.41401
Excess Pore Water Pressure [ksf]	-1.00857e-16	5.41401
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993004	18
Over-consolidation Ratio	1	13082.8
Void Ratio	0	0.756021
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00480961	0.840417

Stage: 21 d = 21 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.0188165	4.62167
Total Consolidation Settlement [in]	-0.0188165	4.58772
Virgin Consolidation Settlement [in]	0	4.16168
Recompression Consolidation Settlement [in]	-0.0513191	0.72651
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.3797
Effective Stress XX [ksf]	-0.817308	12.3369
Effective Stress YY [ksf]	-0.50991	10.205
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0114446	0.170473
Pore Water Pressure [ksf]	-1.00801e-37	4.9257
Excess Pore Water Pressure [ksf]	-1.15533e-16	4.9257
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993005	18
Over-consolidation Ratio	1	13082.8
Void Ratio	0	0.756026
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00386188	0.840417

Stage: 30 d (1 m) = 30 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.0174055	5.37102
Total Consolidation Settlement [in]	-0.0174055	5.33707
Virgin Consolidation Settlement [in]	0	4.83563
Recompression Consolidation Settlement [in]	-0.0523409	0.814673
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.3816
Effective Stress XX [ksf]	-0.804072	12.3369
Effective Stress YY [ksf]	-0.487756	10.205
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0108949	0.170474
Pore Water Pressure [ksf]	-5.67269e-39	4.77433
Excess Pore Water Pressure [ksf]	-1.15454e-16	4.77433
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993005	18
Over-consolidation Ratio	1	13082.8
Void Ratio	0	0.756031
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00333821	0.840417

Stage: 60 d (2 m) = 60 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.0010854	7.1898
Total Consolidation Settlement [in]	-0.0010854	7.15585
Virgin Consolidation Settlement [in]	0	6.47221
Recompression Consolidation Settlement [in]	-0.0185948	1.00625
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.3893
Effective Stress XX [ksf]	-0.777426	12.3369
Effective Stress YY [ksf]	-0.419023	10.205
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0106949	0.170475
Pore Water Pressure [ksf]	-3.00008e-39	4.4291
Excess Pore Water Pressure [ksf]	-1.00878e-16	4.17904
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993005	18
Over-consolidation Ratio	1	13082.8
Void Ratio	0	0.756034
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.000872876	0.840417

Stage: 90 d (3 m) = 90 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	8.46913
Total Consolidation Settlement [in]	0	8.43518
Virgin Consolidation Settlement [in]	0	7.65563
Recompression Consolidation Settlement [in]	-0.0187979	1.13525
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.3977
Effective Stress XX [ksf]	-0.762136	12.3369
Effective Stress YY [ksf]	-0.3951	10.205
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00754159	0.170476
Pore Water Pressure [ksf]	-2.29886e-39	4.02474
Excess Pore Water Pressure [ksf]	-1.57774e-16	3.66376
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.8
Void Ratio	0	0.756029
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.000732048	0.840417

Stage: 183 d (6 m) = 183 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	10.7903
Total Consolidation Settlement [in]	0	10.7563
Virgin Consolidation Settlement [in]	0	9.86939
Recompression Consolidation Settlement [in]	-0.00297507	1.40129
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.4189
Effective Stress XX [ksf]	-0.748986	12.6385
Effective Stress YY [ksf]	-0.281346	10.205
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00469214	0.170476
Pore Water Pressure [ksf]	-6.9692e-24	3.45101
Excess Pore Water Pressure [ksf]	-2.45748e-16	3.45101
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.8
Void Ratio	0	0.755999
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.000565763	0.840417

Stage: 274 d (9 m) = 274 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	11.9378
Total Consolidation Settlement [in]	0	11.9039
Virgin Consolidation Settlement [in]	0	10.9938
Recompression Consolidation Settlement [in]	-0.00110603	1.57122
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.4325
Effective Stress XX [ksf]	-0.743292	13.1001
Effective Stress YY [ksf]	-0.281346	10.3352
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0043767	0.170477
Pore Water Pressure [ksf]	-3.13399e-23	3.21422
Excess Pore Water Pressure [ksf]	-1.55782e-16	3.21422
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.8
Void Ratio	0	0.755987
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.000565763	0.840417

Stage: 335 d (11 m) = 334 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	12.4033
Total Consolidation Settlement [in]	0	12.3693
Virgin Consolidation Settlement [in]	0	11.4548
Recompression Consolidation Settlement [in]	-0.000184086	1.6556
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.4387
Effective Stress XX [ksf]	-0.740781	13.3079
Effective Stress YY [ksf]	-0.281346	10.543
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00418595	0.170477
Pore Water Pressure [ksf]	-3.20688e-23	3.06574
Excess Pore Water Pressure [ksf]	-2.4462e-16	3.06574
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.8
Void Ratio	0	0.755987
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.840417

Stage: 365 d (1 y) = 365 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	12.5864
Total Consolidation Settlement [in]	0	12.5524
Virgin Consolidation Settlement [in]	0	11.6367
Recompression Consolidation Settlement [in]	-0.000570904	1.69294
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.4413
Effective Stress XX [ksf]	-0.739757	13.3977
Effective Stress YY [ksf]	-0.281346	10.6329
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0040845	0.170477
Pore Water Pressure [ksf]	-5.56859e-23	2.98459
Excess Pore Water Pressure [ksf]	-2.44502e-16	2.98459
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.8
Void Ratio	0	0.755986
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.840417

Stage: 1825 d (5 y) = 1825 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	13.5837
Total Consolidation Settlement [in]	0	13.5497
Virgin Consolidation Settlement [in]	0	12.6321
Recompression Consolidation Settlement [in]	-0.000147139	2.19909
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.4936
Effective Stress XX [ksf]	-0.733774	14.3306
Effective Stress YY [ksf]	-0.281346	11.5657
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00148819	0.170477
Pore Water Pressure [ksf]	-0.00591849	1.35414
Excess Pore Water Pressure [ksf]	-0.00676881	0.849251
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.7
Void Ratio	0	0.755986
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.840417

Stage: 3650 d (10 y) = 3650 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	13.5842
Total Consolidation Settlement [in]	0	13.5503
Virgin Consolidation Settlement [in]	0	12.6326
Recompression Consolidation Settlement [in]	-0.000139778	2.28824
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.4962
Effective Stress XX [ksf]	-0.733771	14.3495
Effective Stress YY [ksf]	-0.281346	11.5847
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.000424688	0.170477
Pore Water Pressure [ksf]	-0.0064969	1.35408
Excess Pore Water Pressure [ksf]	-0.00741615	0.257002
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.7
Void Ratio	0	0.755986
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.840417

Stage: 18,250 (50 y) = 18250 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	13.5842
Total Consolidation Settlement [in]	0	13.5503
Virgin Consolidation Settlement [in]	0	12.6326
Recompression Consolidation Settlement [in]	-0.000152035	2.29633
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.4962
Effective Stress XX [ksf]	-0.733771	14.3497
Effective Stress YY [ksf]	-0.281346	11.5848
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-8.56593e-07	0.170477
Pore Water Pressure [ksf]	-0.0107699	1.35408
Excess Pore Water Pressure [ksf]	-0.0197588	0.00786865
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.7
Void Ratio	0	0.755986
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.840417

Stage: 36,500 d (100 y) = 36500 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	13.5842
Total Consolidation Settlement [in]	0	13.5503
Virgin Consolidation Settlement [in]	0	12.6326
Recompression Consolidation Settlement [in]	-0.00015211	2.29633
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.4962
Effective Stress XX [ksf]	-0.733771	14.3497
Effective Stress YY [ksf]	-0.281346	11.5848
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-2.15891e-09	0.170477
Pore Water Pressure [ksf]	-0.0107172	1.35408
Excess Pore Water Pressure [ksf]	-0.0196852	0.00792529
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.7
Void Ratio	0	0.755986
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.840417

Stage: 182,500 d (500 y) = 182500 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	13.5842
Total Consolidation Settlement [in]	0	13.5503
Virgin Consolidation Settlement [in]	0	12.6326
Recompression Consolidation Settlement [in]	-0.000152179	2.29633
Immediate Settlement [in]	0	0.380254
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	6.48287
Loading Stress XX [ksf]	-2.78242	6.43617
Loading Stress YY [ksf]	-0.643095	3.67332
Effective Stress ZZ [ksf]	0	12.4962
Effective Stress XX [ksf]	-0.733771	14.3497
Effective Stress YY [ksf]	-0.281346	11.5848
Total Stress ZZ [ksf]	0	13.1386
Total Stress XX [ksf]	-0.654891	14.3497
Total Stress YY [ksf]	-0.281346	11.5848
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.170477
Pore Water Pressure [ksf]	-0.0106675	1.35408
Excess Pore Water Pressure [ksf]	-0.0196149	0.00797884
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000993006	18
Over-consolidation Ratio	1	13082.7
Void Ratio	0	0.755986
Permeability [ft/d]	0	2.39786
Coefficient of Consolidation [ft^2/d]	0	0.5
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.840417

Embankments

1. Embankment: "Embankment Load 1"

Label	Embankment Load 1
Center Line	(0, 79350) to (0, 79450)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Zones	5
Number of Sections	2

Zone	Name	Unit Weight (kips/ft3)
1	New Zone	0.115
2	New Zone 2	0.115
3	New Zone 3	0.115
4	New Zone 4	0.135
5	New Zone 5	0.125

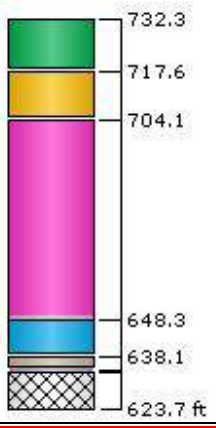
Soil Layers

Ground Surface Drained: Yes

RT Crest (B-002-0-23/CU-07)

XY Location: RT Crest (B-002-0-23/CU-07): (68, 79350)

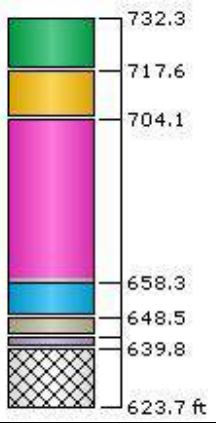
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	14.7	-732.3	No
2	2. V. Stiff Embankment Fill	13.5	-717.6	No
3	3. V. Stiff to Hard Embankment Fill	55.8	-704.1	Yes
4	Rock Fill	0	-648.3	Yes
5	4. M. Stiff to Stiff Cohesive	10.2	-648.3	No
6	5. Stiff Cohesive	3.9	-638.1	No
7	6. V. Stiff to Hard Cohesive	0.3	-634.2	No



LT Crest (B-002-0-23/CU-07)

Header for point on following page (software output limitation)

XY Location:		LT Crest (B-002-0-23/CU-07): (7, 79350)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	14.7	-732.3	No
2	2. V. Stiff Embankment Fill	13.5	-717.6	No
3	3. V. Stiff to Hard Embankment Fill	45.8	-704.1	Yes
4	Rock Fill	0	-658.3	Yes
5	4. M. Stiff to Stiff Cohesive	9.8	-658.3	No
6	5. Stiff Cohesive	5.3	-648.5	No
7	6. V. Stiff to Hard Cohesive	3.4	-643.2	No

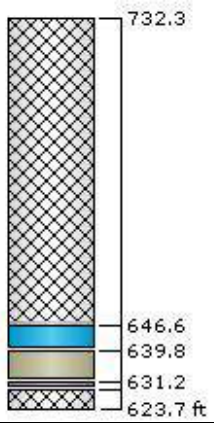


RT Toe (CU-07A)

Header for point on following page (software output limitation)

XY Location: RT Toe (CU-07A): (241, 79350)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-646.6	No
2	2. V. Stiff Embankment Fill	0	-646.6	No
3	3. V. Stiff to Hard Embankment Fill	0	-646.6	Yes
4	Rock Fill	0	-646.6	Yes
5	4. M. Stiff to Stiff Cohesive	6.8	-646.6	No
6	5. Stiff Cohesive	8.6	-639.8	No
7	6. V. Stiff to Hard Cohesive	2	-631.2	No

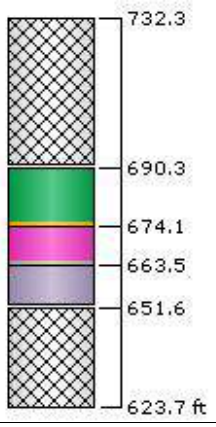


LT Slope (B-002-2-23)

Header for point on following page (software output limitation)

XY Location: LT Slope (B-002-2-23): (-77, 79350)

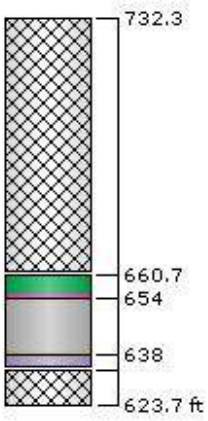
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	16.2	-690.3	No
2	2. V. Stiff Embankment Fill	0	-674.1	No
3	3. V. Stiff to Hard Embankment Fill	10.6	-674.1	Yes
4	Rock Fill	0	-663.5	Yes
5	4. M. Stiff to Stiff Cohesive	0	-663.5	No
6	5. Stiff Cohesive	0	-663.5	No
7	6. V. Stiff to Hard Cohesive	11.9	-663.5	No



LT Toe (CU-07B)

Header for point on following page (software output limitation)

XY Location:		LT Toe (CU-07B): (-151, 79350)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	6.7	-660.7	No
2	2. V. Stiff Embankment Fill	0	-654	No
3	3. V. Stiff to Hard Embankment Fill	0	-654	Yes
4	Rock Fill	16	-654	Yes
5	4. M. Stiff to Stiff Cohesive	0	-638	No
6	5. Stiff Cohesive	0	-638	No
7	6. V. Stiff to Hard Cohesive	4.6	-638	No

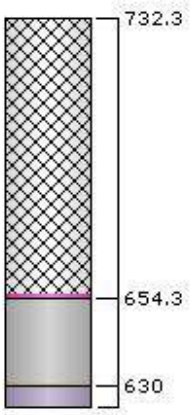


LT Base (CU-07B)

Header for point on following page (software output limitation)

XY Location: LT Base (CU-07B): (-190, 79350)

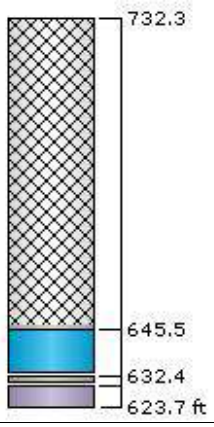
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-654.3	No
2	2. V. Stiff Embankment Fill	0	-654.3	No
3	3. V. Stiff to Hard Embankment Fill	0	-654.3	Yes
4	Rock Fill	24.3	-654.3	Yes
5	4. M. Stiff to Stiff Cohesive	0	-630	No
6	5. Stiff Cohesive	0.1	-630	No
7	6. V. Stiff to Hard Cohesive	6.2	-629.9	No



LT New Toe (CU-07B)

Header for point on following page (software output limitation)

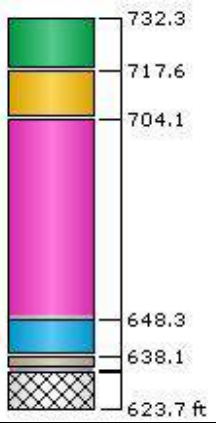
XY Location:			LT New Toe (CU-07B): (-240, 79350)	
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-645.5	No
2	2. V. Stiff Embankment Fill	0	-645.5	No
3	3. V. Stiff to Hard Embankment Fill	0	-645.5	Yes
4	Rock Fill	0	-645.5	Yes
5	4. M. Stiff to Stiff Cohesive	13.1	-645.5	No
6	5. Stiff Cohesive	2.5	-632.4	No
7	6. V. Stiff to Hard Cohesive	6.2	-629.9	No



RT Crest 2 (B-002-0-23/CU-07)

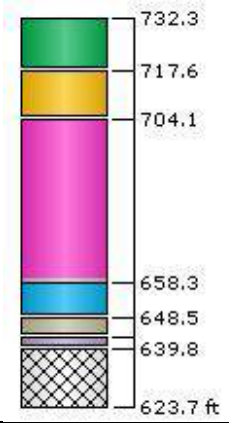
Header for point on following page (software output limitation)

XY Location:		RT Crest 2 (B-002-0-23/CU-07): (68, 79450)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	14.7	-732.3	No
2	2. V. Stiff Embankment Fill	13.5	-717.6	No
3	3. V. Stiff to Hard Embankment Fill	55.8	-704.1	Yes
4	Rock Fill	0	-648.3	Yes
5	4. M. Stiff to Stiff Cohesive	10.2	-648.3	No
6	5. Stiff Cohesive	3.9	-638.1	No
7	6. V. Stiff to Hard Cohesive	0.3	-634.2	No



LT Crest 2 (B-002-0-23/CU-07) Header for point on following page (software output limitation)

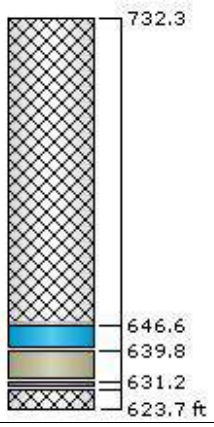
XY Location:		LT Crest 2 (B-002-0-23/CU-07): (7, 79450)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	14.7	-732.3	No
2	2. V. Stiff Embankment Fill	13.5	-717.6	No
3	3. V. Stiff to Hard Embankment Fill	45.8	-704.1	Yes
4	Rock Fill	0	-658.3	Yes
5	4. M. Stiff to Stiff Cohesive	9.8	-658.3	No
6	5. Stiff Cohesive	5.3	-648.5	No
7	6. V. Stiff to Hard Cohesive	3.4	-643.2	No



RT Toe 2 (CU-07A)

Header for point on following page (software output limitation)

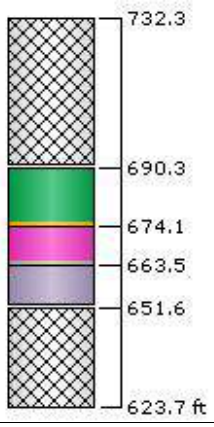
XY Location:		RT Toe 2 (CU-07A): (241, 79450)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-646.6	No
2	2. V. Stiff Embankment Fill	0	-646.6	No
3	3. V. Stiff to Hard Embankment Fill	0	-646.6	Yes
4	Rock Fill	0	-646.6	Yes
5	4. M. Stiff to Stiff Cohesive	6.8	-646.6	No
6	5. Stiff Cohesive	8.6	-639.8	No
7	6. V. Stiff to Hard Cohesive	2	-631.2	No



LT Slope 2 (B-002-2-23)

Header for point on following page (software output limitation)

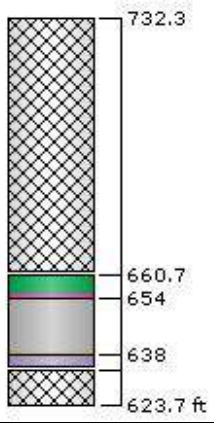
XY Location:		LT Slope 2 (B-002-2-23): (-77, 79450)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	16.2	-690.3	No
2	2. V. Stiff Embankment Fill	0	-674.1	No
3	3. V. Stiff to Hard Embankment Fill	10.6	-674.1	Yes
4	Rock Fill	0	-663.5	Yes
5	4. M. Stiff to Stiff Cohesive	0	-663.5	No
6	5. Stiff Cohesive	0	-663.5	No
7	6. V. Stiff to Hard Cohesive	11.9	-663.5	No



LT Toe 2 (CU-07B)

Header for point on following page (software output limitation)

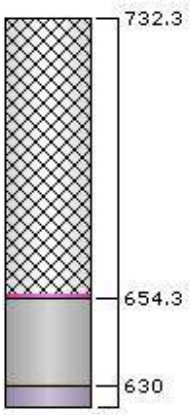
XY Location:		LT Toe 2 (CU-07B): (-151, 79450)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	6.7	-660.7	No
2	2. V. Stiff Embankment Fill	0	-654	No
3	3. V. Stiff to Hard Embankment Fill	0	-654	Yes
4	Rock Fill	16	-654	Yes
5	4. M. Stiff to Stiff Cohesive	0	-638	No
6	5. Stiff Cohesive	0	-638	No
7	6. V. Stiff to Hard Cohesive	4.6	-638	No



LT Base 2 (CU-07B)

Header for point on following page (software output limitation)

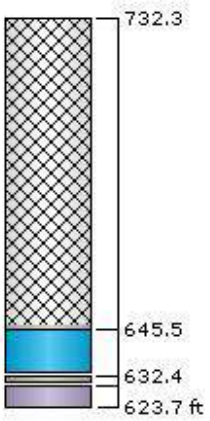
XY Location:		LT Base 2 (CU-07B): (-190, 79450)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-654.3	No
2	2. V. Stiff Embankment Fill	0	-654.3	No
3	3. V. Stiff to Hard Embankment Fill	0	-654.3	Yes
4	Rock Fill	24.3	-654.3	Yes
5	4. M. Stiff to Stiff Cohesive	0	-630	No
6	5. Stiff Cohesive	0.1	-630	No
7	6. V. Stiff to Hard Cohesive	6.2	-629.9	No



LT New Toe 2 (CU-07B)

Header for point on following page (software output limitation)

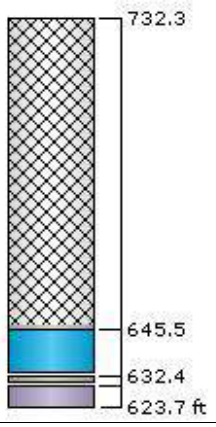
XY Location:		LT New Toe 2 (CU-07B): (-240, 79450)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-645.5	No
2	2. V. Stiff Embankment Fill	0	-645.5	No
3	3. V. Stiff to Hard Embankment Fill	0	-645.5	Yes
4	Rock Fill	0	-645.5	Yes
5	4. M. Stiff to Stiff Cohesive	13.1	-645.5	No
6	5. Stiff Cohesive	2.5	-632.4	No
7	6. V. Stiff to Hard Cohesive	6.2	-629.9	No



LT Far (CU-07B) ← Header for point on following page (software output limitation)

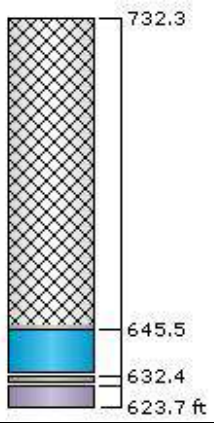
XY Location: LT Far (CU-07B): (-310, 79350)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-645.5	No
2	2. V. Stiff Embankment Fill	0	-645.5	No
3	3. V. Stiff to Hard Embankment Fill	0	-645.5	Yes
4	Rock Fill	0	-645.5	Yes
5	4. M. Stiff to Stiff Cohesive	13.1	-645.5	No
6	5. Stiff Cohesive	2.5	-632.4	No
7	6. V. Stiff to Hard Cohesive	6.2	-629.9	No



LT Far 2 (CU-07B) ← Header for point on following page (software output limitation)

XY Location:		LT Far 2 (CU-07B): (-310, 79450)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-645.5	No
2	2. V. Stiff Embankment Fill	0	-645.5	No
3	3. V. Stiff to Hard Embankment Fill	0	-645.5	Yes
4	Rock Fill	0	-645.5	Yes
5	4. M. Stiff to Stiff Cohesive	13.1	-645.5	No
6	5. Stiff Cohesive	2.5	-632.4	No
7	6. V. Stiff to Hard Cohesive	6.2	-629.9	No

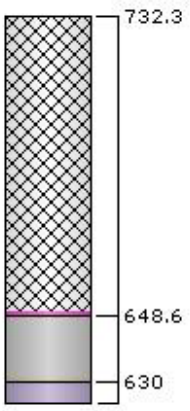


LT Far Shear Key (CU-07B)

Header for point on following page (software output limitation)

XY Location: LT Far Shear Key (CU-07B): (-206, 79350)

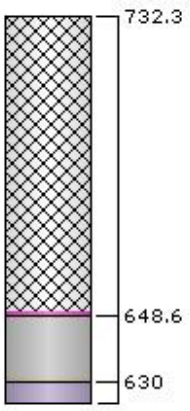
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-648.6	No
2	2. V. Stiff Embankment Fill	0	-648.6	No
3	3. V. Stiff to Hard Embankment Fill	0	-648.6	Yes
4	Rock Fill	18.6	-648.6	Yes
5	4. M. Stiff to Stiff Cohesive	0	-630	No
6	5. Stiff Cohesive	0.1	-630	No
7	6. V. Stiff to Hard Cohesive	6.2	-629.9	No



LT Far Shear Key 2 (CU-07B)

Header for point on following page (software output limitation)

XY Location:		LT Far Shear Key 2 (CU-07B): (-206, 79450)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-648.6	No
2	2. V. Stiff Embankment Fill	0	-648.6	No
3	3. V. Stiff to Hard Embankment Fill	0	-648.6	Yes
4	Rock Fill	18.6	-648.6	Yes
5	4. M. Stiff to Stiff Cohesive	0	-630	No
6	5. Stiff Cohesive	0.1	-630	No
7	6. V. Stiff to Hard Cohesive	6.2	-629.9	No

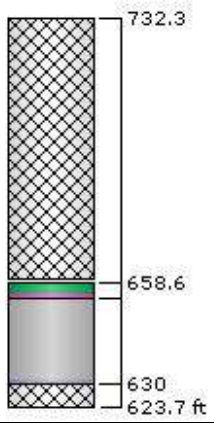


LT Near Shear Key (CU-07B)

Header for point on following page (software output limitation)

XY Location: LT Near Shear Key (CU-07B): (-161, 79350)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	4.6	-658.6	No
2	2. V. Stiff Embankment Fill	0	-654	No
3	3. V. Stiff to Hard Embankment Fill	0	-654	Yes
4	Rock Fill	24	-654	Yes
5	4. M. Stiff to Stiff Cohesive	0	-630	No
6	5. Stiff Cohesive	0	-630	No
7	6. V. Stiff to Hard Cohesive	0	-630	No

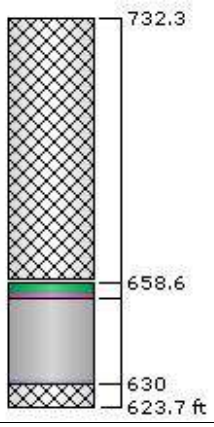


LT Near Shear Key 2 (CU-07B)

Header for point on following page (software output limitation)

XY Location: LT Near Shear Key 2 (CU-07B): (-161, 79450)

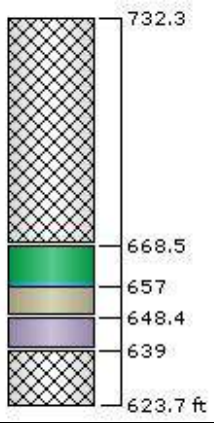
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	4.6	-658.6	No
2	2. V. Stiff Embankment Fill	0	-654	No
3	3. V. Stiff to Hard Embankment Fill	0	-654	Yes
4	Rock Fill	24	-654	Yes
5	4. M. Stiff to Stiff Cohesive	0	-630	No
6	5. Stiff Cohesive	0	-630	No
7	6. V. Stiff to Hard Cohesive	0	-630	No



LT Shear Key (B-002-1-23/CU-07B) ← Header for point on following page (software output limitation)

XY Location: LT Shear Key (B-002-1-23/CU-07B): (-128, 79350)

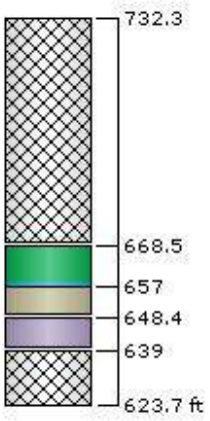
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	11.5	-668.5	No
2	2. V. Stiff Embankment Fill	0	-657	No
3	3. V. Stiff to Hard Embankment Fill	0	-657	Yes
4	Rock Fill	0	-657	Yes
5	4. M. Stiff to Stiff Cohesive	0	-657	No
6	5. Stiff Cohesive	8.6	-657	No
7	6. V. Stiff to Hard Cohesive	9.4	-648.4	No



LT Shear Key 2 (B-002-1-23/CU-07B) ← Header for point on following page (software output limitation)

XY Location: LT Shear Key 2 (B-002-1-23/CU-07B): (-128, 79450)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	11.5	-668.5	No
2	2. V. Stiff Embankment Fill	0	-657	No
3	3. V. Stiff to Hard Embankment Fill	0	-657	Yes
4	Rock Fill	0	-657	Yes
5	4. M. Stiff to Stiff Cohesive	0	-657	No
6	5. Stiff Cohesive	8.6	-657	No
7	6. V. Stiff to Hard Cohesive	9.4	-648.4	No



Soil Properties

Property	1. M. Stiff to Stiff Embankment Fill	2. V. Stiff Embankment Fill	3. V. Stiff to Hard Embankment Fill	4. M. Stiff to Stiff Cohesive
Color				
Unit Weight [kips/ft3]	0.12	0.13	0.14	0.12
Saturated Unit Weight [kips/ft3]	0.125	0.135	0.145	0.125
K0	0.63	0.58	0.55	0.64
Primary Consolidation	Enabled	Enabled	Enabled	Enabled
Material Type	Non-Linear	Non-Linear	Non-Linear	Non-Linear
Cc	0.181	0.203	0.194	0.194
Cr	0.018	0.02	0.019	0.019
e0	0.681	0.444	0.362	0.756
Pc [ksf]	18	18	18	-
OCR	-	-	-	1
Cv [ft2/d]	0.13	0.11	0.12	0.48
Cvr [ft2/d]	0.13	0.11	0.12	0.48
B-bar	1	1	1	1
Undrained Su A [kips/ft2]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Property	5. Stiff Cohesive	6. V. Stiff to Hard Cohesive	Rock Fill
Color			
Unit Weight [kips/ft3]	0.125	0.135	0.135
Saturated Unit Weight [kips/ft3]	0.13	0.14	0.14
K0	0.61	0.56	0.38
Immediate Settlement	Disabled	Disabled	Enabled
Es [ksf]	-	-	2800
Esur [ksf]	-	-	2800
Primary Consolidation	Enabled	Enabled	Disabled
Material Type	Non-Linear	Non-Linear	
Cc	0.234	0.189	-
Cr	0.023	0.019	-
e0	0.58	0.416	-
OCR	1	1	-
Cv [ft2/d]	0.38	0.5	-
Cvr [ft2/d]	0.38	0.5	-
B-bar	1	1	-
Undrained Su A [kips/ft2]	0	0	0
Undrained Su S	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8
Piezo Line ID	1	1	1

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft3
Generating excess pore pressure above water table	

Piezometric Line Entities

ID	Depth (ft)
1	-645.4 ft

Field Point Grid

Number of points	2287
Expansion Factor	1

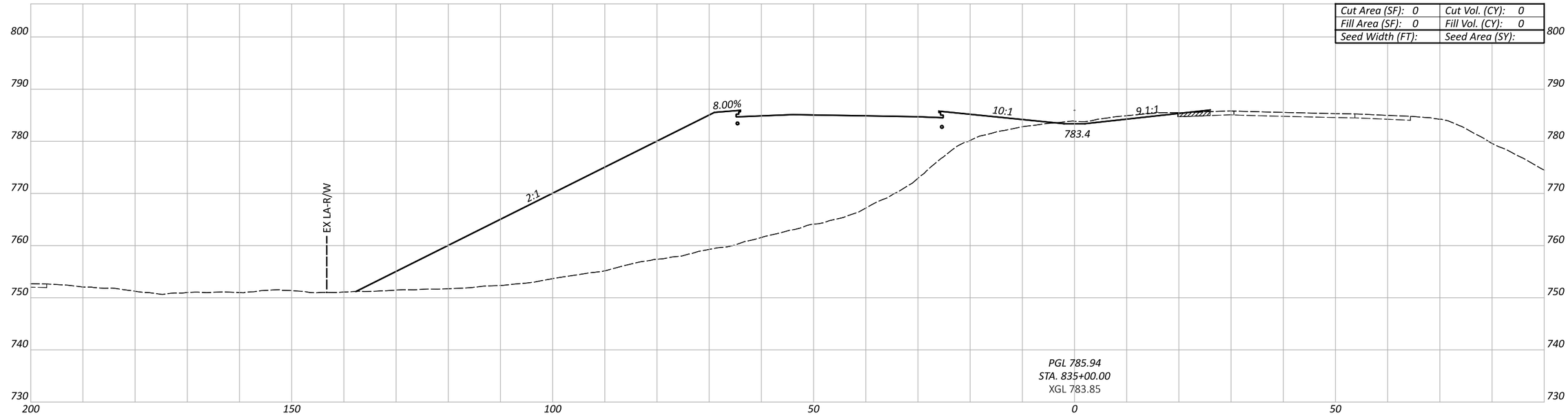
Grid Coordinates

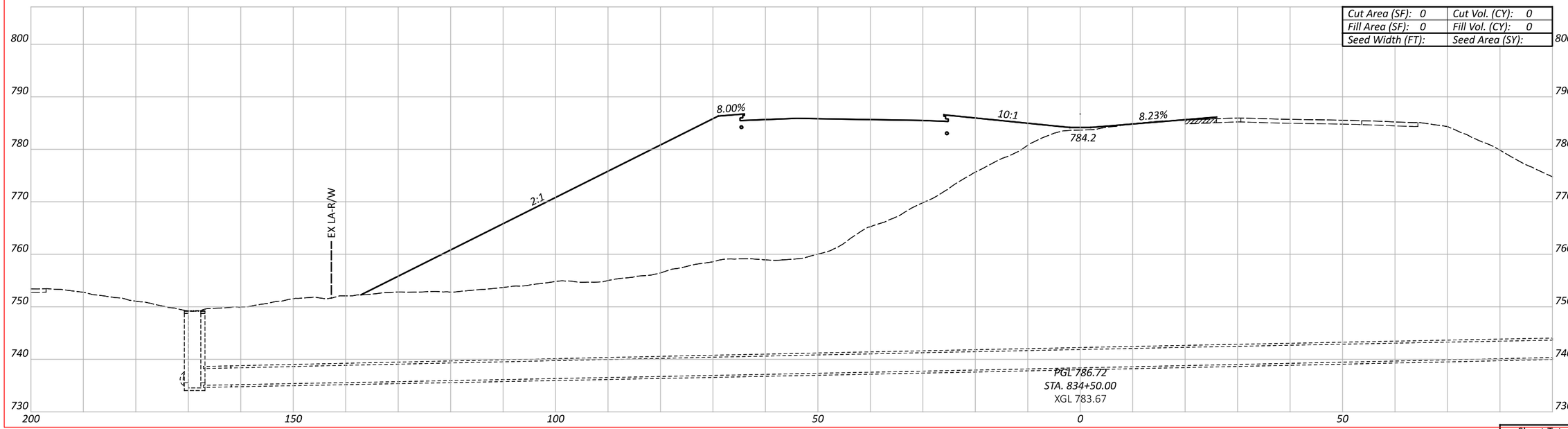
X [ft]	Y [ft]
294.515	79503.5
294.515	79296.5
-363.515	79296.5
-363.515	79503.5

Sta. 834+50

References

Proposed cross-section at Sta. 834+50





CTY-RTE-SECTION

SHEET TITLE
SHEET SUB-TITLE

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY

DESIGNER: XXX

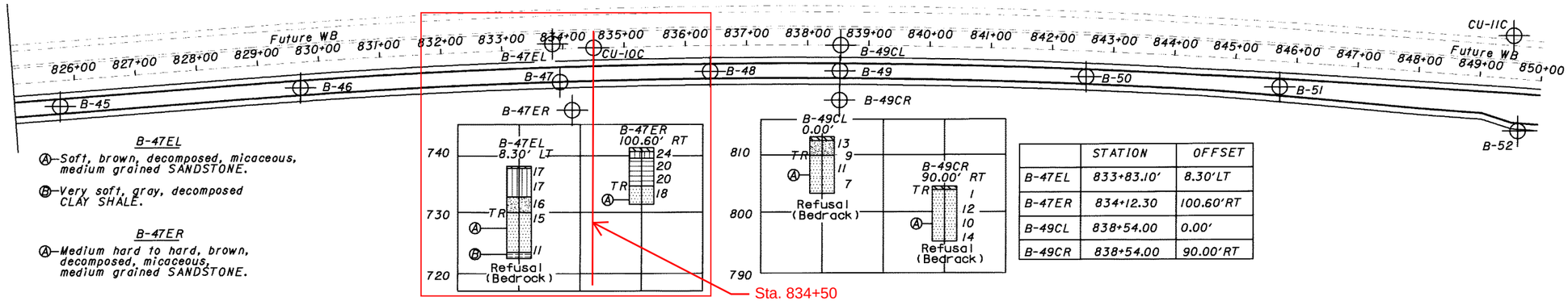
REVIEWER: XXX MM-DD-YY

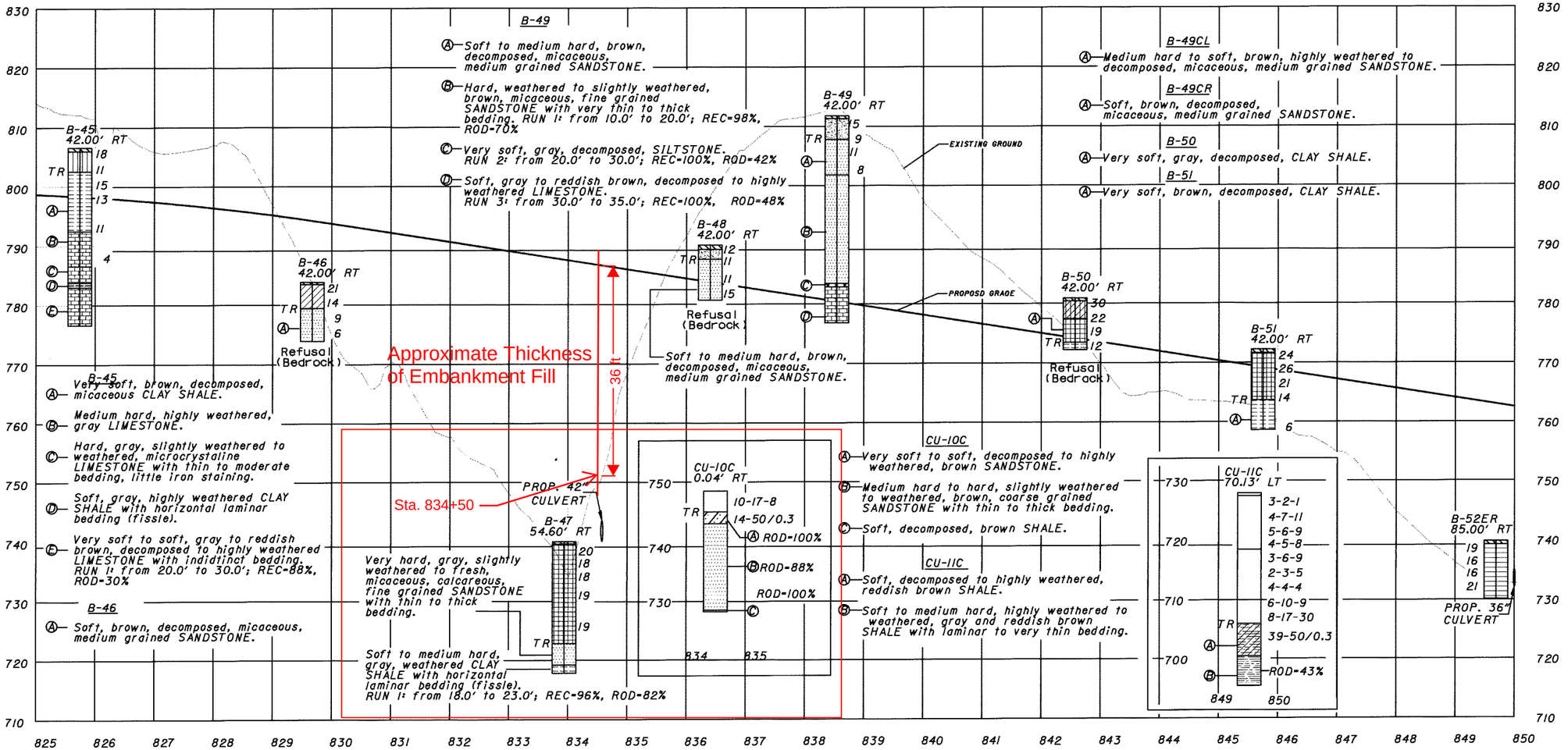
PROJECT ID: 0

SHEET: P.0 TOTAL: 0

Historic Subsurface Explorations

From "Geotech - 19718/Soil Profile Begin 5 pts.pdf"





SOIL PROFILE

MEG-124-22.72

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Historic Subsurface Explorations

SUMMARY OF SOIL TEST DATA

NOTE: NP SHOWN IN LIQUID LIMIT AND PLASTICITY INDEX COLUMNS INDICATES THAT THE MATERIAL IS NON-PLASTIC
** DENOTES SAMPLE TAKEN AT OR NEAR GRADE.

Station & Offset	Depth From	Depth To	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I.	% W.C.	OOOT Class
806+88.00, 42.00' RT (B-40)	1.00	2.50	0	2	63		35*	NP	NP	15	A-3a
	3.50	5.00	BROWN, DECOMPOSED SANOSTONE							11	VISUAL
	6.00	7.50	BROWN, DECOMPOSED SANDSTONE							11	VISUAL
	8.50	9.50	BROWN, DECOMPOSED SANDSTONE							10	VISUAL
806+88.00, 55.00' RT (B-40CL1)	1.00	2.50	BROWN CLAY							29	VISUAL
	3.50	5.00	D	1	6		94*	40	14	17	A-6a
	6.00	7.50	0	1	2		97*	39	15	14	A-6a
806+88.00, 05.00' RT (B-40CL2)	1.00	2.50	BROWN, DECOMPOSED SANOSTONE							12	VISUAL
	3.50	5.00	BROWN, DECOMPOSED SANOSTONE							11	VISUAL
	6.00	7.50	0	4	61		35*	NP	NP	9	A-3a
806+88.00, 100.00' RT (B-40CR1)	1.00	2.50	BROWN, DECOMPOSED SANOSTONE							17	VISUAL
	3.50	5.00	BROWN, DECOMPOSED SANOSTONE							13	VISUAL
	6.00	7.50	BROWN, DECOMPOSED SANOSTONE							12	VISUAL
	8.50	10.00	0	16	57		27*			12	A-3a
812+77.30, 22.20' RT (B-41)	1.00	2.50	1	1	1		96*	61	31	29	A-7-5
	3.50	5.00	REDDISH BROWN, DECOMPOSED CLAY SHALE							16	VISUAL
	6.00	7.50	REDDISH BROWN, DECOMPOSED CLAY SHALE							9	VISUAL
817+70.00, 80.00' RT (B-43)	1.00	2.50	0	2	11		87*	30	11	26	A-6a
	3.50	5.00	BROWN SILT AND CLAY							22	VISUAL
	6.00	7.50	BROWN SILT AND CLAY							14	VISUAL
	8.50	10.00	BROWN SILT AND CLAY							13	VISUAL
	13.50	15.00	3	0	0		96*	56	28	54	A-7-6
	18.50	20.00	BROWN CLAY							37	VISUAL
	23.50	25.00	BROWN CLAY							27	VISUAL
817+70.00, 15.00' RT (B-43L)	1.00	2.50	BROWN SILT AND CLAY							14	VISUAL
	3.50	5.00	D	2	12		86*	31	13	20	A-6a
	6.00	7.50	BROWN SILT AND CLAY							20	VISUAL
	8.50	10.50	BROWN SILT AND CLAY							29	VISUAL
	13.50	15.00	0	D	D		100*	59	30	33	A-7-6
	18.50	20.00	BROWN CLAY							29	VISUAL
817+70.00, 42.00' RT (B-43R)	1.00	2.50	4	3	21	43	28	26	9	20	A-4a
	3.50	5.00	BROWN SANDY SILT							9	VISUAL
	6.00	7.50	BROWN SANDY SILT							22	VISUAL
	8.50	10.00	BROWN ELASTIC CLAY							30	VISUAL
	13.50	15.00	0	D	0		99*	60	29	34	A-7-5
	18.50	20.00	REDDISH BROWN ELASTIC CLAY							28	VISUAL
821+80.00, 42.00' RT (B-44)	1.00	2.50	0	0	1		98*	73	41	27	A-7-5
	3.50	5.00	REDDISH BROWN, DECOMPOSED CLAY SHALE							18	VISUAL
	6.00	7.50	REDDISH BROWN, DECOMPOSED CLAY SHALE							12	VISUAL
	8.50	10.00	GRAY, HIGHLY WEATHERED CLAY SHALE							9	VISUAL
	13.50	15.00	GRAY, WEATHERED SILTSTONE							5	VISUAL
825+74.00, 42.00' RT (B-45)	1.00	2.50	8	5	28	36	23	24	4	18	A-4a
	3.50	5.00	BROWN, DECOMPOSED CLAY SHALE							11	VISUAL
	6.00	7.50	BROWN, DECOMPOSED CLAY SHALE							15	VISUAL
	8.50	10.00	BROWN, DECOMPOSED CLAY SHALE							13	VISUAL*
	13.50	15.00	BROWN, DECOMPOSED CLAY SHALE							11	VISUAL
	18.50	20.00	GRAY, HIGHLY WEATHERED SANDSTONE							4	VISUAL
829+67.00, 42.00' RT (B-46)	1.00	2.50	0	1	13		86*	32	12	21	A-6a
	3.50	5.00	BROWN, DECOMPOSED SANDSTONE							14	VISUAL
	6.00	7.50	BROWN, DECOMPOSED SANDSTONE							9	VISUAL
	8.50	10.00	BROWN, HIGHLY WEATHERED SANDSTONE							6	VISUAL
833+94.00, 54.60' RT (B-47)	1.00	2.50	0	1	24		75*	42	19	20	A-7-6
	3.50	5.00	BROWN CLAY							18	VISUAL
	6.00	7.50	0	1	20		79*	41	19	18	A-7-6
	8.50	10.00	BROWN CLAY							19	VISUAL
	13.50	15.00	BROWN CLAY							19	VISUAL
833+83.10, 08.30' LT (B-47EL)	1.00	2.50	BROWN SANDY SILT							17	VISUAL
	3.50	5.00	BROWN SANDY SILT							17	VISUAL
	6.00	7.50	10	11	50		29*			16	A-3a
	8.50	10.00	BROWN, DECOMPOSED SANDSTONE							15	VISUAL
	13.50	15.00	GRAY, DECOMPOSED CLAY SHALE							11	VISUAL
834+12.30, 100.60' RT (B-47ER)	1.00	2.50	BROWN SANDY SILT							24	VISUAL
	3.50	5.00	BROWN SILTY CLAY							20	VISUAL
	6.00	7.50	0	1	35		64*	39	22	20	A-6b
	8.50	10.00	BROWN, DECOMPOSED SANDSTONE							18	VISUAL
836+40.00, 42.00' RT (B-48)	1.00	2.50	0	4	71		25*	NP	NP	12	A-3a
	3.50	5.00	BROWN, DECOMPOSED SANDSTONE							11	VISUAL
	6.00	7.50	BROWN, DECOMPOSED SANDSTONE							11	VISUAL*
	8.50	10.00	DARK BROWN, DECOMPOSED SANDSTONE							15	VISUAL
838+54.00, 42.00' RT (B-49)	1.00	2.50	0	4	63		33*			15	A-3a
	3.50	5.00	BROWN, DECOMPOSED SANDSTONE							9	VISUAL
	6.00	7.50	BROWN, DECOMPOSED SANDSTONE							11	VISUAL
	8.50	10.00	BROWN, HIGHLY WEATHERED SANDSTONE							8	VISUAL
838+54.00, 00.00' RT (B-49CL)	1.00	2.50	BROWN COARSE AND FINE SAND							13	VISUAL
	3.50	5.00	13	22	42		23*			9	A-3a
	6.00	7.50	BROWN, DECOMPOSED SANDSTONE							11	VISUAL
	8.50	10.00	BROWN, HIGHLY WEATHERED SANDSTONE							7	VISUAL
838+54.00, 90.00' RT (B-49CR)	1.00	2.50	BROWN, DECOMPOSED SANDSTONE							11	VISUAL
	3.50	5.00	BROWN, DECOMPOSED SANDSTONE							12	VISUAL
	6.00	7.50	BROWN, DECOMPOSED SANDSTONE							10	VISUAL
	8.50	8.90	12	16	46		25*			14	A-3a
842+57.00, 42.00' RT (B-50)	1.00	2.50	0	1	1		98*	58	28	30	A-7-5
	3.50	5.00	REDDISH BROWN CLAY							22	VISUAL
	6.00	7.50	REDDISH BROWN CLAY							19	VISUAL*
	8.50	8.70	GRAY, DECOMPOSED CLAY SHALE							12	VISUAL
845+75.00, 42.00' RT (B-51)	1.00	2.50	4	4	8		85*	51	25	24	A-7-6
	3.50	5.00	REDDISH BROWN CLAY							26	VISUAL*
	6.00	7.50	REDDISH BROWN CLAY							21	VISUAL
	8.50	10.00	BROWN, DECOMPOSED CLAY SHALE							14	VISUAL
	13.50	13.60	BROWN, DECOMPOSED CLAY SHALE							6	VISUAL
849+69.00, 85.00' RT (B-52ER)	1.00	2.50	BROWN SILTY CLAY							19	VISUAL
	3.50	5.00	5	8	22		65*	39	18	16	A-6b
	6.00	7.50	BROWN SILTY CLAY							16	VISUAL
	8.50	10.50	BROWN SILTY CLAY							21	VISUAL
853+63.00, 42.00' RT (B-53)	1.00	2.50	1	14	25		60*	35	15	14	A-6a
	3.50	5.00	BROWN SILT AND CLAY							19	VISUAL
	6.00	7.50	BROWN, DECOMPOSED CLAY SHALE							17	VISUAL
	8.50	9.80	BROWN, DECOMPOSED CLAY SHALE							14	VISUAL
857+89.00, 42.00' RT (B-54)	1.00	2.50	2	2	15	38	43	33	8	18	A-4a
	3.50	5.00	REDDISH BROWN, DECOMPOSED CLAY SHALE							13	VISUAL
	6.00	7.50	BROWN, DECOMPOSED CLAY SHALE							11	VISUAL
	8.50	10.00	BROWN, DECOMPOSED CLAY SHALE							9	VISUAL
860+39.00, 42.00' RT (B-55)	1.00	2.50	8	3	11		78*	32	11	26	A-6a
	3.50	5.00	BROWN, DECOMPOSED CLAY SHALE							21	VISUAL
	6.00	7.50	REDDISH BROWN, DECOMPOSED CLAY SHALE							14	VISUAL
	8.50	10.00	REDDISH BROWN, HIGHLY WEATHERED CLAY SHALE							9	VISUAL
	13.50	15.00	BROWN, HIGHLY WEATHERED CLAY SHALE							8	VISUAL
	18.50	20.00	BROWN, HIGHLY WEATHERED CLAY SHALE							7	VISUAL
	23.50	25.00	BROWN, HIGHLY WEATHERED CLAY SHALE							8	VISUAL

*SILT AND CLAY COMBINED

PRIME ENGINEERING & ARCHITECTURE, INC.
COLUMBUS: (614) 457-2100 AKRON: (330) 668-5432

CALCULATED W.I.N. | CHECKED S.S.S. | DATE 1/24/01 | REVIEWED B.M. | DRAWN E.D.S.

SOIL PROFILE

MEG-124-22.72

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From "Geotech - 19718/Soil Profile Begin 5 pts.pdf"

Historic Subsurface Explorations

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/27/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/27/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-08A Station & Offset 813+14.91 139.34' LT Surface Elev. 747.08ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics: % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	OOT Class
747.1	0														
746.8		HS			TOPSOIL Soft, highly weathered, gray SILTSTONE.	1	--	--	--	--	--	--	--	4	VISUAL
743.1	4	RQD = 50%	S.0	0.0	Note: Augered to 4.0 feet and began coring bedrock. Soft to medium hard, highly weathered to weathered, gray SILTSTONE with thin bedding.										
738.1	8				TERMINATION DEPTH = 9.0 FEET										

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/25/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/25/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-10C Station & Offset 834+49.65 0.04' RT Surface Elev. 749.35ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics: % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	OOT Class
749.4	0														
	2	10 - 17 - 8			Medium dense, dark brown COARSE AND FINE SAND (A-3a), little silt and clay, trace gravel, moist.	1	10	21	56	--	12 *	NP	NP	11	A-3a
745.9	4	14 - 50/0.3			Very soft to soft, decomposed to highly weathered, brown SANDSTONE.	2	--	--	--	--	--	--	--	10	VISUAL
743.9	6	RQD = 100%	5.5	0.0	Note: Augered to 5.5 feet and began coring bedrock. Medium hard to hard, slightly weathered to weathered, brown, coarse grained SANDSTONE with thin to thick bedding. U.C. Strength of sandstone at 6.5 feet = 452 psi U.C. Strength of sandstone at 7.1 feet = 431 psi										
	8														
	10														
	12	RQD = 88%	5.0	0.0	Note: Black and brown in color at 10.9 feet. U.C. Strength of sandstone at 11.1 feet = 1488 psi										
	14				Note: Light brown in color at 13.0 feet.										
	16				Note: One inch thick gravel seam at 14.9 feet.										
	18	RQD = 100%	4.0	0.0											
729.4	20	50/0.3													
729.1					Soft, decomposed, brown SHALE. (drove a split spoon sample from 20.0 to 20.3 feet) TERMINATION DEPTH = 20.3 FEET	3	--	--	--	--	--	--	--	12	VISUAL

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

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LOG OF BORING

Date Started 7/24/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/24/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-11C Station & Offset 849+49.92 70.13' LT Surface Elev. 728.78ft

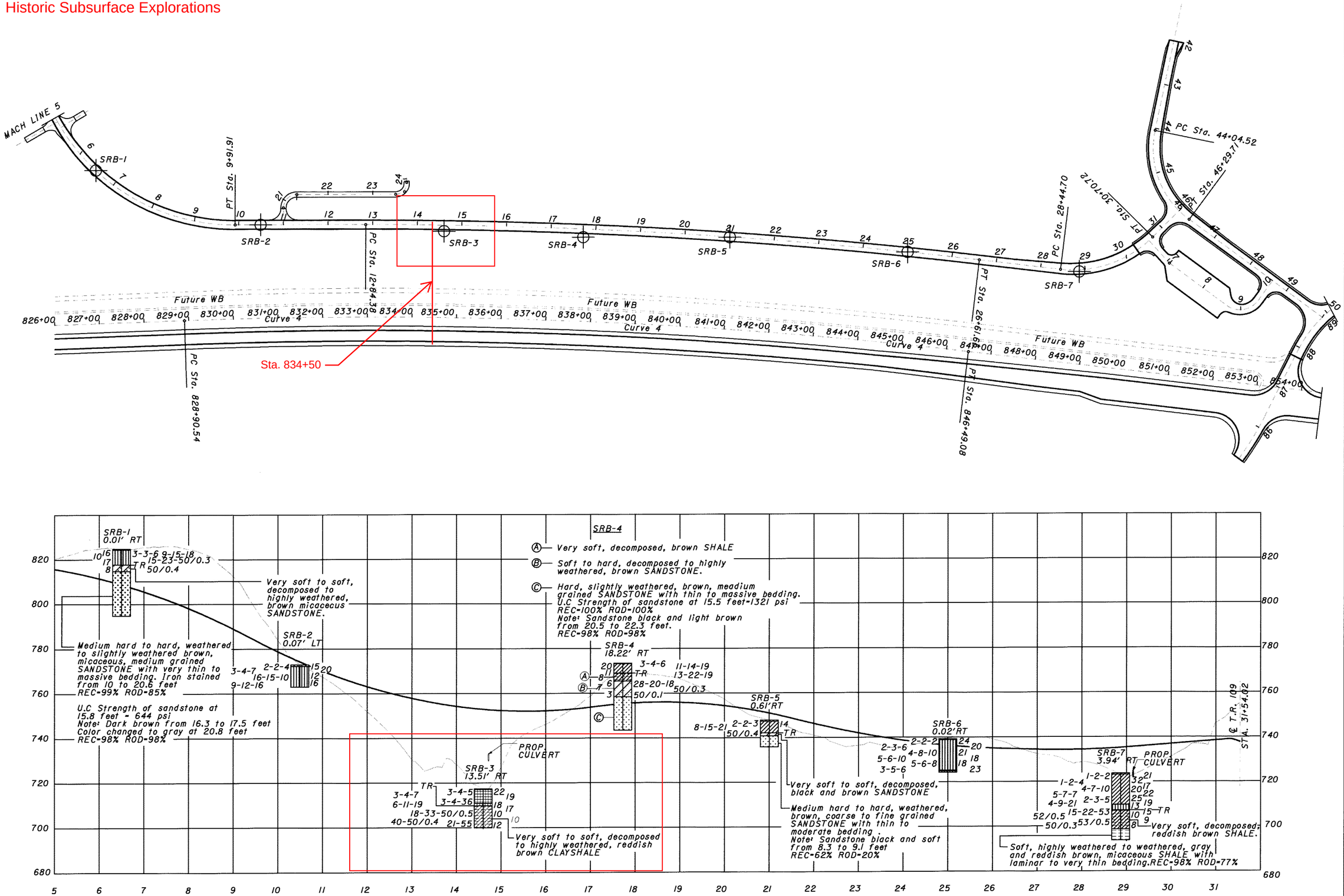
Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics: % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	OOT Class
728.8	0														
728.3	2	3 - 2 - 1			TOPSOIL Soft to very stiff, brown SILTY CLAY (A-6b), little to trace sand, moist.	1	0	2	18	--	79 *	36	16	23	A-6b
	4	4 - 7 - 11				2	--	--	--	--	--	--	--	20	VISUAL
	6	5 - 6 - 9				3	--	--	--	--	--	--	--	21	VISUAL
	8	4 - 5 - 8				4	--	--	--	--	--	--	--	23	VISUAL
719.3	10				Medium stiff to very stiff, brown SANDY SILT (A-4a), some clay, trace gravel to little rock fragments, moist to wet.										
	12	3 - 6 - 9				5	--	--	--	--	--	--	--	21	VISUAL
	14	2 - 3 - 5				6	--	--	--	--	--	--	--	24	VISUAL
	16	4 - 4 - 4			Note: Wet at 16.0 feet during drilling.	7	--	--	--	--	--	--	--	23	VISUAL
	18														
	20	6 - 10 - 9				8	--	--	--	--	--	--	--	18	VISUAL
706.8	22	8 - 17 - 30				9	--	--	--	--	--	--	--	20	VISUAL
	24	39 - 50/0.3			Soft, decomposed to highly weathered, reddish brown SHALE.	10	--	--	--	--	--	--	--	12	VISUAL
701.3	26				Note: Augered to 27.5 feet and began coring bedrock.										
	28	RQD = 43%	5.0	0.0	Soft to medium hard, highly weathered to weathered, gray and reddish brown SHALE with laminar to very thin bedding.										
	30														
696.3	32				Microfolding present from 31.0 to 32.5 feet.										
					TERMINATION DEPTH = 32.5 FEET										

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined) Form TE-151 Revised 9/94

29/67	MEG-124-22.72	SOIL PROFILE	DRAWN E.D.S.	REVIEWED B.M.	DATE 1/24/01	CALCULATED W.I.N. / CHECKED S.S.S.

PRIME ENGINEERING & ARCHITECTURE, INC.
COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

Historic Subsurface Explorations



SOIL PROFILE

MEG-124-22.72

26 67

From "Geotech - 19718/Soil Profile Begin 5 pts.pdf"

Historic Subsurface Explorations

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/26/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/26/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. SRB-1 Station & Offset 6+49.85 0.01' RT Surface Elev. 824.84ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
824.8	0														
824.4		3 - 3 - 6			TOPSOIL Stiff to hard, brown SANDY SILT (A-4a), little clay, trace rock fragments, trace to no roots, moist.	1	--	--	--	--	--	--	--	16	VISUAL
	4	9 - 15 - 18				2	--	--	--	--	--	--	--	10	VISUAL
	6	15-23-50/0.3				3	--	--	--	--	--	--	--	17	VISUAL
817.8	8	50/0.4			Very soft to soft, decomposed to highly weathered, brown, micaceous SANDSTONE. Note: Augered to 10.0 feet and began coring bedrock.	4	--	--	--	--	--	--	--	8	VISUAL
814.8	10	RQD = 85%	9.9	0.1	Medium hard to hard, weathered to slightly weathered, brown, micaceous, medium grained SANDSTONE with very thin to massive bedding. Iron stained from 10.0 to 20.6 feet.										
	12														
	14														
	16				U.C. Strength of sandstone at 15.8 feet = 644 psi Note: Dark brown from 16.3 to 17.5 feet.										
	18														
	20	RQD = 98%	9.8	0.2											
	22				Note: Color changed to gray at 20.8 feet.										
	24														
	26														
	28														
794.8	30														

TERMINATION DEPTH = 30.0 FEET

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined) Form TE-151 Revised 9/94

State of Ohio
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LOG OF BORING

Date Started 7/27/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/27/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. SRB-2 Station & Offset 10+49.03 0.07' LT Surface Elev. 772.95ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Lose (ft)	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
773.0	0														
772.3		2 - 2 - 4			TOPSOIL Medium stiff to very stiff, brown SANDY SILT (A-4a), some to little clay, trace to no roots, no to little sandstone fragments, moist.	1	0	13	26	--	60 *	27	9	15	A-4a
	4	3 - 4 - 7				2	--	--	--	--	--	--	--	20	VISUAL
	6	16 - 15 - 10				3	--	--	--	--	--	--	--	12	VISUAL
	8	9 - 12 - 16				4	--	--	--	--	--	--	--	16	VISUAL
763.0	10														

TERMINATION DEPTH = 10.0 FEET

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

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LOG OF BORING

Date Started 7/26/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/26/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. SRB-3 Station & Offset 14+60.04 13.51' RT Surface Elev. 717.42ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
717.4	0														
717.1		3 - 4 - 5			TOPSOIL Stiff, brown and gray CLAY (A-7-6), some sand, trace roots, moist.	1	0	3	27	--	70 *	54	30	22	A-7-6
	4	3 - 4 - 7				2	--	--	--	--	--	--	--	19	VISUAL
710.9	6	3 - 4 - 36			Hard, brown and gray, micaceous SANDY SILT (A-4a), little clay, moist.	3	--	--	--	--	--	--	--	18	VISUAL
709.8	8	6 - 11 - 19			Very soft to soft, decomposed to highly weathered, reddish brown CLAY SHALE.	4	--	--	--	--	--	--	--	17	VISUAL
	12	18-33-50/0.5				5	--	--	--	--	--	--	--	10	VISUAL
	14	40 - 50/0.4				6	--	--	--	--	--	--	--	10	VISUAL
	16	21 - 55 -				7	--	--	--	--	--	--	--	12	VISUAL
699.9															

TERMINATION DEPTH = 17.5 FEET

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

65/67 MEG-124-22.72 SOIL PROFILE

DRAWN	REVIEWED	DATE	CALCULATED	CHECKED
E.D.S.	B.M.	1/24/01	W.I.N.	S.S.S.

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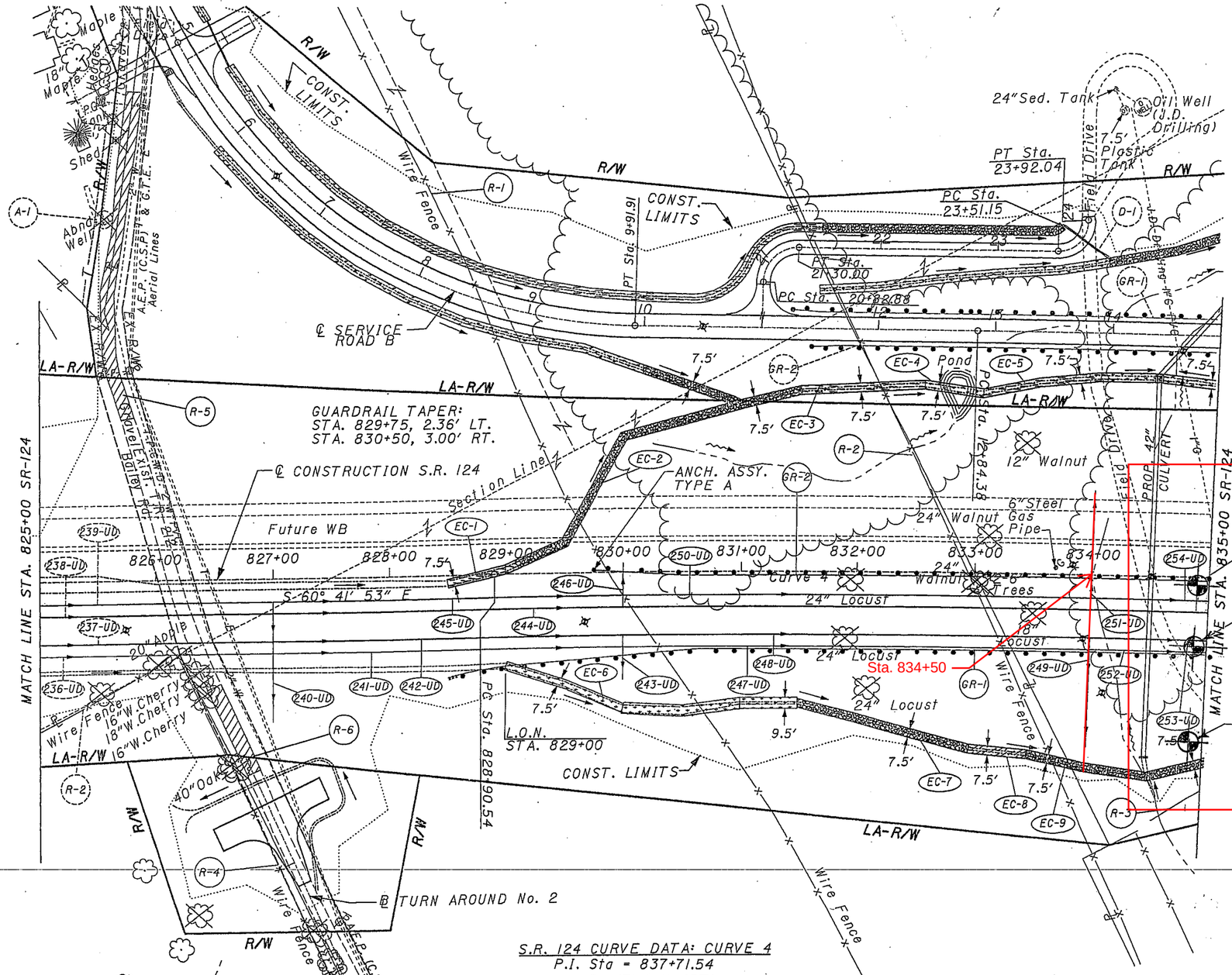
From "Sta. 834+50 Geotech/Boring Plan.pdf"

Historic Subsurface Explorations



S.R. 124 CURVE DATA: CURVE 4
P.I. Sta = 837+71.54
Δ = 8° 47' 34" (RT)
Dc = 0° 30' 00"
R = 11,459.16'
T = 881.00'
L = 1,758.54'
E = 33.82'
e_{max} = 0.017

FOR UNDERDRAIN QUANTITIES
SEE SHEET No. 674.

FOR TURN AROUND No. 2 PLAN & PROFILE
SEE SHEET No. 588.

FOR SERVICE ROAD B PLAN & PROFILE
SEE SHEET No. 565.

FOR CULVERT DETAIL
SEE SHEET No. 657.

8" EXCAVATION, 8" EMBANKMENT, AND SEEDING AND MULCHING

REMOVAL

REFERENCE NUMBER	STATION TO STATION	SIDE	202 FENCE REMOVED LIN FT
R-1	828+20 TO	LT	650
	831+30	RT	
R-2	831+40 TO	LT	605
	833+90	RT	
R-3	834+20 TO 836+80	RT	186
R-4	826+20 TO 827+30	RT	256
TOTALS TO SUB SUM			1697

REMOVAL CONTINUED

REFERENCE NUMBER	STATION TO STATION	SIDE	203 EXCAVATION NOT INCLUDING EMBANKMENT CU YD	203 EMBANKMENT CU YD	870 SEEDING AND MULCHING SQ YD
R-5	826+00	LT	100	100	447
R-6	826+50	RT	28	28	127
TOTALS			128	128	574

* TOTALS CARRIED TO CALCULATIONS SEE SHEET No. 68

DRAINAGE AND EROSION CONTROL

REFERENCE NUMBER	STATION TO STATION	SIDE	601 ROCK CHANNEL PROTECTION, TYPE C WITH FABRIC FILTER CU YD	670 DITCH EROSION PROTECTION SQ YD	839 SEEDING AND EROSION CONTROL WITH VEGETATION MAT SQ YD
EC-1	828+50 TO 829+10	LT		50	
EC-2	829+10 TO 831+50	LT	126		
EC-3	831+50 TO 832+50	LT			167
EC-4	832+50 TO 833+00	LT		42	
EC-5	833+00 TO 834+00	LT			83
EC-6	829+00 TO 831+50	RT		241	
TOTALS TO SUB SUM			126	333	250

DRAINAGE AND EROSION CONTROL CONTINUED

REFERENCE NUMBER	STATION TO STATION	SIDE	601 ROCK CHANNEL PROTECTION, TYPE C WITH FABRIC FILTER CU YD	839 SEEDING AND EROSION CONTROL WITH VEGETATION MAT SQ YD
EC-7	831+50 TO 833+00	RT	63	
EC-8	833+00 TO 833+50	RT		42
EC-9	833+50 TO 835+00	RT	63	
TOTALS TO SUB SUM			126	42

GUARDRAIL

REFERENCE NUMBER	STATION TO STATION	SIDE	606 GUARDRAIL, TYPE 5 LIN FT	606 GUARDRAIL, TYPE 8 LIN FT	606 POST END ANCHOR EACH	606 ANCHOR ASSEMBLY, TYPE A EACH	626 BARRIER REFLECTOR, TYPE A EACH
GR-1	828+50 TO 830+62.50	RT		212.5	1		2
GR-1	830+62.50 TO 835+84.91	RT	525		1		6
GR-1	835+84.91 TO 837+64.90	RT		187.5			2
GR-2	829+75 TO 836+50	℄	625			2	
TOTALS TO SUB SUM			1150	400	2	2	10

HORIZONTAL SCALE IN FEET 0 25 50 100

CALCULATED JMB CHECKED CMK

PLAN AND PROFILE SR-124
STA. 825+00 TO STA. 835+00

MEG-124-22.72

107
823

B-001-5-08
B-001-4-08
B-001-3-08
B-001-2-08
B-001-0-08

GP118MO.DGN

Appears to be relative to current C/L based on elevations and TIMS location. Adjusted an additional 47' right.

From "Sta. 834+50 Geotech/meg-33-15.50 ~ nopid boring logs.pdf"

PROJECT: MEG-33-15.5	DRILLING FIRM / OPERATOR: ODOT / CAREY	DRILL RIG: CME 850R TRACKED	STATION / OFFSET: 834+90 ~~>~~ 90.0 RT
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: ODOT / MCLEISH	HAMMER: CME AUTOMATIC	ALIGNMENT: CL US 33
PID: NOPID BR ID: N/A	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 3/10/09	ELEVATION: 751.0 (MSL) EOB: 35.0 ft.
START: 4/8/09 END: 4/9/09	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 83.6	COORD: 373125.419 N, 2130834.337 E

EXPLORATION ID B-001-0-09

PAGE 1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV. 751.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
TOPSOIL (6")	750.5																	
VERY STIFF, BROWN, **SILT AND CLAY**, "AND" SAND, TRACE STONE FRAGMENTS, DAMP	748.0		4 6 8	20	67	SS-1	2.50	2	7	39	33	19	28	16	12	15	A-6a (4)	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, LITTLE CLAY, TRACE STONE FRAGMENTS, MOIST	746.5		7 8 9	24	100	SS-2	2.00	5	13	50	22	10	NP	NP	NP	14	A-3a (0)	
VERY STIFF TO HARD, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE STONE FRAGMENTS, DAMP TO MOIST			4 7 12	26	100	SS-3	2.50	6	8	43	27	16	19	14	5	14	A-4a (2)	
			7 7 8	21	100	SS-4	3.50	-	-	-	-	-	-	-	-	14	A-4a (V)	
			4 6 6	17	67	SS-5	3.25	-	-	-	-	-	-	-	-	15	A-4a (V)	
@9.0'; SOME CLAY			3 6 8	20	100	SS-6	4.50	4	7	49	17	23	27	18	9	17	A-4a (1)	
			3 6 7	18	100	SS-7	4.00	-	-	-	-	-	-	-	-	21	A-4a (V)	
			3 4 6	14	78	SS-8	2.50	-	-	-	-	-	-	-	-	17	A-4a (V)	
@13.5'; STIFF			2 3 6	13	78	SS-9	1.25	-	-	-	-	-	-	-	-	17	A-4a (V)	
@15.0'; REDDISH BROWN			2 4 6	14	100	SS-10	1.50	3	9	47	17	24	26	17	9	19	A-4a (1)	
@16.5'; VERY STIFF	733.0		6 8 12	28	100	SS-11	2.00	-	-	-	-	-	-	-	-	17	A-4a (V)	
VERY STIFF, REDDISH BROWN, **SILTY CLAY**, "AND" SAND, TRACE STONE FRAGMENTS, SLIGHTLY ORGANIC, MOIST			4 6 9	21	100	SS-12	2.00	1	11	38	23	27	32	12	20	18	A-6b (7)	
			4 7 8	21	100	SS-13	3.25	-	-	-	-	-	-	-	-	21	A-6b (V)	
	728.5		6 12 11	32	100	SS-14	4.00	-	-	-	-	-	-	-	-	19	A-6b (V)	
HARD, BROWN, **SILT**, SOME SAND, LITTLE CLAY, TRACE STONE FRAGMENTS, DAMP	727.0		11 9 15	33	100	SS-15	4.50	1	4	22	59	14	NP	NP	NP	17	A-4b (8)	
CLAYSTONE, LIGHT BROWN, HIGHLY WEATHERED, WEAK, THICK BEDDED; RQD 57%, REC 100%.	723.5	TR	22 40	-	100	SS-16	-	-	-	-	-	-	-	-	-	13	Rock (V)	
SANDSTONE, GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, VERY FINE TO FINE GRAINED, THIN BEDDED, ARGILLACEOUS; RQD 36%, REC 100%.																		

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 6/4/09 16:52 - X:\GINT\PROJECTS\100241.GPJ

PID: NOPID	BR ID: N/A	PROJECT: MEG-33-15.5	STATION / OFFSET: 834+90 100.0 RT	START: 4/8/09	END: 4/9/09	PG 2 OF 2	B-001-0-09

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
SANDSTONE, GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, VERY FINE TO FINE GRAINED, THIN BEDDED, ARGILLACEOUS; RQD 36%, REC 100%. *(continued)*	721.0	31	41		100	NQ2-1											CORE	
	716.0	EOB 35																

NOTES: SLOPE INCLINOMETER INSTALLED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 25 LB. BENTONITE POWDER; 94 LB. CEMENT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 6/4/09 16:52 - X:\GINT\PROJECTS\100241.GPJ

Appears to be relative to current C/L based on elevations and TIMS location. Adjusted an additional 47' right.

From "Sta. 834+50 Geotech/meg-33-15.50 ~ nopid boring logs.pdf"

PROJECT: MEG-33-15.5	DRILLING FIRM / OPERATOR: ODOT / SABO	DRILL RIG: CME 55 TRUCK	STATION / OFFSET: 834+90 22.0 RT
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: ODOT / MCLEISH	HAMMER: CME AUTOMATIC	ALIGNMENT: CL US 33
PID: NOPID BR ID: N/A	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 3/10/09	ELEVATION: 785.0 (MSL) EOB: 46.0 ft.
START: 4/22/09 END: 4/23/09	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 81.3	COORD: 373182.028 N, 2130887.300 E

EXPLORATION ID B-002-0-09

PAGE 1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV. 785.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
TOPSOIL (6")	784.5																	
MEDIUM STIFF, REDDISH BROWN WITH GRAY, **SILT AND CLAY**, SOME SAND, SOME STONE FRAGMENTS, DAMP			4 3 3	8	67	SS-1	1.00	24	8	21	35	12	30	18	12	17	A-6a (3)	
@3.0'; STIFF			4 4 5	12	89	SS-2	1.00	-	-	-	-	-	-	-	-	15	A-6a (V)	
@5.0'; TRACE ASPALT FRAGMENTS	778.5		5 5 6	15	100	SS-3	2.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
VERY STIFF, BROWN WITH GRAY, **SANDY SILT**, LITTLE STONE FRAGMENTS, TRACE CLAY, WET	777.0		6 8 10	24	100	SS-4	2.00	15	6	40	32	7	22	18	4	22	A-4a (1)	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE STONE FRAGMENTS, TRACE CLAY, DAMP			4 4 4	11	100	SS-5	2.00	6	4	56	31	3	NP	NP	NP	13	A-3a (0)	
@11.0'; LOOSE, MOIST	772.5		2 3 6	12	100	SS-6	1.00	-	-	-	-	-	-	-	-	14	A-3a (V)	
			4 3 4	9	100	SS-7	2.00	-	-	-	-	-	-	-	-	26	A-3a (V)	
MEDIUM STIFF TO STIFF, REDDISH BROWN WITH GRAY, **SANDY SILT**, SOME STONE FRAGMENTS, TRACE CLAY, DAMP			3 4 5	12	100	SS-8	2.50	26	5	25	39	5	29	19	10	14	A-4a (2)	
			4 4 4	11	100	SS-9	0.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
			5 6 8	19	100	SS-10	2.00	-	-	-	-	-	-	-	-	15	A-4a (V)	
	766.5		3 4 4	11	100	SS-11	0.50	-	-	-	-	-	-	-	-	15	A-4a (V)	
STIFF TO VERY STIFF, REDDISH BROWN WITH GRAY, **SILT AND CLAY**, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP			2 2 5	9	100	SS-12	1.00	39	9	11	32	9	34	23	11	16	A-6a (1)	
			3 5 5	14	100	SS-13	2.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
			3 5 6	15	89	SS-14	3.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
			3 5 4	12	100	SS-15	2.50	-	-	-	-	-	-	-	-	11	A-6a (V)	
	759.0		4 4 4	11	100	SS-16	2.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
VERY STIFF, REDDISH BROWN AND BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP @ 26.0' - 27.5'; CONTAINS BOULDERS -- DRILLER'S DESCRIPTION			50/4"	-	50	SS-17	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
			5 8 11	26	100	SS-18	3.50	32	5	28	30	5	26	17	9	12	A-2-4 (0)	
			6 57	-	100	SS-19	2.00	-	-	-	-	-	-	-	-	10	A-2-4 (V)	

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 6/4/09 16:52 - X:\GINT\PROJECTS\100241.GPJ

PID: NOPID	BR ID: N/A	PROJECT: MEG-33-15.5	STATION / OFFSET: 834+90 22.0 RT	START: 4/22/09	END: 4/23/09	PG 2 OF 2	B-002-0-09

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
VERY STIFF, REDDISH BROWN AND BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP *(continued)*	755.0		3 5 5	14	100	SS-20	3.00	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
LOOSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE STONE FRAGMENTS, TRACE CLAY, DECOMPOSED SANDSTONE, DAMP	753.0		2 2 4	8	100	SS-21	1.00	3	4	59	33	1	NP	NP	NP	14	A-3a (0)	
@34.0'; DENSE	750.0		3 11 20	42	100	SS-22	2.00	-	-	-	-	-	-	-	-	17	A-3a (V)	
HARD, LIGHT BROWN, **SILT AND CLAY**, "AND" SAND, DAMP	749.0	TR	11 50	-	67	SS-23	-	0	13	33	40	14	35	21	14	16	A-6a (5)	
SANDSTONE, LIGHT BROWN, MODERATELY WEATHERED, SLIGHTLY STRONG, FINE TO MEDIUM GRAINED, THIN BEDDED, MICACEOUS, FRIABLE; RQD 53%, REC 91%.																		
@ 40.4'; SLIGHTLY WEATHERED			61		94	NQ2											CORE	
@ 41.8' - 42.3'; BLACK WITH YELLOWISH BROWN, FINE TO COARSE GRAINED	742.7																	
LIMESTONE, LIGHT GRAY, SLIGHTLY WEATHERED, STRONG, FINE GRAINED, THIN BEDDED, SLIGHTLY ARENACEOUS; RQD 63%, REC 100%. @ 44.5' - 44.8'; SANDSTONE, YELLOWISH BROWN, FINE TO MEDIUM GRAINED	739.5																	
	739.0	EOB																
SANDSTONE, BLACK AND YELLOWISH BROWN, MODERATELY WEATHERED, SLIGHTLY STRONG, FINE TO MEDIUM GRAINED, THIN BEDDED, MICACEOUS, FRIABLE; RQD 0%, REC 100%.																		

NOTES: HOLE DRY BEFORE CORING; SLOPE INCLINOMETER INSTALLED; MONITORING WELL INSTALLED ADJACENT TO THIS BORING.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 25 LB. BENTONITE POWDER; 94 LB. CEMENT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 6/4/09 16:52 - X:\GINT\PROJECTS\100241.GPJ

Appears to be relative to current C/L based on elevations and TIMS location. Adjusted an additional 47' right.

From "Sta. 834+50 Geotech/meg-33-15.50 ~ nopid boring logs.pdf"

PROJECT: MEG-33-15.5	DRILLING FIRM / OPERATOR: ODOT / CAREY	DRILL RIG: CME 55 TRUCK	STATION / OFFSET: 834+90 34.0 LT
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: ODOT / MCLEISH	HAMMER: CME AUTOMATIC	ALIGNMENT: CL US 33
PID: NOPID BR ID: N/A	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 3/10/09	ELEVATION: 784.0 (MSL) EOB: 36.0 ft.
START: 4/14/09 END: 4/15/09	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 81.3	COORD: 373234.057 N, 2130906.976 E

EXPLORATION ID B-003-0-09

PAGE 1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	MON. WELL
TOPSOIL (6")	784.0																	
STIFF TO VERY STIFF, BROWN, REDDISH BROWN , AND GRAY, **SANDY SILT**, SOME CLAY, SOME STONE FRAGMENTS, DAMP	783.5		14 6 7	18	78	SS-1	1.00	21	3	26	26	24	24	16	8	15	A-4a (3)	
			6 6 6	16	67	SS-2	3.00	-	-	-	-	-	-	-	-	13	A-4a (V)	
			5 6 7	18	78	SS-3	2.50	25	2	31	22	20	25	17	8	15	A-4a (1)	
			5 10 10	27	28	SS-4	1.00	-	-	-	-	-	-	-	-	12	A-4a (V)	
	776.5																	
MEDIUM DENSE, BROWN WITH GRAY, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP			8 11 6	23	78	SS-5	2.00	31	2	42	17	8	NP	NP	NP	8	A-2-4 (0)	
	773.5		6 9 10	26	78	SS-6	1.50	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
STIFF TO VERY STIFF, REDDISH BROWN, **SANDY SILT**, SOME STONE FRAGMENTS, LITTLE CLAY, DAMP			4 4 5	12	100	SS-7	1.00	31	3	26	22	18	23	16	7	13	A-4a (1)	
			4 5 6	15	100	SS-8	2.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
@13.5'; SOME CLAY			3 3 4	9	78	SS-9	1.00	22	4	5	39	30	31	22	9	15	A-4a (7)	
			3 5 6	15	78	SS-10	2.50	-	-	-	-	-	-	-	-	11	A-4a (V)	
			2 3 5	11	100	SS-11	1.50	-	-	-	-	-	-	-	-	16	A-4a (V)	
			3 3 8	15	78	SS-12	2.00	-	-	-	-	-	-	-	-	10	A-4a (V)	
			5 5 4	12	78	SS-13	2.50	33	3	5	32	27	26	19	7	8	A-4a (5)	
	761.5		3 2 1	4	78	SS-14	2.00	-	-	-	-	-	-	-	-	11	A-4a (V)	
MEDIUM DENSE, BLACK AND DARK BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, DAMP	761.0	TR	8 16 25	56	78	SS-15	3.50	0	7	70	16	7	NP	NP	NP	12	A-3a (0)	
SANDSTONE, LIGHT BROWN, MODERATELY WEATHERED, SLIGHTLY STRONG, FINE TO MEDIUM GRAINED, THIN BEDDED, MICACEOUS, FRIABLE; RQD 55%, REC 98%.			21 36 24	81	78	SS-16	4.50	-	-	-	-	-	-	-	-	10	Rock (V)	
			67	-	100	SS-17	-	-	-	-	-	-	-	-	-	11	Rock (V)	

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 6/4/09 16:52 - X:\GINT\PROJECTS\100241.GPJ

PID: NOPID	BR ID: N/A	PROJECT: MEG-33-15.5	STATION / OFFSET: 834+90 34.0 LT	START: 4/14/09	END: 4/15/09	PG 2 OF 2	B-003-0-09

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	MON. WELL
SANDSTONE, LIGHT BROWN, MODERATELY WEATHERED, SLIGHTLY STRONG, FINE TO MEDIUM GRAINED, THIN BEDDED, MICACEOUS, FRIABLE; RQD 55%, REC 98%. *(continued)*	754.0	31	55		98	NQ2-1											CORE	
	748.0	EOB 36																

NOTES: HOLE DRY BEFORE CORING; DRIVING ROCK IN SPLIT SPOON SAMPLE @ 6.0 FT; MONITORING WELL INSTALLED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 50 LB. BENTONITE POWDER

PROJECT: MEG-33-13.96
TYPE: LANDSLIDE
PID: 119143 SFN:
START: 11/6/23 END: 11/7/23

DRILLING FIRM / OPERATOR: ODOT / LEWIS
SAMPLING FIRM / LOGGER: ODOT / BINKLEY
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: ACKER REBEL XL
HAMMER: ACKER AUTOMATIC
CALIBRATION DATE: 11/7/23
ENERGY RATIO (%): 90*

STATION / OFFSET: 834+32, 84' LT.
ALIGNMENT: US 33
ELEVATION: 757.7 (ft) EOB: 34.25 ft.
LAT / LONG: 39.023649, -81.928307

EXPLORATION ID B-003-0-23

MATERIAL DESCRIPTION AND NOTES	ELEV. 757.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (2")	757.6																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, LITTLE STONE FRAGMENTS, LITTLE CLAY, DAMP			6 7 6	20	72	SS-1	-	17	1	51	20	11	NP	NP	NP	13	A-3a (0)	
			4 5 7	18	67	SS-2	-	-	-	-	-	-	-	-	-	13	A-3a (V)	
			3 4 5	14	67	SS-3	-	-	-	-	-	-	-	-	-	11	A-3a (V)	
	749.2																	
MEDIUM DENSE, BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP			4 5 7	18	61	SS-4	-	34	1	43	14	8	NP	NP	NP	11	A-2-4 (0)	
			15 10 5	23	78	SS-5	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	
	744.2																	
VERY STIFF, RED, GRAY AND BROWN, **SILT AND CLAY**, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP			3 5 4	14	50	SS-6	2.50	36	1	12	28	23	28	17	11	12	A-6a (4)	
	741.7																	
MEDIUM DENSE, YELLOWISH BROWN, **COARSE AND FINE SAND**, LITTLE SILT, LITTLE STONE FRAGMENTS, LITTLE CLAY, MOIST			4 7 5	18	83	SS-7	-	12	1	57	19	11	NP	NP	NP	16	A-3a (0)	
		▽ 737.4	2 3 8	17	89	SS-8	-	-	-	-	-	-	-	-	-	16	A-3a (V)	
@23.5'; LOOSE, BROWN AND GRAY			2 2 3	8	61	SS-9	-	-	-	-	-	-	-	-	-	17	A-3a (V)	
	729.2																	
MEDIUM STIFF, BROWN, GRAY AND BLACK, **SANDY SILT**, SOME CLAY, TRACE STONE FRAGMENTS, SLIGHTLY ORGANIC (LOI = 3.2%) TRACE WOOD FRAGMENTS, MOIST			2 2 2	6	67	SS-10	0.50	2	3	40	29	26	26	18	8	23	A-4a (4)	
	724.2	TR																
SHALE, GRAY, HIGHLY WEATHERED, VERY WEAK, LAMINATED.	723.5	EOB	43 65/3"	-	100	SS-11	-	-	-	-	-	-	-	-	-	10	Rock (V)	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 100 LB. BENTONITE CHIPS

Historic cross-section from final plans

SEEDING

END WIDTH	SQ. YDS.
143	
	692
106	
	556
94	
	503
	1751

SHEET TOTAL

END AREA VOLUME

CUT	FILL	CUT	FILL
32	2425		
		31	4767
1	2724		
		3	4225
2	1839		
		3	3296
		37	12288

SHEET TOTAL

CALCULATED: CMK

CHECKED: MCH

CROSS SECTIONS - SERVICE ROAD B
STA. 14+00.00 TO STA. 15+00.00

MEG-124-22.72

574
823

---

100 80 60 40 20 0 20 40 60 80 100 120

760 750 740 730 720 710

MATCHLINE SEE SR 124 CROSS SECTIONS

LA-R/W

3:1

743.4

2:1

715.7

752.39
15+00.00
727.00

MATCHLINE SEE SR 124 CROSS SECTIONS

2:1

742.1

FOR CULVERT DETAIL, SEE DRAINAGE DETAIL SHEETS

LA-R/W

2:1

725.4

2" Gas

SRB-3

Ground surface at El. 717.4' (SRB-3)

Top of Rock at El. 709.8 (SRB-3)

753.11
14+50.00
718.34

MATCHLINE SEE SR 124 CROSS SECTIONS

2:1

743.1

LA-R/W

2:1

732.0

754.26
14+00.00
728.22

SEEDING

END WIDTH	SQ. YDS.
	226
	1733
	398
	1994
	3727

END AREA / VOLUME

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL

CALCULATED SAC

CHECKED CMK

240 220 200 180 160 140 120 100 80 60 40 20 0

780 770 760 750 740 730 720 710

Historic cross-section from final plans

9.6+/

784.3

785.94 2:1

835+00 RP

760.56

2:1

7" Gas

MATCH LINE SEE SERVICE ROAD B CROSS SECTIONS

3:1

743.4

LA-R/W

℄ SERVICE RD. B

9.6+/

784.1

750.72

834+50 RP

744.97

2:1

2:1

B-003-0-23

Ground surface at El. 757.7' (B-003-0-23)

B-47EL

Adjusted ground surface from El. 737.5' to El. 747.9' (B-47EL)

Adjusted Top of Rock from El. 750.6' to El. 740.2' (B-47EL - Not used on cross-section)

Top of Rock at El. 724.2' (B-003-0-23)

MATCH LINE SEE SERVICE ROAD B CROSS SECTIONS

3:1

742.1

LOW POINT

CB No. 2-4

PROP. 42" CULVERT

LA-R/W

℄ SERVICE RD. B

SHEET TOTAL

SHEET TOTAL

WESTBOUND CROSS SECTIONS - S.R. 124

STA. 834+50 TO STA. 835+00

MEG-124-22.72

420

823

19718CXO.DGN

Historic cross-section from final plans

B-003-0-09

Ground surface at El. 784.0' (B-003-0-09)

Top of Rock at El. 761.0' (B-003-0-09 - Not used on cross-section)

B-002-0-09

Ground surface at El. 785.0' (B-002-0-09)

Top of Rock at El. 749.0' (B-002-0-09 - Not used on cross-section)

CU-10C

Ground surface at El. 749.4' (CU-10C)

Top of Rock at El. 745.9' (CU-10C)

B-47

Adjusted ground surface from El. 740.8' to El. 749.2' (B-47)

Adjusted Top of Rock from El. 722.8' to El. 731.2' (B-47 - Not used on cross-section)

B-47ER

Adjusted ground surface from El. 741.3' to El. 745.2' (B-47ER)

Adjusted Top of Rock from El. 728.9' to El. 732.8' (B-47ER)

B-001-0-09

Ground surface at El. 751.0' (B-001-0-09)

Top of Rock at El. 727.0' (B-001-0-09)

EASTBOUND CROSS SECTIONS - S.R. 124
STA. 834+50 TO STA. 835+00

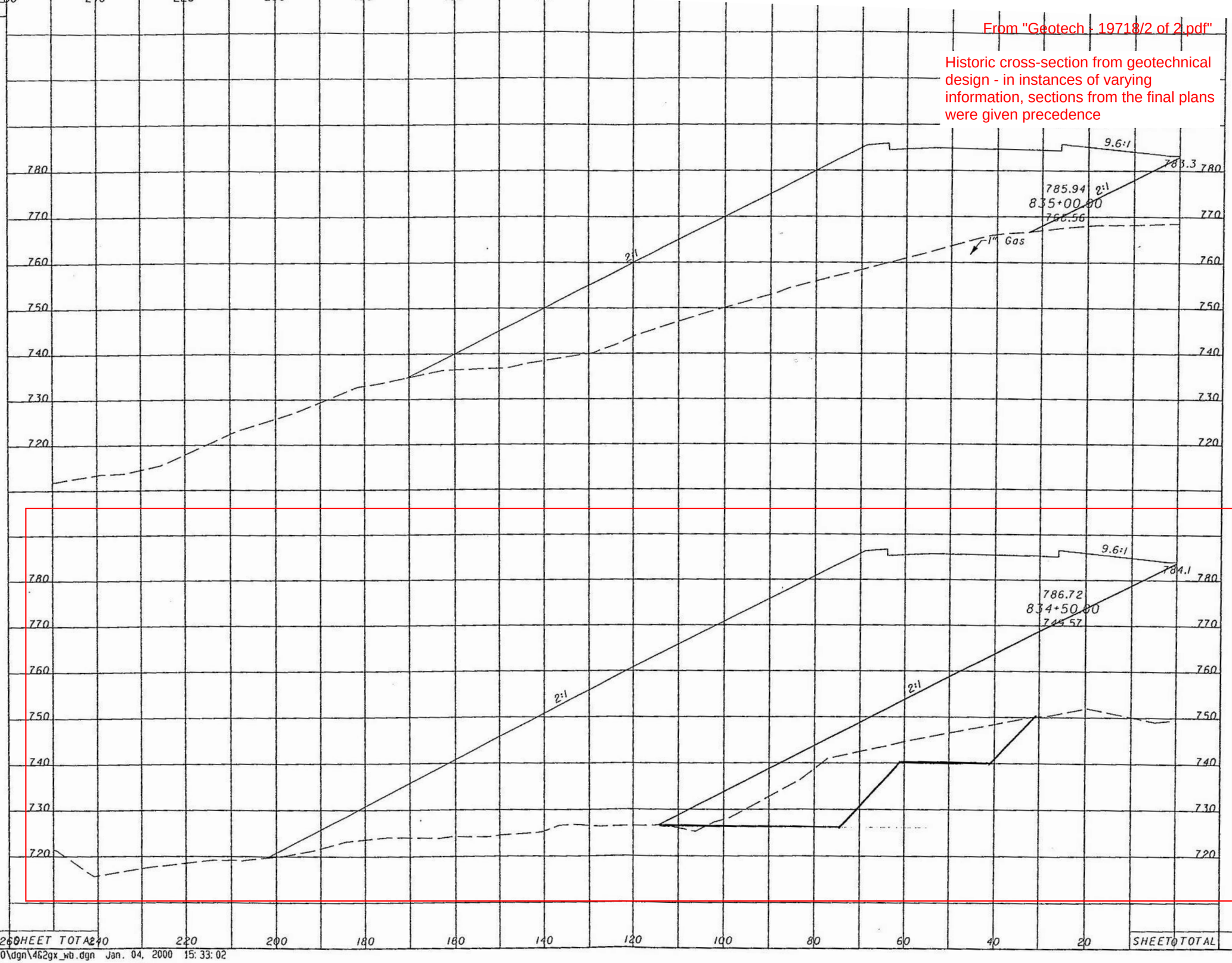
MEG-124-22.72

421
823

19718GXP.DGN

From "Geotech - 19718/2 of 2.pdf"

Historic cross-section from geotechnical design - in instances of varying information, sections from the final plans were given precedence



WESTBOUND CROSS SECTIONS - S.R. 124
STA. 834+50 TO STA. 835+00

MEG-124-22.72

348

...\98520\dgn\4&2gx_wb.dgn Jan. 04, 2000 15:33:02

Soil Parameter Determination

9999 Carver Road, Suite 210, Cincinnati, OH 45242-5583
(513) 984-7500
hdrinc.com

ODOT District 10
MEG-33-13.96

Soil Strength Parameter Determination

Computed By = AKB
Checked By = MM

Layer		Undrained Shear Strength (Su) (psf) PPR	N-values Sowers	N-values T and P	Tested Values	Dry Unit Weight (pcf) Correlation	Dry Unit Weight (pcf) Tested	Moist Unit Wt. (pcf) Correlation	Moist Unit Wt. (pcf) Tested	Adopted Short Term Parameters	Long-Term Strength Values	N_{60} Value	ODOT GB-7 Correlations Cohesion (psf)	ODOT GB-7 Correlations phi (deg)	Tested Cohesion (psf)	Tested phi (deg)	Adopted Long Term Strength Parameters	Consolidation Values ODOT GB-7 Correlations eo	ODOT GB-7 Correlations Cc	Adopted Consolidation Parameters
Layer 1 MEDIUM STIFF TO STIFF EMBANKMENT FILL	Max	3000	2625	1995		115		130			Max	15	150	24				Max	0.787	0.216	
	Min	500	825	1064		95		110		S_u= 1200 psf	Min	8	100	22			c' = 130 psf	Min	0.476	0.117	eo = 0.559 Ko = 0.61
	Average	1654	1644	1606		109		125		Φ = 0 deg	Average	12	129	23			Φ' = 23 deg	Average	0.559	0.171	Cc = 0.171 Es = N/A ksf
	Std Dev	851	698	295		6		5			Std Dev	2	16	1				Std Dev	0.093	0.041	Cr = 0.017
										Y_{dry} = 110 pcf							Y_{dry} = 110 pcf				Cv = 0.13 ft²/day
	Avg + Std	2505	2343	1901		115		130		Y_{moist} = 125 pcf	Avg + Std	14	145	24			Y_{moist} = 125 pcf	Avg + Std	0.651	0.212	σ_p' = 18 ksf
	Avg - Std	803	946	1312		103		120			Avg - Std	10	113	23				Avg - Std	0.466	0.130	
Layer 2 STIFF TO VERY STIFF EMBANKMENT FILL	Max	3000	2450	3591		110		125			Max	27	190	26				Max	0.616	0.162	
	Min	1000	1200	1862		105		125		S_u = 1700 psf	Min	14	143	24			c' = 160 psf	Min	0.543	0.126	eo = 0.587 Ko = 0.59
	Average	2000	1675	2474		107		125		Φ = 0 deg	Average	19	161	24			Φ' = 24 deg	Average	0.587	0.141	Cc = 0.141 Es = N/A ksf
	Std Dev	935	539	662		3		0			Std Dev	5	18	1				Std Dev	0.040	0.019	Cr = 0.014
										Y_{dry} = 105 pcf							Y_{dry} = 105 pcf				Cv = 0.16 ft²/day
	Avg + Std	2935	2214	3136		110		125		Y_{moist} = 125 pcf	Avg + Std	24	179	25			Y_{moist} = 125 pcf	Avg + Std	0.627	0.160	σ_p' = 18 ksf
	Avg - Std	1065	1136	1811		104		125			Avg - Std	14	144	24				Avg - Std	0.547	0.122	
Layer 3 LOOSE TO MEDIUM DENSE EMBANKMENT FILL	Max	N/A	N/A	N/A		110		130			Max	26	N/A	33				Max	0.654	N/A	
	Min	N/A	N/A	N/A		100		120		S_u = 0 psf	Min	8	N/A	29			c' = 0 psf	Min	0.503	N/A	eo = N/A Ko = 0.48
	Average	N/A	N/A	N/A		106		126		Φ = 31 deg	Average	17	N/A	31			Φ' = 31 deg	Average	0.576	N/A	Cc = N/A Es = 550 ksf
	Std Dev	N/A	N/A	N/A		3		3			Std Dev	6	N/A	1				Std Dev	0.052	N/A	Cr = N/A
										Y_{dry} = 105 pcf							Y_{dry} = 105 pcf				Cv = N/A ft²/day
	Avg + Std	N/A	N/A	N/A		109		129		Y_{moist} = 125 pcf	Avg + Std	22	N/A	32			Y_{moist} = 125 pcf	Avg + Std	0.628	N/A	σ_p' = N/A ksf
	Avg - Std	N/A	N/A	N/A		102		122			Avg - Std	11	N/A	30				Avg - Std	0.523	N/A	
Layer 4 STIFF TO VERY STIFF COHESIVE	Max	4500	3500	3458		125		130			Max	26	187	25				Max	0.654	0.396	
	Min	1250	825	1197		100		120		S_u = 1600 psf	Min	9	107	22			c' = 145 psf	Min	0.323	0.081	eo = 0.466 Ko = 0.59
	Average	2615	1547	2093		112		125		Φ = 0 deg	Average	16	147	24			Φ' = 24 deg	Average	0.508	0.204	Cc = 0.342 Es = N/A ksf
	Std Dev	977	763	610		6		2			Std Dev	5	22	1				Std Dev	0.085	0.103	Cr = 0.034
										Y_{dry} = 110 pcf							Y_{dry} = 110 pcf				Cv = 0.19 ft²/day
	Avg + Std	3592	2310	2703		118		127		Y_{moist} = 125 pcf	Avg + Std	20	169	25			Y_{moist} = 125 pcf	Avg + Std	0.593	0.306	OCR = 1
	Avg - Std	1638	784	1482		106		122			Avg - Std	11	125	23				Avg - Std	0.423	0.101	
Layer 5 VERY STIFF TO HARD COHESIVE	Max	4000	4000	4000		130		140			Max	40	250	28				Max	0.476	0.198	
	Min	2000	2100	2793		115		130		S_u = 2800 psf	Min	21	170	25			c' = 195 psf	Min	0.296	0.198	eo = 0.422 Ko = 0.56
	Average	2813	3290	3462		119		132		Φ = 0 deg	Average	28	197	26			Φ' = 26 deg	Average	0.423	0.198	Cc = 0.198 Es = N/A ksf
	Std Dev	987	758	621		7		4			Std Dev	8	33	1				Std Dev	0.075	N/A	Cr = 0.020
										Y_{dry} = 120 pcf							Y_{dry} = 120 pcf				Cv = 0.48 ft²/day
	Avg + Std	3799	4048	4083		126		136		Y_{moist} = 130 pcf	Avg + Std	36	229	27			Y_{moist} = 130 pcf	Avg + Std	0.498	N/A	OCR = 1
	Avg - Std	1826	2532	2841		112		128			Avg - Std	20	164	25				Avg - Std	0.348	N/A	
Layer 6 MEDIUM DENSE TO DENSE GRANULAR	Max	N/A	N/A	N/A		120		140			Max	42	N/A	35				Max	0.654	0.144	
	Min	N/A	N/A	N/A		100		120		S_u = 0 psf	Min	25	N/A	33			c' = 0 psf	Min	0.378	0.144	eo = N/A Ko = 0.44
	Average	N/A	N/A	N/A		114		132		Φ = 34 deg	Average	31	N/A	34			Φ' = 34 deg	Average	0.470	0.144	Cc = N/A Es = 950 ksf
	Std Dev	N/A	N/A	N/A		9		10			Std Dev	10	N/A	1				Std Dev	0.130	N/A	Cr = N/A
										Y_{dry} = 110 pcf							Y_{dry} = 110 pcf				Cv = N/A ft²/day
	Avg + Std	N/A	N/A	N/A		123		142		Y_{moist} = 130 pcf	Avg + Std	41	N/A	35			Y_{moist} = 130 pcf	Avg + Std	0.600	N/A	OCR = N/A
	Avg - Std	N/A	N/A	N/A		104		121			Avg - Std	21	N/A	33				Avg - Std	0.340	N/A	
Layer 7 LOOSE TO MEDIUM DENSE GRANULAR	Max	N/A	N/A	N/A		115		135			Max	14	N/A	31				Max	0.503	N/A	
	Min	N/A	N/A	N/A		110		130		S_u = 0 psf	Min	8	N/A	29			c' = 0 psf	Min	0.470	N/A	eo = N/A Ko = 0.50
	Average	N/A	N/A	N/A		113		133		Φ = 30 deg	Average	11	N/A	30			Φ' = 30 deg	Average	0.487	N/A	Cc = N/A Es = 450 ksf
	Std Dev	N/A	N/A	N/A		4		4			Std Dev	4	N/A	1				Std Dev	0.023	N/A	Cr = N/A
										Y_{dry} = 115 pcf							Y_{dry} = 115 pcf				Cv = N/A ft²/day
	Avg + Std	N/A	N/A	N/A		116		136		Y_{moist} = 135 pcf	Avg + Std	15	N/A	31			Y_{moist} = 135 pcf	Avg + Std	0.510	N/A	OCR = N/A
	Avg - Std	N/A	N/A	N/A		109		129			Avg - Std	7	N/A	29				Avg - Std	0.464	N/A	
Layer 8 SOFT TO MEDIUM STIFF COHESIVE	Max	2000	450	798		105		125			Max	6	75	21				Max	0.697	0.144	
	Min	500	300	532		100		120		Su = 700 psf	Min	4	50	20			c' = 65 psf	Min	0.616	0.144	eo = 0.657 Ko = 0.64
	Average	1250	375	665		103		123		Φ = 0 deg	Average	5	63	21			Φ' = 21 deg	Average	0.657	0.144	Cc = 0.144 Es = N/A ksf
	Std Dev	1061	106	188		4		4			Std Dev	1	18	1				Std Dev	0.057	N/A	Cr = 0.014
										Ydry = 105 pcf							Ydry = 105 pcf				Cv = 0.64 ft²/day
	Avg + Std	2311	481	853		106		126		Ymoist = 125 pcf	Avg + Std	6	80	21			Ymoist = 125 pcf	Avg + Std	0.714	N/A	OCR = 1
	Avg - Std	189	269	477		99		119			Avg - Std	4	45	20				Avg - Std	0.600	N/A	

Settlement parameters were selected based on Borings SRB-3 and B-47.

Ko = 1 - sin(phi)
Assumed Cc/Cr = 10
OCR selected as 1 considering the native materials to be normally consolidated. Preconsolidation pressure for existing fill selected based on correlations with LI in NAVFAC DM 7.1, Chapter 3, Figure 3. Cv values selected based on correlations with LL in USACE EM 1110-1-1904.
Es selected based on ranges provided in Settle3 software, referencing "Essentials of Soil Mechanics and Foundations: Basic Geotechnics, Fifth Edition" by D.F. McCarthy (1998).

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 1

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	15	100	3.0	39	9	26	39	18	34	23	12	17	Max	3000	2625	1995	150	24	25.0	783.0	115	130	0.216	2.72	0.787	-0.08
Min	8	67	0.5	24	3	11	22	5	23	16	7	11	Min	500	825	1064	100	22	2.0	760.0	95	110	0.117	2.72	0.476	-0.64
Average	12	97	1.7	30	6	21	32	11	29	19	10	14	Average	1654	1644	1606	129	23	14.8	770.0	109	125	0.171	2.72	0.559	-0.41
Std Dev	2	9	0.9	7	3	7	7	5	5	3	2	2	Std Dev	851	698	295	16	1	7.6	7.5	6	5	0.041	0.00	0.093	0.24
Avg + Std	14	106	2.5	37	9	28	39	16	34	22	12	15	Avg + Std	2505	2343	1901	145	24	22.4	777.5	115	130	0.212	2.72	0.651	-0.18
Avg - Std	10	87	0.8	23	3	14	25	6	24	16	8	12	Avg - Std	803	946	1312	113	23	7.3	762.5	103	120	0.130	2.72	0.466	-0.65

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	785.0	B-002-0-09	1.5	-	3	SS-1	8	67	1	24	8	21	35	12	30	18	12	17	A-6a	Cohesive	1	1000	1400	1064	100	22	2.0	783.0	95	110	0.18	2.72	0.787	-0.08
US 33	785.0	B-002-0-09	3.5	-	5	SS-2	12	89	1	-	-	-	-	-	-	-	-	15	A-6a	Cohesive	1	1000	2100	1596	129	23	4.0	781.0	100	120		2.72	0.697	
US 33	785.0	B-002-0-09	5	-	6.5	SS-3	15	100	2	-	-	-	-	-	-	-	-	12	A-6a	Cohesive	1	2000	2625	1995	150	24	6.0	779.0	105	125		2.72	0.616	
US 33	785.0	B-002-0-09	12.5	-	14	SS-8	12	100	2.5	26	5	25	39	5	29	19	10	14	A-4a	Cohesive	1	2500	900	1596	129	23	13.0	772.0	110	125	0.171	2.72	0.543	-0.500
US 33	785.0	B-002-0-09	14	-	15.5	SS-9	11	100	0.5	-	-	-	-	-	-	-	-	12	A-4a	Cohesive	1	500	825	1463	121	23	15.0	770.0	110	125		2.72	0.543	
US 33	785.0	B-002-0-09	17	-	18.5	SS-11	11	100	0.5	-	-	-	-	-	-	-	-	15	A-4a	Cohesive	1	500	825	1463	121	23	18.0	767.0	110	125		2.72	0.543	
US 33	785.0	B-002-0-09	18.5	-	20	SS-12	9	100	1	39	9	11	32	9	34	23	11	16	A-6a	Cohesive	1	1000	1575	1197	107	22	19.0	766.0	110	125	0.216	2.72	0.543	-0.64
US 33	785.0	B-002-0-09	20	-	21.5	SS-13	14	100	2	-	-	-	-	-	-	-	-	13	A-6a	Cohesive	1	2000	2450	1862	143	24	21.0	764.0	115	130		2.72	0.476	
US 33	785.0	B-002-0-09	21.5	-	23	SS-14	15	100	3	-	-	-	-	-	-	-	-	14	A-6a	Cohesive	1	3000	2625	1995	150	24	22.0	763.0	115	130		2.72	0.476	
US 33	785.0	B-002-0-09	23	-	24.5	SS-15	12	100	2.5	-	-	-	-	-	-	-	-	11	A-6a	Cohesive	1	2500	2100	1596	129	23	24.0	761.0	115	130		2.72	0.476	
US 33	785.0	B-002-0-09	24.5	-	26	SS-16	11	100	2	-	-	-	-	-	-	-	-	14	A-6a	Cohesive	1	2000	1925	1463	121	23	25.0	760.0	115	130		2.72	0.476	
US 33	784.0	B-003-0-09	10.5	-	12	SS-7	12	100	1	31	3	26	22	18	23	16	7	13	A-4a	Cohesive	1	1000	900	1596	129	23	11.0	773.0	110	125	0.117	2.72	0.543	-0.429
US 33	784.0	B-003-0-09	12	-	13.5	SS-8	15	100	2.5	-	-	-	-	-	-	-	-	12	A-4a	Cohesive	1	2500	1125	1995	150	24	13.0	771.0	110	125		2.72	0.543	

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 2

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	27	78	3.0	36	3	31	28	24	28	17	11	15	Max	3000	2450	3591	190	26	14.0	782.0	110	125	0.162	2.72	0.616	-0.13
Min	14	28	1.0	21	1	12	22	20	24	16	8	12	Min	1000	1200	1862	143	24	2.0	743.7	105	125	0.126	2.72	0.543	-0.45
Average	19	60	2.0	27	2	23	25	22	26	17	9	13	Average	2000	1675	2474	161	24	6.4	772.3	107	125	0.141	2.72	0.587	-0.28
Std Dev	5	21	0.9	8	1	10	3	2	2	1	2	2	Std Dev	935	539	662	18	1	4.6	16.1	3	0	0.019	0.00	0.040	0.17
Avg + Std	24	82	2.9	35	3	33	28	24	28	17	11	15	Avg + Std	2935	2214	3136	179	25	11.0	788.5	110	125	0.160	2.72	0.627	-0.11
Avg - Std	14	39	1.1	20	1	13	22	20	24	16	7	12	Avg - Std	1065	1136	1811	144	24	1.8	756.2	104	125	0.122	2.72	0.547	-0.44

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	784.0	B-003-0-09	1.5	-	3	SS-1	18	78	1	21	3	26	26	24	24	16	8	15	A-4a	Cohesive	2	1000	1350	2394	160	24	2.0	782.0	105	125	0.126	2.72	0.616	-0.125
US 33	784.0	B-003-0-09	3	-	4.5	SS-2	16	67	3	-	-	-	-	-	-	-	-	13	A-4a	Cohesive	2	3000	1200	2128	153	24	4.0	780.0	105	125		2.72	0.616	
US 33	784.0	B-003-0-09	4.5	-	6	SS-3	18	78	2.5	25	2	31	22	20	25	17	8	15	A-4a	Cohesive	2	2500	1350	2394	160	24	5.0	779.0	105	125	0.135	2.72	0.616	-0.250
US 33	784.0	B-003-0-09	6	-	7.5	SS-4	27	28	1	-	-	-	-	-	-	-	-	12	A-4a	Cohesive	2	1000	2025	3591	190	26	7.0	777.0	110	125		2.72	0.543	
US 33	757.7	B-003-0-23	13.5	-	15	SS-6	14	50	2.5	36	1	12	28	23	28	17	11	12	A-6a	Cohesive	2	2500	2450	1862	143	24	14.0	743.7	110	125	0.162	2.72	0.543	-0.455

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 3

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	26	100	2.0	34	4	57	31	11	N/A	N/A	N/A	26	Max	N/A	N/A	N/A	N/A	33	24.0	776.0	110	130	N/A	2.71	0.654	N/A
Min	8	61	1.0	6	1	42	14	3	N/A	N/A	N/A	8	Min	N/A	N/A	N/A	N/A	29	2.0	733.7	100	120	N/A	2.65	0.503	N/A
Average	17	80	1.7	20	2	50	20	8	N/A	N/A	N/A	14	Average	N/A	N/A	N/A	N/A	31	11.0	757.0	106	126	N/A	2.67	0.576	N/A
Std Dev	6	14	0.4	12	1	7	6	3	N/A	N/A	N/A	4	Std Dev	N/A	N/A	N/A	N/A	1	6.0	15.8	3	3	N/A	0.03	0.052	N/A
Avg + Std	22	94	2.1	32	3	57	27	11	N/A	N/A	N/A	18	Avg + Std	N/A	N/A	N/A	N/A	32	17.0	772.8	109	129	N/A	2.70	0.628	N/A
Avg - Std	11	65	1.3	8	0	43	14	5	N/A	N/A	N/A	9	Avg - Std	N/A	N/A	N/A	N/A	30	5.0	741.3	102	122	N/A	2.64	0.523	N/A

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	785.0	B-002-0-09	8	-	9.5	SS-5	11	100	2	6	4	56	31	3	NP	NP	NP	13	A-3a	Granular	3	N/A				30	9.0	776.0	105	125	N/A	2.65	0.575	
US 33	785.0	B-002-0-09	9.5	-	11	SS-6	12	100	1	-	-	-	-	-	-	-	-	14	A-3a	Granular	3	N/A				30	10.0	775.0	105	125		2.65	0.575	
US 33	785.0	B-002-0-09	11	-	12.5	SS-7	9	100	2	-	-	-	-	-	-	-	-	26	A-3a	Granular	3	N/A				30	12.0	773.0	105	125		2.65	0.575	
US 33	784.0	B-003-0-09	7.5	-	9	SS-5	23	78	2	31	2	42	17	8	NP	NP	NP	8	A-2-4	Granular	3	N/A				33	8.0	776.0	105	125	N/A	2.71	0.611	
US 33	784.0	B-003-0-09	9	-	10.5	SS-6	26	78	1.5	-	-	-	-	-	-	-	-	11	A-2-4	Granular	3	N/A				33	10.0	774.0	105	125		2.71	0.611	
US 33	757.7	B-003-0-23	1	-	2.5	SS-1	20	72	-	17	1	51	20	11	NP	NP	NP	13	A-3a	Granular	3	N/A				32	2.0	755.7	100	120	N/A	2.65	0.654	
US 33	757.7	B-003-0-23	3.5	-	5	SS-2	18	67	-	-	-	-	-	-	-	-	-	13	A-3a	Granular	3	N/A				32	4.0	753.7	100	120		2.65	0.654	
US 33	757.7	B-003-0-23	6	-	7.5	SS-3	14	67	-	-	-	-	-	-	-	-	-	11	A-3a	Granular	3	N/A				31	7.0	750.7	105	125		2.65	0.575	
US 33	757.7	B-003-0-23	8.5	-	10	SS-4	18	61	-	34	1	43	14	8	NP	NP	NP	11	A-2-4	Granular	3	N/A				32	9.0	748.7	105	125	N/A	2.71	0.611	
US 33	757.7	B-003-0-23	11	-	12.5	SS-5	23	78	-	-	-	-	-	-	-	-	-	10	A-2-4	Granular	3	N/A				33	12.0	745.7	110	130		2.71	0.537	
US 33	757.7	B-003-0-23	16	-	17.5	SS-7	18	83	-	12	1	57	19	11	NP	NP	NP	16	A-3a	Granular	3	N/A				32	17.0	740.7	110	130	N/A	2.65	0.503	
US 33	757.7	B-003-0-23	18.5	-	20	SS-8	17	89	-	-	-	-	-	-	-	-	-	16	A-3a	Granular	3	N/A				31	19.0	738.7	110	130		2.65	0.503	
US 33	757.7	B-003-0-23	23.5	-	25	SS-9	8	61	-	-	-	-	-	-	-	-	-	17	A-3a	Granular	3	N/A				29	24.0	733.7	110	130		2.65	0.503	

ODOT District 10
MEG-33-13.96

Soil Strength Parameter Determination

Computed By = AKB
Checked By = MM

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 4

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	26	100	4.5	33	9	49	75	27	54	24	30	24	Max	4500	3500	3458	187	25	20.0	768.0	125	130	0.396	2.72	0.654	0.22
Min	9	67	1.3	0	1	5	17	16	19	14	5	8	Min	1250	825	1197	107	22	2.0	712.4	100	120	0.081	2.65	0.323	-1.57
Average	16	86	2.6	6	5	34	42	22	33	19	14	17	Average	2615	1547	2093	147	24	8.8	740.5	112	125	0.204	2.70	0.508	-0.20
Std Dev	5	14	1.0	11	3	15	24	4	11	3	9	4	Std Dev	977	763	610	22	1	5.8	13.9	6	2	0.103	0.03	0.085	0.57
Avg + Std	20	100	3.6	17	8	48	66	26	44	22	23	21	Avg + Std	3592	2310	2703	169	25	14.6	754.4	118	127	0.306	2.73	0.593	0.36
Avg - Std	11	73	1.6	-5	2	19	18	17	21	15	5	13	Avg - Std	1638	784	1482	125	23	3.0	726.6	106	122	0.101	2.67	0.423	-0.77

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	740.8	B-47	1	-	2.5	1	-	-	-	0	1	24	75		42	23	19	20	A-7-6	Cohesive	4	N/A	N/A	N/A			2.0	738.8	115		0.288	2.65	0.438	-0.158
US 33	740.8	B-47	3.5	-	5	2	-	-	-	-	-	-	-	-	-	-	-	18	A-7-6	Cohesive	4	N/A	N/A	N/A			4.0	736.8	115			2.65	0.438	
US 33	740.8	B-47	6	-	7.5	3	-	-	-	-	-	-	-	-	-	-	-	18	A-7-6	Cohesive	4	N/A	N/A	N/A			7.0	733.8	120			2.65	0.378	
US 33	740.8	B-47	8.5	-	10	4	-	-	-	-	-	-	-	-	-	-	-	19	A-7-6	Cohesive	4	N/A	N/A	N/A			9.0	731.8	120			2.65	0.378	
US 33	740.8	B-47	13.5	-	15	5	-	-	-	-	-	-	-	-	-	-	-	19	A-7-6	Cohesive	4	N/A	N/A	N/A			14.0	726.8	125			2.65	0.323	
US 33	737.5	B-47EL	1	-	2.5	1	-	-	-	-	-	-	-	-	-	-	-	17	A-4a	Cohesive	4	N/A	N/A	N/A			2.0	735.5	115			2.72	0.476	
US 33	737.5	B-47EL	3.5	-	5	2	-	-	-	-	-	-	-	-	-	-	-	17	A-4a	Cohesive	4	N/A	N/A	N/A			4.0	733.5	115			2.72	0.476	
US 33	741.3	B-47ER	1	-	2.5	1	-	-	-	-	-	-	-	-	-	-	-	24	A-4a	Cohesive	4	N/A	N/A	N/A			2.0	739.3	115			2.72	0.476	
US 33	741.3	B-47ER	3.5	-	5	2	-	-	-	-	-	-	-	-	-	-	-	20	A-6b	Cohesive	4	N/A	N/A	N/A			4.0	737.3	115			2.70	0.465	
US 33	741.3	B-47ER	6	-	7.5	3	-	-	-	0	1	35	64		39	17	22	20	A-6b	Cohesive	4	N/A	N/A	N/A			7.0	734.3	120		0.261	2.70	0.404	0.136
US 33	717.4	SRB-3	1.5	-	3	1	9	-	-	0	3	27	70		54	24	30	22	A-7-6	Cohesive	4	N/A	2250	1197	107	22	2.0	715.4	100	120	0.396	2.65	0.654	-0.067
US 33	717.4	SRB-3	4	-	5.5	2	11	-	-	-	-	-	-	-	-	-	-	19	A-7-6	Cohesive	4	N/A	2750	1463	121	23	5.0	712.4	100	120		2.65	0.654	
US 33	751.0	B-001-0-09	1.5	-	3	SS-1	20	67	2.5	2	7	39	33	19	28	16	12	15	A-6a	Cohesive	4	2500	3500	2660	167	25	2.0	749.0	105	125	0.162	2.72	0.616	-0.08
US 33	751.0	B-001-0-09	4.5	-	6	SS-3	26	100	2.5	6	8	43	27	16	19	14	5	14	A-4a	Cohesive	4	2500	1950	3458	187	25	5.0	746.0	105	125	0.081	2.72	0.616	0.00
US 33	751.0	B-001-0-09	6	-	7.5	SS-4	21	100	3.5	-	-	-	-	-	-	-	-	14	A-4a	Cohesive	4	3500	1575	2793	170	25	7.0	744.0	110	125		2.72	0.543	
US 33	751.0	B-001-0-09	7.5	-	9	SS-5	17	67	3.25	-	-	-	-	-	-	-	-	15	A-4a	Cohesive	4	3250	1275	2261	157	24	8.0	743.0	110	125		2.72	0.543	
US 33	751.0	B-001-0-09	9	-	10.5	SS-6	20	100	4.5	4	7	49	17	23	27	18	9	17	A-4a	Cohesive	4	4500	1500	2660	167	25	10.0	741.0	110	125	0.153	2.72	0.543	-0.111
US 33	751.0	B-001-0-09	10.5	-	12	SS-7	18	100	4	-	-	-	-	-	-	-	-	21	A-4a	Cohesive	4	4000	1350	2394	160	24	11.0	740.0	115	130		2.72	0.476	
US 33	751.0	B-001-0-09	12	-	13.5	SS-8	14	78	2.5	-	-	-	-	-	-	-	-	17	A-4a	Cohesive	4	2500	1050	1862	143	24	13.0	738.0	110	125		2.72	0.543	
US 33	751.0	B-001-0-09	13.5	-	15	SS-9	13	78	1.25	-	-	-	-	-	-	-	-	17	A-4a	Cohesive	4	1250	975	1729	136	23	14.0	737.0	110	125		2.72	0.543	
US 33	751.0	B-001-0-09	15	-	16.5	SS-10	14	100	1.5	3	9	47	17	24	26	17	9	19	A-4a	Cohesive	4	1500	1050	1862	143	24	16.0	735.0	110	125	0.144	2.72	0.543	0.222
US 33	784.0	B-003-0-09	15	-	16.5	SS-10	15	78	2.5	-	-	-	-	-	-	-	-	11	A-4a	Cohesive	4	2500	1125	1995	150	24	16.0	768.0	110	125		2.72	0.543	
US 33	784.0	B-003-0-09	16.5	-	18	SS-11	11	100	1.5	-	-	-	-	-	-	-	-	16	A-4a	Cohesive	4	1500	825	1463	121	23	17.0	767.0	110	125		2.72	0.543	
US 33	784.0	B-003-0-09	18	-	19.5	SS-12	15	78	2	-	-	-	-	-	-	-	-	10	A-4a	Cohesive	4	2000	1125	1995	150	24	19.0	765.0	110	125		2.72	0.543	
US 33	784.0	B-003-0-09	19.5	-	21	SS-13	12	78	2.5	33	3	5	32	27	26	19	7	8	A-4a	Cohesive	4	2500	900	1596	129	23	20.0	764.0	110	125	0.144	2.72	0.543	-1.571

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 5

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	40	100	4.0	1	11	38	23	27	32	12	20	21	Max	4000	4000	4000	250	28	22.0	734.0	130	140	0.198	2.72	0.476	0.30
Min	21	100	2.0	1	11	38	23	27	32	12	20	17	Min	2000	2100	2793	170	25	7.0	710.4	115	130	0.198	2.70	0.296	0.30
Average	28	100	2.8	1	11	38	23	27	32	12	20	19	Average	2813	3290	3462	197	26	17.0	727.3	119	132	0.198	2.71	0.423	0.30
Std Dev	8	0	1.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	Std Dev	987	758	621	33	1	5.9	9.6	7	4	N/A	0.01	0.075	N/A
Avg + Std	36	100	3.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	Avg + Std	3799	4048	4083	229	27	22.9	736.9	126	136	N/A	2.72	0.498	N/A
Avg - Std	20	100	1.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17	Avg - Std	1826	2532	2841	164	25	11.1	717.7	112	128	N/A	2.70	0.348	N/A

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	717.4	SRB-3	6.5	-	8	3	40	-	-	-	-	-	-	-	-	-	-	18	A-4a	Cohesive	5	N/A	3000	4000	250	28	7.0	710.4	120	130		2.72	0.414	
US 33	751.0	B-001-0-09	16.5	-	18	SS-11	28	100	2	-	-	-	-	-	-	-	-	17	A-4a	Cohesive	5	2000	2100	3724	193	26	17.0	734.0	115	130		2.72	0.476	
US 33	751.0	B-001-0-09	18	-	19.5	SS-12	21	100	2	1	11	38	23	27	32	12	20	18	A-6b	Cohesive	5	2000	3675	2793	170	25	19.0	732.0	115	130	0.198	2.70	0.465	0.300
US 33	751.0	B-001-0-09	19.5	-	21	SS-13	21	100	3.25	-	-	-	-	-	-	-	-	21	A-6b	Cohesive	5	3250	3675	2793	170	25	20.0	731.0	115	130		2.70	0.465	
US 33	751.0	B-001-0-09	21	-	22.5	SS-14	32	100	4	-	-	-	-	-	-	-	-	19	A-6b	Cohesive	5	4000	4000	4000	200	26	22.0	729.0	130	140		2.70	0.296	

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 6

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	42	100	3.5	32	21	56	30	5	26	17	9	17	Max	N/A	N/A	N/A	N/A	35	34.0	757.0	120	140	0.144	2.71	0.654	-0.56
Min	25	100	2.0	10	5	28	12	5	26	17	9	11	Min	N/A	N/A	N/A	N/A	33	2.0	730.5	100	120	0.144	2.65	0.378	-0.56
Average	31	100	2.8	17	12	45	24	5	26	17	9	14	Average	N/A	N/A	N/A	N/A	34	17.8	746.5	114	132	0.144	2.67	0.470	-0.56
Std Dev	10	0	1.1	13	8	15	10	N/A	N/A	N/A	N/A	3	Std Dev	N/A	N/A	N/A	N/A	1	15.6	11.4	9	10	N/A	0.03	0.130	N/A
Avg + Std	41	100	3.8	30	20	59	34	N/A	N/A	N/A	N/A	17	Avg + Std	N/A	N/A	N/A	N/A	35	33.4	757.8	123	142	N/A	2.70	0.600	N/A
Avg - Std	21	100	1.7	5	4	30	14	N/A	N/A	N/A	N/A	11	Avg - Std	N/A	N/A	N/A	N/A	33	2.1	735.1	104	121	N/A	2.64	0.340	N/A

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	737.5	B-47EL	6	-	7.5	3	-	-	-	10	11	50	29		-	-	-	16	A-3a	Granular	6	N/A					7.0	730.5	120			2.65	0.378	
US 33	749.4	CU-10C	1.5	-	3	1	25	-	-	10	21	56	12		NP	NP	NP	11	A-3a	Granular	6	N/A				33	2.0	747.4	100	120	N/A	2.65	0.654	
US 33	785.0	B-002-0-09	27.5	-	29	SS-18	26	100	3.5	32	5	28	30	5	26	17	9	12	A-2-4	Granular	6	N/A				33	28.0	757.0	115	135	0.144	2.71	0.470	-0.556
US 33	785.0	B-002-0-09	33.5	-	35	SS-22	42	100	2	-	-	-	-	-	-	-	-	17	A-3a	Granular	6	N/A				35	34.0	751.0	120	140		2.65	0.378	

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 7

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	14	100	3.0	3	4	59	33	1	N/A	N/A	N/A	14	Max	N/A	N/A	N/A	N/A	31	33.0	754.0	115	135	N/A	2.71	0.503	N/A
Min	8	100	1.0	3	4	59	33	1	N/A	N/A	N/A	13	Min	N/A	N/A	N/A	N/A	29	31.0	752.0	110	130	N/A	2.65	0.470	N/A
Average	11	100	2.0	3	4	59	33	1	N/A	N/A	N/A	14	Average	N/A	N/A	N/A	N/A	30	32.0	753.0	113	133	N/A	2.68	0.487	N/A
Std Dev	4	0	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	Std Dev	N/A	N/A	N/A	N/A	1	1.4	1.4	4	4	N/A	0.04	0.023	N/A
Avg + Std	15	100	3.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	Avg + Std	N/A	N/A	N/A	N/A	31	33.4	754.4	116	136	N/A	2.72	0.510	N/A
Avg - Std	7	100	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	Avg - Std	N/A	N/A	N/A	N/A	29	30.6	751.6	109	129	N/A	2.64	0.464	N/A

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	785.0	B-002-0-09	30.5	-	32	SS-20	14	100	3	-	-	-	-	-	-	-	-	13	A-2-4	Granular	7	N/A				31	31.0	754.0	115	135		2.71	0.470	
US 33	785.0	B-002-0-09	32	-	33.5	SS-21	8	100	1	3	4	59	33	1	NP	NP	NP	14	A-3a	Granular	7	N/A				29	33.0	752.0	110	130	N/A	2.65	0.503	

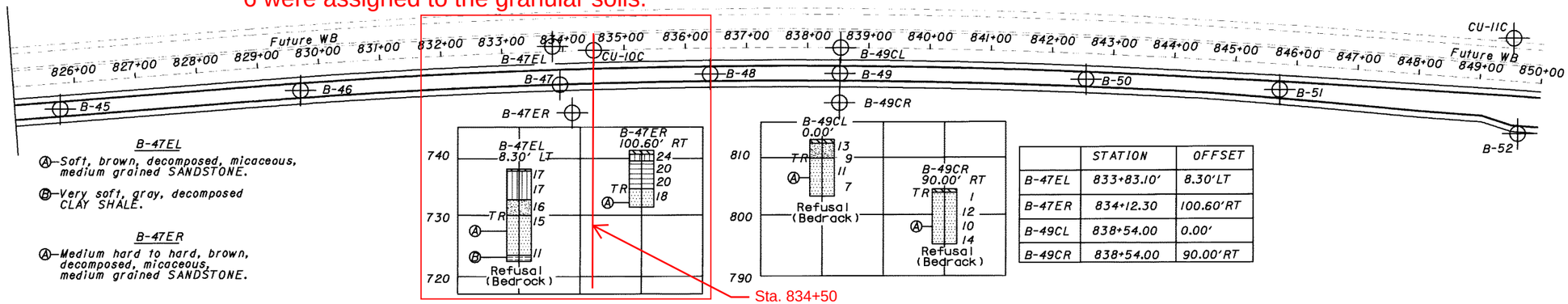
Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 8

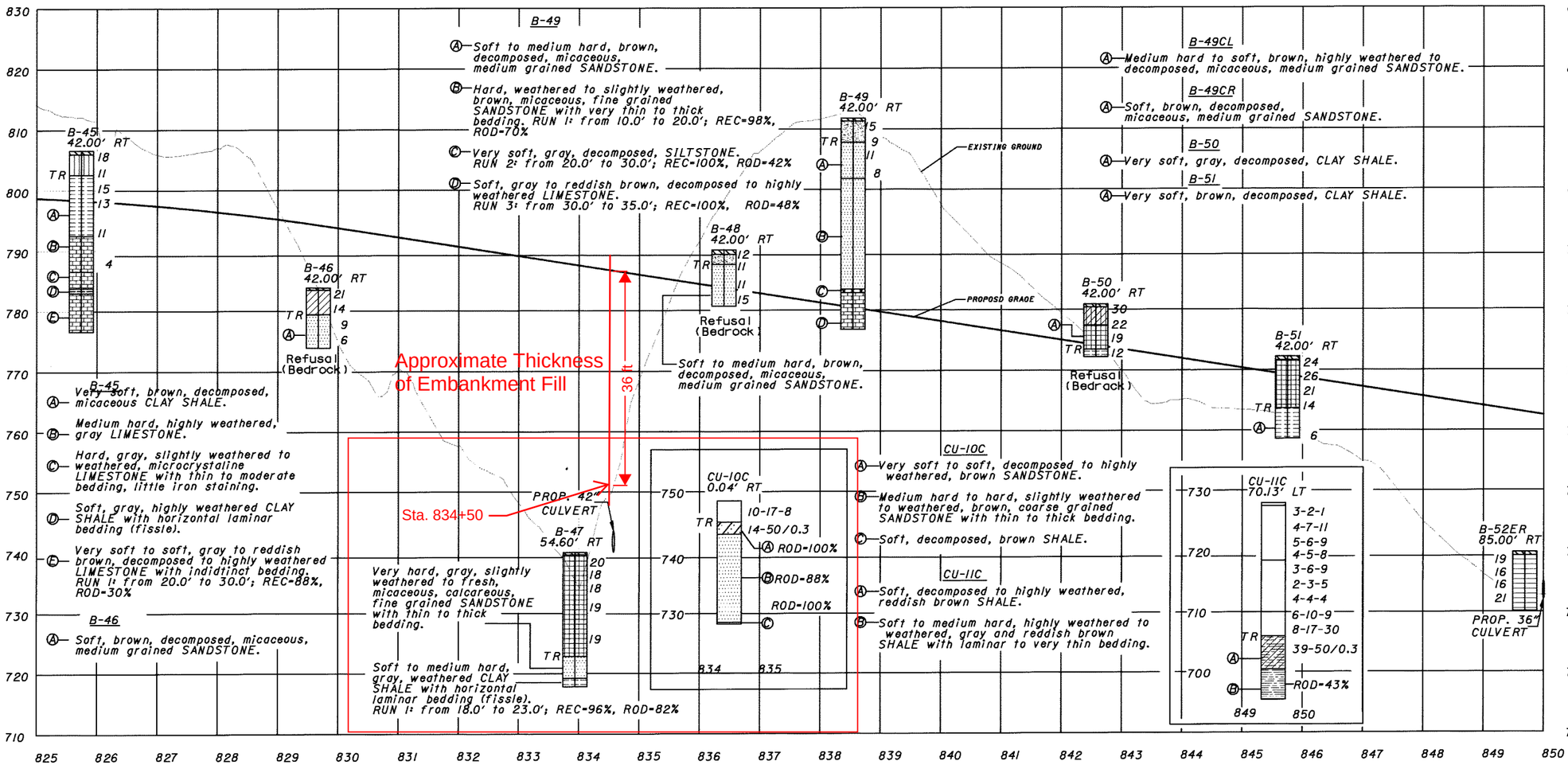
	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
Max	6	78	2.0	2	3	40	29	26	26	18	8	23	Max	2000	450	798	75	21	29.0	762.0	105	125	0.144	2.72	0.697	0.625
Min	4	67	0.5	2	3	40	29	26	26	18	8	11	Min	500	300	532	50	20	22.0	728.7	100	120	0.144	2.72	0.616	0.625
Average	5	73	1.3	2	3	40	29	26	26	18	8	17	Average	1250	375	665	63	21	25.5	745.4	103	123	0.144	2.72	0.657	0.625
Std Dev	1	8	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	Std Dev	1061	106	188	18	1	4.9	23.5	4	4	N/A	0.00	0.057	N/A
Avg + Std	6	80	2.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25	Avg + Std	2311	481	853	80	21	30.4	768.9	106	126	N/A	2.72	0.714	N/A
Avg - Std	4	65	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9	Avg - Std	189	269	477	45	20	20.6	721.8	99	119	N/A	2.72	0.600	N/A

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)	LI
US 33	784.0	B-003-0-09	21	-	22.5	SS-14	4	78	2	-	-	-	-	-	-	-	-	11	A-4a	Cohesive	8	2000	300	532	50	20	22.0	762.0	100	120		2.72	0.697	
US 33	757.7	B-003-0-23	28.5	-	30	SS-10	6	67	0.5	2	3	40	29	26	26	18	8	23	A-4a	Cohesive	8	500	450	798	75	21	29.0	728.7	105	125	0.144	2.72	0.616	0.625

No boring logs were available for B-47, B-47EL, and B-47ER, and no blow counts were included on the graphic logs. Based on the material types encountered within these borings, the properties determined for Layer 4 were assigned to the cohesive soils, and the properties determined for Layer 6 were assigned to the granular soils.



	STATION	OFFSET
B-47EL	833+83.10'	8.30'LT
B-47ER	834+12.30	100.60'RT
B-49CL	838+54.00	0.00'
B-49CR	838+54.00	90.00'RT



SOIL PROFILE

HORIZONTAL SCALE IN FEET
0' 50' 100' 200'

DRAWN	DATE	REVIEWED	CALCULATED	CHECKED
E.D.S.	1/24/01	B.M.	W.I.N.	S.S.S.

MEG-124-22.72

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/27/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/27/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-08A Station & Offset 813+14.91 139.34' LT Surface Elev. 747.08ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics								OOOT Class
							% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
747.1	0														
746.8		HS			TOPSOIL Soft, highly weathered, gray SILTSTONE.	1	--	--	--	--	--	--	--	4	VISUAL
	2														
743.1	4				Note: Augered to 4.0 feet and began coring bedrock.										
		RQD = 50%	S.0	0.0	Soft to medium hard, highly weathered to weathered, gray SILTSTONE with thin bedding.									
	6														
	8														
738.1					TERMINATION DEPTH = 9.0 FEET										

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/25/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/25/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-10C Station & Offset 834+49.65 0.04' RT Surface Elev. 749.35ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics								OOOT Class
							% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
749.4	0														
	2	10 - 17 - 8			Medium dense, dark brown COARSE AND FINE SAND (A-3a), little silt and clay, trace gravel, moist.	1	10	21	56	--	12 *	NP	NP	11	A-3a
745.9	4	14 - 50/0.3			Very soft to soft, decomposed to highly weathered, brown SANDSTONE.	2	--	--	--	--	--	--	--	10	VISUAL
743.9					Note: Augered to 5.5 feet and began coring bedrock.										
	6	RQD = 100%	5.5	0.0	Medium hard to hard, slightly weathered to weathered, brown, coarse grained SANDSTONE with thin to thick bedding.										
	8				U.C. Strength of sandstone at 6.5 feet = 452 psi										
	10				U.C. Strength of sandstone at 7.1 feet = 431 psi										
	12	RQD = 88%	5.0	0.0	Note: Black and brown in color at 10.9 feet. U.C. Strength of sandstone at 11.1 feet = 1488 psi										
	14				Note: Light brown in color at 13.0 feet.										
	16				Note: One inch thick gravel seam at 14.9 feet.										
	18	RQD = 100%	4.0	0.0											
729.4	20	50/0.3				3	--	--	--	--	--	--	--	12	VISUAL
729.1					Soft, decomposed, brown SHALE. (drove a split spoon sample from 20.0 to 20.3 feet) TERMINATION DEPTH = 20.3 FEET										

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

State of Ohio
Department of Transportation
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Testing Laboratory

LOG OF BORING

Date Started 7/24/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/24/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. CU-11C Station & Offset 849+49.92 70.13' LT Surface Elev. 728.78ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics								OOOT Class
							% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	
728.8	0				TOPSOIL										
728.3	2	3 - 2 - 1			Soft to very stiff, brown SILTY CLAY (A-6b), little to trace sand, moist.	1	0	2	18	--	79 *	36	16	23	A-6b
	4	4 - 7 - 11				2	--	--	--	--	--	--	--	20	VISUAL
	6	5 - 6 - 9				3	--	--	--	--	--	--	--	21	VISUAL
	8	4 - 5 - 8				4	--	--	--	--	--	--	--	23	VISUAL
719.3	10				Medium stiff to very stiff, brown SANDY SILT (A-4a), some clay, trace gravel to little rock fragments, moist to wet.										
	12	3 - 6 - 9				5	--	--	--	--	--	--	--	21	VISUAL
	14	2 - 3 - 5				6	--	--	--	--	--	--	--	24	VISUAL
	16	4 - 4 - 4			Note: Wet at 16.0 feet during drilling.	7	--	--	--	--	--	--	--	23	VISUAL
	18														
	20	6 - 10 - 9				8	--	--	--	--	--	--	--	18	VISUAL
706.8	22	8 - 17 - 30				9	--	--	--	--	--	--	--	20	VISUAL
	24				Soft, decomposed to highly weathered, reddish brown SHALE.										
	26	39 - 50/0.3				10	--	--	--	--	--	--	--	12	VISUAL
701.3	28	RQD = 43%	5.0	0.0	Note: Augered to 27.5 feet and began coring bedrock. Soft to medium hard, highly weathered to weathered, gray and reddish brown SHALE with laminar to very thin bedding.										
	30														
696.3	32				Microfolding present from 31.0 to 32.5 feet.										
					TERMINATION DEPTH = 32.5 FEET										

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined) Form TE-151 Revised 9/94

22/67	MEG-124-22.72	SOIL PROFILE	DRAWN E.D.S.	REVIEWED B.M.	DATE 1/24/01	CALCULATED W.I.N. / CHECKED S.S.S.

PRIME ENGINEERING & ARCHITECTURE, INC.
COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

State of Ohio
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Testing Laboratory

LOG OF BORING

Date Started 7/26/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/26/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. SRB-1 Station & Offset 6+49.85 0.01' RT Surface Elev. 824.84ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
824.8	0														
824.4	2	3 - 3 - 6			TOPSOIL Stiff to hard, brown SANDY SILT (A-4a), little clay, trace rock fragments, trace to no roots, moist.	1	--	--	--	--	--	--	--	16	VISUAL
	4	9 - 15 - 18				2	--	--	--	--	--	--	--	10	VISUAL
	6	15-23-50/0.3				3	--	--	--	--	--	--	--	17	VISUAL
817.8	8	50/0.4			Very soft to soft, decomposed to highly weathered, brown, micaceous SANDSTONE. Note: Augered to 10.0 feet and began coring bedrock.	4	--	--	--	--	--	--	--	8	VISUAL
814.8	10	RQD = 85%	9.9	0.1	Medium hard to hard, weathered to slightly weathered, brown, micaceous, medium grained SANDSTONE with very thin to massive bedding. Iron stained from 10.0 to 20.6 feet.										
	12														
	14														
	16				U.C. Strength of sandstone at 15.8 feet = 644 psi Note: Dark brown from 16.3 to 17.5 feet.										
	18														
	20	RQD = 98%	9.8	0.2											
	22				Note: Color changed to gray at 20.8 feet.										
	24														
	26														
	28														
794.8	30														

TERMINATION DEPTH = 30.0 FEET

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined) Form 7E-151 Revised 9/94

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/27/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/27/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. SRB-2 Station & Offset 10+49.03 0.07' LT Surface Elev. 772.95ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Lose (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
773.0	0														
772.3	2	2 - 2 - 4			TOPSOIL Medium stiff to very stiff, brown SANDY SILT (A-4a), some to little clay, trace to no roots, no to little sandstone fragments, moist.	1	0	13	26	--	60 *	27	9	15	A-4a
	4	3 - 4 - 7				2	--	--	--	--	--	--	--	20	VISUAL
	6	16 - 15 - 10				3	--	--	--	--	--	--	--	12	VISUAL
	8	9 - 12 - 16				4	--	--	--	--	--	--	--	16	VISUAL
763.0	10														

TERMINATION DEPTH = 10.0 FEET

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

LOG OF BORING

Date Started 7/26/00 Sampler: Type SS Dia. 2.0" Water Elev. ft
Date Completed 7/26/00 Casing: Length Dia. 3.25"

Project: MEG-124-22.72
Project No.: 99011
Location: Meigs County, Ohio

Boring No. SRB-3 Station & Offset 14+60.04 13.51' RT Surface Elev. 717.42ft

Elev. (ft)	Depth (ft)	Std. Pen./ RQD	Rec. (ft)	Loss (ft)	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	ODOT Class
717.4	0														
717.1	2	3 - 4 - 5			TOPSOIL Stiff, brown and gray CLAY (A-7-6), some sand, trace roots, moist.	1	0	3	27	--	70 *	54	30	22	A-7-6
	4	3 - 4 - 7				2	--	--	--	--	--	--	--	19	VISUAL
710.9	6	3 - 4 - 36			Hard, brown and gray, micaceous SANDY SILT (A-4a), little clay, moist.	3	--	--	--	--	--	--	--	18	VISUAL
709.8	8				Very soft to soft, decomposed to highly weathered, reddish brown CLAY SHALE.										
	10	6 - 11 - 19				4	--	--	--	--	--	--	--	17	VISUAL
	12	18-33-50/0.5				5	--	--	--	--	--	--	--	10	VISUAL
	14	40 - 50/0.4				6	--	--	--	--	--	--	--	10	VISUAL
	16														
699.9		21 - 55 -				7	--	--	--	--	--	--	--	12	VISUAL

TERMINATION DEPTH = 17.5 FEET

Particle Sizes: Agg => 2.00mm, Coarse Sand = 2.00-0.42mm, Fine Sand = 0.42-0.074mm, Silt = 0.074-0.005mm, Clay =< 0.005mm (*Indicates silt & clay combined)

Layer 4

Layer 5

65/67	MEG-124-22.72	SOIL PROFILE	DRAWN E.D.S.	REVIEWED B.M.	DATE 1/24/01	CALCULATED W.I.N. / CHECKED S.S.S.	PRIME ENGINEERING & ARCHITECTURE, INC. COLUMBUS: (614) 457-2100 AKRON: (330) 666-5432

Appears to be relative to current C/L based on elevations and TIMS location. Adjusted an additional 47' right.

PROJECT: MEG-33-15.5	DRILLING FIRM / OPERATOR: ODOT / CAREY	DRILL RIG: CME 850R TRACKED	STATION / OFFSET: 834+90 100.0 RT	EXPLORATION ID B-001-0-09
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: ODOT / MCLEISH	HAMMER: CME AUTOMATIC	ALIGNMENT: CL US 33	
PID: NOPID BR ID: N/A	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 3/10/09	ELEVATION: 751.0 (MSL) EOB: 35.0 ft.	PAGE 1 OF 2
START: 4/8/09 END: 4/9/09	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 83.6	COORD: 373125.419 N, 2130834.337 E	

MATERIAL DESCRIPTION AND NOTES	ELEV. 751.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
TOPSOIL (6")	750.5		Omit															
VERY STIFF, BROWN, **SILT AND CLAY**, "AND" SAND, TRACE STONE FRAGMENTS, DAMP	748.0		4 6 8	20	67	SS-1	2.50	2	7	39	33	19	28	16	12	15	A-6a (4)	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, LITTLE CLAY, TRACE STONE FRAGMENTS, MOIST	746.5		7 8 9	24	100	SS-2	2.00	5	13	50	22	10	NP	NP	NP	14	A-3a (0)	
VERY STIFF TO HARD, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE STONE FRAGMENTS, DAMP TO MOIST			4 7 12	26	100	SS-3	2.50	6	8	43	27	16	19	14	5	14	A-4a (2)	
			7 7 8	21	100	SS-4	3.50	-	-	-	-	-	-	-	-	14	A-4a (V)	
Layer 4			4 6 6	17	67	SS-5	3.25	-	-	-	-	-	-	-	-	15	A-4a (V)	
@9.0'; SOME CLAY			3 6 8	20	100	SS-6	4.50	4	7	49	17	23	27	18	9	17	A-4a (1)	
			3 6 7	18	100	SS-7	4.00	-	-	-	-	-	-	-	-	21	A-4a (V)	
			3 4 6	14	78	SS-8	2.50	-	-	-	-	-	-	-	-	17	A-4a (V)	
@13.5'; STIFF			2 3 6	13	78	SS-9	1.25	-	-	-	-	-	-	-	-	17	A-4a (V)	
@15.0'; REDDISH BROWN			2 4 6	14	100	SS-10	1.50	3	9	47	17	24	26	17	9	19	A-4a (1)	
@16.5'; VERY STIFF	733.0		6 8 12	28	100	SS-11	2.00	-	-	-	-	-	-	-	-	17	A-4a (V)	
VERY STIFF, REDDISH BROWN, **SILTY CLAY**, "AND" SAND, TRACE STONE FRAGMENTS, SLIGHTLY ORGANIC, MOIST			4 6 9	21	100	SS-12	2.00	1	11	38	23	27	32	12	20	18	A-6b (7)	
Layer 5			4 7 8	21	100	SS-13	3.25	-	-	-	-	-	-	-	-	21	A-6b (V)	
	728.5	Omit	6 12 11	32	100	SS-14	4.00	-	-	-	-	-	-	-	-	19	A-6b (V)	
HARD, BROWN, **SILT**, SOME SAND, LITTLE CLAY, TRACE STONE FRAGMENTS, DAMP	727.0	TR	11 9 15	33	100	SS-15	4.50	1	4	22	59	14	NP	NP	NP	17	A-4b (8)	
CLAYSTONE, LIGHT BROWN, HIGHLY WEATHERED, WEAK, THICK BEDDED; RQD 57%, REC 100%.	723.5		22 40	-	100	SS-16	-	-	-	-	-	-	-	-	-	13	Rock (V)	
SANDSTONE, GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, VERY FINE TO FINE GRAINED, THIN BEDDED, ARGILLACEOUS; RQD 36%, REC 100%.																		

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 6/4/09 16:52 - X:\GINT\PROJECTS\100241.GPJ

PID: NOPID	BR ID: N/A	PROJECT: MEG-33-15.5	STATION / OFFSET: 834+90 100.0 RT	START: 4/8/09	END: 4/9/09	PG 2 OF 2	B-001-0-09

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
SANDSTONE, GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, VERY FINE TO FINE GRAINED, THIN BEDDED, ARGILLACEOUS; RQD 36%, REC 100%. *(continued)*	721.0	31 32 33 34	41		100	NQ2-1											CORE	
	716.0	EOB 35																

NOTES: SLOPE INCLINOMETER INSTALLED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 25 LB. BENTONITE POWDER; 94 LB. CEMENT

Appears to be relative to current C/L based on elevations and TIMS location. Adjusted an additional 47' right.

PROJECT: MEG-33-15.5	DRILLING FIRM / OPERATOR: ODOT / SABO	DRILL RIG: CME 55 TRUCK	STATION / OFFSET: 834+90 22.0 RT	EXPLORATION ID B-002-0-09
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: ODOT / MCLEISH	HAMMER: CME AUTOMATIC	ALIGNMENT: CL US 33	
PID: NOPID BR ID: N/A	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 3/10/09	ELEVATION: 785.0 (MSL) EOB: 46.0 ft.	PAGE 1 OF 2
START: 4/22/09 END: 4/23/09	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 81.3	COORD: 373182.028 N, 2130887.300 E	

MATERIAL DESCRIPTION AND NOTES	ELEV. 785.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
TOPSOIL (6")	784.5																	
MEDIUM STIFF, REDDISH BROWN WITH GRAY, **SILT AND CLAY**, SOME SAND, SOME STONE FRAGMENTS, DAMP			4 3 3	8	67	SS-1	1.00	24	8	21	35	12	30	18	12	17	A-6a (3)	
@3.0'; STIFF Layer 1			4 4 5	12	89	SS-2	1.00	-	-	-	-	-	-	-	-	15	A-6a (V)	
@5.0'; TRACE ASPALT FRAGMENTS		Omit	5 5 6	15	100	SS-3	2.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
	778.5		6 8 10	24	100	SS-4	2.00	15	6	40	32	7	22	18	4	22	A-4a (1)	
VERY STIFF, BROWN WITH GRAY, **SANDY SILT**, LITTLE STONE FRAGMENTS, TRACE CLAY, WET	777.0																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE STONE FRAGMENTS, TRACE CLAY, DAMP Layer 3			4 4 4	11	100	SS-5	2.00	6	4	56	31	3	NP	NP	NP	13	A-3a (0)	
@11.0'; LOOSE, MOIST			2 3 6	12	100	SS-6	1.00	-	-	-	-	-	-	-	-	14	A-3a (V)	
	772.5		4 3 4	9	100	SS-7	2.00	-	-	-	-	-	-	-	-	26	A-3a (V)	
MEDIUM STIFF TO STIFF, REDDISH BROWN WITH GRAY, **SANDY SILT**, SOME STONE FRAGMENTS, TRACE CLAY, DAMP Layer 1			3 4 5	12	100	SS-8	2.50	26	5	25	39	5	29	19	10	14	A-4a (2)	
		Omit	4 4 4	11	100	SS-9	0.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
			5 6 8	19	100	SS-10	2.00	-	-	-	-	-	-	-	-	15	A-4a (V)	
	766.5		3 4 4	11	100	SS-11	0.50	-	-	-	-	-	-	-	-	15	A-4a (V)	
STIFF TO VERY STIFF, REDDISH BROWN WITH GRAY, **SILT AND CLAY**, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP			2 2 5	9	100	SS-12	1.00	39	9	11	32	9	34	23	11	16	A-6a (1)	
			3 5 5	14	100	SS-13	2.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
			3 5 6	15	89	SS-14	3.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
		Omit	3 5 4	12	100	SS-15	2.50	-	-	-	-	-	-	-	-	11	A-6a (V)	
			4 4 4	11	100	SS-16	2.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
	759.0		50/4"	-	50	SS-17	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
VERY STIFF, REDDISH BROWN AND BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP @ 26.0' - 27.5'; CONTAINS BOULDERS -- DRILLER'S DESCRIPTION Layer 6		Omit	5 8 11	26	100	SS-18	3.50	32	5	28	30	5	26	17	9	12	A-2-4 (0)	
			6 57	-	100	SS-19	2.00	-	-	-	-	-	-	-	-	10	A-2-4 (V)	

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 6/4/09 16:52 - X:\GINT\PROJECTS\100241.GPJ

PID: NOPID	BR ID: N/A	PROJECT: MEG-33-15.5	STATION / OFFSET: 834+90 22.0 RT	START: 4/22/09	END: 4/23/09	PG 2 OF 2	B-002-0-09

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	INCL.
VERY STIFF, REDDISH BROWN AND BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP *(continued)*	755.0	31	3 5 5	14	100	SS-20	3.00	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
Layer 7	753.0	32																
LOOSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE STONE FRAGMENTS, TRACE CLAY, DECOMPOSED SANDSTONE, DAMP		33	2 2 4	8	100	SS-21	1.00	3	4	59	33	1	NP	NP	NP	14	A-3a (0)	
Layer 6		34																
@34.0'; DENSE	750.0	35	3 11 20	42	100	SS-22	2.00	-	-	-	-	-	-	-	-	17	A-3a (V)	
HARD, LIGHT BROWN, **SILT AND CLAY**, "AND" SAND, DAMP	749.0	TR 36	11 50	-	67	SS-23	-	0	13	33	40	14	35	21	14	16	A-6a (5)	
SANDSTONE, LIGHT BROWN, MODERATELY WEATHERED, SLIGHTLY STRONG, FINE TO MEDIUM GRAINED, THIN BEDDED, MICACEOUS, FRIABLE; RQD 53%, REC 91%.		37																
		38																
		39																
		40																
@ 40.4'; SLIGHTLY WEATHERED		41	61		94	NQ2											CORE	
@ 41.8' - 42.3'; BLACK WITH YELLOWISH BROWN, FINE TO COARSE GRAINED	742.7	42																
LIMESTONE, LIGHT GRAY, SLIGHTLY WEATHERED, STRONG, FINE GRAINED, THIN BEDDED, SLIGHTLY ARENACEOUS; RQD 63%, REC 100%.		43																
		44																
@ 44.5' - 44.8'; SANDSTONE, YELLOWISH BROWN, FINE TO MEDIUM GRAINED	739.5	45																
SANDSTONE, BLACK AND YELLOWISH BROWN, MODERATELY WEATHERED, SLIGHTLY STRONG, FINE TO MEDIUM GRAINED, THIN BEDDED, MICACEOUS, FRIABLE; RQD 0%, REC 100%.	739.0	EOB 46																

Omit

NOTES: HOLE DRY BEFORE CORING; SLOPE INCLINOMETER INSTALLED; MONITORING WELL INSTALLED ADJACENT TO THIS BORING.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 25 LB. BENTONITE POWDER; 94 LB. CEMENT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 6/4/09 16:52 - X:\GINT\PROJECTS\100241.GPJ

Appears to be relative to current C/L based on elevations and TIMS location. Adjusted an additional 47' right.

PROJECT: MEG-33-15.5	DRILLING FIRM / OPERATOR: ODOT / CAREY	DRILL RIG: CME 55 TRUCK	STATION / OFFSET: 834+90 34.0 LT	EXPLORATION ID B-003-0-09
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: ODOT / MCLEISH	HAMMER: CME AUTOMATIC	ALIGNMENT: CL US 33	
PID: NOPID BR ID: N/A	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 3/10/09	ELEVATION: 784.0 (MSL) EOB: 36.0 ft.	PAGE 1 OF 2
START: 4/14/09 END: 4/15/09	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 81.3	COORD: 373234.057 N, 2130906.976 E	

MATERIAL DESCRIPTION AND NOTES	ELEV. 784.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	MON. WELL
TOPSOIL (6")	783.5	1																
STIFF TO VERY STIFF, BROWN, REDDISH BROWN , AND GRAY, **SANDY SILT**, SOME CLAY, SOME STONE FRAGMENTS, DAMP		2	14 6 7	18	78	SS-1	1.00	21	3	26	26	24	24	16	8	15	A-4a (3)	
Layer 2		3 4 5	6 6 6	16	67	SS-2	3.00	-	-	-	-	-	-	-	-	13	A-4a (V)	
		6 7	5 6 7	18	78	SS-3	2.50	25	2	31	22	20	25	17	8	15	A-4a (1)	
	776.5		5 10 10	27	28	SS-4	1.00	-	-	-	-	-	-	-	-	12	A-4a (V)	
MEDIUM DENSE, BROWN WITH GRAY, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP		8 9 10	8 11 6	23	78	SS-5	2.00	31	2	42	17	8	NP	NP	NP	8	A-2-4 (0)	
Layer 3			6 9 10	26	78	SS-6	1.50	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
	773.5	11 12 13	4 4 5	12	100	SS-7	1.00	31	3	26	22	18	23	16	7	13	A-4a (1)	
STIFF TO VERY STIFF, REDDISH BROWN, **SANDY SILT**, SOME STONE FRAGMENTS, LITTLE CLAY, DAMP			4 5 6	15	100	SS-8	2.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
Layer 1		14 15	3 3 4	9	78	SS-9	1.00	22	4	5	39	30	31	22	9	15	A-4a (7)	
@13.5'; SOME CLAY			3 5 6	15	78	SS-10	2.50	-	-	-	-	-	-	-	-	11	A-4a (V)	
		16 17 18	2 3 5	11	100	SS-11	1.50	-	-	-	-	-	-	-	-	16	A-4a (V)	
Layer 4			3 3 8	15	78	SS-12	2.00	-	-	-	-	-	-	-	-	10	A-4a (V)	
		19 20	5 5 4	12	78	SS-13	2.50	33	3	5	32	27	26	19	7	8	A-4a (5)	
Layer 8		21 22	3 2 1	4	78	SS-14	2.00	-	-	-	-	-	-	-	-	11	A-4a (V)	
	761.5																	
MEDIUM DENSE, BLACK AND DARK BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, DAMP	761.0	23	8 16 25	56	78	SS-15	3.50	0	7	70	16	7	NP	NP	NP	12	A-3a (0)	
SANDSTONE, LIGHT BROWN, MODERATELY WEATHERED, SLIGHTLY STRONG, FINE TO MEDIUM GRAINED, THIN BEDDED, MICACEOUS, FRIABLE; RQD 55%, REC 98%.		24 25	21 36 24	81	78	SS-16	4.50	-	-	-	-	-	-	-	-	10	Rock (V)	
		26 27 28 29	67	-	100	SS-17	-	-	-	-	-	-	-	-	-	11	Rock (V)	

Omit

Omit

TR

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 6/4/09 16:52 - X:\GINT\PROJECTS\100241.GPJ

PID: NOPID	BR ID: N/A	PROJECT: MEG-33-15.5	STATION / OFFSET: 834+90 34.0 LT	START: 4/14/09	END: 4/15/09	PG 2 OF 2	B-003-0-09

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	MON. WELL
SANDSTONE, LIGHT BROWN, MODERATELY WEATHERED, SLIGHTLY STRONG, FINE TO MEDIUM GRAINED, THIN BEDDED, MICACEOUS, FRIABLE; RQD 55%, REC 98%. *(continued)*	754.0	31	55		98	NQ2-1											CORE	
	748.0	EOB 36																

NOTES: HOLE DRY BEFORE CORING; DRIVING ROCK IN SPLIT SPOON SAMPLE @ 6.0 FT; MONITORING WELL INSTALLED.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 50 LB. BENTONITE POWDER

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / LEWIS	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 834+32, 84' LT.	EXPLORATION ID B-003-0-23
TYPE: LANDSLIDE	SAMPLING FIRM / LOGGER: ODOT / BINKLEY	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 757.7 (ft) EOB: 34.25 ft.	PAGE 1 OF 1
START: 11/6/23 END: 11/7/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.023649, -81.928307	

MATERIAL DESCRIPTION AND NOTES	ELEV. 757.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (2")	757.6																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, LITTLE STONE FRAGMENTS, LITTLE CLAY, DAMP			6 7 6	20	72	SS-1	-	17	1	51	20	11	NP	NP	NP	13	A-3a (0)	
			4 5 7	18	67	SS-2	-	-	-	-	-	-	-	-	-	13	A-3a (V)	
			3 4 5	14	67	SS-3	-	-	-	-	-	-	-	-	-	11	A-3a (V)	
	749.2																	
MEDIUM DENSE, BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP			4 5 7	18	61	SS-4	-	34	1	43	14	8	NP	NP	NP	11	A-2-4 (0)	
Layer 3			15 10 5	23	78	SS-5	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	
	744.2																	
VERY STIFF, RED, GRAY AND BROWN, **SILT AND CLAY**, "AND" STONE FRAGMENTS, LITTLE SAND, DAMP			3 5 4	14	50	SS-6	2.50	36	1	12	28	23	28	17	11	12	A-6a (4)	
Layer 2	741.7																	
MEDIUM DENSE, YELLOWISH BROWN, **COARSE AND FINE SAND**, LITTLE SILT, LITTLE STONE FRAGMENTS, LITTLE CLAY, MOIST			4 7 5	18	83	SS-7	-	12	1	57	19	11	NP	NP	NP	16	A-3a (0)	
		▽ 737.4	2 3 8	17	89	SS-8	-	-	-	-	-	-	-	-	-	16	A-3a (V)	
@23.5'; LOOSE, BROWN AND GRAY			2 2 3	8	61	SS-9	-	-	-	-	-	-	-	-	-	17	A-3a (V)	
Layer 3	729.2																	
MEDIUM STIFF, BROWN, GRAY AND BLACK, **SANDY SILT**, SOME CLAY, TRACE STONE FRAGMENTS, SLIGHTLY ORGANIC (LOI = 3.2%) TRACE WOOD FRAGMENTS, MOIST			2 2 2	6	67	SS-10	0.50	2	3	40	29	26	26	18	8	23	A-4a (4)	
Layer 8	724.2	TR																
SHALE, GRAY, HIGHLY WEATHERED, VERY WEAK, LAMINATED.	723.5	EOB	43 65/3"	-	100	SS-11	-	-	-	-	-	-	-	-	-	10	Rock (V)	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 100 LB. BENTONITE CHIPS

Source: NAVFAC DM 7.1

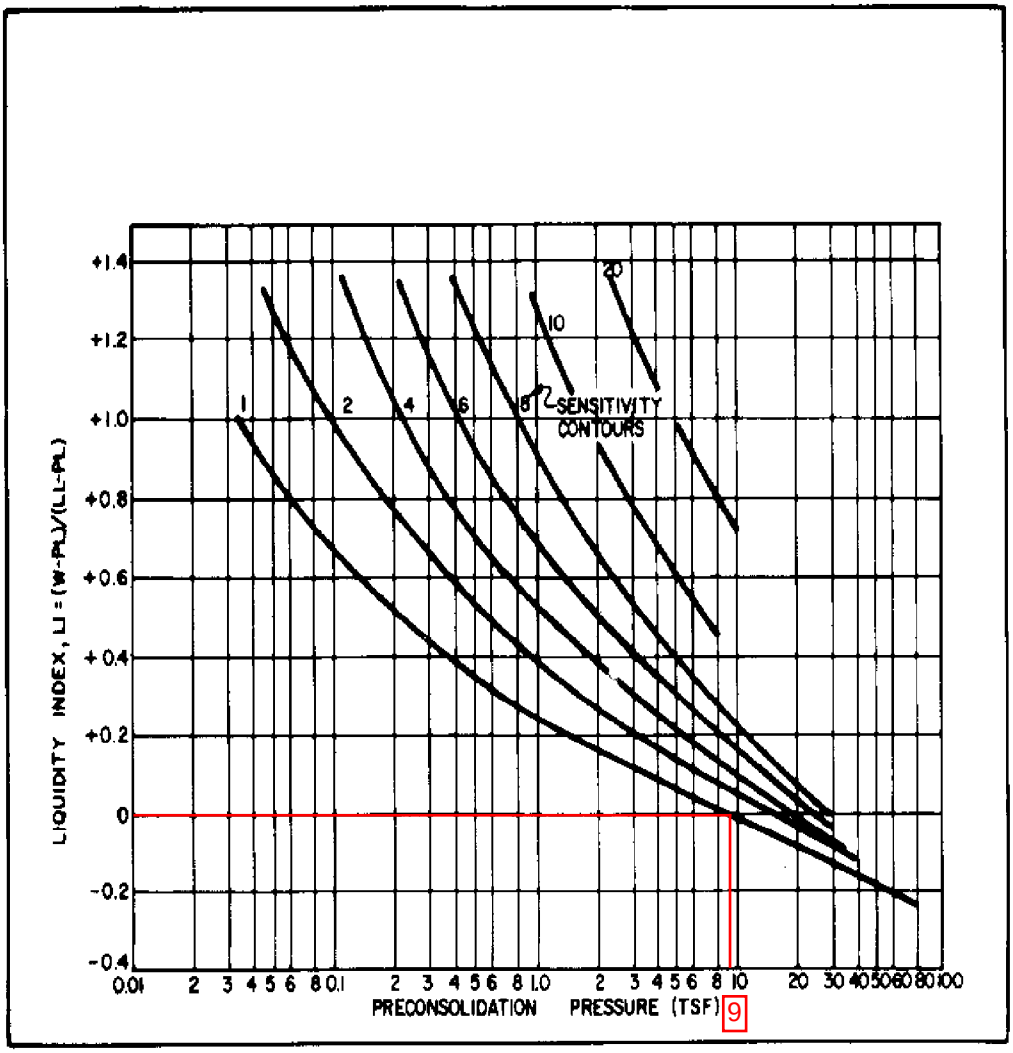


FIGURE 3
Preconsolidation Pressure vs. Liquidity Index

As LI values for the fill are all negative (moisture contents below the plastic limit), the fill was considered to be overconsolidated. Considering a LI of 0, a preconsolidation pressure of 9 tsf (18 ksf) was used in analyses. The underlying native soils were considered to be normally consolidated.

Cv values

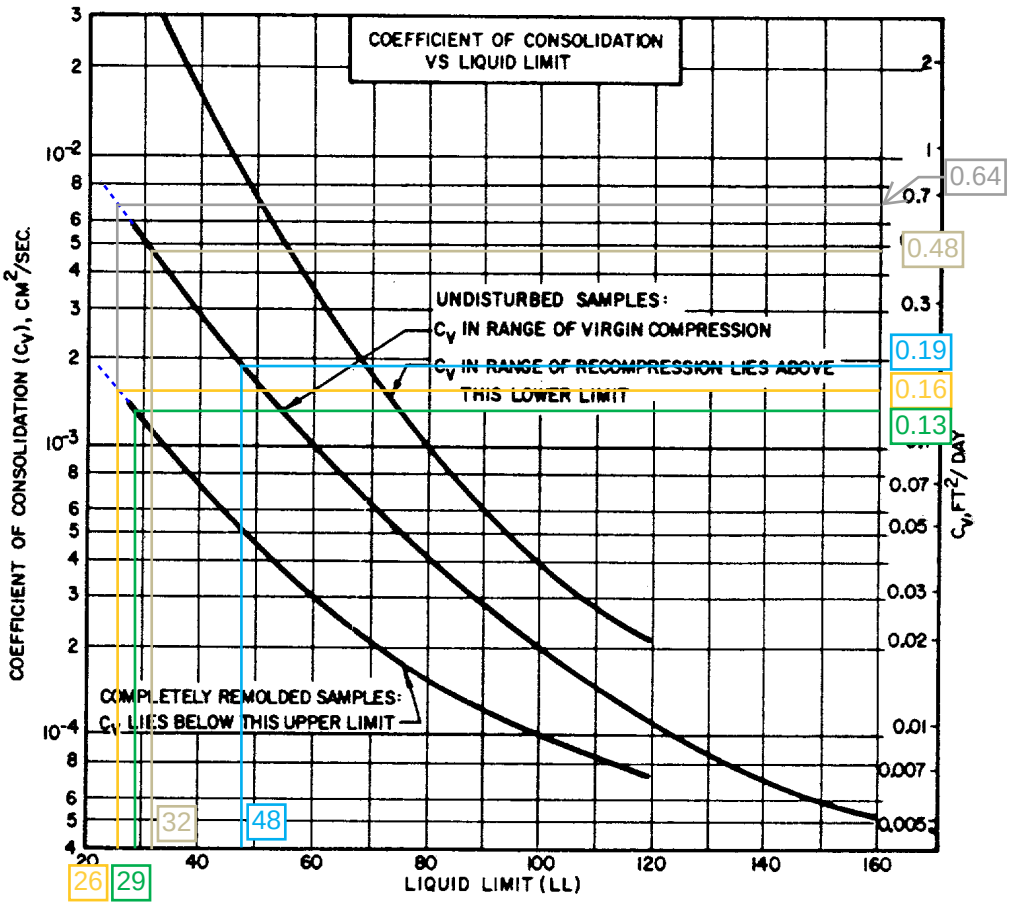
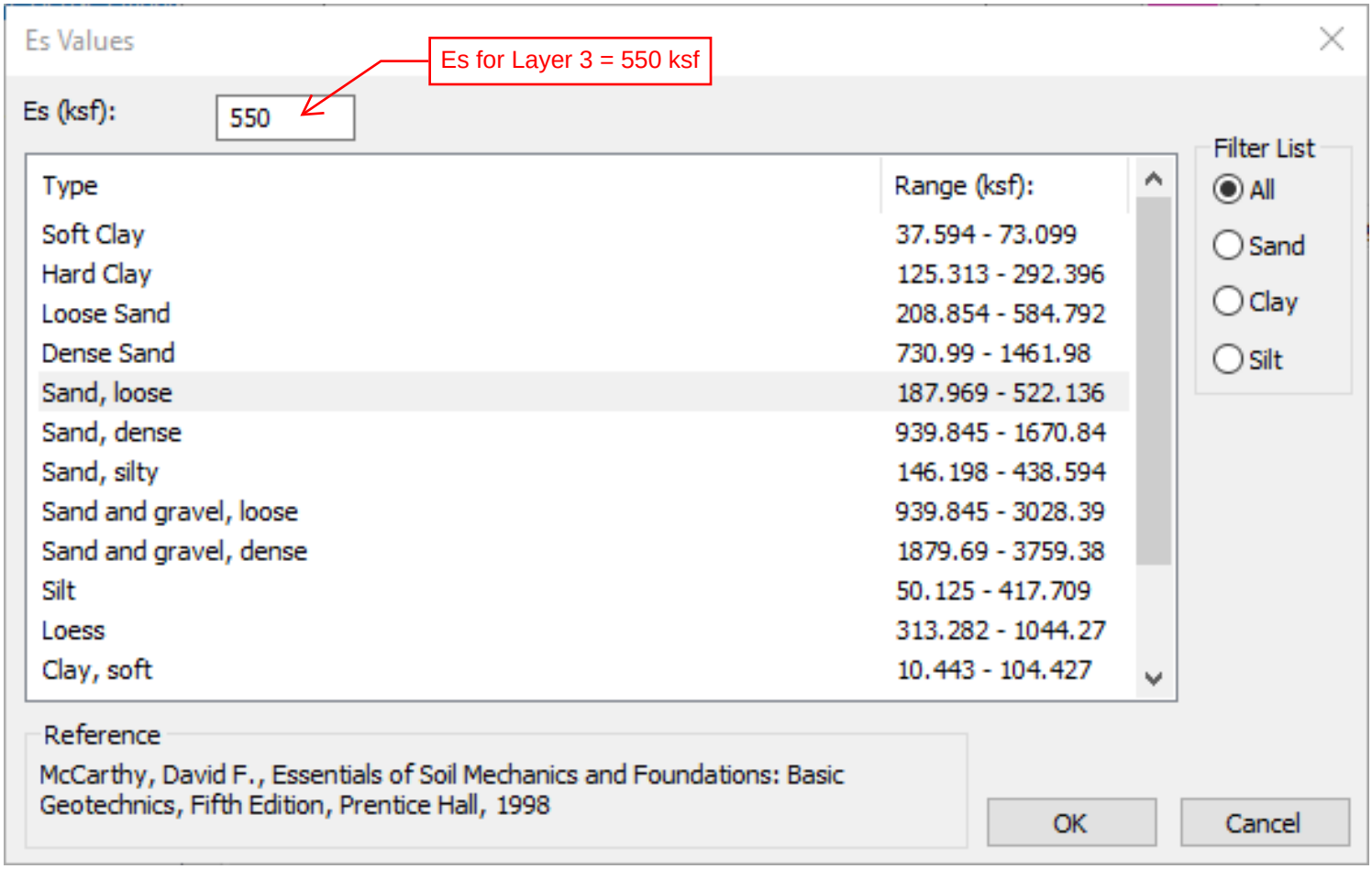
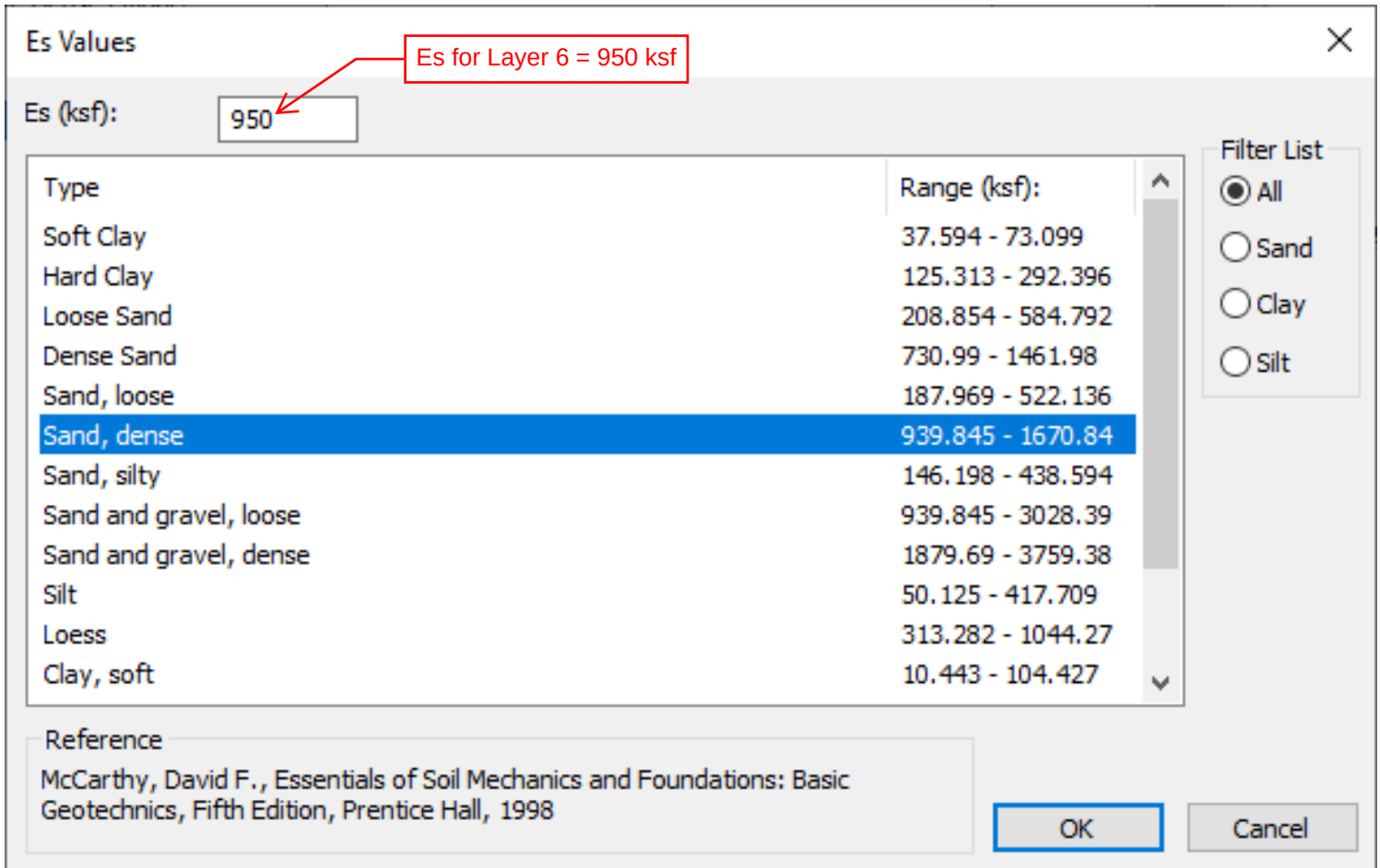


Figure 3-18. Correlations between coefficient of consolidation and liquid limit (NAVFAC DM 7.1)

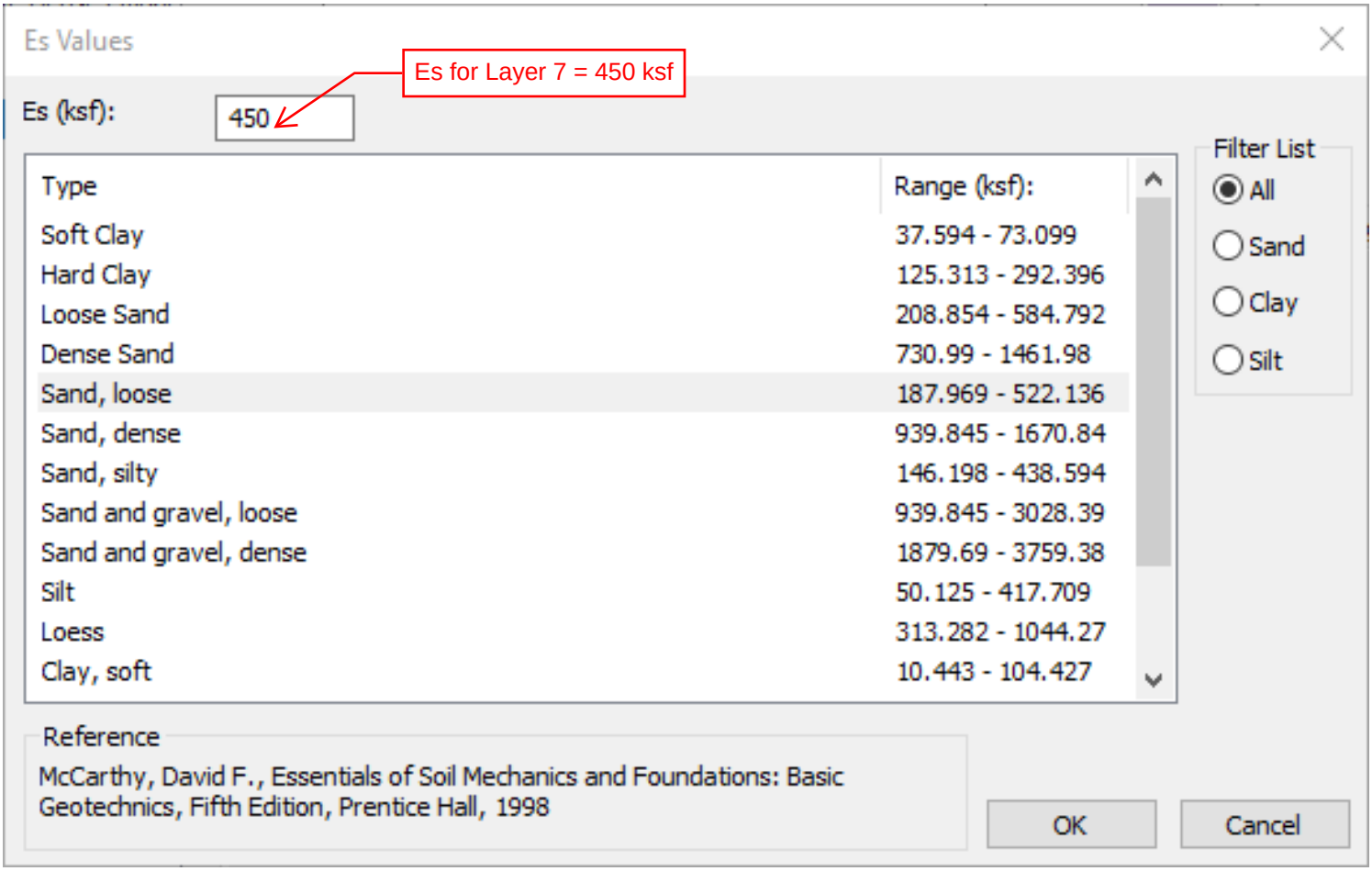
Layer 1: LL = 29, Cv = 0.13 ft²/day
Layer 2: LL = 26, Cv = 0.16 ft²/day
Layer 3: LL = N/A
Layer 4 (SRB-3 and B-47 only): LL = 48, Cv = 0.19 ft²/day
Layer 5: LL = 32, Cv = 0.48 ft²/day
Layer 6: LL = N/A
Layer 7: LL = N/A
Layer 8: LL = 26, Cv = 0.64 ft²/day

Source: Settle3 Software





Source: Settle3 Software



Elastic settlement parameters included in Settle3 for granular layers with "immediate" settlement. This is reflected in the estimated settlement at time = 0 days.

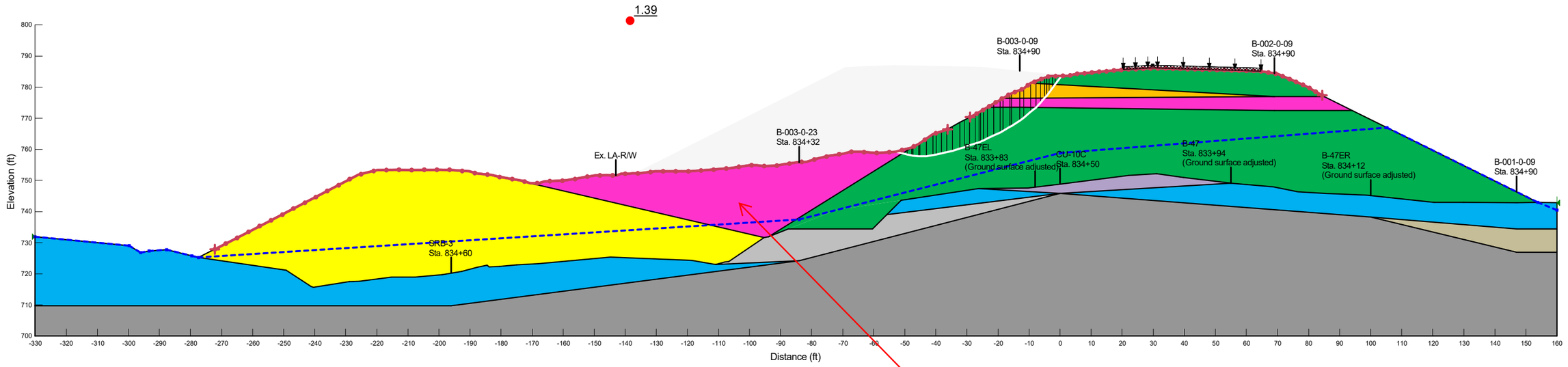
Slope Stability

9999 Carver Road, Suite 210, Cincinnati, OH 45242-5583
(513) 984-7500
hdrinc.com

Long Term (Drained) Condition

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	125	130	23
	2. Stiff to V. Stiff Embankment Fill (LT)	Mohr-Coulomb	125	160	24
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (LT)	Mohr-Coulomb	125	145	24
	5. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	130	195	26
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (LT)	Mohr-Coulomb	125	65	21
	Bedrock	Bedrock (Impenetrable)			
	Roadway Fill (Granular)	Mohr-Coulomb	125	0	31

← Granular Embankment Fill Assumed

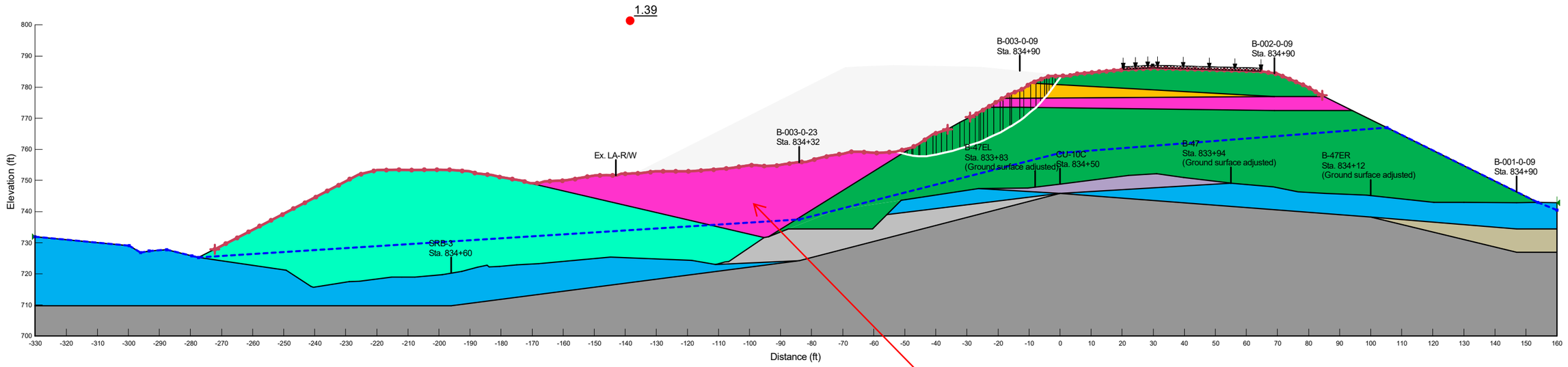


01. Sta. 834+50 Existing Granular Roadway Fill	
Sta. 834+50 LT Slope Stability.gsz	
05/07/2024	1:400

Long Term (Drained) Condition

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	125	130	23
	2. Stiff to V. Stiff Embankment Fill (LT)	Mohr-Coulomb	125	160	24
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (LT)	Mohr-Coulomb	125	145	24
	5. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	130	195	26
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (LT)	Mohr-Coulomb	125	65	21
	Bedrock	Bedrock (Impenetrable)			
	Roadway Fill (Cohesive) (LT)	Mohr-Coulomb	125	130	23

← Cohesive Embankment Fill Assumed



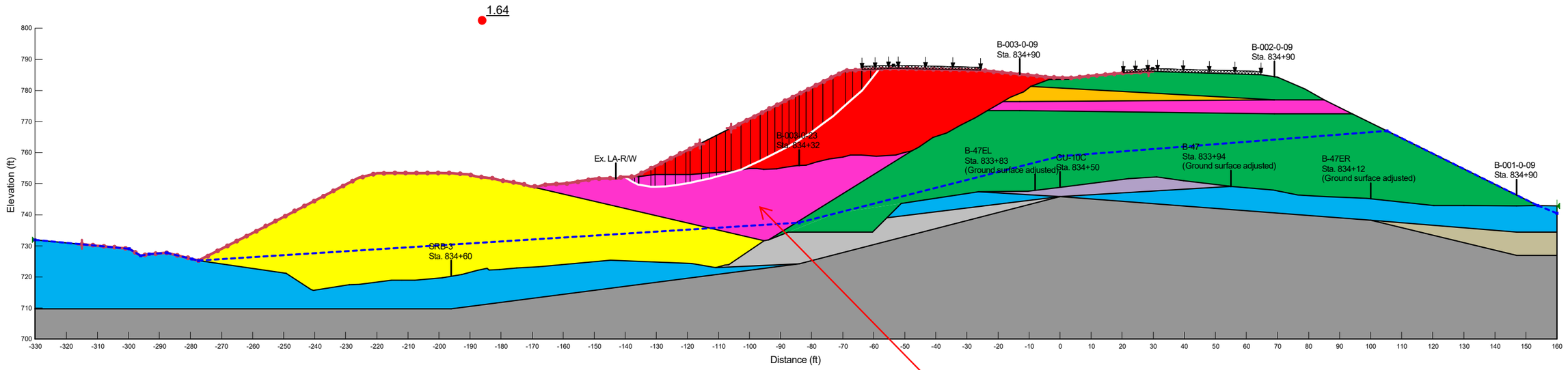
Granular (Layer 3)

02. Sta. 834+50 Existing Cohesive Roadway Fill	
Sta. 834+50 LT Slope Stability.gsz	
05/07/2024	1:400

Long Term (Drained) Condition
New Embankment (A-4a)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	125	130	23
	2. Stiff to V. Stiff Embankment Fill (LT)	Mohr-Coulomb	125	160	24
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (LT)	Mohr-Coulomb	125	145	24
	5. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	130	195	26
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (LT)	Mohr-Coulomb	125	65	21
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-4a) (LT)	Mohr-Coulomb	125	200	30
	Roadway Fill (Granular)	Mohr-Coulomb	125	0	31

← Granular Embankment Fill Assumed



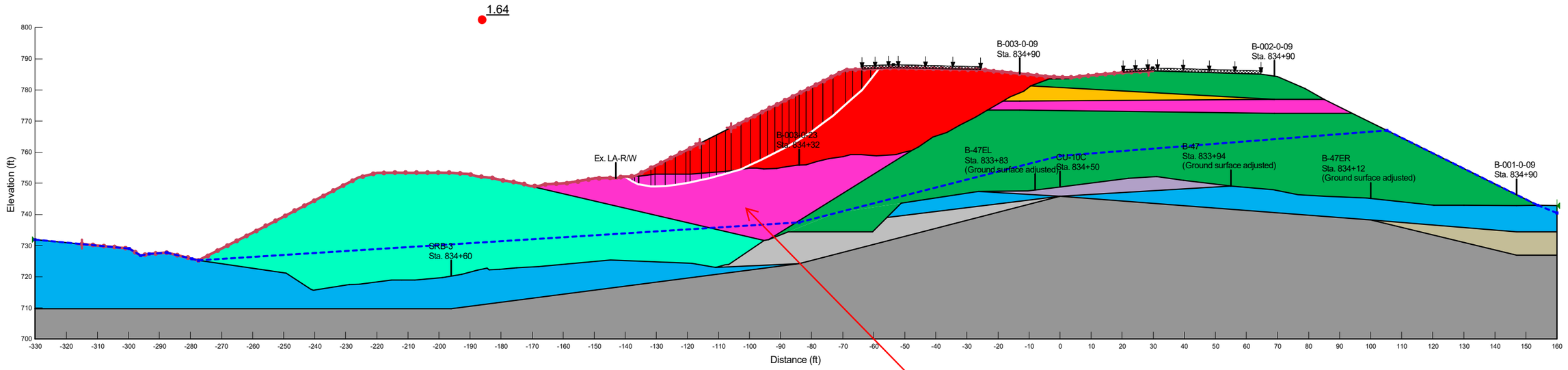
Granular (Layer 3)

03. Sta. 834+50 Proposed A-4a Granular Roadway Fill (LT)
Sta. 834+50 LT Slope Stability.gsz
05/07/2024 1:400

Long Term (Drained) Condition
New Embankment (A-4a)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	125	130	23
	2. Stiff to V. Stiff Embankment Fill (LT)	Mohr-Coulomb	125	160	24
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (LT)	Mohr-Coulomb	125	145	24
	5. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	130	195	26
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (LT)	Mohr-Coulomb	125	65	21
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-4a) (LT)	Mohr-Coulomb	125	200	30
	Roadway Fill (Cohesive) (LT)	Mohr-Coulomb	125	130	23

← Cohesive Embankment Fill Assumed



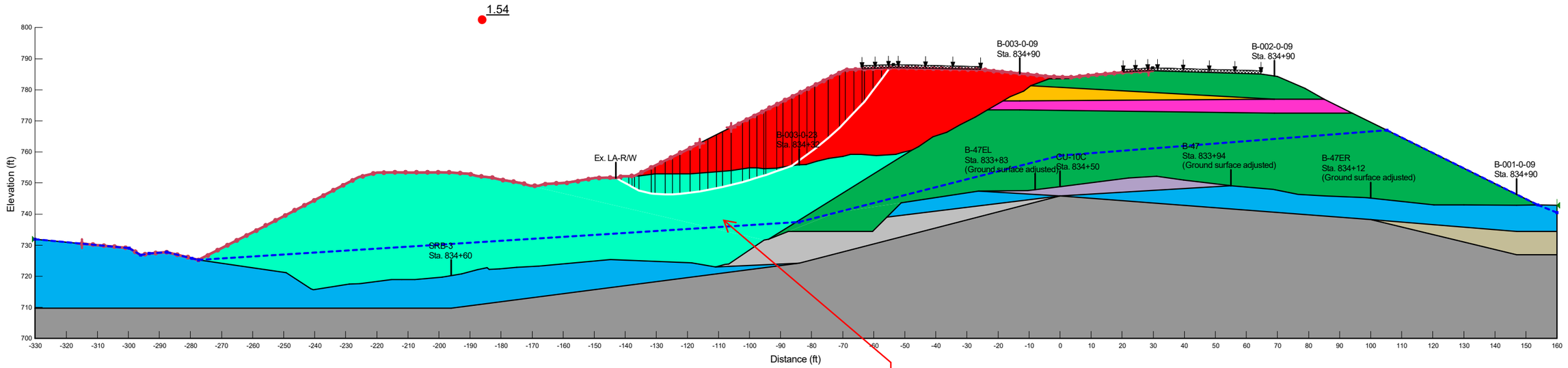
Granular (Layer 3)

05. Sta. 834+50 Proposed A-4a Cohesive Roadway Fill (LT)
Sta. 834+50 LT Slope Stability.gsz
05/07/2024 1:400

Long Term (Drained) Condition
New Embankment (A-4a)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	125	130	23
	2. Stiff to V. Stiff Embankment Fill (LT)	Mohr-Coulomb	125	160	24
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (LT)	Mohr-Coulomb	125	145	24
	5. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	130	195	26
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (LT)	Mohr-Coulomb	125	65	21
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-4a) (LT)	Mohr-Coulomb	125	200	30
	Roadway Fill (Cohesive) (LT)	Mohr-Coulomb	125	130	23

← Cohesive Embankment Fill Assumed

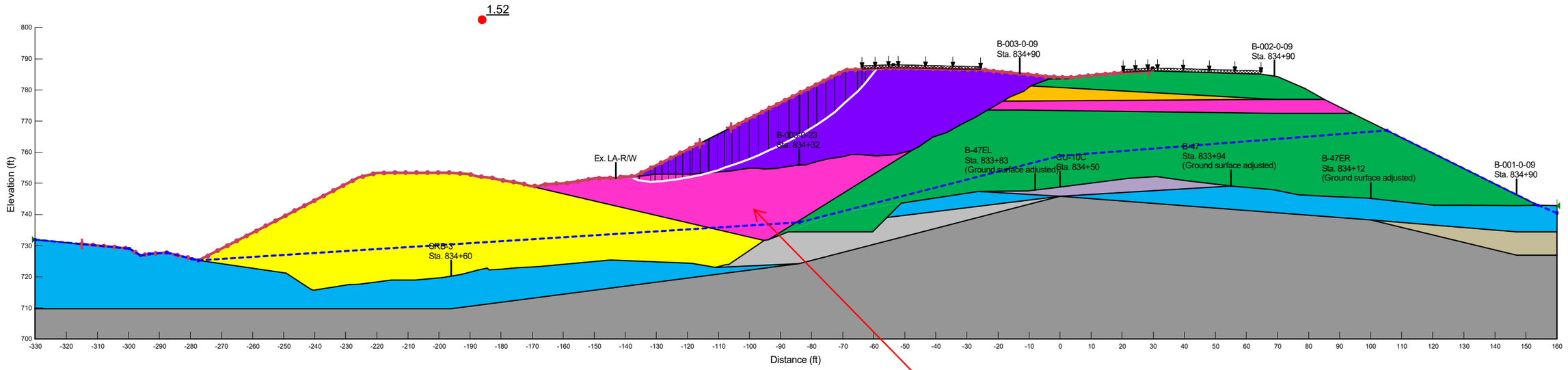


06. Sta. 834+50 Proposed A-4a Cohesive Roadway Fill No Gran. (LT)
Sta. 834+50 LT Slope Stability.gsz
05/07/2024 1:400

Long Term (Drained) Condition
New Embankment (A-7-6)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	125	130	23
	2. Stiff to V. Stiff Embankment Fill (LT)	Mohr-Coulomb	125	160	24
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (LT)	Mohr-Coulomb	125	145	24
	5. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	130	195	26
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (LT)	Mohr-Coulomb	125	65	21
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-7-6) (LT)	Mohr-Coulomb	125	200	26
	Roadway Fill (Granular)	Mohr-Coulomb	125	0	31

← Granular Embankment Fill Assumed



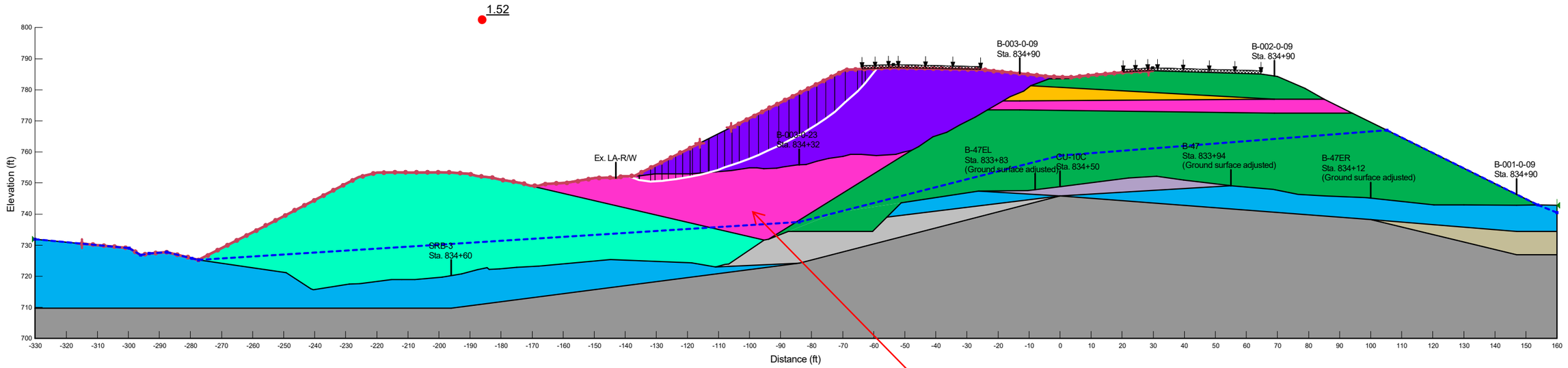
Granular (Layer 3)

07. Sta. 834+50 Proposed A-7-6 Granular Roadway Fill (LT)	
Sta. 834+50 LT Slope Stability.gsz	
05/07/2024	1:400

Long Term (Drained) Condition
New Embankment (A-7-6)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	125	130	23
	2. Stiff to V. Stiff Embankment Fill (LT)	Mohr-Coulomb	125	160	24
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (LT)	Mohr-Coulomb	125	145	24
	5. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	130	195	26
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (LT)	Mohr-Coulomb	125	65	21
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-7-6) (LT)	Mohr-Coulomb	125	200	26
	Roadway Fill (Cohesive) (LT)	Mohr-Coulomb	125	130	23

← Cohesive Embankment Fill Assumed



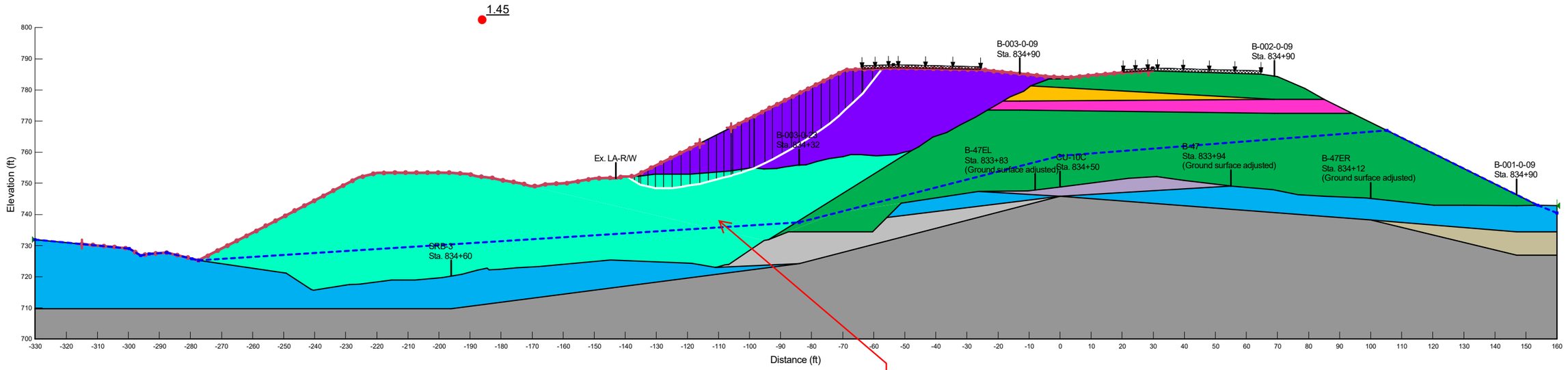
Granular (Layer 3)

09. Sta. 834+50 Proposed A-7-6 Cohesive Roadway Fill (LT)	
Sta. 834+50 LT Slope Stability.gsz	
05/07/2024	1:400

Long Term (Drained) Condition
New Embankment (A-7-6)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (LT)	Mohr-Coulomb	125	130	23
	2. Stiff to V. Stiff Embankment Fill (LT)	Mohr-Coulomb	125	160	24
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (LT)	Mohr-Coulomb	125	145	24
	5. V. Stiff to Hard Cohesive (LT)	Mohr-Coulomb	130	195	26
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (LT)	Mohr-Coulomb	125	65	21
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-7-6) (LT)	Mohr-Coulomb	125	200	26
	Roadway Fill (Cohesive) (LT)	Mohr-Coulomb	125	130	23

← Cohesive Embankment Fill Assumed

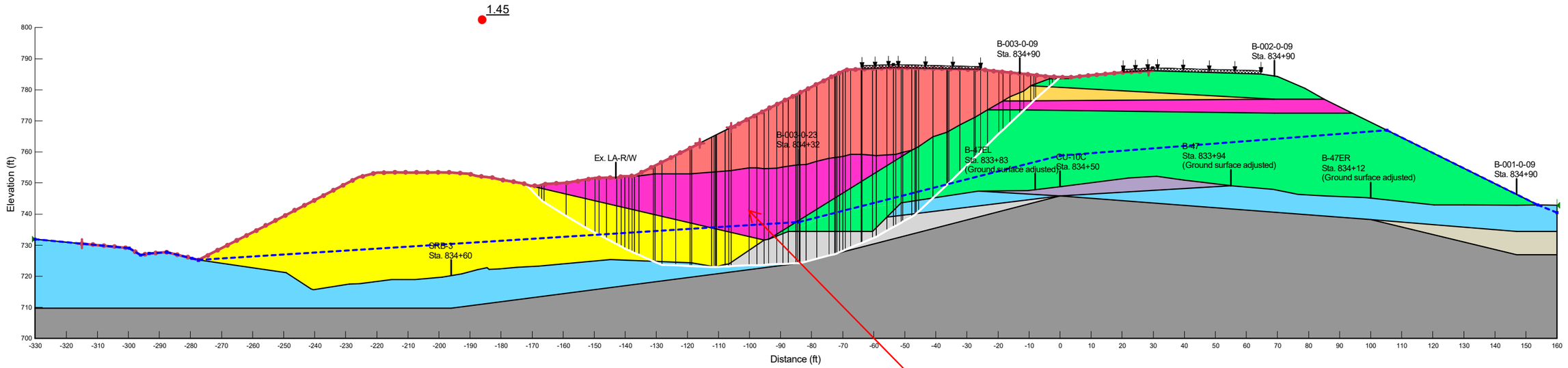


10. Sta. 834+50 Proposed A-7-6 Cohesive Roadway Fill No Gran. (LT)	
Sta. 834+50 LT Slope Stability.gsz	
05/07/2024	1:400

Short Term (Undrained) Condition
New Embankment (A-4a)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,200	0
	2. Stiff to V. Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,700	0
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,600	0
	5. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	130	2,800	0
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (ST)	Mohr-Coulomb	125	700	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-4a) (ST)	Mohr-Coulomb	125	2,000	0
	Roadway Fill (Granular)	Mohr-Coulomb	125	0	31

← Granular Embankment Fill Assumed

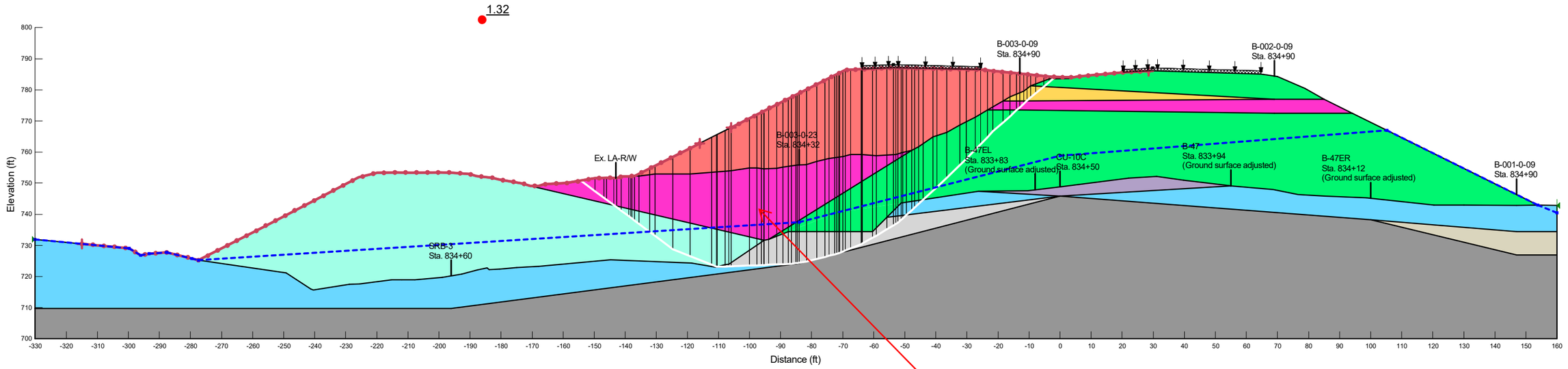


11. Sta. 834+50 Proposed A-4a Granular Roadway Fill (ST)
Sta. 834+50 LT Slope Stability.gsz
05/07/2024 1:400

Short Term (Undrained) Condition
New Embankment (A-4a)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,200	0
	2. Stiff to V. Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,700	0
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,600	0
	5. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	130	2,800	0
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (ST)	Mohr-Coulomb	125	700	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-4a) (ST)	Mohr-Coulomb	125	2,000	0
	Roadway Fill (Cohesive) (ST)	Mohr-Coulomb	125	1,500	0

← Cohesive Embankment Fill Assumed



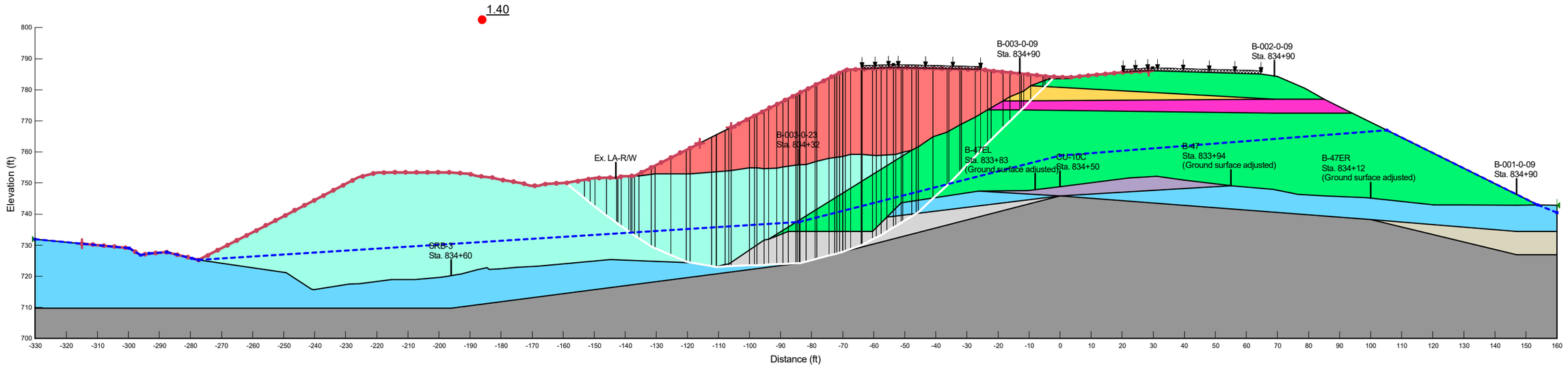
Granular (Layer 3)

13. Sta. 834+50 Proposed A-4a Cohesive Roadway Fill (ST)
Sta. 834+50 LT Slope Stability.gsz
05/07/2024 1:400

Short Term (Undrained) Condition
New Embankment (A-4a)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,200	0
	2. Stiff to V. Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,700	0
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,600	0
	5. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	130	2,800	0
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (ST)	Mohr-Coulomb	125	700	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-4a) (ST)	Mohr-Coulomb	125	2,000	0
	Roadway Fill (Cohesive) (ST)	Mohr-Coulomb	125	1,500	0

← Cohesive Embankment Fill Assumed

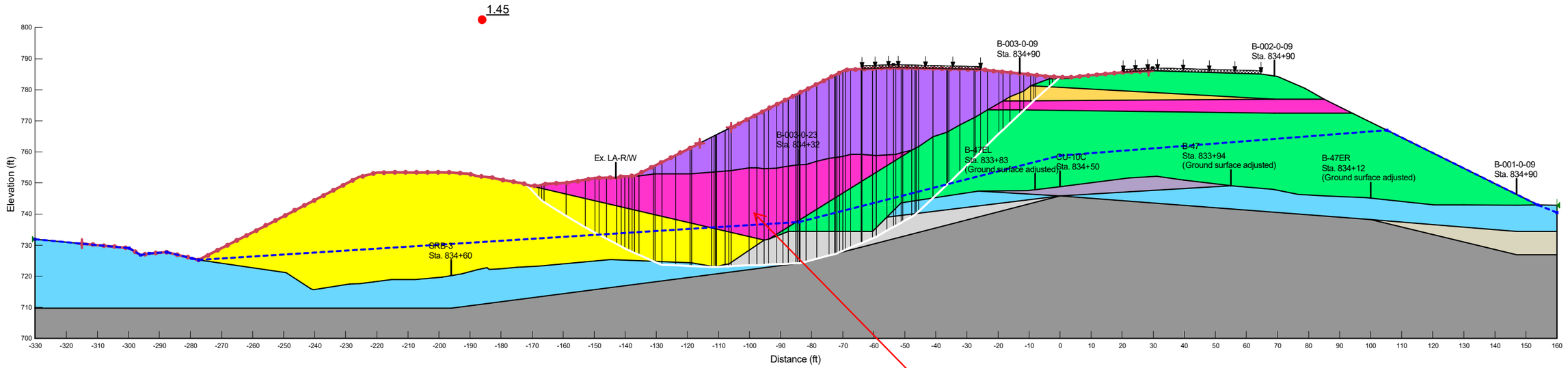


14. Sta. 834+50 Proposed A-4a Cohesive Roadway Fill No Gran. (ST)
Sta. 834+50 LT Slope Stability.gsz
05/07/2024 1:400

Short Term (Undrained) Condition
New Embankment (A-7-6)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,200	0
	2. Stiff to V. Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,700	0
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,600	0
	5. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	130	2,800	0
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (ST)	Mohr-Coulomb	125	700	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-7-6) (ST)	Mohr-Coulomb	125	2,000	0
	Roadway Fill (Granular)	Mohr-Coulomb	125	0	31

← Granular Embankment Fill Assumed



Granular (Layer 3)

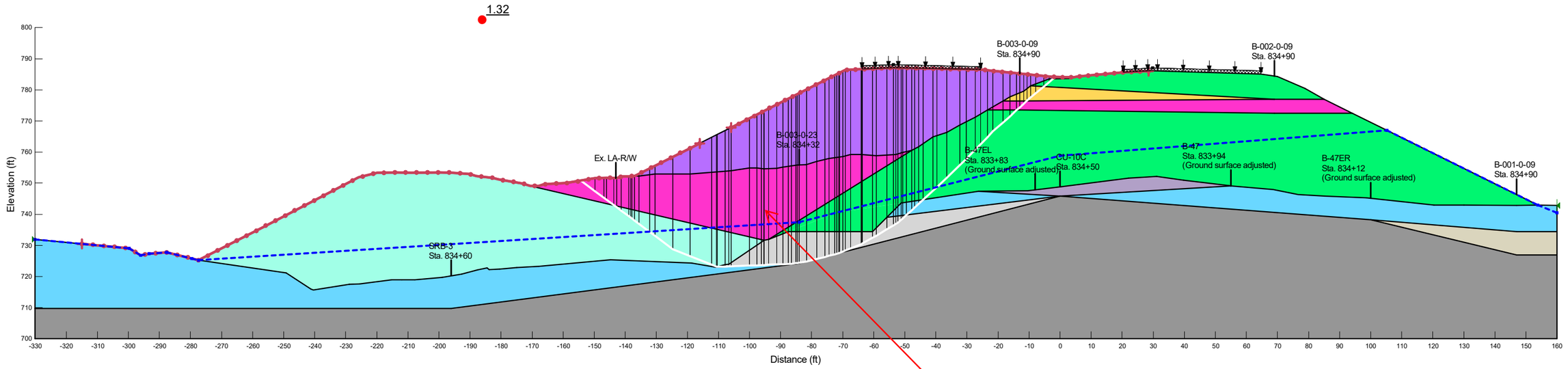
15. Sta. 834+50 Proposed A-7-6 Granular Roadway Fill (ST)	
Sta. 834+50 LT Slope Stability.gsz	
05/07/2024	1:400

Short Term (Undrained) Condition
New Embankment (A-7-6)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,200	0
	2. Stiff to V. Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,700	0
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,600	0
	5. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	130	2,800	0
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (ST)	Mohr-Coulomb	125	700	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-7-6) (ST)	Mohr-Coulomb	125	2,000	0
	Roadway Fill (Cohesive) (ST)	Mohr-Coulomb	125	1,500	0

← Cohesive Embankment Fill Assumed

1.32



Granular (Layer 3)

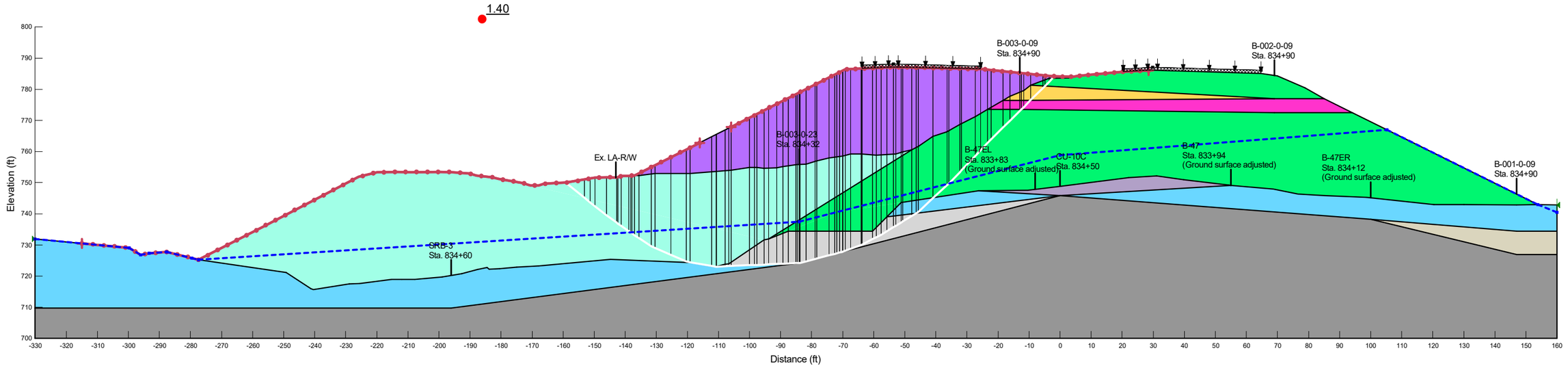
17. Sta. 834+50 Proposed A-7-6 Cohesive Roadway Fill (ST)
Sta. 834+50 LT Slope Stability.gsz
05/07/2024 1:400

Short Term (Undrained) Condition
New Embankment (A-7-6)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. M. Stiff to Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,200	0
	2. Stiff to V. Stiff Embankment Fill (ST)	Mohr-Coulomb	125	1,700	0
	3. Loose to M. Dense Embankment Fill	Mohr-Coulomb	125	0	31
	4. Stiff to V. Stiff Cohesive (ST)	Mohr-Coulomb	125	1,600	0
	5. V. Stiff to Hard Cohesive (ST)	Mohr-Coulomb	130	2,800	0
	6. M. Dense to Dense Granular	Mohr-Coulomb	130	0	34
	8. Soft to M. Stiff Cohesive (ST)	Mohr-Coulomb	125	700	0
	Bedrock	Bedrock (Impenetrable)			
	New Embankment Fill (Assumed A-7-6) (ST)	Mohr-Coulomb	125	2,000	0
	Roadway Fill (Cohesive) (ST)	Mohr-Coulomb	125	1,500	0

← Cohesive Embankment Fill Assumed

1.40



18. Sta. 834+50 Proposed A-7-6 Cohesive Roadway Fill No Gran. (ST)
Sta. 834+50 LT Slope Stability.gsz
05/07/2024 1:400

Settlement

Project: MEG-33-13.96
Client: ODOT D10
Task: Settlement Analysis Summary

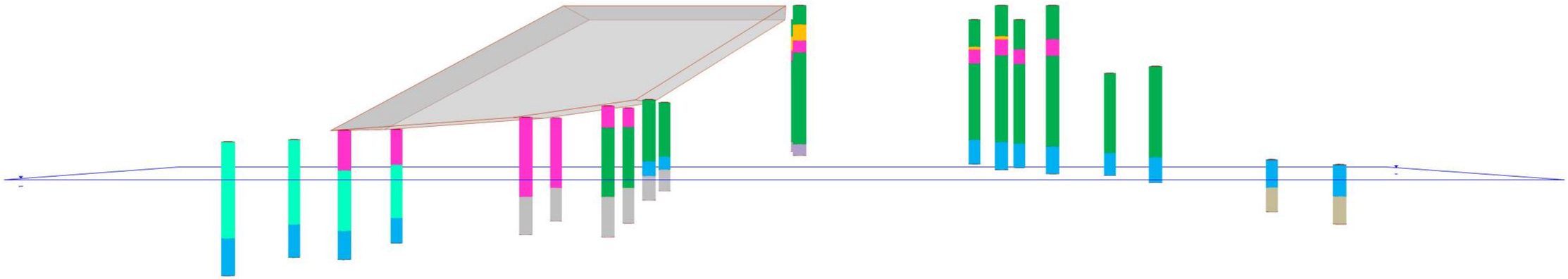
Calculated By: AKB **Date:** 5/1/2024
Checked By: DCM **Date:** 5/6/2024

Analyses	Maximum Settlement (in.)	<3-in. Remaining (in.)	Time to <3-in. Remaining	90% Complete (in.)	Time to 90% Complete
Sta. 834+50 Overconsolidated Existing Embankment Granular Roadway Fill at Toe	6.08	Target: 3.08 Actual: 3.30	1 month	Target: 5.47 Actual: 5.62	6 months
Sta. 834+50 Normally Consolidated Existing Embankment Granular Roadway Fill at Toe	17.43	Target: 14.43 Actual: 15.01	6 months	Target: 15.69 Actual: 16.12	9 months
Sta. 834+50 Overconsolidated Existing Embankment Cohesive Roadway Fill at Toe	6.30	Target: 3.30 Actual: 3.49	1 month	Target: 5.67 Actual: 5.85	6 months
Sta. 834+50 Normally Consolidated Existing Embankment Cohesive Roadway Fill at Toe	17.65	Target: 14.65 Actual: 15.23	6 months	Target: 15.89 Actual: 16.05	8 months

Per ODOT Geotechnical Design Manual Section 504, 3 inches of settlement of less is considered reasonable if settlement does not influence structure, utility, or other roadway infrastructure. As such, analyses highlight time required to reach 3 inches of remaining settlement.

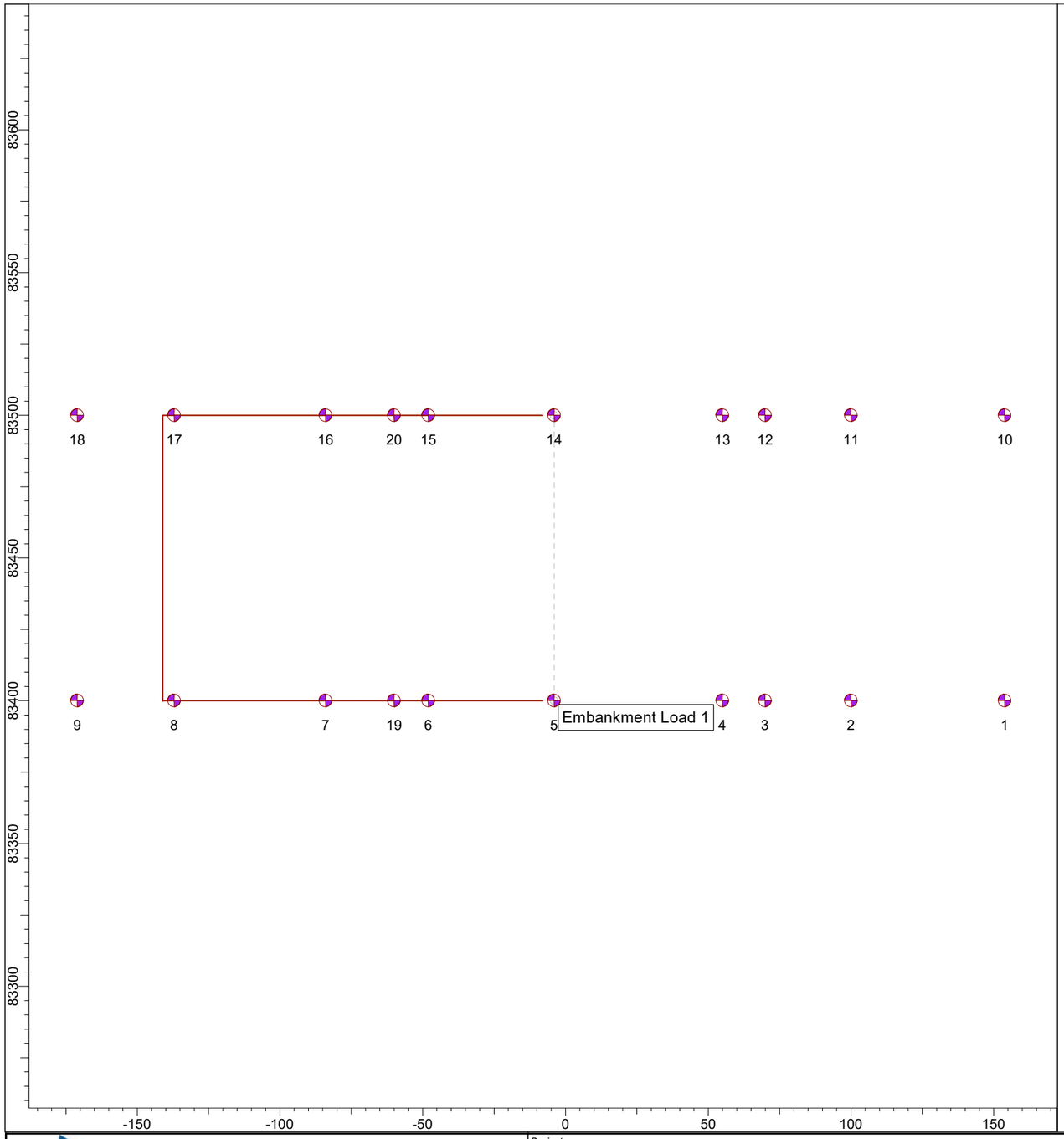
Settlement (Overconsolidated Existing Embankment, Granular Fill at Toe)

3D Model Front View

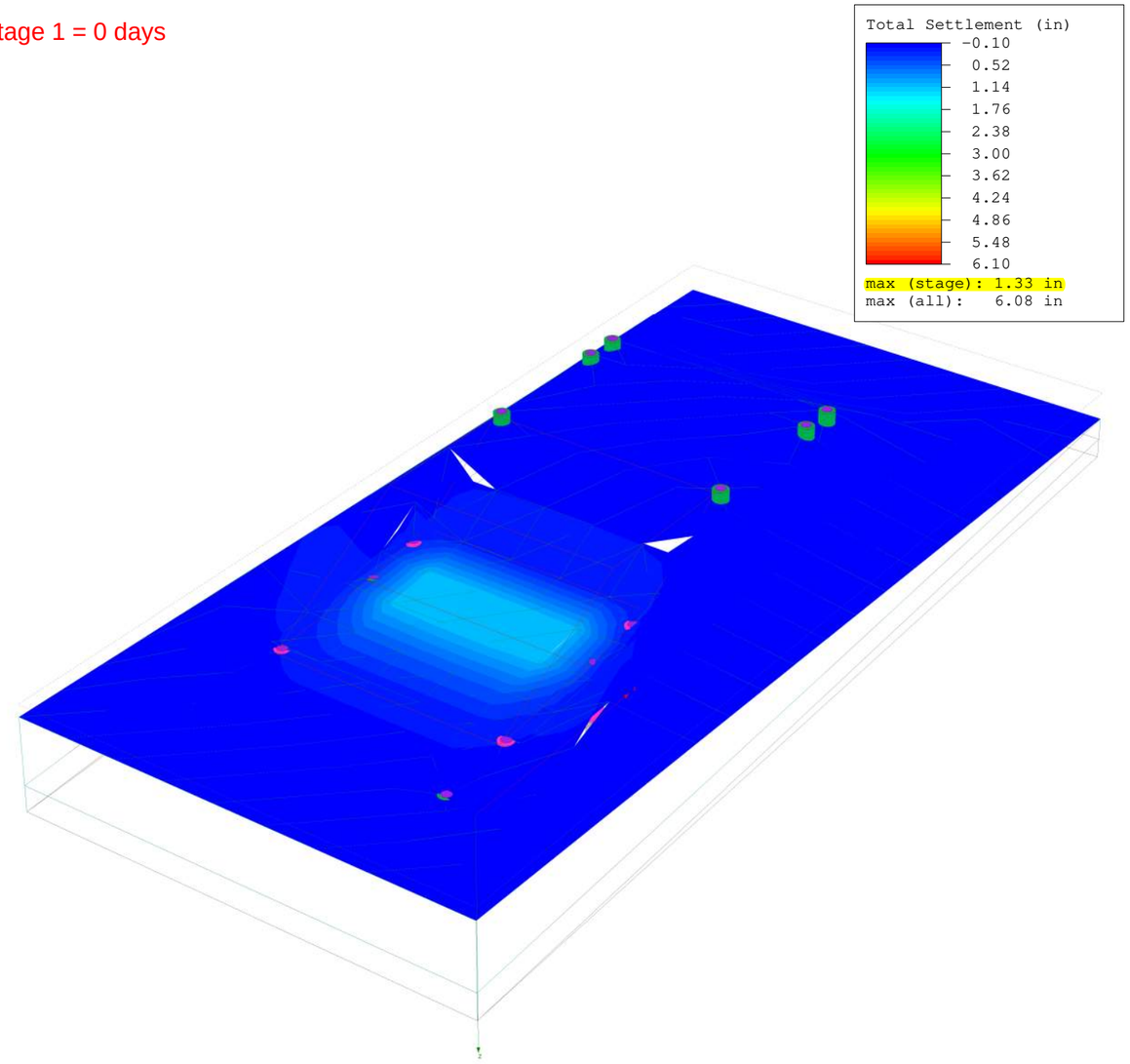


rocscience	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 834+50	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement.s3z

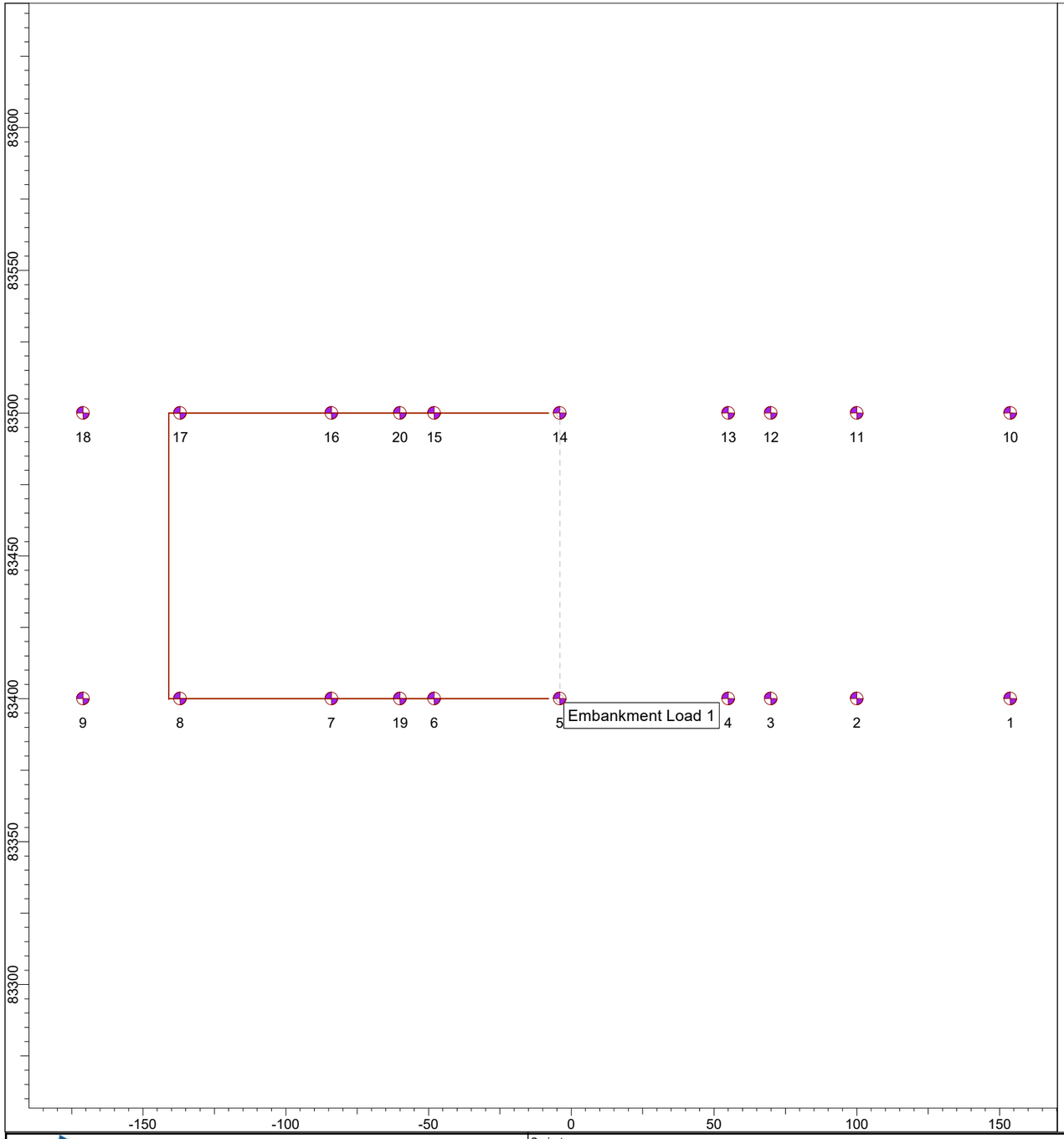
SETTLE3 5.007



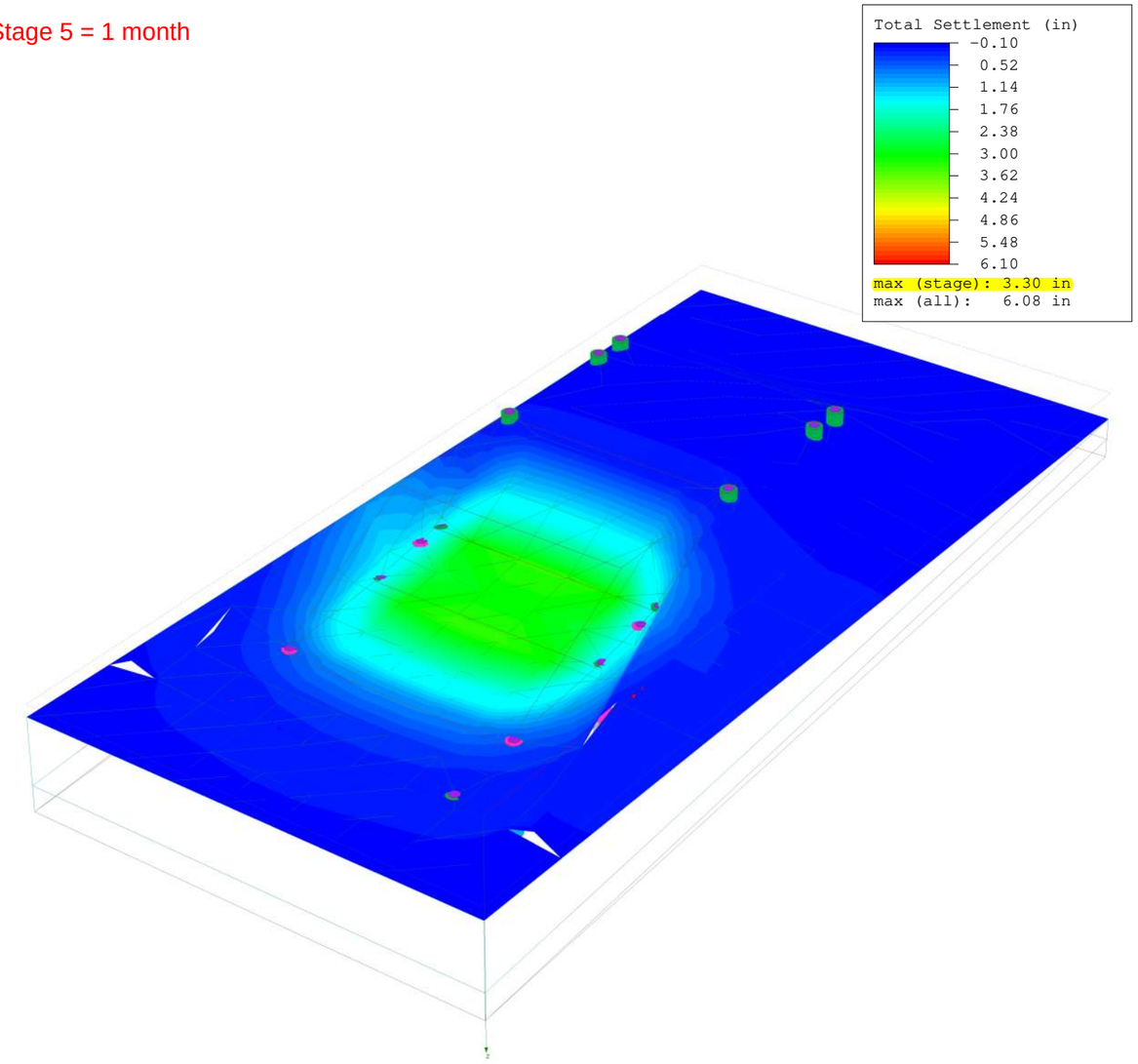
Stage 1 = 0 days



	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50	
	Drawn By	A. Baratta	*Company* HDR
SETTLE3 5.007	*Date*	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement.s3z

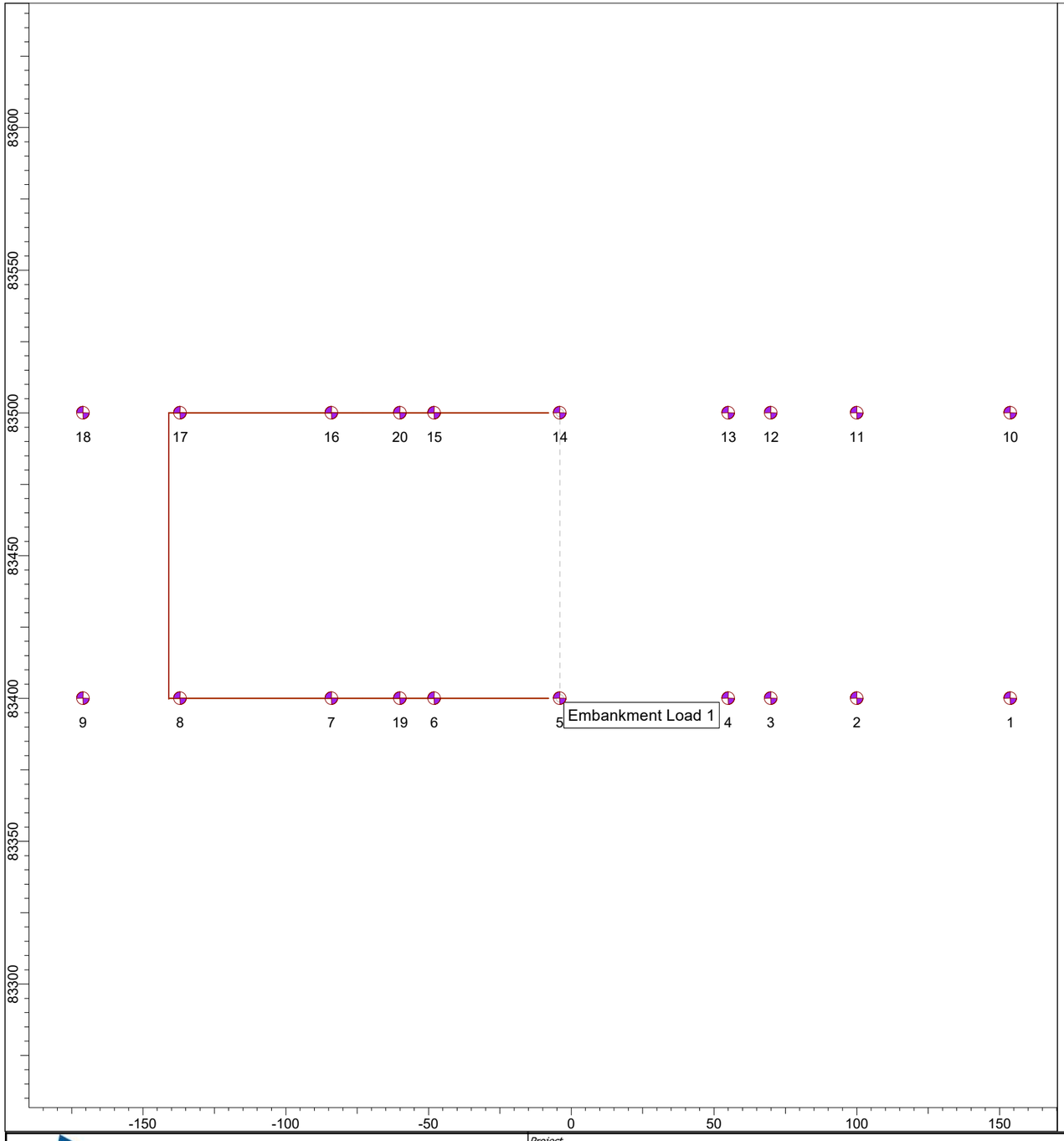


Stage 5 = 1 month

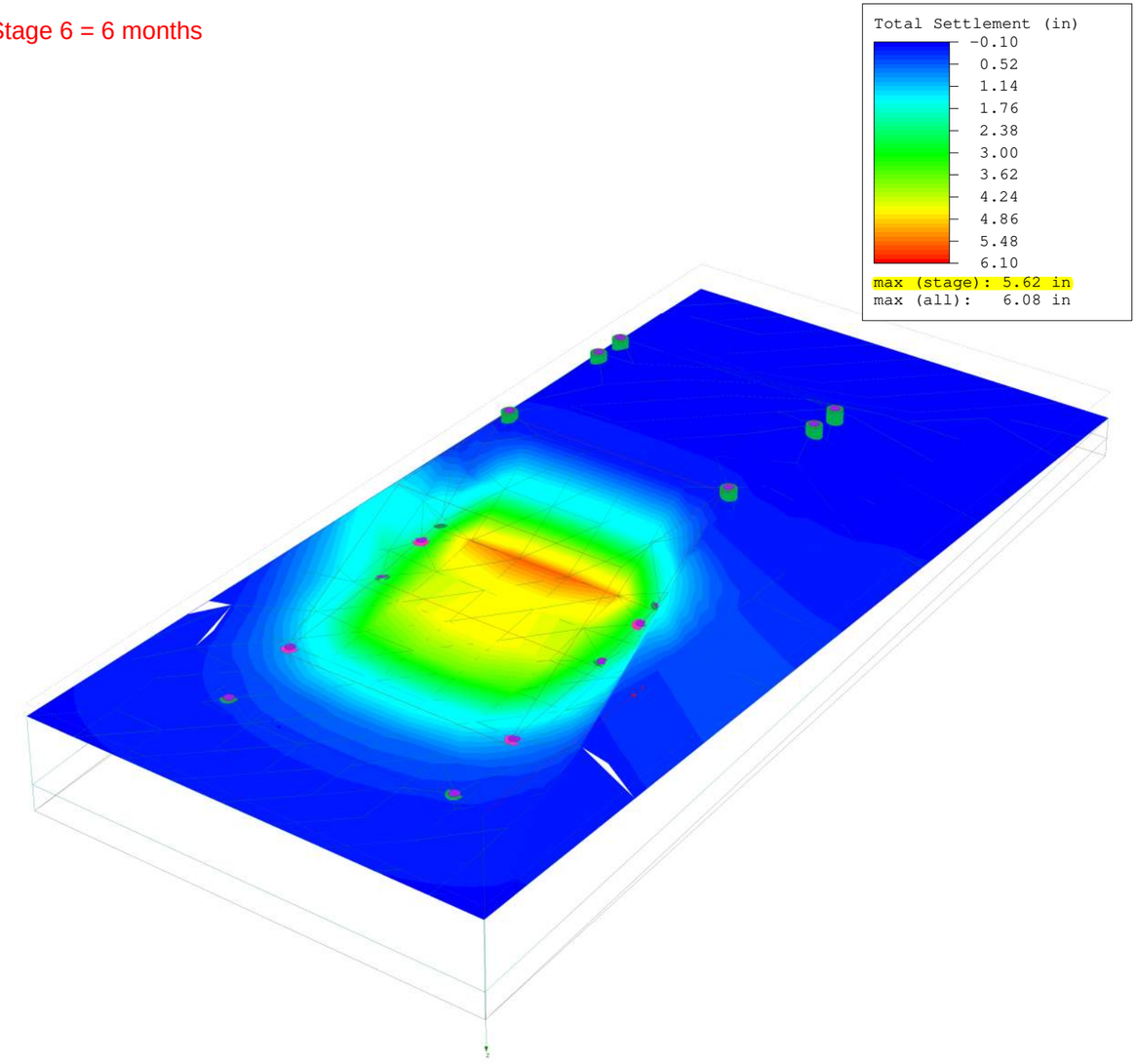


Project	MEG-33-13.96		
Analysis Description	Sta. 834+50		
Drawn By	A. Baratta	*Company*	HDR
Date	4/25/2024, 12:56:29 PM	*File Name*	Sta. 834+50 Settlement.s3z

SETTLE3 5.007

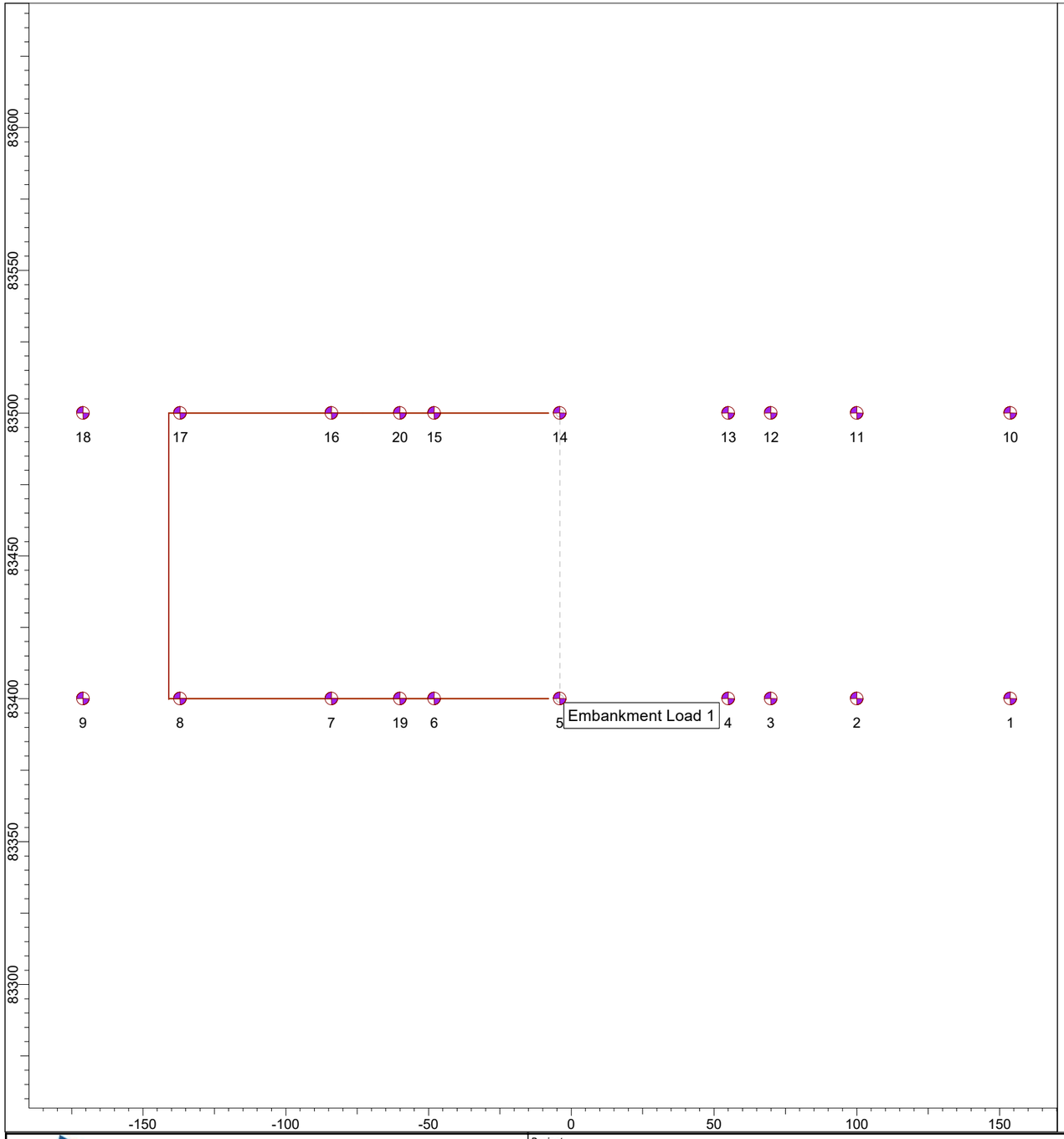


Stage 6 = 6 months

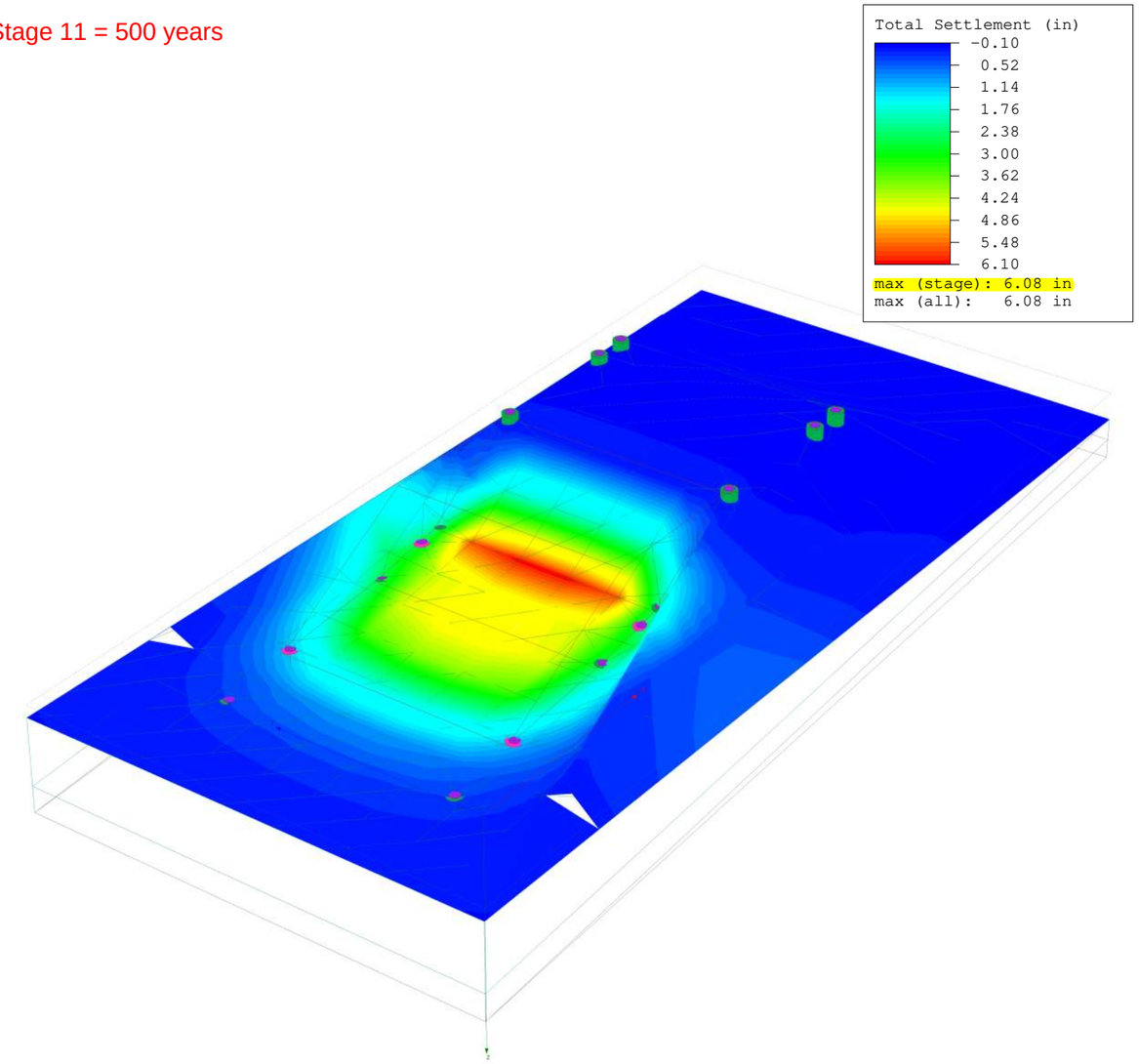


	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50	
	Drawn By	A. Baratta	Company HDR
	Date	4/25/2024, 12:56:29 PM	File Name Sta. 834+50 Settlement.s3z

SETTLE3 5.007



Stage 11 = 500 years



Project	MEG-33-13.96		
Analysis Description	Sta. 834+50		
Drawn By	A. Baratta	*Company*	HDR
Date	4/25/2024, 12:56:29 PM	*File Name*	Sta. 834+50 Settlement.s3z

SETTLE3 5.007

MEG-33-13.96
HDR
Date Created: 2024/05/07, 06:01:50

Table of Contents

Settle3 Analysis Information

MEG-33-13.96

Project Settings

Document Name	Sta. 834+50 Settlement.s3z
Project Title	MEG-33-13.96
Analysis	Sta. 834+50
Author	A. Baratta
Company	HDR
Date Created	4/25/2024, 12:56:29 PM
Stress Computation Method	Boussinesq
Time-dependent Consolidation Analysis	
Time Units	days
Permeability Units	feet/day
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

Stage #	Name	Time [days]
1	0 d	0
2	7 d	7
3	14 d	14
4	21 d	21
5	30 d (1 m)	30
6	183 d (6 m)	183
7	274 d (9 m)	274
8	365 d (1 y)	365
9	3650 d (10 y)	3650
10	36,500 d (100 y)	36500
11	182,500 d (500 y)	182500

Results

Time taken to compute: 12.9792 seconds

Stage: 0 d = 0 d

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.33145
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66246
Effective Stress XX [ksf]	-0.253991	6.86472
Effective Stress YY [ksf]	-0.142571	3.95837
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00764898
Pore Water Pressure [ksf]	0	4.70196
Excess Pore Water Pressure [ksf]	0	4.70196
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.000947083	18
Over-consolidation Ratio	1	36781.6
Void Ratio	0	0.657
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-1.11022e-16	4.44089e-16

Stage: 7 d = 7 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.00317638	2.33619
Total Consolidation Settlement [in]	-0.00317638	1.67098
Virgin Consolidation Settlement [in]	0	1.38274
Recompression Consolidation Settlement [in]	-0.00537466	0.288232
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66285
Effective Stress XX [ksf]	-0.420529	9.45028
Effective Stress YY [ksf]	-0.420529	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00640303	0.0789852
Pore Water Pressure [ksf]	0	3.64819
Excess Pore Water Pressure [ksf]	-8.71321e-34	3.2112
Degree of Consolidation [%]	0	99.9049
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.657195
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00139418	0.568481

Stage: 14 d = 14 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.00277535	2.73321
Total Consolidation Settlement [in]	-0.00277535	2.29013
Virgin Consolidation Settlement [in]	0	1.89493
Recompression Consolidation Settlement [in]	-0.00277535	0.395205
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66301
Effective Stress XX [ksf]	-0.432298	9.45028
Effective Stress YY [ksf]	-0.432298	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0082481	0.0790162
Pore Water Pressure [ksf]	0	3.57509
Excess Pore Water Pressure [ksf]	-5.01365e-34	3.17958
Degree of Consolidation [%]	0	99.9999
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.65725
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00145859	0.568481

Stage: 21 d = 21 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.000586058	3.02286
Total Consolidation Settlement [in]	-0.000586058	2.73249
Virgin Consolidation Settlement [in]	0	2.25865
Recompression Consolidation Settlement [in]	-0.000586058	0.473845
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66314
Effective Stress XX [ksf]	-0.380484	9.45028
Effective Stress YY [ksf]	-0.380484	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00652233	0.0790295
Pore Water Pressure [ksf]	0	3.41387
Excess Pore Water Pressure [ksf]	-5.18137e-34	3.13435
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.657115
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.000485802	0.568481

Stage: 30 d (1 m) = 30 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.30198
Total Consolidation Settlement [in]	0	3.17973
Virgin Consolidation Settlement [in]	0	2.62846
Recompression Consolidation Settlement [in]	0	0.551279
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66328
Effective Stress XX [ksf]	-0.306776	9.45028
Effective Stress YY [ksf]	-0.306776	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00480906	0.0790391
Pore Water Pressure [ksf]	0	3.14716
Excess Pore Water Pressure [ksf]	-3.24815e-34	3.09999
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656916
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-3.31148e-07	0.568481

Stage: 183 d (6 m) = 183 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	5.62361
Total Consolidation Settlement [in]	0	5.53602
Virgin Consolidation Settlement [in]	0	4.50006
Recompression Consolidation Settlement [in]	0	1.03596
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.7808
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00165994	0.0790766
Pore Water Pressure [ksf]	-8.44199e-17	1.73515
Excess Pore Water Pressure [ksf]	-8.44199e-17	1.59264
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656636
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.568481

Stage: 274 d (9 m) = 274 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	5.88595
Total Consolidation Settlement [in]	0	5.79836
Virgin Consolidation Settlement [in]	0	4.66863
Recompression Consolidation Settlement [in]	0	1.12973
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.94493
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0011642	0.0790789
Pore Water Pressure [ksf]	-8.35538e-17	1.71659
Excess Pore Water Pressure [ksf]	-8.35538e-17	1.00023
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656561
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.568481

Stage: 365 d (1 y) = 365 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	5.98826
Total Consolidation Settlement [in]	0	5.90066
Virgin Consolidation Settlement [in]	0	4.71964
Recompression Consolidation Settlement [in]	0	1.18102
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.98722
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.000809998	0.0790794
Pore Water Pressure [ksf]	-8.31543e-17	1.70486
Excess Pore Water Pressure [ksf]	-8.31543e-17	0.626155
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.65652
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.568481

Stage: 3650 d (10 y) = 3650 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	6.08244
Total Consolidation Settlement [in]	0	5.99485
Virgin Consolidation Settlement [in]	0	4.74227
Recompression Consolidation Settlement [in]	0	1.25917
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00189
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-2.45527e-08	0.0790796
Pore Water Pressure [ksf]	-1.82839e-16	1.6848
Excess Pore Water Pressure [ksf]	-8.36329e-06	1.41763e-05
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.568481

Stage: 36,500 d (100 y) = 36500 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	6.08244
Total Consolidation Settlement [in]	0	5.99485
Virgin Consolidation Settlement [in]	0	4.74227
Recompression Consolidation Settlement [in]	0	1.25917
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00189
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.0790796
Pore Water Pressure [ksf]	-1.06224e-15	1.6848
Excess Pore Water Pressure [ksf]	-8.35356e-06	9.6962e-06
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.568481

Stage: 182,500 d (500 y) = 182500 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	6.08244
Total Consolidation Settlement [in]	0	5.99485
Virgin Consolidation Settlement [in]	0	4.74227
Recompression Consolidation Settlement [in]	0	1.25917
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00188
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.0790796
Pore Water Pressure [ksf]	-1.08046e-15	1.6848
Excess Pore Water Pressure [ksf]	-9.69317e-06	8.34988e-06
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00102395	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.568481

Embankments

1. Embankment: "Embankment Load 1"

Label	Embankment Load 1
Center Line	(-4, 83400) to (-4, 83500)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Zones	4
Number of Sections	1

Zone	Name	Unit Weight (kips/ft3)
1	New Zone	0.115
2	New Zone 2	0.115
3	New Zone 3	0.115
4	New Zone 4	0.125

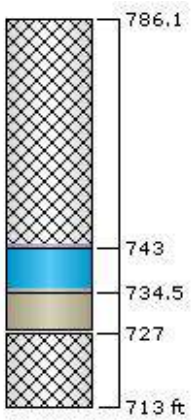
Soil Layers

Ground Surface Drained: Yes

RT Toe (B-001-0-09)

XY Location: RT Toe (B-001-0-09): (153.8, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-743	No
2	2. Stiff to V. Stiff Embankment Fill	0	-743	No
3	3. Loose to M. Dense Embankment Fill	0	-743	Yes
4	Cohesive Roadway Fill	0	-743	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-743	Yes
6	6. M. Dense to Dense Granular	0	-743	Yes
7	4. Stiff to V. Stiff Cohesive	8.5	-743	No
8	8. Soft to M. Stiff Cohesive	0	-734.5	No
9	5. V. Stiff to Hard Cohesive	7.5	-734.5	No

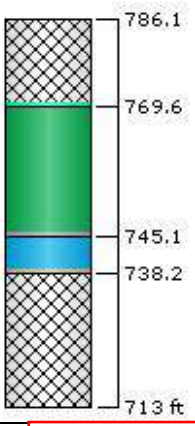


RT Slope (B-002-0-09/B-47ER)

Header for point on following page (software output limitation)

XY Location: RT Slope (B-002-0-09/B-47ER): (100, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-769.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-769.6	No
3	3. Loose to M. Dense Embankment Fill	0	-769.6	Yes
4	Cohesive Roadway Fill	0	-769.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-769.6	Yes
6	6. M. Dense to Dense Granular	0	-745.1	Yes
7	4. Stiff to V. Stiff Cohesive	6.9	-745.1	No
8	8. Soft to M. Stiff Cohesive	0	-738.2	No
9	5. V. Stiff to Hard Cohesive	0	-738.2	No

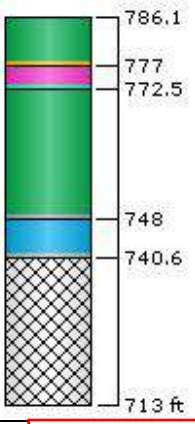


RT Crest (B-002-0-09)

Header for point on following page (software output limitation)

XY Location: RT Crest (B-002-0-09): (69.9, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	9.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0	-777	No
3	3. Loose to M. Dense Embankment Fill	4.5	-777	Yes
4	Cohesive Roadway Fill	0	-772.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-772.5	Yes
6	6. M. Dense to Dense Granular	0	-748	Yes
7	4. Stiff to V. Stiff Cohesive	7.4	-748	No
8	8. Soft to M. Stiff Cohesive	0	-740.6	No
9	5. V. Stiff to Hard Cohesive	0	-740.6	No

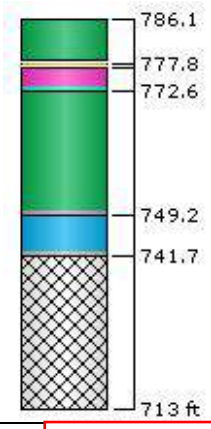


CL Crest (B-002-0-09/B-47)

Header for point on following page (software output limitation)

XY Location: CL Crest (B-002-0-09/B-47): (55, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	8.3	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0.9	-777.8	No
3	3. Loose to M. Dense Embankment Fill	4.3	-776.9	Yes
4	Cohesive Roadway Fill	0	-772.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	23.4	-772.6	Yes
6	6. M. Dense to Dense Granular	0	-749.2	Yes
7	4. Stiff to V. Stiff Cohesive	7.5	-749.2	No
8	8. Soft to M. Stiff Cohesive	0	-741.7	No
9	5. V. Stiff to Hard Cohesive	0	-741.7	No

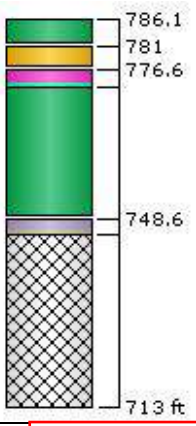


LT Crest (B-003-0-09/CU-10C)

Header for point on following page (software output limitation)

XY Location: LT Crest (B-003-0-09/CU-10C): (-4, 83400)

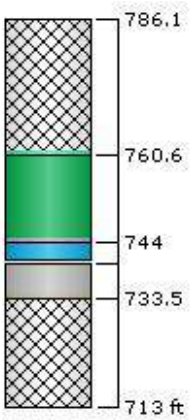
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	5.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	4.4	-781	No
3	3. Loose to M. Dense Embankment Fill	3.2	-776.6	Yes
4	Cohesive Roadway Fill	0	-773.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.8	-773.4	Yes
6	6. M. Dense to Dense Granular	3	-748.6	Yes
7	4. Stiff to V. Stiff Cohesive	0	-745.6	No
8	8. Soft to M. Stiff Cohesive	0	-745.6	No
9	5. V. Stiff to Hard Cohesive	0	-745.6	No



LT Toe (B-003-0-09)

Header for point on following page (software output limitation)

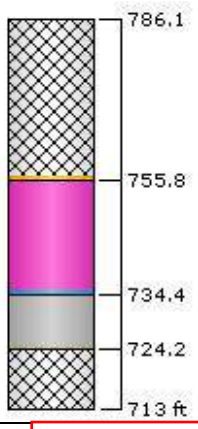
XY Location:		LT Toe (B-003-0-09): (-48, 83400)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-760.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-760.6	No
3	3. Loose to M. Dense Embankment Fill	0	-760.6	Yes
4	Cohesive Roadway Fill	0	-760.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	16.6	-760.6	Yes
6	6. M. Dense to Dense Granular	0	-744	Yes
7	4. Stiff to V. Stiff Cohesive	4	-744	No
8	8. Soft to M. Stiff Cohesive	6.5	-740	No
9	5. V. Stiff to Hard Cohesive	0	-733.5	No



Header for point on following page (software output limitation)

LT Fill (B-003-0-23)

XY Location:		LT Fill (B-003-0-23): (-84, 83400)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-755.8	No
2	2. Stiff to V. Stiff Embankment Fill	0	-755.8	No
3	3. Loose to M. Dense Embankment Fill	21.4	-755.8	Yes
4	Cohesive Roadway Fill	0	-734.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-734.4	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.2	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-724.2	No

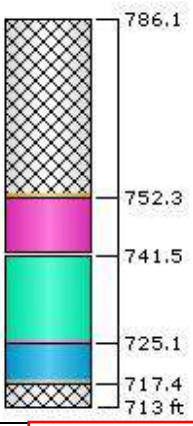


LT New Toe (B-003-0-23/SRB-3)

Header for point on following page (software output limitation)

XY Location: LT New Toe (B-003-0-23/SRB-3): (-137, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-752.3	No
2	2. Stiff to V. Stiff Embankment Fill	0	-752.3	No
3	3. Loose to M. Dense Embankment Fill	10.8	-752.3	Yes
4	Cohesive Roadway Fill	16.4	-741.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-725.1	Yes
6	6. M. Dense to Dense Granular	0	-725.1	Yes
7	4. Stiff to V. Stiff Cohesive	7.7	-725.1	No
8	8. Soft to M. Stiff Cohesive	0	-717.4	No
9	5. V. Stiff to Hard Cohesive	0	-717.4	No

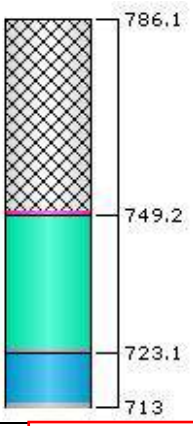


Header for point on following page (software output limitation)

LT Roadway Slope (SRB-3)

XY Location: LT Roadway Slope (SRB-3): (-171, 83400)

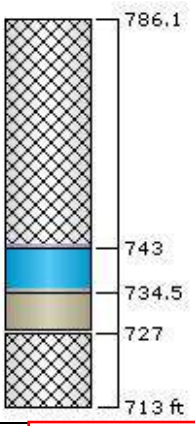
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-749.2	No
2	2. Stiff to V. Stiff Embankment Fill	0	-749.2	No
3	3. Loose to M. Dense Embankment Fill	0	-749.2	Yes
4	Cohesive Roadway Fill	26.1	-749.2	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-723.1	Yes
6	6. M. Dense to Dense Granular	0	-723.1	Yes
7	4. Stiff to V. Stiff Cohesive	10.1	-723.1	No
8	8. Soft to M. Stiff Cohesive	0	-713	No
9	5. V. Stiff to Hard Cohesive	0	-713	No



RT Toe 2 (B-001-0-09)

Header for point on following page (software output limitation)

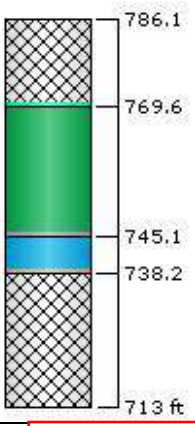
XY Location:		RT Toe 2 (B-001-0-09): (153.8, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-743	No
2	2. Stiff to V. Stiff Embankment Fill	0	-743	No
3	3. Loose to M. Dense Embankment Fill	0	-743	Yes
4	Cohesive Roadway Fill	0	-743	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-743	Yes
6	6. M. Dense to Dense Granular	0	-743	Yes
7	4. Stiff to V. Stiff Cohesive	8.5	-743	No
8	8. Soft to M. Stiff Cohesive	0	-734.5	No
9	5. V. Stiff to Hard Cohesive	7.5	-734.5	No



RT Slope 2 (B-002-0-09/B-47ER)

Header for point on following page (software output limitation)

XY Location:		RT Slope 2 (B-002-0-09/B-47ER): (100, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-769.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-769.6	No
3	3. Loose to M. Dense Embankment Fill	0	-769.6	Yes
4	Cohesive Roadway Fill	0	-769.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-769.6	Yes
6	6. M. Dense to Dense Granular	0	-745.1	Yes
7	4. Stiff to V. Stiff Cohesive	6.9	-745.1	No
8	8. Soft to M. Stiff Cohesive	0	-738.2	No
9	5. V. Stiff to Hard Cohesive	0	-738.2	No

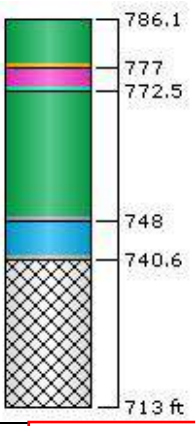


RT Crest 2 (B-002-0-09)

Header for point on following page (software output limitation)

XY Location: RT Crest 2 (B-002-0-09): (69.9, 83500)

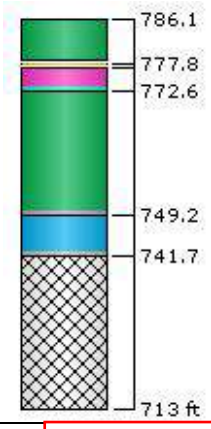
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	9.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0	-777	No
3	3. Loose to M. Dense Embankment Fill	4.5	-777	Yes
4	Cohesive Roadway Fill	0	-772.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-772.5	Yes
6	6. M. Dense to Dense Granular	0	-748	Yes
7	4. Stiff to V. Stiff Cohesive	7.4	-748	No
8	8. Soft to M. Stiff Cohesive	0	-740.6	No
9	5. V. Stiff to Hard Cohesive	0	-740.6	No



CL Crest 2 (B-002-0-09/B-47)

Header for point on following page (software output limitation)

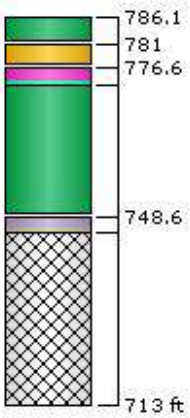
XY Location:		CL Crest 2 (B-002-0-09/B-47): (55, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	8.3	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0.9	-777.8	No
3	3. Loose to M. Dense Embankment Fill	4.3	-776.9	Yes
4	Cohesive Roadway Fill	0	-772.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	23.4	-772.6	Yes
6	6. M. Dense to Dense Granular	0	-749.2	Yes
7	4. Stiff to V. Stiff Cohesive	7.5	-749.2	No
8	8. Soft to M. Stiff Cohesive	0	-741.7	No
9	5. V. Stiff to Hard Cohesive	0	-741.7	No



LT Crest 2 (B-003-0-09/CU-10C)

Header for point on following page (software output limitation)

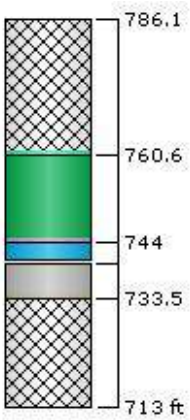
XY Location:		LT Crest 2 (B-003-0-09/CU-10C): (-4, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	5.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	4.4	-781	No
3	3. Loose to M. Dense Embankment Fill	3.2	-776.6	Yes
4	Cohesive Roadway Fill	0	-773.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.8	-773.4	Yes
6	6. M. Dense to Dense Granular	3	-748.6	Yes
7	4. Stiff to V. Stiff Cohesive	0	-745.6	No
8	8. Soft to M. Stiff Cohesive	0	-745.6	No
9	5. V. Stiff to Hard Cohesive	0	-745.6	No



LT Toe 2 (B-003-0-09)

Header for point on following page (software output limitation)

XY Location:		LT Toe 2 (B-003-0-09): (-48, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-760.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-760.6	No
3	3. Loose to M. Dense Embankment Fill	0	-760.6	Yes
4	Cohesive Roadway Fill	0	-760.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	16.6	-760.6	Yes
6	6. M. Dense to Dense Granular	0	-744	Yes
7	4. Stiff to V. Stiff Cohesive	4	-744	No
8	8. Soft to M. Stiff Cohesive	6.5	-740	No
9	5. V. Stiff to Hard Cohesive	0	-733.5	No

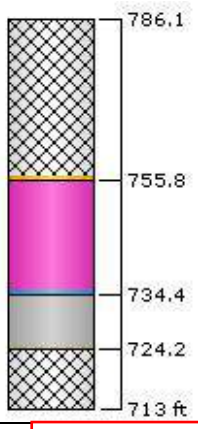


LT Fill 2 (B-003-0-23)

Header for point on following page (software output limitation)

XY Location: LT Fill 2 (B-003-0-23): (-84, 83500)

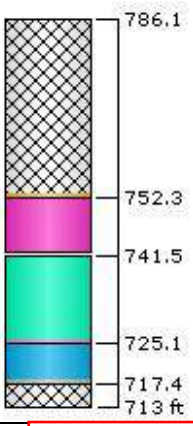
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-755.8	No
2	2. Stiff to V. Stiff Embankment Fill	0	-755.8	No
3	3. Loose to M. Dense Embankment Fill	21.4	-755.8	Yes
4	Cohesive Roadway Fill	0	-734.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-734.4	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.2	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-724.2	No



LT New Toe 2 (B-003-0-23/SRB-3)

Header for point on following page (software output limitation)

XY Location:		LT New Toe 2 (B-003-0-23/SRB-3): (-137, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-752.3	No
2	2. Stiff to V. Stiff Embankment Fill	0	-752.3	No
3	3. Loose to M. Dense Embankment Fill	10.8	-752.3	Yes
4	Cohesive Roadway Fill	16.4	-741.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-725.1	Yes
6	6. M. Dense to Dense Granular	0	-725.1	Yes
7	4. Stiff to V. Stiff Cohesive	7.7	-725.1	No
8	8. Soft to M. Stiff Cohesive	0	-717.4	No
9	5. V. Stiff to Hard Cohesive	0	-717.4	No

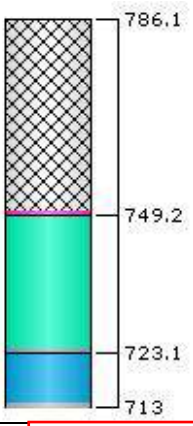


LT Roadway Slope 2 (SRB-3)

Header for point on following page (software output limitation)

XY Location: LT Roadway Slope 2 (SRB-3): (-171, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-749.2	No
2	2. Stiff to V. Stiff Embankment Fill	0	-749.2	No
3	3. Loose to M. Dense Embankment Fill	0	-749.2	Yes
4	Cohesive Roadway Fill	26.1	-749.2	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-723.1	Yes
6	6. M. Dense to Dense Granular	0	-723.1	Yes
7	4. Stiff to V. Stiff Cohesive	10.1	-723.1	No
8	8. Soft to M. Stiff Cohesive	0	-713	No
9	5. V. Stiff to Hard Cohesive	0	-713	No

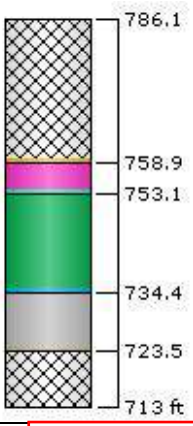


LT Special Bench (B-003-0-09)

Header for point on following page (software output limitation)

XY Location: LT Special Bench (B-003-0-09): (-60, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-758.9	No
2	2. Stiff to V. Stiff Embankment Fill	0	-758.9	No
3	3. Loose to M. Dense Embankment Fill	5.8	-758.9	Yes
4	Cohesive Roadway Fill	0	-753.1	Yes
5	1. M. Stiff to Stiff Embankment Fill	18.7	-753.1	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.9	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-723.5	No

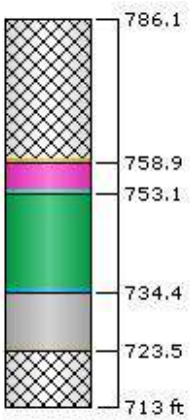


LT Special Bench 2 (B-003-0-09)

Header for point on following page (software output limitation)

XY Location: LT Special Bench 2 (B-003-0-09): (-60, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-758.9	No
2	2. Stiff to V. Stiff Embankment Fill	0	-758.9	No
3	3. Loose to M. Dense Embankment Fill	5.8	-758.9	Yes
4	Cohesive Roadway Fill	0	-753.1	Yes
5	1. M. Stiff to Stiff Embankment Fill	18.7	-753.1	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.9	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-723.5	No



Soil Properties

Property	1. M. Stiff to Stiff Embankment Fill	2. Stiff to V. Stiff Embankment Fill	3. Loose to M. Dense Embankment Fill	4. Stiff to V. Stiff Cohesive
Color				
Unit Weight [kips/ft3]	0.125	0.125	0.125	0.125
Saturated Unit Weight [kips/ft3]	0.13	0.13	0.13	0.13
K0	0.61	0.59	0.48	0.59
Immediate Settlement	Disabled	Disabled	Enabled	Disabled
Es [ksf]	-	-	550	-
Esur [ksf]	-	-	550	-
Primary Consolidation	Enabled	Enabled	Disabled	Enabled
Material Type	Non-Linear	Non-Linear		Non-Linear
Cc	0.171	0.141	-	0.342
Cr	0.017	0.014	-	0.034
e0	0.559	0.59	-	0.466
Pc [ksf]	18	18	-	-
OCR	-	-	-	1
Cv [ft2/d]	0.13	0.16	-	0.19
Cvr [ft2/d]	0.13	0.16	-	0.19
B-bar	1	1	-	1
Undrained Su A [kips/ft2]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Property	5. V. Stiff to Hard Cohesive	6. M. Dense to Dense Granular	8. Soft to M. Stiff Cohesive	Cohesive Roadway Fill
Color				
Unit Weight [kips/ft3]	0.13	0.13	0.135	0.125
Saturated Unit Weight [kips/ft3]	0.135	0.135	0.14	0.13
K0	0.56	0.44	0.64	0.61
Immediate Settlement	Disabled	Enabled	Disabled	Disabled
Es [ksf]	-	950	-	-
Esur [ksf]	-	950	-	-
Primary Consolidation	Enabled	Disabled	Enabled	Enabled
Material Type	Non-Linear		Non-Linear	Non-Linear
Cc	0.198	-	0.144	0.171
Cr	0.02	-	0.014	0.017

e0	0.423	-	0.657	0.559
Pc [ksf]	-	-	-	18
OCR	1	-	1	-
Cv [ft2/d]	0.48	-	0.64	0.13
Cvr [ft2/d]	0.48	-	0.64	0.13
B-bar	1	-	1	1
Undrained Su A [kips/ft2]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft3
Generating excess pore pressure above water table	

Piezometric Line Entities

ID	Depth (ft)
1	-740 ft

Field Point Grid

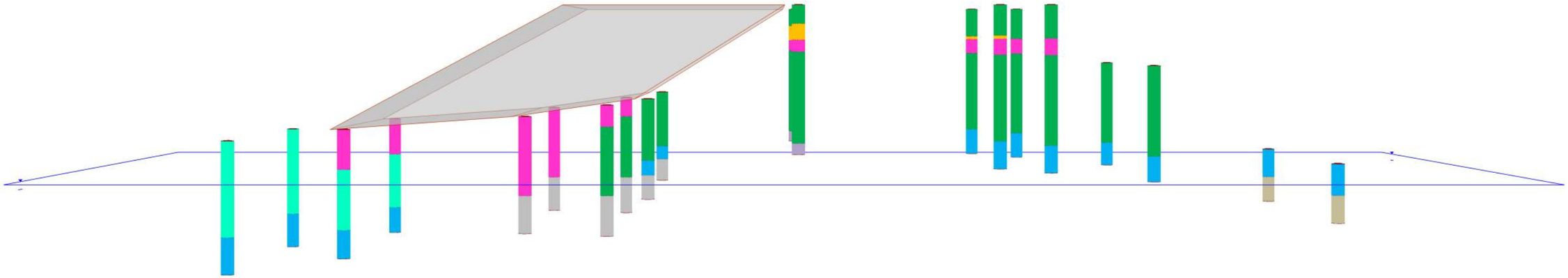
Number of points	520
Expansion Factor	1

Grid Coordinates

X [ft]	Y [ft]
203.8	83550
203.8	83350
-221	83350
-221	83550

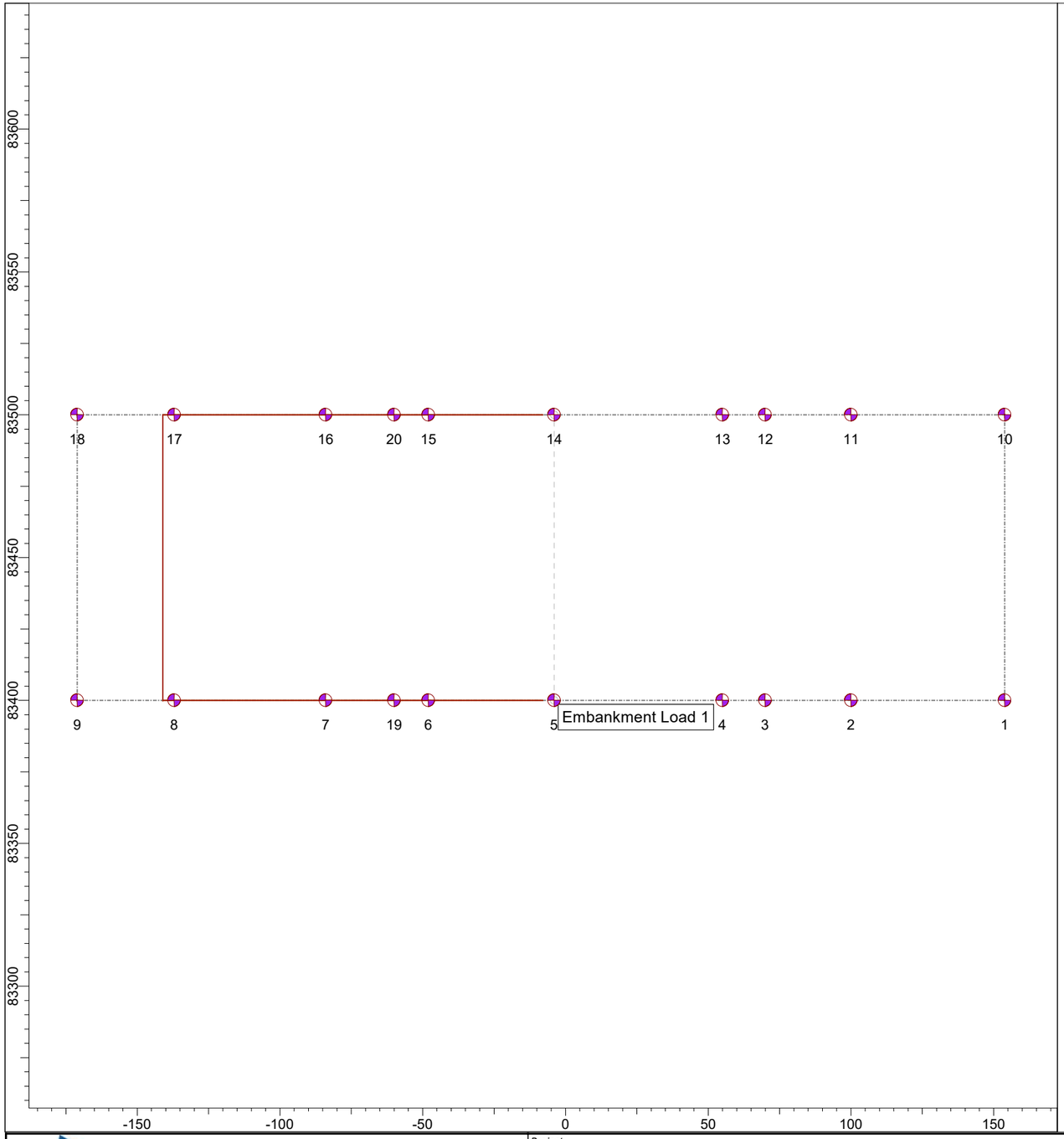
Settlement (Normally Consolidated Existing Embankment, Granular Fill at Toe)

3D Model Front View

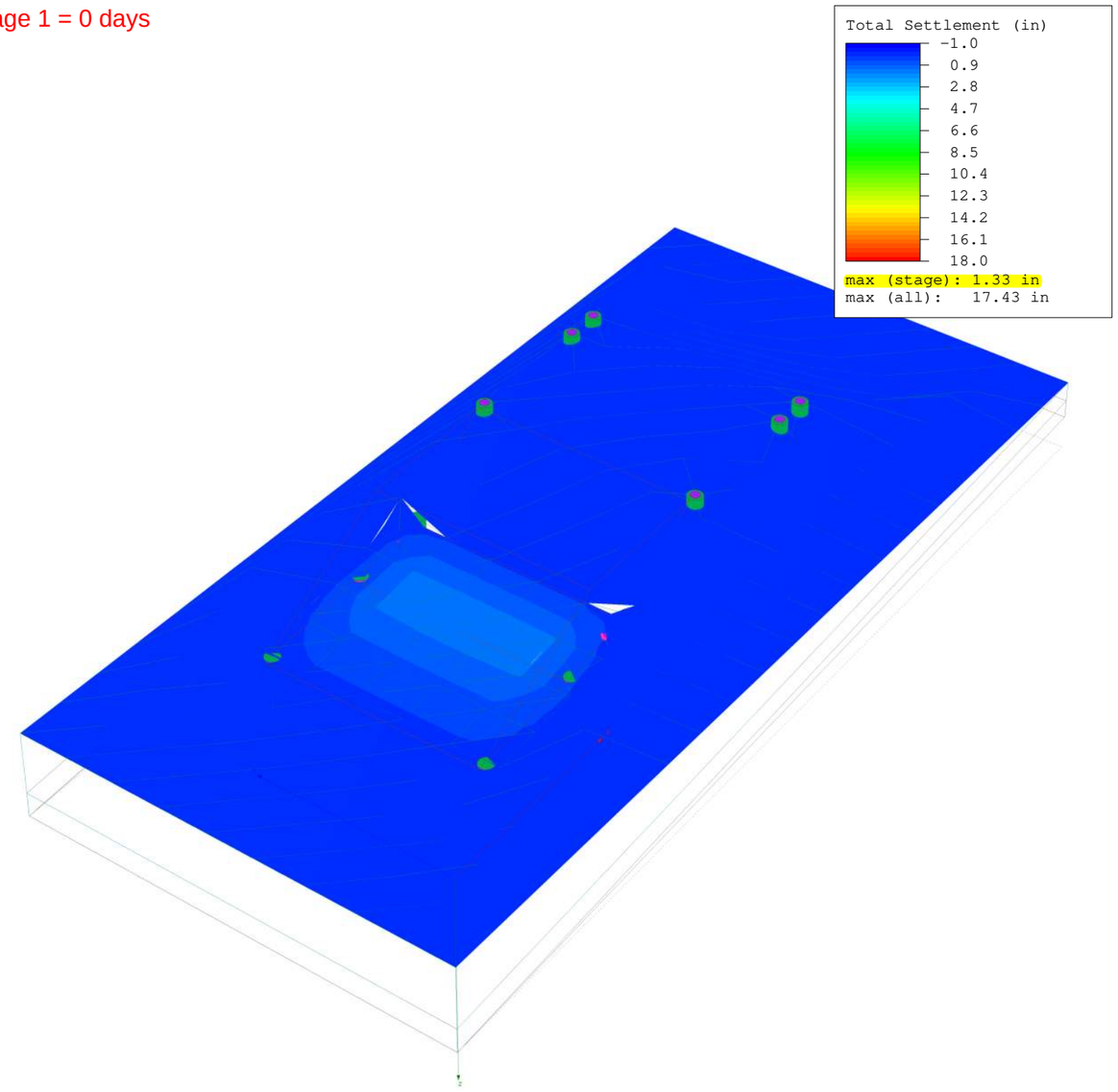


rocscience	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Normally Consolidated Embankment	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_Normally Consolidated Embankment.s3z

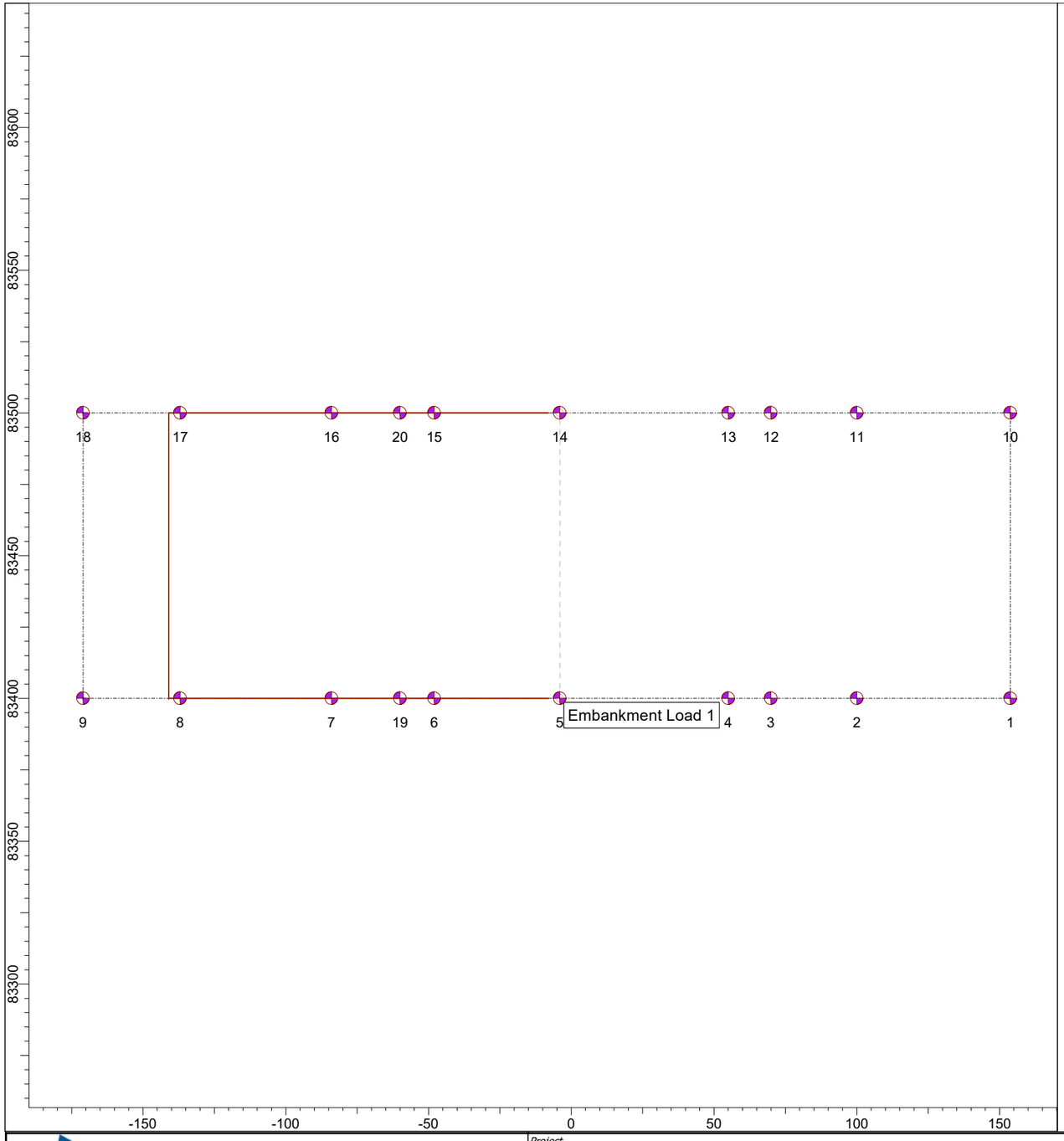
SETTLE3 5.007



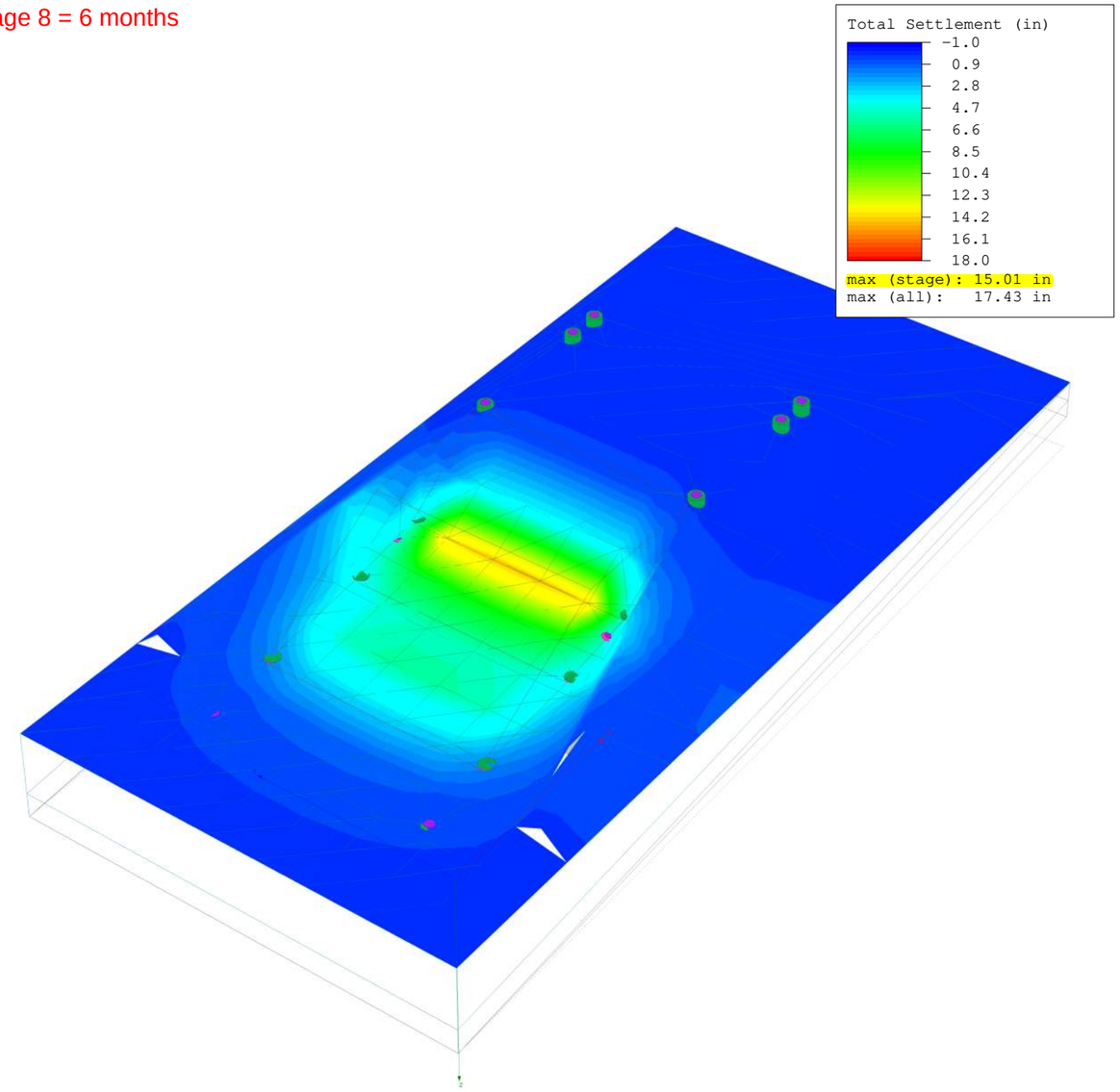
Stage 1 = 0 days



	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Normally Consolidated Embankment	
SETTLE3 5.007	*Drawn By*	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_Normally Consolidated Embankment.s3z

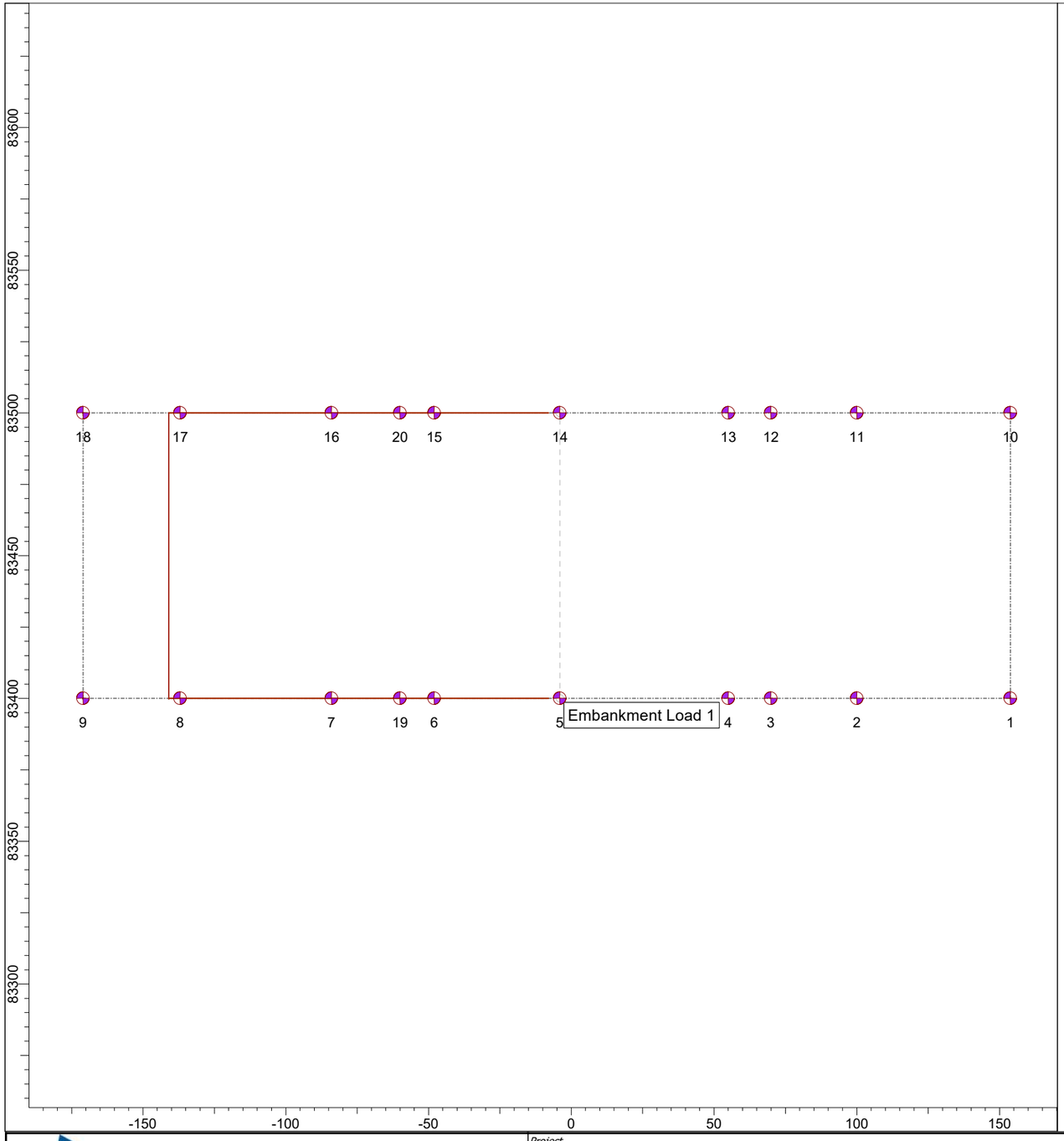


Stage 8 = 6 months

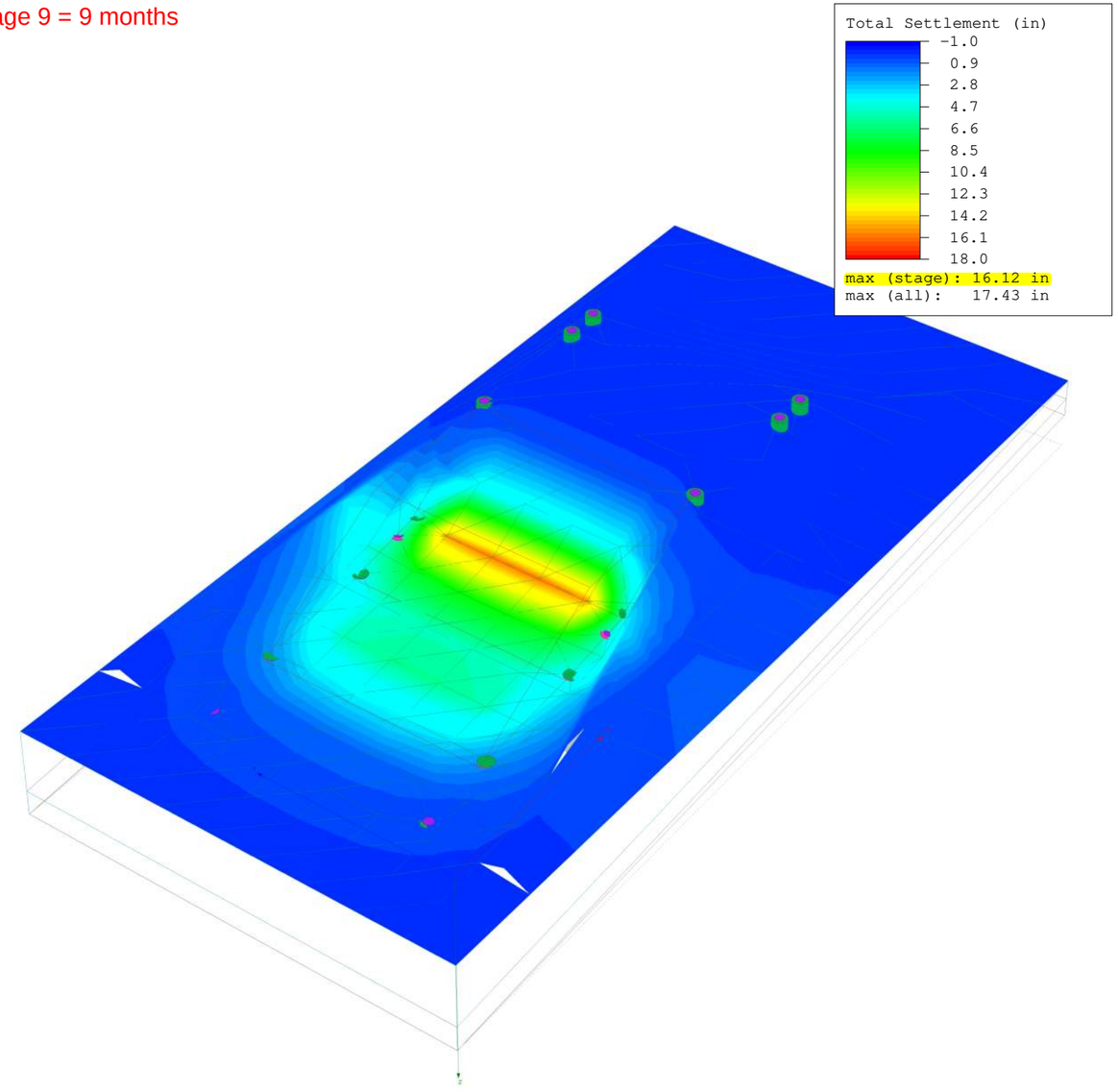


Project	MEG-33-13.96		
Analysis Description	Sta. 834+50 Normally Consolidated Embankment		
Drawn By	A. Baratta	Company	HDR
Date	4/25/2024, 12:56:29 PM	File Name	Sta. 834+50 Settlement_Normally Consolidated Embankment.s3z

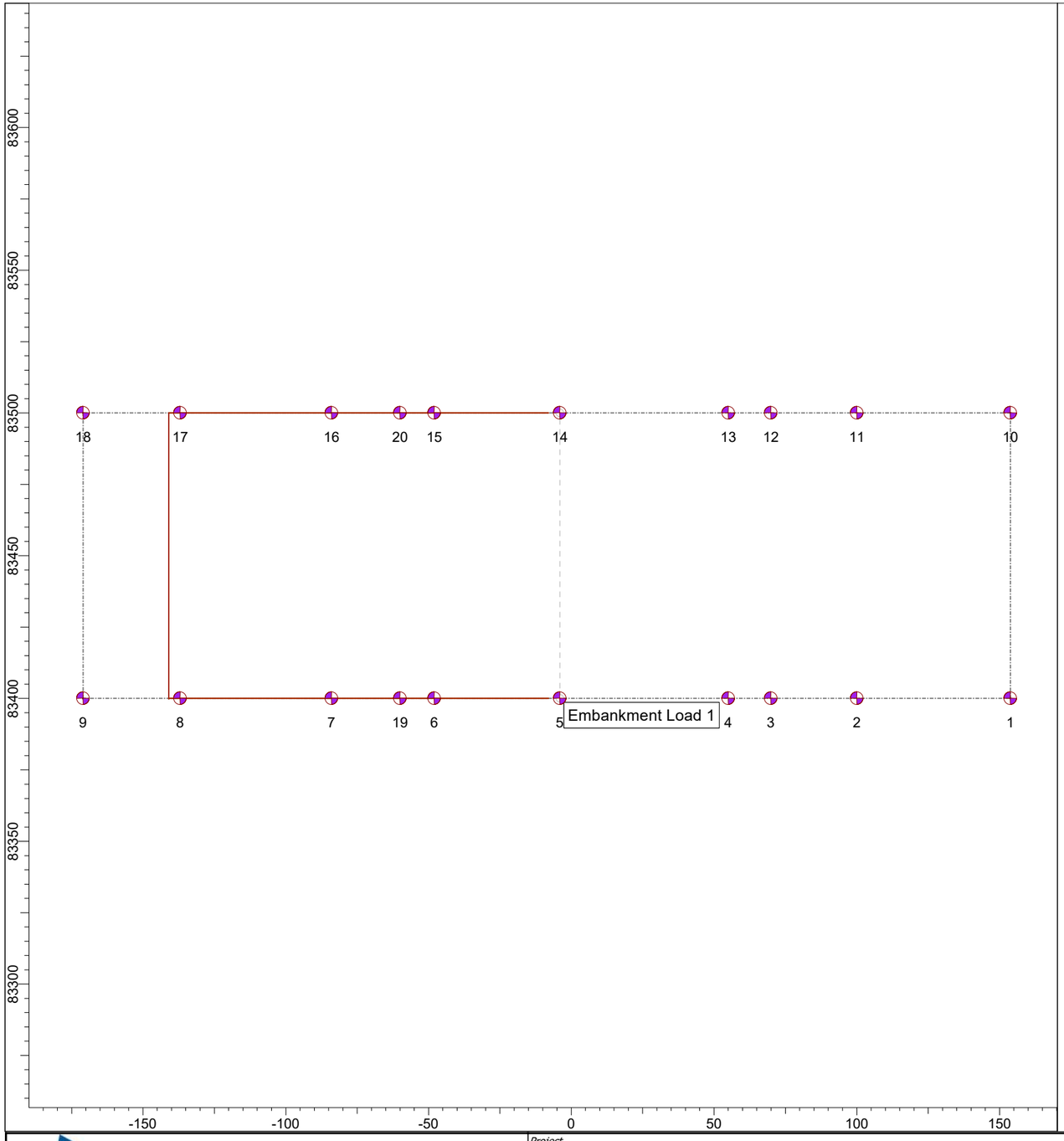
SETTLE3 5.007



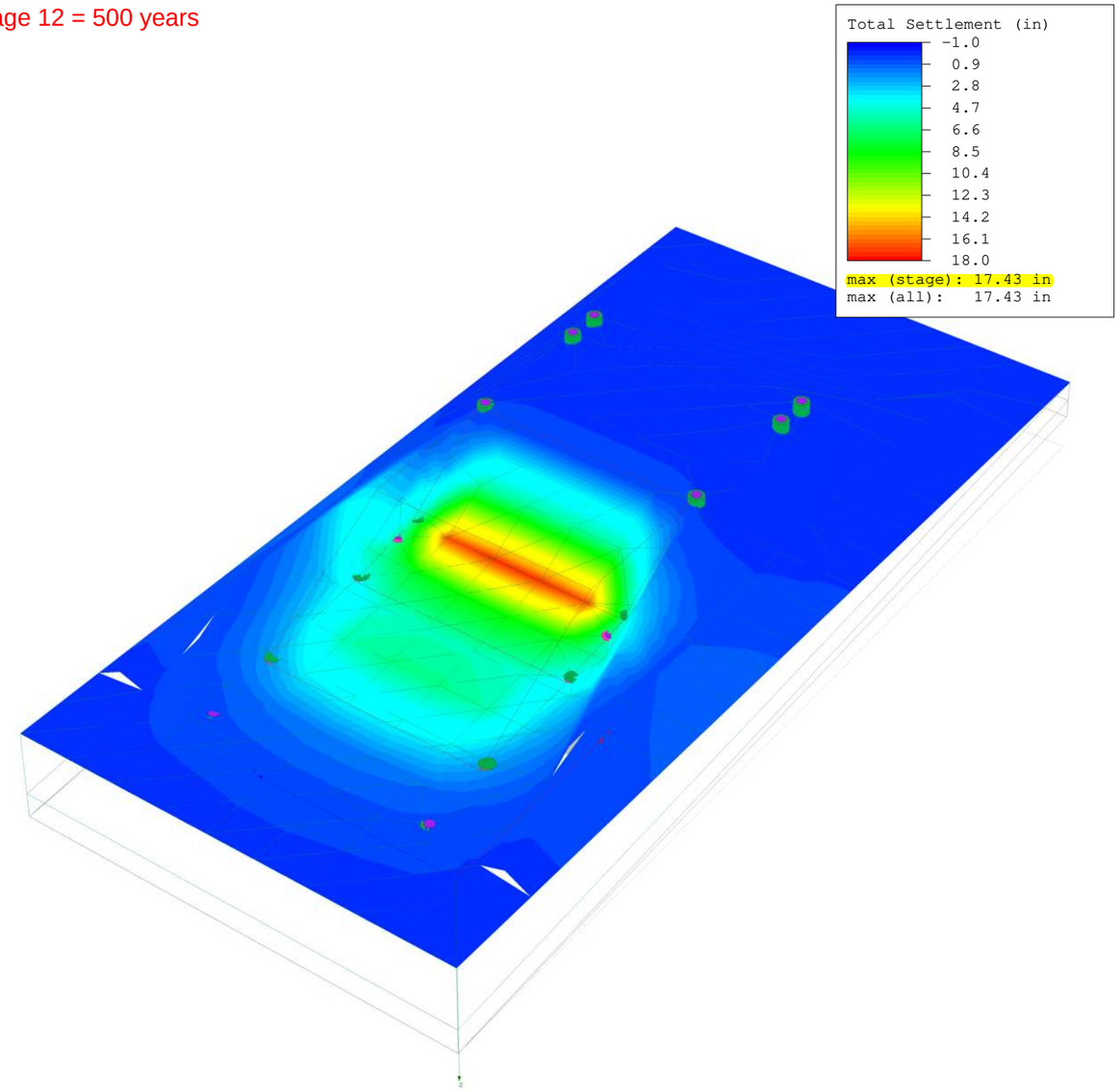
Stage 9 = 9 months



	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Normally Consolidated Embankment	
	Drawn By	A. Baratta	*Company* HDR
SETTLE3 5.007	*Date*	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_Normally Consolidated Embankment.s3z



Stage 12 = 500 years



	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Normally Consolidated Embankment	
	Drawn By	A. Baratta	Company HDR
SETTLE3 5.007	Date	4/25/2024, 12:56:29 PM	File Name Sta. 834+50 Settlement_Normally Consolidated Embankment.s3z

MEG-33-13.96
HDR
Date Created: 2024/05/07, 06:03:13

Table of Contents

Settle3 Analysis Information

MEG-33-13.96

Project Settings

Document Name	Sta. 834+50 Settlement_Normally Consolidated Embankment.s3z
Project Title	MEG-33-13.96
Analysis	Sta. 834+50 Normally Consolidated Embankment
Author	A. Baratta
Company	HDR
Date Created	4/25/2024, 12:56:29 PM
Stress Computation Method	Boussinesq
Time-dependent Consolidation Analysis	
Time Units	days
Permeability Units	feet/day
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

Stage #	Name	Time [days]
1	0 d	0
2	7 d	7
3	14 d	14
4	21 d	21
5	30 d (1 m)	30
6	60 d (2 m)	60
7	90 d (3 m)	90
8	183 d (6 m)	183
9	274 d (9 m)	274
10	365 d (1 y)	365
11	3650 d (10 y)	3650
12	36,500 d (100 y)	36500
13	182,500 d (500 y)	182500

Results

Time taken to compute: 23.9546 seconds

Stage: 0 d = 0 d

Data Type	Minimum	Maximum
Total Settlement [in]	0	1.33145
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66246
Effective Stress XX [ksf]	-0.253991	6.86472
Effective Stress YY [ksf]	-0.142571	3.95837
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00764898
Pore Water Pressure [ksf]	0	4.70196
Excess Pore Water Pressure [ksf]	0	4.70196
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.000489375	5.65319
Over-consolidation Ratio	1	1
Void Ratio	0	0.657
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-1.11022e-16	5.55112e-17

Stage: 7 d = 7 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.00317638	4.38319
Total Consolidation Settlement [in]	-0.00317638	4.2956
Virgin Consolidation Settlement [in]	0	4.29763
Recompression Consolidation Settlement [in]	-0.183666	0
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66285
Effective Stress XX [ksf]	-0.691545	9.45028
Effective Stress YY [ksf]	-0.691545	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00854363	0.122511
Pore Water Pressure [ksf]	0	3.64819
Excess Pore Water Pressure [ksf]	-1.79412e-33	3.2112
Degree of Consolidation [%]	0	99.9049
Pre-consolidation Stress [ksf]	0.000557429	5.65355
Over-consolidation Ratio	1	8.74923
Void Ratio	0	0.657195
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.083821

Stage: 14 d = 14 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.00277535	5.96908
Total Consolidation Settlement [in]	-0.00277535	5.88149
Virgin Consolidation Settlement [in]	0	5.88309
Recompression Consolidation Settlement [in]	-0.197553	0
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66301
Effective Stress XX [ksf]	-0.87027	9.45028
Effective Stress YY [ksf]	-0.87027	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00976081	0.122728
Pore Water Pressure [ksf]	0	3.57509
Excess Pore Water Pressure [ksf]	-1.03252e-33	3.17958
Degree of Consolidation [%]	0	99.9999
Pre-consolidation Stress [ksf]	0.000557429	5.65371
Over-consolidation Ratio	1	3.824
Void Ratio	0	0.65725
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.083821

Stage: 21 d = 21 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.000586058	7.11109
Total Consolidation Settlement [in]	-0.000586058	7.0235
Virgin Consolidation Settlement [in]	0	7.02361
Recompression Consolidation Settlement [in]	-0.203589	0
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66314
Effective Stress XX [ksf]	-0.90623	9.45028
Effective Stress YY [ksf]	-0.90623	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0102563	0.122819
Pore Water Pressure [ksf]	0	3.41387
Excess Pore Water Pressure [ksf]	-5.43986e-34	3.13435
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000557429	5.65384
Over-consolidation Ratio	1	4.30012
Void Ratio	0	0.657115
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.083821

Stage: 30 d (1 m) = 30 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	8.25931
Total Consolidation Settlement [in]	0	8.17172
Virgin Consolidation Settlement [in]	0	8.17172
Recompression Consolidation Settlement [in]	-0.200934	0
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66328
Effective Stress XX [ksf]	-0.899321	9.45028
Effective Stress YY [ksf]	-0.899321	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0102908	0.122888
Pore Water Pressure [ksf]	0	3.14716
Excess Pore Water Pressure [ksf]	-6.69013e-34	3.09999
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000557429	5.65398
Over-consolidation Ratio	1	62.9706
Void Ratio	0	0.656916
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.083821

Stage: 60 d (2 m) = 60 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	10.8193
Total Consolidation Settlement [in]	0	10.7317
Virgin Consolidation Settlement [in]	0	10.7317
Recompression Consolidation Settlement [in]	-0.176145	0
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66366
Effective Stress XX [ksf]	-1.04145	9.45028
Effective Stress YY [ksf]	-1.04145	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00735909	0.122991
Pore Water Pressure [ksf]	-5.09681e-21	2.83986
Excess Pore Water Pressure [ksf]	-5.09681e-21	2.83986
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00055743	5.65436
Over-consolidation Ratio	1	270.806
Void Ratio	0	0.656846
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.083821

Stage: 90 d (3 m) = 90 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	12.4221
Total Consolidation Settlement [in]	0	12.3345
Virgin Consolidation Settlement [in]	0	12.3345
Recompression Consolidation Settlement [in]	-0.203076	0.132842
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66394
Effective Stress XX [ksf]	-1.02286	9.45028
Effective Stress YY [ksf]	-1.02286	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00991128	0.12303
Pore Water Pressure [ksf]	-6.00309e-21	2.50673
Excess Pore Water Pressure [ksf]	-6.00309e-21	2.50673
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00055743	5.65464
Over-consolidation Ratio	1	27.118
Void Ratio	0	0.656779
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.083821

Stage: 183 d (6 m) = 183 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	15.0078
Total Consolidation Settlement [in]	0	14.9202
Virgin Consolidation Settlement [in]	0	14.9202
Recompression Consolidation Settlement [in]	-0.184344	0.252842
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.78078
Effective Stress XX [ksf]	-0.477884	9.45028
Effective Stress YY [ksf]	-0.477884	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00502732	0.123079
Pore Water Pressure [ksf]	-8.37026e-17	1.73515
Excess Pore Water Pressure [ksf]	-8.37026e-17	1.63061
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00055743	5.78031
Over-consolidation Ratio	1	2.99634
Void Ratio	0	0.656636
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.083821

Stage: 274 d (9 m) = 274 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	16.1198
Total Consolidation Settlement [in]	0	16.0322
Virgin Consolidation Settlement [in]	0	16.0322
Recompression Consolidation Settlement [in]	-0.146993	0.255185
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.94492
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00404985	0.1231
Pore Water Pressure [ksf]	-5.6015e-17	1.71659
Excess Pore Water Pressure [ksf]	-5.6015e-17	1.17663
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00055743	5.94446
Over-consolidation Ratio	1	2.37704
Void Ratio	0	0.656561
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.083821

Stage: 365 d (1 y) = 365 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	16.6867
Total Consolidation Settlement [in]	0	16.5992
Virgin Consolidation Settlement [in]	0	16.5992
Recompression Consolidation Settlement [in]	-0.115347	0.255185
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.98722
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00325642	0.123111
Pore Water Pressure [ksf]	-0.00125122	1.70486
Excess Pore Water Pressure [ksf]	-0.00125122	0.973886
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00055743	5.98676
Over-consolidation Ratio	1	2.00041
Void Ratio	0	0.65652
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.0839729

Stage: 3650 d (10 y) = 3650 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	17.4293
Total Consolidation Settlement [in]	0	17.3417
Virgin Consolidation Settlement [in]	0	17.3417
Recompression Consolidation Settlement [in]	-0.000111998	0.255179
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00188
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-6.64883e-07	0.123128
Pore Water Pressure [ksf]	-0.00202422	1.6848
Excess Pore Water Pressure [ksf]	-0.00202422	0.00364926
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00055743	6.00143
Over-consolidation Ratio	1	1.00906
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00014676	0.0845797

Stage: 36,500 d (100 y) = 36500 d ← Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	17.4293
Total Consolidation Settlement [in]	0	17.3417
Virgin Consolidation Settlement [in]	0	17.3417
Recompression Consolidation Settlement [in]	-7.50872e-05	0.255182
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00189
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-3.54094e-07	0.123128
Pore Water Pressure [ksf]	-0.00295218	1.6848
Excess Pore Water Pressure [ksf]	-0.00295218	0.00213129
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00055743	6.00143
Over-consolidation Ratio	1	1.00333
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00014676	0.0845797

Stage: 182,500 d (500 y) = 182500 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	17.4293
Total Consolidation Settlement [in]	0	17.3417
Virgin Consolidation Settlement [in]	0	17.3417
Recompression Consolidation Settlement [in]	-0.000114723	0.255181
Immediate Settlement [in]	0	1.33145
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00188
Effective Stress XX [ksf]	-0.246338	9.45028
Effective Stress YY [ksf]	-0.141687	7.57969
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.246338	10.4305
Total Stress YY [ksf]	-0.141687	7.57969
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-3.56071e-07	0.123128
Pore Water Pressure [ksf]	-0.00213544	1.6848
Excess Pore Water Pressure [ksf]	-0.00213544	0.00290686
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00055743	6.00143
Over-consolidation Ratio	1	1.00814
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.790512
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00014676	0.0845797

Embankments

1. Embankment: "Embankment Load 1"

Label	Embankment Load 1
Center Line	(-4, 83400) to (-4, 83500)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Zones	4
Number of Sections	1

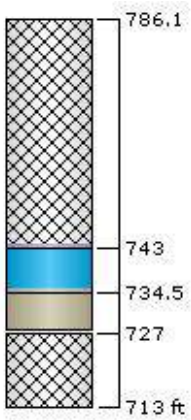
Zone	Name	Unit Weight (kips/ft3)
1	New Zone	0.115
2	New Zone 2	0.115
3	New Zone 3	0.115
4	New Zone 4	0.125

Soil Layers

Ground Surface Drained: Yes

RT Toe (B-001-0-09)

XY Location:		RT Toe (B-001-0-09): (153.8, 83400)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-743	No
2	2. Stiff to V. Stiff Embankment Fill	0	-743	No
3	3. Loose to M. Dense Embankment Fill	0	-743	Yes
4	Cohesive Roadway Fill	0	-743	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-743	Yes
6	6. M. Dense to Dense Granular	0	-743	Yes
7	4. Stiff to V. Stiff Cohesive	8.5	-743	No
8	8. Soft to M. Stiff Cohesive	0	-734.5	No
9	5. V. Stiff to Hard Cohesive	7.5	-734.5	No

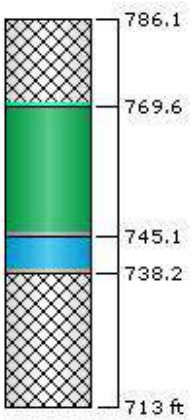


RT Slope (B-002-0-09/B-47ER)

Header for point on following page (software output limitation)

XY Location: RT Slope (B-002-0-09/B-47ER): (100, 83400)

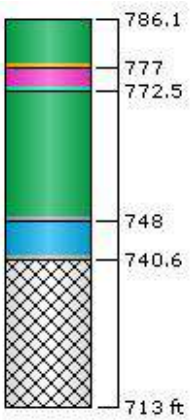
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-769.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-769.6	No
3	3. Loose to M. Dense Embankment Fill	0	-769.6	Yes
4	Cohesive Roadway Fill	0	-769.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-769.6	Yes
6	6. M. Dense to Dense Granular	0	-745.1	Yes
7	4. Stiff to V. Stiff Cohesive	6.9	-745.1	No
8	8. Soft to M. Stiff Cohesive	0	-738.2	No
9	5. V. Stiff to Hard Cohesive	0	-738.2	No



RT Crest (B-002-0-09) ← Header for point on following page (software output limitation)

XY Location: RT Crest (B-002-0-09): (69.9, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	9.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0	-777	No
3	3. Loose to M. Dense Embankment Fill	4.5	-777	Yes
4	Cohesive Roadway Fill	0	-772.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-772.5	Yes
6	6. M. Dense to Dense Granular	0	-748	Yes
7	4. Stiff to V. Stiff Cohesive	7.4	-748	No
8	8. Soft to M. Stiff Cohesive	0	-740.6	No
9	5. V. Stiff to Hard Cohesive	0	-740.6	No

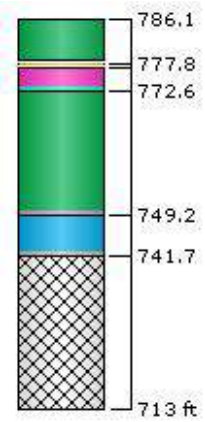


CL Crest (B-002-0-09/B-47)

Header for point on following page (software output limitation)

XY Location: CL Crest (B-002-0-09/B-47): (55, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	8.3	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0.9	-777.8	No
3	3. Loose to M. Dense Embankment Fill	4.3	-776.9	Yes
4	Cohesive Roadway Fill	0	-772.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	23.4	-772.6	Yes
6	6. M. Dense to Dense Granular	0	-749.2	Yes
7	4. Stiff to V. Stiff Cohesive	7.5	-749.2	No
8	8. Soft to M. Stiff Cohesive	0	-741.7	No
9	5. V. Stiff to Hard Cohesive	0	-741.7	No

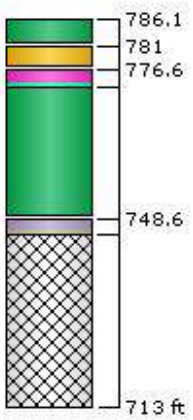


LT Crest (B-003-0-09/CU-10C)

Header for point on following page (software output limitation)

XY Location: LT Crest (B-003-0-09/CU-10C): (-4, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	5.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	4.4	-781	No
3	3. Loose to M. Dense Embankment Fill	3.2	-776.6	Yes
4	Cohesive Roadway Fill	0	-773.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.8	-773.4	Yes
6	6. M. Dense to Dense Granular	3	-748.6	Yes
7	4. Stiff to V. Stiff Cohesive	0	-745.6	No
8	8. Soft to M. Stiff Cohesive	0	-745.6	No
9	5. V. Stiff to Hard Cohesive	0	-745.6	No

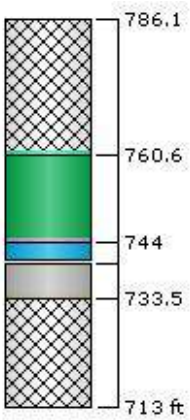


LT Toe (B-003-0-09)

Header for point on following page (software output limitation)

XY Location: LT Toe (B-003-0-09): (-48, 83400)

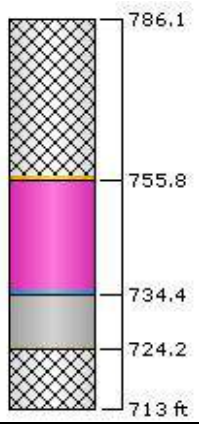
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-760.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-760.6	No
3	3. Loose to M. Dense Embankment Fill	0	-760.6	Yes
4	Cohesive Roadway Fill	0	-760.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	16.6	-760.6	Yes
6	6. M. Dense to Dense Granular	0	-744	Yes
7	4. Stiff to V. Stiff Cohesive	4	-744	No
8	8. Soft to M. Stiff Cohesive	6.5	-740	No
9	5. V. Stiff to Hard Cohesive	0	-733.5	No



LT Fill (B-003-0-23) ← Header for point on following page (software output limitation)

XY Location: LT Fill (B-003-0-23): (-84, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-755.8	No
2	2. Stiff to V. Stiff Embankment Fill	0	-755.8	No
3	3. Loose to M. Dense Embankment Fill	21.4	-755.8	Yes
4	Cohesive Roadway Fill	0	-734.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-734.4	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.2	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-724.2	No

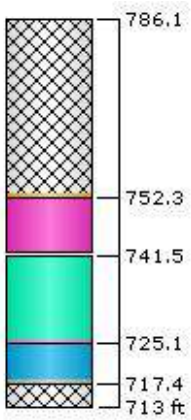


LT New Toe (B-003-0-23/SRB-3)

Header for point on following page (software output limitation)

XY Location: LT New Toe (B-003-0-23/SRB-3): (-137, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-752.3	No
2	2. Stiff to V. Stiff Embankment Fill	0	-752.3	No
3	3. Loose to M. Dense Embankment Fill	10.8	-752.3	Yes
4	Cohesive Roadway Fill	16.4	-741.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-725.1	Yes
6	6. M. Dense to Dense Granular	0	-725.1	Yes
7	4. Stiff to V. Stiff Cohesive	7.7	-725.1	No
8	8. Soft to M. Stiff Cohesive	0	-717.4	No
9	5. V. Stiff to Hard Cohesive	0	-717.4	No

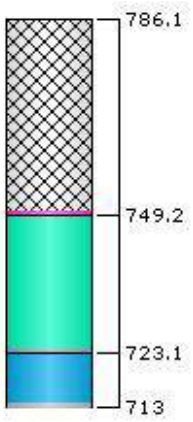


LT Roadway Slope (SRB-3)

Header for point on following page (software output limitation)

XY Location: LT Roadway Slope (SRB-3): (-171, 83400)

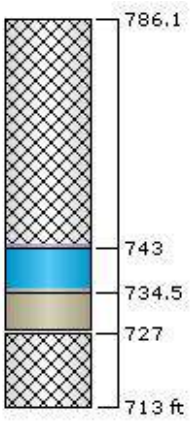
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-749.2	No
2	2. Stiff to V. Stiff Embankment Fill	0	-749.2	No
3	3. Loose to M. Dense Embankment Fill	0	-749.2	Yes
4	Cohesive Roadway Fill	26.1	-749.2	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-723.1	Yes
6	6. M. Dense to Dense Granular	0	-723.1	Yes
7	4. Stiff to V. Stiff Cohesive	10.1	-723.1	No
8	8. Soft to M. Stiff Cohesive	0	-713	No
9	5. V. Stiff to Hard Cohesive	0	-713	No



RT Toe 2 (B-001-0-09)

Header for point on following page (software output limitation)

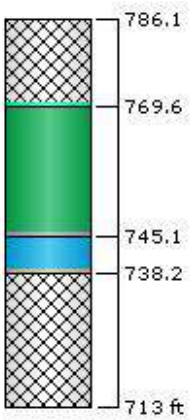
XY Location:		RT Toe 2 (B-001-0-09): (153.8, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-743	No
2	2. Stiff to V. Stiff Embankment Fill	0	-743	No
3	3. Loose to M. Dense Embankment Fill	0	-743	Yes
4	Cohesive Roadway Fill	0	-743	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-743	Yes
6	6. M. Dense to Dense Granular	0	-743	Yes
7	4. Stiff to V. Stiff Cohesive	8.5	-743	No
8	8. Soft to M. Stiff Cohesive	0	-734.5	No
9	5. V. Stiff to Hard Cohesive	7.5	-734.5	No



RT Slope 2 (B-002-0-09/B-47ER)

Header for point on following page (software output limitation)

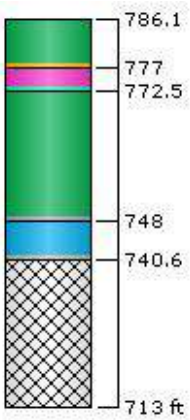
XY Location:		RT Slope 2 (B-002-0-09/B-47ER): (100, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-769.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-769.6	No
3	3. Loose to M. Dense Embankment Fill	0	-769.6	Yes
4	Cohesive Roadway Fill	0	-769.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-769.6	Yes
6	6. M. Dense to Dense Granular	0	-745.1	Yes
7	4. Stiff to V. Stiff Cohesive	6.9	-745.1	No
8	8. Soft to M. Stiff Cohesive	0	-738.2	No
9	5. V. Stiff to Hard Cohesive	0	-738.2	No



RT Crest 2 (B-002-0-09)

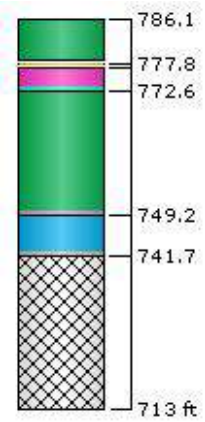
Header for point on following page (software output limitation)

XY Location:		RT Crest 2 (B-002-0-09): (69.9, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	9.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0	-777	No
3	3. Loose to M. Dense Embankment Fill	4.5	-777	Yes
4	Cohesive Roadway Fill	0	-772.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-772.5	Yes
6	6. M. Dense to Dense Granular	0	-748	Yes
7	4. Stiff to V. Stiff Cohesive	7.4	-748	No
8	8. Soft to M. Stiff Cohesive	0	-740.6	No
9	5. V. Stiff to Hard Cohesive	0	-740.6	No



CL Crest 2 (B-002-0-09/B-47) ← Header for point on following page (software output limitation)

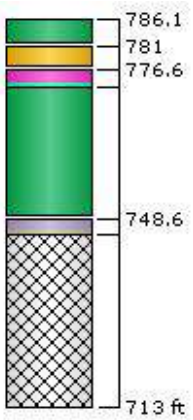
XY Location:		CL Crest 2 (B-002-0-09/B-47): (55, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	8.3	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0.9	-777.8	No
3	3. Loose to M. Dense Embankment Fill	4.3	-776.9	Yes
4	Cohesive Roadway Fill	0	-772.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	23.4	-772.6	Yes
6	6. M. Dense to Dense Granular	0	-749.2	Yes
7	4. Stiff to V. Stiff Cohesive	7.5	-749.2	No
8	8. Soft to M. Stiff Cohesive	0	-741.7	No
9	5. V. Stiff to Hard Cohesive	0	-741.7	No



LT Crest 2 (B-003-0-09/CU-10C)

Header for point on following page (software output limitation)

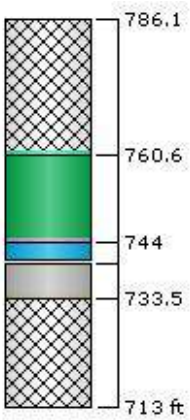
XY Location:			LT Crest 2 (B-003-0-09/CU-10C): (-4, 83500)	
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	5.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	4.4	-781	No
3	3. Loose to M. Dense Embankment Fill	3.2	-776.6	Yes
4	Cohesive Roadway Fill	0	-773.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.8	-773.4	Yes
6	6. M. Dense to Dense Granular	3	-748.6	Yes
7	4. Stiff to V. Stiff Cohesive	0	-745.6	No
8	8. Soft to M. Stiff Cohesive	0	-745.6	No
9	5. V. Stiff to Hard Cohesive	0	-745.6	No



LT Toe 2 (B-003-0-09)

Header for point on following page (software output limitation)

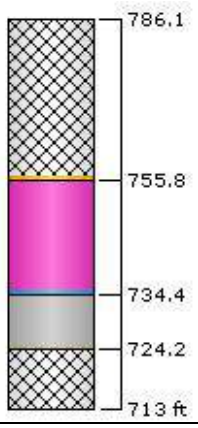
XY Location:		LT Toe 2 (B-003-0-09): (-48, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-760.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-760.6	No
3	3. Loose to M. Dense Embankment Fill	0	-760.6	Yes
4	Cohesive Roadway Fill	0	-760.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	16.6	-760.6	Yes
6	6. M. Dense to Dense Granular	0	-744	Yes
7	4. Stiff to V. Stiff Cohesive	4	-744	No
8	8. Soft to M. Stiff Cohesive	6.5	-740	No
9	5. V. Stiff to Hard Cohesive	0	-733.5	No



LT Fill 2 (B-003-0-23) ← Header for point on following page (software output limitation)

XY Location: LT Fill 2 (B-003-0-23): (-84, 83500)

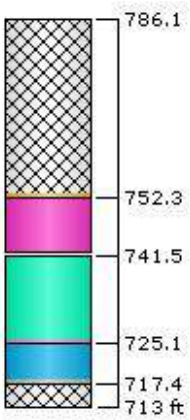
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-755.8	No
2	2. Stiff to V. Stiff Embankment Fill	0	-755.8	No
3	3. Loose to M. Dense Embankment Fill	21.4	-755.8	Yes
4	Cohesive Roadway Fill	0	-734.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-734.4	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.2	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-724.2	No



LT New Toe 2 (B-003-0-23/SRB-3)

Header for point on following page (software output limitation)

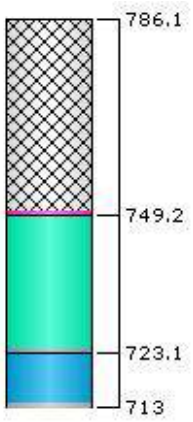
XY Location:			LT New Toe 2 (B-003-0-23/SRB-3): (-137, 83500)	
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-752.3	No
2	2. Stiff to V. Stiff Embankment Fill	0	-752.3	No
3	3. Loose to M. Dense Embankment Fill	10.8	-752.3	Yes
4	Cohesive Roadway Fill	16.4	-741.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-725.1	Yes
6	6. M. Dense to Dense Granular	0	-725.1	Yes
7	4. Stiff to V. Stiff Cohesive	7.7	-725.1	No
8	8. Soft to M. Stiff Cohesive	0	-717.4	No
9	5. V. Stiff to Hard Cohesive	0	-717.4	No



LT Roadway Slope 2 (SRB-3) ← Header for point on following page (software output limitation)

XY Location: LT Roadway Slope 2 (SRB-3): (-171, 83500)

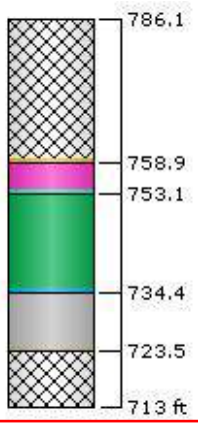
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-749.2	No
2	2. Stiff to V. Stiff Embankment Fill	0	-749.2	No
3	3. Loose to M. Dense Embankment Fill	0	-749.2	Yes
4	Cohesive Roadway Fill	26.1	-749.2	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-723.1	Yes
6	6. M. Dense to Dense Granular	0	-723.1	Yes
7	4. Stiff to V. Stiff Cohesive	10.1	-723.1	No
8	8. Soft to M. Stiff Cohesive	0	-713	No
9	5. V. Stiff to Hard Cohesive	0	-713	No



LT Special Bench (B-003-0-09)

Header for point on following page (software output limitation)

XY Location:		LT Special Bench (B-003-0-09): (-60, 83400)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-758.9	No
2	2. Stiff to V. Stiff Embankment Fill	0	-758.9	No
3	3. Loose to M. Dense Embankment Fill	5.8	-758.9	Yes
4	Cohesive Roadway Fill	0	-753.1	Yes
5	1. M. Stiff to Stiff Embankment Fill	18.7	-753.1	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.9	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-723.5	No

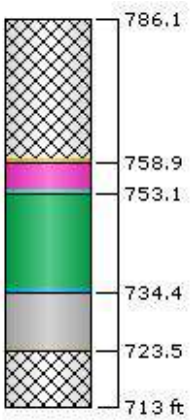


LT Special Bench 2 (B-003-0-09)

Header for point on following page (software output limitation)

XY Location: LT Special Bench 2 (B-003-0-09): (-60, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-758.9	No
2	2. Stiff to V. Stiff Embankment Fill	0	-758.9	No
3	3. Loose to M. Dense Embankment Fill	5.8	-758.9	Yes
4	Cohesive Roadway Fill	0	-753.1	Yes
5	1. M. Stiff to Stiff Embankment Fill	18.7	-753.1	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.9	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-723.5	No



Soil Properties

Property	1. M. Stiff to Stiff Embankment Fill	2. Stiff to V. Stiff Embankment Fill	3. Loose to M. Dense Embankment Fill	4. Stiff to V. Stiff Cohesive
Color				
Unit Weight [kips/ft3]	0.125	0.125	0.125	0.125
Saturated Unit Weight [kips/ft3]	0.13	0.13	0.13	0.13
K0	0.61	0.59	0.48	0.59
Immediate Settlement	Disabled	Disabled	Enabled	Disabled
Es [ksf]	-	-	550	-
Esur [ksf]	-	-	550	-
Primary Consolidation	Enabled	Enabled	Disabled	Enabled
Material Type	Non-Linear	Non-Linear		Non-Linear
Cc	0.171	0.141	-	0.342
Cr	0.017	0.014	-	0.034
e0	0.559	0.59	-	0.466
OCR	1	1	-	1
Cv [ft2/d]	0.13	0.16	-	0.19
Cvr [ft2/d]	0.13	0.16	-	0.19
B-bar	1	1	-	1
Undrained Su A [kips/ft2]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Property	5. V. Stiff to Hard Cohesive	6. M. Dense to Dense Granular	8. Soft to M. Stiff Cohesive	Cohesive Roadway Fill
Color				
Unit Weight [kips/ft3]	0.13	0.13	0.135	0.125
Saturated Unit Weight [kips/ft3]	0.135	0.135	0.14	0.13
K0	0.56	0.44	0.64	0.61
Immediate Settlement	Disabled	Enabled	Disabled	Disabled
Es [ksf]	-	950	-	-
Esur [ksf]	-	950	-	-
Primary Consolidation	Enabled	Disabled	Enabled	Enabled
Material Type	Non-Linear		Non-Linear	Non-Linear
Cc	0.198	-	0.144	0.171
Cr	0.02	-	0.014	0.017
e0	0.423	-	0.657	0.559

OCR	1	-	1	1
Cv [ft2/d]	0.48	-	0.64	0.13
Cvr [ft2/d]	0.48	-	0.64	0.13
B-bar	1	-	1	1
Undrained Su A [kips/ft2]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft3
Generating excess pore pressure above water table	

Piezometric Line Entities

ID	Depth (ft)
1	-740 ft

Field Point Grid

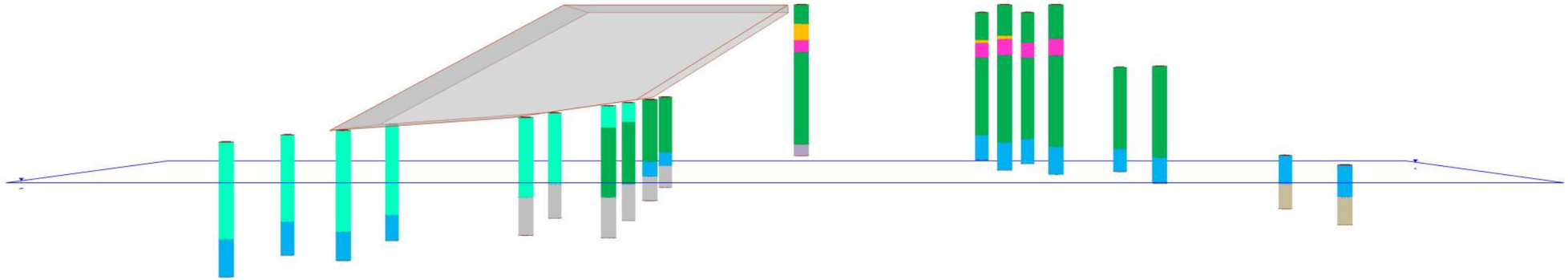
Number of points	520
Expansion Factor	1

Grid Coordinates

X [ft]	Y [ft]
203.8	83550
203.8	83350
-221	83350
-221	83550

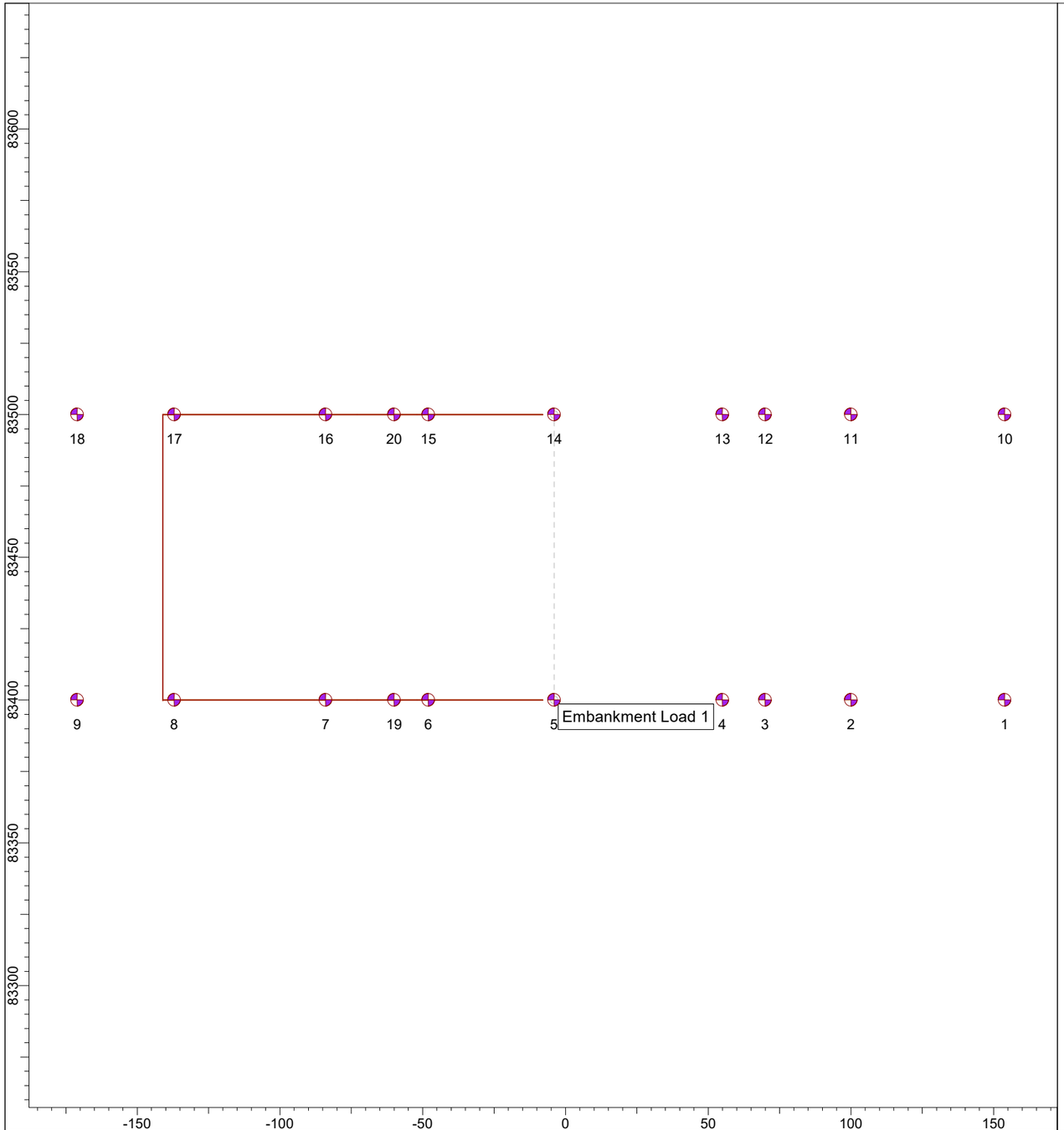
Settlement (Overconsolidated Existing Embankment, Cohesive Roadway Fill at Toe)

3D Model Front View

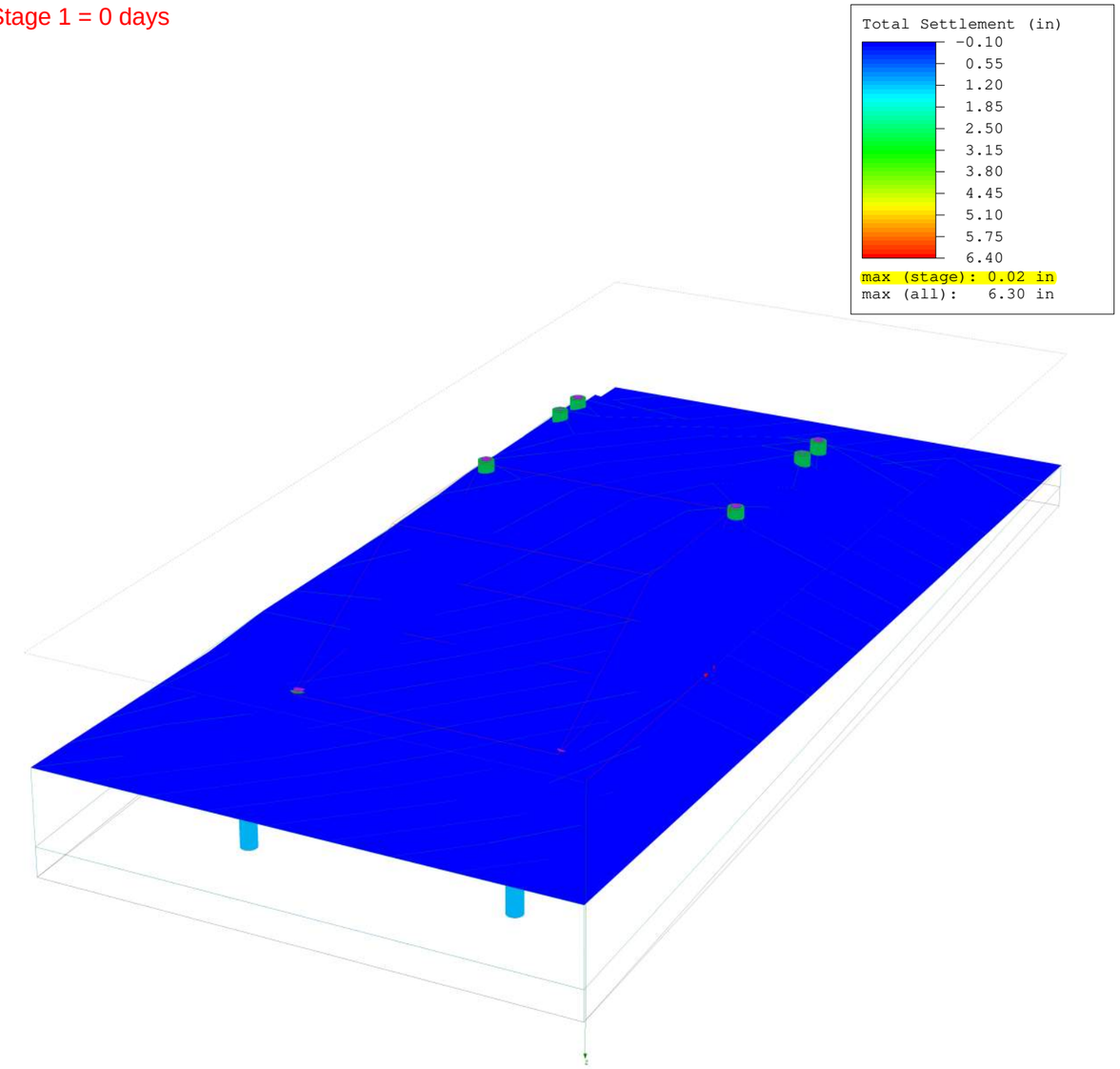


rocscience	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Cohesive Roadway Fill	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_No Granular.s3z

SETTLE3 5.007

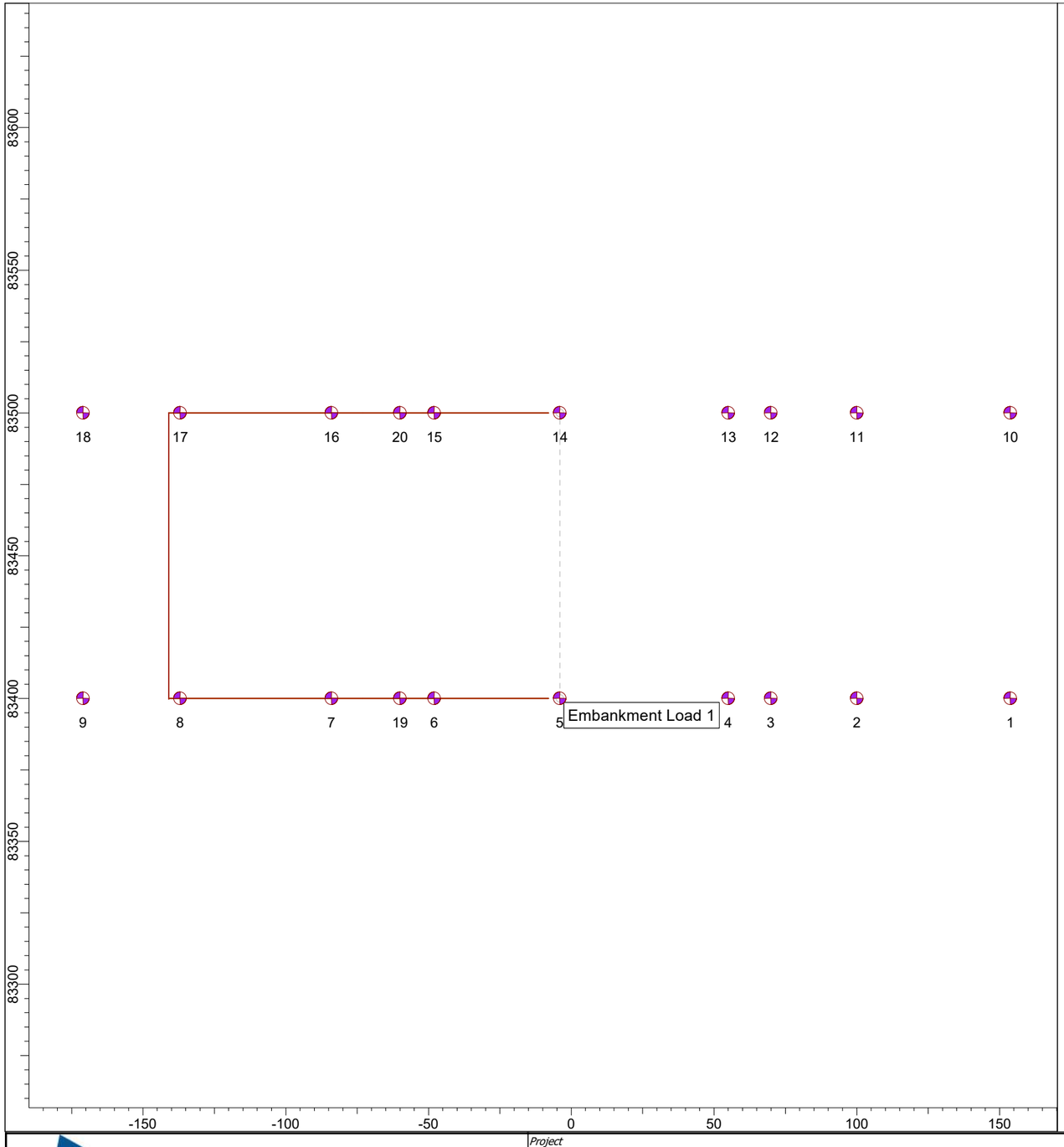


Stage 1 = 0 days

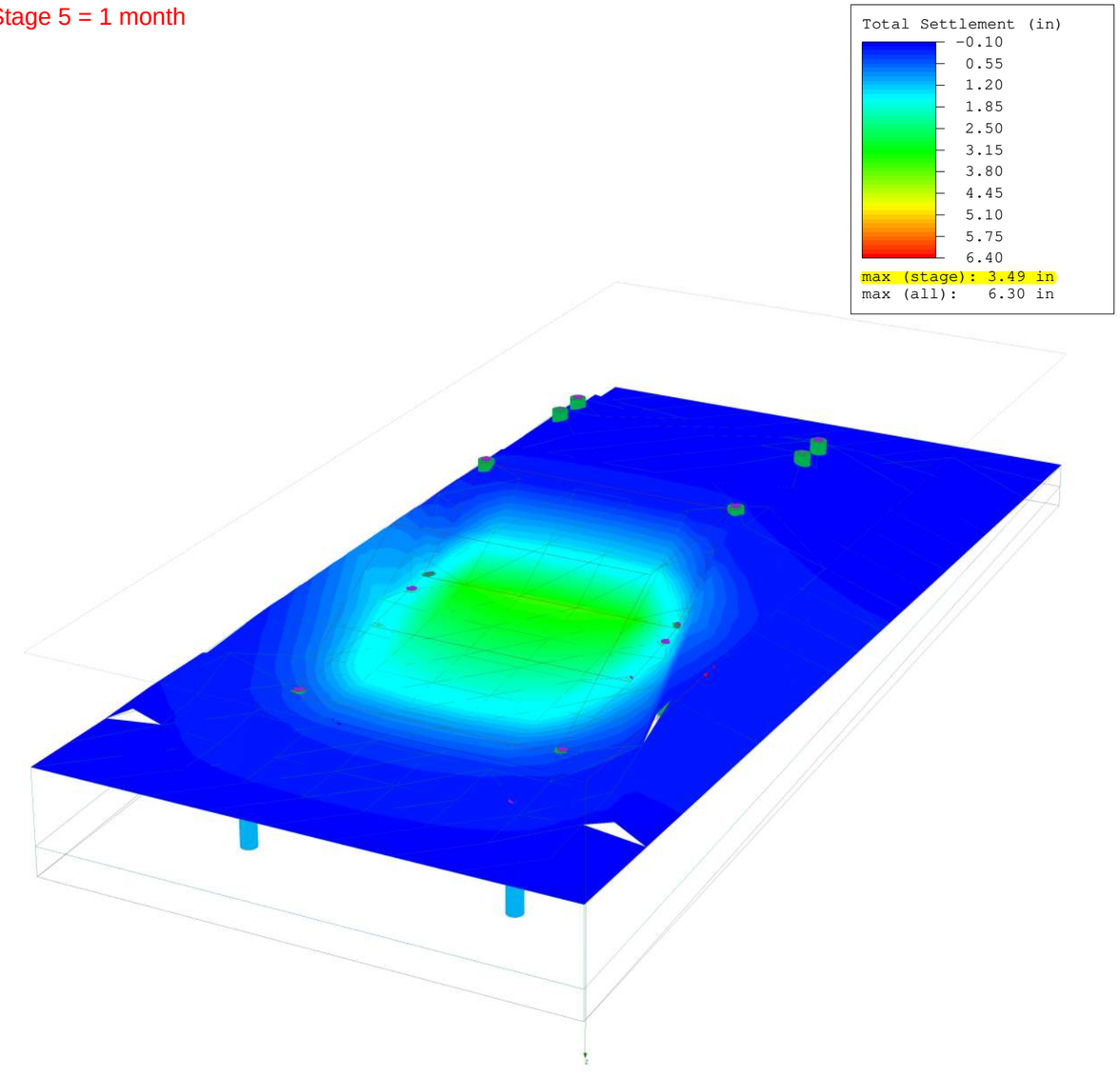


	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Cohesive Roadway Fill	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_No Granular.s3z

SETTLE3 5.007

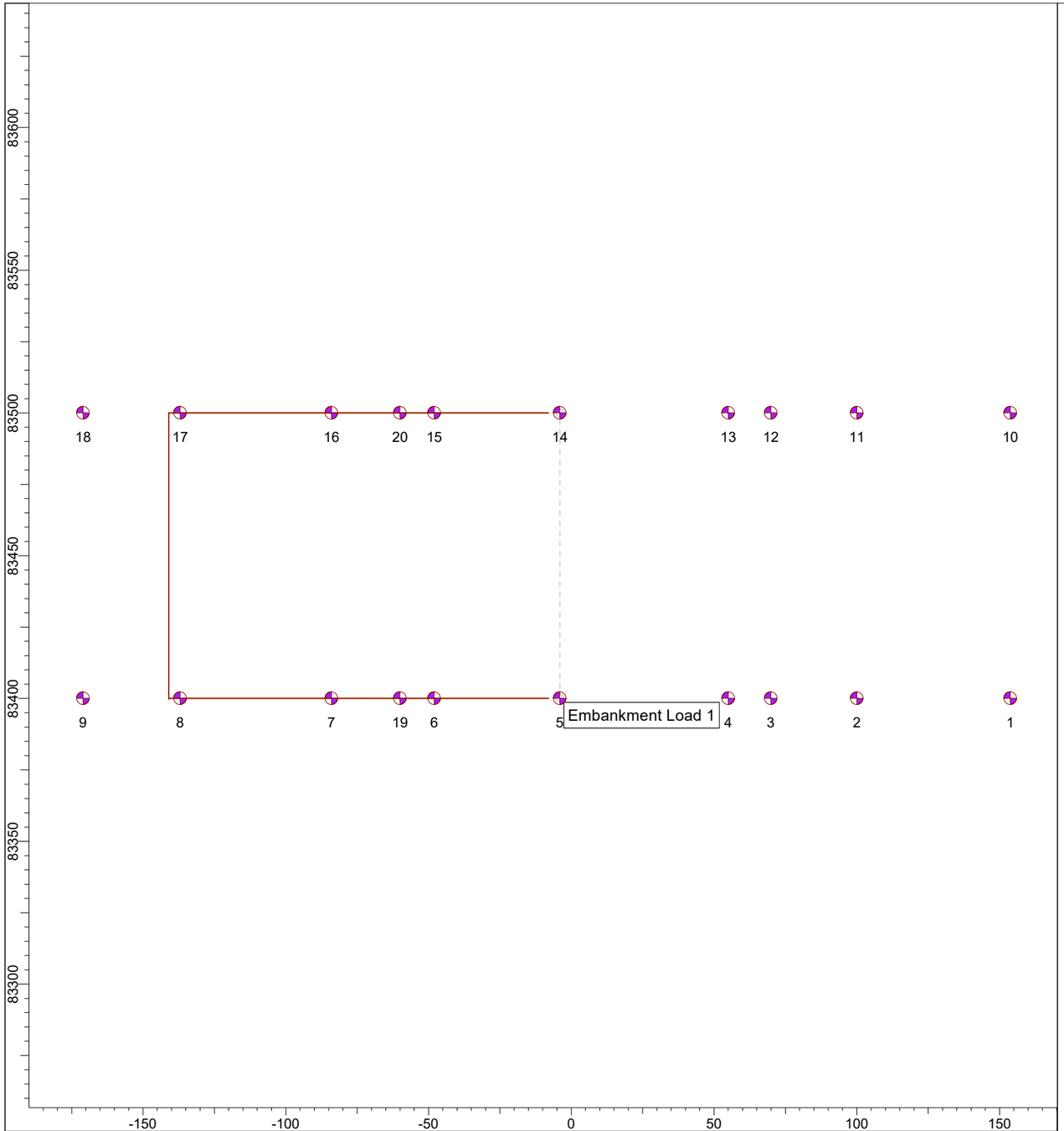


Stage 5 = 1 month

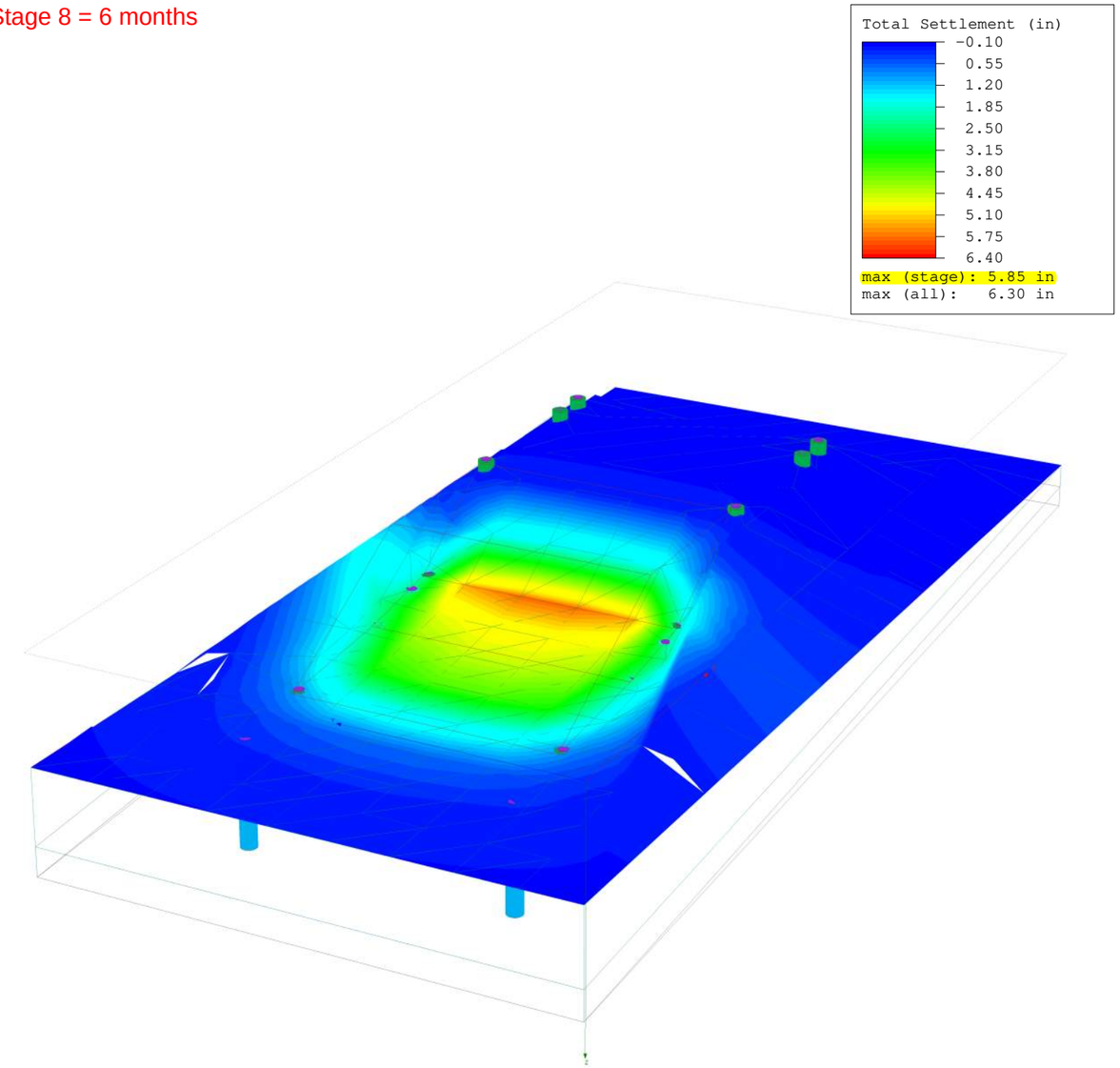


rocscience	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Cohesive Roadway Fill	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_No Granular.s3z

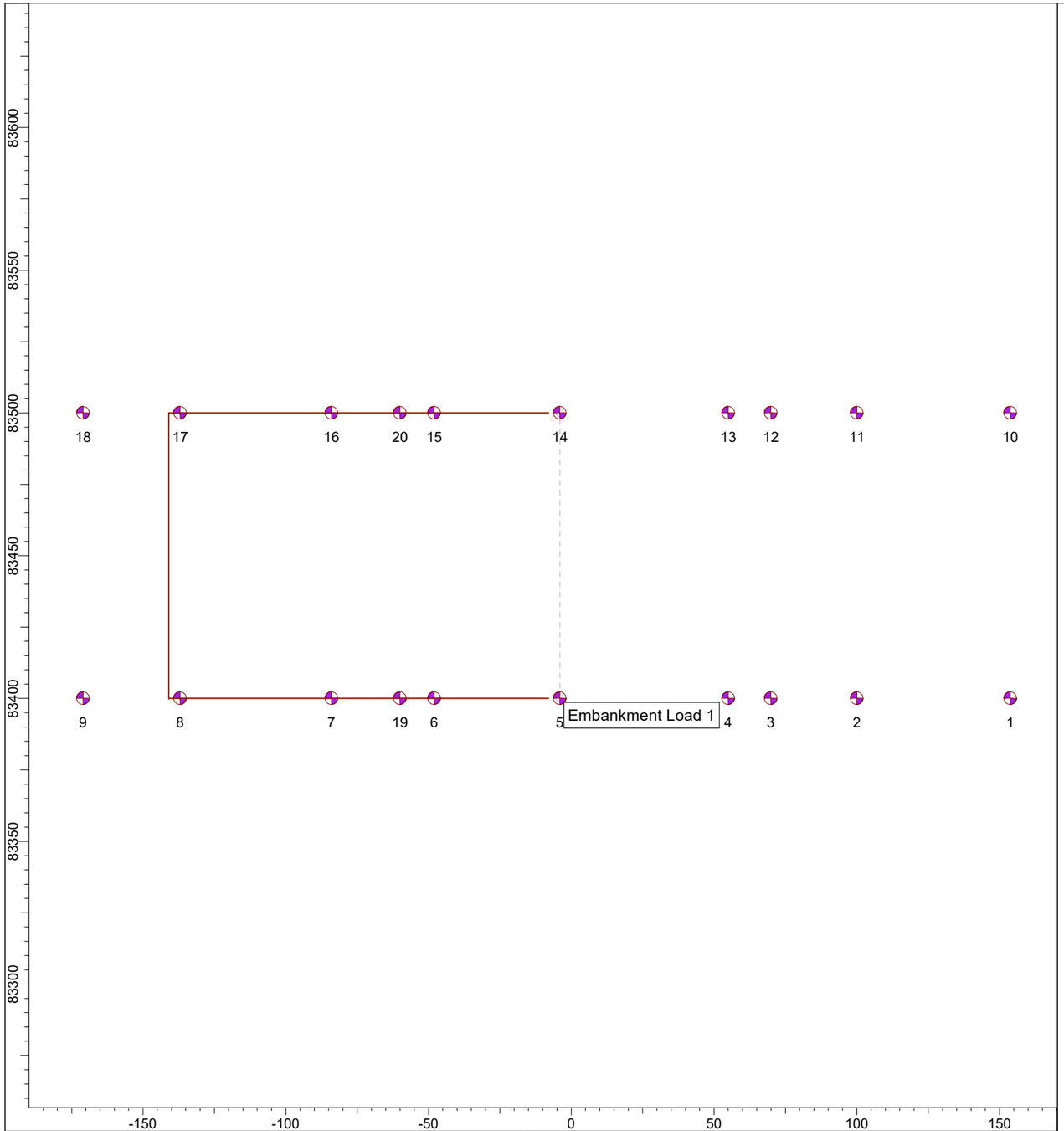
SETTLE3 5.007



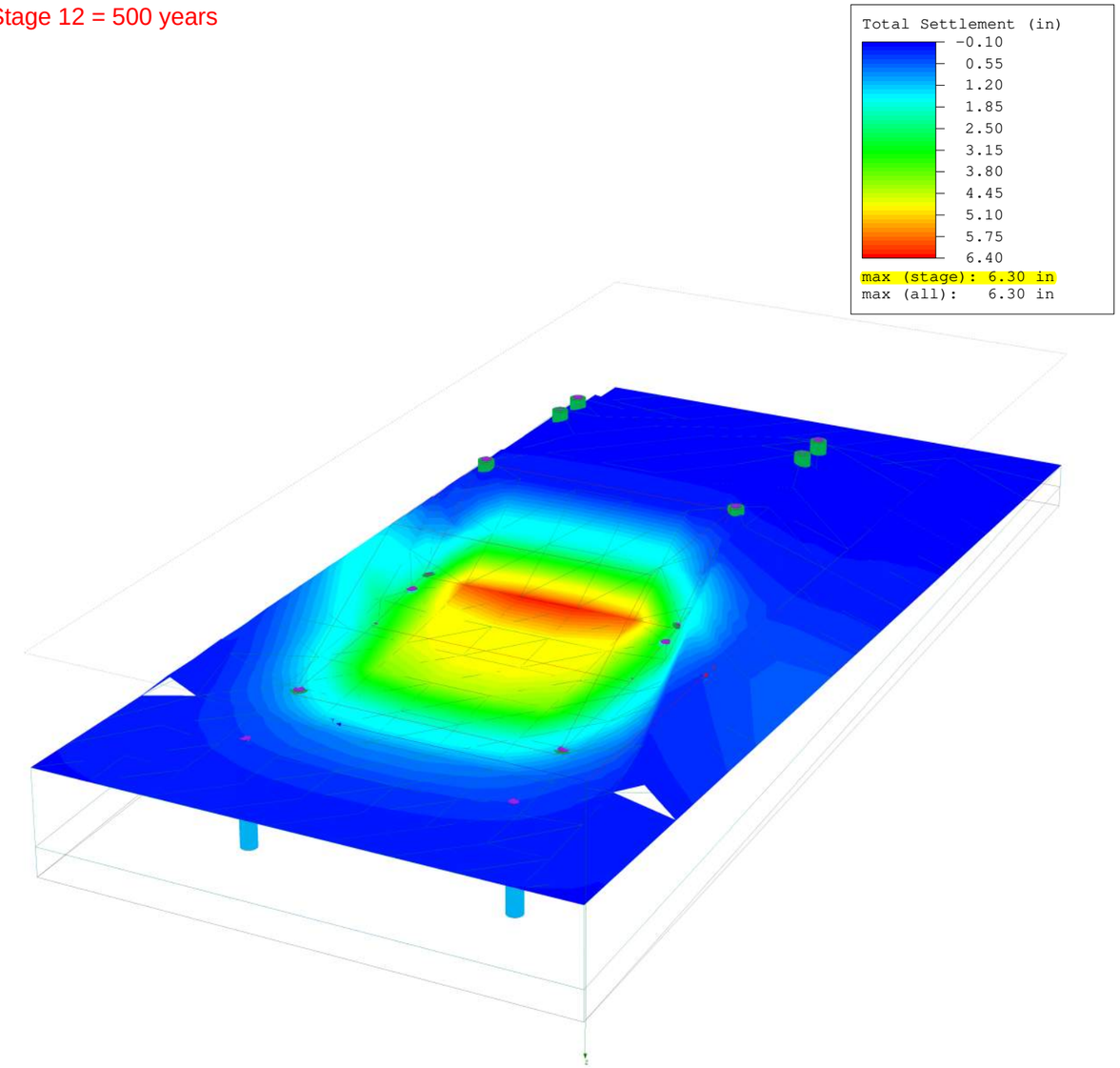
Stage 8 = 6 months



SETTLE3 5.007	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Cohesive Roadway Fill	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_No Granular.s3z



Stage 12 = 500 years



SETTLE3 5.007	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Cohesive Roadway Fill	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_No Granular.s3z

MEG-33-13.96
HDR
Date Created: 2024/05/07, 06:04:47

Table of Contents

Settle3 Analysis Information

MEG-33-13.96

Project Settings

Document Name	Sta. 834+50 Settlement_No Granular.s3z
Project Title	MEG-33-13.96
Analysis	Sta. 834+50 Cohesive Roadway Fill
Author	A. Baratta
Company	HDR
Date Created	4/25/2024, 12:56:29 PM
Stress Computation Method	Boussinesq
Time-dependent Consolidation Analysis	
Time Units	days
Permeability Units	feet/day
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

Stage #	Name	Time [days]
1	0 d	0
2	7 d	7
3	14 d	14
4	21 d	21
5	30 d (1 m)	30
6	60 d (2 m)	60
7	90 d (3 m)	90
8	183 d (6 m)	183
9	365 d (1 y)	365
10	3650 d (10 y)	3650
11	36,500 d (100 y)	36500
12	182,500 d (500 y)	182500

Results

Time taken to compute: 14.3672 seconds

Stage: 0 d = 0 d

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.0236131
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66246
Effective Stress XX [ksf]	-0.22514	6.86472
Effective Stress YY [ksf]	-0.103538	3.95837
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00226711
Pore Water Pressure [ksf]	0	4.70196
Excess Pore Water Pressure [ksf]	0	4.70196
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.00375	18
Over-consolidation Ratio	1	36781.6
Void Ratio	0	0.657
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-1.11022e-16	4.44089e-16

Header for table on following page (software output limitation)

Stage: 7 d = 7 d

Data Type	Minimum	Maximum
Total Settlement [in]	-0.00317638	1.98042
Total Consolidation Settlement [in]	-0.00317638	1.98042
Virgin Consolidation Settlement [in]	0	1.38274
Recompression Consolidation Settlement [in]	-0.053159	0.690399
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66285
Effective Stress XX [ksf]	-0.420529	9.06216
Effective Stress YY [ksf]	-0.420529	6.59317
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0161124	0.0789852
Pore Water Pressure [ksf]	0	3.64819
Excess Pore Water Pressure [ksf]	0	3.62116
Degree of Consolidation [%]	0	99.9049
Pre-consolidation Stress [ksf]	0.00377388	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.657195
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00139418	0.257839

Stage: 14 d = 14 d

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Data Type	Minimum	Maximum
Total Settlement [in]	-0.00277535	2.59983
Total Consolidation Settlement [in]	-0.00277535	2.59983
Virgin Consolidation Settlement [in]	0	1.89493
Recompression Consolidation Settlement [in]	-0.00277535	0.898667
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66301
Effective Stress XX [ksf]	-0.432298	9.06216
Effective Stress YY [ksf]	-0.432298	6.59317
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00920132	0.0790162
Pore Water Pressure [ksf]	0	3.57509
Excess Pore Water Pressure [ksf]	0	3.45039
Degree of Consolidation [%]	0	99.9999
Pre-consolidation Stress [ksf]	0.00377388	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.65725
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.00145859	0.257839

Stage: 21 d = 21 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.000586058	3.04219
Total Consolidation Settlement [in]	-0.000586058	3.04219
Virgin Consolidation Settlement [in]	0	2.25865
Recompression Consolidation Settlement [in]	-0.000586058	1.02684
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66314
Effective Stress XX [ksf]	-0.380484	9.06216
Effective Stress YY [ksf]	-0.380484	6.92109
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0104642	0.0790295
Pore Water Pressure [ksf]	0	3.41387
Excess Pore Water Pressure [ksf]	0	3.40605
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00377388	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.657115
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.000485802	0.257839

Stage: 30 d (1 m) = 30 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	3.48944
Total Consolidation Settlement [in]	0	3.48944
Virgin Consolidation Settlement [in]	0	2.62846
Recompression Consolidation Settlement [in]	0	1.15732
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66328
Effective Stress XX [ksf]	-0.306776	9.06216
Effective Stress YY [ksf]	-0.306776	7.1427
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00823797	0.0790391
Pore Water Pressure [ksf]	0	3.29631
Excess Pore Water Pressure [ksf]	0	3.29631
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00377388	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656916
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-3.31148e-07	0.257839

Stage: 60 d (2 m) = 60 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	4.46411
Total Consolidation Settlement [in]	0	4.46411
Virgin Consolidation Settlement [in]	0	3.42821
Recompression Consolidation Settlement [in]	0	1.43173
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66366
Effective Stress XX [ksf]	-0.2246	9.24708
Effective Stress YY [ksf]	-0.132	7.38059
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00505043	0.079056
Pore Water Pressure [ksf]	-5.09681e-21	2.83986
Excess Pore Water Pressure [ksf]	-5.09681e-21	2.83986
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00377389	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656846
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.257839

Stage: 90 d (3 m) = 90 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	5.03927
Total Consolidation Settlement [in]	0	5.03927
Virgin Consolidation Settlement [in]	0	3.88997
Recompression Consolidation Settlement [in]	0	1.58297
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66394
Effective Stress XX [ksf]	-0.2246	9.32551
Effective Stress YY [ksf]	-0.101899	7.45865
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00467532	0.0790654
Pore Water Pressure [ksf]	-6.00309e-21	2.56387
Excess Pore Water Pressure [ksf]	-6.00309e-21	2.56387
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00377389	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656779
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.257839

Stage: 183 d (6 m) = 183 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	5.84571
Total Consolidation Settlement [in]	0	5.84571
Virgin Consolidation Settlement [in]	0	4.50005
Recompression Consolidation Settlement [in]	0	1.78292
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.78078
Effective Stress XX [ksf]	-0.2246	9.41631
Effective Stress YY [ksf]	-0.101899	7.54774
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00428201	0.0790766
Pore Water Pressure [ksf]	-8.37026e-17	1.88076
Excess Pore Water Pressure [ksf]	-8.37026e-17	1.88076
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00377389	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656636
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.257839

Stage: 365 d (1 y) = 365 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	6.21035
Total Consolidation Settlement [in]	0	6.21035
Virgin Consolidation Settlement [in]	0	4.71963
Recompression Consolidation Settlement [in]	0	1.86734
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.98721
Effective Stress XX [ksf]	-0.2246	9.46223
Effective Stress YY [ksf]	-0.101899	7.59207
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00407327	0.0790794
Pore Water Pressure [ksf]	-8.26748e-17	1.70486
Excess Pore Water Pressure [ksf]	-8.26748e-17	0.965012
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00377389	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.65652
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.257839

Header for table on following page (software output limitation)

Stage: 3650 d (10 y) = 3650 d

Data Type	Minimum	Maximum
Total Settlement [in]	0	6.30455
Total Consolidation Settlement [in]	0	6.30455
Virgin Consolidation Settlement [in]	0	4.74227
Recompression Consolidation Settlement [in]	0	1.88327
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00188
Effective Stress XX [ksf]	-0.2246	9.47403
Effective Stress YY [ksf]	-0.101899	7.60343
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00390738	0.0790796
Pore Water Pressure [ksf]	-1.35225e-16	1.6848
Excess Pore Water Pressure [ksf]	-9.02465e-06	4.71351e-05
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00377389	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.257839

Stage: 36,500 d (100 y) = 36500 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	6.30455
Total Consolidation Settlement [in]	0	6.30455
Virgin Consolidation Settlement [in]	0	4.74227
Recompression Consolidation Settlement [in]	0	1.88327
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00188
Effective Stress XX [ksf]	-0.2246	9.47403
Effective Stress YY [ksf]	-0.101899	7.60343
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00390738	0.0790796
Pore Water Pressure [ksf]	-2.08674e-15	1.6848
Excess Pore Water Pressure [ksf]	-8.99054e-06	7.61967e-06
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00377389	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.257839

Stage: 182,500 d (500 y) = 182500 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	6.30455
Total Consolidation Settlement [in]	0	6.30455
Virgin Consolidation Settlement [in]	0	4.74227
Recompression Consolidation Settlement [in]	0	1.88327
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00188
Effective Stress XX [ksf]	-0.2246	9.47403
Effective Stress YY [ksf]	-0.101899	7.60343
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00390738	0.0790796
Pore Water Pressure [ksf]	-2.14199e-15	1.6848
Excess Pore Water Pressure [ksf]	-8.98793e-06	8.09875e-06
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00377389	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.32068
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	0	0.257839

Embankments

1. Embankment: "Embankment Load 1"

Label	Embankment Load 1
Center Line	(-4, 83400) to (-4, 83500)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Zones	4
Number of Sections	1

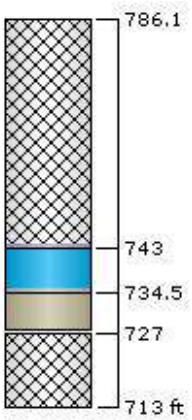
Zone	Name	Unit Weight (kips/ft3)
1	New Zone	0.115
2	New Zone 2	0.115
3	New Zone 3	0.115
4	New Zone 4	0.125

Soil Layers

Ground Surface Drained: Yes

RT Toe (B-001-0-09)

XY Location:		RT Toe (B-001-0-09): (153.8, 83400)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-743	No
2	2. Stiff to V. Stiff Embankment Fill	0	-743	No
3	3. Loose to M. Dense Embankment Fill	0	-743	Yes
4	Cohesive Roadway Fill	0	-743	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-743	Yes
6	6. M. Dense to Dense Granular	0	-743	Yes
7	4. Stiff to V. Stiff Cohesive	8.5	-743	No
8	8. Soft to M. Stiff Cohesive	0	-734.5	No
9	5. V. Stiff to Hard Cohesive	7.5	-734.5	No

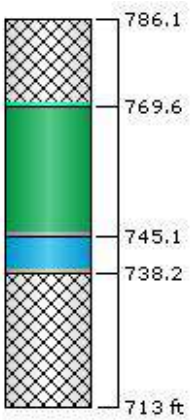


RT Slope (B-002-0-09/B-47ER)

Header for point on following page (software output limitation)

XY Location: RT Slope (B-002-0-09/B-47ER): (100, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-769.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-769.6	No
3	3. Loose to M. Dense Embankment Fill	0	-769.6	Yes
4	Cohesive Roadway Fill	0	-769.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-769.6	Yes
6	6. M. Dense to Dense Granular	0	-745.1	Yes
7	4. Stiff to V. Stiff Cohesive	6.9	-745.1	No
8	8. Soft to M. Stiff Cohesive	0	-738.2	No
9	5. V. Stiff to Hard Cohesive	0	-738.2	No

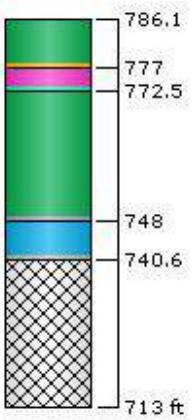


RT Crest (B-002-0-09)

Header for point on following page (software output limitation)

XY Location: RT Crest (B-002-0-09): (69.9, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	9.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0	-777	No
3	3. Loose to M. Dense Embankment Fill	4.5	-777	Yes
4	Cohesive Roadway Fill	0	-772.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-772.5	Yes
6	6. M. Dense to Dense Granular	0	-748	Yes
7	4. Stiff to V. Stiff Cohesive	7.4	-748	No
8	8. Soft to M. Stiff Cohesive	0	-740.6	No
9	5. V. Stiff to Hard Cohesive	0	-740.6	No

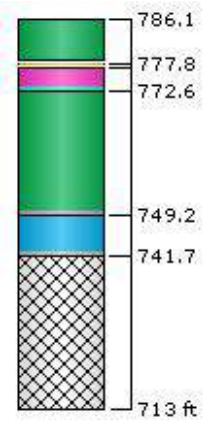


CL Crest (B-002-0-09/B-47)

Header for point on following page (software output limitation)

XY Location: CL Crest (B-002-0-09/B-47): (55, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	8.3	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0.9	-777.8	No
3	3. Loose to M. Dense Embankment Fill	4.3	-776.9	Yes
4	Cohesive Roadway Fill	0	-772.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	23.4	-772.6	Yes
6	6. M. Dense to Dense Granular	0	-749.2	Yes
7	4. Stiff to V. Stiff Cohesive	7.5	-749.2	No
8	8. Soft to M. Stiff Cohesive	0	-741.7	No
9	5. V. Stiff to Hard Cohesive	0	-741.7	No

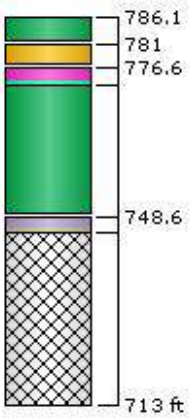


LT Crest (B-003-0-09/CU-10C)

Header for point on following page (software output limitation)

XY Location: LT Crest (B-003-0-09/CU-10C): (-4, 83400)

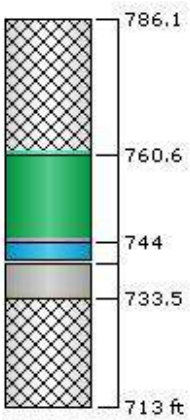
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	5.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	4.4	-781	No
3	3. Loose to M. Dense Embankment Fill	3.2	-776.6	Yes
4	Cohesive Roadway Fill	0	-773.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.8	-773.4	Yes
6	6. M. Dense to Dense Granular	3	-748.6	Yes
7	4. Stiff to V. Stiff Cohesive	0	-745.6	No
8	8. Soft to M. Stiff Cohesive	0	-745.6	No
9	5. V. Stiff to Hard Cohesive	0	-745.6	No



LT Toe (B-003-0-09) Header for point on following page (software output limitation)

XY Location: LT Toe (B-003-0-09): (-48, 83400)

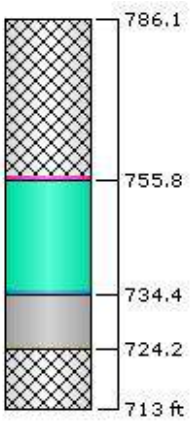
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-760.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-760.6	No
3	3. Loose to M. Dense Embankment Fill	0	-760.6	Yes
4	Cohesive Roadway Fill	0	-760.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	16.6	-760.6	Yes
6	6. M. Dense to Dense Granular	0	-744	Yes
7	4. Stiff to V. Stiff Cohesive	4	-744	No
8	8. Soft to M. Stiff Cohesive	6.5	-740	No
9	5. V. Stiff to Hard Cohesive	0	-733.5	No



LT Fill (B-003-0-23) Header for point on following page (software output limitation)

XY Location: LT Fill (B-003-0-23): (-84, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-755.8	No
2	2. Stiff to V. Stiff Embankment Fill	0	-755.8	No
3	3. Loose to M. Dense Embankment Fill	0	-755.8	Yes
4	Cohesive Roadway Fill	21.4	-755.8	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-734.4	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.2	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-724.2	No

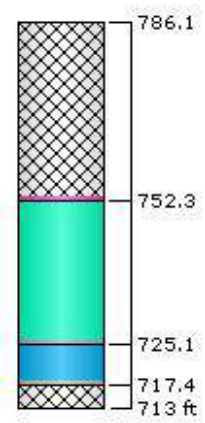


LT New Toe (B-003-0-23/SRB-3)

Header for point on following page (software output limitation)

XY Location: LT New Toe (B-003-0-23/SRB-3): (-137, 83400)

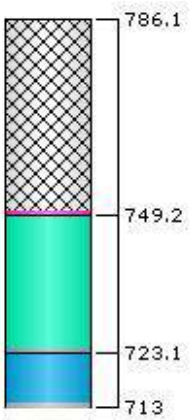
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-752.3	No
2	2. Stiff to V. Stiff Embankment Fill	0	-752.3	No
3	3. Loose to M. Dense Embankment Fill	0	-752.3	Yes
4	Cohesive Roadway Fill	27.2	-752.3	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-725.1	Yes
6	6. M. Dense to Dense Granular	0	-725.1	Yes
7	4. Stiff to V. Stiff Cohesive	7.7	-725.1	No
8	8. Soft to M. Stiff Cohesive	0	-717.4	No
9	5. V. Stiff to Hard Cohesive	0	-717.4	No



LT Roadway Slope (SRB-3) ← Header for point on following page (software output limitation)

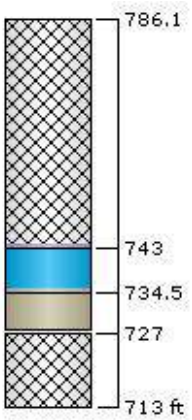
XY Location: LT Roadway Slope (SRB-3): (-171, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-749.2	No
2	2. Stiff to V. Stiff Embankment Fill	0	-749.2	No
3	3. Loose to M. Dense Embankment Fill	0	-749.2	Yes
4	Cohesive Roadway Fill	26.1	-749.2	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-723.1	Yes
6	6. M. Dense to Dense Granular	0	-723.1	Yes
7	4. Stiff to V. Stiff Cohesive	10.1	-723.1	No
8	8. Soft to M. Stiff Cohesive	0	-713	No
9	5. V. Stiff to Hard Cohesive	0	-713	No



RT Toe 2 (B-001-0-09) Header for point on following page (software output limitation)

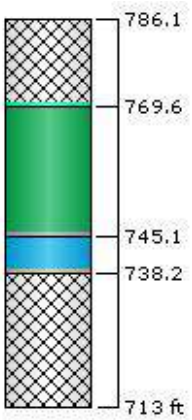
XY Location:		RT Toe 2 (B-001-0-09): (153.8, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-743	No
2	2. Stiff to V. Stiff Embankment Fill	0	-743	No
3	3. Loose to M. Dense Embankment Fill	0	-743	Yes
4	Cohesive Roadway Fill	0	-743	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-743	Yes
6	6. M. Dense to Dense Granular	0	-743	Yes
7	4. Stiff to V. Stiff Cohesive	8.5	-743	No
8	8. Soft to M. Stiff Cohesive	0	-734.5	No
9	5. V. Stiff to Hard Cohesive	7.5	-734.5	No



RT Slope 2 (B-002-0-09/B-47ER)

Header for point on following page (software output limitation)

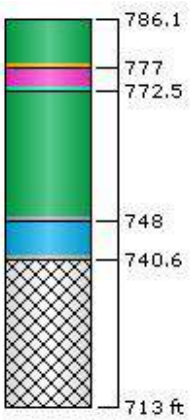
XY Location:		RT Slope 2 (B-002-0-09/B-47ER): (100, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-769.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-769.6	No
3	3. Loose to M. Dense Embankment Fill	0	-769.6	Yes
4	Cohesive Roadway Fill	0	-769.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-769.6	Yes
6	6. M. Dense to Dense Granular	0	-745.1	Yes
7	4. Stiff to V. Stiff Cohesive	6.9	-745.1	No
8	8. Soft to M. Stiff Cohesive	0	-738.2	No
9	5. V. Stiff to Hard Cohesive	0	-738.2	No



RT Crest 2 (B-002-0-09)

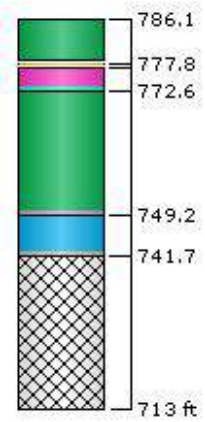
Header for point on following page (software output limitation)

XY Location:		RT Crest 2 (B-002-0-09): (69.9, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	9.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0	-777	No
3	3. Loose to M. Dense Embankment Fill	4.5	-777	Yes
4	Cohesive Roadway Fill	0	-772.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-772.5	Yes
6	6. M. Dense to Dense Granular	0	-748	Yes
7	4. Stiff to V. Stiff Cohesive	7.4	-748	No
8	8. Soft to M. Stiff Cohesive	0	-740.6	No
9	5. V. Stiff to Hard Cohesive	0	-740.6	No



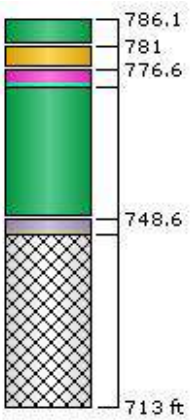
CL Crest 2 (B-002-0-09/B-47) ← Header for point on following page (software output limitation)

XY Location:		CL Crest 2 (B-002-0-09/B-47): (55, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	8.3	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0.9	-777.8	No
3	3. Loose to M. Dense Embankment Fill	4.3	-776.9	Yes
4	Cohesive Roadway Fill	0	-772.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	23.4	-772.6	Yes
6	6. M. Dense to Dense Granular	0	-749.2	Yes
7	4. Stiff to V. Stiff Cohesive	7.5	-749.2	No
8	8. Soft to M. Stiff Cohesive	0	-741.7	No
9	5. V. Stiff to Hard Cohesive	0	-741.7	No



LT Crest 2 (B-003-0-09/CU-10C) Header for point on following page (software output limitation)

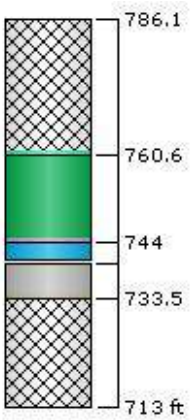
XY Location:		LT Crest 2 (B-003-0-09/CU-10C): (-4, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	5.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	4.4	-781	No
3	3. Loose to M. Dense Embankment Fill	3.2	-776.6	Yes
4	Cohesive Roadway Fill	0	-773.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.8	-773.4	Yes
6	6. M. Dense to Dense Granular	3	-748.6	Yes
7	4. Stiff to V. Stiff Cohesive	0	-745.6	No
8	8. Soft to M. Stiff Cohesive	0	-745.6	No
9	5. V. Stiff to Hard Cohesive	0	-745.6	No



LT Toe 2 (B-003-0-09) Header for point on following page (software output limitation)

XY Location: LT Toe 2 (B-003-0-09): (-48, 83500)

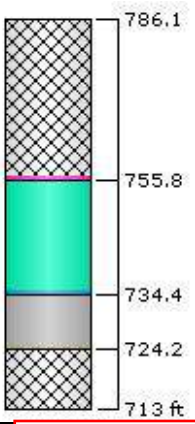
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-760.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-760.6	No
3	3. Loose to M. Dense Embankment Fill	0	-760.6	Yes
4	Cohesive Roadway Fill	0	-760.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	16.6	-760.6	Yes
6	6. M. Dense to Dense Granular	0	-744	Yes
7	4. Stiff to V. Stiff Cohesive	4	-744	No
8	8. Soft to M. Stiff Cohesive	6.5	-740	No
9	5. V. Stiff to Hard Cohesive	0	-733.5	No



LT Fill 2 (B-003-0-23) Header for point on following page (software output limitation)

XY Location: LT Fill 2 (B-003-0-23): (-84, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-755.8	No
2	2. Stiff to V. Stiff Embankment Fill	0	-755.8	No
3	3. Loose to M. Dense Embankment Fill	0	-755.8	Yes
4	Cohesive Roadway Fill	21.4	-755.8	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-734.4	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.2	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-724.2	No

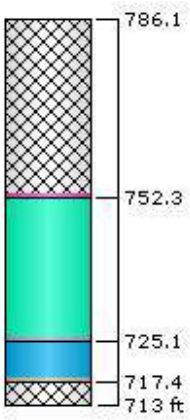


LT New Toe 2 (B-003-0-23/SRB-3)

Header for point on following page (software output limitation)

XY Location: LT New Toe 2 (B-003-0-23/SRB-3): (-137, 83500)

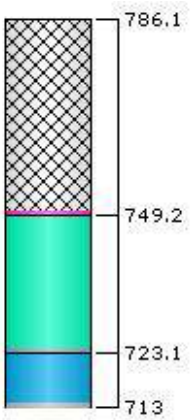
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-752.3	No
2	2. Stiff to V. Stiff Embankment Fill	0	-752.3	No
3	3. Loose to M. Dense Embankment Fill	0	-752.3	Yes
4	Cohesive Roadway Fill	27.2	-752.3	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-725.1	Yes
6	6. M. Dense to Dense Granular	0	-725.1	Yes
7	4. Stiff to V. Stiff Cohesive	7.7	-725.1	No
8	8. Soft to M. Stiff Cohesive	0	-717.4	No
9	5. V. Stiff to Hard Cohesive	0	-717.4	No



LT Roadway Slope 2 (SRB-3) ← Header for point on following page (software output limitation)

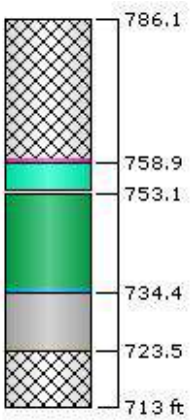
XY Location: LT Roadway Slope 2 (SRB-3): (-171, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-749.2	No
2	2. Stiff to V. Stiff Embankment Fill	0	-749.2	No
3	3. Loose to M. Dense Embankment Fill	0	-749.2	Yes
4	Cohesive Roadway Fill	26.1	-749.2	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-723.1	Yes
6	6. M. Dense to Dense Granular	0	-723.1	Yes
7	4. Stiff to V. Stiff Cohesive	10.1	-723.1	No
8	8. Soft to M. Stiff Cohesive	0	-713	No
9	5. V. Stiff to Hard Cohesive	0	-713	No



LT Special Bench (B-003-0-09) Header for point on following page (software output limitation)

XY Location:		LT Special Bench (B-003-0-09): (-60, 83400)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-758.9	No
2	2. Stiff to V. Stiff Embankment Fill	0	-758.9	No
3	3. Loose to M. Dense Embankment Fill	0	-758.9	Yes
4	Cohesive Roadway Fill	5.8	-758.9	Yes
5	1. M. Stiff to Stiff Embankment Fill	18.7	-753.1	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.9	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-723.5	No

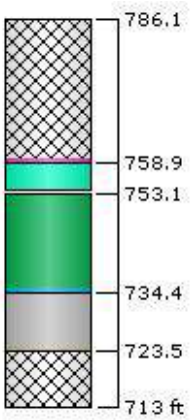


LT Special Bench 2 (B-003-0-09)

Header for point on following page (software output limitation)

XY Location: LT Special Bench 2 (B-003-0-09): (-60, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-758.9	No
2	2. Stiff to V. Stiff Embankment Fill	0	-758.9	No
3	3. Loose to M. Dense Embankment Fill	0	-758.9	Yes
4	Cohesive Roadway Fill	5.8	-758.9	Yes
5	1. M. Stiff to Stiff Embankment Fill	18.7	-753.1	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.9	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-723.5	No



Soil Properties

Property	1. M. Stiff to Stiff Embankment Fill	2. Stiff to V. Stiff Embankment Fill	3. Loose to M. Dense Embankment Fill	4. Stiff to V. Stiff Cohesive
Color				
Unit Weight [kips/ft3]	0.125	0.125	0.125	0.125
Saturated Unit Weight [kips/ft3]	0.13	0.13	0.13	0.13
K0	0.61	0.59	0.48	0.59
Immediate Settlement	Disabled	Disabled	Enabled	Disabled
Es [ksf]	-	-	550	-
Esur [ksf]	-	-	550	-
Primary Consolidation	Enabled	Enabled	Disabled	Enabled
Material Type	Non-Linear	Non-Linear		Non-Linear
Cc	0.171	0.141	-	0.342
Cr	0.017	0.014	-	0.034
e0	0.559	0.59	-	0.466
Pc [ksf]	18	18	-	-
OCR	-	-	-	1
Cv [ft2/d]	0.13	0.16	-	0.19
Cvr [ft2/d]	0.13	0.16	-	0.19
B-bar	1	1	-	1
Undrained Su A [kips/ft2]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Property	5. V. Stiff to Hard Cohesive	6. M. Dense to Dense Granular	8. Soft to M. Stiff Cohesive	Cohesive Roadway Fill
Color				
Unit Weight [kips/ft3]	0.13	0.13	0.135	0.125
Saturated Unit Weight [kips/ft3]	0.135	0.135	0.14	0.13
K0	0.56	0.44	0.64	0.61
Immediate Settlement	Disabled	Enabled	Disabled	Disabled
Es [ksf]	-	950	-	-
Esur [ksf]	-	950	-	-
Primary Consolidation	Enabled	Disabled	Enabled	Enabled
Material Type	Non-Linear		Non-Linear	Non-Linear
Cc	0.198	-	0.144	0.171
Cr	0.02	-	0.014	0.017

e0	0.423	-	0.657	0.559
Pc [ksf]	-	-	-	18
OCR	1	-	1	-
Cv [ft2/d]	0.48	-	0.64	0.13
Cvr [ft2/d]	0.48	-	0.64	0.13
B-bar	1	-	1	1
Undrained Su A [kips/ft2]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft3
Generating excess pore pressure above water table	

Piezometric Line Entities

ID	Depth (ft)
1	-740 ft

Field Point Grid

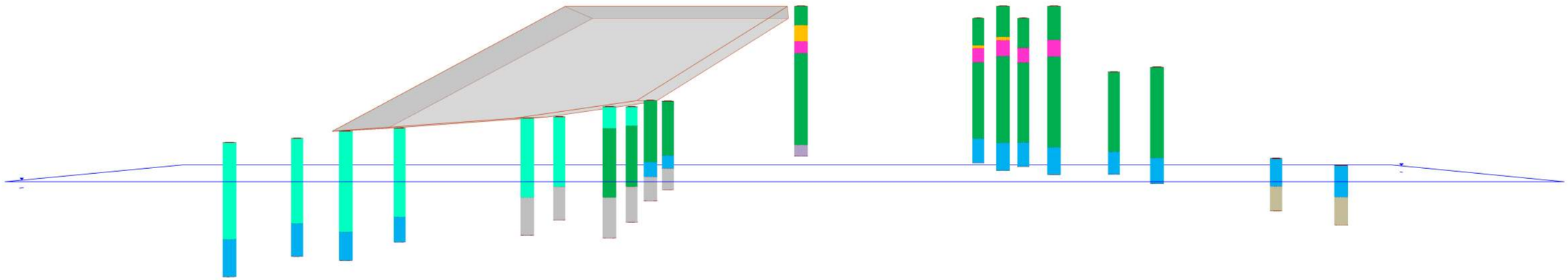
Number of points	520
Expansion Factor	1

Grid Coordinates

X [ft]	Y [ft]
203.8	83550
203.8	83350
-221	83350
-221	83550

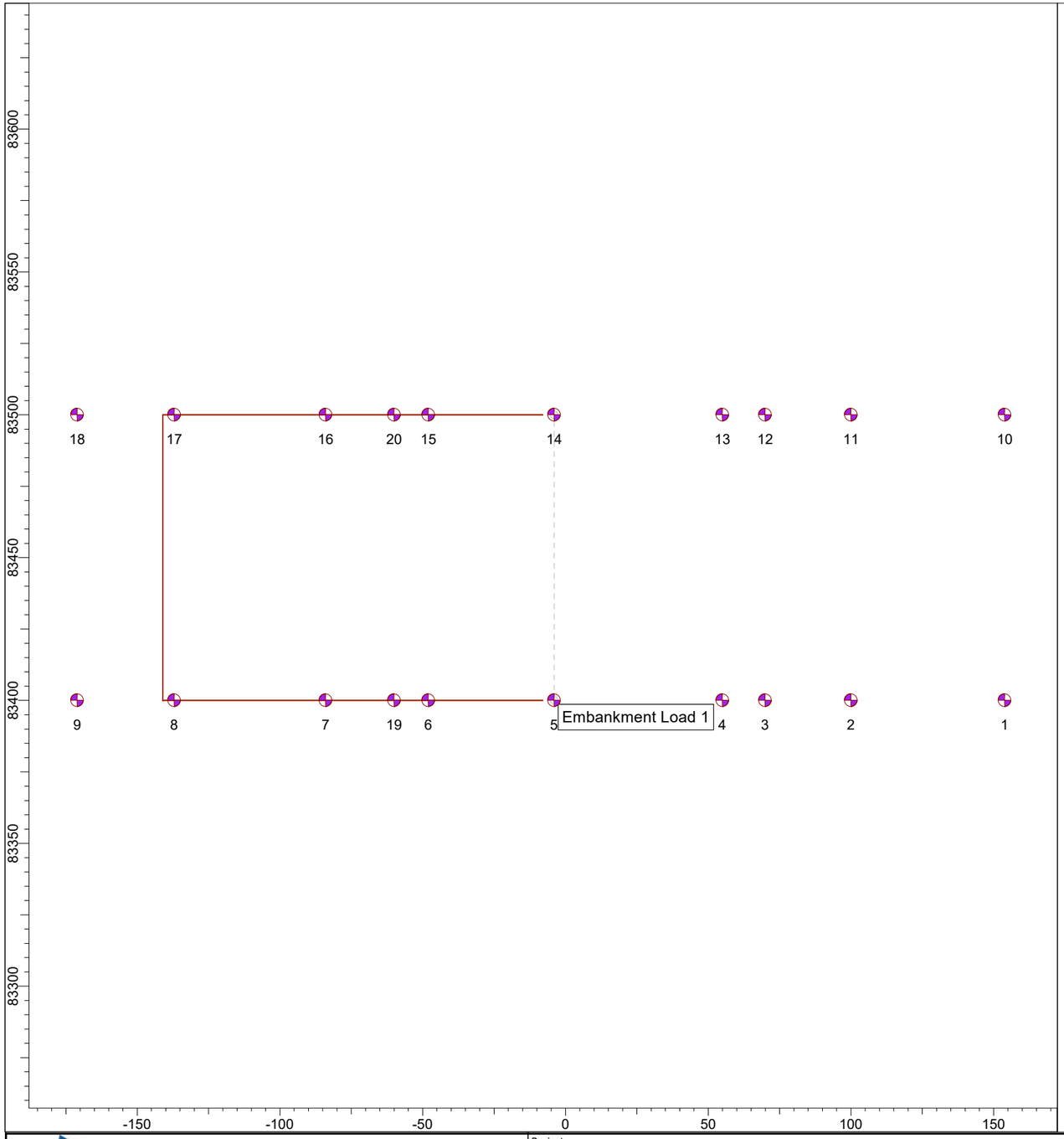
Settlement (Normally Consolidated Existing Embankment, Cohesive Roadway Fill at Toe)

3D Model Front View

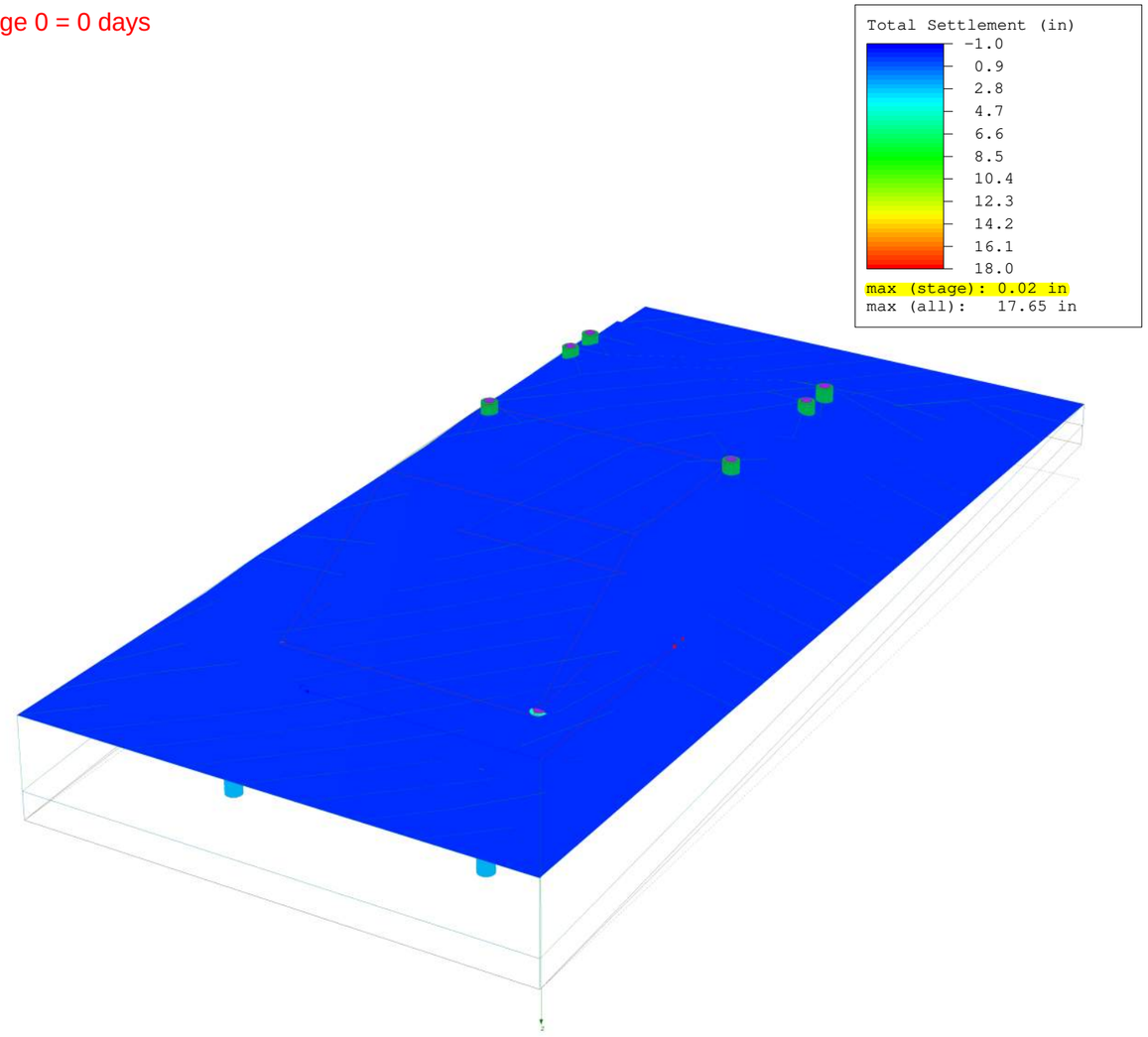


rocscience	*Project*	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Normally Consolidated Embankment Cohesive Roadway Fill	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_No Granular_Normally Consolidated Embankment.s3z

SETTLE3 5.007

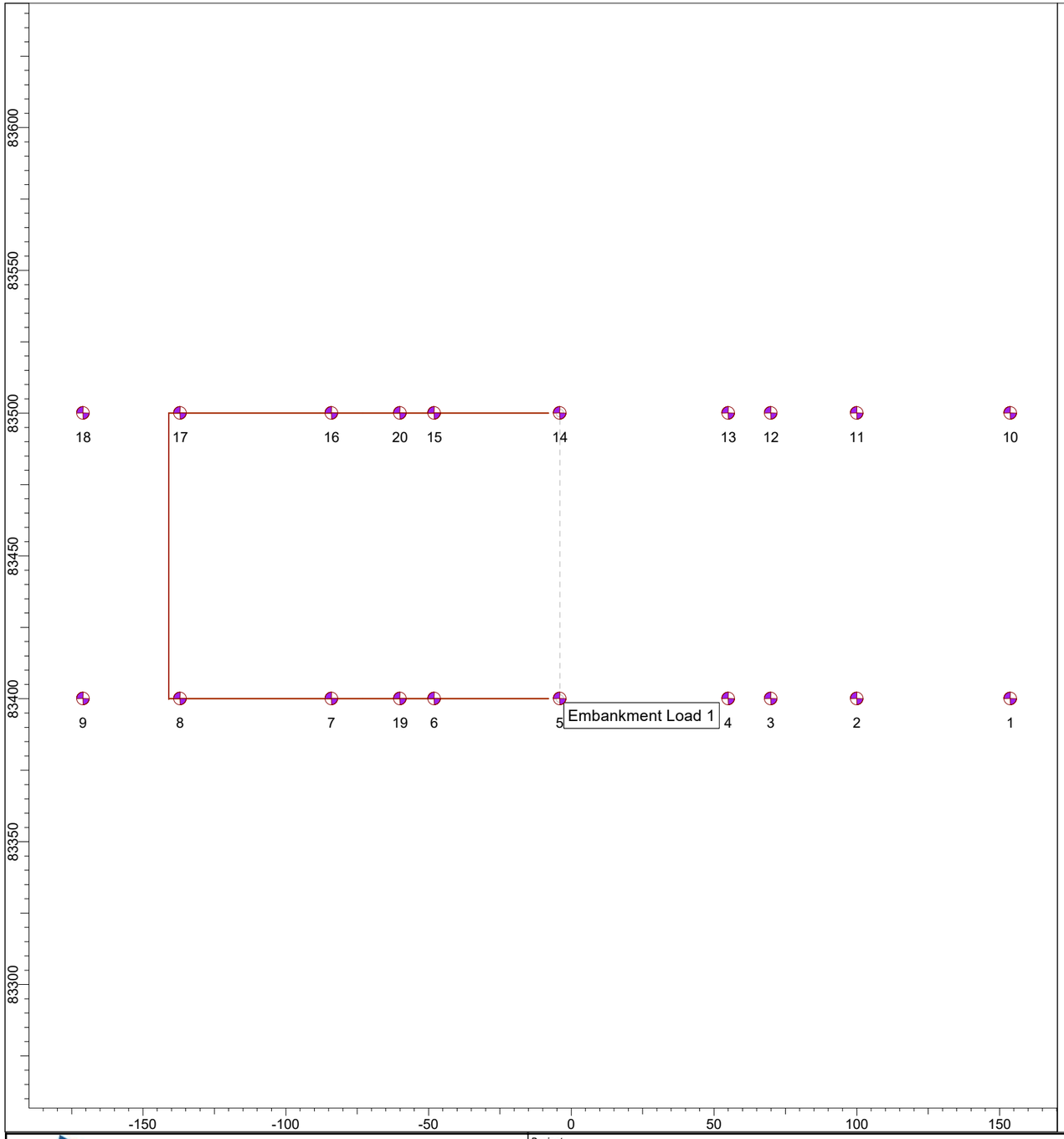


Stage 0 = 0 days

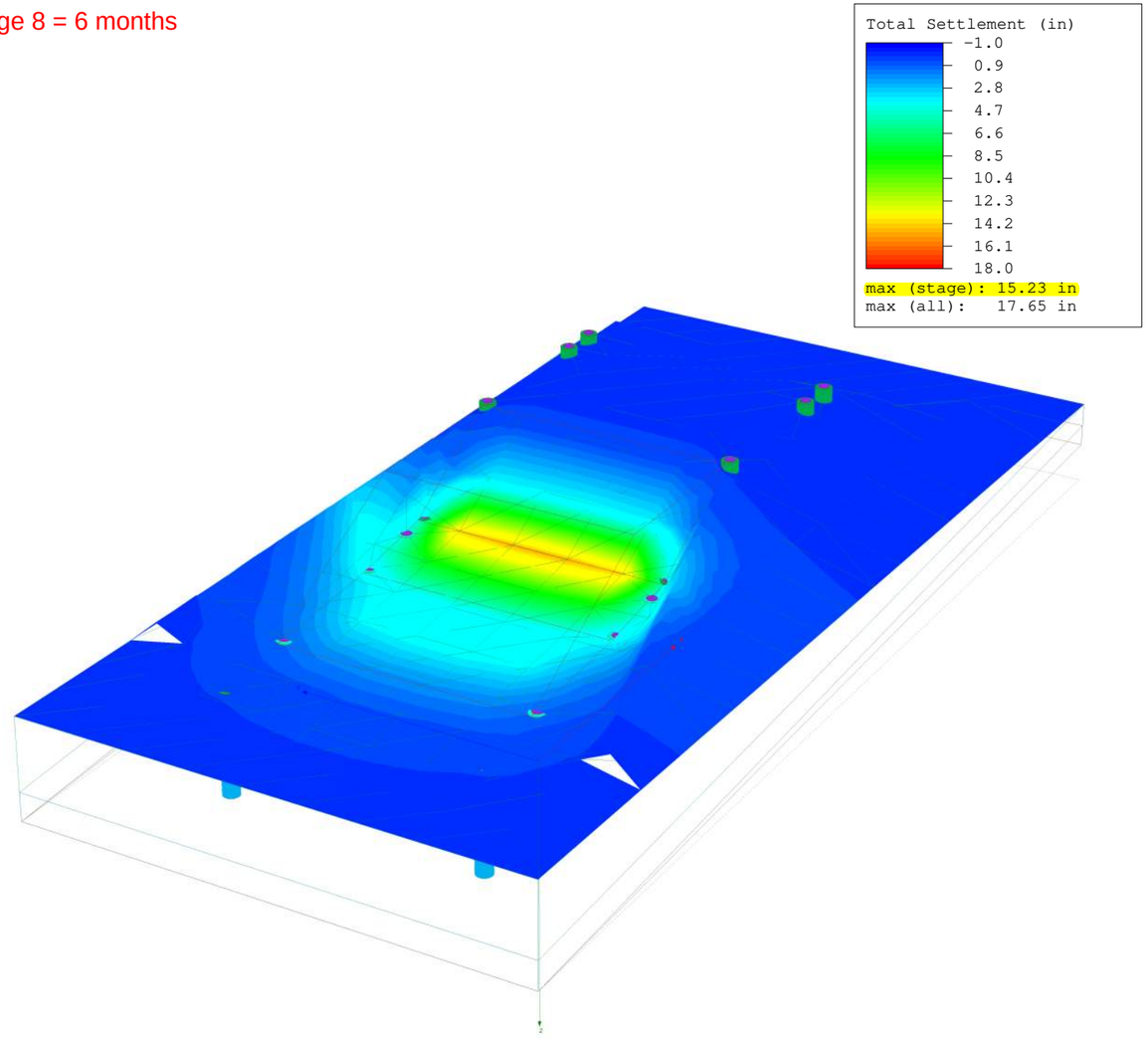


	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Normally Consolidated Embankment Cohesive Roadway Fill	
	Drawn By	A. Baratta	*Company* HDR
	Date	4/25/2024, 12:56:29 PM	*File Name* Sta. 834+50 Settlement_No Granular_Normally Consolidated Embankment.s3z

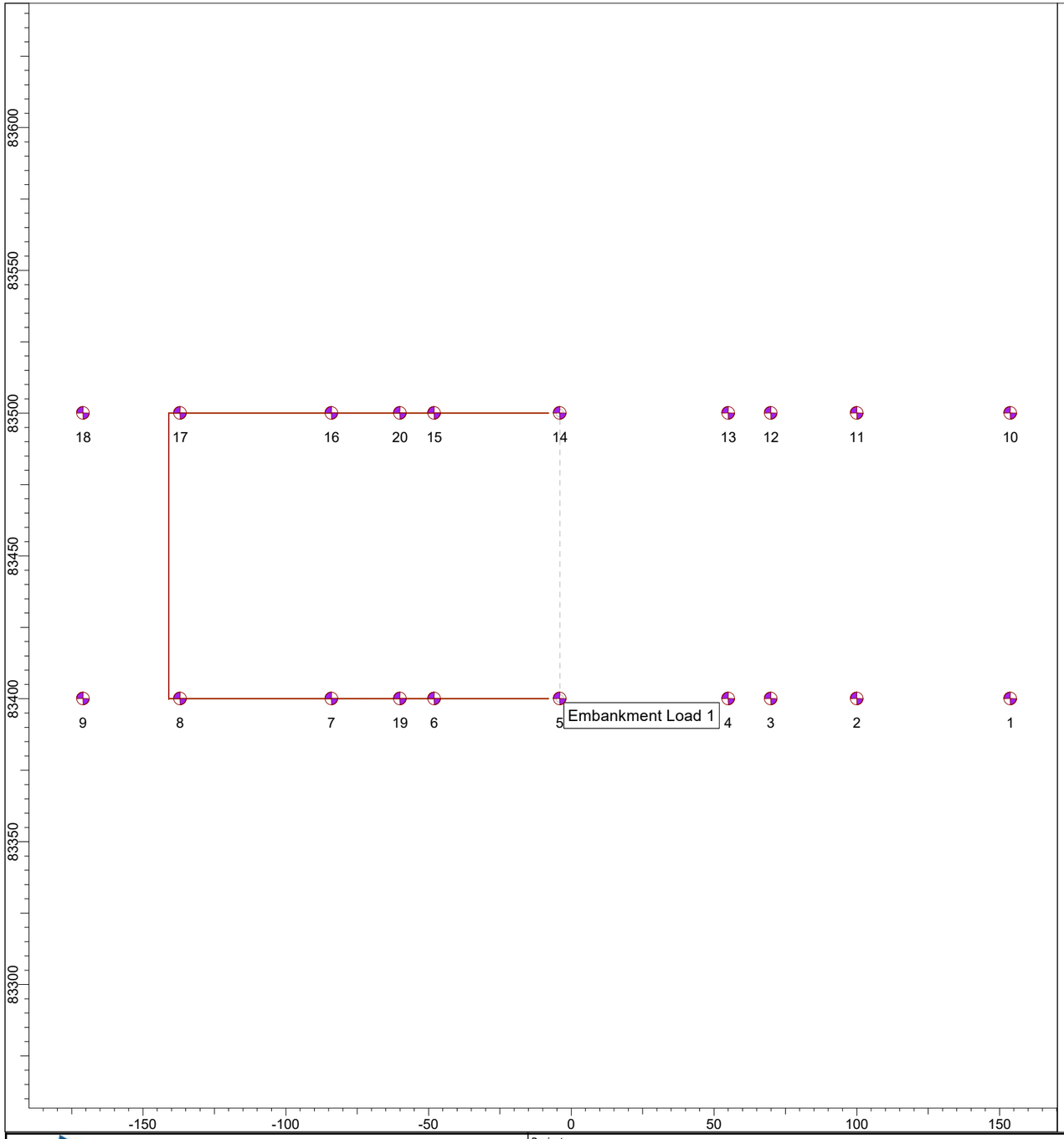
SETTLE3 5.007



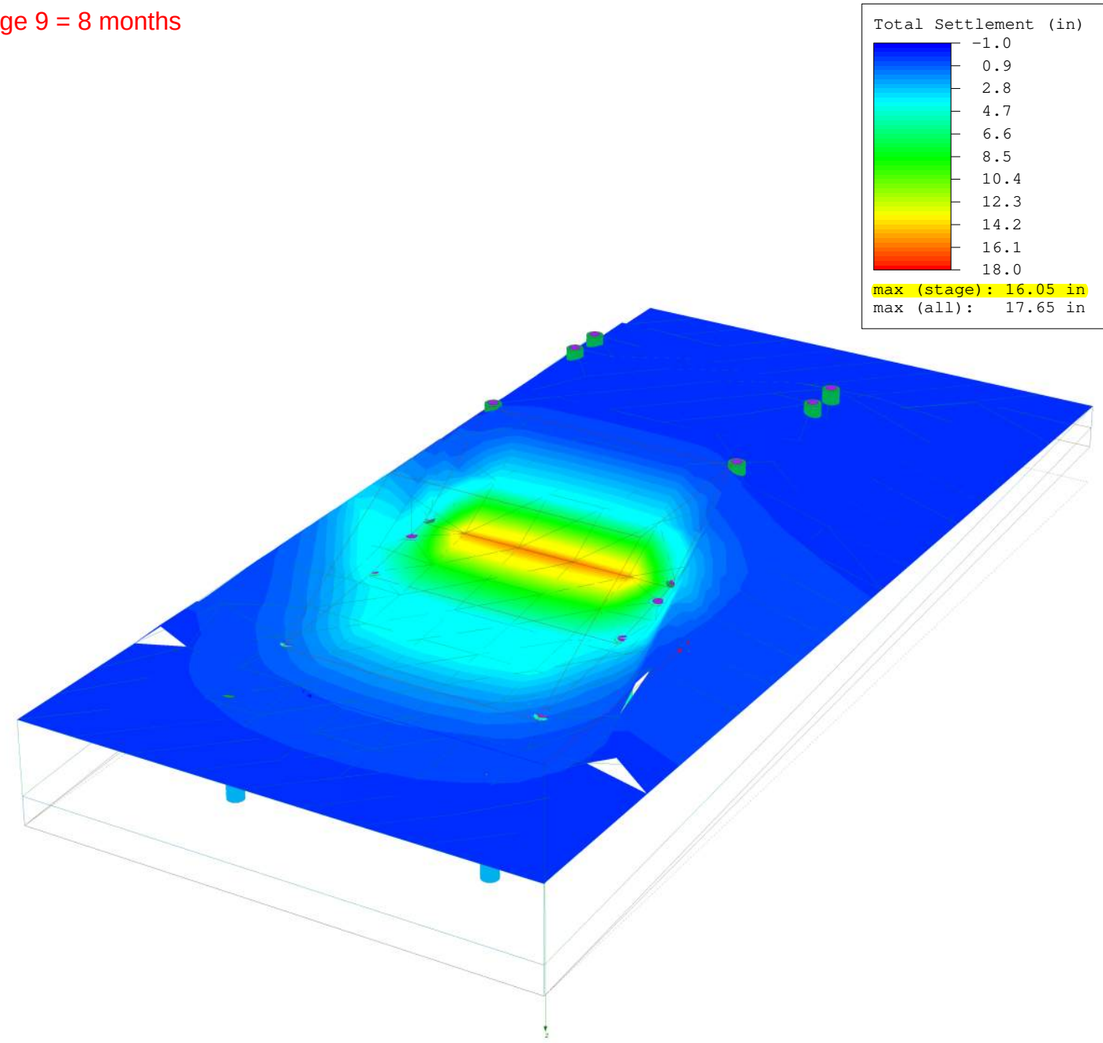
Stage 8 = 6 months



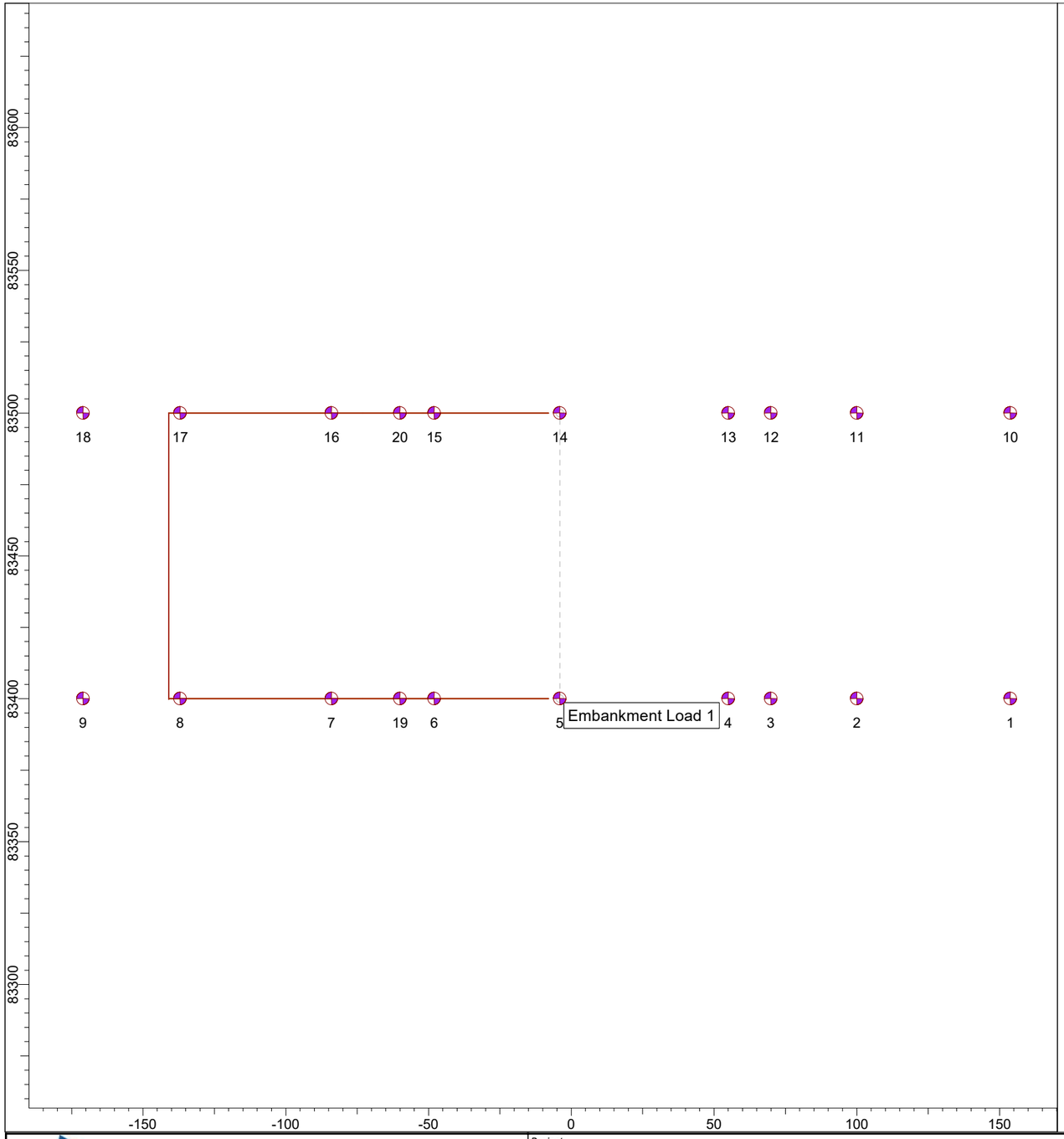
	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Normally Consolidated Embankment Cohesive Roadway Fill	
	Drawn By A. Baratta	*Company*	HDR
SETTLE3 5.007	*Date* 4/25/2024, 12:56:29 PM	*File Name*	Sta. 834+50 Settlement_No Granular_Normally Consolidated Embankment.s3z



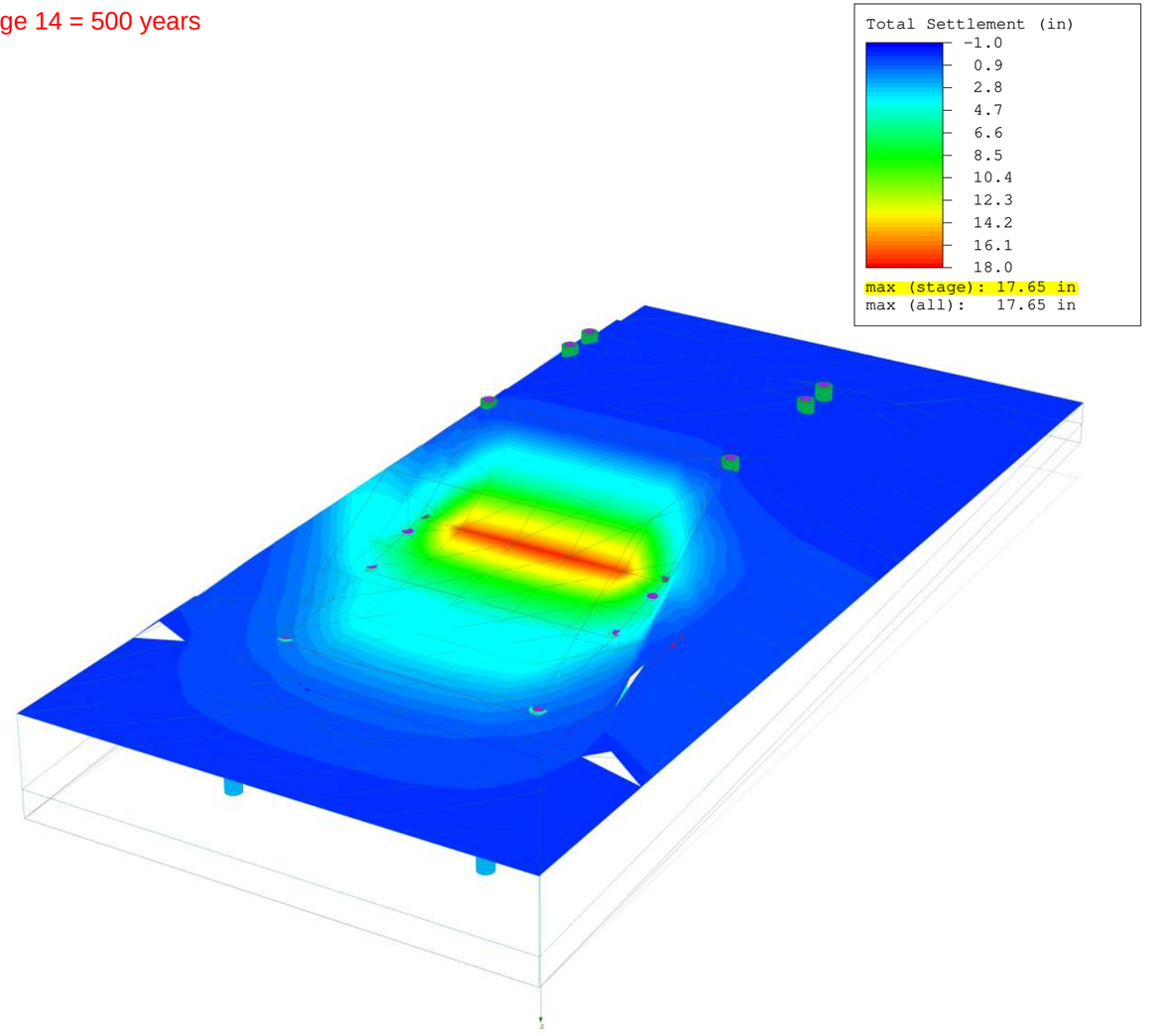
Stage 9 = 8 months



	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Normally Consolidated Embankment Cohesive Roadway Fill	
SETTLE3 5.007	*Drawn By* A. Baratta	*Company*	HDR
	Date 4/25/2024, 12:56:29 PM	*File Name*	Sta. 834+50 Settlement_No Granular_Normally Consolidated Embankment.s3z



Stage 14 = 500 years



	Project	MEG-33-13.96	
	Analysis Description	Sta. 834+50 Normally Consolidated Embankment Cohesive Roadway Fill	
SETTLE3 5.007	*Drawn By* A. Baratta	*Company*	HDR
	Date 4/25/2024, 12:56:29 PM	*File Name*	Sta. 834+50 Settlement_No Granular_Normally Consolidated Embankment.s3z

MEG-33-13.96
HDR
Date Created: 2024/05/07, 06:06:08

Table of Contents

Settle3 Analysis Information

MEG-33-13.96

Project Settings

Document Name	Sta. 834+50 Settlement_No Granular_Normally Consolidated Embankment.s3z
Project Title	MEG-33-13.96
Analysis	Sta. 834+50 Normally Consolidated Embankment Cohesive Roadway Fill
Author	A. Baratta
Company	HDR
Date Created	4/25/2024, 12:56:29 PM
Stress Computation Method	Boussinesq
Time-dependent Consolidation Analysis	
Time Units	days
Permeability Units	feet/day
Minimum settlement ratio for subgrade modulus	0.9
Use average properties to calculate layered stresses	
Improve consolidation accuracy	
Ignore negative effective stresses in settlement calculations	

Stage Settings

Stage #	Name	Time [days]
1	0 d	0
2	7 d	7
3	14 d	14
4	21 d	21
5	30 d (1 m)	30
6	60 d (2 m)	60
7	90 d (3 m)	90
8	183 d (6 m)	183
9	243 d (8 m)	243
10	365 d (1 y)	365
11	426 d (14 m)	426
12	3650 d (10 y)	3650
13	36,500 d (100 y)	36500
14	182,500 d (500 y)	182500

Results

Time taken to compute: 15.4838 seconds

Stage: 0 d = 0 d

Data Type	Minimum	Maximum
Total Settlement [in]	0	0.0236131
Total Consolidation Settlement [in]	0	0
Virgin Consolidation Settlement [in]	0	0
Recompression Consolidation Settlement [in]	0	0
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66246
Effective Stress XX [ksf]	-0.22514	6.86472
Effective Stress YY [ksf]	-0.103538	3.95837
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	0	0.00226711
Pore Water Pressure [ksf]	0	4.70196
Excess Pore Water Pressure [ksf]	0	4.70196
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.000616295	18
Over-consolidation Ratio	1	36781.6
Void Ratio	0	0.657
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-1.11022e-16	5.55112e-17

Stage: 7 d = 7 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.00317638	4.60504
Total Consolidation Settlement [in]	-0.00317638	4.60504
Virgin Consolidation Settlement [in]	0	4.29763
Recompression Consolidation Settlement [in]	-0.183666	0.539431
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66285
Effective Stress XX [ksf]	-0.691545	9.06216
Effective Stress YY [ksf]	-0.691545	6.59317
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0161124	0.122511
Pore Water Pressure [ksf]	0	3.64819
Excess Pore Water Pressure [ksf]	0	3.62116
Degree of Consolidation [%]	0	99.9049
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.657195
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.597442

Header for table on following page (software output limitation)

Stage: 14 d = 14 d

Data Type	Minimum	Maximum
Total Settlement [in]	-0.00277535	6.19119
Total Consolidation Settlement [in]	-0.00277535	6.19119
Virgin Consolidation Settlement [in]	0	5.88309
Recompression Consolidation Settlement [in]	-0.197553	0.692623
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66301
Effective Stress XX [ksf]	-0.87027	9.06216
Effective Stress YY [ksf]	-0.87027	6.59317
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00976081	0.122728
Pore Water Pressure [ksf]	0	3.57509
Excess Pore Water Pressure [ksf]	0	3.45039
Degree of Consolidation [%]	0	99.9999
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.65725
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.597442

Stage: 21 d = 21 d Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	-0.000586058	7.3332
Total Consolidation Settlement [in]	-0.000586058	7.3332
Virgin Consolidation Settlement [in]	0	7.02361
Recompression Consolidation Settlement [in]	-0.203589	0.793353
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66314
Effective Stress XX [ksf]	-0.90623	9.06216
Effective Stress YY [ksf]	-0.90623	6.92109
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0104642	0.122819
Pore Water Pressure [ksf]	0	3.41387
Excess Pore Water Pressure [ksf]	0	3.40605
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.657115
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.597442

Stage: 30 d (1 m) = 30 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	8.48142
Total Consolidation Settlement [in]	0	8.48142
Virgin Consolidation Settlement [in]	0	8.17172
Recompression Consolidation Settlement [in]	-0.200934	0.888704
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66328
Effective Stress XX [ksf]	-0.899321	9.06216
Effective Stress YY [ksf]	-0.899321	7.1427
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.0102908	0.122888
Pore Water Pressure [ksf]	0	3.29631
Excess Pore Water Pressure [ksf]	0	3.29631
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656916
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.597442

Stage: 60 d (2 m) = 60 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	11.0414
Total Consolidation Settlement [in]	0	11.0414
Virgin Consolidation Settlement [in]	0	10.7317
Recompression Consolidation Settlement [in]	-0.176145	1.08263
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66366
Effective Stress XX [ksf]	-1.04145	9.24708
Effective Stress YY [ksf]	-1.04145	7.38059
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00735909	0.122991
Pore Water Pressure [ksf]	-5.09681e-21	2.83986
Excess Pore Water Pressure [ksf]	-5.09681e-21	2.83986
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656846
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.597442

Stage: 90 d (3 m) = 90 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	12.6442
Total Consolidation Settlement [in]	0	12.6442
Virgin Consolidation Settlement [in]	0	12.3345
Recompression Consolidation Settlement [in]	-0.203076	1.19482
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.66394
Effective Stress XX [ksf]	-1.02286	9.32551
Effective Stress YY [ksf]	-1.02286	7.45865
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00991128	0.12303
Pore Water Pressure [ksf]	-6.00309e-21	2.56387
Excess Pore Water Pressure [ksf]	-6.00309e-21	2.56387
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656779
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.597442

Stage: 183 d (6 m) = 183 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	15.2299
Total Consolidation Settlement [in]	0	15.2299
Virgin Consolidation Settlement [in]	0	14.9202
Recompression Consolidation Settlement [in]	-0.184344	1.38479
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.78078
Effective Stress XX [ksf]	-0.477884	9.41631
Effective Stress YY [ksf]	-0.477884	7.54774
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00502732	0.123079
Pore Water Pressure [ksf]	-8.37026e-17	1.88076
Excess Pore Water Pressure [ksf]	-8.37026e-17	1.88076
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656636
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.597442

Stage: 243 d (8 m) = 243 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	16.0478
Total Consolidation Settlement [in]	0	16.0478
Virgin Consolidation Settlement [in]	0	15.7381
Recompression Consolidation Settlement [in]	-0.159325	1.47776
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.91147
Effective Stress XX [ksf]	-0.2246	9.44016
Effective Stress YY [ksf]	-0.141309	7.57081
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00436739	0.123094
Pore Water Pressure [ksf]	-8.3228e-17	1.72198
Excess Pore Water Pressure [ksf]	-8.3228e-17	1.50736
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656582
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0347854	0.597442

Stage: 365 d (1 y) = 365 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	16.9088
Total Consolidation Settlement [in]	0	16.9088
Virgin Consolidation Settlement [in]	0	16.5991
Recompression Consolidation Settlement [in]	-0.115347	1.59426
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.98721
Effective Stress XX [ksf]	-0.2246	9.46223
Effective Stress YY [ksf]	-0.101899	7.59207
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00407327	0.123111
Pore Water Pressure [ksf]	-8.2483e-17	1.70486
Excess Pore Water Pressure [ksf]	-8.2483e-17	0.973886
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.65652
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0320936	0.597442

Stage: 426 d (14 m) = 426 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	17.1358
Total Consolidation Settlement [in]	0	17.1358
Virgin Consolidation Settlement [in]	0	16.8261
Recompression Consolidation Settlement [in]	-0.111684	1.63083
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	5.99597
Effective Stress XX [ksf]	-0.2246	9.46704
Effective Stress YY [ksf]	-0.101899	7.59671
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00403951	0.123116
Pore Water Pressure [ksf]	-0.000478408	1.69954
Excess Pore Water Pressure [ksf]	-0.000478408	0.863121
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656504
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-0.0440821	0.597442

Stage: 3650 d (10 y) = 3650 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	17.6514
Total Consolidation Settlement [in]	0	17.6514
Virgin Consolidation Settlement [in]	0	17.3417
Recompression Consolidation Settlement [in]	-6.18195e-05	1.74983
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00189
Effective Stress XX [ksf]	-0.2246	9.47403
Effective Stress YY [ksf]	-0.101899	7.60343
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00390738	0.123128
Pore Water Pressure [ksf]	-0.00194346	1.6848
Excess Pore Water Pressure [ksf]	-0.00194346	0.00220185
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-8.83605e-05	0.597442

Stage: 36,500 d (100 y) = 36500 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	17.6514
Total Consolidation Settlement [in]	0	17.6514
Virgin Consolidation Settlement [in]	0	17.3417
Recompression Consolidation Settlement [in]	-3.51117e-05	1.74983
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00188
Effective Stress XX [ksf]	-0.2246	9.47403
Effective Stress YY [ksf]	-0.101899	7.60343
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00390738	0.123128
Pore Water Pressure [ksf]	-0.00188516	1.6848
Excess Pore Water Pressure [ksf]	-0.00188516	0.00198162
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-8.83605e-05	0.597442

Stage: 182,500 d (500 y) = 182500 d

Header for table on following page (software output limitation)

Data Type	Minimum	Maximum
Total Settlement [in]	0	17.6514
Total Consolidation Settlement [in]	0	17.6514
Virgin Consolidation Settlement [in]	0	17.3417
Recompression Consolidation Settlement [in]	-2.56497e-05	1.74983
Immediate Settlement [in]	0	0.0236131
Secondary Settlement [in]	0	0
Loading Stress ZZ [ksf]	0	4.70196
Loading Stress XX [ksf]	-1.49643	4.72885
Loading Stress YY [ksf]	-0.467566	2.8005
Effective Stress ZZ [ksf]	0	6.00189
Effective Stress XX [ksf]	-0.2246	9.47403
Effective Stress YY [ksf]	-0.101899	7.60343
Total Stress ZZ [ksf]	0	7.0265
Total Stress XX [ksf]	-0.2246	10.4305
Total Stress YY [ksf]	-0.101899	7.60343
Modulus of Subgrade Reaction (Total) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Immediate) [ksf/ft]	0	0
Modulus of Subgrade Reaction (Consolidation) [ksf/ft]	0	0
Total Strain	-0.00390738	0.123128
Pore Water Pressure [ksf]	-0.00198524	1.6848
Excess Pore Water Pressure [ksf]	-0.00198524	0.00184915
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.000629845	18
Over-consolidation Ratio	1	32291.1
Void Ratio	0	0.656473
Permeability [ft/d]	0	0.627714
Coefficient of Consolidation [ft^2/d]	0	0.64
Hydroconsolidation Settlement [in]	0	0
Average Degree of Consolidation [%]	0	100
Undrained Shear Strength	-8.83605e-05	0.597442

Embankments

1. Embankment: "Embankment Load 1"

Label	Embankment Load 1
Center Line	(-4, 83400) to (-4, 83500)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Zones	4
Number of Sections	1

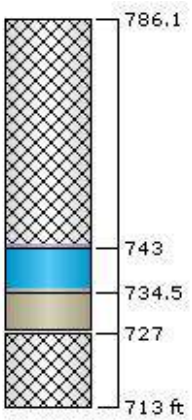
Zone	Name	Unit Weight (kips/ft3)
1	New Zone	0.115
2	New Zone 2	0.115
3	New Zone 3	0.115
4	New Zone 4	0.125

Soil Layers

Ground Surface Drained: Yes

RT Toe (B-001-0-09)

XY Location:		RT Toe (B-001-0-09): (153.8, 83400)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-743	No
2	2. Stiff to V. Stiff Embankment Fill	0	-743	No
3	3. Loose to M. Dense Embankment Fill	0	-743	Yes
4	Cohesive Roadway Fill	0	-743	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-743	Yes
6	6. M. Dense to Dense Granular	0	-743	Yes
7	4. Stiff to V. Stiff Cohesive	8.5	-743	No
8	8. Soft to M. Stiff Cohesive	0	-734.5	No
9	5. V. Stiff to Hard Cohesive	7.5	-734.5	No

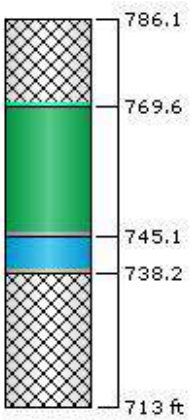


RT Slope (B-002-0-09/B-47ER)

Header for point on following page (software output limitation)

XY Location: RT Slope (B-002-0-09/B-47ER): (100, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-769.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-769.6	No
3	3. Loose to M. Dense Embankment Fill	0	-769.6	Yes
4	Cohesive Roadway Fill	0	-769.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-769.6	Yes
6	6. M. Dense to Dense Granular	0	-745.1	Yes
7	4. Stiff to V. Stiff Cohesive	6.9	-745.1	No
8	8. Soft to M. Stiff Cohesive	0	-738.2	No
9	5. V. Stiff to Hard Cohesive	0	-738.2	No

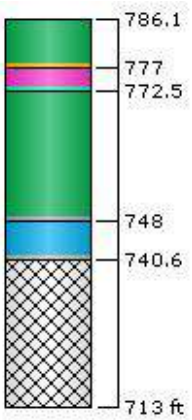


RT Crest (B-002-0-09)

Header for point on following page (software output limitation)

XY Location: RT Crest (B-002-0-09): (69.9, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	9.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0	-777	No
3	3. Loose to M. Dense Embankment Fill	4.5	-777	Yes
4	Cohesive Roadway Fill	0	-772.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-772.5	Yes
6	6. M. Dense to Dense Granular	0	-748	Yes
7	4. Stiff to V. Stiff Cohesive	7.4	-748	No
8	8. Soft to M. Stiff Cohesive	0	-740.6	No
9	5. V. Stiff to Hard Cohesive	0	-740.6	No

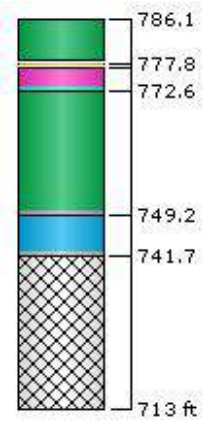


CL Crest (B-002-0-09/B-47)

Header for point on following page (software output limitation)

XY Location: CL Crest (B-002-0-09/B-47): (55, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	8.3	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0.9	-777.8	No
3	3. Loose to M. Dense Embankment Fill	4.3	-776.9	Yes
4	Cohesive Roadway Fill	0	-772.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	23.4	-772.6	Yes
6	6. M. Dense to Dense Granular	0	-749.2	Yes
7	4. Stiff to V. Stiff Cohesive	7.5	-749.2	No
8	8. Soft to M. Stiff Cohesive	0	-741.7	No
9	5. V. Stiff to Hard Cohesive	0	-741.7	No

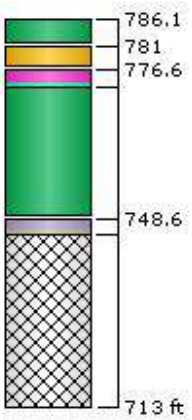


LT Crest (B-003-0-09/CU-10C)

Header for point on following page (software output limitation)

XY Location: LT Crest (B-003-0-09/CU-10C): (-4, 83400)

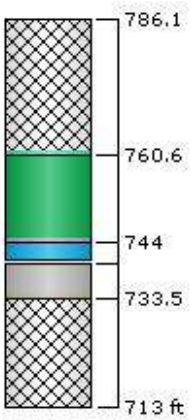
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	5.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	4.4	-781	No
3	3. Loose to M. Dense Embankment Fill	3.2	-776.6	Yes
4	Cohesive Roadway Fill	0	-773.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.8	-773.4	Yes
6	6. M. Dense to Dense Granular	3	-748.6	Yes
7	4. Stiff to V. Stiff Cohesive	0	-745.6	No
8	8. Soft to M. Stiff Cohesive	0	-745.6	No
9	5. V. Stiff to Hard Cohesive	0	-745.6	No



LT Toe (B-003-0-09) Header for point on following page (software output limitation)

XY Location: LT Toe (B-003-0-09): (-48, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-760.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-760.6	No
3	3. Loose to M. Dense Embankment Fill	0	-760.6	Yes
4	Cohesive Roadway Fill	0	-760.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	16.6	-760.6	Yes
6	6. M. Dense to Dense Granular	0	-744	Yes
7	4. Stiff to V. Stiff Cohesive	4	-744	No
8	8. Soft to M. Stiff Cohesive	6.5	-740	No
9	5. V. Stiff to Hard Cohesive	0	-733.5	No

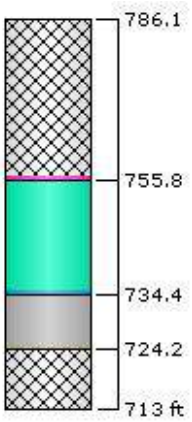


LT Fill (B-003-0-23)

Header for point on following page (software output limitation)

XY Location: LT Fill (B-003-0-23): (-84, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-755.8	No
2	2. Stiff to V. Stiff Embankment Fill	0	-755.8	No
3	3. Loose to M. Dense Embankment Fill	0	-755.8	Yes
4	Cohesive Roadway Fill	21.4	-755.8	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-734.4	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.2	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-724.2	No

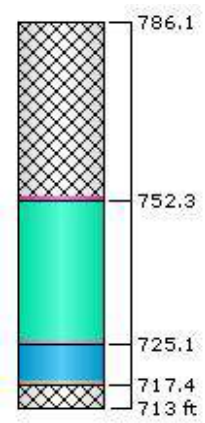


LT New Toe (B-003-0-23/SRB-3)

Header for point on following page (software output limitation)

XY Location: LT New Toe (B-003-0-23/SRB-3): (-137, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-752.3	No
2	2. Stiff to V. Stiff Embankment Fill	0	-752.3	No
3	3. Loose to M. Dense Embankment Fill	0	-752.3	Yes
4	Cohesive Roadway Fill	27.2	-752.3	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-725.1	Yes
6	6. M. Dense to Dense Granular	0	-725.1	Yes
7	4. Stiff to V. Stiff Cohesive	7.7	-725.1	No
8	8. Soft to M. Stiff Cohesive	0	-717.4	No
9	5. V. Stiff to Hard Cohesive	0	-717.4	No

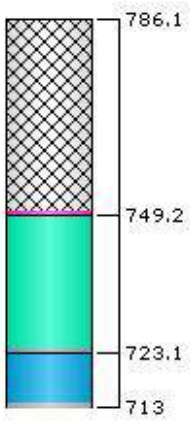


LT Roadway Slope (SRB-3)

Header for point on following page (software output limitation)

XY Location: LT Roadway Slope (SRB-3): (-171, 83400)

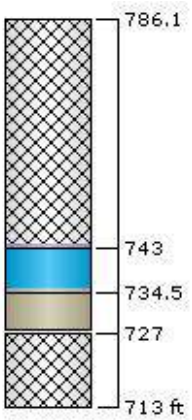
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-749.2	No
2	2. Stiff to V. Stiff Embankment Fill	0	-749.2	No
3	3. Loose to M. Dense Embankment Fill	0	-749.2	Yes
4	Cohesive Roadway Fill	26.1	-749.2	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-723.1	Yes
6	6. M. Dense to Dense Granular	0	-723.1	Yes
7	4. Stiff to V. Stiff Cohesive	10.1	-723.1	No
8	8. Soft to M. Stiff Cohesive	0	-713	No
9	5. V. Stiff to Hard Cohesive	0	-713	No



RT Toe 2 (B-001-0-09)

Header for point on following page (software output limitation)

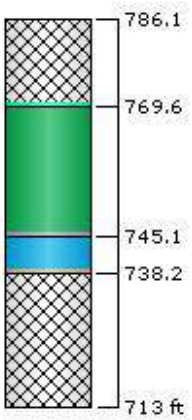
XY Location:		RT Toe 2 (B-001-0-09): (153.8, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-743	No
2	2. Stiff to V. Stiff Embankment Fill	0	-743	No
3	3. Loose to M. Dense Embankment Fill	0	-743	Yes
4	Cohesive Roadway Fill	0	-743	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-743	Yes
6	6. M. Dense to Dense Granular	0	-743	Yes
7	4. Stiff to V. Stiff Cohesive	8.5	-743	No
8	8. Soft to M. Stiff Cohesive	0	-734.5	No
9	5. V. Stiff to Hard Cohesive	7.5	-734.5	No



RT Slope 2 (B-002-0-09/B-47ER)

Header for point on following page (software output limitation)

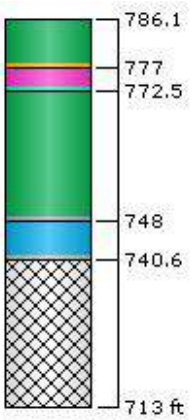
XY Location:		RT Slope 2 (B-002-0-09/B-47ER): (100, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-769.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-769.6	No
3	3. Loose to M. Dense Embankment Fill	0	-769.6	Yes
4	Cohesive Roadway Fill	0	-769.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-769.6	Yes
6	6. M. Dense to Dense Granular	0	-745.1	Yes
7	4. Stiff to V. Stiff Cohesive	6.9	-745.1	No
8	8. Soft to M. Stiff Cohesive	0	-738.2	No
9	5. V. Stiff to Hard Cohesive	0	-738.2	No



RT Crest 2 (B-002-0-09)

Header for point on following page (software output limitation)

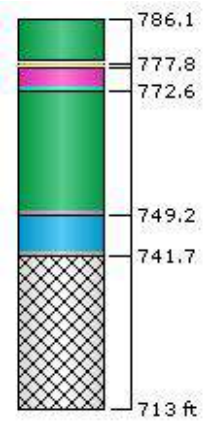
XY Location:		RT Crest 2 (B-002-0-09): (69.9, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	9.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0	-777	No
3	3. Loose to M. Dense Embankment Fill	4.5	-777	Yes
4	Cohesive Roadway Fill	0	-772.5	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.5	-772.5	Yes
6	6. M. Dense to Dense Granular	0	-748	Yes
7	4. Stiff to V. Stiff Cohesive	7.4	-748	No
8	8. Soft to M. Stiff Cohesive	0	-740.6	No
9	5. V. Stiff to Hard Cohesive	0	-740.6	No



CL Crest 2 (B-002-0-09/B-47)

Header for point on following page (software output limitation)

XY Location:		CL Crest 2 (B-002-0-09/B-47): (55, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	8.3	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	0.9	-777.8	No
3	3. Loose to M. Dense Embankment Fill	4.3	-776.9	Yes
4	Cohesive Roadway Fill	0	-772.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	23.4	-772.6	Yes
6	6. M. Dense to Dense Granular	0	-749.2	Yes
7	4. Stiff to V. Stiff Cohesive	7.5	-749.2	No
8	8. Soft to M. Stiff Cohesive	0	-741.7	No
9	5. V. Stiff to Hard Cohesive	0	-741.7	No

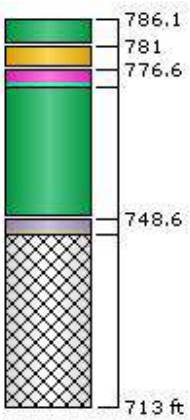


LT Crest 2 (B-003-0-09/CU-10C)

Header for point on following page (software output limitation)

XY Location: LT Crest 2 (B-003-0-09/CU-10C): (-4, 83500)

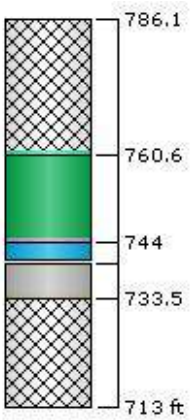
Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	5.1	-786.1	No
2	2. Stiff to V. Stiff Embankment Fill	4.4	-781	No
3	3. Loose to M. Dense Embankment Fill	3.2	-776.6	Yes
4	Cohesive Roadway Fill	0	-773.4	Yes
5	1. M. Stiff to Stiff Embankment Fill	24.8	-773.4	Yes
6	6. M. Dense to Dense Granular	3	-748.6	Yes
7	4. Stiff to V. Stiff Cohesive	0	-745.6	No
8	8. Soft to M. Stiff Cohesive	0	-745.6	No
9	5. V. Stiff to Hard Cohesive	0	-745.6	No



LT Toe 2 (B-003-0-09)

Header for point on following page (software output limitation)

XY Location:		LT Toe 2 (B-003-0-09): (-48, 83500)		
Layer #	**Type**	**Thickness [ft]**	**Depth [ft]**	**Drained at Bottom**
1	1. M. Stiff to Stiff Embankment Fill	0	-760.6	No
2	2. Stiff to V. Stiff Embankment Fill	0	-760.6	No
3	3. Loose to M. Dense Embankment Fill	0	-760.6	Yes
4	Cohesive Roadway Fill	0	-760.6	Yes
5	1. M. Stiff to Stiff Embankment Fill	16.6	-760.6	Yes
6	6. M. Dense to Dense Granular	0	-744	Yes
7	4. Stiff to V. Stiff Cohesive	4	-744	No
8	8. Soft to M. Stiff Cohesive	6.5	-740	No
9	5. V. Stiff to Hard Cohesive	0	-733.5	No

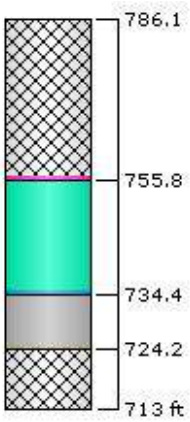


LT Fill 2 (B-003-0-23)

Header for point on following page (software output limitation)

XY Location: LT Fill 2 (B-003-0-23): (-84, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-755.8	No
2	2. Stiff to V. Stiff Embankment Fill	0	-755.8	No
3	3. Loose to M. Dense Embankment Fill	0	-755.8	Yes
4	Cohesive Roadway Fill	21.4	-755.8	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-734.4	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.2	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-724.2	No

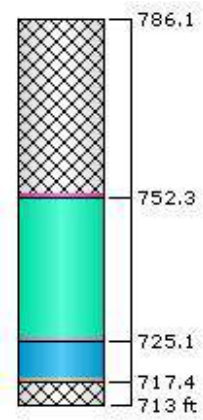


LT New Toe 2 (B-003-0-23/SRB-3)

Header for point on following page (software output limitation)

XY Location: LT New Toe 2 (B-003-0-23/SRB-3): (-137, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-752.3	No
2	2. Stiff to V. Stiff Embankment Fill	0	-752.3	No
3	3. Loose to M. Dense Embankment Fill	0	-752.3	Yes
4	Cohesive Roadway Fill	27.2	-752.3	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-725.1	Yes
6	6. M. Dense to Dense Granular	0	-725.1	Yes
7	4. Stiff to V. Stiff Cohesive	7.7	-725.1	No
8	8. Soft to M. Stiff Cohesive	0	-717.4	No
9	5. V. Stiff to Hard Cohesive	0	-717.4	No

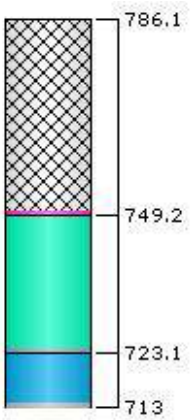


LT Roadway Slope 2 (SRB-3)

Header for point on following page (software output limitation)

XY Location: LT Roadway Slope 2 (SRB-3): (-171, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-749.2	No
2	2. Stiff to V. Stiff Embankment Fill	0	-749.2	No
3	3. Loose to M. Dense Embankment Fill	0	-749.2	Yes
4	Cohesive Roadway Fill	26.1	-749.2	Yes
5	1. M. Stiff to Stiff Embankment Fill	0	-723.1	Yes
6	6. M. Dense to Dense Granular	0	-723.1	Yes
7	4. Stiff to V. Stiff Cohesive	10.1	-723.1	No
8	8. Soft to M. Stiff Cohesive	0	-713	No
9	5. V. Stiff to Hard Cohesive	0	-713	No

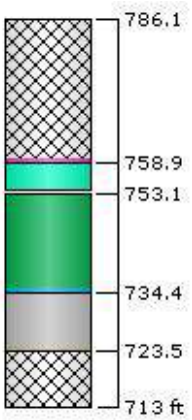


LT Special Bench (B-003-0-09)

Header for point on following page (software output limitation)

XY Location: LT Special Bench (B-003-0-09): (-60, 83400)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-758.9	No
2	2. Stiff to V. Stiff Embankment Fill	0	-758.9	No
3	3. Loose to M. Dense Embankment Fill	0	-758.9	Yes
4	Cohesive Roadway Fill	5.8	-758.9	Yes
5	1. M. Stiff to Stiff Embankment Fill	18.7	-753.1	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.9	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-723.5	No

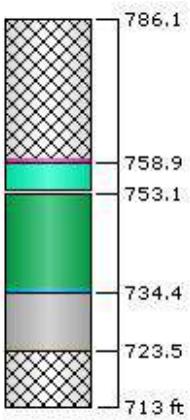


LT Special Bench 2 (B-003-0-09)

Header for point on following page (software output limitation)

XY Location: LT Special Bench 2 (B-003-0-09): (-60, 83500)

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	1. M. Stiff to Stiff Embankment Fill	0	-758.9	No
2	2. Stiff to V. Stiff Embankment Fill	0	-758.9	No
3	3. Loose to M. Dense Embankment Fill	0	-758.9	Yes
4	Cohesive Roadway Fill	5.8	-758.9	Yes
5	1. M. Stiff to Stiff Embankment Fill	18.7	-753.1	Yes
6	6. M. Dense to Dense Granular	0	-734.4	Yes
7	4. Stiff to V. Stiff Cohesive	0	-734.4	No
8	8. Soft to M. Stiff Cohesive	10.9	-734.4	No
9	5. V. Stiff to Hard Cohesive	0	-723.5	No



Soil Properties

Property	1. M. Stiff to Stiff Embankment Fill	2. Stiff to V. Stiff Embankment Fill	3. Loose to M. Dense Embankment Fill	4. Stiff to V. Stiff Cohesive
Color				
Unit Weight [kips/ft3]	0.125	0.125	0.125	0.125
Saturated Unit Weight [kips/ft3]	0.13	0.13	0.13	0.13
K0	0.61	0.59	0.48	0.59
Immediate Settlement	Disabled	Disabled	Enabled	Disabled
Es [ksf]	-	-	550	-
Esur [ksf]	-	-	550	-
Primary Consolidation	Enabled	Enabled	Disabled	Enabled
Material Type	Non-Linear	Non-Linear		Non-Linear
Cc	0.171	0.141	-	0.342
Cr	0.017	0.014	-	0.034
e0	0.559	0.59	-	0.466
OCR	1	1	-	1
Cv [ft2/d]	0.13	0.16	-	0.19
Cvr [ft2/d]	0.13	0.16	-	0.19
B-bar	1	1	-	1
Undrained Su A [kips/ft2]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Property	5. V. Stiff to Hard Cohesive	6. M. Dense to Dense Granular	8. Soft to M. Stiff Cohesive	Cohesive Roadway Fill
Color				
Unit Weight [kips/ft3]	0.13	0.13	0.135	0.125
Saturated Unit Weight [kips/ft3]	0.135	0.135	0.14	0.13
K0	0.56	0.44	0.64	0.61
Immediate Settlement	Disabled	Enabled	Disabled	Disabled
Es [ksf]	-	950	-	-
Esur [ksf]	-	950	-	-
Primary Consolidation	Enabled	Disabled	Enabled	Enabled
Material Type	Non-Linear		Non-Linear	Non-Linear
Cc	0.198	-	0.144	0.171
Cr	0.02	-	0.014	0.017
e0	0.423	-	0.657	0.559

Pc [ksf]	-	-	-	18
OCR	1	-	1	-
Cv [ft2/d]	0.48	-	0.64	0.13
Cvr [ft2/d]	0.48	-	0.64	0.13
B-bar	1	-	1	1
Undrained Su A [kips/ft2]	0	0	0	0
Undrained Su S	0.2	0.2	0.2	0.2
Undrained Su m	0.8	0.8	0.8	0.8
Piezo Line ID	1	1	1	1

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft3
Generating excess pore pressure above water table	

Piezometric Line Entities

ID	Depth (ft)
1	-740 ft

Field Point Grid

Number of points	520
Expansion Factor	1

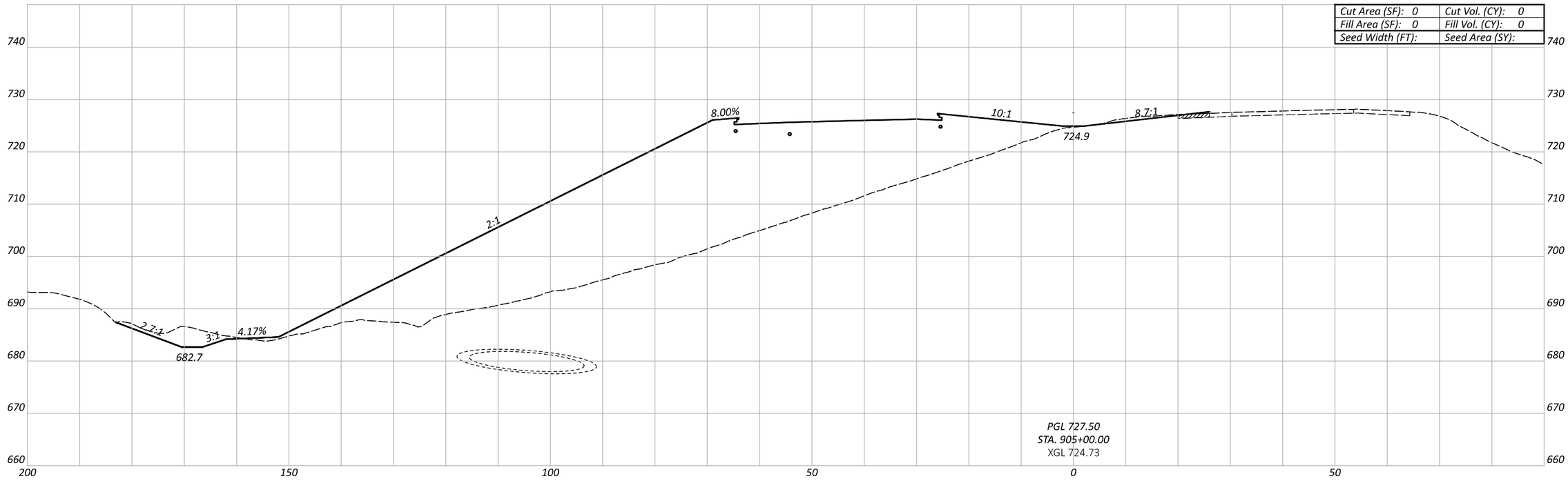
Grid Coordinates

X [ft]	Y [ft]
203.8	83550
203.8	83350
-221	83350
-221	83550

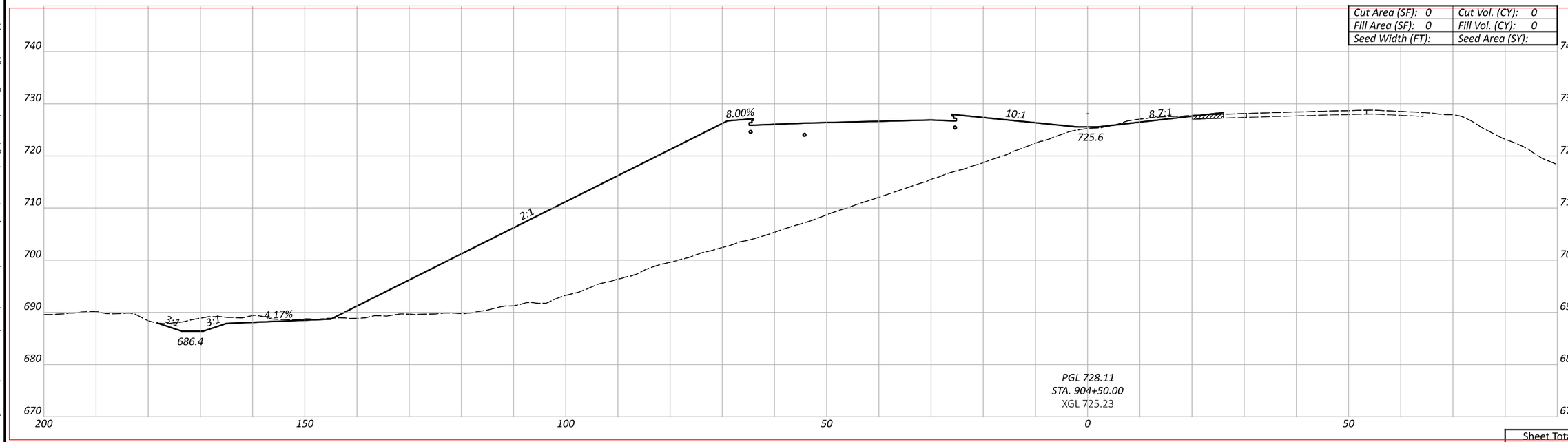
Sta. 904+50

References

Proposed cross-section at Sta. 904+50



Sta. 904+50



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SHEET TITLE
SHEET SUB-TITLE

Sheet Totals		
Seeding	Cut	Fill

DESIGN AGENCY

DESIGNER XXX

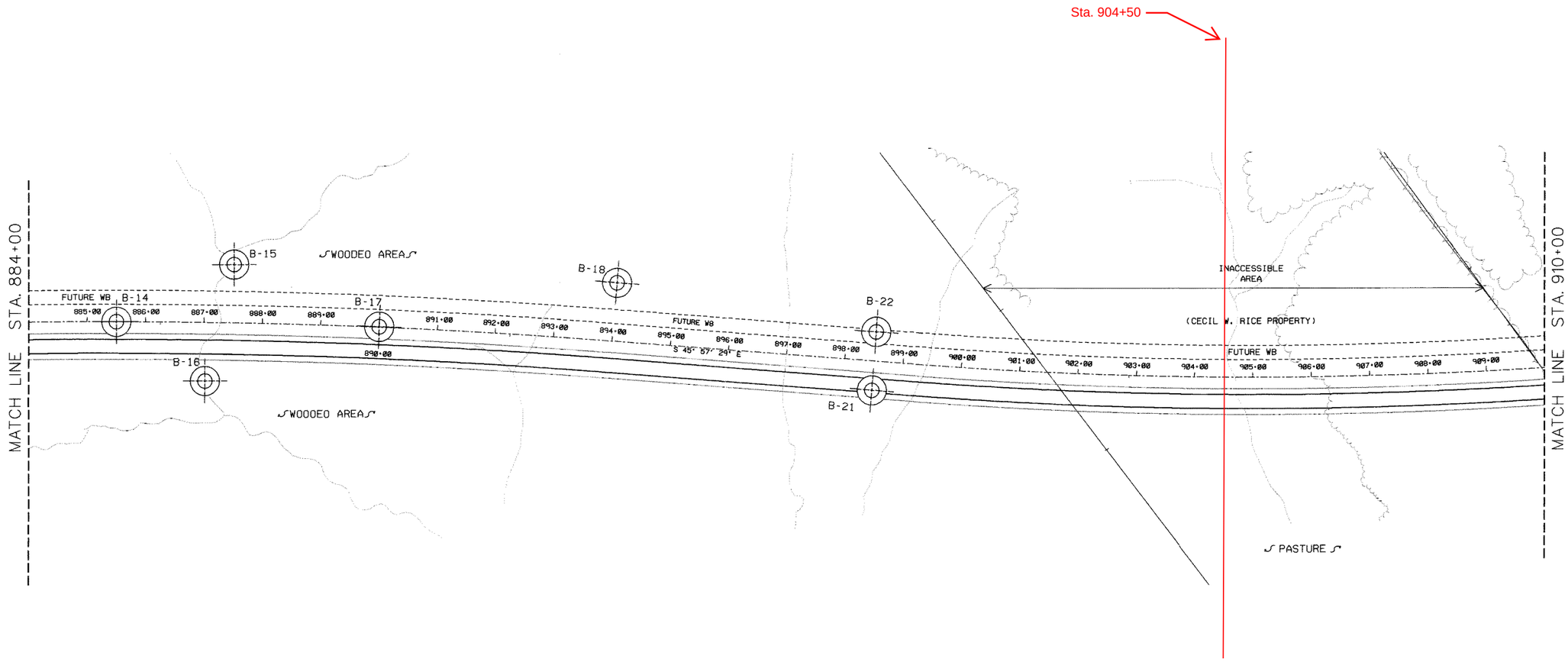
REVIEWER XXX MM-DD-YY

PROJECT ID 0

SHEET P.0 | TOTAL 0

Historic Subsurface Explorations

From "Soil Profile Begin at Morning Star.pdf"



RESOURCE INTERNATIONAL INC.

HORIZONTAL SCALE IN FEET
0 100 200

CALCULATED	CHECKED
	DLK

DATE	DATE
12-1-99	-

REVIEWED	REVIEWED
-	-

DRAWN	DATE
REK	-

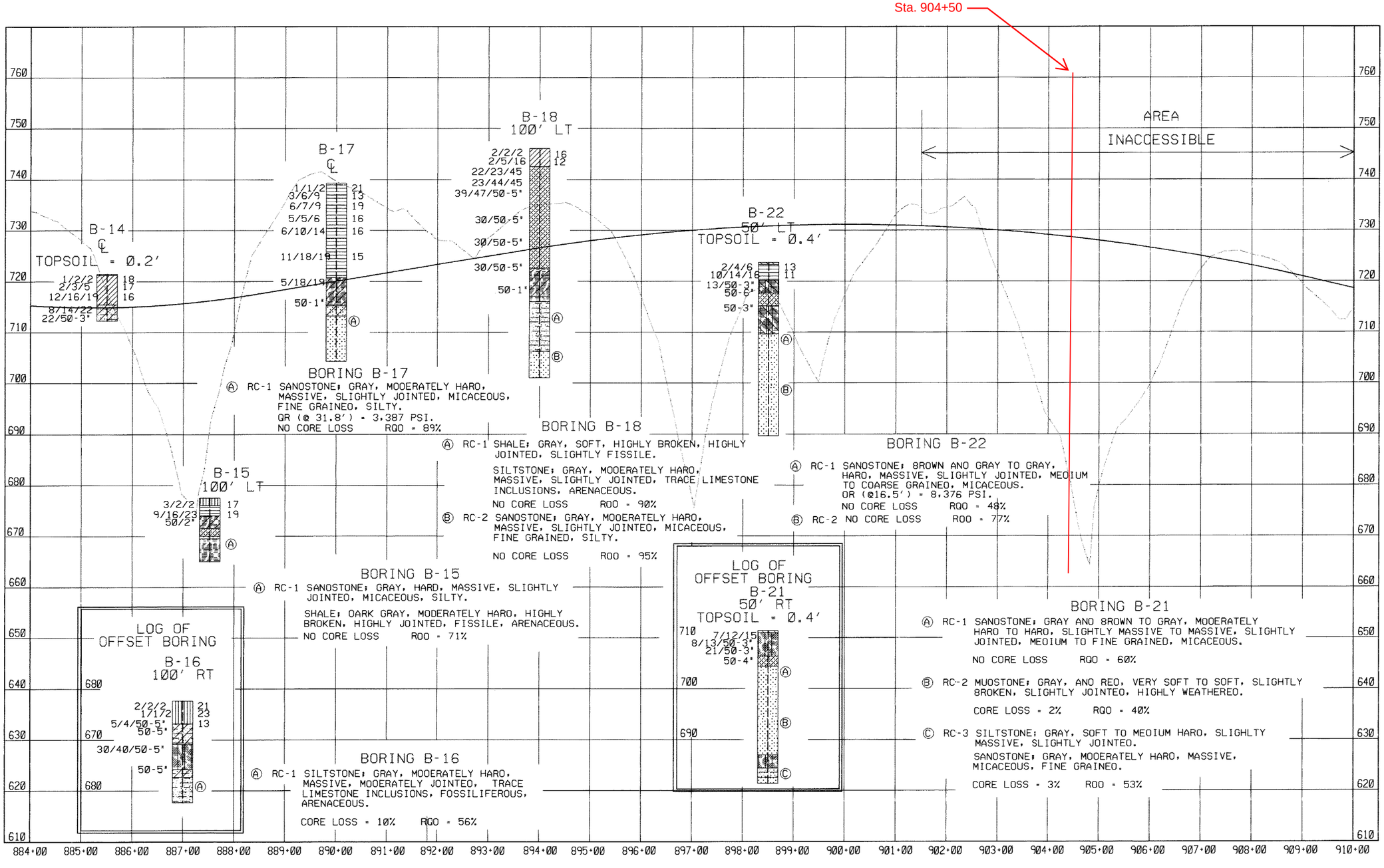
STA. 884+00 TO STA. 910+00
SOIL PROFILE

MEIGS COUNTY
MEG-124-26.66

10/36

Historic Subsurface Explorations

From "Soil Profile Begin at Morning Star.pdf"



HORIZONTAL SCALE IN FEET
0 100 200

CALCULATED	CHECKED
DATE 12-9-99	DATE -
REVIEWED -	REVIEWED -
DRAWN REK	DATE -

STA. 884+00 TO STA. 910+00
SOIL PROFILE

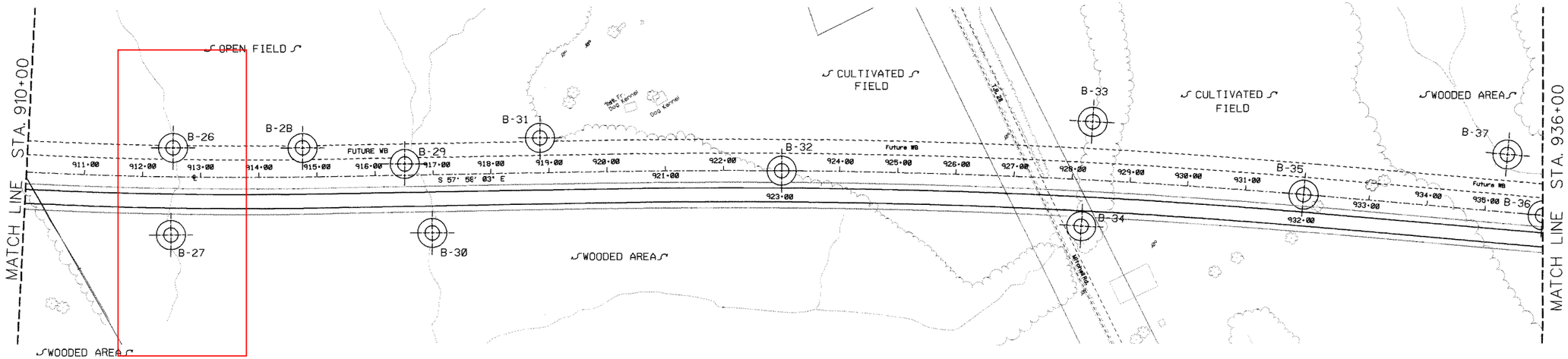
MEIGS COUNTY
MEG-124-26.66

11/36

RESOURCE INTERNATIONAL INC.

Historic Subsurface Explorations

From "Soil Profile Begin at Morning Star.pdf"



HORIZONTAL SCALE IN FEET
0 100 200

CALCULATED	CHECKED
DATE 12-1-99	DATE -
REVIEWED -	REVIEWED -
DRAWN REK	DATE -

STA. 910+00 TO STA. 936+00
SOIL PROFILE

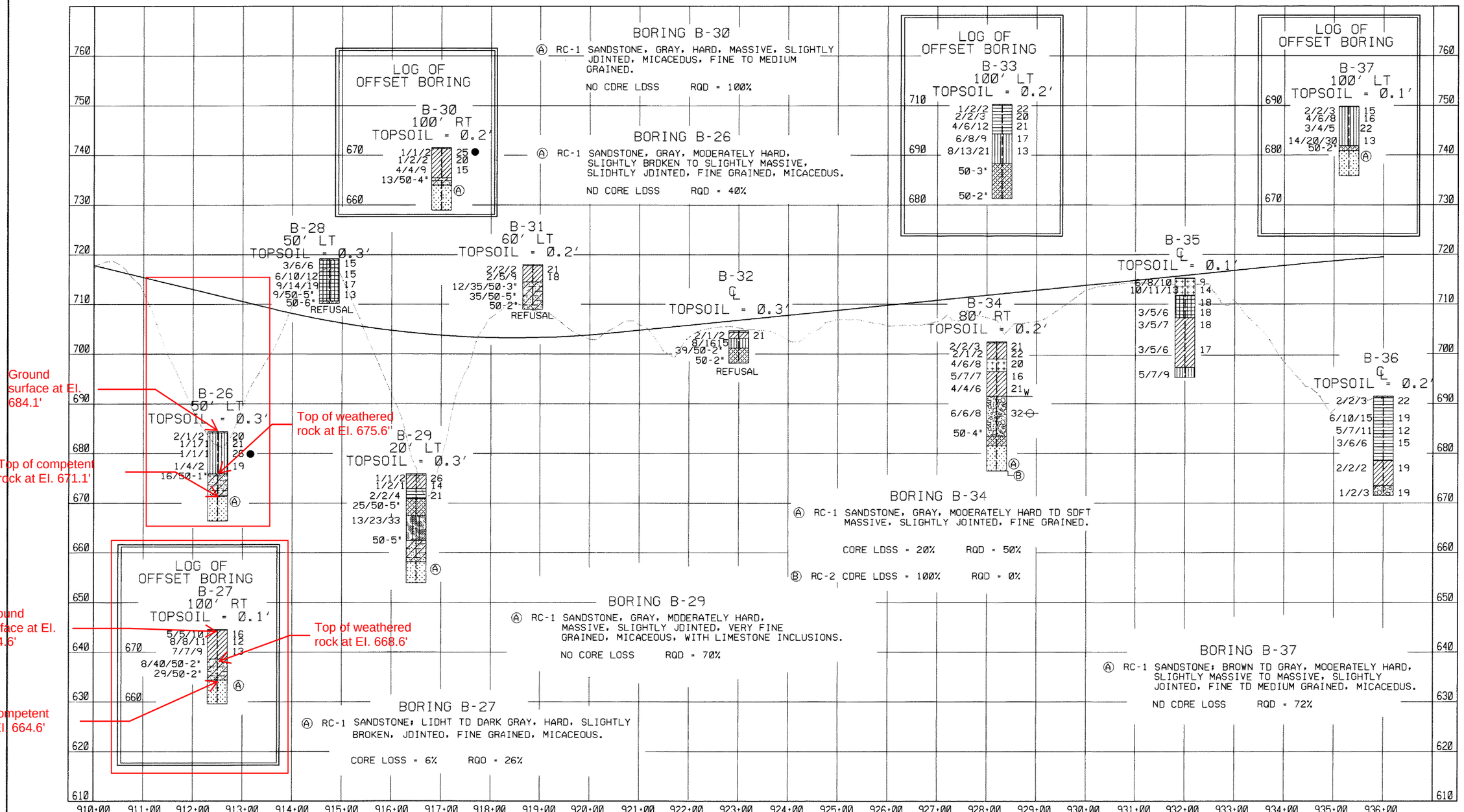
MEIGS COUNTY
MEG-124-26.66

12/36

RESOURCE INTERNATIONAL INC.

Historic Subsurface Explorations

From "Soil Profile Begin at Morning Star.pdf"



HORIZONTAL SCALE IN FEET
0 100 200

DRAWN	DATE	REVIEWED	DATE	REVIEWED	DATE	CALCULATED	CHECKED
REK	-	-	-	-	12-16-99		DLK

STA. 910+00 TO STA. 936+00

SOIL PROFILE

MEIGS COUNTY
MEG-124-26.66

13/36

RESOURCE INTERNATIONAL INC.

Historic Subsurface Explorations

SUMMARY OF SOIL TEST DATA

From "Soil Profile Begin at Morning Star.pdf"

NOTE: NP SHOWN IN LIQUID LIMIT AND PLASTICITY INDEX COLUMNS INDICATES THAT THE MATERIAL IS NON-PLASTIC.

LOCATION & OFFSET		DEPTH FROM TO	% AGG	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	DOT CLASS
			BORINGS REFERENCED TO CENTERLINE								
(B-1)	859+50, 50' LT	0-1.5	SAME AS 1.5-3.0							24	VISUAL
		1.5-3.0	0	4	23	34	39			15	VISUAL
		3.5-5.0	SAME AS 1.5-3.0							8	VISUAL
		6.0-7.5	BROWN TO REDDISH BROWN WEATHERED MUDSTONE								VISUAL
		8.5-9.5	SAME AS 6.0-7.5								VISUAL
		13.5-14.5	LIGHT BROWN WEATHERED SILTSTONE								VISUAL
(B-2)	861+50, 30' RT	0-1.5	SAME AS 1.5-3.0							27	VISUAL
		1.5-3.0	2	18	14	33	33	41	19	19	A-7-6
		3.5-5.0	SAME AS 1.5-3.0							16	VISUAL
		6.0-7.5	BROWN WEATHERED MUDSTONE								VISUAL
		8.5-9.0	BROWN WEATHERED SANDSTONE								VISUAL
(B-5)	864+60, ℄	0-1.5	SAME AS 1.5-3.0								VISUAL
		1.5-3.0	0	9	42	22	27			13	VISUAL
		3.5-4.5	SAME AS 1.5-3.0								VISUAL
		6.0-6.5	BROWN WEATHERED SANDSTONE								VISUAL
		8.5-9.0	SAME AS 6.0-6.5								VISUAL
(B-6)	866+75, ℄	0-1.5	SAME AS 1.5-3.0							21	VISUAL
		1.5-3.0	0	20	37	21	22	27	14	17	A-6a
		3.5-5.0	SAME AS 1.5-3.0							17	VISUAL
		6.0-7.5	SAME AS 1.5-3.0							15	VISUAL
		8.5-9.5	GRAY WEATHERED INDURATED SILT/WEATHERED SILTSTONE								VISUAL
		13.5-14.0	SAME AS 8.5-9.5								VISUAL
(B-7)	866+75, 100' RT	0-1.5	SAME AS 1.5-3.0							21	VISUAL
		1.5-3.0	14	19	23	28	16	22	7	17	A-4a
		3.5-5.0	BROWN AND REDDISH BROWN INDURATED SILT/WEATHERED SILTSTONE								VISUAL
		6.0-7.0	SAME AS 3.5-5.0								VISUAL
		8.5-9.5	SAME AS 3.5-5.0								VISUAL
		13.5-14.5	RED HIGHLY WEATHERED MUDSTONE								VISUAL
		18.5-19.0	GRAY WEATHERED SILTSTONE								VISUAL
(B-8)	868+40, 100' RT	0-1.5	SAME AS 3.5-5.0							24	VISUAL
		1.5-3.0	SAME AS 3.5-5.0							16	VISUAL
		3.5-5.0	B	21	23	26	22	25	9	16	A-4a
		6.0-7.0	BROWN TO GRAY INDURATED CLAY/WEATHERED MUDSTONE								VISUAL
		8.5-9.5	SAME AS 6.0-7.0								VISUAL
(B-9)	869+00, 100' RT	0-1.5	MOTTLED BROWN AND GRAY SILTY SAND, LITTLE CLAY, TRACE GRAVEL, TRACE ORGANICS							13	VISUAL
		1.5-3.0	0	4	5	32	59	42	25	19	A-7-6
		3.5-5.0	SAME AS 1.5-3.0							19	VISUAL
		6.0-7.0	GREENISH BROWN WEATHERED MUDSTONE								VISUAL
		8.5-9.0	GRAY WEATHERED SILTSTONE								VISUAL
(B-10)	871+50, ℄	0-1.5	SAME AS 3.5-5.0							19	VISUAL
		1.5-3.0	SAME AS 3.5-5.0							11	VISUAL
		3.5-5.0	0	16	31	16	37			17	VISUAL
		6.0-7.0	REDDISH BROWN TO LIGHT BROWN HIGHLY WEATHERED SANDSTONE								VISUAL
		8.5-9.0	SAME AS 6.0-7.0								VISUAL
		13.5-14.0	SAME AS 6.0-7.0								VISUAL
		18.5-19.0	SAME AS 6.0-7.0								VISUAL
		23.5-24.0	SAME AS 6.0-7.0								VISUAL
		28.5-29.0	SAME AS 6.0-7.0								VISUAL
		33.5-34.0	SAME AS 6.0-7.0								VISUAL
		38.5-39.5	GRAY INDURATED CLAYEY SILT/WEATHERED MUDSTONE								VISUAL
(B-11)	875+00, 100' LT	0-1.5	SAME AS 1.5-3.0							27	VISUAL
		1.5-3.0	0	3	9	57	31			21	VISUAL
		3.5-5.0	SAME AS 1.5-3.0							18	VISUAL
		6.0-7.5	SAME AS 1.5-3.0							21	VISUAL
		8.5-10.0	SAME AS 1.5-3.0							16	VISUAL
		13.5-14.0	BROWN TO ORANGISH BROWN HIGHLY WEATHERED SANDSTONE								VISUAL
		18.5-19.0	SAME AS 13.5-14.0								VISUAL
		23.5-25.0	MOTTLED ORANGE AND GRAY TO GRAY SILTY CLAY/WEATHERED MUDSTONE								VISUAL
		28.5-29.0	SAME AS 23.5-25.0								VISUAL
(B-12)	879+00,	0-1.5	BROWN CLAYEY SILT, LITTLE SAND, TRACE ORGANICS							21	VISUAL
		1.5-3.0	MOTTLED BROWN AND BLACK SILTY SAND, LITTLE CLAY							19	VISUAL
		3.5-5.0	SAME AS 1.5-3.0							21	VISUAL
		6.0-7.0	LIGHT BROWN HIGHLY WEATHERED SANDSTONE								VISUAL
		8.5-9.0	SAME AS 6.0-7.0								VISUAL
		13.5-14.0	SAME AS 6.0-7.0								VISUAL
		18.5-19.0	SAME AS 6.0-7.0								VISUAL
		23.5-24.5	SAME AS 6.0-7.0								VISUAL
		28.5-30.0	LIGHT BROWN INDURATED CLAY/WEATHERED MUDSTONE								VISUAL
		33.5-34.0	SAME AS 28.5-30.0								VISUAL
(B-13)	882+50, 100' LT	0-1.5	DARK BROWN AND ORANGISH BROWN CLAYEY SILT, TRACE SAND, TRACE ORGANICS							21	VISUAL
		1.5-3.0	0	13	32	33	22			19	VISUAL
		3.5-5.0	0	8	64	-28-				13	A-3a
		6.0-7.5	DARK BROWN, BLACK AND ORANGISH BROWN HIGHLY WEATHERED SANDSTONE.								VISUAL
		8.5-9.5	SAME AS 6.0-7.5								VISUAL
		13.5-14.5	SAME AS 6.0-7.5								VISUAL
		18.5-19.5	SAME AS 6.0-7.5								VISUAL
		23.5-25.0	GRAY AND BROWN INDURATED SILT/WEATHERED SILTSTONE								VISUAL
			BORINGS REFERENCED TO CENTERLINE								
(B-14)	885+50, ℄	0-1.5	SAME AS 1.5-3.0							18	VISUAL
		1.5-3.0	0	10	25	37	28	32	14	17	A-6a
		3.5-5.0	SAME AS 1.5-3.0							16	VISUAL
		6.0-7.5	BROWN AND GRAY INDURATED SILT/WEATHERED SILTSTONE								VISUAL
		8.5-9.2	SAME AS 6.0-7.5								VISUAL
(B-15)	887+50, 100' LT	0-1.5	0	12	32	33	23			17	VISUAL
		1.5-3.5	0	8	16	32	44	39	20	19	A-6b
		3.5-5.0	BLUISH GRAY WEATHERED SHALE								VISUAL
		6.0-6.5	GRAY WEATHERED SANDSTONE								VISUAL
(B-16)	887+00, 100' RT	0-1.5	1	4	25	50	20	23	6	21	A-4a
		1.5-3.0	SAME AS 0-1.5							23	VISUAL
		3.5-5.0	SAME AS 0-1.5							13	VISUAL
		6.0-6.5	GRAY WEATHERED SILTSTONE								VISUAL
		8.5-10.0	REDDISH BROWN AND GRAY WEATHERED MUDSTONE								VISUAL
		13.5-14.0	GRAY ARENACEOUS, WEATHERED SILTSTONE								VISUAL
(B-17)	890+00, ℄	0-1.5	SAME AS 3.5-5.0							21	VISUAL
		1.5-3.0	SAME AS 3.5-5.0							13	VISUAL
		3.5-5.0	0	11	30	23	36	34	18	19	A-6b
		6.0-7.5	SAME AS 3.5-5.0							16	VISUAL
		8.5-10.0	SAME AS 3.5-5.0							16	VISUAL
		13.5-15.0	SAME AS 3.5-5.0							15	VISUAL
		18.5-20.0	BROWN INDURATED CLAY/WEATHERED SHALE								VISUAL
		23.5-24.0	GRAY WEATHERED SANDSTONE								VISUAL
(B-18)	894+00, 100' LT	0-1.5	0	14	18	35	33			16	VISUAL
		1.5-3.0	SAME AS 0-1.5							12	VISUAL
		3.5-5.0	BROWN HIGHLY WEATHERED SANDSTONE								VISUAL
		6.0-7.5	SAME AS 3.5-5.0								VISUAL
		8.5-10.0	SAME AS 3.5-5.0								VISUAL
		13.5-14.5	SAME AS 3.5-5.0								VISUAL
		18.5-19.5	SAME AS 3.5-5.0								VISUAL
		23.5-24.5	DARK GRAY WEATHERED SHALE								VISUAL
		28.5-29.0	SAME AS 23.5-24.5								VISUAL
(B-21)	898+50, 50' RT	0-1.5	BROWN INDURATED SILTY CLAY/HIGHLY WEATHERED MUDSTONE.								VISUAL
		1.5-3.0	SAME AS 1.5-3.0								VISUAL
		3.5-4.5	SAME AS 1.5-3.0								VISUAL
		6.0-6.5	BROWN HIGHLY WEATHERED SANDSTONE.								VISUAL
(B-22)	898+50, 50' LT	0-1.5	SAME AS 1.5-3.0							13	VISUAL
		1.5-3.0	9	5	6	36	44			11	VISUAL
		3.5-4.5	BROWN INDURATED CLAY/WEATHERED CLAY-SHALE.								VISUAL
		6.0-6.5	BROWN HIGHLY WEATHERED SANDSTONE.								VISUAL
		8.5-9.5	BROWN INDURATED CLAY/WEATHERED CLAY-SHALE.								VISUAL
(B-26)	912+50, 50' LT	0-1.5	SAME AS 1.5-3.0							20	VISUAL
		1.5-3.0	0	4	33	38	25	22	7	21	A-4a
		3.5-5.0	SAME AS 1.5-3.0							26	VISUAL
		6.0-7.5	SAME AS 1.5-3.0							19	VISUAL
		8.5-9.5	GREENISH-GRAY WEATHERED SILTSTONE.								VISUAL
(B-27)	912+50, 100' RT	0-1.5	SAME AS 1.5-3.0							16	VISUAL
		1.5-3.0	2	8	38	20	32	29	13	12	A-6a
		3.5-5.0	SAME AS 1.5-3.0							13	VISUAL
		6.0-7.5	GREENISH-GRAY HIGHLY WEATHERED SILTSTONE.								VISUAL
		8.5-9.5	SAME AS 6.0-7.5								VISUAL
(B-28)	914+75, 50' LT	0-1.5	SAME AS 1.5-3.0							15	VISUAL
		1.5-3.0	0	1	25	26	48	50	31	15	A-7-6
		3.5-5.0	SAME AS 1.5-3.0							17	A-6b
		6.0-7.0	SAME AS 1.5-3.0							13	VISUAL
		8.5-9.0	BROWN HIGHLY WEATHERED SANDSTONE.								VISUAL
(B-29)	916+50, 20' LT	0-1.5	BROWN CLAYEY SAND, SOME SILT.							26	VISUAL
		1.5-3.0	SAME AS 0-1.5							15	VISUAL
		3.5-5.0	0	7	30	28	35	39	21	21	A-6b
		6.0-7.0	BROWN HIGHLY WEATHERED SANDSTONE.								VISUAL
		8.5-10.0	REDDISH-BROWN WEATHERED MUDSTONE								VISUAL
		13.5-14.0	GRAY WEATHERED SILTSTONE.								VISUAL
(B-30)	917+00, 100' RT	1.0-1.5	SAME AS 1.5-3.0							25	VISUAL
		1.5-3.0	1	11	28	33	27	26	10	20	A-6a
		3.5-5.0	SAME AS 1.5-3.0							15	VISUAL
		6.0-7.0	BROWN HIGHLY WEATHERED SILTSTONE.								VISUAL
(B-31)	918+85, 60' LT	0-1.5	SAME AS 1.5-3.0							21	VISUAL
		1.5-3.0	1	1	25	39	34	38	15	18	A-6a
		3.5-5.0	GRAY HIGHLY WEATHERED SILTSTONE								VISUAL
		6.0-7.0	SAME AS 3.5-5.0								VISUAL
		8.5-9.0	SAME AS 3.5-5.0								VISUAL

Although closer, Borings B-21 and B-22 were drilled on top of the hill where top of bedrock was relatively shallow, thus not included in design.

Sta. 904+50

Borings B-26 and B-27 were drilled near the floor of the adjacent valley and encountered materials that align with the recently drilled boring (B-004-0-23).

RESOURCE INTERNATIONAL, INC.
2811 ENTERPRISE DRIVE
WESTERVILLE, OHIO 43081

CALCULATED | CHECKED DLK
DATE 12-7-99
REVIEWED .
DRAWN REK

SOIL PROFILE

MEIGS COUNTY
MEG-124-26.66

3/36

RESOURCE INTERNATIONAL, INC.
281 ENTERPRISE DRIVE
WESTERVILLE, OHIO 43081
(614) 885-1959

REPORT OF SOIL EXPLORATION

Client: Korda/Nemeth Engineering, Inc.
Project: MEG-124-26.66
Project Number: W-9012

Boring Number: B-26
Sheet: 1 of 2
Completion Depth: 18.0'

Date Started: 6/7/99
Date Finished: 6/7/99
Drilled By: M.F.

Station: 912+50
Offset: 50' Lt
Elevation: 684.1 ft

Boring Method: 3.75" HSA/RC
Hammer Weight: 140 lbs.
Hammer Drop: 30 inches

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
SS-1	2 1 2	89		4" - Brown SANDY SILT, some organics, some clay (Topsoil). Moist. 0.3	20		
SS-2	1 1 1	100	2.5	Mottled brown and orange coarse to fine SANDY SILT, some clay. Soft to medium stiff. Moist to wet. -trace organics in SS-1 -SS-1: qh = 4.0 ksf -SS-2: ODOT A-4a (6); qh = 2.5 ksf	21	22	15
SS-3	1 1 1	50	5.0	-SS-3: qh = 2.0 ksf	26		
SS-4	1 4 2	56	7.5		19		
SS-5	16 50/1"	57	10.0	Greenish gray weathered SILTSTONE. Hard soil/very soft bedrock. 8.5			
RC-1		100	12.5	SANDSTONE; gray, moderately hard, slightly broken to slightly massive, slightly jointed, fine grained, micaceous. 13.0			

NOTES:

SAMPLE TYPE
SS - 2" OD Split Spoon
GS - Geoprobe Sample
ST - Shelby Tube
RC - Rock Core
AS - Auger Sample

GROUND WATER READING
At Completion ▽ N/A* Ft
After 8 Hrs ▼ N/A
* Wash water used during coring process

BORING METHOD
HSA - Hollow Stem Augers
PCM - Pavement Core Machine
MD - Mud Drilling
WD - Wash Drilling
RC - Rock Coring

RESOURCE INTERNATIONAL, INC.
281 ENTERPRISE DRIVE
WESTERVILLE, OHIO 43081
(614) 885-1959

REPORT OF SOIL EXPLORATION

Client Korda/Nemeth Engineering, Inc.
Project MEG-124-26.66
Project Number W-9012

Boring Number B-26
Sheet 2 of 2
Completion Depth 18.0'

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
				-RC-1: No core loss -RQD = 40%			
			17.5				
			18.0	Bottom of Boring = 18.0 feet			

NOTES:

RESOURCE INTERNATIONAL, INC.
281 ENTERPRISE DRIVE
WESTERVILLE, OHIO 43081
(614) 885-1959

REPORT OF SOIL EXPLORATION

Client: Korda/Nemeth Engineering, Inc.
Project: MEG-124-26.66
Project Number: W-9012

Boring Number: B-27
Sheet: 1 of 1
Completion Depth: 15.0'

Date Started: 6/7/99
Date Finished: 6/7/99
Drilled By: M.F.

Station: 912+50
Offset: 100' Rt
Elevation: 674.6 ft

Boring Method: 3.75" HSA/RC
Hammer Weight: 140 lbs.
Hammer Drop: 30 inches

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
SS-1	5 5 10	89		1" - Brown SANDY SILT, some organics, some clay (Topsoil). Moist. 0.1	16		
SS-2	8 8 11	33	2.5	Orangish brown CLAYEY fine SAND, some silt, trace coarse sand, trace fine gravel. Very stiff. Moist to damp. -trace organics in SS-1 -SS-1: qh = 9.0+ ksf -SS-2: ODOT A-6a (5); qh = 9.0+ ksf	12	29	16
SS-3	7 7 9	94	5.0	-SS-3: qh = 9.0+ ksf 6.0	13		
SS-4	8 40 50/2"	86	7.5	Greenish gray highly weathered SILTSTONE. Hard soil/very soft bedrock.			
SS-5	29 50/2"	50	10.0	10.0			
RC-1		94	12.5	SANDSTONE; light to dark gray, hard, slightly broken, jointed, fine grained, micaceous. -RC-1: Core loss = 4 inches -RQD = 26% Bottom of Boring = 15.0 feet 15.0			

NOTES:

SAMPLE TYPE
SS - 2" OD Split Spoon
GS - Geoprobe Sample
ST - Shelby Tube
RC - Rock Core
AS - Auger Sample

GROUND WATER READING
At Completion ▽ N/A* Ft
After 8 Hrs ▼ N/A
* Wash water used during coring process

BORING METHOD
HSA - Hollow Stem Augers
PCM - Pavement Core Machine
MD - Mud Drilling
WD - Wash Drilling
RC - Rock Coring

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / LEWIS	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 904+75, 121' LT.	EXPLORATION ID B-004-0-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / BENNING	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 688.2 (ft) EOB: 11.5 ft.	PAGE 1 OF 1
START: 11/27/23 END: 11/27/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.011503, -81.909002	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
	688.2																	
TOPSOIL (18")	686.7	1																
VERY STIFF, BROWN AND GRAY, **SANDY SILT**, SOME CLAY, LITTLE STONE FRAGMENTS, DAMP		2	3 7 2	14	33	SS-1	2.50	18	3	18	39	22	28	20	8	11	A-4a (5)	
@3.5'; STIFF		3 4 5	1 2 3	8	78	SS-2	1.50	16	6	19	32	27	30	20	10	18	A-4a (5)	
	682.2	6																
VERY STIFF, RED AND REDDISH BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE STONE FRAGMENTS, DAMP		7	2 2 3	8	67	SS-3	3.00	7	2	8	32	51	37	22	15	20	A-6a (10)	
@8.5'; RED, REDDISH BROWN AND GRAY, TRACE WOOD FRAGMENTS		8 9 10	5 4 5	14	100	SS-4	3.25	-	-	-	-	-	-	-	-	17	A-6a (V)	
	677.0	11																
@11.0'; RED **SANDSTONE**.	676.7	TR EOB	68	-	117	SS-5	2.50	-	-	-	-	-	-	-	-	17	A-6a (V)	

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 12/28/23 14:40 - X:\GINT\PROJECTS\601102.GPJ

Points from ATH/MEG-33-18.75/0.00 embankment inspection indicating start and end of a line of seeps along the embankment face.

From "MEG-19719_COMPLETE PLAN SET.pdf"

SEEDING	
END WIDTH	SQ. YDS.
331	
1703	
1703	SHEET TOTAL

END AREA	
CUT	FILL
68	9676

VOLUME	
CUT	FILL
129	17950
129	17950

CALCULATED MLS
CHECKED DLT

Historic cross-section

MATCH LINE 110' LT. SEE THIS SHEET

MATCH LINE 120' RT. SEE THIS SHEET

725.5

728.11

904+50

671.0

684.0

685.5

B-26

Adjusted ground surface from El. 684.1' to El. 669.3' (B-26)

Adjusted top of rock from El. 671.1 to El 656.3' (B-26)

B-27

Adjusted ground surface from El. 674.6' to El. 682.5' (B-27)

Adjusted top of rock from El. 664.6' to El 672.5' (B-27)

Estimated Top of Rock

B-004-0-23

Ground surface at El 688.2' (B-004-0-23)

Top of rock at El 677.0' (B-004-0-23)

CROSS SECTIONS STA 904+50 TO STA 904+50

MEG-124-26.66

94
501

Soil Parameter Determination

9999 Carver Road, Suite 210, Cincinnati, OH 45242-5583
(513) 984-7500
hdrinc.com

ODOT D10
MEG-33-13.96

Soil Strength Parameter Determination

Computed By = MM
Checked By = AKB

Layer		Undrained Shear Strength (Su) (psf)				Dry Unit Weight (pcf)		Moist Unit Wt. (pcf)		Adopted Short Term Parameters		Long-Term Strength Values						Adopted Long Term Strength Parameters	
		PPR	N-values		Tested	Correlation	Tested	Correlation	Tested				N_{60} Value	ODOT GB-7 Correlations		Tested			
			Sowers	T and P	Values									Cohesion (psf)	phi (deg)	Cohesion (psf)	phi (deg)		
Layer 1 STIFF TO VERY STIFF EMBANKMENT FILL (A-4A)	Max	2500	1050	1862		100		120		S_u= 1450 psf		Max	14	143	24			c' = 120 psf	
	Min	1500	600	1064		95		110		Φ = 0 deg		Min	8	100	22			Φ' = 23 deg	
	Average	2000	825	1463		98		115				Average	11	122	23				
	Std Dev	707	318	564		4		7		Y_{dry} = 100 pcf		Std Dev	4	30	1			Y_{dry} = 100 pcf	
	Avg + Std	2707	1143	2027		101		122		Y_{moist} = 115 pcf		Avg + Std	15	152	24			Y_{moist} = 115 pcf	
	Avg - Std	1293	507	899		94		108				Avg - Std	7	91	22				
Layer 2 SOFT TO MEDIUM STIFF COHESIVE (A-4A, A-6A)	Max	3000	1400	1064		95		120		S_u = 600 psf		Max	8	100	22			c' = 55 psf	
	Min	1000	150	266		85		105		Φ = 0 deg		Min	2	25	18			Φ' = 20 deg	
	Average	1813	475	559		90		111				Average	4	53	20				
	Std Dev	898	532	357		5		8		Y_{dry} = 90 pcf		Std Dev	3	33	2			Y_{dry} = 90 pcf	
	Avg + Std	2711	1007	915		95		119		Y_{moist} = 110 pcf		Avg + Std	7	86	21			Y_{moist} = 110 pcf	
	Avg - Std	914	-57	202		85		103				Avg - Std	2	19	18				
Layer 3 HARD RESIDUUM (WEATHERED SILTSTONE)	Max	N/A	N/A	N/A		N/A		N/A		S_u = 4000 psf		Max	N/A	250	28			c' = 250 psf	
	Min	N/A	N/A	N/A		N/A		N/A		Φ = 0 deg		Min	N/A	250	28			Φ' = 28 deg	
	Average	N/A	N/A	N/A		N/A		N/A				Average	N/A	250	28				
	Std Dev	N/A	N/A	N/A		N/A		N/A		Y_{dry} = 120 pcf		Std Dev	N/A	0	0			Y_{dry} = 120 pcf	
	Avg + Std	N/A	N/A	N/A		N/A		N/A		Y_{moist} = 130 pcf		Avg + Std	N/A	250	28			Y_{moist} = 130 pcf	
	Avg - Std	N/A	N/A	N/A		N/A		N/A				Avg - Std	N/A	250	28				
Layer 4 VERY STIFF COHESIVE (A-6A)	Max	4500	3325	2527		105		125		S_u = 3200 psf		Max	19	163	25			c' = 155 psf	
	Min	4500	2625	1995		100		120		Φ = 0 deg		Min	15	150	24			Φ' = 24 deg	
	Average	4500	2917	2217		103		123				Average	17	155	24				
	Std Dev	0	364	277		3		3		Y_{dry} = 105 pcf		Std Dev	2	7	0			Y_{dry} = 105 pcf	
	Avg + Std	4500	3281	2494		106		126		Y_{moist} = 125 pcf		Avg + Std	19	162	24			Y_{moist} = 125 pcf	
	Avg - Std	4500	2552	1940		100		120				Avg - Std	15	149	24				

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 1

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
Max	14	78	2.5	18	6	19	39	27	30	20	10	18	Max	2500	1050	1862	143	24	4.0	686.2	100	120	0.180	2.72	0.787
Min	8	33	1.5	16	3	18	32	22	28	20	8	11	Min	1500	600	1064	100	22	2.0	684.2	95	110	0.162	2.72	0.697
Average	11	56	2.0	17	5	19	36	25	29	20	9	15	Average	2000	825	1463	122	23	3.0	685.2	98	115	0.171	2.72	0.742
Std Dev	4	32	0.7	1	2	1	5	4	1	0	1	5	Std Dev	707	318	564	30	1	1.4	1.4	4	7	0.013	0.00	0.063
Avg + Std	15	87	2.7	18	7	19	40	28	30	20	10	19	Avg + Std	2707	1143	2027	152	24	4.4	686.6	101	122	0.184	2.72	0.805
Avg - Std	7	24	1.3	16	2	18	31	21	28	20	8	10	Avg - Std	1293	507	899	91	22	1.6	683.8	94	108	0.158	2.72	0.679

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
US 33	688.2	B-004-0-23	1.5	-	3	SS-1	14	33	2.5	18	3	18	39	22	28	20	8	11	A-4a	Cohesive	1	2500	1050	1862	143	24	2.0	686.2	100	120	0.162	2.72	0.697
US 33	688.2	B-004-0-23	3.5	-	5	SS-2	8	78	1.5	16	6	19	32	27	30	20	10	18	A-4a	Cohesive	1	1500	600	1064	100	22	4.0	684.2	95	110	0.18	2.72	0.787

ODOT D10
MEG-33-13.96

Soil Strength Parameter Determination

Computed By = MM
Checked By = AKB

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 2

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
Max	8	100	3.0	7	4	33	38	51	37	22	15	26	Max	3000	1400	1064	100	22	7.0	683.1	95	120	0.243	2.72	0.997
Min	2	50	1.0	0	2	8	32	25	22	15	7	19	Min	1000	150	266	25	18	1.0	677.1	85	105	0.108	2.72	0.787
Average	4	72	1.8	4	3	21	35	38	30	19	11	21	Average	1813	475	559	53	20	4.2	680.7	90	111	0.176	2.72	0.891
Std Dev	3	21	0.9	5	1	18	4	18	11	5	6	3	Std Dev	898	532	357	33	2	2.8	2.3	5	8	0.095	0.00	0.105
Avg + Std	7	94	2.7	8	4	38	39	56	40	23	17	24	Avg + Std	2711	1007	915	86	21	7.0	683.0	95	119	0.271	2.72	0.996
Avg - Std	2	51	0.9	-1	2	3	31	20	19	14	5	18	Avg - Std	914	-57	202	19	18	1.4	678.4	85	103	0.080	2.72	0.785

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
US 33	688.2	B-004-0-23	6	-	7.5	SS-3	8	67	3	7	2	8	32	51	37	22	15	20	A-6a	Cohesive	2	3000	1400	1064	100	22	7.0	681.2	95	120	0.243	2.72	0.787
US 33	684.1	B-26	0	-	1.5	SS-1	3	89	2	-	-	-	-	-	-	-	-	20	A-4a	Cohesive	2	2000	225	399	38	19	1.0	683.1	90	105		2.72	0.886
US 33	684.1	B-26	1.5	-	3	SS-2	2	100	1.25	0	4	33	38	25	22	15	7	21	A-4a	Cohesive	2	1250	150	266	25	18	2.0	682.1	85	105	0.108	2.72	0.997
US 33	684.1	B-26	3.5	-	5	SS-3	2	50	1	-	-	-	-	-	-	-	-	26	A-4a	Cohesive	2	1000	150	266	25	18	4.0	680.1	85	105		2.72	0.997
US 33	684.1	B-26	6	-	7.5	SS-4	6	56	-	-	-	-	-	-	-	-	-	19	A-4a	Cohesive	2	N/A	450	798	75	21	7.0	677.1	95	120		2.72	0.787

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 3

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC		Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
Max	N/A	86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Max	N/A	N/A	N/A	250	28	9.0	675.1	N/A	N/A	N/A	N/A	N/A
Min	N/A	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Min	N/A	N/A	N/A	250	28	7.0	667.0	N/A	N/A	N/A	N/A	N/A
Average	N/A	64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Average	N/A	N/A	N/A	250	28	8.3	670.4	N/A	N/A	N/A	N/A	N/A
Std Dev	N/A	19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Std Dev	N/A	N/A	N/A	0	0	1.2	4.2	N/A	N/A	N/A	N/A	N/A
Avg + Std	N/A	83	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Avg + Std	N/A	N/A	N/A	250	28	9.5	674.6	N/A	N/A	N/A	N/A	N/A
Avg - Std	N/A	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Avg - Std	N/A	N/A	N/A	250	28	7.2	666.1	N/A	N/A	N/A	N/A	N/A

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
US 33	684.1	B-26	8.5	-	9.1	SS-5	Refusal	57	-	-	-	-	-	-	-	-	-	-	W. Rock		3	N/A	N/A	N/A	250	28	9.0	675.1					
US 33	676.0	B-27	6	-	7.2	SS-4	Refusal	86	-	-	-	-	-	-	-	-	-	-	W. Rock		3	N/A	N/A	N/A	250	28	7.0	669.0					
US 33	676.0	B-27	8.5	-	9.2	SS-5	Refusal	50	-	-	-	-	-	-	-	-	-	-	W. Rock		3	N/A	N/A	N/A	250	28	9.0	667.0					

ODOT D10
MEG-33-13.96

Soil Strength Parameter Determination

Computed By = MM
Checked By = AKB

Values for Soil Strength Correlation	
Reference	Value
HI PI (Sowers)	0.25
MD PI (Sowers)	0.175
LO PI (Sowers)	0.075
T&P	0.133

Layer 4

	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC
Max	19	94	4.5	2	8	38	20	32	29	16	13	16
Min	15	33	4.5	2	8	38	20	32	29	16	13	12
Average	17	72	4.5	2	8	38	20	32	29	16	13	14
Std Dev	2	34	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2
Avg + Std	19	106	4.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16
Avg - Std	15	38	4.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12

	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
Max	4500	3325	2527	163	25	4.0	673.6	105	125	0.171	2.72	0.697
Min	4500	2625	1995	150	24	1.0	670.6	100	120	0.171	2.72	0.616
Average	4500	2917	2217	155	24	2.3	672.3	103	123	0.171	2.72	0.643
Std Dev	0	364	277	7	0	1.5	1.5	3	3	N/A	0.00	0.047
Avg + Std	4500	3281	2494	162	24	3.9	673.8	106	126	N/A	2.72	0.690
Avg - Std	4500	2552	1940	149	24	0.8	670.7	100	120	N/A	2.72	0.597

Alignment	Surface Elevation	Exploration ID	From		To	Sample ID	N_{60}	% Rec	HP	% Gr	% CS	% FS	% Silt	% Clay	LL	PL	PI	% WC	ODOT Class.	Soil Type	Layer	Short-Term Cohesion (psf) N-values PPR	Sowers	T & P	Correlated LT Cohesion (psf) per GB-7	phi (deg)	Midpoint Sample Depth (ft.)	Midpoint Sample Elevation (ft.)	Correlated Dry Unit Wt. (pcf) per GB-7	Correlated Moist Unit Wt. (pcf) per GB-7	Correlated C_c	Assumed Specific Gravity (G_s)	Computed Void Ratio (e)
US 33	674.6	B-27	0	-	1.5	SS-1	15	89	4.5	-	-	-	-	-	-	-	-	16	A-6a	Cohesive	4	4500	2625	1995	150	24	1.0	673.6	100	120		2.72	0.697
US 33	674.6	B-27	1.5	-	3	SS-2	19	33	4.5	2	8	38	20	32	29	16	13	12	A-6a	Cohesive	4	4500	3325	2527	163	25	2.0	672.6	105	125	0.171	2.72	0.616
US 33	674.6	B-27	3.5	-	5	SS-3	16	94	4.5	-	-	-	-	-	-	-	-	13	A-6a	Cohesive	4	4500	2800	2128	153	24	4.0	670.6	105	125		2.72	0.616

RESOURCE INTERNATIONAL, INC.
281 ENTERPRISE DRIVE
WESTERVILLE, OHIO 43081
(614) 885-1959

REPORT OF SOIL EXPLORATION

Client: Korda/Nemeth Engineering, Inc.
Project: MEG-124-26.66
Project Number: W-9012

Boring Number: B-26
Sheet: 1 of 2
Completion Depth: 18.0'
Date Started: 6/7/99
Date Finished: 6/7/99
Drilled By: M.F.

Station: 912+50
Offset: 50' Lt
Elevation: 684.1 ft

Boring Method: 3.75" HSA/RC
Hammer Weight: 140 lbs.
Hammer Drop: 30 inches

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
SS-1	2 1 2	89		4" - Brown SANDY SILT, some organics, some clay (Topsoil). Moist. 0.3	20		
SS-2	1 1 1	100	2.5	Mottled brown and orange coarse to fine SANDY SILT, some clay. Soft to medium stiff. Moist to wet. -trace organics in SS-1 -SS-1: qh = 4.0 ksf -SS-2: ODOT A-4a (6); qh = 2.5 ksf	21	22	15
SS-3	1 1 1	50	5.0	-SS-3: qh = 2.0 ksf	26		
SS-4	1 4 2	56	7.5	Layer 2	19		
SS-5	16 50/1"	57	10.0	Greenish gray weathered SILTSTONE. Hard soil/very soft bedrock. 8.5 Layer 3			
RC-1		100	12.5	SANDSTONE; gray, moderately hard, slightly broken to slightly massive, slightly jointed, fine grained, micaceous. 13.0			

NOTES:

SAMPLE TYPE
SS - 2" OD Split Spoon
GS - Geoprobe Sample
ST - Shelby Tube
RC - Rock Core
AS - Auger Sample

GROUND WATER READING
At Completion ▽ N/A* Ft
After 8 Hrs ▼ N/A
* Wash water used during coring process

BORING METHOD
HSA - Hollow Stem Augers
PCM - Pavement Core Machine
MD - Mud Drilling
WD - Wash Drilling
RC - Rock Coring

RESOURCE INTERNATIONAL, INC.
281 ENTERPRISE DRIVE
WESTERVILLE, OHIO 43081
(614) 885-1959

REPORT OF SOIL EXPLORATION

Client: Korda/Nemeth Engineering, Inc.
Project: MEG-124-26.66
Project Number: W-9012

Boring Number: B-26
Sheet: 2 of 2
Completion Depth: 18.0'

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
				-RC-1: No core loss -RQD = 40%			
			17.5				
			18.0	Bottom of Boring = 18.0 feet			

NOTES:

RESOURCE INTERNATIONAL, INC.
281 ENTERPRISE DRIVE
WESTERVILLE, OHIO 43081
(614) 885-1959

REPORT OF SOIL EXPLORATION

Client: Korda/Nemeth Engineering, Inc.
Project: MEG-124-26.66
Project Number: W-9012

Boring Number: B-27
Sheet: 1 of 1
Completion Depth: 15.0'
Date Started: 6/7/99
Date Finished: 6/7/99
Drilled By: M.F.

Station: 912+50
Offset: 100' Rt
Elevation: 674.6 ft

Boring Method: 3.75" HSA/RC
Hammer Weight: 140 lbs.
Hammer Drop: 30 inches

SAMPLE NO	BLOWS PER 6"	PERCENT RECOVERY	DEPTH	SOIL DESCRIPTION	MOISTURE CONTENT	ATTERBERG LL	ATTERBERG PL
SS-1	5 5 10	89		1" - Brown SANDY SILT, some organics, some clay (Topsoil). Moist. 0.1	16		
SS-2	8 8 11	33	2.5	Orangish brown CLAYEY fine SAND, some silt, trace coarse sand, trace fine gravel. Very stiff. Moist to damp. -trace organics in SS-1 -SS-1: qh = 9.0+ ksf -SS-2: ODOT A-6a (5); qh = 9.0+ ksf	12	29	16
SS-3	7 7 9	94	5.0	-SS-3: qh = 9.0+ ksf Layer 4 6.0	13		
SS-4	8 40 50/2"	86	7.5	Greenish gray highly weathered SILTSTONE. Hard soil/very soft bedrock. Layer 3			
SS-5	29 50/2"	50	10.0	10.0			
RC-1		94	12.5	SANDSTONE; light to dark gray, hard, slightly broken, jointed, fine grained, micaceous. -RC-1: Core loss = 4 inches -RQD = 26% Bottom of Boring = 15.0 feet 15.0			

NOTES:

SAMPLE TYPE
SS - 2" OD Split Spoon
GS - Geoprobe Sample
ST - Shelby Tube
RC - Rock Core
AS - Auger Sample

GROUND WATER READING
At Completion ▽ N/A* Ft
After 8 Hrs ▼ N/A
* Wash water used during coring process

BORING METHOD
HSA - Hollow Stem Augers
PCM - Pavement Core Machine
MD - Mud Drilling
WD - Wash Drilling
RC - Rock Coring

PROJECT: MEG-33-13.96	DRILLING FIRM / OPERATOR: ODOT / LEWIS	DRILL RIG: ACKER REBEL XL	STATION / OFFSET: 904+75, 121' LT.	EXPLORATION ID B-004-0-23
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: ODOT / BENNING	HAMMER: ACKER AUTOMATIC	ALIGNMENT: US 33	
PID: 119143 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 11/7/23	ELEVATION: 688.2 (ft) EOB: 11.5 ft.	PAGE 1 OF 1
START: 11/27/23 END: 11/27/23	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.011503, -81.909002	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (18")	688.2																	
VERY STIFF, BROWN AND GRAY, **SANDY SILT**, SOME CLAY, LITTLE STONE FRAGMENTS, DAMP	686.7		3 7 2	14	33	SS-1	2.50	18	3	18	39	22	28	20	8	11	A-4a (5)	
@3.5'; STIFF Layer 1			1 2 3	8	78	SS-2	1.50	16	6	19	32	27	30	20	10	18	A-4a (5)	
VERY STIFF, RED AND REDDISH BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE STONE FRAGMENTS, DAMP	682.2		2 2 3	8	67	SS-3	3.00	7	2	8	32	51	37	22	15	20	A-6a (10)	
@8.5'; RED, REDDISH BROWN AND GRAY, TRACE WOOD FRAGMENTS Layer 2			5 4 5	14	100	SS-4	3.25	-	-	-	-	-	-	-	-	17	A-6a (V)	
@11.0'; RED	677.0	TR	68	-	117	SS-5	2.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
SANDSTONE.	676.7	EOB																

Omitted

NOTES: LAT/LONG/ELEV FROM DISTRICT SURVEY GRADE INSTRUMENTS. HOLE DRY UPON COMPLETION.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH 50 LB. BENTONITE CHIPS

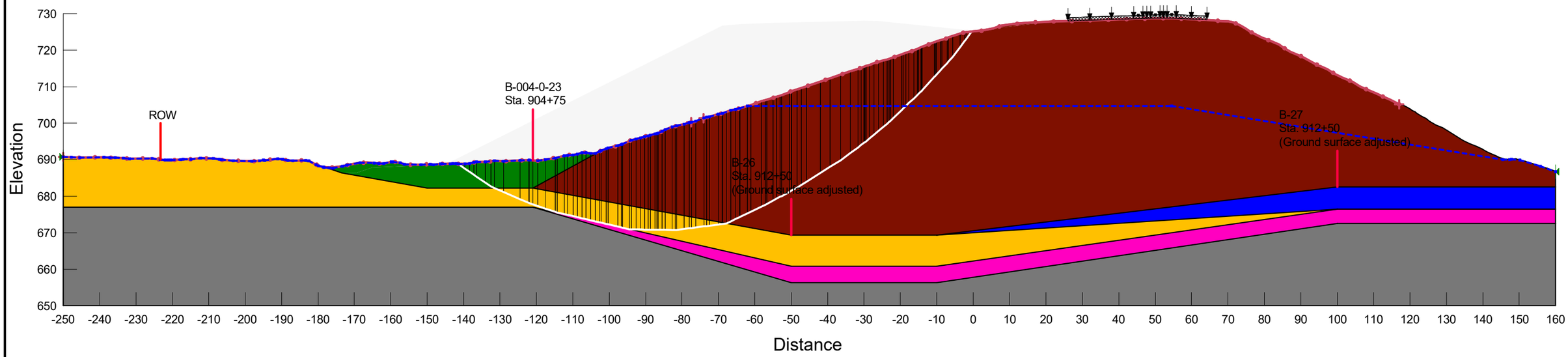
STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 12/28/23 14:40 - X:\GINT\PROJECTS\601102.GPJ

Slope Stability

9999 Carver Road, Suite 210, Cincinnati, OH 45242-5583
(513) 984-7500
hdrinc.com

Long Term (Drained) Condition

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (LT)	115	120	23
	2. Soft to Stiff Cohesive (LT)	110	55	20
	3. Hard Residuum (LT)	130	250	28
	4. Very Stiff Cohesive (LT)	125	155	24
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (LT)	125	200	30



1. Existing (LT)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325

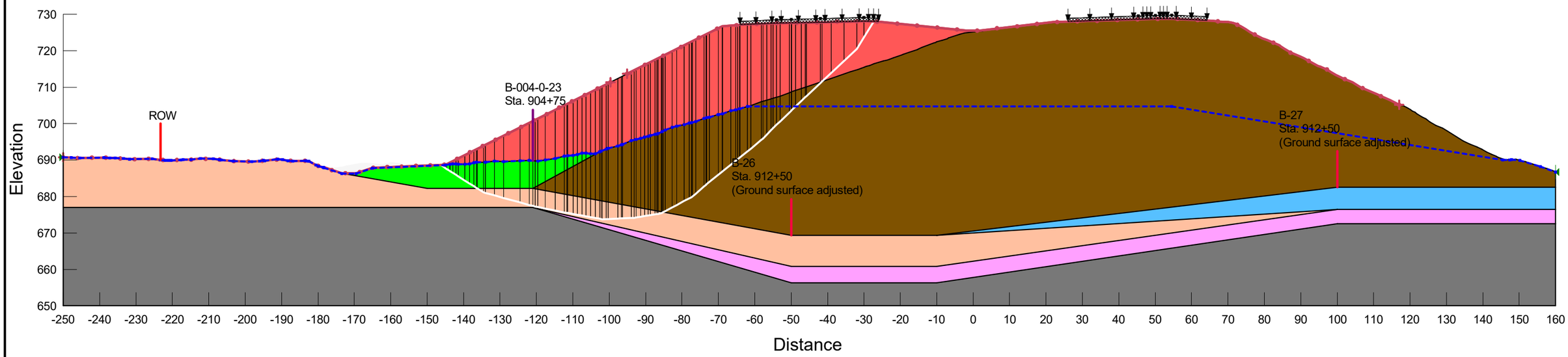
Embankment fill properties for an A-4a material as presented in Table 500-2 from the ODOT Geotechnical Design Manual were assumed for both the new and existing embankment materials based on the soil types as encountered in the historic borings, as well as the upper soil layer as encountered in Boring B-04-0-23 located near the toe of the existing embankment slope.

Short Term (Undrained) Condition

Table 500-2: Assumed Embankment Fill Properties

Borrow Source Soil Class	c (psf)	φ (deg)	c′ (psf)	φ′ (deg)	γ (pcf)
Granular	0	32	0	32	125
A-4a/A-4b	2000	0	200	30	125
A-6a	2500	0	250	28	125
A-6b	2500	0	250	28	125
A-7-6	2000	0	200	26	125
Unknown	2500	0	250	26	125

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (ST)	115	1,450	0
	2. Soft to Stiff Cohesive (ST)	110	600	0
	3. Hard Residuum (ST)	130	4,000	0
	4. Very Stiff Cohesive (ST)	125	3,200	0
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (ST)	125	2,000	0
	New Embankment Fill (Assumed A-4a) (ST)	125	2,000	0



2a. Proposed No Shear Key (ST)	
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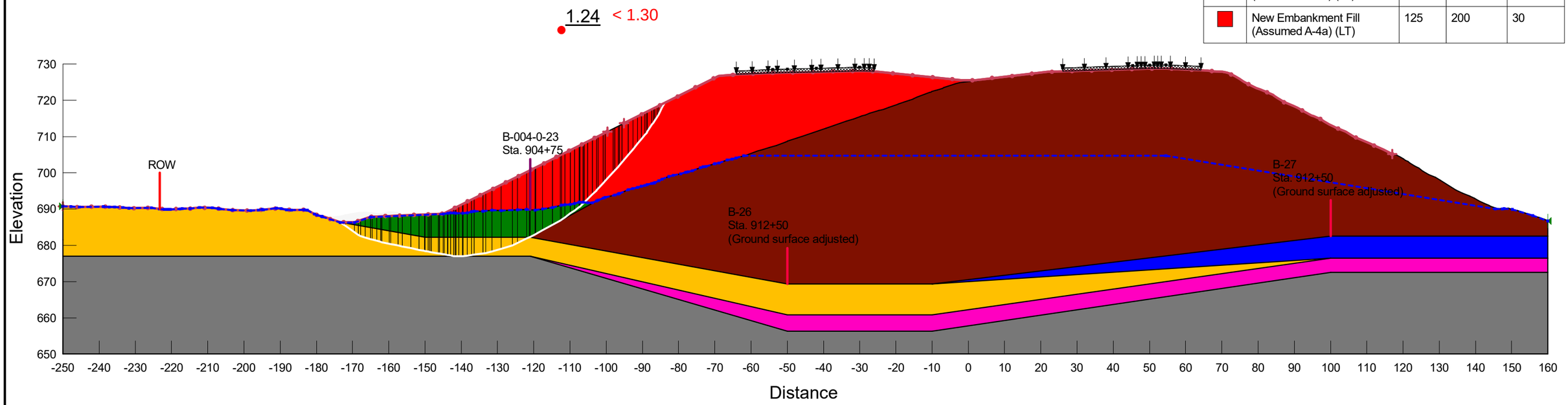
05/07/2024	1:325

Long Term (Drained) Condition

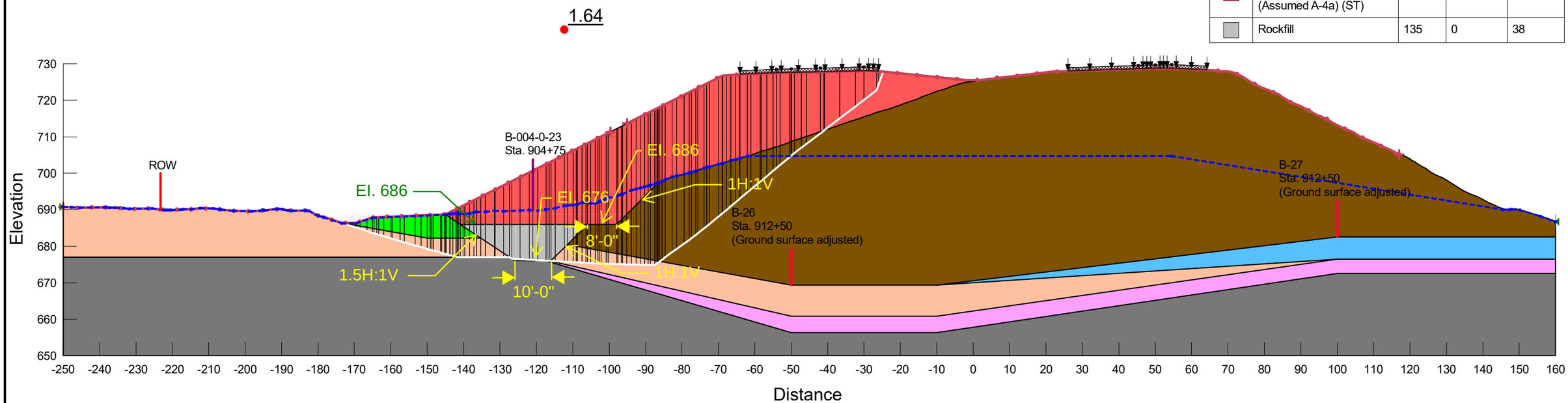
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (LT)	115	120	23
	2. Soft to Stiff Cohesive (LT)	110	55	20
	3. Hard Residuum (LT)	130	250	28
	4. Very Stiff Cohesive (LT)	125	155	24
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (LT)	125	200	30
	New Embankment Fill (Assumed A-4a) (LT)	125	200	30



2b. Proposed No Shear Key (LT)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325

Long Term (Drained) Condition

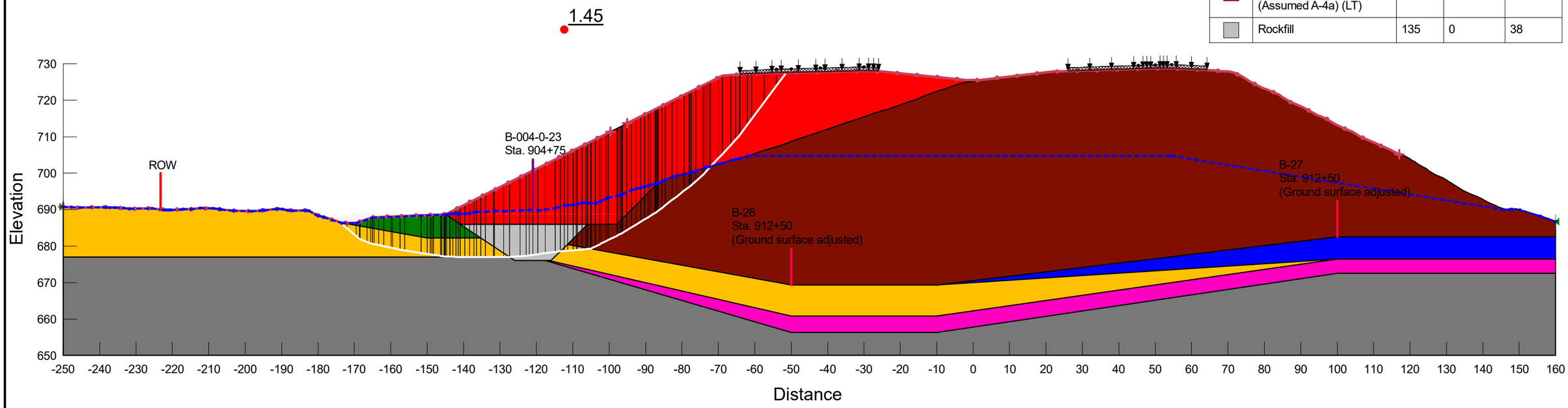
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (ST)	115	1,450	0
	2. Soft to Stiff Cohesive (ST)	110	600	0
	3. Hard Residuum (ST)	130	4,000	0
	4. Very Stiff Cohesive (ST)	125	3,200	0
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (ST)	125	2,000	0
	New Embankment Fill (Assumed A-4a) (ST)	125	2,000	0
	Rockfill	135	0	38



4a. Proposed Overall (ST)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325

Long Term (Drained) Condition

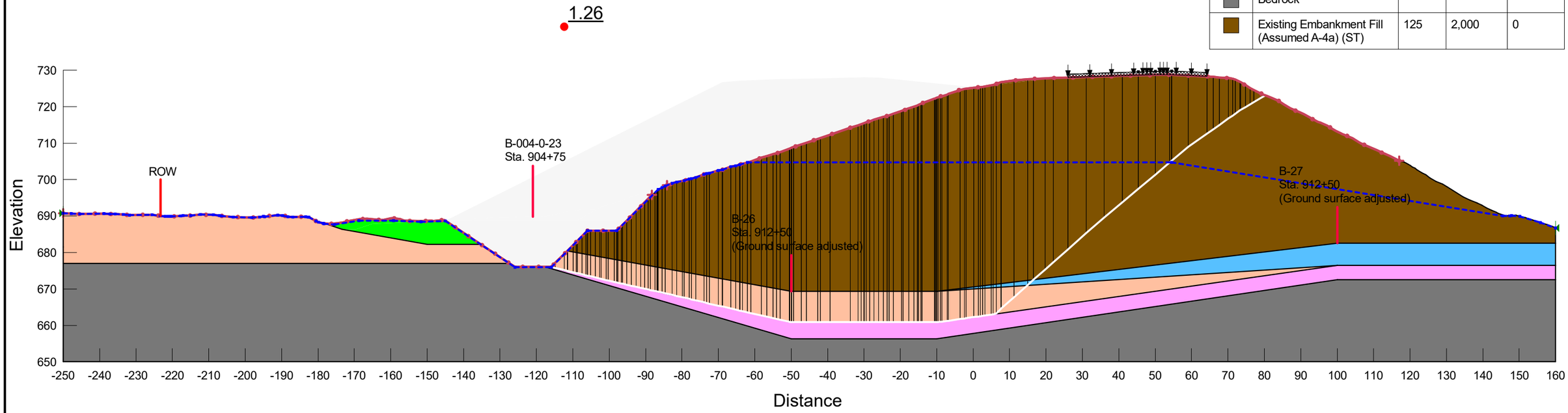
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (LT)	115	120	23
	2. Soft to Stiff Cohesive (LT)	110	55	20
	3. Hard Residuum (LT)	130	250	28
	4. Very Stiff Cohesive (LT)	125	155	24
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (LT)	125	200	30
	New Embankment Fill (Assumed A-4a) (LT)	125	200	30
	Rockfill	135	0	38



4b. Proposed Overall (LT)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325

Short Term (Undrained) Condition

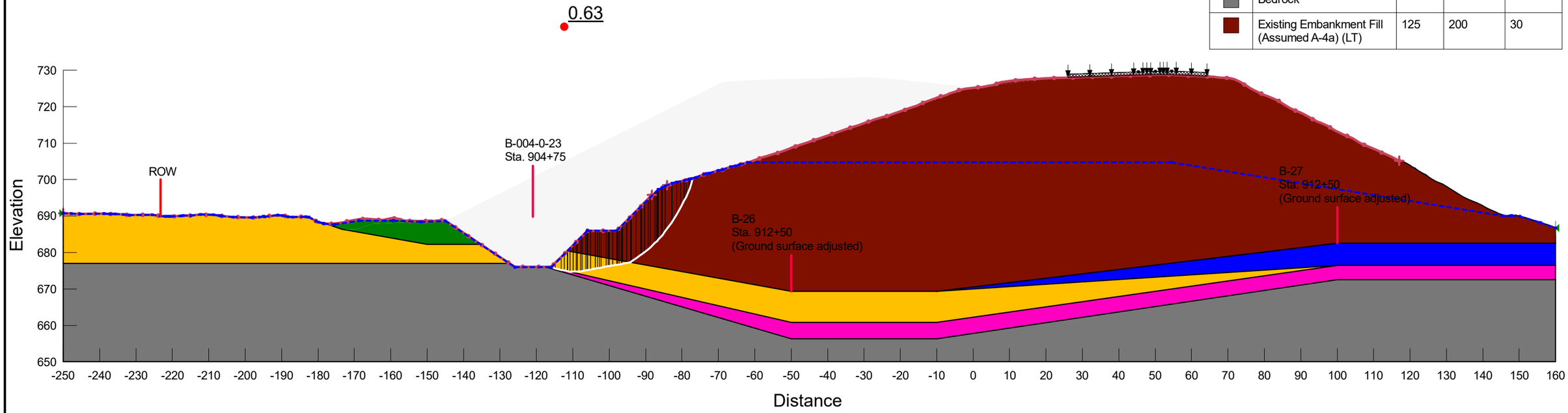
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (ST)	115	1,450	0
	2. Soft to Stiff Cohesive (ST)	110	600	0
	3. Hard Residuum (ST)	130	4,000	0
	4. Very Stiff Cohesive (ST)	125	3,200	0
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (ST)	125	2,000	0



3a. Constructability High Bench (ST)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325

Long Term (Drained) Condition

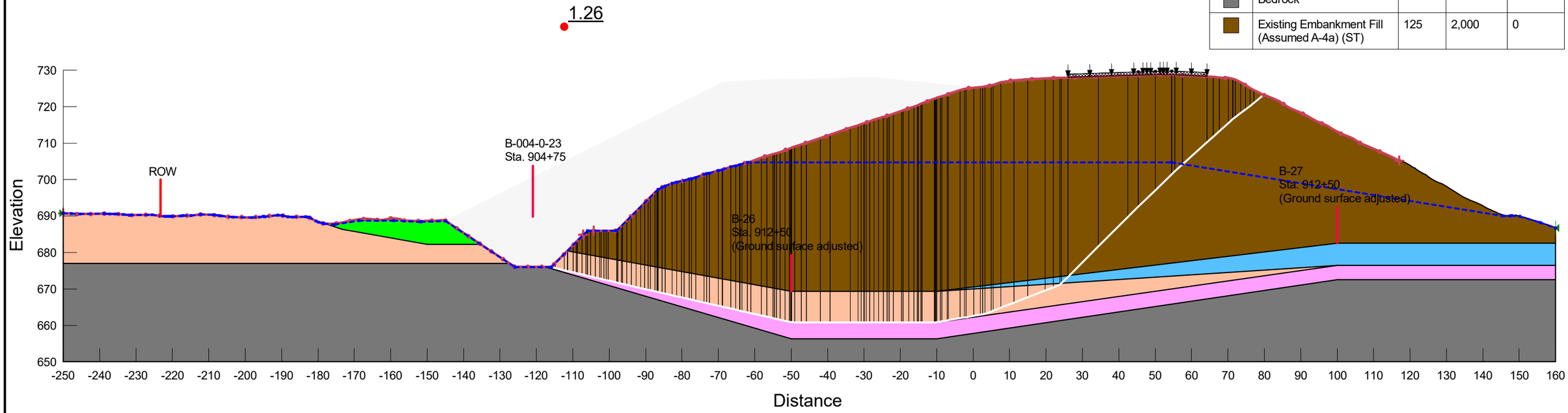
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (LT)	115	120	23
	2. Soft to Stiff Cohesive (LT)	110	55	20
	3. Hard Residuum (LT)	130	250	28
	4. Very Stiff Cohesive (LT)	125	155	24
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (LT)	125	200	30



3b. Constructability High Bench (LT)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325

Short Term (Undrained) Condition

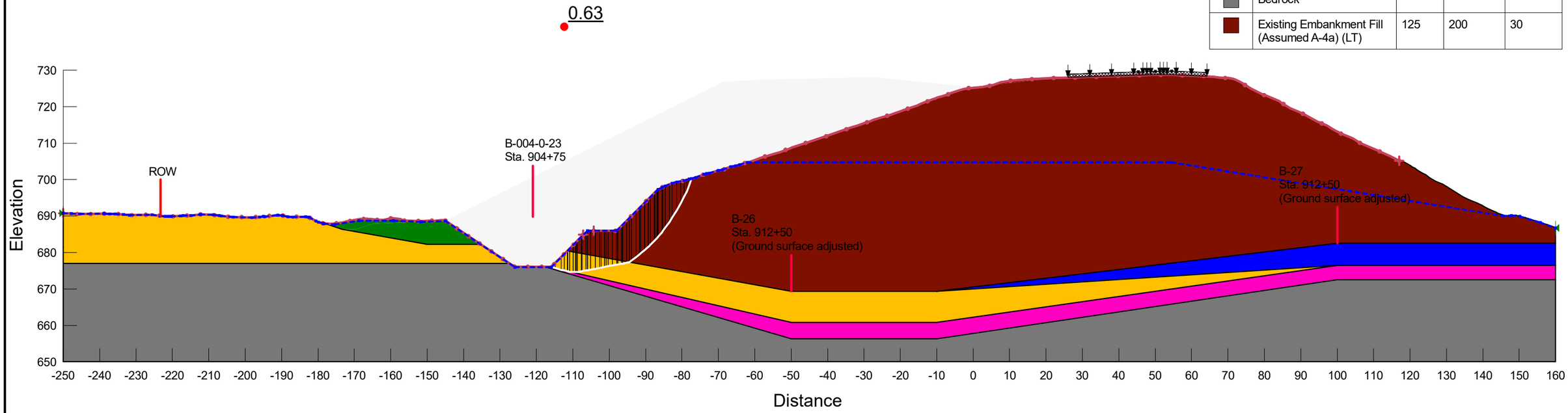
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (ST)	115	1,450	0
	2. Soft to Stiff Cohesive (ST)	110	600	0
	3. Hard Residuum (ST)	130	4,000	0
	4. Very Stiff Cohesive (ST)	125	3,200	0
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (ST)	125	2,000	0



3c. Constructability Lower Bench (ST)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325

Long Term (Drained) Condition

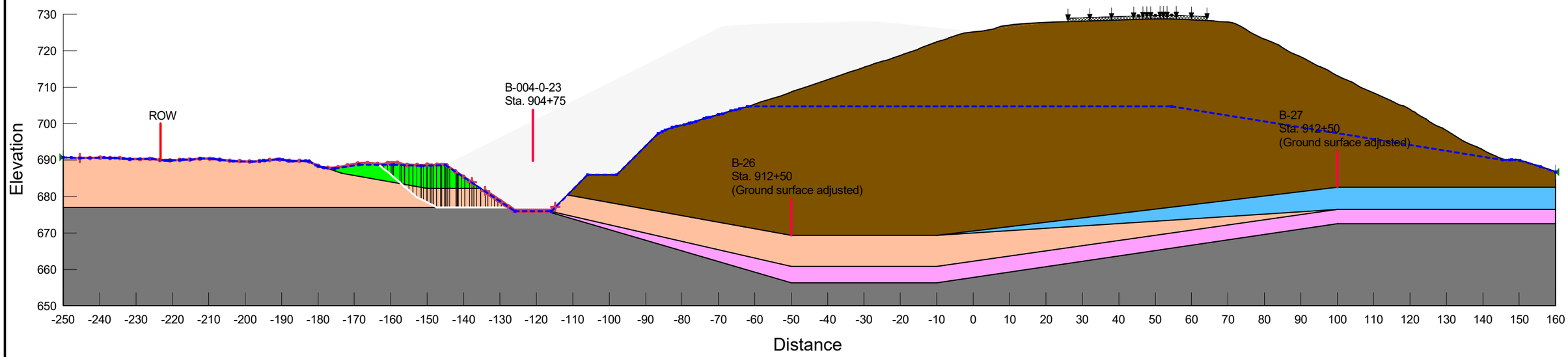
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (LT)	115	120	23
	2. Soft to Stiff Cohesive (LT)	110	55	20
	3. Hard Residuum (LT)	130	250	28
	4. Very Stiff Cohesive (LT)	125	155	24
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (LT)	125	200	30



3d. Constructability Lower Bench (LT)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325

Short Term (Undrained) Condition

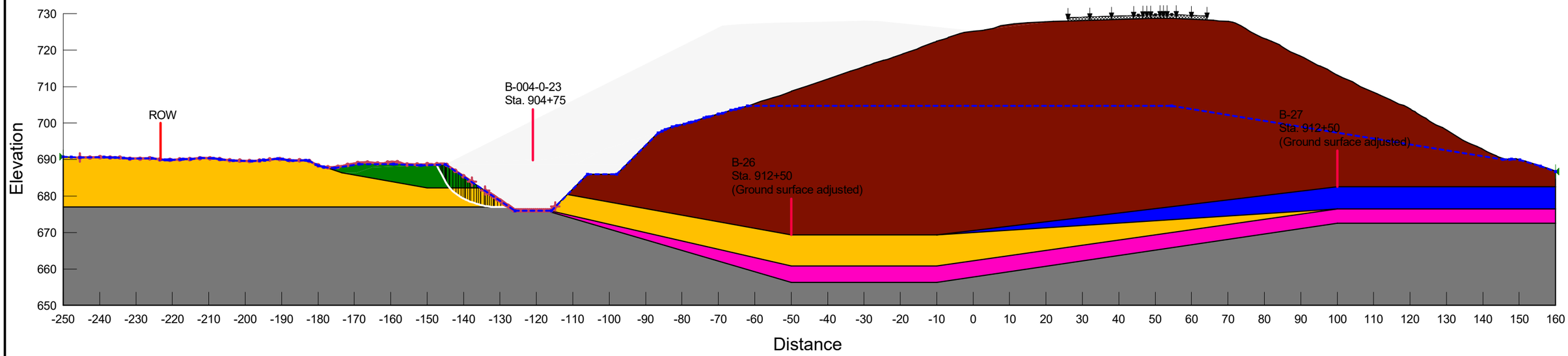
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (ST)	115	1,450	0
	2. Soft to Stiff Cohesive (ST)	110	600	0
	3. Hard Residuum (ST)	130	4,000	0
	4. Very Stiff Cohesive (ST)	125	3,200	0
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (ST)	125	2,000	0



3e. Constructability Shear Key Backslope (ST)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325

Long Term (Drained) Condition

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	1. Stiff to Very Stiff Embankment Fill (LT)	115	120	23
	2. Soft to Stiff Cohesive (LT)	110	55	20
	3. Hard Residuum (LT)	130	250	28
	4. Very Stiff Cohesive (LT)	125	155	24
	Bedrock			
	Existing Embankment Fill (Assumed A-4a) (LT)	125	200	30



3f. Constructability Shear key Backslope (LT)	
Sta. 904+50 LT SlopeW.gsz	
05/07/2024	1:325