Mississippi Valley Division,
Regional Planning and Environment Division South

St. Tammany Parish, Louisiana Feasibility Study



Appendix D – Annex 3 - Geotechnical Analysis

July 2023

2.0 GEOTECHNICAL

2.0.1 Background

This appendix summarizes the preliminary geotechnical design results for the St. Tammany Parish Louisiana Feasibility Study Optimized Tentatively Selected Plan (TSP). The optimized TSP consists of a total of 15 miles (79,100 feet) of levees constructed in two separate (non-continuous) segments. Previously, several alternatives were looked at and chosen for the final array. These alternatives were evaluated for the full array. The geotechnical report for the final array can be found in section 12 of the geotechnical annex. The optimized TSP consists of a combination of portions of the Slidell levee alignment proposed in Alternative 5 (excluding the western portion of that alignment) and the West Slidell levee alignment proposed in Alternative 6a (excluding the northwestern portion of that alignment) as can be found in the St. Tammany Parish Louisiana Feasibility Study Final Array engineering appendix. The two alignments are connected by a new railroad gate across the existing Norfolk Southern Railway Corp. railroad tracks.

The two segments combined (both South Slidell and West Slidell) make up the aligmnet of the TSP. This alignment of the TSP is divided into four hydraulic reaches. Geotechnical analyses also utilize the same four reaches for analyses. The West Slidell section is comprised only of the West Slidell West levee section (Reach 1) which stretches west from Delwood pump station until it ties into high ground. The West Slidell high ground (reach 1A) is already above 2032 design grade elevation. The West Slidell floodwall tracks north to south parallel to the Norfolk Southern Railway Corp railroad tracks. The South Slidell section has the other three reaches: Oak Harbor, I-10 Crossing, and the Slidell East and Northeast reach. Tracking westward from the floodwall is the Oak Harbor levee section (reach 2) which tracks along part of the existing Oak Harbor levee section to I-10. The part of the alignment which crosses underneath I-10 is called I-10 crossing (reach 3). The fourth part of the alignment ties to an existing portion of the Lakeshore Estates ring levee and turns northward. This is the Slidell East and Northeast (reach 4) part of the alignment. Reach 4 ties into the Northeast Tie-in floodwall which completes the alignment in an area with less right-of-way (ROW). These reaches can be found in figure 1 below. Also included as part of the TSP is channel improvements to the lower 2.15 miles of the channel of Mile Branch in Covington, Louisiana. This involves cleaning and grubbing with mechanical dredging deepening the canal by 5 feet.

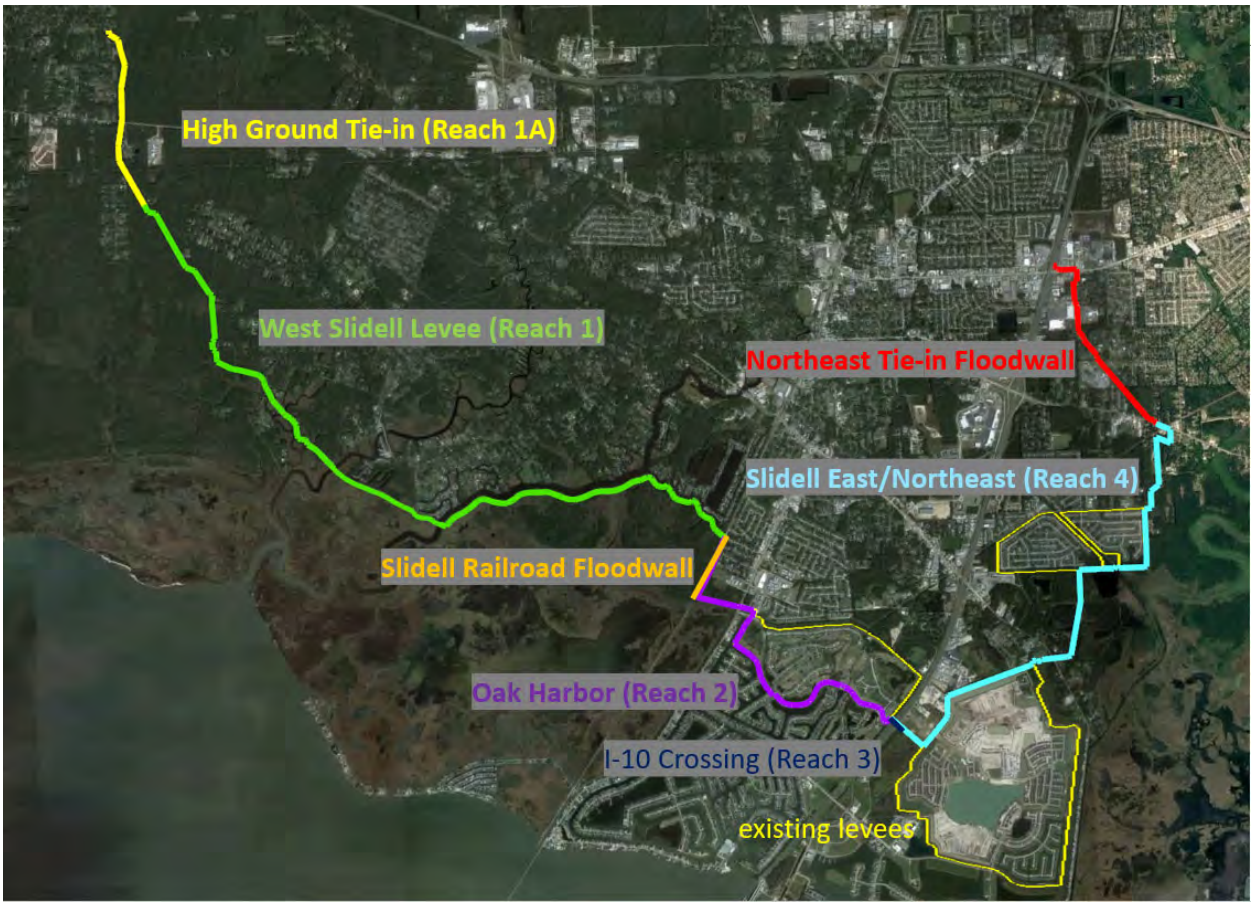


Figure 1: Reach Breakdown

The amount of information in the way of geotechnical investigations, associated testing, and geologic profiles was limited. Soil borings were not taken, and soil testing was not performed for this study. Soil unit weights and shear strengths were assigned based on USACE geotechnical experience in the region and limited boring information in the vicinity of the TSP alignment.

Earthwork stability analyses, settlement, and lift schedules were performed on levee features of the various measures and used for elimination of alternatives in the determination of a TSP. Pile capacity analyses and Lane's weighted creep analyses were performed on structural features of the various measures to assist in quantity estimates for structural pile and sheet pile lengths. The results presented in this appendix are only intended for cost estimating purposes and determining the technical feasibility of the proposed alternatives.

2.0.2 Geology

The amount of geologic information available for use in the St. Tammany Parish Louisiana Feasibility Study Optimized TSP was limited. Neither geologic profiles nor geologic maps could be obtained for the tentative TSP project alignment made up of the different alternatives in the final array. Geological conditions are inferred from the limited boring information obtained from

geotechnical reports prepared by Eustis Engineering, LLC job for various projects in St. Tammany Parish. More information on these geotechnical investigations can be found in section 2.0.3 below.

The western part of the alignment designated as West Slidell starting at the Shannon Drive lift gate and terminating at the Norfolk Southern Railway Corp railroad tracks west of US Highway 11 in the vicinity of Delwood Pump Station in Slidell. These marsh deposits make up the top 2 to 10 feet of the subsurface and are comprised of soft organic clays with some sand layers. Below marsh deposits and in some places at the surface, Pleistocene Prairie Terrace deposits are present. These deposits span at least 40 feet below and are composed of predominantly medium to very stiff clay, however, some borings show an approximately 10-foot-thick sand layer around 20 feet below the ground surface.

As the alignment runs eastward into the area designated as South Slidell alignments starting at the floodwall parallel to the railroad tracks and including the tie-ins with Oak Harbor levee and the Lakeshore Estates levee, the marsh deposits will transition into areas of fill deposits overlaying shallow Pleistocene deposits. This is due to the system of filling used to develop the Slidell and Eden Isles areas. The top 5 to 15 feet of fill consists of silt and clay with some sands. A compressed marsh section mat exists under the fill section depending on how development occurred, and this is underlain by Pleistocene Prairie Terrace Deposits.

At the point that a thorough geotechnical investigation plan is conducted along the alignment, a geologic profile should be developed for the project alignment for future reference.

2.0.3 Furnished Information and Locations

USACE has very limited boring information in St. Tammany Parish. Eustis Engineering LLC provided all the job reports for projects that they had completed in St Tammany Parish. Projects that had boring information were plotted based on the project location. Borings of appropriate depth were considered for use for this study. The closest available projects to levee or structural features which had geotechnical investigations were used to develop parameters. Levees were not broken into individual geotechnical reaches. Sections analyzed were based on hydraulic reaches. Boring data located within the vicinity to study features with enough data of sufficient depth was used to get soil information for development of parameters. Parameters were utilized throughout an entire levee or structural feature. Future analyses should take site specific information and a more refined parameter selection process should be developed. This could result in a more refined geotechnical design involving more geotechnical reaches. Many of the levee features given in the alternatives are many miles long, so a levee feature may have multiple reaches requiring the full scope of geotechnical analyses instead of one per feature as done for the TSP analysis. The lack of subsurface information and the number of assumptions required as a result are noted in the risk register.

The TSP alignment includes 7 hydraulic reaches and are captured in 4 different geotechnical areas of study. These are the West Slidell area, the Oak Harbor area, the I-10 crossing, and Slidell East and Northeast. When applicable, the closest Eustis report that had viable boring information was

utilized. The Eustis project number, boring information including number and depth, proximity to feature and assumptions are contained within.

West Slidell Section: Slidell West Levee.

Slidell West Levee (Reach 1):

The levees would commence on the south side of US Highway 190 and South Tranquility Road, and on the eastern side of Pineridge Road. The alignment would track southward and would run on the west side of Tranquility Road (CC Road) and then it would turn in the southeast direction crossing Bayou Paquet Road and would stay on the east side of Bayou Paquet Channel to avoid impact to the Big Branch Marsh National Wildlife Refuge (NWR). The alignment would cross Bayou Paquet and Bayou Liberty and would continue eastward on the northside of the Big Branch Marsh NWR. The alignment would cross Bayou Bonfouca and would continue on the south bank of the bayou (northern side of the refuge) until reaching the Norfolk Southern Railway Corp railroad tracks west of US Highway 11 in the vicinity of Dellwood Pump Station in Slidell.

The closest boring is at Delwood Pump Station at the far eastern end of the hydraulic reach taken from Eustis Engineering project No. 13965. Delwood pump station is at the corner of the eastern end of the west Slidell levee alignment and the northern end of the Slidell railroad wall. This boring information was used for development of the soil parameters for settlement of the levee and for pile capacities for structures within the first hydraulic reach. The stability analysis for the levee section utilized generalized values assumed from soils in southeast Louisiana.

The parts of the alignment that are west of Delwood Pump Station are in a non-developed area with little geotechnical information. It is probable that the borings utilized at the Delwood Pump Station are overestimating the strengths occurring in the undeveloped parts of the alignment where marsh deposits are more likely near the surface. An alternative section which utilized c/p values multiplied by a factor of 0.22 was used to estimate in-situ material strengths. This proved to also overestimate the strengths to estimate the need for berms, so strata was taken in 10 foot increments and starting with a typical weak value for marsh of 200 psf. Every 10 feet, 50 psf was added to the cohesion values until the strength line intersected the c/p value. From this point the c/p value was used. The parameters can be found in section 3 of Annex A3. The current berm section was created to help give a more accurate fill quantity count for estimation purposes for berms would likely be utilized in actual construction.

There are five structures in the West Slidell section of the alignment. These include the W Doucette Road Gate, West Bayou Pacquet Gate, Bayou Pacquet Gate, Bayou Liberty Gate, and Bayou Bonfouca Gate. No boring data was available in in these locations. The closest is at Delwood pump station from Eustis Engineering project No. 13965. This boring was used to establish soil properties such as unit weight, cohesion, and material type and utilized for structural analysis and levee settlement. The alternative section was utilized to analyze levee stability.

South Slidell Section: Oak Harbor, I-10 Crossing, Slidell East and Northeast Levee.

Oak Harbor Levee (Reach 2):

From the railroad gate connecting West Slidell with South Slidell, the alignment would transition to a floodwall running parallel along the east side of the railroad tracks. The alignment would transition to levee when it turned east toward Highway 11. The alignment would cross Highway 11 and would turn south in the vicinity of the existing Schneider Canal Pump Station and then turn east (on a portion of the existing Oak Harbor ring levee). The alignment would then turn north and then east in the vicinity of the I-10.

Boring information from Eustis Engineering project No. 10120 was utilized for development of geotechnical parameters for this section. The report totals 20 borings that make up the Oak Harbor ring ranging from 20 to 50 feet deep. Thirteen of those borings are along the proposed Oak Harbor alignment. This stretch of the alignment gives the greatest confidence against risk of changing in Preconstruction Engineering and design (PED) phase, however additional explorations and testing are still required to meet design requirements.

The floodwall along the West Slidell railroad divides the West Slidell Levee Section from the Oak Harbor Levee Section. Boring information was also taken from borings taken for Delwood Pump Station from Eustis Engineering project No. 13965 to establish soil properties such as unit weight, cohesion, and material type. Delwood pump station is at the corner of the eastern end of the west Slidell levee alignment and the northern end of the Slidell railroad wall.

I-10 Crossing (Reach 3):

The alignment at I-10 would be raised to ramp over the new levee section. This lift will be applied to clear the 2082 elevation with settlement to avoid future work for maintenance at the I-10 crossing.

Borings from Eustis Engineering project No. 10120 was again utilized for development of geotechnical parameters for this section. There are two borings taken directly below interstate 10.

Slidell East and Northeast (Reach 4):

The alignment would continue southeast and would tie to an existing portion of the Lakeshore Estates ring levee. The alignment then would turn north and then east and cross Old Spanish Trail/Highway 433. The alignment would continue north and tie to a portion of the existing King's Point west levee and would turn north. Immediately south of Highway 190 Business the alignment would turn from levee to floodwall to provide risk reduction to the existing Hardin Road power substation. The alignment would wind northerly before tying into high ground in the vicinity of I-10.

There was no geotechnical information from King's Point west levee. Eustis Engineering project No. 10802 was developed to address seepage around a bend of the northern end of the Lakeshore Estates levee (approximately 100 feet south of the TSP alignment), but very little strength data was within, and none at a greater depth than 15 feet. Eustis Engineering project No. 10120 has geotechnical information at the western end of this reach (at I-10) and approximately 1700 feet from the Lakeshore Estate levee on its western side. The geotechnical information goes down to depths of 50 feet. No other geotechnical information was provided this far east. Eustis Engineering project No. 10120 was utilized for parameter development and analyses for the Slidell East and Northeast levees.

Three structures are within the Slidell East and Northeast section of the alignment. These are the northeast tie-in wall, the Lakeshore Estates Northeast Gate and Kingspoint W14 Canal Gate. The closest boring to the Northeast tie-in wall is at Slidell Memorial Hospital from Eustis Engineering project No. 13418 which is approximately 2.5 miles away from the project location. Borings taken from Oak Harbor Pump Station from Eustis Engineering project No. 10463 were used for the Lakeshore Estates Northeast Gate and Kingspoint W14 Canal Gate. The boring is 1.5 miles from Lakeshore Estates Northeast Gate and 2.1 miles from Kingspoint W14 Canal Gate. Soil properties such as unit weight, cohesion, and material type were taken from these borings.

2.0.3 Methodology and Assumptions

The Hurricane and Storm Damage Risk Reduction System (HSDRRS) design criteria was used as a reference to direct design criteria. For actual construction, a full geotechnical exploration plan should be developed with investigations taken at every 500 feet off center with borings alternating between 5-inch continuous Shelby tube borings (undisturbed) and 3-inch Shelby tube borings (general type) or cone penetrometer test (CPT). These explorations should include comprehensive testing and full development of site-specific parameters. The project areas across the alignment would be further refined which would divide into numerous reaches based on subsurface profiles, topography, and design elevations.

Stability and seepage analysis follows HSDRRS guidelines for factor of safety requirements. Levees were analyzed for 2032 and 2082 project grade elevation with some overbuild to account for settlement. Water levels were checked for the overbuild elevation (1-2 feet above project grade) and the project grade elevation as well as low water condition in the evaluation of the Q-case (i.e., undrained). S-case (i.e. drained) analysis were also performed for low water cases for flood side and land side analyses. Q case analyses utilize unit weight and cohesion for stability parameters, whereas S-case utilize unit weight and friction angle for stability parameters. In the case of the levee sections without berms, the factor of safety for Scase low water was the same for only a centerline vertical was assumed for analysis with no variation at the toes. Block Searches and Circular were done for Spencer's analysis. Janbu was used as a design check in lieu of Method of Planes. The HSDRRS guidelines for factor of safety requirements for Method of Planes was followed for Janbu analyses. Elevations for far off timelines like 2082 would typically not be checked for stability, but was performed in this case to give an idea for future right of way (ROW) considerations. Table 1 below summarizes these HSDRRS criteria.

Table 1: Deep-Seated Global Stability FOS for Levee Embankment Design

COMPONENT	ANALYSIS TYPE		HSDRRS (Janbu instead of MOP), MINIMUM FOS
Levee Embankment	**Deep-Seated Global Stability (Spencer's Method)**	Design Hurricane (SWL)	1.50
		Water at Project Grade	1.40
		Low Water (hurricane condition)	1.40
		Low Water (non-hurricane condition) S-case	1.40
		Design Hurricane (SWL) w/ dry PS borrow pit	N/A
		Water at Construction Grade	1.20
		Water at Interim Construction Grade (levees designed with staged construction)	1.50
	Deep-Seated Global Stability (Design Check with Janbu's Method)	Design Hurricane (SWL)	1.30
		Water at Project Grade	1.20
		Low Water (hurricane condition)	1.30
		Low Water (non-hurricane condition) S-case	1.30
		Design Hurricane (SWL) w/ dry PS borrow pit	N/A
		Water at Interim Construction Grade	1.30

A simple levee section was analyzed on the different alternatives for stability and settlement. For stability, a ten-foot crown with 1V:3H slopes were analyzed to check stability for a minimum levee section. Stability was checked at the highest 2032 design elevation along a given levee alignment. With more site-specific data, and a full HSDRRS analysis, the levee as designed here may no longer be feasible and stability berms, reinforcement geotextile, or deep-soil mixing may be necessary to meet HSDRRS criteria.

For settlement, a ten-foot crown with 1V:3H slopes were analyzed to give the loading for a simple levee section. Settlement was checked on an overbuild section that was 2.5 feet above the 2032 design elevation and plotted on a 50-year gradient line with 2032 to 2082 design elevations

For estimating structural design features, HSDRRS criteria was followed to create pile capacity curves for 18-inch pipe piles. The parameters include the lateral earth pressure coefficient, k, and the bearing capacity factors, N_c and N_q. A summary of the design values that MVN-ED-F assumed for these parameters for clay and sand material for non-displacement-type piles is included in Table 2 below. Lane's weighted creep analyses were performed assuming water loads to the top of the wall for 2082 design elevations. These were used to help inform on sheet pile lengths for quantity estimates.

Table 2: HSDRRS properties for Pile capacity

MATERIAL	**UNDRAINED CONDITIONS**				**DRAINED CONDITIONS**			
	K_c	**K_t**	**N_c**	**N_q**	**K_c**	**K_t**	**N_c**	**N_q**
CH	1	0.7	9	1	1	0.7	0	10
ML	1	0.35	12.9	4.5	1	0.35	0	19.5
SM	1.25	0.5	0	22.5	1.25	0.5	0	22.5

2.0.4 Boring and Design Information

Test information taken from the borings found in the reports mentioned in section 2.0.2 were used to create parameters for stability analysis. This test information can be found in annex 2 (section 2). Seven different strength lines were developed for the various features (floodgates/levees) throughout the alignment in the different alternatives. These strength lines were plotted based on data acquired from unconfined compression tests (UCT) and one-point unconsolidated undrained overburden tests taken from the borings. Borings are 3-inch as they are not taken for U.S. Army Corps of Engineers (USACE) Mississippi Valley Division (MVN) specific projects. For a typical USACE-MVN hurricane risk reduction project, 5-inch undisturbed borings would be taken and three-point unconsolidated undrained (Q) triaxial compression tests would be performed. Atterberg limit tests were also performed from these selected boring samples. The location of these borings can be found in the table below. Note that Eustis reports had one set of coordinates per job, so jobs that have more than one boring have the same coordinate. The boring information that was available can be found in section 2 of annex A3.

Table 3:Borings Utilized

Eustis Job No. 13965 Used For West Doucette, Slidell Railroad, Bayou Bonfouca Floodgate, Bayou Liberty Floodgate, Bayou Pacquet Floodgate, West Bayou Pacquet				
Boring No.	Latitude	Longitude	Ground EL	Depth
B-1 (EE 13965)	30° 15' 15.73" N	89° 47' 18.18" W	NA	80'
Eustis Job No.13418 Used For Northeast Tie-in				
B-1 (EE 13418)	30° 17' 0.97" N	89° 46' 6.10" W	NA	40'
B-2 (EE 13418)	30° 17' 0.97" N	89° 46' 6.10" W	NA	40'

B-3 (EE 13418)	30° 17’ 0.97” N	89° 46’ 6.10” W	NA	40’
A-1 (EE 13418)	30° 17’ 0.97” N	89° 46’ 6.10” W	NA	10’
A-2 (EE 13418)	30° 17’ 0.97” N	89° 46’ 6.10” W	NA	10’
Eustis Job No. 10120 Used For South Slidell Levee				
B-1 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	50’
B-2 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-3 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-4 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-5 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-6 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-7 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-8 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	50’
B-9 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-10 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-11 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-12 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-13 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-14 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-15 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	50’
B-16 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-17 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-18 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-19 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-20 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	50’
Eustis Job No. 10463 Used For W-14 Floodgate, Lakeshore Estates Northeast Gate, Kingspoint				
Boring No.	Latitude	Longitude	Ground EL	Depth
B-1 (EE 10463)	30° 14’ 29.80” N	89° 46’ 38.66” W	1.6	50’
B-2 (EE 10463)	30° 14’ 29.80” N	89° 46’ 38.66” W	2.15	100’
B-3 (EE 10463)	30° 14’ 29.80” N	89° 46’ 38.66” W	5	50’

No settlement test data was available, so correlations which use water contents from the strength and compression tests and the liquid limits from the Atterberg tests that were taken in some areas.

The initial void ratio (or e0) was calculated by multiplying the water content results from the strength tests by the specific gravity and assuming the soil is saturated. The specific gravity was assumed to be 2.7, so the equation is as seen below.

$$E0 = wGs/S \text{ or } 2.7w/100$$

The compression index (or Cc) was calculated as a function of the in-situ water content. All clays in analyses were classified as fat or lean clays (CH and CL) which is typical for southeast Louisiana. The Cc correlation data points were based on a Plasticity Index correlation found in

"Correlation of Compression Index and Soil Properties of New Orleans Area Clays," Table 16, dated 04 September 2011. The equation can be seen below.

$$Cc = 0.017w - 0.299$$

Recompression index (or Cr) values were chosen as 20% of the Compression Index (or Cr) as recommended in the "Correlation of Compression Index and Soil Properties of New Orleans Area Clays" report. All soil was assumed as normally consolidated for this study, so the overconsolidation ratio (or OCR) is assumed as 1. This is a conservative assumption as OCR values are typically overconsolidated near the surface resulting in lower settlement estimates. Unit weights in the settlement analysis are taken from the same values used in the stability parameters.

The C_v correlation data points were based on a water content correlation which can be found in NAVFAC DM-7. 1, and is included as Figure 1 below. Since the correlation is only provided in graphical form in the NAVFAC DM, an equation was estimated for the C_V correlation using Microsoft Excel. The image was first imported into Microsoft Excel and points were manually added to match the C_V correlation line. Next, a trend line was added to these points and the power function option was selected. The resulting equation may be found below. In areas where no liquid limit values are available, values between 10 and 50 which is in the Settle/3D recommended value range and among the high average of tested values from the available Atterberg test information. $C_{V\,and}\,C_{Vr}$ values were set to be equal to each other in the analysis.

$$C_V = 9809.9LL^{-2.847}$$

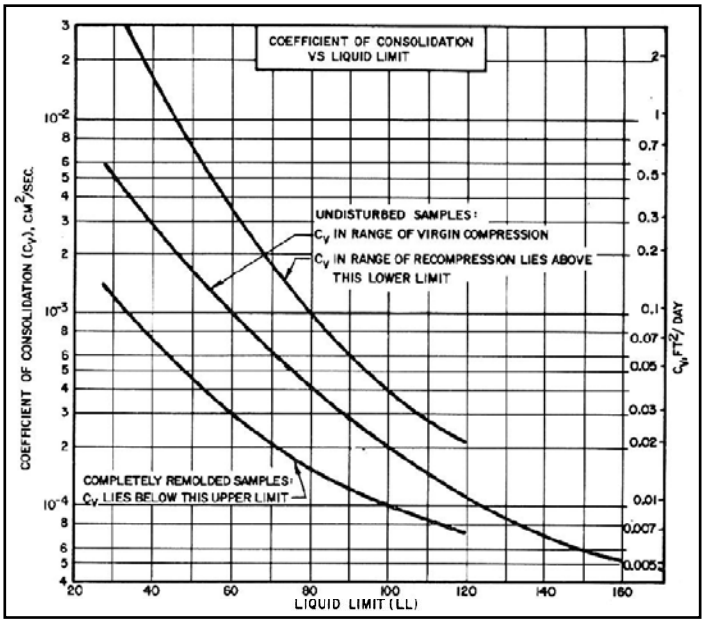


Figure 1: Approximate Correlations for Consolidation Characteristics of Silts and Clays (FIGURE 4 from the NAVFAC DM, 7.1-144)

Design parameters, correlation plots, and strength plots can be found in section 3 of annex A3.

2.0.5 Levee Stability Analysis

The stability of the earthen levees was analyzed in SLOPE/W version 10.0.0.17401 from the Geostudio Suite of programs. The methodology used in cross sections was Spencer's method with design checks done with Janbu's method analyses. Spencer's stability was performed on overbuild sections to account for settlement. Entry-exit and block searches with tension cracks applied to the driving side were checked for water at the top of the levee, at project grade water level, and low water at the ground surface. Failure surfaces were then optimized. Janbu checks were performed with block searches done with no tension cracks or optimization. S-cases were performed in both Spencer's and Janbu analyses on each section for low water analysis. All S-case runs are not optimized and have no tension cracks.

Table 2: 2032 Spencer's Factor of Safety

Project Feature	2032 Design EL	2032 Overbuild EL	FS at top of levee	FS at project grade	FS at low water	FS S-case Land Side	FS S-case flood side
West Slidell	+13.5	+14.5	1.38	1.56	1.41	2.49	2.21
Oak Harbor	+14	+15.5	2.24	2.27	2.28	1.48	1.48
I-10 crossing	+15	+16.5	2.13	2.14	2.15	1.40	1.40
Slidell East & NE	+16	+17.5	2.01	2.03	2.03	1.41	1.41

Table 3: 2032 Janbu Factor of Safety

Project Feature	2032 Design EL	2032 Overbuild EL	FS at top of levee	FS at project grade	FS at low water	FS S-case Land Side	FS S-case flood side
West Slidell	+13.5	+14.5	1.31	1.35	1.43	2.32	2.50
Oak Harbor	+14	+15.5	1.95	2.00	2.07	1.32	1.32
I-10 crossing	+15	+16.5	1.84	1.89	1.95	1.31	1.31
Slidell East & NE	+16	+17.5	1.74	1.79	1.85	1.30	1.30

The stability results for these levee sections can be found in table 2.1 below. Checks were performed for 2082 levee sections also. This was performed to get an idea if levee sections without design berms would continue to fit in the anticipated right of way at the end of the 50-year life cycle of the levee. The West Slidell levee section transitions into high ground just south of S. Tranquility Rd where the ground surface is higher than the 2032 design elevation of +13.5 ft. A small unbermed levee section was checked for a slight overbuild 2082 elevation of +19.0 ft.

The 2082 stability results for Spencer's and Janbu's methods can be found in table 4 and 5 respectively.

Table 4: 2082 Spencer's Factor of Safety

Project Feature	2082 Design EL	2082 Overbuild EL	FS at top of levee	FS at project grade	FS at low water	FS S-case Land Side	FS S-case flood side
West Slidell	+17.5	+19	1.43	1.42	1.42	1.41	1.41
Oak Harbor	+17.5	+19	1.86	1.88	1.88	1.99	1.99
I-10 crossing	+18.5	+21.5	2.07	2.09	2.08	1.40	1.40
Slidell East & NE	+20	+21.5	1.67	1.68	1.68	1.41	1.41

Table 5: 2082 Janbu Factor of Safety

Project Feature	2082 Design EL	2082 Overbuild EL	FS at top of levee	FS at project grade	FS at low water	FS S-case Land Side	FS S-case flood side
West Slidell	+17.5	+19	1.49	1.55	1.71	1.31	1.31
Oak Harbor	+17.5	+19	1.61	1.66	1.71	1.98	1.98
I-10 crossing	+18.5	+21.5	1.84	1.93	1.95	1.31	1.31
Slidell East & NE	+20	+21.5	1.43	1.47	1.53	1.30	1.30

The West Slidell Levee section starts at the Norfolk Southern Railway Corp. railroad west of US Highway 11 in the vicinity of Dellwood Pump Station in Slidell and tracks westward until tying into high ground on the south side of US Highway 190 and South Tranquility Road. This entire section is in undeveloped marsh area and consists of flood side and land side stability berms. These bermed areas required slightly higher shear strengths for stability. These strength gains were within reasonable expectations for strength gain after decades of consolidating pressure. A reinforcement geotextile was also utilized to keep the berm sizes within the established right of way of the 2032 levee section. For this section, stability was checked trough, around, and in front of the geotextile. To meet 2082 design elevations, a 110 ft geotextile with 13,200 lbft/ft in strength. The 2082 stability results for the West Slidell berm section for Spencer's and Janbu can be found in table 6 and 7 respectively.

Table 6: 2082 West Slidell Berm Section Spencers Factor of Safety

Analysis	***Around***	***Through***	***In Front***
Q-case High Water (top)	1.34	1.38	1.97

Q-case Project Grade	1.40	1.42	1.96
Q-case Low Water Flood Side	1.40	1.43	2.59
Q-case Low Water Land Side	1.66	1.43	1.97
S-case Flood Side	3.64	3.28	2.31
S-case Land Side	4.63	3.32	2.06

Table 7: 2082 West Slidell Berm Section Janbu Factor of Safety

Analysis	***Around***	***Through***	***In Front***
Q-case High Water (top)	1.40	1.32	2.02
Q-case Project Grade	1.49	1.37	2.02
Q-case Low Water Flood Side	1.63	1.44	2.69
Q-case Low Water Land Side	2.10	1.46	2.02
S-case Flood Side	3.66	3.06	1.41
S-case Land Side	4.70	2.97	1.44

2.0.5 Settlement Analysis

Settle3D Version 4.013 by Rocscience Inc., was used for the settlement analysis for the levee sections. Embankment sections with a ten-foot crown with 1V:3H slopes were used to model the loading on the soil. No settlement test data was available, so correlations were utilized from the test data. The lift schedules were created with a family of settlement curves based on CEMVN's experience with soft soils in southeastern Louisiana. Settlement was calculated at the levee centerline for overbuilt levee sections to give time for levee section to settle before needing to be lifted to stay above future hydraulic design grades. Lift schedules were created to serve as a guide for fill estimates for the 50 year life of the project. The settlement output can be found in section 5 of Annex 3. The family of curves and lift schedule can be found in section 6 of Annex 3.

All elevations used in analysis are referenced to the North American Vertical Datum of 1988 (NAVD 88 (2004.65)). The existing elevations were obtained from the LIDAR raster dataset developed in the U.S. Geological Survey Watershed Boundary Dataset (WBDHU12) and tied to the NAVD88 (2004.65) datum.

West Slidell Section: Lacombe, Bayou Bonfouca, Slidell West Levee

The preliminary design elevation is +13.5 ft for the levee. A levee section of elevation +14.5 ft (1 ft above the 2032 design elevation) with an assumed ground surface of +2.0 ft (taken from LIDAR dataset), 1 on 3 slopes and a 10-foot crown was used as a cross section in the initial lift in 2032. The levee section has a 99 ft berm on the land side and an 84 ft berm on the flood side. The second lift is estimated to elevation +16.0 ft in 2033 followed by a lift to Elevation +17.5 ft in 2038, elevation +19.0 ft in 2051, and elevation +19.0 ft in 2076. The schedule was estimated for the West Slidell section with the berms (reach 1) and applied to entire West Slidell levee section including the tie-in section without berms (reach 1A). Lifts for the tie-in section would

not include the berms and ground surface is higher. As a result, lifts would not utilize as much fill, but the schedule was kept the same to stay conservative for fill quantity estimates given the lack of site specific geotechnical subsurface information.

South Slidell Section: Oak Harbor Levee

The preliminary design elevation is +14.0 ft for the levee. A general levee section of 15.5 ft (1.5 ft above the 2032 design elevation) with an assumed ground surface of 0 ft (taken from LIDAR dataset), 1 on 3 slopes and a 10-foot crown was used as a cross section in the initial lift in 2032. The second lift is estimated to elevation +17.0 ft in 2035 followed by a lift to Elevation +18.0 ft in 2048, and elevation +19.0 ft in 2064. The TSP alignment tracks along the southern edge of the existing Oak Harbor ring levee. The settlement analysis takes into account the entire levee section including the existing ring levee. The existing levee has likely prestressed the soil, so settlement estimates are likely conservative. Estimates remain conservative for fill quantity estimates.

South Slidell Section: I-10 Crossing

For stability, a theoretical levee cross section with 1 on 3 slopes and a 10-foot crown. For settlement, a 2200 ft wider and flatter section that would sit over the existing Interstate 10 section was assumed for settlement. The wider section allows for a better approximation of fill that would be placed over the existing Interstate 10 highway and build it high enough that after settling the road elevation would remain over the 2082 elevation. Thus, design elevation used in analysis was +21.5 ft with an assumed ground surface at the Interstate 10 highway of +10.0 ft (taken from LIDAR dataset). The levee and the Interstate 10 would be lifted during first construction in year 2032 to construction elevation of +21.5 ft with no future lifts planned to avoid future disruptions to the traffic on the interstate.

South Slidell Section: Slidell East and Northeast Levee

The preliminary design elevation for the Slidell East and Northeast levee section is +16.0 ft for the levee. A general levee section of +17.5 ft (1.5 ft above the 2032 design elevation) with an assumed ground surface of 0 (taken from LIDAR dataset), 1 on 3 slopes and a 10-foot crown was used as a cross section in the initial lift in 2032. The second lift is estimated to elevation +19.0 ft in 2034 followed by a lift to Elevation +20.5 ft in 2047, and elevation +21.5 ft in 2064. The TSP alignment tracks along sections of the Lakeshore estates ring levee and King's Point West levee. The settlement analysis takes into account the entire levee section including the existing ring levee. The existing levee has likely prestressed the soil, so settlement estimates are likely conservative. Estimates remain conservative for fill quantity estimates.

2.0.6 Seepage

As previously noted, little geotechnical information is located on the project alignment. The threat of seepage is highly dependent on the presence of aquifers: material with a granular makeup that allows water to freely flow through underneath the levee section. Because the scope of the project is large and the location, extent, depth and proliferation is largely unknown; the seepage analysis consisted of different iterations to see what kind of blanket would be required to meet factor of safety requirements against threats of seepage and piping at the toes of the levee.

Two different embankment sections were checked. A 15-foot embankment section with the largest head differential of fifteen feet like in South Slidell or Pearl River and a 9-foot embankment with the smallest head differential of nine feet like in Bayou Lacombe and Eden Isles. Two different aquifer sizes were checked. The first was a 12-foot aquifer which was representative for the larger end of sand strata found in geotechnical boring information that does exist on the northern shores of Lake Pontchartrain. The second was a 20-foot aquifer to represent what would represent a large strata of sand encountered in southeastern Louisiana.

Seepage parameters were estimated based upon Figure 2-5, “Approximate range in coefficient of permeability of soils and rocks” from EM 1110-2-1901, Seepage Analysis and Control for Dams. Conservative values for sand, silt, and clay were chosen and are shown in Table 2 below. A Ky’/Kx’ anisotropy ratio of 0.25 was used for silt and clay, and an anisotropy ratio of 1.0 was used for sand.

Table 3 - Seepage Parameters

MATERIAL	COEFFICIENT OF PERMEABILITY (cm/sec)	COEFFICIENT OF PERMEABILITY (ft/sec)
Sand	5.00E-02	1.64E-03
Silt	6.00E-05	1.97E-06
Clay	5.00E-07	1.64E-08

The analyses were aiming to achieve a 1.6 factor of safety and aquifers were adjusted to various elevations until a factor of safety of 1.6 was cleared. Overburden used for calculations was 115 pcf for total stress or 52.6 pcf for effective stress. USACE levee specification requires levee construction to a density of 115 pcf and the low average of densities observed in the first 30 feet of the boring information at hand. Effective stress steady-state analysis was performed on the two representative levee sections.

The 9-foot embankment section met minimum factor of safety with a 9 foot clay blanket and the 20 foot embankment section met minimum factor of safety with a 22 foot clay blanket. Results were identical for the 12-foot aquifer and the 20 foot aquifer. Once a full geotechnical exploration program is developed, special attention should be made to the location of the sand. If

it is located less than 9 feet down or overburden appears to trend less than 115 pcf total stress than a seepage berm may need to be considered. For the larger levee sections with potentially 15 feet of head differential, any sand encountered less than 22 feet down or similar weaker overburden should anticipate the need for a seepage berm. The levees will be constructed of compacted clay and erosion is not expected to occur at the toes.

Seepage results can be found in section 7 of Annex 3.

2.0.7 Mile Branch Channel Improvements

The Mile Branch channel improvements are further north from the TSP alignment which largely occurs in and around Slidell, Louisiana. The Mile Branch channel improvements would start at the intersection of Mile Branch and Highway 190, crossing Highway 190 Business, and ending at the intersection of Mile Branch and the Tchefuncte River.

The improvement involves clearing and grubbing and deredging of the channel. The channel dimensions after cdreding will be 11 feet deep with slopes on a 1 vertical to 3 horizonjtal slope with a 76 foot width. No geotechnical explorations were available in the area. The same subsurface assumptions made for the West Slidell levee were used for channel stability evaluations.

Channel stability results can be found in section 11 of Annex 3.

2.0.8 Structural Elements

Several structural elements are necessary throughout the alignment where levees are not practical. Floodwalls are implemented in areas where right-of-way (ROW) is limited and gates are implemented where access is necessary. Design elevations for the structures is the 2082 hydraulic design grade for a 100 year return period storm. The 2082 elevation for structures is slightly lower than adjacent levee sections. The levee and wall/gate elevations were designed for an allowable overtopping rate of 0.1 cfs/ft (as was done in the HSDRRS design) using overtopping equations from the 2018 EurOtop manual. The equations for computing overtopping rates are slightly different for levees vs. floodwalls since the equations for a levee include an input for slope of the levee (and were designed with wave runup in mind) whereas for a floodwall there is no slope since it is vertical.

For the TSP feasibility study only pile capacities and seepage analyses were performed to inform on quantities for 18-inch pipe piles and sheet piles necessary for all structures throughout the alignment.

Pile capacity curves for 18-inch diameter open ended steel pipe piles were developed. The 2010 version of the Pile Capacity software developed by Daniel Haggerty, P.E. of MVN-EDG was used. Ultimate (i.e. Factor of Safety equal to 1.0) tension and compression capacities for the undrained and drained conditions were developed. Unbalanced loads were not calculated as part of the study, and as such pile capacity curves are taken from the ground surface. Because of the

nature of the pile (hollow pipe), the development of an inner soil plug was considered for compressive capacities. The theoretical frictional capacity of the soil plug along the inner surface of the pile was compared to the theoretical bearing capacity of the end area of the plug. The lesser of the two was taken as the end bearing of the plug and was added to the bearing capacity of the pile (steel area only) and the frictional capacity of the outer shaft surface of the pile to obtain the total compressive capacity of the pile. End bearing capacity for cohesive soils for undrained conditions with cohesive values less than 1,000 psf were not considered. Overburden stress was limited to 3,500 psf and did not consider pile batter in determination of skin friction capacity. The pile capacity curves do not consider group effects. Densities were derived from the material tests from the individual Eustis reports. Other parameters such as lateral earth pressure coefficient, k, and the bearing capacity factors, N_c and N_q were taken from HSDRRS.

West Slidell Section: W Doucette Road Gate, West Bayou Pacquet Gate, Bayou Pacquet Gate, Bayou Liberty Gate, and Bayou Bonfouca Gate

The preliminary design elevation for all West Slidell structures including the W Doucette Road Gate, West Bayou Pacquet Gate, Bayou Pacquet Gate, Bayou Liberty Gate, and Bayou Bonfouca Gate is +16.0 ft to satisfy the 2082 required hydraulic design grade. All of these structural features utilized the boring information at Delwood pump station from Eustis Engineering project No. 13965 for soil properties such as unit weight, cohesion, and material type. Pile Capacity analyses and Lane's weighted Creep analyses were performed to determine sheet pile lengths and pile lengths for quantity estimates. Sheet pile length was recommended to be 30 ft.

Oak Harbor: Slidell Railroad

The floodwall along the West Slidell railroad divides the West Slidell Levee Section from the Oak Harbor Levee Section. Boring information was also taken from Delwood Pump Station from Eustis Engineering project No. 13965 to establish soil properties such as unit weight, cohesion, and material type. The preliminary design elevation for the Slidell Railroad floodwall is +16.5 ft. Pile capacity analyses and Lane's Weighted Creep Analysis were performed to help inform on pile lengths for quantity estimates in the final array. Sheet Pile length was recommended to be 30 ft.

South Slidell: Lakeshore Estates Northeast Gate, Kingspoint W14 Canal Gate

The Lakeshore Estates Northeast Gate and Kingspoint W14 Canal Gate both have preliminary design elevations of +18.5 ft to satisfy the 2082 required hydraulic design grade. Soil properties such as unit weight, cohesion, and material type were taken from the boring at Oak Harbor Pump Station from Eustis Engineering project No. 10463 and used for analyses. Pile capacity analyses and Lane's Weighted Creep Analysis were performed to help inform on pile lengths for quantity estimates in the final array. Sheet Pile length was recommended to be 30 ft.

South Slidell Section: Northeast Tie-in Wall

The preliminary design elevation for the Northeast Tie-in is +18.5 ft to satisfy the 2082 required hydraulic design grade. Soil properties such as unit weight, cohesion, and material type were

taken from the boring at Slidell Memorial Hospital from Eustis Engineering project No. 13418 and used for analyses. Pile capacity analyses and Lane's Weighted Creep Analysis were performed to help inform on pile lengths for quantity estimates in the final array. Sheet Pile length was recommended to be 40 ft.

Pile capacities and Lane's weighted Creep results can be found in section 9 and 10 respectively in Annex 3.

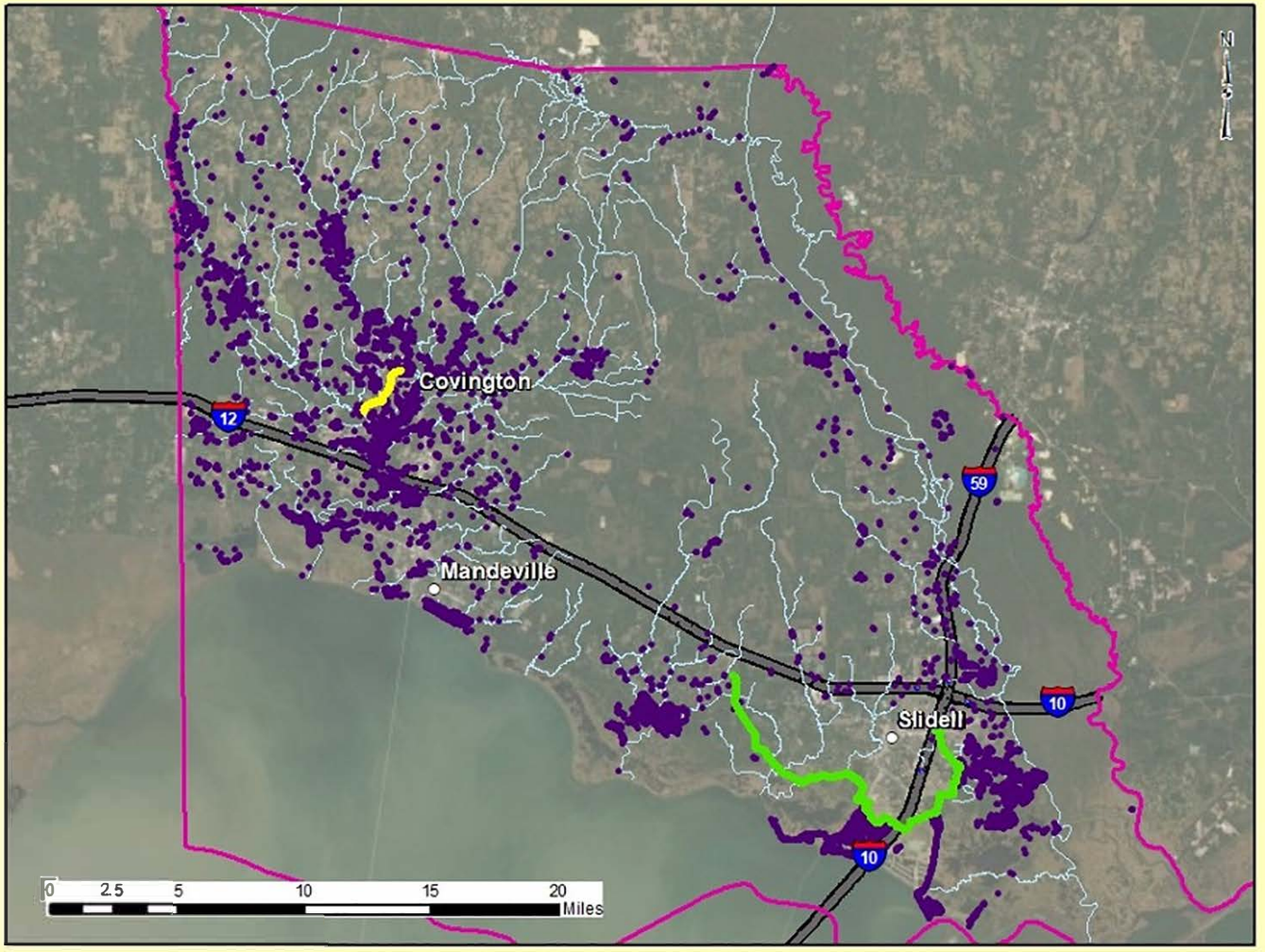
2.0.8 Conclusions and Recommendations

Geotechnical Analysis were performed on levee features and structural features on the TSP alignment. Geotechnical data was limited. For many features, the closest geotechnical investigations were utilized rather than site specific borings. Also, the number of borings that may have been available for a given feature may have been limited. This resulted in few borings not on the alignment to help inform decisions on the final array. As a consequence, analyses made a lot of assumptions to complete preliminary checks. These assumptions were primarily made to aid in quantity estimates, but a full geotechnical exploration program should be developed and implemented with associated testing to better inform on soil conditions along an alignment. This should be completed before any design sections are analyzed for PED.

SECTION 1

Maps of Closest Borings

St. Tammany Feasibility Study: Optimized Tentatively Selected Plan Alternatives



U.S. Army Corps of Engineers
New Orleans District

Alternatives

- (1) South Slidell and West Slidell Levee and Floodwall System
- (2) Mile Branch Channel Improvements
- (3) Nonstructural Plan

Location Map



Date: 3/22/2022

Optimized Tentatively Selected Plan for the South Slidell and West Slidell Levee and Floodwall System



U.S. Army Corps of Engineers
New Orleans District

Alternatives

South Slidell and West Slidell Levee and Floodwall System

- 2032 Optimized TSP
- 2082 Western Extension

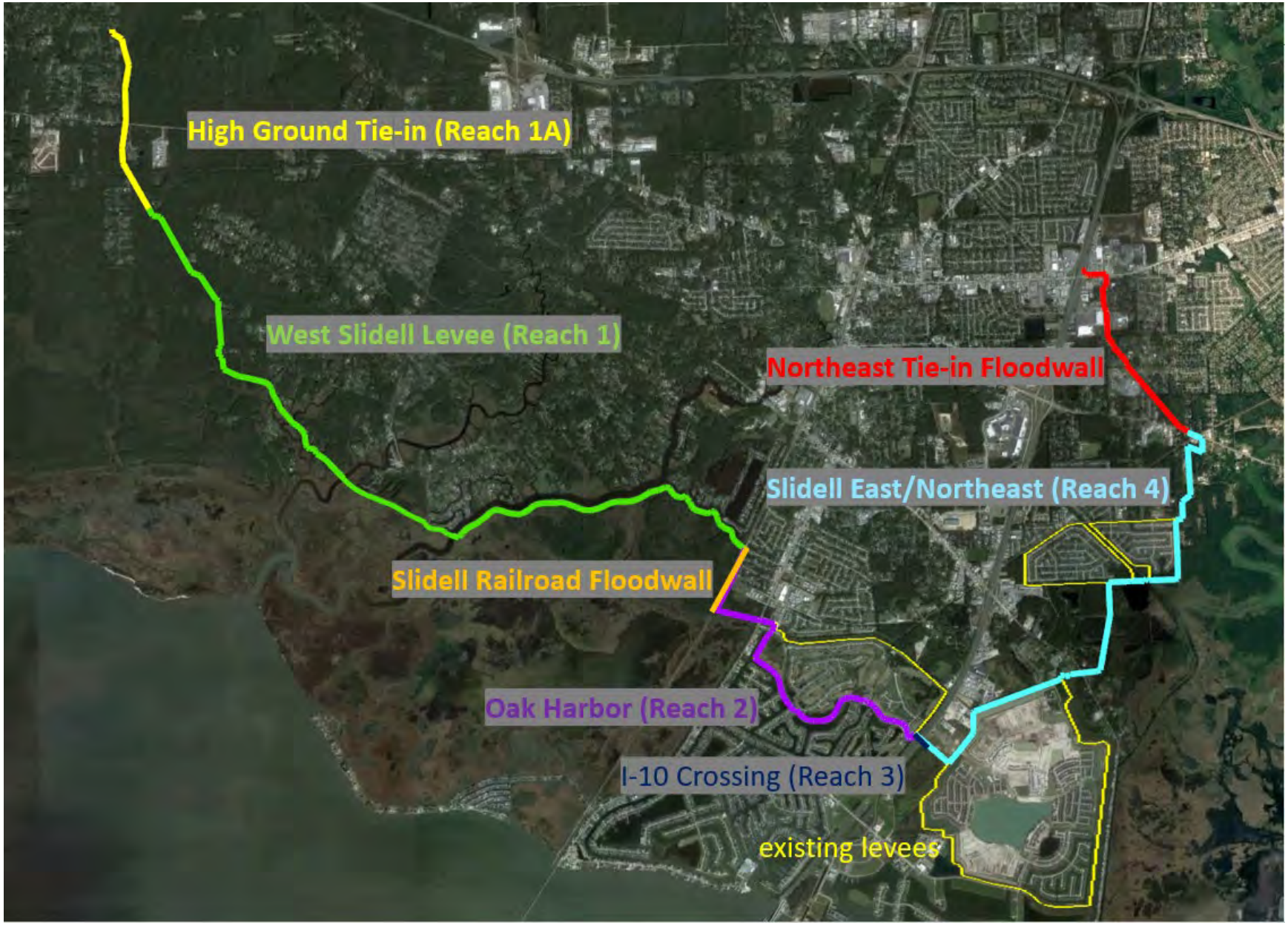
Existing Alignments

- Slidell Levees
- Authorized SELA Schneider Canal
- Railroad

Location Map



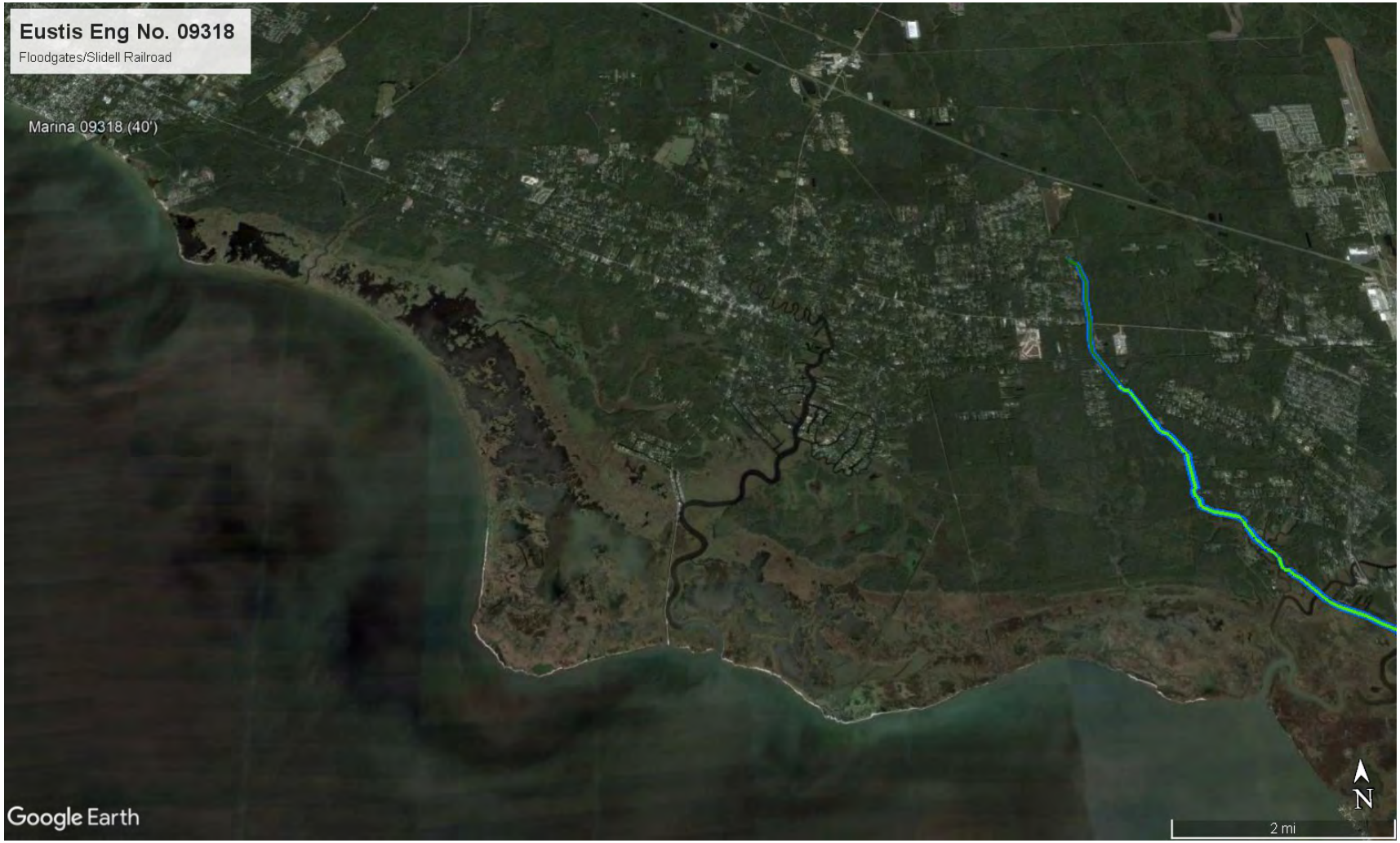
Date: 3/25/2022


High Ground Tie-in (Reach 1A)
West Slidell Levee (Reach 1)
Northeast Tie-in Floodwall
Slidell East/Northeast (Reach 4)
Slidell Railroad Floodwall
Oak Harbor (Reach 2)
I-10 Crossing (Reach 3)
existing levees

Borings from Eustis Job 09318

Used for

West Slidell Levee Section


Eustis Eng No. 09318
Floodgates/Slidell Railroad
Marina 09318 (40')
Google Earth
N
2 mi

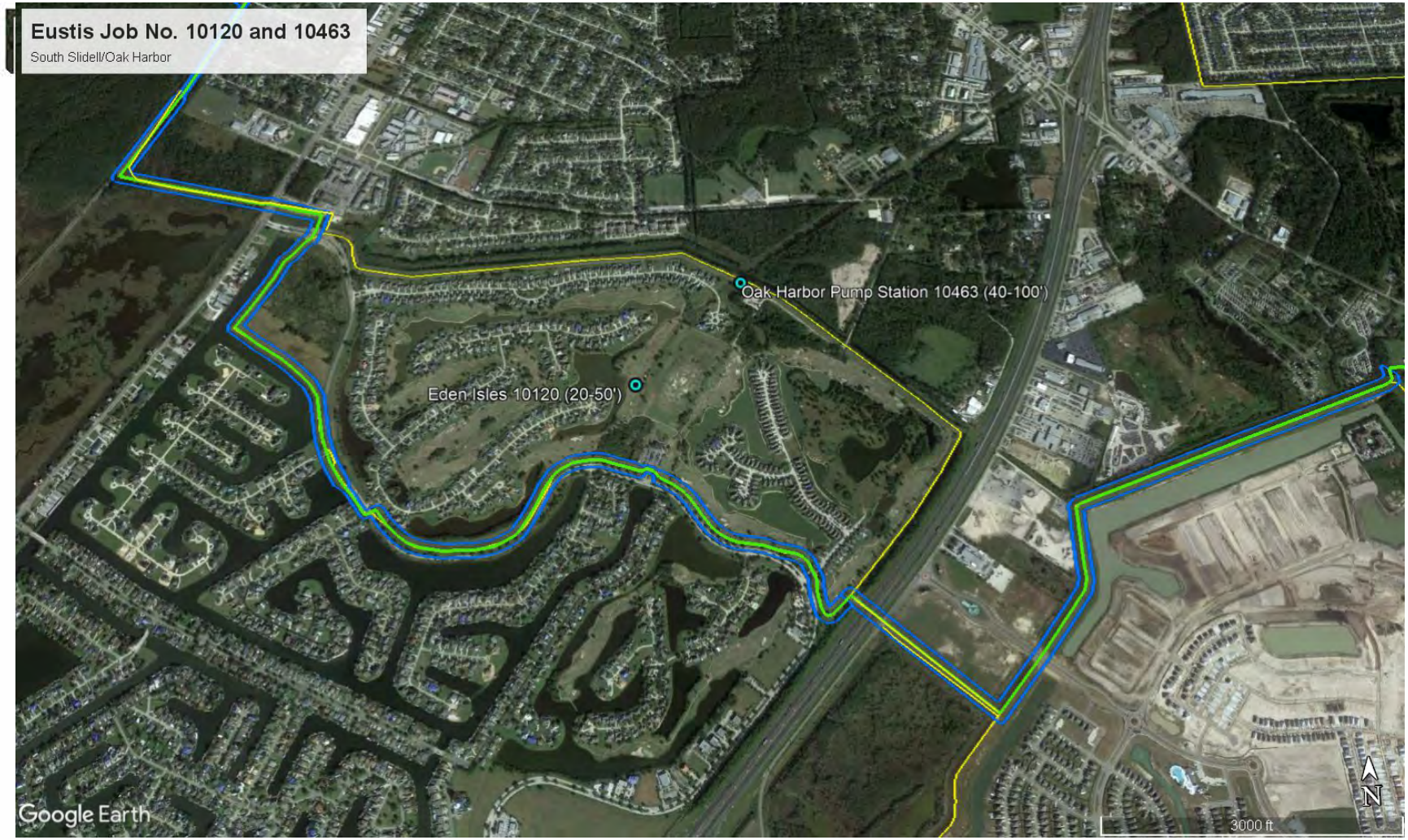
Borings from Eustis Job 10120

Used for Oak Harbor, I-10 crossing, and East and Northeast Slidell Levee

Borings from Eustis Job 10463

Used for

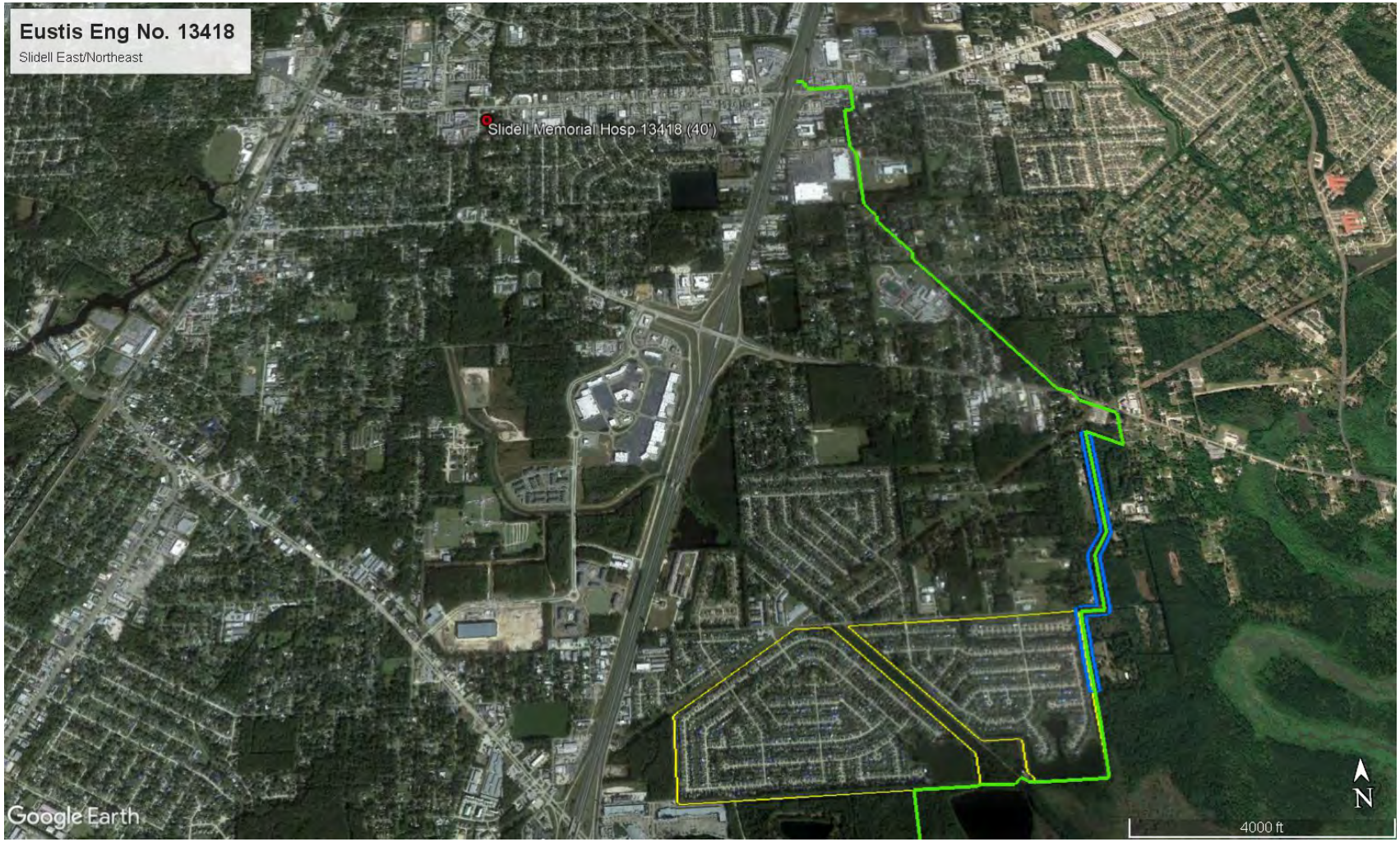
Lakeshore Estates Northeast Gate and Kingspoint W-14 Canal Gate


Eustis Job No. 10120 and 10463
South Slidell/Oak Harbor
Oak Harbor Pump Station 10463 (40-100')
Eden Isles 10120 (20-50')
Google Earth
3000 ft
N

Borings from Eustis Job 13418

Used for

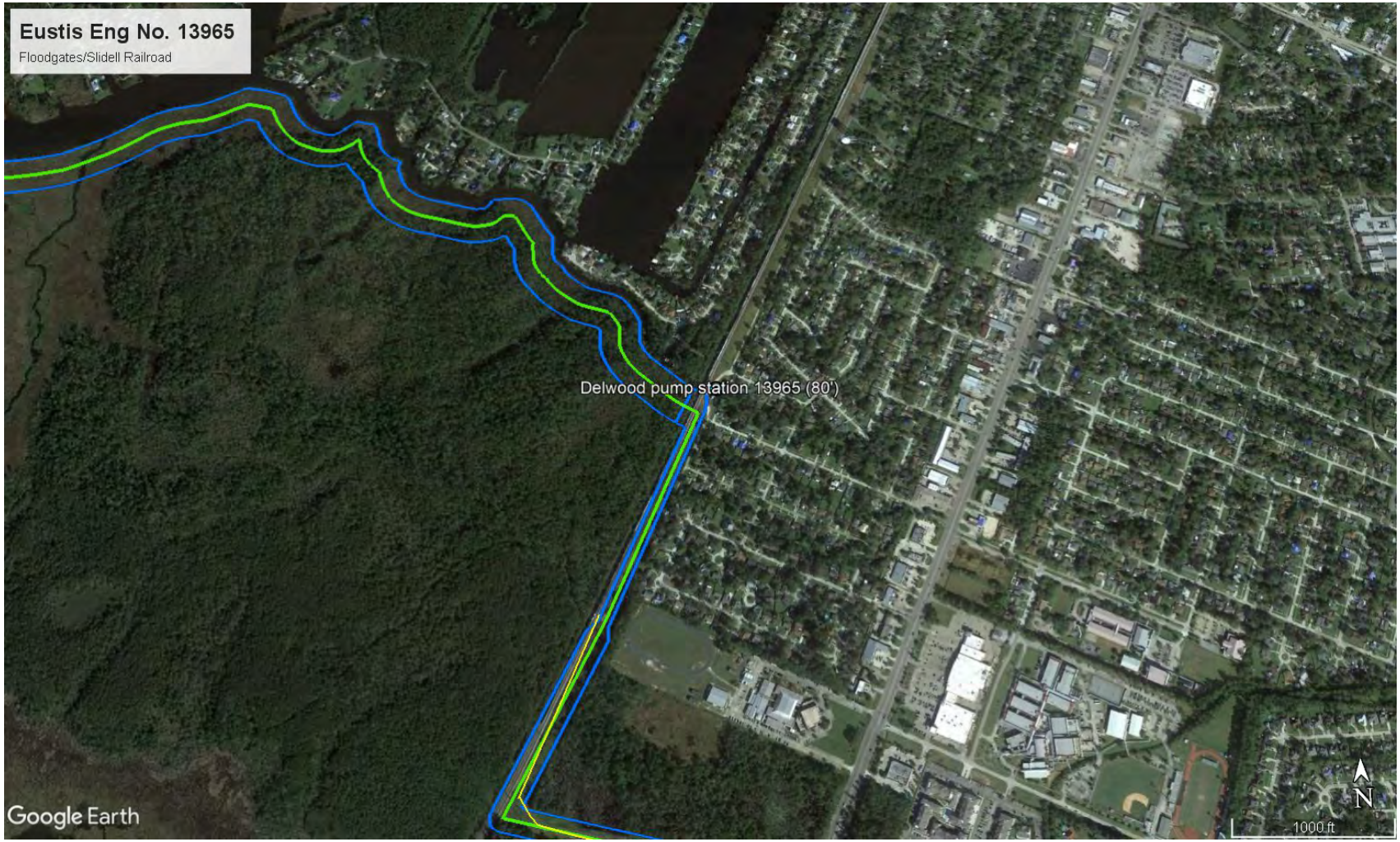
Northeast Tie-in


Eustis Eng No. 13418
Slidell East/Northeast
Slidell Memorial Hosp 13418 (40')
Google Earth
4000 ft
N

Borings from Eustis Job 13965

Used for

West Doucette Road Gate, Bayou Paquet Floodgate, Bayou Bonfouca Floodgate, Bayou Liberty Floodgate, West Bayou Paquet Floodgate, Slidell Railroad


Eustis Eng No. 13965
Floodgates/Slidell Railroad
Delwood pump station 13965 (80')
Google Earth
N
1000 ft

SECTION 2

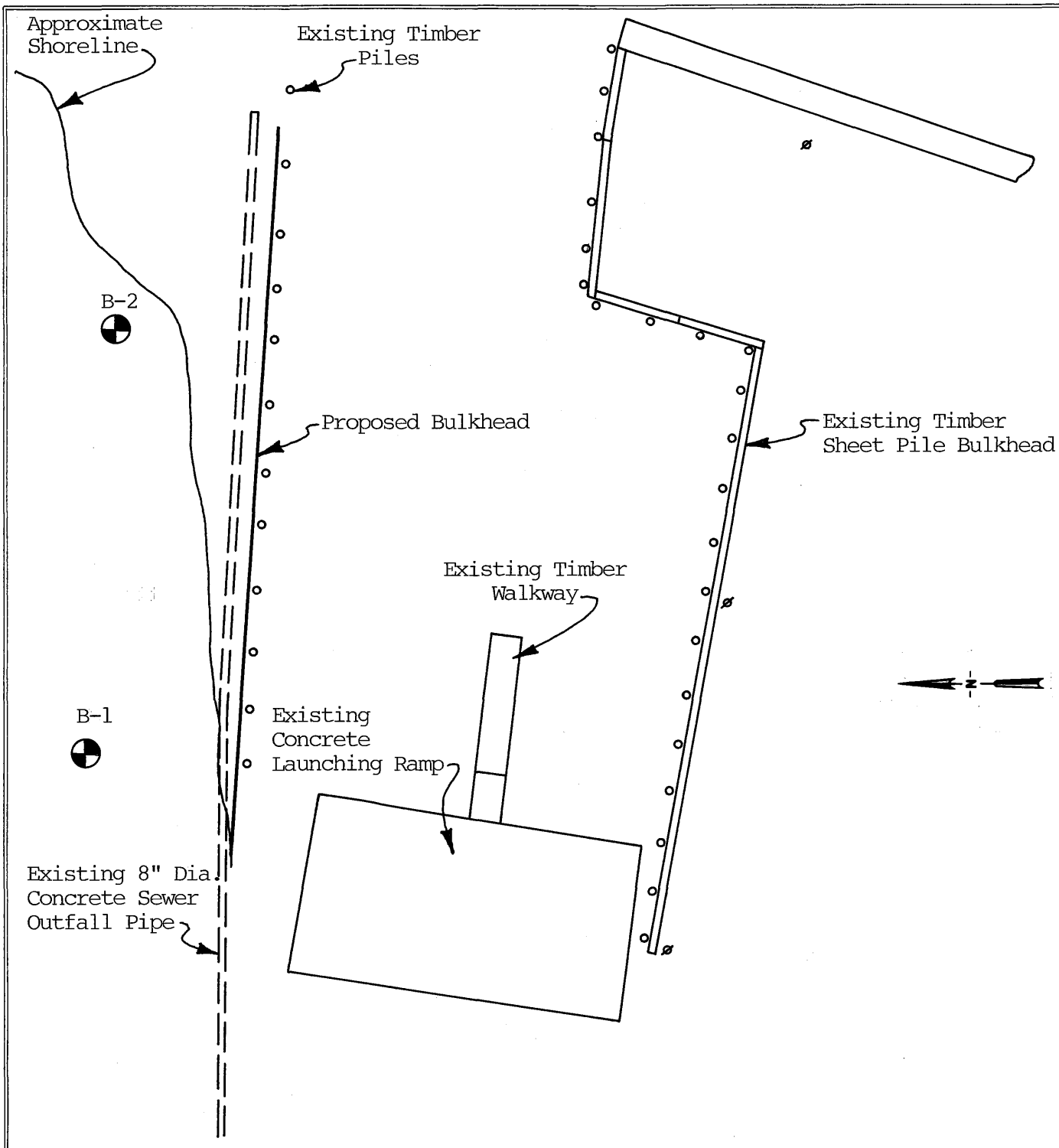
Borings Taken from

Eustis St. Tammany Projects

Borings from Eustis Job 09318

Used for

West Slidell Levee Analysis



LOCATION OF BORINGS

Scale: 1" = 20'

Geotechnical Investigation
City of Mandeville
Marina Improvements
Mandeville, Louisiana

For: City of Mandeville, Louisiana

Dyer & Moody, Inc., Consulting Engineers, Baker, Louisiana Fig. 1

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS

METAIRIE, LA.

Name of Project: City of Mandeville

Marina Improvements, Mandeville, Louisiana

For: City of Mandeville, Louisiana

Dyer & Moody, Inc., Consulting Engineers, Baker, Louisiana

Boring No. 1 **Soil Technician** R. Elkins **Date** 26 December 1985

Ground Elev. _____ **Datum** _____ **Gr. Water Depth** See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
			0.0	0.5	Compact gray shells & sand		
1	1.5	2.5	0.5	3.0	Very soft gray sandy clay w/silty sand		
					& humus layers		
2	4.5	5.5	3.0	6.0	Soft gray & tan clay w/concretions		
3	7.5	8.5	6.0		Medium stiff to stiff gray & tan clay		
					w/trace of sand		
4	10.5	11.5			Ditto		
5	13.5	14.5			Medium stiff to stiff gray & tan clay		
6	18.0	19.0		20.0	Ditto		
7	23.0	24.0	20.0	25.0	Stiff gray clay w/some decayed wood		
8	28.0	29.0	25.0	30.0	Stiff greenish-gray sandy clay w/sand		
					layers		
9	30.0	31.5	30.0	32.5	Dense greenish-gray sand w/trace of	10	42
					clay		
10	32.5	34.0	32.5		Dense gray sand	7	41
11	35.0	36.5		38.5	Ditto	5	38
12	38.5	40.0	38.5	40.0	Very dense gray sand	14	50=10"

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

Remarks: _____

CLAY SILT SAND HUMUS

Predominant type shown heavy. Modifying type shown light.

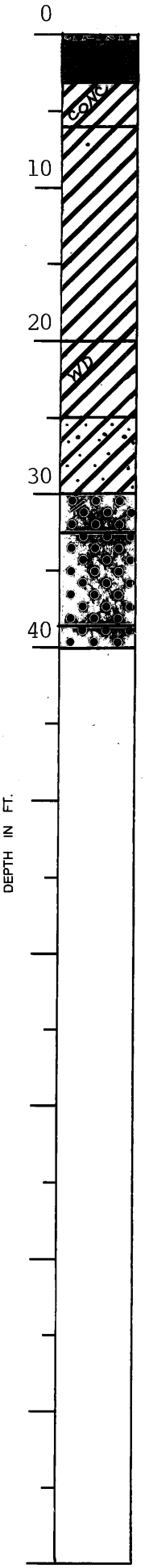


Fig. 2

LOG OF BORING

EUSTIS ENGINEERING COMPANY

SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Name of Project: City of Mandeville
Marina Improvements, Mandeville, Louisiana
For: City of Mandeville, Louisiana
Dyer & Moody, Inc., Consulting Engineers, Baker, Louisiana

Boring No. 2 **Soil Technician** R. Elkins **Date** 26 December 1985

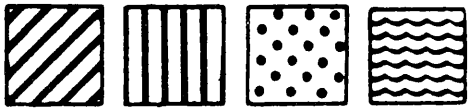
Ground Elev. _____ **Datum** _____ **Gr. Water Depth** See Text

Sample No.	SAMPLE Depth — Feet From	SAMPLE Depth — Feet To	DEPTH STRATUM Feet From	DEPTH STRATUM Feet To	VISUAL CLASSIFICATION	*STANDARD PENETRATION TEST	
1	0.0	0.5	0.0	1.0	Very soft gray clay w/roots & organic		
					matter		
2	1.5	2.5	1.0	3.0	Soft gray & tan clay w/sandy silt &		
					humus layers		
3	4.5	5.5	3.0	6.0	Very soft gray clay w/trace of silt &		
					wood		
4	7.5	8.5	6.0		Medium stiff tan & gray clay w/wood		
5	10.5	11.5			Ditto		
6	13.5	14.5		15.0	Medium stiff tan & gray clay		
7	18.0	19.0	15.0	21.0	Stiff tan & gray clay		
8	23.0	24.0	21.0	25.0	Medium stiff gray clay w/sandy clay		
					pockets & lenses		
9	28.0	29.0	25.0	31.0	Medium stiff greenish-gray sandy clay		
					w/sand layers		
10	33.0	34.5	31.0	35.5	Medium dense gray silty sand w/clay	7	21
					layers		
11	35.5	37.0	35.5		Dense gray silty sand	7	34
12	38.5	40.0		40.0	Dense gray silty sand w/trace of shell	12	40
					fragments		

*Number in first column indicates number of blows of 140-lb. hammer dropped 30 in. required to seat 2-in. O. D. splitspoon sampler 6 in. Number in second column indicates number of blows of 140-lb. hammer dropped 30 in. required to drive 2-in. O. D. splitspoon sampler 1 ft. after seating 6 in.

WHILE THIS LOG OF BORING IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT ITS RESPECTIVE LOCATION ON THE DATE SHOWN, IT IS NOT WARRANTED THAT IT IS REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

Remarks: _____



Predominant type shown heavy. Modifying type shown light.

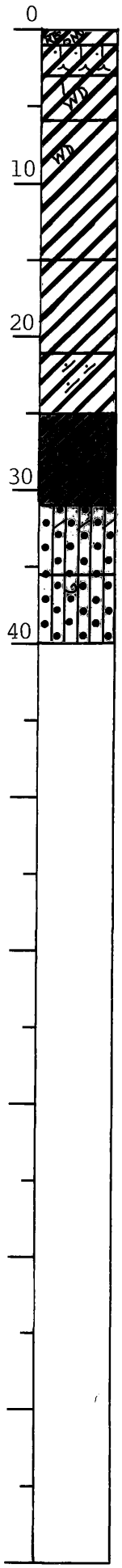


Fig. 3

Geotechnical Investigation
City of Mandeville
Marina Improvements
Mandeville, Louisiana

For: City of Mandeville, Louisiana

Dyer & Moody, Inc., Consulting Engineers, Baker, Louisiana

SUMMARY OF LABORATORY TEST RESULTS

BORING 1

Sample No.	Depth In Feet	Classification	Water Content Percent	Density PCF Dry	Density PCF Wet	Unconfined Compressive Strength PSF
1	1.5	Very soft gray sandy clay w/clayey sand layers & humus pockets	27.1	88.6	112.6	295*
2	4.5	Soft gray & tan sandy clay w/concretions	26.2	97.1	122.5	770
3	7.5	Stiff gray & tan clay w/sand pockets	29.5	93.9	121.6	2455
4	10.5	Medium stiff gray & tan clay w/vertical clayey sand lenses	31.3	89.3	117.2	1135*
5	13.5	Medium stiff gray & tan clay	43.8	77.4	111.3	1685
6	18.0	Stiff gray & tan clay	24.3	104.0	129.2	2385
7	23.0	Stiff gray clay w/sand pockets	29.7	92.2	119.6	2240
8	28.0	Stiff greenish-gray sandy clay w/clayey sand layers	23.1	101.8	125.3	----

BORING 2

2	1.5	Soft gray & tan clay w/sandy clay layers & humus pockets	43.8	71.6	102.9	535
3	4.5	Very soft gray clay w/organic matter & decayed roots	58.9	63.3	100.5	460
4	7.5	Medium stiff gray & tan clay w/few roots	41.3	80.0	113.0	1235
5	10.5	Medium stiff tan & gray clay	42.9	78.5	112.2	1690
6	13.5	Ditto	46.2	73.6	107.6	1105
7	18.0	Stiff tan & gray clay	29.6	92.5	119.9	3515
8	23.0	Medium stiff gray clay w/sand pockets	29.1	93.2	120.3	1420
9	28.0	Medium stiff greenish-gray sandy clay w/clayey sand layers & pockets	20.5	105.9	127.6	1390*

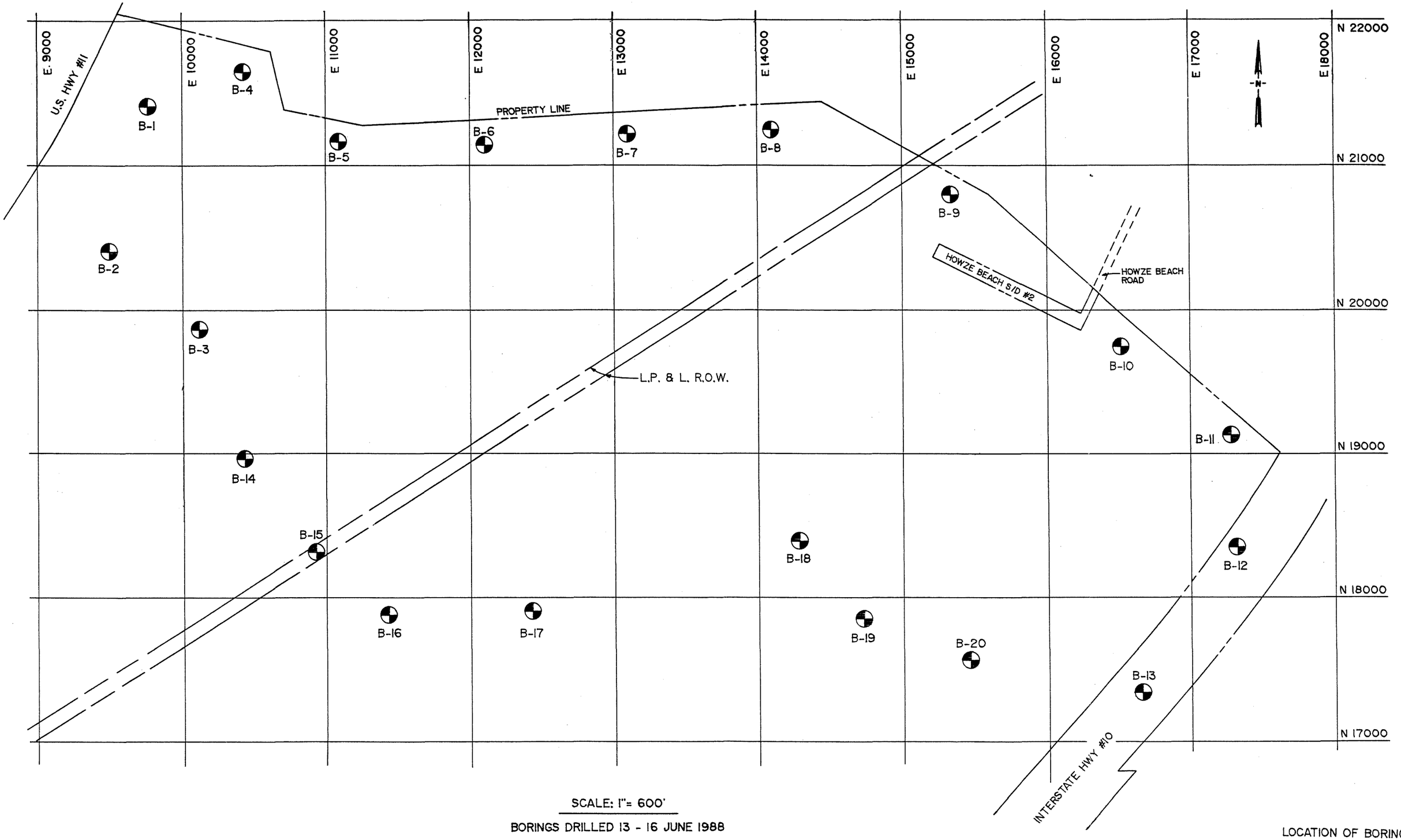
*Unconsolidated Undrained Triaxial Compression Test - One Specimen; Confined at the approximate overburden pressure.

Fig. 4

Borings from Eustis Job 10120

Oak Harbor, I-10 crossing, and East and

Northeast Slidell Levee Analysis



SCALE: 1"= 600'

BORINGS DRILLED 13 - 16 JUNE 1988

LOCATION OF BORINGS

EDEN ISLES EXPANSION
PROPOSED LEVEE SYSTEM
VICINITY OF SLIDELL, LOUISIANA

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FIGURE 1

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LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/15/88 | Boring: 1 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
				Medium stiff tan & gray silty clay w/organic matter & roots	CL													
	1.00					1	2-3	26	94	118	UC	—	930					
5				Stiff gray silty clay w/decayed wood	CL													
	1.50					2	5-6	19	111	132	UC	—	1520					
				Stiff gray & tan clay w/silt lenses & pockets	CH													
	1.25					3	8-9											
10																		
	1.80					4	11-12	24	100	125	UC	—	1280					
15	1.75					5	14-15											
				Stiff tan & gray clay w/silt lenses	CH														
20	2.10					6	19-20	44	77	110	UC	—	1400					
25	2.50					7	24-25											
				Soft gray clay w/sand layers	CH														
30	0.75					8	29-30	46	74	108	UC	—	330	63	21	42		
35	0.60					9	34-35											
				Medium stiff gray fissured clay w/shell layers	CH														
40	0.90					10	39-40	55	66	105	UC	—	750					
				Stiff greenish-gray fissured clay w/silt lenses	CH														
45	2.50					11	44-45											
50	2.75					12	49-50	35	85	115	UC	—	1120					

Boring offset 40 feet west of staked location.

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/16/88 | Boring: 2 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ϕ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
	0.45				Medium compact gray clayey silt	ML	1	2-3	22	105	127	OB	—	765	25	19	6		
5	0.35				Medium stiff light gray silty clay	CL	2	5-6	22	104	127	UC	—	740					
	1.25				Medium stiff greenish-gray silty clay	CL	3	8-9	23	102	125	UC	—	920					
10	1.65				Medium stiff greenish-gray & tan clay w/silt pockets	CH	4	11-12	36	85	116	UC	—	855					
15	1.75				Stiff gray & tan clay w/silt lenses	CH	5	14-15											
	1.75				Stiff tan & gray clay	CH	6	18-19	47	75	109	UC	—	1100					
20																			

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: Datum: Gr. Water Depth: See Text Job No: 10120 Date Drilled: 6/16/88 Boring: 3 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLIT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
					Loose black organic clay w/roots & humus	OH	1	0-1	148										
	1.10				Medium stiff dark gray silty clay w/roots	CL	2	2-3	24	101	124	UC	—	725					
5	0.50				Medium stiff greenish-gray silty clay	CL	3	5-6	25	99	124	UC	—	860					
	1.80				Stiff gray & tan clay w/silty sand pockets	CH	4	8-9	24	101	125	UC	—	1220					
10	1.95						5	11-12											
					Medium stiff gray & tan clay w/silt lenses	CH													
15	2.45						6	14-15	37	84	115	UC	—	690					
					Stiff gray & tan clay	CH													
20	1.50						7	18-19											

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: Datum: Gr. Water Depth: 6.2' Job No: 10120 Date Drilled: 6/13/88 Boring: 4 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ϕ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other Tests
				Loose tan fine sand	SP	1	1-2	4									
				Very loose tan & gray clayey sand	SC												
5	0.40					2	4-5	17	116	136	UC	—	135				
	0.80			Medium dense tan sand w/some clay	SP	3	6-7	13	119	134							
		28		Medium dense tan & gray fine sand	SP	4	8-9										
10		29				5	10-11										
		55		Very dense tan & gray fine sand	SP	6	12-13										
		31		Dense tan & gray fine sand	SP	7	14-15										
15																	
				Medium dense gray fine sand	SP												
20		18				8	19-20										

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: Datum: Gr. Water Depth: See Text Job No: 10120 Date Drilled: 6/15/88 Boring: 5 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
					Loose tan & gray sand w/roots & some silt	SP	1	2-3	16	98	114	OB	—	440					
5	0.30				Very soft gray & tan sandy clay	CL	2	5-6	23	103	126	UC	—	210					
					Stiff tan & gray clay w/few silt pockets	CH													
	1.55						3	8-9	30	92	120	UC	—	1805					
10					Stiff tan & gray silty clay	CL													
	1.90						4	11-12	28	94	121	UC	—	1045					
15	1.50						5	14-15											
					Stiff tan & gray fissured clay	CH													
20	1.50						6	19-20	43	77	110	UC	—	1090					

Boring drilled at staked location

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LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: Datum: Gr. Water Depth: 6.3' Job No: 10120 Date Drilled: 6/15/88 Boring: 6 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Other Tests
				Medium dense tan sand w/roots & trace of clay	SP												
						1	2-3	16	94	109	OB	—	985				
5				Medium stiff gray & tan sandy clay	CL												
						2	5-6	22	105	127	OB	—	805				
				Stiff tan & gray sandy clay	CL												
	1.20					3	8-9	17	112	131	UC	—	1040				
10				Medium dense tan & gray clayey sand	SC												
						4	11-12	22	104	127							
		17		Medium dense tan sand	SP												
						5	13-14										
15																	
		24				6	16-17										
				Dense tan sand	SP												
20		32				7	19-20										

Boring drilled at staked location

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LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: Datum: Gr. Water Depth: See Text Job No: 10120 Date Drilled: 6/15/88 Boring: 7 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ϕ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
				Medium compact gray & tan clayey silt	ML	1	2-3	22	103	125	OB	—	885					
5	0.90			Medium stiff gray & tan silty clay	CL	2	5-6	23	103	127	UC	—	590					
				Medium stiff greenish-gray & tan silty clay	CL													
	0.75					3	8-9	34	88	118	UC	—	755					
10				Soft light gray silty clay w/clayey silt layers	CL													
	0.75					4	11-12	26	97	122	OB	—	355					
				Medium stiff tan & gray fissured clay w/silt lenses	CH													
15	1.50					5	14-15											
20	1.75					6	19-20	49	73	108	UC	—	690					

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/15-16/88 | Boring: 8 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ϕ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
				Medium compact gray & tan clayey silty w/some sand	ML	1	1-2	22	97	118	OB	—	695					
				Soft dark gray silty clay w/roots	CL	2	3-4	24	100	124	UC	—	445					
5				Stiff tan & gray silty clay	CL													
	1.50					3	5-6	20	108	129	UC	—	1610					
	1.10					4	8-9	23	102	126	UC	—	1195					
10																		
	1.60					5	11-12											
				Medium stiff gray & tan fissured clay w/silt lenses	CH													
15	2.20					6	14-15	38	81	112	UC	—	595					
20	2.00					7	19-20											
				Medium stiff gray clay w/trace of silt & shell fragments	CH														
25	0.75					8	24-25	48	74	109	UC	—	745	66	21	45		
				Stiff greenish-gray clay w/silty sand lenses & pockets	CH														
30	2.50					9	28-29	28	96	122	UC	—	1090					
				Medium stiff gray clay w/silty sand lenses & shell fragments	CH														
35	0.40					10	33-34	44	76	109	UC	—	710					
				Medium stiff gray clay w/shell fragments	CH														
40	0.75					11	38-39	58	66	104	UC	—	875	79	22	57		
	0.30			Medium stiff gray & brown clay w/decayed wood, organic clay layers and roots	CH	12	42-43	101	44	88	UC	—	585					
	1.85					13	43-44	27	97	123	UC	—	1440					
45				Stiff dark gray silty clay	CL													
				Medium stiff gray clay w/silty sand pockets	CH													
50	2.30					14	48-49	28	95	121	UC	—	865				1.20	

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: Datum: Gr. Water Depth: See Text Job No: 10120 Date Drilled: 6/16/88 Boring: 9 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLB	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ϕ′	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
	0.25				Very soft gray & tan silty clay	CL	1	2-3	36	82	112	UC	—	215					
5	0.75				Soft tan & gray silty clay	CL	2	5-6	28	96	122	UC	—	490	40	20	20		
	2.25				Stiff tan & gray clay w/silt pockets	CH	3	8-9	22	103	126	UC	—	1385					
10	1.75				Medium stiff gray & tan clay	CH	4	11-12											
15	1.25				w/silt lenses		5	14-15	34	86	115	UC	—	800					
	1.15				Stiff tan & gray clay	CH	6	18-19											
20																			

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/16/88 | Boring: 10 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
	0.95			Medium stiff tan & gray clay w/many silt lenses & pockets	CH	1	2-3	23	102	125	UC	—	765					
5	1.50			Medium stiff gray & tan clay w/clayey silt lenses & pockets	CH	2	5-6	23	103	126	UC	—	950					
	2.25			Stiff gray & tan clay	CH	3	8-9											
10	1.75			Medium stiff gray & tan clay w/silt lenses	CH	4	11-12	35	86	116	UC	—	850					
15	1.95			Stiff tan & gray clay	CH	5	14-15											
	1.75					6	18-19	44	77	111	UC	—	1075					
20																		

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/16/88 | Boring: 11 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø'	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	T.V. TSF	Other Tests
	1.40			Stiff gray & tan sandy clay w/clay pockets & roots	CL	1	2-3	17	112	131	UC	—	1520					
5				Medium dense dark gray silty sand w/roots	SM	2	5-6	22	92	112	OB	—	685					
	0.90			Medium stiff gray & tan sandy clay	CL	3	8-9	21	106	128	UC	—	885					
10	1.50			Very stiff tan & gray sandy clay w/clay layers	CL	4	11-12	19	108	129	UC	—	2130					
15	2.50			Very stiff gray & tan clay w/sand pockets	CH	5	14-15											
	1.70			Stiff tan & gray clay w/clayey silt layers	CH	6	18-19	34	86	115	OB	—	1055				1.18	
20																		

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: 5.0' | Job No: 10120 | Date Drilled: 6/15/88 | Boring: 12 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth in Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
		26			Medium dense tan & gray sand w/clay pockets & trace of shell fragments	SP	1	1-2	15										
5		21			Medium dense gray sand	SP	2	4-5	27										
					Very loose gray clayey sand w/small roots & organic matter	SC	3	6-7	21										
10					Very soft gray & tan sandy clay w/roots	CL	4	8-9	23										
	2.25				Stiff gray & tan sandy clay	CL	5	11-12	17	111	130	UC	—	1370					
15	1.95				Very stiff gray & tan clay w/sand pockets	CH	6	14-15	18	110	130	UC	—	3105					
					Stiff gray & tan clay w/sandy clay layers	CH													
20	1.90						7	18-19	18	105	124	OB	—	1510					

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/15/88 | Boring: 13 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
		28			Medium dense tan & gray sand w/trace of clay & shells	SP	1	1-2	7										
5		18			Medium dense tan & gray sand w/shells	SP	2	4-5	11										
		3			Very loose gray shells w/sand	SI	3	7-8											
10		2			Very loose brown & gray organic clayey sand w/small roots	SC	4	9-10	32										
					Very loose gray clayey sand w/small roots	SC	5	11-12	20										
15	2.25				Medium dense tan & gray clayey sand	SC	6	14-15	20	107	128	OB	—	770					
20	2.20				Stiff gray & tan clay w/sand pockets	CH	7	18-19	21	105	127	UC	—	1745					

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/16/88 | Boring: 14 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	T.V. TSF	Other Tests
					Medium dense gray & tan clayey sand w/small roots	SC	1	2-3	17	110	129	OB	—	620					
5	0.85				Medium stiff tan & gray sandy clay	CL	2	5-6	23	103	126	UC	—	630				0.875	
	1.25				Medium stiff gray & tan fissured clay w/sand pockets & lenses	CH	3	8-9	35	85	115	UC	—	540				0.975	
10	0.70				Medium stiff gray & tan clay w/sandy silt lenses & pockets	CH	4	11-12	37	84	115							0.375	
15	1.20				Medium stiff gray & tan clay w/clayey silt layers	CH	5	14-15	41	80	112	OB	—	735					
	1.60				Stiff gray & tan clay	CH	6	18-19											
20																			

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: Datum: Gr. Water Depth: 7.7' Job No: 10120 Date Drilled: 6/13/88 Boring: 15 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	T.V. TSF	Other Tests
					Stiff tan & gray clay w/sandy silt lenses & pockets	CH													
	1.00						1	2-3	22	104	127	UC	—	1390					
5					Medium stiff gray & tan clay w/sandy silt pockets & shell fragments	CH													
	0.70						2	5-6	33	88	117	UC	—	625	55	21	34	0.475	
	0.75				Medium stiff gray & tan silty clay w/sand pockets & decayed roots	CL	3	8-9	29	94	121	UC	—	645					
10																			
	0.60				Medium stiff dark gray & tan sandy clay w/decayed roots	CL	4	11-12	21	108	131	UC	—	620					
	0.80				Medium stiff tan & gray sandy clay w/decayed roots	CL	5	14-15	23	103	127	UC	—	865					
15																			
	1.10				Medium compact gray & tan clayey silt w/clay lenses	ML	6	18-19	30	93	120	OB	—	615					
20																			
	1.30				Stiff tan & gray clay w/silt pockets & lenses	CH	7	23-24											
25																			
	2.20				Medium stiff tan & gray fissured clay	CH	8	28-29	44	78	112	UC	—	770				1.25	
30																			
	2.00						9	33-34											
35																			
	1.60				Medium stiff gray clay w/sand pockets & shell fragments	CH	10	38-39	29	92	119	UC	—	990				0.900	
40																			
	1.15				Medium stiff gray fissured clay w/sand pockets & shell fragments	CH	11	43-44											
45																			
	1.25						12	48-49	54	69	106	UC	—	760				0.600	
50																			

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/13/88 | Boring: 16 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	T.V. TSF	Other Tests
	1.00				Medium stiff greenish-gray & tan clay w/silty clay layers & organic matter	CH	1	2-3	38	86	119	UC	—	640					
5	0.70				Medium stiff tan & gray sandy clay w/clay lenses & organic matter	CL	2	5-6	24	99	122	UC	—	950					
	0.65				Soft greenish-gray & tan silty clay w/trace of organic matter	CL	3	8-9	38	83	115								
10	0.70				Medium stiff gray & tan silty clay w/roots & trace of sand	CL	4	11-12	25	102	127	UC	—	560	43	20	23		
15	1.20				Stiff greenish-gray & tan clay w/sand pockets	CH	5	14-15	27	99	125	UC	—	1110				1.63	
20	1.35						6	18-19											

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/13/88 | Boring: 17 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
					Soft tan & gray clay w/clayey silt pockets	CH													
	1.10						1	2-3	37	84	115	UC	—	435					
5					Soft greenish-gray & tan clay w/sandy clay layers	CH													
	0.85						2	5-6	32	89	118	UC	—	360					
	0.40				Loose gray clayey sand w/humus & roots	SC	3	8-9	28	94	120	OB	—	425					
10					Soft gray & tan sandy clay w/decayed roots	CL													
	0.75						4	11-12	23	103	127	UC	—	365					
15	2.20				Stiff greenish-gray & tan clay w/sand pockets	CH	5	14-15	23	102	127	UC	—	1585					
					Stiff tan & gray clay w/silt lenses & pockets	CH													
	1.50						6	18-19											
20																			

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/16/88 | Boring: 18 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø'	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
	1.25				Medium stiff gray & tan silty clay	CL	1	2-3	22	102	125	UC	—	890					
5	0.35				Medium stiff dark gray silty clay w/roots	CL	2	5-6	20	107	128	UC	—	695					
	0.35				Soft gray & tan silty clay w/roots & trace of sand	CL	3	8-9	26	97	122	UC	—	410	47	21	26		
10	2.25				Stiff light gray clay w/silt lenses & pockets	CH	4	11-12	21	106	128	UC	—	1755					
15	2.50						5	14-15											
	1.50				Medium stiff gray & tan clay w/silt pockets	CH	6	18-19	34	86	114	UC	—	905					
20																			

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: | Datum: | Gr. Water Depth: See Text | Job No: 10120 | Date Drilled: 6/15/88 | Boring: 19 | Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
	0.50			Medium stiff tan & gray silty clay w/trace of sand	CL	1	2-3	25	98	122	UC	—	860					
5	0.05			Medium stiff gray & tan clay w/clayey silt lenses	CH	2	5-6	23	101	124	UC	—	560					
	0.50			Medium compact gray clayey silt w/many roots	ML	3	8-9	22	103	126	OB	—	830					
10	0.85			Soft gray & tan sandy clay	CL	4	11-12	24	101	126	OB	—	325					
				Stiff gray & tan sandy clay w/silt pockets	CL													
15	2.20					5	14-15	20	106	128	UC	—	1185					
				Very stiff gray & tan clay w/sand pockets	CH													
20	2.85					6	18-19	25	99	123	UC	—	2055					

Boring drilled at staked location

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Eden Isles Expansion, Proposed Levee System, Vicinity of Slidell, Louisiana

Ground Elev.: Datum: Gr. Water Depth: See Text Job No: 10120 Date Drilled: 6/15/88 Boring: 20 Refer To "Legends & Notes"

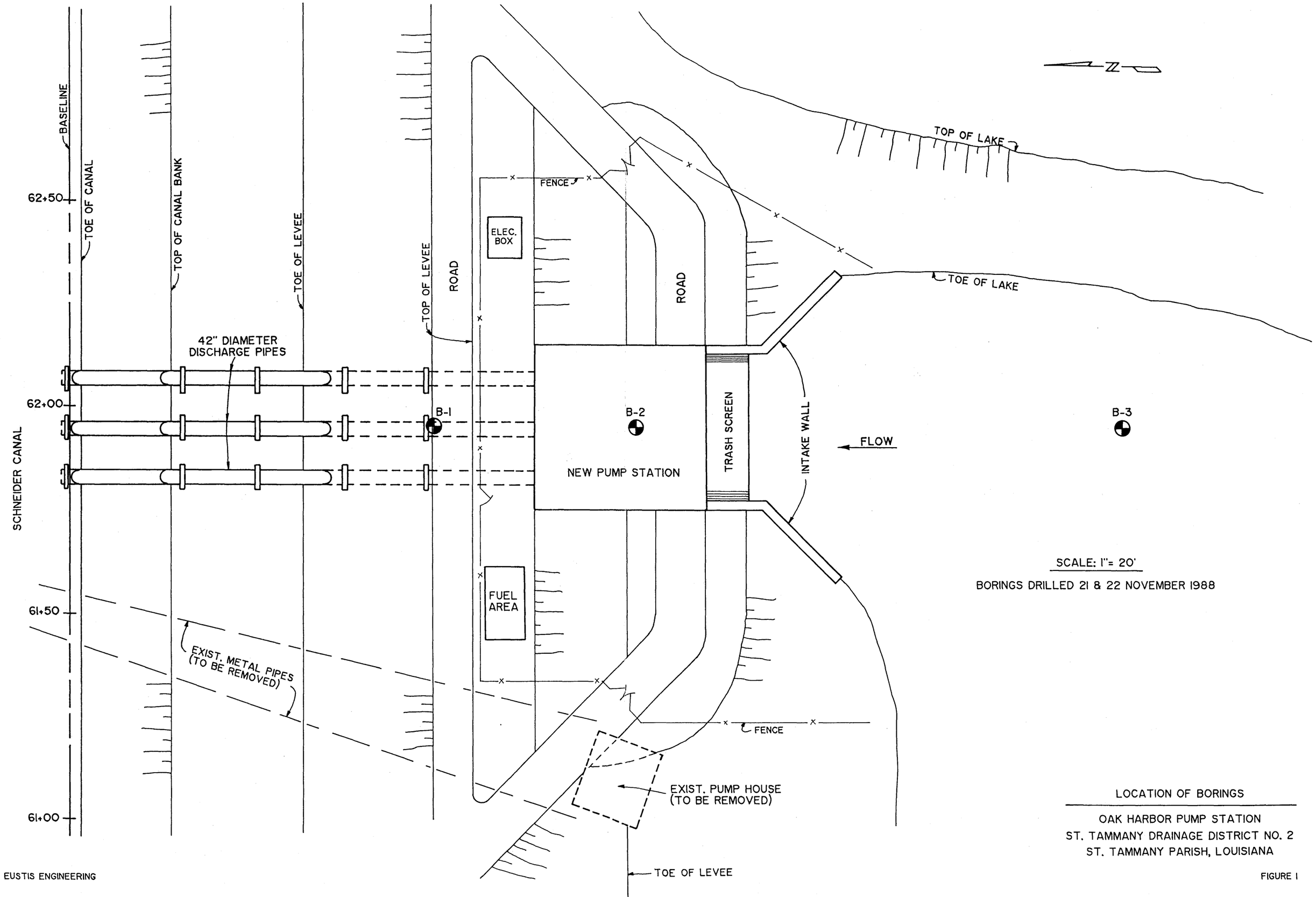
Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ϕ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
					Medium stiff tan & gray clay w/silt pockets & trace of organic matter (fill)	CH													
	0.75						1	2-3	36	84	114	UC	—	575					
5					Medium stiff greenish-gray & tan clay w/sand pockets & lenses (fill)	CH													
	1.20						2	5-6	22	99	121	UC	—	595					
					Very soft gray sandy clay w/organic matter & some roots	CL	3	8-9	26										
10					Medium stiff gray & tan sandy clay w/few small roots	CL													
	0.85						4	11-12	19	110	131	UC	—	620					
15	1.25				Stiff gray & tan sandy clay	CL	5	14-15	23	100	123	UC	—	1020					
	1.30				Medium stiff gray & tan clay w/silty sand lenses & layers	CH	6	18-19	29	93	119	UC	—	810					
20																			
	2.55				Very stiff gray & tan clay w/silt lenses & pockets	CH	7	23-24											
25																			
	3.05				Stiff greenish-gray clay	CH	8	28-29	41	80	113	UC	—	1825					
30																			
	0.60				Medium stiff gray clay w/trace of shell fragments & clayey sand layers	CH	9	33-34											
35					Soft gray clay w/sand lenses & layers	CH													
	0.95						10	38-39	36	82	111	UC	—	345					
40					Medium stiff gray clay w/shell fragments	CH													
	0.65						11	43-44											
45																			
	0.70						12	48-49	53	70	107	UC	—	895					
50																			

Boring drilled at staked location

Borings from Eustis Job 10463

Used for

Lakeshore Estates Northeast Gate and Kingspoint W-14 Canal Gate



SCALE: 1"= 20'

BORINGS DRILLED 21 & 22 NOVEMBER 1988

LOCATION OF BORINGS

OAK HARBOR PUMP STATION
ST. TAMMANY DRAINAGE DISTRICT NO. 2
ST. TAMMANY PARISH, LOUISIANA

EUSTIS ENGINEERING

FIGURE 1

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Oak Harbor Pump Station, St. Tammany Drainage District No. 2, St. Tammany Parish, Louisiana

Ground Elev.: 1.60 Datum: MSL Gr. Water Depth: See Text Job No: 10463 Date Drilled: 11/22/88 Boring: 1 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
				Very soft gray & tan sandy clay w/roots & gravel (fill)	CL													
	0.25					1	2-3	25	97	121	UC	—	175					
5				Very soft tan & gray silty clay w/organic matter, glass, tin, etc. (fill)	CL													
						2	5-6	30										
				Medium stiff gray & tan clay w/sand lenses & pockets	CH													
	0.90					3	8-9	23	101	125	UC	—	1000					
10				Medium stiff to stiff gray & tan clay w/silty clay layers	CH													
	1.90					4	11-12	27	96	121	UC	—	1145					
15	2.30			w/silt lenses & pockets		5	14-15	40	81	113	UC	—	710					
				Soft gray & tan clay	CH													
	1.50					6	18-19	42	79	113	UC	—	460					
20																		
				Stiff greenish-gray & tan clay w/silt pockets	CH													
	2.50					7	23-24	36	84	115	UC	—	1225					
25																		
				Soft gray sandy clay w/clayey sand pockets	CL													
						8	28-29	35										
30				Medium stiff gray clay w/sandy clay pockets & layers	CH													
	0.25					9	33-34	39	82	114	UC	—	665					
35																		
		25		Medium dense gray fine sand	SP	10	37-38											
40																		
		7		Loose gray clayey sand w/clay layers	SC	11	40-41	28										
45		50=7"		Very dense gray fine sand	SP	12	44-45											
50		50=9"				13	49-50											

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Oak Harbor Pump Station, St. Tammany Drainage District No. 2, St. Tammany Parish, Louisiana

Ground Elev.: 2.15 Datum: MSL Gr. Water Depth: See Text Job No: 10463 Date Drilled: 11/21/88 Boring: 2 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ϕ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
				Medium compact shells, sand & clay pockets														
				Compact tan & gray sandy silt w/organic matter & shell fragments	ML	1	2-3	56										
5	0.25			Soft light gray & tan silty clay w/silt pockets	CL	2	4-5	23	104	128	UC	—	355					
				Stiff gray & tan silty clay w/clayey silt	CL													
	1.30					3	8-9	19	109	130	UC	—	2115					
10				Stiff light gray & tan clay w/silty sand pockets	CH													
	2.00					4	11-12	25	100	125	UC	—	1605					
				Medium stiff to stiff gray & tan clay w/silt pockets	CH													
15	2.25					5	14-15	39	81	113	UC	—	940	70	24	46		
	1.90					6	18-19	40	81	114	UC	—	1130					
20				Stiff gray & greenish-gray clay w/silt pockets	CH													
	2.00					7	23-24	39	82	115	UC	—	1445					
25				Medium stiff gray clay w/clayey sand pockets	CH													
	0.30					8	28-29	45	76	110	UC	—	480	61	21	40		
30				Medium stiff gray sandy clay	CL													
	0.25					9	33-34	34	87	117	OB	—	515					
35				Loose gray fine sand w/clay pockets	SP													
						10	38-39	27	97	124	OB	—	760					
40				Loose gray clayey sand w/clay pockets	SC													
	0.30					11	42-43	26	98	123	OB	—	680					
45		50=10"		Very dense gray fine sand	SP	12	44-45											
		50=7"				13	47-48											
50																		

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Oak Harbor Pump Station, St. Tammany Drainage District No. 2, St. Tammany Parish, Louisiana

Ground Elev.: 2.15 Datum: MSL Gr. Water Depth: See Text Job No: 10463 Date Drilled: 11/21/88 Boring: 2 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
		50=7"		Very dense gray fine sand	SP	14	50-51											
55		50=8"				15	54-55											
60		50=7"				16	59-60											
65		50=6"				17	64-65											
70		34		Dense gray medium coarse sand w/gravel & clay layers	SP	18	69-70											
75		50=7"		Very dense gray fine sand	SP	19	74-75											
80		50=10"				20	79-80											
85		50=10"				21	84-85											
90		50=7"		w/silt		22	89-90											
95		50=7"				23	94-95											
100		50=4"				24	99-100											

EUSTIS ENGINEERING

LOG OF BORING AND TEST RESULTS

Oak Harbor Pump Station, St. Tammany Drainage District No. 2, St. Tammany Parish, Louisiana

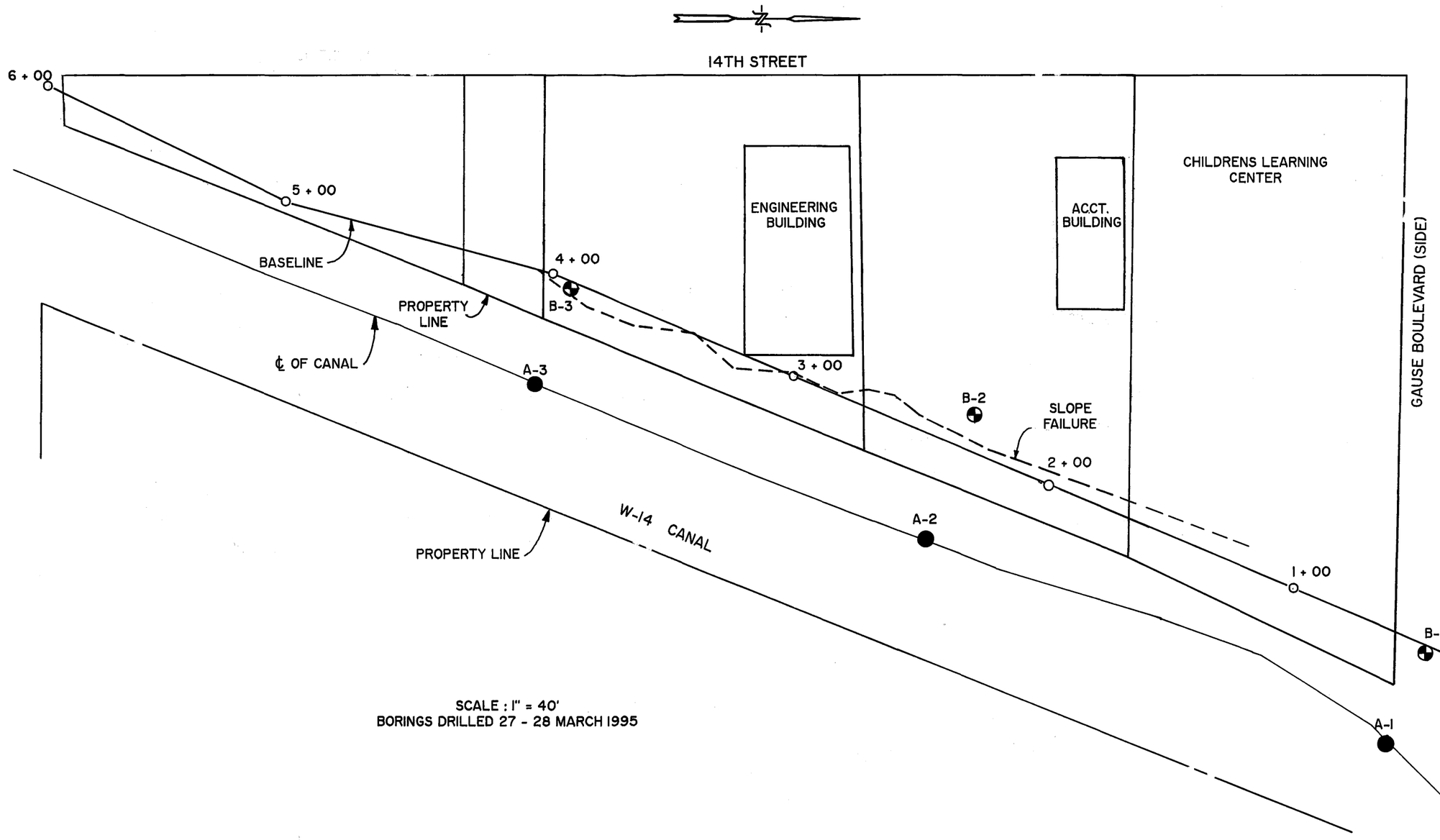
Ground Elev.: 5.00 Datum: MSL Gr. Water Depth: See Text Job No: 10463 Date Drilled: 11/22/88 Boring: 3 Refer To "Legends & Notes"

Scale In Feet	PP	SPT	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ϕ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
				Loose gray & tan fine sand w/clay pockets (fill)	SP	1	2-3											
5				Very stiff tan & gray sandy clay w/roots	CL	2	5-6	15	112	129	UC	—	2413					
	0.90			Medium stiff light gray & tan & red sandy clay	CL	3	8-9	22	103	125	UC	—	720					
10																		
	4.25			Very stiff gray sandy clay w/silty sand pockets	CL	4	11-12	17	111	130	UC	—	2037					
				Medium stiff gray silty clay w/vertical silty sand lenses	CL	5	14-15	21										
15																		
		15		Medium dense gray fine sand	SP	6	18-19											
20																		
		48		Dense gray fine sand	SP	7	21-22											
25																		
		22		Medium dense gray fine sand	SP	8	25-26											
				Soft gray sandy clay w/silty clay pockets	CL													
30		4				9	29-30	32										
				Medium stiff gray silty clay w/sand lenses & pockets	CL													
35	0.40					10	33-34	38	83	115	OB	—	890					
				Medium stiff gray sandy clay w/clay lenses	CL													
	0.50					11	38-39	39	82	114	OB	—	651	36	21	15		
40																		
	0.40					12	43-44	39	82	114	OB	—	915					
45																		
				Loose gray clayey sand	SC	13	47-48											
				Dense gray fine sand	SP													
50		33				14	49-50											

Borings from Eustis Job 13418

Used for

Northeast Tie-in



SCALE : 1" = 40'
BORINGS DRILLED 27 - 28 MARCH 1995

LOCATION OF BORINGS

SLIDELL MEMORIAL HOSPITAL
BANK STABILIZATION STUDY
W-14 DRAINAGE CANAL
SLIDELL, LOUISIANA

FIGURE 1

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

SLIDELL MEMORIAL HOSPITAL, BANK STABILIZATION STUDY
W-14 DRAINAGE CANAL, SLIDELL, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth: See Text** **Job No.: 13418** **Date Drilled: 3/28/95** **Boring: 1** **Refer To "Legends & Notes"**

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests Ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
					8" Asphalt Pavement														
		8			Loose tan fine sand	SP	1	1-2											
					Loose gray clayey silt	ML													
5					Loose brown & gray sandy silt w/few roots	CL	2	3-4	14	114	130								
	0.40				Soft tan & light gray sandy clay w/clayey sand pockets	CL	3	5-6	19	102	122	OB	--	410					
	2.70				Stiff tan & gray sandy clay w/clayey sand pockets		4	8-9	23	100	123	OB	--	1195					
10					Dense light gray clayey sand	SC													
	3.00				Loose light gray clayey sand	SC	5	11-12	19	108	128	OB	--	1910					
15							6	14-15	21	103	125	OB	--	440					
					Loose light gray fine sand	SP	7	18-19											
20		16			Medium dense light gray fine sand	SP	8	21-22											
25		13					9	24-25											
30		10			Loose light gray fine sand	SP	10	29-30											
35		23			Medium dense gray fine sand	SP	11	34-35											
40		19					12	39-40											
45																			
50																			

Boring located at Station 0+45, 3 feet east of baseline and 6 feet west of failure.

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

SLIDELL MEMORIAL HOSPITAL, BANK STABILIZATION STUDY
W-14 DRAINAGE CANAL, SLIDELL, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth: See Text** **Job No.: 13418** **Date Drilled: 3/28/95** **Boring: 2** **Refer To "Legends & Notes"**

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests Ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
					3.5" Loose white shells		1	0-0.3											
	0.10				Very loose light gray clayey sand w/trace of organic matter & clayey silt layers	SC	2	2-3	24	98	122	OB	--	75					
5	0.60				Stiff tan & gray sandy clay w/few concretions	CL	3	5-6	21	101	123	UC	--	1055					
	2.50				Stiff tan & light gray clay w/sand pockets & lenses	CH	4	8-9	19	104	123	UC	--	1375					
10	2.60				Medium stiff light gray clay w/vertical clayey sand lenses	CH	5	11-12	27	95	120	UC	--	980					
15	2.70				w/few clayey sand pockets		6	14-15											
	1.70				Medium stiff light gray & tan clay w/fissures & silt lenses & pockets	CH	7	18-19	36	84	115	OB	--	630					
20																			
	1.50				Stiff brown & gray clay	CH	8	23-24											
25																			
					Medium dense greenish-gray clayey sand	SC	9	28-29	25	98	123	OB	--	1635					
30																			
	1.25				Stiff gray clay w/clayey silt & clayey sand lenses & trace of organic matter	CH	10	33-34											
35																			
	0.40				Loose gray clayey sand w/clay lenses & pockets	SC	11	38-39	29	93	120	OB	--	480					
40																			
45																			
50																			

Boring located at Station 2+34, 12 feet west of baseline and 8 feet west of failure.

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

SLIDELL MEMORIAL HOSPITAL, BANK STABILIZATION STUDY
W-14 DRAINAGE CANAL, SLIDELL, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth: See Text** **Job No.: 13418** **Date Drilled: 3/27/95** **Boring: 3** **Refer To "Legends & Notes"**

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests Ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
					4" Asphalt pavement														
		6			8" Medium dense white shells	ML	1	1-2	16										
	0.20				Loose gray clayey silt w/shell fragments	ML	2	3-4	22	103	125	OB	--	230					
5					Very loose dark gray clayey silt														
	1.10				Medium stiff light gray & tan clay w/clayey sand pockets	CH	3	5-6	25	99	123	UC	--	605					
	1.50				Stiff light gray & tan clay w/sand pockets	CH	4	8-9	28	95	121	UC	--	1335					
10					Very stiff light gray & tan clay	CH													
	2.50						5	11-12											
15	3.00				w/sand pockets		6	14-15	25	98	123	UC	--	2190					
	2.20				w/few silt lenses		7	18-19											
20																			
	1.60				Medium stiff gray & tan clay w/sand pockets	CH	8	23-24	33	86	114	UC	--	875					
25																			
	0.75				Medium stiff gray & dark gray clay w/silty sand layers	CH	9	28-29											
30																			
	1.30				Soft gray & reddish-brown clay w/silty sand pockets & lenses & trace of organic matter	CH	10	33-34	49	72	108	OB	--	430					
35																			
	0.40				Soft gray sandy clay w/clayey sand pockets	CL	11	38-39											
40																			
45																			
50																			

Boring located at Station 3+92, 3 feet west of failure.

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

SLIDELL MEMORIAL HOSPITAL, BANK STABILIZATION STUDY
W-14 DRAINAGE CANAL, SLIDELL, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth: See Text** **Job No.: 13418** **Date Drilled: 3/27/95** **Boring: A-1 - A-3** **Refer To "Legends & Notes"**

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests Ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
					AUGER BORING A-1														
0					Very loose gray & tan fine sand	SP	1	0-1	26	98	123								
					Very loose gray & tan sandy silt	ML	2	1-2	25	101	126	OB	--	210					
					Loose light gray silty sand	SM	3	3-4											
5							4	5-6											
							5	7-8	25										
10					Very soft light gray sandy clay	CL	6	9-10											
					Station 0+45														
					AUGER BORING A-2														
0					Soft gray & tan silty clay w/trace of sand	CL	1	0-1											
							2	1-2	30	91	119	OB	--	480					
							3	3-4											
5					Medium stiff gray & tan clay w/silt pockets & fissures	CH	4	5-6	48										
							5	7-8											
10							6	9-10	49										
					Station 2+34														
					AUGER BORING A-3														
0					Loose gray & tan sandy silt		1	0-0.5	36										
					Medium stiff gray & tan clay w/sand & organic clay layers	SC	2	1.5-2	38										
					Very loose gray & tan clayey sand w/clay layers	CL	3	3-4	38										
5					Very soft gray & tan silty clay w/trace of sand	CL	4	5-6											
					Stiff tan & gray sandy clay		5	7-8											
10							6	9-10											
					Station 3+92														

Borings located near canal centerline. Depths referenced from existing mudline.

Borings from Eustis Job 13965

Used for

West Doucette Road Gate, Bayou Paquet Floodgate, Bayou Bonfouca Floodgate, Bayou Liberty Floodgate, West Bayou Paquet Floodgate, Slidell Railroad

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

DELWOOD PUMPING STATION
FRONT STREET
SLIDELL, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13965 **Date Drilled:** 3/27/96 **Boring:** 1 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Loose dark gray & tan clayey silt w/silty clay layers, shells & roots	ML	1	0-0.5											
	2.80				Very stiff tan & gray silty clay w/clay layers, shells & roots	CL	2	2-3	17									DIST.	
					Loose tan fine sand w/clayey sand pockets	SP	3	5-6											
	2.10				Stiff gray & tan silty clay w/clayey silt layers	CL	4	8-9	21	105	126	UC	--	1600	43				
10					Medium stiff gray & tan silty clay w/clayey silt layers	CL	5	11-12	28	94	121	OB	--	580					
	1.60				Stiff tan & gray clay w/clayey silt lenses	CH	6	14-15	45	76	111	OB	--	345					
	1.60						7	18-19	35						74				
20					Medium stiff gray & tan clay w/shell fragments & fissures	CH	8	23-24	50	72	107	OB	--	630					
					Loose gray clayey sand w/shell fragments	SC	9	28-29	26										
30																			
	0.40				Soft gray clay w/silty sand layers, pockets & concretions	CH	10	33-34	40	82	114	OB	--	345					
	0.60				Medium stiff gray clay w/clayey silt lenses & shell fragments	CH	11	38-39	48	73	108	UC	--	580					
40																			
	0.60				w/shell fragments		12	43-44	48	74	109	UC	--	445					
					Medium compact gray clayey silt w/shell	ML	13	48-49											
50																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

DELWOOD PUMPING STATION
FRONT STREET
SLIDELL, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13965 **Date Drilled:** 3/27/96 **Boring:** 1 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	S P L R	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ϕ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
50					Medium compact gray clayey silt w/shell fragments	ML													
						CH													
	1.80				Stiff greenish-gray clay w/clayey silt pockets & shell fragments		14	53-54	33	88	117	OB	--	955					
	1.60				w/fissures & shell fragments		15	58-59	35	85	115	OB	--	1105					
60																			
					Loose gray clayey sand	SC	16	62-63											
	0.60				Medium stiff brown & gray clay w/organic matter & fissures	CH	17	64-65	64	60	99	OB	--	515					
	0.90						18	68-69	71	57	97	OB	--	805					
70																			
	1.80				Stiff greenish-gray clay w/silt pockets	CH	19	73-74	30	92	119	OB	--	2225					
	2.70				Stiff greenish-gray & tan clay w/fissures	CH	20	78-79	44	76	110	OB	--	835					
80																			
90																			
100																			

Comments:

SECTION 3

Parameters for Estimates

Stability Parameter Tables

Eustis Engineering Project No. 13965 Used For West Doucette Road Gate, Bayou Paquet Floodgate, Bayou Bonfouca Floodgate, Bayou Liberty Floodgate, West Bayou Paquet Floodgate, Slidell Railroad

Material	Top EL (ft)	Bottom EL (ft)	Thickness (ft)	Density (pcf)	C-top (psf)	C-bottom (psf)	Friction angle (degrees)
CL	0	-13	13 ‘	105	580	580	23
CH	-13	-26	13 ‘	107	400	400	23
SC	-26	-32	6 ‘	122	0	0	30
CH	-32	-48	16 ‘	108	400	400	23
ML	-48	-52	4 ‘	117	200	200	15
CH	-52	-80	28 ‘	105	800	800	23

Eustis Engineering Project No. 10120 Used For Oak Harbor, I-10 Crossing, and Slidell East and Northeast Levees

Material	Top EL (ft)	Bottom EL (ft)	Thickness (ft)	Density (pcf)	C-top (psf)	C-bottom (psf)	Friction angle (degrees)
CH	0	-10	10 ‘	125	640	640	23
CH	-10	-20	10 ‘	123	800	800	23
CH	-20	-35	15 ‘	111	725	725	23
CH	-35	-50	15 ‘	110	760	760	23

Eustis Engineering Project No. 10463 Used For Lakeshore Estates Northeast Gate and Kingspoint W-14 Canal Gate

Material	Top EL (ft)	Bottom EL (ft)	Thickness (ft)	Density (pcf)	C-top (psf)	C-bottom (psf)	Friction angle (degrees)
ML	0	-3	3 ‘	117	200	200	15
CH	-3	-16	13 ‘	125	1000	1000	23
SP	-16	-26	10 ‘	122	0	0	30
CH	-26	-44	18 ‘	108	600	600	23
SP	-44	-100	4 ‘	122	0	0	30

Eustis Engineering Project No.13418 Used For Northeast Tie-in

Material	Top EL (ft)	Bottom EL (ft)	Thickness (ft)	Density (pcf)	C-top (psf)	C-bottom (psf)	Friction angle (degrees)
CL	0	-15	15 ‘	124	500	50	23
SM	-15	-22	7 ‘	122	0	0	30
CH	-22	-29	7 ‘	114	900	900	23
SM	-29	-33	4 ‘	122	0	0	30
CH	-33	-40	7 ‘	120	450	450	23

Bermed Levee Section Used For 2032 West Slidell Levee

Material	Top EL (ft)	Bottom EL (ft)	Thickness (ft)	Density (pcf)	C-top (psf)	C-bottom (psf)	Friction angle (degrees)
CH	2	-8	10 ‘	90	200	200	23
CL	-8	-18	10 ‘	100	200	200	23
CH	-18	-28	10 ‘	110	250	250	23
CH	-28	-38	10 ’	110	250	348	23
CH	-38	-48	10 ‘	109	348	449	23
CH	-48	-58	10 ’	115	449	563	23
CH	-58	-68	10 ‘	97	563	638	23

Bermed Levee Section Used For 2082 West Slidell Levee

Material	Top EL (ft)	Bottom EL (ft)	Thickness (ft)	Density (pcf)	C-top (psf)	C-bottom (psf)	Friction angle (degrees)
CH	2	-8	10 ‘	90	300	300	23
CL	-8	-18	10 ‘	100	300	300	23
CH	-18	-28	10 ‘	110	313	313	23
CH	-28	-38	10 ’	110	250	348	23
CH	-38	-48	10 ‘	109	348	449	23
CH	-48	-58	10 ’	115	449	563	23
CH	-58	-68	10 ‘	97	563	638	23

Settlement Parameter Tables

Eustis Engineering Project No. 13965 Used For West Slidell Levee Analysis (Correlations Based on Water Content)

Material	Top EL (ft)	Bottom EL (ft)	Thickness (ft)	Density (pcf)	Cc	e0	Cr	Cv	Cvr
CL	0	-13	13 ‘	105	0.16	0.62	0.032	80	80
CH	-13	-26	13 ‘	107	0.43	1.03	0.086	17	17
SC	-26	-32	6 ‘	122	NA	NA	NA	NA	NA
CH	-32	-48	16 ‘	108	0.39	1.1	0.078	17	17
ML	-48	-52	4 ‘	117	0.26	0.9	0.052	17	17
CH	-52	-80	28 ‘	105	0.5	1.2	0.1	17	17

Eustis Engineering Project No. 10120 Used For Oak Harbor, I-10 crossing, and East and Northeast Slidell Levee Analysis (Correlations Based on Water Content)

Material	Top EL (ft)	Bottom EL (ft)	Thickness (ft)	Density (pcf)	Cc	e0	Cr	Cv	Cvr
CH	0	-10	10 ‘	125	0.11	0.65	0.022	76	76
CH	-10	-20	10 ‘	123	0.15	0.79	0.030	95	95
CH	-20	-35	15 ‘	111	0.45	1.19	0.090	31	31
CH	-35	-50	15 ‘	110	0.36	0.945	0.072	15	15

NATURAL MOISTURE CONTENT (w)
IN PERCENT

TOTAL UNIT WEIGHT (γ)
IN PCF

UNDRAINED SHEAR STRENGTH (S_u)
IN PSF

ELEVATION IN FEET (NAVD 88)

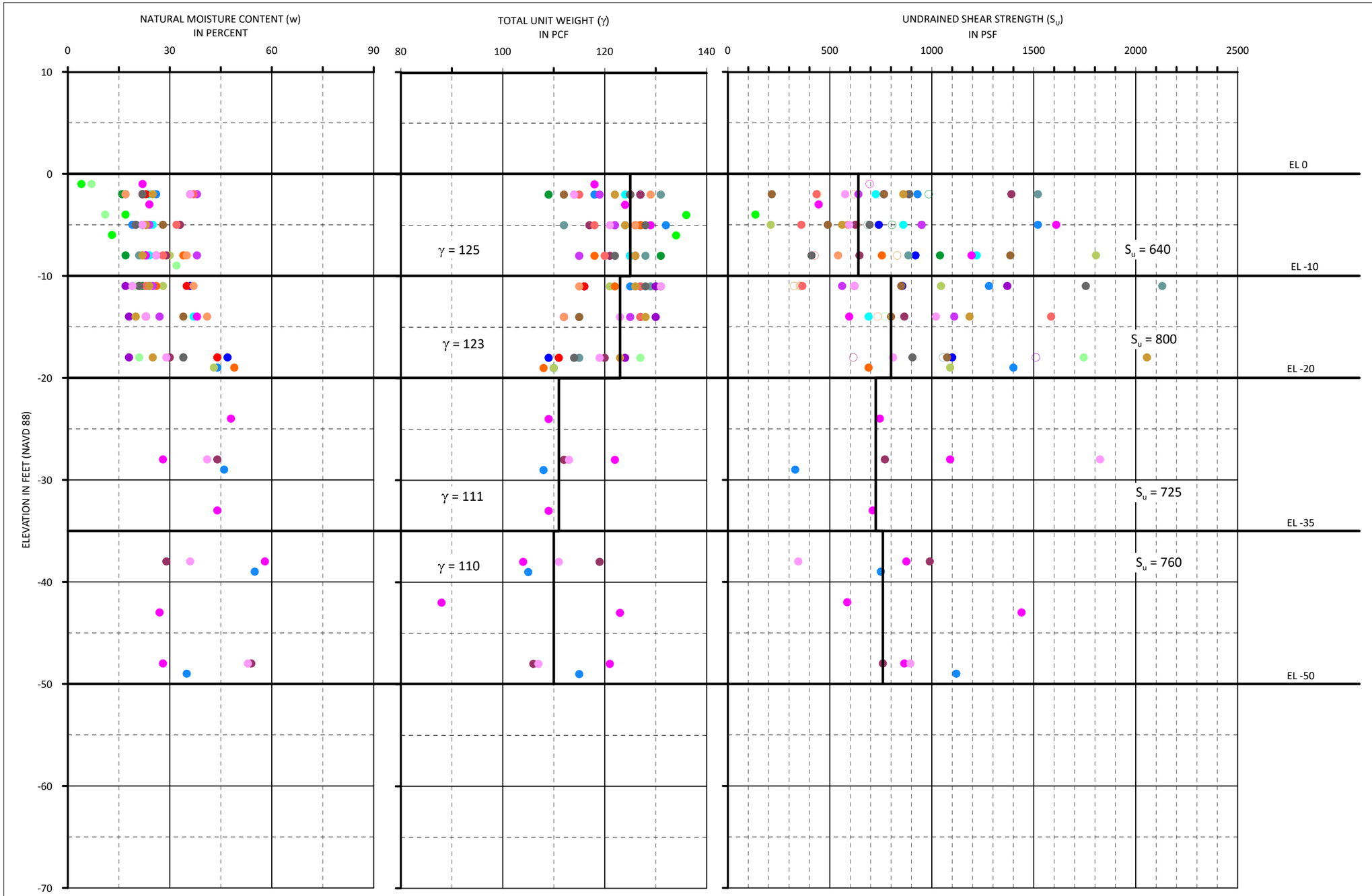
γ = 105
S_u = 580
γ = 107
S_u = 400
γ = 122
S_u = 0
γ = 108
S_u = 400
γ = 117
S_u = 200
γ = 105
S_u = 800

EL 0
EL -13
EL -26
EL -32
EL -48
EL -52
EL -80

LEGEND
B-1 UC (EE 13965)
B-1 OB (EE 13965)
Design Line

SOIL DESIGN PARAMETERS
WEST SLIDELL LEVEE ANALYSIS

DATE: 3 FEB 2021

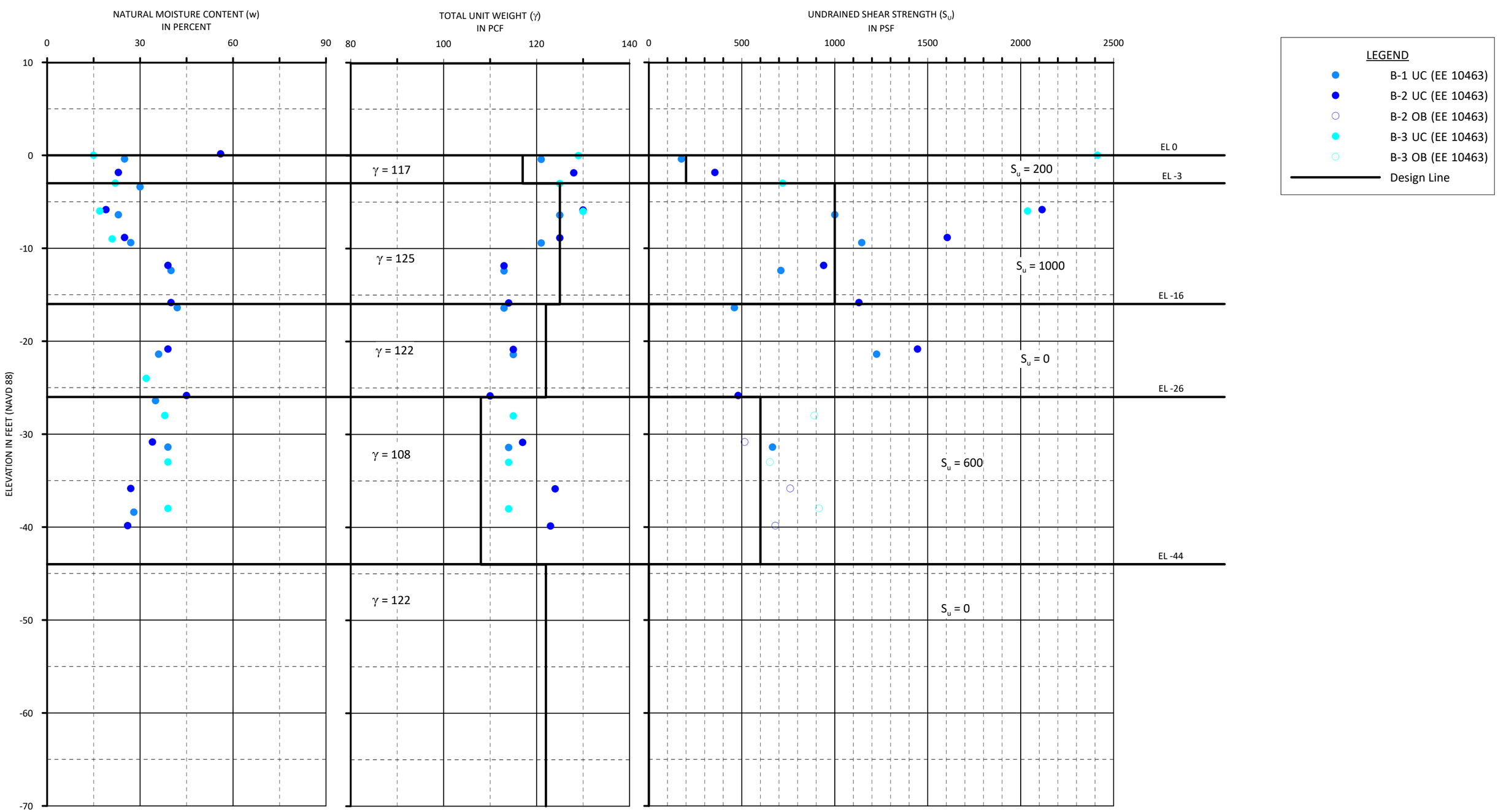


LEGEND

- B-1 UC (EE 10120)
- B-2 UC (EE 10120)
- B-2 OB (EE 10120)
- B-3 UC (EE 10120)
- B-4 UC (EE 10120)
- B-5 UC (EE 10120)
- B-5 OB (EE 10120)
- B-6 UC (EE 10120)
- B-6 OB (EE 10120)
- B-7 UC (EE 10120)
- B-7 OB (EE 10120)
- B-8 UC (EE 10120)
- B-8 OB (EE 10120)
- B-9 UC (EE 10120)
- B-10 UC (EE 10120)
- B-11 UC (EE 10120)
- B-11 OB (EE 10120)
- B-12 UC (EE 10120)
- B-12 OB (EE 10120)
- B-13 UC (EE 10120)
- B-13 OB (EE 10120)
- B-14 UC (EE 10120)
- B-14 OB (EE 10120)
- B-15 UC (EE 10120)
- B-15 OB (EE 10120)
- B-16 UC (EE 10120)
- B-17 UC (EE 10120)
- B-17 OB (EE 10120)
- B-18 UC (EE 10120)
- B-19 UC (EE 10120)
- B-19 OB (EE 10120)
- B-20 UC (EE 10120)
- Design Line

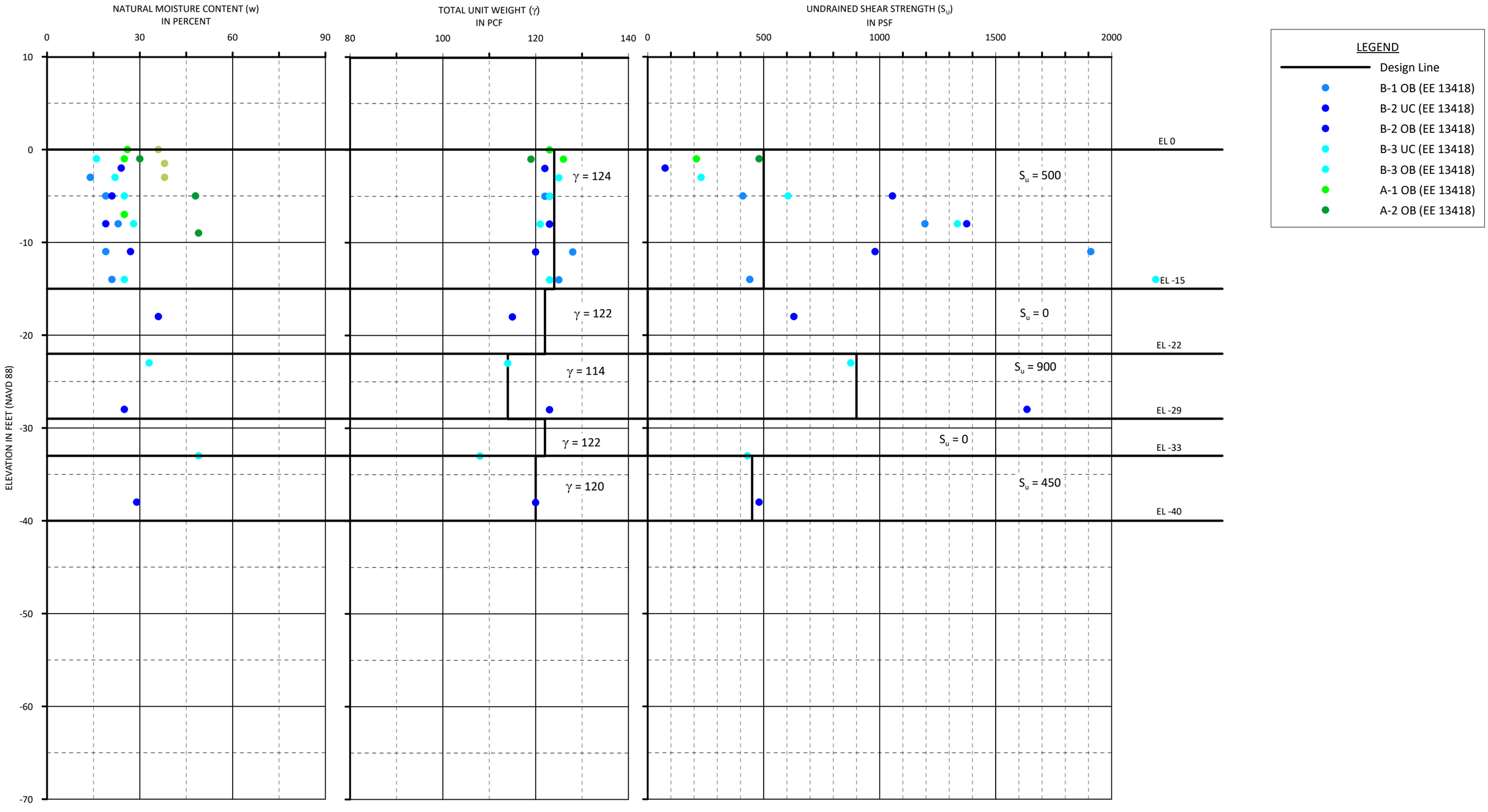
SOIL DESIGN PARAMETERS
SOUTH SLIDELL LEVEE ANALYSIS

DATE: 4 FEB 2021



SOIL DESIGN PARAMETERS
W-14 FLOODGATE

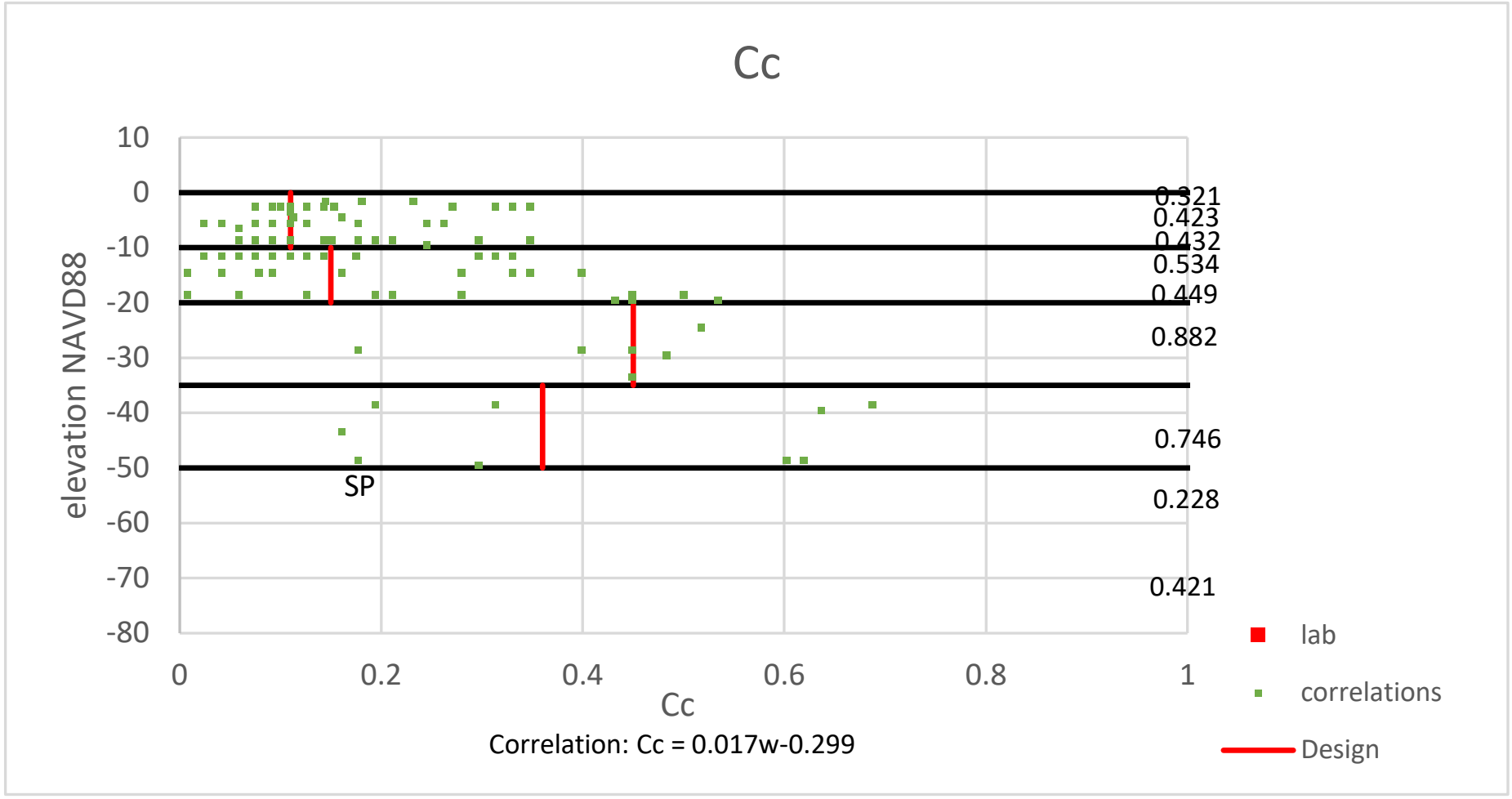
DATE: 3 FEB 2021



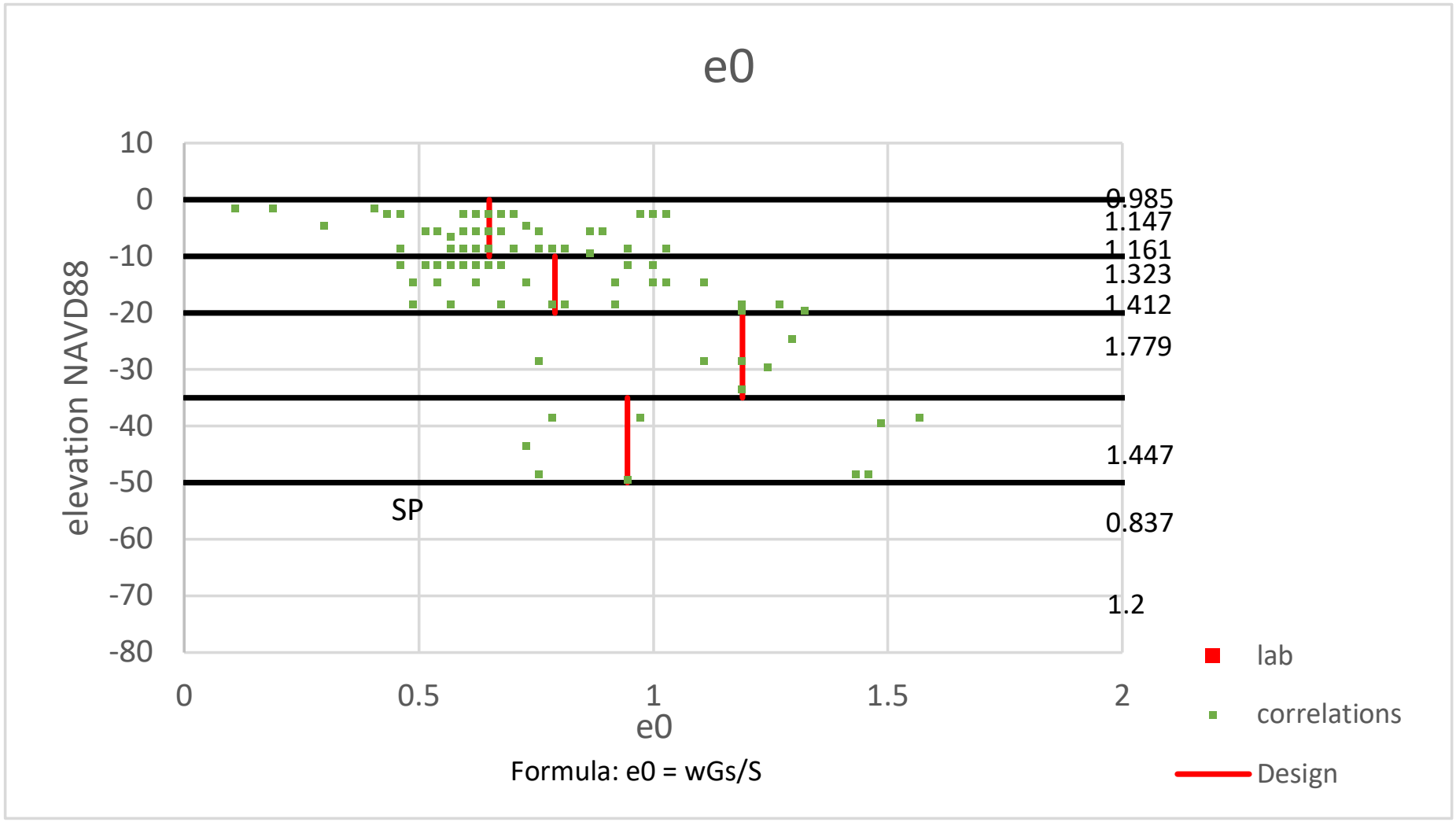
SOIL DESIGN PARAMETERS
PEARL RIVER LEVEE ANALYSIS

DATE: 3 FEB 2021

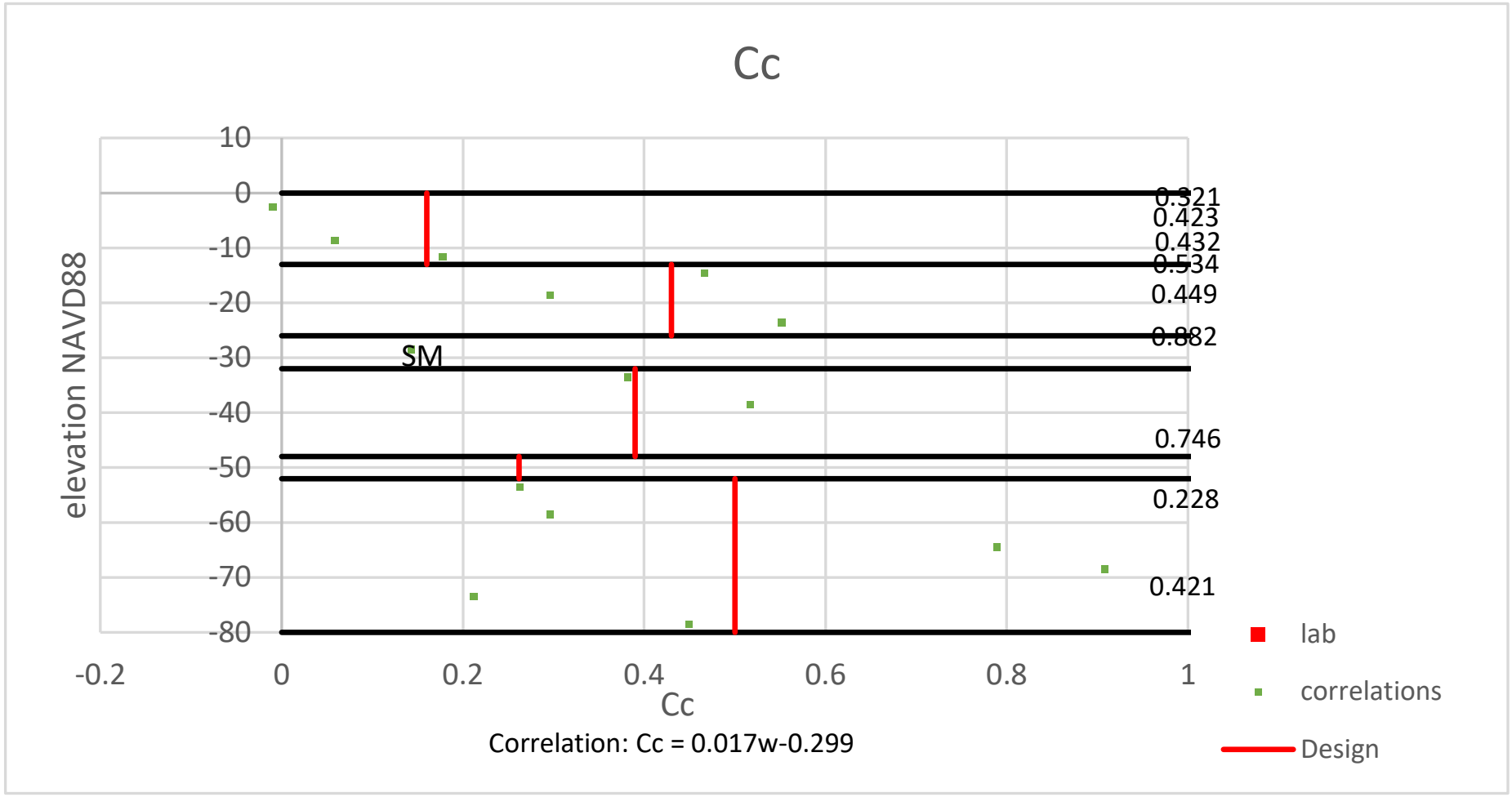
Oak Harbor (reach 2), I-10 Crossing (reach 3), Slidell East and Northeast (reach 4) settlement parameters



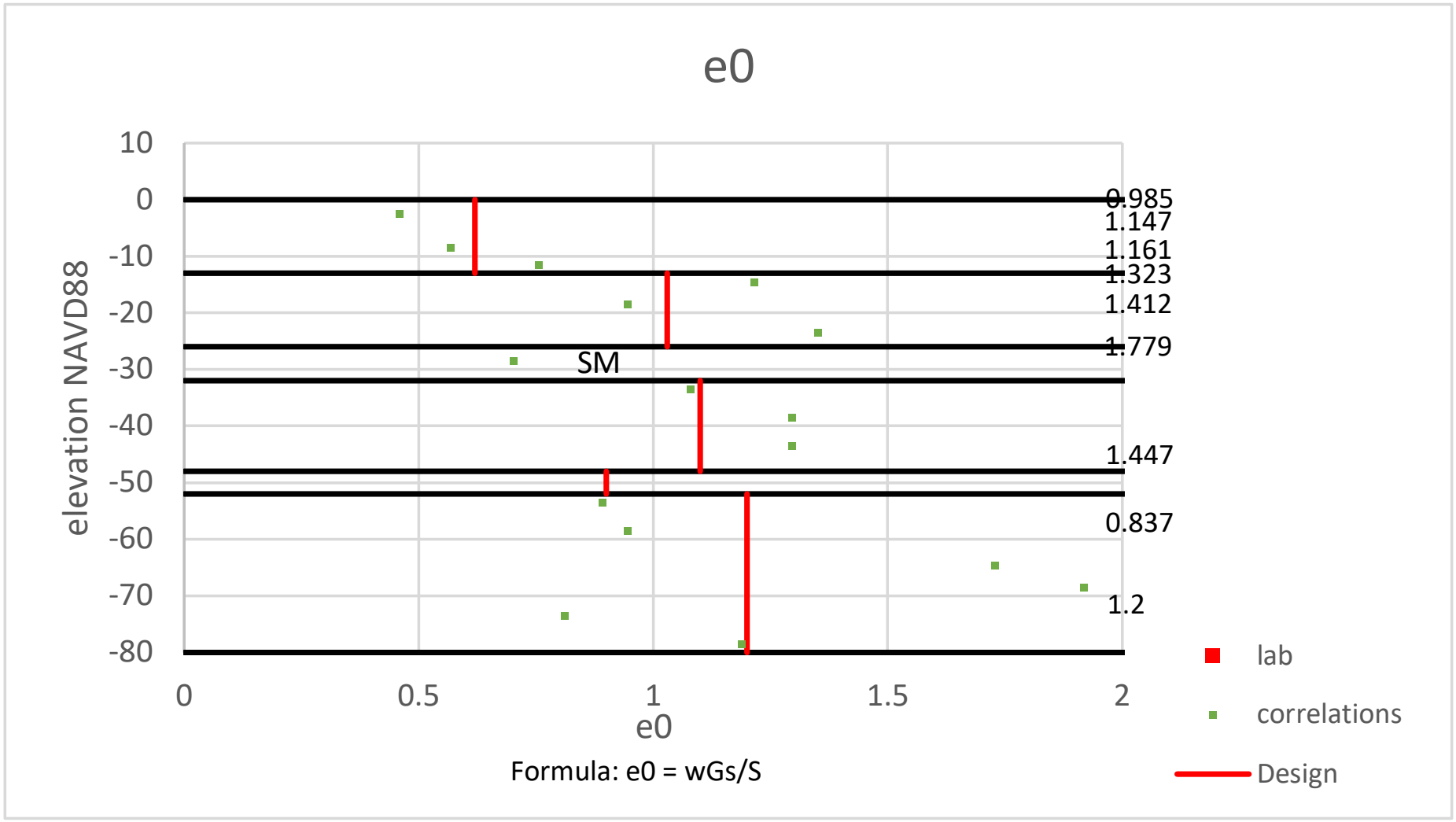
Oak Harbor (reach 2), I-10 Crossing (reach 3), Slidell East and Northeast (reach 4) settlement parameters



West Slidell (Reach 1) Settlement Parameters



West Slidell (Reach 1) Settlement Parameters



SECTION 4

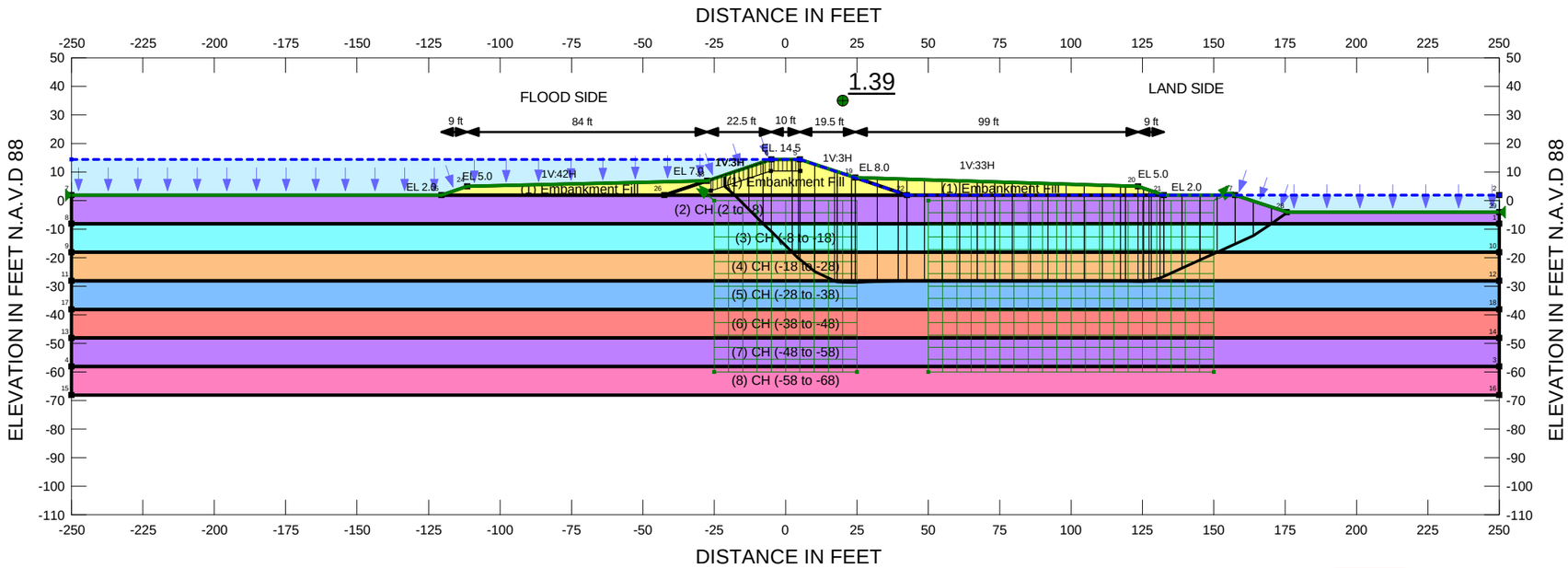
Stability Results

Spencer's Analysis

West Slidell Levee

Spencer's Q case

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Spencer's Q case

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,428
Date: 02/24/2022
Time: 10:03:26 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 02/24/2022
Last Solved Time: 10:04:44 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-25, 0) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	14.5 ft
Coordinate 2	-5 ft	14.5 ft
Coordinate 3	5 ft	14.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Tension Crack Line

	X	Y
Coordinate 1	-26.1 ft	3.4 ft
Coordinate 2	-5.2 ft	10.4 ft
Coordinate 3	5.2 ft	10.4 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)

Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

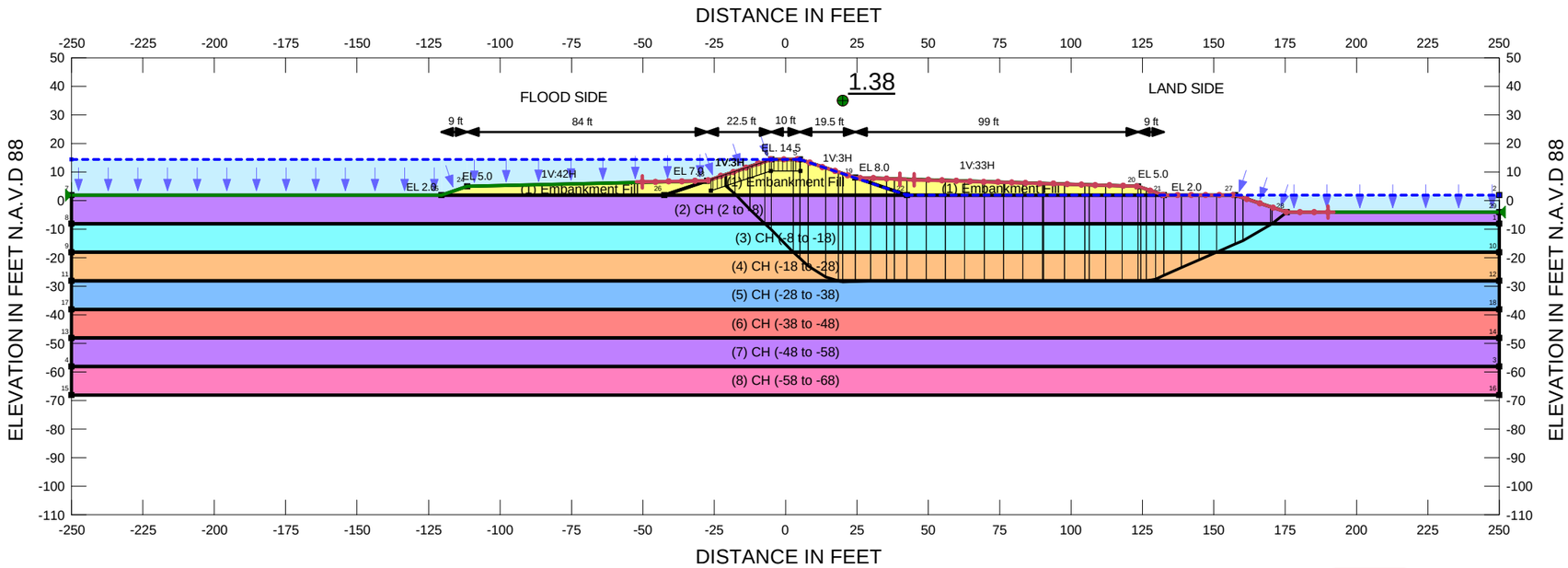
Slip Surfaces Analysed: 51535 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.39
Volume: 5,706.8922 ft³
Weight: 579,519.95 lbf
Resisting Moment: 3,694,917.3 lbf·ft
Activating Moment: 2,666,515.1 lbf·ft
Resisting Force: 48,299.498 lbf
Activating Force: 34,848.97 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (175.89528, -4) ft
Entry: (-21.277078, 5.0153327) ft
Radius: 77.704185 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-19.606494 ft	3.5786963 ft	681.48935 psf	612.00309 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-15.350794 ft	-0.42897 ft	931.56773 psf	1,274.8319 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-10.251982 ft	-5.5 ft	1,248 psf	1,800.1282 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	-6.3691429 ft	-9.3616828 ft	1,488.969 psf	2,211.882 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-1.34175 ft	-14.361683 ft	1,800.969 psf	2,713.5102 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	3.42777 ft	-19.105215 ft	2,096.9654 psf	3,145.0988 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 7	4.76952 ft	-20.400609 ft	2,177.798 psf	3,335.2853 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 8	7.59689 ft	-22.733596 ft	2,269.3611 psf	3,486.6554 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 9	13.68674 ft	-26.438202 ft	2,373.8596 psf	3,783.0199 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 10	17.620365 ft	-28.197033 ft	2,401.7913 psf	3,824.2997 psf	0 psf	251.93093 psf	0 psf	(5) CH (-28 to -38)
Slice 11	20.627145 ft	-28.545858 ft	2,361.0169 psf	3,885.5107 psf	0 psf	255.34941 psf	0 psf	(5) CH (-28 to -38)
Slice 12	23.84663 ft	-28.658267 ft	2,301.066 psf	3,817.5632 psf	0 psf	256.45102 psf	0 psf	(5) CH (-28 to -38)
Slice 13	28.334445 ft	-28.387767 ft	2,190.8402 psf	3,749.0085 psf	0 psf	253.80012 psf	0 psf	(5) CH (-28 to -38)
Slice 14	35.812625 ft	-28.078315 ft	2,015.9842 psf	3,674.946 psf	0 psf	250.76748 psf	0 psf	(5) CH (-28 to -38)
Slice 15	40.97818 ft	-27.999982 ft	1,903.6527 psf	3,640.8035 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 16	45.576063 ft	-27.999984 ft	1,871.999 psf	3,624.7808 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 17	51.72819 ft	-27.999987 ft	1,871.9992 psf	3,603.3419 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 18	57.880316 ft	-27.99999 ft	1,871.9994 psf	3,581.903 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 19	64.032443 ft	-27.999993 ft	1,871.9995 psf	3,560.4641 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 20	70.184569 ft	-27.999996 ft	1,871.9997 psf	3,539.0252 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 21	76.336696 ft	-27.999999 ft	1,871.9999 psf	3,517.5863 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 22	82.567212 ft	-28.000001 ft	1,872.0001 psf	3,495.8742 psf	0 psf	250.00001 psf	0 psf	(5) CH (-28 to -38)
Slice 23	88.876117 ft	-28.000004 ft	1,872.0003 psf	3,473.889 psf	0 psf	250.00004 psf	0 psf	(5) CH (-28 to -38)
Slice 24	95.185022 ft	-28.000007 ft	1,872.0005 psf	3,451.9037 psf	0 psf	250.00007 psf	0 psf	(5) CH (-28 to -38)
Slice 25	101.49393 ft	-28.00001 ft	1,872.0007 psf	3,429.9185 psf	0 psf	250.0001 psf	0 psf	(5) CH (-28 to -38)
Slice 26	107.80283 ft	-28.000014 ft	1,872.0008 psf	3,407.9332 psf	0 psf	250.00013 psf	0 psf	(5) CH (-28 to -38)
Slice 27	114.11174 ft	-28.000017 ft	1,872.001 psf	3,385.948 psf	0 psf	250.00016 psf	0 psf	(5) CH (-28 to -38)
Slice 28	118.196 ft	-28.021794 ft	1,873.3599 psf	3,366.2881 psf	0 psf	250.21358 psf	0 psf	(5) CH (-28 to -38)
Slice 29	121.31291 ft	-28.101882 ft	1,878.3574 psf	3,363.1663 psf	0 psf	250.99844 psf	0 psf	(5) CH (-28 to -38)
Slice 30	124.493 ft	-28.18667 ft	1,883.6482 psf	3,326.8619 psf	0 psf	251.82937 psf	0 psf	(5) CH (-28 to -38)
Slice 31	126.4476 ft	-28.106573 ft	1,878.6502 psf	3,288.7222 psf	0 psf	251.04442 psf	0 psf	(5) CH (-28 to -38)
Slice 32	127.8046 ft	-27.956177 ft	1,869.2655 psf	3,219.6926 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 33	129.68926 ft	-27.543009 ft	1,843.4838 psf	3,146.0883 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 34	131.83926 ft	-26.867061 ft	1,801.3046 psf	3,057.4564 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 35	135.65743 ft	-25.09533 ft	1,690.7486 psf	2,832.4638 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 36	141.9723 ft	-22.165073 ft	1,507.9006 psf	2,503.1484 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 37	148.18138 ft	-19.349972 ft	1,332.2383 psf	2,180.5812 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 38	154.36652 ft	-16.613826 ft	1,161.5028 psf	1,869.5807 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 39	160.72116 ft	-13.802693 ft	986.08806 psf	1,553.4597 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 40	167.06529 ft	-10.188867 ft	760.5853 psf	1,179.3866 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 41	172.84413 ft	-6.1385259 ft	507.84401 psf	727.14048 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 42	175.69764 ft	-4.1385259 ft	383.04401 psf	510.91253 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Spencer's Q case

CASE: Top of Levee (CG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,428
Date: 02/24/2022
Time: 10:03:26 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 02/24/2022
Last Solved Time: 10:04:00 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-50.11176, 6.461625) ft
Left-Zone Right Coordinate: (40.12261, 7.526588) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (45.12927, 7.374871) ft
Right-Zone Right Coordinate: (190, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	14.5 ft
Coordinate 2	-5 ft	14.5 ft
Coordinate 3	5 ft	14.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Tension Crack Line

	X	Y
Coordinate 1	-26.1 ft	3.4 ft
Coordinate 2	-5.2 ft	10.4 ft
Coordinate 3	5.2 ft	10.4 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-58, 563)
- Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-48, 449)
- Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

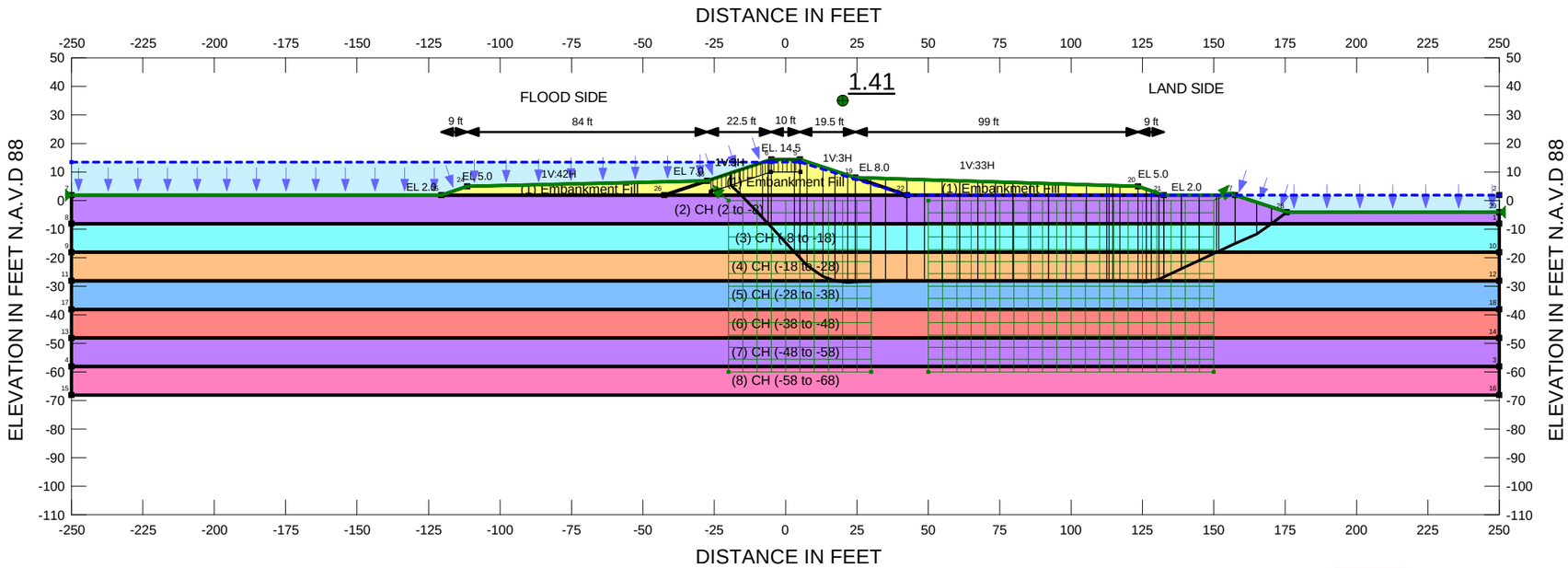
Slip Surfaces Analysed: 11918 of 20182 converged

Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.38
Volume: 5,678.0671 ft³
Weight: 576,498.28 lbf
Resisting Moment: 3,673,264.7 lbf·ft
Activating Moment: 2,654,680.2 lbf·ft
Resisting Force: 48,045.678 lbf
Activating Force: 34,714.458 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (175.57265, -4) ft
Entry: (-20.894887, 5.1433392) ft
Radius: 77.529812 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-19.261289 ft	3.6834621 ft	674.95196 psf	590.69531 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.984238 ft	-0.3882075 ft	929.02415 psf	1,277.3507 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-9.8104809 ft	-5.5 ft	1,248 psf	1,808.4243 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	-6.1400882 ft	-9.1264337 ft	1,474.2895 psf	2,194.0591 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-1.079479 ft	-14.126434 ft	1,786.2895 psf	2,691.7822 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	3.920521 ft	-19.06655 ft	2,094.5527 psf	3,141.9961 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 7	6.426435 ft	-21.542452 ft	2,219.3792 psf	3,350.1988 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 8	10.931335 ft	-24.846334 ft	2,331.8395 psf	3,656.9011 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 9	16.310895 ft	-27.370432 ft	2,377.4484 psf	3,845.1644 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 10	19.32253 ft	-28.1944 ft	2,366.2219 psf	3,820.3541 psf	0 psf	251.90512 psf	0 psf	(5) CH (-28 to -38)
Slice 11	22.266535 ft	-28.33526 ft	2,313.7763 psf	3,829.5056 psf	0 psf	253.28554 psf	0 psf	(5) CH (-28 to -38)
Slice 12	27.21729 ft	-28.216581 ft	2,203.395 psf	3,721.1872 psf	0 psf	252.12249 psf	0 psf	(5) CH (-28 to -38)
Slice 13	32.65187 ft	-28.086304 ft	2,082.2264 psf	3,687.8167 psf	0 psf	250.84577 psf	0 psf	(5) CH (-28 to -38)
Slice 14	36.79457 ft	-28.010569 ft	1,991.3324 psf	3,659.2089 psf	0 psf	250.10357 psf	0 psf	(5) CH (-28 to -38)
Slice 15	40.35999 ft	-27.999974 ft	1,916.5106 psf	3,643.0206 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 16	45.886016 ft	-27.999978 ft	1,871.9986 psf	3,623.7636 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 17	52.658047 ft	-27.999983 ft	1,871.9989 psf	3,600.1647 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 18	59.430079 ft	-27.999988 ft	1,871.9992 psf	3,576.5657 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 19	66.202111 ft	-27.999993 ft	1,871.9995 psf	3,552.9668 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 20	72.974142 ft	-27.999998 ft	1,871.9998 psf	3,529.3678 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 21	79.765531 ft	-28.000003 ft	1,872.0002 psf	3,505.7014 psf	0 psf	250.00002 psf	0 psf	(5) CH (-28 to -38)
Slice 22	86.576277 ft	-28.000007 ft	1,872.0005 psf	3,481.9675 psf	0 psf	250.00007 psf	0 psf	(5) CH (-28 to -38)
Slice 23	90.240282 ft	-28.000005 ft	1,872.0003 psf	3,469.2056 psf	0 psf	250.00005 psf	0 psf	(5) CH (-28 to -38)
Slice 24	94.068033 ft	-27.999931 ft	1,871.9957 psf	3,455.8583 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 25	101.20627 ft	-27.999793 ft	1,871.9871 psf	3,430.9674 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 26	105.62247 ft	-28.00435 ft	1,872.2714 psf	3,414.2298 psf	0 psf	250.04263 psf	0 psf	(5) CH (-28 to -38)
Slice 27	109.30796 ft	-28.009757 ft	1,872.6088 psf	3,403.7341 psf	0 psf	250.09562 psf	0 psf	(5) CH (-28 to -38)
Slice 28	114.98477 ft	-28.011319 ft	1,872.7063 psf	3,384.1239 psf	0 psf	250.11093 psf	0 psf	(5) CH (-28 to -38)
Slice 29	120.66159 ft	-28.012881 ft	1,872.8038 psf	3,364.5136 psf	0 psf	250.12624 psf	0 psf	(5) CH (-28 to -38)
Slice 30	124.02289 ft	-28.013806 ft	1,872.8615 psf	3,334.6807 psf	0 psf	250.1353 psf	0 psf	(5) CH (-28 to -38)
Slice 31	125.47913 ft	-28.013916 ft	1,872.8684 psf	3,278.9739 psf	0 psf	250.13638 psf	0 psf	(5) CH (-28 to -38)
Slice 32	128.06098 ft	-27.717363 ft	1,854.3635 psf	3,206.377 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 33	131.10473 ft	-26.804133 ft	1,797.3779 psf	3,072.5246 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 34	135.58725 ft	-24.822851 ft	1,673.7459 psf	2,795.4628 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 35	141.76176 ft	-22.093711 ft	1,503.4475 psf	2,489.0243 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 36	147.93626 ft	-19.36457 ft	1,333.1492 psf	2,182.5858 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 37	154.26176 ft	-16.568693 ft	1,158.6864 psf	1,865.2805 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 38	158.82634 ft	-14.551141 ft	1,032.7912 psf	1,647.3127 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 39	165.02205 ft	-11.186036 ft	822.80865 psf	1,274.3256 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 40	170.15387 ft	-8.2035875 ft	636.70386 psf	960.9682 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 41	172.95816 ft	-6.0281782 ft	500.95832 psf	729.99537 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 42	175.53632 ft	-4.0281782 ft	376.15832 psf	513.96634 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Spencer's Q case

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,433
Date: 07/12/2022
Time: 04:02:25 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 07/12/2022
Last Solved Time: 04:03:20 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-20, 0) ft
Lower Left: (-20, -60) ft
Lower Right: (30, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	13.5 ft
Coordinate 2	-5 ft	13.5 ft
Coordinate 3	5 ft	13.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Tension Crack Line

	X	Y
Coordinate 1	-26.1 ft	3 ft
Coordinate 2	-5.2 ft	10 ft
Coordinate 3	5.2 ft	10 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

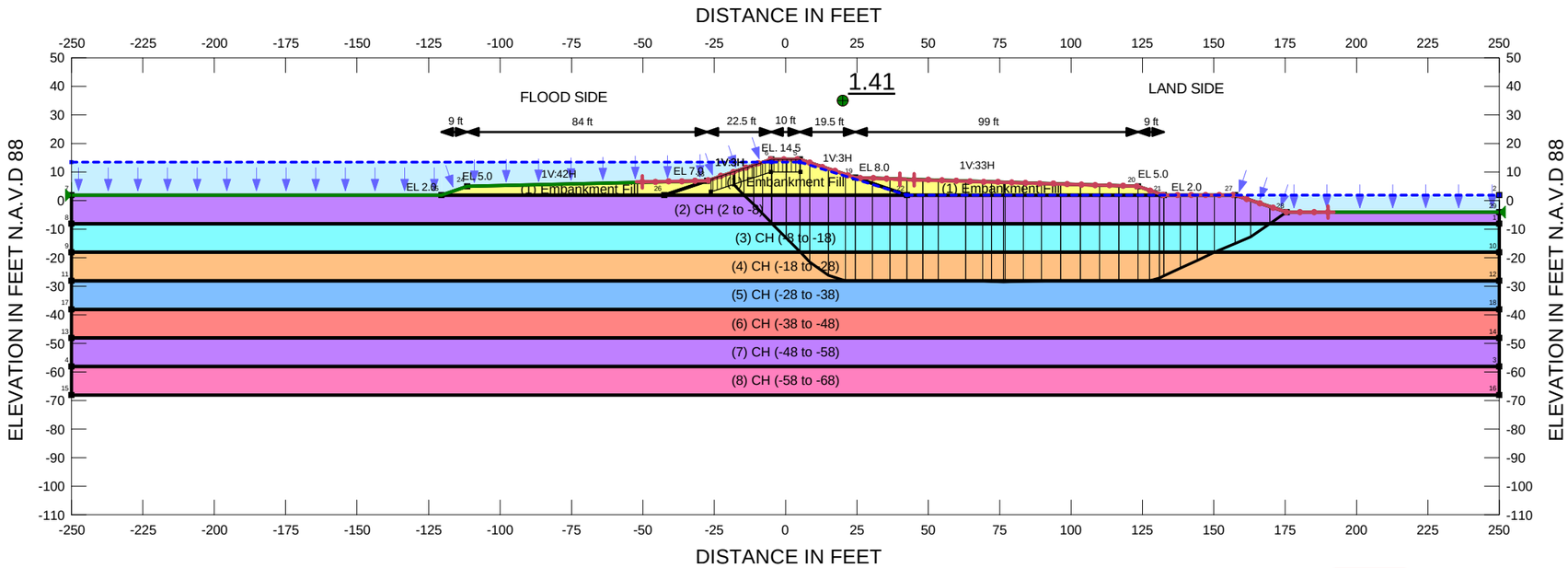
Slip Surfaces Analysed: 51195 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.41
Volume: 5,653.5253 ft³
Weight: 574,072.64 lbf
Resisting Moment: 3,657,781.6 lbf·ft
Activating Moment: 2,594,754.9 lbf·ft
Resisting Force: 47,680.681 lbf
Activating Force: 33,821.801 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (175.61339, -4) ft
Entry: (-19.071242, 5.3541296) ft
Radius: 77.036338 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-17.473526 ft	3.8718243 ft	600.79816 psf	531.939 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-11.937905 ft	-1.8259346 ft	956.33832 psf	1,379.7606 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-7.0851723 ft	-7.0206941 ft	1,280.4913 psf	1,930.8809 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	-5.5851723 ft	-8.626416 ft	1,380.6884 psf	2,129.5627 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-0.91437607 ft	-13.626416 ft	1,692.6884 psf	2,627.9209 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	4.0856239 ft	-18.978822 ft	2,026.6785 psf	3,113.1892 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 7	6.27519 ft	-21.322712 ft	2,148.5352 psf	3,312.5066 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 8	10.35014 ft	-24.558546 ft	2,272.473 psf	3,633.8942 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 9	15.245205 ft	-27.239953 ft	2,346.1208 psf	3,833.6646 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 10	19.51963 ft	-28.332097 ft	2,332.4752 psf	3,879.7195 psf	0 psf	253.25455 psf	0 psf	(5) CH (-28 to -38)
Slice 11	23.099375 ft	-28.549282 ft	2,277.5255 psf	3,828.5058 psf	0 psf	255.38296 psf	0 psf	(5) CH (-28 to -38)
Slice 12	27.140099 ft	-28.363721 ft	2,188.6232 psf	3,744.9127 psf	0 psf	253.56447 psf	0 psf	(5) CH (-28 to -38)
Slice 13	32.420929 ft	-28.121211 ft	2,072.4367 psf	3,699.5867 psf	0 psf	251.18787 psf	0 psf	(5) CH (-28 to -38)
Slice 14	38.78083 ft	-27.999945 ft	1,943.1666 psf	3,648.2028 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 15	45.599313 ft	-27.999952 ft	1,871.997 psf	3,624.4421 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 16	51.797939 ft	-27.999957 ft	1,871.9973 psf	3,602.8415 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 17	57.996564 ft	-27.999963 ft	1,871.9977 psf	3,581.2408 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 18	64.19519 ft	-27.999969 ft	1,871.998 psf	3,559.6402 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 19	70.393816 ft	-27.999974 ft	1,871.9984 psf	3,538.0395 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 20	76.592442 ft	-27.99998 ft	1,871.9988 psf	3,516.4389 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 21	82.791067 ft	-27.999986 ft	1,871.9991 psf	3,494.8383 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 22	88.989693 ft	-27.999991 ft	1,871.9995 psf	3,473.2376 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 23	95.188319 ft	-27.999997 ft	1,871.9998 psf	3,451.637 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 24	101.83047 ft	-28.000003 ft	1,872.0002 psf	3,428.4908 psf	0 psf	250.00003 psf	0 psf	(5) CH (-28 to -38)
Slice 25	108.91614 ft	-28.00001 ft	1,872.0006 psf	3,403.799 psf	0 psf	250.0001 psf	0 psf	(5) CH (-28 to -38)
Slice 26	112.84467 ft	-28.001855 ft	1,872.1158 psf	3,388.7359 psf	0 psf	250.01818 psf	0 psf	(5) CH (-28 to -38)
Slice 27	113.92594 ft	-28.011754 ft	1,872.7334 psf	3,383.8141 psf	0 psf	250.11519 psf	0 psf	(5) CH (-28 to -38)
Slice 28	115.83773 ft	-28.046706 ft	1,874.9145 psf	3,377.5336 psf	0 psf	250.45772 psf	0 psf	(5) CH (-28 to -38)
Slice 29	120.27698 ft	-28.177841 ft	1,883.0973 psf	3,373.1316 psf	0 psf	251.74285 psf	0 psf	(5) CH (-28 to -38)
Slice 30	124.89177 ft	-28.327093 ft	1,892.4106 psf	3,325.0499 psf	0 psf	253.20551 psf	0 psf	(5) CH (-28 to -38)
Slice 31	127.22322 ft	-28.186053 ft	1,883.6097 psf	3,295.5647 psf	0 psf	251.82332 psf	0 psf	(5) CH (-28 to -38)
Slice 32	129.45076 ft	-27.745016 ft	1,856.089 psf	3,160.1378 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 33	131.6193 ft	-27.075448 ft	1,814.308 psf	3,089.0896 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 34	135.56638 ft	-25.217387 ft	1,698.3649 ft	2,845.7741 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 35	141.69913 ft	-22.330432 ft	1,518.219 psf	2,521.3168 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 36	147.83189 ft	-19.443477 ft	1,338.073 psf	2,196.8596 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 37	151.31155 ft	-17.80545 ft	1,235.86 psf	1,996.0748 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 38	154.61241 ft	-16.34157 ft	1,144.514 psf	1,839.3519 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 39	161.22698 ft	-13.433931 ft	963.07729 psf	1,508.9111 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 40	167.54895 ft	-9.89781 ft	742.42334 psf	1,148.464 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 41	172.82197 ft	-6.0414648 ft	501.7874 psf	721.46105 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 42	175.5567 ft	-4.0414648 ft	376.9874 psf	504.88205 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Spencer's Q case

CASE: Project Grade (PG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,433
Date: 07/12/2022
Time: 04:02:25 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 07/12/2022
Last Solved Time: 04:02:56 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-50.11176, 6.461625) ft
Left-Zone Right Coordinate: (40.12261, 7.526588) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (45.12927, 7.374871) ft
Right-Zone Right Coordinate: (190, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	13.5 ft
Coordinate 2	-5 ft	13.5 ft
Coordinate 3	5 ft	13.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Tension Crack Line

	X	Y
Coordinate 1	-26.1 ft	3 ft
Coordinate 2	-5.2 ft	10 ft
Coordinate 3	5.2 ft	10 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-58, 563)
- Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-48, 449)
- Data Point: (-38, 348)

CH, -28 to -38
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

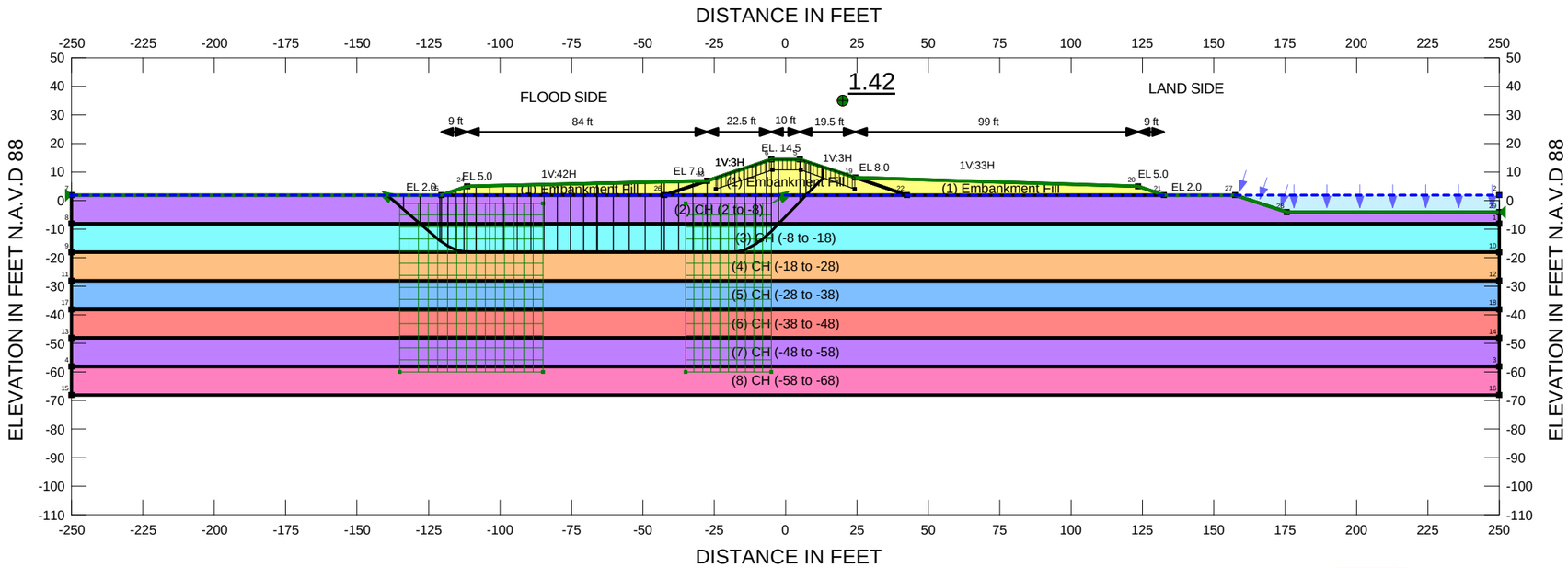
Slip Surfaces Analysed: 11863 of 20182 converged

Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.41
Volume: 5,577.9273 ft³
Weight: 566,247.21 lbf
Resisting Moment: 3,627,548.6 lbf·ft
Activating Moment: 2,564,323.8 lbf·ft
Resisting Force: 47,467.587 lbf
Activating Force: 33,548.159 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (175.41231, -3.9707713) ft
Entry: (-18.087013, 5.6837754) ft
Radius: 76.923502 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-16.270196 ft	3.8418877 ft	602.66621 psf	521.2482 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-12.817405 ft	0.34145 ft	821.09352 psf	1,194.3949 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-9.590715 ft	-2.9511025 ft	1,026.5488 psf	1,530.1341 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	-6.5 ft	-6.1259239 ft	1,224.6577 psf	1,885.2966 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 5	-4.8377857 ft	-7.8333714 ft	1,331.2024 psf	2,087.1139 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 6	-2.2566785 ft	-10.484717 ft	1,496.6464 psf	2,338.9128 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 7	2.5811072 ft	-15.454152 ft	1,806.7391 psf	2,813.8461 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 8	6.75996 ft	-19.746722 ft	2,040.9169 psf	3,143.4687 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 9	11.82825 ft	-23.852604 ft	2,200.1371 psf	3,495.3329 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 10	18.12476 ft	-27.070341 ft	2,280.4338 psf	3,733.8778 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 11	22.80647 ft	-27.990567 ft	2,248.2668 psf	3,761.7195 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 12	27.5 ft	-27.992004 ft	2,158.5411 psf	3,686.5055 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 13	33.5 ft	-27.993842 ft	2,043.8398 psf	3,665.7989 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 14	39.5 ft	-27.99568 ft	1,929.1384 psf	3,645.0922 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 15	45.275571 ft	-27.997449 ft	1,871.8408 psf	3,625.1601 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 16	50.826712 ft	-27.99915 ft	1,871.9469 psf	3,606.0025 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 17	58.337591 ft	-28.001451 ft	1,872.0905 psf	3,580.0821 psf	0 psf	250.01421 psf	0 psf	(5) CH (-28 to -38)
Slice 18	66.0564 ft	-28.05424 ft	1,875.3846 psf	3,553.3066 psf	0 psf	250.53155 psf	0 psf	(5) CH (-28 to -38)
Slice 19	70.64029 ft	-28.172071 ft	1,882.7372 psf	3,542.1088 psf	0 psf	251.68629 psf	0 psf	(5) CH (-28 to -38)
Slice 20	74.32392 ft	-28.327433 ft	1,892.4318 psf	3,545.9811 psf	0 psf	253.20884 psf	0 psf	(5) CH (-28 to -38)
Slice 21	76.70943 ft	-28.430831 ft	1,898.8839 psf	3,547.2062 psf	0 psf	254.22214 psf	0 psf	(5) CH (-28 to -38)
Slice 22	80.18217 ft	-28.33796 ft	1,893.0887 psf	3,552.672 psf	0 psf	253.31201 psf	0 psf	(5) CH (-28 to -38)
Slice 23	86.52311 ft	-28.123163 ft	1,879.6854 psf	3,506.7597 psf	0 psf	251.20699 psf	0 psf	(5) CH (-28 to -38)
Slice 24	93.074222 ft	-28.014504 ft	1,872.905 psf	3,460.6978 psf	0 psf	250.14214 psf	0 psf	(5) CH (-28 to -38)
Slice 25	99.835506 ft	-28.011983 ft	1,872.7478 psf	3,436.8573 psf	0 psf	250.11744 psf	0 psf	(5) CH (-28 to -38)
Slice 26	106.59679 ft	-28.009463 ft	1,872.5905 psf	3,413.0168 psf	0 psf	250.09274 psf	0 psf	(5) CH (-28 to -38)
Slice 27	113.35807 ft	-28.006943 ft	1,872.4332 psf	3,389.1764 psf	0 psf	250.06804 psf	0 psf	(5) CH (-28 to -38)
Slice 28	120.11936 ft	-28.004422 ft	1,872.276 psf	3,365.3359 psf	0 psf	250.04334 psf	0 psf	(5) CH (-28 to -38)
Slice 29	125.49366 ft	-28.002419 ft	1,872.151 psf	3,276.9089 psf	0 psf	250.02371 psf	0 psf	(5) CH (-28 to -38)
Slice 30	129.23022 ft	-27.569238 ft	1,845.1205 psf	3,165.1494 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 31	131.73657 ft	-26.778745 ft	1,795.7937 psf	3,050.2477 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 32	135.44253 ft	-25.040629 ft	1,687.3352 psf	2,825.0243 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 33	141.32758 ft	-22.280507 ft	1,515.1036 psf	2,514.8477 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 34	147.21263 ft	-19.520385 ft	1,342.872 psf	2,204.671 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 35	153.82758 ft	-16.568747 ft	1,158.6898 psf	1,859.5976 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 36	160.21902 ft	-13.833593 ft	988.01618 psf	1,556.0573 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 37	166.28632 ft	-10.335008 ft	769.7045 psf	1,198.0055 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 38	172.52346 ft	-5.9853856 ft	498.28806 psf	712.48286 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Spencer's Q case

CASE: Low Water (LW) Block Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,428
Date: 02/24/2022
Time: 10:03:26 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 02/24/2022
Last Solved Time: 10:05:54 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 1 °
  - Resisting Side Maximum Convex Angle: 1 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (-85, -1) ft
- Lower Left: (-85, -60) ft
- Lower Right: (-135, -60) ft
- X Increments: 15
- Y Increments: 14
- Starting Angle: 145 °
- Ending Angle: 155 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 35 °
- Upper Left: (-35, -1) ft
- Lower Left: (-35, -60) ft
- Lower Right: (-5, -60) ft
- X Increments: 10
- Y Increments: 14
- Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	4 ft
Coordinate 2	-4.5 ft	10.7 ft
Coordinate 3	5.5 ft	10.7 ft
Coordinate 4	24.3 ft	4 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-58, 563)

Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

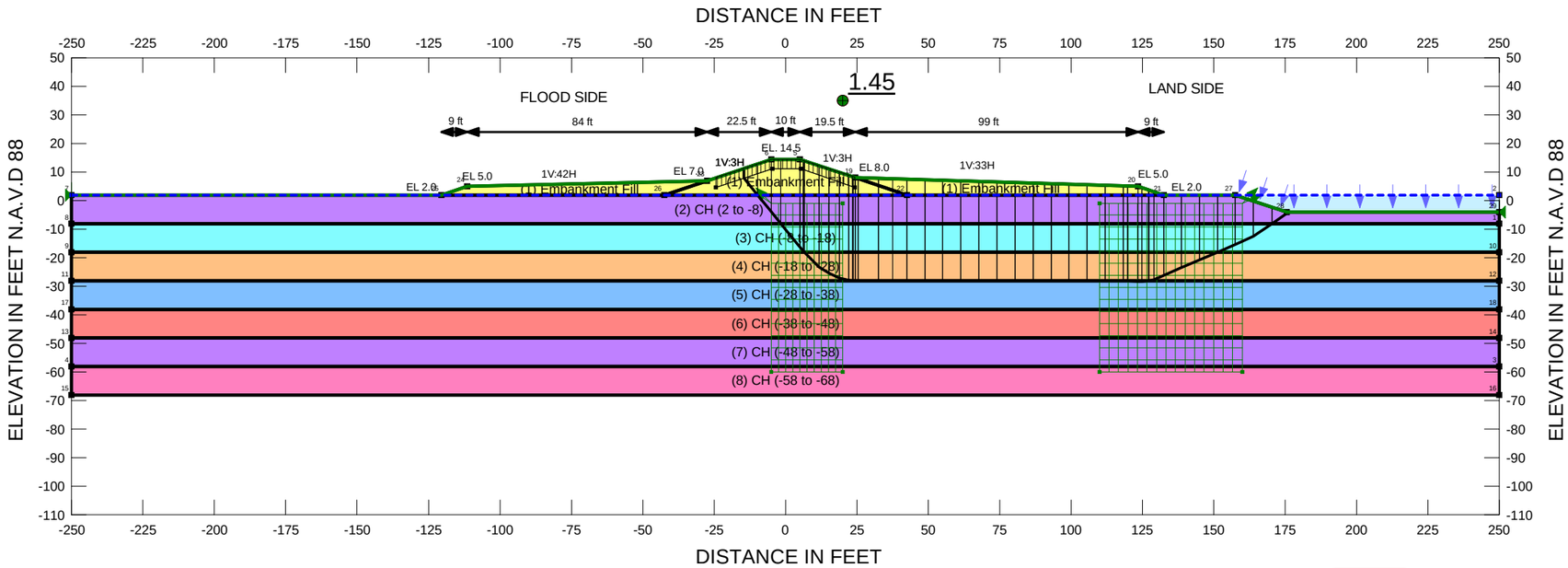
Slip Surfaces Analysed: 23264 of 23761 converged

Current Slip Surface

Slip Surface: 23,761
Factor of Safety: 1.42
Volume: 3,243.0992 ft³
Weight: 321,853.33 lbf
Resisting Moment: 2,039,535.7 lbf·ft
Activating Moment: 1,431,734.4 lbf·ft
Resisting Force: 32,904.758 lbf
Activating Force: 23,093.661 lbf
Slip Rank: 1 of 23,761 slip surfaces
Exit: (-139.60838, 2) ft
Entry: (13.147672, 7.9745) ft
Radius: 60.201391 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-136.70405 ft	-0.5 ft	156 psf	365.33212 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 2	-130.89538 ft	-5.5 ft	468 psf	832.51636 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-124.51696 ft	-10.990434 ft	810.60311 psf	1,376.5715 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-120.77143 ft	-14.170902 ft	1,009.0643 psf	1,671.4064 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-119.34831 ft	-15.167242 ft	1,071.2359 psf	1,819.6226 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-116.75691 ft	-16.614846 ft	1,161.5664 psf	2,011.7901 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 7	-113.94436 ft	-17.538132 ft	1,219.1794 psf	2,158.8687 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 8	-112.03576 ft	-17.842827 ft	1,238.1924 psf	2,224.6831 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 9	-109.91988 ft	-17.932505 ft	1,243.7883 psf	2,258.5763 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 10	-105.95114 ft	-17.999527 ft	1,247.9705 psf	2,266.1075 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 11	-101.17391 ft	-17.99963 ft	1,247.9769 psf	2,279.1984 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 12	-96.39668 ft	-17.999734 ft	1,247.9834 psf	2,292.2892 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 13	-91.619452 ft	-17.999837 ft	1,247.9898 psf	2,305.3801 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 14	-86.842224 ft	-17.99994 ft	1,247.9963 psf	2,318.4709 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 15	-82.16108 ft	-17.999982 ft	1,247.9988 psf	2,331.2862 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 16	-77.57602 ft	-17.999961 ft	1,247.9975 psf	2,343.8384 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 17	-72.99096 ft	-17.999939 ft	1,247.9962 psf	2,356.3906 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 18	-68.4059 ft	-17.999918 ft	1,247.9949 psf	2,368.9429 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 19	-66.00154 ft	-17.999838 ft	1,247.9899 psf	2,375.369 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 20	-63.102254 ft	-17.999794 ft	1,247.9872 psf	2,383.4556 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 21	-57.527341 ft	-17.999845 ft	1,247.9903 psf	2,398.7253 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 22	-51.952429 ft	-17.999895 ft	1,247.9935 psf	2,413.995 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 23	-46.377516 ft	-17.999946 ft	1,247.9966 psf	2,429.2647 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 24	-43.04503 ft	-17.999951 ft	1,247.997 psf	2,438.3789 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 25	-40 ft	-17.999841 ft	1,247.9901 psf	2,446.7055 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 26	-35 ft	-17.999661 ft	1,247.9788 psf	2,460.3779 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 27	-30 ft	-17.99948 ft	1,247.9675 psf	2,474.0502 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 28	-25.01854 ft	-17.9993 ft	1,247.9563 psf	2,576 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 29	-20.05562 ft	-17.999121 ft	1,247.9451 psf	2,766.227 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 30	-15.92418 ft	-17.605704 ft	1,223.3959 psf	2,823.036 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 31	-12.308255 ft	-16.233058 ft	1,137.7428 psf	2,757.9679 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 32	-8.466475 ft	-13.806285 ft	986.31222 psf	2,597.2514 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 33	-5.79532 ft	-11.534558 ft	844.55644 psf	2,414.0637 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 34	-3.692461 ft	-9.3551418 ft	708.56085 psf	2,234.5592 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 35	1.307539 ft	-4.1731099 ft	385.20206 psf	1,774.9789 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 36	6.1319015 ft	0.8268901 ft	73.202058 psf	1,302.514 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 37	8.0066665 ft	2.7699085 ft	-48.04229 psf	780.66353 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 38	10.948601 ft	5.7571585 ft	-234.44669 psf	351.21682 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Spencer's Q case

CASE: Low Water (LW) Block Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,428
Date: 02/24/2022
Time: 10:03:26 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 02/24/2022
Last Solved Time: 10:05:04 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (20, -1) ft
- Lower Left: (20, -60) ft
- Lower Right: (-5, -60) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (110, -1) ft
- Lower Left: (110, -60) ft
- Lower Right: (160, -60) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	4.6 ft
Coordinate 2	-4.5 ft	11.2 ft
Coordinate 3	5.5 ft	11.2 ft
Coordinate 4	24.3 ft	4.6 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-58, 563)
- Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y

Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

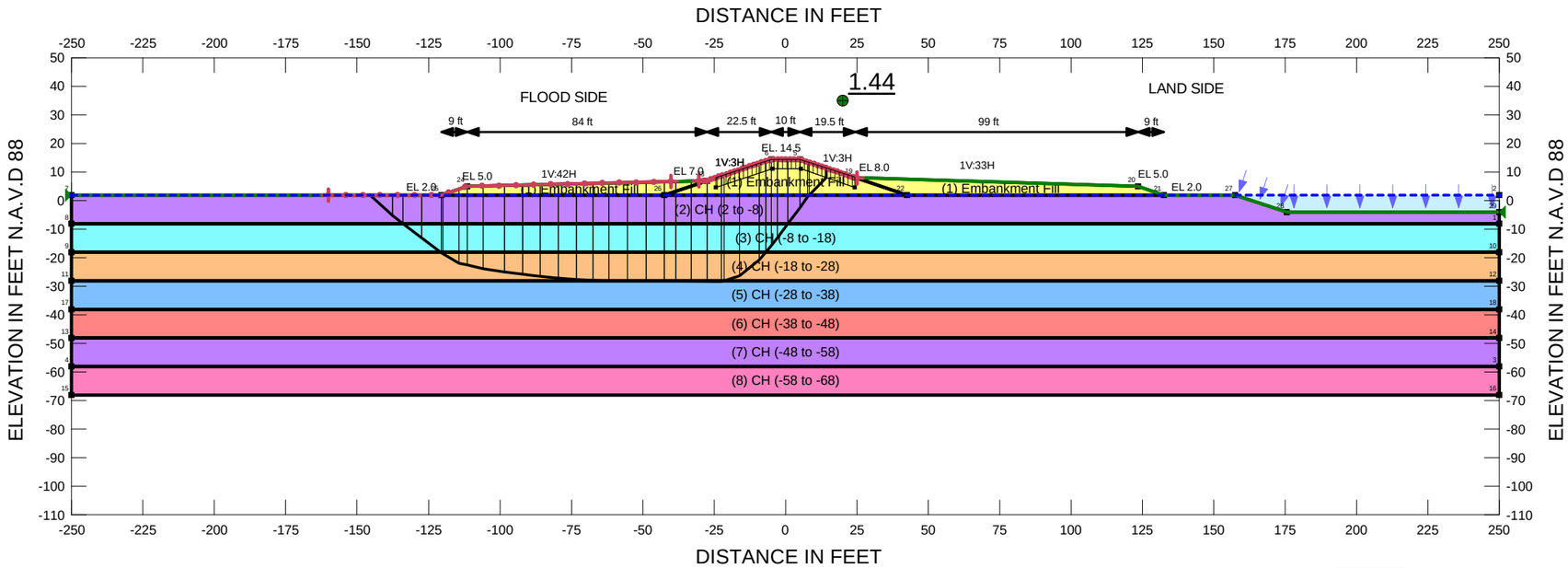
Slip Surfaces Analysed: 38772 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.45
Volume: 5,469.6897 ft³
Weight: 555,016.17 lbf
Resisting Moment: 3,619,642.6 lbf·ft
Activating Moment: 2,488,326.4 lbf·ft
Resisting Force: 47,296.011 lbf
Activating Force: 32,514.92 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (176.21303, -4) ft
Entry: (-14.505908, 7.8646972) ft
Radius: 76.917545 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-12.118596 ft	4.9323486 ft	-182.97855 psf	321.25389 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-7.3656415 ft	-0.90572989 ft	181.31754 psf	1,372.5378 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-3.2949921 ft	-5.9057299 ft	493.31754 psf	1,885.5605 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	1.7050079 ft	-12.047256 ft	876.54878 psf	2,448.423 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	5.611545 ft	-16.845676 ft	1,175.9702 psf	2,881.474 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	6.4275505 ft	-17.79842 ft	1,235.4214 psf	3,003.9584 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 7	9.2592055 ft	-20.590182 ft	1,409.6274 psf	3,161.5065 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 8	13.609105 ft	-24.285204 ft	1,640.1967 psf	3,498.4084 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 9	17.15932 ft	-26.199296 ft	1,759.6361 psf	3,634.6138 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 10	20.582865 ft	-27.432319 ft	1,836.5767 psf	3,696.8539 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 11	22.87005 ft	-27.925529 ft	1,867.353 psf	3,718.3064 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 12	23.642795 ft	-27.997211 ft	1,871.826 psf	3,720.9457 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 13	24.112195 ft	-27.999574 ft	1,871.9734 psf	3,712.2878 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 14	24.98372 ft	-27.999847 ft	1,871.9905 psf	3,695.7665 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 15	29.038037 ft	-28 ft	1,872 psf	3,681.7588 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 16	35.081475 ft	-28 ft	1,872 psf	3,660.6985 psf	0 psf	250 psf	0 psf	(5) CH (-28 to -38)
Slice 17	40.027158 ft	-28.000001 ft	1,872.0001 psf	3,643.4636 psf	0 psf	250.00001 psf	0 psf	(5) CH (-28 to -38)
Slice 18	45.658456 ft	-28.000002 ft	1,872.0001 psf	3,623.8395 psf	0 psf	250.00002 psf	0 psf	(5) CH (-28 to -38)
Slice 19	51.975369 ft	-28.000003 ft	1,872.0002 psf	3,601.8261 psf	0 psf	250.00003 psf	0 psf	(5) CH (-28 to -38)
Slice 20	58.292281 ft	-28.000004 ft	1,872.0002 psf	3,579.8127 psf	0 psf	250.00004 psf	0 psf	(5) CH (-28 to -38)
Slice 21	64.609194 ft	-28.000004 ft	1,872.0003 psf	3,557.7993 psf	0 psf	250.00004 psf	0 psf	(5) CH (-28 to -38)
Slice 22	70.926106 ft	-28.000005 ft	1,872.0003 psf	3,535.7859 psf	0 psf	250.00005 psf	0 psf	(5) CH (-28 to -38)
Slice 23	77.243019 ft	-28.000006 ft	1,872.0004 psf	3,513.7725 psf	0 psf	250.00006 psf	0 psf	(5) CH (-28 to -38)
Slice 24	83.559931 ft	-28.000007 ft	1,872.0004 psf	3,491.7591 psf	0 psf	250.00007 psf	0 psf	(5) CH (-28 to -38)
Slice 25	89.876844 ft	-28.000008 ft	1,872.0005 psf	3,469.7458 psf	0 psf	250.00008 psf	0 psf	(5) CH (-28 to -38)
Slice 26	96.193756 ft	-28.000009 ft	1,872.0006 psf	3,447.7324 psf	0 psf	250.00009 psf	0 psf	(5) CH (-28 to -38)
Slice 27	102.51067 ft	-28.00001 ft	1,872.0006 psf	3,425.719 psf	0 psf	250.0001 psf	0 psf	(5) CH (-28 to -38)
Slice 28	108.82758 ft	-28.000011 ft	1,872.0007 psf	3,403.7056 psf	0 psf	250.0001 psf	0 psf	(5) CH (-28 to -38)
Slice 29	115.14449 ft	-28.000012 ft	1,872.0007 psf	3,381.6922 psf	0 psf	250.00011 psf	0 psf	(5) CH (-28 to -38)
Slice 30	119.07164 ft	-28.019151 ft	1,873.195 psf	3,362.1879 psf	0 psf	250.18768 psf	0 psf	(5) CH (-28 to -38)
Slice 31	121.67016 ft	-28.098857 ft	1,878.1687 psf	3,359.2982 psf	0 psf	250.9688 psf	0 psf	(5) CH (-28 to -38)
Slice 32	124.20677 ft	-28.182817 ft	1,883.4078 psf	3,335.106 psf	0 psf	251.79161 psf	0 psf	(5) CH (-28 to -38)
Slice 33	126.01165 ft	-28.122211 ft	1,879.626 psf	3,293.9594 psf	0 psf	251.19767 psf	0 psf	(5) CH (-28 to -38)
Slice 34	127.20893 ft	-28.019106 ft	1,873.1922 psf	3,273.1128 psf	0 psf	250.18724 psf	0 psf	(5) CH (-28 to -38)
Slice 35	128.23508 ft	-27.821403 ft	1,860.8556 psf	3,211.478 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 36	130.83104 ft	-26.915799 ft	1,804.3458 psf	3,085.6796 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 37	135.63312 ft	-24.823992 ft	1,673.8171 psf	2,785.8713 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 38	141.89935 ft	-22.094395 ft	1,503.4903 psf	2,479.7627 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 39	148.16558 ft	-19.364798 ft	1,333.1634 psf	2,173.654 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 40	154.39935 ft	-16.649341 ft	1,163.7189 psf	1,866.1885 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 41	160.68932 ft	-13.909401 ft	992.74665 psf	1,557.9292 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 42	167.15048 ft	-10.26006 ft	765.02774 psf	1,176.2548 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 43	172.96116 ft	-6.2462676 ft	514.5671 psf	727.10441 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 44	175.85652 ft	-4.2462676 ft	389.7671 psf	512.53577 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Spencer's Q case

CASE: Low Water (LW) Circular Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (FS)

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Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
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Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (FS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-160, 2) ft
Left-Zone Right Coordinate: (-40.12966, 6.699294) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (-30.30383, 6.933242) ft
Right-Zone Right Coordinate: (25.01878, 7.984279) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	4.6 ft
Coordinate 2	-4.5 ft	11.2 ft
Coordinate 3	5.5 ft	11.2 ft
Coordinate 4	24.3 ft	4.6 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
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CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %

Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

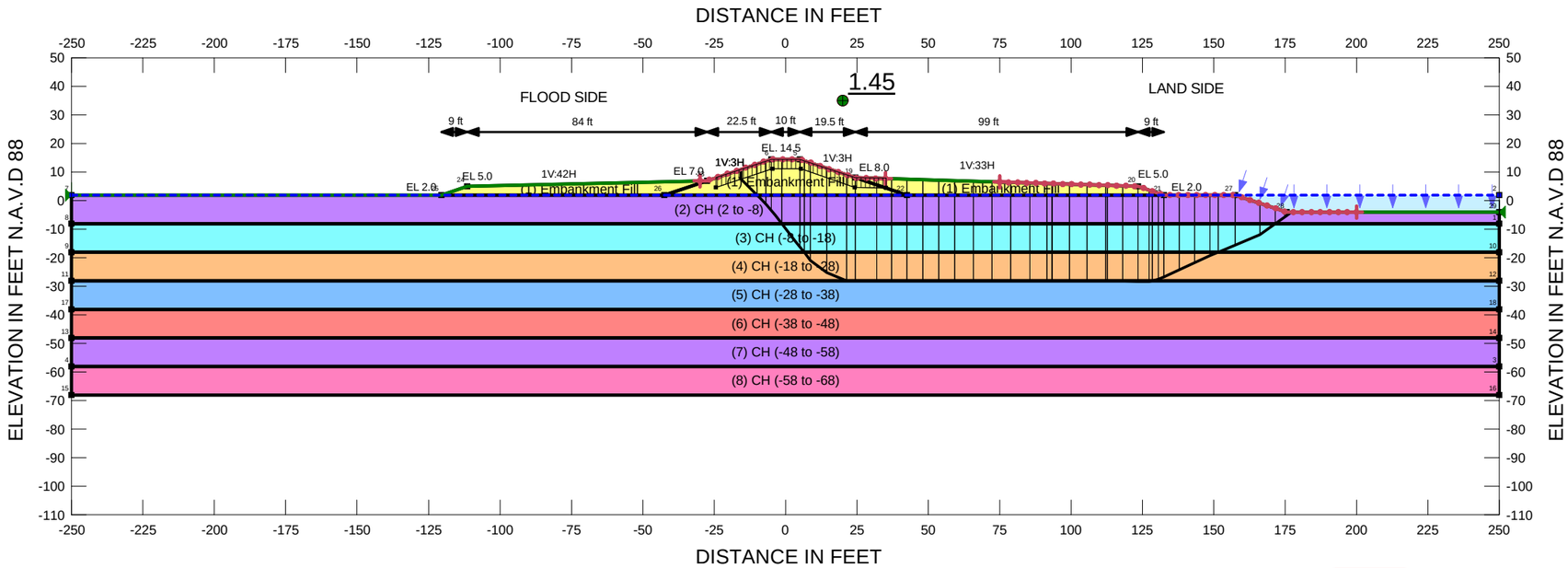
Slip Surfaces Analysed: 12326 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.44
Volume: 4,368.0029 ft³
Weight: 442,915.68 lbf
Resisting Moment: 2,929,858.1 lbf·ft
Activating Moment: 2,030,184 lbf·ft
Resisting Force: 40,051.303 lbf
Activating Force: 27,706.115 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (-145.44547, 2) ft
Entry: (14.36464, 8.0879455) ft
Radius: 65.887065 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-141.54159 ft	-1.5730345 ft	222.95735 psf	472.11764 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 2	-135.76186 ft	-6.5730345 ft	534.95735 psf	911.55442 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-130.59959 ft	-10.5 ft	780 psf	1,302.3231 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-123.90658 ft	-15.591401 ft	1,097.7034 psf	1,828.0679 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-120.16375 ft	-18.438589 ft	1,275.368 psf	2,168.6157 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 6	-117.08698 ft	-20.280902 ft	1,390.3283 psf	2,448.0753 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 7	-112.92324 ft	-22.186455 ft	1,509.2348 psf	2,722.3365 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 8	-108.64668 ft	-23.145071 ft	1,569.0524 psf	2,891.7307 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 9	-102.0671 ft	-24.395175 ft	1,647.0589 psf	3,030.5108 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 10	-95.20673 ft	-25.402029 ft	1,709.8866 psf	3,149.4936 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 11	-88.93849 ft	-26.194707 ft	1,759.3497 psf	3,254.4021 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 12	-82.666543 ft	-26.841674 ft	1,799.7204 psf	3,328.6215 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 13	-76.390888 ft	-27.342929 ft	1,830.9988 psf	3,401.1836 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 14	-70.376798 ft	-27.694391 ft	1,852.93 psf	3,442.2778 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 15	-64.624273 ft	-27.896059 ft	1,865.5141 psf	3,480.2675 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 16	-58.512 ft	-27.99767 ft	1,871.8546 psf	3,497.1171 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 17	-52.03998 ft	-27.999223 ft	1,871.9515 psf	3,515.0092 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 18	-45.651985 ft	-28.000757 ft	1,872.0472 psf	3,532.6692 psf	0 psf	250.00741 psf	0 psf	(5) CH (-28 to -38)
Slice 19	-40.42146 ft	-28.002012 ft	1,872.1256 psf	3,547.1294 psf	0 psf	250.01972 psf	0 psf	(5) CH (-28 to -38)
Slice 20	-35.63219 ft	-28.059662 ft	1,875.7229 psf	3,573.3134 psf	0 psf	250.58469 psf	0 psf	(5) CH (-28 to -38)
Slice 21	-30.21073 ft	-28.173965 ft	1,882.8554 psf	3,600.8039 psf	0 psf	251.70486 psf	0 psf	(5) CH (-28 to -38)
Slice 22	-25.01138 ft	-28.283585 ft	1,889.6957 psf	3,715.8289 psf	0 psf	252.77914 psf	0 psf	(5) CH (-28 to -38)
Slice 23	-22.009828 ft	-28.168027 ft	1,882.4849 psf	3,703.6839 psf	0 psf	251.64666 psf	0 psf	(5) CH (-28 to -38)
Slice 24	-18.816198 ft	-27.121854 ft	1,817.2037 psf	3,711.2509 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 25	-12.61981 ft	-23.544999 ft	1,594.0079 psf	3,420.5094 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 26	-7.9553995 ft	-19.423145 ft	1,336.8042 psf	3,017.9579 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 27	-5.9033395 ft	-16.880856 ft	1,178.1654 psf	2,876.9268 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 28	-3.90361 ft	-14.4034 ft	1,023.5722 psf	2,674.235 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 29	-0.94899396 ft	-10.522543 ft	781.40671 psf	2,278.8077 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 30	2.954616 ft	-5.2233894 ft	450.7395 psf	1,803.4502 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 31	6.410725 ft	-0.53171845 ft	157.97923 psf	1,352.536 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 32	8.122356 ft	1.691671 ft	19.23973 psf	1,159.8887 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 33	11.393951 ft	5.0439727 ft	-189.9439 psf	413.41555 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Spencer's Q case

CASE: Low Water (LW) Circular Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,428
Date: 02/24/2022
Time: 10:03:26 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 02/24/2022
Last Solved Time: 10:06:14 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-29.99999, 6.940476) ft
Left-Zone Right Coordinate: (35, 7.681818) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (75, 6.469697) ft
Right-Zone Right Coordinate: (200, -4) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	4.6 ft
Coordinate 2	-4.5 ft	11.2 ft
Coordinate 3	5.5 ft	11.2 ft
Coordinate 4	24.3 ft	4.6 ft
Coordinate 5	35.3 ft	4.4 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-58, 563)
- Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-48, 449)
- Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

Slip Surfaces Analysed: 16045 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.45
Volume: 5,498.4379 ft³
Weight: 558,108.7 lbf
Resisting Moment: 3,650,463.3 lbf·ft
Activating Moment: 2,510,708.1 lbf·ft
Resisting Force: 48,033.329 lbf
Activating Force: 33,067.371 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (177.17277, -4) ft
Entry: (-15.482486, 7.5391712) ft
Radius: 77.40176 ft
Center: (20, 35) ft

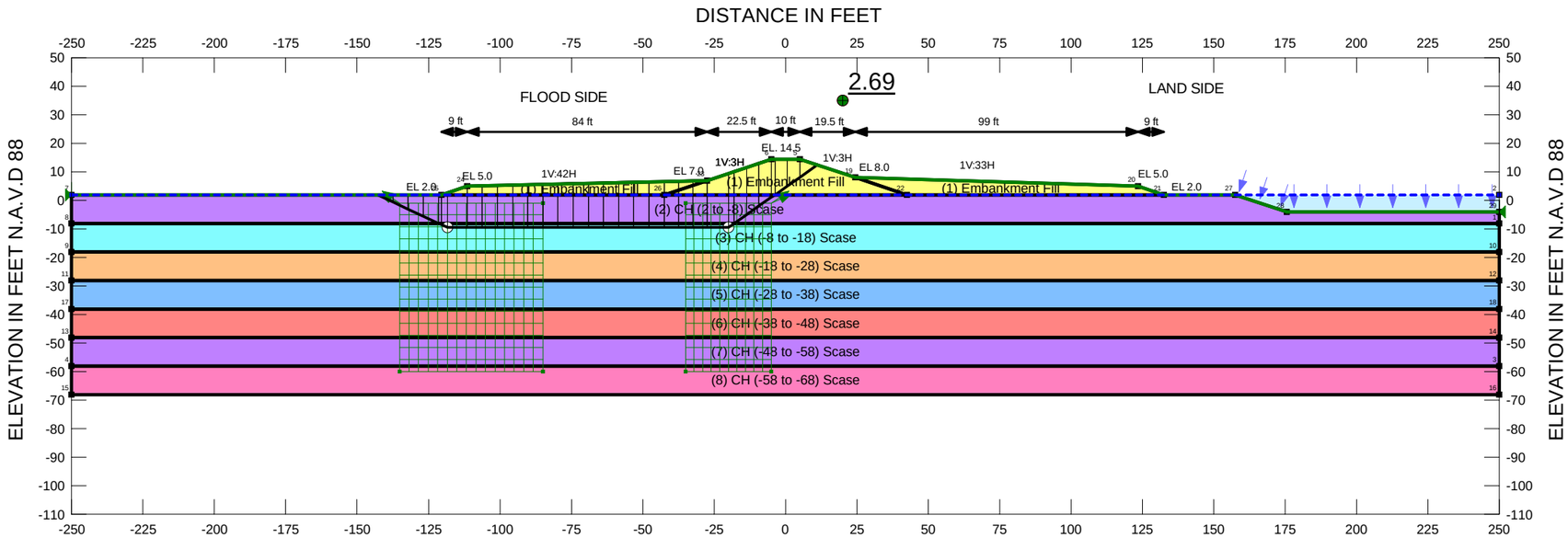
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-12.700557 ft	4.7695856 ft	-172.82214 psf	410.44274 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-8.3666638 ft	0.4549225 ft	96.412836 psf	1,261.6751 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-5.90735 ft	-2.239306 ft	264.5327 psf	1,531.2528 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	-3.1794023 ft	-5.6942285 ft	480.11986 psf	1,858.8177 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 5	1.8205977 ft	-12.026686 ft	875.26521 psf	2,436.9545 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	5.7685121 ft	-17.026686 ft	1,187.2652 psf	2,882.7788 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 7	7.6645371 ft	-19.427985 ft	1,337.1063 psf	3,015.1416 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 8	11.6316 ft	-23.039658 ft	1,562.4746 psf	3,398.6329 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 9	17.8962 ft	-26.611968 ft	1,785.3868 psf	3,663.3318 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 10	22.910625 ft	-28.000517 ft	1,872.0323 psf	3,758.5526 psf	0 psf	250.00507 psf	0 psf	(5) CH (-28 to -38)
Slice 11	28.258605 ft	-28.000263 ft	1,872.0164 psf	3,684.5002 psf	0 psf	250.00258 psf	0 psf	(5) CH (-28 to -38)
Slice 12	34.637907 ft	-28.000076 ft	1,872.0047 psf	3,662.2338 psf	0 psf	250.00074 psf	0 psf	(5) CH (-28 to -38)
Slice 13	39.879303 ft	-28.00006 ft	1,872.0037 psf	3,643.9666 psf	0 psf	250.00059 psf	0 psf	(5) CH (-28 to -38)
Slice 14	45.293885 ft	-28.000043 ft	1,872.0027 psf	3,625.0957 psf	0 psf	250.00042 psf	0 psf	(5) CH (-28 to -38)
Slice 15	50.881654 ft	-28.000026 ft	1,872.0016 psf	3,605.6213 psf	0 psf	250.00025 psf	0 psf	(5) CH (-28 to -38)
Slice 16	56.469423 ft	-28.000009 ft	1,872.0005 psf	3,586.1469 psf	0 psf	250.00008 psf	0 psf	(5) CH (-28 to -38)
Slice 17	62.547435 ft	-27.99999 ft	1,871.9994 psf	3,564.9638 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 18	69.115691 ft	-27.99997 ft	1,871.9981 psf	3,542.0722 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 19	75.683947 ft	-27.999949 ft	1,871.9968 psf	3,519.1806 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 20	82.252202 ft	-27.999929 ft	1,871.9956 psf	3,496.289 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 21	88.55812 ft	-27.999794 ft	1,871.9871 psf	3,474.3114 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 22	92.464415 ft	-28.008036 ft	1,872.5015 psf	3,458.536 psf	0 psf	250.07876 psf	0 psf	(5) CH (-28 to -38)
Slice 23	93.38183 ft	-28.016873 ft	1,873.0529 psf	3,454.7615 psf	0 psf	250.16536 psf	0 psf	(5) CH (-28 to -38)
Slice 24	96.471917 ft	-28.013007 ft	1,872.8117 psf	3,448.6348 psf	0 psf	250.12747 psf	0 psf	(5) CH (-28 to -38)
Slice 25	102.58627 ft	-28.004336 ft	1,872.2706 psf	3,426.3693 psf	0 psf	250.04249 psf	0 psf	(5) CH (-28 to -38)
Slice 26	108.89576 ft	-27.995387 ft	1,871.7122 psf	3,403.3946 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 27	112.39791 ft	-27.995387 ft	1,871.7122 psf	3,384.8274 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 28	115.36081 ft	-28.05009 ft	1,875.1256 psf	3,380.5315 psf	0 psf	250.49088 psf	0 psf	(5) CH (-28 to -38)
Slice 29	120.78694 ft	-28.15027 ft	1,881.3768 psf	3,372.6656 psf	0 psf	251.47264 psf	0 psf	(5) CH (-28 to -38)
Slice 30	125.39401 ft	-28.235328 ft	1,886.6845 psf	3,300.0369 psf	0 psf	252.30621 psf	0 psf	(5) CH (-28 to -38)
Slice 31	127.89482 ft	-28.135148 ft	1,880.4332 psf	3,269.3358 psf	0 psf	251.32445 psf	0 psf	(5) CH (-28 to -38)
Slice 32	129.53245 ft	-27.770415 ft	1,857.6739 psf	3,165.1813 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 33	131.53163 ft	-27.097495 ft	1,815.6837 psf	3,085.8998 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 34	135.20264 ft	-25.416843 ft	1,710.811 psf	2,859.3677 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 35	140.60793 ft	-22.942208 ft	1,556.3938 psf	2,581.5911 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 36	146.01323 ft	-20.467573 ft	1,401.9765 psf	2,303.8145 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 37	150.17144 ft	-18.615127 ft	1,286.384 psf	2,086.4225 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 38	154.56351 ft	-16.759035 ft	1,170.5638 psf	1,874.7131 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 39	161.86225 ft	-13.674578 ft	978.09367 psf	1,520.9139 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 40	168.90252 ft	-9.9155435 ft	743.52991 psf	1,129.8423 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 41	173.54028 ft	-6.5982502 ft	536.53081 psf	759.26781 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 42	176.33639 ft	-4.5982502 ft	411.73081 psf	549.81204 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)

West Slidell Levees

Spencer's Scase

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2032 Spencer's S case

CASE: Low Water (LW) Block Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,435
Date: 02/24/2022
Time: 10:51:35 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Scase - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 02/24/2022
Last Solved Time: 10:52:46 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-85, -1) ft
Lower Left: (-85, -60) ft
Lower Right: (-135, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (-35, -1) ft
Lower Left: (-35, -60) ft
Lower Right: (-5, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

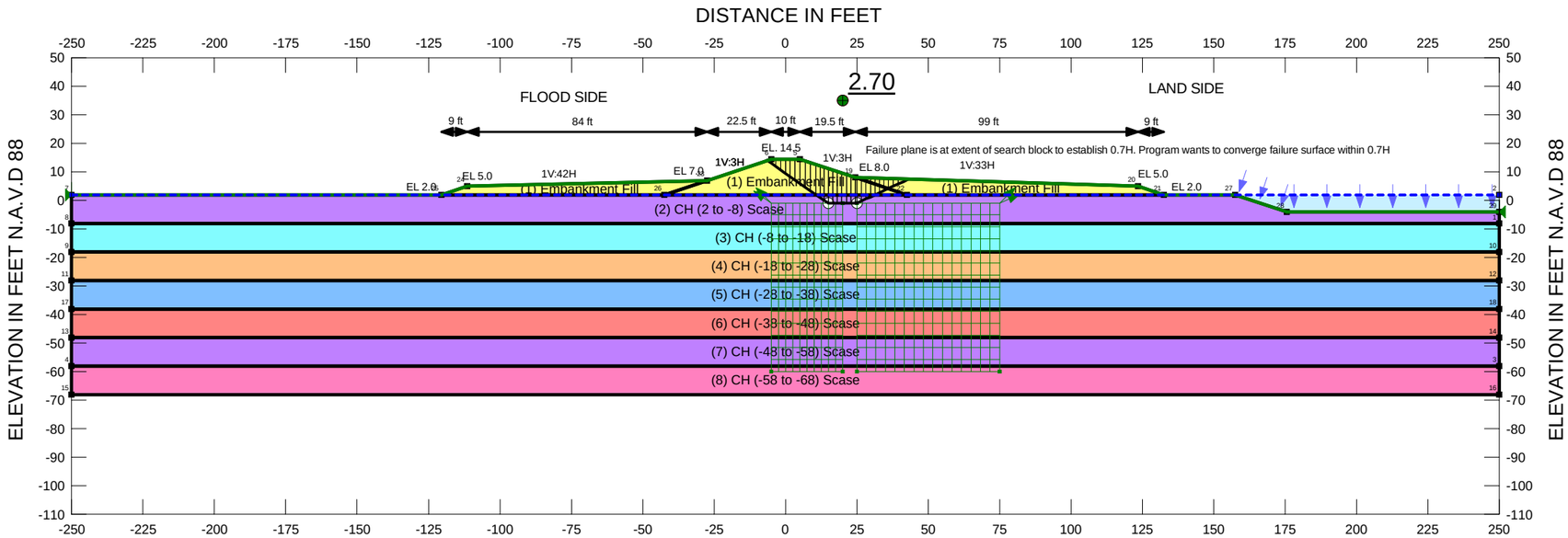
Slip Surfaces Analysed: 22088 of 23760 converged

Current Slip Surface

Slip Surface: 4,242
Factor of Safety: 2.69
Volume: 2,022.0938 ft³
Weight: 200,053.86 lbf
Resisting Moment: 1,918,528.4 lbf·ft
Activating Moment: 713,609.92 lbf·ft
Resisting Force: 47,783.954 lbf
Activating Force: 17,727.358 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-142.84198, 2) ft
Entry: (11.214929, 12.428357) ft
Radius: 59.891046 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-140.16135 ft	0.75 ft	78 psf	121.14362 psf	18.313382 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-134.80008 ft	-1.75 ft	234 psf	363.43087 psf	54.940147 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-129.43882 ft	-4.25 ft	390 psf	605.71812 psf	91.566911 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	-124.07755 ft	-6.75 ft	546 psf	848.00537 psf	128.19368 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	-120.94846 ft	-8.2091191 ft	637.04903 psf	991.81282 psf	150.58829 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 6	-119.41667 ft	-8.9234048 ft	681.62046 psf	1,116.8273 psf	184.73435 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 7	-114.91667 ft	-9.4285714 ft	713.14286 psf	1,264.3889 psf	233.99007 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	-108.84615 ft	-9.4285714 ft	713.14286 psf	1,404.5354 psf	293.47873 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 9	-103.53846 ft	-9.4285714 ft	713.14286 psf	1,419.2689 psf	299.73274 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 10	-98.230769 ft	-9.4285714 ft	713.14286 psf	1,434.0025 psf	305.98676 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 11	-92.923077 ft	-9.4285714 ft	713.14286 psf	1,448.736 psf	312.24077 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 12	-87.615385 ft	-9.4285714 ft	713.14286 psf	1,463.4695 psf	318.49478 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 13	-82.307692 ft	-9.4285714 ft	713.14286 psf	1,478.2031 psf	324.74879 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 14	-77 ft	-9.4285714 ft	713.14286 psf	1,492.9366 psf	331.00281 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 15	-71.692308 ft	-9.4285714 ft	713.14286 psf	1,507.6701 psf	337.25682 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 16	-66.384615 ft	-9.4285714 ft	713.14286 psf	1,522.4037 psf	343.51083 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 17	-61.076923 ft	-9.4285714 ft	713.14286 psf	1,537.1372 psf	349.76485 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 18	-55.769231 ft	-9.4285714 ft	713.14286 psf	1,551.8707 psf	356.01886 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 19	-50.461538 ft	-9.4285714 ft	713.14286 psf	1,566.6043 psf	362.27287 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 20	-45.153846 ft	-9.4285714 ft	713.14286 psf	1,581.3378 psf	368.52689 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 21	-40 ft	-9.4285714 ft	713.14286 psf	1,595.6443 psf	374.59962 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 22	-35 ft	-9.4285714 ft	713.14286 psf	1,609.5237 psf	380.49109 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 23	-30 ft	-9.4285714 ft	713.14286 psf	1,623.4031 psf	386.38255 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 24	-23.75 ft	-9.4285714 ft	713.14286 psf	1,776.0766 psf	451.18863 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 25	-18.979894 ft	-8.7142857 ft	668.57143 psf	1,674.0162 psf	426.78597 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 26	-15.799824 ft	-6.4875764 ft	529.62477 psf	1,588.3597 psf	449.40632 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 27	-11.479894 ft	-3.4627292 ft	340.8743 psf	1,480.3816 psf	483.69215 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 28	-7.1599648 ft	-0.43788196 ft	152.12383 psf	1,372.4035 psf	517.97799 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 29	-4.3391542 ft	1.5372708 ft	28.874301 psf	1,280.0159 psf	531.07811 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 30	-1.5087314 ft	3.5191543 ft	-94.795226 psf	1,090.7207 psf	462.98348 psf	0 psf	0 psf	(1) Embankment Fill
Slice 31	2.8304229 ft	6.5574628 ft	-284.38568 psf	788.92738 psf	334.87981 psf	0 psf	0 psf	(1) Embankment Fill
Slice 32	8.1074644 ft	10.252487 ft	-514.95519 psf	319.01536 psf	135.41399 psf	0 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2032 Spencer's S case

CASE: Low Water (LW) Block Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,435
Date: 02/24/2022
Time: 10:51:35 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Scase - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 02/24/2022
Last Solved Time: 10:52:30 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 10 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (20, -1) ft
- Lower Left: (20, -60) ft
- Lower Right: (-5, -60) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (25, -1) ft
- Lower Left: (25, -60) ft
- Lower Right: (75, -60) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²

Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

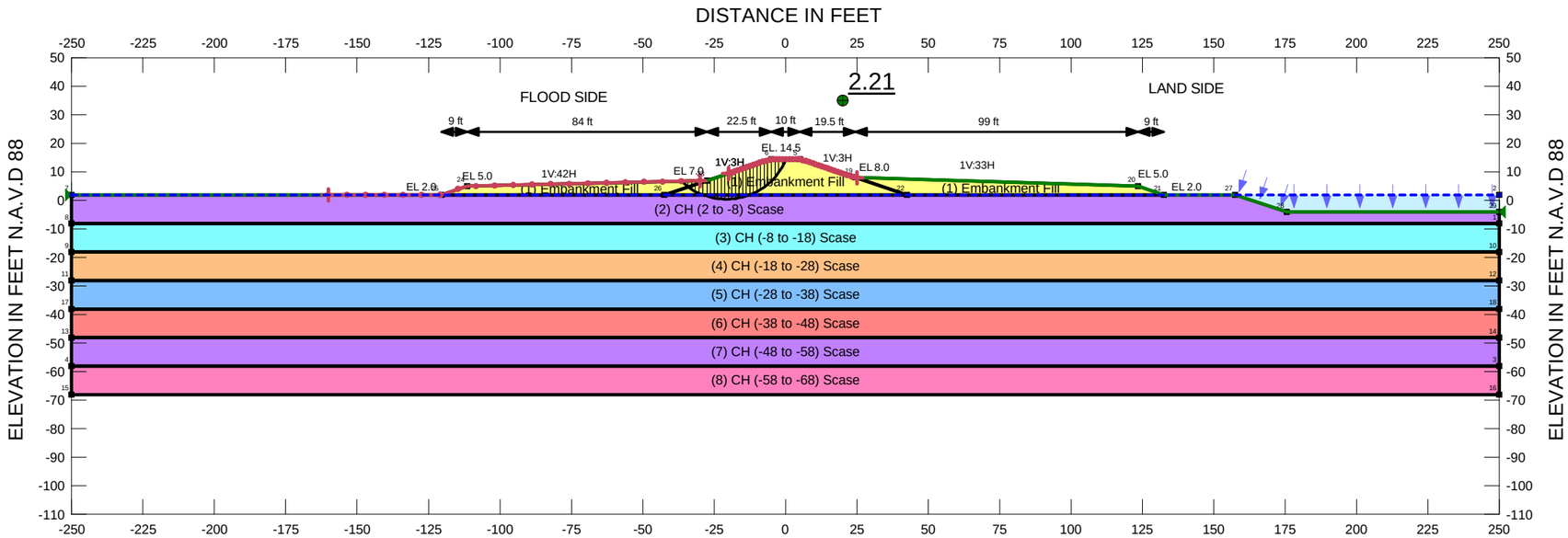
Slip Surfaces Analysed: 32399 of 39600 converged

Current Slip Surface

Slip Surface: 641
Factor of Safety: 2.70
Volume: 340.69064 ft³
Weight: 38,027.5 lbf
Resisting Moment: 555,771.36 lbf·ft
Activating Moment: 205,552.72 lbf·ft
Resisting Force: 14,559.192 lbf
Activating Force: 5,399.5349 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (43.092338, 7.4365958) ft
Entry: (-6.4473054, 14.017565) ft
Radius: 22.544348 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.7236527 ft	13.510858 ft	-718.27753 psf	72.636058 psf	30.832177 psf	0 psf	0 psf	(1) Embankment Fill
Slice 2	-4.1666667 ft	12.420644 ft	-650.24822 psf	201.94039 psf	85.718609 psf	0 psf	0 psf	(1) Embankment Fill
Slice 3	-2.5 ft	11.253632 ft	-577.42663 psf	315.27693 psf	133.82712 psf	0 psf	0 psf	(1) Embankment Fill
Slice 4	-0.83333333 ft	10.086619 ft	-504.60505 psf	428.61348 psf	181.93563 psf	0 psf	0 psf	(1) Embankment Fill
Slice 5	0.83333333 ft	8.9196068 ft	-431.78346 psf	541.95002 psf	230.04414 psf	0 psf	0 psf	(1) Embankment Fill
Slice 6	2.5 ft	7.7525942 ft	-358.96188 psf	655.28657 psf	278.15265 psf	0 psf	0 psf	(1) Embankment Fill
Slice 7	4.1666667 ft	6.5855817 ft	-286.1403 psf	768.62311 psf	326.26115 psf	0 psf	0 psf	(1) Embankment Fill
Slice 8	5.9525927 ft	5.3350628 ft	-208.10792 psf	859.23193 psf	364.72232 psf	0 psf	0 psf	(1) Embankment Fill
Slice 9	7.857778 ft	4.0010377 ft	-124.86475 psf	927.11303 psf	393.53613 psf	0 psf	0 psf	(1) Embankment Fill
Slice 10	9.7629633 ft	2.6670126 ft	-41.621584 psf	994.99413 psf	422.34995 psf	0 psf	0 psf	(1) Embankment Fill
Slice 11	11.42963 ft	1.5 ft	31.2 psf	1,046.1472 psf	430.81951 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 12	12.857778 ft	0.5 ft	93.6 psf	1,080.5721 psf	418.94482 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 13	14.285926 ft	-0.5 ft	156 psf	1,114.9971 psf	407.07013 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 14	15.791667 ft	-1 ft	187.2 psf	1,318.2712 psf	480.11125 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 15	17.375 ft	-1 ft	187.2 psf	1,256.2357 psf	453.77872 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 16	18.958333 ft	-1 ft	187.2 psf	1,194.2001 psf	427.44619 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 17	20.541667 ft	-1 ft	187.2 psf	1,132.1646 psf	401.11367 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 18	22.125 ft	-1 ft	187.2 psf	1,070.129 psf	374.78114 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 19	23.708333 ft	-1 ft	187.2 psf	1,008.0935 psf	348.44862 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 20	24.75 ft	-1 ft	187.2 psf	976.18526 psf	334.90437 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 21	25.80419 ft	-0.625 ft	163.8 psf	1,076.9595 psf	387.6132 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 22	27.41257 ft	0.125 ft	117 psf	995.3473 psf	372.83631 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 23	29.02095 ft	0.875 ft	70.2 psf	913.73512 psf	358.05941 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 24	30.629331 ft	1.625 ft	23.4 psf	832.12293 psf	343.28252 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 25	32.202371 ft	2.3585209 ft	-22.371704 psf	739.13279 psf	313.74325 psf	0 psf	0 psf	(1) Embankment Fill
Slice 26	33.740072 ft	3.0755627 ft	-67.115111 psf	634.76467 psf	269.44162 psf	0 psf	0 psf	(1) Embankment Fill
Slice 27	35.277773 ft	3.7926045 ft	-111.85852 psf	530.39656 psf	225.13998 psf	0 psf	0 psf	(1) Embankment Fill
Slice 28	36.927338 ft	4.5618092 ft	-159.85689 psf	418.43594 psf	177.61552 psf	0 psf	0 psf	(1) Embankment Fill
Slice 29	38.688767 ft	5.3831768 ft	-211.11023 psf	298.88282 psf	126.86823 psf	0 psf	0 psf	(1) Embankment Fill
Slice 30	40.450195 ft	6.2045444 ft	-262.36357 psf	179.32969 psf	76.120937 psf	0 psf	0 psf	(1) Embankment Fill
Slice 31	42.211624 ft	7.025912 ft	-313.61691 psf	59.776563 psf	25.373646 psf	0 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2032 Spencer's S case

CASE: Low Water (LW) Circular Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (FS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,435
Date: 02/24/2022
Time: 10:51:35 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Scase - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 02/24/2022
Last Solved Time: 10:52:02 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (FS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 10 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings

Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-160, 2) ft
Left-Zone Right Coordinate: (-30, 6.940476) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (-20, 9.5) ft
Right-Zone Right Coordinate: (25.01878, 7.984279) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

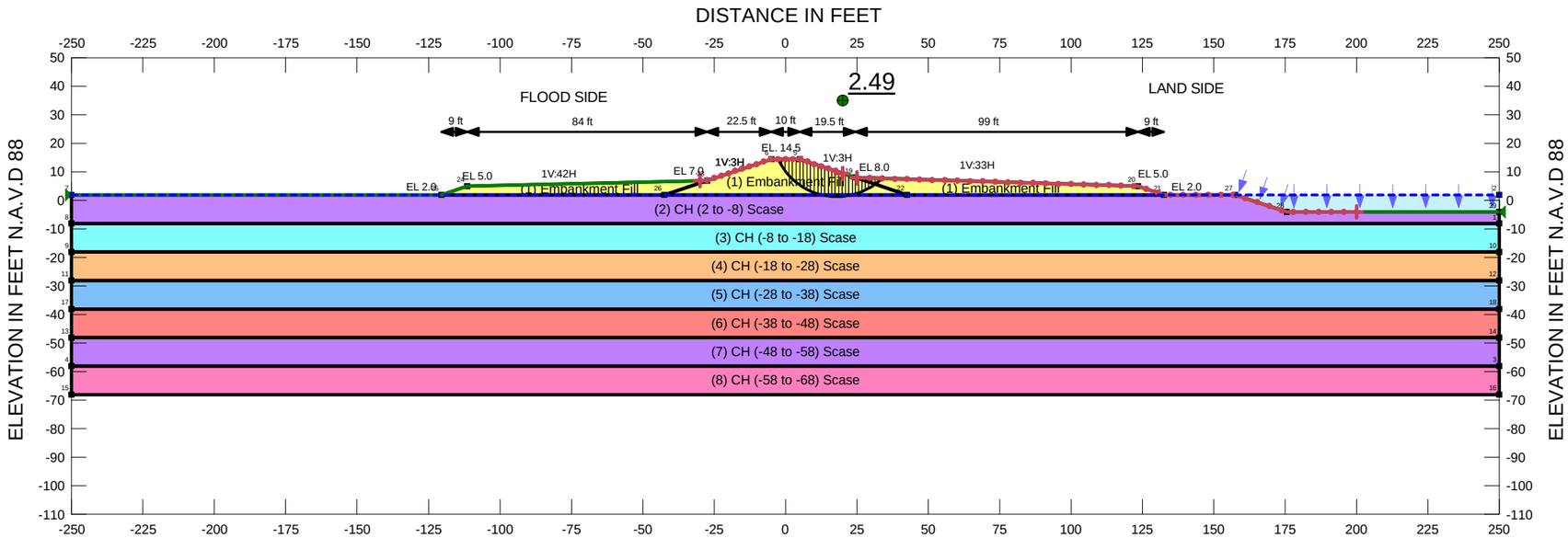
Slip Surfaces Analysed: 11379 of 26691 converged

Current Slip Surface

Slip Surface: 24,728
Factor of Safety: 2.21
Volume: 250.78406 ft³
Weight: 28,409.963 lbf
Resisting Moment: 329,528.82 lbf·ft
Activating Moment: 149,036.39 lbf·ft
Resisting Force: 11,186.583 lbf
Activating Force: 5,078.1641 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (-36.523648, 6.7851512) ft
Entry: (0.28695676, 14.5) ft
Radius: 22.775093 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-35.926615 ft	6.2512238 ft	-265.27636 psf	97.85511 psf	41.53703 psf	0 psf	0 psf	(1) Embankment Fill
Slice 2	-34.73255 ft	5.2527285 ft	-202.97026 psf	263.98 psf	112.05286 psf	0 psf	0 psf	(1) Embankment Fill
Slice 3	-33.497586 ft	4.3571121 ft	-147.0838 psf	397.56859 psf	168.75785 psf	0 psf	0 psf	(1) Embankment Fill
Slice 4	-32.221723 ft	3.5540124 ft	-96.970376 psf	506.70009 psf	215.08143 psf	0 psf	0 psf	(1) Embankment Fill
Slice 5	-30.945859 ft	2.8625357 ft	-53.822229 psf	593.06421 psf	251.74082 psf	0 psf	0 psf	(1) Embankment Fill
Slice 6	-29.669996 ft	2.271555 ft	-16.945033 psf	661.14622 psf	280.63992 psf	0 psf	0 psf	(1) Embankment Fill
Slice 7	-28.266032 ft	1.7321585 ft	16.713307 psf	707.95123 psf	293.41309 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 8	-26.87398 ft	1.2895904 ft	44.329562 psf	760.74338 psf	304.09962 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 9	-25.62194 ft	0.97782998 ft	63.783409 psf	826.69366 psf	323.83619 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 10	-24.369899 ft	0.74008305 ft	78.618817 psf	883.71853 psf	341.74455 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 11	-23.117859 ft	0.57401034 ft	88.981755 psf	932.37674 psf	357.99993 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 12	-21.865819 ft	0.47803639 ft	94.970529 psf	973.07514 psf	372.73329 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 13	-20.613778 ft	0.45127194 ft	96.640631 psf	1,006.0985 psf	386.04195 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 14	-19.361738 ft	0.49347167 ft	94.007368 psf	1,031.6285 psf	397.99658 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 15	-18.109698 ft	0.60502289 ft	87.046572 psf	1,049.7558 psf	408.64582 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 16	-16.857657 ft	0.78696352 ft	75.693476 psf	1,060.4851 psf	418.01922 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 17	-15.605617 ft	1.0410317 ft	59.839623 psf	1,063.7362 psf	426.12883 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 18	-14.353577 ft	1.3697524 ft	39.327452 psf	1,059.3401 psf	432.96967 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 19	-13.101536 ft	1.776572 ft	13.941907 psf	1,047.0282 psf	438.5191 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 20	-11.852556 ft	2.2646492 ft	-16.51411 psf	1,021.2953 psf	433.51415 psf	0 psf	0 psf	(1) Embankment Fill
Slice 21	-10.606637 ft	2.8395016 ft	-52.3849 psf	981.78764 psf	416.74413 psf	0 psf	0 psf	(1) Embankment Fill
Slice 22	-9.3607178 ft	3.5098433 ft	-94.214225 psf	932.67741 psf	395.89807 psf	0 psf	0 psf	(1) Embankment Fill
Slice 23	-8.1147984 ft	4.2858815 ft	-142.63901 psf	873.38591 psf	370.73032 psf	0 psf	0 psf	(1) Embankment Fill
Slice 24	-6.868879 ft	5.1813641 ft	-198.51712 psf	803.13229 psf	340.90943 psf	0 psf	0 psf	(1) Embankment Fill
Slice 25	-5.6229597 ft	6.2153469 ft	-263.03765 psf	720.86347 psf	305.98839 psf	0 psf	0 psf	(1) Embankment Fill
Slice 26	-4.3391304 ft	7.4581023 ft	-340.58558 psf	602.82859 psf	255.88555 psf	0 psf	0 psf	(1) Embankment Fill
Slice 27	-3.0173912 ft	8.9691188 ft	-434.87301 psf	448.89987 psf	190.54669 psf	0 psf	0 psf	(1) Embankment Fill
Slice 28	-1.695652 ft	10.806625 ft	-549.53341 psf	279.00909 psf	118.43233 psf	0 psf	0 psf	(1) Embankment Fill
Slice 29	-0.37391284 ft	13.160735 ft	-696.42988 psf	90.557989 psf	38.439586 psf	0 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2032 Spencer's S case

CASE: Low Water (LW) Circular Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,435
Date: 02/24/2022
Time: 10:51:35 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Scase - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 02/24/2022
Last Solved Time: 10:52:58 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 10 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-29.99999, 6.940476) ft
Left-Zone Right Coordinate: (20, 9.5) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (25, 7.984848) ft
Right-Zone Right Coordinate: (200, -4) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

Slip Surfaces Analysed: 13658 of 26691 converged

Current Slip Surface

Slip Surface: 14,063
Factor of Safety: 2.49
Volume: 245.65212 ft³
Weight: 28,131.904 lbf
Resisting Moment: 418,909.04 lbf·ft
Activating Moment: 168,333.5 lbf·ft
Resisting Force: 11,480.812 lbf
Activating Force: 4,625.8131 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (33.821236, 7.7175383) ft
Entry: (-2.6017379, 14.5) ft
Radius: 22.7498 ft
Center: (20, 35) ft

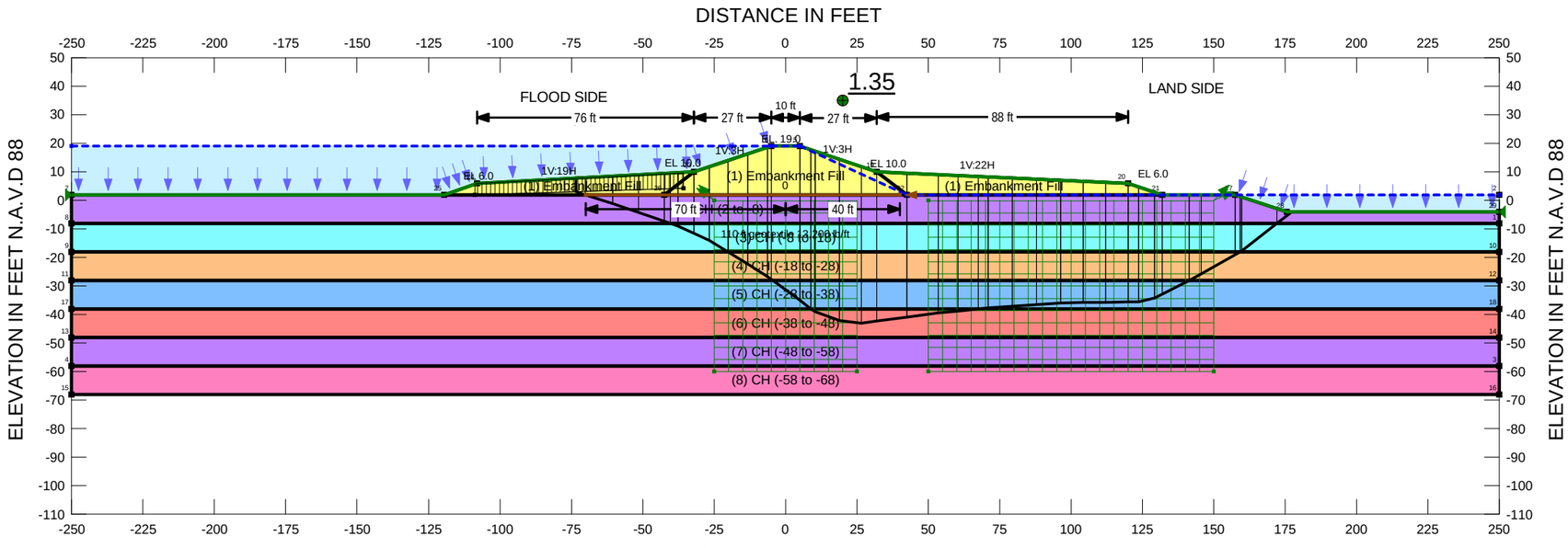
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-1.9682597 ft	13.323646 ft	-706.59551 psf	85.519078 psf	36.300695 psf	0 psf	0 psf	(1) Embankment Fill
Slice 2	-0.7013034 ft	11.225179 ft	-575.65115 psf	259.60775 psf	110.19695 psf	0 psf	0 psf	(1) Embankment Fill
Slice 3	0.56565291 ft	9.5427518 ft	-470.66771 psf	417.03473 psf	177.02074 psf	0 psf	0 psf	(1) Embankment Fill
Slice 4	1.8326092 ft	8.1393274 ft	-383.09403 psf	559.95048 psf	237.68488 psf	0 psf	0 psf	(1) Embankment Fill
Slice 5	3.0995655 ft	6.9447182 ft	-308.55041 psf	690.18356 psf	292.96554 psf	0 psf	0 psf	(1) Embankment Fill
Slice 6	4.3665218 ft	5.9170658 ft	-244.42491 psf	809.14997 psf	343.46378 psf	0 psf	0 psf	(1) Embankment Fill
Slice 7	5.6328314 ft	5.0294333 ft	-189.03664 psf	897.4405 psf	380.94089 psf	0 psf	0 psf	(1) Embankment Fill
Slice 8	6.8984941 ft	4.2627792 ft	-141.19742 psf	954.34952 psf	405.09734 psf	0 psf	0 psf	(1) Embankment Fill
Slice 9	8.1641569 ft	3.6029591 ft	-100.02465 psf	1,000.6621 psf	424.75587 psf	0 psf	0 psf	(1) Embankment Fill
Slice 10	9.4298196 ft	3.0398656 ft	-64.887615 psf	1,036.9966 psf	440.17895 psf	0 psf	0 psf	(1) Embankment Fill
Slice 11	10.695482 ft	2.5658683 ft	-35.310183 psf	1,063.8028 psf	451.5575 psf	0 psf	0 psf	(1) Embankment Fill
Slice 12	11.961145 ft	2.1751599 ft	-10.929979 psf	1,081.3938 psf	459.02442 psf	0 psf	0 psf	(1) Embankment Fill
Slice 13	13.19768 ft	1.8687979 ft	8.1870131 psf	1,086.9038 psf	457.88811 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 14	14.405086 ft	1.6401961 ft	22.451765 psf	1,081.2621 psf	449.43832 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 15	15.612492 ft	1.4783281 ft	32.552326 psf	1,068.7275 psf	439.83025 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 16	16.819899 ft	1.3817627 ft	38.578007 psf	1,049.3725 psf	429.05682 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 17	18.027305 ft	1.3496656 ft	40.580865 psf	1,023.1987 psf	417.09651 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 18	19.234711 ft	1.3817627 ft	38.578007 psf	990.13559 psf	403.91223 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 19	20.442117 ft	1.4783281 ft	32.552326 psf	950.03728 psf	389.44926 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 20	21.649524 ft	1.6401961 ft	22.451765 psf	902.67361 psf	373.63201 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 21	22.85693 ft	1.8687979 ft	8.1870131 psf	847.71634 psf	356.35906 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 22	23.980317 ft	2.1409389 ft	-8.7945885 psf	784.87279 psf	333.15873 psf	0 psf	0 psf	(1) Embankment Fill
Slice 23	25.076023 ft	2.4696616 ft	-29.306882 psf	732.21386 psf	310.80634 psf	0 psf	0 psf	(1) Embankment Fill
Slice 24	26.228068 ft	2.8801485 ft	-54.921266 psf	688.91188 psf	292.42574 psf	0 psf	0 psf	(1) Embankment Fill
Slice 25	27.380113 ft	3.3627536 ft	-85.035825 psf	634.47958 psf	269.3206 psf	0 psf	0 psf	(1) Embankment Fill
Slice 26	28.532158 ft	3.9226754 ft	-119.97494 psf	567.28103 psf	240.79651 psf	0 psf	0 psf	(1) Embankment Fill
Slice 27	29.684204 ft	4.5665972 ft	-160.15567 psf	485.06737 psf	205.89888 psf	0 psf	0 psf	(1) Embankment Fill
Slice 28	30.836249 ft	5.3032044 ft	-206.11995 psf	384.63191 psf	163.26656 psf	0 psf	0 psf	(1) Embankment Fill
Slice 29	32.014513 ft	6.1658331 ft	-259.94799 psf	257.83328 psf	109.44374 psf	0 psf	0 psf	(1) Embankment Fill
Slice 30	33.218995 ft	7.1766475 ft	-323.02281 psf	94.865012 psf	40.267808 psf	0 psf	0 psf	(1) Embankment Fill

West Slidell Levees

Spencer's Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Top of Levee (CG) Block Around

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:01:34 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block) around

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Piezometric Line: 1
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-25, 0) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft

Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	-108.7 ft	2 ft
Coordinate 2	-35.7 ft	4.2 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

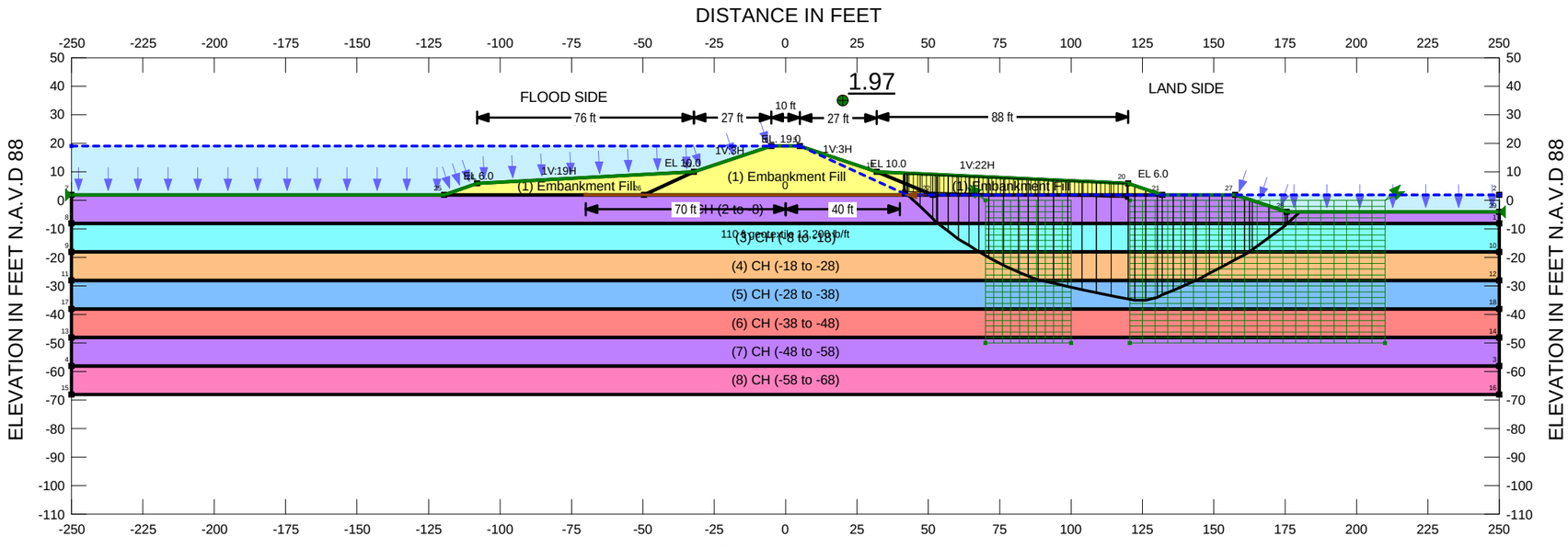
Slip Surfaces Analysed: 33932 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.35
Volume: 8,859.6386 ft³
Weight: 918,336.92 lbf
Resisting Moment: 7,133,169.2 lbf·ft
Activating Moment: 5,270,137.7 lbf·ft
Resisting Force: 82,617.125 lbf
Activating Force: 61,023.738 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (177.31321, -4) ft
Entry: (-73.422316, 3.0631631) ft
Radius: 98.524914 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-71.78045 ft	2.5315815 ft	1,027.6293 psf	1,160.2139 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-65.332067 ft	0.4438105 ft	1,157.9062 psf	1,447.1347 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-56.019163 ft	-2.6483097 ft	1,350.8545 psf	1,742.7574 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-47.006388 ft	-5.720171 ft	1,542.5387 psf	2,040.4063 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	-41.408709 ft	-7.6280508 ft	1,661.5904 psf	2,225.2709 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	-38.953969 ft	-8.46471 ft	1,713.7979 psf	2,310.9274 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	-34.79526 ft	-10.209825 ft	1,822.6931 psf	2,458.2675 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	-29.2948 ft	-12.729383 ft	1,979.9135 psf	2,755.0397 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	-23.380405 ft	-15.984267 ft	2,183.0183 psf	3,121.7637 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	-16.69025 ft	-20.186431 ft	2,445.2333 psf	3,664.3749 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	-9.72833 ft	-24.559294 ft	2,718.0999 psf	4,255.2706 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	-5.623685 ft	-27.206308 ft	2,883.2736 psf	4,567.5609 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	0 ft	-31.359319 ft	3,142.4215 psf	5,037.9249 psf	0 psf	282.92133 psf	0 psf	(5) CH (-28 to -38)
Slice 14	6.9961464 ft	-36.525874 ft	3,408.3476 psf	5,490.9381 psf	0 psf	333.55357 psf	0 psf	(5) CH (-28 to -38)
Slice 15	9.6827414 ft	-38.509887 ft	3,456.1515 psf	5,592.7206 psf	0 psf	353.14985 psf	0 psf	(6) CH (-38 to -48)
Slice 16	14.637355 ft	-40.570387 ft	3,444.5707 psf	5,796.3796 psf	0 psf	373.96091 psf	0 psf	(6) CH (-38 to -48)
Slice 17	22.70033 ft	-42.572204 ft	3,341.3986 psf	5,825.253 psf	0 psf	394.17927 psf	0 psf	(6) CH (-38 to -48)
Slice 18	29.24957 ft	-42.662753 ft	3,161.784 psf	5,711.1768 psf	0 psf	395.09381 psf	0 psf	(6) CH (-38 to -48)
Slice 19	37.25 ft	-41.613684 ft	2,870.0059 psf	5,461.3953 psf	0 psf	384.49821 psf	0 psf	(6) CH (-38 to -48)
Slice 20	47.968855 ft	-40.208157 ft	2,633.789 psf	5,249.3438 psf	0 psf	370.30238 psf	0 psf	(6) CH (-38 to -48)
Slice 21	56.966757 ft	-39.118283 ft	2,565.7809 psf	5,069.6194 psf	0 psf	359.29466 psf	0 psf	(6) CH (-38 to -48)
Slice 22	64.024851 ft	-38.372761 ft	2,519.2603 psf	4,950.1899 psf	0 psf	351.76489 psf	0 psf	(6) CH (-38 to -48)
Slice 23	69.310469 ft	-37.814459 ft	2,484.4223 psf	4,860.572 psf	0 psf	346.1817 psf	0 psf	(5) CH (-28 to -38)
Slice 24	75.273292 ft	-37.3461 ft	2,455.1966 psf	4,760.435 psf	0 psf	341.59178 psf	0 psf	(5) CH (-28 to -38)
Slice 25	83.685795 ft	-36.780462 ft	2,419.9008 psf	4,653.5394 psf	0 psf	336.04853 psf	0 psf	(5) CH (-28 to -38)
Slice 26	92.098298 ft	-36.214824 ft	2,384.605 psf	4,546.6437 psf	0 psf	330.50528 psf	0 psf	(5) CH (-28 to -38)
Slice 27	100.25379 ft	-35.873636 ft	2,363.3149 psf	4,444.5129 psf	0 psf	327.16164 psf	0 psf	(5) CH (-28 to -38)
Slice 28	108.15228 ft	-35.756899 ft	2,356.0305 psf	4,390.3096 psf	0 psf	326.01761 psf	0 psf	(5) CH (-28 to -38)
Slice 29	116.05076 ft	-35.640162 ft	2,348.7461 psf	4,336.1063 psf	0 psf	324.87359 psf	0 psf	(5) CH (-28 to -38)
Slice 30	121.8205 ft	-35.554887 ft	2,343.425 psf	4,236.2081 psf	0 psf	324.0379 psf	0 psf	(5) CH (-28 to -38)
Slice 31	126.41867 ft	-34.869506 ft	2,300.6572 psf	4,070.3378 psf	0 psf	317.32116 psf	0 psf	(5) CH (-28 to -38)
Slice 32	130.59816 ft	-33.493621 ft	2,214.802 psf	3,855.6042 psf	0 psf	303.83749 psf	0 psf	(5) CH (-28 to -38)
Slice 33	136.66642 ft	-30.388105 ft	2,021.0178 psf	3,439.9008 psf	0 psf	273.40343 psf	0 psf	(5) CH (-28 to -38)
Slice 34	143.47086 ft	-26.905844 ft	1,803.7247 psf	3,065.6678 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	151.55444 ft	-22.414342 ft	1,523.455 psf	2,581.8264 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 36	158.3899 ft	-18.508498 ft	1,279.7303 psf	2,134.5851 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 37	159.52922 ft	-17.857484 ft	1,239.107 psf	2,046.4766 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	165.98892 ft	-12.857484 ft	927.107 psf	1,536.5504 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	173.84961 ft	-6.709117 ft	543.4489 psf	843.91621 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 40	176.40661 ft	-4.709117 ft	418.6489 psf	638.38807 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Top of Levee (CG) Block Front

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block) front (2)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,492
Date: 07/18/2022
Time: 01:28:55 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/18/2022
Last Solved Time: 01:31:56 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block) front (2)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (70.03837, 0) ft
- Lower Left: (70.03837, -50) ft
- Lower Right: (100.0138, -50) ft
- X Increments: 10
- Y Increments: 25
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (120.58071, 0) ft
- Lower Left: (120.58071, -50) ft
- Lower Right: (210.0026, -50) ft
- X Increments: 20
- Y Increments: 25
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft

Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	41.6 ft	3 ft
Coordinate 2	119.6 ft	1 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

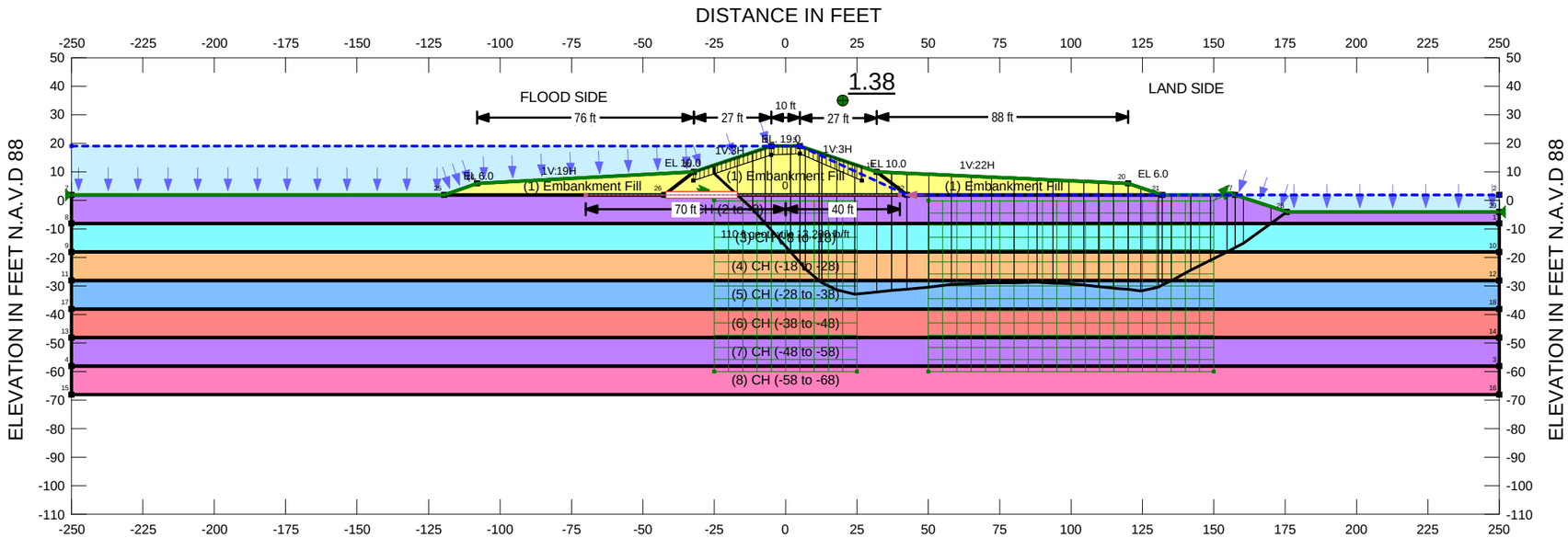
Slip Surfaces Analysed: 62391 of 90091 converged

Current Slip Surface

Slip Surface: 90,091
Factor of Safety: 1.97
Volume: 3,772.2044 ft³
Weight: 381,771.01 lbf
Resisting Moment: 3,098,365.1 lbf·ft
Activating Moment: 1,568,729 lbf·ft
Resisting Force: 41,719.23 lbf
Activating Force: 21,155.86 lbf
Slip Rank: 1 of 90,091 slip surfaces
Exit: (180.18553, -4) ft
Entry: (41.603004, 2.999923) ft
Radius: 58.882217 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	42.051502 ft	2.5749944 ft	-23.192533 psf	453.51321 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	42.579195 ft	2.0750329 ft	-4.6820526 psf	559.84258 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	44.868792 ft	-0.094240995 ft	130.68064 psf	872.37945 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	49.289597 ft	-4.282723 ft	392.04191 psf	1,214.2772 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	52.23954 ft	-7.0776395 ft	566.4447 psf	1,442.4209 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	53.125229 ft	-7.8891575 ft	617.08343 psf	1,546.6803 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 7	55.130333 ft	-9.4098718 ft	711.976 psf	1,683.3364 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	58.848244 ft	-12.229615 ft	887.92799 psf	1,938.7267 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	62.480765 ft	-14.729615 ft	1,043.928 psf	2,196.0256 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	66.027895 ft	-16.909872 ft	1,179.976 psf	2,391.0839 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 11	69.478445 ft	-19.030765 ft	1,312.3197 psf	2,587.1908 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	73.746822 ft	-21.33562 ft	1,456.1427 psf	2,844.9721 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	78.929608 ft	-23.8838 ft	1,615.1491 psf	3,093.6667 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 14	83.272098 ft	-25.856232 ft	1,738.2289 psf	3,310.071 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 15	86.774293 ft	-27.252916 ft	1,825.382 psf	3,443.4361 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 16	91.164585 ft	-28.516129 ft	1,904.2064 psf	3,616.0488 psf	0 psf	255.05806 psf	0 psf	(5) CH (-28 to -38)
Slice 17	96.329109 ft	-29.6215 ft	1,973.1816 psf	3,708.9373 psf	0 psf	265.8907 psf	0 psf	(5) CH (-28 to -38)
Slice 18	101.37977 ft	-30.7025 ft	2,040.636 psf	3,799.7778 psf	0 psf	276.4845 psf	0 psf	(5) CH (-28 to -38)
Slice 19	106.43042 ft	-31.7835 ft	2,108.0904 psf	3,890.6183 psf	0 psf	287.0783 psf	0 psf	(5) CH (-28 to -38)
Slice 20	111.48108 ft	-32.8645 ft	2,175.5448 psf	3,981.4588 psf	0 psf	297.6721 psf	0 psf	(5) CH (-28 to -38)
Slice 21	117.0032 ft	-33.972191 ft	2,244.6647 psf	4,080.284 psf	0 psf	308.52748 psf	0 psf	(5) CH (-28 to -38)
Slice 22	121.14857 ft	-34.756769 ft	2,293.6224 psf	4,106.1197 psf	0 psf	316.21633 psf	0 psf	(5) CH (-28 to -38)
Slice 23	124.27468 ft	-34.933138 ft	2,304.6278 psf	4,071.174 psf	0 psf	317.94475 psf	0 psf	(5) CH (-28 to -38)
Slice 24	128.1981 ft	-34.408783 ft	2,271.908 psf	3,931.9498 psf	0 psf	312.80607 psf	0 psf	(5) CH (-28 to -38)
Slice 25	131.072 ft	-33.527909 ft	2,216.9415 psf	3,775.0175 psf	0 psf	304.17351 psf	0 psf	(5) CH (-28 to -38)
Slice 26	133.9413 ft	-32.298759 ft	2,140.2426 psf	3,598.6098 psf	0 psf	292.12784 psf	0 psf	(5) CH (-28 to -38)
Slice 27	137.82389 ft	-30.63553 ft	2,036.4571 psf	3,408.8122 psf	0 psf	275.82819 psf	0 psf	(5) CH (-28 to -38)
Slice 28	141.70649 ft	-28.972301 ft	1,932.6716 psf	3,219.0146 psf	0 psf	259.52855 psf	0 psf	(5) CH (-28 to -38)
Slice 29	143.7798 ft	-28.070343 ft	1,876.3894 psf	3,141.8861 psf	0 psf	250.68936 psf	0 psf	(5) CH (-28 to -38)
Slice 30	146.1765 ft	-26.7932 ft	1,796.6957 psf	3,016.9255 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 31	150.7059 ft	-24.379601 ft	1,646.0871 psf	2,746.1027 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	155.2353 ft	-21.966001 ft	1,495.4785 psf	2,475.2798 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	159.14935 ft	-19.880305 ft	1,365.331 psf	2,226.2022 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	161.639 ft	-18.500705 ft	1,279.244 psf	2,063.7706 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	163.02532 ft	-17.674647 ft	1,227.698 psf	1,957.2489 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	166.41237 ft	-15.223284 ft	1,074.7329 psf	1,709.1539 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	172.09444 ft	-10.971261 ft	809.40666 psf	1,219.6086 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	175.21774 ft	-8.5847484 ft	660.4883 psf	979.22862 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	175.67567 ft	-8.1621239 ft	634.11653 psf	928.09302 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 40	178.01843 ft	-6 ft	499.2 psf	724.96081 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Top of Levee (CG) Block Through

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:04:56 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block) through

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-25, 0) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-16.867114, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 53.132886 ft

Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Tension Crack Line

	X	Y
Coordinate 1	-32.2 ft	7 ft
Coordinate 2	-5 ft	15.9 ft
Coordinate 3	5.1 ft	16.3 ft
Coordinate 4	26.7 ft	7 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

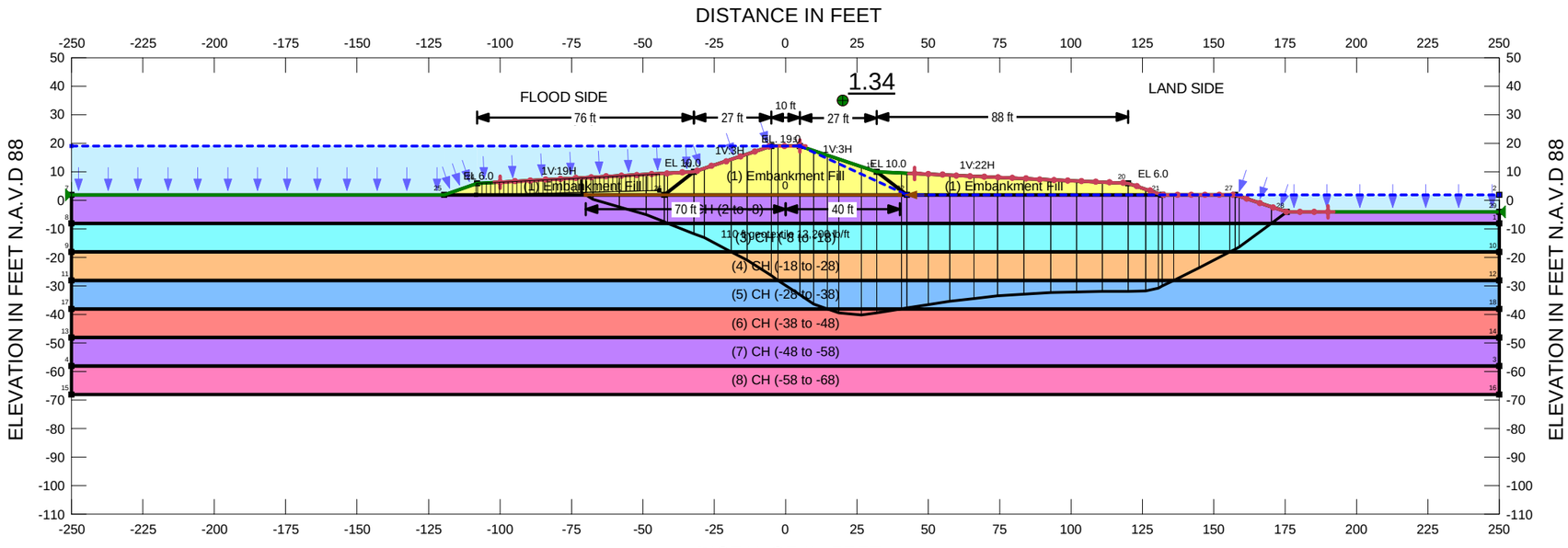
Slip Surfaces Analysed: 45992 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.38
Volume: 6,416.6075 ft³
Weight: 659,641.53 lbf
Resisting Moment: 4,849,749.3 lbf·ft
Activating Moment: 3,516,723.2 lbf·ft
Resisting Force: 59,356.59 lbf
Activating Force: 43,029.437 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (175.54242, -4) ft
Entry: (-24.860606, 9.4014928) ft
Radius: 81.134386 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-20.86386 ft	5.7007464 ft	829.87342 psf	837.23492 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.151092 ft	-0.514873 ft	1,217.7281 psf	1,781.6323 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-9.2468468 ft	-5.514873 ft	1,529.7281 psf	2,249.1259 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-6.0293118 ft	-9.1689716 ft	1,757.7438 psf	2,637.9653 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-1.6266734 ft	-14.168972 ft	2,069.7438 psf	3,136.8213 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	3.3733266 ft	-19.847385 ft	2,424.0768 psf	3,697.5043 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 7	6.011735 ft	-22.843779 ft	2,582.4319 psf	3,981.9197 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	9.4190302 ft	-25.996395 ft	2,682.7695 psf	4,287.6881 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	12.257015 ft	-28.370037 ft	2,750.6038 psf	4,481.7384 psf	0 psf	253.62636 psf	0 psf	(5) CH (-28 to -38)
Slice 10	15.331815 ft	-29.999047 ft	2,765.2742 psf	4,633.3896 psf	0 psf	269.59067 psf	0 psf	(5) CH (-28 to -38)
Slice 11	21.10548 ft	-32.069021 ft	2,731.1151 psf	4,705.9233 psf	0 psf	289.8764 psf	0 psf	(5) CH (-28 to -38)
Slice 12	28.123385 ft	-32.492987 ft	2,559.0481 psf	4,603.8085 psf	0 psf	294.03127 psf	0 psf	(5) CH (-28 to -38)
Slice 13	34.625 ft	-31.843881 ft	2,334.6262 psf	4,369.6211 psf	0 psf	287.67004 psf	0 psf	(5) CH (-28 to -38)
Slice 14	39.875 ft	-31.319734 ft	2,153.4074 psf	4,283.819 psf	0 psf	282.53339 psf	0 psf	(5) CH (-28 to -38)
Slice 15	46.410713 ft	-30.667224 ft	2,038.4348 psf	4,176.235 psf	0 psf	276.13879 psf	0 psf	(5) CH (-28 to -38)
Slice 16	54.232138 ft	-29.886351 ft	1,989.7083 psf	4,048.4074 psf	0 psf	268.48624 psf	0 psf	(5) CH (-28 to -38)
Slice 17	61.635263 ft	-29.324189 ft	1,954.6294 psf	3,932.2257 psf	0 psf	262.97705 psf	0 psf	(5) CH (-28 to -38)
Slice 18	68.620087 ft	-28.980736 ft	1,933.1979 psf	3,857.6498 psf	0 psf	259.61122 psf	0 psf	(5) CH (-28 to -38)
Slice 19	76.090987 ft	-28.782241 ft	1,920.8118 psf	3,784.0985 psf	0 psf	257.66596 psf	0 psf	(5) CH (-28 to -38)
Slice 20	84.047962 ft	-28.728703 ft	1,917.4711 psf	3,736.5947 psf	0 psf	257.14129 psf	0 psf	(5) CH (-28 to -38)
Slice 21	90.817792 ft	-28.825215 ft	1,923.4934 psf	3,697.9129 psf	0 psf	258.0871 psf	0 psf	(5) CH (-28 to -38)
Slice 22	96.400478 ft	-29.071776 ft	1,938.8788 psf	3,695.8249 psf	0 psf	260.5034 psf	0 psf	(5) CH (-28 to -38)
Slice 23	101.82308 ft	-29.438199 ft	1,961.7436 psf	3,693.8516 psf	0 psf	264.09435 psf	0 psf	(5) CH (-28 to -38)
Slice 24	107.08561 ft	-29.924485 ft	1,992.0879 psf	3,719.5448 psf	0 psf	268.85995 psf	0 psf	(5) CH (-28 to -38)
Slice 25	112.28765 ft	-30.427547 ft	2,023.479 psf	3,744.845 psf	0 psf	273.78996 psf	0 psf	(5) CH (-28 to -38)
Slice 26	117.42922 ft	-30.947386 ft	2,055.9169 psf	3,774.796 psf	0 psf	278.88438 psf	0 psf	(5) CH (-28 to -38)
Slice 27	122.24119 ft	-31.433901 ft	2,086.2754 psf	3,729.1809 psf	0 psf	283.65223 psf	0 psf	(5) CH (-28 to -38)
Slice 28	127.57446 ft	-30.977357 ft	2,057.7871 psf	3,570.5182 psf	0 psf	279.1781 psf	0 psf	(5) CH (-28 to -38)
Slice 29	131.33327 ft	-29.953369 ft	1,993.8902 psf	3,401.358 psf	0 psf	269.14302 psf	0 psf	(5) CH (-28 to -38)
Slice 30	133.57713 ft	-28.806261 ft	1,922.3107 psf	3,233.7412 psf	0 psf	257.90136 psf	0 psf	(5) CH (-28 to -38)
Slice 31	138.58964 ft	-26.243775 ft	1,762.4115 psf	2,969.7185 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	145.46037 ft	-22.731323 ft	1,543.2346 psf	2,577.9586 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	151.73692 ft	-19.487549 ft	1,340.8231 psf	2,219.7521 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	156.03905 ft	-17.235093 ft	1,200.2698 psf	1,970.9397 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 35	158.90552 ft	-15.734303 ft	1,106.6205 psf	1,805.8662 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	165.15698 ft	-11.499211 ft	842.35074 psf	1,370.3319 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	172.75147 ft	-6.0153162 ft	500.15573 psf	761.50483 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 38	175.52121 ft	-4.0153162 ft	375.35573 psf	549.24714 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Top of Levee (CG) Circular Around

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (circ) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:00:40 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (circ) around

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-99.99877, 6.421117) ft
Left-Zone Right Coordinate: (5, 19) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (45.23142, 9.398572) ft
Right-Zone Right Coordinate: (190, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	-108.3 ft	2 ft
Coordinate 2	-44.2 ft	3.5 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

Slip Surfaces Analysed: 9319 of 20182 converged

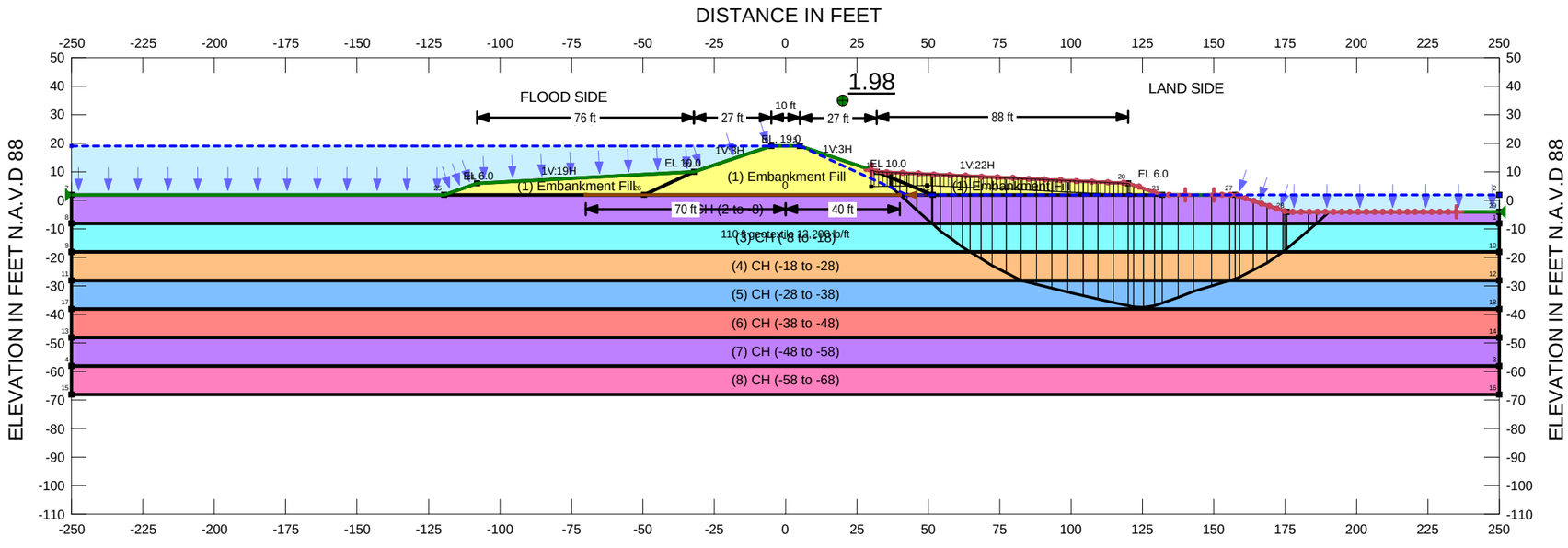
Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.34
Volume: 8,297.0906 ft³
Weight: 856,756.96 lbf
Resisting Moment: 6,406,592.4 lbf·ft
Activating Moment: 4,775,077.2 lbf·ft
Resisting Force: 76,725.368 lbf
Activating Force: 57,131.488 lbf

Slip Rank: 1 of 20,182 slip surfaces
Exit: (175.53131, -4) ft
Entry: (-71.378454, 2.8639987) ft
Radius: 96.005965 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-70.693443 ft	2.4319994 ft	1,033.8432 psf	1,012.7955 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-68.711991 ft	1.182405 ft	1,111.8179 psf	1,289.2794 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-62.77589 ft	-0.96579725 ft	1,245.8657 psf	1,589.2912 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-53.49657 ft	-3.6270117 ft	1,411.9255 psf	1,851.7161 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	-45.678455 ft	-6.22061 ft	1,573.7661 psf	2,071.1664 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	-41.850213 ft	-7.7418005 ft	1,668.6884 psf	2,216.5218 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 7	-36.600213 ft	-9.8279407 ft	1,798.8635 psf	2,433.8702 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	-30.211625 ft	-12.36651 ft	1,957.2702 psf	2,722.0675 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	-23.683459 ft	-15.538569 ft	2,155.2067 psf	3,108.1692 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	-16.121784 ft	-19.465438 ft	2,400.2433 psf	3,635.1059 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	-9.14995 ft	-23.676018 ft	2,662.9836 psf	4,156.7607 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	-3.8066005 ft	-27.21058 ft	2,883.5402 psf	4,608.1648 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	1.1933995 ft	-30.518021 ft	3,089.9245 psf	4,980.49 psf	0 psf	274.6766 psf	0 psf	(5) CH (-28 to -38)
Slice 14	7.422855 ft	-34.638731 ft	3,278.5191 psf	5,313.8526 psf	0 psf	315.05957 psf	0 psf	(5) CH (-28 to -38)
Slice 15	12.269369 ft	-37.120711 ft	3,296.2964 psf	5,522.1477 psf	0 psf	339.38296 psf	0 psf	(5) CH (-28 to -38)
Slice 16	16.684369 ft	-38.722447 ft	3,271.3533 psf	5,524.4958 psf	0 psf	355.29671 psf	0 psf	(6) CH (-38 to -48)
Slice 17	22.59608 ft	-39.826701 ft	3,173.0282 psf	5,543.0278 psf	0 psf	366.44968 psf	0 psf	(6) CH (-38 to -48)
Slice 18	29.258225 ft	-39.780436 ft	2,981.6825 psf	5,403.7122 psf	0 psf	365.9824 psf	0 psf	(6) CH (-38 to -48)
Slice 19	36.330896 ft	-38.676182 ft	2,712.7053 psf	5,152.5234 psf	0 psf	354.82943 psf	0 psf	(6) CH (-38 to -48)
Slice 20	41.580896 ft	-37.856501 ft	2,513.0452 psf	5,033.7053 psf	0 psf	346.59371 psf	0 psf	(5) CH (-28 to -38)
Slice 21	46.252497 ft	-37.127125 ft	2,441.5326 psf	4,927.3986 psf	0 psf	339.44582 psf	0 psf	(5) CH (-28 to -38)
Slice 22	53.757492 ft	-35.955372 ft	2,368.4152 psf	4,756.6152 psf	0 psf	327.96265 psf	0 psf	(5) CH (-28 to -38)
Slice 23	61.715465 ft	-34.894925 ft	2,302.2433 psf	4,578.1379 psf	0 psf	317.57026 psf	0 psf	(5) CH (-28 to -38)
Slice 24	70.126415 ft	-33.945782 ft	2,243.0168 psf	4,428.0863 psf	0 psf	308.26866 psf	0 psf	(5) CH (-28 to -38)
Slice 25	78.958223 ft	-33.16488 ft	2,194.2885 psf	4,276.5874 psf	0 psf	300.61582 psf	0 psf	(5) CH (-28 to -38)
Slice 26	88.210887 ft	-32.55222 ft	2,156.0585 psf	4,160.0737 psf	0 psf	294.61176 psf	0 psf	(5) CH (-28 to -38)
Slice 27	97.36435 ft	-32.181181 ft	2,132.9057 psf	4,051.7052 psf	0 psf	290.97557 psf	0 psf	(5) CH (-28 to -38)
Slice 28	106.41861 ft	-32.051763 ft	2,124.83 psf	3,990.0578 psf	0 psf	289.70728 psf	0 psf	(5) CH (-28 to -38)
Slice 29	115.47287 ft	-31.922345 ft	2,116.7543 psf	3,928.4105 psf	0 psf	288.43898 psf	0 psf	(5) CH (-28 to -38)
Slice 30	123.0775 ft	-31.813648 ft	2,109.9716 psf	3,774.6943 psf	0 psf	287.37375 psf	0 psf	(5) CH (-28 to -38)
Slice 31	128.33392 ft	-31.241768 ft	2,074.2863 psf	3,588.5416 psf	0 psf	281.76933 psf	0 psf	(5) CH (-28 to -38)
Slice 32	131.25643 ft	-30.349229 ft	2,018.5919 psf	3,457.9905 psf	0 psf	273.02244 psf	0 psf	(5) CH (-28 to -38)
Slice 33	134.02343 ft	-28.99229 ft	1,933.9189 psf	3,271.5588 psf	0 psf	259.72444 psf	0 psf	(5) CH (-28 to -38)
Slice 34	140.42711 ft	-25.851933 ft	1,737.9606 psf	2,940.9359 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	150.24247 ft	-20.851933 ft	1,425.9606 psf	2,391.8751 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 36	156.58879 ft	-17.521864 ft	1,218.1643 psf	2,017.5154 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	158.17299 ft	-16.690593 ft	1,166.293 psf	1,926.5757 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	164.48382 ft	-12.168729 ft	884.12872 psf	1,468.6776 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	172.81083 ft	-6.0115739 ft	499.92221 psf	779.2156 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 40	175.51565 ft	-4.0115739 ft	375.12221 psf	564.49991 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Top of Levee (CG) Circular Front

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (circ) front (2)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,479
Date: 07/14/2022
Time: 11:39:14 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/14/2022
Last Solved Time: 11:40:20 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (circ) front (2)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (30, 10.666667) ft
Left-Zone Right Coordinate: (140, 2) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (150, 2) ft
Right-Zone Right Coordinate: (235, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	30 ft	4.9 ft

Coordinate 2	49.7 ft	5.2 ft
Coordinate 3	120.7 ft	2 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 10856 of 20182 converged

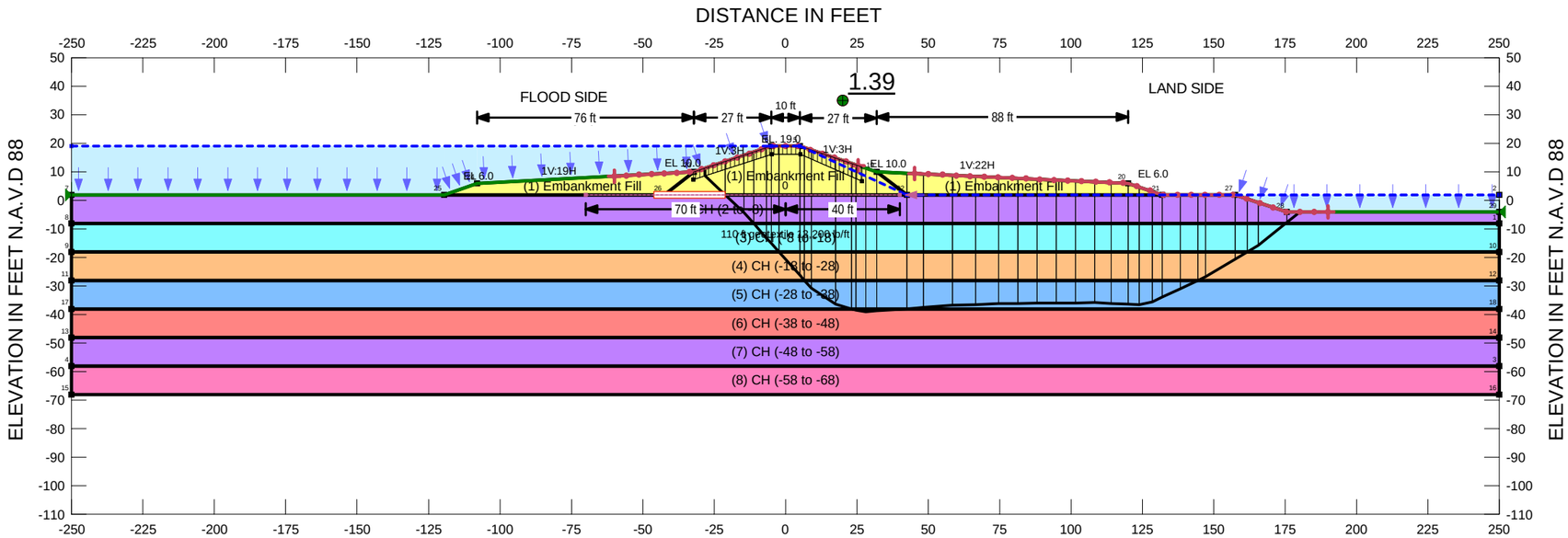
Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.98
Volume: 4,334.4559 ft³

Weight: 441,138.05 lbf
Resisting Moment: 3,630,217.5 lbf·ft
Activating Moment: 1,837,561.8 lbf·ft
Resisting Force: 47,548.885 lbf
Activating Force: 24,075.795 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (190.47059, -4) ft
Entry: (36.751258, 5.002811) ft
Radius: 65.770249 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	37.180984 ft	4.6096447 ft	-12.377504 psf	287.90321 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	38.822 ft	3.1082392 ft	34.889139 psf	474.41494 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	41.266645 ft	0.87157373 ft	105.30294 psf	813.92872 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	44.21654 ft	-1.8273568 ft	238.82706 psf	1,034.5453 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	48.549066 ft	-5.6989305 ft	480.41326 psf	1,357.2867 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	51.332526 ft	-8.1473136 ft	633.19237 psf	1,558.5416 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	52.87999 ft	-9.5084921 ft	718.12991 psf	1,682.8504 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	56.189515 ft	-12.129868 ft	881.70376 psf	1,952.406 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	60.048585 ft	-14.94489 ft	1,057.3611 psf	2,207.4074 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	63.296041 ft	-17.176201 ft	1,196.5949 psf	2,432.4728 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 11	66.558834 ft	-19.215691 ft	1,323.8591 psf	2,623.5671 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	70.448578 ft	-21.647074 ft	1,475.5774 psf	2,865.5405 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	74.909228 ft	-24.147074 ft	1,631.5774 psf	3,141.7568 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 14	79.956308 ft	-26.723616 ft	1,792.3537 psf	3,394.406 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 15	85.216415 ft	-28.695111 ft	1,915.3749 psf	3,659.325 psf	0 psf	256.81209 psf	0 psf	(5) CH (-28 to -38)
Slice 16	90.674025 ft	-30.053633 ft	2,000.1467 psf	3,777.7808 psf	0 psf	270.1256 psf	0 psf	(5) CH (-28 to -38)
Slice 17	96.131635 ft	-31.412155 ft	2,084.9185 psf	3,896.2366 psf	0 psf	283.43912 psf	0 psf	(5) CH (-28 to -38)
Slice 18	101.58925 ft	-32.770677 ft	2,169.6902 psf	4,014.6924 psf	0 psf	296.75263 psf	0 psf	(5) CH (-28 to -38)
Slice 19	106.93171 ft	-34.020795 ft	2,247.6976 psf	4,131.0224 psf	0 psf	309.00379 psf	0 psf	(5) CH (-28 to -38)
Slice 20	112.15902 ft	-35.16251 ft	2,318.9406 psf	4,227.5236 psf	0 psf	320.1926 psf	0 psf	(5) CH (-28 to -38)
Slice 21	117.38634 ft	-36.304225 ft	2,390.1836 psf	4,324.0248 psf	0 psf	331.3814 psf	0 psf	(5) CH (-28 to -38)
Slice 22	120.98617 ft	-37.090475 ft	2,439.2456 psf	4,358.0737 psf	0 psf	339.08665 psf	0 psf	(5) CH (-28 to -38)
Slice 23	123.65391 ft	-37.387736 ft	2,457.7947 psf	4,342.8294 psf	0 psf	341.99981 psf	0 psf	(5) CH (-28 to -38)
Slice 24	127.27177 ft	-37.18598 ft	2,445.2052 psf	4,243.925 psf	0 psf	340.0226 psf	0 psf	(5) CH (-28 to -38)
Slice 25	130.60403 ft	-36.401394 ft	2,396.247 psf	4,093.7705 psf	0 psf	332.33366 psf	0 psf	(5) CH (-28 to -38)
Slice 26	134.73851 ft	-34.917686 ft	2,303.6636 psf	3,871.4429 psf	0 psf	317.79332 psf	0 psf	(5) CH (-28 to -38)
Slice 27	140.21552 ft	-32.952192 ft	2,181.0168 psf	3,648.6865 psf	0 psf	298.53148 psf	0 psf	(5) CH (-28 to -38)
Slice 28	146.12948 ft	-30.977084 ft	2,057.77 psf	3,412.755 psf	0 psf	279.17542 psf	0 psf	(5) CH (-28 to -38)
Slice 29	152.48039 ft	-28.992361 ft	1,933.9233 psf	3,188.6395 psf	0 psf	259.72514 psf	0 psf	(5) CH (-28 to -38)
Slice 30	156.57792 ft	-27.711841 ft	1,854.0189 psf	3,055.718 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 31	158.2633 ft	-27.185144 ft	1,821.153 psf	2,990.2428 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	161.45722 ft	-25.680907 ft	1,727.2886 psf	2,847.8247 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	166.31846 ft	-23.149512 ft	1,569.3295 psf	2,519.9865 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	171.48436 ft	-19.941907 ft	1,369.175 psf	2,158.3371 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	174.49454 ft	-17.804831 ft	1,235.8215 psf	1,886.7685 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	175.13472 ft	-17.301203 ft	1,204.3951 psf	1,858.9459 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	179.3175 ft	-13.769064 ft	983.9896 psf	1,487.5413 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	184.56134 ft	-9.2726925 ft	703.41601 psf	1,033.822 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	188.22913 ft	-6 ft	499.2 psf	716.933 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Top of Levee (CG) Circular Through

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (circ) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:05:10 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (circ) through

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-59.99949, 8.526343) ft
Left-Zone Right Coordinate: (25.45455, 12.181817) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (45.23142, 9.398572) ft
Right-Zone Right Coordinate: (190, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-21.146778, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 48.853222 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Tension Crack Line

	X	Y

Coordinate 1	-32.2 ft	7.3 ft
Coordinate 2	-4.8 ft	16.1 ft
Coordinate 3	5.3 ft	16.1 ft
Coordinate 4	26.7 ft	6.7 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

Slip Surfaces Analysed: 10144 of 20182 converged

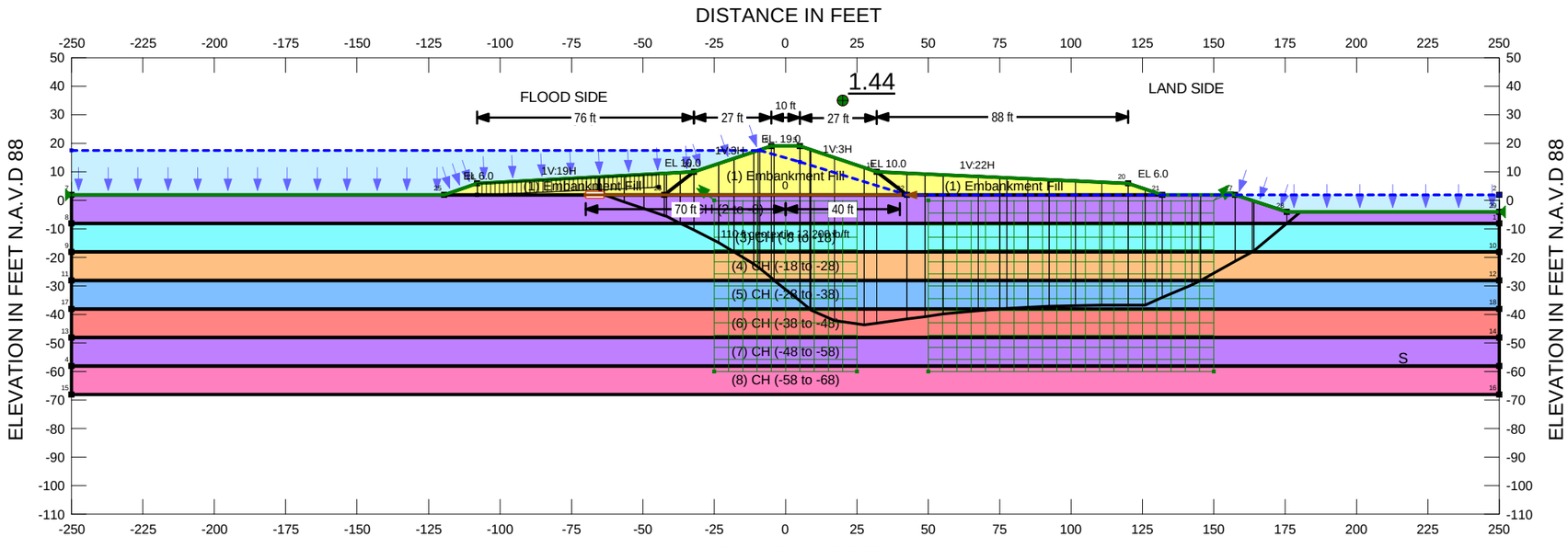
Current Slip Surface

Slip Surface: 20,182

Factor of Safety: 1.39
Volume: 7,560.1122 ft³
Weight: 783,382.19 lbf
Resisting Moment: 6,087,878.7 lbf·ft
Activating Moment: 4,379,901.3 lbf·ft
Resisting Force: 68,681.721 lbf
Activating Force: 49,388.762 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (180.11786, -4) ft
Entry: (-28.223514, 8.5771196) ft
Radius: 85.796299 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-24.685146 ft	5.2885598 ft	855.59387 psf	817.89288 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-17.845539 ft	-1.068172 ft	1,252.2539 psf	1,762.3523 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-12.857904 ft	-6.068172 ft	1,564.2539 psf	2,228.8079 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-8.8837838 ft	-10.62067 ft	1,848.3298 psf	2,717.4407 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-5.79803 ft	-14.127518 ft	2,067.1571 psf	3,125.297 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-3.6553694 ft	-16.506847 ft	2,215.6273 psf	3,365.9282 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	1.3446306 ft	-22.059126 ft	2,562.0894 psf	3,929.7242 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	5.8472868 ft	-27.059126 ft	2,850.1214 psf	4,436.5823 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	7.9218568 ft	-29.362844 ft	2,935.1879 psf	4,639.791 psf	0 psf	263.35587 psf	0 psf	(5) CH (-28 to -38)
Slice 10	13.358015 ft	-33.527879 ft	3,041.3081 psf	5,005.607 psf	0 psf	304.17321 psf	0 psf	(5) CH (-28 to -38)
Slice 11	20.304586 ft	-37.165036 ft	3,071.7621 psf	5,263.7889 psf	0 psf	339.81735 psf	0 psf	(5) CH (-28 to -38)
Slice 12	23.822216 ft	-38.23787 ft	3,039.2003 psf	5,250.9864 psf	0 psf	350.40249 psf	0 psf	(6) CH (-38 to -48)
Slice 13	26.333485 ft	-38.717848 ft	2,998.1121 psf	5,269.3172 psf	0 psf	355.25026 psf	0 psf	(6) CH (-38 to -48)
Slice 14	30.03241 ft	-38.824655 ft	2,900.1417 psf	5,224.8199 psf	0 psf	356.32902 psf	0 psf	(6) CH (-38 to -48)
Slice 15	37.25 ft	-38.328344 ft	2,665.0007 psf	5,064.9905 psf	0 psf	351.31627 psf	0 psf	(6) CH (-38 to -48)
Slice 16	45.36272 ft	-37.77048 ft	2,481.6779 psf	4,962.037 psf	0 psf	345.7507 psf	0 psf	(5) CH (-28 to -38)
Slice 17	53.365345 ft	-37.162132 ft	2,443.7171 psf	4,855.9907 psf	0 psf	339.7889 psf	0 psf	(5) CH (-28 to -38)
Slice 18	62.56105 ft	-36.588 ft	2,407.8912 psf	4,729.1239 psf	0 psf	334.1624 psf	0 psf	(5) CH (-28 to -38)
Slice 19	70.67265 ft	-36.262724 ft	2,387.594 psf	4,650.6872 psf	0 psf	330.9747 psf	0 psf	(5) CH (-28 to -38)
Slice 20	78.081543 ft	-36.070908 ft	2,375.6247 psf	4,579.3034 psf	0 psf	329.0949 psf	0 psf	(5) CH (-28 to -38)
Slice 21	84.787729 ft	-36.012553 ft	2,371.9833 psf	4,537.8025 psf	0 psf	328.52302 psf	0 psf	(5) CH (-28 to -38)
Slice 22	91.493915 ft	-35.954198 ft	2,368.342 psf	4,496.3017 psf	0 psf	327.95114 psf	0 psf	(5) CH (-28 to -38)
Slice 23	98.200101 ft	-35.895843 ft	2,364.7006 psf	4,454.8008 psf	0 psf	327.37926 psf	0 psf	(5) CH (-28 to -38)
Slice 24	104.90629 ft	-35.837488 ft	2,361.0592 psf	4,413.3 psf	0 psf	326.80738 psf	0 psf	(5) CH (-28 to -38)
Slice 25	111.19454 ft	-35.928829 ft	2,366.759 psf	4,372.5519 psf	0 psf	327.70253 psf	0 psf	(5) CH (-28 to -38)
Slice 26	117.06485 ft	-36.169868 ft	2,381.7998 psf	4,368.3669 psf	0 psf	330.06471 psf	0 psf	(5) CH (-28 to -38)
Slice 27	121.92517 ft	-36.369436 ft	2,394.2528 psf	4,302.4604 psf	0 psf	332.02048 psf	0 psf	(5) CH (-28 to -38)
Slice 28	126.14278 ft	-35.999994 ft	2,371.1997 psf	4,185.2502 psf	0 psf	328.39995 psf	0 psf	(5) CH (-28 to -38)
Slice 29	130.2176 ft	-34.713397 ft	2,290.916 psf	3,980.1258 psf	0 psf	315.79129 psf	0 psf	(5) CH (-28 to -38)
Slice 30	135.12373 ft	-32.406468 ft	2,146.9636 psf	3,641.3267 psf	0 psf	293.18338 psf	0 psf	(5) CH (-28 to -38)
Slice 31	141.3712 ft	-29.468823 ft	1,963.6545 psf	3,303.0786 psf	0 psf	264.39446 psf	0 psf	(5) CH (-28 to -38)
Slice 32	145.79591 ft	-27.388262 ft	1,833.8275 psf	3,088.6763 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	152.29844 ft	-23.67489 ft	1,602.1131 psf	2,713.5187 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	159.65772 ft	-19.286628 ft	1,328.2856 psf	2,202.2888 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	163.66147 ft	-16.899236 ft	1,179.3123 psf	1,903.4988 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	170.50375 ft	-11.763792 ft	858.86064 psf	1,374.5698 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	177.80893 ft	-5.8645562 ft	490.74831 psf	740.67377 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Project Grade (PG) Block Around

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:03:12 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block) around

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-25, 0) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	13.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-63.494289, 2) ft
Max. Pullout Force: 500,000 lbf
Available Length: 6.505711 ft

Required Length: 6.505711 ft
Pullout Force: 3,448.0268 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Pullout Resistance

Tension Crack Line

	X	Y
Coordinate 1	-108 ft	2 ft
Coordinate 2	-44.3 ft	4.7 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

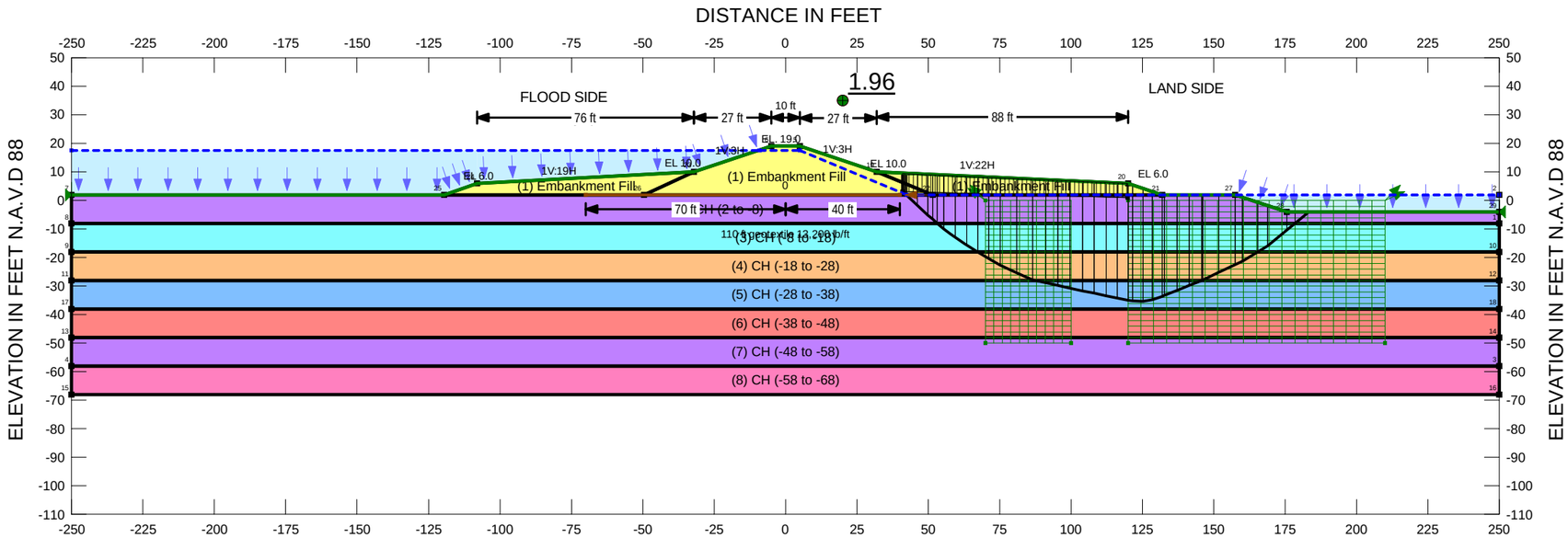
Slip Surfaces Analysed: 32741 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.44
Volume: 8,918.067 ft³
Weight: 925,183.62 lbf
Resisting Moment: 7,250,900 lbf·ft
Activating Moment: 5,046,548.6 lbf·ft
Resisting Force: 81,639.924 lbf
Activating Force: 56,819.95 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (180.42736, -4) ft
Entry: (-65.333147, 3.8084851) ft
Radius: 97.178937 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-64.413718 ft	2.9042426 ft	910.77526 psf	764.17613 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-63.415674 ft	1.922684 ft	972.02452 psf	1,095.0616 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-59.864217 ft	0.65863673 ft	1,050.9011 psf	1,352.0625 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-52.91853 ft	-1.7148258 ft	1,199.0051 psf	1,582.4901 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	-45.972843 ft	-4.0882883 ft	1,347.1092 psf	1,812.9177 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	-42.054175 ft	-5.4273658 ft	1,430.6676 psf	1,945.9741 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 7	-39.192171 ft	-6.789856 ft	1,515.687 psf	2,029.5357 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 8	-34.387996 ft	-9.1960283 ft	1,665.8322 psf	2,267.674 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	-27.69236 ft	-12.549539 ft	1,875.0913 psf	2,675.3702 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	-20.692653 ft	-16.353511 ft	2,112.4591 psf	3,139.0837 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 11	-14.510553 ft	-20.134531 ft	2,348.3947 psf	3,633.4737 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	-10.26026 ft	-22.882957 ft	2,519.8965 psf	3,940.3763 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	-9.25 ft	-23.698723 ft	2,570.8003 psf	4,054.5548 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 14	-7 ft	-25.515556 ft	2,648.5136 psf	4,328.2579 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 15	-4.4616093 ft	-27.56526 ft	2,731.1592 psf	4,625.0762 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 16	0.53839071 ft	-31.602667 ft	2,893.9505 psf	5,070.3646 psf	0 psf	285.30613 psf	0 psf	(5) CH (-28 to -38)
Slice 17	6.7304837 ft	-36.602667 ft	3,093.2919 psf	5,516.9373 psf	0 psf	334.30613 psf	0 psf	(5) CH (-28 to -38)
Slice 18	8.6815737 ft	-38.178136 ft	3,154.2651 psf	5,610.7939 psf	0 psf	349.79917 psf	0 psf	(6) CH (-38 to -48)
Slice 19	13.05456 ft	-40.256464 ft	3,200.2713 psf	5,800.1809 psf	0 psf	370.79029 psf	0 psf	(6) CH (-38 to -48)
Slice 20	22.393585 ft	-42.869971 ft	3,184.6425 psf	5,864.9895 psf	0 psf	397.1867 psf	0 psf	(6) CH (-38 to -48)
Slice 21	29.790115 ft	-43.285561 ft	3,069.0353 psf	5,751.9602 psf	0 psf	401.38416 psf	0 psf	(6) CH (-38 to -48)
Slice 22	37.25 ft	-42.280542 ft	2,863.5698 psf	5,527.7336 psf	0 psf	391.23348 psf	0 psf	(6) CH (-38 to -48)
Slice 23	45.69872 ft	-41.142305 ft	2,692.0798 psf	5,357.6558 psf	0 psf	379.73728 psf	0 psf	(6) CH (-38 to -48)
Slice 24	52.09616 ft	-40.280422 ft	2,638.2984 psf	5,228.7249 psf	0 psf	371.03227 psf	0 psf	(6) CH (-38 to -48)
Slice 25	61.388405 ft	-39.207529 ft	2,571.3498 psf	5,049.0074 psf	0 psf	360.19604 psf	0 psf	(6) CH (-38 to -48)
Slice 26	71.289442 ft	-38.282788 ft	2,513.646 psf	4,882.8852 psf	0 psf	350.85616 psf	0 psf	(6) CH (-38 to -48)
Slice 27	76.289457 ft	-37.911431 ft	2,490.4733 psf	4,816.6648 psf	0 psf	347.13203 psf	0 psf	(5) CH (-28 to -38)
Slice 28	81.182535 ft	-37.619006 ft	2,472.226 psf	4,750.2385 psf	0 psf	344.26626 psf	0 psf	(5) CH (-28 to -38)
Slice 29	88.583685 ft	-37.211292 ft	2,446.7846 psf	4,666.3183 psf	0 psf	340.27066 psf	0 psf	(5) CH (-28 to -38)
Slice 30	96.90355 ft	-36.954709 ft	2,430.7739 psf	4,577.7513 psf	0 psf	337.75615 psf	0 psf	(5) CH (-28 to -38)
Slice 31	106.14213 ft	-36.849258 ft	2,424.1937 psf	4,517.807 psf	0 psf	336.72273 psf	0 psf	(5) CH (-28 to -38)
Slice 32	115.38071 ft	-36.743806 ft	2,417.6135 psf	4,457.8628 psf	0 psf	335.6893 psf	0 psf	(5) CH (-28 to -38)
Slice 33	122.98677 ft	-36.656989 ft	2,412.1961 psf	4,309.7824 psf	0 psf	334.83849 psf	0 psf	(5) CH (-28 to -38)
Slice 34	128.98677 ft	-35.336234 ft	2,329.781 psf	4,079.6691 psf	0 psf	321.8951 psf	0 psf	(5) CH (-28 to -38)
Slice 35	137.17538 ft	-31.83966 ft	2,111.5948 psf	3,561.2212 psf	0 psf	287.62867 psf	0 psf	(5) CH (-28 to -38)
Slice 36	143.83576 ft	-28.814874 ft	1,922.8481 psf	3,249.0168 psf	0 psf	257.98577 psf	0 psf	(5) CH (-28 to -38)
Slice 37	151.41039 ft	-24.658429 ft	1,663.486 psf	2,806.4091 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 38	160.52229 ft	-19.658429 ft	1,351.486 psf	2,219.231 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 39	163.84003 ft	-17.837874 ft	1,237.8833 psf	1,981.4885 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 40	169.81775 ft	-12.90594 ft	930.13065 psf	1,500.471 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 41	177.96368 ft	-6.0680659 ft	503.44731 psf	761.77586 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Project Grade (PG) Block Front

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block) front (3)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,498
Date: 07/19/2022
Time: 10:11:27 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 10:16:22 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block) front (3)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (70, 0) ft
- Lower Left: (70, -50) ft
- Lower Right: (100, -50) ft
- X Increments: 10
- Y Increments: 25
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (120, 0) ft
- Lower Left: (120, -50) ft
- Lower Right: (210, -50) ft
- X Increments: 20
- Y Increments: 25
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft

Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	41.01875 ft	3 ft
Coordinate 2	119.8 ft	1 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

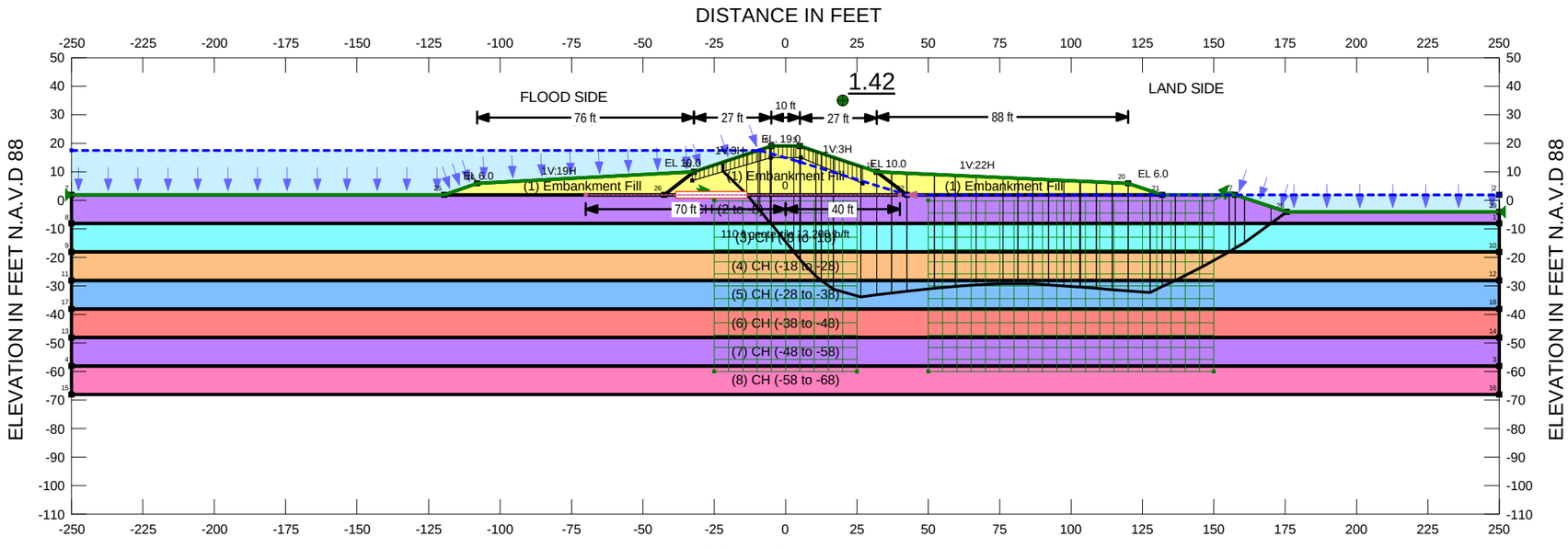
Slip Surfaces Analysed: 61896 of 90091 converged

Current Slip Surface

Slip Surface: 90,091
Factor of Safety: 1.96
Volume: 3,886.0816 ft³
Weight: 393,703.35 lbf
Resisting Moment: 3,209,378.7 lbf·ft
Activating Moment: 1,633,551.5 lbf·ft
Resisting Force: 42,850.315 lbf
Activating Force: 21,810.005 lbf
Slip Rank: 1 of 90,091 slip surfaces
Exit: (183.2392, -4) ft
Entry: (41.06158, 2.9989127) ft
Radius: 60.2784 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	41.458983 ft	2.63247 ft	-12.616207 psf	449.13569 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	42.000637 ft	2.1330137 ft	4.5795102 psf	562.76229 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	42.322445 ft	1.8362773 ft	14.795809 psf	720.98752 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	44.36058 ft	-0.043074365 ft	127.48784 psf	874.26047 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	48.08174 ft	-3.4743321 ft	341.59832 psf	1,154.1011 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	50.72116 ft	-5.8645732 ft	490.74937 psf	1,359.7752 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 7	52.343255 ft	-7.2695927 ft	578.42259 psf	1,474.0942 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 8	54.34083 ft	-8.9998435 ft	686.39023 psf	1,624.5643 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	57.512102 ft	-11.441807 ft	838.76873 psf	1,877.6618 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	61.546008 ft	-14.326045 ft	1,018.7452 psf	2,138.1278 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 11	65.426931 ft	-16.884083 ft	1,178.3667 psf	2,394.9196 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 12	69.274776 ft	-19.187701 ft	1,322.1126 psf	2,608.6042 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	73.242525 ft	-21.563104 ft	1,470.3377 psf	2,843.959 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 14	78.08798 ft	-24.053351 ft	1,625.7291 psf	3,125.7551 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 15	83.81114 ft	-26.658443 ft	1,788.2868 psf	3,378.1595 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 16	88.910198 ft	-28.438474 ft	1,899.3608 psf	3,619.3705 psf	0 psf	254.29705 psf	0 psf	(5) CH (-28 to -38)
Slice 17	93.293751 ft	-29.37394 ft	1,957.7338 psf	3,697.9145 psf	0 psf	263.46461 psf	0 psf	(5) CH (-28 to -38)
Slice 18	97.585903 ft	-30.289899 ft	2,014.8897 psf	3,774.8207 psf	0 psf	272.44101 psf	0 psf	(5) CH (-28 to -38)
Slice 19	101.87805 ft	-31.205859 ft	2,072.0456 psf	3,851.7269 psf	0 psf	281.41742 psf	0 psf	(5) CH (-28 to -38)
Slice 20	106.07941 ft	-32.089888 ft	2,127.209 psf	3,927.4209 psf	0 psf	290.0809 psf	0 psf	(5) CH (-28 to -38)
Slice 21	110.18998 ft	-32.941984 ft	2,180.3798 psf	3,998.3964 psf	0 psf	298.43145 psf	0 psf	(5) CH (-28 to -38)
Slice 22	114.18395 ft	-33.755801 ft	2,231.162 psf	4,068.0415 psf	0 psf	306.40685 psf	0 psf	(5) CH (-28 to -38)
Slice 23	118.06132 ft	-34.531338 ft	2,279.5555 psf	4,131.9787 psf	0 psf	314.00711 psf	0 psf	(5) CH (-28 to -38)
Slice 24	120.81878 ft	-35.082875 ft	2,313.9714 psf	4,150.5409 psf	0 psf	319.41217 psf	0 psf	(5) CH (-28 to -38)
Slice 25	123.42179 ft	-35.285849 ft	2,326.637 psf	4,129.3506 psf	0 psf	321.40133 psf	0 psf	(5) CH (-28 to -38)
Slice 26	126.89505 ft	-35.045618 ft	2,311.6466 psf	4,028.1618 psf	0 psf	319.04706 psf	0 psf	(5) CH (-28 to -38)
Slice 27	130.29204 ft	-34.156321 ft	2,256.1544 psf	3,855.7264 psf	0 psf	310.33195 psf	0 psf	(5) CH (-28 to -38)
Slice 28	132.32636 ft	-33.429929 ft	2,210.8276 psf	3,706.9634 psf	0 psf	303.2133 psf	0 psf	(5) CH (-28 to -38)
Slice 29	134.8506 ft	-32.42783 ft	2,148.2966 psf	3,606.3912 psf	0 psf	293.39273 psf	0 psf	(5) CH (-28 to -38)
Slice 30	139.24636 ft	-30.656698 ft	2,037.778 psf	3,404.6802 psf	0 psf	276.03564 psf	0 psf	(5) CH (-28 to -38)
Slice 31	143.64211 ft	-28.885566 ft	1,927.2593 psf	3,202.9692 psf	0 psf	258.67855 psf	0 psf	(5) CH (-28 to -38)
Slice 32	145.98669 ft	-27.940894 ft	1,868.3118 psf	3,109.8377 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	148.97503 ft	-26.522948 ft	1,779.8319 psf	2,972.0712 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	154.65834 ft	-23.805267 ft	1,610.2486 psf	2,667.757 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	158.71621 ft	-21.864854 ft	1,489.1669 psf	2,439.4046 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 36	162.64222 ft	-19.641641 ft	1,350.4384 psf	2,185.9087 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 37	167.10623 ft	-16.937279 ft	1,181.6862 psf	1,847.3049 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	172.18022 ft	-13.132947 ft	944.29587 psf	1,458.2603 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	176.94782 ft	-9.1956681 ft	698.60969 psf	1,016.7824 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 40	180.81742 ft	-6 ft	499.2 psf	707.80041 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Project Grade (PG) Block Through

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:04:28 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block) through

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (-25, 0) ft
- Lower Left: (-25, -60) ft
- Lower Right: (25, -60) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (50, 0) ft
- Lower Left: (50, -60) ft
- Lower Right: (150, -60) ft
- X Increments: 20
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	13.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-13.437925, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 56.562075 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf

Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Tension Crack Line

	X	Y
Coordinate 1	-32.6 ft	7 ft
Coordinate 2	-5.2 ft	15 ft
Coordinate 3	5.5 ft	15 ft
Coordinate 4	27 ft	6 ft

Cohesion Functions

CH, -58 to -68
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

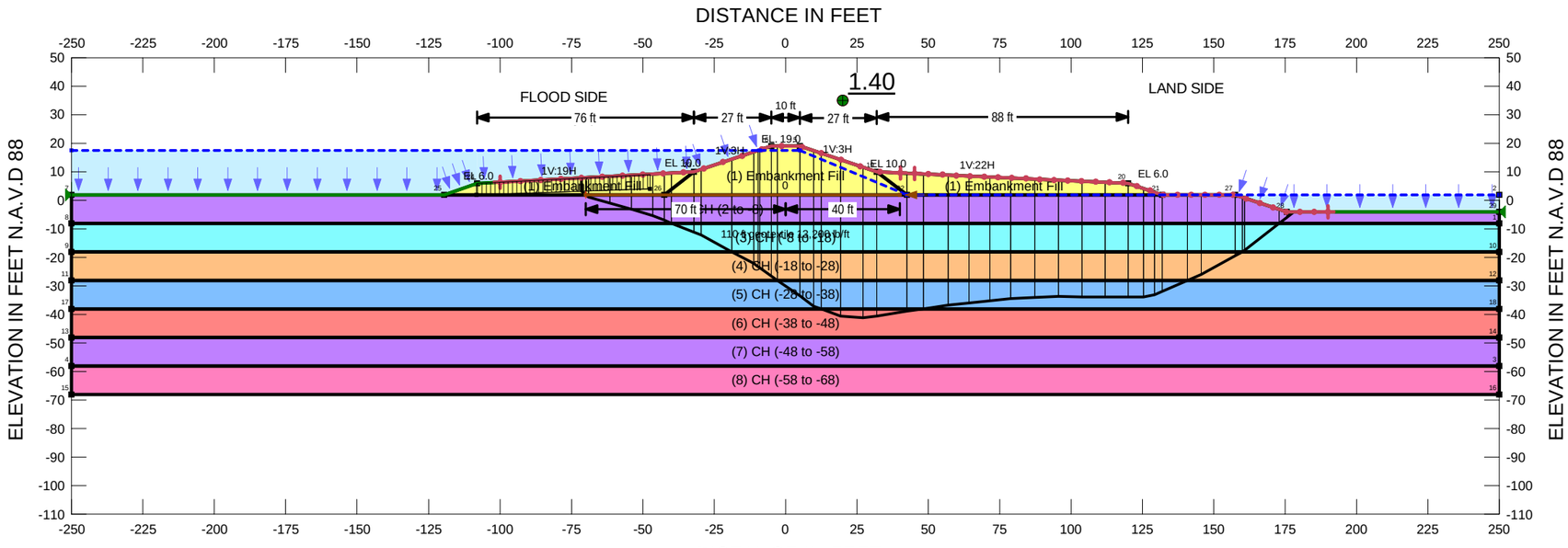
Slip Surfaces Analysed: 43206 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.42
Volume: 6,427.1155 ft³
Weight: 661,183.67 lbf
Resisting Moment: 4,893,543 lbf·ft
Activating Moment: 3,451,422.5 lbf·ft
Resisting Force: 59,238.379 lbf
Activating Force: 41,884.193 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (175.52814, -4) ft
Entry: (-21.795133, 10.154706) ft
Radius: 80.622739 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-17.685802 ft	6.1622298 ft	707.47686 psf	742.0847 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-11.538235 ft	-0.32761561 ft	1,112.4432 psf	1,653.754 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-9.25 ft	-3.1313004 ft	1,287.3931 psf	1,964.3251 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-7.1381988 ft	-5.7188078 ft	1,415.6604 psf	2,249.7346 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	-5.1381988 ft	-8.1693296 ft	1,532.9158 psf	2,576.7134 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-1.0574352 ft	-13.16933 ft	1,772.1616 psf	3,028.4955 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	3.9425648 ft	-19.295634 ft	2,065.3001 psf	3,628.7189 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	5.14481 ft	-20.768698 ft	2,135.5957 psf	3,813.4303 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	7.960325 ft	-23.742566 ft	2,267.2873 psf	4,045.4569 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 10	11.630825 ft	-27.269502 ft	2,417.1294 psf	4,391.2994 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	14.73226 ft	-29.535559 ft	2,499.1823 psf	4,539.6905 psf	0 psf	265.04848 psf	0 psf	(5) CH (-28 to -38)
Slice 12	21.60286 ft	-32.443107 ft	2,549.1375 psf	4,720.5646 psf	0 psf	293.54245 psf	0 psf	(5) CH (-28 to -38)
Slice 13	29.18591 ft	-33.474115 ft	2,468.3632 psf	4,677.3334 psf	0 psf	303.64633 psf	0 psf	(5) CH (-28 to -38)
Slice 14	34.625 ft	-32.815065 ft	2,323.156 psf	4,482.1354 psf	0 psf	297.18763 psf	0 psf	(5) CH (-28 to -38)
Slice 15	39.875 ft	-32.178926 ft	2,182.997 psf	4,383.7801 psf	0 psf	290.95348 psf	0 psf	(5) CH (-28 to -38)
Slice 16	47.31979 ft	-31.276847 ft	2,076.4753 psf	4,243.3179 psf	0 psf	282.1131 psf	0 psf	(5) CH (-28 to -38)
Slice 17	55.77736 ft	-30.40471 ft	2,022.0539 psf	4,089.8828 psf	0 psf	273.56616 psf	0 psf	(5) CH (-28 to -38)
Slice 18	63.05292 ft	-29.828456 ft	1,986.0957 psf	3,987.8488 psf	0 psf	267.91887 psf	0 psf	(5) CH (-28 to -38)
Slice 19	71.488155 ft	-29.365301 ft	1,957.1948 psf	3,879.86 psf	0 psf	263.37994 psf	0 psf	(5) CH (-28 to -38)
Slice 20	78.863853 ft	-29.214973 ft	1,947.8143 psf	3,812.8229 psf	0 psf	261.90674 psf	0 psf	(5) CH (-28 to -38)
Slice 21	84.020337 ft	-29.264376 ft	1,950.897 psf	3,791.3132 psf	0 psf	262.39088 psf	0 psf	(5) CH (-28 to -38)
Slice 22	89.351475 ft	-29.46872 ft	1,963.6482 psf	3,770.2524 psf	0 psf	264.39346 psf	0 psf	(5) CH (-28 to -38)
Slice 23	94.857265 ft	-29.828007 ft	1,986.0677 psf	3,780.8774 psf	0 psf	267.91447 psf	0 psf	(5) CH (-28 to -38)
Slice 24	100.36306 ft	-30.187295 ft	2,008.4872 psf	3,791.5024 psf	0 psf	271.43549 psf	0 psf	(5) CH (-28 to -38)
Slice 25	103.16625 ft	-30.376561 ft	2,020.2974 psf	3,872.1036 psf	0 psf	273.2903 psf	0 psf	(5) CH (-28 to -38)
Slice 26	106.01378 ft	-30.60728 ft	2,034.6942 psf	3,804.0226 psf	0 psf	275.55134 psf	0 psf	(5) CH (-28 to -38)
Slice 27	111.60827 ft	-31.049471 ft	2,062.287 psf	3,823.2181 psf	0 psf	279.88481 psf	0 psf	(5) CH (-28 to -38)
Slice 28	117.20276 ft	-31.491662 ft	2,089.8797 psf	3,842.4136 psf	0 psf	284.21828 psf	0 psf	(5) CH (-28 to -38)
Slice 29	123.9009 ft	-32.021087 ft	2,122.9158 psf	3,735.933 psf	0 psf	289.40665 psf	0 psf	(5) CH (-28 to -38)
Slice 30	129.9009 ft	-31.290559 ft	2,077.3309 psf	3,592.4178 psf	0 psf	282.24748 psf	0 psf	(5) CH (-28 to -38)
Slice 31	134.27487 ft	-29.125851 ft	1,942.2531 psf	3,259.2762 psf	0 psf	261.03334 psf	0 psf	(5) CH (-28 to -38)
Slice 32	141.30198 ft	-25.648086 ft	1,725.2405 psf	2,891.1126 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	150.68436 ft	-20.648086 ft	1,413.2405 psf	2,355.9276 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	156.40726 ft	-17.375038 ft	1,209.0024 psf	1,991.496 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 35	159.15234 ft	-15.805064 ft	1,111.036 psf	1,817.0918 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	165.45493 ft	-11.430026 ft	838.03362 psf	1,356.5782 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	172.80258 ft	-6.0103797 ft	499.8477 psf	757.14039 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 38	175.51407 ft	-4.0103797 ft	375.0477 psf	545.78035 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Project Grade (PG) Circular Around

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:02:36 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ) around

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-99.99877, 6.421117) ft
Left-Zone Right Coordinate: (40.20991, 9.626822) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (45.21347, 9.399388) ft
Right-Zone Right Coordinate: (190, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-69.999342, 2) ft
Max. Pullout Force: 500,000 lbf
Available Length: 0.00065832985 ft
Required Length: 0.00065832985 ft
Pullout Force: 0.34891482 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Pullout Resistance

Tension Crack Line

	X	Y
Coordinate 1	-108.2 ft	2 ft

Coordinate 2	-47.4 ft	4 ft

Cohesion Functions

CH, -58 to -68
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

Slip Surfaces Analysed: 8029 of 20182 converged

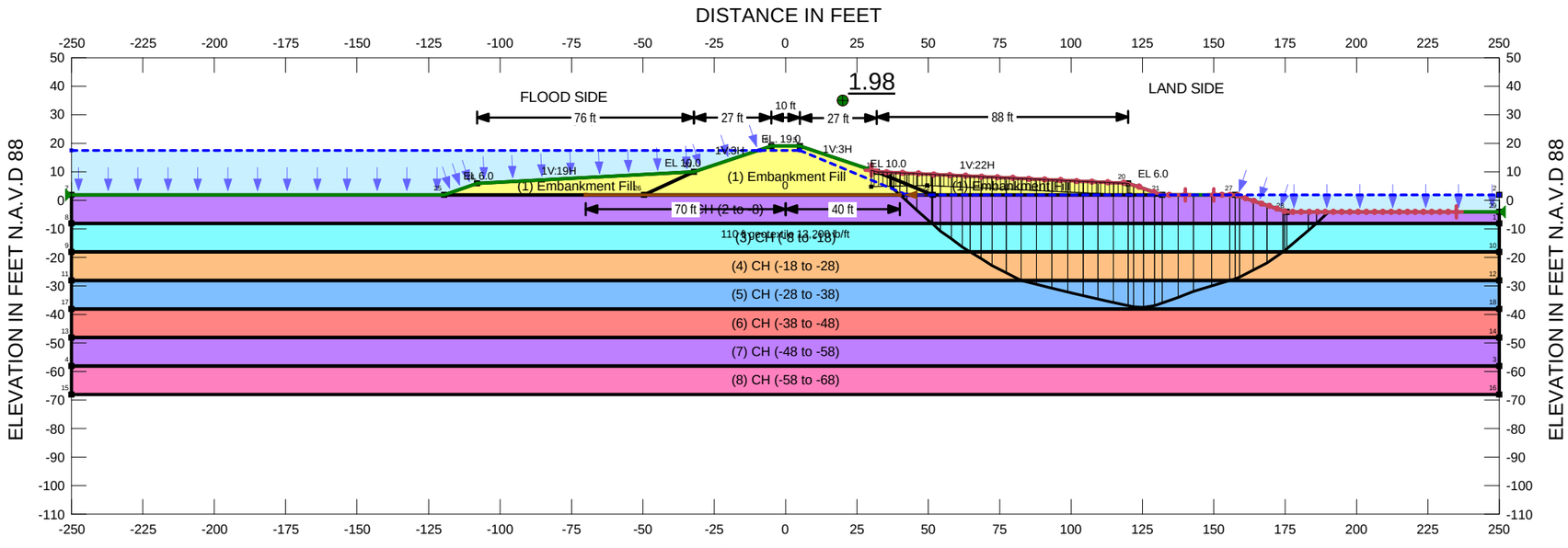
Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.40
Volume: 8,558.3501 ft³
Weight: 885,207.47 lbf

Resisting Moment: 6,733,430.2 lbf·ft
Activating Moment: 4,801,799.8 lbf·ft
Resisting Force: 79,182.565 lbf
Activating Force: 56,440.361 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (178.08731, -4) ft
Entry: (-71.520894, 3.2065495) ft
Radius: 97.399061 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-70.760118 ft	2.6032748 ft	929.55565 psf	847.70763 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-69.487971 ft	1.594497 ft	992.50339 psf	1,127.1118 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-65.232555 ft	0.10541683 ft	1,085.422 psf	1,397.2055 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-57.744465 ft	-2.0617375 ft	1,220.6524 psf	1,610.9112 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	-50.256375 ft	-4.2288918 ft	1,355.8829 psf	1,824.6169 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	-44.506165 ft	-6.1263751 ft	1,474.2858 psf	1,977.151 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 7	-41.193971 ft	-7.4701406 ft	1,558.1368 psf	2,105.5004 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 8	-35.943971 ft	-9.6000787 ft	1,691.0449 psf	2,324.7229 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	-30.805915 ft	-11.684601 ft	1,821.1191 psf	2,557.6216 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	-24.187932 ft	-15.084522 ft	2,033.2742 psf	2,968.0128 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 11	-14.910332 ft	-20.071459 ft	2,344.459 psf	3,635.3769 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	-10.278315 ft	-22.694536 ft	2,508.1391 psf	3,939.4492 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	-9.25 ft	-23.423338 ft	2,553.6163 psf	4,040.5837 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 14	-7 ft	-25.01799 ft	2,653.1226 psf	4,296.0601 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 15	-3.8962419 ft	-27.217729 ft	2,790.3863 psf	4,607.1669 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 16	1.1037581 ft	-30.761399 ft	3,011.5113 psf	5,004.6012 psf	0 psf	277.06171 psf	0 psf	(5) CH (-28 to -38)
Slice 17	7.45425 ft	-35.262209 ft	3,229.0619 psf	5,375.4594 psf	0 psf	321.16965 psf	0 psf	(5) CH (-28 to -38)
Slice 18	11.214626 ft	-37.50081 ft	3,271.7629 psf	5,603.77 psf	0 psf	343.10794 psf	0 psf	(5) CH (-28 to -38)
Slice 19	15.869401 ft	-39.279824 ft	3,262.7174 psf	5,615.1886 psf	0 psf	360.92622 psf	0 psf	(6) CH (-38 to -48)
Slice 20	23.227165 ft	-40.876552 ft	3,172.5818 psf	5,642.6051 psf	0 psf	377.05318 psf	0 psf	(6) CH (-38 to -48)
Slice 21	29.61814 ft	-40.832155 ft	3,004.9754 psf	5,498.339 psf	0 psf	376.60476 psf	0 psf	(6) CH (-38 to -48)
Slice 22	37.25 ft	-39.674488 ft	2,735.896 psf	5,250.5743 psf	0 psf	364.91233 psf	0 psf	(6) CH (-38 to -48)
Slice 23	45.394488 ft	-38.439061 ft	2,523.3974 psf	5,070.7563 psf	0 psf	352.43452 psf	0 psf	(6) CH (-38 to -48)
Slice 24	52.670703 ft	-37.335341 ft	2,454.5253 psf	4,909.4669 psf	0 psf	341.48635 psf	0 psf	(5) CH (-28 to -38)
Slice 25	60.704255 ft	-36.307691 ft	2,390.3999 psf	4,731.3978 psf	0 psf	331.41537 psf	0 psf	(5) CH (-28 to -38)
Slice 26	68.007905 ft	-35.581707 ft	2,345.0985 psf	4,612.2801 psf	0 psf	324.30073 psf	0 psf	(5) CH (-28 to -38)
Slice 27	75.311555 ft	-34.855724 ft	2,299.7972 psf	4,493.1624 psf	0 psf	317.18609 psf	0 psf	(5) CH (-28 to -38)
Slice 28	83.150123 ft	-34.293186 ft	2,264.6948 psf	4,370.1712 psf	0 psf	311.67322 psf	0 psf	(5) CH (-28 to -38)
Slice 29	91.523607 ft	-33.894094 ft	2,239.7915 psf	4,282.1291 psf	0 psf	307.76212 psf	0 psf	(5) CH (-28 to -38)
Slice 30	99.758625 ft	-33.71367 ft	2,228.533 psf	4,200.0793 psf	0 psf	305.99397 psf	0 psf	(5) CH (-28 to -38)
Slice 31	107.85518 ft	-33.751914 ft	2,230.9195 psf	4,161.9774 psf	0 psf	306.36876 psf	0 psf	(5) CH (-28 to -38)
Slice 32	115.95172 ft	-33.790159 ft	2,233.3059 psf	4,123.8754 psf	0 psf	306.74355 psf	0 psf	(5) CH (-28 to -38)
Slice 33	122.75126 ft	-33.822276 ft	2,235.31 psf	4,000.8084 psf	0 psf	307.05831 psf	0 psf	(5) CH (-28 to -38)
Slice 34	127.35282 ft	-33.441595 ft	2,211.5555 psf	3,858.0774 psf	0 psf	303.32763 psf	0 psf	(5) CH (-28 to -38)
Slice 35	130.60156 ft	-32.437934 ft	2,148.9271 psf	3,695.0678 psf	0 psf	293.49175 psf	0 psf	(5) CH (-28 to -38)
Slice 36	136.38793 ft	-29.913975 ft	1,991.432 psf	3,350.4115 psf	0 psf	268.75695 psf	0 psf	(5) CH (-28 to -38)
Slice 37	143.14717 ft	-26.965654 ft	1,807.4568 psf	3,036.224 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 38	151.50924 ft	-22.653473 ft	1,538.3767 psf	2,589.7475 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 39	158.7571 ft	-18.687819 ft	1,290.9199 psf	2,133.7357 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 40	160.406 ft	-17.785622 ft	1,234.6228 psf	2,014.2481 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 41	166.8946 ft	-12.785622 ft	922.62281 psf	1,509.6522 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 42	174.2457 ft	-7.0154446 ft	562.56374 psf	859.15019 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 43	176.79366 ft	-5.0154446 ft	437.76374 psf	658.25881 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Project Grade (PG) Circular Front

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,498
Date: 07/19/2022
Time: 10:11:27 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 10:13:52 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ) front

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (30, 10.666667) ft
Left-Zone Right Coordinate: (140, 2) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (150, 2) ft
Right-Zone Right Coordinate: (235, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	30 ft	4.9 ft

Coordinate 2	49.7 ft	5.2 ft
Coordinate 3	120.7 ft	2 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 10856 of 20182 converged

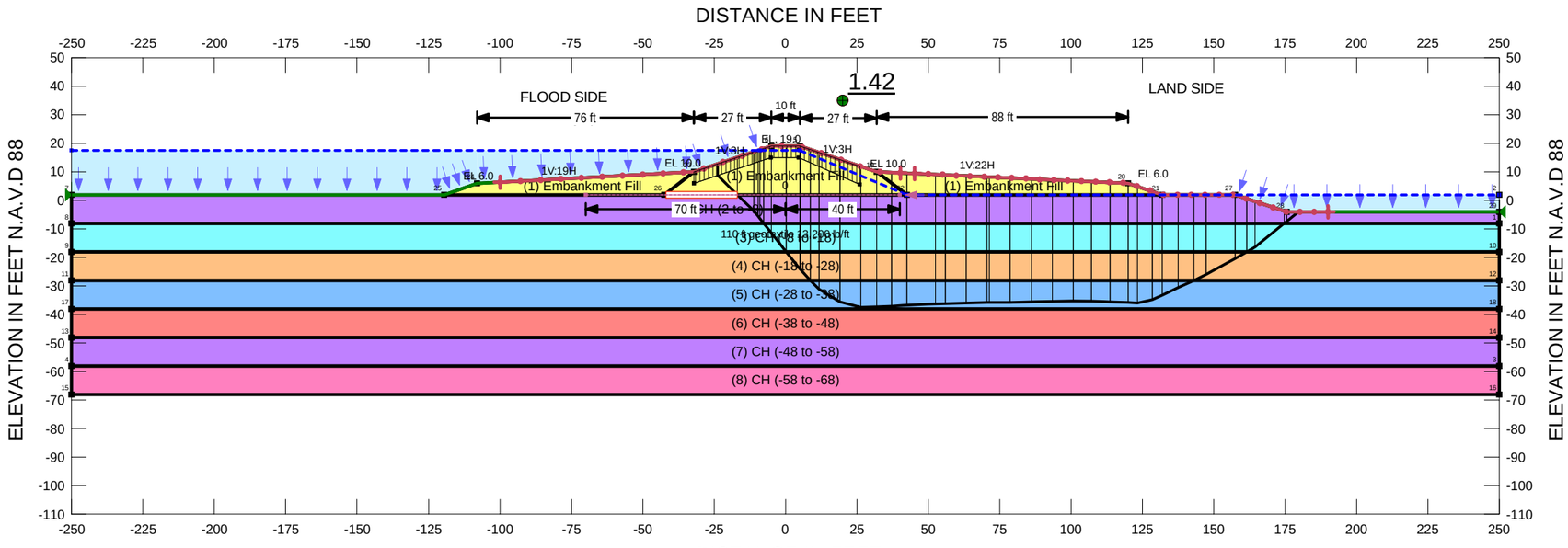
Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.98

Volume: 4,333.616 ft³
Weight: 441,061.19 lbf
Resisting Moment: 3,626,710.3 lbf·ft
Activating Moment: 1,835,723.2 lbf·ft
Resisting Force: 47,471.878 lbf
Activating Force: 24,038.07 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (190.21389, -4) ft
Entry: (36.751254, 5.002811) ft
Radius: 65.67582 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	37.375929 ft	4.4312806 ft	-19.55188 psf	315.38118 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	39.016945 ft	2.9298751 ft	31.810744 psf	493.34165 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	41.266643 ft	0.87157147 ft	102.22468 psf	813.94774 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	44.21654 ft	-1.8273615 ft	238.82736 psf	1,034.5676 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	48.549066 ft	-5.698933 ft	480.41342 psf	1,357.3122 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	51.332526 ft	-8.1473132 ft	633.19234 psf	1,558.5694 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	52.879995 ft	-9.5084942 ft	718.13004 psf	1,682.88 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	56.189525 ft	-12.129873 ft	881.70409 psf	1,952.4332 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	60.048595 ft	-14.944896 ft	1,057.3615 psf	2,207.4374 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	63.296046 ft	-17.176203 ft	1,196.5951 psf	2,432.5002 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 11	66.558837 ft	-19.215692 ft	1,323.8592 psf	2,623.5962 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	70.448586 ft	-21.647077 ft	1,475.5776 psf	2,865.5722 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	74.909237 ft	-24.147078 ft	1,631.5776 psf	3,141.7844 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 14	79.956317 ft	-26.723619 ft	1,792.3538 psf	3,394.4354 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 15	85.216425 ft	-28.695114 ft	1,915.3751 psf	3,659.3392 psf	0 psf	256.81212 psf	0 psf	(5) CH (-28 to -38)
Slice 16	90.674035 ft	-30.053636 ft	2,000.1469 psf	3,777.7954 psf	0 psf	270.12563 psf	0 psf	(5) CH (-28 to -38)
Slice 17	96.131645 ft	-31.412157 ft	2,084.9186 psf	3,896.2516 psf	0 psf	283.43914 psf	0 psf	(5) CH (-28 to -38)
Slice 18	101.58925 ft	-32.770679 ft	2,169.6904 psf	4,014.7079 psf	0 psf	296.75266 psf	0 psf	(5) CH (-28 to -38)
Slice 19	106.93172 ft	-34.020797 ft	2,247.6977 psf	4,131.036 psf	0 psf	309.00381 psf	0 psf	(5) CH (-28 to -38)
Slice 20	112.15903 ft	-35.16251 ft	2,318.9406 psf	4,227.5374 psf	0 psf	320.19259 psf	0 psf	(5) CH (-28 to -38)
Slice 21	117.38634 ft	-36.304223 ft	2,390.1835 psf	4,324.0387 psf	0 psf	331.38138 psf	0 psf	(5) CH (-28 to -38)
Slice 22	120.98618 ft	-37.090473 ft	2,439.2455 psf	4,358.0875 psf	0 psf	339.08663 psf	0 psf	(5) CH (-28 to -38)
Slice 23	123.65391 ft	-37.387736 ft	2,457.7947 psf	4,342.83 psf	0 psf	341.99981 psf	0 psf	(5) CH (-28 to -38)
Slice 24	127.27177 ft	-37.18598 ft	2,445.2052 psf	4,243.9109 psf	0 psf	340.02261 psf	0 psf	(5) CH (-28 to -38)
Slice 25	130.60403 ft	-36.401395 ft	2,396.247 psf	4,093.7412 psf	0 psf	332.33367 psf	0 psf	(5) CH (-28 to -38)
Slice 26	134.73851 ft	-34.917686 ft	2,303.6636 psf	3,871.4152 psf	0 psf	317.79332 psf	0 psf	(5) CH (-28 to -38)
Slice 27	140.21552 ft	-32.952192 ft	2,181.0168 psf	3,648.6603 psf	0 psf	298.53148 psf	0 psf	(5) CH (-28 to -38)
Slice 28	146.12947 ft	-30.977084 ft	2,057.77 psf	3,412.7334 psf	0 psf	279.17542 psf	0 psf	(5) CH (-28 to -38)
Slice 29	152.48038 ft	-28.992361 ft	1,933.9233 psf	3,188.6193 psf	0 psf	259.72514 psf	0 psf	(5) CH (-28 to -38)
Slice 30	156.57792 ft	-27.71184 ft	1,854.0188 psf	3,055.6973 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 31	158.2633 ft	-27.185142 ft	1,821.1529 psf	2,990.2223 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	161.45722 ft	-25.680906 ft	1,727.2885 psf	2,847.793 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	166.31847 ft	-23.149511 ft	1,569.3295 psf	2,519.9568 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	171.48436 ft	-19.941907 ft	1,369.175 psf	2,158.3018 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	174.49454 ft	-17.804831 ft	1,235.8215 psf	1,886.7362 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	175.13473 ft	-17.301206 ft	1,204.3953 psf	1,858.909 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	179.31751 ft	-13.769068 ft	983.98984 psf	1,487.5114 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	184.51144 ft	-9.2726925 ft	703.41601 psf	1,040.049 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	188.05088 ft	-6 ft	499.2 psf	722.80444 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Project Grade (PG) Circular Through

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:04:00 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ) through

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-99.99877, 6.421117) ft
Left-Zone Right Coordinate: (40.20991, 9.626822) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (45.21347, 9.399388) ft
Right-Zone Right Coordinate: (190, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-16.898086, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 53.101914 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Tension Crack Line

	X	Y

Coordinate 1	-32 ft	6 ft
Coordinate 2	-5.2 ft	15.1 ft
Coordinate 3	4.6 ft	15.1 ft
Coordinate 4	26 ft	5.5 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

Slip Surfaces Analysed: 9807 of 20182 converged

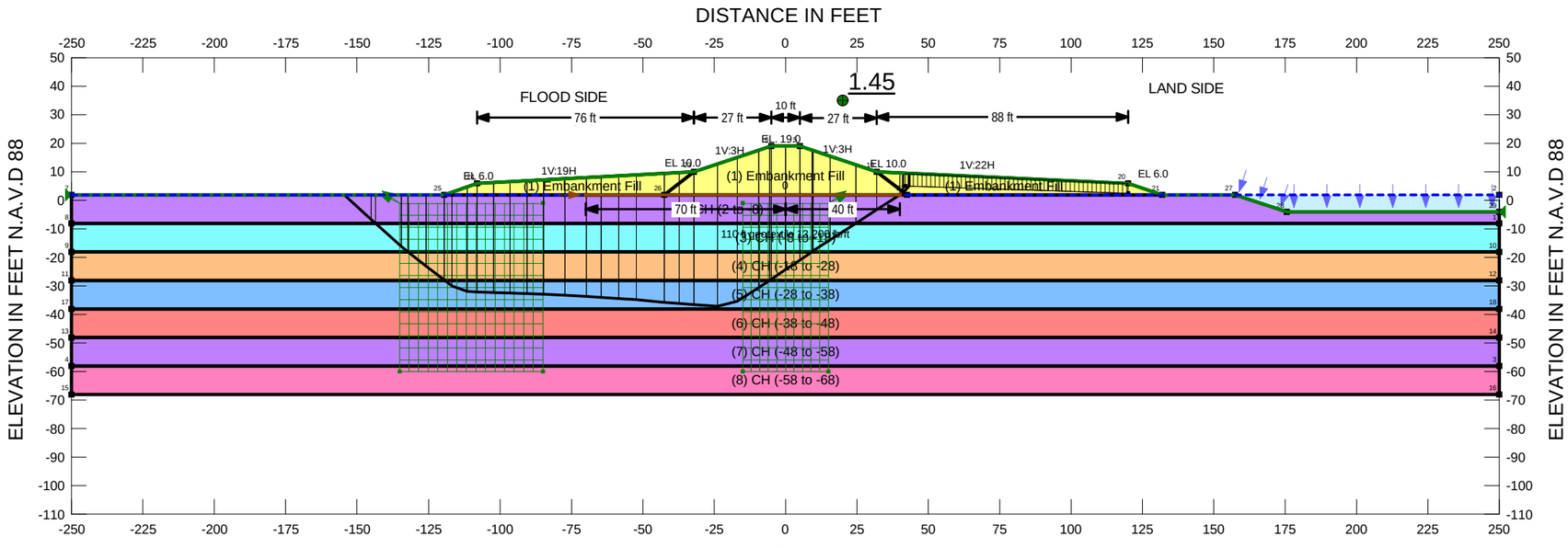
Current Slip Surface

Slip Surface: 20,182

Factor of Safety: 1.42
Volume: 7,299.993 ft³
Weight: 755,720.95 lbf
Resisting Moment: 5,822,271.2 lbf·ft
Activating Moment: 4,097,723.5 lbf·ft
Resisting Force: 66,249.549 lbf
Activating Force: 46,600.13 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (179.55249, -4) ft
Entry: (-23.87043, 8.7604136) ft
Radius: 84.118541 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-20.384258 ft	5.3802068 ft	756.2751 psf	782.20335 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-13.970763 ft	-0.838344 ft	1,144.3127 psf	1,716.1978 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-10.27172 ft	-4.6566844 ft	1,382.5771 psf	2,042.0638 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-9.25 ft	-5.9541523 ft	1,463.5391 psf	2,192.6612 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	-8.3194758 ft	-7.1358119 ft	1,537.2747 psf	2,315.5887 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	-6.3194758 ft	-9.6755839 ft	1,695.7564 psf	2,622.7124 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	-2.3821145 ft	-14.675584 ft	2,007.7564 psf	3,152.605 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	2.6178855 ft	-21.025014 ft	2,403.9609 psf	3,784.6065 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	5.09103 ft	-24.165625 ft	2,597.5872 psf	4,174.7761 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 10	6.9918643 ft	-26.140611 ft	2,671.8 psf	4,334.8429 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	10.301884 ft	-29.541318 ft	2,798.632 psf	4,608.6592 psf	0 psf	265.10492 psf	0 psf	(5) CH (-28 to -38)
Slice 12	15.474 ft	-33.335528 ft	2,901.9915 psf	4,934.2382 psf	0 psf	302.28817 psf	0 psf	(5) CH (-28 to -38)
Slice 13	22.80582 ft	-36.569813 ft	2,914.7086 psf	5,122.4861 psf	0 psf	333.98417 psf	0 psf	(5) CH (-28 to -38)
Slice 14	29.23287 ft	-37.412476 ft	2,801.5243 psf	5,089.2871 psf	0 psf	342.24227 psf	0 psf	(5) CH (-28 to -38)
Slice 15	34.625 ft	-37.142142 ft	2,645.5817 psf	4,939.5187 psf	0 psf	339.59299 psf	0 psf	(5) CH (-28 to -38)
Slice 16	39.875 ft	-36.878933 ft	2,493.7494 psf	4,882.9036 psf	0 psf	337.01355 psf	0 psf	(5) CH (-28 to -38)
Slice 17	47.527075 ft	-36.495297 ft	2,402.1065 psf	4,799.3185 psf	0 psf	333.25391 psf	0 psf	(5) CH (-28 to -38)
Slice 18	54.242225 ft	-36.190863 ft	2,383.1099 psf	4,725.8526 psf	0 psf	330.27046 psf	0 psf	(5) CH (-28 to -38)
Slice 19	59.619098 ft	-36.052404 ft	2,374.47 psf	4,677.764 psf	0 psf	328.91356 psf	0 psf	(5) CH (-28 to -38)
Slice 20	66.996692 ft	-35.880289 ft	2,363.73 psf	4,620.1692 psf	0 psf	327.22683 psf	0 psf	(5) CH (-28 to -38)
Slice 21	71.061405 ft	-35.799914 ft	2,358.7146 psf	4,590.3337 psf	0 psf	326.43915 psf	0 psf	(5) CH (-28 to -38)
Slice 22	75.113141 ft	-35.732523 ft	2,354.5094 psf	4,560.1806 psf	0 psf	325.77872 psf	0 psf	(5) CH (-28 to -38)
Slice 23	82.464784 ft	-35.586376 ft	2,345.3899 psf	4,505.5978 psf	0 psf	324.34649 psf	0 psf	(5) CH (-28 to -38)
Slice 24	89.816426 ft	-35.44023 ft	2,336.2703 psf	4,451.015 psf	0 psf	322.91425 psf	0 psf	(5) CH (-28 to -38)
Slice 25	97.168069 ft	-35.294083 ft	2,327.1508 psf	4,396.4321 psf	0 psf	321.48202 psf	0 psf	(5) CH (-28 to -38)
Slice 26	104.03657 ft	-35.320042 ft	2,328.7706 psf	4,346.0119 psf	0 psf	321.73641 psf	0 psf	(5) CH (-28 to -38)
Slice 27	110.42194 ft	-35.518107 ft	2,341.1299 psf	4,334.4262 psf	0 psf	323.67745 psf	0 psf	(5) CH (-28 to -38)
Slice 28	116.80732 ft	-35.716172 ft	2,353.4891 psf	4,322.8404 psf	0 psf	325.61848 psf	0 psf	(5) CH (-28 to -38)
Slice 29	121.6386 ft	-35.866031 ft	2,362.8403 psf	4,261.6091 psf	0 psf	327.0871 psf	0 psf	(5) CH (-28 to -38)
Slice 30	125.89701 ft	-35.381806 ft	2,332.6247 psf	4,123.8788 psf	0 psf	322.3417 psf	0 psf	(5) CH (-28 to -38)
Slice 31	130.25841 ft	-34.034113 ft	2,248.5286 psf	3,891.1945 psf	0 psf	309.1343 psf	0 psf	(5) CH (-28 to -38)
Slice 32	134.79756 ft	-31.916103 ft	2,116.3649 psf	3,576.8501 psf	0 psf	288.37781 psf	0 psf	(5) CH (-28 to -38)
Slice 33	140.39269 ft	-29.305368 ft	1,953.455 psf	3,276.9323 psf	0 psf	262.7926 psf	0 psf	(5) CH (-28 to -38)
Slice 34	145.29587 ft	-27.017499 ft	1,810.692 psf	3,039.674 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	152.45075 ft	-23.177083 ft	1,571.05 psf	2,641.2068 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 36	159.54871 ft	-19.159584 ft	1,320.358 psf	2,173.5513 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 37	163.05668 ft	-17.174046 ft	1,196.4605 psf	1,922.4655 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	169.59877 ft	-12.174046 ft	884.4605 psf	1,419.4783 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	175.0908 ft	-7.6639633 ft	603.03131 psf	910.8742 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 40	177.52625 ft	-5.6639633 ft	478.23131 psf	719.43916 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Block Around Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,465
Date: 04/07/2022
Time: 09:10:12 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/07/2022
Last Solved Time: 09:11:50 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) around

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 1 °
  - Resisting Side Maximum Convex Angle: 1 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (-85, -1) ft
- Lower Left: (-85, -60) ft
- Lower Right: (-135, -60) ft
- X Increments: 15
- Y Increments: 14
- Starting Angle: 145 °
- Ending Angle: 155 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 35 °
- Upper Left: (-15, -1) ft
- Lower Left: (-15, -60) ft
- Lower Right: (15, -60) ft
- X Increments: 10
- Y Increments: 14
- Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	41.9 ft	5 ft
Coordinate 2	120 ft	2.5 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

Slip Surfaces Analysed: 20848 of 23761 converged

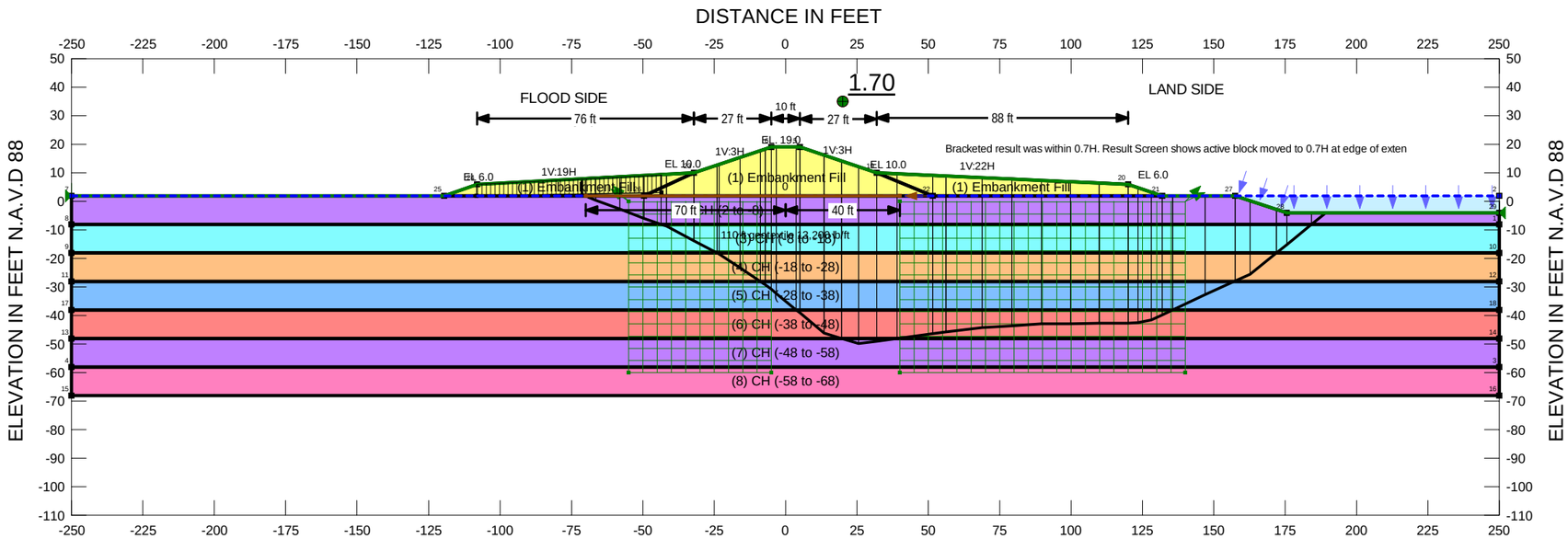
Current Slip Surface

Slip Surface: 23,761

Factor of Safety: 1.45
Volume: 6,698.8544 ft³
Weight: 692,129.87 lbf
Resisting Moment: 5,279,273.2 lbf·ft
Activating Moment: 3,645,086.6 lbf·ft
Resisting Force: 61,406.368 lbf
Activating Force: 42,398.486 lbf
Slip Rank: 1 of 23,761 slip surfaces
Exit: (-154.55719, 2) ft
Entry: (43.365102, 4.9531017) ft
Radius: 79.436881 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-149.81677 ft	-2.3399585 ft	270.81341 psf	597.25258 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 2	-144.3387 ft	-7.3399585 ft	582.81341 psf	1,051.3578 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-139.0401 ft	-12.081108 ft	878.66114 psf	1,527.9887 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-133.31048 ft	-17.081108 ft	1,190.6611 psf	2,009.9535 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-128.98136 ft	-20.484991 ft	1,403.0634 psf	2,388.8425 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 6	-122.66045 ft	-25.454973 ft	1,713.1903 psf	2,944.886 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 7	-118.20798 ft	-28.955853 ft	1,931.6452 psf	3,358.5715 psf	0 psf	259.36736 psf	0 psf	(5) CH (-28 to -38)
Slice 8	-114.21032 ft	-30.950932 ft	2,056.1382 psf	3,638.4572 psf	0 psf	278.91913 psf	0 psf	(5) CH (-28 to -38)
Slice 9	-109.75235 ft	-31.99112 ft	2,121.0459 psf	3,843.0089 psf	0 psf	289.11298 psf	0 psf	(5) CH (-28 to -38)
Slice 10	-105.09003 ft	-32.153413 ft	2,131.173 psf	3,948.7083 psf	0 psf	290.70345 psf	0 psf	(5) CH (-28 to -38)
Slice 11	-99.270094 ft	-32.356003 ft	2,143.8146 psf	4,006.339 psf	0 psf	292.68883 psf	0 psf	(5) CH (-28 to -38)
Slice 12	-93.450156 ft	-32.558592 ft	2,156.4561 psf	4,063.9697 psf	0 psf	294.6742 psf	0 psf	(5) CH (-28 to -38)
Slice 13	-87.630219 ft	-32.761181 ft	2,169.0977 psf	4,121.6004 psf	0 psf	296.65958 psf	0 psf	(5) CH (-28 to -38)
Slice 14	-80.950828 ft	-33.059388 ft	2,187.7058 psf	4,200.1901 psf	0 psf	299.582 psf	0 psf	(5) CH (-28 to -38)
Slice 15	-73.411982 ft	-33.453211 ft	2,212.2804 psf	4,289.4367 psf	0 psf	303.44147 psf	0 psf	(5) CH (-28 to -38)
Slice 16	-67.085335 ft	-33.813266 ft	2,234.7478 psf	4,371.1477 psf	0 psf	306.97001 psf	0 psf	(5) CH (-28 to -38)
Slice 17	-61.461058 ft	-34.199244 ft	2,258.8328 psf	4,450.7302 psf	0 psf	310.75259 psf	0 psf	(5) CH (-28 to -38)
Slice 18	-55.326952 ft	-34.644911 ft	2,286.6425 psf	4,537.2997 psf	0 psf	315.12013 psf	0 psf	(5) CH (-28 to -38)
Slice 19	-47.37995 ft	-35.260904 ft	2,325.0804 psf	4,656.2871 psf	0 psf	321.15686 psf	0 psf	(5) CH (-28 to -38)
Slice 20	-39.875 ft	-35.86555 ft	2,362.8103 psf	4,768.8347 psf	0 psf	327.08239 psf	0 psf	(5) CH (-28 to -38)
Slice 21	-34.625 ft	-36.288522 ft	2,389.2038 psf	4,847.566 psf	0 psf	331.22752 psf	0 psf	(5) CH (-28 to -38)
Slice 22	-27.90294 ft	-36.830093 ft	2,422.9978 psf	5,080.8572 psf	0 psf	336.53491 psf	0 psf	(5) CH (-28 to -38)
Slice 23	-20.288805 ft	-36.232455 ft	2,385.7052 psf	5,189.5814 psf	0 psf	330.67806 psf	0 psf	(5) CH (-28 to -38)
Slice 24	-13.04519 ft	-32.911427 ft	2,178.473 psf	4,989.9255 psf	0 psf	298.13198 psf	0 psf	(5) CH (-28 to -38)
Slice 25	-7.4461555 ft	-29.259061 ft	1,950.5654 psf	4,812.0652 psf	0 psf	262.3388 psf	0 psf	(5) CH (-28 to -38)
Slice 26	-5.2868305 ft	-27.807136 ft	1,859.9653 psf	4,713.6583 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 27	-2.5 ft	-25.933277 ft	1,743.0365 psf	4,521.2939 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 28	2.5 ft	-22.571289 ft	1,533.2484 psf	4,156.7152 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 29	7.1492449 ft	-19.445147 ft	1,338.1772 psf	3,736.4918 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 30	9.5002699 ft	-17.864324 ft	1,239.5338 psf	3,483.3459 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 31	12.694165 ft	-15.760647 ft	1,108.2644 psf	3,159.2461 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 32	20.159512 ft	-10.896323 ft	804.73059 psf	2,399.9751 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 33	28.316372 ft	-5.6149282 ft	475.17152 psf	1,594.1594 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 34	36.03863 ft	-0.61492817 ft	163.17152 psf	990.20162 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 35	40.52959 ft	2.292874 ft	-18.275338 psf	573.14806 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 36	41.144541 ft	2.7472887 ft	-46.630813 psf	373.77941 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 37	42.336132 ft	3.9309655 ft	-120.49225 psf	227.87474 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Block Around Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,498
Date: 07/19/2022
Time: 10:11:27 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 10:13:12 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) around

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (-55, 0) ft
- Lower Left: (-55, -60) ft
- Lower Right: (-5, -60) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (40, 0) ft
- Lower Left: (40, -60) ft
- Lower Right: (140, -60) ft
- X Increments: 20
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	-108.2 ft	2 ft
Coordinate 2	-43.4 ft	3 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

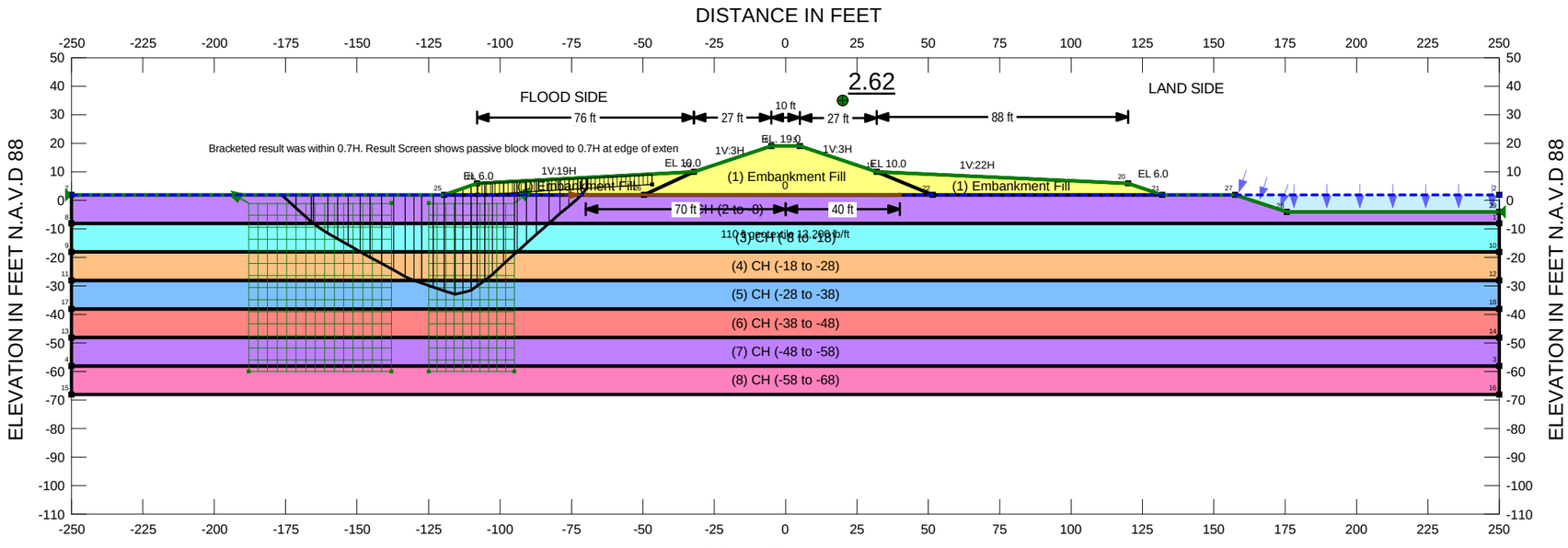
Slip Surfaces Analysed: 30330 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.70
Volume: 10,264.611 ft³
Weight: 1,069,172.4 lbf
Resisting Moment: 8,869,873.5 lbf·ft
Activating Moment: 5,214,254.1 lbf·ft
Resisting Force: 93,810.003 lbf
Activating Force: 55,139.045 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (189.22479, -4) ft
Entry: (-71.24223, 2.570336) ft
Radius: 103.45086 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-70.640104 ft	2.285168 ft	-17.794482 psf	472.91627 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-68.277009 ft	1.1660015 ft	52.041506 psf	688.80213 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-62.26203 ft	-1.215535 ft	200.64938 psf	958.37508 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-53.75401 ft	-4.3106109 ft	393.78212 psf	1,285.7823 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	-46.556145 ft	-6.9290745 ft	557.17425 psf	1,562.7719 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	-42.630715 ft	-8.3570805 ft	646.28182 psf	1,717.3733 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	-36.82457 ft	-11.238141 ft	826.05999 psf	2,003.1758 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	-27.949662 ft	-15.88106 ft	1,115.7782 psf	2,644.4801 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	-23.539012 ft	-18.188498 ft	1,259.7622 psf	3,037.7932 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 10	-19.579536 ft	-20.782746 ft	1,421.6434 psf	3,432.6063 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	-12.381208 ft	-25.594249 ft	1,721.8811 psf	4,226.028 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	-7.9121018 ft	-28.581486 ft	1,908.2847 psf	4,740.0303 psf	0 psf	255.69856 psf	0 psf	(5) CH (-28 to -38)
Slice 13	-6.02108 ft	-29.994693 ft	1,996.4688 psf	4,920.9606 psf	0 psf	269.54799 psf	0 psf	(5) CH (-28 to -38)
Slice 14	-4.070185 ft	-31.583794 ft	2,095.6288 psf	5,123.9916 psf	0 psf	285.12118 psf	0 psf	(5) CH (-28 to -38)
Slice 15	0.28679739 ft	-35.170588 ft	2,319.4447 psf	5,492.1225 psf	0 psf	320.27176 psf	0 psf	(5) CH (-28 to -38)
Slice 16	4.3569824 ft	-38.530865 ft	2,529.126 psf	5,839.2625 psf	0 psf	353.36173 psf	0 psf	(6) CH (-38 to -48)
Slice 17	9.305325 ft	-42.616134 ft	2,784.0468 psf	6,095.3782 psf	0 psf	394.62296 psf	0 psf	(6) CH (-38 to -48)
Slice 18	16.62825 ft	-47.08527 ft	3,062.9208 psf	6,483.4188 psf	0 psf	439.76122 psf	0 psf	(6) CH (-38 to -48)
Slice 19	22.607685 ft	-48.897827 ft	3,176.0244 psf	6,454.1506 psf	0 psf	459.23522 psf	0 psf	(7) CH (-48 to -58)
Slice 20	28.78476 ft	-49.367699 ft	3,205.3444 psf	6,451.9485 psf	0 psf	464.59177 psf	0 psf	(7) CH (-48 to -58)
Slice 21	35.530175 ft	-48.469872 ft	3,149.32 psf	6,205.3326 psf	0 psf	454.35655 psf	0 psf	(7) CH (-48 to -58)
Slice 22	45.280175 ft	-47.17213 ft	3,068.3409 psf	6,008.2608 psf	0 psf	440.63852 psf	0 psf	(6) CH (-38 to -48)
Slice 23	53.828245 ft	-46.034367 ft	2,997.3445 psf	5,838.011 psf	0 psf	429.14711 psf	0 psf	(6) CH (-38 to -48)
Slice 24	62.55657 ft	-44.999088 ft	2,932.7431 psf	5,670.7493 psf	0 psf	418.69079 psf	0 psf	(6) CH (-38 to -48)
Slice 25	74.141955 ft	-43.941378 ft	2,866.742 psf	5,475.7785 psf	0 psf	408.00792 psf	0 psf	(6) CH (-38 to -48)
Slice 26	84.512565 ft	-43.276731 ft	2,825.268 psf	5,348.601 psf	0 psf	401.29499 psf	0 psf	(6) CH (-38 to -48)
Slice 27	94.748225 ft	-42.885352 ft	2,800.846 psf	5,233.7667 psf	0 psf	397.34206 psf	0 psf	(6) CH (-38 to -48)
Slice 28	104.84893 ft	-42.76724 ft	2,793.4758 psf	5,168.0525 psf	0 psf	396.14913 psf	0 psf	(6) CH (-38 to -48)
Slice 29	114.94965 ft	-42.649128 ft	2,786.1056 psf	5,102.3383 psf	0 psf	394.9562 psf	0 psf	(6) CH (-38 to -48)
Slice 30	121.78124 ft	-42.569244 ft	2,781.1208 psf	4,998.9075 psf	0 psf	394.14936 psf	0 psf	(6) CH (-38 to -48)
Slice 31	125.82846 ft	-42.04987 ft	2,748.7119 psf	4,857.0185 psf	0 psf	388.90369 psf	0 psf	(6) CH (-38 to -48)
Slice 32	130.04722 ft	-40.625478 ft	2,659.8298 psf	4,618.7407 psf	0 psf	374.51733 psf	0 psf	(6) CH (-38 to -48)
Slice 33	133.79241 ft	-38.849816 ft	2,549.0285 psf	4,342.2021 psf	0 psf	356.58314 psf	0 psf	(6) CH (-38 to -48)
Slice 34	141.26666 ft	-35.306138 ft	2,327.903 psf	3,938.8115 psf	0 psf	321.60015 psf	0 psf	(5) CH (-28 to -38)
Slice 35	152.22424 ft	-30.221632 ft	2,010.6298 psf	3,353.9367 psf	0 psf	271.77199 psf	0 psf	(5) CH (-28 to -38)
Slice 36	160.10908 ft	-26.648713 ft	1,787.6797 psf	2,944.6938 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 37	167.32793 ft	-21.733219 ft	1,480.9529 psf	2,418.0645 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 38	173.71884 ft	-16.557524 ft	1,157.9895 psf	1,787.6639 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	179.89281 ft	-11.557524 ft	845.98951 psf	1,259.2749 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 40	186.7552 ft	-6 ft	499.2 psf	713.70882 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Block Front Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,498
Date: 07/19/2022
Time: 10:11:27 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 10:14:16 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) front

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 1 °
  - Resisting Side Maximum Convex Angle: 1 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (-138, -1) ft
- Lower Left: (-138, -60) ft
- Lower Right: (-188, -60) ft
- X Increments: 15
- Y Increments: 14
- Starting Angle: 145 °
- Ending Angle: 155 °
- Angle Increments: 2

Right Grid
- Starting Angle: 35 °
- Ending Angle: 45 °
- Upper Left: (-125, -1) ft
- Lower Left: (-125, -60) ft
- Lower Right: (-95, -60) ft
- X Increments: 10
- Y Increments: 14
- Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	-107.7 ft	2 ft
Coordinate 2	-46.6 ft	5.6 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 8016 of 23761 converged

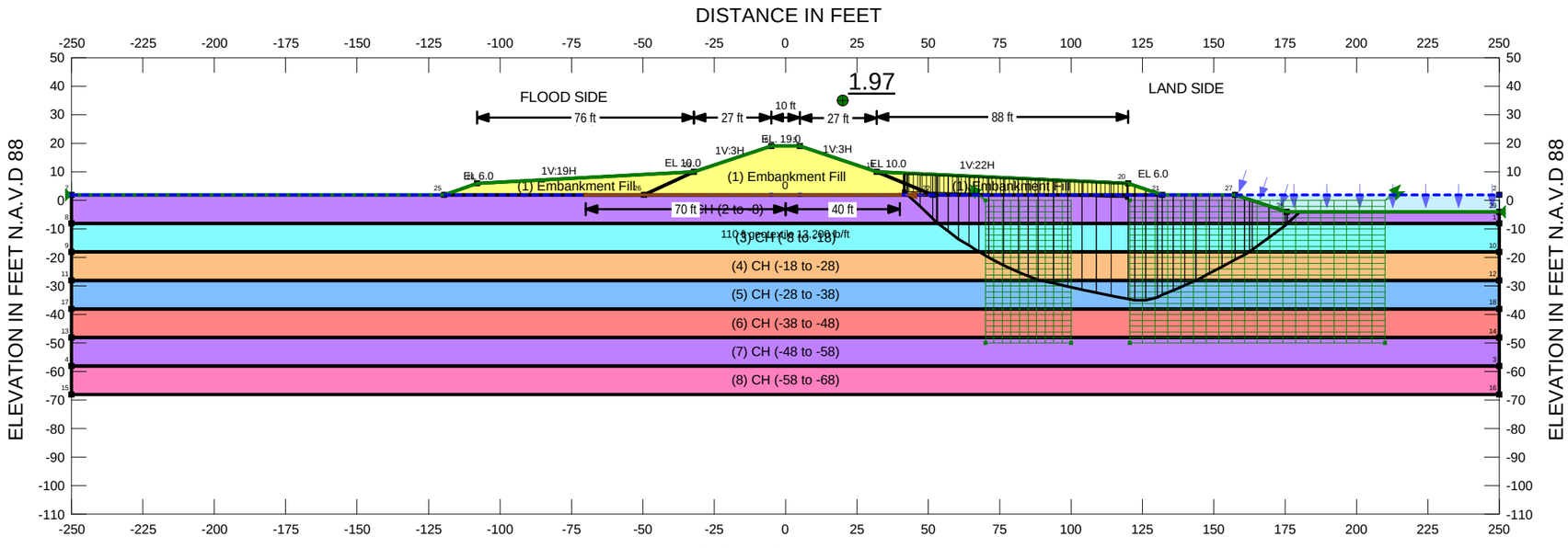
Current Slip Surface

Slip Surface: 23,761

Factor of Safety: 2.62
Volume: 2,315.8017 ft³
Weight: 230,127.2 lbf
Resisting Moment: 2,206,743.4 lbf·ft
Activating Moment: 841,771.78 lbf·ft
Resisting Force: 32,555.05 lbf
Activating Force: 12,463.888 lbf
Slip Rank: 1 of 23,761 slip surfaces
Exit: (-176.4728, 2) ft
Entry: (-69.447661, 4.2538203) ft
Radius: 47.487376 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-173.90839 ft	-0.299721 ft	143.50259 psf	317.23181 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 2	-168.71312 ft	-5.011023 ft	437.48784 psf	751.604 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-165.66867 ft	-7.711302 ft	605.98524 psf	969.4479 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-162.75749 ft	-9.74332 ft	732.78317 psf	1,172.5983 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-158.50725 ft	-12.498141 ft	904.68403 psf	1,434.4833 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-155.00192 ft	-14.521145 ft	1,030.9194 psf	1,639.1456 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	-151.08382 ft	-16.766323 ft	1,171.0186 psf	1,865.1503 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	-147.23768 ft	-18.95752 ft	1,307.7492 psf	2,099.4292 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	-143.49076 ft	-21.04812 ft	1,438.2027 psf	2,328.474 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 10	-139.35833 ft	-23.314281 ft	1,579.6111 psf	2,580.5156 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	-135.2259 ft	-25.580442 ft	1,721.0196 psf	2,832.5572 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	-131.58984 ft	-27.356761 ft	1,831.8619 psf	3,005.018 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	-128.67795 ft	-28.549899 ft	1,906.3137 psf	3,127.8547 psf	0 psf	255.38902 psf	0 psf	(5) CH (-28 to -38)
Slice 14	-125.37692 ft	-29.745724 ft	1,980.9332 psf	3,248.9795 psf	0 psf	267.10809 psf	0 psf	(5) CH (-28 to -38)
Slice 15	-121.45897 ft	-31.037573 ft	2,061.5446 psf	3,393.7212 psf	0 psf	279.76822 psf	0 psf	(5) CH (-28 to -38)
Slice 16	-117.63566 ft	-32.298219 ft	2,140.2089 psf	3,610.0353 psf	0 psf	292.12255 psf	0 psf	(5) CH (-28 to -38)
Slice 17	-114.34536 ft	-32.585574 ft	2,158.1398 psf	3,670.2793 psf	0 psf	294.93863 psf	0 psf	(5) CH (-28 to -38)
Slice 18	-111.49345 ft	-31.930844 ft	2,117.2846 psf	3,712.6515 psf	0 psf	288.52227 psf	0 psf	(5) CH (-28 to -38)
Slice 19	-109.03374 ft	-30.818456 ft	2,047.8716 psf	3,596.0781 psf	0 psf	277.62087 psf	0 psf	(5) CH (-28 to -38)
Slice 20	-106.66115 ft	-29.016717 ft	1,935.4431 psf	3,454.4514 psf	0 psf	259.96382 psf	0 psf	(5) CH (-28 to -38)
Slice 21	-103.95262 ft	-26.959869 ft	1,807.0958 psf	3,233.0543 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 22	-100.65853 ft	-24.129512 ft	1,630.4815 psf	2,916.1748 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 23	-96.809703 ft	-20.549059 ft	1,407.0613 psf	2,552.388 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 24	-94.46404 ft	-18.379417 ft	1,271.6756 psf	2,336.8352 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 25	-92.355318 ft	-16.480106 ft	1,153.1586 psf	2,163.3482 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 26	-88.980373 ft	-13.440317 ft	963.4758 psf	1,884.8134 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 27	-85.044566 ft	-9.9602115 ft	746.3172 psf	1,570.4804 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 28	-80.867791 ft	-6.318688 ft	519.08613 psf	1,253.9404 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 29	-77.400788 ft	-3.3347592 ft	332.88898 psf	1,013.9403 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 30	-74.323662 ft	-0.72952575 ft	170.32241 psf	801.68749 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 31	-72.138187 ft	1.2865455 ft	44.519561 psf	604.49994 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 32	-70.469468 ft	3.1269101 ft	-70.319193 psf	299.72709 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Block Front Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) front (3)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,498
Date: 07/19/2022
Time: 10:11:27 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 10:18:06 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) front (3)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (70.03837, 0) ft
Lower Left: (70.03837, -50) ft
Lower Right: (100.0138, -50) ft
X Increments: 10
Y Increments: 25
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (120.58071, 0) ft
Lower Left: (120.58071, -50) ft
Lower Right: (210.0026, -50) ft
X Increments: 20
Y Increments: 25
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	-5 ft	2 ft
Coordinate 3	5 ft	2 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft

Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	41.6 ft	3 ft
Coordinate 2	119.6 ft	1 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

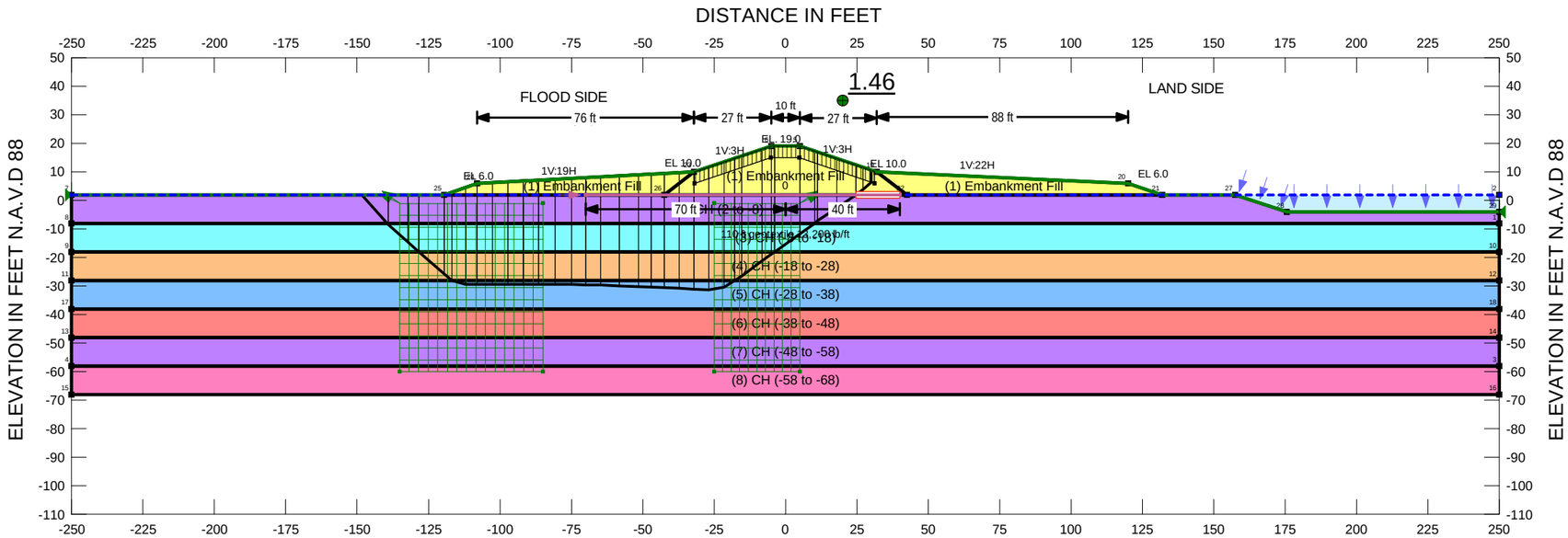
Slip Surfaces Analysed: 62337 of 90091 converged

Current Slip Surface

Slip Surface: 90,091
Factor of Safety: 1.97
Volume: 3,772.2044 ft³
Weight: 381,771.01 lbf
Resisting Moment: 3,098,365.1 lbf·ft
Activating Moment: 1,568,729 lbf·ft
Resisting Force: 41,719.23 lbf
Activating Force: 21,155.86 lbf
Slip Rank: 1 of 90,091 slip surfaces
Exit: (180.18553, -4) ft
Entry: (41.603004, 2.999923) ft
Radius: 58.882217 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	42.051502 ft	2.5749944 ft	-35.87965 psf	453.51321 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	42.579195 ft	2.0750329 ft	-4.6820526 psf	559.84258 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	44.868792 ft	-0.094240995 ft	130.68064 psf	872.37945 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	49.289597 ft	-4.282723 ft	392.04191 psf	1,214.2772 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	52.23954 ft	-7.0776395 ft	566.4447 psf	1,442.4209 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	53.125229 ft	-7.8891575 ft	617.08343 psf	1,546.6803 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 7	55.130333 ft	-9.4098718 ft	711.976 psf	1,683.3364 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	58.848244 ft	-12.229615 ft	887.92799 psf	1,938.7267 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	62.480765 ft	-14.729615 ft	1,043.928 psf	2,196.0256 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	66.027895 ft	-16.909872 ft	1,179.976 psf	2,391.0839 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 11	69.478445 ft	-19.030765 ft	1,312.3197 psf	2,587.1908 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	73.746822 ft	-21.33562 ft	1,456.1427 psf	2,844.9721 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	78.929608 ft	-23.8838 ft	1,615.1491 psf	3,093.6667 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 14	83.272098 ft	-25.856232 ft	1,738.2289 psf	3,310.071 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 15	86.774293 ft	-27.252916 ft	1,825.382 psf	3,443.4361 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 16	91.164585 ft	-28.516129 ft	1,904.2064 psf	3,616.0488 psf	0 psf	255.05806 psf	0 psf	(5) CH (-28 to -38)
Slice 17	96.329109 ft	-29.6215 ft	1,973.1816 psf	3,708.9373 psf	0 psf	265.8907 psf	0 psf	(5) CH (-28 to -38)
Slice 18	101.37977 ft	-30.7025 ft	2,040.636 psf	3,799.7778 psf	0 psf	276.4845 psf	0 psf	(5) CH (-28 to -38)
Slice 19	106.43042 ft	-31.7835 ft	2,108.0904 psf	3,890.6183 psf	0 psf	287.0783 psf	0 psf	(5) CH (-28 to -38)
Slice 20	111.48108 ft	-32.8645 ft	2,175.5448 psf	3,981.4588 psf	0 psf	297.6721 psf	0 psf	(5) CH (-28 to -38)
Slice 21	117.0032 ft	-33.972191 ft	2,244.6647 psf	4,080.284 psf	0 psf	308.52748 psf	0 psf	(5) CH (-28 to -38)
Slice 22	121.14857 ft	-34.756769 ft	2,293.6224 psf	4,106.1197 psf	0 psf	316.21633 psf	0 psf	(5) CH (-28 to -38)
Slice 23	124.27468 ft	-34.933138 ft	2,304.6278 psf	4,071.174 psf	0 psf	317.94475 psf	0 psf	(5) CH (-28 to -38)
Slice 24	128.1981 ft	-34.408783 ft	2,271.908 psf	3,931.9498 psf	0 psf	312.80607 psf	0 psf	(5) CH (-28 to -38)
Slice 25	131.072 ft	-33.527909 ft	2,216.9415 psf	3,775.0175 psf	0 psf	304.17351 psf	0 psf	(5) CH (-28 to -38)
Slice 26	133.9413 ft	-32.298759 ft	2,140.2426 psf	3,598.6098 psf	0 psf	292.12784 psf	0 psf	(5) CH (-28 to -38)
Slice 27	137.82389 ft	-30.63553 ft	2,036.4571 psf	3,408.8122 psf	0 psf	275.82819 psf	0 psf	(5) CH (-28 to -38)
Slice 28	141.70649 ft	-28.972301 ft	1,932.6716 psf	3,219.0146 psf	0 psf	259.52855 psf	0 psf	(5) CH (-28 to -38)
Slice 29	143.7798 ft	-28.070343 ft	1,876.3894 psf	3,141.8861 psf	0 psf	250.68936 psf	0 psf	(5) CH (-28 to -38)
Slice 30	146.1765 ft	-26.7932 ft	1,796.6957 psf	3,016.9255 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 31	150.7059 ft	-24.379601 ft	1,646.0871 psf	2,746.1027 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	155.2353 ft	-21.966001 ft	1,495.4785 psf	2,475.2798 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	159.14935 ft	-19.880305 ft	1,365.331 psf	2,226.2022 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	161.639 ft	-18.500705 ft	1,279.244 psf	2,063.7706 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	163.02532 ft	-17.674647 ft	1,227.698 psf	1,957.2489 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	166.41237 ft	-15.223284 ft	1,074.7329 psf	1,709.1539 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	172.09444 ft	-10.971261 ft	809.40666 psf	1,219.6086 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	175.21774 ft	-8.5847484 ft	660.4883 psf	979.22862 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	175.67567 ft	-8.1621239 ft	634.11653 psf	928.09302 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 40	178.01843 ft	-6 ft	499.2 psf	724.96081 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Block Through Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,467
Date: 04/07/2022
Time: 09:24:59 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/07/2022
Last Solved Time: 09:26:22 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) through

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 1 °
  - Resisting Side Maximum Convex Angle: 1 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (-85, -1) ft
- Lower Left: (-85, -60) ft
- Lower Right: (-135, -60) ft
- X Increments: 15
- Y Increments: 14
- Starting Angle: 145 °
- Ending Angle: 155 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 35 °
- Upper Left: (-25, -1) ft
- Lower Left: (-25, -60) ft
- Lower Right: (5, -60) ft
- X Increments: 10
- Y Increments: 14
- Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Slip Surface Intersection: (24.593994, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 15.406006 ft
Required Length: 15.406006 ft
Pullout Force: 8,165.1834 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Pullout Resistance

Tension Crack Line

	X	Y
Coordinate 1	-31.9 ft	6 ft
Coordinate 2	-5.1 ft	15 ft
Coordinate 3	4.9 ft	15 ft
Coordinate 4	31.3 ft	6 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

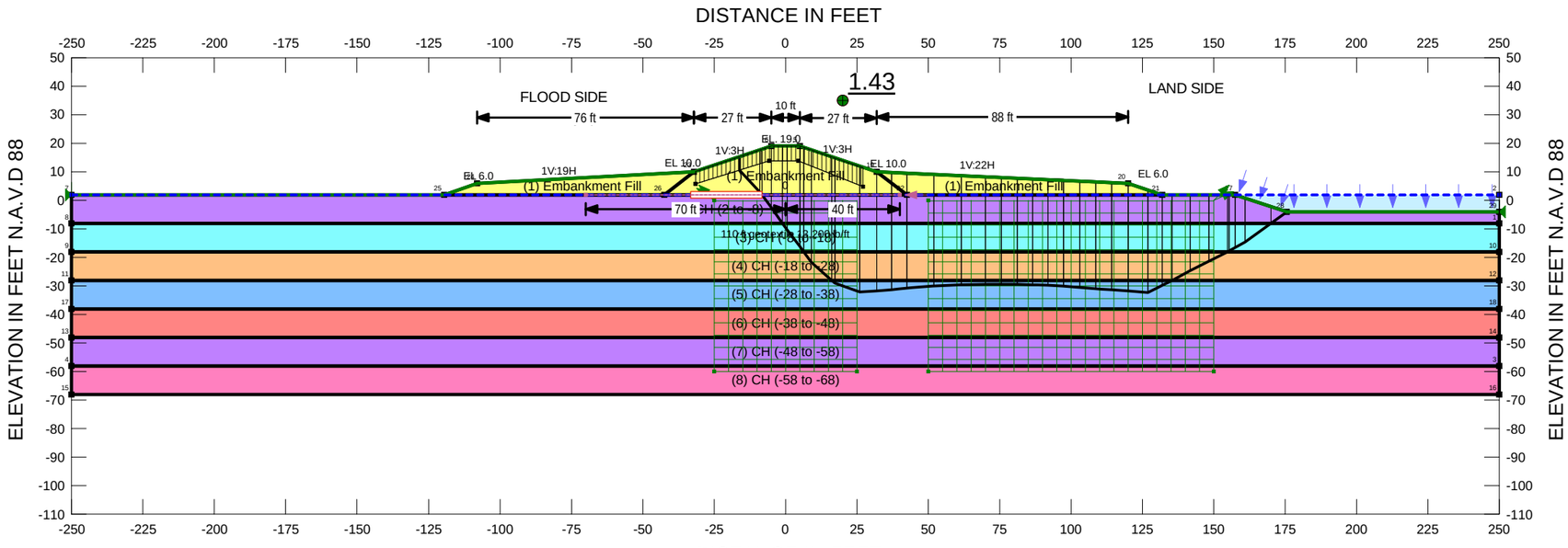
Slip Surfaces Analysed: 21924 of 23761 converged

Current Slip Surface

Slip Surface: 23,761
Factor of Safety: 1.46
Volume: 5,583.208 ft³
Weight: 574,645.85 lbf
Resisting Moment: 4,227,376.1 lbf·ft
Activating Moment: 2,896,317 lbf·ft
Resisting Force: 52,322.345 lbf
Activating Force: 35,899.489 lbf
Slip Rank: 1 of 23,761 slip surfaces
Exit: (-148.42918, 2) ft
Entry: (29.999208, 6.4434518) ft
Radius: 72.003269 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-143.81057 ft	-3.1992165 ft	324.43111 psf	713.64344 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 2	-135.73956 ft	-11.456085 ft	839.6597 psf	1,448.3224 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 3	-130.28751 ft	-16.256868 ft	1,139.2286 psf	1,930.9408 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-123.89393 ft	-21.830263 ft	1,487.0084 psf	2,541.6879 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 5	-118.17406 ft	-26.81637 ft	1,798.1415 psf	3,151.7736 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 6	-114.42453 ft	-28.730781 ft	1,917.6007 psf	3,356.073 psf	0 psf	257.16165 psf	0 psf	(5) CH (-28 to -38)
Slice 7	-110.00047 ft	-29.476542 ft	1,964.1362 psf	3,544.3143 psf	0 psf	264.47011 psf	0 psf	(5) CH (-28 to -38)
Slice 8	-105.29982 ft	-29.446454 ft	1,962.2587 psf	3,637.1187 psf	0 psf	264.17525 psf	0 psf	(5) CH (-28 to -38)
Slice 9	-99.899456 ft	-29.411887 ft	1,960.1017 psf	3,665.9985 psf	0 psf	263.83649 psf	0 psf	(5) CH (-28 to -38)
Slice 10	-94.499094 ft	-29.37732 ft	1,957.9447 psf	3,694.8784 psf	0 psf	263.49773 psf	0 psf	(5) CH (-28 to -38)
Slice 11	-89.098731 ft	-29.342753 ft	1,955.7878 psf	3,723.7582 psf	0 psf	263.15898 psf	0 psf	(5) CH (-28 to -38)
Slice 12	-83.536113 ft	-29.350961 ft	1,956.3 psf	3,761.8357 psf	0 psf	263.23942 psf	0 psf	(5) CH (-28 to -38)
Slice 13	-77.811238 ft	-29.401946 ft	1,959.4814 psf	3,802.1071 psf	0 psf	263.73907 psf	0 psf	(5) CH (-28 to -38)
Slice 14	-72.40652 ft	-29.484174 ft	1,964.6125 psf	3,847.0994 psf	0 psf	264.54491 psf	0 psf	(5) CH (-28 to -38)
Slice 15	-67.32196 ft	-29.597646 ft	1,971.6931 psf	3,890.3968 psf	0 psf	265.65693 psf	0 psf	(5) CH (-28 to -38)
Slice 16	-61.443905 ft	-29.769974 ft	1,982.4464 psf	3,947.742 psf	0 psf	267.34574 psf	0 psf	(5) CH (-28 to -38)
Slice 17	-54.772355 ft	-30.001157 ft	1,996.8722 psf	4,013.6585 psf	0 psf	269.61134 psf	0 psf	(5) CH (-28 to -38)
Slice 18	-49.202435 ft	-30.230261 ft	2,011.1683 psf	4,076.8573 psf	0 psf	271.85656 psf	0 psf	(5) CH (-28 to -38)
Slice 19	-44.734145 ft	-30.457286 ft	2,025.3346 psf	4,129.0092 psf	0 psf	274.0814 psf	0 psf	(5) CH (-28 to -38)
Slice 20	-39.875 ft	-30.704169 ft	2,040.7402 psf	4,185.6002 psf	0 psf	276.50086 psf	0 psf	(5) CH (-28 to -38)
Slice 21	-34.625 ft	-30.970911 ft	2,057.3848 psf	4,246.8758 psf	0 psf	279.11493 psf	0 psf	(5) CH (-28 to -38)
Slice 22	-29.415855 ft	-31.235577 ft	2,073.9 psf	4,391.161 psf	0 psf	281.70865 psf	0 psf	(5) CH (-28 to -38)
Slice 23	-24.16985 ft	-30.836089 ft	2,048.972 psf	4,485.2451 psf	0 psf	277.79368 psf	0 psf	(5) CH (-28 to -38)
Slice 24	-19.657904 ft	-29.152653 ft	1,943.9256 psf	4,374.6017 psf	0 psf	261.296 psf	0 psf	(5) CH (-28 to -38)
Slice 25	-16.542794 ft	-27.211856 ft	1,822.8198 psf	4,260.2904 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 26	-11.695445 ft	-23.761443 ft	1,607.5141 psf	4,035.1142 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 27	-6.55656 ft	-19.983938 ft	1,371.7977 psf	3,826.4671 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 28	-4.3937682 ft	-18.43435 ft	1,275.1035 psf	3,718.5781 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 29	0.60623176 ft	-14.851972 ft	1,051.5631 psf	3,363.1045 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 30	7.5848366 ft	-9.8519723 ft	739.56307 psf	2,770.0558 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 31	10.738552 ft	-7.5924125 ft	598.56654 psf	2,433.0689 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 32	14.629071 ft	-4.8886188 ft	429.84981 psf	2,047.5365 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 33	21.272353 ft	-0.29620625 ft	143.28327 psf	1,385.7443 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 34	25.897607 ft	2.9011705 ft	-56.233039 psf	765.06152 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 35	28.600214 ft	5.1228964 ft	-194.86873 psf	300.96871 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Block Through Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:05:48 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) through

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (-25, 0) ft
- Lower Left: (-25, -60) ft
- Lower Right: (25, -60) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (50, 0) ft
- Lower Left: (50, -60) ft
- Lower Right: (150, -60) ft
- X Increments: 20
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-8.2588754, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 61.741125 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Tension Crack Line

	X	Y
Coordinate 1	-31.4 ft	5.8 ft
Coordinate 2	-5.7 ft	13.8 ft
Coordinate 3	4.5 ft	13.8 ft
Coordinate 4	27.2 ft	4.9 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

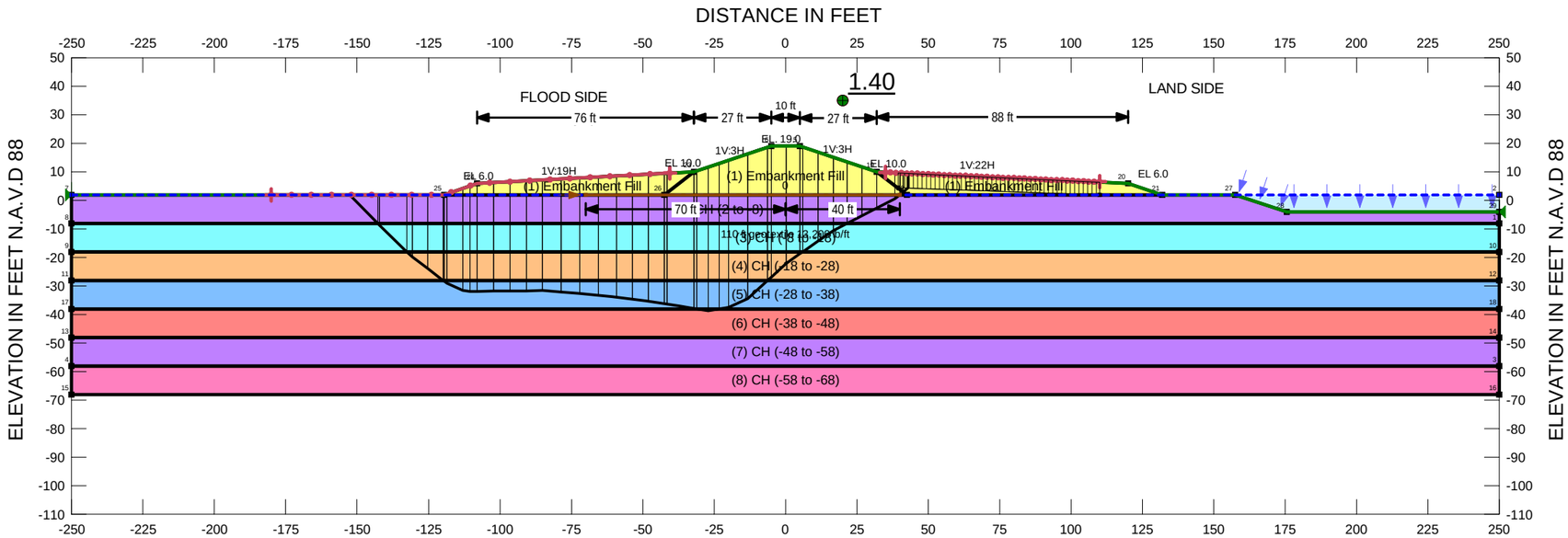
Slip Surfaces Analysed: 36582 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.43
Volume: 6,160.0637 ft³
Weight: 632,830.27 lbf
Resisting Moment: 4,676,088.8 lbf·ft
Activating Moment: 3,261,814.4 lbf·ft
Resisting Force: 57,080.795 lbf
Activating Force: 39,818.17 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (175.501, -4) ft
Entry: (-16.116581, 10.557484) ft
Radius: 78.99736 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-12.536601 ft	6.7612207 ft	-297.10017 psf	666.67546 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-8.6077477 ft	2.4824785 ft	-30.106658 psf	1,171.3939 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-6.6294377 ft	-0.25345695 ft	140.61571 psf	1,750.9248 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-3.0140198 ft	-5.2534569 ft	452.61571 psf	2,243.9663 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	-0.15488982 ft	-9.2075365 ft	699.35028 psf	2,602.4567 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	2.85913 ft	-13.286337 ft	953.86741 psf	3,002.8892 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	5.6868645 ft	-17.0788 ft	1,190.5171 psf	3,349.4482 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	7.7672995 ft	-19.869011 ft	1,364.6263 psf	3,543.647 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	12.71457 ft	-24.869011 ft	1,676.6263 psf	4,033.8768 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 10	16.81839 ft	-28.484684 ft	1,902.2443 psf	4,311.9857 psf	0 psf	254.7499 psf	0 psf	(5) CH (-28 to -38)
Slice 11	21.682105 ft	-30.576553 ft	2,032.7769 psf	4,488.6477 psf	0 psf	275.25022 psf	0 psf	(5) CH (-28 to -38)
Slice 12	28.99785 ft	-31.93337 ft	2,117.4423 psf	4,502.3891 psf	0 psf	288.54702 psf	0 psf	(5) CH (-28 to -38)
Slice 13	34.625 ft	-31.464086 ft	2,088.159 psf	4,321.506 psf	0 psf	283.94804 psf	0 psf	(5) CH (-28 to -38)
Slice 14	39.875 ft	-31.026255 ft	2,060.8383 psf	4,245.3975 psf	0 psf	279.6573 psf	0 psf	(5) CH (-28 to -38)
Slice 15	47.24712 ft	-30.411447 ft	2,022.4743 psf	4,137.421 psf	0 psf	273.63218 psf	0 psf	(5) CH (-28 to -38)
Slice 16	56.776125 ft	-29.761966 ft	1,981.9467 psf	4,006.3999 psf	0 psf	267.26727 psf	0 psf	(5) CH (-28 to -38)
Slice 17	65.77428 ft	-29.444063 ft	1,962.1095 psf	3,913.2874 psf	0 psf	264.15182 psf	0 psf	(5) CH (-28 to -38)
Slice 18	72.796947 ft	-29.37803 ft	1,957.9891 psf	3,865.8164 psf	0 psf	263.5047 psf	0 psf	(5) CH (-28 to -38)
Slice 19	78.409742 ft	-29.374593 ft	1,957.7746 psf	3,836.0975 psf	0 psf	263.47101 psf	0 psf	(5) CH (-28 to -38)
Slice 20	83.888462 ft	-29.481207 ft	1,964.4273 psf	3,807.4712 psf	0 psf	264.51583 psf	0 psf	(5) CH (-28 to -38)
Slice 21	89.233105 ft	-29.697874 ft	1,977.9473 psf	3,803.3519 psf	0 psf	266.63917 psf	0 psf	(5) CH (-28 to -38)
Slice 22	94.577748 ft	-29.914541 ft	1,991.4673 psf	3,799.2325 psf	0 psf	268.7625 psf	0 psf	(5) CH (-28 to -38)
Slice 23	97.30761 ft	-30.032602 ft	1,998.8344 psf	3,870.118 psf	0 psf	269.9195 psf	0 psf	(5) CH (-28 to -38)
Slice 24	100.19451 ft	-30.255327 ft	2,012.7324 psf	3,797.019 psf	0 psf	272.1022 psf	0 psf	(5) CH (-28 to -38)
Slice 25	105.85322 ft	-30.681318 ft	2,039.3142 psf	3,814.1243 psf	0 psf	276.27691 psf	0 psf	(5) CH (-28 to -38)
Slice 26	111.51193 ft	-31.107309 ft	2,065.8961 psf	3,831.2297 psf	0 psf	280.45163 psf	0 psf	(5) CH (-28 to -38)
Slice 27	117.17064 ft	-31.5333 ft	2,092.4779 psf	3,848.3351 psf	0 psf	284.62634 psf	0 psf	(5) CH (-28 to -38)
Slice 28	123.50131 ft	-32.009876 ft	2,122.2162 psf	3,751.3584 psf	0 psf	289.29678 psf	0 psf	(5) CH (-28 to -38)
Slice 29	129.50131 ft	-30.989981 ft	2,058.5748 psf	3,582.6213 psf	0 psf	279.30181 psf	0 psf	(5) CH (-28 to -38)
Slice 30	133.66113 ft	-28.853253 ft	1,925.243 psf	3,236.4696 psf	0 psf	258.36188 psf	0 psf	(5) CH (-28 to -38)
Slice 31	138.56696 ft	-26.333333 ft	1,768 psf	2,976.1231 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	145.05636 ft	-23 ft	1,560 psf	2,604.2151 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	151.54576 ft	-19.666667 ft	1,352 psf	2,232.3072 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	155.13673 ft	-17.822132 ft	1,236.901 psf	2,023.3616 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 35	156.4915 ft	-17.066554 ft	1,189.753 psf	1,962.4558 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	159.21302 ft	-15.507552 ft	1,092.4713 psf	1,788.3859 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	165.44426 ft	-11.26313 ft	827.61931 psf	1,337.2972 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	172.73124 ft	-6.0003608 ft	499.22251 psf	753.80071 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 39	175.5005 ft	-4.0003608 ft	374.42251 psf	541.21848 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Circular Around Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (FS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,466
Date: 04/07/2022
Time: 09:16:33 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/07/2022
Last Solved Time: 09:18:28 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (FS) around

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-180, 2) ft
Left-Zone Right Coordinate: (-40.4285, 9.556395) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (35, 9.863636) ft
Right-Zone Right Coordinate: (110.00024, 6.454535) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	39.5 ft	4.5 ft
Coordinate 2	110 ft	2 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

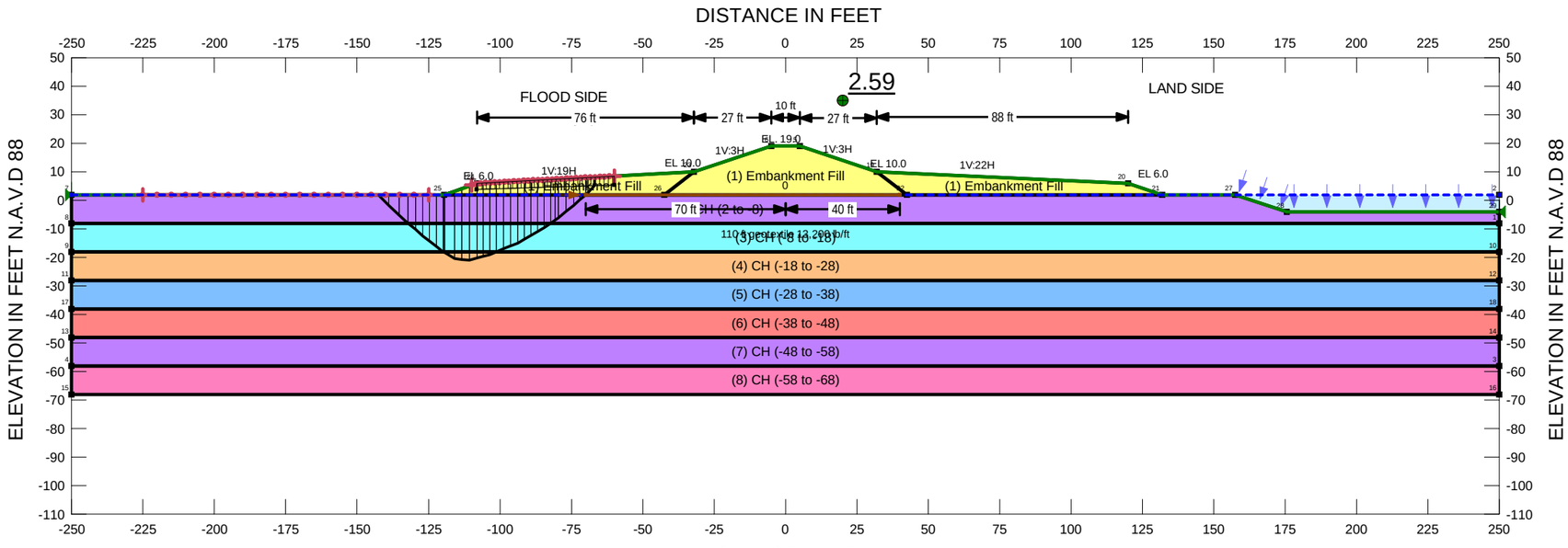
Slip Surfaces Analysed: 10251 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.40
Volume: 6,613.4947 ft³
Weight: 683,613.36 lbf
Resisting Moment: 5,196,927.2 lbf·ft
Activating Moment: 3,702,470.7 lbf·ft
Resisting Force: 60,547.321 lbf
Activating Force: 43,293.062 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (-152.61309, 2) ft
Entry: (42.956408, 4.3774323) ft
Radius: 78.361835 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-147.73597 ft	-3 ft	312 psf	689.6978 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 2	-142.52519 ft	-8.342069 ft	645.34511 psf	1,184.8554 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 3	-137.35634 ft	-13.342069 ft	957.34511 psf	1,680.3022 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-131.60103 ft	-18.886388 ft	1,303.3106 psf	2,264.8976 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 5	-127.99716 ft	-21.829583 ft	1,486.966 psf	2,539.4936 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 6	-122.62967 ft	-25.943194 ft	1,743.6553 psf	2,999.5976 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 7	-119.72296 ft	-28.170875 ft	1,882.6626 psf	3,213.648 psf	0 psf	251.67457 psf	0 psf	(5) CH (-28 to -38)
Slice 8	-119.00357 ft	-28.72221 ft	1,917.0659 psf	3,298.5992 psf	0 psf	257.07766 psf	0 psf	(5) CH (-28 to -38)
Slice 9	-115.76851 ft	-30.304482 ft	2,015.7996 psf	3,525.799 psf	0 psf	272.58392 psf	0 psf	(5) CH (-28 to -38)
Slice 10	-111.79776 ft	-31.693514 ft	2,102.4753 psf	3,762.1717 psf	0 psf	286.19644 psf	0 psf	(5) CH (-28 to -38)
Slice 11	-109.28281 ft	-31.863928 ft	2,113.1091 psf	3,834.3516 psf	0 psf	287.86649 psf	0 psf	(5) CH (-28 to -38)
Slice 12	-105.12894 ft	-31.809498 ft	2,109.7127 psf	3,897.0335 psf	0 psf	287.33308 psf	0 psf	(5) CH (-28 to -38)
Slice 13	-99.386816 ft	-31.734256 ft	2,105.0176 psf	3,923.5 psf	0 psf	286.59571 psf	0 psf	(5) CH (-28 to -38)
Slice 14	-93.644694 ft	-31.659015 ft	2,100.3225 psf	3,949.9665 psf	0 psf	285.85835 psf	0 psf	(5) CH (-28 to -38)
Slice 15	-87.902571 ft	-31.583774 ft	2,095.6275 psf	3,976.4331 psf	0 psf	285.12098 psf	0 psf	(5) CH (-28 to -38)
Slice 16	-81.78927 ft	-31.840842 ft	2,111.6685 psf	4,072.2117 psf	0 psf	287.64025 psf	0 psf	(5) CH (-28 to -38)
Slice 17	-75.30479 ft	-32.43022 ft	2,148.4457 psf	4,176.9605 psf	0 psf	293.41615 psf	0 psf	(5) CH (-28 to -38)
Slice 18	-68.82031 ft	-33.019597 ft	2,185.2229 psf	4,281.7093 psf	0 psf	299.19205 psf	0 psf	(5) CH (-28 to -38)
Slice 19	-62.33583 ft	-33.608975 ft	2,222 psf	4,386.458 psf	0 psf	304.96796 psf	0 psf	(5) CH (-28 to -38)
Slice 20	-56.327992 ft	-34.288545 ft	2,264.4052 psf	4,513.8105 psf	0 psf	311.62774 psf	0 psf	(5) CH (-28 to -38)
Slice 21	-50.796795 ft	-35.058306 ft	2,312.4383 psf	4,633.1868 psf	0 psf	319.1714 psf	0 psf	(5) CH (-28 to -38)
Slice 22	-45.265598 ft	-35.828068 ft	2,360.4714 psf	4,752.5631 psf	0 psf	326.71506 psf	0 psf	(5) CH (-28 to -38)
Slice 23	-41.991915 ft	-36.283657 ft	2,388.9002 psf	4,823.2169 psf	0 psf	331.17984 psf	0 psf	(5) CH (-28 to -38)
Slice 24	-36.741915 ft	-37.101752 ft	2,439.9493 psf	4,952.7349 psf	0 psf	339.19717 psf	0 psf	(5) CH (-28 to -38)
Slice 25	-31.521418 ft	-37.924569 ft	2,491.2931 psf	5,091.7961 psf	0 psf	347.26078 psf	0 psf	(5) CH (-28 to -38)
Slice 26	-29.063488 ft	-38.311971 ft	2,515.467 psf	5,229.2842 psf	0 psf	351.1509 psf	0 psf	(6) CH (-38 to -48)
Slice 27	-25.179329 ft	-38.311971 ft	2,515.467 psf	5,261.1616 psf	0 psf	351.1509 psf	0 psf	(6) CH (-38 to -48)
Slice 28	-21.571794 ft	-37.721128 ft	2,478.5984 psf	5,335.1068 psf	0 psf	345.26705 psf	0 psf	(5) CH (-28 to -38)
Slice 29	-16.498845 ft	-35.890505 ft	2,364.3675 psf	5,227.5792 psf	0 psf	327.32695 psf	0 psf	(5) CH (-28 to -38)
Slice 30	-9.6940804 ft	-31.169377 ft	2,069.7692 psf	4,846.2481 psf	0 psf	281.0599 psf	0 psf	(5) CH (-28 to -38)
Slice 31	-5.6297704 ft	-27.418851 ft	1,835.7363 psf	4,574.3357 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	-2.39842 ft	-24.436975 ft	1,649.6673 psf	4,276.4015 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	2.60158 ft	-20.362201 ft	1,395.4013 psf	3,904.7662 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	5.4929603 ft	-18.344076 ft	1,269.4704 psf	3,667.4489 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	8.6646855 ft	-16.130277 ft	1,131.3293 psf	3,332.3739 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	14.022215 ft	-12.39083 ft	897.98781 psf	2,761.6506 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	19.147283 ft	-9.2605535 ft	702.65854 psf	2,307.245 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	24.195189 ft	-6.6594214 ft	540.3479 psf	1,871.8741 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 39	29.398396 ft	-3.9782643 ft	373.04369 psf	1,435.9592 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 40	35.20802 ft	-0.98462737 ft	186.24075 psf	1,054.2773 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 41	39.231059 ft	1.3342155 ft	41.544953 psf	758.2813 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 42	40.638191 ft	2.4836937 ft	-30.182489 psf	469.98281 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 43	42.093356 ft	3.6724099 ft	-104.35838 psf	318.11043 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Circular Front Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (FS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,461
Date: 04/07/2022
Time: 08:39:49 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/07/2022
Last Solved Time: 08:42:22 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (FS) front

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-225, 2) ft
Left-Zone Right Coordinate: (-125, 2) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (-110, 5.304348) ft
Right-Zone Right Coordinate: (-60, 8.526316) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	-108.1 ft	3.8 ft
Coordinate 2	-60 ft	5.4 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

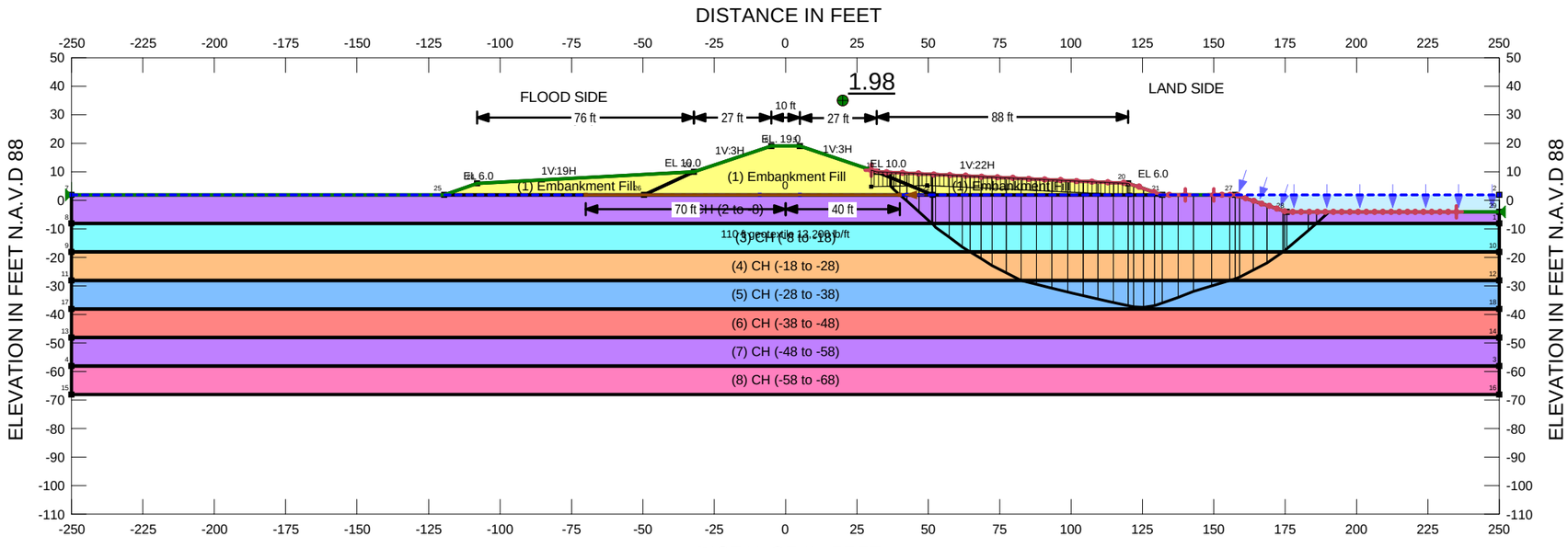
Slip Surfaces Analysed: 6155 of 20182 converged

Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 2.59
Volume: 1,232.1559 ft³
Weight: 120,802.93 lbf
Resisting Moment: 1,227,359.6 lbf·ft
Activating Moment: 473,309.96 lbf·ft
Resisting Force: 23,939.416 lbf
Activating Force: 9,262.7898 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (-142.61624, 2) ft
Entry: (-66.819899, 5.1731427) ft
Radius: 33.771947 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-140.7428 ft	0.15007 ft	115.43563 psf	292.50001 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 2	-137.05129 ft	-3.4549365 ft	340.38804 psf	623.83065 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-133.72002 ft	-6.6054125 ft	536.97774 psf	909.50835 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-130.90878 ft	-9.1126527 ft	693.42953 psf	1,142.9415 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-128.31269 ft	-11.336334 ft	832.18726 psf	1,371.1919 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-125.81668 ft	-13.373479 ft	959.3051 psf	1,566.2648 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	-123.42075 ft	-15.224087 ft	1,074.7831 psf	1,755.7286 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	-121.02482 ft	-17.074696 ft	1,190.261 psf	1,945.1925 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	-119.66343 ft	-18.12623 ft	1,255.8768 psf	2,058.2446 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 10	-119.44889 ft	-18.291938 ft	1,266.2169 psf	2,078.9991 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	-117.65758 ft	-19.348634 ft	1,332.1548 psf	2,235.2885 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	-114.62234 ft	-20.531276 ft	1,405.9516 psf	2,401.7673 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	-112.03225 ft	-20.862123 ft	1,426.5965 psf	2,542.3041 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 14	-109.3686 ft	-20.643171 ft	1,412.9338 psf	2,544.3677 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 15	-106.9003 ft	-19.949941 ft	1,369.6763 psf	2,529.637 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 16	-104.7009 ft	-19.332233 ft	1,331.1313 psf	2,475.4591 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 17	-102.38821 ft	-18.511689 ft	1,279.9294 psf	2,373.0475 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 18	-99.945585 ft	-17.481289 ft	1,215.6324 psf	2,282.7762 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 19	-97.486315 ft	-16.443866 ft	1,150.8973 psf	2,195.0327 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 20	-95.027045 ft	-15.406444 ft	1,086.1621 psf	2,107.2892 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 21	-92.631194 ft	-14.223895 ft	1,012.371 psf	1,979.4015 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 22	-90.298761 ft	-12.896218 ft	929.52402 psf	1,862.7491 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 23	-87.966329 ft	-11.568542 ft	846.67701 psf	1,746.0966 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 24	-85.633896 ft	-10.240865 ft	763.82999 psf	1,629.4441 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 25	-83.333361 ft	-8.7885135 ft	673.20324 psf	1,480.5682 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 26	-81.394636 ft	-7.4408225 ft	589.10732 psf	1,365.5312 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 27	-80.06602 ft	-6.494997 ft	530.08781 psf	1,283.6337 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 28	-78.18039 ft	-5.0108615 ft	437.47776 psf	1,154.0732 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 29	-75.45755 ft	-2.8158865 ft	300.51132 psf	977.29342 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 30	-73.075441 ft	-0.78879925 ft	174.02107 psf	799.0317 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 31	-71.034063 ft	1.0704003 ft	58.007024 psf	648.19275 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 32	-69.610817 ft	2.3666315 ft	-22.877806 psf	435.36192 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 33	-68.014079 ft	3.9532028 ft	-121.87986 psf	238.13272 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Circular Front Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS) front (2)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,498
Date: 07/19/2022
Time: 10:11:27 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 10:18:32 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS) front (2)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (30, 10.666667) ft
Left-Zone Right Coordinate: (140, 2) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (150, 2) ft
Right-Zone Right Coordinate: (235, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	-9 ft	2 ft
Coordinate 3	5 ft	2 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Tension Crack Line

	X	Y
Coordinate 1	30 ft	4.9 ft

Coordinate 2	49.7 ft	5.2 ft
Coordinate 3	120.7 ft	2 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

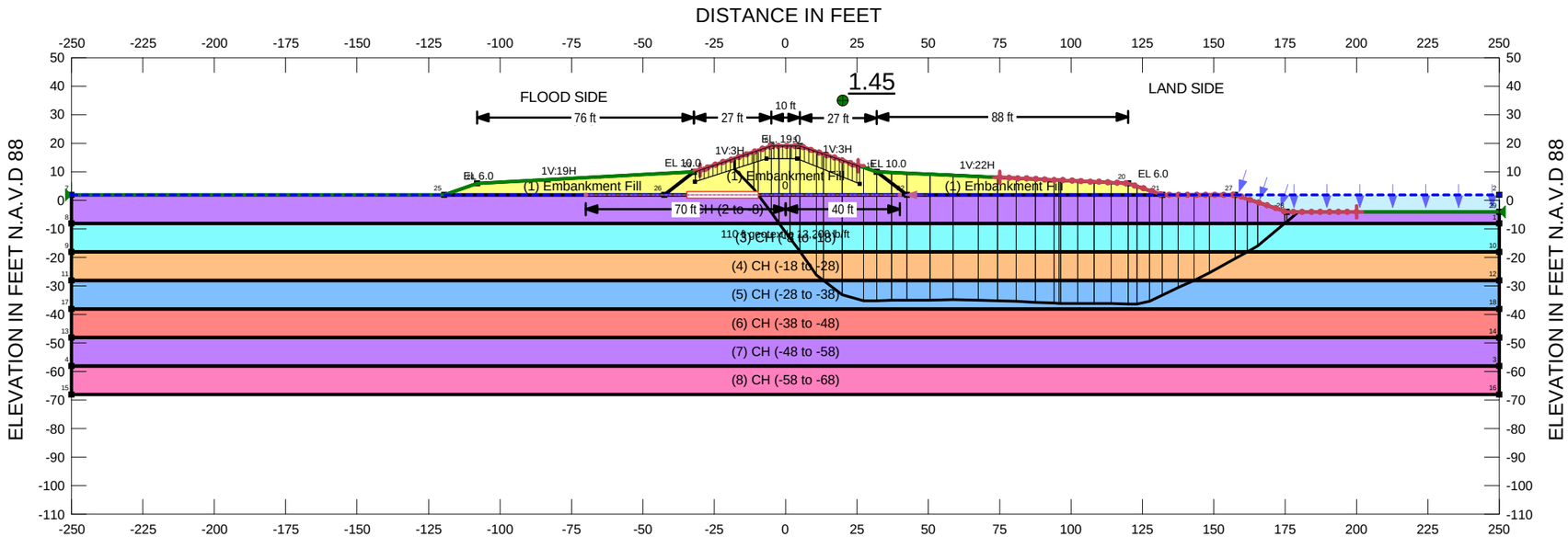
Slip Surfaces Analysed: 10856 of 20182 converged

Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.98
Volume: 4,333.9212 ft³
Weight: 441,090.32 lbf
Resisting Moment: 3,630,139.1 lbf·ft
Activating Moment: 1,837,291.5 lbf·ft
Resisting Force: 47,557.525 lbf
Activating Force: 24,077.265 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (190.47059, -4) ft
Entry: (36.725811, 5.0024235) ft
Radius: 65.77757 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	37.29895 ft	4.4639573 ft	-153.75093 psf	302.93048 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	38.941626 ft	2.9627455 ft	-60.075319 psf	494.65822 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	41.255581 ft	0.87983403 ft	69.898356 psf	815.84614 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	44.655099 ft	-2.180249 ft	260.84753 psf	1,065.825 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	48.965297 ft	-6.060083 ft	502.94918 psf	1,382.7695 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	51.310198 ft	-8.1708504 ft	634.66107 psf	1,556.8563 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	52.04275 ft	-8.8302584 ft	675.80813 psf	1,617.1215 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	54.933687 ft	-11.077234 ft	816.0194 psf	1,852.0299 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	59.630063 ft	-14.59407 ft	1,035.47 psf	2,171.034 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	63.296105 ft	-17.176244 ft	1,196.5976 psf	2,432.4711 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 11	66.55886 ft	-19.215705 ft	1,323.86 psf	2,623.5618 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	70.44866 ft	-21.647116 ft	1,475.58 psf	2,865.5362 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 13	74.909315 ft	-24.147116 ft	1,631.58 psf	3,141.7523 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 14	79.95639 ft	-26.723651 ft	1,792.3558 psf	3,394.3991 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 15	85.216511 ft	-28.695149 ft	1,915.3773 psf	3,659.3225 psf	0 psf	256.81246 psf	0 psf	(5) CH (-28 to -38)
Slice 16	90.674114 ft	-30.053665 ft	2,000.1487 psf	3,777.7776 psf	0 psf	270.12591 psf	0 psf	(5) CH (-28 to -38)
Slice 17	96.131716 ft	-31.41218 ft	2,084.9201 psf	3,896.2326 psf	0 psf	283.43937 psf	0 psf	(5) CH (-28 to -38)
Slice 18	101.58932 ft	-32.770696 ft	2,169.6914 psf	4,014.6877 psf	0 psf	296.75282 psf	0 psf	(5) CH (-28 to -38)
Slice 19	106.93177 ft	-34.020806 ft	2,247.6983 psf	4,131.0178 psf	0 psf	309.0039 psf	0 psf	(5) CH (-28 to -38)
Slice 20	112.15906 ft	-35.162511 ft	2,318.9407 psf	4,227.518 psf	0 psf	320.1926 psf	0 psf	(5) CH (-28 to -38)
Slice 21	117.38635 ft	-36.304215 ft	2,390.183 psf	4,324.0181 psf	0 psf	331.38131 psf	0 psf	(5) CH (-28 to -38)
Slice 22	120.98619 ft	-37.090464 ft	2,439.245 psf	4,358.0661 psf	0 psf	339.08655 psf	0 psf	(5) CH (-28 to -38)
Slice 23	123.65398 ft	-37.38773 ft	2,457.7944 psf	4,342.8263 psf	0 psf	341.99975 psf	0 psf	(5) CH (-28 to -38)
Slice 24	127.27184 ft	-37.185974 ft	2,445.2047 psf	4,243.9283 psf	0 psf	340.02254 psf	0 psf	(5) CH (-28 to -38)
Slice 25	130.60406 ft	-36.401397 ft	2,396.2472 psf	4,093.7827 psf	0 psf	332.33369 psf	0 psf	(5) CH (-28 to -38)
Slice 26	134.73852 ft	-34.917693 ft	2,303.664 psf	3,871.456 psf	0 psf	317.79339 psf	0 psf	(5) CH (-28 to -38)
Slice 27	140.21556 ft	-32.952187 ft	2,181.0165 psf	3,648.6974 psf	0 psf	298.53143 psf	0 psf	(5) CH (-28 to -38)
Slice 28	146.12952 ft	-30.977076 ft	2,057.7695 psf	3,412.7638 psf	0 psf	279.17534 psf	0 psf	(5) CH (-28 to -38)
Slice 29	152.48039 ft	-28.992359 ft	1,933.9232 psf	3,188.6483 psf	0 psf	259.72511 psf	0 psf	(5) CH (-28 to -38)
Slice 30	156.57791 ft	-27.711838 ft	1,854.0187 psf	3,055.7254 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 31	158.26332 ft	-27.185132 ft	1,821.1522 psf	2,990.249 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	161.45725 ft	-25.680892 ft	1,727.2876 psf	2,847.8333 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	166.31848 ft	-23.149498 ft	1,569.3287 psf	2,519.9936 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	171.48437 ft	-19.941901 ft	1,369.1746 psf	2,158.3446 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	174.49455 ft	-17.804827 ft	1,235.8212 psf	1,886.7745 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	175.13473 ft	-17.301201 ft	1,204.395 psf	1,858.9529 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	179.31751 ft	-13.769065 ft	983.98965 psf	1,487.543 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 38	184.56135 ft	-9.27269 ft	703.41586 psf	1,033.818 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 39	188.22914 ft	-6 ft	499.2 psf	716.92552 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Circular Through Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/06/2022
Time: 06:00:03 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/06/2022
Last Solved Time: 06:06:08 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS) through

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-30, 10.666667) ft
Left-Zone Right Coordinate: (25.45455, 12.181817) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (75.06573, 8.042467) ft
Right-Zone Right Coordinate: (200, -4) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-9.6079261, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 60.392074 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Tension Crack Line

	X	Y
Coordinate 1	-31.7 ft	6.5 ft
Coordinate 2	-6.6 ft	14.7 ft
Coordinate 3	4.1 ft	14.7 ft
Coordinate 4	26 ft	5.8 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

Slip Surfaces Analysed: 13146 of 26692 converged

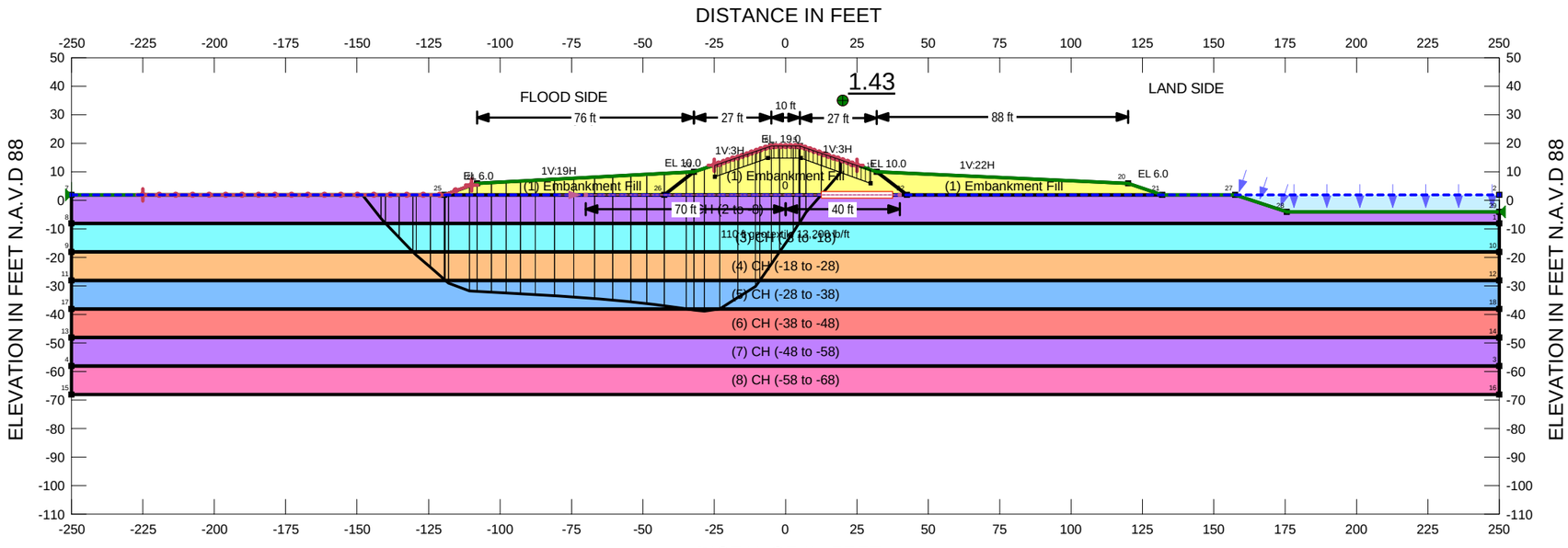
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.45
Volume: 6,962.1478 ft³
Weight: 719,817.5 lbf
Resisting Moment: 5,578,121.6 lbf·ft
Activating Moment: 3,834,928 lbf·ft
Resisting Force: 64,139.603 lbf
Activating Force: 44,091.763 lbf

Slip Rank: 1 of 26,692 slip surfaces
Exit: (179.66456, -4) ft
Entry: (-17.907498, 11.005917) ft
Radius: 83.216219 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-14.500159 ft	7.510435 ft	-343.85114 psf	531.13413 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-10.350373 ft	3.0074765 ft	-62.866534 psf	1,057.7855 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-7.303963 ft	-1.1264033 ft	195.08756 psf	1,808.2811 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-3.6192768 ft	-6.1264033 ft	507.08756 psf	2,328.2411 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	-0.27276676 ft	-10.667509 ft	790.45256 psf	2,745.8248 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	3.34651 ft	-15.62787 ft	1,099.9791 psf	3,215.3251 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	7.951555 ft	-22.013566 ft	1,498.4465 psf	3,746.2149 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	12.1391 ft	-27.053206 ft	1,812.92 psf	4,329.5384 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	16.616785 ft	-30.483207 ft	2,026.9521 psf	4,546.4724 psf	0 psf	274.33543 psf	0 psf	(5) CH (-28 to -38)
Slice 10	23.607035 ft	-34.047271 ft	2,249.3497 psf	4,813.9191 psf	0 psf	309.26325 psf	0 psf	(5) CH (-28 to -38)
Slice 11	29.677795 ft	-35.104308 ft	2,315.3088 psf	4,803.3631 psf	0 psf	319.62222 psf	0 psf	(5) CH (-28 to -38)
Slice 12	34.625 ft	-35.053567 ft	2,312.1426 psf	4,694.6594 psf	0 psf	319.12496 psf	0 psf	(5) CH (-28 to -38)
Slice 13	39.875 ft	-34.99972 ft	2,308.7825 psf	4,661.2691 psf	0 psf	318.59726 psf	0 psf	(5) CH (-28 to -38)
Slice 14	46.528495 ft	-34.931478 ft	2,304.5242 psf	4,618.0509 psf	0 psf	317.92849 psf	0 psf	(5) CH (-28 to -38)
Slice 15	54.585485 ft	-34.848841 ft	2,299.3677 psf	4,566.808 psf	0 psf	317.11865 psf	0 psf	(5) CH (-28 to -38)
Slice 16	63.080815 ft	-34.851395 ft	2,299.527 psf	4,515.5389 psf	0 psf	317.14367 psf	0 psf	(5) CH (-28 to -38)
Slice 17	70.866709 ft	-35.036159 ft	2,311.0563 psf	4,484.3968 psf	0 psf	318.95435 psf	0 psf	(5) CH (-28 to -38)
Slice 18	77.504826 ft	-35.317942 ft	2,328.6396 psf	4,480.6725 psf	0 psf	321.71583 psf	0 psf	(5) CH (-28 to -38)
Slice 19	84.142944 ft	-35.599725 ft	2,346.2228 psf	4,476.9482 psf	0 psf	324.47731 psf	0 psf	(5) CH (-28 to -38)
Slice 20	90.781061 ft	-35.881508 ft	2,363.8061 psf	4,473.2239 psf	0 psf	327.23878 psf	0 psf	(5) CH (-28 to -38)
Slice 21	94.923385 ft	-36.097608 ft	2,377.2907 psf	4,464.2429 psf	0 psf	329.35655 psf	0 psf	(5) CH (-28 to -38)
Slice 22	96.0404 ft	-36.185651 ft	2,382.7846 psf	4,499.7589 psf	0 psf	330.21937 psf	0 psf	(5) CH (-28 to -38)
Slice 23	99.292381 ft	-36.202373 ft	2,383.8281 psf	4,478.8344 psf	0 psf	330.38326 psf	0 psf	(5) CH (-28 to -38)
Slice 24	105.20884 ft	-36.210148 ft	2,384.3132 psf	4,448.7652 psf	0 psf	330.45945 psf	0 psf	(5) CH (-28 to -38)
Slice 25	111.12531 ft	-36.217922 ft	2,384.7984 psf	4,418.696 psf	0 psf	330.53564 psf	0 psf	(5) CH (-28 to -38)
Slice 26	117.04177 ft	-36.225697 ft	2,385.2835 psf	4,388.6268 psf	0 psf	330.61183 psf	0 psf	(5) CH (-28 to -38)
Slice 27	121.53175 ft	-36.231597 ft	2,385.6517 psf	4,317.2373 psf	0 psf	330.66965 psf	0 psf	(5) CH (-28 to -38)
Slice 28	125.2964 ft	-35.821259 ft	2,360.0466 psf	4,190.2876 psf	0 psf	326.64834 psf	0 psf	(5) CH (-28 to -38)
Slice 29	129.76466 ft	-34.34969 ft	2,268.2207 psf	3,948.3381 psf	0 psf	312.22696 psf	0 psf	(5) CH (-28 to -38)
Slice 30	134.79122 ft	-31.967854 ft	2,119.5941 psf	3,584.6267 psf	0 psf	288.88497 psf	0 psf	(5) CH (-28 to -38)
Slice 31	140.37365 ft	-29.322618 ft	1,954.5314 psf	3,280.5961 psf	0 psf	262.96166 psf	0 psf	(5) CH (-28 to -38)
Slice 32	145.85651 ft	-26.724567 ft	1,792.4129 psf	3,008.2788 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	153.02408 ft	-22.922829 ft	1,555.1845 psf	2,610.8508 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	159.623 ft	-19.198263 ft	1,322.7716 psf	2,174.9521 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	163.55345 ft	-16.979834 ft	1,184.3416 psf	1,895.9444 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	170.12075 ft	-11.979833 ft	872.34161 psf	1,395.34 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	175.1903 ft	-7.7410492 ft	607.84147 psf	916.89765 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 38	177.58228 ft	-5.7410492 ft	483.04147 psf	725.91329 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Spencer's Q case

CASE: Low Water (LW) Circular Through Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (FS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,461
Date: 04/07/2022
Time: 08:39:49 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 04/07/2022
Last Solved Time: 08:42:58 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (FS) through

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-225, 2) ft
Left-Zone Right Coordinate: (-110, 5.304348) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (-25, 12.333333) ft
Right-Zone Right Coordinate: (25, 12.333333) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Slip Surface Intersection: (12.578903, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 27.421097 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Tension Crack Line

	X	Y
Coordinate 1	-24.7 ft	8.2 ft
Coordinate 2	-6 ft	14.8 ft
Coordinate 3	5.4 ft	14.8 ft
Coordinate 4	29.9 ft	6 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	929 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	510 ft²
Region 10	(1) Embankment Fill	23,24,25,26	437 ft²

Slip Results

Slip Surfaces Analysed: 10112 of 20182 converged

Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.43
Volume: 5,952.5917 ft³
Weight: 616,432.47 lbf
Resisting Moment: 4,675,855 lbf·ft
Activating Moment: 3,268,875.5 lbf·ft
Resisting Force: 53,774.58 lbf
Activating Force: 37,857.903 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (-148.08512, 2) ft
Entry: (19.296067, 9.8087594) ft
Radius: 71.454508 ft
Center: (20, 35) ft

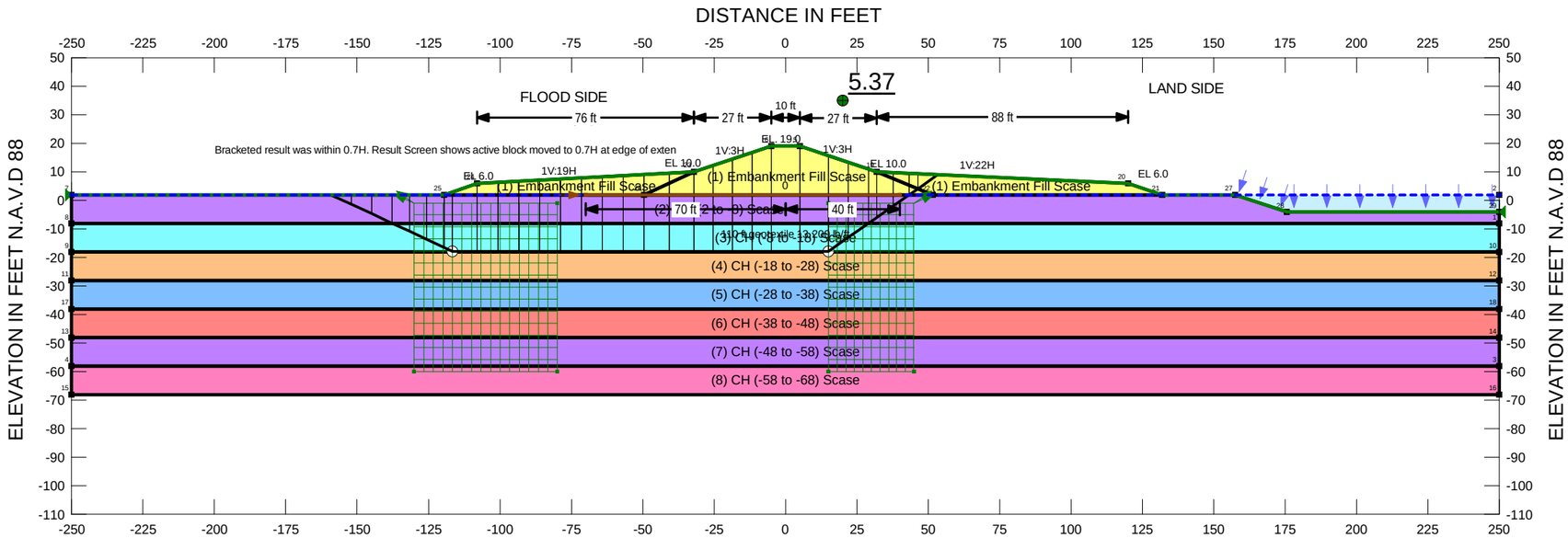
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-144.85247 ft	-2.194183 ft	261.71702 psf	668.23682 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 2	-140.84683 ft	-7.194183 ft	573.71702 psf	1,069.1503 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-137.67567 ft	-10.5 ft	780 psf	1,397.6911 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-132.87934 ft	-15.5 ft	1,092 psf	1,907.0194 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-129.86892 ft	-18.638259 ft	1,287.8274 psf	2,243.0055 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 6	-126.81749 ft	-21.393012 ft	1,459.7239 psf	2,504.9289 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 7	-121.93917 ft	-25.625999 ft	1,723.8623 psf	2,977.7658 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	-119.35162 ft	-27.871246 ft	1,863.9658 psf	3,261.0454 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	-118.60088 ft	-28.522672 ft	1,904.6148 psf	3,308.0338 psf	0 psf	255.12219 psf	0 psf	(5) CH (-28 to -38)
Slice 10	-114.32368 ft	-30.36462 ft	2,019.5523 psf	3,562.5175 psf	0 psf	273.17328 psf	0 psf	(5) CH (-28 to -38)
Slice 11	-109.32442 ft	-31.758803 ft	2,106.5493 psf	3,842.0796 psf	0 psf	286.83627 psf	0 psf	(5) CH (-28 to -38)
Slice 12	-105.45859 ft	-31.977451 ft	2,120.1929 psf	3,933.2939 psf	0 psf	288.97902 psf	0 psf	(5) CH (-28 to -38)
Slice 13	-100.37576 ft	-32.264931 ft	2,138.1317 psf	3,995.8892 psf	0 psf	291.79632 psf	0 psf	(5) CH (-28 to -38)
Slice 14	-95.292937 ft	-32.55241 ft	2,156.0704 psf	4,058.4846 psf	0 psf	294.61362 psf	0 psf	(5) CH (-28 to -38)
Slice 15	-90.210113 ft	-32.83989 ft	2,174.0091 psf	4,121.0799 psf	0 psf	297.43092 psf	0 psf	(5) CH (-28 to -38)
Slice 16	-84.2939 ft	-33.216917 ft	2,197.5356 psf	4,201.8275 psf	0 psf	301.12579 psf	0 psf	(5) CH (-28 to -38)
Slice 17	-77.5443 ft	-33.683492 ft	2,226.6499 psf	4,294.3929 psf	0 psf	305.69822 psf	0 psf	(5) CH (-28 to -38)
Slice 18	-70.51527 ft	-34.161225 ft	2,256.4604 psf	4,389.1427 psf	0 psf	310.38 psf	0 psf	(5) CH (-28 to -38)
Slice 19	-63.66577 ft	-34.694666 ft	2,289.7472 psf	4,496.9162 psf	0 psf	315.60773 psf	0 psf	(5) CH (-28 to -38)
Slice 20	-57.27523 ft	-35.272657 ft	2,325.8138 psf	4,599.7655 psf	0 psf	321.27204 psf	0 psf	(5) CH (-28 to -38)
Slice 21	-51.32102 ft	-35.883801 ft	2,363.9492 psf	4,712.045 psf	0 psf	327.26125 psf	0 psf	(5) CH (-28 to -38)
Slice 22	-45.53104 ft	-36.600894 ft	2,408.6958 psf	4,831.0553 psf	0 psf	334.28877 psf	0 psf	(5) CH (-28 to -38)
Slice 23	-38.646719 ft	-37.497919 ft	2,464.6701 psf	4,972.3554 psf	0 psf	343.07961 psf	0 psf	(5) CH (-28 to -38)
Slice 24	-33.396719 ft	-38.181992 ft	2,507.3563 psf	5,081.9107 psf	0 psf	349.83812 psf	0 psf	(6) CH (-38 to -48)
Slice 25	-30.17034 ft	-38.602388 ft	2,533.589 psf	5,206.3933 psf	0 psf	354.08412 psf	0 psf	(6) CH (-38 to -48)
Slice 26	-25.689805 ft	-38.463061 ft	2,524.895 psf	5,269.877 psf	0 psf	352.67692 psf	0 psf	(6) CH (-38 to -48)
Slice 27	-19.867205 ft	-36.093694 ft	2,377.0465 psf	5,080.2554 psf	0 psf	329.3182 psf	0 psf	(5) CH (-28 to -38)
Slice 28	-13.5917 ft	-32.153087 ft	2,131.1526 psf	4,905.7555 psf	0 psf	290.70025 psf	0 psf	(5) CH (-28 to -38)
Slice 29	-9.7252977 ft	-29.102058 ft	1,940.7684 psf	4,525.4199 psf	0 psf	260.80017 psf	0 psf	(5) CH (-28 to -38)
Slice 30	-6.9813377 ft	-25.136788 ft	1,693.3356 psf	4,148.8598 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 31	-3.5213462 ft	-20.136788 ft	1,381.3356 psf	3,687.1953 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	0.34627879 ft	-14.547721 ft	1,032.5778 psf	3,132.9486 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 33	3.7450351 ft	-9.547721 ft	720.57779 psf	2,625.653 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 34	4.8774101 ft	-7.8121035 ft	612.27526 psf	2,485.4472 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 35	6.098915 ft	-5.9398745 ft	495.44817 psf	2,253.0672 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 36	9.8883665 ft	-1.127771 ft	195.17291 psf	1,774.5578 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 37	15.937485 ft	5.9043797 ft	-243.63329 psf	594.63916 psf	0 psf	600 psf	0 psf	(1) Embankment Fill

West Slidell Levees

Spencer's Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Block Around Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,488
Date: 07/18/2022
Time: 02:18:16 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/18/2022
Last Solved Time: 02:19:30 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) around

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 5,000,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+06 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-80, -1) ft
Lower Left: (-80, -60) ft
Lower Right: (-130, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (15, -1) ft
Lower Left: (15, -60) ft
Lower Right: (45, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 5,000,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft

Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 16784 of 23760 converged

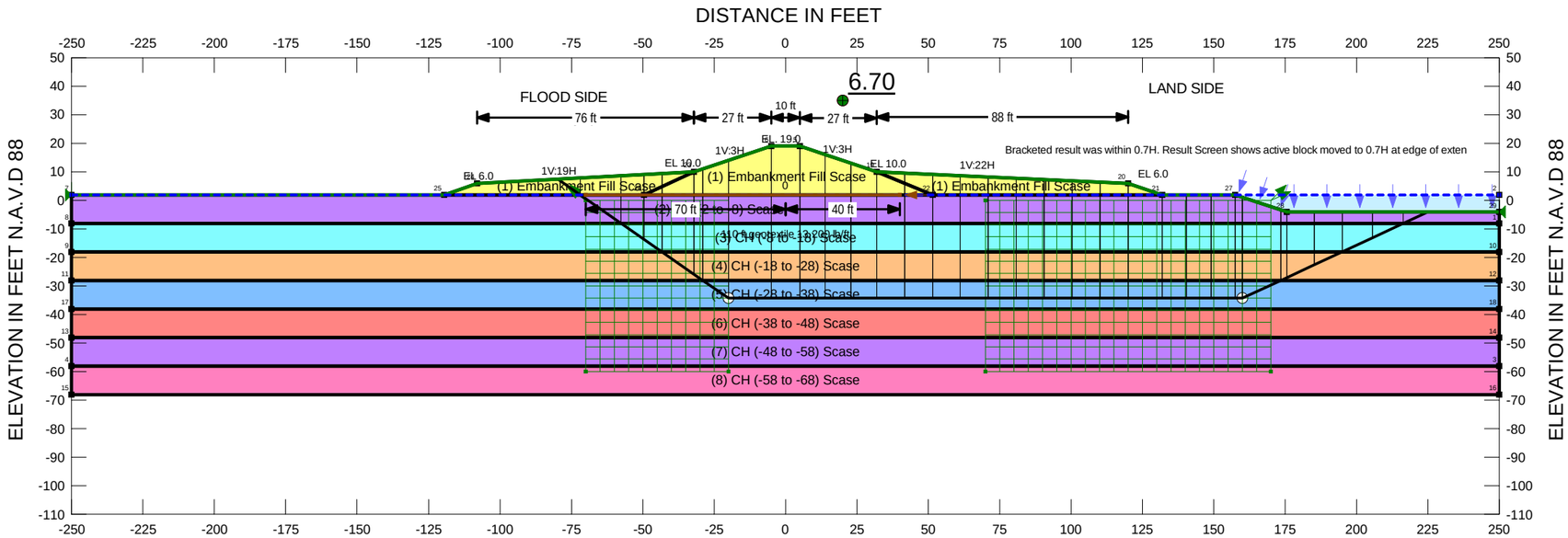
Current Slip Surface

Slip Surface: 7,494
Factor of Safety: 5.37
Volume: 4,768.377 ft³
Weight: 480,105.49 lbf
Resisting Moment: 6,414,559.3 lbf·ft
Activating Moment: 1,194,965.8 lbf·ft
Resisting Force: 115,163.99 lbf
Activating Force: 21,456.052 lbf

Slip Rank: 1 of 23,760 slip surfaces
Exit: (-159.25045, 2) ft
Entry: (53.395234, 9.0274894) ft
Radius: 80.555021 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-155.67627 ft	0.33333333 ft	104 psf	155.34257 psf	21.793629 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-148.52791 ft	-3 ft	312 psf	466.02772 psf	65.380886 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-141.37956 ft	-6.3333333 ft	520 psf	776.71286 psf	108.96814 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	-134.75448 ft	-9.4226563 ft	712.77375 psf	1,079.813 psf	155.79892 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 5	-128.65269 ft	-12.267969 ft	890.32126 psf	1,375.3282 psf	205.87323 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 6	-122.5509 ft	-15.113282 ft	1,067.8688 psf	1,670.8434 psf	255.94753 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 7	-118.08333 ft	-17.19654 ft	1,197.8641 psf	1,947.5886 psf	318.23917 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	-112.33333 ft	-17.857143 ft	1,239.0857 psf	2,175.7236 psf	397.57918 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 9	-104.34375 ft	-17.857143 ft	1,239.0857 psf	2,371.8869 psf	480.84557 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 10	-97.03125 ft	-17.857143 ft	1,239.0857 psf	2,416.3053 psf	499.70005 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 11	-89.71875 ft	-17.857143 ft	1,239.0857 psf	2,460.7237 psf	518.55454 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 12	-82.40625 ft	-17.857143 ft	1,239.0857 psf	2,505.142 psf	537.40903 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 13	-75.09375 ft	-17.857143 ft	1,239.0857 psf	2,549.5604 psf	556.26351 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 14	-67.78125 ft	-17.857143 ft	1,239.0857 psf	2,593.9788 psf	575.118 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 15	-60.46875 ft	-17.857143 ft	1,239.0857 psf	2,638.3972 psf	593.97248 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 16	-53.15625 ft	-17.857143 ft	1,239.0857 psf	2,682.8156 psf	612.82697 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 17	-45.125 ft	-17.857143 ft	1,239.0857 psf	2,731.5999 psf	633.53467 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 18	-36.375 ft	-17.857143 ft	1,239.0857 psf	2,784.7501 psf	656.0956 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 19	-28.625 ft	-17.857143 ft	1,239.0857 psf	2,941.1635 psf	722.48917 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 20	-21.875 ft	-17.857143 ft	1,239.0857 psf	3,200.8403 psf	832.7154 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 21	-15.125 ft	-17.857143 ft	1,239.0857 psf	3,460.517 psf	942.94163 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 22	-8.375 ft	-17.857143 ft	1,239.0857 psf	3,720.1937 psf	1,053.1679 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 23	0 ft	-17.857143 ft	1,239.0857 psf	3,850.032 psf	1,108.281 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 24	10 ft	-17.857143 ft	1,239.0857 psf	3,657.6789 psf	1,026.6319 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 25	18.519365 ft	-15.392857 ft	1,085.3143 psf	2,891.208 psf	766.55641 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 26	25.558094 ft	-10.464286 ft	777.77143 psf	2,172.5229 psf	592.03688 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 27	30.538729 ft	-6.9768074 ft	560.15278 psf	1,673.4228 psf	472.55507 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 28	34.839735 ft	-3.965211 ft	372.22917 psf	1,348.8473 psf	414.54979 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 29	40.519204 ft	0.011596323 ft	124.07639 psf	979.21145 psf	362.9833 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 30	44.86278 ft	3.0530008 ft	-65.707251 psf	675.36142 psf	286.67391 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 31	49.880927 ft	6.5667455 ft	-284.96492 psf	278.16464 psf	118.07388 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Block Around Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,496
Date: 07/19/2022
Time: 11:16:18 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 11:17:40 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) around

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 5,000,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+06 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-70, 0) ft
Lower Left: (-70, -60) ft
Lower Right: (-20, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (70, 0) ft
Lower Left: (70, -60) ft
Lower Right: (170, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 5,000,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft

Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 39662 of 51975 converged

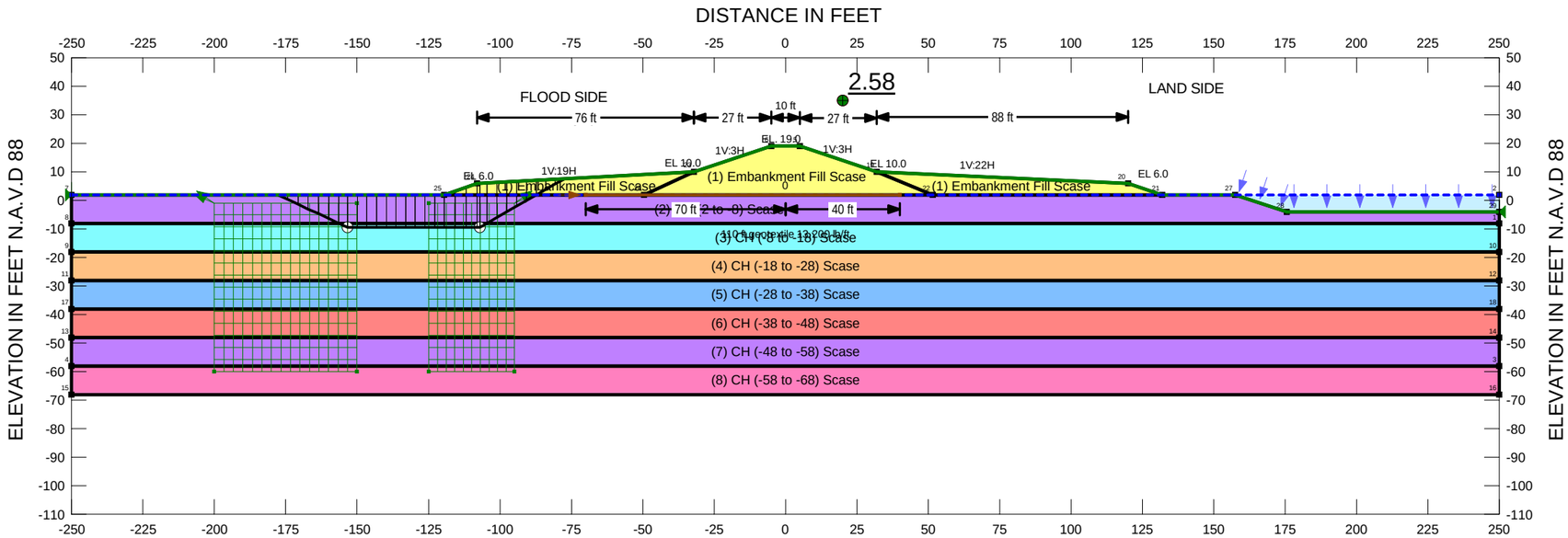
Current Slip Surface

Slip Surface: 31,171
Factor of Safety: 6.70
Volume: 10,191.106 ft³
Weight: 1,053,333.1 lbf

Resisting Moment: 17,376,018 lbf·ft
Activating Moment: 2,594,653.8 lbf·ft
Resisting Force: 221,239.05 lbf
Activating Force: 33,029.082 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (224.94792, -4) ft
Entry: (-79.663867, 7.4913754) ft
Radius: 116.65575 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-75.742619 ft	4.7456877 ft	-171.33091 psf	318.94795 psf	135.38537 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-64.68063 ft	-3 ft	312 psf	1,113.6968 psf	340.30012 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-53.519945 ft	-10.814796 ft	799.64327 psf	1,883.7992 psf	460.1969 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 4	-46.379205 ft	-15.814796 ft	1,111.6433 psf	2,406.575 psf	549.66592 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 5	-37.629205 ft	-21.941612 ft	1,493.9566 psf	3,084.1966 psf	675.01682 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 6	-30.488465 ft	-26.941612 ft	1,805.9566 psf	3,699.7885 psf	803.88394 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 7	-24.488465 ft	-31.142857 ft	2,068.1143 psf	4,360.4867 psf	973.05435 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 8	-12.5 ft	-34.285714 ft	2,264.2286 psf	5,365.111 psf	1,316.2465 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 9	0 ft	-34.285714 ft	2,264.2286 psf	5,653.1854 psf	1,438.5268 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 10	9.5 ft	-34.285714 ft	2,264.2286 psf	5,480.3408 psf	1,365.1586 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 11	18.5 ft	-34.285714 ft	2,264.2286 psf	5,134.6515 psf	1,218.4223 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 12	27.5 ft	-34.285714 ft	2,264.2286 psf	4,788.9623 psf	1,071.6859 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 13	36.875 ft	-34.285714 ft	2,264.2286 psf	4,590.5838 psf	987.47923 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 14	46.625 ft	-34.285714 ft	2,264.2286 psf	4,539.5161 psf	965.80226 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 15	56.392857 ft	-34.285714 ft	2,264.2286 psf	4,488.3549 psf	944.0856 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 16	66.178571 ft	-34.285714 ft	2,264.2286 psf	4,437.1001 psf	922.32923 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 17	75.964286 ft	-34.285714 ft	2,264.2286 psf	4,385.8453 psf	900.57286 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 18	85.75 ft	-34.285714 ft	2,264.2286 psf	4,334.5905 psf	878.8165 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 19	95.535714 ft	-34.285714 ft	2,264.2286 psf	4,283.3357 psf	857.06013 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 20	105.32143 ft	-34.285714 ft	2,264.2286 psf	4,232.0809 psf	835.30376 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 21	115.10714 ft	-34.285714 ft	2,264.2286 psf	4,180.8261 psf	813.5474 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 22	126 ft	-34.285714 ft	2,264.2286 psf	3,924.7393 psf	704.84497 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 23	136.25 ft	-34.285714 ft	2,264.2286 psf	3,694.2798 psf	607.02072 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 24	144.75 ft	-34.285714 ft	2,264.2286 psf	3,694.2798 psf	607.02072 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 25	153.25 ft	-34.285714 ft	2,264.2286 psf	3,694.2798 psf	607.02072 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 26	158.75 ft	-34.285714 ft	2,264.2286 psf	3,683.0299 psf	602.24544 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 27	166.73988 ft	-31.142857 ft	2,068.1143 psf	3,352.3908 psf	545.14302 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 28	174.48988 ft	-27.528973 ft	1,842.6079 psf	2,870.0808 psf	436.13639 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 29	180.35621 ft	-24.793459 ft	1,671.9119 psf	2,546.6146 psf	371.28929 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 30	190.06862 ft	-20.264486 ft	1,389.304 psf	2,033.6391 psf	273.50405 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 31	200.28609 ft	-15.5 ft	1,092 psf	1,520.1991 psf	181.75975 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 32	211.00863 ft	-10.5 ft	780 psf	1,006.2947 psf	96.056408 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 33	220.65891 ft	-6 ft	499.2 psf	564.74959 psf	27.824148 psf	0 psf	0 psf	(2) CH (2 to -8) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Block Front Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,483
Date: 07/18/2022
Time: 01:51:52 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/18/2022
Last Solved Time: 01:55:32 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) front

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 5 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 5,000,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+06 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-150, -1) ft
Lower Left: (-150, -60) ft
Lower Right: (-200, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (-125, -1) ft
Lower Left: (-125, -60) ft
Lower Right: (-95, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 5,000,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft

Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 5691 of 23760 converged

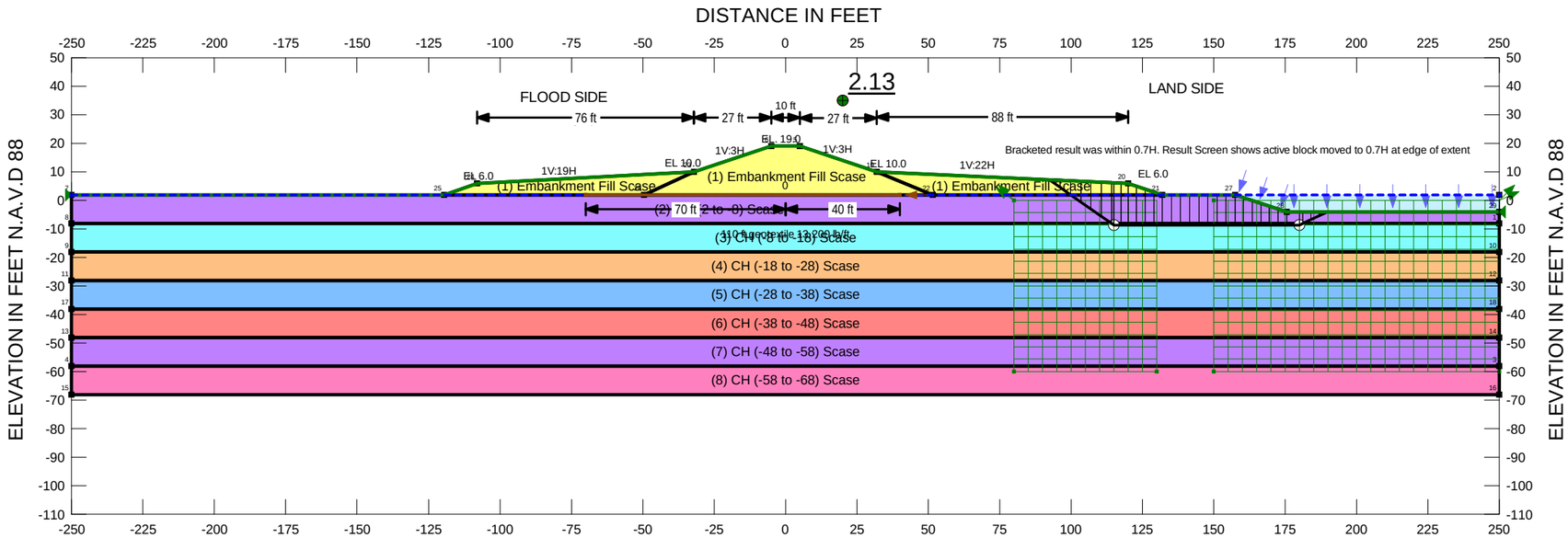
Current Slip Surface

Slip Surface: 3,353
Factor of Safety: 2.58
Volume: 924.97683 ft³
Weight: 87,506.628 lbf

Resisting Moment: 418,092.52 lbf·ft
Activating Moment: 162,188.43 lbf·ft
Resisting Force: 15,980.746 lbf
Activating Force: 6,200.9126 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-177.84198, 2) ft
Entry: (-77.496185, 7.6054639) ft
Radius: 39.76378 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-176.05489 ft	1.1666667 ft	52 psf	79.360121 psf	11.613682 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-172.48072 ft	-0.5 ft	156 psf	238.08036 psf	34.841047 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-168.90654 ft	-2.1666667 ft	260 psf	396.8006 psf	58.068412 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	-165.33236 ft	-3.8333333 ft	364 psf	555.52085 psf	81.295776 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	-161.75818 ft	-5.5 ft	468 psf	714.24109 psf	104.52314 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 6	-158.184 ft	-7.1666667 ft	572 psf	872.96133 psf	127.75051 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 7	-154.86512 ft	-8.7142857 ft	668.57143 psf	1,028.3792 psf	152.72933 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	-151.64167 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 9	-148.25833 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 10	-144.875 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 11	-141.49167 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 12	-138.10833 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 13	-134.725 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 14	-131.34167 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 15	-127.95833 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 16	-124.575 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 17	-121.19167 ft	-9.4285714 ft	713.14286 psf	1,045.8397 psf	141.22142 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 18	-117.58333 ft	-9.4285714 ft	713.14286 psf	1,123.1998 psf	174.05886 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 19	-113.75 ft	-9.4285714 ft	713.14286 psf	1,277.9202 psf	239.73375 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 20	-109.91667 ft	-9.4285714 ft	713.14286 psf	1,432.6405 psf	305.40865 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 21	-107.5 ft	-9.4285714 ft	713.14286 psf	1,513.0544 psf	339.54231 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 22	-105.76282 ft	-8.7142857 ft	668.57143 psf	1,344.6274 psf	286.96874 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 23	-102.79359 ft	-7 ft	561.6 psf	1,208.016 psf	274.38732 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 24	-99.329489 ft	-5 ft	436.8 psf	1,056.0947 psf	262.87501 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 25	-95.865388 ft	-3 ft	312 psf	904.17342 psf	251.36271 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 26	-92.401286 ft	-1 ft	187.2 psf	752.25212 psf	239.8504 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 27	-88.937184 ft	1 ft	62.4 psf	600.33082 psf	228.33809 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 28	-85.586976 ft	2.934244 ft	-58.296825 psf	436.97514 psf	185.48494 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 29	-82.350659 ft	4.802732 ft	-174.89047 psf	262.18508 psf	111.29097 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 30	-79.114343 ft	6.6712199 ft	-291.48412 psf	87.395028 psf	37.096989 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Block Front Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,496
Date: 07/19/2022
Time: 11:16:18 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 11:18:34 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) front

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 5,000,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+06 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (80, 0) ft
Lower Left: (80, -60) ft
Lower Right: (130, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (150, 0) ft
Lower Left: (150, -60) ft
Lower Right: (250, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 5,000,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft

Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 21751 of 51975 converged

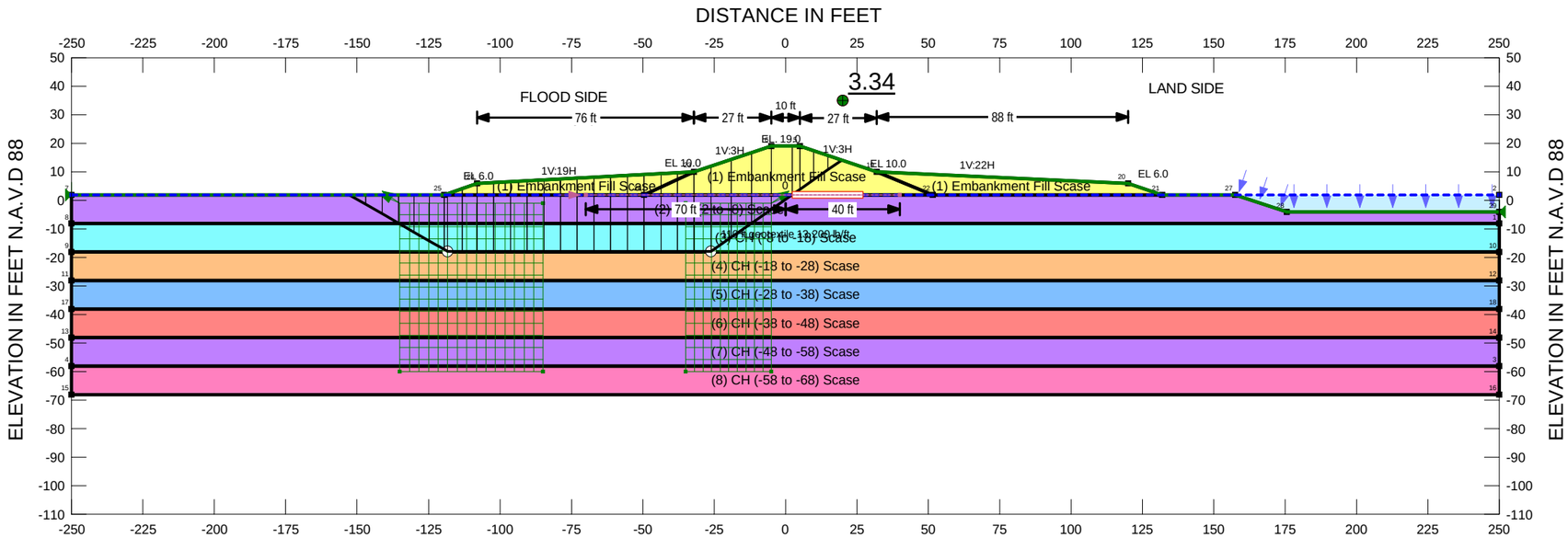
Current Slip Surface

Slip Surface: 9,376
Factor of Safety: 2.13

Volume: 840.35878 ft³
Weight: 79,309.717 lbf
Resisting Moment: 365,027.49 lbf·ft
Activating Moment: 170,736.84 lbf·ft
Resisting Force: 14,334.165 lbf
Activating Force: 6,729.9655 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (189.80346, -4) ft
Entry: (92.398039, 7.2546346) ft
Radius: 39.393495 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	94.274138 ft	5.9409759 ft	-245.9169 psf	120.20205 psf	51.022744 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	98.026336 ft	3.3136586 ft	-81.972299 psf	360.60616 psf	153.06823 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	101.68762 ft	0.75 ft	78 psf	576.91672 psf	211.77759 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	105.25799 ft	-1.75 ft	234 psf	769.13375 psf	227.1508 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	108.82836 ft	-4.25 ft	390 psf	961.35077 psf	242.52401 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 6	112.39873 ft	-6.75 ft	546 psf	1,153.5678 psf	257.89723 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 7	114.59196 ft	-8.2857143 ft	641.82857 psf	1,274.0751 psf	268.37274 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	116.25 ft	-8.5714286 ft	659.65714 psf	1,447.9109 psf	334.59389 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 9	118.75 ft	-8.5714286 ft	659.65714 psf	1,434.655 psf	328.96707 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 10	121.5 ft	-8.5714286 ft	659.65714 psf	1,369.7008 psf	301.39565 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 11	124.5 ft	-8.5714286 ft	659.65714 psf	1,253.0484 psf	251.87964 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 12	127.5 ft	-8.5714286 ft	659.65714 psf	1,136.396 psf	202.36363 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 13	130.5 ft	-8.5714286 ft	659.65714 psf	1,019.7436 psf	152.84762 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 14	133.59375 ft	-8.5714286 ft	659.65714 psf	961.41737 psf	128.08962 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 15	136.78125 ft	-8.5714286 ft	659.65714 psf	961.41737 psf	128.08962 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 16	139.96875 ft	-8.5714286 ft	659.65714 psf	961.41737 psf	128.08962 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 17	143.15625 ft	-8.5714286 ft	659.65714 psf	961.41737 psf	128.08962 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 18	146.34375 ft	-8.5714286 ft	659.65714 psf	961.41737 psf	128.08962 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 19	149.53125 ft	-8.5714286 ft	659.65714 psf	961.41737 psf	128.08962 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 20	152.71875 ft	-8.5714286 ft	659.65714 psf	961.41737 psf	128.08962 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 21	155.90625 ft	-8.5714286 ft	659.65714 psf	961.41737 psf	128.08962 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 22	159 ft	-8.5714286 ft	659.65714 psf	948.16985 psf	122.46638 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 23	162 ft	-8.5714286 ft	659.65714 psf	921.67481 psf	111.2199 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 24	165 ft	-8.5714286 ft	659.65714 psf	895.17978 psf	99.973426 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 25	168 ft	-8.5714286 ft	659.65714 psf	868.68474 psf	88.726951 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 26	171 ft	-8.5714286 ft	659.65714 psf	842.1897 psf	77.480475 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 27	174 ft	-8.5714286 ft	659.65714 psf	815.69467 psf	66.233999 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 28	177.75 ft	-8.5714286 ft	659.65714 psf	793.4379 psf	56.78656 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 29	180.61272 ft	-8.2857143 ft	641.82857 psf	807.52762 psf	70.335072 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 30	182.6551 ft	-7.3333333 ft	582.4 psf	711.90381 psf	54.971108 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 31	185.51445 ft	-6 ft	499.2 psf	582.68358 psf	35.436677 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 32	188.37379 ft	-4.6666667 ft	416 psf	453.46335 psf	15.902247 psf	0 psf	0 psf	(2) CH (2 to -8) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Block Through Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,483
Date: 07/18/2022
Time: 01:51:52 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/18/2022
Last Solved Time: 01:55:18 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) through

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-85, -1) ft
Lower Left: (-85, -60) ft
Lower Right: (-135, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (-35, -1) ft
Lower Left: (-35, -60) ft
Lower Right: (-5, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Slip Surface Intersection: (2.358939, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 37.641061 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft

Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 21241 of 23760 converged

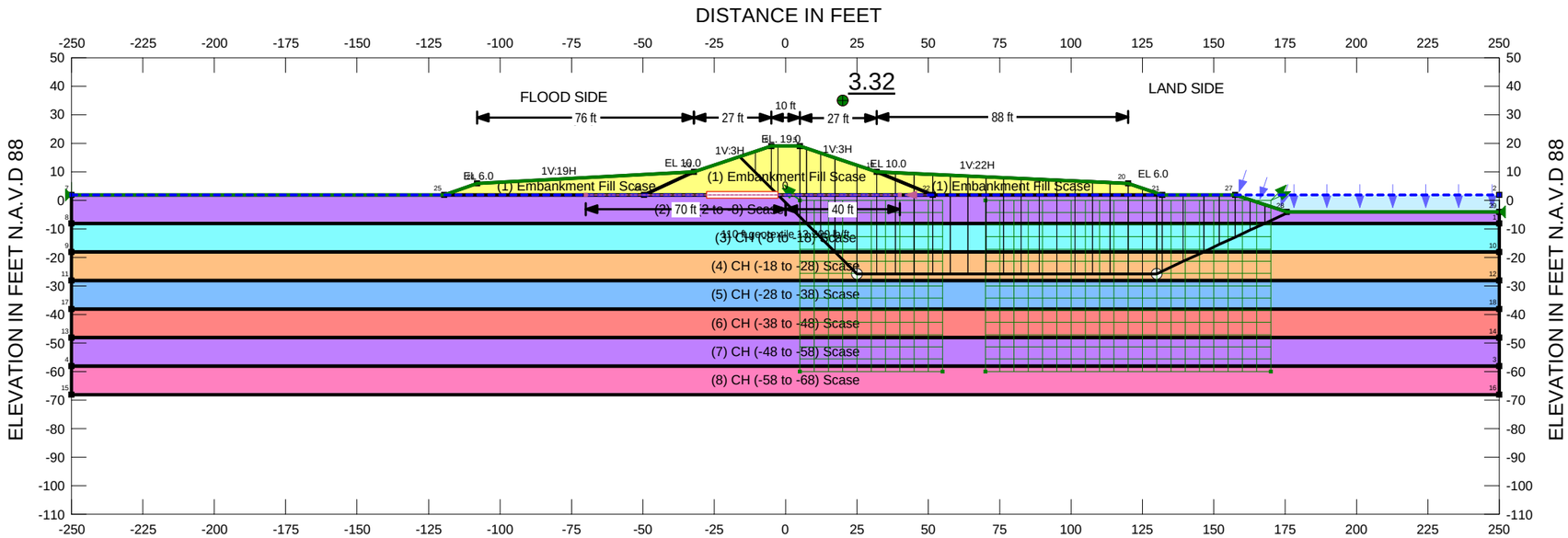
Current Slip Surface

Slip Surface: 7,371
Factor of Safety: 3.34
Volume: 3,551.6244 ft³
Weight: 357,660.53 lbf

Resisting Moment: 3,997,491.2 lbf·ft
Activating Moment: 1,198,378.4 lbf·ft
Resisting Force: 84,665.248 lbf
Activating Force: 25,380.287 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-152.72691, 2) ft
Entry: (19.659032, 14.113656) ft
Radius: 69.59114 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-149.84016 ft	0.33333333 ft	104 psf	158.55811 psf	23.158543 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-144.06666 ft	-3 ft	312 psf	475.67432 psf	69.475628 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-138.29316 ft	-6.3333333 ft	520 psf	792.79054 psf	115.79271 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	-132.75534 ft	-9.5305946 ft	719.5091 psf	1,114.0831 psf	167.48673 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 5	-127.4532 ft	-12.591784 ft	910.52731 psf	1,439.5521 psf	224.55768 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 6	-122.15107 ft	-15.652973 ft	1,101.5455 psf	1,765.021 psf	281.62863 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 7	-118.91667 ft	-17.520355 ft	1,218.0702 psf	2,016.229 psf	338.79833 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	-115.75 ft	-17.857143 ft	1,239.0857 psf	2,045.8222 psf	342.43932 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 9	-110.58333 ft	-17.857143 ft	1,239.0857 psf	2,253.7117 psf	430.6832 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 10	-105.075 ft	-17.857143 ft	1,239.0857 psf	2,374.8351 psf	482.09703 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 11	-99.225 ft	-17.857143 ft	1,239.0857 psf	2,410.4526 psf	497.21572 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 12	-93.375 ft	-17.857143 ft	1,239.0857 psf	2,446.07 psf	512.33442 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 13	-87.525 ft	-17.857143 ft	1,239.0857 psf	2,481.6874 psf	527.45311 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 14	-81.675 ft	-17.857143 ft	1,239.0857 psf	2,517.3048 psf	542.5718 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 15	-75.825 ft	-17.857143 ft	1,239.0857 psf	2,552.9222 psf	557.6905 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 16	-69.975 ft	-17.857143 ft	1,239.0857 psf	2,588.5396 psf	572.80919 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 17	-64.125 ft	-17.857143 ft	1,239.0857 psf	2,624.157 psf	587.92788 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 18	-58.275 ft	-17.857143 ft	1,239.0857 psf	2,659.7744 psf	603.04658 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 19	-52.425 ft	-17.857143 ft	1,239.0857 psf	2,695.3918 psf	618.16527 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 20	-46.583333 ft	-17.857143 ft	1,239.0857 psf	2,730.9721 psf	633.2682 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 21	-40.75 ft	-17.857143 ft	1,239.0857 psf	2,766.488 psf	648.34382 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 22	-34.916667 ft	-17.857143 ft	1,239.0857 psf	2,802.004 psf	663.41944 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 23	-29 ft	-17.857143 ft	1,239.0857 psf	2,935.3097 psf	720.00437 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 24	-22.480635 ft	-15.392857 ft	1,085.3143 psf	2,705.6828 psf	687.80561 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 25	-15.441906 ft	-10.464286 ft	777.77143 psf	2,482.7986 psf	723.74109 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 26	-8.4612705 ft	-5.5763923 ft	472.76688 psf	2,283.5374 psf	768.6265 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 27	-1.3205305 ft	-0.57639228 ft	160.76688 psf	1,975.6002 psf	770.35106 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 28	3.6794695 ft	2.9246454 ft	-57.697874 psf	1,666.469 psf	707.37414 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 29	7.4431721 ft	5.5600183 ft	-222.14514 psf	1,301.4603 psf	552.43713 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 30	12.329516 ft	8.9814733 ft	-435.64394 psf	780.87619 psf	331.46228 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 31	17.21586 ft	12.402928 ft	-649.14273 psf	260.29206 psf	110.48743 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Block Through Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,483
Date: 07/18/2022
Time: 01:51:52 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/18/2022
Last Solved Time: 01:54:06 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) through

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (5, 0) ft
Lower Left: (5, -60) ft
Lower Right: (55, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (70, 0) ft
Lower Left: (70, -60) ft
Lower Right: (170, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-2.7142857, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 67.285714 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft

Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

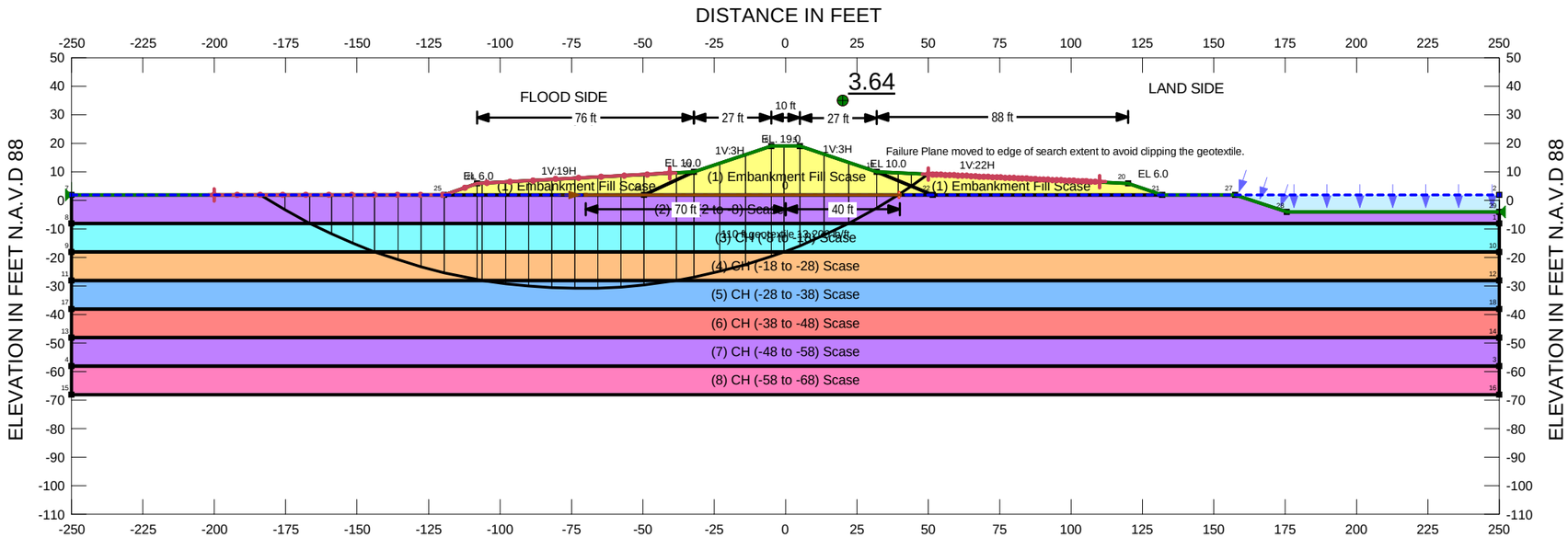
Slip Surfaces Analysed: 36883 of 51975 converged

Current Slip Surface

Slip Surface: 22,111
Factor of Safety: 3.32
Volume: 5,156.6983 ft³
Weight: 525,124.15 lbf
Resisting Moment: 7,395,874.1 lbf·ft
Activating Moment: 2,230,719 lbf·ft
Resisting Force: 113,874.4 lbf
Activating Force: 34,343.699 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (176.56644, -4) ft
Entry: (-16.035714, 15.321429) ft
Radius: 80.545739 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-13.276786 ft	12.5625 ft	-659.1 psf	359.53789 psf	152.61478 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-7.7589286 ft	7.0446429 ft	-314.78571 psf	1,078.6137 psf	457.84434 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	-3.8571429 ft	3.1428571 ft	-71.314286 psf	1,561.2452 psf	662.70929 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	1.1428571 ft	-1.8571429 ft	240.68571 psf	1,984.6974 psf	740.28906 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	6.1428571 ft	-6.8571429 ft	552.68571 psf	2,369.995 psf	771.40202 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 6	9.7857143 ft	-10.5 ft	780 psf	2,568.3788 psf	759.12174 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 7	14.785714 ft	-15.5 ft	1,092 psf	2,862.4906 psf	751.52865 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	21.142857 ft	-21.857143 ft	1,488.6857 psf	3,267.3821 psf	755.01181 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 9	28.5 ft	-25.714286 ft	1,729.3714 psf	3,822.0501 psf	888.28941 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 10	35.25 ft	-25.714286 ft	1,729.3714 psf	3,670.1474 psf	823.81053 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 11	41.75 ft	-25.714286 ft	1,729.3714 psf	3,635.9259 psf	809.28437 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 12	48.25 ft	-25.714286 ft	1,729.3714 psf	3,601.7044 psf	794.7582 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 13	54.613636 ft	-25.714286 ft	1,729.3714 psf	3,568.4088 psf	780.62504 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 14	60.840909 ft	-25.714286 ft	1,729.3714 psf	3,535.6231 psf	766.70836 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 15	67.068182 ft	-25.714286 ft	1,729.3714 psf	3,502.8375 psf	752.79168 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 16	73.295455 ft	-25.714286 ft	1,729.3714 psf	3,470.0519 psf	738.87501 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 17	79.522727 ft	-25.714286 ft	1,729.3714 psf	3,437.2662 psf	724.95833 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 18	85.75 ft	-25.714286 ft	1,729.3714 psf	3,404.4806 psf	711.04165 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 19	91.977273 ft	-25.714286 ft	1,729.3714 psf	3,371.6949 psf	697.12497 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 20	98.204545 ft	-25.714286 ft	1,729.3714 psf	3,338.9093 psf	683.2083 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 21	104.43182 ft	-25.714286 ft	1,729.3714 psf	3,306.1237 psf	669.29162 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 22	110.65909 ft	-25.714286 ft	1,729.3714 psf	3,273.338 psf	655.37494 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 23	116.88636 ft	-25.714286 ft	1,729.3714 psf	3,240.5524 psf	641.45826 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 24	122.5 ft	-25.714286 ft	1,729.3714 psf	3,128.8537 psf	594.045 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 25	127.5 ft	-25.714286 ft	1,729.3714 psf	2,935.8094 psf	512.10252 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 26	131 ft	-25.247978 ft	1,700.2738 psf	2,907.1 psf	512.26731 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 27	135.63583 ft	-23.086253 ft	1,565.3822 psf	2,595.7794 psf	437.37768 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 28	142.9075 ft	-19.695418 ft	1,353.7941 psf	2,200.2171 psf	359.28526 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 29	149.2825 ft	-16.722706 ft	1,168.2969 psf	1,867.5112 psf	296.79886 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 30	154.76083 ft	-14.168119 ft	1,008.8906 psf	1,597.6617 psf	249.91848 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 31	160.1221 ft	-11.668119 ft	852.89062 psf	1,308.1036 psf	193.22645 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 32	165.36631 ft	-9.2227063 ft	700.29687 psf	998.83696 psf	126.72275 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 33	171.7442 ft	-6.2486436 ft	514.71536 psf	642.01818 psf	54.036841 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 34	176.03322 ft	-4.2486436 ft	389.91536 psf	408.64494 psf	7.9502346 psf	0 psf	0 psf	(2) CH (2 to -8) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Circular Around Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (FS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,499
Date: 10/20/2022
Time: 02:41:12 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 10/20/2022
Last Solved Time: 02:41:36 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (FS) around

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings

Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 5,000,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+06 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-200, 2) ft
Left-Zone Right Coordinate: (-40.4285, 9.556395) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (50, 9.181818) ft
Right-Zone Right Coordinate: (110.00024, 6.454535) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Slip Surface Intersection: (39.543025, 2) ft
Max. Pullout Force: 5,000,000 lbf
Available Length: 0.45697472 ft
Required Length: 0.45697472 ft
Pullout Force: 242.1966 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Pullout Resistance

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft

Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

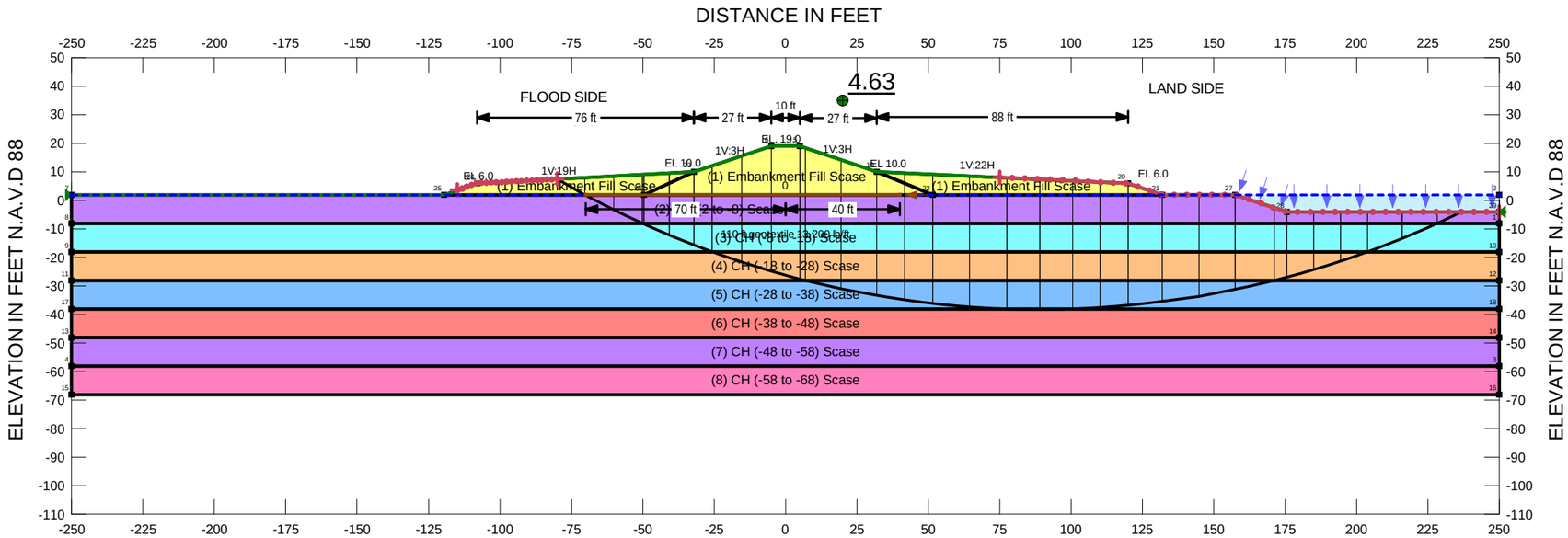
Slip Surfaces Analysed: 8345 of 26691 converged

Current Slip Surface

Slip Surface: 2,552
Factor of Safety: 3.64
Volume: 6,388.0344 ft³
Weight: 651,762.61 lbf
Resisting Moment: 9,132,628.3 lbf·ft
Activating Moment: 2,506,735.9 lbf·ft
Resisting Force: 143,206.87 lbf
Activating Force: 39,323.939 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (-183.96592, 2) ft
Entry: (50, 9.1818182) ft
Radius: 206.73163 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-179.62632 ft	-0.64007488 ft	164.74067 psf	250.76427 psf	36.514849 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-170.94712 ft	-5.6400749 ft	476.74067 psf	721.3808 psf	103.84357 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-162.81471 ft	-9.8498007 ft	739.42756 psf	1,133.362 psf	167.21526 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 4	-155.22909 ft	-13.363071 ft	958.65564 psf	1,494.8936 psf	227.6195 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 5	-147.64347 ft	-16.51327 ft	1,155.2281 psf	1,815.7436 psf	280.37221 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 6	-139.79222 ft	-19.404177 ft	1,335.6206 psf	2,122.0231 psf	333.80806 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 7	-131.67533 ft	-22.027507 ft	1,499.3164 psf	2,411 psf	386.98673 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 8	-123.55844 ft	-24.287512 ft	1,640.3408 psf	2,656.7305 psf	431.43183 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 9	-113.75 ft	-26.508261 ft	1,778.9155 psf	3,133.1002 psf	574.81731 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 10	-107.08905 ft	-27.844078 ft	1,862.2705 psf	3,516.1246 psf	702.01942 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 11	-102.12967 ft	-28.592242 ft	1,908.9559 psf	3,621.6064 psf	726.97702 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 12	-94.032801 ft	-29.614298 ft	1,972.7322 psf	3,770.9059 psf	763.27947 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 13	-85.935928 ft	-30.313525 ft	2,016.364 psf	3,883.2477 psf	792.44512 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 14	-77.839055 ft	-30.693207 ft	2,040.0561 psf	3,959.3653 psf	814.6984 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 15	-69.742182 ft	-30.755106 ft	2,043.9186 psf	3,999.7981 psf	830.22157 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 16	-61.645309 ft	-30.49951 ft	2,027.9694 psf	4,004.9049 psf	839.15932 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 17	-53.548436 ft	-29.925233 ft	1,992.1345 psf	3,974.8726 psf	841.62236 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 18	-43.872391 ft	-28.779092 ft	1,920.6153 psf	3,888.7445 psf	835.42127 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 19	-35.122391 ft	-27.430514 ft	1,836.4641 psf	3,777.2278 psf	823.80532 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 20	-27.5 ft	-25.863924 ft	1,738.7089 psf	3,778.9123 psf	866.01499 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 21	-18.5 ft	-23.655758 ft	1,600.9193 psf	3,855.3914 psf	956.96666 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 22	-9.5 ft	-21.011718 ft	1,435.9312 psf	3,881.8491 psf	1,038.2305 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 23	-2.7861168 ft	-18.789371 ft	1,297.2567 psf	3,792.2643 psf	1,059.0679 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 24	2.2138832 ft	-16.924755 ft	1,180.9047 psf	3,591.2578 psf	1,023.1342 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 25	9.2961577 ft	-14.005813 ft	998.76274 psf	3,136.4921 psf	907.41227 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 26	17.888473 ft	-10.081058 ft	753.85803 psf	2,431.7958 psf	712.24233 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 27	27.092315 ft	-5.3109123 ft	456.20093 psf	1,656.2538 psf	509.39222 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 28	35.771513 ft	-0.31091227 ft	144.20093 psf	1,022.8717 psf	372.9736 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 29	41.831586 ft	3.5138159 ft	-94.462113 psf	631.08636 psf	267.88027 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 30	47.060074 ft	7.104725 ft	-318.53484 psf	229.47569 psf	97.406651 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Circular Around Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS) around

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Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,495
Date: 07/19/2022
Time: 11:07:07 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 11:07:48 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS) around

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 5,000,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+06 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-114.91681, 3.594153) ft
Left-Zone Right Coordinate: (-80, 7.473684) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (75.06576, 8.042465) ft
Right-Zone Right Coordinate: (250, -4) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 5,000,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft

Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

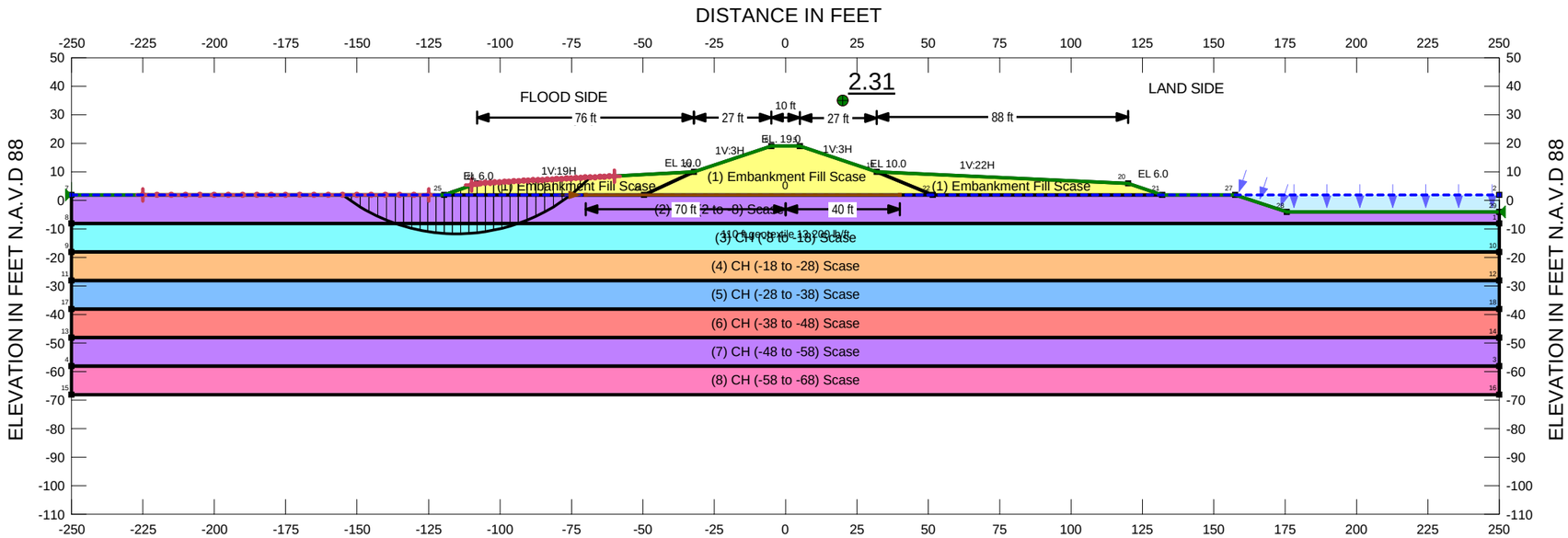
Slip Surfaces Analysed: 16286 of 26691 converged

Current Slip Surface

Slip Surface: 26,575
Factor of Safety: 4.63
Volume: 9,873.5678 ft³
Weight: 1,018,436.4 lbf
Resisting Moment: 16,246,092 lbf·ft
Activating Moment: 3,510,007.9 lbf·ft
Resisting Force: 213,842.64 lbf
Activating Force: 46,171.525 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (236.75474, -4) ft
Entry: (-80, 7.4736842) ft
Radius: 335.88091 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-75.11768 ft	4.7368421 ft	-170.77895 psf	322.89875 psf	137.06239 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-65.199122 ft	-0.60510252 ft	162.5584 psf	905.59677 psf	315.40107 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-55.126644 ft	-5.6051025 ft	474.5584 psf	1,405.4225 psf	395.12836 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	-49.795203 ft	-8.1340714 ft	632.36605 psf	1,661.899 psf	437.01081 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 5	-45.125 ft	-10.175579 ft	759.75616 psf	1,890.0991 psf	479.80209 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 6	-36.375 ft	-13.845103 ft	988.73444 psf	2,303.8735 psf	558.24341 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 7	-28.808866 ft	-16.803595 ft	1,173.3443 psf	2,740.7879 psf	665.34033 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	-20.463299 ft	-19.778863 ft	1,359.001 psf	3,363.516 psf	850.86611 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 9	-10.154433 ft	-23.152267 ft	1,569.5014 psf	4,118.8694 psf	1,082.1425 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 10	0 ft	-26.122588 ft	1,754.8495 psf	4,643.4981 psf	1,226.1586 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 11	5.9820561 ft	-27.749184 ft	1,856.3491 psf	4,790.786 psf	1,245.5946 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 12	13.223084 ft	-29.451675 ft	1,962.5845 psf	4,714.2794 psf	1,168.0252 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 13	25.741028 ft	-32.105769 ft	2,128.2 psf	4,548.2609 psf	1,027.2549 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 14	36.875 ft	-34.075563 ft	2,251.1151 psf	4,514.2097 psf	960.62666 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 15	46.625 ft	-35.46444 ft	2,337.7811 psf	4,625.8409 psf	971.22376 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 16	58.025014 ft	-36.692288 ft	2,414.3988 psf	4,713.3139 psf	975.83156 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 17	71.075041 ft	-37.649317 ft	2,474.1174 psf	4,764.4157 psf	972.17398 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 18	83.348704 ft	-38.098418 ft	2,502.1413 psf	4,762.7459 psf	959.56974 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 19	94.846003 ft	-38.098418 ft	2,502.1413 psf	4,714.6737 psf	939.1643 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 20	105.44599 ft	-37.763561 ft	2,481.2462 psf	4,633.0965 psf	913.40625 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 21	115.14866 ft	-37.149671 ft	2,442.9395 psf	4,523.8746 psf	883.30455 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 22	126 ft	-36.108886 ft	2,377.9945 psf	4,159.7998 psf	756.33148 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 23	138.375 ft	-34.499857 ft	2,277.5911 psf	3,757.0816 psf	628.00645 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 24	151.125 ft	-32.356045 ft	2,143.8172 psf	3,528.0691 psf	587.58007 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 25	164.3653 ft	-29.578965 ft	1,970.5274 psf	3,163.7419 psf	506.48949 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 26	173.3653 ft	-27.446724 ft	1,837.4756 psf	2,846.995 psf	428.51558 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 27	180.21874 ft	-25.563266 ft	1,719.9478 psf	2,615.4926 psf	380.13621 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 28	189.65622 ft	-22.752254 ft	1,544.5407 psf	2,304.1461 psf	322.43336 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 29	199.0937 ft	-19.635713 ft	1,350.0685 psf	1,956.8941 psf	257.58219 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 30	209.93061 ft	-15.640536 ft	1,100.7694 psf	1,533.7846 psf	183.80404 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 31	222.16694 ft	-10.640536 ft	788.76943 psf	1,022.3725 psf	99.158602 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 32	232.51993 ft	-6 ft	499.2 psf	565.96367 psf	28.339495 psf	0 psf	0 psf	(2) CH (2 to -8) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Circular Front Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (FS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,488
Date: 07/18/2022
Time: 02:18:16 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/18/2022
Last Solved Time: 02:20:12 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (FS) front

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 5,000,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+06 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-225, 2) ft
Left-Zone Right Coordinate: (-125, 2) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (-110, 5.304348) ft
Right-Zone Right Coordinate: (-60, 8.526316) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 5,000,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft

Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

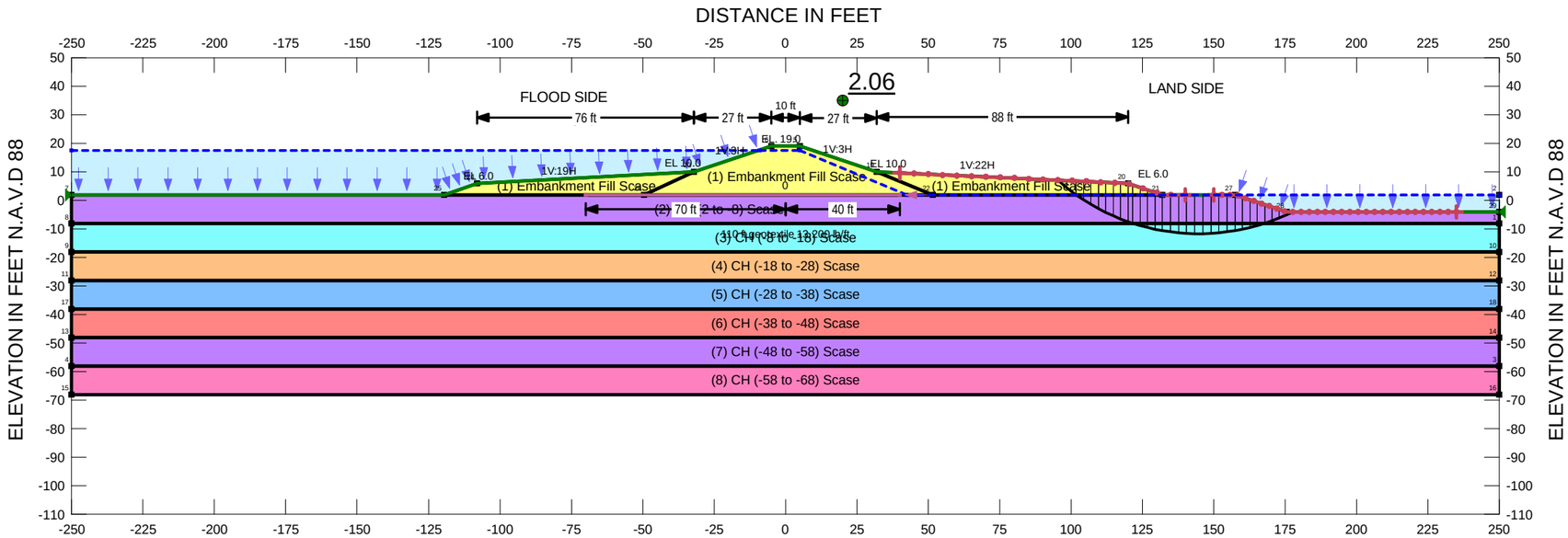
Slip Surfaces Analysed: 5503 of 20181 converged

Current Slip Surface

Slip Surface: 14,242
Factor of Safety: 2.31
Volume: 946.6279 ft³
Weight: 91,329.553 lbf
Resisting Moment: 490,999.16 lbf·ft
Activating Moment: 211,893.01 lbf·ft
Resisting Force: 18,447.766 lbf
Activating Force: 7,991.3919 lbf
Slip Rank: 1 of 20,181 slip surfaces
Exit: (-155, 2) ft
Entry: (-68.352434, 8.086714) ft
Radius: 65.11493 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-153.47026 ft	0.88248123 ft	69.733171 psf	112.16931 psf	18.013072 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-150.41078 ft	-1.2238758 ft	201.16985 psf	319.14014 psf	50.075416 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-147.3513 ft	-3.086176 ft	317.37738 psf	497.49373 psf	76.454853 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	-144.29182 ft	-4.7279848 ft	419.82625 psf	651.15377 psf	98.192706 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	-141.23234 ft	-6.167604 ft	509.65849 psf	783.00638 psf	116.0293 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 6	-138.17285 ft	-7.4194381 ft	587.77294 psf	895.2339 psf	130.50944 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 7	-135.21452 ft	-8.4647487 ft	653.00032 psf	992.04977 psf	143.91796 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	-132.35734 ft	-9.3228567 ft	706.54626 psf	1,074.8196 psf	156.32277 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 9	-129.50015 ft	-10.040827 ft	751.3476 psf	1,142.1832 psf	165.89986 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 10	-126.64296 ft	-10.623382 ft	787.69903 psf	1,194.9561 psf	172.87038 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 11	-123.78578 ft	-11.074198 ft	815.82996 psf	1,233.7942 psf	177.4153 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 12	-120.92859 ft	-11.396029 ft	835.91223 psf	1,259.2207 psf	179.68376 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 13	-118.0625 ft	-11.591008 ft	848.07887 psf	1,330.5315 psf	204.78901 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 14	-115.1875 ft	-11.659491 ft	852.35225 psf	1,445.9952 psf	251.98647 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 15	-112.3125 ft	-11.60088 ft	848.69493 psf	1,546.2935 psf	296.11301 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 16	-109.4375 ft	-11.414829 ft	837.08536 psf	1,631.6331 psf	337.26549 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 17	-106.55087 ft	-11.098433 ft	817.34225 psf	1,654.1455 psf	355.20193 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 18	-103.6526 ft	-10.648714 ft	789.27977 psf	1,615.3019 psf	350.62558 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 19	-100.75433 ft	-10.0636 ft	752.76861 psf	1,563.3808 psf	344.08448 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 20	-97.856065 ft	-9.3392949 ft	707.572 psf	1,498.1827 psf	335.59433 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 21	-94.957798 ft	-8.4709033 ft	653.38437 psf	1,419.4149 psf	325.16065 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 22	-91.978924 ft	-7.4194381 ft	587.77294 psf	1,329.0439 psf	314.65087 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 23	-88.919443 ft	-6.167604 ft	509.65849 psf	1,226.3232 psf	304.20612 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 24	-85.859962 ft	-4.7279848 ft	419.82625 psf	1,108.0295 psf	292.12496 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice	-82.800481	-3.086176	317.37738	973.1995	278.37997	0 psf	0 psf	(2) CH (2 to
25	ft	ft	psf	psf	psf			-8) Scase
Slice 26	-79.741 ft	-1.2238758 ft	201.16985 psf	820.61015 psf	262.93681 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 27	-76.681519 ft	0.88248123 ft	69.733171 psf	648.69885 psf	245.75635 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 28	-73.451942 ft	3.4143676 ft	-88.256536 psf	423.95492 psf	179.95819 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 29	-70.05227 ft	6.4577246 ft	-278.16201 psf	144.41778 psf	61.30171 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Circular Front Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,488
Date: 07/18/2022
Time: 02:18:16 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/18/2022
Last Solved Time: 02:19:58 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS) front

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (40, 9.636364) ft
Left-Zone Right Coordinate: (140, 2) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (150, 2) ft
Right-Zone Right Coordinate: (235, -4) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 13,200 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft

Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

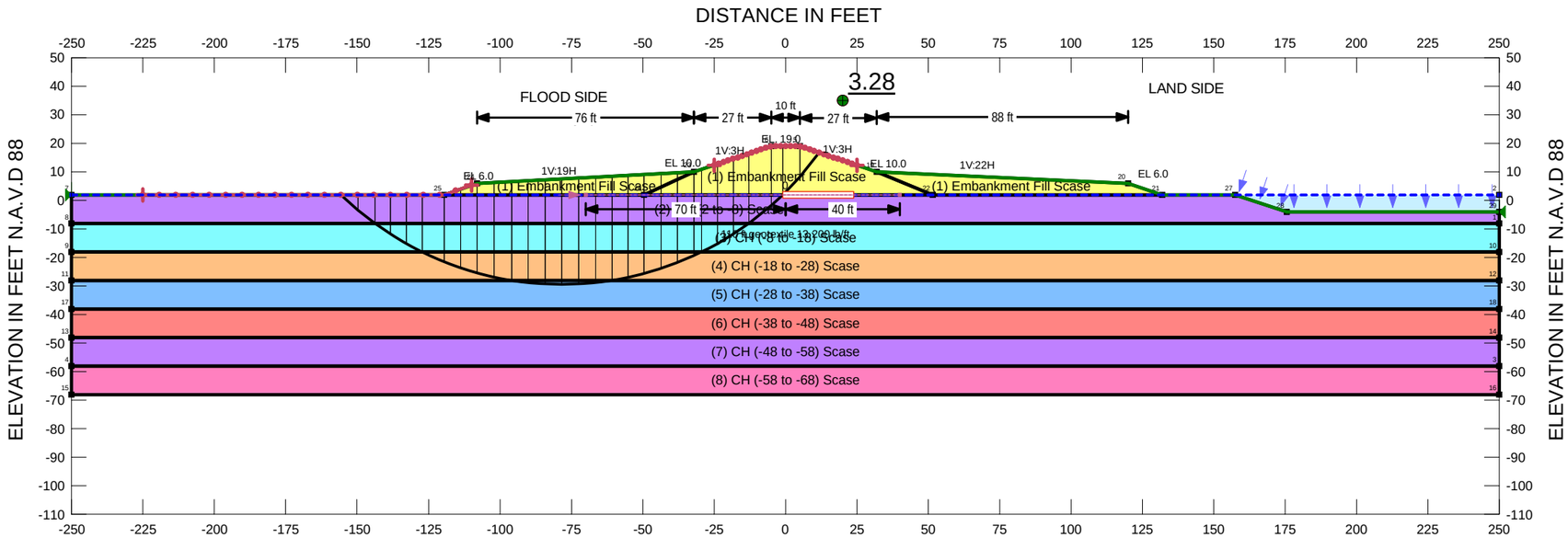
Slip Surfaces Analysed: 11372 of 20181 converged

Current Slip Surface

Slip Surface: 10,892
Factor of Safety: 2.06
Volume: 821.61001 ft³
Weight: 78,100.458 lbf
Resisting Moment: 362,251.8 lbf·ft
Activating Moment: 175,313.29 lbf·ft
Resisting Force: 13,987.176 lbf
Activating Force: 6,784.406 lbf
Slip Rank: 1 of 20,181 slip surfaces
Exit: (177.68422, -4) ft
Entry: (95.345297, 7.1206683) ft
Radius: 74.255981 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	96.952511 ft	5.7677922 ft	-235.11023 psf	120.50853 psf	51.152834 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	100.16694 ft	3.207458 ft	-75.345379 psf	355.23191 psf	150.787 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	103.076 ft	1.1168802 ft	55.106672 psf	540.08749 psf	205.86214 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	105.67969 ft	-0.57203601 ft	160.49505 psf	676.93952 psf	219.21767 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	108.28338 ft	-2.1120225 ft	256.5902 psf	802.31968 psf	231.64842 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 6	110.88708 ft	-3.5135229 ft	344.04383 psf	916.86684 psf	243.14894 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 7	113.49077 ft	-4.7852057 ft	423.39683 psf	1,021.1144 psf	253.71604 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 8	116.09446 ft	-5.9343184 ft	495.10147 psf	1,115.5087 psf	263.34723 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 9	118.69815 ft	-6.9669514 ft	559.53777 psf	1,200.4231 psf	272.0397 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 10	120.79979 ft	-7.727422 ft	606.99113 psf	1,238.4908 psf	268.05569 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 11	122.89963 ft	-8.4003964 ft	648.98474 psf	1,232.3518 psf	247.62461 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 12	125.49974 ft	-9.1498623 ft	695.75141 psf	1,218.7171 psf	221.98575 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 13	128.09984 ft	-9.7981537 ft	736.20479 psf	1,194.0316 psf	194.33593 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 14	130.69995 ft	-10.347974 ft	770.51357 psf	1,158.4413 psf	164.66553 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 15	133.41667 ft	-10.817447 ft	799.80868 psf	1,162.3133 psf	153.87409 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 16	136.25 ft	-11.199639 ft	823.65749 psf	1,206.3359 psf	162.43734 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 17	139.08333 ft	-11.471452 ft	840.6186 psf	1,239.8758 psf	169.47464 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 18	141.91667 ft	-11.6341 ft	850.76785 psf	1,262.8995 psf	174.93953 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 19	144.75 ft	-11.688302 ft	854.15006 psf	1,275.325 psf	178.77815 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 20	147.58333 ft	-11.634296 ft	850.78008 psf	1,277.0199 psf	180.92808 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 21	150.41667 ft	-11.471845 ft	840.64313 psf	1,267.7987 psf	181.31678 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 22	153.25 ft	-11.200231 ft	823.69441 psf	1,247.4177 psf	179.85985 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 23	156.08333 ft	-10.81824 ft	799.85817 psf	1,215.569 psf	176.45876 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 24	158.80069 ft	-10.348828 ft	770.56686 psf	1,161.9954 psf	166.15154 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 25	161.40208 ft	-9.7988801 ft	736.25012 psf	1,086.838 psf	148.81571 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 26	164.00347 ft	-9.1503668 ft	695.78289 psf	1,000.3037 psf	129.26144 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 27	166.60486 ft	-8.4005812 ft	648.99627 psf	901.83458 psf	107.3235 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 28	169.17129 ft	-7.5591738 ft	596.49244 psf	797.39181 psf	85.27672 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 29	171.70278 ft	-6.625253 ft	538.21578 psf	687.3751 psf	63.314372 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 30	174.23426 ft	-5.5845074 ft	473.27326 psf	565.34549 psf	39.082342 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 31	176.59211 ft	-4.5184283 ft	406.74992 psf	440.58484 psf	14.362072 psf	0 psf	0 psf	(2) CH (2 to -8) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Circular Through Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (FS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,483
Date: 07/18/2022
Time: 01:51:52 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/18/2022
Last Solved Time: 01:55:04 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (FS) through

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-225, 2) ft
Left-Zone Right Coordinate: (-110, 5.304348) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (-25, 12.333333) ft
Right-Zone Right Coordinate: (25, 12.333333) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Slip Surface Intersection: (-0.90826177, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 40.908262 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft

Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

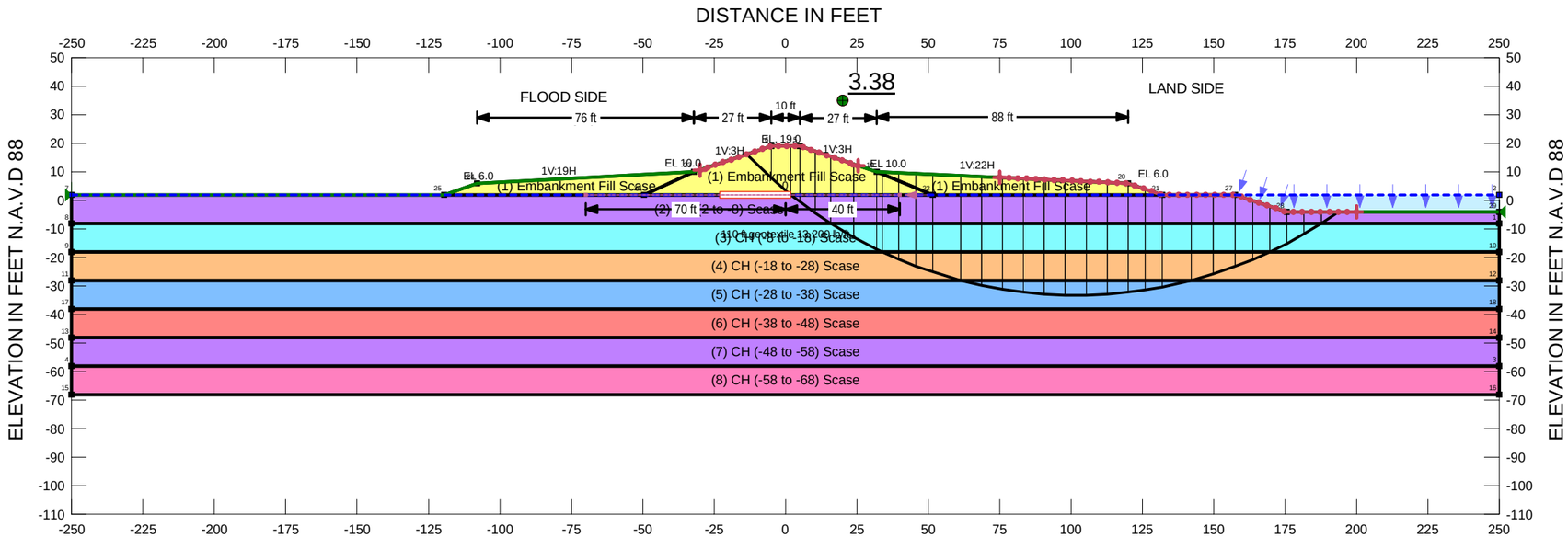
Slip Surfaces Analysed: 8530 of 20181 converged

Current Slip Surface

Slip Surface: 12,230
Factor of Safety: 3.28
Volume: 4,343.8597 ft³
Weight: 442,633.75 lbf
Resisting Moment: 5,577,877 lbf·ft
Activating Moment: 1,699,122.3 lbf·ft
Resisting Force: 97,101.12 lbf
Activating Force: 29,579.609 lbf
Slip Rank: 1 of 20,181 slip surfaces
Exit: (-155.66504, 2) ft
Entry: (11.803511, 16.732163) ft
Radius: 111.02373 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-152.70465 ft	-0.67706328 ft	167.04875 psf	268.25938 psf	42.961364 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-146.78387 ft	-5.6770633 ft	479.04875 psf	757.35588 psf	118.13437 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-141.0703 ft	-9.8890024 ft	741.87375 psf	1,180.2889 psf	186.09619 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 4	-135.56394 ft	-13.437009 ft	963.26936 psf	1,550.6755 psf	249.33912 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 5	-130.05757 ft	-16.548007 ft	1,157.3956 psf	1,868.5656 psf	301.87376 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 6	-123.40219 ft	-19.736979 ft	1,356.3875 psf	2,206.1184 psf	360.68938 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 7	-116.625 ft	-22.532273 ft	1,530.8139 psf	2,640.2425 psf	470.92452 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 8	-110.875 ft	-24.473716 ft	1,651.9599 psf	3,089.2534 psf	610.09489 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 9	-104.97621 ft	-26.106022 ft	1,753.8158 psf	3,392.2001 psf	695.45289 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 10	-98.928618 ft	-27.4276 ft	1,836.2823 psf	3,554.2086 psf	729.21648 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 11	-92.968461 ft	-28.391888 ft	1,896.4538 psf	3,674.5949 psf	754.77611 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 12	-87.095737 ft	-29.017579 ft	1,935.4969 psf	3,755.7624 psf	772.65685 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 13	-81.223013 ft	-29.329097 ft	1,954.9356 psf	3,801.3404 psf	783.75232 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 14	-75.350289 ft	-29.329097 ft	1,954.9356 psf	3,812.0932 psf	788.31662 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 15	-69.477565 ft	-29.017579 ft	1,935.4969 psf	3,788.4602 psf	786.53624 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 16	-63.604841 ft	-28.391888 ft	1,896.4538 psf	3,730.5756 psf	778.53851 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 17	-57.876359 ft	-27.477628 ft	1,839.404 psf	3,641.6949 psf	765.02711 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 18	-52.29212 ft	-26.282594 ft	1,764.8339 psf	3,522.4112 psf	746.04731 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 19	-46.583333 ft	-24.740524 ft	1,668.6087 psf	3,366.5208 psf	720.72093 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 20	-40.75 ft	-22.822838 ft	1,548.9451 psf	3,172.0428 psf	688.96411 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 21	-34.916667 ft	-20.536265 ft	1,406.263 psf	2,939.8279 psf	650.95969 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 22	-30.634458 ft	-18.648985 ft	1,288.4967 psf	2,795.7901 psf	639.80812 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 23	-26.515732 ft	-16.548007 ft	1,157.3956 psf	2,711.2853 psf	659.58706 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 24	-21.009366 ft	-13.437009 ft	963.26936 psf	2,583.8099 psf	687.87864 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 25	-15.502999 ft	-9.8890024 ft	741.87375 psf	2,412.5904 psf	709.17714 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 26	-8.874908 ft	-4.8908681 ft	429.99017 psf	2,160.4879 psf	734.55272 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 27	-2.9541309 ft	0.10913187 ft	117.99017 psf	1,839.093 psf	730.5648 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 28	2.0458691 ft	5.1015028 ft	-193.53378 psf	1,346.7404 psf	571.65737 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 29	8.4017556 ft	12.467584 ft	-653.17726 psf	504.72332 psf	214.24234 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Spencer's S case

CASE: Low Water (LW) Circular Through Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,483
Date: 07/18/2022
Time: 01:51:52 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/18/2022
Last Solved Time: 01:54:16 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS) through

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 40 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-30, 10.666667) ft
Left-Zone Right Coordinate: (25.45455, 12.181817) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (75.06573, 8.042467) ft
Right-Zone Right Coordinate: (200, -4) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (1.8787509, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 71.878751 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft

Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 3870 of 26691 converged

Current Slip Surface

Slip Surface: 8,817
Factor of Safety: 3.38
Volume: 5,696.13 ft³
Weight: 583,021.6 lbf
Resisting Moment: 8,098,953.4 lbf·ft
Activating Moment: 2,397,071.7 lbf·ft
Resisting Force: 122,738.82 lbf
Activating Force: 36,331.19 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (193.66983, -4) ft
Entry: (-13.517585, 16.160805) ft
Radius: 159.24279 ft

Center: (20, 35) ft

Slip Slices

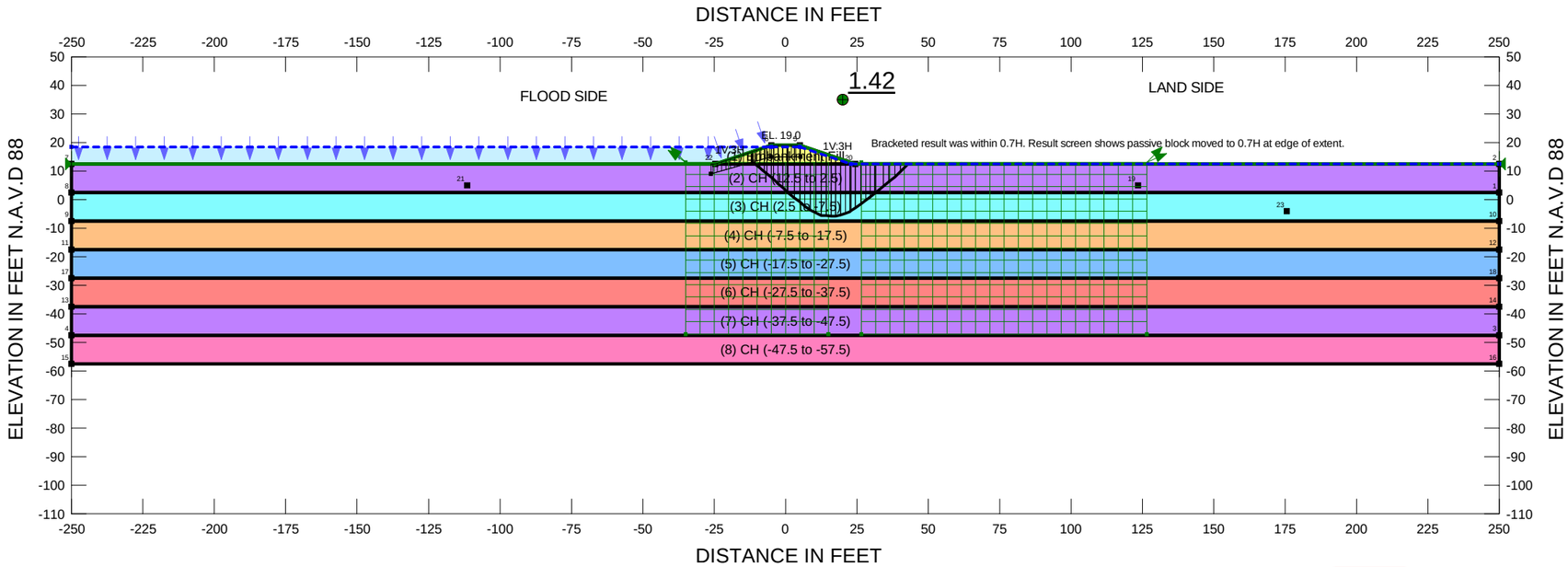
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-9.2587925 ft	12.014509 ft	-624.90534 psf	547.26423 psf	232.29988 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-1.5606246 ft	4.9341061 ft	-183.08822 psf	1,413.8203 psf	600.13109 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	3.4393754 ft	0.77514392 ft	76.43102 psf	1,835.1089 psf	746.51446 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	7.6910589 ft	-2.4201798 ft	275.81922 psf	2,024.9077 psf	742.44401 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	13.073177 ft	-6.1953237 ft	511.3882 psf	2,179.3518 psf	708.00854 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 6	19.823177 ft	-10.436647 ft	776.0468 psf	2,348.6349 psf	667.52403 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 7	27.941059 ft	-14.997506 ft	1,060.6444 psf	2,520.4378 psf	619.64555 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	32.916114 ft	-17.560859 ft	1,220.5976 psf	2,644.0712 psf	604.22871 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 9	36.776857 ft	-19.316253 ft	1,330.1342 psf	2,803.5506 psf	625.42817 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 10	42.666114 ft	-21.809266 ft	1,485.6982 psf	3,053.5257 psf	665.5033 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 11	48.555371 ft	-24.029809 ft	1,624.2601 psf	3,276.0369 psf	701.13766 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 12	56.425584 ft	-26.536797 ft	1,780.6961 psf	3,523.7994 psf	739.90343 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 13	65.016719 ft	-28.869203 ft	1,926.2383 psf	3,756.5107 psf	776.90457 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 14	72.347824 ft	-30.427201 ft	2,023.4574 psf	3,908.681 psf	800.22996 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 15	79.678928 ft	-31.629097 ft	2,098.4557 psf	4,023.0481 psf	816.94102 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 16	87.010032 ft	-32.48301 ft	2,151.7398 psf	4,100.0442 psf	827.00614 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 17	94.341136 ft	-32.994557 ft	2,183.6604 psf	4,139.8504 psf	830.35341 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 18	101.67224 ft	-33.167047 ft	2,194.4237 psf	4,142.403 psf	826.86815 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 19	109.00334 ft	-33.001584 ft	2,184.0988 psf	4,107.3912 psf	816.38916 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 20	116.33445 ft	-32.497108 ft	2,152.6195 psf	4,034.2468 psf	798.70339 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 21	123 ft	-31.755799 ft	2,106.3619 psf	3,834.0913 psf	733.37762 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 22	129 ft	-30.830567 ft	2,048.6274 psf	3,508.2413 psf	619.56935 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 23	137.07283 ft	-29.154693 ft	1,944.0528 psf	3,212.9333 psf	538.60782 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 24	145.98424 ft	-26.889618 ft	1,802.7122 psf	2,976.7105 psf	498.33271 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 25	153.66141 ft	-24.455067 ft	1,650.7962 psf	2,715.8581 psf	452.09195 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 26	160.54115 ft	-21.922446 ft	1,492.7606 psf	2,410.2364 psf	389.44536 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 27	166.62345 ft	-19.356998 ft	1,332.6767 psf	2,066.4911 psf	311.48574 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 28	172.5823 ft	-16.550524 ft	1,157.5527 psf	1,707.5461 psf	233.45838 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 29	178.55815 ft	-13.416607 ft	961.99627 psf	1,346.6886 psf	163.29222 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 30	184.67444 ft	-9.8660832 ft	740.44359 psf	973.60613 psf	98.971628 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 31	190.70121 ft	-6 ft	499.2 psf	584.10242 psf	36.038941 psf	0 psf	0 psf	(2) CH (2 to -8) Scase

West Slidell Levees

Tie-in to High Ground

Spencer's Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (12.5 to 2.5)	Mohr-Coulomb	90		200	0
	(3) CH (2.5 to -7.5)	Mohr-Coulomb	100		200	0
	(4) CH (-7.5 to -17.5)	Mohr-Coulomb	110		250	0
	(5) CH (-17.5 to -27.5)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-27.5 to -37.5)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-37.5 to -47.5)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-47.5 to -57.5)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West High Ground Tie-in 2082 Spencer's Q case

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,440
Date: 07/13/2022
Time: 08:20:56 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/13/2022
Last Solved Time: 08:21:56 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (2.5 to -7.5)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (12.5 to 2.5)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-27.5 to -37.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-7.5 to -17.5)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-17.5 to -27.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-37.5 to -47.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-47.5 to -57.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Slip Surface Block

Left Grid
Upper Left: (-35, 13) ft
Lower Left: (-35, -47) ft
Lower Right: (15, -47) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (26.5, 13) ft
Lower Left: (26.5, -47) ft
Lower Right: (126.5, -47) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	18.5 ft
Coordinate 2	-5 ft	18.5 ft
Coordinate 3	5 ft	18.5 ft
Coordinate 4	23 ft	12.5 ft
Coordinate 5	250 ft	12.5 ft

Tension Crack Line

	X	Y
Coordinate 1	-26.1 ft	9 ft
Coordinate 2	-5.2 ft	15 ft
Coordinate 3	5.2 ft	15 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)

Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5)	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5)	13,14,3,4	5,000 ft²

Slip Results

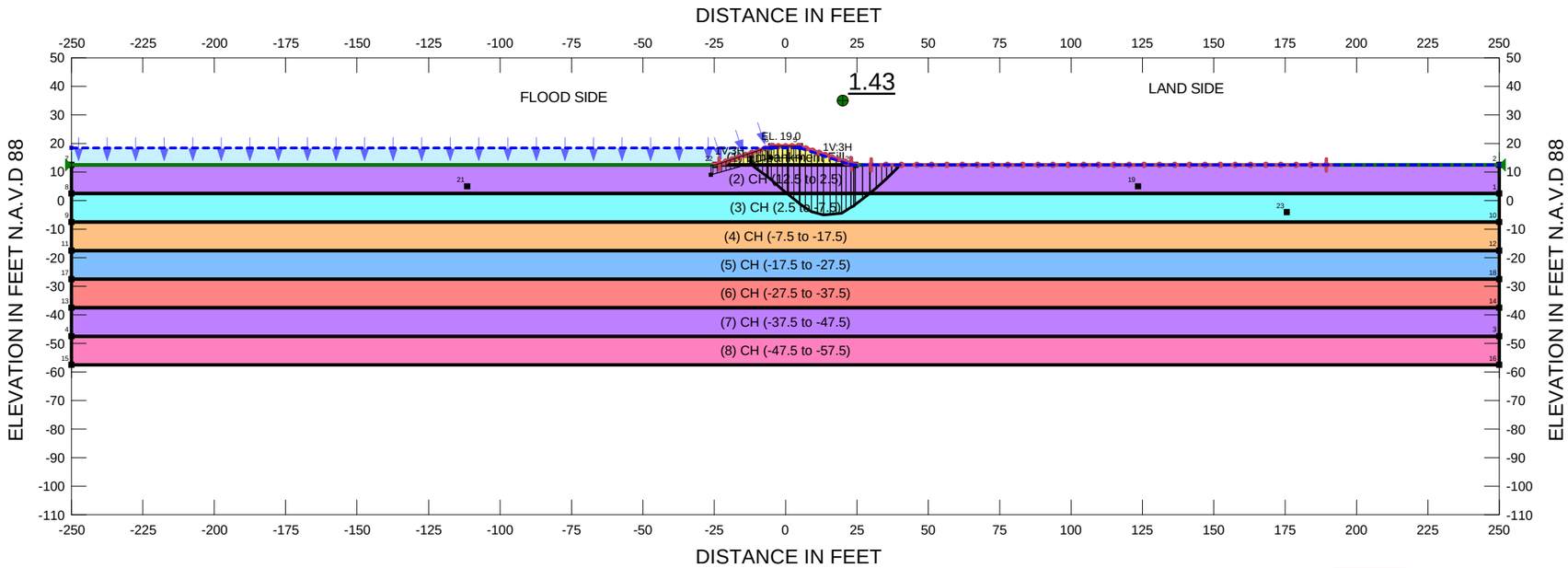
Slip Surfaces Analysed: 50393 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.42
Volume: 747.86581 ft³
Weight: 73,011.652 lbf
Resisting Moment: 499,211.69 lbf·ft
Activating Moment: 349,843.72 lbf·ft
Resisting Force: 11,254.966 lbf
Activating Force: 7,942.9493 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (42.966529, 12.5) ft
Entry: (-11.585205, 13.166927) ft
Radius: 24.535432 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-11.154431 ft	12.833463 ft	353.59189 psf	237.41366 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-9.8872755 ft	11.852554 ft	414.80061 psf	571.41056 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 3	-8.2145118 ft	10.557663 ft	495.60184 psf	714.48672 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 4	-6.939065 ft	9.5215454 ft	560.25557 psf	810.17332 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 5	-5.75 ft	8.4689545 ft	625.93724 psf	938.24686 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 6	-4.626455 ft	7.4743636 ft	687.99971 psf	1,053.6328 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 7	-3.424915 ft	6.4003933 ft	755.01546 psf	1,145.8406 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 8	-1.768925 ft	4.913796 ft	847.77913 psf	1,276.3344 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 9	-0.112935 ft	3.4271987 ft	940.5428 psf	1,406.8283 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 10	0.81939642 ft	2.59195 ft	992.66232 psf	1,483.0582 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 11	2.0294214 ft	1.5255745 ft	1,059.2042 psf	1,586.2153 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 12	4.067555 ft	-0.14587948 ft	1,163.5029 psf	1,774.1022 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 13	5.9422925 ft	-1.5472977 ft	1,231.3517 psf	1,875.9775 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 14	7.8268775 ft	-2.9560772 ft	1,280.0602 psf	1,943.1976 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 15	9.72145 ft	-4.1237223 ft	1,313.5141 psf	2,036.8825 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 16	11.62601 ft	-5.0502327 ft	1,331.7135 psf	2,056.2598 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 17	13.416907 ft	-5.5658052 ft	1,326.6346 psf	2,122.9727 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 18	15.09414 ft	-5.6704395 ft	1,298.2773 psf	2,069.2367 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 19	16.771373 ft	-5.7750738 ft	1,269.92 psf	2,015.5006 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 20	18.443965 ft	-5.5554397 ft	1,221.425 psf	2,005.7656 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 21	20.111915 ft	-5.011537 ft	1,152.7921 psf	1,886.3403 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 22	21.779865 ft	-4.4676343 ft	1,084.1592 psf	1,766.9149 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 23	22.80692 ft	-4.0543075 ft	1,037.0049 psf	1,763.201 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 24	23.75 ft	-3.3637732 ft	989.89945 psf	1,655.7806 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 25	25.404097 ft	-2.1526236 ft	914.32371 psf	1,502.7594 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 26	27.212293 ft	-0.82864185 ft	831.70725 psf	1,367.5729 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 27	28.900637 ft	0.4179365 ft	753.92076 psf	1,242.6484 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 28	30.469133 ft	1.5871115 ft	680.96424 psf	1,123.2233 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 29	31.451235 ft	2.3358495 ft	634.24299 psf	1,061.3624 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 30	32.957025 ft	3.585132 ft	556.28776 psf	944.55564 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 31	35.278365 ft	5.488859 ft	437.4952 psf	765.49972 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 32	37.305175 ft	7.126049 ft	335.33454 psf	614.7218 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 33	39.284975 ft	8.843995 ft	228.13471 psf	475.79188 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 34	41.608949 ft	11.121673 ft	86.007605 psf	278.13485 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (12.5 to 2.5)	Mohr-Coulomb	90		200	0
	(3) CH (2.5 to -7.5)	Mohr-Coulomb	100		200	0
	(4) CH (-7.5 to -17.5)	Mohr-Coulomb	110		250	0
	(5) CH (-17.5 to -27.5)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-27.5 to -37.5)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-37.5 to -47.5)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-47.5 to -57.5)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West High Ground Tie-in 2082 Spencer's Q case

CASE: Top of Levee (CG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (circ)

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Last Solved Date: 07/13/2022
Last Solved Time: 08:21:22 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (2.5 to -7.5)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (12.5 to 2.5)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-27.5 to -37.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-7.5 to -17.5)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-17.5 to -27.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-37.5 to -47.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-47.5 to -57.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-23.15, 12.95) ft
Left-Zone Right Coordinate: (23.15, 12.95) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (30, 12.5) ft
Right-Zone Right Coordinate: (189.4572, 12.5) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	18.5 ft
Coordinate 2	-5 ft	18.5 ft
Coordinate 3	5 ft	18.5 ft
Coordinate 4	23 ft	12.5 ft
Coordinate 5	250 ft	12.5 ft

Tension Crack Line

	X	Y
Coordinate 1	-26.1 ft	9 ft
Coordinate 2	-5.2 ft	15 ft
Coordinate 3	5.2 ft	15 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-58, 563)
- Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-48, 449)
- Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5)	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5)	13,14,3,4	5,000 ft²

Slip Results

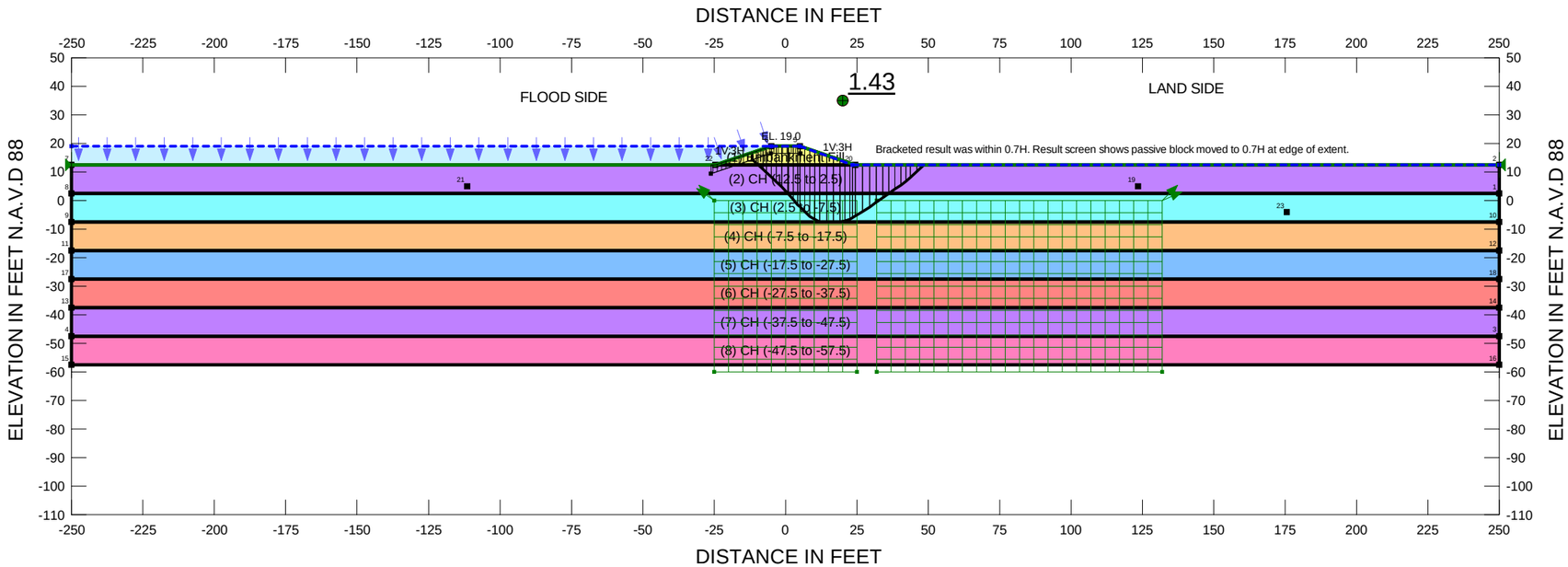
Slip Surfaces Analysed: 8294 of 20182 converged

Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.43
Volume: 710.32974 ft³
Weight: 69,484.156 lbf
Resisting Moment: 467,928.92 lbf·ft
Activating Moment: 326,129.9 lbf·ft
Resisting Force: 10,741.824 lbf
Activating Force: 7,539.2106 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (40.264865, 12.5) ft
Entry: (-12.293958, 12.963457) ft
Radius: 23.509484 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-12.006384 ft	12.731729 ft	359.94014 psf	217.61091 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-11.3854 ft	12.231336 ft	391.16463 psf	508.07807 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 3	-10.293325 ft	11.391967 ft	443.54123 psf	608.96713 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 4	-8.775995 ft	10.250558 ft	514.76515 psf	735.7929 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 5	-7.258665 ft	9.1091495 ft	585.98907 psf	862.61867 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 6	-6.311315 ft	8.396507 ft	630.45796 psf	945.60442 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 7	-5.561315 ft	7.7591931 ft	670.22635 psf	1,008.4143 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 8	-3.943345 ft	6.3312901 ft	759.3275 psf	1,154.6348 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 9	-2.024801 ft	4.6740722 ft	862.73789 psf	1,307.1919 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 10	-0.30102296 ft	3.2246907 ft	953.1793 psf	1,434.478 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 11	0.77505303 ft	2.319908 ft	1,009.6377 psf	1,515.6943 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 12	1.9662325 ft	1.3461953 ft	1,070.3974 psf	1,615.8835 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 13	3.9202175 ft	-0.24104625 ft	1,169.4413 psf	1,770.892 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 14	4.948605 ft	-1.0682811 ft	1,221.0607 psf	1,881.6506 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 15	6.0219225 ft	-1.7702682 ft	1,243.6087 psf	1,912.0881 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 16	8.0657675 ft	-3.1070141 ft	1,284.5097 psf	1,966.3676 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 17	10.17148 ft	-4.0618428 ft	1,300.2922 psf	2,056.9771 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 18	12.33906 ft	-4.6347543 ft	1,290.9562 psf	2,031.3774 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 19	14.511245 ft	-4.8485795 ft	1,259.1175 psf	2,035.1695 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 20	16.688035 ft	-4.7033185 ft	1,204.7759 psf	1,937.0065 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 21	18.687025 ft	-4.4989765 ft	1,150.446 psf	1,854.8334 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 22	20.448215 ft	-3.8624444 ft	1,074.0937 psf	1,809.5923 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 23	22.149405 ft	-2.8528033 ft	975.7073 psf	1,640.4536 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 24	23.43274 ft	-2.0911553 ft	910.48809 psf	1,512.8596 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 25	24.18274 ft	-1.5935279 ft	879.43614 psf	1,463.5515 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 26	25.753165 ft	-0.40157638 ft	805.05837 psf	1,329.1853 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 27	28.215115 ft	1.5247875 ft	684.85326 psf	1,140.5478 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 28	29.56294 ft	2.6121735 ft	617.00037 psf	1,030.3064 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 29	30.723607 ft	3.5886208 ft	556.07007 psf	946.96761 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 30	32.766863 ft	5.3171682 ft	448.2087 psf	787.41533 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 31	34.640637 ft	6.9718722 ft	344.95517 psf	647.86968 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 32	36.344932 ft	8.5527327 ft	246.30948 psf	501.58843 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 33	37.964026 ft	10.132372 ft	147.73997 psf	371.00997 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 34	39.497919 ft	11.710791 ft	49.246657 psf	224.50395 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (12.5 to 2.5)	Mohr-Coulomb	90		200	0
	(3) CH (2.5 to -7.5)	Mohr-Coulomb	100		200	0
	(4) CH (-7.5 to -17.5)	Mohr-Coulomb	110		250	0
	(5) CH (-17.5 to -27.5)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-27.5 to -37.5)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-37.5 to -47.5)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-47.5 to -57.5)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West High Ground Tie-in 2082 Spencer's Q case

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,440
Date: 07/13/2022
Time: 08:20:56 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/13/2022
Last Solved Time: 08:23:14 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (2.5 to -7.5)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (12.5 to 2.5)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-27.5 to -37.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-7.5 to -17.5)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-17.5 to -27.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-37.5 to -47.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-47.5 to -57.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Slip Surface Block

Left Grid
Upper Left: (-25, 0) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (32, 0) ft
Lower Left: (32, -60) ft
Lower Right: (132, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	23.5 ft	12.5 ft
Coordinate 5	250 ft	12.5 ft

Tension Crack Line

	X	Y
Coordinate 1	-26.1 ft	9.5 ft
Coordinate 2	-5.2 ft	16.5 ft
Coordinate 3	5.2 ft	16.5 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)

Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5)	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5)	13,14,3,4	5,000 ft²

Slip Results

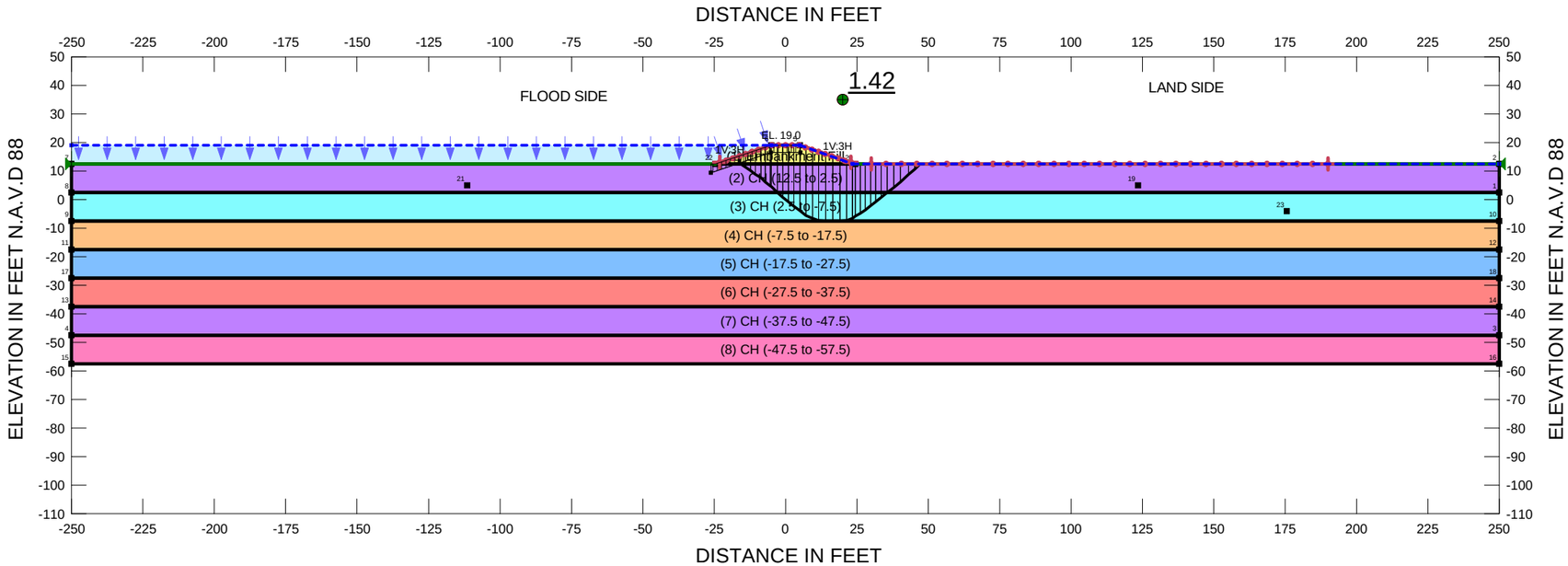
Slip Surfaces Analysed: 47126 of 51976 converged

Current Slip Surface

Slip Surface: 51,976
Factor of Safety: 1.43
Volume: 862.07648 ft³
Weight: 83,948.978 lbf
Resisting Moment: 602,317.64 lbf·ft
Activating Moment: 419,235 lbf·ft
Resisting Force: 12,878.198 lbf
Activating Force: 9,026.4812 lbf
Slip Rank: 1 of 51,976 slip surfaces
Exit: (48.522259, 12.5) ft
Entry: (-11.644377, 14.341596) ft
Radius: 27.517527 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-10.588289 ft	13.420798 ft	348.1422 psf	182.83876 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-8.6807102 ft	11.75759 ft	451.92638 psf	619.88251 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 3	-7.216995 ft	10.444474 ft	533.86485 psf	752.26197 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 4	-5.802385 ft	9.1055811 ft	617.41174 psf	891.15274 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 5	-4.065855 ft	7.4430652 ft	721.15273 psf	1,051.8116 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 6	-2.197565 ft	5.6544051 ft	832.76512 psf	1,209.6953 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 7	-0.20839199 ft	3.6300375 ft	959.08566 psf	1,369.7537 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 8	0.93756801 ft	2.402603 ft	1,035.6776 psf	1,478.8046 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 9	1.8469625 ft	1.3647295 ft	1,100.4409 psf	1,567.3088 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 10	3.4838875 ft	-0.5162235 ft	1,217.8123 psf	1,751.0794 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 11	4.651175 ft	-1.791506 ft	1,297.39 psf	1,908.6056 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 12	5.8808425 ft	-2.9717539 ft	1,351.7256 psf	1,991.2405 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 13	7.6425275 ft	-4.662638 ft	1,418.613 psf	2,090.8398 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 14	9.408435 ft	-5.9913612 ft	1,462.809 psf	2,229.6977 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 15	11.178565 ft	-6.9579237 ft	1,484.3136 psf	2,258.1805 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 16	13.230108 ft	-7.4505578 ft	1,470.0752 psf	2,328.4616 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 17	15.563065 ft	-7.4692635 ft	1,420.094 psf	2,240.9165 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 18	17.896022 ft	-7.4879692 ft	1,370.1127 psf	2,153.3714 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 19	19.915187 ft	-7.2666252 ft	1,312.032 psf	2,104.5766 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 20	21.620562 ft	-6.8052317 ft	1,245.8519 psf	1,992.4432 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 21	22.986625 ft	-6.2639947 ft	1,182.1287 psf	1,945.4978 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 22	24 ft	-5.6510046 ft	1,132.6227 psf	1,844.0965 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 23	25.75071 ft	-4.5920009 ft	1,066.5409 psf	1,717.4607 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 24	28.203135 ft	-3.0253185 ft	968.77987 psf	1,570.8306 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 25	30.606565 ft	-1.4050615 ft	867.67584 psf	1,406.5365 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 26	32.917717 ft	0.17880025 ft	768.84286 psf	1,249.817 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 27	35.136592 ft	1.7262667 ft	672.28095 psf	1,092.8281 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 28	37.305472 ft	3.2388663 ft	577.89475 psf	946.87211 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 29	39.424357 ft	4.7165988 ft	485.68424 psf	811.94909 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 30	41.3136 ft	6.1443345 ft	396.59353 psf	702.25239 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 31	42.88908 ft	7.4415885 ft	315.64488 psf	581.28682 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 32	44.856635 ft	9.1624797 ft	208.26126 psf	438.01597 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 33	47.300385 ft	11.387493 ft	69.420421 psf	233.95976 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (12.5 to 2.5)	Mohr-Coulomb	90		200	0
	(3) CH (2.5 to -7.5)	Mohr-Coulomb	100		200	0
	(4) CH (-7.5 to -17.5)	Mohr-Coulomb	110		250	0
	(5) CH (-17.5 to -27.5)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-27.5 to -37.5)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-37.5 to -47.5)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-47.5 to -57.5)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West High Ground Tie-in 2082 Spencer's Q case

CASE: Project Grade (PG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,440
Date: 07/13/2022
Time: 08:20:56 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/13/2022
Last Solved Time: 08:22:36 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (2.5 to -7.5)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (12.5 to 2.5)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-27.5 to -37.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-7.5 to -17.5)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-17.5 to -27.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-37.5 to -47.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-47.5 to -57.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-23, 13) ft
Left-Zone Right Coordinate: (23, 13) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (30, 12.5) ft
Right-Zone Right Coordinate: (190, 12.5) ft
Right-Zone Increment: 30
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	23.5 ft	12.5 ft
Coordinate 5	250 ft	12.5 ft

Tension Crack Line

	X	Y
Coordinate 1	-26.1 ft	9.5 ft
Coordinate 2	-5.2 ft	16.5 ft
Coordinate 3	5.2 ft	16.5 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-58, 563)
- Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-48, 449)
- Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5)	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5)	13,14,3,4	5,000 ft²

Slip Results

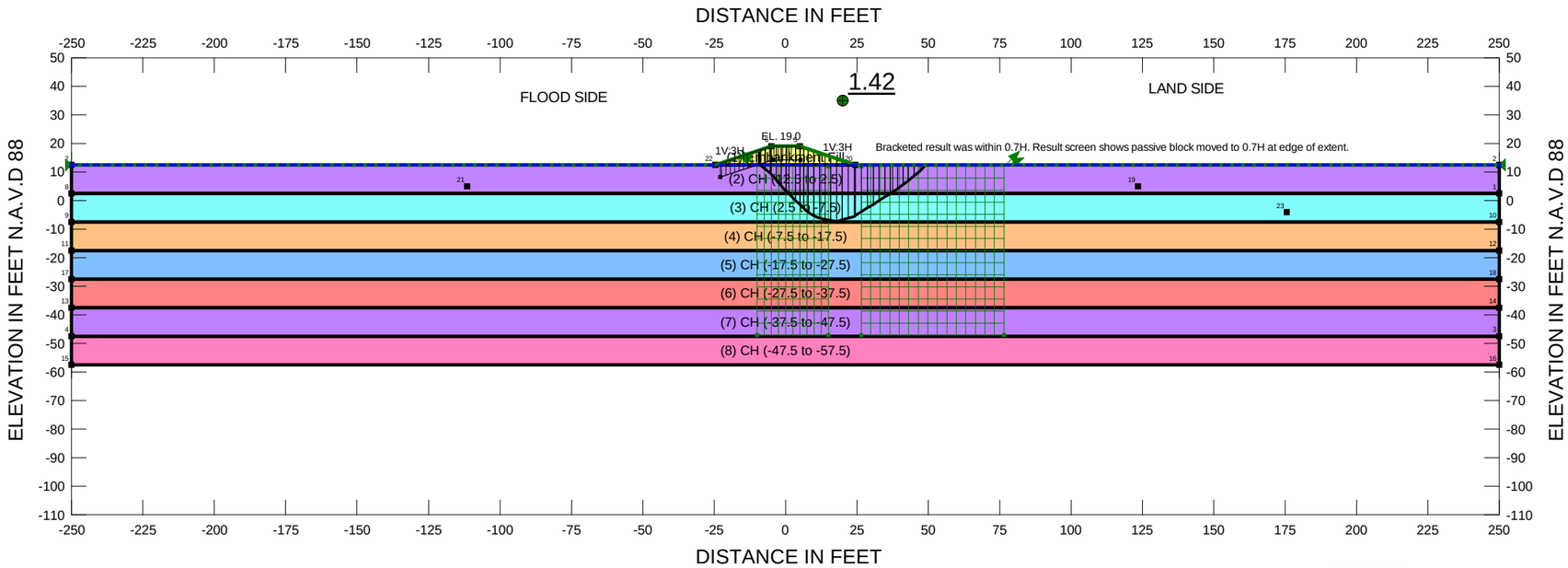
Slip Surfaces Analysed: 8038 of 20182 converged

Current Slip Surface

Slip Surface: 20,182
Factor of Safety: 1.42
Volume: 939.69528 ft³
Weight: 91,631.032 lbf
Resisting Moment: 599,779.86 lbf·ft
Activating Moment: 419,820.62 lbf·ft
Resisting Force: 12,862.816 lbf
Activating Force: 9,066.7612 lbf
Slip Rank: 1 of 20,182 slip surfaces
Exit: (47.133843, 12.5) ft
Entry: (-16.224954, 12.807432) ft
Radius: 27.896398 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-15.986133 ft	12.653716 ft	396.00813 psf	260.90758 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.858101 ft	11.927665 ft	441.31372 psf	528.86208 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 3	-13.07968 ft	10.782994 ft	512.74116 psf	661.13618 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 4	-11.310002 ft	9.559841 ft	589.06592 psf	785.09087 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 5	-9.5490675 ft	8.258205 ft	670.28801 psf	930.58864 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 6	-7.8264775 ft	6.9065267 ft	754.63273 psf	1,064.4743 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 7	-6.1422325 ft	5.5048062 ft	842.10009 psf	1,217.1052 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 8	-5.150055 ft	4.6686047 ft	894.27906 psf	1,296.0477 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 9	-3.8728443 ft	3.5166317 ft	966.16218 psf	1,399.9033 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 10	-1.8227343 ft	1.6675465 ft	1,081.5451 psf	1,570.5695 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 11	0.083516667 ft	0.052569161 ft	1,182.3197 psf	1,747.6173 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 12	2.05011 ft	-1.5124785 ft	1,279.9787 psf	1,900.8921 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 13	4.0167033 ft	-3.0775262 ft	1,377.6376 psf	2,054.167 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 14	6.0586 ft	-4.7025015 ft	1,455.827 psf	2,173.5687 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 15	8.252645 ft	-6.0046107 ft	1,488.9757 psf	2,295.651 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 16	10.523535 ft	-6.9239262 ft	1,496.5532 psf	2,300.48 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 17	12.88432 ft	-7.4029867 ft	1,474.688 psf	2,336.0841 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 18	15.334999 ft	-7.441792 ft	1,423.38 psf	2,246.0596 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 19	17.811034 ft	-7.4809988 ft	1,371.5411 psf	2,155.1038 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 20	20.24393 ft	-7.4028695 ft	1,313.3262 psf	2,073.3117 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 21	22.42835 ft	-6.9083155 ft	1,234.5741 psf	2,000.3962 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 22	23.465285 ft	-6.4896546 ft	1,185.7156 psf	1,964.3715 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 23	24 ft	-6.1501672 ft	1,163.7704 psf	1,908.9944 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 24	25.382108 ft	-5.272675 ft	1,109.0149 psf	1,800.2503 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 25	27.146323 ft	-4.152585 ft	1,039.1213 psf	1,686.3261 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 26	28.941053 ft	-2.8698278 ft	959.07726 psf	1,584.9505 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 27	30.7663 ft	-1.4244035 ft	868.88278 psf	1,437.3122 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 28	32.591547 ft	0.021020833 ft	778.6883 psf	1,289.6739 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 29	34.602449 ft	1.6218665 ft	678.79553 psf	1,127.4891 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 30	36.833044 ft	3.405347 ft	567.50635 psf	954.53273 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 31	39.097675 ft	5.216041 ft	454.51904 psf	788.04544 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 32	41.70296 ft	7.460732 ft	314.45032 psf	599.15099 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 33	44.165408 ft	9.725057 ft	173.15644 psf	394.27626 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 34	46.144365 ft	11.575019 ft	57.718814 psf	223.5537 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (12.5 to 2.5)	Mohr-Coulomb	90		200	0
	(3) CH (2.5 to -7.5)	Mohr-Coulomb	100		200	0
	(4) CH (-7.5 to -17.5)	Mohr-Coulomb	110		250	0
	(5) CH (-17.5 to -27.5)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-27.5 to -37.5)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-37.5 to -47.5)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-47.5 to -57.5)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West High Ground Tie-in 2082 Spencer's Q case

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,442
Date: 07/13/2022
Time: 01:28:28 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/13/2022
Last Solved Time: 01:29:00 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (2.5 to -7.5)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (12.5 to 2.5)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-27.5 to -37.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-7.5 to -17.5)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-17.5 to -27.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-37.5 to -47.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-47.5 to -57.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Slip Surface Block

Left Grid
Upper Left: (15, 12) ft
Lower Left: (15, -47) ft
Lower Right: (-10, -47) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2

Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (26.5, 12) ft
Lower Left: (26.5, -47) ft
Lower Right: (76.5, -47) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	12.5 ft
Coordinate 2	250 ft	12.5 ft

Tension Crack Line

	X	Y
Coordinate 1	-22.8 ft	8.3 ft
Coordinate 2	-4.4 ft	14.3 ft
Coordinate 3	5.2 ft	14.3 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function

Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5)	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5)	13,14,3,4	5,000 ft²

Slip Results

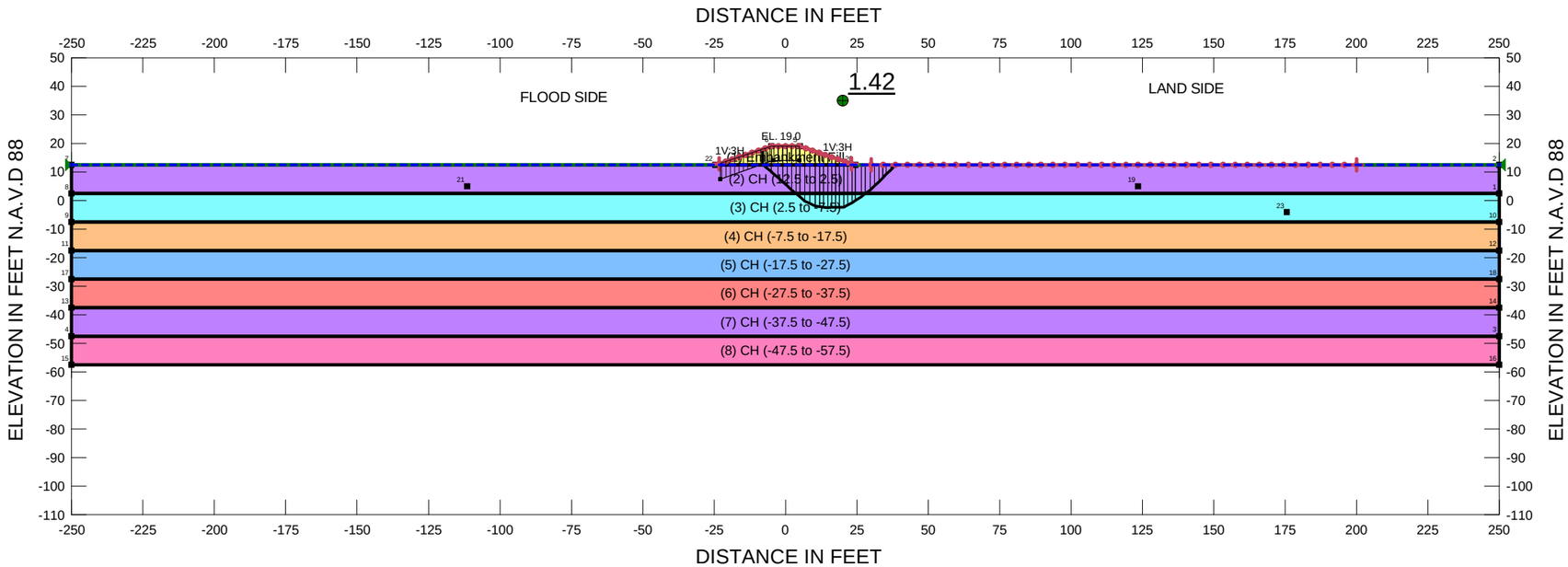
Slip Surfaces Analysed: 27543 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.42
Volume: 835.87737 ft³
Weight: 81,167.92 lbf
Resisting Moment: 542,976.92 lbf·ft
Activating Moment: 382,182.01 lbf·ft
Resisting Force: 11,776.313 lbf
Activating Force: 8,347.3789 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (49.153375, 12.5) ft
Entry: (-9.1115803, 12.763615) ft
Radius: 25.935046 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-8.9574283 ft	12.631808 ft	-8.2247921 psf	150.20448 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-7.9436998 ft	11.765019 ft	45.862799 psf	569.20406 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 3	-6.2245466 ft	10.295058 ft	137.5884 psf	761.88652 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 4	-5.182485 ft	9.3609802 ft	195.87484 psf	843.75335 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 5	-4.1145933 ft	8.1958769 ft	268.57728 psf	951.66678 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 6	-2.34378 ft	6.2638642 ft	389.13488 psf	1,119.4213 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 7	-0.57296667 ft	4.3318514 ft	509.69247 psf	1,287.1759 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 8	0.73678244 ft	2.9329225 ft	596.98564 psf	1,421.4873 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 9	2.3747424 ft	1.2618435 ft	701.26097 psf	1,578.8905 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 10	4.29418 ft	-0.63027904 ft	819.32941 psf	1,779.9735 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 11	5.7491775 ft	-1.9783833 ft	903.45112 psf	1,882.874 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 12	7.2475325 ft	-3.3666598 ft	990.07957 psf	1,961.8164 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 13	8.9763175 ft	-4.5802515 ft	1,065.8077 psf	2,096.1912 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 14	10.935533 ft	-5.6191585 ft	1,130.6355 psf	2,124.4766 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 15	12.912318 ft	-6.3388962 ft	1,175.5471 psf	2,189.924 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 16	14.906675 ft	-6.7394645 ft	1,200.5426 psf	2,153.7736 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 17	16.901032 ft	-7.1400328 ft	1,225.538 psf	2,117.6231 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 18	18.9204 ft	-7.0361712 ft	1,219.0571 psf	2,135.3373 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 19	20.96478 ft	-6.4278795 ft	1,181.0997 psf	1,994.7399 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 20	23.00916 ft	-5.8195878 ft	1,143.1423 psf	1,854.1425 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 21	24.265675 ft	-5.3662103 ft	1,114.8515 psf	1,828.825 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 22	25.541053 ft	-4.553976 ft	1,064.1681 psf	1,736.6542 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 23	27.623159 ft	-3.2279706 ft	981.42537 psf	1,601.1653 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 24	29.705265 ft	-1.9019653 ft	898.68264 psf	1,465.6764 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 25	31.787371 ft	-0.57595999 ft	815.9399 psf	1,330.1875 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 26	33.869477 ft	0.75004534 ft	733.19717 psf	1,194.6986 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 27	35.864711 ft	1.956524 ft	657.9129 psf	1,059.3264 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 28	37.144771 ft	2.685612 ft	612.41781 psf	986.89267 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 29	38.394827 ft	3.5560225 ft	558.1042 psf	937.06341 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 30	40.24318 ft	4.9256195 ft	472.64134 psf	810.66453 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 31	42.091533 ft	6.2952165 ft	387.17849 psf	684.26565 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 32	44.03963 ft	7.820893 ft	291.97628 psf	556.55731 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 33	46.08747 ft	9.502649 ft	187.0347 psf	400.92083 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 34	48.132383 ft	11.421764 ft	67.281958 psf	259.34239 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (12.5 to 2.5)	Mohr-Coulomb	90		200	0
	(3) CH (2.5 to -7.5)	Mohr-Coulomb	100		200	0
	(4) CH (-7.5 to -17.5)	Mohr-Coulomb	110		250	0
	(5) CH (-17.5 to -27.5)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-27.5 to -37.5)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-37.5 to -47.5)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-47.5 to -57.5)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West High Ground Tie-in 2082 Spencer's Q case

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,442
Date: 07/13/2022
Time: 01:28:28 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/13/2022
Last Solved Time: 01:29:18 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (2.5 to -7.5)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (12.5 to 2.5)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-27.5 to -37.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-7.5 to -17.5)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-17.5 to -27.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-37.5 to -47.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-47.5 to -57.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-23.15, 12.95) ft
Left-Zone Right Coordinate: (23.15, 12.95) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (30, 12.5) ft
Right-Zone Right Coordinate: (200, 12.5) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	12.5 ft
Coordinate 2	250 ft	12.5 ft

Tension Crack Line

	X	Y
Coordinate 1	-22.8 ft	7.5 ft
Coordinate 2	-4.4 ft	14 ft
Coordinate 3	4.9 ft	14 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-58, 563)
- Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-48, 449)
- Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function

Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5)	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5)	13,14,3,4	5,000 ft²

Slip Results

Slip Surfaces Analysed: 10574 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.42
Volume: 586.36836 ft³
Weight: 57,282.624 lbf
Resisting Moment: 390,954.7 lbf·ft
Activating Moment: 273,855.43 lbf·ft
Resisting Force: 9,415.9393 lbf
Activating Force: 6,634.5058 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (38.511522, 12.5) ft
Entry: (-8.0895335, 12.696632) ft
Radius: 20.579387 ft
Center: (20, 35) ft

Slip Slices

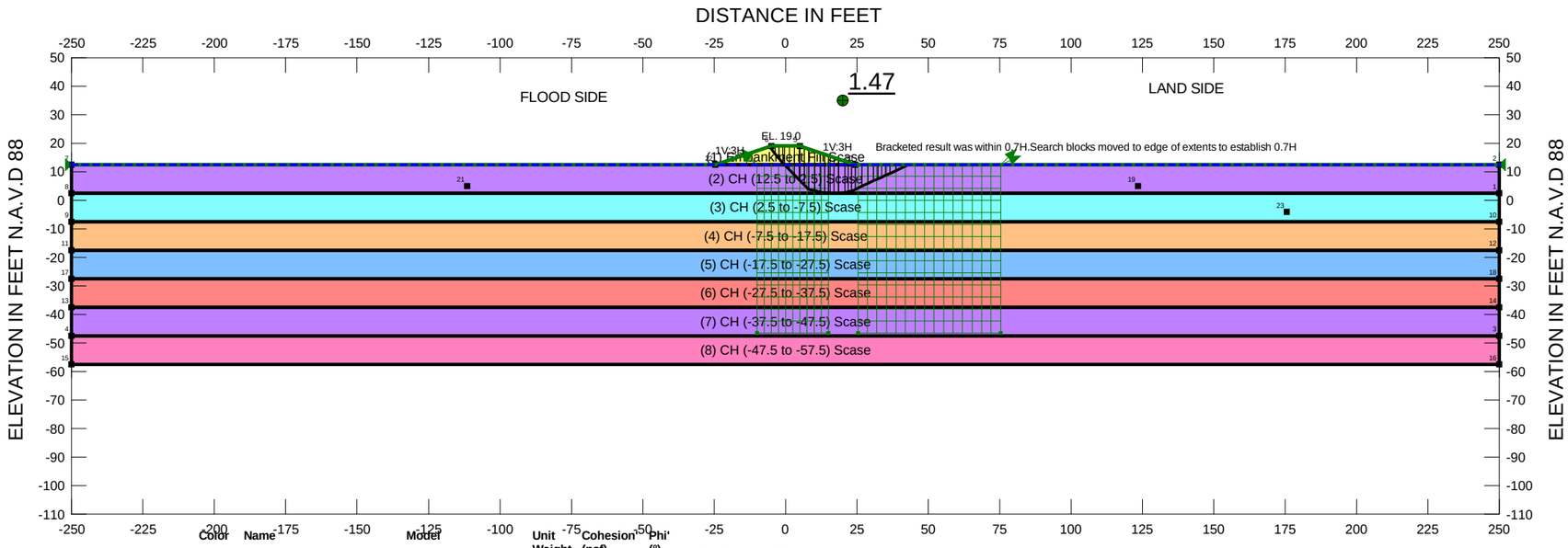
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-7.9698733 ft	12.598316 ft	-6.1349245 psf	118.61321 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-7.1376598 ft	11.914547 ft	36.532282 psf	587.08722 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 3	-5.7125533 ft	10.74364 ft	109.59685 psf	740.97277 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 4	-4.95924 ft	10.124698 ft	148.21887 psf	820.81423 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 5	-3.77695 ft	9.08129 ft	213.3275 psf	900.01818 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 6	-1.759515 ft	7.2932505 ft	324.90117 psf	1,053.6599 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 7	-0.118025 ft	5.8209485 ft	416.77281 psf	1,177.2386 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 8	1.413145 ft	4.4325875 ft	503.40654 psf	1,296.9334 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 9	2.9114344 ft	3.1192035 ft	585.3617 psf	1,422.4702 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 10	4.3220694 ft	1.9270854 ft	659.74987 psf	1,531.0449 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 11	5.87545 ft	0.61433388 ft	741.66557 psf	1,624.918 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 12	7.678065 ft	-0.56846 ft	815.4719 psf	1,751.3381 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 13	9.532395 ft	-1.454374 ft	870.75294 psf	1,768.4508 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 14	11.178743 ft	-1.9821057 ft	903.68339 psf	1,838.7621 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 15	12.61711 ft	-2.151655 ft	914.26327 psf	1,800.7965 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 16	14.055477 ft	-2.3212043 ft	924.84315 psf	1,762.8308 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 17	15.473075 ft	-2.3803476 ft	928.53369 psf	1,749.1532 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 18	16.869905 ft	-2.3290849 ft	925.3349 psf	1,690.3773 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 19	18.266735 ft	-2.2778221 ft	922.1361 psf	1,631.6014 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 20	19.663565 ft	-2.2265594 ft	918.93731 psf	1,572.8254 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 21	21.121772 ft	-1.85688 ft	895.86931 psf	1,569.6814 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 22	22.641358 ft	-1.168784 ft	852.93212 psf	1,439.7713 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 23	23.950575 ft	-0.42730398 ft	806.66377 psf	1,369.621 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 24	25.520915 ft	0.70861702 ft	735.7823 psf	1,230.0777 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 25	27.262551 ft	1.973553 ft	656.85029 psf	1,100.4071 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 26	28.821941 ft	3.1126015 ft	585.77367 psf	988.67451 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 27	30.42899 ft	4.4325225 ft	503.4106 psf	901.6497 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 28	31.96575 ft	5.8471615 ft	415.13712 psf	768.38952 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 29	33.367052 ft	7.2085803 ft	330.18459 psf	660.43141 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 30	34.632897 ft	8.5167788 ft	248.55301 psf	536.48833 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 31	36.077246 ft	10.003158 ft	155.80291 psf	394.36728 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 32	37.700097 ft	11.66772 ft	51.934303 psf	236.72359 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)

West Slidell Levees

Tie-in to High Ground

Spencer's Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (12.5 to 2.5) Scase	Mohr-Coulomb	90	0	23
	(3) CH (2.5 to -7.5) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-7.5 to -17.5) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-17.5 to -27.5) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-27.5 to -37.5) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-37.5 to -47.5) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-47.5 to -57.5) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West High Ground Tie-in 2082 Spencer's S case

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,454
Date: 10/19/2022
Time: 03:40:58 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19 - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 10/19/2022
Last Solved Time: 03:43:01 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 14 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (2.5 to -7.5) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (12.5 to 2.5) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-27.5 to -37.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-7.5 to -17.5) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-17.5 to -27.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-37.5 to -47.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-47.5 to -57.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Slip Surface Block

Left Grid
- Upper Left: (15, 12.5) ft
- Lower Left: (15, -46.5) ft
- Lower Right: (-10, -46.5) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (25.5, 12.5) ft
- Lower Left: (25.5, -46.5) ft
- Lower Right: (75.5, -46.5) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	12.5 ft
Coordinate 2	250 ft	12.5 ft

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area

Region 1	(8) CH (-47.5 to -57.5) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5) Scase	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5) Scase	13,14,3,4	5,000 ft²

Slip Results

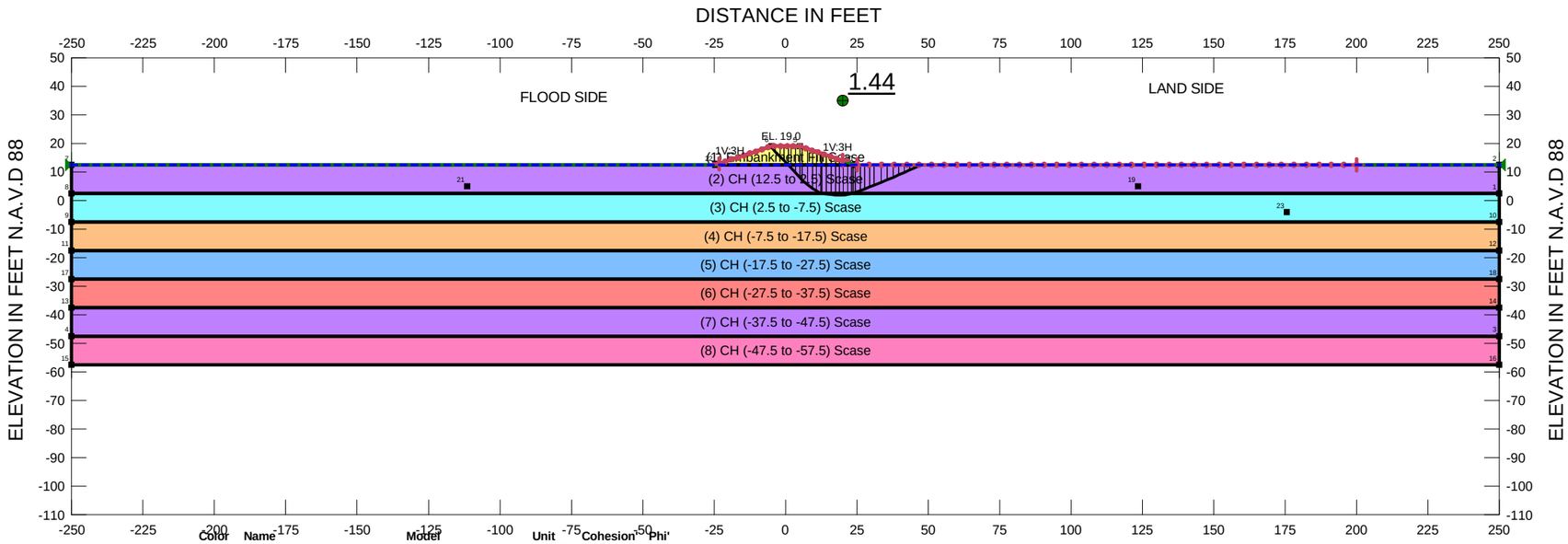
Slip Surfaces Analysed: 24543 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.47
Volume: 390.01998 ft³
Weight: 38,011.277 lbf
Resisting Moment: 300,961.41 lbf·ft
Activating Moment: 204,262.99 lbf·ft
Resisting Force: 8,197.6299 lbf
Activating Force: 5,584.7732 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (43.115086, 12.5) ft
Entry: (-5.6151361, 18.794955) ft
Radius: 22.637888 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.3075681 ft	18.393793 ft	-367.7727 psf	38.39315 psf	16.296925 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-4.28247 ft	17.056757 ft	-284.34164 psf	148.12308 psf	62.874515 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	-2.9033875 ft	15.373667 ft	-179.31682 psf	290.53773 psf	123.32595 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	-1.5802825 ft	13.879237 ft	-86.064389 psf	410.26979 psf	174.14919 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	-0.61634579 ft	12.816011 ft	-19.719086 psf	507.98349 psf	215.6262 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	0.54254201 ft	11.604898 ft	55.854334 psf	601.98794 psf	231.81996 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 7	2.2555492 ft	9.8146955 ft	167.563 psf	738.07943 psf	242.16986 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 8	3.9685564 ft	8.0244925 ft	279.27167 psf	874.17091 psf	252.51975 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 9	4.91253 ft	7.0463931 ft	340.30507 psf	969.71769 psf	267.16981 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 10	5.7986575 ft	6.2055706 ft	392.77239 psf	1,011.9452 psf	262.82327 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 11	7.3959725 ft	4.6899215 ft	487.3489 psf	1,083.6183 psf	253.10136 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 12	9.203285 ft	3.6554048 ft	551.90274 psf	1,304.6483 psf	319.52152 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 13	11.220595 ft	3.1020202 ft	586.43394 psf	1,280.4063 psf	294.57381 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 14	12.942802 ft	2.743996 ft	608.77465 psf	1,305.1673 psf	295.60114 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 15	14.369907 ft	2.581332 ft	618.92488 psf	1,265.4385 psf	274.42874 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 16	15.349195 ft	2.469711 ft	625.89003 psf	1,238.4763 psf	260.02744 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 17	16.33457 ft	2.4502725 ft	627.103 psf	1,246.6439 psf	262.97951 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 18	17.77385 ft	2.4719735 ft	625.74885 psf	1,186.7053 psf	238.11189 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 19	18.563021 ft	2.491412 ft	624.53589 psf	1,189.179 psf	239.67679 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 20	19.688571 ft	2.630433 ft	615.86098 psf	1,128.6436 psf	217.6633 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 21	21.359748 ft	2.9126552 ft	598.25031 psf	1,069.0863 psf	199.85803 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 22	22.590062 ft	3.2162337 ft	579.30701 psf	984.74973 psf	172.10022 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 23	23.85261 ft	3.6537987 ft	552.00296 psf	939.1253 psf	164.32368 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 24	25.65498 ft	4.4494142 ft	502.35655 psf	825.60065 psf	137.20898 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 25	27.824523 ft	5.4318642 ft	441.05167 psf	730.46496 psf	122.84865 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 26	29.853648 ft	6.3770847 ft	382.06991 psf	632.78001 psf	106.42012 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 27	31.579939 ft	7.1694955 ft	332.62348 psf	548.01135 psf	91.426728 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 28	33.003396 ft	7.8090965 ft	292.71238 psf	482.25611 psf	80.456542 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 29	34.426854 ft	8.4486975 ft	252.80128 psf	416.50087 psf	69.486356 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 30	35.850311 ft	9.0882985 ft	212.89017 psf	350.74563 psf	58.51617 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 31	37.62095 ft	9.9120865 ft	161.4858 psf	268.32025 psf	45.348533 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 32	39.82752 ft	10.946068 ft	96.965357 psf	160.38715 psf	26.920953 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 33	42.045133 ft	11.988031 ft	31.946866 psf	53.125586 psf	8.9898334 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (12.5 to 2.5) Scase	Mohr-Coulomb	90	0	23
	(3) CH (2.5 to -7.5) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-7.5 to -17.5) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-17.5 to -27.5) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-27.5 to -37.5) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-37.5 to -47.5) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-47.5 to -57.5) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West High Ground Tie-in 2082 Spencer's S case

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,454
Date: 10/19/2022
Time: 03:40:58 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19 - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 10/19/2022
Last Solved Time: 03:43:12 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 14 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (2.5 to -7.5) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (12.5 to 2.5) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-27.5 to -37.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-7.5 to -17.5) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-17.5 to -27.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-37.5 to -47.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-47.5 to -57.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-23.15, 12.95) ft
Left-Zone Right Coordinate: (20, 14) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (25, 12.5) ft
Right-Zone Right Coordinate: (200, 12.5) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	12.5 ft
Coordinate 2	250 ft	12.5 ft

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5) Scase	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5) Scase	13,14,3,4	5,000 ft²

Slip Results

Slip Surfaces Analysed: 6789 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.44
Volume: 414.02655 ft³
Weight: 40,047.444 lbf
Resisting Moment: 301,805.51 lbf·ft
Activating Moment: 209,799.71 lbf·ft
Resisting Force: 8,216.09 lbf
Activating Force: 5,736.9602 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (47.458583, 12.5) ft
Entry: (-5.0875119, 18.970829) ft
Radius: 24.112336 ft
Center: (20, 35) ft

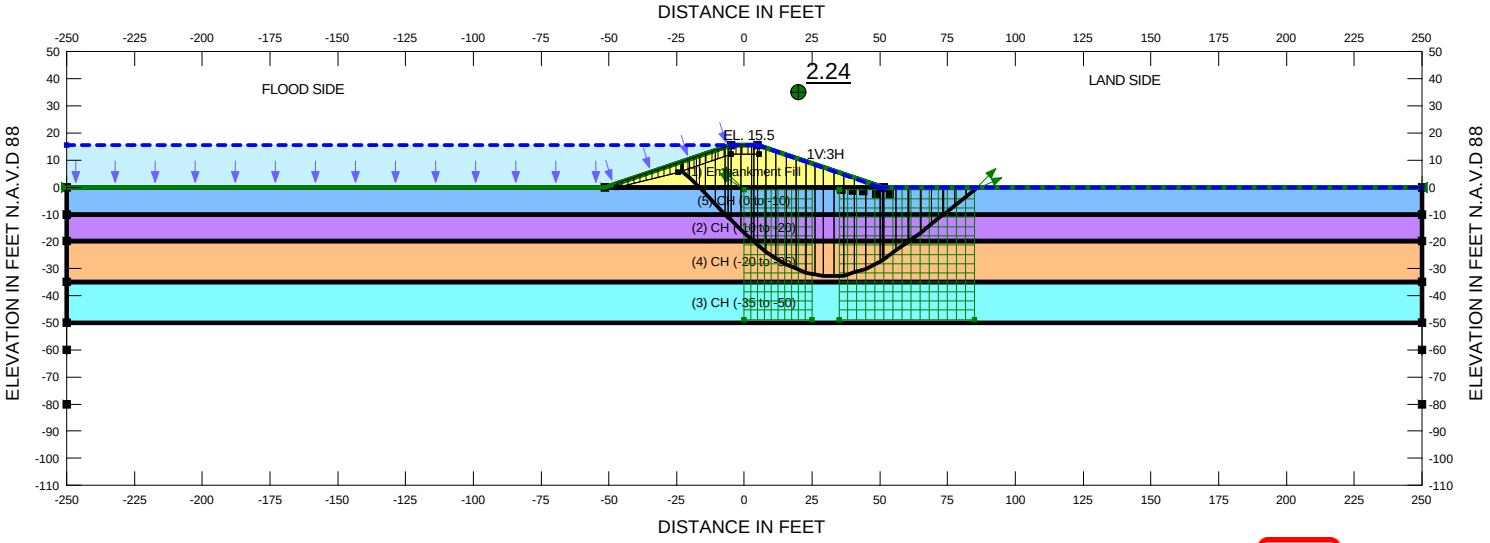
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.0437559 ft	18.922263 ft	-400.74921 psf	5.0960369 psf	2.1631393 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-4.250225 ft	18.041493 ft	-345.78918 psf	77.346895 psf	32.831809 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	-2.70295 ft	16.326644 ft	-238.78259 psf	215.92663 psf	91.655416 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	-1.193325 ft	14.707999 ft	-137.77911 psf	354.23368 psf	150.36328 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	0.23092513 ft	13.236 ft	-45.926369 psf	475.72283 psf	201.93236 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	1.5102751 ft	11.913759 ft	36.58147 psf	581.40648 psf	231.2645 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 7	2.808125 ft	10.527042 ft	123.11256 psf	676.80237 psf	235.02738 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 8	4.269375 ft	8.9260931 ft	223.01179 psf	798.58632 psf	244.31689 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 9	5.44964 ft	7.6329917 ft	303.70132 psf	884.80699 psf	246.66472 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 10	6.799645 ft	6.3382605 ft	384.49254 psf	989.75158 psf	256.91722 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 11	8.57797 ft	4.8917175 ft	474.75683 psf	1,088.2593 psf	260.41633 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 12	10.170248 ft	3.8242272 ft	541.36822 psf	1,161.3788 psf	263.17889 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 13	11.598883 ft	2.9781237 ft	594.16508 psf	1,185.1191 psf	250.8451 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 14	12.519711 ft	2.527536 ft	622.28175 psf	1,332.8354 psf	301.61211 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 15	13.541169 ft	2.3913358 ft	630.78064 psf	1,307.5528 psf	287.27272 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 16	15.171061 ft	2.1740075 ft	644.34193 psf	1,267.6414 psf	264.57493 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 17	16.800954 ft	1.9566792 ft	657.90322 psf	1,227.73 psf	241.87713 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 18	18.29078 ft	1.865359 ft	663.6016 psf	1,229.758 psf	240.31912 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 19	19.64054 ft	1.900047 ft	661.43707 psf	1,171.9646 psf	216.70608 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 20	21.009946 ft	2.0630433 ft	651.2661 psf	1,155.76 psf	214.14494 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 21	22.398998 ft	2.3543478 ft	633.0887 psf	1,063.8831 psf	182.86137 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 22	23.430732 ft	2.5707175 ft	619.58723 psf	996.44656 psf	159.9673 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 23	24.13397 ft	2.7772478 ft	606.69974 psf	988.47919 psf	162.05576 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 24	25.324434 ft	3.2189607 ft	579.13685 psf	927.0437 psf	147.6777 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 25	26.973301 ft	3.8307611 ft	540.96051 psf	865.93356 psf	137.94288 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 26	28.622169 ft	4.4425615 ft	502.78416 psf	804.82341 psf	128.20805 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 27	30.271036 ft	5.0543618 ft	464.60782 psf	743.71326 psf	118.47323 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 28	32.29711 ft	5.8508685 ft	414.90581 psf	671.32947 psf	108.84539 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 29	34.571545 ft	6.796242 ft	355.9145 psf	578.53496 psf	94.496781 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 30	36.717135 ft	7.705776 ft	299.15958 psf	486.28049 psf	79.428113 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 31	38.73795 ft	8.5687667 ft	245.30895 psf	399.54049 psf	65.467401 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 32	40.63399 ft	9.3852143 ft	194.36263 psf	316.56301 psf	51.870982 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 33	42.561439 ft	10.244532 ft	140.74122 psf	231.30515 psf	38.442105 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 34	44.520296 ft	11.146719 ft	84.444734 psf	138.78309 psf	23.065263 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 35	46.479154 ft	12.048906 ft	28.148245 psf	46.26103 psf	7.6884211 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase

Oak Harbor Levees

Spencer's Q case

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2032 Spencer's Qcase

CASE: Top of Leve (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:47:01 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 01/21/2022
Last Solved Time: 11:49:00 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	15.5 ft
Coordinate 2	-5 ft	15.5 ft
Coordinate 3	5 ft	15.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-46.9 ft	0 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

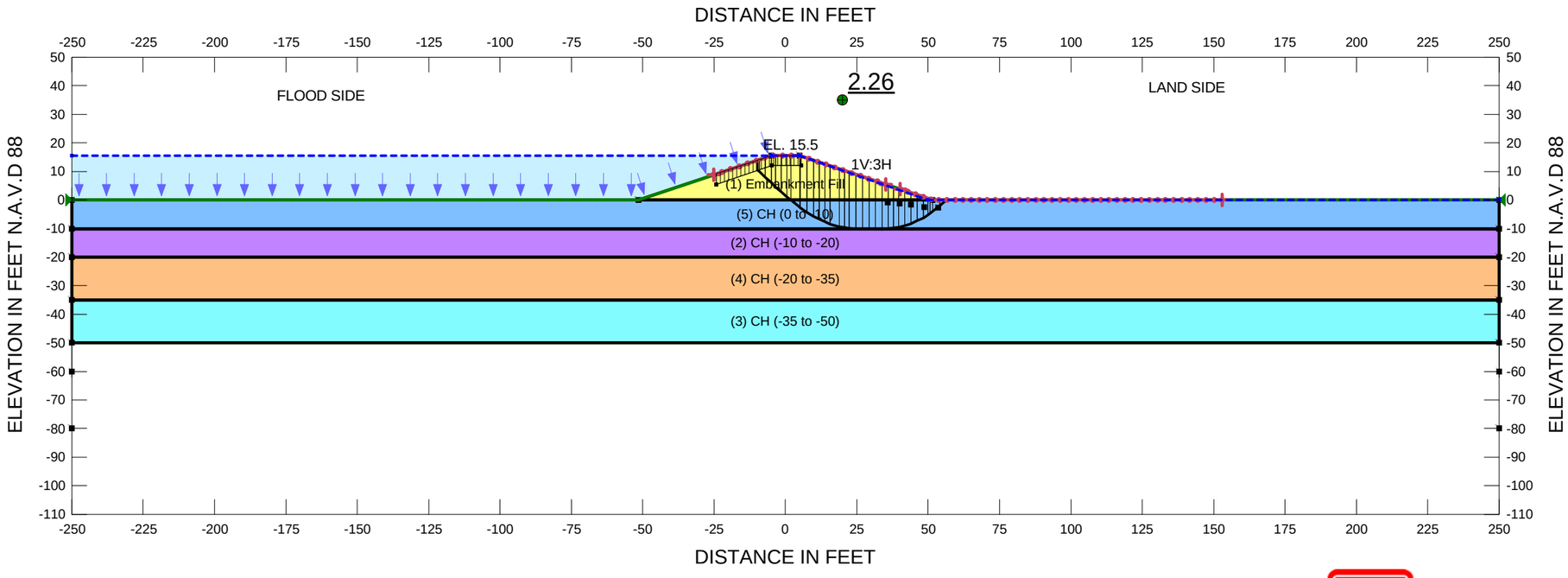
Slip Surfaces Analysed: 39579 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.24
Volume: 2,808.5633 ft³
Weight: 335,743.75 lbf
Resisting Moment: 5,879,565.7 lbf·ft
Activating Moment: 2,619,851.8 lbf·ft
Resisting Force: 78,136.165 lbf
Activating Force: 34,875.151 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (86.015315, 0) ft
Entry: (-23.047794, 5.8366668) ft
Radius: 49.869029 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-21.682703 ft	4.6353129 ft	677.95648 psf	688.75463 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-18.952521 ft	2.232605 ft	827.88545 psf	1,006.9786 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-17.078808 ft	0.5156255 ft	935.02497 psf	1,185.0808 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-15.416623 ft	-1.1694465 ft	1,040.1735 psf	1,391.8103 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-12.460082 ft	-4.2541697 ft	1,232.6602 psf	1,789.7724 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-8.8541247 ft	-8.0847232 ft	1,471.6867 psf	2,303.3904 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-6.4962781 ft	-10.589428 ft	1,627.9803 psf	2,570.2865 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-5.470705 ft	-11.625354 ft	1,692.6221 psf	2,762.5556 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	-3.06274 ft	-13.909482 ft	1,835.1517 psf	3,037.6849 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	0.81178 ft	-17.584743 ft	2,064.488 psf	3,467.4817 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	3.0855703 ft	-19.711187 ft	2,197.1781 psf	3,764.4 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	4.2110503 ft	-20.677083 ft	2,257.45 psf	3,895.7545 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	6.410605 ft	-22.564758 ft	2,344.9223 psf	4,044.2548 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	9.7657925 ft	-24.993153 ft	2,424.34 psf	4,302.4282 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	13.654958 ft	-27.428756 ft	2,492.7305 psf	4,419.686 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	17.38128 ft	-29.352422 ft	2,532.6762 psf	4,615.9046 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	20.94476 ft	-30.76415 ft	2,544.1769 psf	4,635.5807 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	24.361618 ft	-31.799435 ft	2,535.339 psf	4,730.5937 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	27.631853 ft	-32.458276 ft	2,506.1625 psf	4,678.9344 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	31.121775 ft	-32.747832 ft	2,449.2207 psf	4,706.2579 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	34.831385 ft	-32.668102 ft	2,364.5137 psf	4,555.0287 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	38.69704 ft	-32.040591 ft	2,242.2711 psf	4,490.9124 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	42.71874 ft	-30.865298 ft	2,082.4932 psf	4,201.6746 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	47.364795 ft	-28.813576 ft	1,854.6065 psf	3,933.1333 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	50.5114 ft	-27.065375 ft	1,688.8794 psf	3,608.6189 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	51.2614 ft	-26.61476 ft	1,660.7611 psf	3,603.592 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	53.705845 ft	-24.909084 ft	1,554.3268 psf	3,397.2542 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	58.117535 ft	-21.830709 ft	1,362.2363 psf	3,042.0205 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	60.517017 ft	-20.145761 ft	1,257.0955 psf	2,875.0125 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	62.872137 ft	-18.372933 ft	1,146.4711 psf	2,677.5537 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	67.093495 ft	-15.10897 ft	942.79974 psf	2,279.8901 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	71.213245 ft	-11.835177 ft	738.51503 psf	1,858.9493 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	73.39699 ft	-10.09914 ft	630.18634 psf	1,638.3864 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	75.603269 ft	-8.3333333 ft	520 psf	1,344.0786 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	79.768088 ft	-5 ft	312 psf	908.37158 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 36	83.932906 ft	-1.6666667 ft	104 psf	472.66451 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2032 Spencer's Qcase

CASE: Top of Levee (CG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:47:01 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 01/21/2022
Last Solved Time: 11:48:36 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.16957, 8.77681) ft
Left-Zone Right Coordinate: (35.16229, 5.445903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.15864, 3.780453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	15.5 ft
Coordinate 2	-5 ft	15.5 ft
Coordinate 3	5 ft	15.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 17840 of 26692 converged

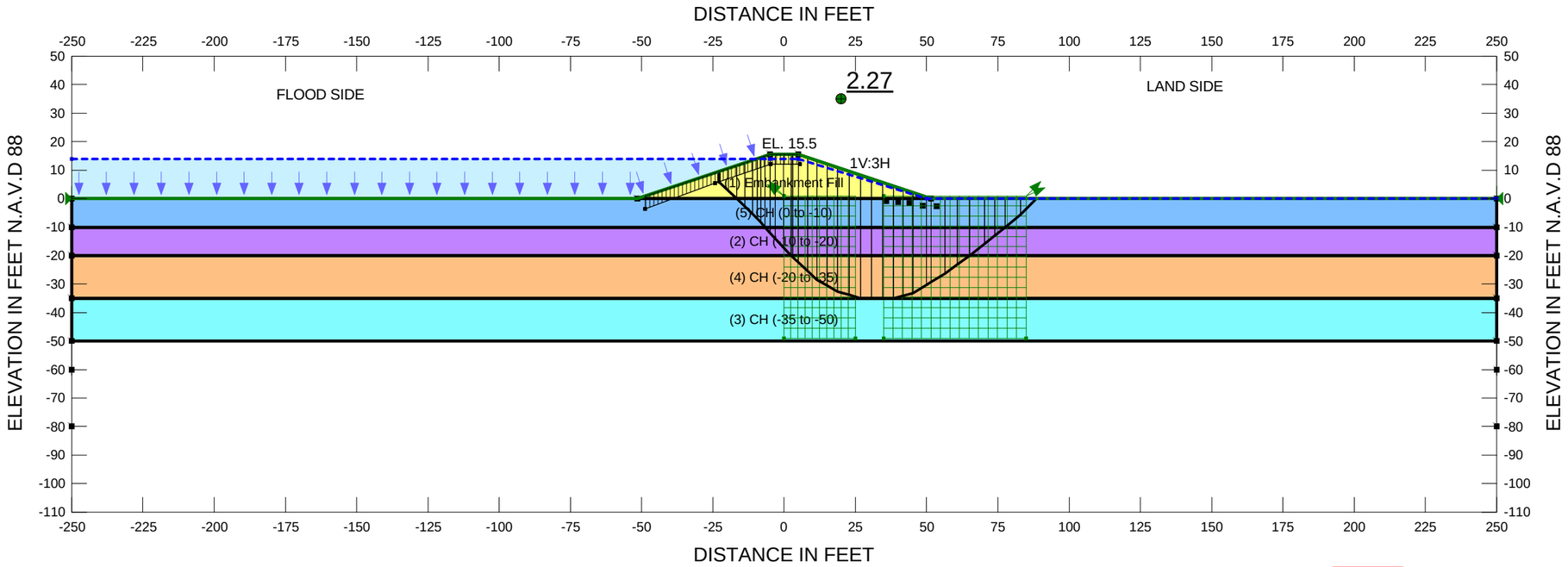
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.26
Volume: 921.36219 ft³
Weight: 109,914.7 lbf
Resisting Moment: 2,088,935 lbf·ft
Activating Moment: 923,963.92 lbf·ft
Resisting Force: 41,919.583 lbf
Activating Force: 18,553.102 lbf
Slip Rank: 1 of 26,692 slip surfaces

Exit: (56.46133, 0) ft
Entry: (-9.7632266, 10.469234) ft
Radius: 30.64561 ft
Center: (20, 35) ft

lip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-9.4505233 ft	10.222818 ft	329.29613 psf	248.22124 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-8.103365 ft	9.0020011 ft	405.47513 psf	423.0601 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-6.034455 ft	7.0531973 ft	527.08049 psf	656.77286 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-4.213385 ft	5.3378457 ft	634.11843 psf	849.56719 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-2.4692175 ft	3.7377082 ft	733.96701 psf	1,029.4057 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	-0.5541125 ft	2.0193327 ft	841.19364 psf	1,206.4308 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	1.121774 ft	0.5800725 ft	931.00348 psf	1,390.4708 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	3.420054 ft	-1.2758456 ft	1,046.8128 psf	1,584.3784 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	5.104835 ft	-2.6363481 ft	1,129.4549 psf	1,734.6897 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	6.3842275 ft	-3.499184 ft	1,155.7974 psf	1,856.5923 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	8.7333425 ft	-5.055542 ft	1,202.4238 psf	1,952.8237 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	10.86805 ft	-6.2598202 ft	1,231.6888 psf	2,128.6231 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	12.78835 ft	-7.1120185 ft	1,243.5924 psf	2,159.7461 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	14.70865 ft	-7.9642168 ft	1,255.4959 psf	2,190.8691 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	17.30459 ft	-8.8517505 ft	1,255.0826 psf	2,290.3204 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	19.791483 ft	-9.4467045 ft	1,238.7561 psf	2,340.9295 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	21.493688 ft	-9.7137435 ft	1,218.8333 psf	2,309.6933 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	23.518945 ft	-9.921276 ft	1,188.2538 psf	2,312.6307 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	25.833968 ft	-9.9955994 ft	1,143.134 psf	2,269.7599 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	28.115704 ft	-9.9962202 ft	1,094.1306 psf	2,182.374 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	30.39744 ft	-9.996841 ft	1,045.1272 psf	2,094.9881 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	32.679176 ft	-9.9974618 ft	996.12386 psf	2,007.6023 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	34.960912 ft	-9.9980826 ft	947.12049 psf	1,920.2164 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	36.96801 ft	-9.886721 ft	897.0323 psf	1,897.7101 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	38.70047 ft	-9.663377 ft	845.85929 psf	1,801.7781 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	40.661693 ft	-9.2397547 ft	777.27205 psf	1,752.4122 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	42.851677 ft	-8.6158542 ft	691.27058 psf	1,584.2662 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	45.03821 ft	-7.78774 ft	592.60038 psf	1,482.5425 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	47.22129 ft	-6.755412 ft	481.26145 psf	1,255.9267 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	49.156415 ft	-5.6913568 ft	373.27212 psf	1,115.7055 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	50.30487 ft	-4.9454588 ft	308.59663 psf	965.82683 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	51.05487 ft	-4.3863137 ft	273.70598 psf	929.45665 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	52.740333 ft	-3.0188816 ft	188.37821 psf	719.37246 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	55.220998 ft	-1.0062939 ft	62.792736 psf	438.23537 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2032 Spencer's Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:47:01 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 01/21/2022
Last Solved Time: 11:49:22 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, 1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, 1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	14 ft
Coordinate 2	-5 ft	14 ft
Coordinate 3	5 ft	14 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-48.7 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

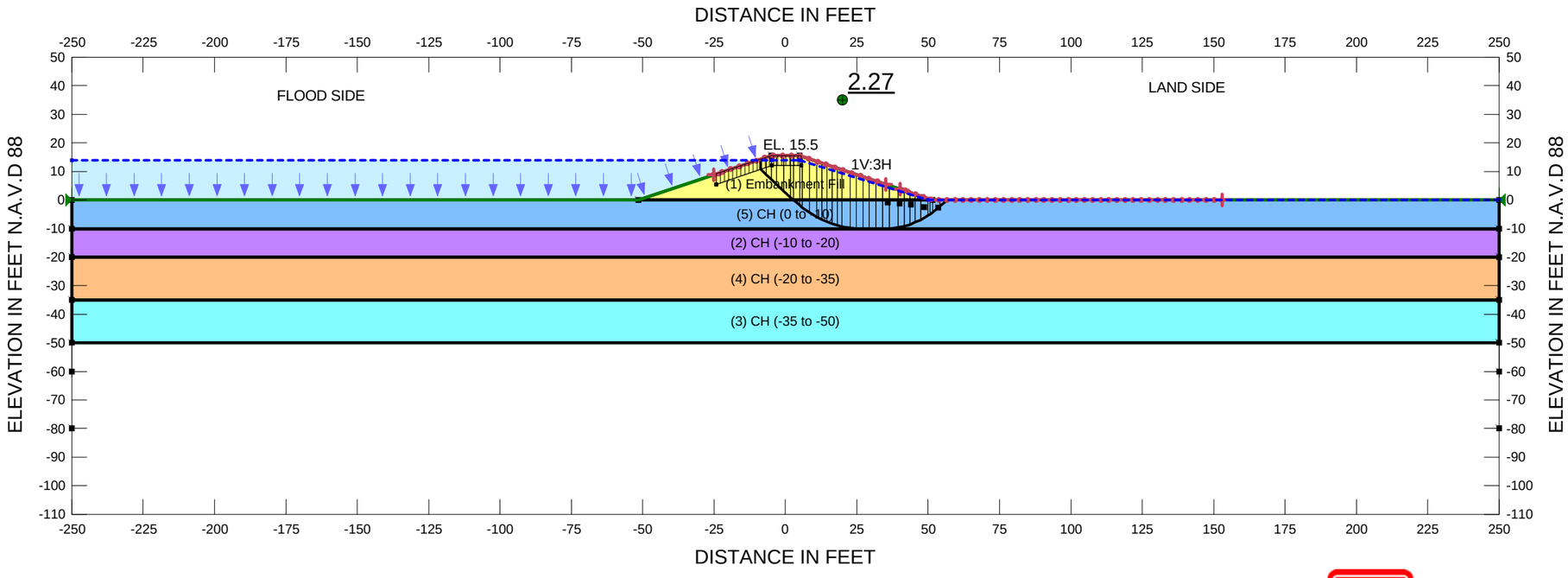
Slip Surfaces Analysed: 39581 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.27
Volume: 3,035.7478 ft³
Weight: 361,954.83 lbf
Resisting Moment: 6,271,385.9 lbf·ft
Activating Moment: 2,759,155.8 lbf·ft
Resisting Force: 79,895.997 lbf
Activating Force: 35,268.647 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (88.559923, 0) ft
Entry: (-22.929006, 5.8780903) ft
Radius: 51.43846 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-22.679438 ft	5.6695276 ft	519.82148 psf	461.11307 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-20.998869 ft	4.0957237 ft	618.02684 psf	666.33933 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-18.136866 ft	1.3652412 ft	788.40895 psf	1,016.7414 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-15.286731 ft	-1.3539193 ft	958.08456 psf	1,363.3491 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-12.448464 ft	-4.0617578 ft	1,127.0537 psf	1,736.8368 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-10.264665 ft	-6.2056942 ft	1,260.8353 psf	2,003.4553 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-8.881935 ft	-7.6342682 ft	1,349.9783 psf	2,210.0051 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	-7.5058937 ft	-9.1364125 ft	1,443.7121 psf	2,400.8676 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	-5.8739587 ft	-10.99573 ft	1,559.7336 psf	2,606.6412 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	-4.06794 ft	-13.053387 ft	1,688.1314 psf	2,879.6027 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	-1.7236936 ft	-15.586486 ft	1,846.1967 psf	3,222.1173 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	1.1006791 ft	-18.528829 ft	2,029.7989 psf	3,568.2208 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 13	2.7431027 ft	-20.239854 ft	2,136.5669 psf	3,798.1476 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	3.98667 ft	-21.42533 ft	2,210.5406 psf	3,975.1389 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	6.635355 ft	-23.897036 ft	2,333.0273 psf	4,178.4915 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	9.906065 ft	-26.949205 ft	2,459.9873 psf	4,383.5184 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	13.34744 ft	-29.512956 ft	2,553.1568 psf	4,710.9929 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	16.95948 ft	-31.588291 ft	2,612.536 psf	4,800.6358 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	20.778855 ft	-33.209317 ft	2,639.5412 psf	4,982.4501 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	24.805565 ft	-34.376036 ft	2,634.1726 psf	4,957.9104 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	28.742567 ft	-34.964324 ft	2,594.4514 psf	5,026.1186 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	32.58986 ft	-34.974179 ft	2,520.3776 psf	4,879.7494 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	36.437153 ft	-34.984034 ft	2,446.3038 psf	4,733.3802 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	40.05478 ft	-34.540696 ft	2,348.4093 psf	4,685.4341 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	43.44274 ft	-33.644164 ft	2,226.6941 psf	4,453.3553 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	47.56836 ft	-31.705363 ft	2,025.6209 psf	4,253.5401 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	50.75 ft	-29.755097 ft	1,856.718 psf	3,905.753 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	53.96063 ft	-27.78706 ft	1,733.9126 psf	3,651.7254 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	58.553358 ft	-24.709066 ft	1,541.8457 psf	3,359.609 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	62.853163 ft	-21.543472 ft	1,344.3127 psf	2,996.1853 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	67.64436 ft	-17.878602 ft	1,115.6248 psf	2,601.6063 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	72.076578 ft	-14.357228 ft	895.89101 psf	2,159.6069 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	75.694035 ft	-11.452409 ft	714.63034 psf	1,789.2792 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	80.257196 ft	-7.788189 ft	485.98299 psf	1,255.85 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	85.785776 ft	-2.788189 ft	173.98299 psf	673.09681 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2032 Spencer's Qcase

CASE: Project Grade (PG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:47:01 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 01/21/2022
Last Solved Time: 11:47:46 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.16957, 8.77681) ft
Left-Zone Right Coordinate: (35.16229, 5.445903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.15864, 3.780453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	14 ft
Coordinate 2	-5 ft	14 ft
Coordinate 3	5 ft	14 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 17676 of 26692 converged

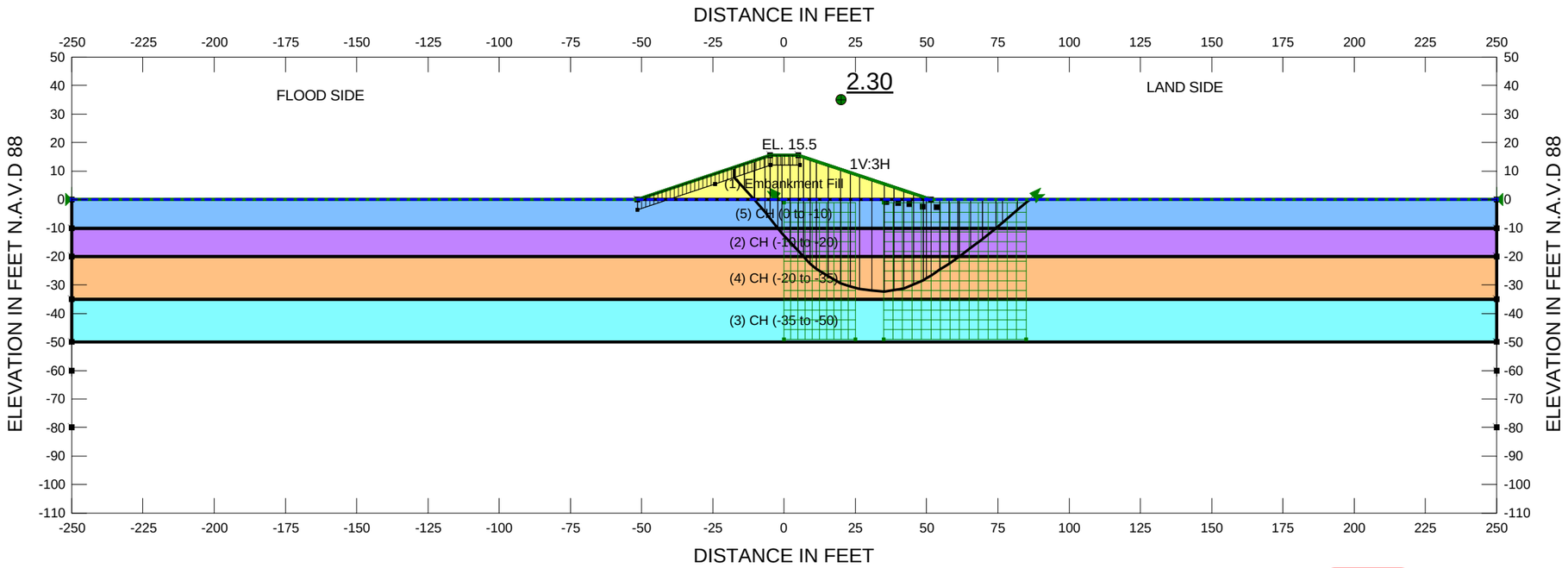
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.27
Volume: 899.84463 ft³
Weight: 107,389.04 lbf
Resisting Moment: 2,063,110.1 lbf·ft
Activating Moment: 907,092.07 lbf·ft
Resisting Force: 41,436.696 lbf
Activating Force: 18,230.967 lbf
Slip Rank: 1 of 26,692 slip surfaces

Exit: (56.74178, 0) ft
Entry: (-8.7226145, 10.832114) ft
Radius: 30.625455 ft
Center: (20, 35) ft

lip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-8.5272072 ft	10.684993 ft	206.85641 psf	120.73453 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-7.49885 ft	9.7222066 ft	266.93431 psf	306.00153 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-5.83295 ft	8.0908737 ft	368.72948 psf	529.10056 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-4.031565 ft	6.3268671 ft	478.80349 psf	737.40762 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-1.858735 ft	4.2518613 ft	608.28386 psf	964.18481 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	0.550055 ft	1.9985298 ft	748.89174 psf	1,195.2537 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	2.272377 ft	0.435932 ft	846.39784 psf	1,392.5858 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	3.895152 ft	-0.92993521 ft	931.62796 psf	1,531.295 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	5.475225 ft	-2.2598607 ft	1,005.3896 psf	1,664.7363 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	7.191755 ft	-3.4794235 ft	1,048.1668 psf	1,827.5485 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	9.674365 ft	-5.1185685 ft	1,102.2537 psf	1,928.6114 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	11.82807 ft	-6.3427927 ft	1,136.8347 psf	2,104.1294 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	13.65287 ft	-7.152096 ft	1,151.9097 psf	2,133.6423 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	15.47767 ft	-7.9613993 ft	1,166.9848 psf	2,163.1551 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	17.248738 ft	-8.6051433 ft	1,172.7721 psf	2,264.8113 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	18.966072 ft	-9.0833277 ft	1,169.2716 psf	2,258.9646 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	21.25808 ft	-9.566844 ft	1,154.9475 psf	2,292.7951 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	23.736635 ft	-9.905401 ft	1,127.9565 psf	2,286.762 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	25.944681 ft	-9.9990559 ft	1,090.935 psf	2,266.141 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	28.270343 ft	-9.9980997 ft	1,045.7265 psf	2,176.8663 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	30.596005 ft	-9.9971435 ft	1,000.518 psf	2,087.5917 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	32.921667 ft	-9.9961873 ft	955.30946 psf	1,998.317 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	35.247329 ft	-9.9952311 ft	910.10094 psf	1,909.0423 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	37.94207 ft	-9.810608 ft	846.26655 psf	1,845.0704 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	40.51118 ft	-9.3637755 ft	768.50922 psf	1,757.1693 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	42.58558 ft	-8.8384005 ft	695.4548 psf	1,607.0421 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	44.541852 ft	-8.1664642 ft	615.54821 psf	1,538.2011 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	46.379998 ft	-7.3479667 ft	528.78944 psf	1,354.825 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	48.649535 ft	-6.1331401 ft	408.92497 psf	1,170.9137 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	50.285505 ft	-5.1572531 ft	321.81259 psf	970.70997 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	51.035505 ft	-4.6115596 ft	287.76132 psf	958.76214 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	52.810445 ft	-3.1771315 ft	198.253 psf	738.54688 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	55.431335 ft	-1.0590438 ft	66.084334 psf	442.74929 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2032 Spencer's Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:47:01 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 01/21/2022
Last Solved Time: 11:49:36 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-51.5 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

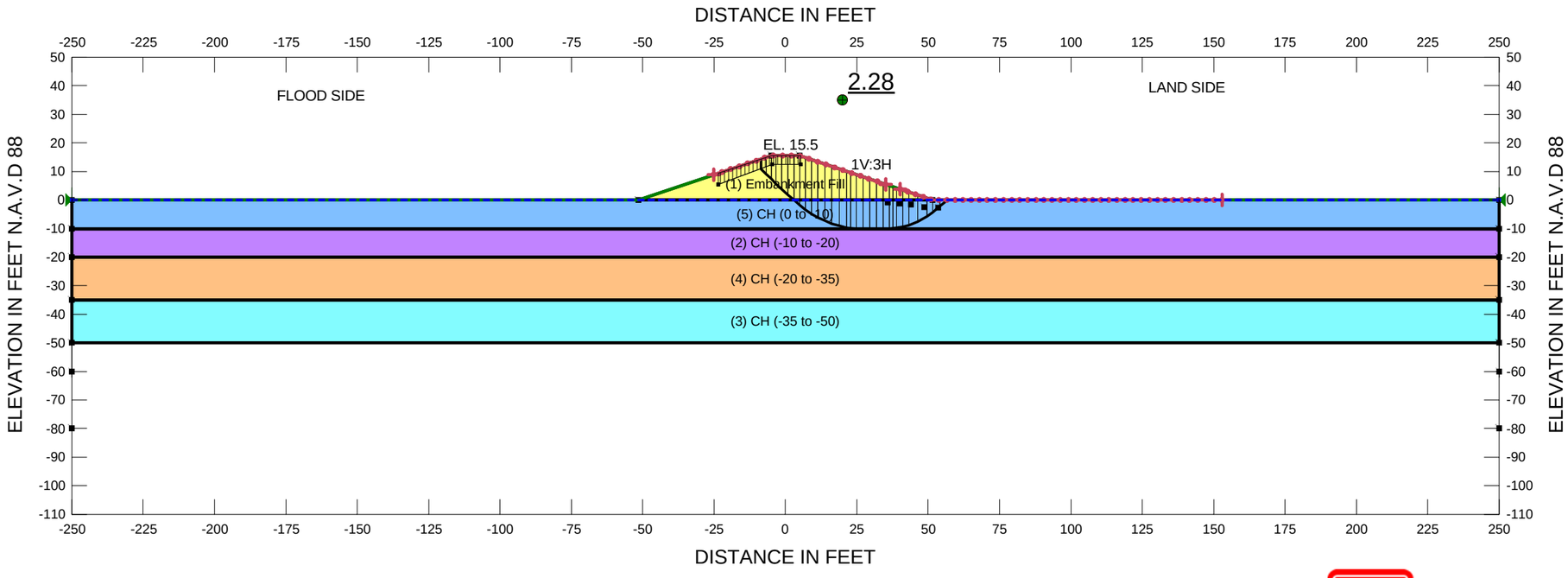
Slip Surfaces Analysed: 36985 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.30
Volume: 2,622.7799 ft³
Weight: 313,782.3 lbf
Resisting Moment: 5,582,939.4 lbf·ft
Activating Moment: 2,418,209.7 lbf·ft
Resisting Force: 74,184.028 lbf
Activating Force: 32,271.805 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (86.097885, 0) ft
Entry: (-17.499012, 7.7716267) ft
Radius: 48.806899 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-15.745891 ft	5.82872 ft	-363.71213 psf	397.76693 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-12.239649 ft	1.9429067 ft	-121.23738 psf	954.21821 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-10.383239 ft	-0.114471 ft	7.1429904 psf	1,229.7307 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-8.545905 ft	-2.2764055 ft	142.0477 psf	1,528.5248 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-5.90593 ft	-5.4548504 ft	340.38267 psf	1,975.6589 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-3.6326047 ft	-8.2929159 ft	517.47795 psf	2,342.5741 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-1.5218997 ft	-10.927963 ft	681.90489 psf	2,572.8254 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	0.6660575 ft	-13.407587 ft	836.63345 psf	2,940.8808 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	3.5553525 ft	-16.51091 ft	1,030.2808 psf	3,303.4036 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	5.9019048 ft	-19.031286 ft	1,187.5522 psf	3,564.9927 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	7.9703098 ft	-21.25291 ft	1,326.1816 psf	3,766.5532 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	10.23579 ft	-23.419101 ft	1,461.3519 psf	4,030.8001 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	13.43583 ft	-25.612275 ft	1,598.2059 psf	4,258.5017 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	17.63795 ft	-28.172059 ft	1,757.9365 psf	4,377.9706 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	21.44072 ft	-29.953323 ft	1,869.0874 psf	4,593.4539 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	24.84414 ft	-30.956065 ft	1,931.6585 psf	4,574.568 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	28.698348 ft	-31.652539 ft	1,975.1185 psf	4,614.0196 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	33.003343 ft	-32.042746 ft	1,999.4674 psf	4,492.849 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	36.86491 ft	-31.983443 ft	1,995.7668 psf	4,466.3061 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	40.28305 ft	-31.474629 ft	1,964.0168 psf	4,277.4135 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	43.722493 ft	-30.504364 ft	1,903.4723 psf	4,174.8046 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	47.183237 ft	-29.072647 ft	1,814.1332 psf	3,877.1548 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	49.456805 ft	-27.996431 ft	1,746.9773 psf	3,793.9807 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	50.75 ft	-27.138518 ft	1,693.4435 psf	3,644.2867 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	53.066585 ft	-25.601683 ft	1,597.545 psf	3,438.2118 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	56.199755 ft	-23.523122 ft	1,467.8428 psf	3,199.6948 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	59.332925 ft	-21.44456 ft	1,338.1405 psf	2,961.1778 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	61.171618 ft	-20.20264 ft	1,260.6447 psf	2,856.9037 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	63.472362 ft	-18.489271 ft	1,153.7305 psf	2,667.4582 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	67.529634 ft	-15.467814 ft	965.19158 psf	2,281.6626 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	71.960614 ft	-11.978542 ft	747.46105 psf	1,872.0809 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	75.527744 ft	-9.0406955 ft	564.1394 psf	1,430.3306 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	79.279505 ft	-5.8777225 ft	366.76988 psf	1,027.8922 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	83.982183 ft	-1.837027 ft	114.63048 psf	505.86749 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2032 Spencer's Qcase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:47:01 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 01/21/2022
Last Solved Time: 11:48:02 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.16957, 8.77681) ft
Left-Zone Right Coordinate: (35.16229, 5.445903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.15864, 3.780453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-23.5 ft	5.5 ft
Coordinate 2	-4.6 ft	12.4 ft
Coordinate 3	5.4 ft	12.4 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 16765 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.28
Volume: 900.17764 ft³
Weight: 107,443.27 lbf
Resisting Moment: 2,065,584.9 lbf·ft
Activating Moment: 907,524.14 lbf·ft
Resisting Force: 41,420.229 lbf
Activating Force: 18,209.369 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (56.808236, 0) ft
Entry: (-8.6371225, 10.92613) ft
Radius: 30.683068 ft
Center: (20, 35) ft

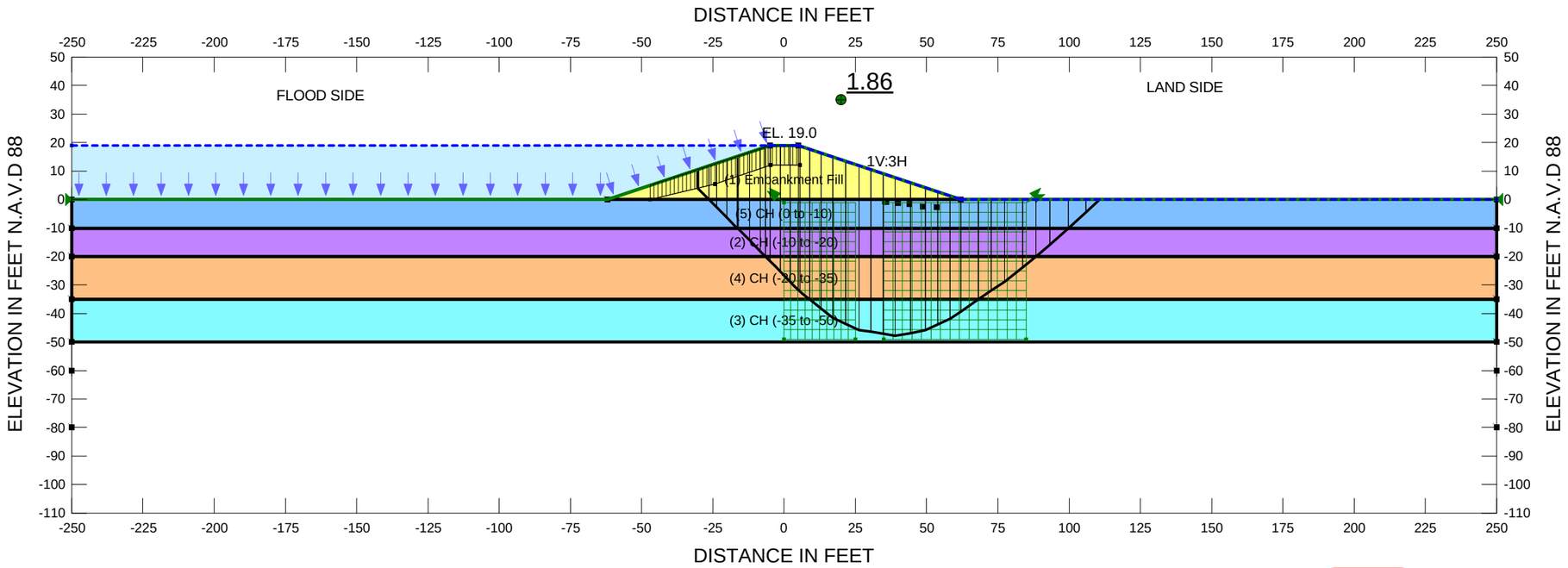
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-7.7278418 ft	10.028689 ft	-625.79018 psf	242.87741 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-5.9092806 ft	8.2338064 ft	-513.78952 psf	510.1172 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-4.12509 ft	6.4728471 ft	-403.90566 psf	721.02824 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-2.248885 ft	4.6787385 ft	-291.95328 psf	923.88082 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-0.246295 ft	2.8175575 ft	-175.81559 psf	1,115.3068 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	1.86894 ft	0.9434835 ft	-58.87337 psf	1,340.0717 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	3.99144 ft	-0.85422893 ft	53.303885 psf	1,523.0137 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	5.97706 ft	-2.5360069 ft	158.24683 psf	1,678.9927 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	8.062835 ft	-4.072425 ft	254.11932 psf	1,877.6851 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	10.280265 ft	-5.490163 ft	342.58617 psf	1,962.9711 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	12.581435 ft	-6.7338762 ft	420.19388 psf	2,122.4226 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	14.966345 ft	-7.8035647 ft	486.94244 psf	2,162.4316 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	17.47801 ft	-8.6777262 ft	541.49012 psf	2,278.0082 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	20.11643 ft	-9.3563608 ft	583.83691 psf	2,262.2144 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	22.108395 ft	-9.7808795 ft	610.32688 psf	2,312.3516 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	23.794725 ft	-9.932751 ft	619.80366 psf	2,301.7757 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	25.973976 ft	-9.9993575 ft	623.95991 psf	2,264.3213 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	28.305328 ft	-9.9992305 ft	623.95198 psf	2,174.9363 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	30.63668 ft	-9.9991035 ft	623.94406 psf	2,085.5513 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	32.968032 ft	-9.9989765 ft	623.93613 psf	1,996.1663 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	35.299384 ft	-9.9988495 ft	623.92821 psf	1,906.7813 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	37.0647 ft	-9.962204 ft	621.64153 psf	1,866.1135 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	38.32366 ft	-9.852429 ft	614.79157 psf	1,829.5264 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	40.036907 ft	-9.5287835 ft	594.59609 psf	1,787.1363 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	42.144762 ft	-9.0278785 ft	563.33962 psf	1,639.2561 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	44.740945 ft	-8.1903295 ft	511.07656 psf	1,498.2044 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	47.910405 ft	-6.7096235 ft	418.68051 psf	1,253.9959 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	50.518805 ft	-5.0311237 ft	313.94212 psf	1,032.0435 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	52.827059 ft	-3.184675 ft	198.72372 psf	733.24981 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	55.481177 ft	-1.0615583 ft	66.24124 psf	437.82785 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Oak Harbor

Spencer's Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

OAK HARBOR 2082 Spencer's Qcase

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,378
Date: 04/13/2022
Time: 08:52:47 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 01:44:26 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	62 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-46.9 ft	0 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

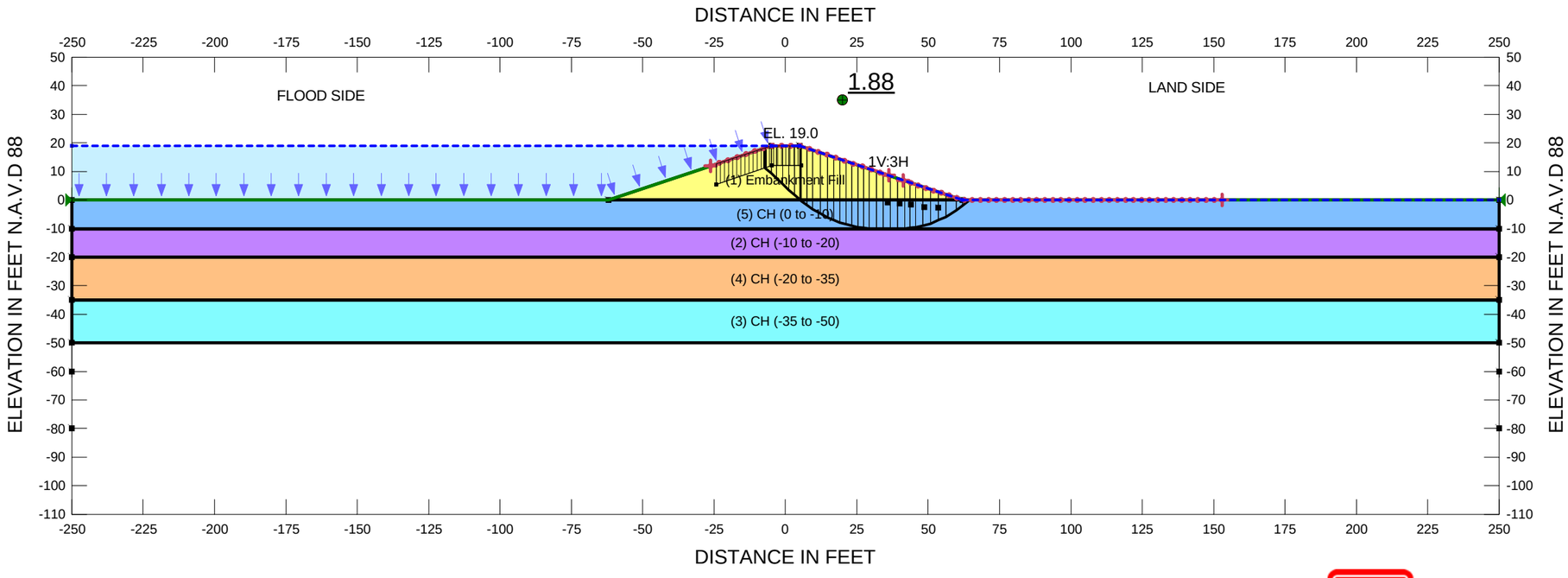
Slip Surfaces Analysed: 39569 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.86
Volume: 5,080.6792 ft³
Weight: 598,281.58 lbf
Resisting Moment: 9,607,392.9 lbf·ft
Activating Moment: 5,146,549.9 lbf·ft
Resisting Force: 103,746.71 lbf
Activating Force: 55,863.648 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (110.69703, 0) ft
Entry: (-30.468303, 3.9261576) ft
Radius: 64.603417 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-28.42933 ft	1.9630788 ft	1,063.1039 psf	1,183.3352 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-25.025769 ft	-1.3137965 ft	1,267.5809 psf	1,610.8906 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 3	-21.870017 ft	-4.4706947 ft	1,464.5714 psf	2,016.7105 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-18.287692 ft	-8.1568982 ft	1,694.5905 psf	2,519.2926 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-16.33029 ft	-10.17106 ft	1,820.2742 psf	2,712.6761 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 6	-14.203852 ft	-12.320734 ft	1,954.4138 psf	3,012.7417 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-10.283458 ft	-16.277959 ft	2,201.3447 psf	3,546.3968 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-7.4616245 ft	-19.128286 ft	2,379.205 psf	3,929.431 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	-5.7999945 ft	-20.809352 ft	2,484.1036 psf	4,184.02 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	-3.2044275 ft	-23.435279 ft	2,647.9614 psf	4,477.111 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	0.3867175 ft	-27.06843 ft	2,874.67 psf	4,863.7048 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	3.591145 ft	-30.29789 ft	3,076.1883 psf	5,212.5148 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	5.26967 ft	-31.981217 ft	3,175.6188 psf	5,381.7846 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	7.246743 ft	-33.625829 ft	3,237.1195 psf	5,603.2792 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	10.974439 ft	-36.625995 ft	3,346.7937 psf	5,771.7193 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	15.015026 ft	-39.877985 ft	3,465.6737 psf	5,967.8159 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	19.333693 ft	-42.56046 ft	3,543.2319 psf	6,318.7863 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	23.930438 ft	-44.67342 ft	3,579.4683 psf	6,373.9221 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	28.339318 ft	-46.071668 ft	3,575.0143 psf	6,559.5492 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	32.560335 ft	-46.755204 ft	3,529.8698 psf	6,473.5268 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	36.781352 ft	-47.43874 ft	3,484.7253 psf	6,387.5044 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	41.57241 ft	-47.296413 ft	3,376.1901 psf	6,421.1784 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	46.93351 ft	-46.328224 ft	3,204.2642 psf	6,106.7461 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 24	51.744363 ft	-44.853256 ft	3,012.1604 psf	5,946.8331 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 25	56.004967 ft	-42.871508 ft	2,799.8788 psf	5,557.7979 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 26	60.067635 ft	-40.557619 ft	2,570.9886 psf	5,280.8392 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 27	65.09248 ft	-37.117302 ft	2,316.1196 psf	4,814.7152 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 28	70.461888 ft	-33.441076 ft	2,086.7231 psf	4,382.5072 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	75.015743 ft	-30.323227 ft	1,892.1694 psf	4,026.013 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	80.48295 ft	-26.267595 ft	1,639.0979 psf	3,617.0282 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	85.975954 ft	-21.885444 ft	1,365.6517 psf	3,133.3492 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 32	90.790774 ft	-17.943125 ft	1,119.651 psf	2,690.2048 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	96.549543 ft	-12.943125 ft	807.651 psf	2,100.0278 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	102.79416 ft	-7.2823515 ft	454.41873 psf	1,285.4533 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	108.24456 ft	-2.2823515 ft	142.41873 psf	644.60376 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

OAK HARBOR 2082 Spencer's Qcase

CASE: Top of Levee (CG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,378
Date: 04/13/2022
Time: 08:52:47 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 01:44:10 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.21957, 11.92681) ft
Left-Zone Right Coordinate: (36.21229, 8.595903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.20864, 6.930453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	62 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 20693 of 26692 converged

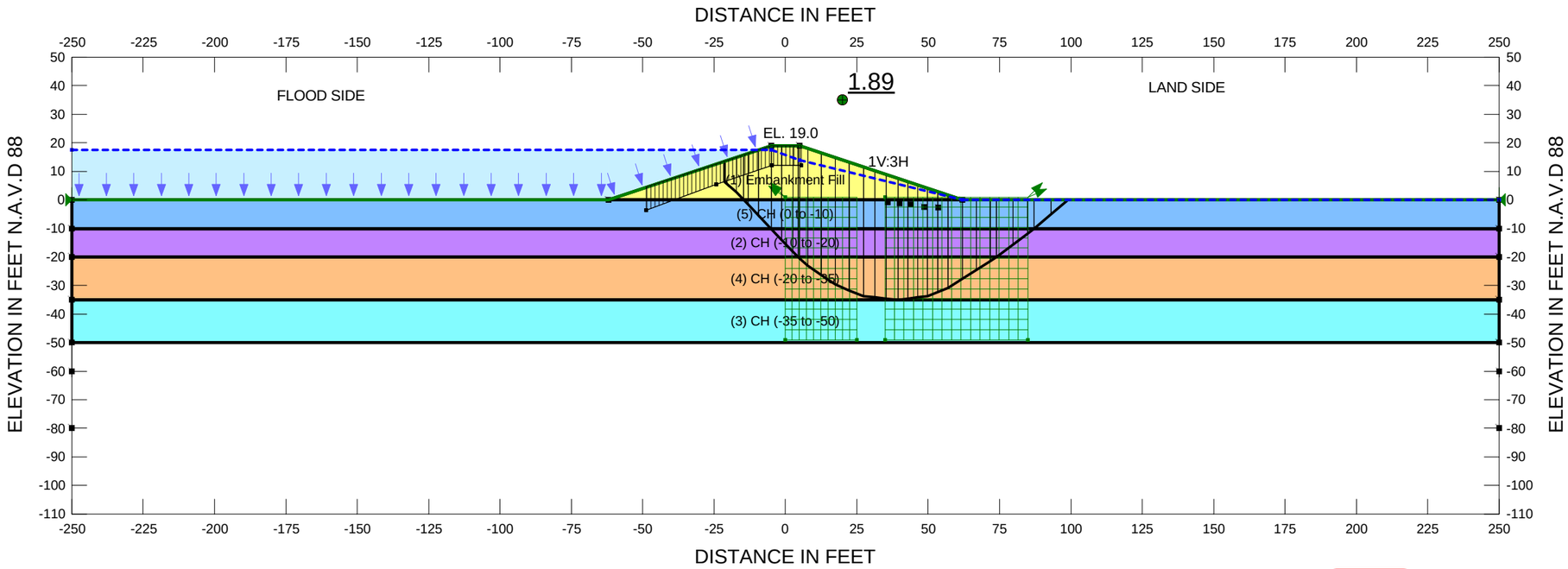
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.88
Volume: 1,132.2464 ft³
Weight: 134,491.76 lbf
Resisting Moment: 2,239,342.6 lbf·ft
Activating Moment: 1,192,105.9 lbf·ft
Resisting Force: 45,422.495 lbf
Activating Force: 24,195.541 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (64.462358, 0) ft
Entry: (-7.2895094, 11.331863) ft
Radius: 32.921097 ft

Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-6.9978597 ft	11.125185 ft	491.38847 psf	267.65395 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-5.853105 ft	10.122013 ft	553.9864 psf	660.16707 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-4.101515 ft	8.4866578 ft	656.03255 psf	838.41536 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-2.1017975 ft	6.5931107 ft	774.18989 psf	1,018.7057 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	0.1006675 ft	4.4837403 ft	905.81461 psf	1,230.0408 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	2.151425 ft	2.6101667 ft	1,022.7256 psf	1,463.0388 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	4.050475 ft	0.97238996 ft	1,124.9229 psf	1,629.2555 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	5.0889948 ft	0.076750805 ft	1,178.9597 psf	1,717.1426 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 9	5.3396848 ft	-0.139449 ft	1,187.2362 psf	1,718.4776 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	6.51089 ft	-1.0227233 ft	1,217.9914 psf	1,845.6869 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	8.52991 ft	-2.5103737 ft	1,268.8252 psf	1,943.1609 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	10.828807 ft	-3.9855665 ft	1,313.0602 psf	2,131.7032 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	13.407583 ft	-5.4483015 ft	1,350.6963 psf	2,208.9301 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	15.788905 ft	-6.6135515 ft	1,373.8764 psf	2,369.4181 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	17.972775 ft	-7.4813165 ft	1,382.6004 psf	2,392.743 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	20.111922 ft	-8.184196 ft	1,381.9659 psf	2,494.4737 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	22.206345 ft	-8.72219 ft	1,371.9727 psf	2,481.934 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	24.300768 ft	-9.260184 ft	1,361.9795 psf	2,469.3942 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	26.344413 ft	-9.6461682 ft	1,343.5571 psf	2,538.8857 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	28.337277 ft	-9.8801428 ft	1,316.7055 psf	2,492.5786 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	30.573245 ft	-9.9970486 ft	1,277.4923 psf	2,506.8467 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	33.052315 ft	-9.9968858 ft	1,225.9175 psf	2,411.7944 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	35.531385 ft	-9.996723 ft	1,174.3427 psf	2,316.7421 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	38.010455 ft	-9.9965602 ft	1,122.7679 psf	2,221.6897 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	40.489525 ft	-9.9963974 ft	1,071.1931 psf	2,126.6374 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	42.675545 ft	-9.894138 ft	1,019.3429 psf	2,101.9579 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	44.568515 ft	-9.689782 ft	967.21728 psf	2,002.1868 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	46.823015 ft	-9.266187 ft	893.89136 psf	1,950.5524 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	49.439045 ft	-8.623353 ft	799.36509 psf	1,762.7949 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	52.126022 ft	-7.697565 ft	685.70679 psf	1,655.0213 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	54.883947 ft	-6.488823 ft	552.91645 psf	1,379.5724 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	58.052355 ft	-4.759267 ft	379.08928 psf	1,122.7022 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	60.9209 ft	-2.7853669 ft	196.25217 psf	809.18945 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	63.231179 ft	-0.96832587 ft	60.423534 psf	503.59339 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

OAK HARBOR 2082 Spencer's Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,378
Date: 04/13/2022
Time: 08:52:47 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 01:44:42 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
- Upper Left: (0, 1) ft
- Lower Left: (0, -49) ft
- Lower Right: (25, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (35, 1) ft
- Lower Left: (35, -49) ft
- Lower Right: (85, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-5 ft	17.5 ft
Coordinate 3	5 ft	14 ft
Coordinate 4	62 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-48.7 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

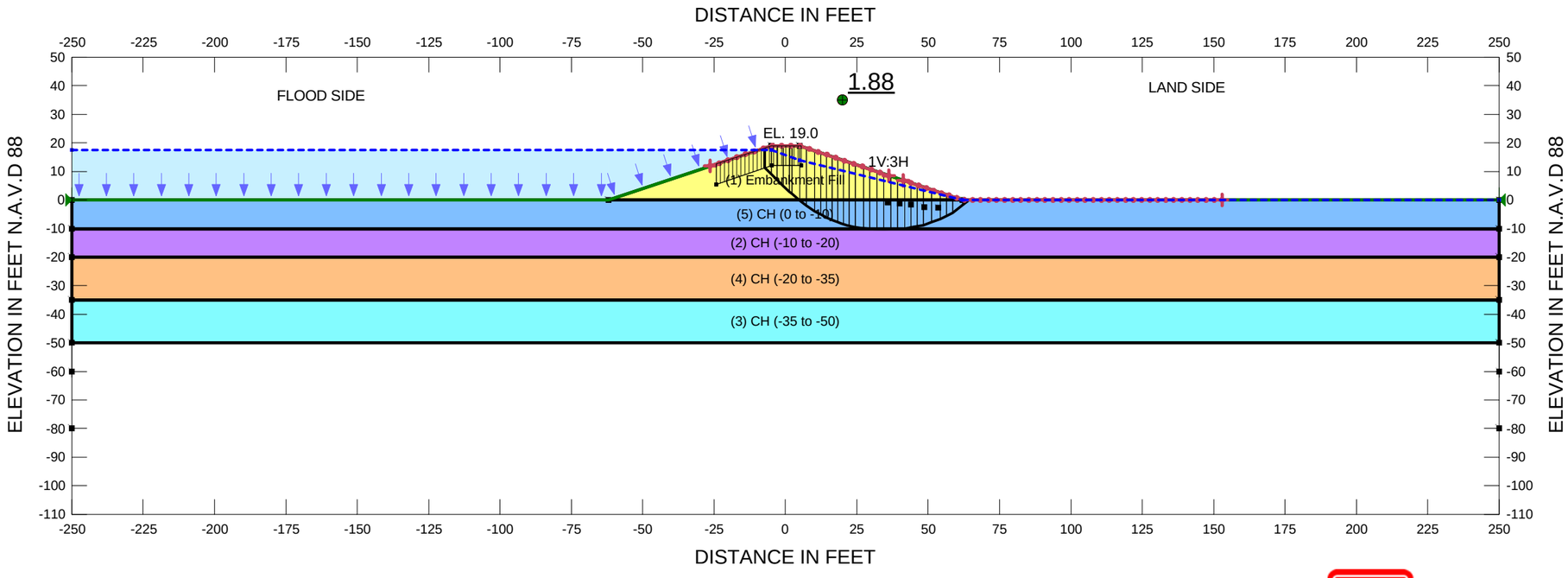
Slip Surfaces Analysed: 39575 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.89
Volume: 3,500.4427 ft³
Weight: 416,592.81 lbf
Resisting Moment: 6,801,292.3 lbf·ft
Activating Moment: 3,604,931.4 lbf·ft
Resisting Force: 86,237.976 lbf
Activating Force: 45,668.98 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (98.936099, 0) ft
Entry: (-21.350318, 6.4286071) ft
Radius: 54.607301 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-19.313434 ft	4.5538915 ft	807.83717 psf	961.41324 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-15.9893 ft	1.339588 ft	1,008.4097 psf	1,344.7973 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-13.911305 ft	-0.822896 ft	1,143.3487 psf	1,601.8876 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-11.31028 ft	-3.5483808 ft	1,313.419 psf	1,961.6222 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-7.25 ft	-7.8157005 ft	1,579.6997 psf	2,574.3747 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-3.161185 ft	-12.11301 ft	1,807.6921 psf	3,077.2791 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	0.65372 ft	-16.149227 ft	1,976.2345 psf	3,535.5723 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	3.5526554 ft	-19.126432 ft	2,098.6994 psf	3,953.0851 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	4.7377504 ft	-20.248246 ft	2,142.8181 psf	4,113.9617 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	6.40651 ft	-21.827898 ft	2,214.1042 psf	4,228.7363 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	10.205908 ft	-24.771816 ft	2,339.574 psf	4,571.0951 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	14.991682 ft	-27.996843 ft	2,467.4673 psf	4,738.7045 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	19.874222 ft	-30.63833 ft	2,557.4648 psf	5,013.4803 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	24.853527 ft	-32.69628 ft	2,609.5664 psf	5,050.1125 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	29.344336 ft	-33.937712 ft	2,618.2042 psf	5,227.5532 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	33.346648 ft	-34.362627 ft	2,583.3782 psf	5,121.9829 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	37.372677 ft	-34.79006 ft	2,548.3459 psf	5,015.787 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	41.143936 ft	-34.775879 ft	2,489.6615 psf	5,033.8867 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	44.617519 ft	-34.320084 ft	2,407.9826 psf	4,848.6515 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	48.071913 ft	-33.866806 ft	2,326.7549 psf	4,664.4396 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	51.581685 ft	-32.926912 ft	2,214.3137 psf	4,604.2011 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	55.146835 ft	-31.500401 ft	2,070.6588 psf	4,301.7874 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	59.464705 ft	-29.204635 ft	1,861.2259 psf	4,015.6061 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	64.444435 ft	-26.096326 ft	1,628.4108 psf	3,555.8301 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	69.333305 ft	-23.044732 ft	1,437.9913 psf	3,203.6467 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	72.820006 ft	-20.759467 ft	1,295.3908 psf	3,001.6064 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	76.776496 ft	-17.876493 ft	1,115.4932 psf	2,672.8382 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	82.207135 ft	-13.815597 ft	862.09325 psf	2,174.0707 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	85.876173 ft	-10.939104 ft	682.60009 psf	1,827.9897 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	90.023838 ft	-7.5597795 ft	471.73024 psf	1,307.2173 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	95.97749 ft	-2.5597795 ft	159.73024 psf	669.59585 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

OAK HARBOR 2082 Spencer's Qcase

CASE: Project Grade (PG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,378
Date: 04/13/2022
Time: 08:52:47 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 01:43:46 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.33462, 11.88846) ft
Left-Zone Right Coordinate: (36.28368, 8.572107) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.25819, 6.913937) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-5 ft	17.5 ft
Coordinate 3	5 ft	14 ft
Coordinate 4	62 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 20269 of 26692 converged

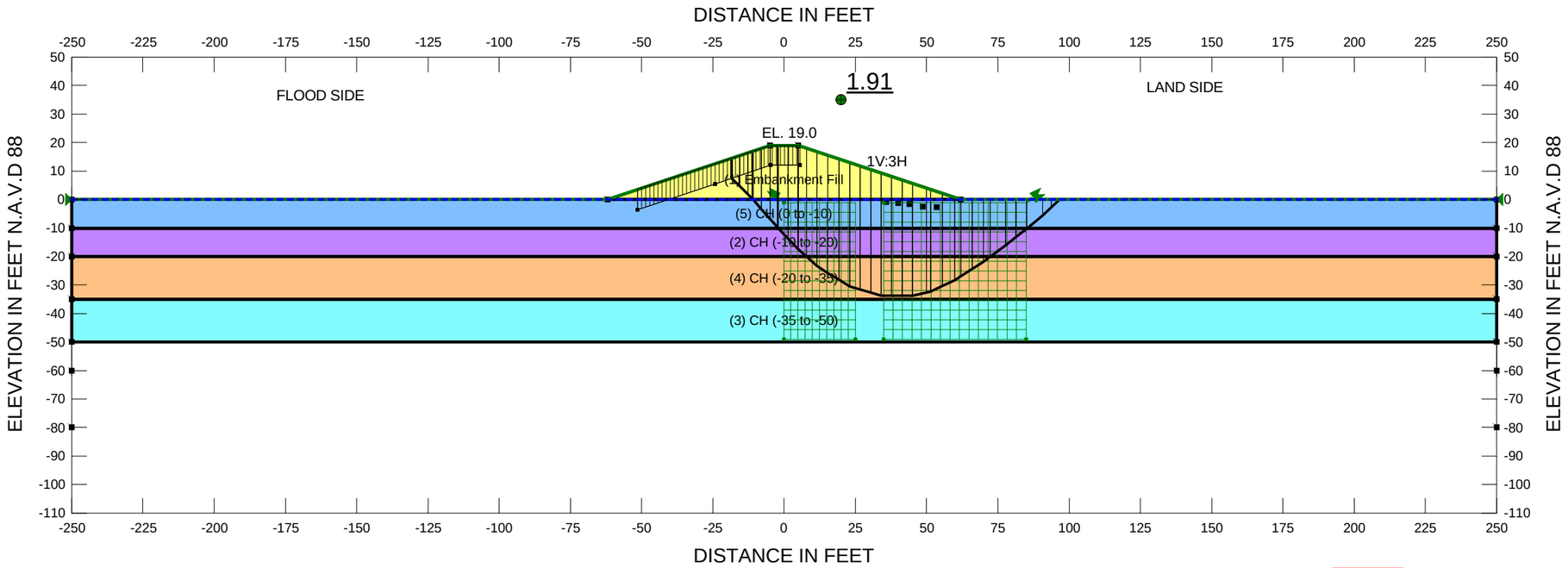
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.88
Volume: 1,137.5512 ft³
Weight: 135,108.75 lbf
Resisting Moment: 2,241,471.2 lbf·ft
Activating Moment: 1,190,131.1 lbf·ft
Resisting Force: 45,353.57 lbf
Activating Force: 24,095.298 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (64.261571, 0) ft
Entry: (-7.3769405, 11.301375) ft
Radius: 32.870882 ft

Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-6.1884702 ft	10.163595 ft	457.79167 psf	538.7022 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-3.9394133 ft	8.0104648 ft	568.98378 psf	877.99385 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-1.81824 ft	5.9797637 ft	649.37311 psf	1,081.6659 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	0.30293333 ft	3.9490626 ft	729.76243 psf	1,285.338 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	1.79369 ft	2.532902 ft	785.57273 psf	1,439.4019 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	3.61193 ft	1.0142942 ft	840.62349 psf	1,655.547 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	6.19992 ft	-1.0697863 ft	921.96431 psf	1,825.098 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	8.84703 ft	-3.007903 ft	1,002.3324 psf	2,027.922 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	11.309128 ft	-4.5000803 ft	1,057.7093 psf	2,209.2449 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	13.338945 ft	-5.540767 ft	1,091.5386 psf	2,257.7152 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	15.368762 ft	-6.5814537 ft	1,125.3678 psf	2,306.1855 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	17.349845 ft	-7.4481828 ft	1,149.089 psf	2,438.3345 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	19.282195 ft	-8.1409543 ft	1,162.7021 psf	2,450.2057 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	21.303123 ft	-8.730884 ft	1,168.5404 psf	2,534.8801 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	23.412627 ft	-9.217972 ft	1,166.6037 psf	2,515.5841 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	25.88901 ft	-9.653601 ft	1,155.8331 psf	2,544.0901 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	28.45929 ft	-9.9225985 ft	1,133.2257 psf	2,529.1449 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	30.82434 ft	-9.9995595 ft	1,101.7805 psf	2,496.8536 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	33.25714 ft	-9.9996565 ft	1,064.5007 psf	2,403.6089 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	35.68994 ft	-9.9997535 ft	1,027.2209 psf	2,310.3643 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	38.12274 ft	-9.9998505 ft	989.9411 psf	2,217.1196 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	40.55554 ft	-9.9999475 ft	952.66129 psf	2,123.875 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	42.860177 ft	-9.8121635 ft	905.62198 psf	2,127.2017 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	45.03665 ft	-9.4364985 ft	848.82317 psf	1,993.2718 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	47.213123 ft	-9.0608335 ft	792.02435 psf	1,859.3419 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	49.766933 ft	-8.3320855 ft	707.40999 psf	1,789.3853 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	52.698077 ft	-7.2502545 ft	594.98008 psf	1,526.9625 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	55.24896 ft	-6.1363832 ft	486.37889 psf	1,368.4695 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	57.41958 ft	-4.9904717 ft	381.6064 psf	1,122.1049 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	60.252445 ft	-3.0764911 ft	218.75663 psf	867.13521 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	63.130785 ft	-0.86773314 ft	54.146548 psf	478.36351 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

OAK HARBOR 2082 Spencer's Qcase

CASE:: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,378
Date: 04/13/2022
Time: 08:52:47 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 01:45:10 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-51.5 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 38817 of 39601 converged

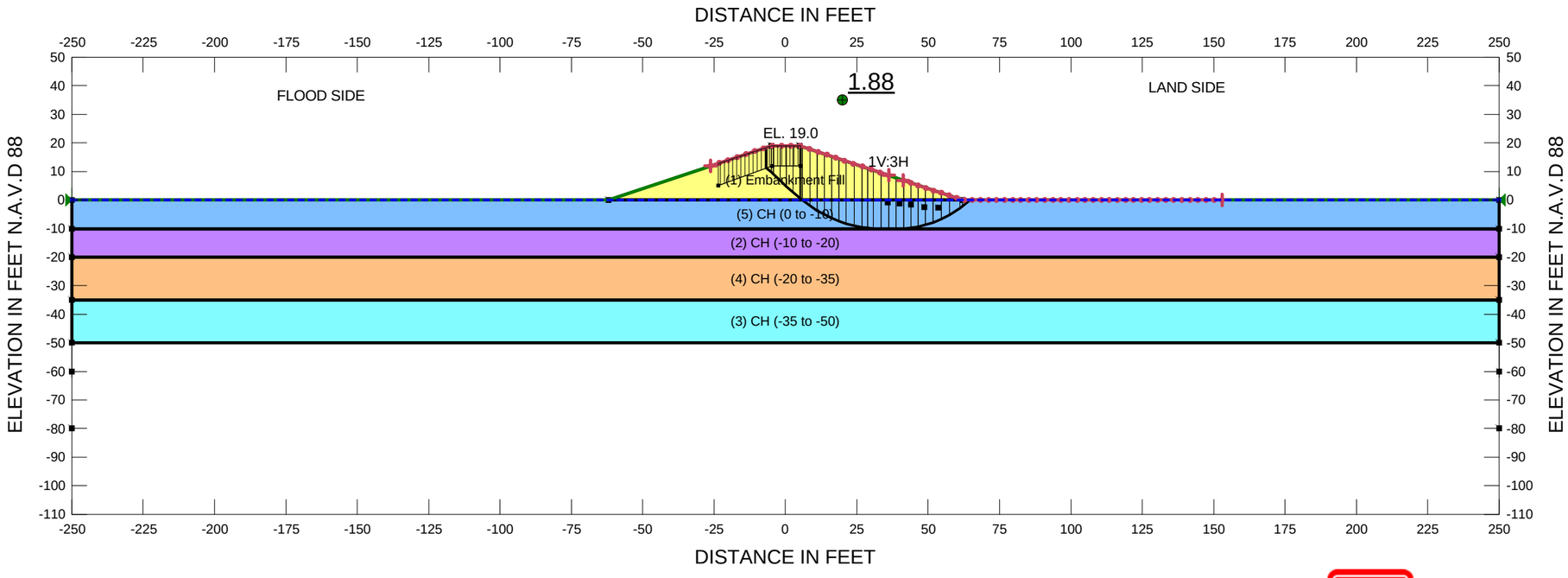
Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.91

Volume: 3,262.8659 ft³
Weight: 388,715.67 lbf
Resisting Moment: 6,399,823.3 lbf·ft
Activating Moment: 3,355,644 lbf·ft
Resisting Force: 82,597.477 lbf
Activating Force: 43,281.699 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (96.725658, 0) ft
Entry: (-18.560114, 7.4016013) ft
Radius: 53.02284 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-17.106603 ft	6.021381 ft	-375.73417 psf	675.29995 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.199581 ft	3.2609403 ft	-203.48268 psf	1,111.9707 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-11.95725 ft	1.1169985 ft	-69.700706 psf	1,418.5489 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-11.014918 ft	0.1766385 ft	-11.022242 psf	1,484.2747 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-9.396054 ft	-1.6861023 ft	105.21278 psf	1,736.2804 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-6.4653513 ft	-5.0583068 ft	315.63834 psf	2,233.9356 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-3.749405 ft	-8.1834025 ft	510.64432 psf	2,650.436 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	-2.3175308 ft	-9.811198 ft	612.21876 psf	2,892.856 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	-0.38605617 ft	-11.822826 ft	737.74431 psf	3,048.417 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	3.1143346 ft	-15.468476 ft	965.23293 psf	3,469.1218 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	4.932265 ft	-17.352785 ft	1,082.8138 psf	3,769.1294 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	6.4243347 ft	-18.707134 ft	1,167.3252 psf	3,875.0353 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 13	9.6781447 ft	-21.660612 ft	1,351.6222 psf	4,113.1646 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	13.420167 ft	-24.527766 ft	1,530.5326 psf	4,451.6699 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	17.24526 ft	-26.940851 ft	1,681.1091 psf	4,568.2429 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	21.070353 ft	-29.353936 ft	1,831.6856 psf	4,684.8159 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	24.823708 ft	-31.096205 ft	1,940.4032 psf	4,959.0628 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	28.505325 ft	-32.167659 ft	2,007.2619 psf	4,937.2666 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	32.186942 ft	-33.239112 ft	2,074.1206 psf	4,915.4704 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	35.875983 ft	-33.768482 ft	2,107.1533 psf	5,036.2325 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	39.57245 ft	-33.755769 ft	2,106.36 psf	4,893.0924 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	43.268917 ft	-33.743056 ft	2,105.5667 psf	4,749.9523 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	47.558575 ft	-33.167772 ft	2,069.669 psf	4,676.7484 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	50.65518 ft	-32.446166 ft	2,024.6408 psf	4,474.9734 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	53.452298 ft	-31.301258 ft	1,953.1985 psf	4,390.7781 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	57.736173 ft	-29.316796 ft	1,829.3681 psf	3,994.6836 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	60.939055 ft	-27.630543 ft	1,724.1459 psf	3,797.2995 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	63.975878 ft	-25.643992 ft	1,600.1851 psf	3,524.8516 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	67.927632 ft	-23.058934 ft	1,438.8775 psf	3,225.5271 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	71.11578 ft	-20.883202 ft	1,303.1118 psf	3,017.8827 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	75.000065 ft	-18.053297 ft	1,126.5258 psf	2,696.7225 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	79.53013 ft	-14.631945 ft	913.03337 psf	2,294.0688 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	83.24623 ft	-11.682645 ft	728.99705 psf	1,912.1348 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	87.866445 ft	-7.844334 ft	489.48644 psf	1,362.4384 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	92.152872 ft	-4.1105048 ft	256.4955 psf	886.86893 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 36	95.201396 ft	-1.3701683 ft	85.498499 psf	523.68012 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

OAK HARBOR 2082 Spencer's Qcase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,378
Date: 04/13/2022
Time: 08:52:47 AM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 01:43:58 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.21957, 11.92681) ft
Left-Zone Right Coordinate: (36.21229, 8.595903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.20864, 6.930453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-23.5 ft	5 ft
Coordinate 2	-4.6 ft	12 ft
Coordinate 3	5.4 ft	12 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 19735 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.88
Volume: 1,113.8316 ft³
Weight: 132,286.77 lbf
Resisting Moment: 2,217,063.7 lbf·ft
Activating Moment: 1,178,643.4 lbf·ft
Resisting Force: 45,266.362 lbf
Activating Force: 24,127.358 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (64.764916, 0) ft
Entry: (-6.7574031, 11.200962) ft
Radius: 32.739791 ft
Center: (20, 35) ft

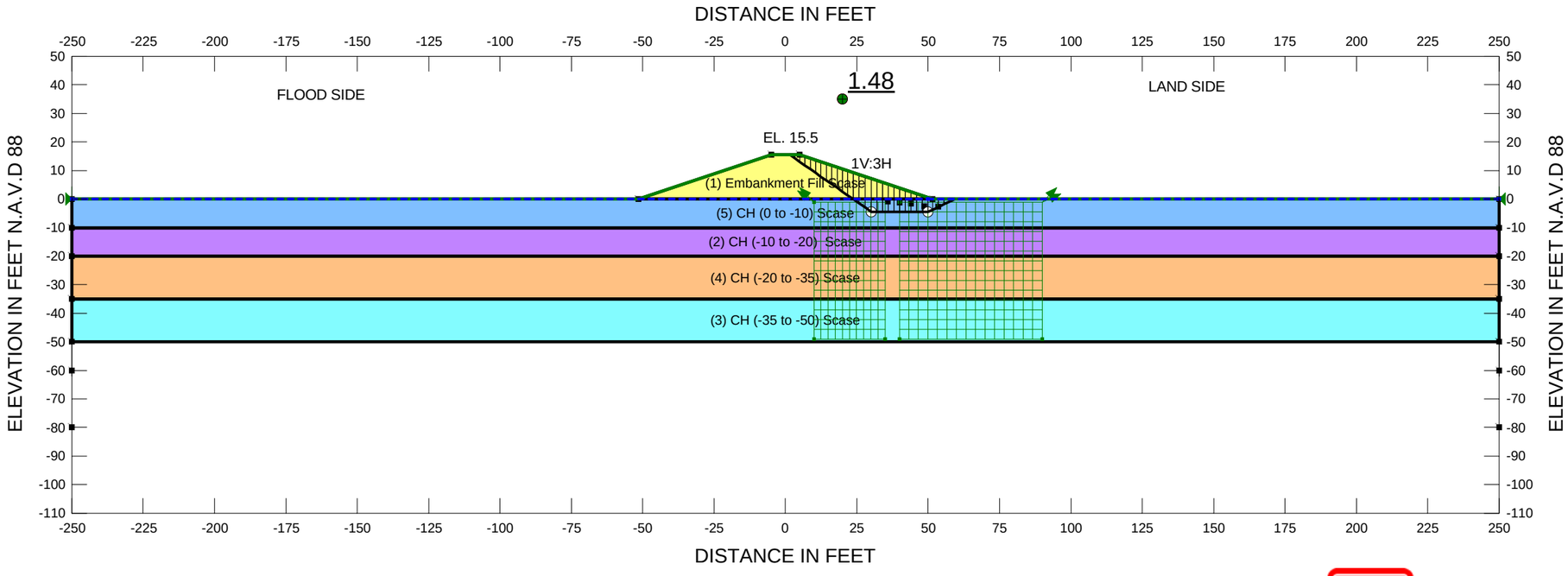
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.8787016 ft	10.455002 ft	-652.39216 psf	515.39633 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-4.57058 ft	9.3444941 ft	-583.09643 psf	784.79944 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-3.0175225 ft	7.91386 ft	-493.82486 psf	889.88284 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-0.7702475 ft	5.78169 ft	-360.77746 psf	1,103.5769 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	1.5150425 ft	3.7191881 ft	-232.07734 psf	1,352.1898 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	3.8383475 ft	1.7263543 ft	-107.72451 psf	1,554.4097 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	5.184635 ft	0.57156518 ft	-35.665667 psf	1,665.345 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	5.6549692 ft	0.2065965 ft	-12.891622 psf	1,756.763 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 9	7.2386138 ft	-0.938578 ft	58.567267 psf	1,818.1132 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	9.8345046 ft	-2.815734 ft	175.7018 psf	1,939.5948 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	12.398072 ft	-4.4105638 ft	275.21918 psf	2,154.725 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	14.929317 ft	-5.7230672 ft	357.1194 psf	2,216.7575 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	17.45681 ft	-6.857736 ft	427.92273 psf	2,349.4669 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	19.98055 ft	-7.81457 ft	487.62917 psf	2,371.0557 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	22.635265 ft	-8.6210677 ft	537.95463 psf	2,468.4844 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	25.420955 ft	-9.2772292 ft	578.89911 psf	2,444.5945 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	27.82101 ft	-9.7027245 ft	605.45001 psf	2,505.0567 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	29.83543 ft	-9.8975535 ft	617.60734 psf	2,452.9738 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	32.168849 ft	-9.9951676 ft	623.69846 psf	2,445.5531 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	34.821266 ft	-9.9955669 ft	623.72337 psf	2,343.9294 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	37.473684 ft	-9.9959661 ft	623.74829 psf	2,242.3057 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	40.126101 ft	-9.9963654 ft	623.7732 psf	2,140.682 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	42.68927 ft	-9.8494095 ft	614.60315 psf	2,103.7331 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	45.16319 ft	-9.5550985 ft	596.23815 psf	1,969.6311 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	47.709983 ft	-9.044344 ft	564.36707 psf	1,908.3234 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	50.329647 ft	-8.317146 ft	518.98991 psf	1,708.3765 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	53.099193 ft	-7.268718 ft	453.568 psf	1,578.0398 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	56.018617 ft	-5.89906 ft	368.10134 psf	1,272.6532 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	59.25031 ft	-4.0653035 ft	253.67494 psf	987.58425 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	61.511145 ft	-2.5354443 ft	158.21173 psf	745.16299 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	63.382458 ft	-1.0772563 ft	67.220794 psf	516.45192 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Oak Harbor

Spencer's Scase

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Oak Harbor 2032 Spencer's S case

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,378
Date: 01/26/2022
Time: 02:27:55 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 01/26/2022
Last Solved Time: 02:28:46 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (10, -1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (40, -1) ft
Lower Left: (40, -49) ft
Lower Right: (90, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39421 of 39600 converged

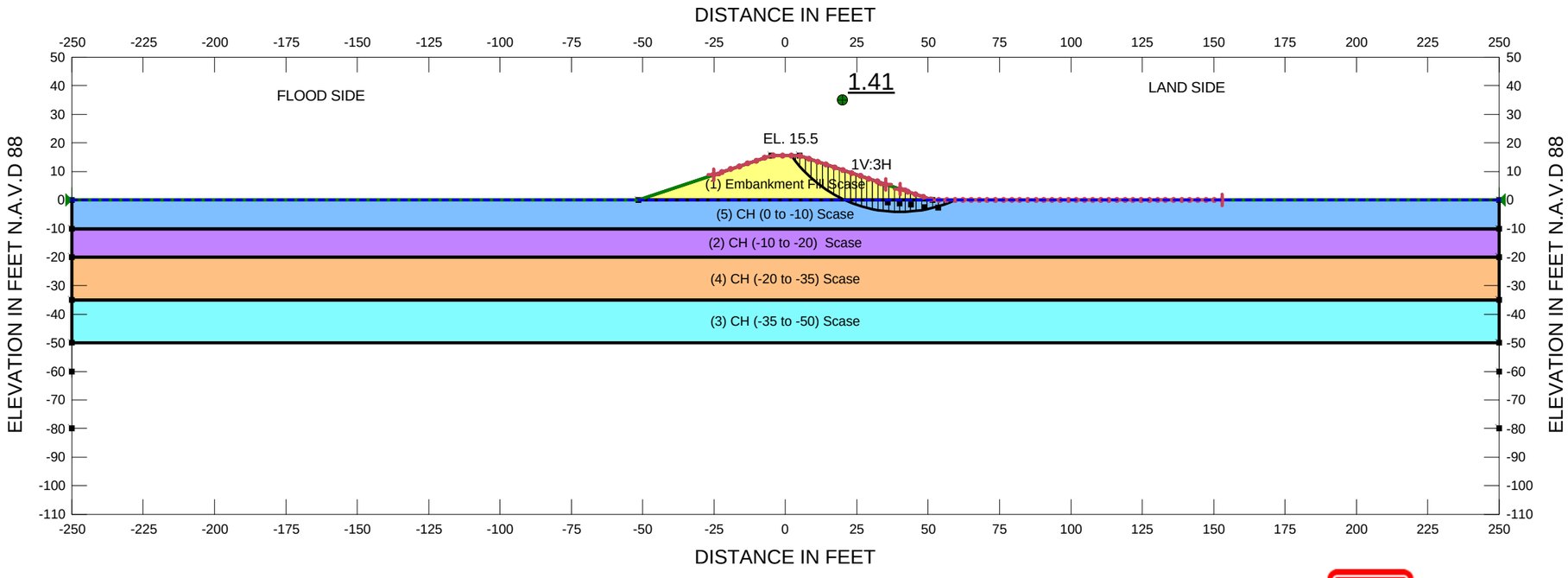
Current Slip Surface

Slip Surface: 4,736
Factor of Safety: 1.48
Volume: 366.06876 ft³
Weight: 43,333.961 lbf
Resisting Moment: 519,647.87 lbf·ft
Activating Moment: 351,299.88 lbf·ft
Resisting Force: 13,969.656 lbf
Activating Force: 9,470.4361 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (59.497102, 0) ft
Entry: (1.5390504, 15.5) ft
Radius: 29.549302 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	2.4042878 ft	14.894154 ft	-929.39523 psf	53.126761 psf	22.550972 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	4.1347626 ft	13.682463 ft	-853.78568 psf	159.38028 psf	67.652916 psf	0 psf	0 psf	(1) Embankment

								Fill Scase
Slice 3	5.9337672 ft	12.422786 ft	-775.18186 psf	242.54754 psf	102.95532 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	7.8013017 ft	11.115124 ft	-693.58377 psf	302.62853 psf	128.45819 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	9.6688361 ft	9.8074628 ft	-611.98568 psf	362.70952 psf	153.96106 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	11.536371 ft	8.4998011 ft	-530.38759 psf	422.79051 psf	179.46392 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	13.403905 ft	7.1921394 ft	-448.7895 psf	482.8715 psf	204.96679 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	15.271439 ft	5.8844777 ft	-367.19141 psf	542.95249 psf	230.46966 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	17.138974 ft	4.576816 ft	-285.59332 psf	603.03348 psf	255.97252 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	19.006508 ft	3.2691543 ft	-203.99523 psf	663.11447 psf	281.47539 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	20.874043 ft	1.9614926 ft	-122.39714 psf	723.19546 psf	306.97826 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 12	22.741577 ft	0.65383085 ft	-40.799045 psf	783.27645 psf	332.48113 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 13	24.729454 ft	-0.73809524 ft	46.057143 psf	857.13187 psf	344.28079 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	26.837672 ft	-2.2142857 ft	138.17143 psf	944.76172 psf	342.37727 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	28.945891 ft	-3.6904762 ft	230.28571 psf	1,032.3916 psf	340.47374 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	31 ft	-4.4285714 ft	276.34286 psf	1,428.9965 psf	489.27245 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	33 ft	-4.4285714 ft	276.34286 psf	1,345.8686 psf	453.98674 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	35 ft	-4.4285714 ft	276.34286 psf	1,262.7407 psf	418.70104 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	37 ft	-4.4285714 ft	276.34286 psf	1,179.6128 psf	383.41534 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	39 ft	-4.4285714 ft	276.34286 psf	1,096.4849 psf	348.12963 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	41 ft	-4.4285714 ft	276.34286 psf	1,013.357 psf	312.84393 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	43 ft	-4.4285714 ft	276.34286 psf	930.22906 psf	277.55822 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	45 ft	-4.4285714 ft	276.34286 psf	847.10115 psf	242.27252 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	47 ft	-4.4285714 ft	276.34286 psf	763.97324 psf	206.98682 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	49 ft	-4.4285714 ft	276.34286 psf	680.84533 psf	171.70111 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	50.75 ft	-4.0788407 ft	254.51966 psf	729.20107 psf	201.49031 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	52.499638 ft	-3.2629712 ft	203.6094 psf	548.79481 psf	146.52251 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	54.498913 ft	-2.3306937 ft	145.43529 psf	391.99629 psf	104.65894 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	56.498189 ft	-1.3984162 ft	87.261173 psf	235.19778 psf	62.795363 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	58.497464 ft	-0.46613874 ft	29.087058 psf	78.399259 psf	20.931788 psf	0 psf	0 psf	(5) CH (0 to -10) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Oak Harbor 2032 Spencer's S case

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,378
Date: 01/26/2022
Time: 02:27:55 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 01/26/2022
Last Solved Time: 02:28:30 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 10 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Solution Settings
- Search Method: Root Finder
- Tolerable difference between starting and converged F of S: 3
- Maximum iterations to calculate converged lambda: 20
- Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.16957, 8.77681) ft
Left-Zone Right Coordinate: (35.16229, 5.445903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.15864, 3.780453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 14027 of 26691 converged

Current Slip Surface

Slip Surface: 11,671
Factor of Safety: 1.41
Volume: 393.6402 ft³
Weight: 46,347.06 lbf
Resisting Moment: 575,159.66 lbf·ft
Activating Moment: 409,947.71 lbf·ft
Resisting Force: 15,422.449 lbf
Activating Force: 10,950.939 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (59.399755, 0) ft
Entry: (2.113904, 15.5) ft
Radius: 46.58026 ft
Center: (20, 35) ft

Slip Slices

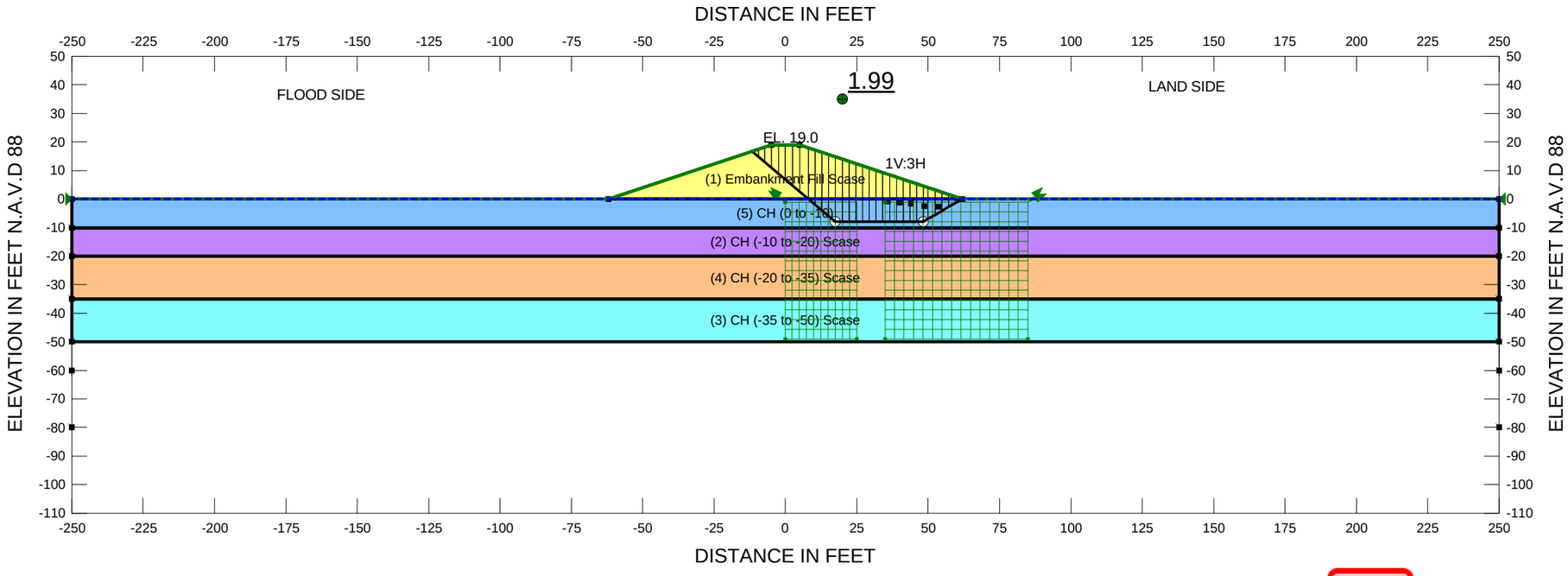
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	2.835428 ft	14.534538 ft	-906.95519 psf	65.595193 psf	27.843508 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	4.278476 ft	12.698326 ft	-792.37553 psf	198.98468 psf	84.463985 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	5.9918659 ft	10.757653 ft	-671.27754 psf	328.07109 psf	139.25792 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	7.9755977 ft	8.7403522 ft	-545.39798 psf	449.54207 psf	190.81929 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	9.9593295 ft	6.9489411 ft	-433.61393 psf	560.57026 psf	237.94796 psf	0 psf	0 psf	(1) Embankment Fill Scase

Slice 6	11.943061 ft	5.3503771 ft	-333.86353 psf	661.33351 psf	280.71942 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	13.926793 ft	3.9204661 ft	-244.63708 psf	752.00528 psf	319.2073 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	15.910525 ft	2.6409134 ft	-164.79299 psf	832.73129 psf	353.47346 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	17.894257 ft	1.4975447 ft	-93.446791 psf	903.61832 psf	383.56322 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	19.877988 ft	0.4791747 ft	-29.900501 psf	964.72833 psf	409.50288 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	21.827046 ft	-0.40925895 ft	25.537759 psf	1,019.8325 psf	422.05308 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	23.74143 ft	-1.1785145 ft	73.539305 psf	1,067.9967 psf	422.12211 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	25.655815 ft	-1.8516326 ft	115.54187 psf	1,105.1344 psf	420.05712 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	27.570199 ft	-2.4329528 ft	151.81626 psf	1,131.3039 psf	415.76783 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	29.484583 ft	-2.9260142 ft	182.58329 psf	1,146.4851 psf	409.15204 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	31.398967 ft	-3.3336765 ft	208.02141 psf	1,150.5799 psf	400.09233 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	33.313351 ft	-3.6582113 ft	228.27239 psf	1,143.4089 psf	388.4524 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	35.227735 ft	-3.9013695 ft	243.44546 psf	1,124.706 psf	374.07291 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	37.142119 ft	-4.0644306 ft	253.62047 psf	1,094.1098 psf	356.76654 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	39.056503 ft	-4.1482376 ft	258.85002 psf	1,051.1511 psf	336.31187 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	40.970887 ft	-4.1532192 ft	259.16088 psf	995.23706 psf	312.4458 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	42.885272 ft	-4.0794009 ft	254.55461 psf	925.62812 psf	284.8538 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	44.799656 ft	-3.9264053 ft	245.00769 psf	841.409 psf	253.15734 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	46.71404 ft	-3.6934428 ft	230.47083 psf	741.44881 psf	216.89728 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	48.628424 ft	-3.3792907 ft	210.86774 psf	624.34771 psf	175.51184 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	50.542808 ft	-2.9822603 ft	186.09304 psf	488.36414 psf	128.30647 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	52.487469 ft	-2.4911213 ft	155.44597 psf	378.828 psf	94.820048 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	54.462408 ft	-1.9001601 ft	118.56999 psf	297.73507 psf	76.051065 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	56.437347 ft	-1.2118176 ft	75.617418 psf	196.15558 psf	51.165416 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	58.412285 ft	-0.42138677 ft	26.294534 psf	70.687507 psf	18.843699 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

Oak Harbor

Spencer's Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2082 Spencer's Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,381
Date: 06/30/2022
Time: 01:44:29 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 01:45:20 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39540 of 39600 converged

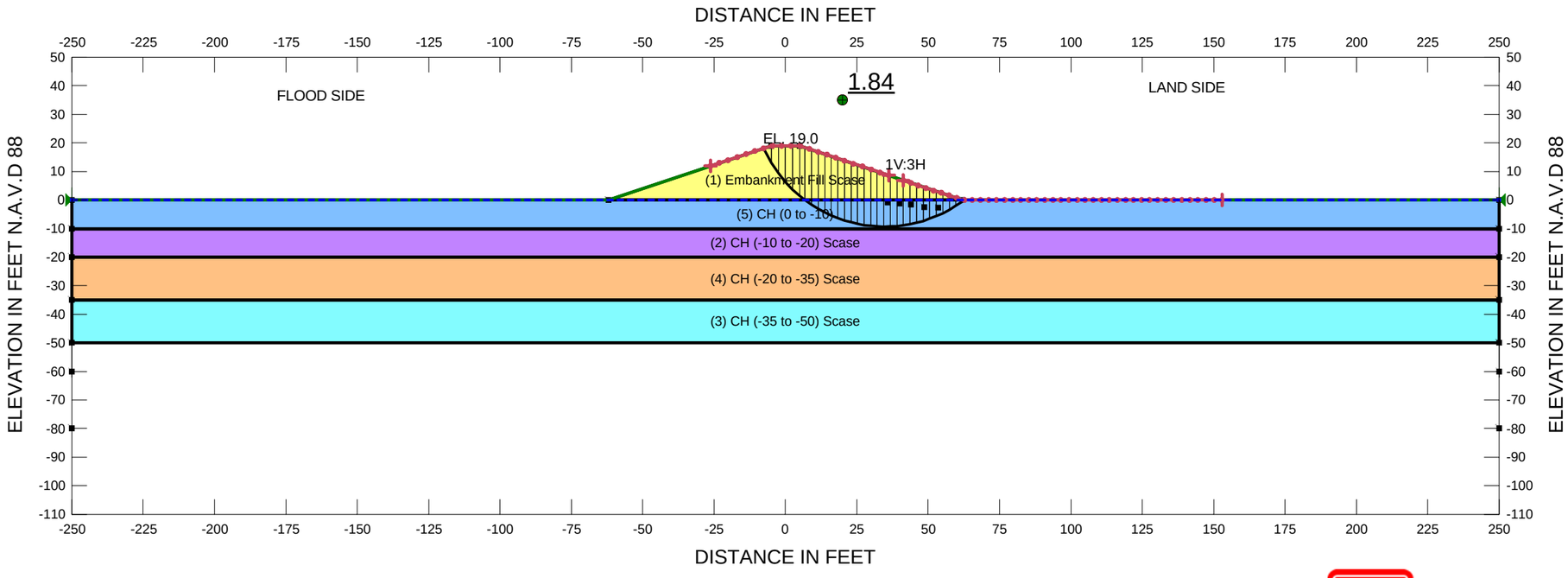
Current Slip Surface

Slip Surface: 7,062
Factor of Safety: 1.99
Volume: 1,018.7537 ft³
Weight: 120,481.79 lbf
Resisting Moment: 1,975,499 lbf·ft
Activating Moment: 993,905.97 lbf·ft
Resisting Force: 42,104.721 lbf
Activating Force: 21,220.916 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (61.963422, 0.012192607) ft
Entry: (-11.804143, 16.731952) ft
Radius: 36.266557 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-10.670119 ft	15.780394 ft	-984.69656 psf	118.46657 psf	50.286076 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-8.4020713 ft	13.877276 ft	-865.942 psf	355.39971 psf	150.85823 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	-6.1340238 ft	11.974158 ft	-747.18745 psf	592.33285 psf	251.43038 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	-3.75 ft	9.9737243 ft	-622.3604 psf	804.25585 psf	341.38636 psf	0 psf	0 psf	(1) Embankment Fill Scase

Slice 5	-1.25 ft	7.8759752 ft	-491.46085 psf	991.16871 psf	420.72616 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	1.25 ft	5.7782261 ft	-360.56131 psf	1,178.0816 psf	500.06596 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	3.75 ft	3.6804771 ft	-229.66177 psf	1,364.9944 psf	579.40576 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	6.5681109 ft	1.3158013 ft	-82.105999 psf	1,529.1171 psf	649.07172 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	9.3066941 ft	-0.98214286 ft	61.285714 psf	1,679.1728 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	11.647639 ft	-2.9464286 ft	183.85714 psf	1,814.6832 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	13.988583 ft	-4.9107143 ft	306.42857 psf	1,950.1935 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	16.329528 ft	-6.875 ft	429 psf	2,085.7039 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	18.685897 ft	-7.8571429 ft	490.28571 psf	2,699.8265 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	21.057692 ft	-7.8571429 ft	490.28571 psf	2,608.9077 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	23.429487 ft	-7.8571429 ft	490.28571 psf	2,517.9889 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	25.801282 ft	-7.8571429 ft	490.28571 psf	2,427.0701 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	28.173077 ft	-7.8571429 ft	490.28571 psf	2,336.1513 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	30.544872 ft	-7.8571429 ft	490.28571 psf	2,245.2325 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	32.916667 ft	-7.8571429 ft	490.28571 psf	2,154.3137 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	35.288462 ft	-7.8571429 ft	490.28571 psf	2,063.3949 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	37.660256 ft	-7.8571429 ft	490.28571 psf	1,972.4761 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	40.032051 ft	-7.8571429 ft	490.28571 psf	1,881.5573 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	42.403846 ft	-7.8571429 ft	490.28571 psf	1,790.6385 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	44.775641 ft	-7.8571429 ft	490.28571 psf	1,699.7197 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	47.147436 ft	-7.8571429 ft	490.28571 psf	1,608.8009 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	49.166667 ft	-7.3760176 ft	460.2635 psf	1,847.6876 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	51.19423 ft	-6.2054032 ft	387.21716 psf	1,597.9067 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	53.582691 ft	-4.8264247 ft	301.1689 psf	1,303.666 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	55.971152 ft	-3.4474462 ft	215.12064 psf	1,009.4252 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	58.359613 ft	-2.0684677 ft	129.07239 psf	715.1845 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	60.748074 ft	-0.68948924 ft	43.024129 psf	420.94377 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	61.952863 ft	0.0060963035 ft	-0.38040934 psf	1.5034594 psf	0.63818067 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2082 Spencer's Scase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,385
Date: 10/17/2022
Time: 02:59:41 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 10/17/2022
Last Solved Time: 02:59:59 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 14 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.21957, 11.92681) ft
Left-Zone Right Coordinate: (36.21229, 8.595903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.20864, 6.930453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 11992 of 26691 converged

Current Slip Surface

Slip Surface: 7,894
Factor of Safety: 1.84
Volume: 1,024.3269 ft³
Weight: 121,328.36 lbf
Resisting Moment: 1,992,718 lbf·ft
Activating Moment: 1,085,468.6 lbf·ft
Resisting Force: 41,498.082 lbf
Activating Force: 22,620.989 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (62.667186, 0) ft
Entry: (-7.6439621, 18.118679) ft
Radius: 46.500338 ft
Center: (20, 35) ft

Slip Slices

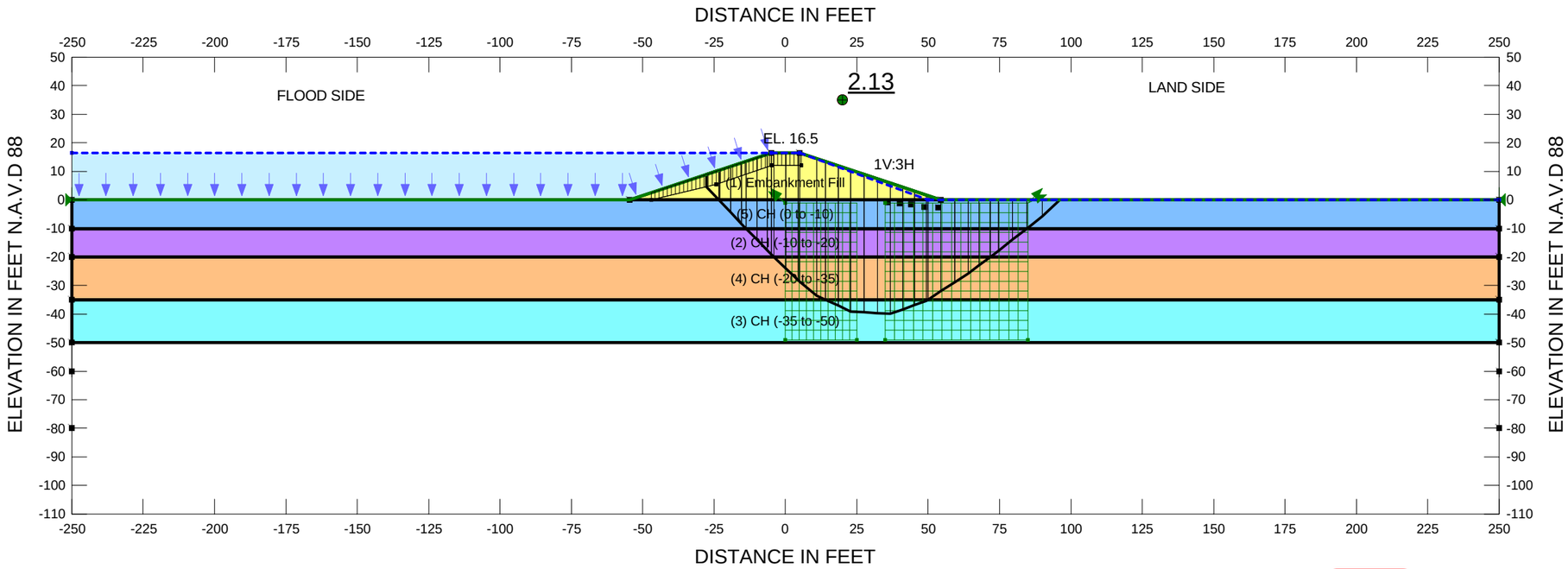
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-6.321981 ft	15.603432 ft	-973.65415 psf	196.32682 psf	83.335789 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-3.75 ft	11.233978 ft	-701.00024 psf	571.69798 psf	242.67139 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	-1.25 ft	7.8460638 ft	-489.59438 psf	879.58678 psf	373.36244 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	1.25 ft	5.010842 ft	-312.67654 psf	1,163.2994 psf	493.79129 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	3.75 ft	2.5891848 ft	-161.56513 psf	1,425.4252 psf	605.05711 psf	0 psf	0 psf	(1) Embankment Fill Scase

Slice 6	5.9288595 ft	0.73452081 ft	-45.834099 psf	1,611.743 psf	684.14433 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	8.0065164 ft	-0.80875274 ft	50.466171 psf	1,768.03 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	10.304111 ft	-2.3283847 ft	145.2912 psf	1,910.4554 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	12.601707 ft	-3.6623354 ft	228.52973 psf	2,029.9608 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	14.899302 ft	-4.8283837 ft	301.29115 psf	2,128.5843 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	17.196897 ft	-5.8402411 ft	364.43105 psf	2,207.8978 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	19.494492 ft	-6.7086116 ft	418.61736 psf	2,269.1231 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	21.792087 ft	-7.4418993 ft	464.37451 psf	2,313.2106 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	24.089682 ft	-8.0466937 ft	502.11368 psf	2,340.8927 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	26.387277 ft	-8.5281088 ft	532.15399 psf	2,352.7217 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	28.684872 ft	-8.8900217 ft	554.73735 psf	2,349.0952 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	30.982467 ft	-9.1352403 ft	570.039 psf	2,330.2738 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	33.280062 ft	-9.265617 ft	578.1745 psf	2,296.3918 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	35.577657 ft	-9.2821205 ft	579.20432 psf	2,247.4629 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	37.875252 ft	-9.1848727 ft	573.13606 psf	2,183.3805 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	40.172847 ft	-8.9731531 ft	559.92475 psf	2,103.9135 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	42.470442 ft	-8.6453715 ft	539.47118 psf	2,008.6962 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	44.768037 ft	-8.1990074 ft	511.61806 psf	1,897.2128 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	47.065632 ft	-7.6305087 ft	476.14374 psf	1,768.7732 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	49.363227 ft	-6.9351416 ft	432.75284 psf	1,622.4786 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	51.660822 ft	-6.1067749 ft	381.06275 psf	1,457.1714 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	53.958417 ft	-5.1375737 ft	320.5846 psf	1,271.3635 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	56.256012 ft	-4.0175631 ft	250.69593 psf	1,063.1301 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	58.553607 ft	-2.7339952 ft	170.6013 psf	829.94883 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	60.851202 ft	-1.2704101 ft	79.27359 psf	568.44627 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	62.333593 ft	-0.24564423 ft	15.3282 psf	400.63376 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

I-10 Crossing

Spencer's Q case

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2032 Spencer's Qcase

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,372
Date: 01/21/2022
Time: 11:19:04 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 01/21/2022
Last Solved Time: 11:21:58 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	16.5 ft
Coordinate 2	-5 ft	16.5 ft
Coordinate 3	5 ft	16.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-46.9 ft	0 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

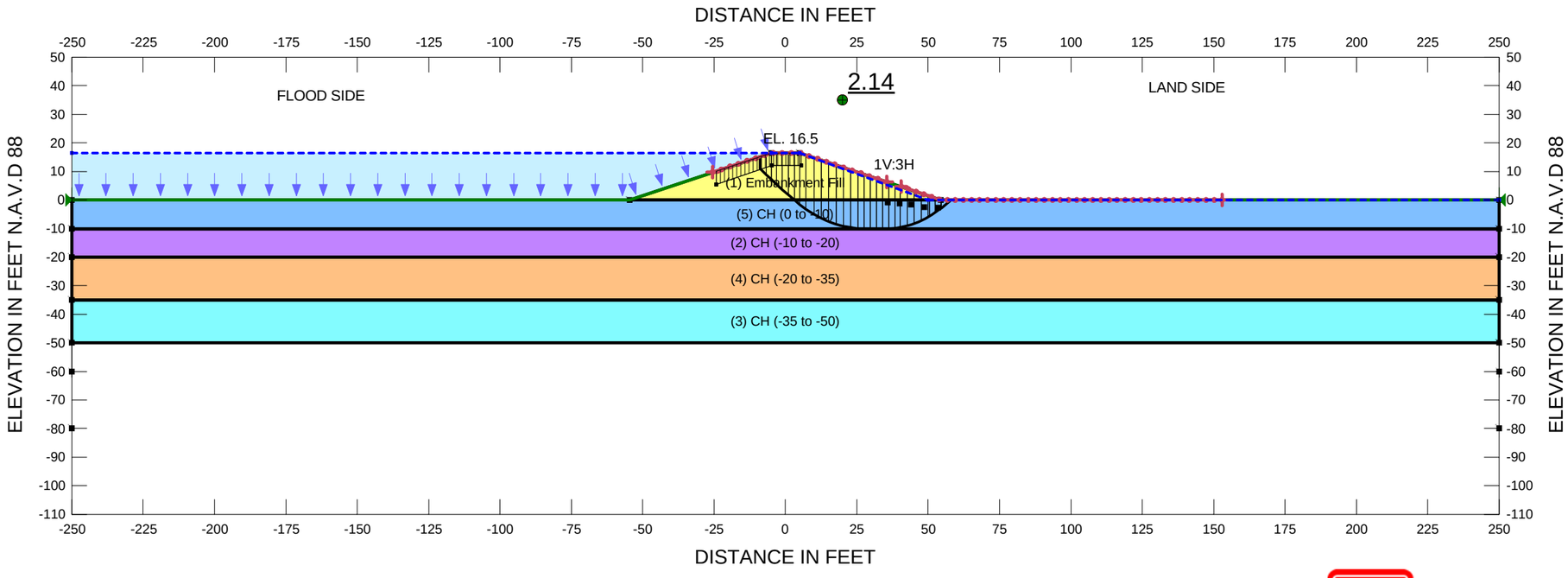
Slip Surfaces Analysed: 39573 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.13
Volume: 3,782.6045 ft³
Weight: 448,896.73 lbf
Resisting Moment: 7,571,216.4 lbf·ft
Activating Moment: 3,544,802.8 lbf·ft
Resisting Force: 90,297.823 lbf
Activating Force: 42,474.057 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (96.048191, 0) ft
Entry: (-27.624733, 4.6055949) ft
Radius: 56.479512 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-25.460623 ft	2.3027974 ft	885.90544 psf	932.15566 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-23.165372 ft	-0.1395465 ft	1,038.3077 psf	1,228.4678 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 3	-21.107878 ft	-2.3288965 ft	1,174.9231 psf	1,525.054 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-17.255173 ft	-6.4285035 ft	1,430.7386 psf	2,080.4181 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-14.588311 ft	-9.2391535 ft	1,606.1232 psf	2,475.8645 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-11.962612 ft	-11.936966 ft	1,774.4667 psf	2,769.2769 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-8.1922305 ft	-15.810898 ft	2,016.2 psf	3,289.6724 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-5.65352 ft	-18.381556 ft	2,176.6091 psf	3,665.1798 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	-4.4922178 ft	-19.507624 ft	2,246.8757 psf	3,809.2428 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	-1.8939191 ft	-22.02709 ft	2,404.0904 psf	4,114.3691 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	2.2871136 ft	-26.081269 ft	2,657.0712 psf	4,546.1033 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	4.688815 ft	-28.36648 ft	2,799.6683 psf	4,863.6281 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	7.929335 ft	-31.054427 ft	2,900.373 psf	5,043.1953 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	12.475771 ft	-34.242126 ft	2,995.263 psf	5,416.9298 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	16.287187 ft	-36.028392 ft	3,019.5208 psf	5,460.2337 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	20.675816 ft	-38.085176 ft	3,047.4523 psf	5,517.0858 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	25.19042 ft	-39.239633 ft	3,016.1963 psf	5,717.6696 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	29.831 ft	-39.491762 ft	2,925.7527 psf	5,567.8703 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	34.47158 ft	-39.743891 ft	2,835.3091 psf	5,418.071 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	38.90038 ft	-39.109957 ft	2,694.4206 psf	5,424.2812 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	43.1174 ft	-37.58996 ft	2,503.0874 psf	5,090.1706 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	47.33442 ft	-36.069963 ft	2,311.7541 psf	4,756.06 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	49.67803 ft	-35.154982 ft	2,201.0376 psf	4,733.2151 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 24	49.956565 ft	-34.971367 ft	2,183.2071 psf	4,689.5374 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	52.25 ft	-33.459491 ft	2,087.8723 psf	4,426.2249 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	56.871175 ft	-30.413127 ft	1,897.7791 psf	3,989.2503 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	61.613525 ft	-27.286882 ft	1,702.7014 psf	3,631.9524 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	65.907195 ft	-24.292819 ft	1,515.8719 psf	3,332.2358 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	69.752185 ft	-21.43094 ft	1,337.2906 psf	3,003.896 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	73.14599 ft	-18.904884 ft	1,179.6647 psf	2,729.097 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	77.096346 ft	-15.857325 ft	989.4971 psf	2,363.0102 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	82.054437 ft	-11.952442 ft	745.83237 psf	1,865.6041 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	87.258087 ft	-7.8541625 ft	490.09974 psf	1,274.6419 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	93.015441 ft	-2.8541625 ft	178.09974 psf	679.725 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2032 Spencer's Qcase

CASE: Top of Levee (CG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,372
Date: 01/21/2022
Time: 11:19:04 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 01/21/2022
Last Solved Time: 11:21:32 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.45986, 9.680047) ft
Left-Zone Right Coordinate: (35.45592, 6.348027) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.45394, 4.68202) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	16.5 ft
Coordinate 2	-5 ft	16.5 ft
Coordinate 3	5 ft	16.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 18605 of 26692 converged

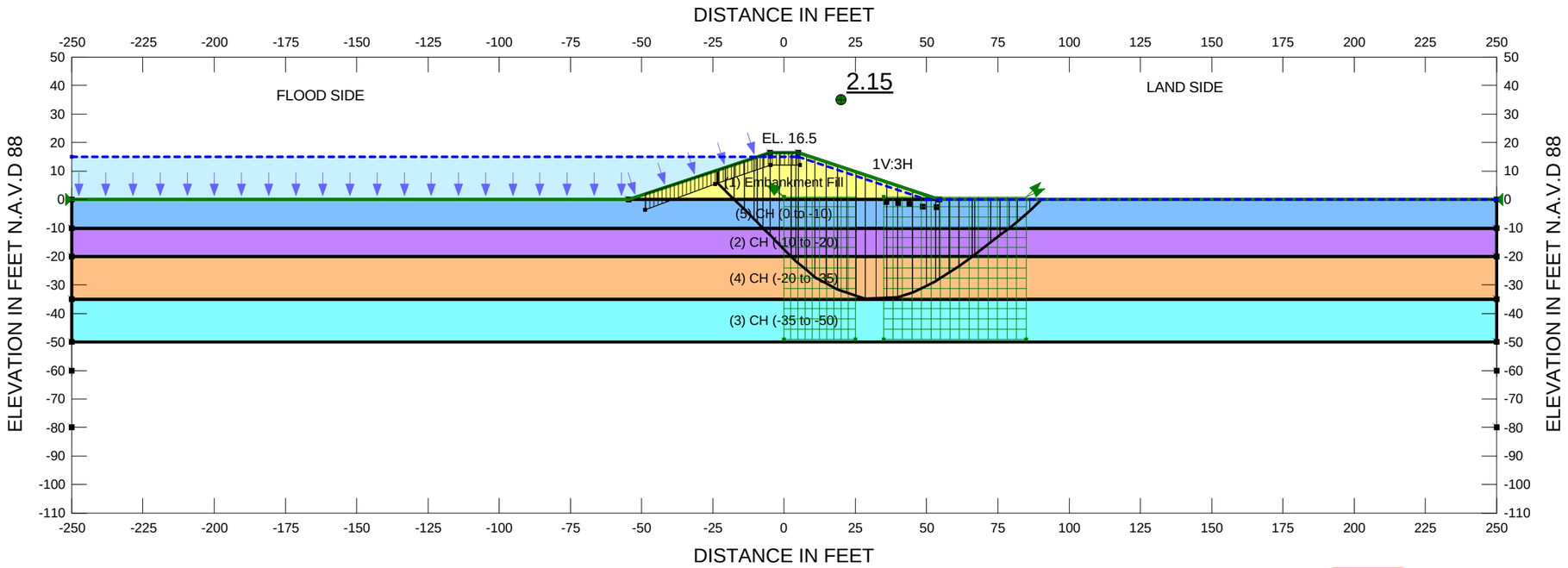
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.14
Volume: 965.63806 ft³
Weight: 114,998.25 lbf
Resisting Moment: 2,095,339 lbf·ft
Activating Moment: 980,976.52 lbf·ft
Resisting Force: 42,266.232 lbf
Activating Force: 19,803.006 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (57.95179, 0) ft
Entry: (-8.8367166, 10.792324) ft
Radius: 31.004567 ft

Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-8.7223933 ft	10.710185 ft	361.28447 psf	58.068204 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-7.7060525 ft	9.7857073 ft	418.97186 psf	441.83495 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-5.9020175 ft	8.101032 ft	524.0956 psf	642.95077 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-4.0480175 ft	6.3696975 ft	632.13087 psf	834.04628 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-2.1440525 ft	4.5917038 ft	743.07768 psf	1,015.1215 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	-0.11315115 ft	2.7770302 ft	856.31331 psf	1,230.1763 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	2.0446866 ft	0.92567675 ft	971.83777 psf	1,420.4915 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	4.0618027 ft	-0.8049423 ft	1,079.8284 psf	1,593.5564 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	5.01948 ft	-1.6265978 ft	1,130.654 psf	1,684.6981 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	6.134365 ft	-2.4643535 ft	1,157.4214 psf	1,793.1095 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	8.598975 ft	-4.17015 ft	1,207.4728 psf	1,954.011 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	11.251547 ft	-5.6901933 ft	1,241.6327 psf	2,117.2414 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	13.818283 ft	-6.9607717 ft	1,262.1899 psf	2,173.7988 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	16.404357 ft	-8.0072272 ft	1,268.3193 psf	2,307.295 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	19.009773 ft	-8.8295598 ft	1,260.0209 psf	2,310.0903 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	21.576075 ft	-9.4288875 ft	1,238.702 psf	2,388.2336 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	24.103265 ft	-9.8052105 ft	1,204.3624 psf	2,339.4044 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	26.451124 ft	-9.9940024 ft	1,162.424 psf	2,365.4464 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	28.619652 ft	-9.9952632 ft	1,112.8868 psf	2,282.4837 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	30.78818 ft	-9.996524 ft	1,063.3495 psf	2,199.5211 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	32.956708 ft	-9.9977848 ft	1,013.8123 psf	2,116.5585 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	35.125236 ft	-9.9990456 ft	964.27505 psf	2,033.5958 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	37.323155 ft	-9.9200835 ft	909.05942 psf	1,980.8121 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	39.306345 ft	-9.72203 ft	851.3255 psf	1,915.9689 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	41.406882 ft	-9.2735925 ft	775.2827 psf	1,851.4534 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	43.868887 ft	-8.6136395 ft	677.77096 psf	1,667.7703 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	46.324917 ft	-7.7073064 ft	565.0218 psf	1,560.7575 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	48.774972 ft	-6.5545931 ft	437.03524 psf	1,306.1781 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	50.19296 ft	-5.8874517 ft	367.37699 psf	1,158.8385 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	51.41444 ft	-5.0772248 ft	316.81883 psf	1,111.5362 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	53.47148 ft	-3.6383404 ft	227.03244 psf	825.10284 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	54.576735 ft	-2.8652226 ft	178.78989 psf	674.45781 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	56.30263 ft	-1.4057735 ft	87.720266 psf	535.79532 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2032 Spencer's Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,372
Date: 01/21/2022
Time: 11:19:04 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 01/21/2022
Last Solved Time: 11:22:20 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
- Upper Left: (0, 1) ft
- Lower Left: (0, -49) ft
- Lower Right: (25, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (35, 1) ft
- Lower Left: (35, -49) ft
- Lower Right: (85, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	15 ft
Coordinate 2	-5 ft	15 ft
Coordinate 3	5 ft	15 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-48.7 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

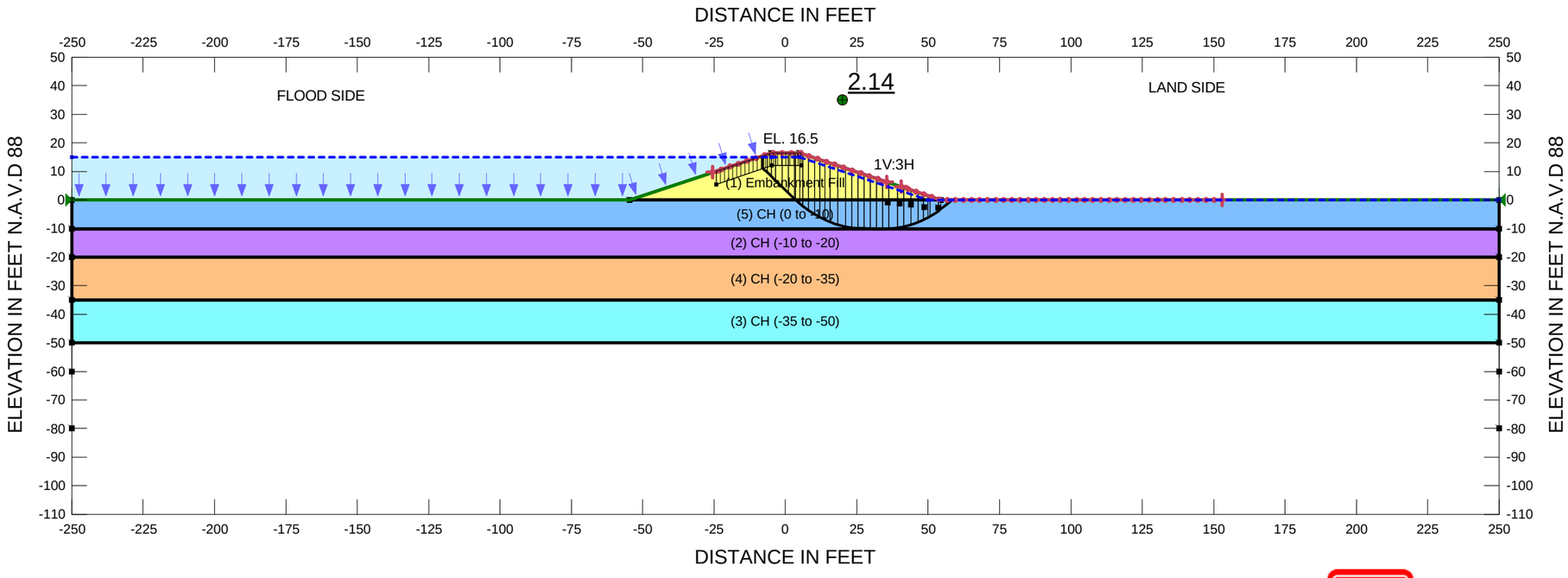
Slip Surfaces Analysed: 39584 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.15
Volume: 3,139.211 ft³
Weight: 374,268.11 lbf
Resisting Moment: 6,362,534.9 lbf·ft
Activating Moment: 2,956,443.5 lbf·ft
Resisting Force: 81,632.85 lbf
Activating Force: 38,106.622 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (90.396331, 0) ft
Entry: (-23.386157, 5.7186734) ft
Radius: 52.000101 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-22.048714 ft	4.4278112 ft	659.70458 psf	691.69606 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-19.105302 ft	1.5684745 ft	838.12719 psf	1,064.14 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-15.770867 ft	-1.688112 ft	1,041.3382 psf	1,478.2678 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-12.313936 ft	-5.064336 ft	1,252.0146 psf	1,940.189 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-10.042735 ft	-7.304878 ft	1,391.8244 psf	2,230.4025 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-8.4474559 ft	-8.928654 ft	1,493.148 psf	2,471.5172 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-6.1974559 ft	-11.218846 ft	1,636.056 psf	2,755.6041 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-3.32371 ft	-14.143927 ft	1,818.581 psf	3,142.2058 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	0.44788611 ft	-17.92508 ft	2,054.525 psf	3,599.7568 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	3.3382761 ft	-20.787348 ft	2,233.1305 psf	3,957.9422 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	4.56668 ft	-21.942484 ft	2,305.211 psf	4,152.8937 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	6.4309025 ft	-23.524776 ft	2,374.1833 psf	4,268.9013 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	9.2927075 ft	-25.953785 ft	2,466.2279 psf	4,422.4958 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	12.735387 ft	-28.278097 ft	2,539.6572 psf	4,704.6591 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	16.758942 ft	-30.497714 ft	2,594.4713 psf	4,794.3992 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	20.396213 ft	-32.152683 ft	2,622.0862 psf	4,959.0611 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	23.6472 ft	-33.243006 ft	2,622.5018 psf	4,955.5233 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	26.898187 ft	-34.333329 ft	2,622.9174 psf	4,951.9855 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	30.418517 ft	-34.773319 ft	2,577.1499 psf	5,091.7063 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	34.20819 ft	-34.562976 ft	2,485.1994 psf	4,922.6323 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	37.997863 ft	-34.352633 ft	2,393.2488 psf	4,753.5583 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	42.47335 ft	-33.480166 ft	2,245.7167 psf	4,620.4044 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	47.527 ft	-31.496919 ft	2,016.8462 psf	4,308.0993 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	51.56509 ft	-29.511428 ft	1,841.5131 psf	3,923.7506 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	53.81509 ft	-28.294984 ft	1,765.607 psf	3,782.7756 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	56.20774 ft	-26.733778 ft	1,668.1878 psf	3,576.7053 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	59.62322 ft	-24.505175 ft	1,529.1229 psf	3,321.2458 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	63.67261 ft	-21.695437 ft	1,353.7953 psf	3,034.9272 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	66.48425 ft	-19.659711 ft	1,226.766 psf	2,824.3978 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	69.73662 ft	-17.140483 ft	1,069.5662 psf	2,533.5398 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	74.115304 ft	-13.721159 ft	856.20031 psf	2,093.365 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	77.307911 ft	-11.240386 ft	701.4001 psf	1,776.2798 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	80.349712 ft	-8.8767955 ft	553.91204 psf	1,408.0815 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	83.94549 ft	-5.8151933 ft	362.86806 psf	1,055.4605 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	88.246051 ft	-1.9383978 ft	120.95602 psf	548.70459 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2032 Spencer's Qcase

CASE: Project Grade (PG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,372
Date: 01/21/2022
Time: 11:19:04 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 01/21/2022
Last Solved Time: 11:20:38 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.45986, 9.680047) ft
Left-Zone Right Coordinate: (35.45592, 6.348027) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.45394, 4.68202) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	15 ft
Coordinate 2	-5 ft	15 ft
Coordinate 3	5 ft	15 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 18453 of 26692 converged

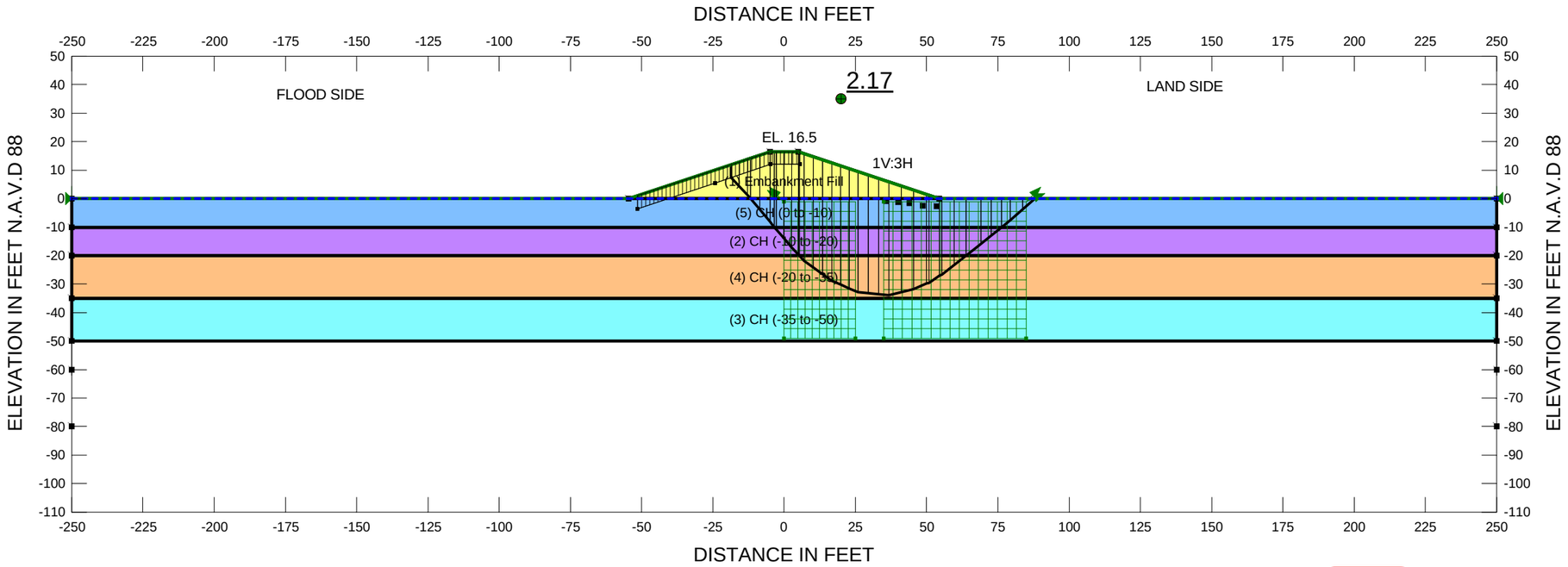
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.14
Volume: 952.07104 ft³
Weight: 113,436.44 lbf
Resisting Moment: 2,085,056.8 lbf·ft
Activating Moment: 971,776.44 lbf·ft
Resisting Force: 42,007.873 lbf
Activating Force: 19,597.592 lbf
Slip Rank: 1 of 26,692 slip surfaces

Exit: (58.369276, 0) ft
Entry: (-7.9917486, 11.08698) ft
Radius: 31.076016 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-7.1953043 ft	10.384413 ft	288.01263 psf	319.97543 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-5.69943 ft	8.9693898 ft	376.31007 psf	520.19822 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-4.20587 ft	7.4480138 ft	471.24394 psf	697.3022 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-2.32527 ft	5.6014275 ft	586.47092 psf	906.2259 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-0.15233 ft	3.5260945 ft	715.9717 psf	1,117.3233 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	2.02061 ft	1.4507615 ft	845.47248 psf	1,328.4206 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	3.3474542 ft	0.2065475 ft	923.11144 psf	1,496.0306 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	4.2939142 ft	-0.60672178 ft	973.85944 psf	1,573.105 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	5.504155 ft	-1.6466513 ft	1,028.2646 psf	1,672.1357 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	7.046405 ft	-2.8081908 ft	1,068.6659 psf	1,826.505 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	9.122595 ft	-4.2648542 ft	1,116.3769 psf	1,920.0292 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	11.084667 ft	-5.4611352 ft	1,150.2138 psf	2,091.9038 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	12.93262 ft	-6.3970335 ft	1,170.1764 psf	2,135.0643 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	14.780573 ft	-7.3329318 ft	1,190.139 psf	2,178.2248 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	17.029308 ft	-8.196359 ft	1,197.2432 psf	2,318.1774 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	19.678822 ft	-8.987315 ft	1,191.4889 psf	2,315.5879 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	22.086883 ft	-9.5341377 ft	1,175.523 psf	2,387.8954 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	24.253487 ft	-9.8368272 ft	1,149.3455 psf	2,343.5259 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	26.42455 ft	-9.989289 ft	1,113.701 psf	2,365.144 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	28.60007 ft	-9.991523 ft	1,068.5896 psf	2,282.04 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	30.77559 ft	-9.993757 ft	1,023.4782 psf	2,198.9359 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	32.95111 ft	-9.995991 ft	978.36675 psf	2,115.8319 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	35.12663 ft	-9.998225 ft	933.25534 psf	2,032.7279 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	37.75345 ft	-9.866953 ft	870.42611 psf	1,964.974 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	40.342975 ft	-9.551668 ft	796.8902 psf	1,874.0655 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	42.681883 ft	-8.977164 ft	712.39188 psf	1,780.6898 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	45.258767 ft	-8.193948 ft	609.91999 psf	1,575.4795 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	47.410408 ft	-7.3777011 ft	514.23207 psf	1,481.1744 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	49.136803 ft	-6.5284233 ft	425.32812 psf	1,296.4088 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	50.322755 ft	-5.9450092 ft	370.96857 psf	1,169.4836 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	52.053955 ft	-4.870519 ft	303.92039 psf	1,028.7764 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	53.9812 ft	-3.5366658 ft	220.68794 psf	835.21024 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	55.467319 ft	-2.3388957 ft	145.94709 psf	644.59682 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	57.401957 ft	-0.77963189 ft	48.64903 psf	425.55087 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2032 Spencer's Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,372
Date: 01/21/2022
Time: 11:19:04 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 01/21/2022
Last Solved Time: 11:22:34 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-51.5 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

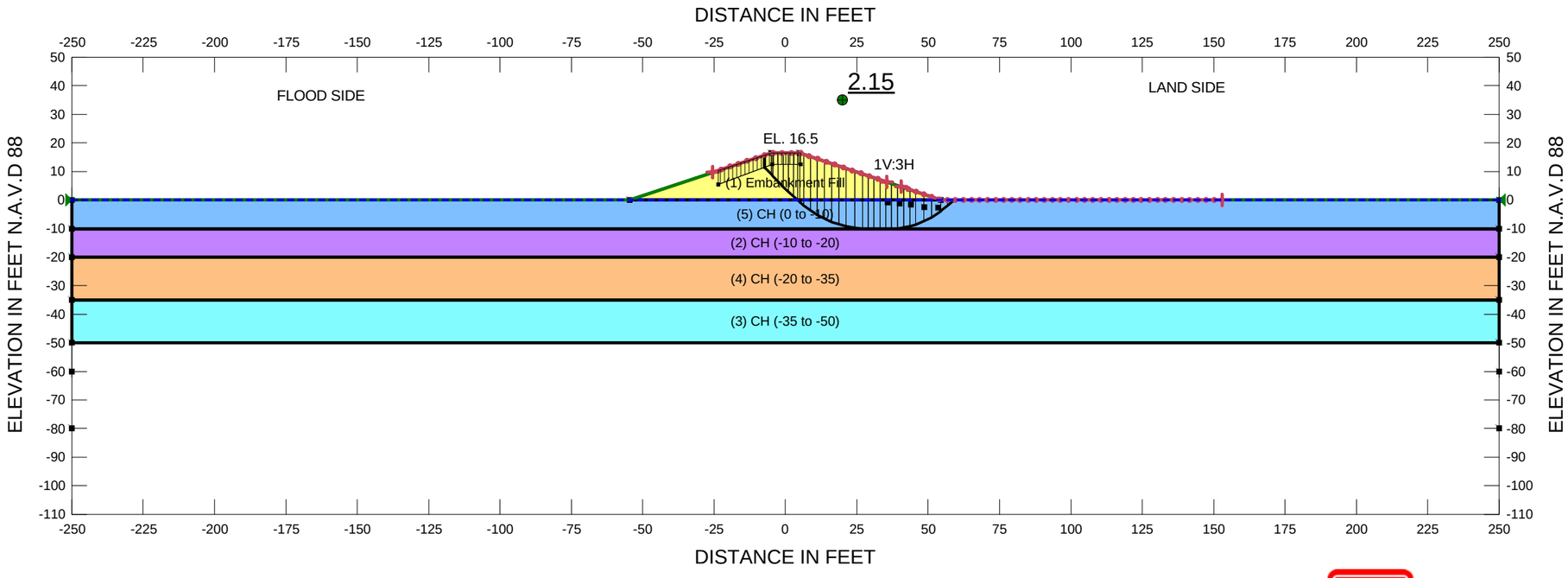
Slip Surfaces Analysed: 37723 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.17
Volume: 2,863.7864 ft³
Weight: 341,736.57 lbf
Resisting Moment: 5,881,599.9 lbf·ft
Activating Moment: 2,707,482.2 lbf·ft
Resisting Force: 76,427.14 lbf
Activating Force: 35,335.497 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (88.013159, 0) ft
Entry: (-18.731329, 7.3418956) ft
Radius: 50.145435 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-17.250422 ft	5.8404747 ft	-364.44562 psf	457.29006 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.288607 ft	2.8376329 ft	-177.06829 psf	904.57481 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-12.25852 ft	0.668106 ft	-41.689814 psf	1,152.0473 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-10.157035 ft	-1.8884605 ft	117.83994 psf	1,502.8624 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-6.802365 ft	-5.9683974 ft	372.428 psf	2,105.209 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-4.2433004 ft	-9.0799369 ft	566.58807 psf	2,537.0828 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-3.1634554 ft	-10.392909 ft	648.51752 psf	2,610.5358 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-1.458465 ft	-12.348211 ft	770.52838 psf	2,878.275 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	1.305225 ft	-15.472998 ft	965.51506 psf	3,242.1294 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	3.843535 ft	-18.310128 ft	1,142.552 psf	3,587.139 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	5.1883091 ft	-19.792432 ft	1,235.0478 psf	3,753.1291 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	6.2117541 ft	-20.920545 ft	1,305.442 psf	3,871.265 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	8.6430233 ft	-22.995779 ft	1,434.9366 psf	4,195.6138 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	11.83529 ft	-25.305155 ft	1,579.0417 psf	4,324.9241 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	15.027557 ft	-27.614531 ft	1,723.1467 psf	4,454.2344 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	18.162312 ft	-29.451222 ft	1,837.7563 psf	4,688.0156 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	21.239555 ft	-30.815228 ft	1,922.8702 psf	4,720.7367 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	24.316798 ft	-32.179234 ft	2,007.9842 psf	4,753.4578 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	27.661052 ft	-33.032113 ft	2,061.2038 psf	4,917.5349 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	31.272315 ft	-33.373865 ft	2,082.5291 psf	4,817.5091 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	34.883578 ft	-33.715616 ft	2,103.8544 psf	4,717.4833 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	38.874527 ft	-33.357955 ft	2,081.5364 psf	4,715.6702 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	43.245163 ft	-32.300882 ft	2,015.575 psf	4,427.3198 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	47.71524 ft	-30.79366 ft	1,921.5244 psf	4,186.6443 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	50.3744 ft	-29.6546 ft	1,850.447 psf	3,953.2946 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	52.6244 ft	-28.31076 ft	1,766.5914 psf	3,820.9764 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	54.92006 ft	-26.862247 ft	1,676.2042 psf	3,580.7421 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	57.456257 ft	-24.959502 ft	1,557.4729 psf	3,437.0067 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	61.688533 ft	-21.68411 ft	1,353.0885 psf	3,058.8593 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	66.449485 ft	-17.933881 ft	1,119.0742 psf	2,642.4618 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	70.907905 ft	-14.366012 ft	896.43913 psf	2,187.2668 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	74.535115 ft	-11.455337 ft	714.81304 psf	1,814.346 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	77.8165 ft	-8.822172 ft	550.50353 psf	1,409.3595 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	81.4665 ft	-5.733258 ft	357.7553 psf	1,033.5062 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	85.830939 ft	-1.911086 ft	119.25177 psf	533.94005 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2032 Spencer's Qcase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,372
Date: 01/21/2022
Time: 11:19:04 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 01/21/2022
Last Solved Time: 11:21:14 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.45986, 9.680047) ft
Left-Zone Right Coordinate: (35.45592, 6.348027) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.45394, 4.68202) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-23.5 ft	5.5 ft
Coordinate 2	-4.6 ft	12.4 ft
Coordinate 3	5.4 ft	12.4 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 17672 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.15
Volume: 945.82822 ft³
Weight: 112,754.64 lbf
Resisting Moment: 2,093,209.9 lbf·ft
Activating Moment: 974,114.28 lbf·ft
Resisting Force: 42,115.753 lbf
Activating Force: 19,614.248 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (59.115507, 0) ft
Entry: (-7.4190496, 11.370823) ft
Radius: 31.281201 ft
Center: (20, 35) ft

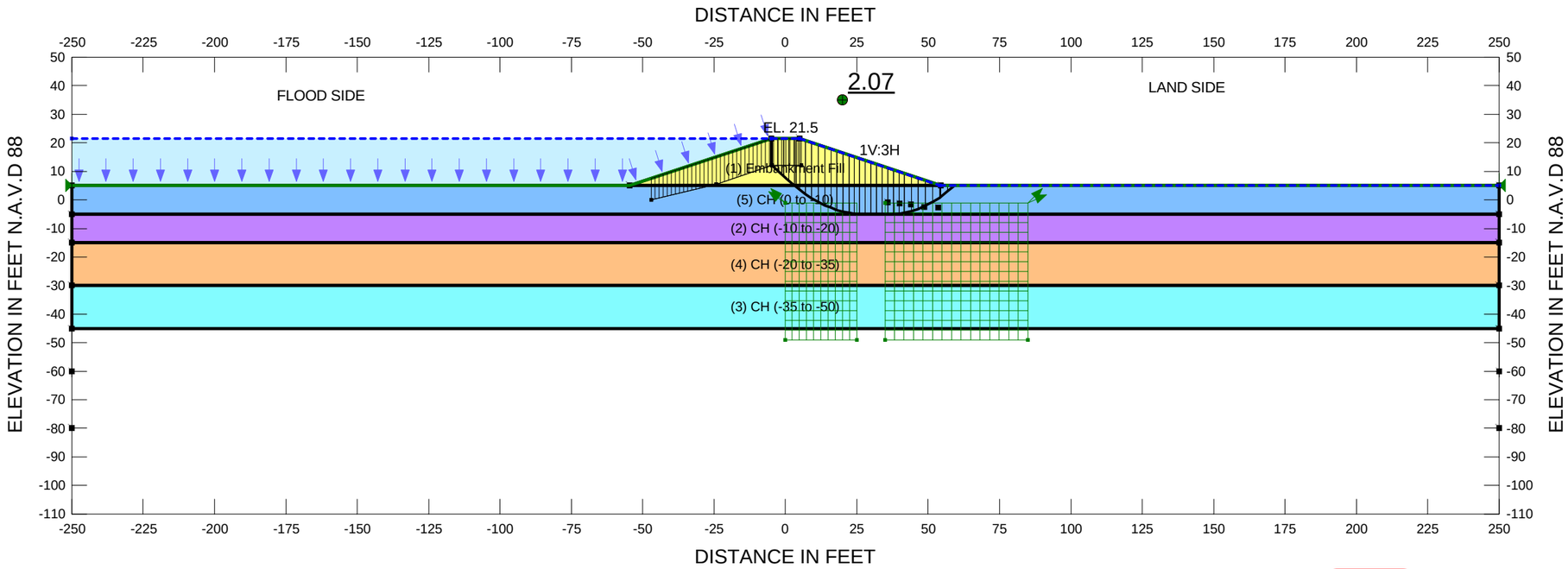
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-7.2119698 ft	11.21057 ft	-699.53957 psf	138.38627 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-6.002445 ft	10.026653 ft	-625.66313 psf	402.78367 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-4.679855 ft	8.6760667 ft	-541.38656 psf	572.7625 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-3.4479525 ft	7.3985425 ft	-461.66905 psf	694.59941 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-1.6244375 ft	5.4973375 ft	-343.03386 psf	885.92597 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	0.15587 ft	3.734217 ft	-233.01514 psf	1,103.7718 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	1.89297 ft	2.109181 ft	-131.61289 psf	1,269.4326 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	3.5007686 ft	0.6483315 ft	-40.455886 psf	1,443.1044 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 9	4.6200086 ft	-0.33325782 ft	20.795288 psf	1,534.567 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	5.748605 ft	-1.3230528 ft	82.558496 psf	1,619.4076 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	7.6566075 ft	-2.786838 ft	173.89869 psf	1,805.4963 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	9.9754025 ft	-4.401334 ft	274.64324 psf	1,908.5932 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	12.37805 ft	-5.8260008 ft	363.54245 psf	2,093.6664 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	14.86455 ft	-7.0608383 ft	440.59631 psf	2,148.9466 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	17.394375 ft	-8.0706715 ft	503.6099 psf	2,285.9263 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	19.967525 ft	-8.8555005 ft	552.58323 psf	2,285.4139 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	22.75064 ft	-9.5104005 ft	593.44899 psf	2,338.4636 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	25.61557 ft	-9.885174 ft	616.83486 psf	2,333.2148 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	28.002396 ft	-9.9976576 ft	623.85383 psf	2,306.3002 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	30.039268 ft	-9.9980488 ft	623.87824 psf	2,228.2711 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	32.076139 ft	-9.9984399 ft	623.90265 psf	2,150.2419 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	34.113011 ft	-9.9988311 ft	623.92706 psf	2,072.2128 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	36.149882 ft	-9.9992223 ft	623.95147 psf	1,994.1837 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	38.186754 ft	-9.9996134 ft	623.97588 psf	1,916.1545 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	40.281498 ft	-9.7737592 ft	609.88257 psf	1,925.6049 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	42.434115 ft	-9.3216595 ft	581.67155 psf	1,782.4594 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	44.586732 ft	-8.8695598 ft	553.46053 psf	1,639.3138 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	47.02549 ft	-8.0192875 ft	500.40354 psf	1,564.37 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	49.75039 ft	-6.7708425 ft	422.50057 psf	1,286.4248 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	52.756845 ft	-5.025379 ft	313.58365 psf	1,035.6053 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	54.450425 ft	-3.8630857 ft	241.05655 psf	870.89372 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	55.653877 ft	-2.866525 ft	178.87116 psf	728.25111 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	57.96163 ft	-0.95550833 ft	59.62372 psf	458.8281 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

I-10 Crossing

Spencer's Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I10 Crossing Theoretical Levee Section

2082 Spencer's Qcase

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/05/2022
Time: 07:31:19 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 04/05/2022
Last Solved Time: 07:32:46 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	21.5 ft
Coordinate 2	-5 ft	21.5 ft
Coordinate 3	5 ft	21.5 ft
Coordinate 4	54 ft	5 ft
Coordinate 5	250 ft	5 ft

Tension Crack Line

	X	Y
Coordinate 1	-46.9 ft	0 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39585 of 39601 converged

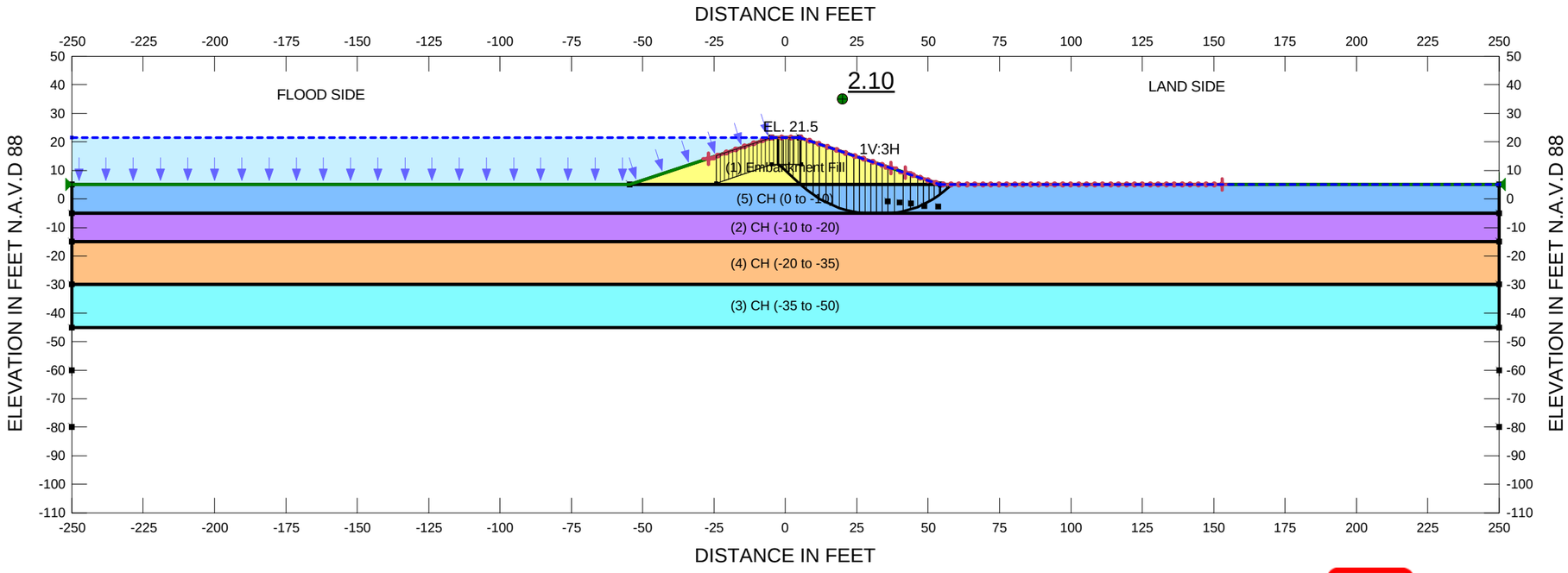
Current Slip Surface

Slip Surface: 39,601

Factor of Safety: 2.07
Volume: 948.97927 ft³
Weight: 113,187.83 lbf
Resisting Moment: 1,813,277.9 lbf·ft
Activating Moment: 873,875.79 lbf·ft
Resisting Force: 40,737.993 lbf
Activating Force: 19,645.86 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (59.209409, 5) ft
Entry: (-4.9509502, 12.147361) ft
Radius: 28.130739 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-4.7903701 ft	12.039437 ft	590.3391 psf	-314.14217 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-3.6456267 ft	11.049168 ft	652.13194 psf	868.75986 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-1.6773 ft	9.284475 ft	762.24876 psf	1,047.4996 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	0.29102667 ft	7.5197823 ft	872.36558 psf	1,226.2394 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	2.2200811 ft	5.818718 ft	978.512 psf	1,411.8195 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	3.4824761 ft	4.724893 ft	1,046.7667 psf	1,513.2962 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	4.39999 ft	4.0000694 ft	1,091.9957 psf	1,651.0239 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	6.024175 ft	2.7827181 ft	1,146.4382 psf	1,752.4521 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	8.072525 ft	1.2474487 ft	1,199.1986 psf	1,854.3113 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	10.294223 ft	-0.14555025 ft	1,239.4388 psf	2,060.664 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	12.689267 ft	-1.3962788 ft	1,267.159 psf	2,120.4778 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	14.90555 ft	-2.397791 ft	1,283.0843 psf	2,249.666 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	16.94307 ft	-3.150087 ft	1,287.2147 psf	2,264.7566 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	19.051783 ft	-3.7837227 ft	1,282.4448 psf	2,346.703 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	21.231687 ft	-4.2986983 ft	1,268.7746 psf	2,328.173 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	23.21296 ft	-4.666157 ft	1,250.073 psf	2,371.8422 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	24.9956 ft	-4.886099 ft	1,226.3401 psf	2,331.7475 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	26.883332 ft	-4.9962532 ft	1,193.5483 psf	2,354.5517 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	28.876155 ft	-4.9966195 ft	1,151.6974 psf	2,278.2081 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	30.868978 ft	-4.9969858 ft	1,109.8466 psf	2,201.8644 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	32.861802 ft	-4.9973522 ft	1,067.9958 psf	2,125.5208 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	34.854625 ft	-4.9977185 ft	1,026.1449 psf	2,049.1771 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	36.847448 ft	-4.9980848 ft	984.29411 psf	1,972.8335 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	38.805067 ft	-4.8797208 ft	935.77422 psf	1,957.6342 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	40.727483 ft	-4.6426263 ft	880.58527 psf	1,852.3437 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	42.890353 ft	-4.1975637 ft	807.36661 psf	1,798.9242 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	45.293678 ft	-3.5445333 ft	716.11826 psf	1,617.7327 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	47.767355 ft	-2.608023 ft	605.7025 psf	1,513.2133 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	50.311385 ft	-1.388033 ft	476.11934 psf	1,243.6728 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	52.7917 ft	0.019518397 ft	336.17115 psf	1,042.2048 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	54.107935 ft	0.8883189 ft	256.5689 psf	865.53881 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	54.357935 ft	1.0745125 ft	244.95042 psf	902.73286 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	55.677352 ft	2.1420964 ft	178.33318 psf	744.50548 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	58.032057 ft	4.0473655 ft	59.444394 psf	473.1959 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I10 Crossing Theoretical Levee Section

2082 Spencer's Qcase

CASE: Top of Levee (CG) Circular

US Army Corps of Engineers
New Orleans District

CAP-BP (CG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/05/2022
Time: 07:31:19 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 04/05/2022
Last Solved Time: 07:32:28 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.95986, 14.180047) ft
Left-Zone Right Coordinate: (36.95592, 10.848027) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.95394, 9.18202) ft
Right-Zone Right Coordinate: (153, 5) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	21.5 ft
Coordinate 2	-5 ft	21.5 ft
Coordinate 3	5 ft	21.5 ft
Coordinate 4	54 ft	5 ft
Coordinate 5	250 ft	5 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 18604 of 26692 converged

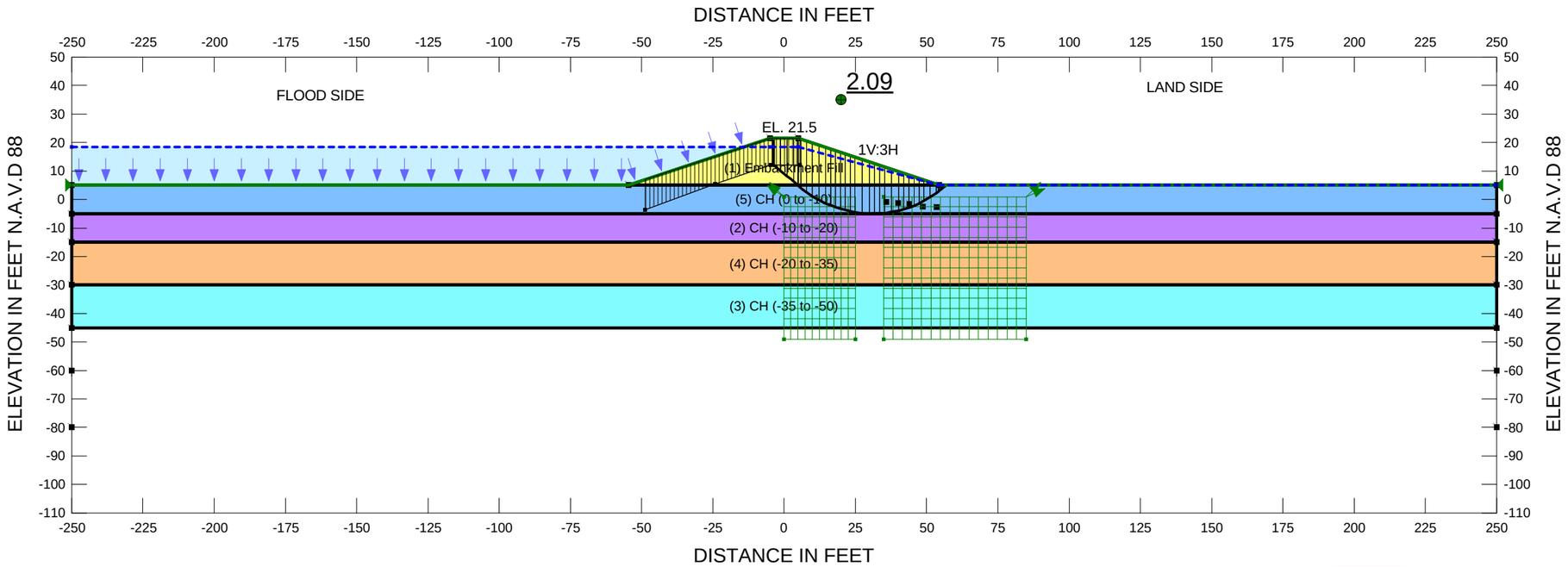
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.10
Volume: 878.65855 ft³
Weight: 104,787.61 lbf
Resisting Moment: 1,701,936.7 lbf·ft
Activating Moment: 810,085.59 lbf·ft
Resisting Force: 38,648.4 lbf
Activating Force: 18,416.94 lbf
Slip Rank: 1 of 26,692 slip surfaces

Exit: (58.349419, 5) ft
Entry: (-2.5316866, 12.2) ft
Radius: 27.088846 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-1.6553205 ft	11.390781 ft	630.81529 psf	609.48193 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	0.0974117 ft	9.772342 ft	731.80586 psf	984.95895 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	1.8501439 ft	8.1539033 ft	832.79643 psf	1,147.2825 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	3.863255 ft	6.3310608 ft	946.5418 psf	1,343.9017 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	5.1779979 ft	5.1587188 ft	1,015.9558 psf	1,456.0244 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	6.3235079 ft	4.13728 ft	1,055.6239 psf	1,515.7348 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	8.4385575 ft	2.4741265 ft	1,114.9627 psf	1,725.3087 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	10.733633 ft	0.8732595 ft	1,166.6321 psf	1,826.2593 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	13.06042 ft	-0.47951533 ft	1,202.1542 psf	2,027.6395 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	15.41892 ft	-1.584198 ft	1,221.5291 psf	2,072.0156 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	17.77742 ft	-2.6888807 ft	1,240.9039 psf	2,116.3916 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	20.216853 ft	-3.5655787 ft	1,244.3519 psf	2,261.9463 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	22.737217 ft	-4.2142923 ft	1,231.8731 psf	2,247.031 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	24.982488 ft	-4.6531493 ft	1,212.0796 psf	2,308.2369 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	26.952662 ft	-4.8821497 ft	1,184.9714 psf	2,262.1884 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	28.927315 ft	-4.996939 ft	1,150.6424 psf	2,277.9642 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	30.906445 ft	-4.997517 ft	1,109.0925 psf	2,202.1733 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	32.885575 ft	-4.998095 ft	1,067.5426 psf	2,126.3825 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	34.864705 ft	-4.998673 ft	1,025.9927 psf	2,050.5916 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	37.04292 ft	-4.9168065 ft	975.11504 psf	2,000.1462 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	39.744975 ft	-4.5730655 ft	896.88936 psf	1,915.9779 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	42.513595 ft	-3.934314 ft	798.85635 psf	1,802.4796 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	45.024025 ft	-3.179982 ft	699.03626 psf	1,602.41 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	47.284737 ft	-2.3296385 ft	598.47218 psf	1,496.9178 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	49.295732 ft	-1.3832835 ft	497.16411 psf	1,285.758 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	51.199145 ft	-0.33403275 ft	391.69589 psf	1,155.6063 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	52.994975 ft	0.81811375 ft	282.06753 psf	918.6066 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	53.946445 ft	1.4375188 ft	223.42414 psf	874.76974 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	54.25 ft	1.6831275 ft	206.97284 psf	826.19237 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	55.462355 ft	2.6640534 ft	145.76307 psf	674.50868 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	57.387064 ft	4.2213511 ft	48.58769 psf	451.15538 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I10 Crossing Theoretical Levee Section

2082 Spencer's Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/05/2022
Time: 07:31:19 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 04/05/2022
Last Solved Time: 07:33:04 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Piezometric Line: 1
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Slip Surface Block

Left Grid
Upper Left: (0, 1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, 1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	18.5 ft
Coordinate 2	-5 ft	18.5 ft
Coordinate 3	5 ft	18.5 ft
Coordinate 4	54 ft	5 ft
Coordinate 5	250 ft	5 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure

Tension Crack Line

	X	Y
Coordinate 1	-48.7 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

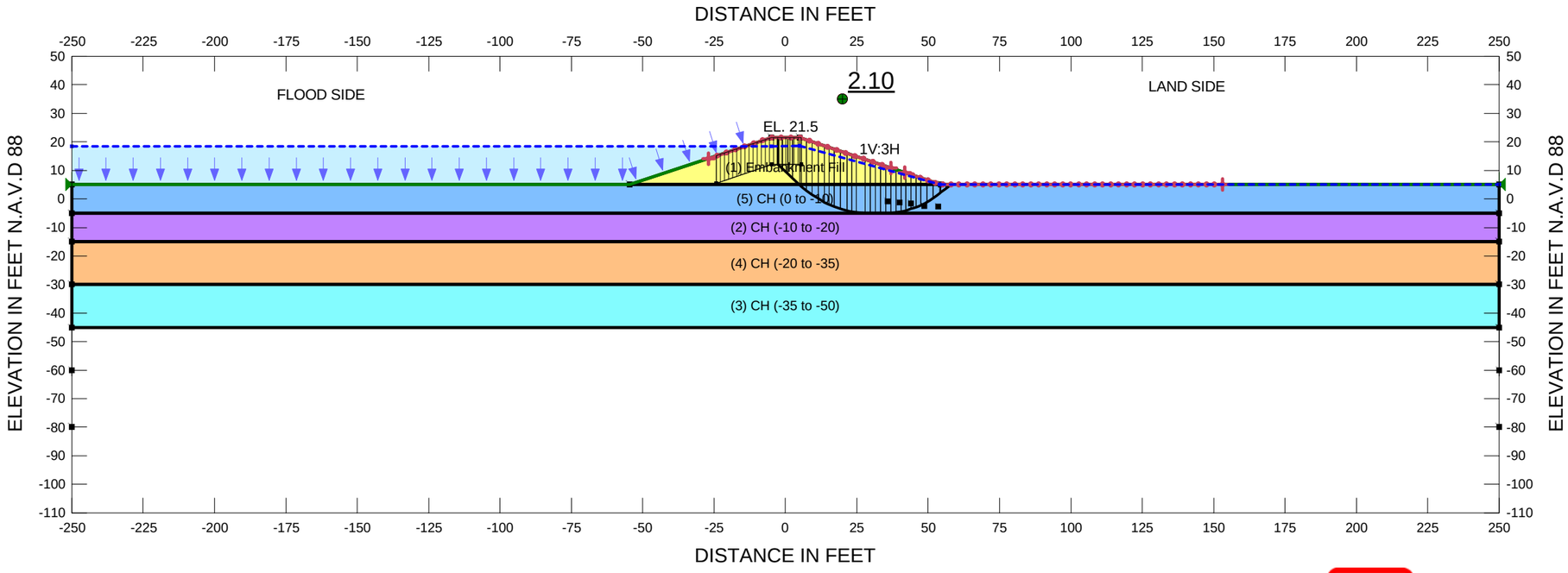
Slip Surfaces Analysed: 39580 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.09
Volume: 878.42801 ft³
Weight: 104,565.47 lbf
Resisting Moment: 1,676,690.6 lbf·ft
Activating Moment: 801,654.08 lbf·ft
Resisting Force: 38,583.117 lbf
Activating Force: 18,464.365 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (56.910312, 5) ft
Entry: (-3.9170843, 12.2) ft
Radius: 26.965809 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-3.7407721 ft	12.090231 ft	399.96962 psf	-245.91016 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-2.424815 ft	11.031221 ft	466.05181 psf	891.94467 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-0.145525 ft	9.132741 ft	584.51696 psf	1,084.6932 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	2.133765 ft	7.234261 ft	702.98211 psf	1,277.4418 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	4.0083712 ft	5.6425105 ft	802.30734 psf	1,420.3583 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	4.8716662 ft	4.8878093 ft	849.4007 psf	1,485.502 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	5.430915 ft	4.3989083 ft	872.4999 psf	1,524.6448 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	6.8774025 ft	3.289158 ft	916.88054 psf	1,674.3262 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	8.9085475 ft	1.823078 ft	973.44482 psf	1,768.8555 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	11.092075 ft	0.48117275 ft	1,019.6409 psf	1,955.29 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	13.427985 ft	-0.73655775 ft	1,055.4687 psf	2,013.1571 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	15.455517 ft	-1.6625215 ft	1,078.3918 psf	2,139.3466 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	17.17467 ft	-2.2967185 ft	1,088.4103 psf	2,151.978 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	18.893823 ft	-2.9309155 ft	1,098.4288 psf	2,164.6094 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	20.611155 ft	-3.4616467 ft	1,102.0223 psf	2,240.1863 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	22.326665 ft	-3.888912 ft	1,099.1909 psf	2,228.3047 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	24.042175 ft	-4.3161773 ft	1,096.3595 psf	2,216.4231 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	26.161515 ft	-4.645693 ft	1,080.4859 psf	2,279.1704 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	28.684685 ft	-4.877459 ft	1,051.5702 psf	2,212.3968 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	30.825188 ft	-4.9640887 ft	1,020.1767 psf	2,223.722 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	32.583025 ft	-4.905582 ft	986.30545 psf	2,148.6267 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	34.340862 ft	-4.8470753 ft	952.4342 psf	2,073.5314 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	36.47008 ft	-4.5996457 ft	900.38942 psf	2,050.3056 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	38.97068 ft	-4.1632932 ft	830.17111 psf	1,895.6044 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	41.105497 ft	-3.6593912 ft	762.0262 psf	1,838.2536 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	42.87453 ft	-3.0879395 ft	695.95469 psf	1,691.4544 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	44.643563 ft	-2.5164878 ft	629.88317 psf	1,544.6551 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	46.42163 ft	-1.794421 ft	554.25797 psf	1,471.9699 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	48.20873 ft	-0.921739 ft	469.07908 psf	1,279.3976 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	50.17376 ft	0.181837 ft	366.43346 psf	1,118.8195 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	52.31672 ft	1.516307 ft	246.32112 psf	842.4456 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	53.6941 ft	2.4281551 ft	165.74211 psf	740.72315 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	54.25 ft	2.8726807 ft	132.74472 psf	652.62542 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	55.705156 ft	4.0362967 ft	60.135089 psf	474.95737 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I10 Crossing Theoretical Levee Section

2082 Spencer's Qcase

CASE: Project Grade (PG) Circular

US Army Corps of Engineers
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/05/2022
Time: 07:31:19 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 04/05/2022
Last Solved Time: 07:32:00 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-27.01283, 14.16239) ft
Left-Zone Right Coordinate: (36.94008, 10.853307) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.87432, 9.20856) ft
Right-Zone Right Coordinate: (153.07437, 5) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	18.5 ft
Coordinate 2	-5 ft	18.5 ft
Coordinate 3	5 ft	18.55 ft
Coordinate 4	54 ft	5 ft
Coordinate 5	250 ft	5 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

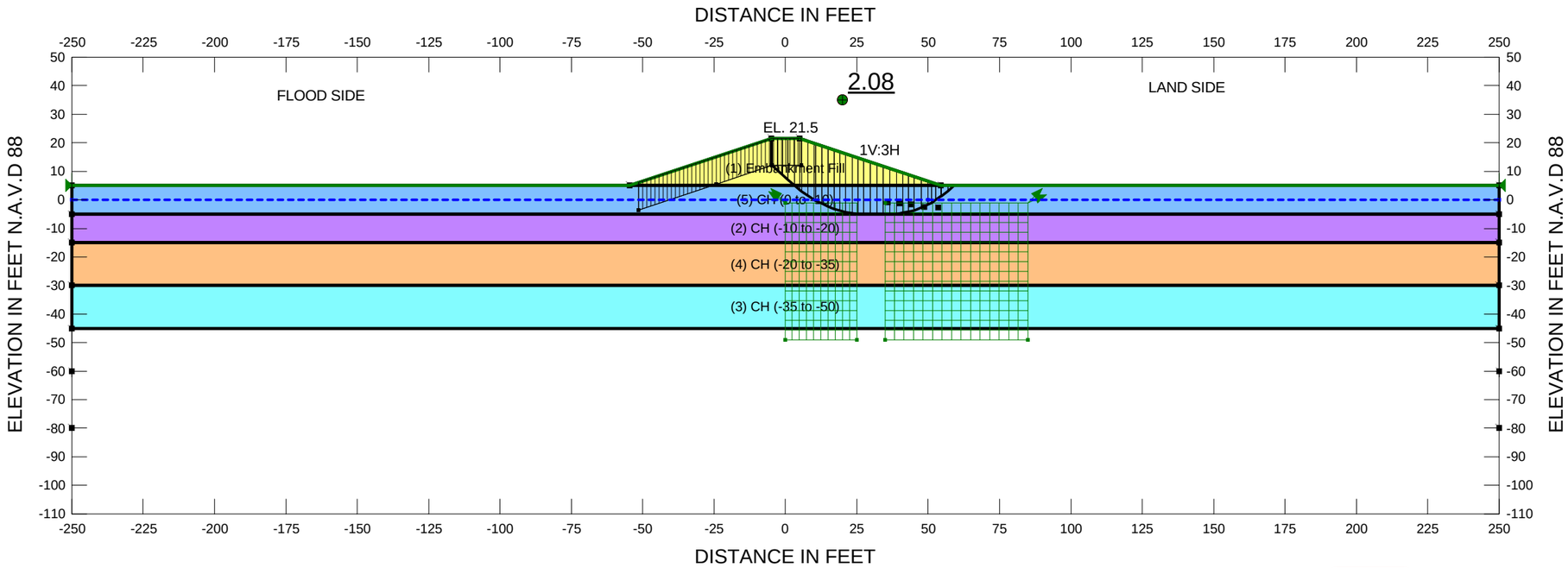
Slip Surfaces Analysed: 18307 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.10
Volume: 884.25537 ft³
Weight: 105,454.26 lbf
Resisting Moment: 1,702,297.9 lbf·ft
Activating Moment: 810,848.85 lbf·ft
Resisting Force: 38,495.932 lbf
Activating Force: 18,393.451 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (57.973816, 5) ft
Entry: (-2.6544836, 12.2) ft
Radius: 27.002707 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-1.7874764 ft	11.361955 ft	446.4163 psf	601.35967 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-0.053461813 ft	9.6858655 ft	551.54531 psf	979.8543 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	1.6805527 ft	8.0097758 ft	656.67432 psf	1,147.3381 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	3.77378 ft	6.0323538 ft	780.71854 psf	1,361.06 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	5.284705 ft	4.6284348 ft	863.79294 psf	1,482.9469 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	6.48461 ft	3.643632 ft	904.53966 psf	1,619.285 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	8.31501 ft	2.20311 ft	962.84375 psf	1,717.1622 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	10.326187 ft	0.82149425 ft	1,014.3527 psf	1,900.4273 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	12.518142 ft	-0.50121525 ft	1,059.0664 psf	1,974.7416 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	14.481993 ft	-1.5558737 ft	1,090.9899 psf	2,113.477 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	16.217737 ft	-2.3424813 ft	1,110.123 psf	2,143.1661 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	18.193845 ft	-3.079774 ft	1,122.0314 psf	2,245.827 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	20.410315 ft	-3.767752 ft	1,126.7149 psf	2,246.8118 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	22.35011 ft	-4.2649455 ft	1,124.2676 psf	2,315.3008 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	24.01323 ft	-4.5713545 ft	1,114.6895 psf	2,290.5605 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	26.346525 ft	-4.8618205 ft	1,092.5524 psf	2,298.7902 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	28.760206 ft	-4.9989526 ft	1,059.4602 psf	2,284.1612 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	30.584098 ft	-4.9986938 ft	1,027.9718 psf	2,214.2114 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	32.40799 ft	-4.998435 ft	996.48349 psf	2,144.2616 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	34.231882 ft	-4.9981762 ft	964.99516 psf	2,074.3119 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	36.055774 ft	-4.9979174 ft	933.50682 psf	2,004.3621 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	37.84122 ft	-4.8511233 ft	893.53809 psf	2,021.6746 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	39.58822 ft	-4.557794 ft	845.08896 psf	1,915.251 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	41.33522 ft	-4.2644647 ft	796.63984 psf	1,808.8275 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	43.076625 ft	-3.8058963 ft	737.97634 psf	1,796.546 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	44.812435 ft	-3.182089 ft	669.09848 psf	1,643.4428 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	46.548245 ft	-2.5582817 ft	600.22061 psf	1,490.3397 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	48.507683 ft	-1.6351247 ft	508.80453 psf	1,399.8303 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	50.690748 ft	-0.41261825 ft	394.85022 psf	1,140.6821 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	52.89114 ft	1.0585253 ft	265.08196 psf	953.99943 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	54.25 ft	2.1122838 ft	180.19349 psf	744.88013 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	55.368454 ft	2.9796139 ft	126.07209 psf	610.63244 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	57.105362 ft	4.326538 ft	42.024031 psf	419.08358 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I10 Crossing Theoretical Levee Section

2082 Spencer's Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/05/2022
Time: 07:31:19 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 04/05/2022
Last Solved Time: 07:33:18 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-51.5 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 36476 of 39601 converged

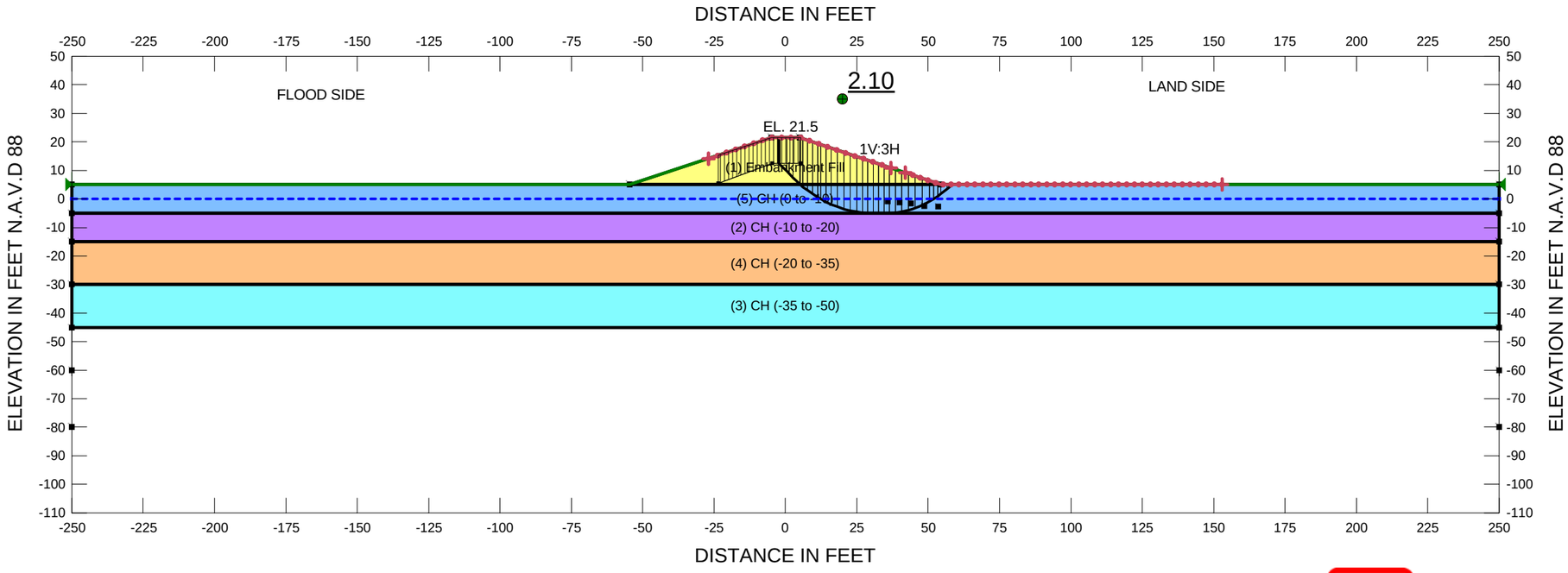
Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.08

Volume: 947.18555 ft³
Weight: 112,969.15 lbf
Resisting Moment: 1,810,363.8 lbf·ft
Activating Moment: 871,281.13 lbf·ft
Resisting Force: 40,675.826 lbf
Activating Force: 19,622.567 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (59.17073, 5) ft
Entry: (-4.8929092, 12.167601) ft
Radius: 28.109138 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-4.7428746 ft	12.062847 ft	-752.72168 psf	-391.95671 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-3.7018083 ft	11.138659 ft	-695.05232 psf	852.04796 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-1.919745 ft	9.499789 ft	-592.78683 psf	1,017.6468 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-0.13768167 ft	7.860919 ft	-490.52135 psf	1,183.2457 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	1.9915104 ft	6.020742 ft	-375.6943 psf	1,410.9341 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	4.1148354 ft	4.2702685 ft	-266.46476 psf	1,585.016 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	5.345115 ft	3.2560235 ft	-203.17587 psf	1,686.0567 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	6.7916842 ft	2.2286325 ft	-139.06667 psf	1,828.5535 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	8.9945925 ft	0.7428775 ft	-46.355556 psf	1,920.5125 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	10.356793 ft	-0.175861 ft	10.973726 psf	1,977.3766 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	11.700895 ft	-0.8376455 ft	52.269079 psf	2,134.5206 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	13.867605 ft	-1.8094925 ft	112.91233 psf	2,170.519 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	16.034315 ft	-2.7813395 ft	173.55558 psf	2,206.5174 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	18.108763 ft	-3.5352773 ft	220.6013 psf	2,330.0804 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	20.090947 ft	-4.0713057 ft	254.04948 psf	2,321.4507 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	22.267135 ft	-4.538966 ft	283.23148 psf	2,362.414 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	24.44795 ft	-4.8408375 ft	302.06826 psf	2,360.211 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	26.398505 ft	-4.971482 ft	310.22048 psf	2,350.1332 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	28.510279 ft	-4.9998142 ft	311.98841 psf	2,292.4556 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	30.824157 ft	-4.9996406 ft	311.97757 psf	2,203.7342 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	33.138035 ft	-4.999467 ft	311.96674 psf	2,115.0128 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	35.451913 ft	-4.9992934 ft	311.95591 psf	2,026.2915 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	37.765791 ft	-4.9991198 ft	311.94508 psf	1,937.5701 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	39.95338 ft	-4.786165 ft	298.6567 psf	1,951.2849 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	42.01468 ft	-4.360429 ft	272.09077 psf	1,814.8179 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	44.07598 ft	-3.934693 ft	245.52484 psf	1,678.3508 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	46.329972 ft	-3.1735909 ft	198.03207 psf	1,628.948 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	48.776657 ft	-2.0771228 ft	129.61246 psf	1,381.4395 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	50.571985 ft	-1.2725569 ft	79.407548 psf	1,199.8228 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	51.893061 ft	-0.5081125 ft	31.70622 psf	1,162.33 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	53.571076 ft	0.63009453 ft	-39.317898 psf	932.29414 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	54.546995 ft	1.292066 ft	-80.62492 psf	800.51312 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	55.738175 ft	2.2429572 ft	-139.96053 psf	726.26891 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	58.026545 ft	4.0809857 ft	-254.65351 psf	464.99731 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I10 Crossing Theoretical Levee Section

2082 Spencer's Qcase

CASE: Low Water (LW) Circular

US Army Corps of Engineers
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/05/2022
Time: 07:31:19 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 04/05/2022
Last Solved Time: 07:32:14 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.95986, 14.180047) ft
Left-Zone Right Coordinate: (36.95592, 10.848027) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.95394, 9.18202) ft
Right-Zone Right Coordinate: (153, 5) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-23.5 ft	5.5 ft
Coordinate 2	-4.6 ft	12.4 ft
Coordinate 3	5.4 ft	12.4 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 16767 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.10
Volume: 877.11492 ft³
Weight: 104,616.84 lbf
Resisting Moment: 1,706,637.9 lbf·ft
Activating Moment: 812,456.72 lbf·ft
Resisting Force: 38,725.5 lbf
Activating Force: 18,452.352 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (58.55319, 5) ft
Entry: (-2.4351559, 12.4) ft
Radius: 27.205697 ft
Center: (20, 35) ft

Slip Slices

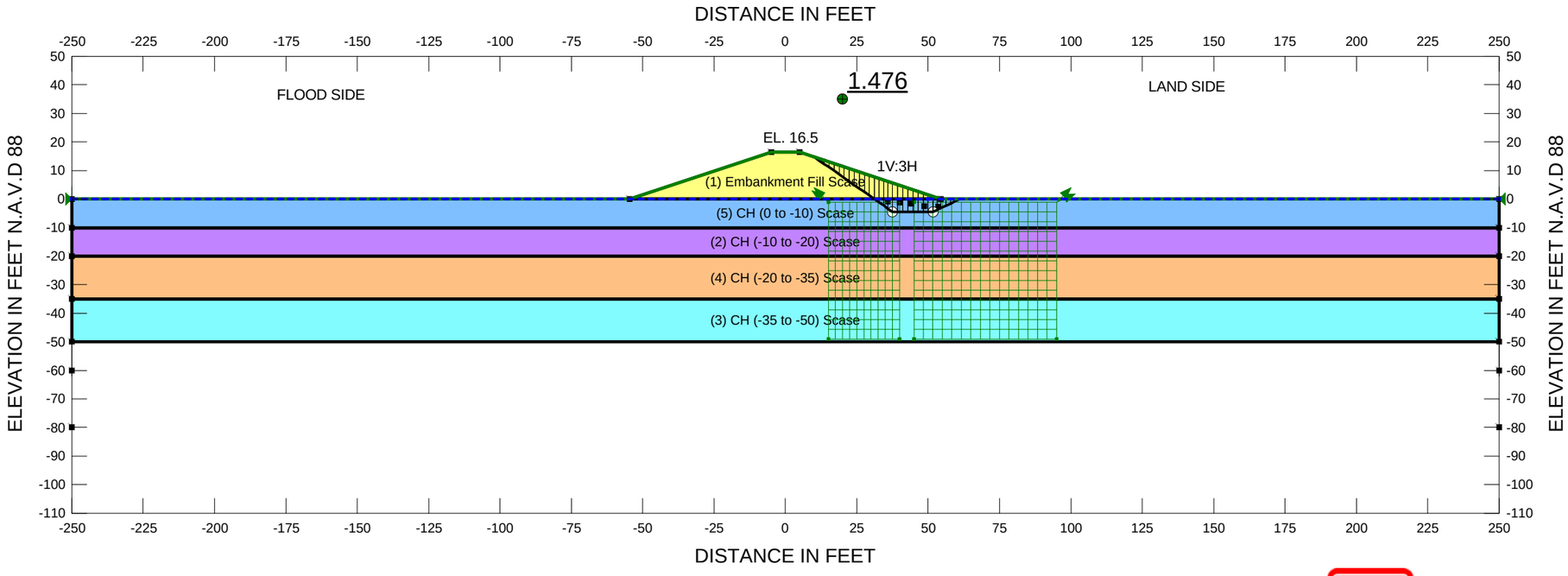
	X	Y	PWP	Base	Frictional	Cohesive	Suction	Base

				Normal Stress	Strength	Strength	Strength	Material
Slice 1	-2.127518 ft	12.155667 ft	-758.51362 psf	208.15791 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-0.68323333 ft	10.79874 ft	-673.84137 psf	863.22597 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	1.59006 ft	8.5735516 ft	-534.98962 psf	1,085.07 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	3.8633533 ft	6.3483633 ft	-396.13787 psf	1,306.9141 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	5.120433 ft	5.1178846 ft	-319.356 psf	1,425.5866 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	5.619983 ft	4.6289055 ft	-288.8437 psf	1,447.3752 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	6.877305 ft	3.6438632 ft	-227.37706 psf	1,649.1375 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	8.633715 ft	2.4159675 ft	-150.75637 psf	1,726.7834 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	10.390125 ft	1.1880718 ft	-74.135682 psf	1,804.4294 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	11.813989 ft	0.287062 ft	-17.912669 psf	1,952.0274 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	13.286542 ft	-0.48762225 ft	30.427628 psf	1,989.3373 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	15.140327 ft	-1.4628668 ft	91.282885 psf	2,036.3063 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	17.154583 ft	-2.3458308 ft	146.37984 psf	2,163.6321 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	19.329307 ft	-3.1365142 ft	195.71849 psf	2,178.2686 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	21.55808 ft	-3.790824 ft	236.54742 psf	2,260.0556 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	23.8409 ft	-4.30876 ft	268.86662 psf	2,238.0716 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	25.951835 ft	-4.6757058 ft	291.76404 psf	2,278.0517 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	27.890885 ft	-4.8916613 ft	305.23966 psf	2,231.5284 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	29.804364 ft	-4.9995549 ft	311.97222 psf	2,244.6184 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	31.692271 ft	-4.9993866 ft	311.96173 psf	2,172.2266 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	33.580179 ft	-4.9992184 ft	311.95123 psf	2,099.8348 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	35.468086 ft	-4.9990501 ft	311.94073 psf	2,027.4429 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	37.50122 ft	-4.8809478 ft	304.57114 psf	2,001.6993 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	39.67958 ft	-4.6449112 ft	289.84246 psf	1,886.7376 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	41.943295 ft	-4.2167003 ft	263.1221 psf	1,837.9199 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	44.292365 ft	-3.5963148 ft	224.41004 psf	1,663.0835 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	46.719828 ft	-2.7049385 ft	168.78816 psf	1,564.3514 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	49.225682 ft	-1.5425715 ft	96.256462 psf	1,304.0651 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	51.222155 ft	-0.480694 ft	29.995306 psf	1,174.634 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	52.677065 ft	0.4598905 ft	-28.697167 psf	981.73404 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	53.944215 ft	1.3588575 ft	-84.792706 psf	873.13201 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	55.513297 ft	2.5984504 ft	-162.14331 psf	671.9561 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	57.539892 ft	4.1994835 ft	-262.04777 psf	443.52945 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

I-10 Crossing

Spencer's Scase

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

I-10 Crossing Theoretical Levee Section

2032 Spencer's Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,377
Date: 01/26/2022
Time: 02:02:09 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 01/26/2022
Last Solved Time: 02:02:58 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (15, -1) ft
Lower Left: (15, -49) ft
Lower Right: (40, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, -1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39368 of 39600 converged

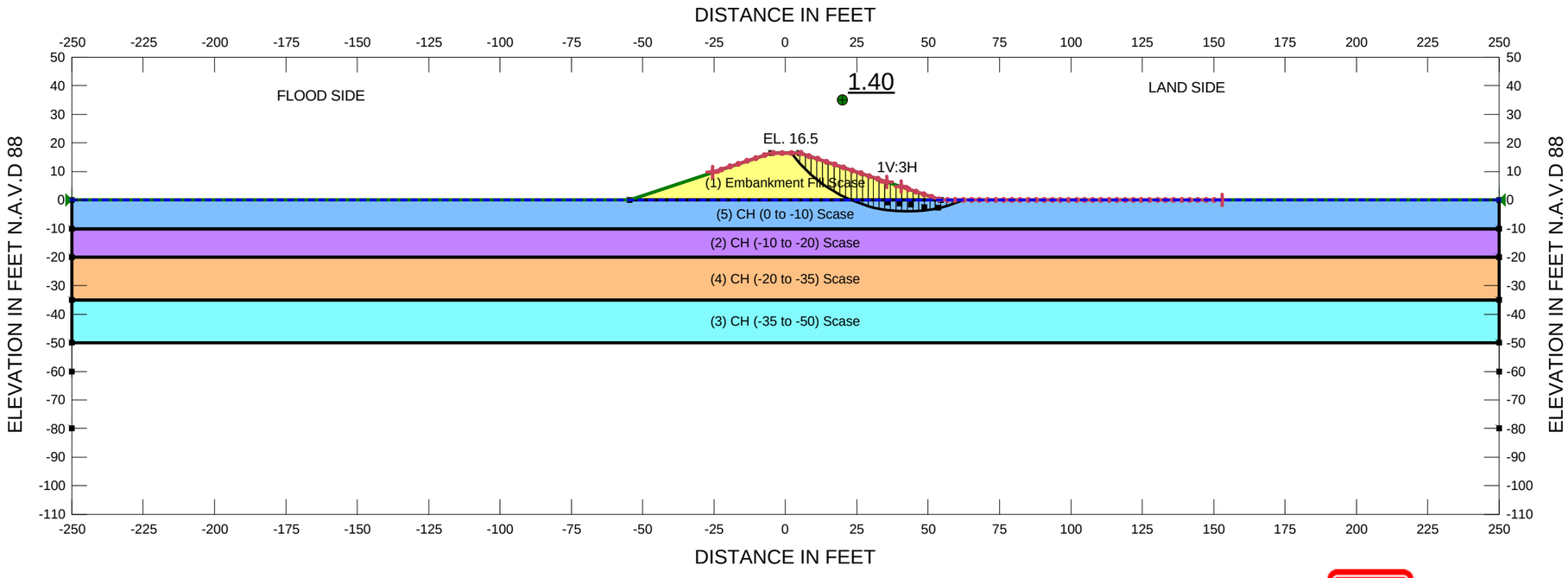
Current Slip Surface

Slip Surface: 4,971
Factor of Safety: 1.476
Volume: 270.82885 ft³
Weight: 32,123.038 lbf
Resisting Moment: 357,457.82 lbf·ft
Activating Moment: 241,554.47 lbf·ft
Resisting Force: 10,195.508 lbf
Activating Force: 6,925.7498 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (61.163769, 0) ft
Entry: (9.9831074, 14.838964) ft
Radius: 26.659128 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	10.866117 ft	14.220674 ft	-887.37006 psf	28.471084 psf	12.085258 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	12.632137 ft	12.984094 ft	-810.20745 psf	85.413251 psf	36.255774 psf	0 psf	0 psf	(1) Embankment

								Fill Scase
Slice 3	14.398157 ft	11.747513 ft	-733.04483 psf	142.35542 psf	60.42629 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	16.164177 ft	10.510933 ft	-655.88222 psf	199.29759 psf	84.596806 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	17.930196 ft	9.2743526 ft	-578.7196 psf	256.23975 psf	108.76732 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	19.696216 ft	8.0377723 ft	-501.55699 psf	313.18192 psf	132.93784 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	21.462236 ft	6.8011919 ft	-424.39438 psf	370.12409 psf	157.10835 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	23.228256 ft	5.5646116 ft	-347.23176 psf	427.06626 psf	181.27887 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	24.994275 ft	4.3280312 ft	-270.06915 psf	484.00842 psf	205.44939 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	26.760295 ft	3.0914509 ft	-192.90653 psf	540.95059 psf	229.6199 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	28.526315 ft	1.8548705 ft	-115.74392 psf	597.89276 psf	253.79042 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 12	30.292335 ft	0.61829018 ft	-38.581307 psf	654.83492 psf	277.96093 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 13	31.965926 ft	-0.55357143 ft	34.542857 psf	716.35585 psf	289.41244 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	33.54709 ft	-1.6607143 ft	103.62857 psf	782.45553 psf	288.14495 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	35.128254 ft	-2.7678571 ft	172.71429 psf	848.55522 psf	286.87746 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	36.709418 ft	-3.875 ft	241.8 psf	914.6549 psf	285.60996 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	38.392857 ft	-4.4285714 ft	276.34286 psf	1,243.8961 psf	410.702 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	40.178571 ft	-4.4285714 ft	276.34286 psf	1,169.8673 psf	379.27861 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	41.964286 ft	-4.4285714 ft	276.34286 psf	1,095.8384 psf	347.85523 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	43.75 ft	-4.4285714 ft	276.34286 psf	1,021.8096 psf	316.43184 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	45.535714 ft	-4.4285714 ft	276.34286 psf	947.78071 psf	285.00846 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	47.321429 ft	-4.4285714 ft	276.34286 psf	873.75185 psf	253.58507 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	49.107143 ft	-4.4285714 ft	276.34286 psf	799.723 psf	222.16169 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	50.833333 ft	-4.4285714 ft	276.34286 psf	728.16177 psf	191.78575 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	52.375 ft	-4.0982702 ft	255.73206 psf	806.69427 psf	233.86958 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	53.791667 ft	-3.4376677 ft	214.51046 psf	615.18981 psf	170.07829 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	55.332971 ft	-2.7189456 ft	169.66221 psf	454.50789 psf	120.90982 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	56.998913 ft	-1.942104 ft	121.18729 psf	324.64849 psf	86.364156 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	58.664855 ft	-1.1652624 ft	72.712374 psf	194.78909 psf	51.818494 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	60.330798 ft	-0.3884208 ft	24.237458 psf	64.929698 psf	17.272831 psf	0 psf	0 psf	(5) CH (0 to -10) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

I-10 Crossing Theoretical Levee Section

2032 Spencer's Scase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,378
Date: 01/26/2022
Time: 02:13:50 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 01/26/2022
Last Solved Time: 02:14:10 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 10 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Solution Settings
- Search Method: Root Finder
- Tolerable difference between starting and converged F of S: 3
- Maximum iterations to calculate converged lambda: 20
- Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.45986, 9.680047) ft
Left-Zone Right Coordinate: (35.45592, 6.348027) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.45394, 4.68202) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 20

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 9941 of 18081 converged

Current Slip Surface

Slip Surface: 7,927
Factor of Safety: 1.40
Volume: 421.17097 ft³
Weight: 49,490.938 lbf
Resisting Moment: 609,537.49 lbf·ft
Activating Moment: 436,587.97 lbf·ft
Resisting Force: 16,683.678 lbf
Activating Force: 11,913.492 lbf
Slip Rank: 1 of 18,081 slip surfaces
Exit: (62.355322, 0) ft
Entry: (2.084889, 16.5) ft
Radius: 50.420749 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	3.5424445 ft	14.701919 ft	-917.39971 psf	126.06822 psf	53.512783 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	5.9990899 ft	11.844191 ft	-739.07752 psf	322.58032 psf	136.92722 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	7.9972696 ft	9.8375971 ft	-613.86606 psf	441.39213 psf	187.35984 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	9.9954493 ft	8.0400697 ft	-501.70035 psf	550.67464 psf	233.74752 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	11.993629 ft	6.4232108 ft	-400.80835 psf	650.53472 psf	276.13561 psf	0 psf	0 psf	(1) Embankment Fill Scase

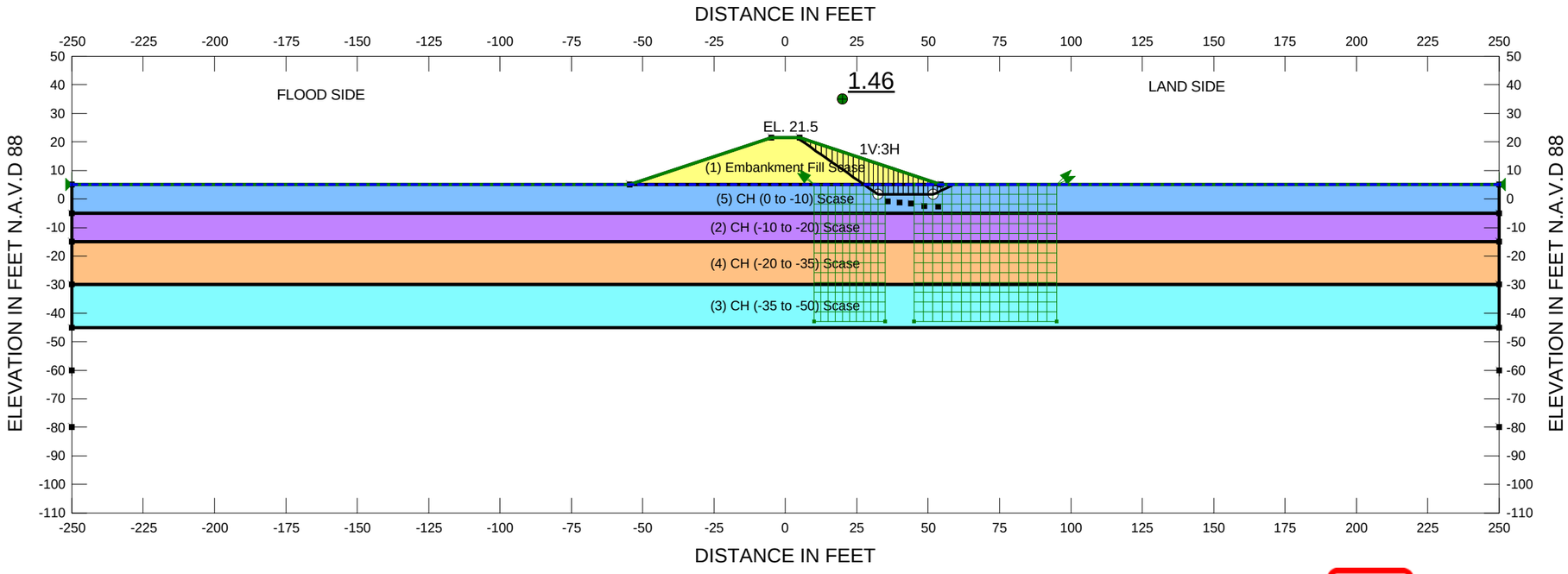
Slice 6	13.991809 ft	4.9657527 ft	-309.86297 psf	741.08593 psf	314.57231 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	15.989988 ft	3.6513178 ft	-227.84223 psf	822.42744 psf	349.09974 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	17.988168 ft	2.4670204 ft	-153.94207 psf	894.63294 psf	379.74915 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	19.986348 ft	1.4025522 ft	-87.519259 psf	957.74428 psf	406.53833 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	21.984528 ft	0.44956255 ft	-28.052703 psf	1,011.7673 psf	429.46976 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	23.968504 ft	-0.39344994 ft	24.551276 psf	1,060.5707 psf	439.76413 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	25.938278 ft	-1.13343 ft	70.726032 psf	1,103.0902 psf	438.21257 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	27.908052 ft	-1.7815818 ft	111.17071 psf	1,134.8783 psf	434.53809 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	29.877826 ft	-2.3415749 ft	146.11427 psf	1,155.9418 psf	428.64634 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	31.8476 ft	-2.8164231 ft	175.7448 psf	1,166.2186 psf	420.43116 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	33.817374 ft	-3.2085749 ft	200.21507 psf	1,165.5762 psf	409.77149 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	35.787148 ft	-3.5199818 ft	219.64686 psf	1,153.8083 psf	396.52801 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	37.756922 ft	-3.7521498 ft	234.13415 psf	1,130.6286 psf	380.5393 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	39.726696 ft	-3.9061774 ft	243.74547 psf	1,095.6623 psf	361.61725 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	41.69647 ft	-3.982782 ft	248.5256 psf	1,048.4351 psf	339.54146 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	43.666244 ft	-3.9823173 ft	248.4966 psf	988.35741 psf	314.05228 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	45.636017 ft	-3.9047811 ft	243.65834 psf	914.70424 psf	284.84209 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	47.605791 ft	-3.7498154 ft	233.98848 psf	826.58896 psf	251.54398 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	49.575565 ft	-3.5166984 ft	219.44198 psf	722.92827 psf	213.71725 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	51.545339 ft	-3.2043268 ft	199.94999 psf	602.39599 psf	170.82819 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	53.515113 ft	-2.8111895 ft	175.41822 psf	463.36087 psf	122.2244 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	55.481915 ft	-2.3361748 ft	145.77731 psf	353.83623 psf	88.315775 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	57.445746 ft	-1.7770932 ft	110.89061 psf	276.60627 psf	70.342123 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	59.409576 ft	-1.1303599 ft	70.534457 psf	181.19043 psf	46.970673 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

Slice 30	61.373407 ft	-0.39233448 ft	24.481671 psf	64.927499 psf	17.168235 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

I-10 Crossing

Spencer's Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

I-10 Crossing Theoretical Levee Section

2082 Spencer's Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,382
Date: 04/05/2022
Time: 08:09:28 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 04/05/2022
Last Solved Time: 08:10:10 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Slip Surface Block

Left Grid
Upper Left: (10, 5) ft
Lower Left: (10, -43) ft
Lower Right: (35, -43) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, 5) ft
Lower Left: (45, -43) ft
Lower Right: (95, -43) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	5 ft
Coordinate 2	50 ft	5 ft
Coordinate 3	250 ft	5 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39505 of 39600 converged

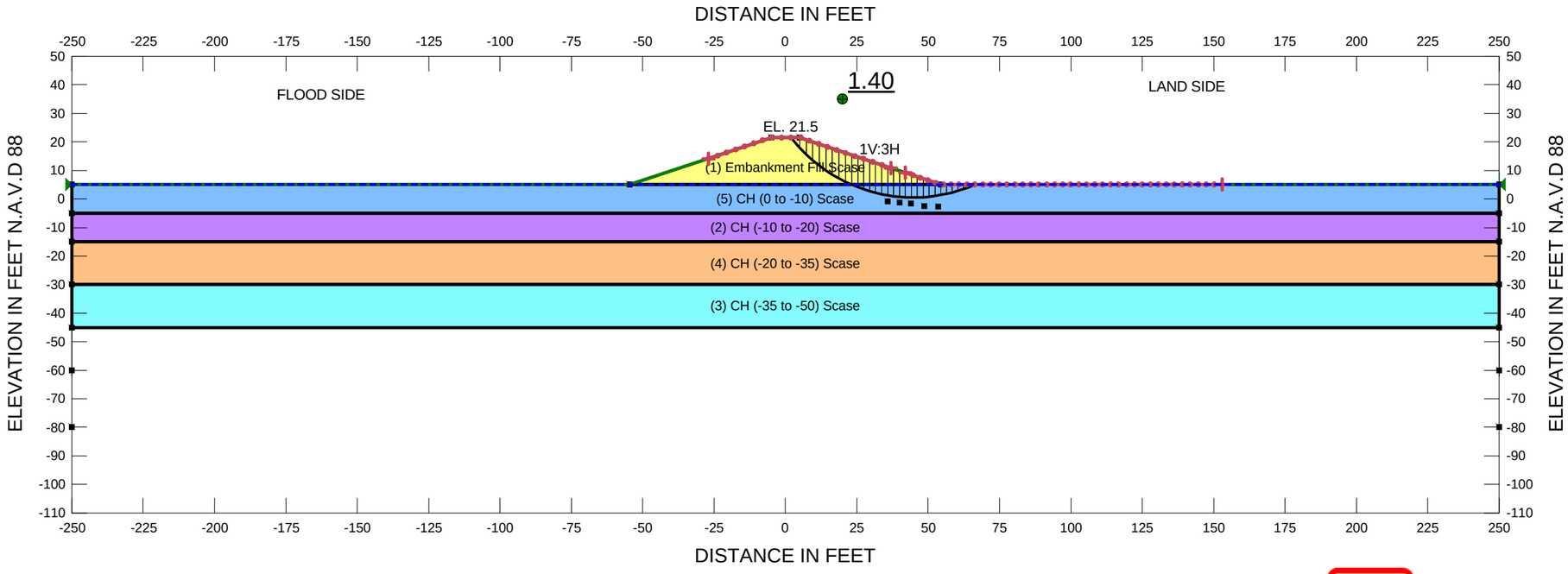
Current Slip Surface

Slip Surface: 4,971
Factor of Safety: 1.46
Volume: 316.53677 ft³
Weight: 37,268.856 lbf
Resisting Moment: 377,967.48 lbf·ft
Activating Moment: 258,035.28 lbf·ft
Resisting Force: 12,476.489 lbf
Activating Force: 8,536.9857 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (59.019262, 5) ft
Entry: (4.0390504, 21.5) ft
Radius: 28.872603 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice	4.5195252	21.163568	-1,008.6066	29.241134	12.412125	0 psf	0 psf	(1)

1	ft	ft	psf	psf	psf			Embankment Fill Scase
Slice 2	5.9418122 ft	20.167672 ft	-946.46273 psf	88.513858 psf	37.571904 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	7.8254366 ft	18.848744 ft	-864.16162 psf	148.57704 psf	63.067211 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	9.7090609 ft	17.529816 ft	-781.86051 psf	208.64022 psf	88.562517 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	11.592685 ft	16.210888 ft	-699.55941 psf	268.7034 psf	114.05782 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	13.47631 ft	14.89196 ft	-617.2583 psf	328.76657 psf	139.55313 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	15.359934 ft	13.573032 ft	-534.95719 psf	388.82975 psf	165.04844 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	17.243558 ft	12.254104 ft	-452.65609 psf	448.89293 psf	190.54375 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	19.127183 ft	10.935176 ft	-370.35498 psf	508.95611 psf	216.03905 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	21.010807 ft	9.616248 ft	-288.05387 psf	569.01929 psf	241.53436 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	22.894432 ft	8.29732 ft	-205.75277 psf	629.08247 psf	267.02967 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 12	24.778056 ft	6.978392 ft	-123.45166 psf	689.14565 psf	292.52497 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 13	26.66168 ft	5.659464 ft	-41.150553 psf	749.20883 psf	318.02028 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 14	28.419577 ft	4.4285714 ft	35.657143 psf	812.66413 psf	329.8199 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	30.051746 ft	3.2857143 ft	106.97143 psf	879.51155 psf	327.92383 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	31.683915 ft	2.1428571 ft	178.28571 psf	946.35897 psf	326.02776 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	33.375 ft	1.5714286 ft	213.94286 psf	1,335.0846 psf	475.89644 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	35.125 ft	1.5714286 ft	213.94286 psf	1,261.6675 psf	444.73274 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	36.875 ft	1.5714286 ft	213.94286 psf	1,188.2505 psf	413.56905 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	38.625 ft	1.5714286 ft	213.94286 psf	1,114.8334 psf	382.40535 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	40.375 ft	1.5714286 ft	213.94286 psf	1,041.4163 psf	351.24166 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	42.125 ft	1.5714286 ft	213.94286 psf	967.99929 psf	320.07796 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	43.875 ft	1.5714286 ft	213.94286 psf	894.58222 psf	288.91427 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	45.625 ft	1.5714286 ft	213.94286 psf	821.16516 psf	257.75058 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	47.375 ft	1.5714286 ft	213.94286 psf	747.7481 psf	226.58688 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	49.125 ft	1.5714286 ft	213.94286 psf	674.33103 psf	195.42319 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	50.833333 ft	1.5714286 ft	213.94286 psf	602.66199 psf	165.00148 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	52.375 ft	1.9017298 ft	193.33206 psf	661.43011 psf	198.69583 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	53.791667 ft	2.5623323 ft	152.11046 psf	463.15604 psf	132.03102 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	55.629815 ft	3.4194752 ft	98.624747 psf	273.01425 psf	74.023954 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 31	57.889446 ft	4.4731584 ft	32.874916 psf	91.004752 psf	24.674651 psf	0 psf	0 psf	(5) CH (0 to -10) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

I-10 Crossing Theoretical Levee Section

2082 Spencer's Scase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,382
Date: 04/05/2022
Time: 08:09:28 AM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 04/05/2022
Last Solved Time: 08:09:56 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 10.5 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.95986, 14.180047) ft
Left-Zone Right Coordinate: (36.95592, 10.848027) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.95394, 9.18202) ft
Right-Zone Right Coordinate: (153, 5) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	5 ft
Coordinate 2	250 ft	5 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 14317 of 26691 converged

Current Slip Surface

Slip Surface: 11,732
Factor of Safety: 1.40
Volume: 442.41401 ft³
Weight: 52,169.118 lbf
Resisting Moment: 542,058.38 lbf·ft
Activating Moment: 388,770.25 lbf·ft
Resisting Force: 17,147.249 lbf
Activating Force: 12,270.61 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (66.413351, 5) ft
Entry: (1.9267751, 21.5) ft
Radius: 54.400324 ft
Center: (20, 35) ft

Slip Slices

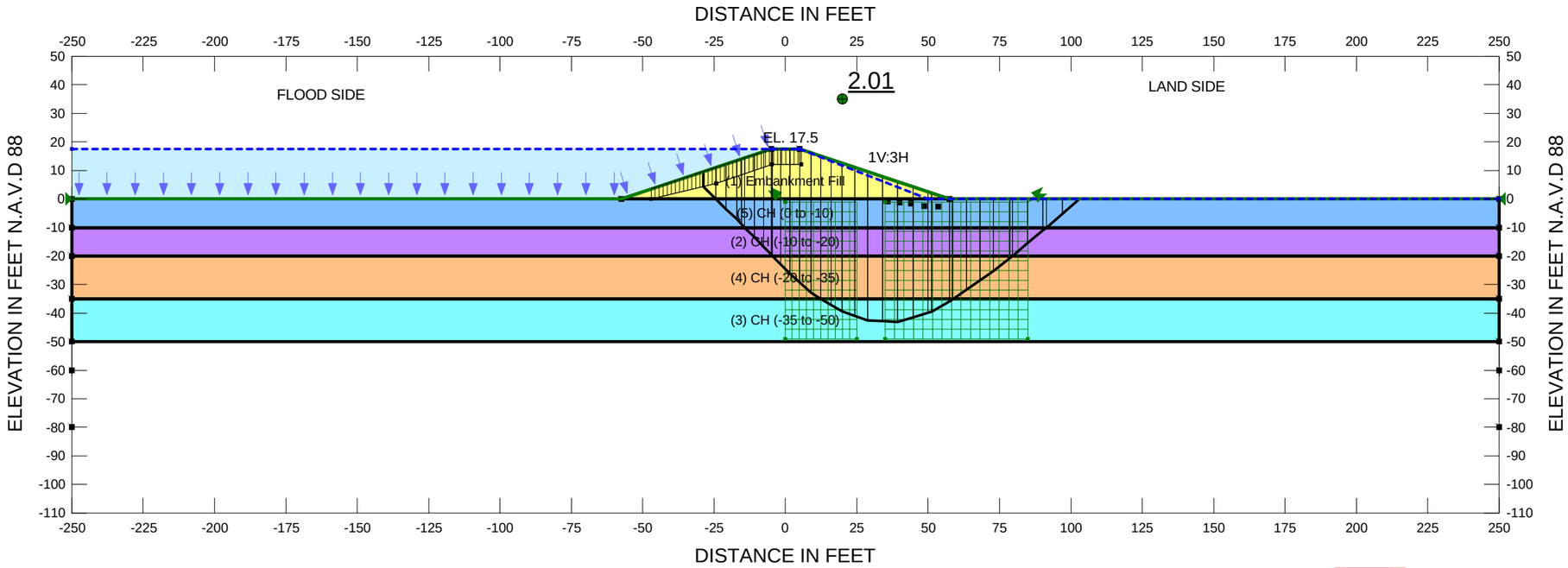
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	3.4633876 ft	19.696067 ft	-917.03459 psf	130.43483 psf	55.3663 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	6.141261 ft	16.736139 ft	-732.33506 psf	336.00637 psf	142.62624 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	8.4237829 ft	14.551187 ft	-595.99405 psf	464.69429 psf	197.25102 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	10.706305 ft	12.602173 ft	-474.3756 psf	581.78686 psf	246.95387 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	12.988827 ft	10.857568 ft	-365.51222 psf	687.42771 psf	291.79575 psf	0 psf	0 psf	(1) Embankment Fill Scase

Slice 6	15.271349 ft	9.2937897 ft	-267.93247 psf	781.75802 psf	331.83659 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	17.553871 ft	7.8927166 ft	-180.50552 psf	864.89186 psf	367.12481 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	19.836393 ft	6.6401286 ft	-102.34403 psf	936.90338 psf	397.69189 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	22.118915 ft	5.5246921 ft	-32.740787 psf	997.81952 psf	423.54926 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	24.301503 ft	4.5754041 ft	26.494784 psf	1,050.5857 psf	434.70082 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 11	26.384158 ft	3.7752412 ft	76.424951 psf	1,094.8116 psf	432.27947 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	28.466813 ft	3.0710192 ft	120.3684 psf	1,127.8058 psf	427.63179 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	30.549468 ft	2.458868 ft	158.56663 psf	1,149.5967 psf	420.66731 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	32.632123 ft	1.9355917 ft	191.21908 psf	1,160.1442 psf	411.28433 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	34.714778 ft	1.4985748 ft	218.48893 psf	1,159.339 psf	399.36717 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	36.797433 ft	1.1457115 ft	240.5076 psf	1,146.9999 psf	384.78315 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	38.880088 ft	0.87535131 ft	257.37808 psf	1,122.8691 psf	367.37914 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	40.962743 ft	0.68625896 ft	269.17744 psf	1,086.6052 psf	346.97751 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	43.045398 ft	0.57758508 ft	275.95869 psf	1,037.7736 psf	323.37124 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	45.128053 ft	0.54884691 ft	277.75195 psf	975.83313 psf	296.31788 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	47.210708 ft	0.59991744 ft	274.56515 psf	900.11948 psf	265.53206 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	49.293363 ft	0.73102258 ft	266.38419 psf	809.8226 psf	230.67592 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	51.376018 ft	0.94274617 ft	253.17264 psf	703.95767 psf	191.34689 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	53.458673 ft	1.2360432 ft	234.87091 psf	581.32677 psf	147.06179 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	55.492779 ft	1.6015727 ft	212.06187 psf	491.53722 psf	118.63025 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	57.478338 ft	2.0371571 ft	184.8814 psf	438.04113 psf	107.45993 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	59.463896 ft	2.5515949 ft	152.78048 psf	370.50562 psf	92.41884 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	61.449455 ft	3.1472395 ft	115.61226 psf	287.4164 psf	72.926534 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	63.435013 ft	3.8269349 ft	73.199263 psf	186.89124 psf	48.25938 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	65.420572 ft	4.5940918 ft	25.328673 psf	66.559151 psf	17.501299 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

Slidell East/Northeast

Spencer's Qcase 2032

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: CAP-BP (CG) (block)

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:36:40 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-5 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-46.9 ft	0 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

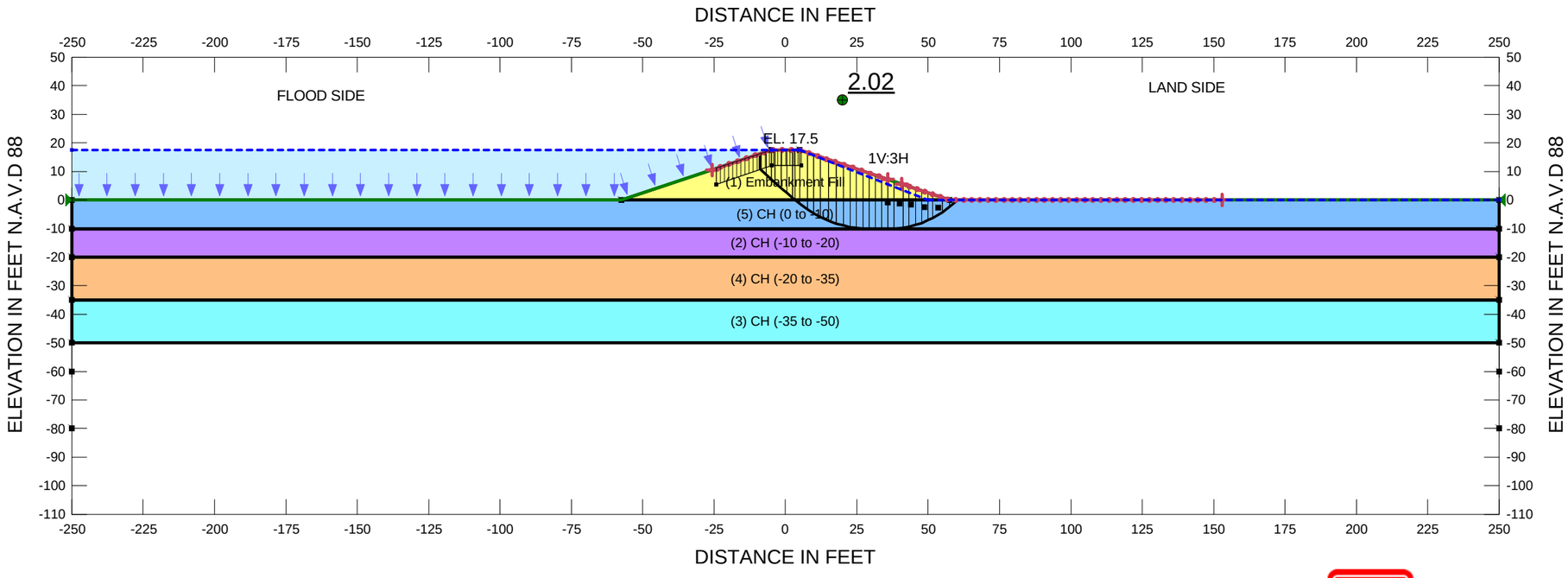
Slip Surfaces Analysed: 39566 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.01
Volume: 4,297.1942 ft³
Weight: 508,222.2 lbf
Resisting Moment: 8,407,657.2 lbf·ft
Activating Moment: 4,174,970.1 lbf·ft
Resisting Force: 96,410.104 lbf
Activating Force: 48,112.725 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (103.01034, 0) ft
Entry: (-28.821253, 4.3197006) ft
Radius: 60.144589 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-26.602825 ft	2.1598503 ft	957.22534 psf	1,049.4323 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-22.565478 ft	-1.7708905 ft	1,202.5036 psf	1,559.5869 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 3	-18.927639 ft	-5.3126715 ft	1,423.5107 psf	2,046.6798 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-16.22892 ft	-7.9778955 ft	1,589.8207 psf	2,395.2106 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-14.800945 ft	-9.4361145 ft	1,680.8135 psf	2,589.2119 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-12.59481 ft	-11.705477 ft	1,822.4218 psf	2,820.3184 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-9.2788901 ft	-15.116431 ft	2,035.2653 psf	3,278.6162 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-6.310465 ft	-18.185025 ft	2,226.7456 psf	3,684.529 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	-4.7827981 ft	-19.774071 ft	2,325.9021 psf	3,893.9338 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	-3.1545781 ft	-21.46771 ft	2,431.5851 psf	4,111.9278 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	-0.05767 ft	-24.509583 ft	2,621.398 psf	4,491.4766 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	3.31411 ft	-27.657906 ft	2,817.8533 psf	4,827.38 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	6.941705 ft	-31.045091 ft	2,982.095 psf	5,117.2243 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	10.661051 ft	-33.929057 ft	3,071.7983 psf	5,477.8577 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	14.251866 ft	-36.092351 ft	3,119.6507 psf	5,567.2085 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	17.878215 ft	-38.277051 ft	3,167.9767 psf	5,665.9438 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	21.977988 ft	-40.157192 ft	3,185.8096 psf	5,872.9848 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	26.551182 ft	-41.732771 ft	3,173.1495 psf	5,871.0219 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	31.459418 ft	-42.664042 ft	3,112.1543 psf	5,967.9528 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	36.702692 ft	-42.951005 ft	3,002.8241 psf	5,798.9265 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	41.993248 ft	-42.276916 ft	2,832.3767 psf	5,748.0232 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	47.331083 ft	-40.641773 ft	2,600.8124 psf	5,358.3799 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	50.63273 ft	-39.630378 ft	2,472.9356 psf	5,117.3712 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 24	54.38273 ft	-37.621988 ft	2,347.612 psf	4,912.5954 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 25	58.054495 ft	-35.48465 ft	2,214.2422 psf	4,548.838 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 26	61.053474 ft	-33.460618 ft	2,087.9426 psf	4,371.8289 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	65.826144 ft	-30.139038 ft	1,880.676 psf	3,991.6951 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	70.482515 ft	-26.898397 ft	1,678.46 psf	3,620.8243 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	75.704425 ft	-23.009443 ft	1,435.7893 psf	3,221.0618 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	79.040285 ft	-20.370406 ft	1,271.1133 psf	2,944.9758 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	82.146937 ft	-17.767759 ft	1,108.7081 psf	2,651.4769 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	87.475972 ft	-13.303276 ft	830.12439 psf	2,081.7077 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	90.765724 ft	-10.535517 ft	657.41626 psf	1,737.6627 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	94.188359 ft	-7.6040075 ft	474.49007 psf	1,284.0063 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	99.998052 ft	-2.6040075 ft	162.49007 psf	637.82364 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: CAP-BP (CG) (circ)

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:36:18 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.76957, 10.57681) ft
Left-Zone Right Coordinate: (35.76229, 7.245903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.75864, 5.580453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-5 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 19302 of 26692 converged

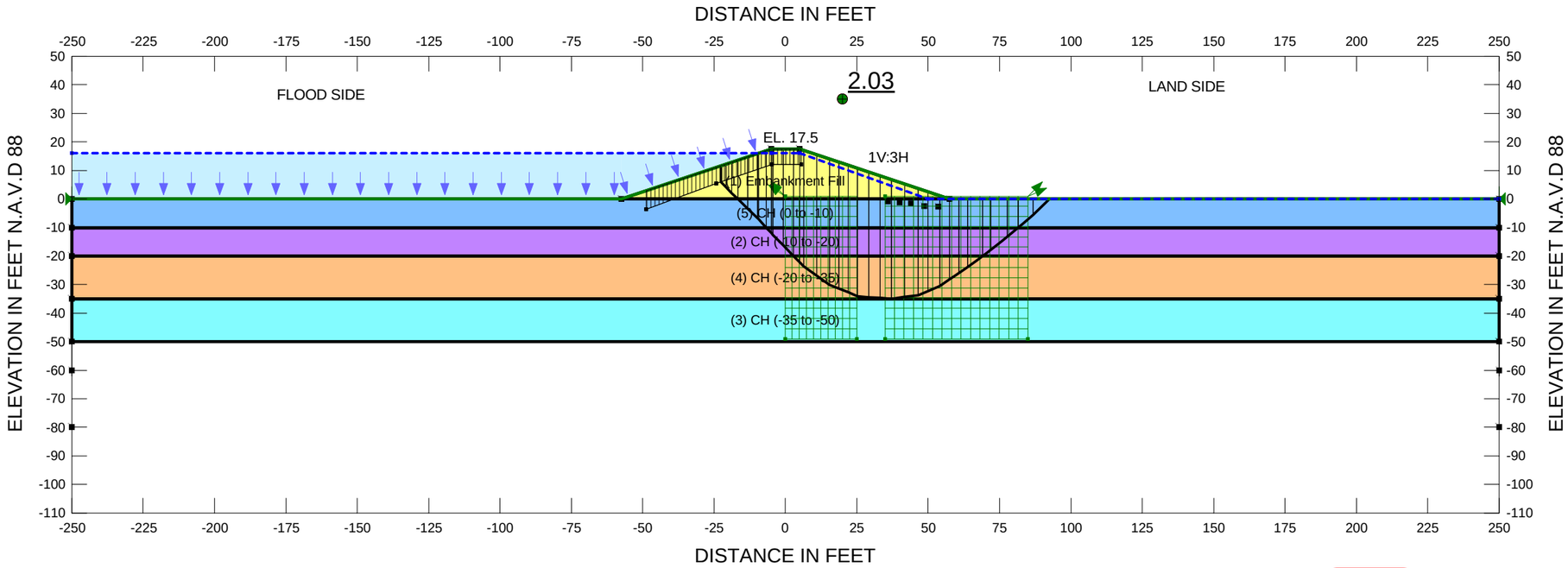
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.02
Volume: 1,045.5545 ft³
Weight: 124,345.13 lbf
Resisting Moment: 2,169,831.7 lbf·ft
Activating Moment: 1,072,380.9 lbf·ft
Resisting Force: 43,881.358 lbf
Activating Force: 21,701.016 lbf
Slip Rank: 1 of 26,692 slip surfaces

Exit: (60.42545, 0) ft
Entry: (-8.9094806, 10.76695) ft
Radius: 31.793517 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-8.7784053 ft	10.676054 ft	425.81422 psf	44.458831 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-7.7354975 ft	9.7524532 ft	483.44692 psf	540.49677 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-5.9118325 ft	8.0870437 ft	587.36848 psf	739.77024 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-4.32968 ft	6.6421884 ft	677.52744 psf	901.67036 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-2.6267283 ft	5.138498 ft	771.35772 psf	1,074.4817 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	-0.561465 ft	3.355418 ft	882.62192 psf	1,256.9944 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	1.5037983 ft	1.572338 ft	993.88611 psf	1,439.5071 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	2.9759398 ft	0.340399 ft	1,070.7591 psf	1,607.2837 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 9	4.2077248 ft	-0.61361463 ft	1,130.2896 psf	1,700.2937 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	6.31949 ft	-2.2491701 ft	1,200.3286 psf	1,838.8108 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	8.7719075 ft	-3.9458015 ft	1,246.6864 psf	2,043.2672 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	11.037762 ft	-5.2951825 ft	1,275.903 psf	2,118.6592 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	13.586237 ft	-6.547776 ft	1,292.2219 psf	2,284.0411 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	16.417333 ft	-7.703582 ft	1,295.6429 psf	2,318.0078 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	19.045552 ft	-8.5831963 ft	1,286.7527 psf	2,426.8091 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	21.470897 ft	-9.1866188 ft	1,265.5512 psf	2,409.8683 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	23.788193 ft	-9.6160533 ft	1,236.1149 psf	2,462.0295 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	25.997438 ft	-9.8714997 ft	1,198.4438 psf	2,410.131 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	28.193964 ft	-9.999167 ft	1,153.1078 psf	2,418.4886 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	30.377772 ft	-9.999055 ft	1,100.1071 psf	2,334.7614 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	32.56158 ft	-9.998943 ft	1,047.1064 psf	2,251.0341 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	34.745388 ft	-9.998831 ft	994.10564 psf	2,167.3069 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	36.929196 ft	-9.998719 ft	941.10491 psf	2,083.5796 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	39.59676 ft	-9.849935 ft	867.0879 psf	2,019.9301 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	42.250215 ft	-9.5166465 ft	781.90019 psf	1,920.7229 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	44.416772 ft	-9.018668 ft	698.2512 psf	1,841.217 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	46.594298 ft	-8.391832 ft	606.29536 psf	1,672.4403 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	48.84153 ft	-7.5623761 ft	500.00447 psf	1,563.3877 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	50.76016 ft	-6.7077266 ft	418.56214 psf	1,370.7324 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	53.19896 ft	-5.344697 ft	333.50909 psf	1,174.3567 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	56.1888 ft	-3.2992077 ft	205.87056 psf	849.65355 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	58.962725 ft	-1.1390682 ft	71.077859 psf	489.22242 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: CAP-BP (PG) (block)

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:36:58 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, 1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, 1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	16 ft
Coordinate 2	-5 ft	16 ft
Coordinate 3	5 ft	16 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-48.7 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

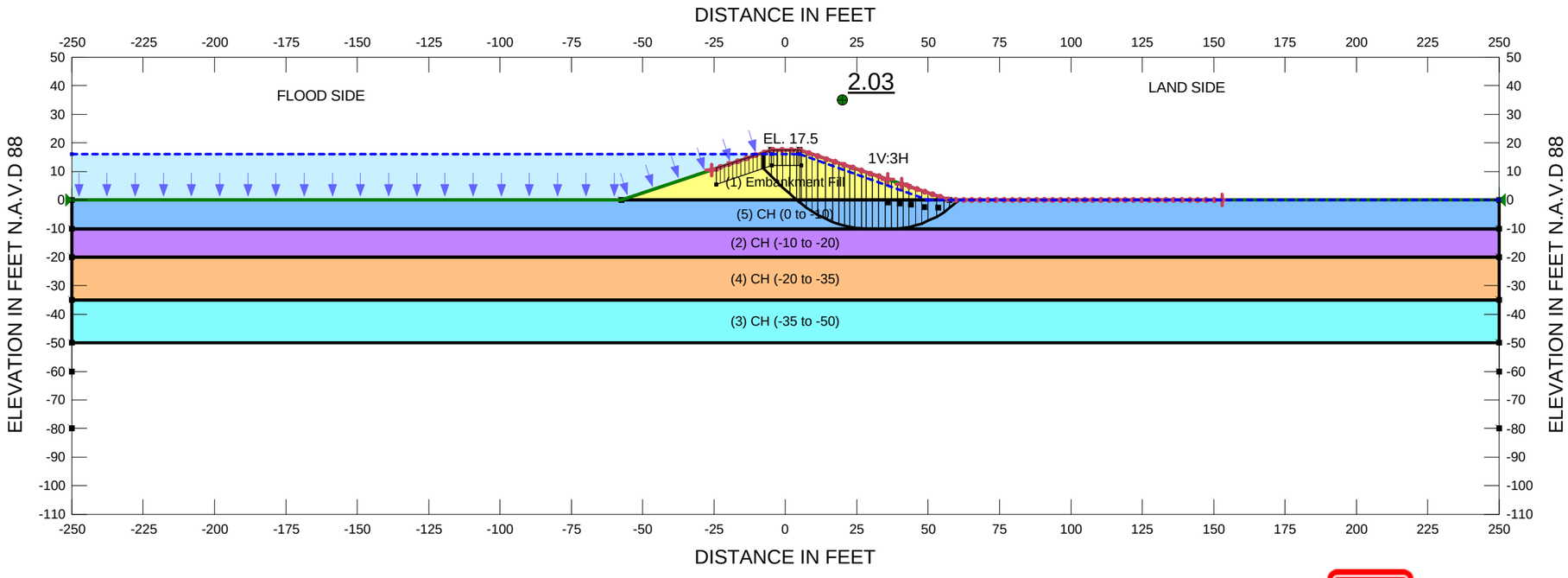
Slip Surfaces Analysed: 39577 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.03
Volume: 3,301.8878 ft³
Weight: 393,134.1 lbf
Resisting Moment: 6,534,250.4 lbf·ft
Activating Moment: 3,210,880.2 lbf·ft
Resisting Force: 82,626.417 lbf
Activating Force: 40,711.156 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (92.503797, 0) ft
Entry: (-22.661356, 5.9714247) ft
Radius: 52.649955 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-21.776273 ft	5.0379684 ft	684.03077 psf	678.28918 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-19.852415 ft	3.066542 ft	807.04778 psf	971.91685 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-17.767566 ft	1.014286 ft	935.10855 psf	1,241.6369 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-14.986131 ft	-1.6826255 ft	1,103.3958 psf	1,582.8763 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-11.51541 ft	-5.0478765 ft	1,313.3875 psf	2,042.0799 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-9.640025 ft	-6.883209 ft	1,427.9122 psf	2,242.4373 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-8.1410387 ft	-8.517958 ft	1,529.9206 psf	2,487.2418 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	-5.8910387 ft	-10.97174 ft	1,683.0366 psf	2,779.8837 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	-4.71673 ft	-12.252405 ft	1,762.9501 psf	2,961.0958 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	-2.6167355 ft	-14.420998 ft	1,898.2703 psf	3,248.9886 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	1.0167136 ft	-18.140333 ft	2,130.3568 psf	3,682.9412 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	3.9167191 ft	-21.108887 ft	2,315.5945 psf	4,050.5704 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	5.67129 ft	-22.904931 ft	2,412.774 psf	4,215.2699 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	8.63334 ft	-25.208598 ft	2,490.8048 psf	4,529.7725 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	13.21486 ft	-28.441615 ft	2,590.8964 psf	4,706.4111 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	17.113068 ft	-30.723053 ft	2,646.7699 psf	4,980.8964 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	20.327965 ft	-32.052912 ft	2,658.4253 psf	5,004.7504 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	23.542862 ft	-33.382771 ft	2,670.0806 psf	5,028.6045 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	27.15565 ft	-34.20555 ft	2,641.2663 psf	5,189.1891 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	31.16633 ft	-34.52125 ft	2,571.9824 psf	5,070.9819 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	35.17701 ft	-34.83695 ft	2,502.6984 psf	4,952.7746 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	39.493448 ft	-34.666043 ft	2,396.2664 psf	4,904.6038 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	44.115643 ft	-34.008527 ft	2,252.6864 psf	4,652.5365 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	48.21337 ft	-32.939506 ft	2,095.0645 psf	4,538.211 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	52.04015 ft	-31.353935 ft	1,956.4855 psf	4,208.2796 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	55.79015 ft	-29.347625 ft	1,831.2918 psf	3,987.1256 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	59.098155 ft	-27.101462 ft	1,691.1312 psf	3,660.5121 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	62.294465 ft	-24.931141 ft	1,555.7032 psf	3,410.6202 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	66.463401 ft	-21.92299 ft	1,367.9946 psf	3,101.5149 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	70.490806 ft	-18.910419 ft	1,180.0101 psf	2,770.4316 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	74.79259 ft	-15.508679 ft	967.74154 psf	2,369.6626 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	79.563365 ft	-11.598259 ft	723.73139 psf	1,875.9689 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	84.14004 ft	-7.799622 ft	486.69641 psf	1,310.0766 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	89.647449 ft	-2.799622 ft	174.69641 psf	711.64253 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: CAP-BP (PG) (circ)

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:35:44 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.78864, 10.570453) ft
Left-Zone Right Coordinate: (35.7748, 7.241733) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.76786, 5.57738) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	16 ft
Coordinate 2	-5 ft	16 ft
Coordinate 3	5 ft	16 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 19191 of 26692 converged

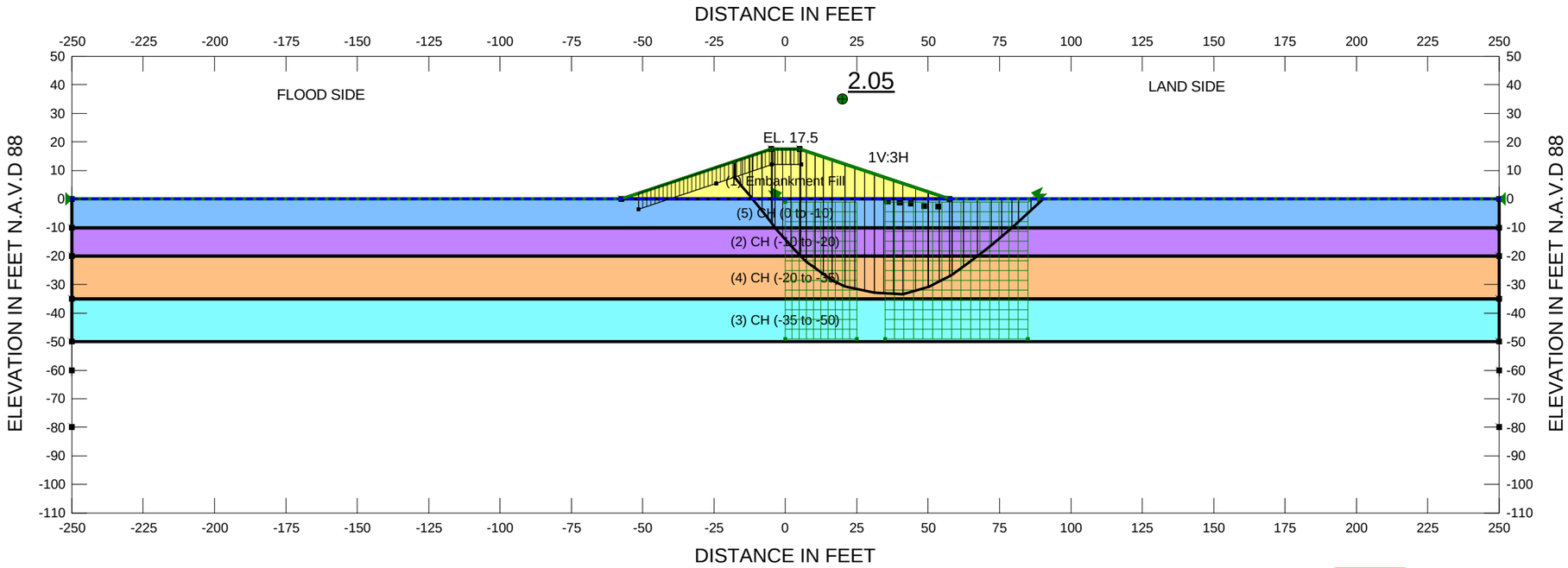
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.03
Volume: 1,030.5725 ft³
Weight: 122,632.88 lbf
Resisting Moment: 2,159,639 lbf·ft
Activating Moment: 1,063,851.1 lbf·ft
Resisting Force: 43,548.569 lbf
Activating Force: 21,467.416 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (60.893381, 0) ft
Entry: (-7.8919969, 11.121765) ft
Radius: 31.852111 ft

Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-7.5993134 ft	10.901395 ft	318.15295 psf	229.26232 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-6.153315 ft	9.5292145 ft	403.77702 psf	542.2113 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-3.97602 ft	7.3547597 ft	539.46299 psf	799.44967 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-1.92806 ft	5.3094712 ft	667.08899 psf	1,005.0562 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	0.31189728 ft	3.2151202 ft	797.7765 psf	1,264.4671 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	2.7438519 ft	1.0717067 ft	931.5255 psf	1,483.1712 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	4.4799146 ft	-0.45837951 ft	1,027.0029 psf	1,630.488 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	5.23016 ft	-1.1196115 ft	1,063.1573 psf	1,695.9959 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	6.42686 ft	-1.9730103 ft	1,089.8586 psf	1,857.5031 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	8.35994 ft	-3.274103 ft	1,128.1582 psf	1,938.2072 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	10.29302 ft	-4.5751957 ft	1,166.4577 psf	2,018.9114 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	12.59546 ft	-5.8525232 ft	1,195.0795 psf	2,201.4664 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	15.26726 ft	-7.1060858 ft	1,214.0235 psf	2,252.304 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	17.628305 ft	-8.0512367 ft	1,220.6172 psf	2,375.8703 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	19.678595 ft	-8.6879763 ft	1,214.8606 psf	2,376.8256 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	21.593563 ft	-9.1748215 ft	1,202.753 psf	2,442.2249 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	23.373207 ft	-9.5117725 ft	1,184.2944 psf	2,416.8176 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	25.47954 ft	-9.809089 ft	1,156.1144 psf	2,428.4245 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	27.457085 ft	-9.968833 ft	1,122.2073 psf	2,416.1082 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	29.324934 ft	-9.9997412 ft	1,082.6946 psf	2,375.3145 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	31.538562 ft	-9.9997516 ft	1,033.5823 psf	2,290.4601 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	33.75219 ft	-9.999762 ft	984.46989 psf	2,205.6058 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	35.965818 ft	-9.9997724 ft	935.35752 psf	2,120.7514 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	38.179446 ft	-9.9997828 ft	886.24514 psf	2,035.897 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	40.261565 ft	-9.8725078 ft	832.10789 psf	2,019.32 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	42.212175 ft	-9.6179473 ft	772.94579 psf	1,910.6826 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	44.348712 ft	-9.1731642 ft	697.78868 psf	1,855.4506 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	46.671177 ft	-8.5381588 ft	606.63658 psf	1,680.1365 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	48.916205 ft	-7.7290986 ft	506.34155 psf	1,587.3349 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	51.473205 ft	-6.5693661 ft	409.92844 psf	1,327.3502 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	54.26312 ft	-5.061674 ft	315.84846 psf	1,104.7642 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	56.539915 ft	-3.4592718 ft	215.85856 psf	864.17557 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	59.19669 ft	-1.3481933 ft	84.12726 psf	524.58722 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: CAP-BP (LW) (block)

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:37:18 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-51.5 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

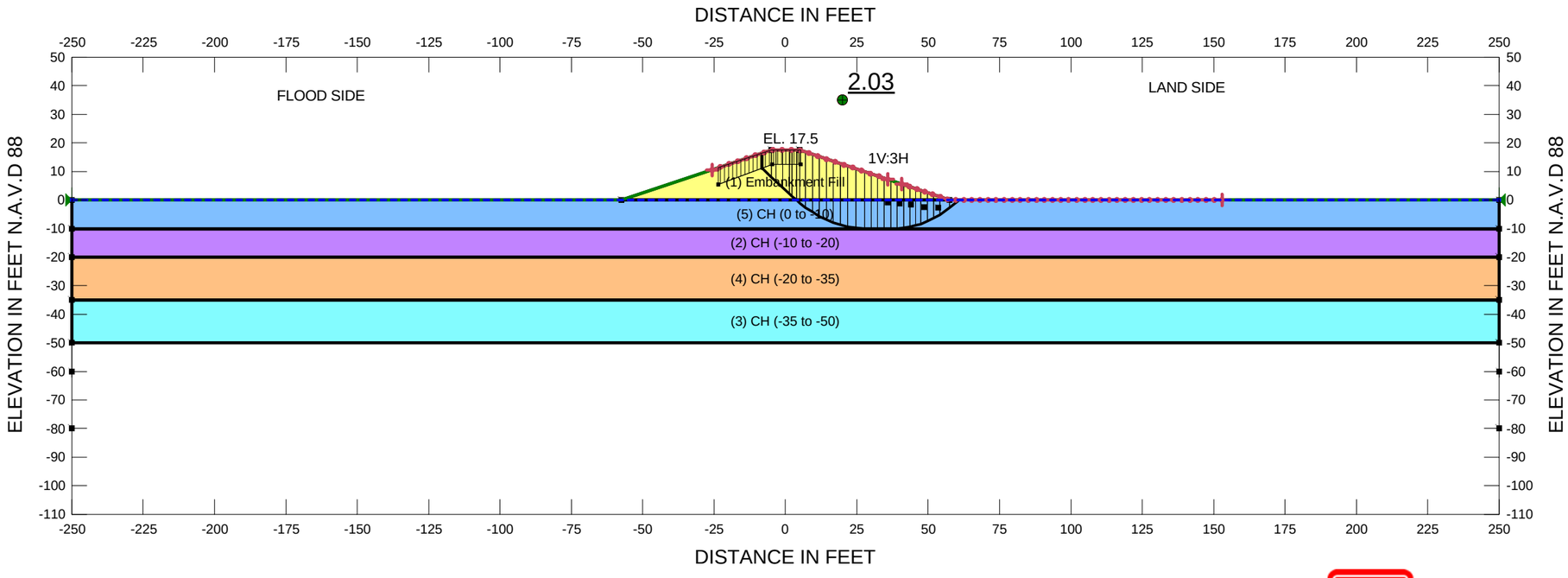
Slip Surfaces Analysed: 38299 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.05
Volume: 3,012.3126 ft³
Weight: 359,276.3 lbf
Resisting Moment: 6,049,720.1 lbf·ft
Activating Moment: 2,938,331 lbf·ft
Resisting Force: 77,548.863 lbf
Activating Force: 37,814.716 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (90.277997, 0) ft
Entry: (-17.761433, 7.6801158) ft
Radius: 50.537397 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-16.369281 ft	5.9682404 ft	-372.4182 psf	497.66043 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-13.760645 ft	2.765867 ft	-172.5901 psf	955.88456 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-12.043396 ft	0.6376845 ft	-39.791513 psf	1,231.2727 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-9.9069746 ft	-2.0828867 ft	129.97213 psf	1,598.2899 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-6.6356582 ft	-6.2486601 ft	389.91639 psf	2,203.2632 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-4.83124 ft	-8.5464499 ft	533.29848 psf	2,530.902 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-4.1544715 ft	-9.3806765 ft	585.35421 psf	2,651.49 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	-2.3286265 ft	-11.606602 ft	724.25193 psf	2,824.9856 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	0.4919075 ft	-14.803373 ft	923.73046 psf	3,279.1056 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	3.4973025 ft	-17.983712 ft	1,122.1836 psf	3,649.3597 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	5.2013392 ft	-19.786941 ft	1,234.7051 psf	3,851.9859 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	6.3612692 ft	-21.014391 ft	1,311.298 psf	3,975.7844 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	8.8224733 ft	-23.110635 ft	1,442.1036 psf	4,292.4599 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	11.8277 ft	-25.274343 ft	1,577.119 psf	4,412.8032 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	14.832927 ft	-27.438051 ft	1,712.1344 psf	4,533.1464 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	18.622205 ft	-29.542669 ft	1,843.4625 psf	4,777.4049 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	22.603462 ft	-30.944907 ft	1,930.9622 psf	4,914.1808 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	25.992645 ft	-31.703856 ft	1,978.3206 psf	4,869.0453 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	29.381828 ft	-32.462805 ft	2,025.679 psf	4,823.9098 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	32.756312 ft	-32.920648 ft	2,054.2484 psf	4,853.207 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	36.116095 ft	-33.077384 ft	2,064.0288 psf	4,742.0899 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	39.475878 ft	-33.234122 ft	2,073.8092 psf	4,630.9729 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	43.366827 ft	-32.699901 ft	2,040.4738 psf	4,616.0057 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	47.788942 ft	-31.474722 ft	1,964.0226 psf	4,305.9075 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	50.05064 ft	-30.848102 ft	1,924.9216 psf	4,147.3072 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	51.95096 ft	-29.866505 ft	1,863.6699 psf	4,105.2151 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	55.65032 ft	-27.931372 ft	1,742.9176 psf	3,738.3563 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	57.925755 ft	-26.741093 ft	1,668.6442 psf	3,529.4953 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	60.358365 ft	-25.110236 ft	1,566.8787 psf	3,441.5385 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	64.790538 ft	-21.851045 ft	1,363.5052 psf	3,098.7209 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	69.638683 ft	-18.150856 ft	1,132.6134 psf	2,678.3564 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	73.897592 ft	-14.726284 ft	918.92012 psf	2,289.6261 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	77.569757 ft	-11.575428 ft	722.30671 psf	1,883.4559 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	80.58182 ft	-8.9909645 ft	561.03618 psf	1,474.1169 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	83.887849 ft	-5.9864467 ft	373.55428 psf	1,111.0114 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 36	88.147948 ft	-1.9954823 ft	124.51809 psf	585.86309 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: CAP-BP (LW) (circ)

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:36:02 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.76957, 10.57681) ft
Left-Zone Right Coordinate: (35.76229, 7.245903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.75864, 5.580453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-23.5 ft	5.5 ft
Coordinate 2	-4.6 ft	12.4 ft
Coordinate 3	5.4 ft	12.4 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 18547 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.03
Volume: 1,037.7645 ft³
Weight: 123,480.84 lbf
Resisting Moment: 2,170,117.2 lbf·ft
Activating Moment: 1,067,729.4 lbf·ft
Resisting Force: 43,774.789 lbf
Activating Force: 21,549.526 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (60.871464, 0) ft
Entry: (-8.2825845, 11.055564) ft
Radius: 31.925902 ft
Center: (20, 35) ft

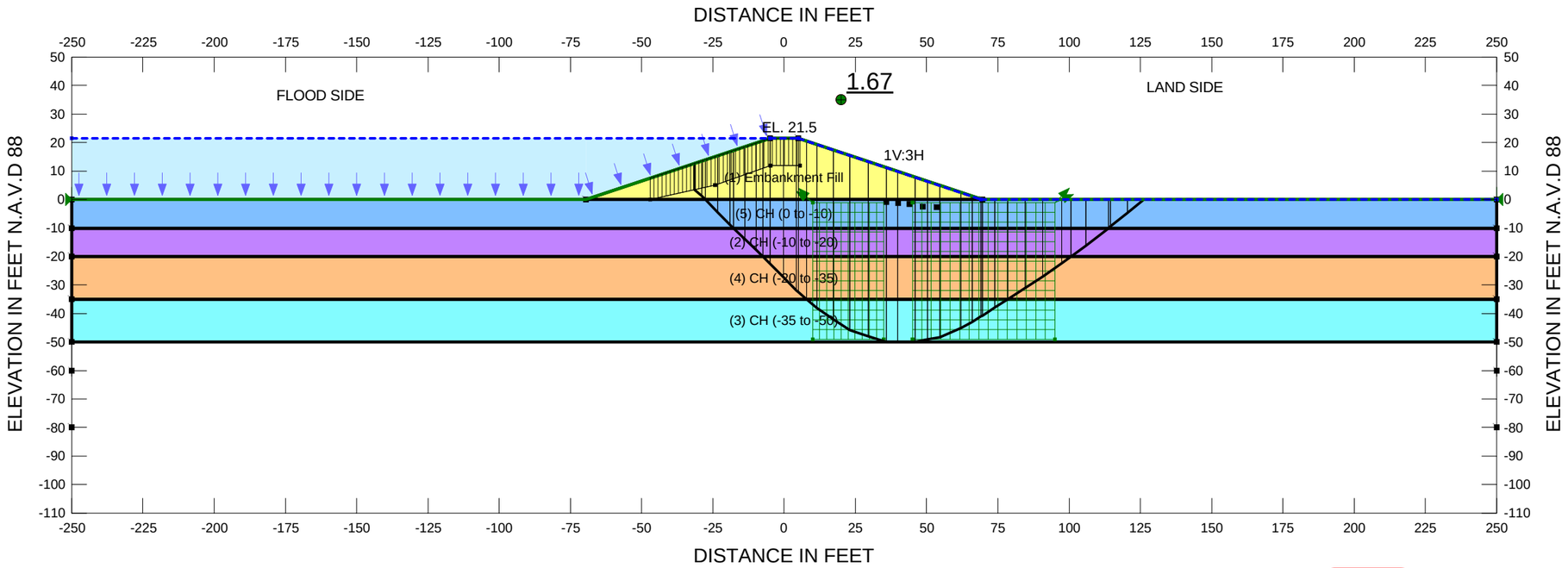
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-8.0824922 ft	10.911792 ft	-680.8958 psf	140.13506 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-6.4412 ft	9.4000498 ft	-586.56311 psf	562.33963 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-4.191385 ft	7.2645533 ft	-453.30813 psf	827.6535 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-2.2085225 ft	5.4026847 ft	-337.12753 psf	1,023.1826 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	0.1399725 ft	3.2140023 ft	-200.55374 psf	1,245.6438 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	1.761815 ft	1.7230895 ft	-107.52078 psf	1,417.3129 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	3.0109296 ft	0.663259 ft	-41.387362 psf	1,552.4226 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	4.4062246 ft	-0.49135023 ft	30.660254 psf	1,663.6294 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	6.02774 ft	-1.8331572 ft	114.38901 psf	1,778.5481 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	8.26344 ft	-3.4498143 ft	215.26841 psf	1,985.7695 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	10.67936 ft	-4.9822147 ft	310.8902 psf	2,076.5859 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	13.107812 ft	-6.2959772 ft	392.86898 psf	2,249.631 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	15.548797 ft	-7.3911017 ft	461.20475 psf	2,290.3729 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	18.038745 ft	-8.2886975 ft	517.21472 psf	2,412.6729 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	20.577655 ft	-8.9887645 ft	560.8989 psf	2,403.2238 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	23.287205 ft	-9.5670825 ft	596.98595 psf	2,447.2952 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	26.20651 ft	-9.8975095 ft	617.60459 psf	2,435.8484 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	28.831071 ft	-9.9995512 ft	623.97199 psf	2,393.5108 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	31.121773 ft	-9.9993496 ft	623.95942 psf	2,305.6742 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	33.412475 ft	-9.999148 ft	623.94684 psf	2,217.8377 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	35.703177 ft	-9.9989464 ft	623.93426 psf	2,130.0012 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	37.993879 ft	-9.9987448 ft	623.92168 psf	2,042.1646 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	40.245897 ft	-9.8516235 ft	614.74131 psf	2,017.0003 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	42.459232 ft	-9.5575825 ft	596.39315 psf	1,893.0791 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	44.533608 ft	-9.152422 ft	571.11113 psf	1,838.7678 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	46.469022 ft	-8.636142 ft	538.89526 psf	1,694.6194 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	48.548977 ft	-7.8522885 ft	489.9828 psf	1,626.3682 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	50.77347 ft	-6.8008615 ft	424.37376 psf	1,394.192 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	52.997963 ft	-5.7494345 ft	358.76471 psf	1,162.0158 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	55.805105 ft	-3.914251 ft	244.24926 psf	944.90179 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	59.185732 ft	-1.3023905 ft	81.269168 psf	505.58396 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Slidell East/Northeastt

Spencer's Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: CAP-BP (CG) (block)

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,379
Date: 07/13/2022
Time: 01:45:04 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 07/13/2022
Last Solved Time: 01:45:34 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (10, -1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, -1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	21.5 ft
Coordinate 2	-5 ft	21.5 ft
Coordinate 3	5 ft	21.5 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-46.9 ft	0 ft
Coordinate 2	-24.3 ft	5 ft
Coordinate 3	-4.8 ft	12 ft
Coordinate 4	5.5 ft	12 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

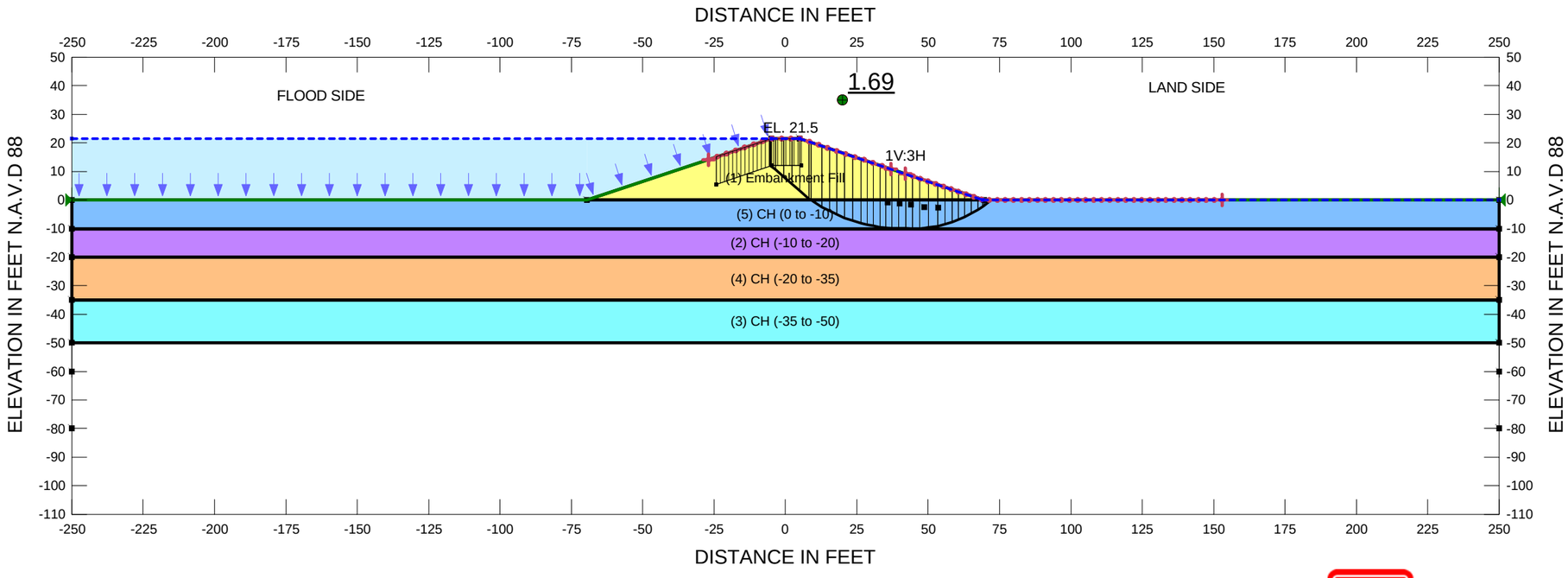
Slip Surfaces Analysed: 39596 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.67
Volume: 6,023.9362 ft³
Weight: 707,754.58 lbf
Resisting Moment: 11,056,738 lbf·ft
Activating Moment: 6,617,262.1 lbf·ft
Resisting Force: 116,164.22 lbf
Activating Force: 69,940.704 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (126.26907, 0) ft
Entry: (-31.390723, 3.4312561) ft
Radius: 70.595956 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-30.156436 ft	2.3153485 ft	1,197.1223 psf	1,343.46 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-28.332318 ft	0.5997205 ft	1,304.1774 psf	1,565.4969 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-25.557699 ft	-2.2214137 ft	1,480.2162 psf	1,921.8031 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-21.188126 ft	-6.6642412 ft	1,757.4487 psf	2,526.8934 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-18.417773 ft	-9.4428275 ft	1,930.8324 psf	2,938.2343 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-15.83338 ft	-11.901903 ft	2,084.2787 psf	3,190.2749 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-11.835727 ft	-15.705709 ft	2,321.6362 psf	3,706.9214 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-8.6550751 ft	-18.803806 ft	2,514.9575 psf	4,087.7211 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	-6.2366251 ft	-21.25166 ft	2,667.7036 psf	4,443.7441 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	-2.6678375 ft	-24.863839 ft	2,893.1035 psf	4,847.973 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	1.9964875 ft	-29.584874 ft	3,187.6962 psf	5,348.7203 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	4.664325 ft	-32.233673 ft	3,352.9812 psf	5,731.7798 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	6.442718 ft	-33.760977 ft	3,418.042 psf	5,841.6701 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	9.695173 ft	-36.554223 ft	3,524.1609 psf	6,002.1401 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	14.380355 ft	-40.025895 ft	3,642.5802 psf	6,334.437 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	20.131245 ft	-43.860796 ft	3,761.3249 psf	6,529.8383 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	26.226213 ft	-46.833684 ft	3,819.0674 psf	6,873.8631 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	32.665258 ft	-48.944561 ft	3,815.8077 psf	6,859.4467 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	37.812705 ft	-50 ft	3,773.7637 psf	7,030.6255 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	42.887045 ft	-50 ft	3,667.3928 psf	6,836.1091 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	48.155463 ft	-49.573753 ft	3,530.3558 psf	6,740.8474 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	52.399468 ft	-48.721259 ft	3,388.1952 psf	6,481.9971 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	58.306695 ft	-46.651984 ft	3,135.2422 psf	6,197.8064 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 24	64.04301 ft	-43.979546 ft	2,848.2345 psf	5,742.1006 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 25	67.49705 ft	-41.985107 ft	2,651.3763 psf	5,464.4126 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 26	69.25 ft	-40.859557 ft	2,549.6364 psf	5,267.5993 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 27	71.718943 ft	-39.274276 ft	2,450.7148 psf	5,078.0427 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 28	76.156828 ft	-36.424759 ft	2,272.9049 psf	4,755.0673 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 29	81.456158 ft	-33.022117 ft	2,060.5801 psf	4,352.5051 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	87.616933 ft	-29.066351 ft	1,813.7403 psf	3,900.0672 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	94.05564 ft	-24.724104 ft	1,542.7841 psf	3,441.2252 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 32	99.024038 ft	-21.17987 ft	1,321.6239 psf	3,051.7408 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 33	103.24075 ft	-18.089852 ft	1,128.8068 psf	2,709.2636 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	109.78499 ft	-13.089852 ft	816.8068 psf	2,103.7551 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 35	114.11964 ft	-9.688448 ft	604.55916 psf	1,586.5407 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 36	117.45477 ft	-7.032672 ft	438.83873 psf	1,248.171 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 37	123.33097 ft	-2.344224 ft	146.27958 psf	639.81262 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: CAP-BP (CG) (circ)

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/13/2022
Time: 08:21:45 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:22:38 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.96957, 14.17681) ft
Left-Zone Right Coordinate: (36.96229, 10.845903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.95864, 9.180453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	21.5 ft
Coordinate 2	-5 ft	21.5 ft
Coordinate 3	5 ft	21.5 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 22025 of 26692 converged

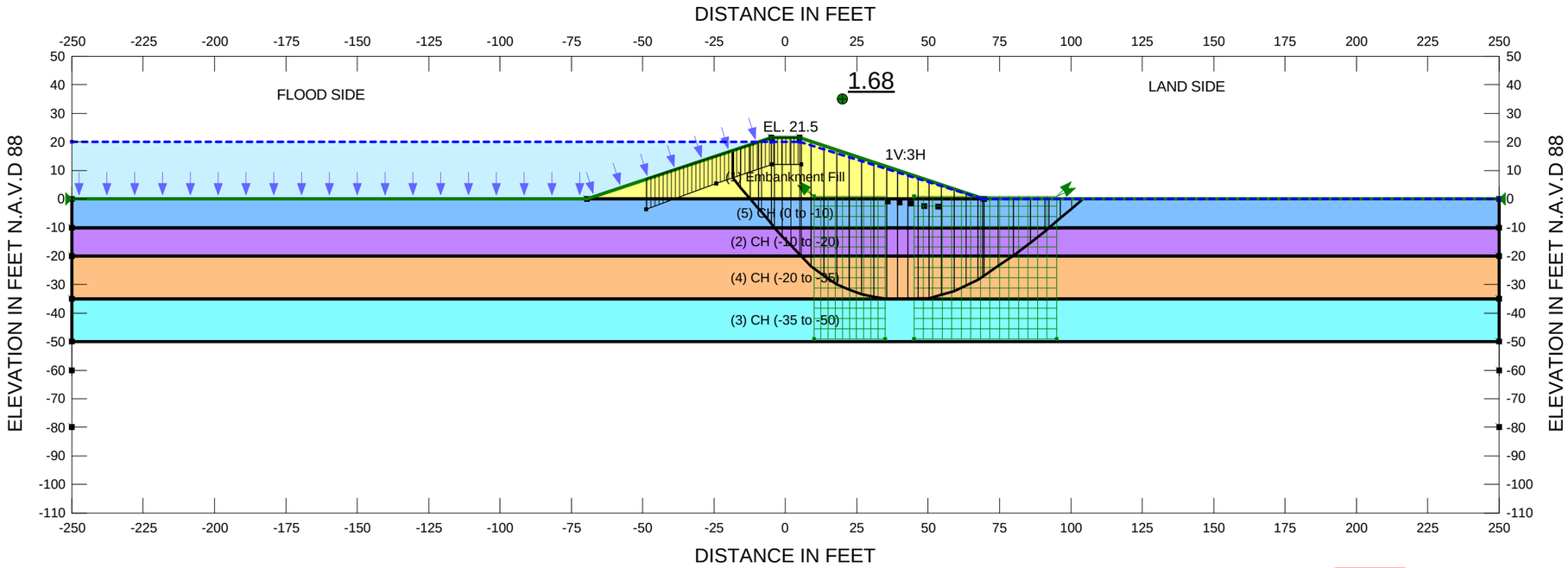
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.69
Volume: 1,270.1853 ft³
Weight: 150,480.63 lbf
Resisting Moment: 2,358,837.4 lbf·ft
Activating Moment: 1,396,754.2 lbf·ft
Resisting Force: 48,980.857 lbf
Activating Force: 29,072.928 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (72.135803, 0) ft
Entry: (-5.2901842, 12.029064) ft
Radius: 35.037881 ft

Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.1450921 ft	11.924087 ft	597.53698 psf	-630.94269 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-4.21884 ft	11.253924 ft	639.35512 psf	874.24169 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-2.0221725 ft	9.4013938 ft	754.95303 psf	977.69883 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	0.8088425 ft	6.8267032 ft	915.61372 psf	1,234.0351 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	3.612175 ft	4.3773354 ft	1,068.4543 psf	1,516.1465 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	6.644045 ft	1.8387579 ft	1,192.3982 psf	1,716.4604 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	8.646132 ft	0.2311015 ft	1,250.7472 psf	1,925.669 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	10.879047 ft	-1.210154 ft	1,293.8741 psf	1,998.6515 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	14.078012 ft	-3.0762662 ft	1,343.2612 psf	2,200.1725 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	16.726195 ft	-4.3881825 ft	1,369.6122 psf	2,257.7815 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	19.374378 ft	-5.7000988 ft	1,395.9633 psf	2,315.3904 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	22.123875 ft	-6.796032 ft	1,406.7132 psf	2,482.6137 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	24.974685 ft	-7.675982 ft	1,401.8619 psf	2,483.2908 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	27.50833 ft	-8.3540557 ft	1,391.0622 psf	2,543.9758 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	29.72481 ft	-8.830253 ft	1,374.314 psf	2,519.4346 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	31.94129 ft	-9.3064503 ft	1,357.5657 psf	2,494.8933 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	34.112192 ft	-9.6541247 ft	1,333.753 psf	2,544.1409 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	36.237518 ft	-9.8732762 ft	1,302.876 psf	2,490.9986 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	38.505954 ft	-9.9844267 ft	1,262.2597 psf	2,499.7679 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	40.917501 ft	-9.9875763 ft	1,211.9041 psf	2,407.7394 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	43.329049 ft	-9.9907257 ft	1,161.5486 psf	2,315.7109 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	45.740596 ft	-9.9938753 ft	1,111.1931 psf	2,223.6825 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	48.545178 ft	-9.7748158 ft	1,038.7327 psf	2,193.7231 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	51.742793 ft	-9.3335473 ft	944.16756 psf	2,011.7058 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	54.598135 ft	-8.7822445 ft	849.91115 psf	1,919.6015 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	57.111205 ft	-8.1209075 ft	755.96349 psf	1,732.1896 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	59.445225 ft	-7.346542 ft	658.71619 psf	1,639.703 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	61.600195 ft	-6.459148 ft	558.16925 psf	1,431.5549 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	63.862655 ft	-5.3633258 ft	442.36312 psf	1,279.9967 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	66.232605 ft	-4.0590753 ft	311.29781 psf	999.82404 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	68.20879 ft	-2.8356305 ft	193.52908 psf	846.72337 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	69.25 ft	-2.0837901 ft	130.0285 psf	694.02895 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	70.817901 ft	-0.95163462 ft	59.382 psf	521.70829 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: CAP-BP (PG) (block)

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,377
Date: 04/13/2022
Time: 08:26:27 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:27:16 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (10, 1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, 1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	20 ft
Coordinate 2	-5 ft	20 ft
Coordinate 3	5 ft	20 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-48.7 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

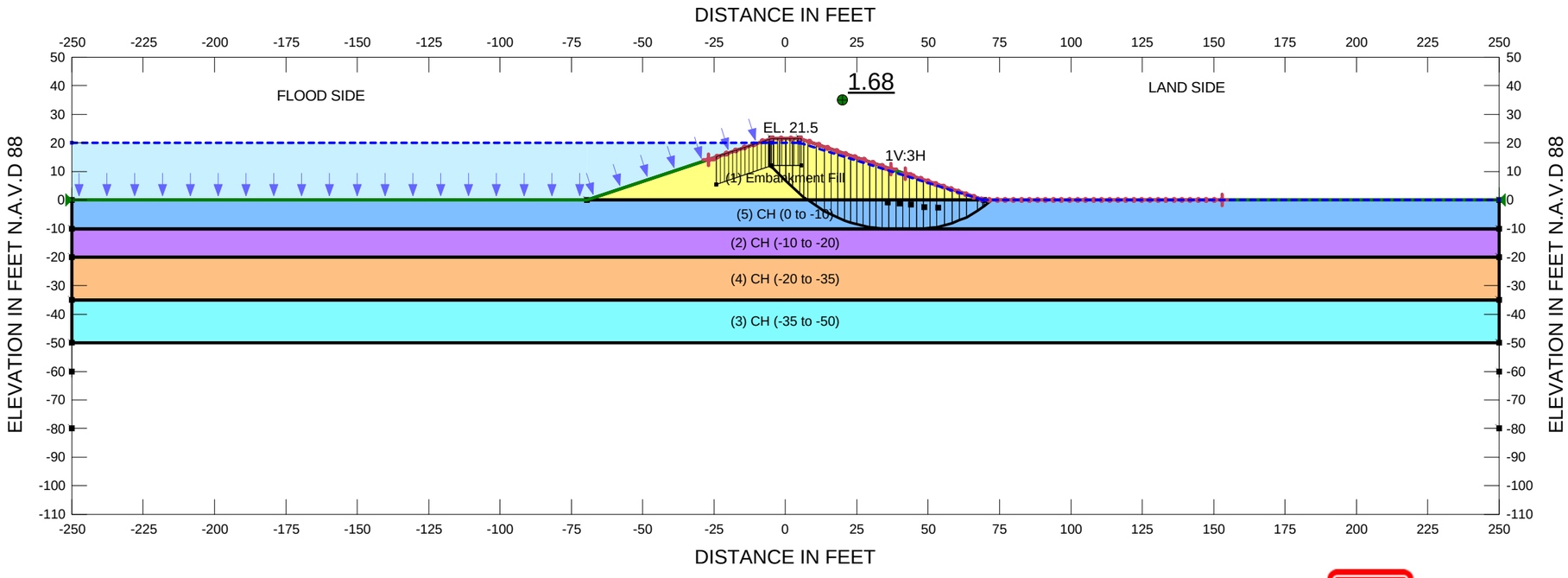
Slip Surfaces Analysed: 39598 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.68
Volume: 3,834.0333 ft³
Weight: 455,302.88 lbf
Resisting Moment: 7,118,203.6 lbf·ft
Activating Moment: 4,230,360.5 lbf·ft
Resisting Force: 88,137.386 lbf
Activating Force: 52,523.138 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (104.31315, 0) ft
Entry: (-18.431089, 7.4465945) ft
Radius: 55.902286 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-18.354895 ft	7.3180697 ft	791.35245 psf	-519.94282 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-16.99246 ft	5.5861235 ft	899.42589 psf	1,015.3283 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-14.013786 ft	1.991351 ft	1,123.7397 psf	1,474.6944 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-10.910676 ft	-1.6598281 ft	1,351.5733 psf	1,905.5762 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-8.96986 ft	-3.9434291 ft	1,494.07 psf	2,211.7467 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-6.71986 ft	-6.5908224 ft	1,659.2673 psf	2,597.4114 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-4.4112126 ft	-9.3072214 ft	1,828.7706 psf	2,972.2632 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	-2.4978226 ft	-11.558553 ft	1,969.2537 psf	3,132.2881 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	0.370085 ft	-14.702866 ft	2,165.4588 psf	3,589.6135 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	3.456695 ft	-17.874385 ft	2,363.3616 psf	3,953.7313 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	5.2627014 ft	-19.730072 ft	2,474.0338 psf	4,157.3807 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	7.2792164 ft	-21.802059 ft	2,564.0038 psf	4,342.7617 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	11.289183 ft	-25.202621 ft	2,698.0045 psf	4,778.5349 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	15.801488 ft	-28.399628 ft	2,809.5078 psf	4,951.9019 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	20.2167 ft	-30.838398 ft	2,875.5904 psf	5,291.4575 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	24.53482 ft	-32.51893 ft	2,896.2522 psf	5,311.9157 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	28.870815 ft	-33.769397 ft	2,889.7295 psf	5,443.2895 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	33.2299 ft	-34.590781 ft	2,855.9817 psf	5,368.3455 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	37.327155 ft	-34.980933 ft	2,800.4307 psf	5,414.8618 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	41.067902 ft	-34.939852 ft	2,724.9227 psf	5,266.7936 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	44.719185 ft	-34.899752 ft	2,651.2205 psf	5,122.2665 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	48.370468 ft	-34.859654 ft	2,577.5182 psf	4,977.7394 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	52.44541 ft	-34.20695 ft	2,457.3282 psf	4,958.5906 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	56.94401 ft	-32.941641 ft	2,290.6502 psf	4,639.4623 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	61.248328 ft	-31.32091 ft	2,105.5824 psf	4,438.1219 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	65.358362 ft	-29.344756 ft	1,902.1247 psf	4,048.1993 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	68.20669 ft	-27.811989 ft	1,750.9377 psf	3,908.7816 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	69.25 ft	-27.095649 ft	1,690.7685 psf	3,783.2913 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	72.021104 ft	-25.192998 ft	1,572.0431 psf	3,551.461 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	77.175389 ft	-21.654046 ft	1,351.2125 psf	3,138.0017 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	82.849375 ft	-17.557652 ft	1,095.5975 psf	2,712.1142 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	88.39029 ft	-13.271484 ft	828.14057 psf	2,186.6211 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	91.648679 ft	-10.636878 ft	663.74119 psf	1,869.7135 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	94.391323 ft	-8.3333333 ft	520 psf	1,473.468 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	98.360053 ft	-5 ft	312 psf	1,030.996 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 36	102.32878 ft	-1.6666667 ft	104 psf	588.52407 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: CAP-BP (PG) (circ)

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/13/2022
Time: 08:21:45 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:22:12 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.98864, 14.170453) ft
Left-Zone Right Coordinate: (36.9748, 10.841733) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.96786, 9.17738) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	20 ft
Coordinate 2	-5 ft	20 ft
Coordinate 3	5 ft	20 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 21900 of 26692 converged

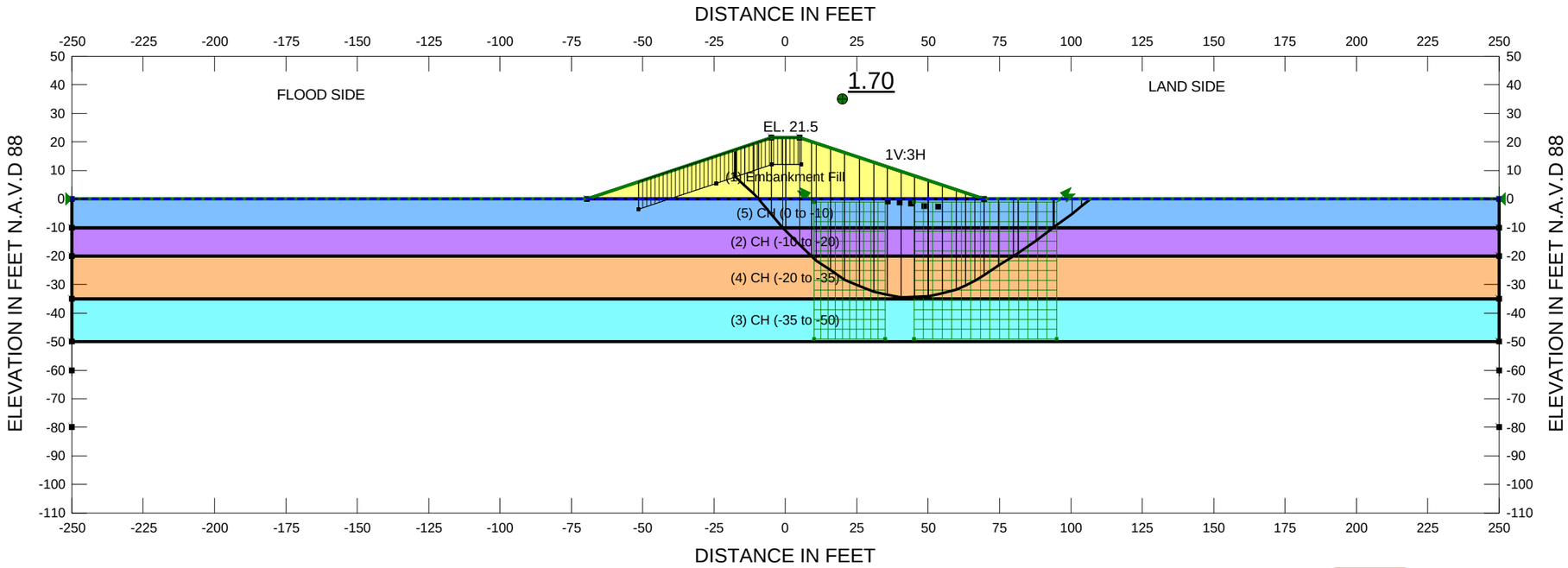
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.68
Volume: 1,311.4812 ft³
Weight: 155,510.76 lbf
Resisting Moment: 2,414,327.8 lbf·ft
Activating Moment: 1,438,226.6 lbf·ft
Resisting Force: 49,279.441 lbf
Activating Force: 29,222.309 lbf
Slip Rank: 1 of 26,692 slip surfaces

Exit: (72.264282, 0) ft
Entry: (-5.5748529, 11.929795) ft
Radius: 35.22973 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.2874265 ft	11.714883 ft	516.99127 psf	69.815562 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-4.645405 ft	11.234838 ft	546.94611 psf	862.69604 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-3.1735817 ft	9.8901093 ft	630.85718 psf	900.27767 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-0.939125 ft	7.73092 ft	765.59059 psf	1,112.8792 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	1.2953317 ft	5.5717307 ft	900.32401 psf	1,325.4807 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	3.70628 ft	3.3648173 ft	1,038.0354 psf	1,594.276 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	5.75585 ft	1.5788678 ft	1,134.7396 psf	1,747.4827 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	7.188486 ft	0.4601185 ft	1,176.6131 psf	1,926.5853 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 9	9.3004814 ft	-0.975739 ft	1,225.0267 psf	1,999.7626 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	12.1709 ft	-2.927217 ft	1,290.8258 psf	2,119.514 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	14.779902 ft	-4.4499257 ft	1,334.9673 psf	2,351.385 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	17.127485 ft	-5.543865 ft	1,357.4512 psf	2,394.6338 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	19.475068 ft	-6.6378043 ft	1,379.9352 psf	2,437.8826 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	21.73221 ft	-7.5216545 ft	1,391.0731 psf	2,579.0377 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	23.89891 ft	-8.1954155 ft	1,390.8652 psf	2,580.1414 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	26.110292 ft	-8.779517 ft	1,384.1912 psf	2,642.2167 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	28.366357 ft	-9.273959 ft	1,371.0511 psf	2,618.445 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	30.588282 ft	-9.6393032 ft	1,350.521 psf	2,670.9771 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	32.776068 ft	-9.8755497 ft	1,322.601 psf	2,617.6438 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	35.072102 ft	-9.9940851 ft	1,285.2249 psf	2,634.4972 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	37.476385 ft	-9.9949092 ft	1,238.3928 psf	2,542.4415 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	39.880668 ft	-9.9957334 ft	1,191.5607 psf	2,450.3858 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	42.284952 ft	-9.9965576 ft	1,144.7286 psf	2,358.3302 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	44.689235 ft	-9.9973817 ft	1,097.8965 psf	2,266.2745 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	47.093518 ft	-9.9982059 ft	1,051.0644 psf	2,174.2188 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	49.47871 ft	-9.8684623 ft	996.4572 psf	2,149.9236 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	51.84481 ft	-9.6081508 ft	934.07481 psf	2,024.2816 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	54.383345 ft	-9.1411632 ft	855.43336 psf	1,967.7178 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	57.094315 ft	-8.4674997 ft	760.53284 psf	1,771.097 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	59.700945 ft	-7.6056738 ft	655.92561 psf	1,674.3519 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	62.203235 ft	-6.5556853 ft	541.61168 psf	1,429.3104 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	65.3592 ft	-4.8737875 ft	375.11994 psf	1,191.2078 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	68.13201 ft	-3.0716742 ft	208.59827 psf	902.32616 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	69.25 ft	-2.2406299 ft	139.81531 psf	733.81949 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	70.882141 ft	-1.0273977 ft	64.109619 psf	548.66098 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: CAP-BP (LW) (block)

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,377
Date: 04/13/2022
Time: 08:26:27 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:27:30 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (10, -1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, -1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-51.5 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39574 of 39601 converged

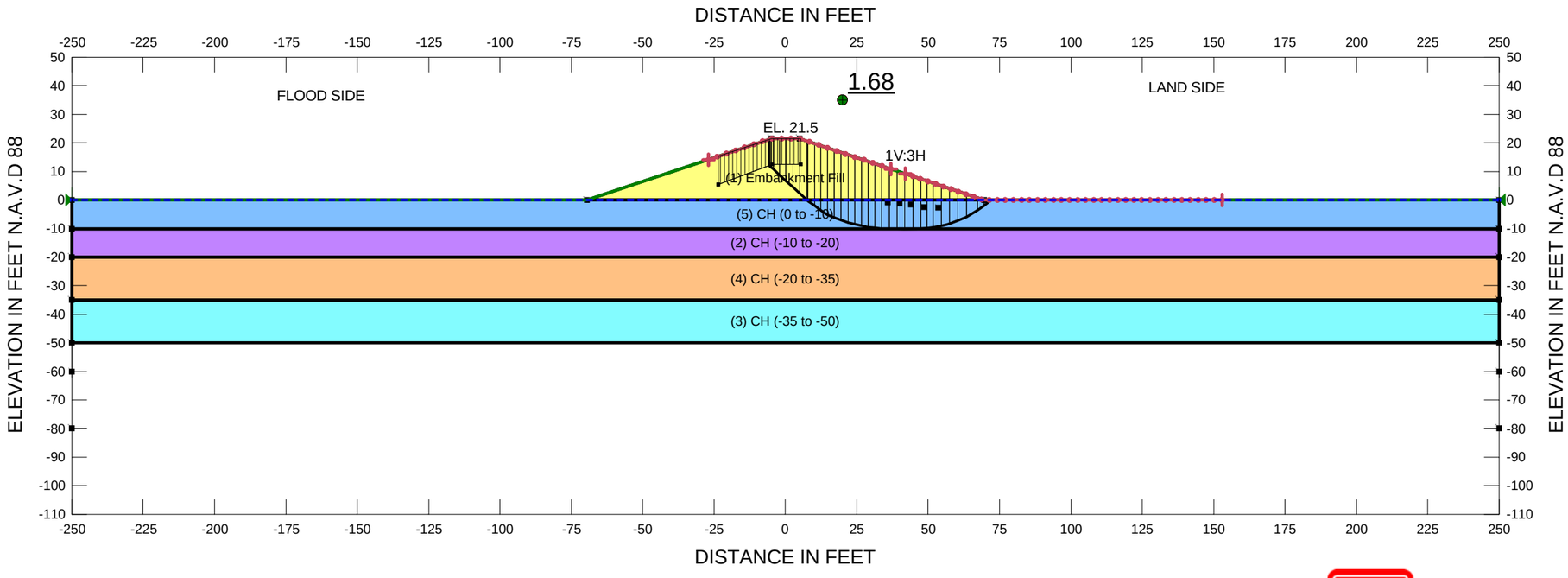
Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.70
Volume: 3,680.7411 ft³

Weight: 437,811.58 lbf
Resisting Moment: 6,964,416.9 lbf·ft
Activating Moment: 4,104,471.2 lbf·ft
Resisting Force: 89,274.876 lbf
Activating Force: 52,640.247 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (107.01043, 0) ft
Entry: (-17.556645, 7.7515288) ft
Radius: 56.445805 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-17.527043 ft	7.7309194 ft	-482.40937 psf	-2,502.0698 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-15.88022 ft	6.222863 ft	-388.30665 psf	974.29747 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-12.64578 ft	3.247969 ft	-202.67327 psf	1,411.1243 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-10.279526 ft	0.880261 ft	-54.928286 psf	1,637.9532 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-7.2652457 ft	-2.6621044 ft	166.11531 psf	2,120.1596 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-3.0106309 ft	-7.6621044 ft	478.11531 psf	2,775.8514 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-0.49492095 ft	-10.618553 ft	662.59771 psf	3,019.1545 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	2.51571 ft	-13.624931 ft	850.19572 psf	3,503.1994 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	7.0741609 ft	-18.006378 ft	1,123.598 psf	3,932.5411 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	9.9745459 ft	-20.794142 ft	1,297.5545 psf	4,176.9676 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	13.284833 ft	-23.257888 ft	1,451.2922 psf	4,518.5215 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	18.252958 ft	-26.597095 ft	1,659.6587 psf	4,690.3159 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	23.288155 ft	-29.328184 ft	1,830.0787 psf	4,988.5321 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	28.390425 ft	-31.451153 ft	1,962.552 psf	5,027.416 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	33.340567 ft	-32.988236 ft	2,058.466 psf	5,179.1513 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	38.138582 ft	-33.939433 ft	2,117.8207 psf	5,101.9257 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	42.903193 ft	-34.347803 ft	2,143.3029 psf	5,146.023 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	47.634397 ft	-34.213344 ft	2,134.9127 psf	4,949.328 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	50.07463 ft	-34.143994 ft	2,130.5852 psf	4,847.8778 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	52.557475 ft	-33.533649 ft	2,092.4997 psf	4,860.3395 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	57.373905 ft	-32.317202 ft	2,016.5934 psf	4,534.6916 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	61.414457 ft	-30.963927 ft	1,932.149 psf	4,379.0801 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	64.679133 ft	-29.473824 ft	1,839.1666 psf	4,078.5383 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	67.905735 ft	-27.702289 ft	1,728.6228 psf	3,885.1001 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	72.092101 ft	-25.006854 ft	1,560.4277 psf	3,507.059 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	77.276303 ft	-21.668951 ft	1,352.1426 psf	3,118.3155 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	80.688147 ft	-19.4722 ft	1,215.0653 psf	2,889.1268 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	84.61756 ft	-16.735518 ft	1,044.2963 psf	2,582.0214 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	90.78112 ft	-12.263318 ft	765.23104 psf	2,022.0525 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	94.02048 ft	-9.862543 ft	615.42268 psf	1,628.3263 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	97.29889 ft	-7.423098 ft	463.20132 psf	1,307.564 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	102.04648 ft	-3.8408325 ft	239.66795 psf	847.81316 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	105.35578 ft	-1.2802775 ft	79.889316 psf	508.62213 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: CAP-BP (LW) (circ)

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/13/2022
Time: 08:21:45 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:22:24 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.96957, 14.17681) ft
Left-Zone Right Coordinate: (36.96229, 10.845903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.95864, 9.180453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-23.5 ft	5.5 ft
Coordinate 2	-4.6 ft	12.4 ft
Coordinate 3	5.4 ft	12.4 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 21223 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.68
Volume: 1,318.3912 ft³
Weight: 156,361.28 lbf
Resisting Moment: 2,422,369.6 lbf·ft
Activating Moment: 1,437,940.7 lbf·ft
Resisting Force: 49,305.874 lbf
Activating Force: 29,343.483 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (72.152346, 0) ft
Entry: (-5.7158369, 11.992631) ft
Radius: 35.281258 ft
Center: (20, 35) ft

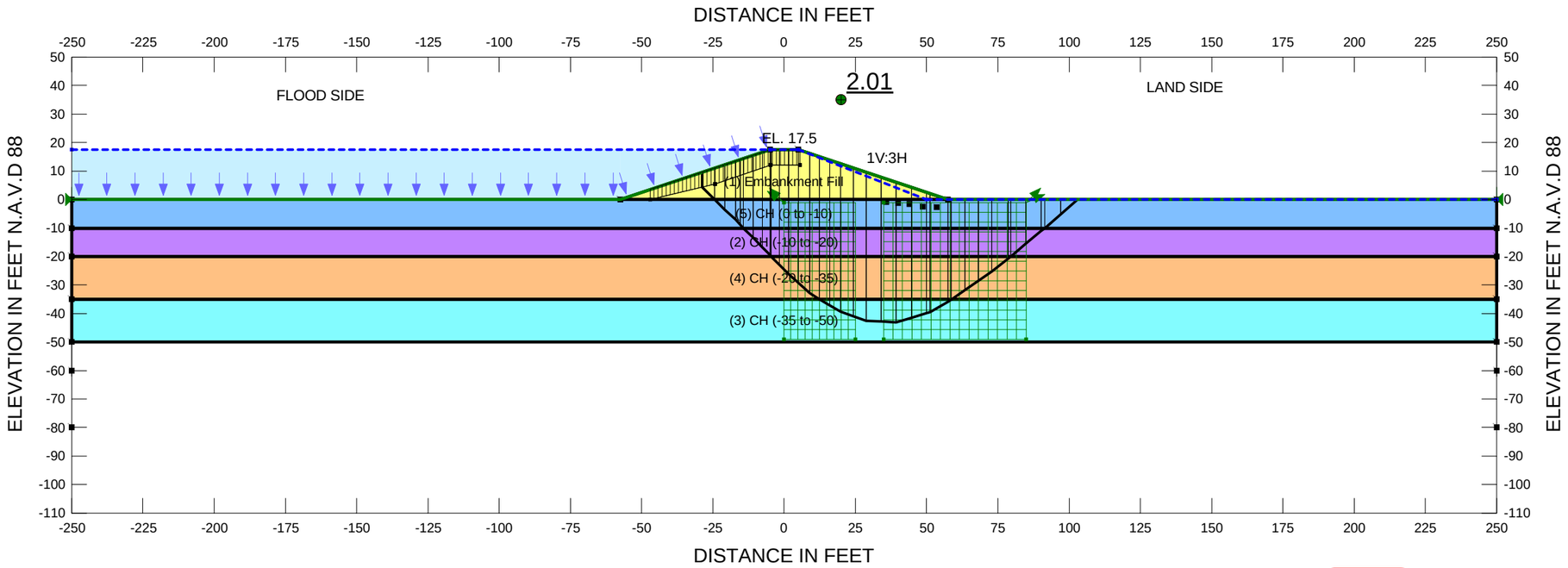
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.3579184 ft	11.722096 ft	-731.45876 psf	246.74595 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-4.580945 ft	11.134814 ft	-694.81239 psf	872.26309 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-3.095325 ft	9.786682 ft	-610.68896 psf	915.09138 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-0.962195 ft	7.72391 ft	-481.97198 psf	1,119.4434 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	1.3282775 ft	5.5891879 ft	-348.76533 psf	1,363.6509 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	3.7760925 ft	3.3825158 ft	-211.06899 psf	1,584.3277 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	6.2641231 ft	1.1395899 ft	-71.110409 psf	1,766.4908 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	7.7063881 ft	-0.1605925 ft	10.020972 psf	1,834.6667 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	9.014435 ft	-1.1308582 ft	70.56555 psf	2,011.0314 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	11.274245 ft	-2.7502045 ft	171.61276 psf	2,114.4893 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	13.534055 ft	-4.3695508 ft	272.65997 psf	2,217.9472 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	15.875118 ft	-5.6417147 ft	352.043 psf	2,518.575 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	18.297435 ft	-6.566696 ft	409.76183 psf	2,539.9822 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	20.719752 ft	-7.4916773 ft	467.48067 psf	2,561.3894 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	23.0925 ft	-8.2158337 ft	512.66802 psf	2,682.6651 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	25.41568 ft	-8.739165 ft	545.3239 psf	2,659.8802 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	27.73886 ft	-9.2624963 ft	577.97977 psf	2,637.0953 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	30.091985 ft	-9.6425635 ft	601.69596 psf	2,696.5513 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	32.475055 ft	-9.8793665 ft	616.47247 psf	2,635.8049 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	35.035601 ft	-9.997864 ft	623.86671 psf	2,633.8065 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	37.773623 ft	-9.998056 ft	623.87869 psf	2,528.8742 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	40.511645 ft	-9.998248 ft	623.89068 psf	2,423.9419 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	43.249667 ft	-9.99844 ft	623.90266 psf	2,319.0096 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	45.987689 ft	-9.998632 ft	623.91464 psf	2,214.0773 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	48.44427 ft	-9.92244 ft	619.16026 psf	2,162.3822 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	50.58064 ft	-9.7192735 ft	606.48267 psf	2,091.3067 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	53.093695 ft	-9.2743417 ft	578.71893 psf	2,006.4328 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	56.022205 ft	-8.6382353 ft	539.02588 psf	1,807.4698 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	58.977018 ft	-7.717985 ft	481.60226 psf	1,699.2461 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	61.958132 ft	-6.513591 ft	406.44808 psf	1,415.3378 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	65.372915 ft	-4.756333 ft	296.79518 psf	1,160.3326 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	68.39857 ft	-2.7843037 ft	173.74055 psf	839.47726 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	70.826173 ft	-0.98366773 ft	61.380867 psf	534.54943 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Slidell East/Northeast

Spencer's Qcase

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:36:40 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-5 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-46.9 ft	0 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

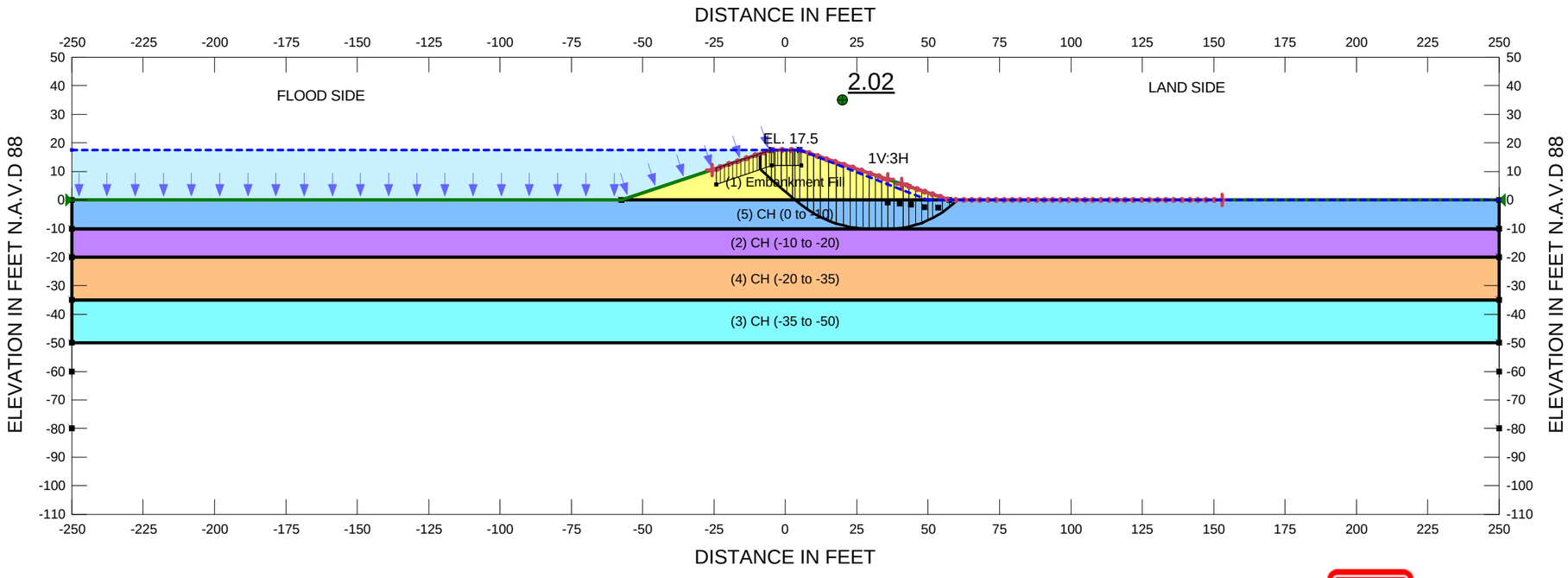
Slip Surfaces Analysed: 39566 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.01
Volume: 4,297.1942 ft³
Weight: 508,222.2 lbf
Resisting Moment: 8,407,657.2 lbf·ft
Activating Moment: 4,174,970.1 lbf·ft
Resisting Force: 96,410.104 lbf
Activating Force: 48,112.725 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (103.01034, 0) ft
Entry: (-28.821253, 4.3197006) ft
Radius: 60.144589 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-26.602825 ft	2.1598503 ft	957.22534 psf	1,049.4323 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-22.565478 ft	-1.7708905 ft	1,202.5036 psf	1,559.5869 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 3	-18.927639 ft	-5.3126715 ft	1,423.5107 psf	2,046.6798 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-16.22892 ft	-7.9778955 ft	1,589.8207 psf	2,395.2106 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-14.800945 ft	-9.4361145 ft	1,680.8135 psf	2,589.2119 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-12.59481 ft	-11.705477 ft	1,822.4218 psf	2,820.3184 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-9.2788901 ft	-15.116431 ft	2,035.2653 psf	3,278.6162 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-6.310465 ft	-18.185025 ft	2,226.7456 psf	3,684.529 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	-4.7827981 ft	-19.774071 ft	2,325.9021 psf	3,893.9338 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	-3.1545781 ft	-21.46771 ft	2,431.5851 psf	4,111.9278 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	-0.05767 ft	-24.509583 ft	2,621.398 psf	4,491.4766 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	3.31411 ft	-27.657906 ft	2,817.8533 psf	4,827.38 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	6.941705 ft	-31.045091 ft	2,982.095 psf	5,117.2243 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	10.661051 ft	-33.929057 ft	3,071.7983 psf	5,477.8577 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	14.251866 ft	-36.092351 ft	3,119.6507 psf	5,567.2085 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	17.878215 ft	-38.277051 ft	3,167.9767 psf	5,665.9438 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	21.977988 ft	-40.157192 ft	3,185.8096 psf	5,872.9848 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	26.551182 ft	-41.732771 ft	3,173.1495 psf	5,871.0219 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	31.459418 ft	-42.664042 ft	3,112.1543 psf	5,967.9528 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	36.702692 ft	-42.951005 ft	3,002.8241 psf	5,798.9265 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	41.993248 ft	-42.276916 ft	2,832.3767 psf	5,748.0232 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	47.331083 ft	-40.641773 ft	2,600.8124 psf	5,358.3799 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	50.63273 ft	-39.630378 ft	2,472.9356 psf	5,117.3712 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 24	54.38273 ft	-37.621988 ft	2,347.612 psf	4,912.5954 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 25	58.054495 ft	-35.48465 ft	2,214.2422 psf	4,548.838 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 26	61.053474 ft	-33.460618 ft	2,087.9426 psf	4,371.8289 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	65.826144 ft	-30.139038 ft	1,880.676 psf	3,991.6951 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	70.482515 ft	-26.898397 ft	1,678.46 psf	3,620.8243 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	75.704425 ft	-23.009443 ft	1,435.7893 psf	3,221.0618 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	79.040285 ft	-20.370406 ft	1,271.1133 psf	2,944.9758 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	82.146937 ft	-17.767759 ft	1,108.7081 psf	2,651.4769 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	87.475972 ft	-13.303276 ft	830.12439 psf	2,081.7077 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	90.765724 ft	-10.535517 ft	657.41626 psf	1,737.6627 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	94.188359 ft	-7.6040075 ft	474.49007 psf	1,284.0063 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	99.998052 ft	-2.6040075 ft	162.49007 psf	637.82364 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: Top of Levee (CG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:36:18 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.76957, 10.57681) ft
Left-Zone Right Coordinate: (35.76229, 7.245903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.75864, 5.580453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-5 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 19302 of 26692 converged

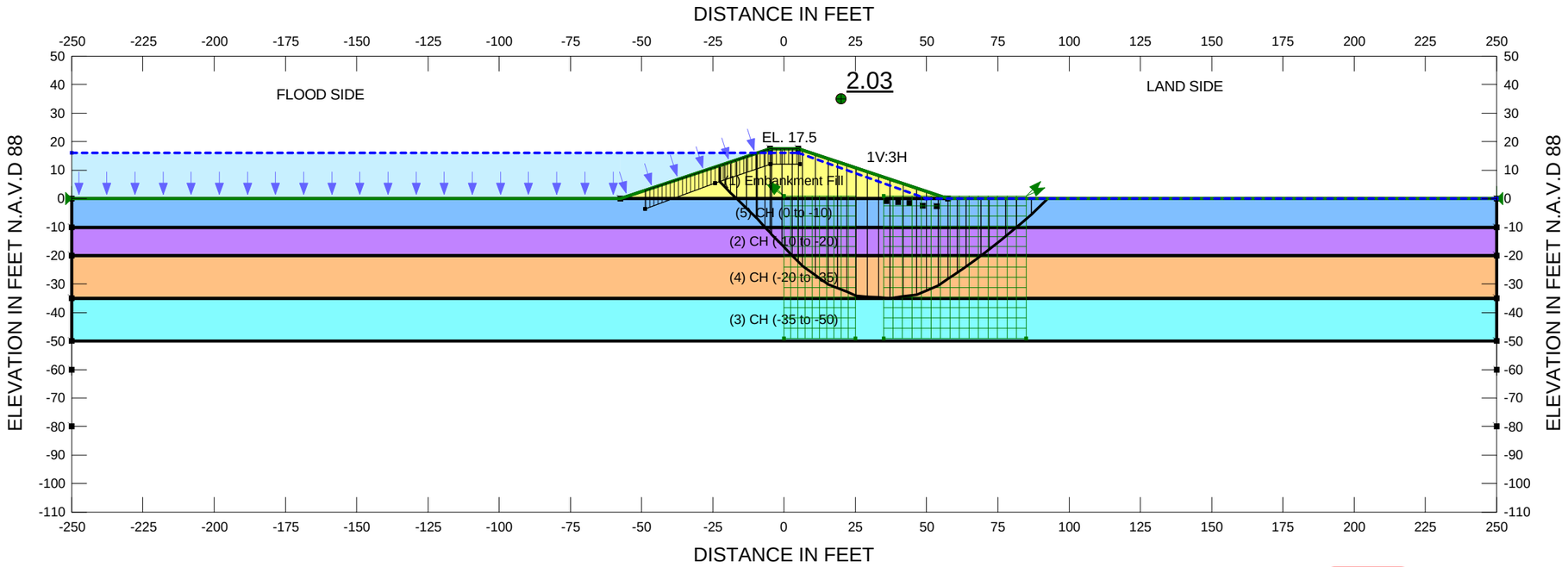
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.02
Volume: 1,045.5545 ft³
Weight: 124,345.13 lbf
Resisting Moment: 2,169,831.7 lbf·ft
Activating Moment: 1,072,380.9 lbf·ft
Resisting Force: 43,881.358 lbf
Activating Force: 21,701.016 lbf
Slip Rank: 1 of 26,692 slip surfaces

Exit: (60.42545, 0) ft
Entry: (-8.9094806, 10.76695) ft
Radius: 31.793517 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-8.7784053 ft	10.676054 ft	425.81422 psf	44.458831 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-7.7354975 ft	9.7524532 ft	483.44692 psf	540.49677 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-5.9118325 ft	8.0870437 ft	587.36848 psf	739.77024 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-4.32968 ft	6.6421884 ft	677.52744 psf	901.67036 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-2.6267283 ft	5.138498 ft	771.35772 psf	1,074.4817 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	-0.561465 ft	3.355418 ft	882.62192 psf	1,256.9944 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	1.5037983 ft	1.572338 ft	993.88611 psf	1,439.5071 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	2.9759398 ft	0.340399 ft	1,070.7591 psf	1,607.2837 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 9	4.2077248 ft	-0.61361463 ft	1,130.2896 psf	1,700.2937 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	6.31949 ft	-2.2491701 ft	1,200.3286 psf	1,838.8108 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	8.7719075 ft	-3.9458015 ft	1,246.6864 psf	2,043.2672 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	11.037762 ft	-5.2951825 ft	1,275.903 psf	2,118.6592 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	13.586237 ft	-6.547776 ft	1,292.2219 psf	2,284.0411 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	16.417333 ft	-7.703582 ft	1,295.6429 psf	2,318.0078 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	19.045552 ft	-8.5831963 ft	1,286.7527 psf	2,426.8091 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	21.470897 ft	-9.1866188 ft	1,265.5512 psf	2,409.8683 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	23.788193 ft	-9.6160533 ft	1,236.1149 psf	2,462.0295 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	25.997438 ft	-9.8714997 ft	1,198.4438 psf	2,410.131 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	28.193964 ft	-9.999167 ft	1,153.1078 psf	2,418.4886 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	30.377772 ft	-9.999055 ft	1,100.1071 psf	2,334.7614 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	32.56158 ft	-9.998943 ft	1,047.1064 psf	2,251.0341 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	34.745388 ft	-9.998831 ft	994.10564 psf	2,167.3069 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	36.929196 ft	-9.998719 ft	941.10491 psf	2,083.5796 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	39.59676 ft	-9.849935 ft	867.0879 psf	2,019.9301 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	42.250215 ft	-9.5166465 ft	781.90019 psf	1,920.7229 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	44.416772 ft	-9.018668 ft	698.2512 psf	1,841.217 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	46.594298 ft	-8.391832 ft	606.29536 psf	1,672.4403 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	48.84153 ft	-7.5623761 ft	500.00447 psf	1,563.3877 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	50.76016 ft	-6.7077266 ft	418.56214 psf	1,370.7324 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	53.19896 ft	-5.344697 ft	333.50909 psf	1,174.3567 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	56.1888 ft	-3.2992077 ft	205.87056 psf	849.65355 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	58.962725 ft	-1.1390682 ft	71.077859 psf	489.22242 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:36:58 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, 1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, 1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	16 ft
Coordinate 2	-5 ft	16 ft
Coordinate 3	5 ft	16 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-48.7 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

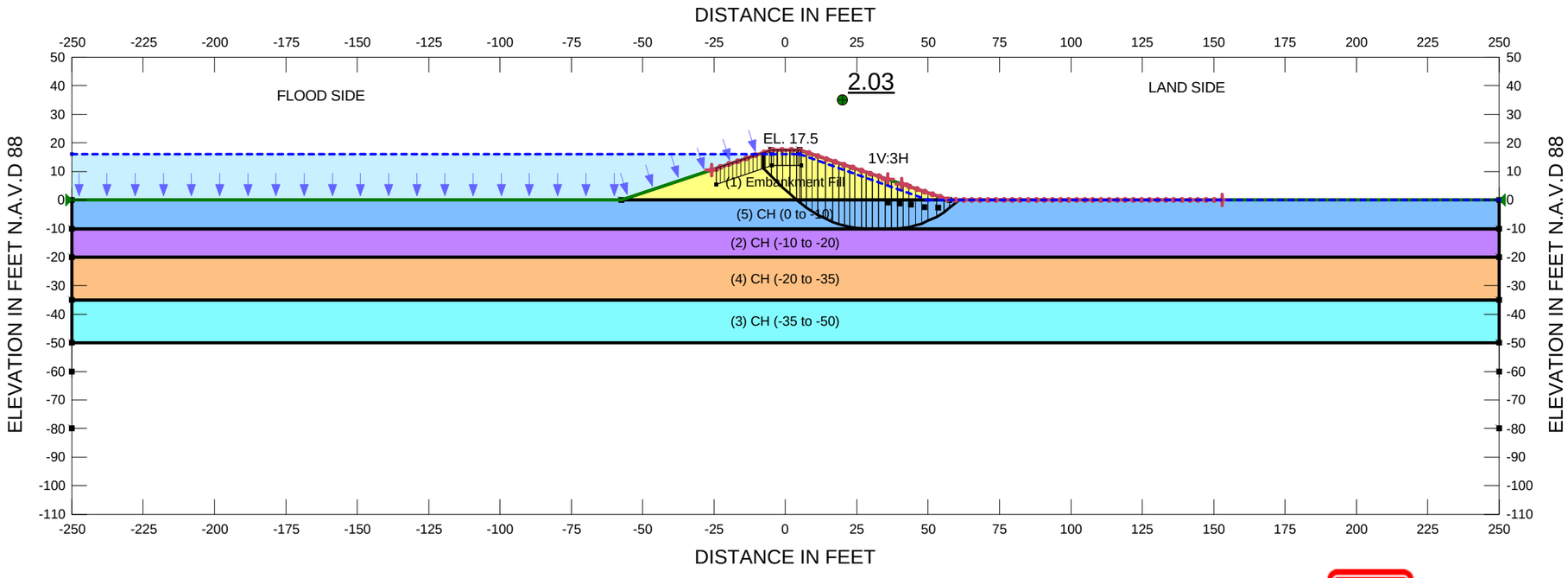
Slip Surfaces Analysed: 39577 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.03
Volume: 3,301.8878 ft³
Weight: 393,134.1 lbf
Resisting Moment: 6,534,250.4 lbf·ft
Activating Moment: 3,210,880.2 lbf·ft
Resisting Force: 82,626.417 lbf
Activating Force: 40,711.156 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (92.503797, 0) ft
Entry: (-22.661356, 5.9714247) ft
Radius: 52.649955 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-21.776273 ft	5.0379684 ft	684.03077 psf	678.28918 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-19.852415 ft	3.066542 ft	807.04778 psf	971.91685 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-17.767566 ft	1.014286 ft	935.10855 psf	1,241.6369 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-14.986131 ft	-1.6826255 ft	1,103.3958 psf	1,582.8763 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-11.51541 ft	-5.0478765 ft	1,313.3875 psf	2,042.0799 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-9.640025 ft	-6.883209 ft	1,427.9122 psf	2,242.4373 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-8.1410387 ft	-8.517958 ft	1,529.9206 psf	2,487.2418 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	-5.8910387 ft	-10.97174 ft	1,683.0366 psf	2,779.8837 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	-4.71673 ft	-12.252405 ft	1,762.9501 psf	2,961.0958 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	-2.6167355 ft	-14.420998 ft	1,898.2703 psf	3,248.9886 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	1.0167136 ft	-18.140333 ft	2,130.3568 psf	3,682.9412 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	3.9167191 ft	-21.108887 ft	2,315.5945 psf	4,050.5704 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	5.67129 ft	-22.904931 ft	2,412.774 psf	4,215.2699 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	8.63334 ft	-25.208598 ft	2,490.8048 psf	4,529.7725 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	13.21486 ft	-28.441615 ft	2,590.8964 psf	4,706.4111 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	17.113068 ft	-30.723053 ft	2,646.7699 psf	4,980.8964 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	20.327965 ft	-32.052912 ft	2,658.4253 psf	5,004.7504 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	23.542862 ft	-33.382771 ft	2,670.0806 psf	5,028.6045 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	27.15565 ft	-34.20555 ft	2,641.2663 psf	5,189.1891 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	31.16633 ft	-34.52125 ft	2,571.9824 psf	5,070.9819 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	35.17701 ft	-34.83695 ft	2,502.6984 psf	4,952.7746 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	39.493448 ft	-34.666043 ft	2,396.2664 psf	4,904.6038 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	44.115643 ft	-34.008527 ft	2,252.6864 psf	4,652.5365 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	48.21337 ft	-32.939506 ft	2,095.0645 psf	4,538.211 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	52.04015 ft	-31.353935 ft	1,956.4855 psf	4,208.2796 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	55.79015 ft	-29.347625 ft	1,831.2918 psf	3,987.1256 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	59.098155 ft	-27.101462 ft	1,691.1312 psf	3,660.5121 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	62.294465 ft	-24.931141 ft	1,555.7032 psf	3,410.6202 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	66.463401 ft	-21.92299 ft	1,367.9946 psf	3,101.5149 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	70.490806 ft	-18.910419 ft	1,180.0101 psf	2,770.4316 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	74.79259 ft	-15.508679 ft	967.74154 psf	2,369.6626 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	79.563365 ft	-11.598259 ft	723.73139 psf	1,875.9689 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	84.14004 ft	-7.799622 ft	486.69641 psf	1,310.0766 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	89.647449 ft	-2.799622 ft	174.69641 psf	711.64253 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: Project Grade (PG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:35:44 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.78864, 10.570453) ft
Left-Zone Right Coordinate: (35.7748, 7.241733) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.76786, 5.57738) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	16 ft
Coordinate 2	-5 ft	16 ft
Coordinate 3	5 ft	16 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 19191 of 26692 converged

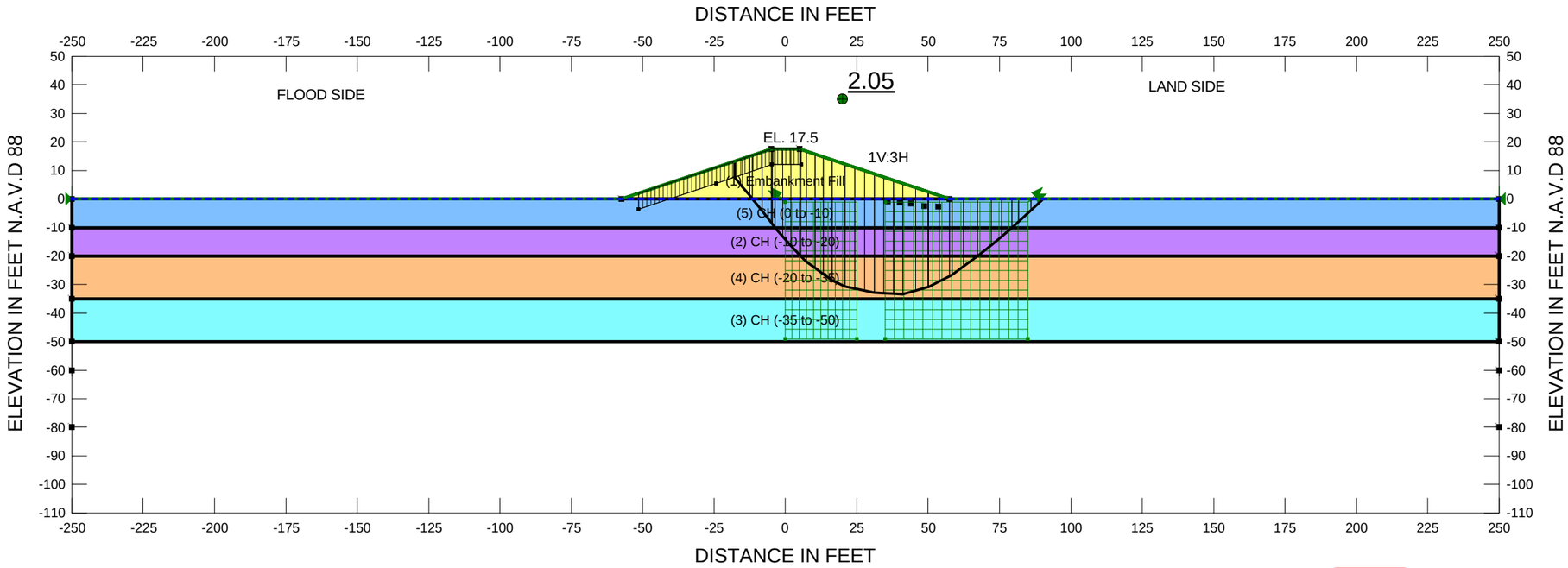
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.03
Volume: 1,030.5725 ft³
Weight: 122,632.88 lbf
Resisting Moment: 2,159,639 lbf·ft
Activating Moment: 1,063,851.1 lbf·ft
Resisting Force: 43,548.569 lbf
Activating Force: 21,467.416 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (60.893381, 0) ft
Entry: (-7.8919969, 11.121765) ft
Radius: 31.852111 ft

Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-7.5993134 ft	10.901395 ft	318.15295 psf	229.26232 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-6.153315 ft	9.5292145 ft	403.77702 psf	542.2113 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-3.97602 ft	7.3547597 ft	539.46299 psf	799.44967 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-1.92806 ft	5.3094712 ft	667.08899 psf	1,005.0562 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	0.31189728 ft	3.2151202 ft	797.7765 psf	1,264.4671 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	2.7438519 ft	1.0717067 ft	931.5255 psf	1,483.1712 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	4.4799146 ft	-0.45837951 ft	1,027.0029 psf	1,630.488 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	5.23016 ft	-1.1196115 ft	1,063.1573 psf	1,695.9959 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	6.42686 ft	-1.9730103 ft	1,089.8586 psf	1,857.5031 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	8.35994 ft	-3.274103 ft	1,128.1582 psf	1,938.2072 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	10.29302 ft	-4.5751957 ft	1,166.4577 psf	2,018.9114 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	12.59546 ft	-5.8525232 ft	1,195.0795 psf	2,201.4664 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	15.26726 ft	-7.1060858 ft	1,214.0235 psf	2,252.304 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	17.628305 ft	-8.0512367 ft	1,220.6172 psf	2,375.8703 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	19.678595 ft	-8.6879763 ft	1,214.8606 psf	2,376.8256 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	21.593563 ft	-9.1748215 ft	1,202.753 psf	2,442.2249 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	23.373207 ft	-9.5117725 ft	1,184.2944 psf	2,416.8176 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	25.47954 ft	-9.809089 ft	1,156.1144 psf	2,428.4245 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	27.457085 ft	-9.968833 ft	1,122.2073 psf	2,416.1082 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	29.324934 ft	-9.9997412 ft	1,082.6946 psf	2,375.3145 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	31.538562 ft	-9.9997516 ft	1,033.5823 psf	2,290.4601 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	33.75219 ft	-9.999762 ft	984.46989 psf	2,205.6058 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	35.965818 ft	-9.9997724 ft	935.35752 psf	2,120.7514 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	38.179446 ft	-9.9997828 ft	886.24514 psf	2,035.897 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	40.261565 ft	-9.8725078 ft	832.10789 psf	2,019.32 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	42.212175 ft	-9.6179473 ft	772.94579 psf	1,910.6826 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	44.348712 ft	-9.1731642 ft	697.78868 psf	1,855.4506 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	46.671177 ft	-8.5381588 ft	606.63658 psf	1,680.1365 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	48.916205 ft	-7.7290986 ft	506.34155 psf	1,587.3349 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	51.473205 ft	-6.5693661 ft	409.92844 psf	1,327.3502 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	54.26312 ft	-5.061674 ft	315.84846 psf	1,104.7642 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	56.539915 ft	-3.4592718 ft	215.85856 psf	864.17557 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	59.19669 ft	-1.3481933 ft	84.12726 psf	524.58722 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:37:18 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-51.5 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

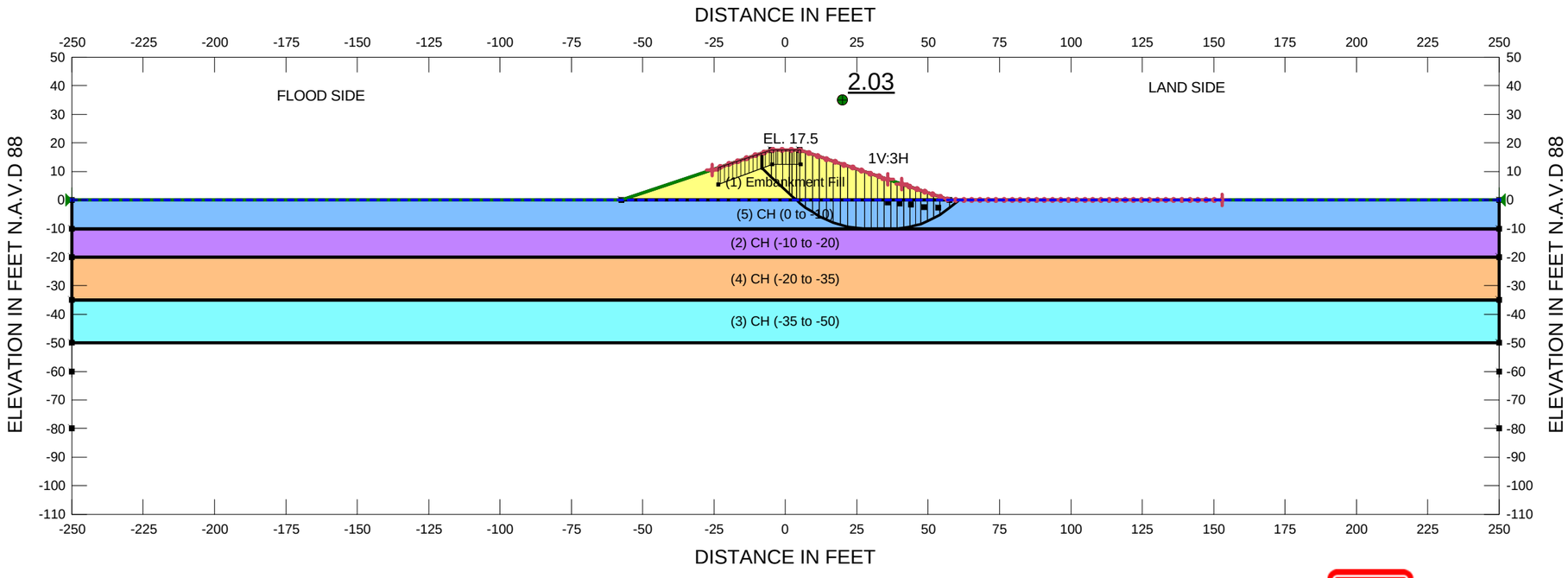
Slip Surfaces Analysed: 38299 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 2.05
Volume: 3,012.3126 ft³
Weight: 359,276.3 lbf
Resisting Moment: 6,049,720.1 lbf·ft
Activating Moment: 2,938,331 lbf·ft
Resisting Force: 77,548.863 lbf
Activating Force: 37,814.716 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (90.277997, 0) ft
Entry: (-17.761433, 7.6801158) ft
Radius: 50.537397 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-16.369281 ft	5.9682404 ft	-372.4182 psf	497.66043 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-13.760645 ft	2.765867 ft	-172.5901 psf	955.88456 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-12.043396 ft	0.6376845 ft	-39.791513 psf	1,231.2727 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-9.9069746 ft	-2.0828867 ft	129.97213 psf	1,598.2899 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-6.6356582 ft	-6.2486601 ft	389.91639 psf	2,203.2632 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-4.83124 ft	-8.5464499 ft	533.29848 psf	2,530.902 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-4.1544715 ft	-9.3806765 ft	585.35421 psf	2,651.49 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	-2.3286265 ft	-11.606602 ft	724.25193 psf	2,824.9856 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	0.4919075 ft	-14.803373 ft	923.73046 psf	3,279.1056 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	3.4973025 ft	-17.983712 ft	1,122.1836 psf	3,649.3597 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	5.2013392 ft	-19.786941 ft	1,234.7051 psf	3,851.9859 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	6.3612692 ft	-21.014391 ft	1,311.298 psf	3,975.7844 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	8.8224733 ft	-23.110635 ft	1,442.1036 psf	4,292.4599 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	11.8277 ft	-25.274343 ft	1,577.119 psf	4,412.8032 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	14.832927 ft	-27.438051 ft	1,712.1344 psf	4,533.1464 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	18.622205 ft	-29.542669 ft	1,843.4625 psf	4,777.4049 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	22.603462 ft	-30.944907 ft	1,930.9622 psf	4,914.1808 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	25.992645 ft	-31.703856 ft	1,978.3206 psf	4,869.0453 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	29.381828 ft	-32.462805 ft	2,025.679 psf	4,823.9098 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	32.756312 ft	-32.920648 ft	2,054.2484 psf	4,853.207 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	36.116095 ft	-33.077384 ft	2,064.0288 psf	4,742.0899 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	39.475878 ft	-33.234122 ft	2,073.8092 psf	4,630.9729 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	43.366827 ft	-32.699901 ft	2,040.4738 psf	4,616.0057 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	47.788942 ft	-31.474722 ft	1,964.0226 psf	4,305.9075 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	50.05064 ft	-30.848102 ft	1,924.9216 psf	4,147.3072 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	51.95096 ft	-29.866505 ft	1,863.6699 psf	4,105.2151 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	55.65032 ft	-27.931372 ft	1,742.9176 psf	3,738.3563 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	57.925755 ft	-26.741093 ft	1,668.6442 psf	3,529.4953 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	60.358365 ft	-25.110236 ft	1,566.8787 psf	3,441.5385 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	64.790538 ft	-21.851045 ft	1,363.5052 psf	3,098.7209 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	69.638683 ft	-18.150856 ft	1,132.6134 psf	2,678.3564 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	73.897592 ft	-14.726284 ft	918.92012 psf	2,289.6261 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	77.569757 ft	-11.575428 ft	722.30671 psf	1,883.4559 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	80.58182 ft	-8.9909645 ft	561.03618 psf	1,474.1169 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	83.887849 ft	-5.9864467 ft	373.55428 psf	1,111.0114 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 36	88.147948 ft	-1.9954823 ft	124.51809 psf	585.86309 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2032 Sepncer's Qcase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,374
Date: 01/21/2022
Time: 11:34:55 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/21/2022
Last Solved Time: 11:36:02 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.76957, 10.57681) ft
Left-Zone Right Coordinate: (35.76229, 7.245903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.75864, 5.580453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-23.5 ft	5.5 ft
Coordinate 2	-4.6 ft	12.4 ft
Coordinate 3	5.4 ft	12.4 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 18547 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 2.03
Volume: 1,037.7645 ft³
Weight: 123,480.84 lbf
Resisting Moment: 2,170,117.2 lbf·ft
Activating Moment: 1,067,729.4 lbf·ft
Resisting Force: 43,774.789 lbf
Activating Force: 21,549.526 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (60.871464, 0) ft
Entry: (-8.2825845, 11.055564) ft
Radius: 31.925902 ft
Center: (20, 35) ft

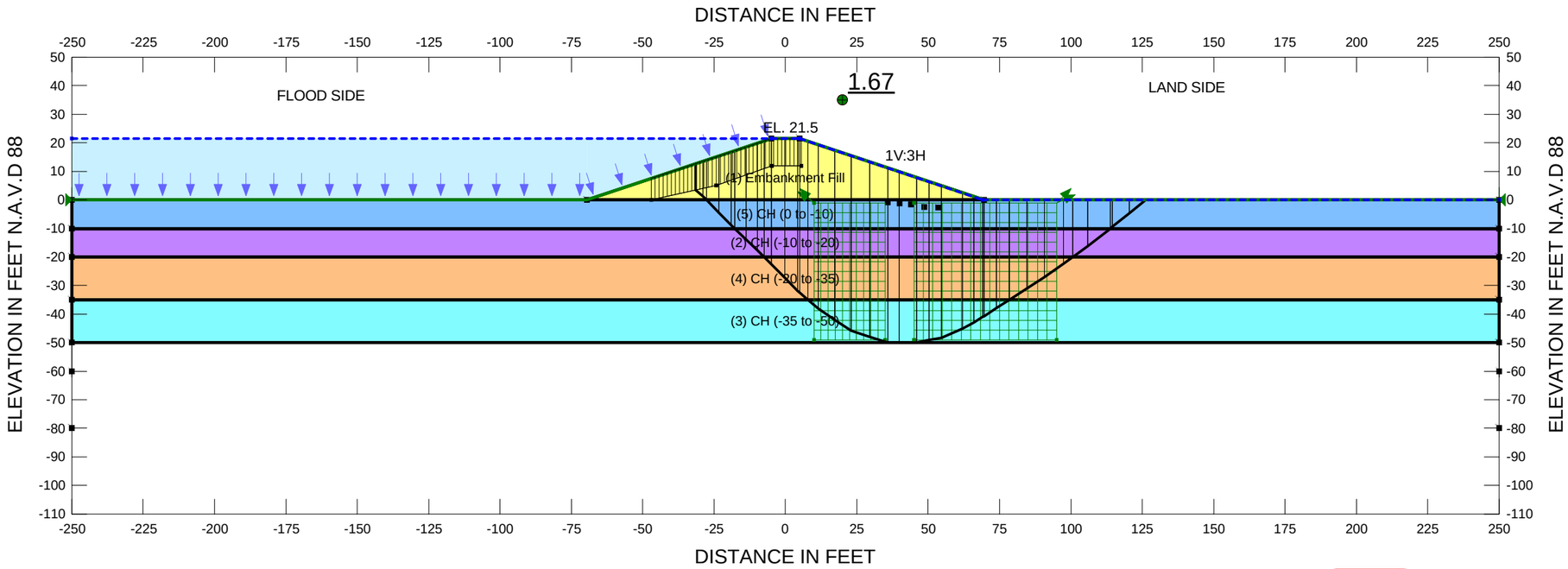
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-8.0824922 ft	10.911792 ft	-680.8958 psf	140.13506 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-6.4412 ft	9.4000498 ft	-586.56311 psf	562.33963 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-4.191385 ft	7.2645533 ft	-453.30813 psf	827.6535 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-2.2085225 ft	5.4026847 ft	-337.12753 psf	1,023.1826 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	0.1399725 ft	3.2140023 ft	-200.55374 psf	1,245.6438 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	1.761815 ft	1.7230895 ft	-107.52078 psf	1,417.3129 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	3.0109296 ft	0.663259 ft	-41.387362 psf	1,552.4226 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	4.4062246 ft	-0.49135023 ft	30.660254 psf	1,663.6294 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	6.02774 ft	-1.8331572 ft	114.38901 psf	1,778.5481 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	8.26344 ft	-3.4498143 ft	215.26841 psf	1,985.7695 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	10.67936 ft	-4.9822147 ft	310.8902 psf	2,076.5859 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	13.107812 ft	-6.2959772 ft	392.86898 psf	2,249.631 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	15.548797 ft	-7.3911017 ft	461.20475 psf	2,290.3729 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	18.038745 ft	-8.2886975 ft	517.21472 psf	2,412.6729 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	20.577655 ft	-8.9887645 ft	560.8989 psf	2,403.2238 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	23.287205 ft	-9.5670825 ft	596.98595 psf	2,447.2952 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	26.20651 ft	-9.8975095 ft	617.60459 psf	2,435.8484 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	28.831071 ft	-9.9995512 ft	623.97199 psf	2,393.5108 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	31.121773 ft	-9.9993496 ft	623.95942 psf	2,305.6742 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	33.412475 ft	-9.999148 ft	623.94684 psf	2,217.8377 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	35.703177 ft	-9.9989464 ft	623.93426 psf	2,130.0012 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	37.993879 ft	-9.9987448 ft	623.92168 psf	2,042.1646 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	40.245897 ft	-9.8516235 ft	614.74131 psf	2,017.0003 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	42.459232 ft	-9.5575825 ft	596.39315 psf	1,893.0791 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	44.533608 ft	-9.152422 ft	571.11113 psf	1,838.7678 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	46.469022 ft	-8.636142 ft	538.89526 psf	1,694.6194 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	48.548977 ft	-7.8522885 ft	489.9828 psf	1,626.3682 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	50.77347 ft	-6.8008615 ft	424.37376 psf	1,394.192 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	52.997963 ft	-5.7494345 ft	358.76471 psf	1,162.0158 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	55.805105 ft	-3.914251 ft	244.24926 psf	944.90179 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	59.185732 ft	-1.3023905 ft	81.269168 psf	505.58396 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Slidell East/Northeastt

Spencer's Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: Top of Levee (CG) Block)

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,379
Date: 07/13/2022
Time: 01:45:04 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 07/13/2022
Last Solved Time: 01:45:34 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (10, -1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, -1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	21.5 ft
Coordinate 2	-5 ft	21.5 ft
Coordinate 3	5 ft	21.5 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-46.9 ft	0 ft
Coordinate 2	-24.3 ft	5 ft
Coordinate 3	-4.8 ft	12 ft
Coordinate 4	5.5 ft	12 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

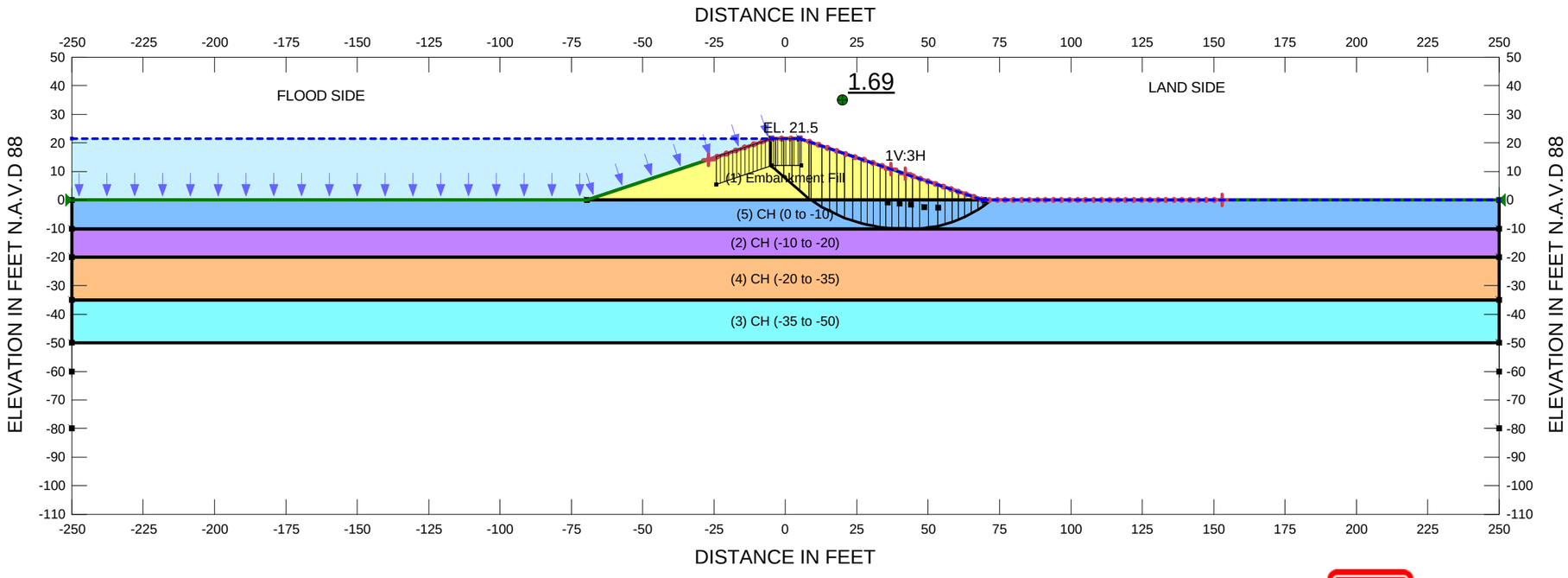
Slip Surfaces Analysed: 39596 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.67
Volume: 6,023.9362 ft³
Weight: 707,754.58 lbf
Resisting Moment: 11,056,738 lbf·ft
Activating Moment: 6,617,262.1 lbf·ft
Resisting Force: 116,164.22 lbf
Activating Force: 69,940.704 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (126.26907, 0) ft
Entry: (-31.390723, 3.4312561) ft
Radius: 70.595956 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-30.156436 ft	2.3153485 ft	1,197.1223 psf	1,343.46 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-28.332318 ft	0.5997205 ft	1,304.1774 psf	1,565.4969 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-25.557699 ft	-2.2214137 ft	1,480.2162 psf	1,921.8031 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-21.188126 ft	-6.6642412 ft	1,757.4487 psf	2,526.8934 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-18.417773 ft	-9.4428275 ft	1,930.8324 psf	2,938.2343 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-15.83338 ft	-11.901903 ft	2,084.2787 psf	3,190.2749 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-11.835727 ft	-15.705709 ft	2,321.6362 psf	3,706.9214 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-8.6550751 ft	-18.803806 ft	2,514.9575 psf	4,087.7211 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	-6.2366251 ft	-21.25166 ft	2,667.7036 psf	4,443.7441 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	-2.6678375 ft	-24.863839 ft	2,893.1035 psf	4,847.973 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	1.9964875 ft	-29.584874 ft	3,187.6962 psf	5,348.7203 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	4.664325 ft	-32.233673 ft	3,352.9812 psf	5,731.7798 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	6.442718 ft	-33.760977 ft	3,418.042 psf	5,841.6701 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	9.695173 ft	-36.554223 ft	3,524.1609 psf	6,002.1401 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	14.380355 ft	-40.025895 ft	3,642.5802 psf	6,334.437 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	20.131245 ft	-43.860796 ft	3,761.3249 psf	6,529.8383 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	26.226213 ft	-46.833684 ft	3,819.0674 psf	6,873.8631 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	32.665258 ft	-48.944561 ft	3,815.8077 psf	6,859.4467 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	37.812705 ft	-50 ft	3,773.7637 psf	7,030.6255 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	42.887045 ft	-50 ft	3,667.3928 psf	6,836.1091 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	48.155463 ft	-49.573753 ft	3,530.3558 psf	6,740.8474 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	52.399468 ft	-48.721259 ft	3,388.1952 psf	6,481.9971 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	58.306695 ft	-46.651984 ft	3,135.2422 psf	6,197.8064 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 24	64.04301 ft	-43.979546 ft	2,848.2345 psf	5,742.1006 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 25	67.49705 ft	-41.985107 ft	2,651.3763 psf	5,464.4126 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 26	69.25 ft	-40.859557 ft	2,549.6364 psf	5,267.5993 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 27	71.718943 ft	-39.274276 ft	2,450.7148 psf	5,078.0427 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 28	76.156828 ft	-36.424759 ft	2,272.9049 psf	4,755.0673 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 29	81.456158 ft	-33.022117 ft	2,060.5801 psf	4,352.5051 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	87.616933 ft	-29.066351 ft	1,813.7403 psf	3,900.0672 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	94.05564 ft	-24.724104 ft	1,542.7841 psf	3,441.2252 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 32	99.024038 ft	-21.17987 ft	1,321.6239 psf	3,051.7408 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 33	103.24075 ft	-18.089852 ft	1,128.8068 psf	2,709.2636 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	109.78499 ft	-13.089852 ft	816.8068 psf	2,103.7551 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 35	114.11964 ft	-9.688448 ft	604.55916 psf	1,586.5407 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 36	117.45477 ft	-7.032672 ft	438.83873 psf	1,248.171 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 37	123.33097 ft	-2.344224 ft	146.27958 psf	639.81262 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: Top of Levee (CG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/13/2022
Time: 08:21:45 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:22:38 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.96957, 14.17681) ft
Left-Zone Right Coordinate: (36.96229, 10.845903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.95864, 9.180453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	21.5 ft
Coordinate 2	-5 ft	21.5 ft
Coordinate 3	5 ft	21.5 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 22025 of 26692 converged

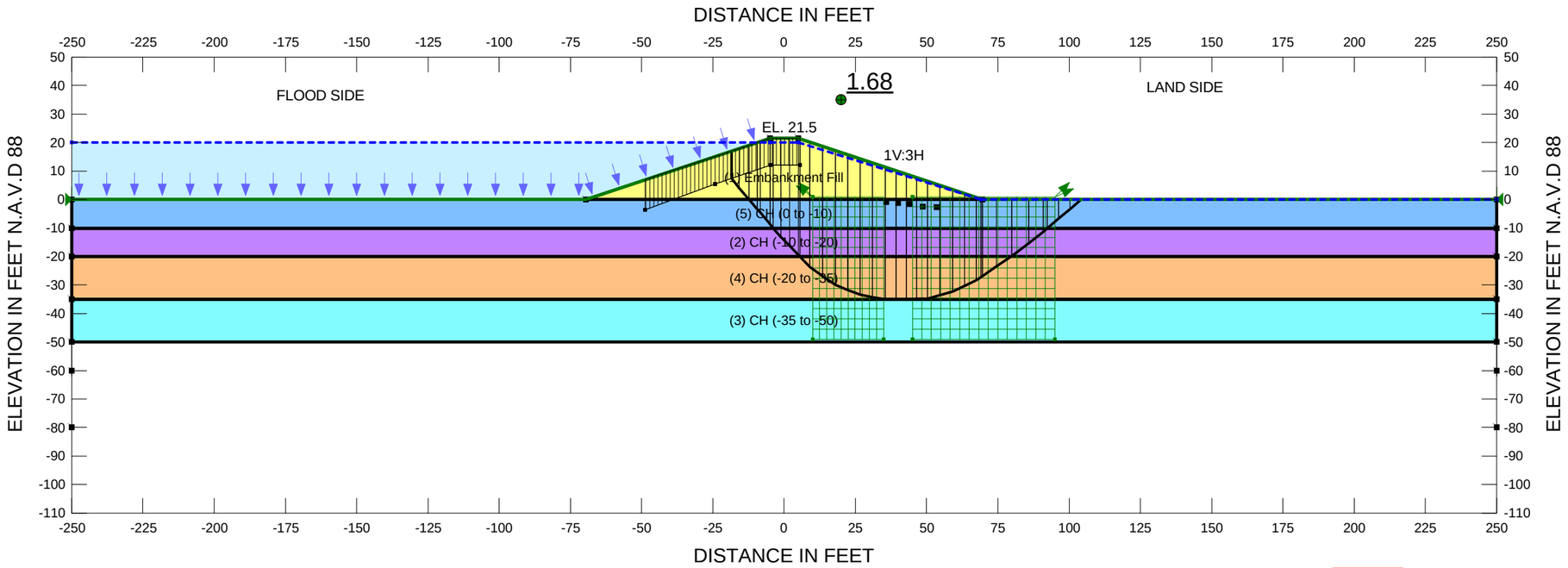
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.69
Volume: 1,270.1853 ft³
Weight: 150,480.63 lbf
Resisting Moment: 2,358,837.4 lbf·ft
Activating Moment: 1,396,754.2 lbf·ft
Resisting Force: 48,980.857 lbf
Activating Force: 29,072.928 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (72.135803, 0) ft
Entry: (-5.2901842, 12.029064) ft
Radius: 35.037881 ft

Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.1450921 ft	11.924087 ft	597.53698 psf	-630.94269 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-4.21884 ft	11.253924 ft	639.35512 psf	874.24169 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-2.0221725 ft	9.4013938 ft	754.95303 psf	977.69883 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	0.8088425 ft	6.8267032 ft	915.61372 psf	1,234.0351 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	3.612175 ft	4.3773354 ft	1,068.4543 psf	1,516.1465 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	6.644045 ft	1.8387579 ft	1,192.3982 psf	1,716.4604 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	8.646132 ft	0.2311015 ft	1,250.7472 psf	1,925.669 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	10.879047 ft	-1.210154 ft	1,293.8741 psf	1,998.6515 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	14.078012 ft	-3.0762662 ft	1,343.2612 psf	2,200.1725 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	16.726195 ft	-4.3881825 ft	1,369.6122 psf	2,257.7815 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	19.374378 ft	-5.7000988 ft	1,395.9633 psf	2,315.3904 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	22.123875 ft	-6.796032 ft	1,406.7132 psf	2,482.6137 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	24.974685 ft	-7.675982 ft	1,401.8619 psf	2,483.2908 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	27.50833 ft	-8.3540557 ft	1,391.0622 psf	2,543.9758 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	29.72481 ft	-8.830253 ft	1,374.314 psf	2,519.4346 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	31.94129 ft	-9.3064503 ft	1,357.5657 psf	2,494.8933 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	34.112192 ft	-9.6541247 ft	1,333.753 psf	2,544.1409 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	36.237518 ft	-9.8732762 ft	1,302.876 psf	2,490.9986 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	38.505954 ft	-9.9844267 ft	1,262.2597 psf	2,499.7679 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	40.917501 ft	-9.9875763 ft	1,211.9041 psf	2,407.7394 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	43.329049 ft	-9.9907257 ft	1,161.5486 psf	2,315.7109 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	45.740596 ft	-9.9938753 ft	1,111.1931 psf	2,223.6825 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	48.545178 ft	-9.7748158 ft	1,038.7327 psf	2,193.7231 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	51.742793 ft	-9.3335473 ft	944.16756 psf	2,011.7058 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	54.598135 ft	-8.7822445 ft	849.91115 psf	1,919.6015 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	57.111205 ft	-8.1209075 ft	755.96349 psf	1,732.1896 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	59.445225 ft	-7.346542 ft	658.71619 psf	1,639.703 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	61.600195 ft	-6.459148 ft	558.16925 psf	1,431.5549 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	63.862655 ft	-5.3633258 ft	442.36312 psf	1,279.9967 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	66.232605 ft	-4.0590753 ft	311.29781 psf	999.82404 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	68.20879 ft	-2.8356305 ft	193.52908 psf	846.72337 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	69.25 ft	-2.0837901 ft	130.0285 psf	694.02895 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	70.817901 ft	-0.95163462 ft	59.382 psf	521.70829 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,377
Date: 04/13/2022
Time: 08:26:27 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:27:16 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (10, 1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, 1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	20 ft
Coordinate 2	-5 ft	20 ft
Coordinate 3	5 ft	20 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-48.7 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

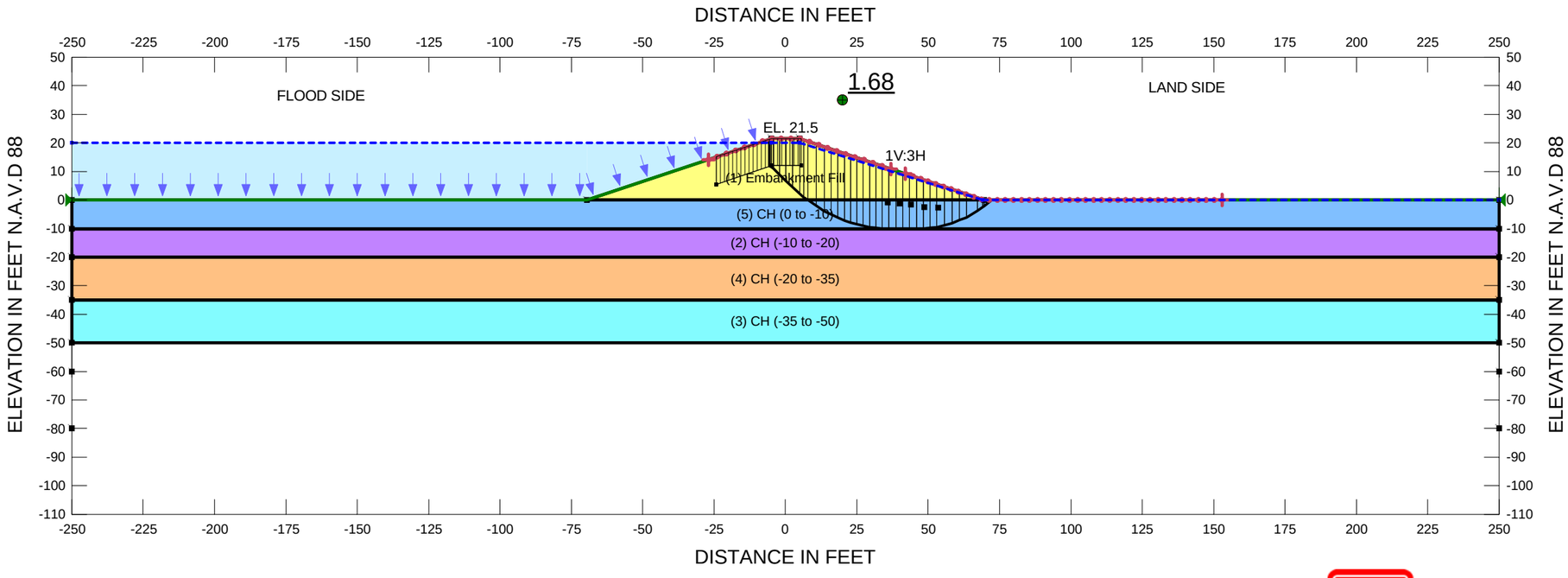
Slip Surfaces Analysed: 39598 of 39601 converged

Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.68
Volume: 3,834.0333 ft³
Weight: 455,302.88 lbf
Resisting Moment: 7,118,203.6 lbf·ft
Activating Moment: 4,230,360.5 lbf·ft
Resisting Force: 88,137.386 lbf
Activating Force: 52,523.138 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (104.31315, 0) ft
Entry: (-18.431089, 7.4465945) ft
Radius: 55.902286 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-18.354895 ft	7.3180697 ft	791.35245 psf	-519.94282 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-16.99246 ft	5.5861235 ft	899.42589 psf	1,015.3283 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-14.013786 ft	1.991351 ft	1,123.7397 psf	1,474.6944 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-10.910676 ft	-1.6598281 ft	1,351.5733 psf	1,905.5762 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-8.96986 ft	-3.9434291 ft	1,494.07 psf	2,211.7467 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-6.71986 ft	-6.5908224 ft	1,659.2673 psf	2,597.4114 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-4.4112126 ft	-9.3072214 ft	1,828.7706 psf	2,972.2632 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	-2.4978226 ft	-11.558553 ft	1,969.2537 psf	3,132.2881 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	0.370085 ft	-14.702866 ft	2,165.4588 psf	3,589.6135 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	3.456695 ft	-17.874385 ft	2,363.3616 psf	3,953.7313 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	5.2627014 ft	-19.730072 ft	2,474.0338 psf	4,157.3807 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	7.2792164 ft	-21.802059 ft	2,564.0038 psf	4,342.7617 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	11.289183 ft	-25.202621 ft	2,698.0045 psf	4,778.5349 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	15.801488 ft	-28.399628 ft	2,809.5078 psf	4,951.9019 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	20.2167 ft	-30.838398 ft	2,875.5904 psf	5,291.4575 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	24.53482 ft	-32.51893 ft	2,896.2522 psf	5,311.9157 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	28.870815 ft	-33.769397 ft	2,889.7295 psf	5,443.2895 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	33.2299 ft	-34.590781 ft	2,855.9817 psf	5,368.3455 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	37.327155 ft	-34.980933 ft	2,800.4307 psf	5,414.8618 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	41.067902 ft	-34.939852 ft	2,724.9227 psf	5,266.7936 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	44.719185 ft	-34.899752 ft	2,651.2205 psf	5,122.2665 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	48.370468 ft	-34.859654 ft	2,577.5182 psf	4,977.7394 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	52.44541 ft	-34.20695 ft	2,457.3282 psf	4,958.5906 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	56.94401 ft	-32.941641 ft	2,290.6502 psf	4,639.4623 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	61.248328 ft	-31.32091 ft	2,105.5824 psf	4,438.1219 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	65.358362 ft	-29.344756 ft	1,902.1247 psf	4,048.1993 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	68.20669 ft	-27.811989 ft	1,750.9377 psf	3,908.7816 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	69.25 ft	-27.095649 ft	1,690.7685 psf	3,783.2913 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	72.021104 ft	-25.192998 ft	1,572.0431 psf	3,551.461 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 30	77.175389 ft	-21.654046 ft	1,351.2125 psf	3,138.0017 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 31	82.849375 ft	-17.557652 ft	1,095.5975 psf	2,712.1142 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	88.39029 ft	-13.271484 ft	828.14057 psf	2,186.6211 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 33	91.648679 ft	-10.636878 ft	663.74119 psf	1,869.7135 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 34	94.391323 ft	-8.3333333 ft	520 psf	1,473.468 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	98.360053 ft	-5 ft	312 psf	1,030.996 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 36	102.32878 ft	-1.6666667 ft	104 psf	588.52407 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: Project Grade (PG) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/13/2022
Time: 08:21:45 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:22:12 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.98864, 14.170453) ft
Left-Zone Right Coordinate: (36.9748, 10.841733) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.96786, 9.17738) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	20 ft
Coordinate 2	-5 ft	20 ft
Coordinate 3	5 ft	20 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-24.3 ft	5.4 ft
Coordinate 2	-4.8 ft	12.2 ft
Coordinate 3	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 21900 of 26692 converged

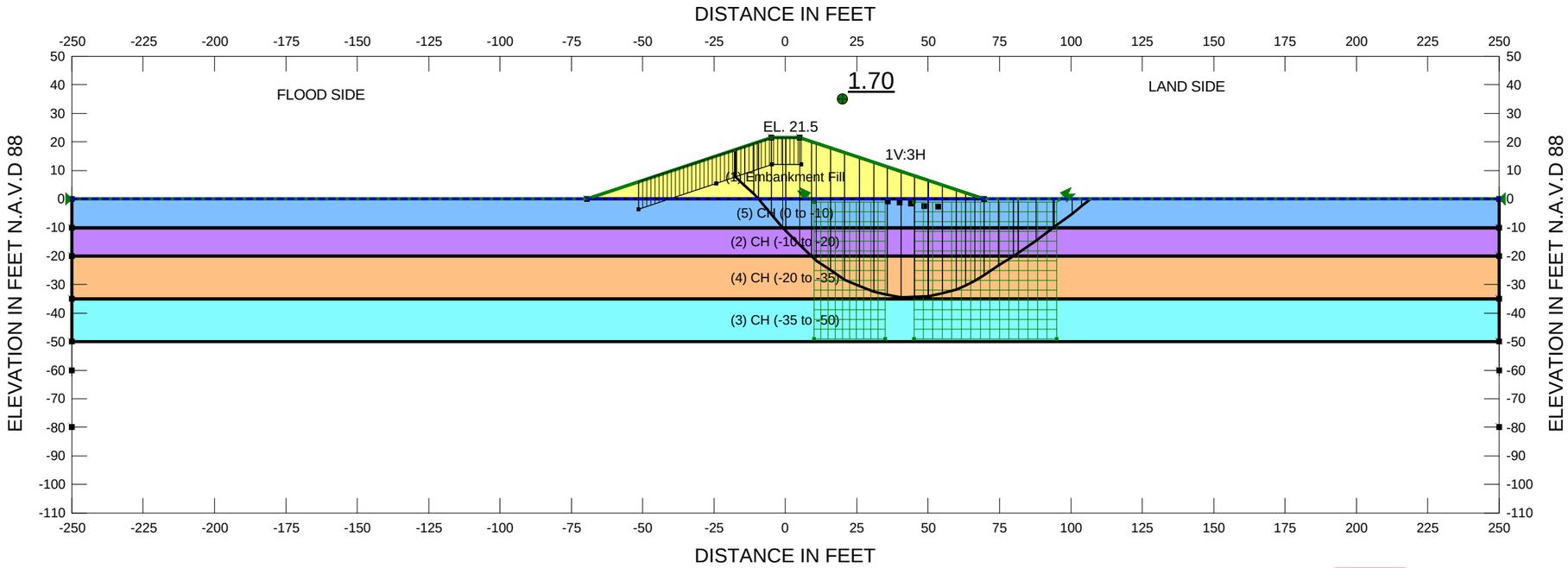
Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.68
Volume: 1,311.4812 ft³
Weight: 155,510.76 lbf
Resisting Moment: 2,414,327.8 lbf·ft
Activating Moment: 1,438,226.6 lbf·ft
Resisting Force: 49,279.441 lbf
Activating Force: 29,222.309 lbf
Slip Rank: 1 of 26,692 slip surfaces

Exit: (72.264282, 0) ft
Entry: (-5.5748529, 11.929795) ft
Radius: 35.22973 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.2874265 ft	11.714883 ft	516.99127 psf	69.815562 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-4.645405 ft	11.234838 ft	546.94611 psf	862.69604 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-3.1735817 ft	9.8901093 ft	630.85718 psf	900.27767 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-0.939125 ft	7.73092 ft	765.59059 psf	1,112.8792 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	1.2953317 ft	5.5717307 ft	900.32401 psf	1,325.4807 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	3.70628 ft	3.3648173 ft	1,038.0354 psf	1,594.276 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	5.75585 ft	1.5788678 ft	1,134.7396 psf	1,747.4827 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	7.188486 ft	0.4601185 ft	1,176.6131 psf	1,926.5853 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 9	9.3004814 ft	-0.975739 ft	1,225.0267 psf	1,999.7626 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	12.1709 ft	-2.927217 ft	1,290.8258 psf	2,119.514 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	14.779902 ft	-4.4499257 ft	1,334.9673 psf	2,351.385 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	17.127485 ft	-5.543865 ft	1,357.4512 psf	2,394.6338 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	19.475068 ft	-6.6378043 ft	1,379.9352 psf	2,437.8826 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	21.73221 ft	-7.5216545 ft	1,391.0731 psf	2,579.0377 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	23.89891 ft	-8.1954155 ft	1,390.8652 psf	2,580.1414 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	26.110292 ft	-8.779517 ft	1,384.1912 psf	2,642.2167 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	28.366357 ft	-9.273959 ft	1,371.0511 psf	2,618.445 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	30.588282 ft	-9.6393032 ft	1,350.521 psf	2,670.9771 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	32.776068 ft	-9.8755497 ft	1,322.601 psf	2,617.6438 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	35.072102 ft	-9.9940851 ft	1,285.2249 psf	2,634.4972 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	37.476385 ft	-9.9949092 ft	1,238.3928 psf	2,542.4415 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	39.880668 ft	-9.9957334 ft	1,191.5607 psf	2,450.3858 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	42.284952 ft	-9.9965576 ft	1,144.7286 psf	2,358.3302 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	44.689235 ft	-9.9973817 ft	1,097.8965 psf	2,266.2745 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	47.093518 ft	-9.9982059 ft	1,051.0644 psf	2,174.2188 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	49.47871 ft	-9.8684623 ft	996.4572 psf	2,149.9236 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	51.84481 ft	-9.6081508 ft	934.07481 psf	2,024.2816 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	54.383345 ft	-9.1411632 ft	855.43336 psf	1,967.7178 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	57.094315 ft	-8.4674997 ft	760.53284 psf	1,771.097 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	59.700945 ft	-7.6056738 ft	655.92561 psf	1,674.3519 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	62.203235 ft	-6.5556853 ft	541.61168 psf	1,429.3104 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	65.3592 ft	-4.8737875 ft	375.11994 psf	1,191.2078 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	68.13201 ft	-3.0716742 ft	208.59827 psf	902.32616 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	69.25 ft	-2.2406299 ft	139.81531 psf	733.81949 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 35	70.882141 ft	-1.0273977 ft	64.109619 psf	548.66098 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,377
Date: 04/13/2022
Time: 08:26:27 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:27:30 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: Tension Crack Line
Filled with water (0 to 1): 1
Tension Crack Fluid Unit Weight: 62.4 pcf
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (10, -1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, -1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-51.5 ft	-3.5 ft
Coordinate 2	-24.3 ft	5.4 ft
Coordinate 3	-4.8 ft	12.2 ft
Coordinate 4	5.5 ft	12.2 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39574 of 39601 converged

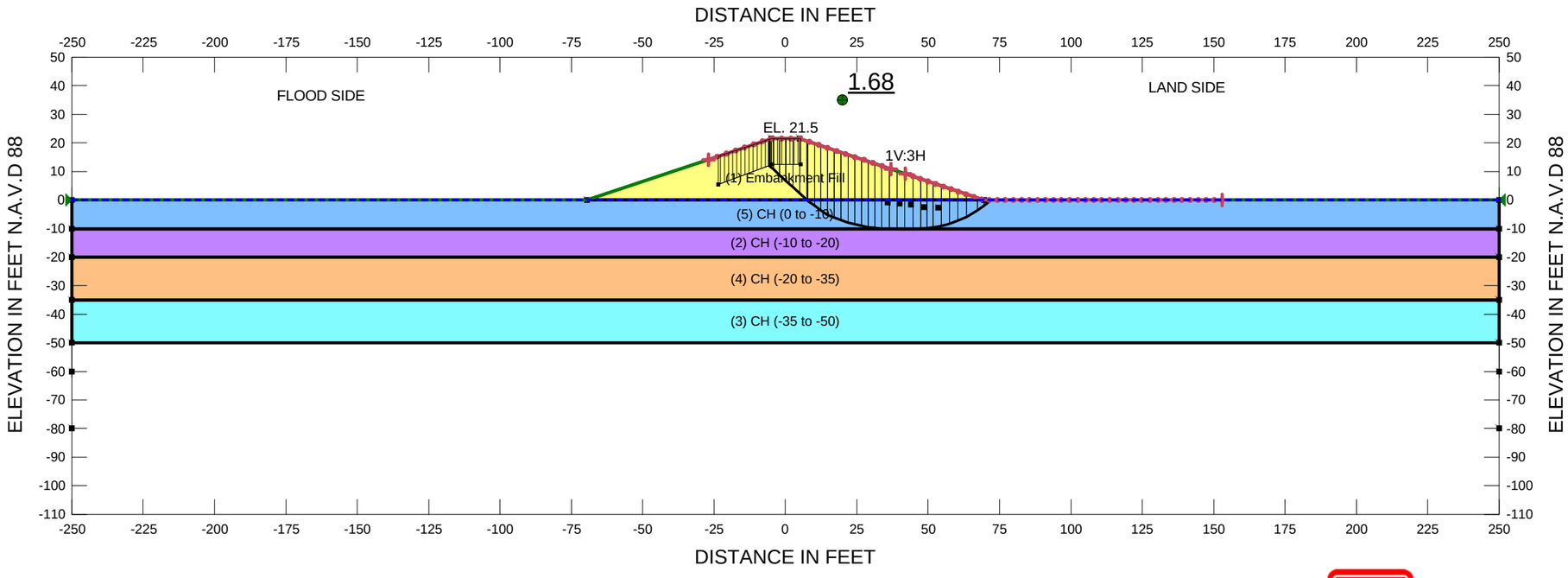
Current Slip Surface

Slip Surface: 39,601
Factor of Safety: 1.70
Volume: 3,680.7411 ft³

Weight: 437,811.58 lbf
Resisting Moment: 6,964,416.9 lbf·ft
Activating Moment: 4,104,471.2 lbf·ft
Resisting Force: 89,274.876 lbf
Activating Force: 52,640.247 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (107.01043, 0) ft
Entry: (-17.556645, 7.7515288) ft
Radius: 56.445805 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-17.527043 ft	7.7309194 ft	-482.40937 psf	-2,502.0698 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-15.88022 ft	6.222863 ft	-388.30665 psf	974.29747 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-12.64578 ft	3.247969 ft	-202.67327 psf	1,411.1243 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-10.279526 ft	0.880261 ft	-54.928286 psf	1,637.9532 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-7.2652457 ft	-2.6621044 ft	166.11531 psf	2,120.1596 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-3.0106309 ft	-7.6621044 ft	478.11531 psf	2,775.8514 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-0.49492095 ft	-10.618553 ft	662.59771 psf	3,019.1545 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	2.51571 ft	-13.624931 ft	850.19572 psf	3,503.1994 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	7.0741609 ft	-18.006378 ft	1,123.598 psf	3,932.5411 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	9.9745459 ft	-20.794142 ft	1,297.5545 psf	4,176.9676 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	13.284833 ft	-23.257888 ft	1,451.2922 psf	4,518.5215 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	18.252958 ft	-26.597095 ft	1,659.6587 psf	4,690.3159 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	23.288155 ft	-29.328184 ft	1,830.0787 psf	4,988.5321 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	28.390425 ft	-31.451153 ft	1,962.552 psf	5,027.416 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	33.340567 ft	-32.988236 ft	2,058.466 psf	5,179.1513 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	38.138582 ft	-33.939433 ft	2,117.8207 psf	5,101.9257 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	42.903193 ft	-34.347803 ft	2,143.3029 psf	5,146.023 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	47.634397 ft	-34.213344 ft	2,134.9127 psf	4,949.328 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	50.07463 ft	-34.143994 ft	2,130.5852 psf	4,847.8778 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	52.557475 ft	-33.533649 ft	2,092.4997 psf	4,860.3395 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	57.373905 ft	-32.317202 ft	2,016.5934 psf	4,534.6916 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	61.414457 ft	-30.963927 ft	1,932.149 psf	4,379.0801 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	64.679133 ft	-29.473824 ft	1,839.1666 psf	4,078.5383 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	67.905735 ft	-27.702289 ft	1,728.6228 psf	3,885.1001 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	72.092101 ft	-25.006854 ft	1,560.4277 psf	3,507.059 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	77.276303 ft	-21.668951 ft	1,352.1426 psf	3,118.3155 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	80.688147 ft	-19.4722 ft	1,215.0653 psf	2,889.1268 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	84.61756 ft	-16.735518 ft	1,044.2963 psf	2,582.0214 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	90.78112 ft	-12.263318 ft	765.23104 psf	2,022.0525 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	94.02048 ft	-9.862543 ft	615.42268 psf	1,628.3263 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	97.29889 ft	-7.423098 ft	463.20132 psf	1,307.564 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	102.04648 ft	-3.8408325 ft	239.66795 psf	847.81316 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	105.35578 ft	-1.2802775 ft	79.889316 psf	508.62213 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Spencer's Qcase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,376
Date: 04/13/2022
Time: 08:21:45 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 04/13/2022
Last Solved Time: 08:22:24 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: Yes
- Optimizations Settings
  - Maximum Iterations: 3,000
  - Convergence Tolerance: 1e-07
  - Starting Points: 8
  - Ending Points: 16
  - Complete Passes per Insertion: 1
  - Driving Side Maximum Convex Angle: 8 °
  - Resisting Side Maximum Convex Angle: 3 °
- Tension Crack Option: Tension Crack Line
  - Filled with water (0 to 1): 1
  - Tension Crack Fluid Unit Weight: 62.4 pcf

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01
- Solution Settings
  - Search Method: Root Finder
  - Tolerable difference between starting and converged F of S: 3
  - Maximum iterations to calculate converged lambda: 20
  - Max Absolute Lambda: 2

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.96957, 14.17681) ft
Left-Zone Right Coordinate: (36.96229, 10.845903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.95864, 9.180453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Tension Crack Line

	X	Y
Coordinate 1	-23.5 ft	5.5 ft
Coordinate 2	-4.6 ft	12.4 ft
Coordinate 3	5.4 ft	12.4 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 21223 of 26692 converged

Current Slip Surface

Slip Surface: 26,692
Factor of Safety: 1.68
Volume: 1,318.3912 ft³
Weight: 156,361.28 lbf
Resisting Moment: 2,422,369.6 lbf·ft
Activating Moment: 1,437,940.7 lbf·ft
Resisting Force: 49,305.874 lbf
Activating Force: 29,343.483 lbf
Slip Rank: 1 of 26,692 slip surfaces
Exit: (72.152346, 0) ft
Entry: (-5.7158369, 11.992631) ft
Radius: 35.281258 ft
Center: (20, 35) ft

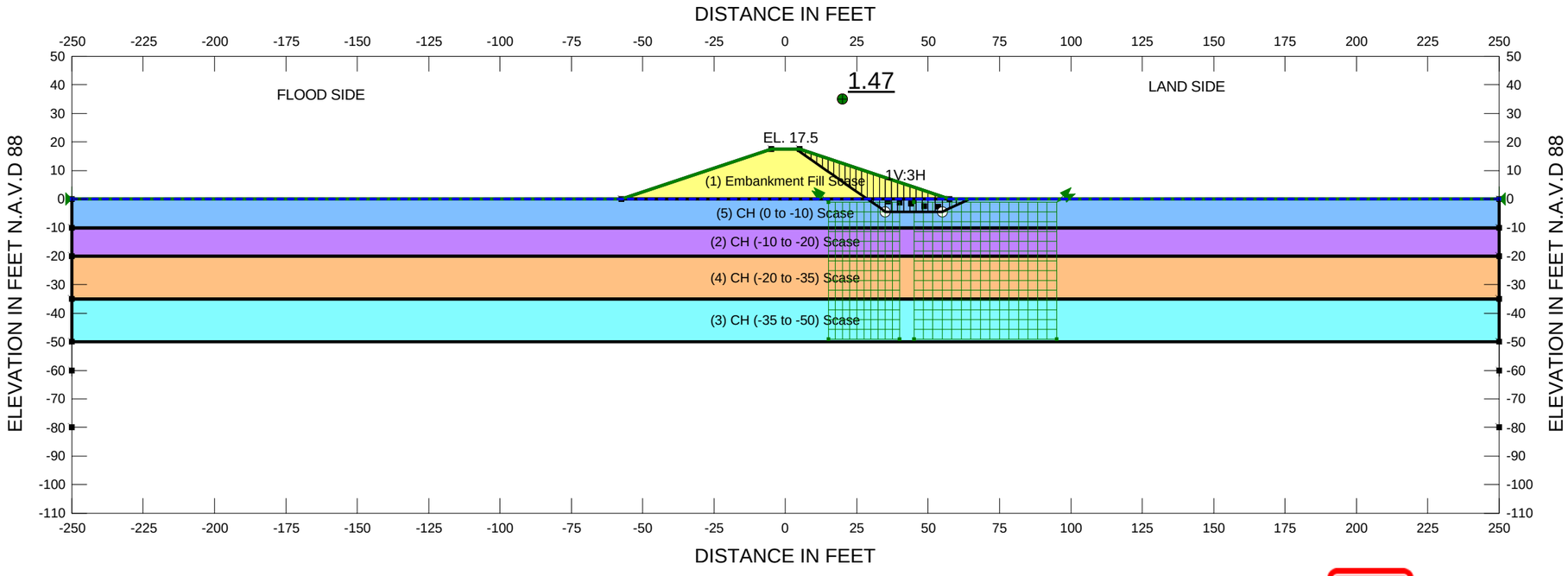
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-5.3579184 ft	11.722096 ft	-731.45876 psf	246.74595 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-4.580945 ft	11.134814 ft	-694.81239 psf	872.26309 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-3.095325 ft	9.786682 ft	-610.68896 psf	915.09138 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-0.962195 ft	7.72391 ft	-481.97198 psf	1,119.4434 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	1.3282775 ft	5.5891879 ft	-348.76533 psf	1,363.6509 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	3.7760925 ft	3.3825158 ft	-211.06899 psf	1,584.3277 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 7	6.2641231 ft	1.1395899 ft	-71.110409 psf	1,766.4908 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 8	7.7063881 ft	-0.1605925 ft	10.020972 psf	1,834.6667 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	9.014435 ft	-1.1308582 ft	70.56555 psf	2,011.0314 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 10	11.274245 ft	-2.7502045 ft	171.61276 psf	2,114.4893 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 11	13.534055 ft	-4.3695508 ft	272.65997 psf	2,217.9472 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 12	15.875118 ft	-5.6417147 ft	352.043 psf	2,518.575 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 13	18.297435 ft	-6.566696 ft	409.76183 psf	2,539.9822 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 14	20.719752 ft	-7.4916773 ft	467.48067 psf	2,561.3894 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 15	23.0925 ft	-8.2158337 ft	512.66802 psf	2,682.6651 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 16	25.41568 ft	-8.739165 ft	545.3239 psf	2,659.8802 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 17	27.73886 ft	-9.2624963 ft	577.97977 psf	2,637.0953 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 18	30.091985 ft	-9.6425635 ft	601.69596 psf	2,696.5513 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 19	32.475055 ft	-9.8793665 ft	616.47247 psf	2,635.8049 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 20	35.035601 ft	-9.997864 ft	623.86671 psf	2,633.8065 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 21	37.773623 ft	-9.998056 ft	623.87869 psf	2,528.8742 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 22	40.511645 ft	-9.998248 ft	623.89068 psf	2,423.9419 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 23	43.249667 ft	-9.99844 ft	623.90266 psf	2,319.0096 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 24	45.987689 ft	-9.998632 ft	623.91464 psf	2,214.0773 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 25	48.44427 ft	-9.92244 ft	619.16026 psf	2,162.3822 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 26	50.58064 ft	-9.7192735 ft	606.48267 psf	2,091.3067 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	53.093695 ft	-9.2743417 ft	578.71893 psf	2,006.4328 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	56.022205 ft	-8.6382353 ft	539.02588 psf	1,807.4698 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	58.977018 ft	-7.717985 ft	481.60226 psf	1,699.2461 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	61.958132 ft	-6.513591 ft	406.44808 psf	1,415.3378 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	65.372915 ft	-4.756333 ft	296.79518 psf	1,160.3326 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	68.39857 ft	-2.7843037 ft	173.74055 psf	839.47726 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	70.826173 ft	-0.98366773 ft	61.380867 psf	534.54943 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Slidell East/Northeast

Spencer's Scase

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Slidell East/Northeast 2032 Spencer's Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,379
Date: 01/26/2022
Time: 03:40:59 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/26/2022
Last Solved Time: 03:41:40 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (15, -1) ft
Lower Left: (15, -49) ft
Lower Right: (40, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, -1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39469 of 39600 converged

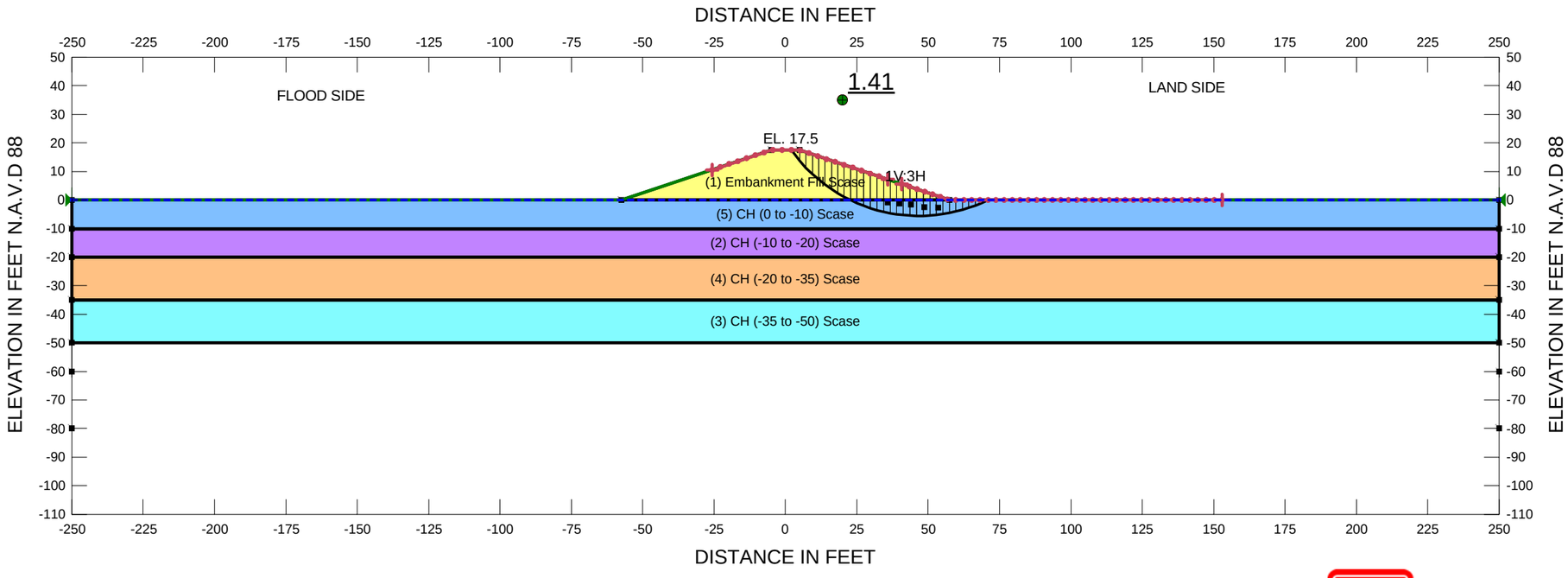
Current Slip Surface

Slip Surface: 4,736
Factor of Safety: 1.47
Volume: 387.34695 ft³
Weight: 45,780.953 lbf
Resisting Moment: 533,353.5 lbf·ft
Activating Moment: 363,576.64 lbf·ft
Resisting Force: 14,920.117 lbf
Activating Force: 10,159.054 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (64.497102, 0) ft
Entry: (3.6827544, 17.5) ft
Radius: 31.62282 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	4.3413772 ft	17.038827 ft	-1,063.2228 psf	40.171242 psf	17.051681 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	5.9864727 ft	15.886919 ft	-991.34375 psf	111.8674 psf	47.484895 psf	0 psf	0 psf	(1) Embankment

								Fill Scase
Slice 3	7.9594181 ft	14.505448 ft	-905.13995 psf	174.91724 psf	74.247962 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	9.9323634 ft	13.123977 ft	-818.93614 psf	237.96707 psf	101.01103 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	11.905309 ft	11.742505 ft	-732.73234 psf	301.01691 psf	127.7741 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	13.878254 ft	10.361034 ft	-646.52853 psf	364.06675 psf	154.53717 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	15.8512 ft	8.979563 ft	-560.32473 psf	427.11658 psf	181.30023 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	17.824145 ft	7.5980917 ft	-474.12092 psf	490.16642 psf	208.0633 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	19.79709 ft	6.2166205 ft	-387.91712 psf	553.21625 psf	234.82637 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	21.770036 ft	4.8351493 ft	-301.71332 psf	616.26609 psf	261.58944 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	23.742981 ft	3.4536781 ft	-215.50951 psf	679.31593 psf	288.3525 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 12	25.715926 ft	2.0722068 ft	-129.30571 psf	742.36576 psf	315.11557 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 13	27.688872 ft	0.69073561 ft	-43.101902 psf	805.4156 psf	341.87864 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 14	29.729454 ft	-0.73809524 ft	46.057143 psf	880.27671 psf	354.1052 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	31.837672 ft	-2.2142857 ft	138.17143 psf	966.9491 psf	351.79525 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	33.945891 ft	-3.6904762 ft	230.28571 psf	1,053.6215 psf	349.4853 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	36.071429 ft	-4.4285714 ft	276.34286 psf	1,475.5692 psf	509.04139 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	38.214286 ft	-4.4285714 ft	276.34286 psf	1,385.9071 psf	470.9821 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	40.357143 ft	-4.4285714 ft	276.34286 psf	1,296.2451 psf	432.9228 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	42.5 ft	-4.4285714 ft	276.34286 psf	1,206.583 psf	394.86351 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	44.642857 ft	-4.4285714 ft	276.34286 psf	1,116.9209 psf	356.80422 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	46.785714 ft	-4.4285714 ft	276.34286 psf	1,027.2588 psf	318.74492 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	48.928571 ft	-4.4285714 ft	276.34286 psf	937.59676 psf	280.68563 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	51.25 ft	-4.4285714 ft	276.34286 psf	840.46285 psf	239.45473 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	53.75 ft	-4.4285714 ft	276.34286 psf	735.85709 psf	195.05222 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	56.25 ft	-3.8456869 ft	239.97086 psf	733.25855 psf	209.3882 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	58.666184 ft	-2.7190019 ft	169.66572 psf	466.36333 psf	125.94066 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	60.998551 ft	-1.6314011 ft	101.79943 psf	279.818 psf	75.564398 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	63.330918 ft	-0.54380038 ft	33.933144 psf	93.272666 psf	25.188133 psf	0 psf	0 psf	(5) CH (0 to -10) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Slidell East/Northeast 2032 Spencer's Scase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,379
Date: 01/26/2022
Time: 03:40:59 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 01/26/2022
Last Solved Time: 03:41:22 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 12 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-25.76957, 10.57681) ft
Left-Zone Right Coordinate: (35.76229, 7.245903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (40.75864, 5.580453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 13699 of 26691 converged

Current Slip Surface

Slip Surface: 11,795
Factor of Safety: 1.41
Volume: 539.34938 ft³
Weight: 63,820.013 lbf
Resisting Moment: 769,237.41 lbf·ft
Activating Moment: 546,861.04 lbf·ft
Resisting Force: 20,494.003 lbf
Activating Force: 14,512.87 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (70.968466, 0) ft
Entry: (2.0506584, 17.5) ft
Radius: 55.12447 ft
Center: (20, 35) ft

Slip Slices

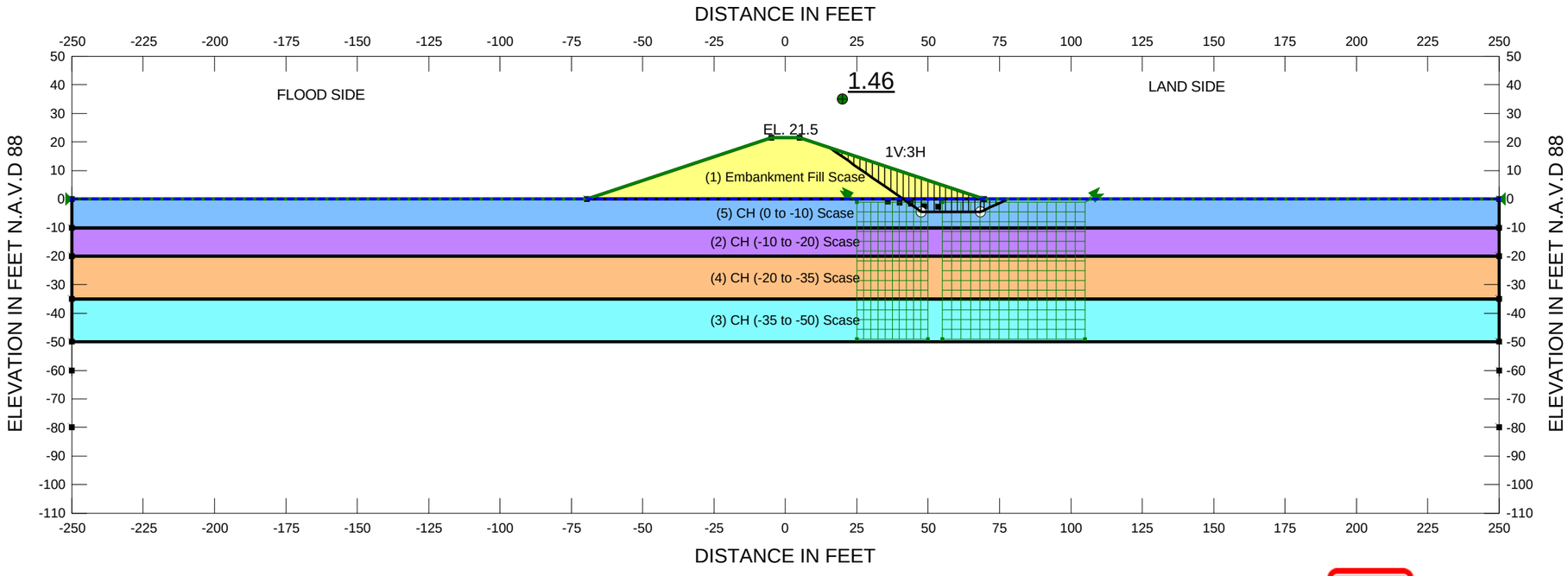
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	3.5253292 ft	15.617696 ft	-974.54424 psf	132.37923 psf	56.191648 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	6.1116936 ft	12.51282 ft	-780.79998 psf	344.92954 psf	146.41391 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	8.3350808 ft	10.202178 ft	-636.61593 psf	483.10961 psf	205.06786 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	10.558468 ft	8.1398299 ft	-507.92538 psf	609.83458 psf	258.85942 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	12.781855 ft	6.2899973 ft	-392.49583 psf	725.31869 psf	307.87952 psf	0 psf	0 psf	(1) Embankment Fill Scase

Slice 6	15.005242 ft	4.6262742 ft	-288.67951 psf	829.77766 psf	352.21972 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	17.228629 ft	3.1285562 ft	-195.22191 psf	923.40165 psf	391.96074 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	19.452017 ft	1.7811687 ft	-111.14492 psf	1,006.3427 psf	427.16712 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	21.675404 ft	0.57166487 ft	-35.671888 psf	1,078.7086 psf	457.88463 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	23.944194 ft	-0.52954923 ft	33.043872 psf	1,147.7122 psf	473.14864 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 11	26.258388 ft	-1.5259295 ft	95.218002 psf	1,211.3624 psf	473.77517 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	28.572581 ft	-2.4002269 ft	149.77416 psf	1,261.165 psf	471.75744 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	30.886775 ft	-3.1585286 ft	197.09218 psf	1,297.2685 psf	466.99713 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	33.200968 ft	-3.8057891 ft	237.48124 psf	1,319.7185 psf	459.38247 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	35.515162 ft	-4.3460155 ft	271.19137 psf	1,328.4608 psf	448.78427 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	37.829355 ft	-4.7824054 ft	298.4221 psf	1,323.3398 psf	435.05177 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	40.143549 ft	-5.1174487 ft	319.3288 psf	1,304.0938 psf	418.00794 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	42.457742 ft	-5.3530034 ft	334.02741 psf	1,270.3466 psf	397.4439 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	44.771936 ft	-5.4903483 ft	342.59774 psf	1,221.595 psf	373.11219 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	47.086129 ft	-5.5302191 ft	345.08567 psf	1,157.1909 psf	344.71822 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	49.400323 ft	-5.4728278 ft	341.50445 psf	1,076.3172 psf	311.90952 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	51.714516 ft	-5.3178689 ft	331.83502 psf	977.95516 psf	274.26173 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	54.02871 ft	-5.0645109 ft	316.02548 psf	860.84044 psf	231.26023 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	56.342903 ft	-4.7113738 ft	293.98972 psf	723.40418 psf	182.27562 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	58.622372 ft	-4.2648496 ft	266.12662 psf	620.34832 psf	150.35819 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	60.867117 ft	-3.7255041 ft	232.47146 psf	555.36925 psf	137.06198 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	63.111861 ft	-3.0849996 ft	192.50398 psf	472.14798 psf	118.70184 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	65.356605 ft	-2.3395847 ft	145.99008 psf	368.38176 psf	94.399667 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	67.60135 ft	-1.4846546 ft	92.642449 psf	241.11077 psf	63.021063 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	69.846094 ft	-0.5145888 ft	32.110341 psf	86.459724 psf	23.069944 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

Slidell East/Northeast

Spencer's Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Slidell East/Northeast 2082 Spencer's Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,381
Date: 06/30/2022
Time: 10:35:35 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 06/30/2022
Last Solved Time: 10:36:32 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (25, -1) ft
Lower Left: (25, -49) ft
Lower Right: (50, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (55, -1) ft
Lower Left: (55, -49) ft
Lower Right: (105, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39438 of 39600 converged

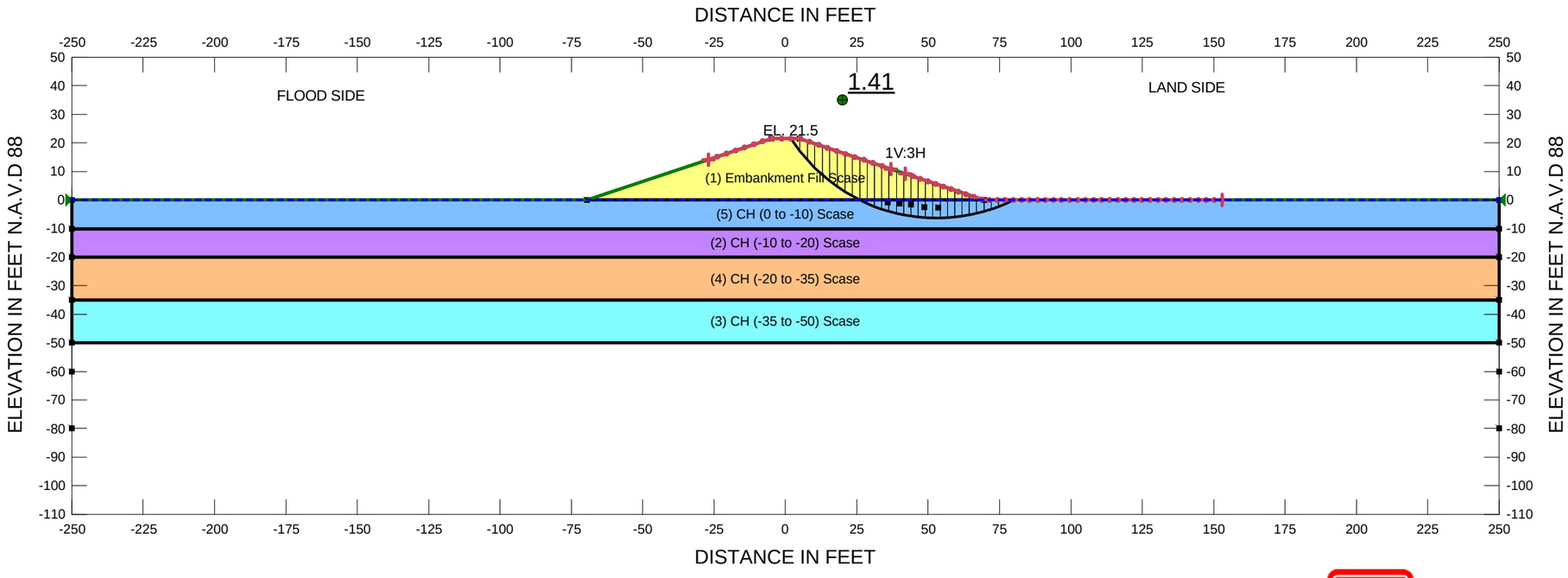
Current Slip Surface

Slip Surface: 4,981
Factor of Safety: 1.46
Volume: 382.49988 ft³
Weight: 45,260.445 lbf
Resisting Moment: 468,240.05 lbf·ft
Activating Moment: 319,673.65 lbf·ft
Resisting Force: 14,598.654 lbf
Activating Force: 10,013.678 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (77.830435, 0) ft
Entry: (15.440224, 18.019925) ft
Radius: 32.469541 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	16.512521 ft	17.269095 ft	-1,077.5915 psf	34.488175 psf	14.639362 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	18.657114 ft	15.767435 ft	-983.88792 psf	103.46453 psf	43.918086 psf	0 psf	0 psf	(1) Embankment

								Fill Scase
Slice 3	20.801708 ft	14.265774 ft	-890.18431 psf	172.44088 psf	73.19681 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	22.946301 ft	12.764114 ft	-796.4807 psf	241.41723 psf	102.47553 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	25.090894 ft	11.262453 ft	-702.77709 psf	310.39358 psf	131.75426 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	27.235488 ft	9.7607929 ft	-609.07347 psf	379.36993 psf	161.03298 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	29.380081 ft	8.2591324 ft	-515.36986 psf	448.34628 psf	190.31171 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	31.524674 ft	6.757472 ft	-421.66625 psf	517.32263 psf	219.59043 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	33.669268 ft	5.2558115 ft	-327.96264 psf	586.29898 psf	248.86915 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	35.813861 ft	3.7541511 ft	-234.25903 psf	655.27533 psf	278.14788 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	37.958454 ft	2.2524907 ft	-140.55542 psf	724.25168 psf	307.4266 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 12	40.103048 ft	0.75083022 ft	-46.851806 psf	793.22804 psf	336.70532 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 13	42.229454 ft	-0.73809524 ft	46.057143 psf	871.60926 psf	350.42608 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	44.337672 ft	-2.2142857 ft	138.17143 psf	959.39535 psf	348.58887 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	46.445891 ft	-3.6904762 ft	230.28571 psf	1,047.1814 psf	346.75166 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	48.75 ft	-4.4285714 ft	276.34286 psf	1,439.9672 psf	493.92924 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	51.018519 ft	-4.4285714 ft	276.34286 psf	1,345.6316 psf	453.88616 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	53.055556 ft	-4.4285714 ft	276.34286 psf	1,260.9221 psf	417.9291 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	55.092593 ft	-4.4285714 ft	276.34286 psf	1,176.2126 psf	381.97204 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	57.12963 ft	-4.4285714 ft	276.34286 psf	1,091.5031 psf	346.01499 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	59.166667 ft	-4.4285714 ft	276.34286 psf	1,006.7936 psf	310.05793 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	61.203704 ft	-4.4285714 ft	276.34286 psf	922.08404 psf	274.10087 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	63.240741 ft	-4.4285714 ft	276.34286 psf	837.37452 psf	238.14381 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	65.277778 ft	-4.4285714 ft	276.34286 psf	752.66501 psf	202.18676 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	67.314815 ft	-4.4285714 ft	276.34286 psf	667.95549 psf	166.2297 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	68.916667 ft	-4.1565586 ft	259.36926 psf	734.30212 psf	201.59704 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	70.541304 ft	-3.3989776 ft	212.0962 psf	572.88957 psf	153.1477 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	72.623913 ft	-2.4278411 ft	151.49729 psf	409.20684 psf	109.39121 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	74.706522 ft	-1.4567047 ft	90.898372 psf	245.5241 psf	65.634728 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	76.789131 ft	-0.48556823 ft	30.299457 psf	81.841367 psf	21.878243 psf	0 psf	0 psf	(5) CH (0 to -10) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Slidell East/Northeast 2082 Spencer's Scase

CASE: Low Water (LW) Circular

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,381
Date: 06/30/2022
Time: 10:35:35 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082 - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 06/30/2022
Last Solved Time: 10:36:04 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-26.96957, 14.17681) ft
Left-Zone Right Coordinate: (36.96229, 10.845903) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (41.95864, 9.180453) ft
Right-Zone Right Coordinate: (153, 0) ft
Right-Zone Increment: 40
Radius Increments: 30

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 13186 of 26691 converged

Current Slip Surface

Slip Surface: 11,889
Factor of Safety: 1.41
Volume: 773.54524 ft³
Weight: 91,226.521 lbf
Resisting Moment: 1,117,295.9 lbf·ft
Activating Moment: 793,037.88 lbf·ft
Resisting Force: 30,017.463 lbf
Activating Force: 21,169.092 lbf
Slip Rank: 1 of 26,691 slip surfaces
Exit: (79.854757, 0) ft
Entry: (1.9241673, 21.5) ft
Radius: 60.77755 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	3.4620837 ft	19.335402 ft	-1,206.5291 psf	143.04782 psf	60.720198 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	6.3166268 ft	15.592513 ft	-972.9728 psf	389.1302 psf	165.17597 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	8.9498805 ft	12.630381 ft	-788.13575 psf	568.05969 psf	241.12703 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	11.583134 ft	10.021794 ft	-625.35996 psf	732.21154 psf	310.80536 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	14.216388 ft	7.7069758 ft	-480.91529 psf	881.77366 psf	374.29071 psf	0 psf	0 psf	(1) Embankment Fill Scase

Slice 6	16.849641 ft	5.6438167 ft	-352.17416 psf	1,017.0527 psf	431.71327 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	19.482895 ft	3.8013872 ft	-237.20656 psf	1,138.3573 psf	483.20399 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	22.116149 ft	2.1562513 ft	-134.55008 psf	1,245.9502 psf	528.87447 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	24.749402 ft	0.69022981 ft	-43.07034 psf	1,340.0292 psf	568.80864 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	27.343499 ft	-0.59394691 ft	37.062287 psf	1,426.4743 psf	589.77041 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 11	29.898438 ft	-1.7119681 ft	106.82681 psf	1,503.9029 psf	593.0236 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	32.453378 ft	-2.6940552 ft	168.10904 psf	1,566.0733 psf	593.40063 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	35.008317 ft	-3.5471254 ft	221.34063 psf	1,613.1787 psf	590.8002 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	37.563257 ft	-4.2768096 ft	266.87292 psf	1,645.2955 psf	585.10569 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	40.118196 ft	-4.8876657 ft	304.99034 psf	1,662.3886 psf	576.18138 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	42.673136 ft	-5.3833377 ft	335.92027 psf	1,664.3105 psf	563.86822 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	45.228075 ft	-5.7666729 ft	359.84039 psf	1,650.7979 psf	547.97897 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	47.783015 ft	-6.0398093 ft	376.8841 psf	1,621.4628 psf	528.29233 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	50.337954 ft	-6.204237 ft	387.14439 psf	1,575.7792 psf	504.54555 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	52.892894 ft	-6.2608402 ft	390.67643 psf	1,513.0637 psf	476.42512 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	55.447833 ft	-6.2099209 ft	387.49906 psf	1,432.4486 psf	443.55477 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	58.002772 ft	-6.0512074 ft	377.59534 psf	1,332.8456 psf	405.47969 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	60.557712 ft	-5.7838468 ft	360.91204 psf	1,212.8957 psf	361.64559 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	63.112651 ft	-5.4063819 ft	337.35823 psf	1,070.9009 psf	311.3704 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	65.667591 ft	-4.9167104 ft	306.80273 psf	904.73072 psf	253.80537 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	68.22253 ft	-4.3120242 ft	269.07031 psf	711.68945 psf	187.88068 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	70.794345 ft	-3.5831343 ft	223.58758 psf	553.97299 psf	140.24028 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	73.383034 ft	-2.7238254 ft	169.96671 psf	434.6785 psf	112.36349 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	75.971723 ft	-1.732272 ft	108.09378 psf	286.2543 psf	75.624656 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	78.560413 ft	-0.60131591 ft	37.522112 psf	103.30057 psf	27.921299 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

SECTION 5

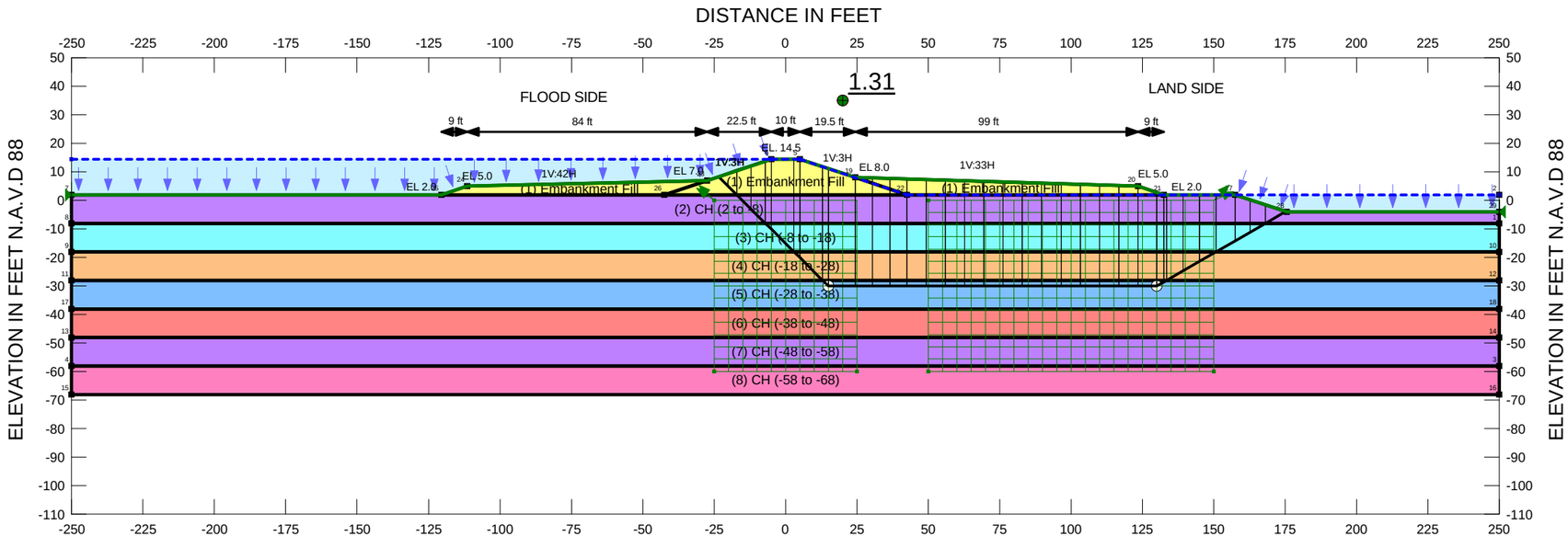
Stability Results

Janbu Analysis

West Slidell Levee

Janbu Q case

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Janbu Q case

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,432
Date: 06/30/2022
Time: 03:11:23 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 06/30/2022
Last Solved Time: 03:11:44 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-25, 0) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	14.5 ft
Coordinate 2	-5 ft	14.5 ft
Coordinate 3	5 ft	14.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

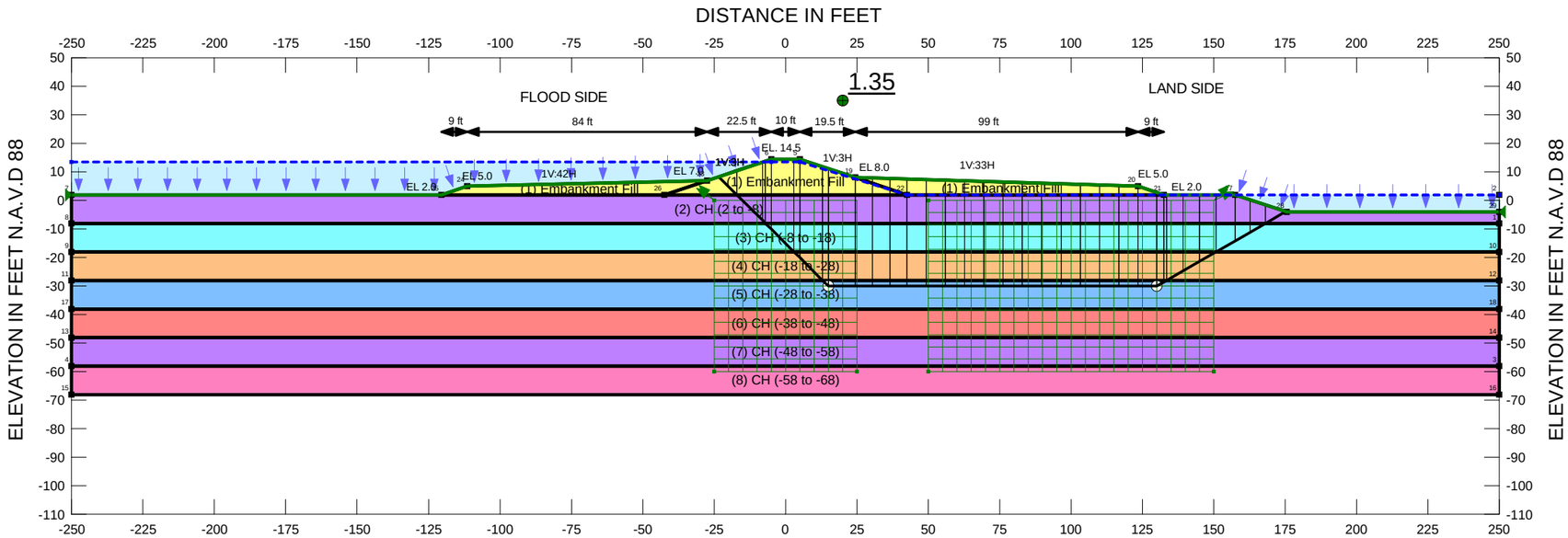
Slip Surfaces Analysed: 51539 of 51975 converged

Current Slip Surface

Slip Surface: 26,857
Factor of Safety: 1.31
Volume: 5,913.8789 ft³
Weight: 602,864.46 lbf
Resisting Force: 51,962.606 lbf
Activating Force: 39,589.409 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (175.20414, -3.9013791) ft
Entry: (-23.375, 8.375) ft
Radius: 80.419951 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-20.1875 ft	5.1875 ft	581.1 psf	349.8565 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.5 ft	-0.5 ft	936 psf	1,344.3355 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-9.5 ft	-5.5 ft	1,248 psf	1,882.0022 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	-6 ft	-9 ft	1,466.4 psf	2,268.3688 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-1 ft	-14 ft	1,778.4 psf	2,785.9022 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	4 ft	-19 ft	2,090.4 psf	3,258.0027 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 7	9 ft	-24 ft	2,319.2 psf	3,654.6694 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 8	14 ft	-29 ft	2,527.2 psf	4,005.5744 psf	0 psf	259.8 psf	0 psf	(5) CH (-28 to -38)
Slice 9	19.75 ft	-30 ft	2,470 psf	4,092.0833 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 10	27.5 ft	-30 ft	2,308.8 psf	3,899.5455 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 11	33.5 ft	-30 ft	2,184 psf	3,878.6364 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 12	39.5 ft	-30 ft	2,059.2 psf	3,857.7273 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 13	45.875 ft	-30 ft	1,996.8 psf	3,835.5114 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 14	52.625 ft	-30 ft	1,996.8 psf	3,811.9886 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 15	59.375 ft	-30 ft	1,996.8 psf	3,788.4659 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 16	66.125 ft	-30 ft	1,996.8 psf	3,764.9432 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 17	72.875 ft	-30 ft	1,996.8 psf	3,741.4205 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 18	79.625 ft	-30 ft	1,996.8 psf	3,717.8977 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 19	86.375 ft	-30 ft	1,996.8 psf	3,694.375 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 20	93.125 ft	-30 ft	1,996.8 psf	3,670.8523 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 21	99.875 ft	-30 ft	1,996.8 psf	3,647.3295 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 22	106.625 ft	-30 ft	1,996.8 psf	3,623.8068 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 23	113.375 ft	-30 ft	1,996.8 psf	3,600.2841 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 24	120.125 ft	-30 ft	1,996.8 psf	3,576.7614 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 25	126.75 ft	-30 ft	1,996.8 psf	3,440.4167 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 26	131.25 ft	-29.278312 ft	1,951.7667 psf	3,303.4196 psf	0 psf	262.52746 psf	0 psf	(5) CH (-28 to -38)
Slice 27	132.98205 ft	-28.278312 ft	1,889.3667 psf	3,141.2143 psf	0 psf	252.72746 psf	0 psf	(5) CH (-28 to -38)
Slice 28	136.35085 ft	-26.333333 ft	1,768 psf	2,926.073 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 29	142.12436 ft	-23 ft	1,560 psf	2,559.4063 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 30	147.89786 ft	-19.666667 ft	1,352 psf	2,192.7396 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 31	154.1423 ft	-16.061434 ft	1,127.0335 psf	1,793.6684 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 32	160.15128 ft	-12.592151 ft	910.5502 psf	1,422.3483 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 33	165.45384 ft	-9.5307169 ft	719.51673 psf	1,067.4214 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 34	171.65463 ft	-5.9506896 ft	496.12303 psf	672.86454 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Janbu Q case

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,432
Date: 06/30/2022
Time: 03:11:23 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 06/30/2022
Last Solved Time: 03:11:54 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-25, 0) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	13.5 ft
Coordinate 2	-5 ft	13.5 ft
Coordinate 3	5 ft	13.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

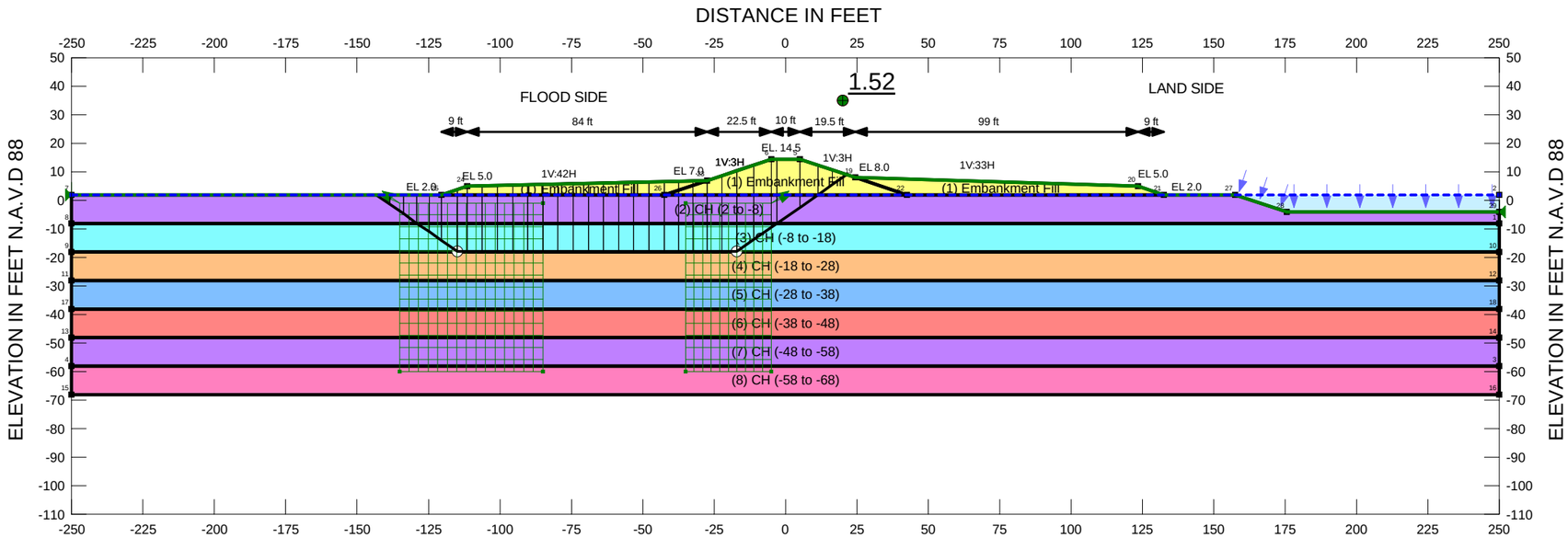
Slip Surfaces Analysed: 51539 of 51975 converged

Current Slip Surface

Slip Surface: 26,857
Factor of Safety: 1.35
Volume: 5,913.8789 ft³
Weight: 602,864.46 lbf
Resisting Force: 51,962.606 lbf
Activating Force: 38,486.535 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (175.20414, -3.9013791) ft
Entry: (-23.375, 8.375) ft
Radius: 80.419951 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-20.1875 ft	5.1875 ft	518.7 psf	300.16589 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-12.5 ft	-2.5 ft	998.4 psf	1,501.2386 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-7.5 ft	-7.5 ft	1,310.4 psf	2,049.3053 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	-6 ft	-9 ft	1,404 psf	2,251.8053 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-1 ft	-14 ft	1,716 psf	2,790.1386 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	4 ft	-19 ft	2,028 psf	3,263.2983 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 7	9 ft	-24 ft	2,263.456 psf	3,659.965 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 8	14 ft	-29 ft	2,479.776 psf	4,011.0776 psf	0 psf	259.8 psf	0 psf	(5) CH (-28 to -38)
Slice 9	19.75 ft	-30 ft	2,432.144 psf	4,092.0833 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 10	27.5 ft	-30 ft	2,283.84 psf	3,899.5455 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 11	33.5 ft	-30 ft	2,169.024 psf	3,878.6364 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 12	39.5 ft	-30 ft	2,054.208 psf	3,857.7273 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 13	45.875 ft	-30 ft	1,996.8 psf	3,835.5114 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 14	52.625 ft	-30 ft	1,996.8 psf	3,811.9886 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 15	59.375 ft	-30 ft	1,996.8 psf	3,788.4659 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 16	66.125 ft	-30 ft	1,996.8 psf	3,764.9432 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 17	72.875 ft	-30 ft	1,996.8 psf	3,741.4205 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 18	79.625 ft	-30 ft	1,996.8 psf	3,717.8977 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 19	86.375 ft	-30 ft	1,996.8 psf	3,694.375 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 20	93.125 ft	-30 ft	1,996.8 psf	3,670.8523 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 21	99.875 ft	-30 ft	1,996.8 psf	3,647.3295 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 22	106.625 ft	-30 ft	1,996.8 psf	3,623.8068 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 23	113.375 ft	-30 ft	1,996.8 psf	3,600.2841 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 24	120.125 ft	-30 ft	1,996.8 psf	3,576.7614 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 25	126.75 ft	-30 ft	1,996.8 psf	3,440.4167 psf	0 psf	269.6 psf	0 psf	(5) CH (-28 to -38)
Slice 26	131.25 ft	-29.278312 ft	1,951.7667 psf	3,300.209 psf	0 psf	262.52746 psf	0 psf	(5) CH (-28 to -38)
Slice 27	132.98205 ft	-28.278312 ft	1,889.3667 psf	3,138.1235 psf	0 psf	252.72746 psf	0 psf	(5) CH (-28 to -38)
Slice 28	136.35085 ft	-26.333333 ft	1,768 psf	2,923.0156 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 29	142.12436 ft	-23 ft	1,560 psf	2,556.3489 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 30	147.89786 ft	-19.666667 ft	1,352 psf	2,189.6822 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 31	154.1423 ft	-16.061434 ft	1,127.0335 psf	1,791.2225 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 32	160.15128 ft	-12.592151 ft	910.5502 psf	1,419.9024 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 33	165.45384 ft	-9.5307169 ft	719.51673 psf	1,064.9755 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 34	171.65463 ft	-5.9506896 ft	496.12303 psf	670.41861 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Janbu Q case

CASE: Low Water (LW) Block Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,432
Date: 06/30/2022
Time: 03:11:23 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 06/30/2022
Last Solved Time: 03:12:00 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-85, -1) ft
Lower Left: (-85, -60) ft
Lower Right: (-135, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (-35, -1) ft
Lower Left: (-35, -60) ft
Lower Right: (-5, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft

Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

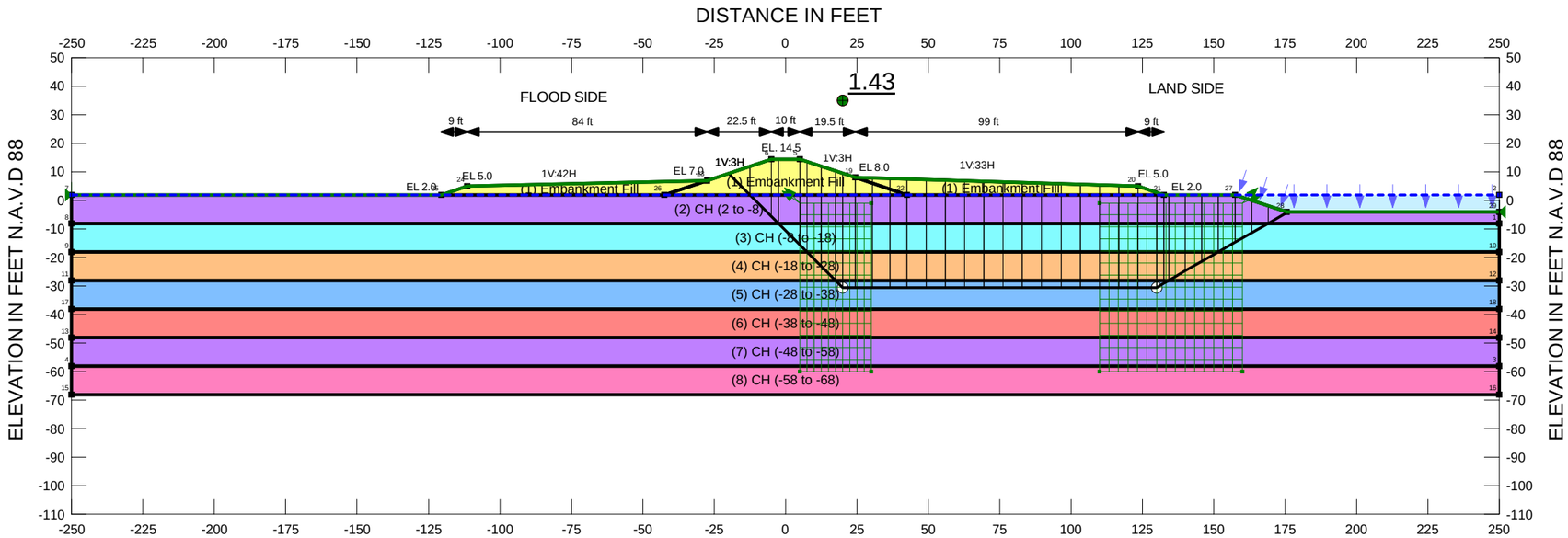
Slip Surfaces Analysed: 23238 of 23760 converged

Current Slip Surface

Slip Surface: 7,248
Factor of Safety: 1.52
Volume: 3,305.3774 ft³
Weight: 328,437.84 lbf
Resisting Force: 36,969.667 lbf
Activating Force: 24,285.631 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-143.35894, 2) ft
Entry: (21.402425, 9.0325249) ft
Radius: 64.632573 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-140.97869 ft	0.33333333 ft	104 psf	241.68098 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 2	-136.2182 ft	-3 ft	312 psf	541.68098 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-131.45771 ft	-6.3333333 ft	520 psf	841.68098 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	-126.93309 ft	-9.5015003 ft	717.69362 psf	1,141.831 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-122.64436 ft	-12.504501 ft	905.08087 psf	1,442.1311 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-117.75 ft	-15.931572 ft	1,118.9301 psf	1,890.2549 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 7	-113.25 ft	-17.857143 ft	1,239.0857 psf	2,163.631 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 8	-108.84615 ft	-17.857143 ft	1,239.0857 psf	2,237.9808 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 9	-103.53846 ft	-17.857143 ft	1,239.0857 psf	2,252.5137 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 10	-98.230769 ft	-17.857143 ft	1,239.0857 psf	2,267.0467 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 11	-92.923077 ft	-17.857143 ft	1,239.0857 psf	2,281.5797 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 12	-87.615385 ft	-17.857143 ft	1,239.0857 psf	2,296.1126 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 13	-82.307692 ft	-17.857143 ft	1,239.0857 psf	2,310.6456 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 14	-77 ft	-17.857143 ft	1,239.0857 psf	2,325.1786 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 15	-71.692308 ft	-17.857143 ft	1,239.0857 psf	2,339.7115 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 16	-66.384615 ft	-17.857143 ft	1,239.0857 psf	2,354.2445 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 17	-61.076923 ft	-17.857143 ft	1,239.0857 psf	2,368.7775 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 18	-55.769231 ft	-17.857143 ft	1,239.0857 psf	2,383.3104 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 19	-50.461538 ft	-17.857143 ft	1,239.0857 psf	2,397.8434 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 20	-45.153846 ft	-17.857143 ft	1,239.0857 psf	2,412.3764 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 21	-40 ft	-17.857143 ft	1,239.0857 psf	2,426.4881 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 22	-35 ft	-17.857143 ft	1,239.0857 psf	2,440.1786 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 23	-30 ft	-17.857143 ft	1,239.0857 psf	2,453.869 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 24	-24.875 ft	-17.857143 ft	1,239.0857 psf	2,561.3393 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 25	-19.625 ft	-17.857143 ft	1,239.0857 psf	2,762.5893 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 26	-14 ft	-15.75652 ft	1,108.0069 psf	2,676.471 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 27	-8 ft	-11.555275 ft	845.84916 psf	2,486.3465 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 28	-3.9612705 ft	-8.7273262 ft	669.38515 psf	2,318.5516 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 29	1.0387295 ft	-5.2262885 ft	450.9204 psf	1,996.185 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 30	8.1794695 ft	-0.22628851 ft	138.9204 psf	1,424.3053 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 31	13.869811 ft	3.7581312 ft	-109.70739 psf	620.26255 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 32	18.891554 ft	7.2743937 ft	-329.12216 psf	23.392219 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		200	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		200	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		250	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2032 Janbu Q case

CASE: Low Water (LW) Block Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,432
Date: 06/30/2022
Time: 03:11:23 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Canal - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 06/30/2022
Last Solved Time: 03:11:50 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (30, -1) ft
Lower Left: (30, -60) ft
Lower Right: (5, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (110, -1) ft
Lower Left: (110, -60) ft
Lower Right: (160, -60) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

Slip Surfaces Analysed: 38581 of 39600 converged

Current Slip Surface

Slip Surface: 19,472
Factor of Safety: 1.43
Volume: 5,816.5413 ft³
Weight: 593,194.89 lbf
Resisting Force: 52,166.07 lbf
Activating Force: 36,408.229 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (175.89935, -4) ft
Entry: (-20, 9.5) ft
Radius: 80.263626 ft
Center: (20, 35) ft

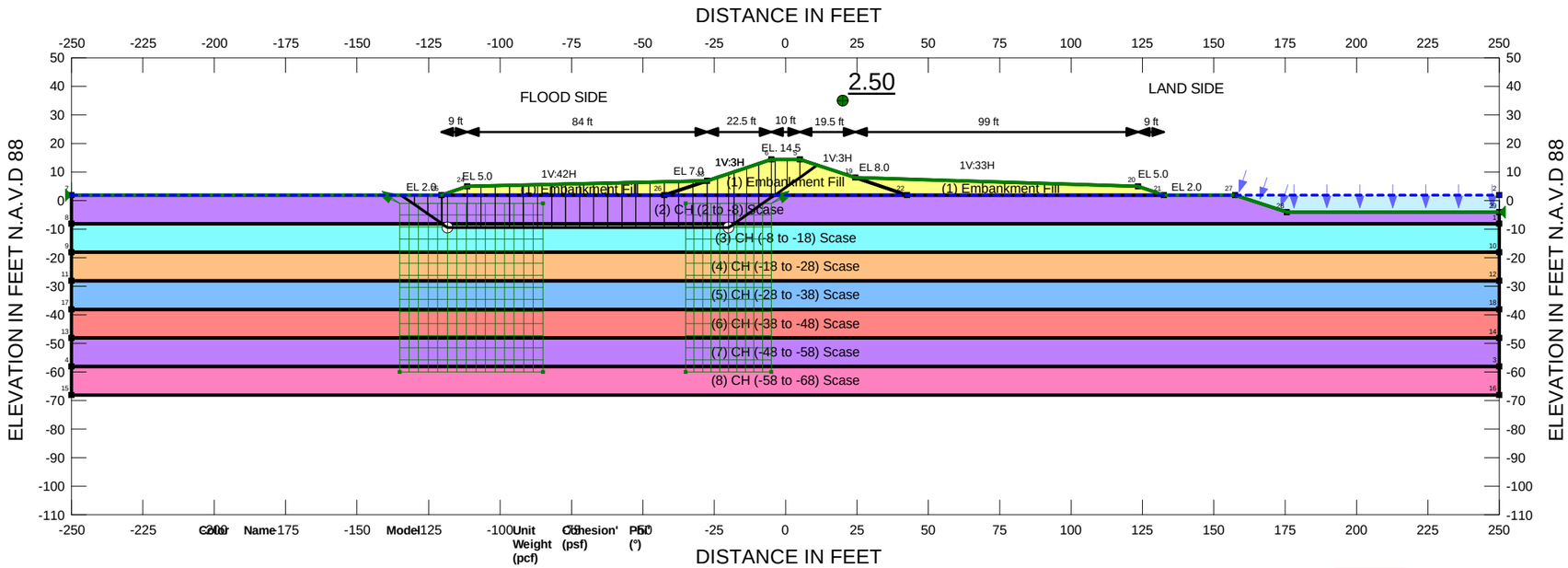
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-16.25 ft	5.75 ft	-234 psf	155.28527 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-8.75 ft	-1.75 ft	234 psf	1,491.3451 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 3	-3.75 ft	-6.75 ft	546 psf	2,085.0951 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 4	1.25 ft	-11.75 ft	858 psf	2,572.5951 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 5	6.25 ft	-16.75 ft	1,170 psf	3,024.6784 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 6	10 ft	-20.5 ft	1,404 psf	3,245.9522 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 7	15 ft	-25.5 ft	1,716 psf	3,604.2855 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 8	18.75 ft	-29.25 ft	1,950 psf	3,864.4664 psf	0 psf	262.25 psf	0 psf	(5) CH (-28 to -38)
Slice 9	22.25 ft	-30.5 ft	2,028 psf	4,051.25 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 10	27.5 ft	-30.5 ft	2,028 psf	3,954.5455 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 11	33.5 ft	-30.5 ft	2,028 psf	3,933.6364 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 12	39.5 ft	-30.5 ft	2,028 psf	3,912.7273 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 13	45.875 ft	-30.5 ft	2,028 psf	3,890.5114 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 14	52.625 ft	-30.5 ft	2,028 psf	3,866.9886 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 15	59.375 ft	-30.5 ft	2,028 psf	3,843.4659 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 16	66.125 ft	-30.5 ft	2,028 psf	3,819.9432 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 17	72.875 ft	-30.5 ft	2,028 psf	3,796.4205 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 18	79.625 ft	-30.5 ft	2,028 psf	3,772.8977 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 19	86.375 ft	-30.5 ft	2,028 psf	3,749.375 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 20	93.125 ft	-30.5 ft	2,028 psf	3,725.8523 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 21	99.875 ft	-30.5 ft	2,028 psf	3,702.3295 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 22	106.625 ft	-30.5 ft	2,028 psf	3,678.8068 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 23	113.375 ft	-30.5 ft	2,028 psf	3,655.2841 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 24	120.125 ft	-30.5 ft	2,028 psf	3,631.7614 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 25	126.75 ft	-30.5 ft	2,028 psf	3,495.4167 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 26	131.25 ft	-29.778312 ft	1,982.9667 psf	3,351.5371 psf	0 psf	267.42746 psf	0 psf	(5) CH (-28 to -38)
Slice 27	133.41506 ft	-28.528312 ft	1,904.9667 psf	3,161.173 psf	0 psf	255.17746 psf	0 psf	(5) CH (-28 to -38)
Slice 28	137.21688 ft	-26.333333 ft	1,768 psf	2,917.6343 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 29	142.99038 ft	-23 ft	1,560 psf	2,550.9677 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 30	148.76388 ft	-19.666667 ft	1,352 psf	2,184.301 psf	0 psf	250 psf	0 psf	(4) CH (-18 to -28)
Slice 31	154.57532 ft	-16.311434 ft	1,142.6335 psf	1,811.9175 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 32	160.36779 ft	-12.967151 ft	933.9502 psf	1,451.1056 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 33	166.10336 ft	-9.6557169 ft	727.31673 psf	1,067.1949 psf	0 psf	200 psf	0 psf	(3) CH (-8 to -18)
Slice 34	172.23557 ft	-6.1152814 ft	506.39356 psf	675.5822 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)
Slice 35	175.69967 ft	-4.1152814 ft	381.59356 psf	465.54946 psf	0 psf	200 psf	0 psf	(2) CH (2 to -8)

West Slidell Levees

Janbu Scase

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2032 Janbu S case

CASE: Low Water (LW) Block Floodd Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,442
Date: 06/30/2022
Time: 03:18:36 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Janbu - Scase - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °

Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-85, -1) ft
Lower Left: (-85, -60) ft
Lower Right: (-135, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (-35, -1) ft
Lower Left: (-35, -60) ft
Lower Right: (-5, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

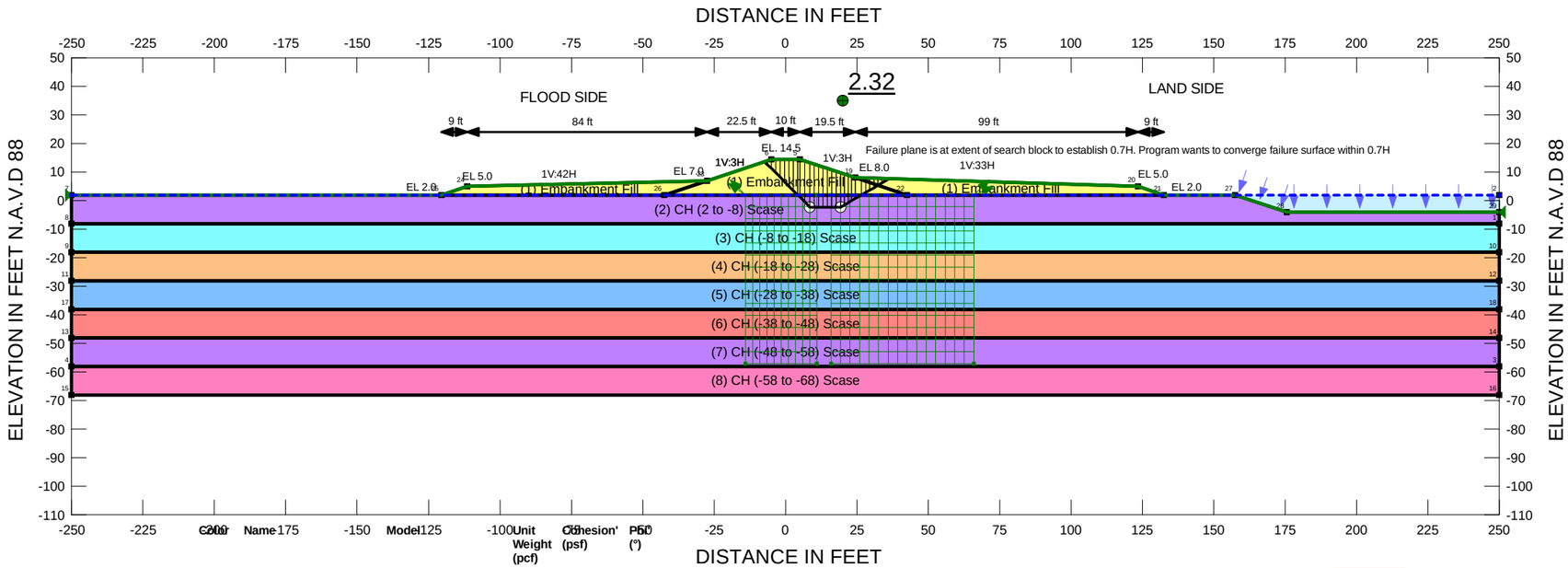
Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²

Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2032 Janbu S case

CASE: Low Water (LW) Block Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,442
Date: 06/30/2022
Time: 03:18:36 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, Lacombe. Bonfouca - 13965 - Janbu - Scase - Canal.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\Canal\
Last Solved Date: 06/30/2022
Last Solved Time: 03:18:50 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (11, 2) ft
Lower Left: (11, -57) ft
Lower Right: (-14, -57) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (16, 2) ft
Lower Left: (16, -57) ft
Lower Right: (66, -57) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	14.5 ft
Point 6	-5 ft	14.5 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	24.5 ft	8 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	2 ft
Point 22	42.5 ft	2 ft
Point 23	-27.5 ft	7 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	2 ft
Point 26	-42.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	593.75 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	405 ft²
Region 10	(1) Embankment Fill	23,24,25,26	312 ft²

Slip Results

Slip Surfaces Analysed: 27173 of 39600 converged

Current Slip Surface

Slip Surface: 2,887
Factor of Safety: 2.32
Volume: 377.76746 ft³
Weight: 41,695.366 lbf
Resisting Force: 15,335.401 lbf
Activating Force: 6,604.8178 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (36.400387, 7.6393822) ft
Entry: (-7.4107143, 13.696429) ft
Radius: 20.868383 ft
Center: (20, 35) ft

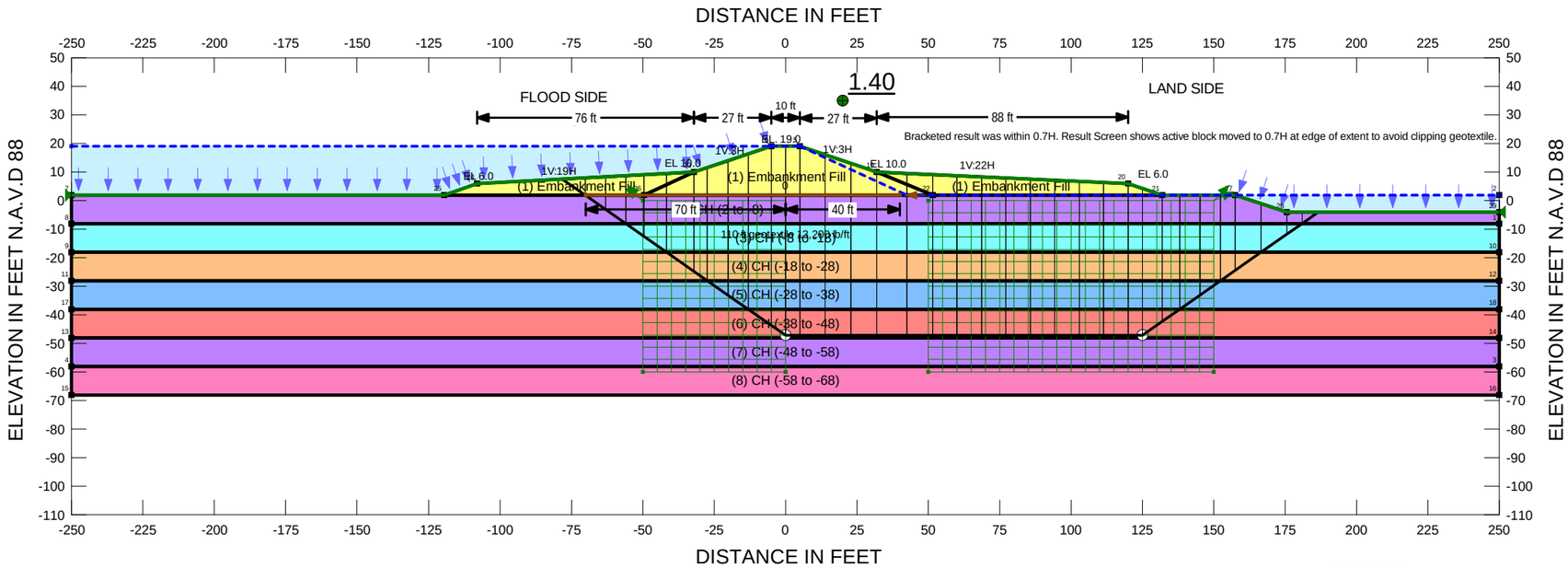
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-6.8080357 ft	13.09375 ft	-692.25 psf	78.155504 psf	33.175043 psf	0 psf	0 psf	(1) Embankment Fill
Slice 2	-5.6026786 ft	11.888393 ft	-617.03571 psf	234.46651 psf	99.52513 psf	0 psf	0 psf	(1) Embankment Fill
Slice 3	-4.2261905 ft	10.511905 ft	-531.14286 psf	387.88287 psf	164.64651 psf	0 psf	0 psf	(1) Embankment Fill
Slice 4	-2.6785714 ft	8.9642857 ft	-434.57143 psf	538.40458 psf	228.53919 psf	0 psf	0 psf	(1) Embankment Fill
Slice 5	-1.1309524 ft	7.4166667 ft	-338 psf	688.92629 psf	292.43186 psf	0 psf	0 psf	(1) Embankment Fill
Slice 6	0.41666667 ft	5.8690476 ft	-241.42857 psf	839.44801 psf	356.32454 psf	0 psf	0 psf	(1) Embankment Fill
Slice 7	1.9642857 ft	4.3214286 ft	-144.85714 psf	989.96972 psf	420.21721 psf	0 psf	0 psf	(1) Embankment Fill
Slice 8	3.5119048 ft	2.7738095 ft	-48.285714 psf	1,140.4914 psf	484.10989 psf	0 psf	0 psf	(1) Embankment Fill
Slice 9	4.6428571 ft	1.6428571 ft	22.285714 psf	1,246.3746 psf	519.5949 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 10	5.875 ft	0.41071429 ft	99.171429 psf	1,323.654 psf	519.762 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 11	7.625 ft	-1.3392857 ft	208.37143 psf	1,416.9681 psf	513.01887 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 12	9.2738095 ft	-2.2142857 ft	262.97143 psf	1,652.9563 psf	590.01359 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 13	10.821429 ft	-2.2142857 ft	262.97143 psf	1,593.631 psf	564.83146 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 14	12.369048 ft	-2.2142857 ft	262.97143 psf	1,534.3056 psf	539.64932 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 15	13.916667 ft	-2.2142857 ft	262.97143 psf	1,474.9802 psf	514.46718 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 16	15.464286 ft	-2.2142857 ft	262.97143 psf	1,415.6548 psf	489.28505 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 17	17.011905 ft	-2.2142857 ft	262.97143 psf	1,356.3294 psf	464.10291 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 18	18.559524 ft	-2.2142857 ft	262.97143 psf	1,297.004 psf	438.92077 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 19	19.979167 ft	-1.8414137 ft	239.70421 psf	1,323.1156 psf	459.88087 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 20	21.270833 ft	-1.0956696 ft	193.16978 psf	1,198.2344 psf	426.62462 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 21	22.5625 ft	-0.34992547 ft	146.63535 psf	1,073.3531 psf	393.36836 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 22	23.854167 ft	0.39581863 ft	100.10092 psf	948.47189 psf	360.11211 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 23	25.566345 ft	1.3843453 ft	38.416851 psf	824.46893 psf	333.65931 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 24	27.35867 ft	2.4191446 ft	-26.154625 psf	706.2039 psf	299.76577 psf	0 psf	0 psf	(1) Embankment Fill
Slice 25	28.81063 ft	3.2574339 ft	-78.463876 psf	592.79849 psf	251.62803 psf	0 psf	0 psf	(1) Embankment Fill
Slice 26	30.262589 ft	4.0957232 ft	-130.77313 psf	479.39309 psf	203.49029 psf	0 psf	0 psf	(1) Embankment Fill
Slice 27	31.714549 ft	4.9340124 ft	-183.08238 psf	365.98769 psf	155.35256 psf	0 psf	0 psf	(1) Embankment Fill
Slice 28	33.100505 ft	5.7341946 ft	-233.01374 psf	257.73749 psf	109.40307 psf	0 psf	0 psf	(1) Embankment Fill
Slice 29	34.420458 ft	6.4962697 ft	-280.56723 psf	154.64249 psf	65.641843 psf	0 psf	0 psf	(1) Embankment Fill
Slice 30	35.74041 ft	7.2583447 ft	-328.12071 psf	51.547497 psf	21.880614 psf	0 psf	0 psf	(1) Embankment Fill

West Slidell Levees

Janbu Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Top of Levee (CG) Block Around

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,486
Date: 07/19/2022
Time: 03:44:47 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block) around

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-50, 0) ft
Lower Left: (-50, -60) ft
Lower Right: (0, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2

Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y

Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

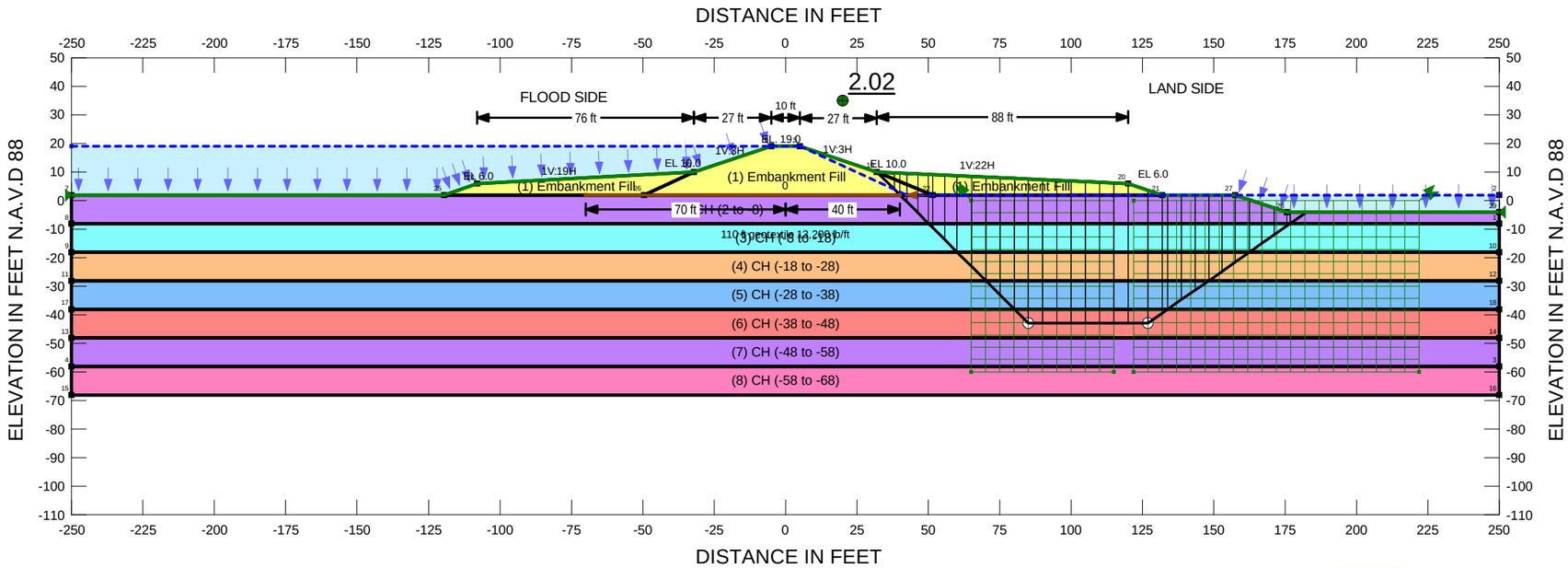
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Top of Levee (CG) Block Front

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,480
Date: 07/19/2022
Time: 03:08:22 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 03:09:48 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block) front

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (65, 0) ft
Lower Left: (65, -60) ft
Lower Right: (115, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 125 °
Ending Angle: 135 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (122, 0) ft
Lower Left: (122, -60) ft
Lower Right: (222, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)

Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

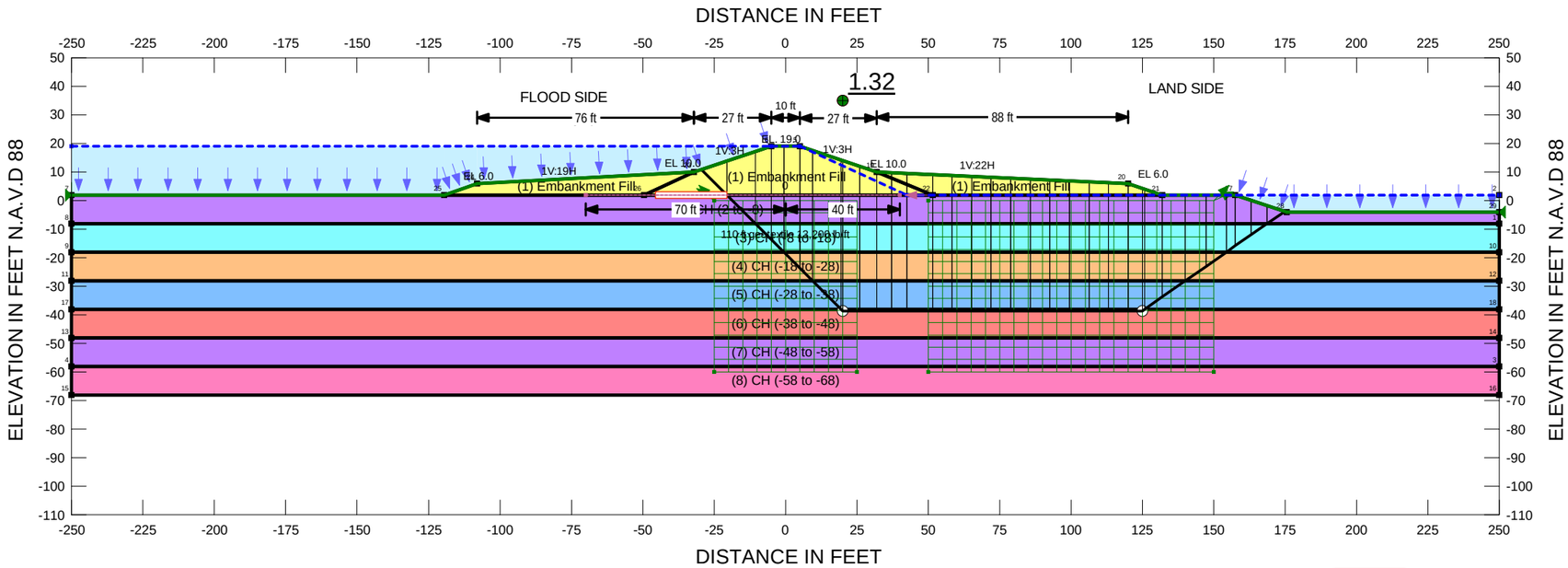
Slip Surfaces Analysed: 29166 of 51975 converged

Current Slip Surface

Slip Surface: 36,128
Factor of Safety: 2.02
Volume: 4,724.1036 ft³
Weight: 485,240.86 lbf
Resisting Force: 52,724.356 lbf
Activating Force: 26,158.736 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (182.49375, -4) ft
Entry: (32.14966, 9.9931973) ft
Radius: 69.605146 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	32.195948 ft	9.9469092 ft	-204.40611 psf	-291.71779 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	35.215195 ft	6.9276625 ft	-101.41357 psf	39.71316 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	39.165505 ft	2.9773519 ft	33.339429 psf	473.34952 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	41.321429 ft	0.82142857 ft	106.88229 psf	828.9463 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	44.410714 ft	-2.2678571 ft	266.31429 psf	1,090.8335 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	48.232143 ft	-6.0892857 ft	504.77143 psf	1,414.7864 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 7	50.821429 ft	-8.6785714 ft	666.34286 psf	1,641.0729 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	53.660714 ft	-11.517857 ft	843.51429 psf	1,910.1598 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	57.982143 ft	-15.839286 ft	1,113.1714 psf	2,319.7133 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	62.642857 ft	-20.5 ft	1,404 psf	2,779.9913 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	67.642857 ft	-25.5 ft	1,716 psf	3,303.8549 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	72.642857 ft	-30.5 ft	2,028 psf	3,846.7632 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 13	77.642857 ft	-35.5 ft	2,340 psf	4,346.3882 psf	0 psf	323.5 psf	0 psf	(5) CH (-28 to -38)
Slice 14	82.571429 ft	-40.428571 ft	2,647.5429 psf	4,836.0868 psf	0 psf	372.52857 psf	0 psf	(6) CH (-38 to -48)
Slice 15	87.5 ft	-42.857143 ft	2,799.0857 psf	5,259.3149 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 16	92.5 ft	-42.857143 ft	2,799.0857 psf	5,233.1786 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 17	97.5 ft	-42.857143 ft	2,799.0857 psf	5,207.0422 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 18	102.5 ft	-42.857143 ft	2,799.0857 psf	5,180.9058 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 19	107.5 ft	-42.857143 ft	2,799.0857 psf	5,154.7695 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 20	112.5 ft	-42.857143 ft	2,799.0857 psf	5,128.6331 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 21	117.5 ft	-42.857143 ft	2,799.0857 psf	5,102.4968 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 22	123.5 ft	-42.857143 ft	2,799.0857 psf	4,955.2619 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 23	129.5 ft	-41.106624 ft	2,689.8533 psf	4,665.8594 psf	0 psf	379.3769 psf	0 psf	(6) CH (-38 to -48)
Slice 24	132.96836 ft	-38.678053 ft	2,538.3105 psf	4,296.8159 psf	0 psf	354.84833 psf	0 psf	(6) CH (-38 to -48)
Slice 25	136.31697 ft	-36.333333 ft	2,392 psf	4,031.5454 psf	0 psf	331.66667 psf	0 psf	(5) CH (-28 to -38)
Slice 26	141.07746 ft	-33 ft	2,184 psf	3,653.5641 psf	0 psf	299 psf	0 psf	(5) CH (-28 to -38)
Slice 27	145.83795 ft	-29.666667 ft	1,976 psf	3,275.5827 psf	0 psf	266.33333 psf	0 psf	(5) CH (-28 to -38)
Slice 28	150.53865 ft	-26.375203 ft	1,770.6127 psf	2,929.6856 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 29	155.17955 ft	-23.12561 ft	1,567.838 psf	2,572.2303 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 30	159.99984 ft	-19.750406 ft	1,357.2254 psf	2,177.9594 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 31	164.6664 ft	-16.482846 ft	1,153.3296 psf	1,786.2642 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 32	168.99984 ft	-13.448539 ft	963.98881 psf	1,442.9658 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 33	173.33328 ft	-10.414231 ft	774.64802 psf	1,099.6674 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 34	176.14058 ft	-8.4485386 ft	651.98881 psf	883.1643 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 35	179.63746 ft	-6 ft	499.2 psf	658.31043 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Top of Levee (CG) Block Through

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,469
Date: 06/30/2022
Time: 04:12:25 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 06/30/2022
Last Solved Time: 04:15:26 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block) through

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-25, 0) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-20.571429, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 49.428571 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf

Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

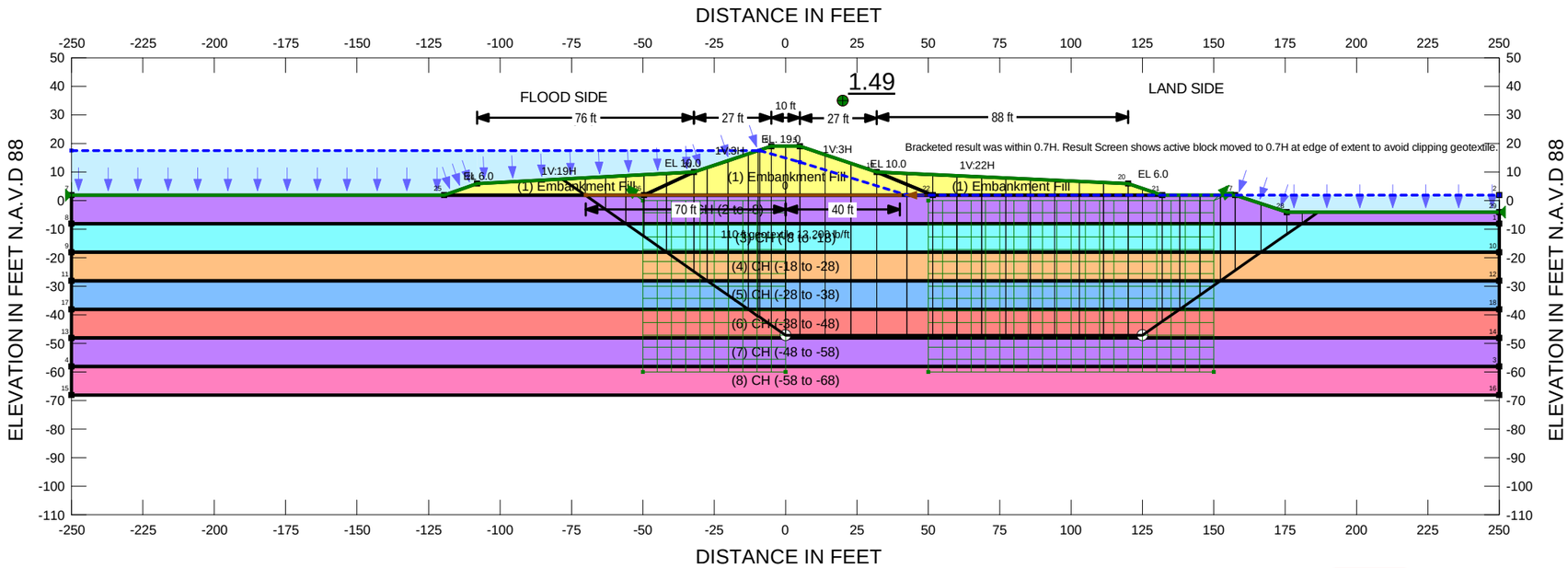
Slip Surfaces Analysed: 48227 of 51975 converged

Current Slip Surface

Slip Surface: 34,098
Factor of Safety: 1.32
Volume: 7,521.4287 ft³
Weight: 780,455.38 lbf
Resisting Force: 69,914.663 lbf
Activating Force: 53,070.222 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (174.73655, -3.7455182) ft
Entry: (-29.428571, 10.857143) ft
Radius: 86.315439 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-25 ft	6.4285714 ft	784.45714 psf	636.89807 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-15.571429 ft	-3 ft	1,372.8 psf	1,990.5728 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-7.7857143 ft	-10.785714 ft	1,858.6286 psf	2,855.6538 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-2.7857143 ft	-15.785714 ft	2,170.6286 psf	3,404.4967 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	2.2142857 ft	-20.785714 ft	2,482.6286 psf	3,922.4272 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 6	7.2142857 ft	-25.785714 ft	2,731.9909 psf	4,387.5463 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 7	14.428571 ft	-33 ft	2,978.0846 psf	4,915.2602 psf	0 psf	299 psf	0 psf	(5) CH (-28 to -38)
Slice 8	19.714286 ft	-38.285714 ft	3,158.3909 psf	5,254.165 psf	0 psf	350.88571 psf	0 psf	(6) CH (-38 to -48)
Slice 9	23 ft	-38.571429 ft	3,083.2731 psf	5,427.2857 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 10	29 ft	-38.571429 ft	2,913.5451 psf	5,197.2857 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 11	34.625 ft	-38.571429 ft	2,754.4251 psf	5,068.5641 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 12	39.875 ft	-38.571429 ft	2,605.9131 psf	5,041.1209 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 13	47 ft	-38.571429 ft	2,531.6571 psf	5,003.8766 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 14	54.925 ft	-38.571429 ft	2,531.6571 psf	4,962.4505 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 15	61.775 ft	-38.571429 ft	2,531.6571 psf	4,926.6437 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 16	68.625 ft	-38.571429 ft	2,531.6571 psf	4,890.8369 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 17	75.475 ft	-38.571429 ft	2,531.6571 psf	4,855.03 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 18	82.325 ft	-38.571429 ft	2,531.6571 psf	4,819.2232 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 19	89.175 ft	-38.571429 ft	2,531.6571 psf	4,783.4164 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 20	96.025 ft	-38.571429 ft	2,531.6571 psf	4,747.6096 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 21	102.875 ft	-38.571429 ft	2,531.6571 psf	4,711.8028 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 22	109.725 ft	-38.571429 ft	2,531.6571 psf	4,675.9959 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 23	116.575 ft	-38.571429 ft	2,531.6571 psf	4,640.1891 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 24	122.5 ft	-38.571429 ft	2,531.6571 psf	4,526.4524 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 25	125.40804 ft	-38.285714 ft	2,513.8286 psf	4,571.4413 psf	0 psf	350.88571 psf	0 psf	(6) CH (-38 to -48)
Slice 26	128.90804 ft	-35.834988 ft	2,360.9032 psf	4,155.0935 psf	0 psf	326.78288 psf	0 psf	(5) CH (-28 to -38)
Slice 27	136.04878 ft	-30.834988 ft	2,048.9032 psf	3,460.3698 psf	0 psf	277.78288 psf	0 psf	(5) CH (-28 to -38)
Slice 28	143.66793 ft	-25.5 ft	1,716 psf	2,892.3505 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 29	150.80867 ft	-20.5 ft	1,404 psf	2,342.3505 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 30	155.93952 ft	-16.907342 ft	1,179.8181 psf	1,951.1341 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 31	160.29013 ft	-13.861013 ft	989.72719 psf	1,620.8319 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 32	165.87039 ft	-9.9536709 ft	745.90906 psf	1,178.7594 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 33	171.69854 ft	-5.8727591 ft	491.26017 psf	738.32164 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Project Grade (PG) Block Around

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,474
Date: 07/19/2022
Time: 01:35:12 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 01:35:42 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block) around

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-50, 0) ft
Lower Left: (-50, -60) ft
Lower Right: (0, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	13.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)

Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

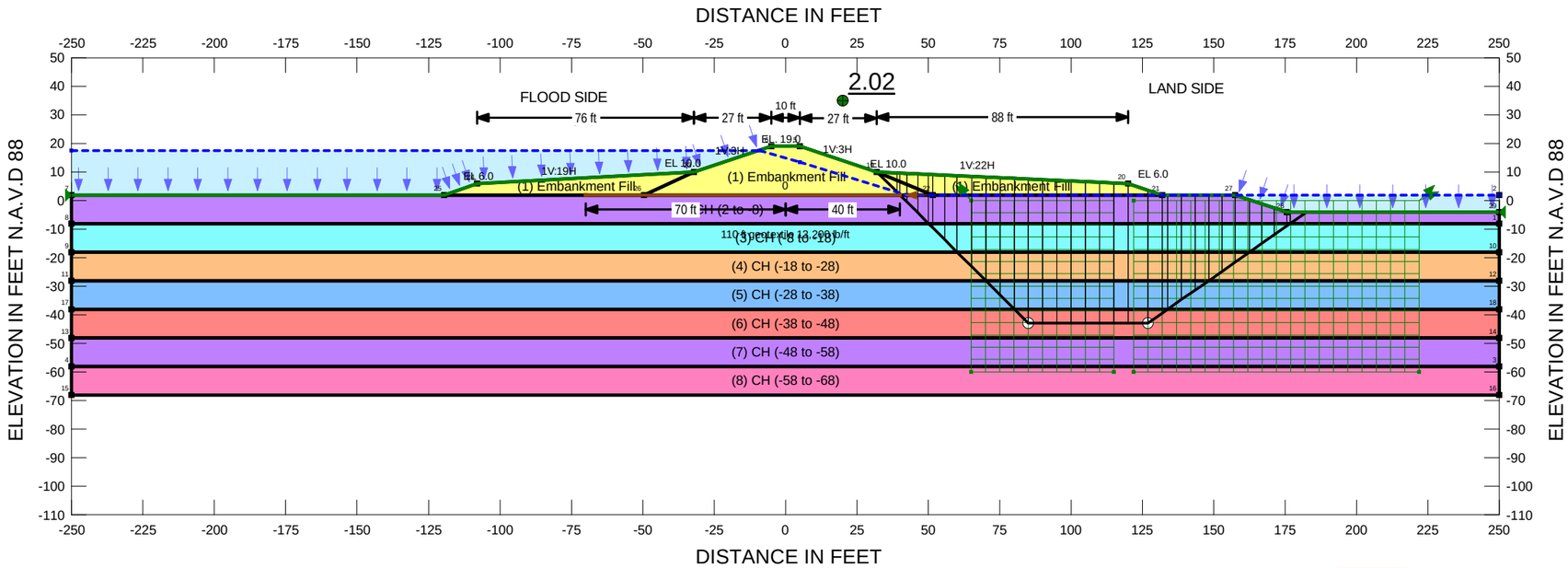
Slip Surfaces Analysed: 42197 of 51975 converged

Current Slip Surface

Slip Surface: 41,553
Factor of Safety: 1.49
Volume: 11,133.402 ft³
Weight: 1,162,310.3 lbf
Resisting Force: 102,158.38 lbf
Activating Force: 68,492.537 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (186.61439, -4) ft
Entry: (-78.140291, 7.5715636) ft
Radius: 107.7283 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-74.161782 ft	4.7857818 ft	793.36721 psf	669.79258 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-66.612903 ft	-0.5 ft	1,123.2 psf	1,376.6164 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-59.472163 ft	-5.5 ft	1,435.2 psf	1,846.385 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-52.700897 ft	-10.241292 ft	1,731.0566 psf	2,314.2599 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-45.560157 ft	-15.241292 ft	2,043.0566 psf	2,834.0285 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-36.810157 ft	-21.368108 ft	2,425.3699 psf	3,498.5239 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 7	-29.669417 ft	-26.368108 ft	2,737.3699 psf	4,102.7033 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	-23.768463 ft	-30.5 ft	2,995.2 psf	4,678.7134 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 9	-16.627723 ft	-35.5 ft	3,307.2 psf	5,330.9562 psf	0 psf	323.5 psf	0 psf	(5) CH (-28 to -38)
Slice 10	-11.278677 ft	-39.245443 ft	3,540.9156 psf	5,818.1233 psf	0 psf	360.57897 psf	0 psf	(6) CH (-38 to -48)
Slice 11	-9.25 ft	-40.665937 ft	3,629.5545 psf	6,007.0046 psf	0 psf	374.92597 psf	0 psf	(6) CH (-38 to -48)
Slice 12	-7 ft	-42.241404 ft	3,692.2065 psf	6,257.5251 psf	0 psf	390.83818 psf	0 psf	(6) CH (-38 to -48)
Slice 13	-2.5 ft	-45.392338 ft	3,808.5962 psf	6,662.7327 psf	0 psf	422.66262 psf	0 psf	(6) CH (-38 to -48)
Slice 14	2.5 ft	-47.142857 ft	3,828.6857 psf	7,051.5714 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 15	9.5 ft	-47.142857 ft	3,698.0023 psf	6,879.0714 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 16	18.5 ft	-47.142857 ft	3,525.7783 psf	6,534.0714 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 17	27.5 ft	-47.142857 ft	3,353.5543 psf	6,189.0714 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 18	37.25 ft	-47.142857 ft	3,166.9783 psf	5,989.1282 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 19	47 ft	-47.142857 ft	3,066.5143 psf	5,938.1623 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 20	55.78125 ft	-47.142857 ft	3,066.5143 psf	5,892.2603 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 21	64.34375 ft	-47.142857 ft	3,066.5143 psf	5,847.5018 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 22	72.90625 ft	-47.142857 ft	3,066.5143 psf	5,802.7433 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 23	81.46875 ft	-47.142857 ft	3,066.5143 psf	5,757.9848 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 24	90.03125 ft	-47.142857 ft	3,066.5143 psf	5,713.2263 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 25	98.59375 ft	-47.142857 ft	3,066.5143 psf	5,668.4677 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 26	107.15625 ft	-47.142857 ft	3,066.5143 psf	5,623.7092 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 27	115.71875 ft	-47.142857 ft	3,066.5143 psf	5,578.9507 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 28	122.5 ft	-47.142857 ft	3,066.5143 psf	5,460.7381 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 29	128.5 ft	-44.692131 ft	2,913.589 psf	5,158.3276 psf	0 psf	415.59052 psf	0 psf	(6) CH (-38 to -48)
Slice 30	135.02868 ft	-40.120702 ft	2,628.3318 psf	4,504.2423 psf	0 psf	369.41909 psf	0 psf	(6) CH (-38 to -48)
Slice 31	141.62772 ft	-35.5 ft	2,340 psf	3,976.571 psf	0 psf	323.5 psf	0 psf	(5) CH (-28 to -38)
Slice 32	148.76846 ft	-30.5 ft	2,028 psf	3,403.6128 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 33	154.91942 ft	-26.193056 ft	1,759.2467 psf	2,947.8876 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	162.06016 ft	-21.193056 ft	1,447.2467 psf	2,355.9342 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 35	171.06016 ft	-14.891188 ft	1,054.0101 psf	1,604.9259 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	178.2009 ft	-9.8911882 ft	742.01015 psf	1,064.0793 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 37	183.75809 ft	-6 ft	499.2 psf	694.96047 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Project Grade (PG) Block Front

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,480
Date: 07/19/2022
Time: 03:08:22 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 03:09:24 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block) front

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (65, 0) ft
Lower Left: (65, -60) ft
Lower Right: (115, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 125 °
Ending Angle: 135 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (122, 0) ft
Lower Left: (122, -60) ft
Lower Right: (222, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	13.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)

Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

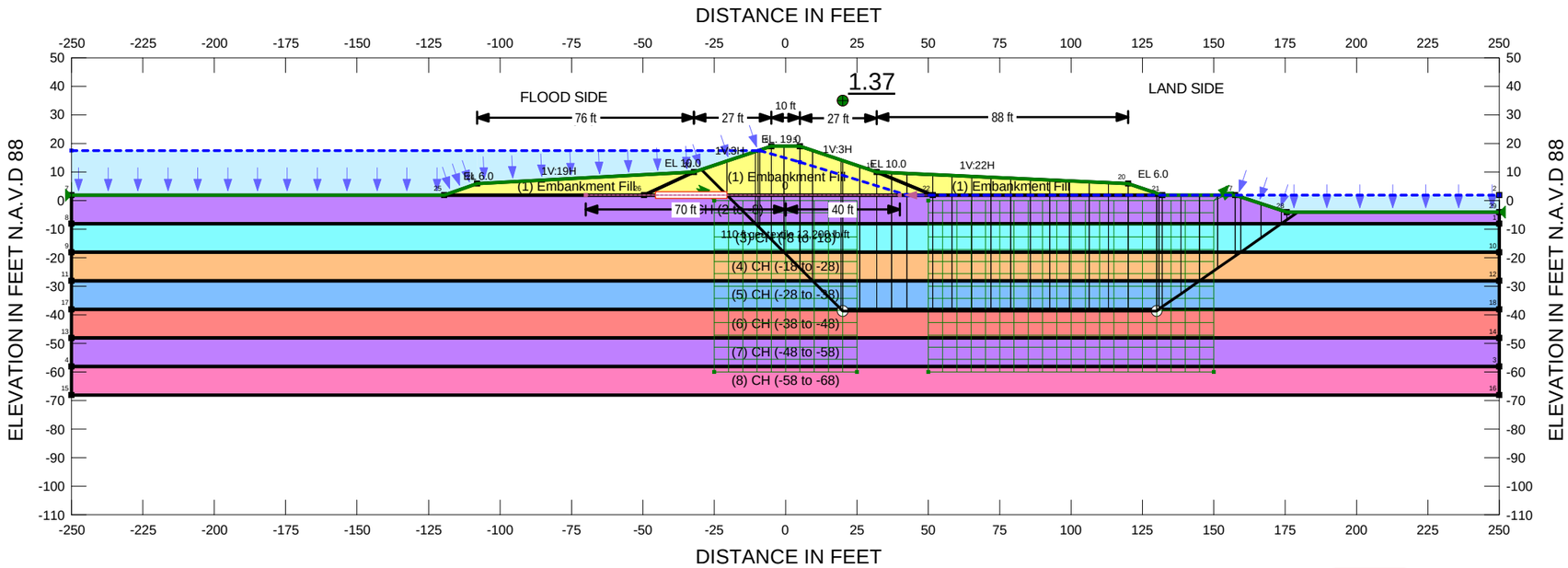
Slip Surfaces Analysed: 29165 of 51975 converged

Current Slip Surface

Slip Surface: 36,128
Factor of Safety: 2.02
Volume: 4,724.1036 ft³
Weight: 485,240.86 lbf
Resisting Force: 52,724.356 lbf
Activating Force: 26,158.736 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (182.49375, -4) ft
Entry: (32.14966, 9.9931973) ft
Radius: 69.605146 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	32.195948 ft	9.9469092 ft	-298.70879 psf	-291.71779 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	35.671255 ft	6.4716018 ft	-148.35309 psf	89.776187 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	39.621566 ft	2.5212912 ft	22.553143 psf	523.41255 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	41.321429 ft	0.82142857 ft	96.096 psf	828.9463 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	44.410714 ft	-2.2678571 ft	266.31429 psf	1,090.8335 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	48.232143 ft	-6.0892857 ft	504.77143 psf	1,414.7864 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 7	50.821429 ft	-8.6785714 ft	666.34286 psf	1,641.0729 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	53.660714 ft	-11.517857 ft	843.51429 psf	1,910.1598 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	57.982143 ft	-15.839286 ft	1,113.1714 psf	2,319.7133 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	62.642857 ft	-20.5 ft	1,404 psf	2,779.9913 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	67.642857 ft	-25.5 ft	1,716 psf	3,303.8549 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	72.642857 ft	-30.5 ft	2,028 psf	3,846.7632 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 13	77.642857 ft	-35.5 ft	2,340 psf	4,346.3882 psf	0 psf	323.5 psf	0 psf	(5) CH (-28 to -38)
Slice 14	82.571429 ft	-40.428571 ft	2,647.5429 psf	4,836.0868 psf	0 psf	372.52857 psf	0 psf	(6) CH (-38 to -48)
Slice 15	87.5 ft	-42.857143 ft	2,799.0857 psf	5,259.3149 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 16	92.5 ft	-42.857143 ft	2,799.0857 psf	5,233.1786 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 17	97.5 ft	-42.857143 ft	2,799.0857 psf	5,207.0422 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 18	102.5 ft	-42.857143 ft	2,799.0857 psf	5,180.9058 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 19	107.5 ft	-42.857143 ft	2,799.0857 psf	5,154.7695 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 20	112.5 ft	-42.857143 ft	2,799.0857 psf	5,128.6331 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 21	117.5 ft	-42.857143 ft	2,799.0857 psf	5,102.4968 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 22	123.5 ft	-42.857143 ft	2,799.0857 psf	4,955.2619 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 23	129.5 ft	-41.106624 ft	2,689.8533 psf	4,665.8594 psf	0 psf	379.3769 psf	0 psf	(6) CH (-38 to -48)
Slice 24	132.96836 ft	-38.678053 ft	2,538.3105 psf	4,296.8159 psf	0 psf	354.84833 psf	0 psf	(6) CH (-38 to -48)
Slice 25	136.31697 ft	-36.333333 ft	2,392 psf	4,031.5454 psf	0 psf	331.66667 psf	0 psf	(5) CH (-28 to -38)
Slice 26	141.07746 ft	-33 ft	2,184 psf	3,653.5641 psf	0 psf	299 psf	0 psf	(5) CH (-28 to -38)
Slice 27	145.83795 ft	-29.666667 ft	1,976 psf	3,275.5827 psf	0 psf	266.33333 psf	0 psf	(5) CH (-28 to -38)
Slice 28	150.53865 ft	-26.375203 ft	1,770.6127 psf	2,929.6856 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 29	155.17955 ft	-23.12561 ft	1,567.838 psf	2,572.2303 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 30	159.99984 ft	-19.750406 ft	1,357.2254 psf	2,177.9594 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 31	164.6664 ft	-16.482846 ft	1,153.3296 psf	1,786.2642 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 32	168.99984 ft	-13.448539 ft	963.98881 psf	1,442.9658 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 33	173.33328 ft	-10.414231 ft	774.64802 psf	1,099.6674 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 34	176.14058 ft	-8.4485386 ft	651.98881 psf	883.1643 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 35	179.63746 ft	-6 ft	499.2 psf	658.31043 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Project Grade (PG) Block Through

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,469
Date: 06/30/2022
Time: 04:12:25 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 06/30/2022
Last Solved Time: 04:15:14 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block) through

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-25, 0) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-9 ft	17.5 ft
Coordinate 3	5 ft	13.5 ft
Coordinate 4	42.5 ft	2 ft
Coordinate 5	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-20.571429, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 49.428571 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf

Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

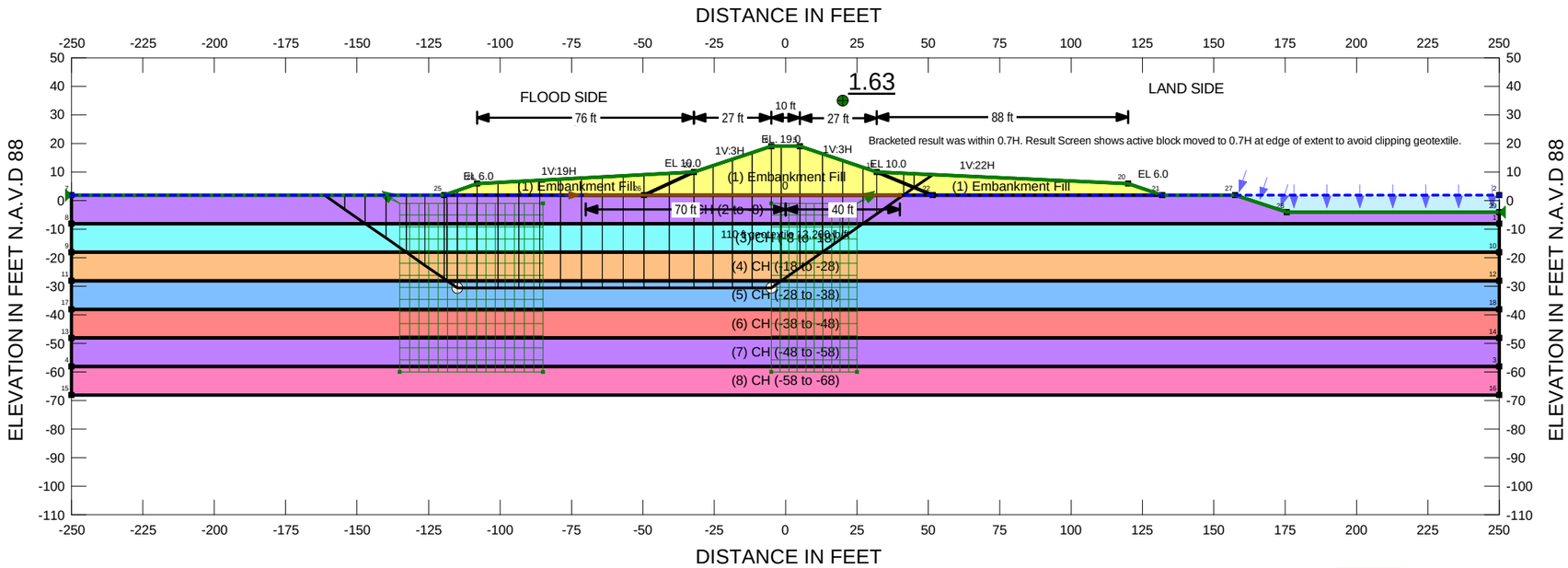
Slip Surfaces Analysed: 47126 of 51975 converged

Current Slip Surface

Slip Surface: 34,103
Factor of Safety: 1.37
Volume: 7,694.4292 ft³
Weight: 798,579.71 lbf
Resisting Force: 71,574.489 lbf
Activating Force: 52,260.57 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (179.37312, -4) ft
Entry: (-29.428571, 10.857143) ft
Radius: 87.889097 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
			Stress					
Slice 1	-25 ft	6.4285714 ft	690.85714 psf	560.97279 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-15.571429 ft	-3 ft	1,279.2 psf	1,905.8102 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-10.035714 ft	-8.5357143 ft	1,624.6286 psf	2,506.4412 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-9.25 ft	-9.3214286 ft	1,673.6571 psf	2,603.9888 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-7 ft	-11.571429 ft	1,778.4 psf	2,915.2388 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-2.7857143 ft	-15.785714 ft	1,966.2367 psf	3,413.334 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	2.2142857 ft	-20.785714 ft	2,189.0939 psf	3,931.6475 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	7.2142857 ft	-25.785714 ft	2,409.056 psf	4,396.7666 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	14.428571 ft	-33 ft	2,721.1749 psf	4,924.0681 psf	0 psf	299 psf	0 psf	(5) CH (-28 to -38)
Slice 10	19.714286 ft	-38.285714 ft	2,949.856 psf	5,264.5014 psf	0 psf	350.88571 psf	0 psf	(6) CH (-38 to -48)
Slice 11	23 ft	-38.571429 ft	2,904.8091 psf	5,427.2857 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 12	29 ft	-38.571429 ft	2,789.9931 psf	5,197.2857 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 13	34.625 ft	-38.571429 ft	2,682.3531 psf	5,068.5641 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 14	39.875 ft	-38.571429 ft	2,581.8891 psf	5,041.1209 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 15	47 ft	-38.571429 ft	2,531.6571 psf	5,003.8766 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 16	54.925 ft	-38.571429 ft	2,531.6571 psf	4,962.4505 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 17	61.775 ft	-38.571429 ft	2,531.6571 psf	4,926.6437 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 18	68.625 ft	-38.571429 ft	2,531.6571 psf	4,890.8369 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 19	75.475 ft	-38.571429 ft	2,531.6571 psf	4,855.03 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 20	82.325 ft	-38.571429 ft	2,531.6571 psf	4,819.2232 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 21	89.175 ft	-38.571429 ft	2,531.6571 psf	4,783.4164 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 22	96.025 ft	-38.571429 ft	2,531.6571 psf	4,747.6096 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 23	102.875 ft	-38.571429 ft	2,531.6571 psf	4,711.8028 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 24	109.725 ft	-38.571429 ft	2,531.6571 psf	4,675.9959 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 25	116.575 ft	-38.571429 ft	2,531.6571 psf	4,640.1891 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 26	125 ft	-38.571429 ft	2,531.6571 psf	4,430.619 psf	0 psf	353.77143 psf	0 psf	(6) CH (-38 to -48)
Slice 27	130.40804 ft	-38.285714 ft	2,513.8286 psf	4,372.5371 psf	0 psf	350.88571 psf	0 psf	(6) CH (-38 to -48)
Slice 28	131.40804 ft	-37.585507 ft	2,470.1356 psf	4,253.8952 psf	0 psf	343.93797 psf	0 psf	(5) CH (-28 to -38)
Slice 29	135.27439 ft	-34.87826 ft	2,301.2034 psf	3,919.7684 psf	0 psf	317.40695 psf	0 psf	(5) CH (-28 to -38)
Slice 30	141.82317 ft	-30.292753 ft	2,015.0678 psf	3,392.2627 psf	0 psf	272.46898 psf	0 psf	(5) CH (-28 to -38)
Slice 31	148.19817 ft	-25.82893 ft	1,736.5253 psf	2,922.0768 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	154.39939 ft	-21.486791 ft	1,465.5758 psf	2,444.4414 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	158.43952 ft	-18.657861 ft	1,289.0505 psf	2,124.6155 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 34	162.94941 ft	-15.5 ft	1,092 psf	1,754.0773 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 35	170.09015 ft	-10.5 ft	780 psf	1,188.3825 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 36	174.58026 ft	-7.3559928 ft	583.81395 psf	839.11284 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 37	177.43656 ft	-5.3559928 ft	459.01395 psf	650.65125 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Low Water (LW) Block Around Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,472
Date: 07/19/2022
Time: 01:18:13 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 01:19:22 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) around

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-85, -1) ft
Lower Left: (-85, -60) ft
Lower Right: (-135, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (-5, -1) ft
Lower Left: (-5, -60) ft
Lower Right: (25, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

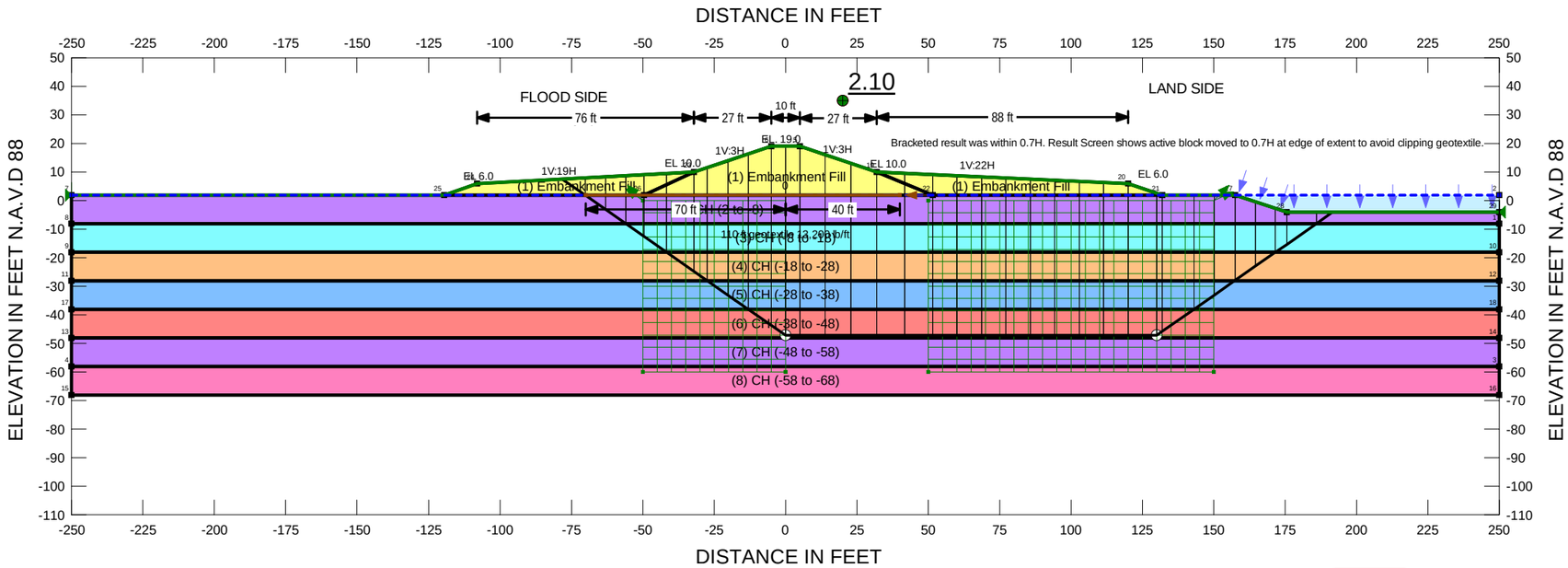
Slip Surfaces Analysed: 21167 of 23760 converged

Current Slip Surface

Slip Surface: 11,982
Factor of Safety: 1.63
Volume: 6,519.2317 ft³
Weight: 670,586.09 lbf
Resisting Force: 64,238.526 lbf
Activating Force: 39,398.798 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-161.41481, 2) ft
Entry: (51.569617, 9.110472) ft
Radius: 84.919532 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-157.84444 ft	-0.5 ft	156 psf	353.14307 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 2	-150.7037 ft	-5.5 ft	468 psf	803.14307 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-143.56296 ft	-10.5 ft	780 psf	1,278.1431 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-136.42222 ft	-15.5 ft	1,092 psf	1,778.1431 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-129.51389 ft	-20.337267 ft	1,393.8454 psf	2,290.7953 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 6	-122.83796 ft	-25.0118 ft	1,685.5363 psf	2,804.9939 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 7	-119.03519 ft	-27.674533 ft	1,851.6909 psf	3,116.4872 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	-116.78519 ft	-29.25 ft	1,950 psf	3,358.111 psf	0 psf	262.25 psf	0 psf	(5) CH (-28 to -38)
Slice 9	-111.5 ft	-30.5 ft	2,028 psf	3,595 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 10	-104.34375 ft	-30.5 ft	2,028 psf	3,757.1299 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 11	-97.03125 ft	-30.5 ft	2,028 psf	3,801.3898 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 12	-89.71875 ft	-30.5 ft	2,028 psf	3,845.6497 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 13	-82.40625 ft	-30.5 ft	2,028 psf	3,889.9095 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 14	-75.09375 ft	-30.5 ft	2,028 psf	3,934.1694 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 15	-67.78125 ft	-30.5 ft	2,028 psf	3,978.4293 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 16	-60.46875 ft	-30.5 ft	2,028 psf	4,022.6891 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 17	-53.15625 ft	-30.5 ft	2,028 psf	4,066.949 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 18	-45.125 ft	-30.5 ft	2,028 psf	4,115.5592 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 19	-36.375 ft	-30.5 ft	2,028 psf	4,168.5197 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 20	-28.625 ft	-30.5 ft	2,028 psf	4,324.375 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 21	-21.875 ft	-30.5 ft	2,028 psf	4,583.125 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 22	-15.125 ft	-30.5 ft	2,028 psf	4,841.875 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 23	-8.375 ft	-30.5 ft	2,028 psf	5,100.625 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 24	-3.214815 ft	-29.25 ft	1,950 psf	4,980.4816 psf	0 psf	262.25 psf	0 psf	(5) CH (-28 to -38)
Slice 25	1.785185 ft	-25.748962 ft	1,731.5352 psf	4,573.6899 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 26	8.925925 ft	-20.748962 ft	1,419.5352 psf	3,873.1961 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 27	16.42222 ft	-15.5 ft	1,092 psf	3,039.0052 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 28	23.56296 ft	-10.5 ft	780 psf	2,265.2768 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 29	29.566665 ft	-6.2961605 ft	517.68042 psf	1,631.7892 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 30	36.707405 ft	-1.2961605 ft	205.68042 psf	1,063.9045 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 31	43.277776 ft	3.304463 ft	-81.398493 psf	454.74859 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 32	48.35518 ft	6.859699 ft	-303.24522 psf	19.35548 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Low Water (LW) Block Around Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,473
Date: 07/19/2022
Time: 01:31:05 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 01:31:42 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) around

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-50, 0) ft
Lower Left: (-50, -60) ft
Lower Right: (0, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

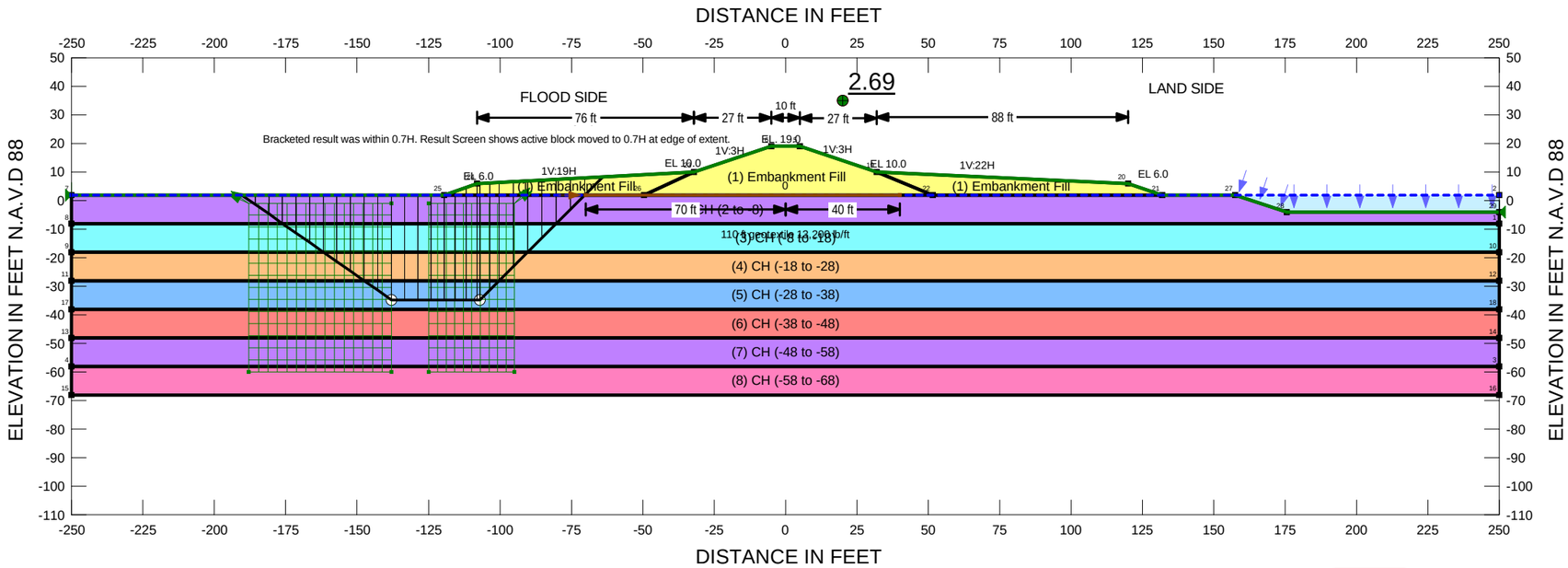
Slip Surfaces Analysed: 35250 of 51975 converged

Current Slip Surface

Slip Surface: 41,558
Factor of Safety: 2.10
Volume: 11,349.116 ft³
Weight: 1,185,093.2 lbf
Resisting Force: 104,349.85 lbf
Activating Force: 49,801.651 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (191.61439, -4) ft
Entry: (-78.140291, 7.5715636) ft
Radius: 109.38988 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-74.161782 ft	4.7857818 ft	-173.83279 psf	144.31154 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-66.612903 ft	-0.5 ft	156 psf	835.43394 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-59.472163 ft	-5.5 ft	468 psf	1,328.6542 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-52.700897 ft	-10.241292 ft	763.85662 psf	1,818.7674 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-45.560157 ft	-15.241292 ft	1,075.8566 psf	2,361.9877 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-36.810157 ft	-21.368108 ft	1,458.1699 psf	3,056.9746 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 7	-29.669417 ft	-26.368108 ft	1,770.1699 psf	3,725.4278 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	-23.768463 ft	-30.5 ft	2,028 psf	4,418.981 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 9	-16.627723 ft	-35.5 ft	2,340 psf	5,226.3651 psf	0 psf	323.5 psf	0 psf	(5) CH (-28 to -38)
Slice 10	-9.0286766 ft	-40.82091 ft	2,672.0248 psf	6,082.4655 psf	0 psf	376.49119 psf	0 psf	(6) CH (-38 to -48)
Slice 11	-2.5 ft	-45.392338 ft	2,957.2819 psf	6,719.7831 psf	0 psf	422.66262 psf	0 psf	(6) CH (-38 to -48)
Slice 12	2.5 ft	-47.142857 ft	3,066.5143 psf	7,051.5714 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 13	9.5 ft	-47.142857 ft	3,066.5143 psf	6,879.0714 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 14	18.5 ft	-47.142857 ft	3,066.5143 psf	6,534.0714 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 15	27.5 ft	-47.142857 ft	3,066.5143 psf	6,189.0714 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 16	36.875 ft	-47.142857 ft	3,066.5143 psf	5,991.0885 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 17	46.625 ft	-47.142857 ft	3,066.5143 psf	5,940.1226 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 18	55.78125 ft	-47.142857 ft	3,066.5143 psf	5,892.2603 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 19	64.34375 ft	-47.142857 ft	3,066.5143 psf	5,847.5018 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 20	72.90625 ft	-47.142857 ft	3,066.5143 psf	5,802.7433 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 21	81.46875 ft	-47.142857 ft	3,066.5143 psf	5,757.9848 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 22	90.03125 ft	-47.142857 ft	3,066.5143 psf	5,713.2263 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 23	98.59375 ft	-47.142857 ft	3,066.5143 psf	5,668.4677 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 24	107.15625 ft	-47.142857 ft	3,066.5143 psf	5,623.7092 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 25	115.71875 ft	-47.142857 ft	3,066.5143 psf	5,578.9507 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 26	125 ft	-47.142857 ft	3,066.5143 psf	5,364.9048 psf	0 psf	440.34286 psf	0 psf	(6) CH (-38 to -48)
Slice 27	131 ft	-46.44265 ft	3,022.8213 psf	5,203.1024 psf	0 psf	433.27076 psf	0 psf	(6) CH (-38 to -48)
Slice 28	137.52868 ft	-41.871221 ft	2,737.5642 psf	4,651.0825 psf	0 psf	387.09933 psf	0 psf	(6) CH (-38 to -48)
Slice 29	146.62772 ft	-35.5 ft	2,340 psf	3,932.9055 psf	0 psf	323.5 psf	0 psf	(5) CH (-28 to -38)
Slice 30	153.84905 ft	-30.443575 ft	2,024.4791 psf	3,360.17 psf	0 psf	273.94703 psf	0 psf	(5) CH (-28 to -38)
Slice 31	161.03008 ft	-25.415362 ft	1,710.7186 psf	2,787.6163 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 32	168.09024 ft	-20.471787 ft	1,402.2395 psf	2,178.8696 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 33	173.56016 ft	-16.641707 ft	1,163.2425 psf	1,716.4842 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 34	180.7009 ft	-11.641707 ft	851.24252 psf	1,198.6376 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 35	188.75809 ft	-6 ft	499.2 psf	654.46691 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Low Water (LW) Block Front Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,485
Date: 07/19/2022
Time: 03:41:31 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 03:42:10 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) front

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-138, -1) ft
Lower Left: (-138, -60) ft
Lower Right: (-188, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 35 °
Ending Angle: 45 °
Upper Left: (-125, -1) ft
Lower Left: (-125, -60) ft
Lower Right: (-95, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

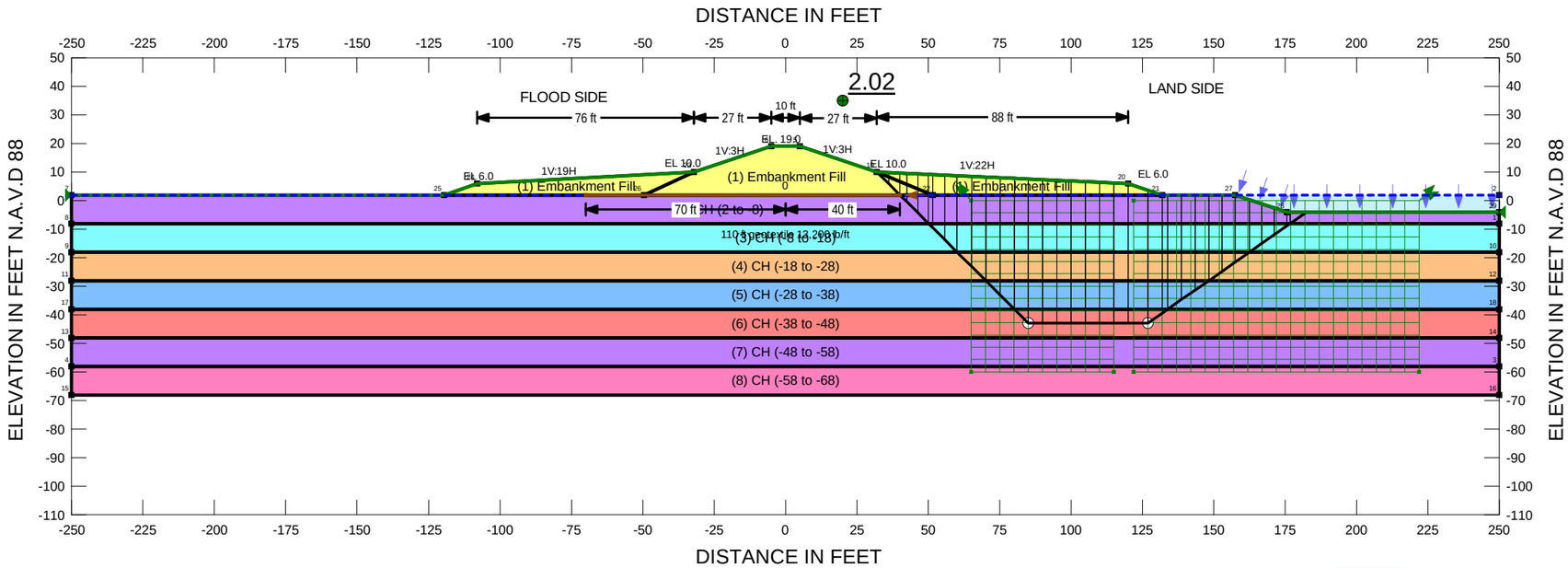
Slip Surfaces Analysed: 6545 of 23760 converged

Current Slip Surface

Slip Surface: 12,693
Factor of Safety: 2.69
Volume: 3,004.833 ft³
Weight: 301,708.65 lbf
Resisting Force: 40,361.465 lbf
Activating Force: 15,009.72 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-190.43343, 2) ft
Entry: (-63.968254, 8.3174603) ft
Radius: 57.19653 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-188.05319 ft	0.33333333 ft	104 psf	227.84938 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 2	-183.29269 ft	-3 ft	312 psf	527.84938 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-178.5322 ft	-6.3333333 ft	520 psf	827.84938 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-173.77171 ft	-9.6666667 ft	728 psf	1,144.5161 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-169.01121 ft	-13 ft	936 psf	1,477.8494 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	-164.25072 ft	-16.333333 ft	1,144 psf	1,811.1827 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	-159.49023 ft	-19.666667 ft	1,352 psf	2,164.5562 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	-154.72973 ft	-23 ft	1,560 psf	2,531.2229 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	-149.96924 ft	-26.333333 ft	1,768 psf	2,897.8895 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 10	-145.19175 ft	-29.678571 ft	1,976.7429 psf	3,253.7861 psf	0 psf	266.45 psf	0 psf	(5) CH (-28 to -38)
Slice 11	-140.39725 ft	-33.035714 ft	2,186.2286 psf	3,631.6093 psf	0 psf	299.35 psf	0 psf	(5) CH (-28 to -38)
Slice 12	-135.6875 ft	-34.714286 ft	2,290.9714 psf	3,738.5714 psf	0 psf	315.8 psf	0 psf	(5) CH (-28 to -38)
Slice 13	-131.0625 ft	-34.714286 ft	2,290.9714 psf	3,738.5714 psf	0 psf	315.8 psf	0 psf	(5) CH (-28 to -38)
Slice 14	-126.4375 ft	-34.714286 ft	2,290.9714 psf	3,738.5714 psf	0 psf	315.8 psf	0 psf	(5) CH (-28 to -38)
Slice 15	-121.8125 ft	-34.714286 ft	2,290.9714 psf	3,738.5714 psf	0 psf	315.8 psf	0 psf	(5) CH (-28 to -38)
Slice 16	-117.58333 ft	-34.714286 ft	2,290.9714 psf	3,815.2381 psf	0 psf	315.8 psf	0 psf	(5) CH (-28 to -38)
Slice 17	-113.75 ft	-34.714286 ft	2,290.9714 psf	3,968.5714 psf	0 psf	315.8 psf	0 psf	(5) CH (-28 to -38)
Slice 18	-109.91667 ft	-34.714286 ft	2,290.9714 psf	4,121.9048 psf	0 psf	315.8 psf	0 psf	(5) CH (-28 to -38)
Slice 19	-107.5 ft	-34.714286 ft	2,290.9714 psf	4,201.5977 psf	0 psf	315.8 psf	0 psf	(5) CH (-28 to -38)
Slice 20	-105.32143 ft	-33.035714 ft	2,186.2286 psf	3,919.2014 psf	0 psf	299.35 psf	0 psf	(5) CH (-28 to -38)
Slice 21	-101.96429 ft	-29.678571 ft	1,976.7429 psf	3,582.428 psf	0 psf	266.45 psf	0 psf	(5) CH (-28 to -38)
Slice 22	-97.785714 ft	-25.5 ft	1,716 psf	3,130.825 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 23	-92.785714 ft	-20.5 ft	1,404 psf	2,611.0882 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 24	-87.785714 ft	-15.5 ft	1,092 psf	2,121.1692 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 25	-82.785714 ft	-10.5 ft	780 psf	1,651.4323 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 26	-77.785714 ft	-5.5 ft	468 psf	1,206.6955 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 27	-72.785714 ft	-0.5 ft	156 psf	786.95865 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 28	-67.126984 ft	5.1587302 ft	-197.10476 psf	121.77445 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Low Water (LW) Block Front Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,482
Date: 07/19/2022
Time: 03:27:56 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 03:28:56 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) front

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (65, 0) ft
Lower Left: (65, -60) ft
Lower Right: (115, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 125 °
Ending Angle: 135 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (122, 0) ft
Lower Left: (122, -60) ft
Lower Right: (222, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	42.5 ft	2 ft
Coordinate 3	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

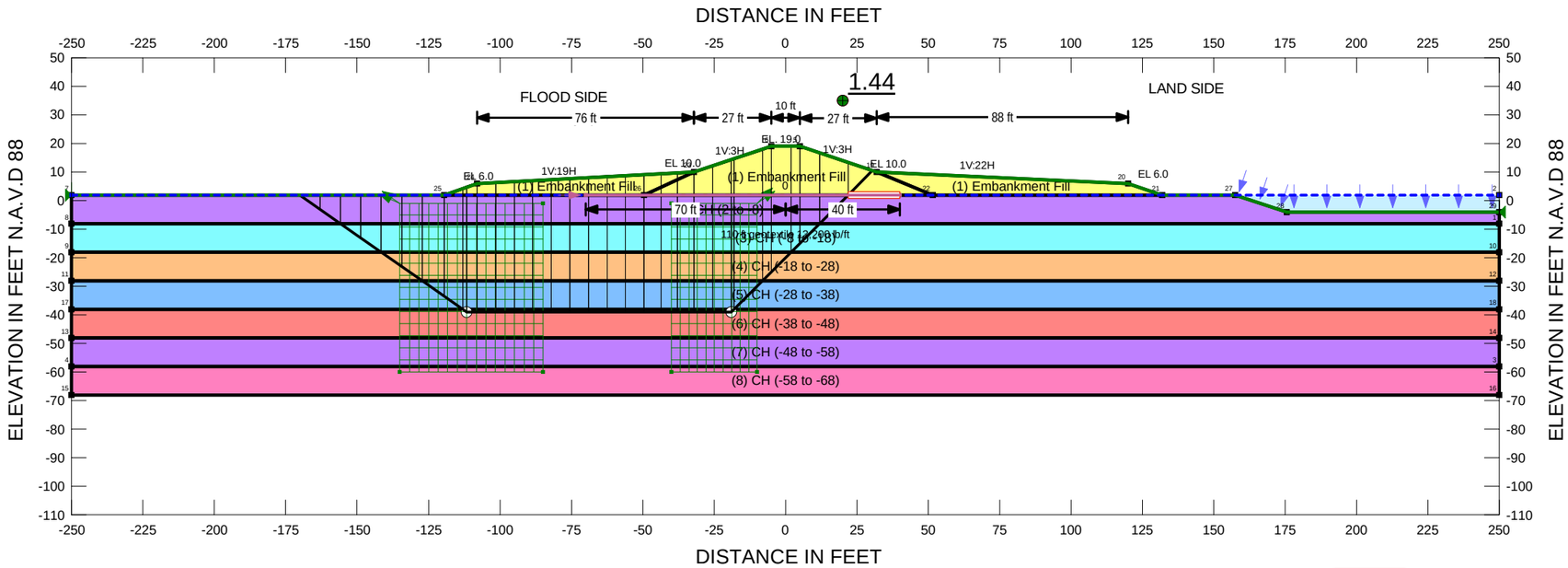
Slip Surfaces Analysed: 29165 of 51975 converged

Current Slip Surface

Slip Surface: 36,128
Factor of Safety: 2.02
Volume: 4,724.1036 ft³
Weight: 485,240.86 lbf
Resisting Force: 52,724.356 lbf
Activating Force: 26,158.736 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (182.49375, -4) ft
Entry: (32.14966, 9.9931973) ft
Radius: 69.605146 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	32.195948 ft	9.9469092 ft	-495.88713 psf	-291.71779 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	34.217391 ft	7.9254658 ft	-369.74907 psf	-69.818437 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	38.167702 ft	3.9751553 ft	-123.24969 psf	363.81793 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	41.321429 ft	0.82142857 ft	73.542857 psf	828.9463 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	44.410714 ft	-2.2678571 ft	266.31429 psf	1,090.8335 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 6	48.232143 ft	-6.0892857 ft	504.77143 psf	1,414.7864 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 7	50.821429 ft	-8.6785714 ft	666.34286 psf	1,641.0729 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 8	53.660714 ft	-11.517857 ft	843.51429 psf	1,910.1598 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 9	57.982143 ft	-15.839286 ft	1,113.1714 psf	2,319.7133 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 10	62.642857 ft	-20.5 ft	1,404 psf	2,779.9913 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 11	67.642857 ft	-25.5 ft	1,716 psf	3,303.8549 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 12	72.642857 ft	-30.5 ft	2,028 psf	3,846.7632 psf	0 psf	274.5 psf	0 psf	(5) CH (-28 to -38)
Slice 13	77.642857 ft	-35.5 ft	2,340 psf	4,346.3882 psf	0 psf	323.5 psf	0 psf	(5) CH (-28 to -38)
Slice 14	82.571429 ft	-40.428571 ft	2,647.5429 psf	4,836.0868 psf	0 psf	372.52857 psf	0 psf	(6) CH (-38 to -48)
Slice 15	87.5 ft	-42.857143 ft	2,799.0857 psf	5,259.3149 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 16	92.5 ft	-42.857143 ft	2,799.0857 psf	5,233.1786 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 17	97.5 ft	-42.857143 ft	2,799.0857 psf	5,207.0422 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 18	102.5 ft	-42.857143 ft	2,799.0857 psf	5,180.9058 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 19	107.5 ft	-42.857143 ft	2,799.0857 psf	5,154.7695 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 20	112.5 ft	-42.857143 ft	2,799.0857 psf	5,128.6331 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 21	117.5 ft	-42.857143 ft	2,799.0857 psf	5,102.4968 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 22	123.5 ft	-42.857143 ft	2,799.0857 psf	4,955.2619 psf	0 psf	397.05714 psf	0 psf	(6) CH (-38 to -48)
Slice 23	129.5 ft	-41.106624 ft	2,689.8533 psf	4,665.8594 psf	0 psf	379.3769 psf	0 psf	(6) CH (-38 to -48)
Slice 24	132.96836 ft	-38.678053 ft	2,538.3105 psf	4,296.8159 psf	0 psf	354.84833 psf	0 psf	(6) CH (-38 to -48)
Slice 25	136.31697 ft	-36.333333 ft	2,392 psf	4,031.5454 psf	0 psf	331.66667 psf	0 psf	(5) CH (-28 to -38)
Slice 26	141.07746 ft	-33 ft	2,184 psf	3,653.5641 psf	0 psf	299 psf	0 psf	(5) CH (-28 to -38)
Slice 27	145.83795 ft	-29.666667 ft	1,976 psf	3,275.5827 psf	0 psf	266.33333 psf	0 psf	(5) CH (-28 to -38)
Slice 28	150.53865 ft	-26.375203 ft	1,770.6127 psf	2,929.6856 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 29	155.17955 ft	-23.12561 ft	1,567.838 psf	2,572.2303 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 30	159.99984 ft	-19.750406 ft	1,357.2254 psf	2,177.9594 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 31	164.6664 ft	-16.482846 ft	1,153.3296 psf	1,786.2642 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 32	168.99984 ft	-13.448539 ft	963.98881 psf	1,442.9658 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 33	173.33328 ft	-10.414231 ft	774.64802 psf	1,099.6674 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 34	176.14058 ft	-8.4485386 ft	651.98881 psf	883.1643 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 35	179.63746 ft	-6 ft	499.2 psf	658.31043 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Low Water (LW) Block Through Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,485
Date: 07/19/2022
Time: 03:41:31 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 03:41:58 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) through

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
- Upper Left: (-85, -1) ft
- Lower Left: (-85, -60) ft
- Lower Right: (-135, -60) ft
- X Increments: 15
- Y Increments: 14
- Starting Angle: 145 °
- Ending Angle: 155 °
- Angle Increments: 2

Right Grid
- Starting Angle: 35 °
- Ending Angle: 45 °
- Upper Left: (-40, -1) ft
- Lower Left: (-40, -60) ft
- Lower Right: (-10, -60) ft
- X Increments: 10
- Y Increments: 14
- Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Slip Surface Intersection: (21.928571, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 18.071429 ft
Required Length: 18.071429 ft
Pullout Force: 9,577.8571 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Pullout Resistance

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

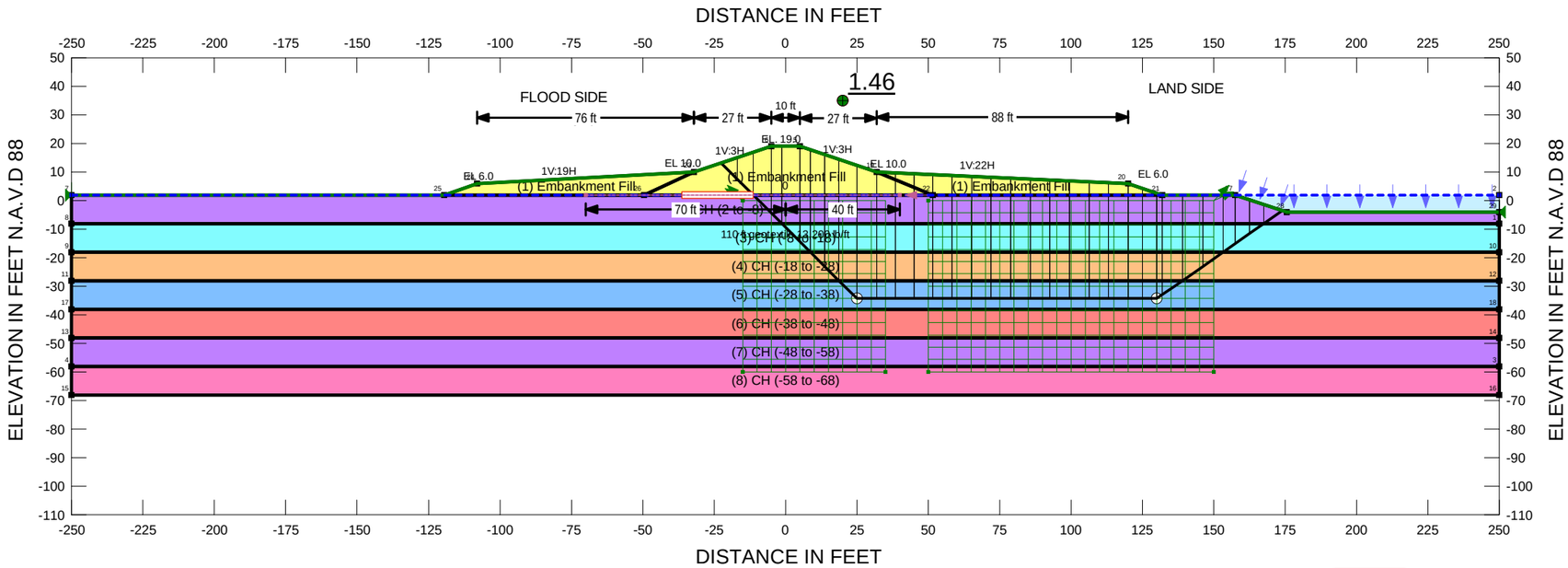
Slip Surfaces Analysed: 20356 of 23760 converged

Current Slip Surface

Slip Surface: 15,072
Factor of Safety: 1.44
Volume: 7,101.3601 ft³
Weight: 735,893.16 lbf
Resisting Force: 68,452.161 lbf
Activating Force: 47,653.203 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-170.11872, 2) ft
Entry: (30.446429, 10.517857) ft
Radius: 84.243157 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-166.54835 ft	-0.5 ft	156 psf	370.81425 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 2	-159.40761 ft	-5.5 ft	468 psf	820.81425 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 3	-152.26687 ft	-10.5 ft	780 psf	1,295.8142 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 4	-145.12613 ft	-15.5 ft	1,092 psf	1,795.8142 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 5	-137.98539 ft	-20.5 ft	1,404 psf	2,327.1329 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 6	-130.84465 ft	-25.5 ft	1,716 psf	2,877.1329 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 7	-123.38714 ft	-30.721806 ft	2,041.8407 psf	3,433.8752 psf	0 psf	276.6737 psf	0 psf	(5) CH (-28 to -38)
Slice 8	-116.2464 ft	-35.721806 ft	2,353.8407 psf	4,137.8355 psf	0 psf	325.6737 psf	0 psf	(5) CH (-28 to -38)
Slice 9	-112.32974 ft	-38.464286 ft	2,524.9714 psf	4,608.8415 psf	0 psf	352.68929 psf	0 psf	(6) CH (-38 to -48)
Slice 10	-109.83333 ft	-38.928571 ft	2,553.9429 psf	4,587.881 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 11	-104.75 ft	-38.928571 ft	2,553.9429 psf	4,680.8853 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 12	-98.25 ft	-38.928571 ft	2,553.9429 psf	4,720.2274 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 13	-91.75 ft	-38.928571 ft	2,553.9429 psf	4,759.5695 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 14	-85.25 ft	-38.928571 ft	2,553.9429 psf	4,798.9117 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 15	-78.75 ft	-38.928571 ft	2,553.9429 psf	4,838.2538 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 16	-72.25 ft	-38.928571 ft	2,553.9429 psf	4,877.5959 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 17	-65.75 ft	-38.928571 ft	2,553.9429 psf	4,916.938 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 18	-59.25 ft	-38.928571 ft	2,553.9429 psf	4,956.2801 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 19	-52.75 ft	-38.928571 ft	2,553.9429 psf	4,995.6222 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 20	-46.583333 ft	-38.928571 ft	2,553.9429 psf	5,032.9467 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 21	-40.75 ft	-38.928571 ft	2,553.9429 psf	5,068.2538 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 22	-34.916667 ft	-38.928571 ft	2,553.9429 psf	5,103.5608 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 23	-28.75 ft	-38.928571 ft	2,553.9429 psf	5,245.7976 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 24	-22.25 ft	-38.928571 ft	2,553.9429 psf	5,494.9643 psf	0 psf	357.37857 psf	0 psf	(6) CH (-38 to -48)
Slice 25	-18.535714 ft	-38.464286 ft	2,524.9714 psf	5,341.9196 psf	0 psf	352.68929 psf	0 psf	(6) CH (-38 to -48)
Slice 26	-13.071429 ft	-33 ft	2,184 psf	4,988.0451 psf	0 psf	299 psf	0 psf	(5) CH (-28 to -38)
Slice 27	-6.5357143 ft	-26.464286 ft	1,776.1714 psf	4,509.9341 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 28	-1.5357143 ft	-21.464286 ft	1,464.1714 psf	4,018.8032 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 29	3.4642857 ft	-16.464286 ft	1,152.1714 psf	3,493.1842 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 30	8.4642857 ft	-11.464286 ft	840.17143 psf	2,860.3866 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 31	16.928571 ft	-3 ft	312 psf	1,739.4938 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 32	26.1875 ft	6.2589286 ft	-265.75714 psf	236.54706 psf	0 psf	600 psf	0 psf	(1) Embankment Fill



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (2 to -8)	Mohr-Coulomb	90		300	0
	(3) CH (-8 to -18)	Mohr-Coulomb	100		300	0
	(4) CH (-18 to -28)	Mohr-Coulomb	110		313	0
	(5) CH (-28 to -38)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-38 to -48)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-48 to -58)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-58 to -68)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West 2082 Janbu Q case

CASE: Low Water (LW) Block Through Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,471
Date: 07/19/2022
Time: 01:09:39 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell, - 13965 - Cnl - 2082 - Janbu sgain.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 01:10:36 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) through

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 300 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 313 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-15, 0) ft
Lower Left: (-15, -60) ft
Lower Right: (35, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-11.285714, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 58.714286 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8)	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58)	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 43341 of 51975 converged

Current Slip Surface

Slip Surface: 30,323
Factor of Safety: 1.46
Volume: 6,584.8014 ft³
Weight: 680,017.63 lbf
Resisting Force: 63,526.676 lbf
Activating Force: 43,648.588 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (173.97734, -3.4924475) ft
Entry: (-22.464286, 13.178571) ft
Radius: 83.460544 ft
Center: (20, 35) ft

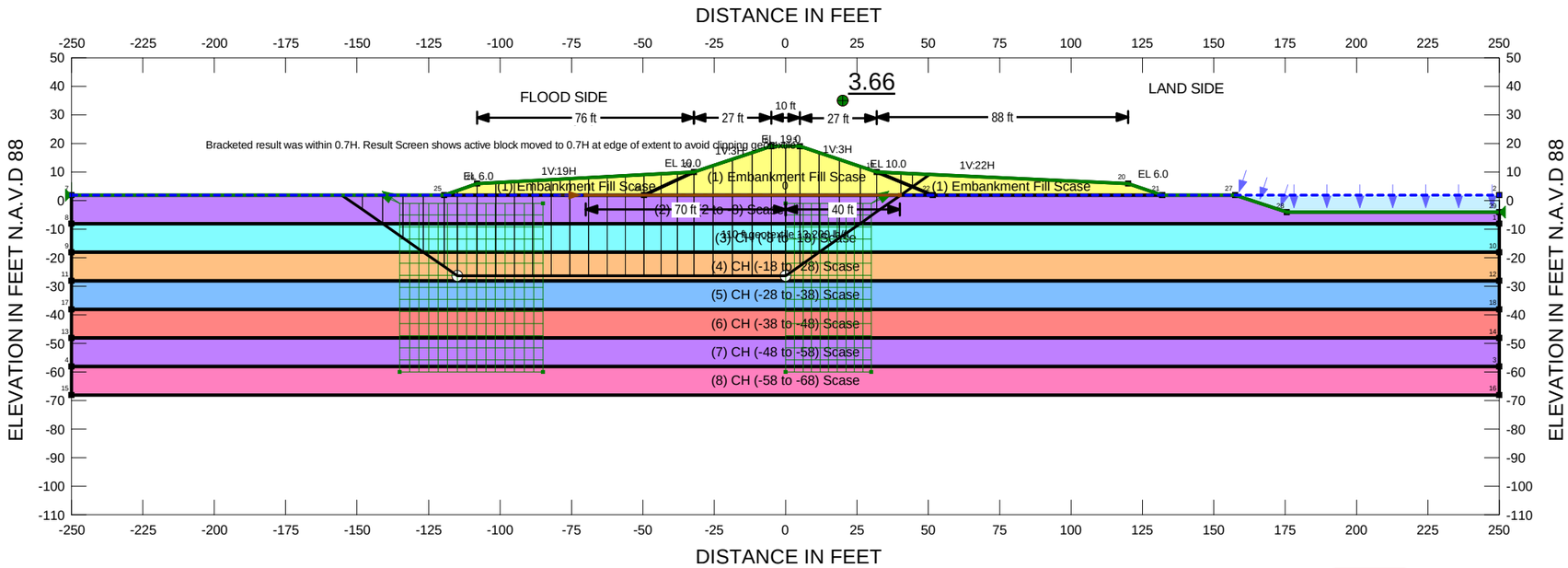
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-19.669643 ft	10.383929 ft	-523.15714 psf	17.746643 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.080357 ft	4.7946429 ft	-174.38571 psf	874.77045 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-8.1428571 ft	-1.1428571 ft	196.11429 psf	1,911.9983 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 4	-3.1428571 ft	-6.1428571 ft	508.11429 psf	2,482.4745 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)
Slice 5	1.8571429 ft	-11.142857 ft	820.11429 psf	2,963.9031 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 6	6.8571429 ft	-16.142857 ft	1,132.1143 psf	3,392.7126 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 7	11.214286 ft	-20.5 ft	1,404 psf	3,677.5032 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 8	16.214286 ft	-25.5 ft	1,716 psf	4,035.8365 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 9	21.857143 ft	-31.142857 ft	2,068.1143 psf	4,462.2857 psf	0 psf	280.8 psf	0 psf	(5) CH (-28 to -38)
Slice 10	28.5 ft	-34.285714 ft	2,264.2286 psf	4,745.5952 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 11	35.25 ft	-34.285714 ft	2,264.2286 psf	4,594.4399 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 12	41.75 ft	-34.285714 ft	2,264.2286 psf	4,560.4627 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 13	48.25 ft	-34.285714 ft	2,264.2286 psf	4,526.4854 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 14	54.925 ft	-34.285714 ft	2,264.2286 psf	4,491.5933 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 15	61.775 ft	-34.285714 ft	2,264.2286 psf	4,455.7865 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 16	68.625 ft	-34.285714 ft	2,264.2286 psf	4,419.9797 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 17	75.475 ft	-34.285714 ft	2,264.2286 psf	4,384.1729 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 18	82.325 ft	-34.285714 ft	2,264.2286 psf	4,348.3661 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 19	89.175 ft	-34.285714 ft	2,264.2286 psf	4,312.5593 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 20	96.025 ft	-34.285714 ft	2,264.2286 psf	4,276.7524 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 21	102.875 ft	-34.285714 ft	2,264.2286 psf	4,240.9456 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 22	109.725 ft	-34.285714 ft	2,264.2286 psf	4,205.1388 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 23	116.575 ft	-34.285714 ft	2,264.2286 psf	4,169.332 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 24	122.5 ft	-34.285714 ft	2,264.2286 psf	4,055.5952 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 25	127.5 ft	-34.285714 ft	2,264.2286 psf	3,863.9286 psf	0 psf	311.6 psf	0 psf	(5) CH (-28 to -38)
Slice 26	131 ft	-33.585507 ft	2,220.5356 psf	3,798.8208 psf	0 psf	304.73797 psf	0 psf	(5) CH (-28 to -38)
Slice 27	135.48847 ft	-30.44265 ft	2,024.4213 psf	3,400.0086 psf	0 psf	273.93797 psf	0 psf	(5) CH (-28 to -38)
Slice 28	142.5473 ft	-25.5 ft	1,716 psf	2,875.0423 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 29	149.68804 ft	-20.5 ft	1,404 psf	2,325.0423 psf	0 psf	313 psf	0 psf	(4) CH (-18 to -28)
Slice 30	155.37921 ft	-16.515003 ft	1,155.3362 psf	1,895.3108 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 31	160.00997 ft	-13.272505 ft	953.00433 psf	1,547.9692 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 32	165.02992 ft	-9.7575017 ft	733.66811 psf	1,150.2854 psf	0 psf	300 psf	0 psf	(3) CH (-8 to -18)
Slice 33	170.75862 ft	-5.7462238 ft	483.36436 psf	718.99133 psf	0 psf	300 psf	0 psf	(2) CH (2 to -8)

West Slidell Levees

Janbu Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Janbu S case

CASE: Low Water (LW) Block Around Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,486
Date: 07/19/2022
Time: 02:10:21 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - Janbu sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 02:11:00 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) around

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-85, -1) ft
Lower Left: (-85, -60) ft
Lower Right: (-135, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (0, -1) ft
Lower Left: (0, -60) ft
Lower Right: (30, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft

Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

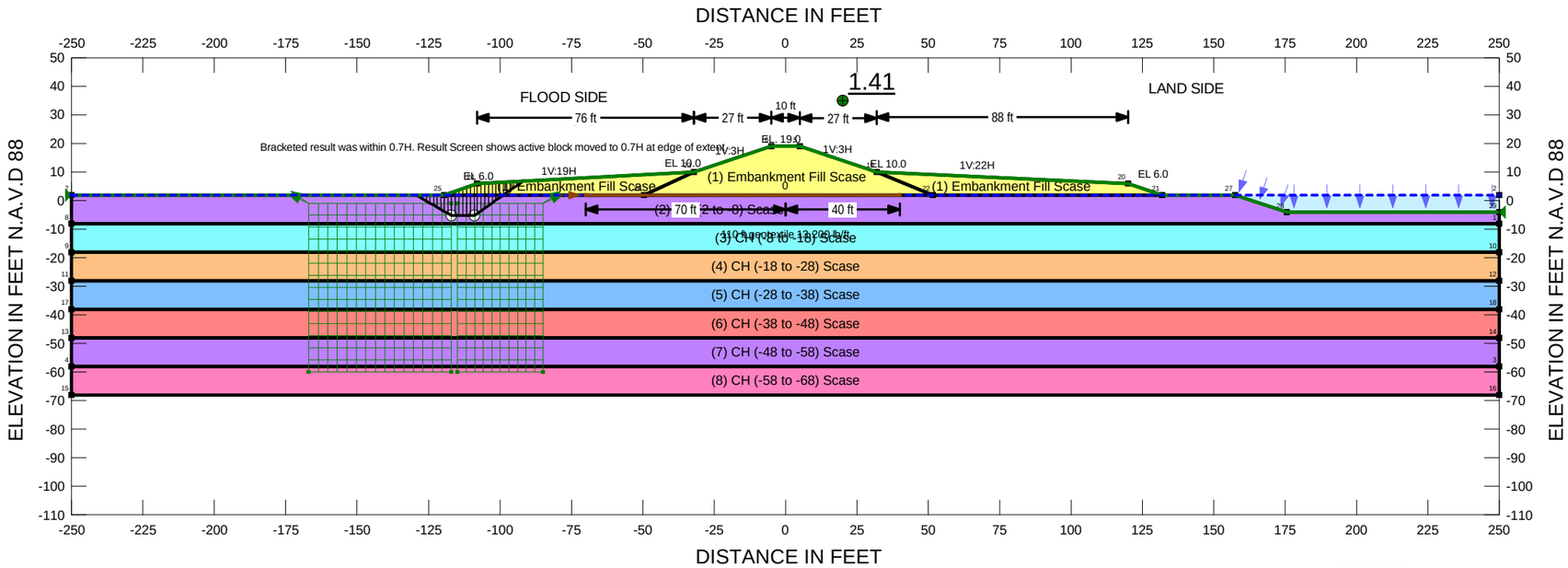
Slip Surfaces Analysed: 20095 of 23760 converged

Current Slip Surface

Slip Surface: 10,398
Factor of Safety: 3.66
Volume: 5,823.9774 ft³
Weight: 596,182.97 lbf
Resisting Force: 134,826.87 lbf
Activating Force: 36,799.377 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-155.39619, 2) ft
Entry: (50.613087, 9.1539506) ft
Radius: 81.213844 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-151.82582 ft	-0.5 ft	156 psf	231.1051 psf	31.880224 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-144.68508 ft	-5.5 ft	468 psf	693.3153 psf	95.640671 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-137.54434 ft	-10.5 ft	780 psf	1,182.7375 psf	170.95192 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 4	-130.4036 ft	-15.5 ft	1,092 psf	1,699.3717 psf	257.81398 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 5	-123.16661 ft	-20.56739 ft	1,408.2051 psf	2,250.9146 psf	357.70894 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 6	-117.25 ft	-24.710247 ft	1,666.7194 psf	2,822.0403 psf	490.4046 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 7	-111.5 ft	-26.285714 ft	1,765.0286 psf	3,131.4286 psf	580.00239 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 8	-104.75 ft	-26.285714 ft	1,765.0286 psf	3,291.0996 psf	647.77873 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 9	-98.25 ft	-26.285714 ft	1,765.0286 psf	3,330.4417 psf	664.47846 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 10	-91.75 ft	-26.285714 ft	1,765.0286 psf	3,369.7838 psf	681.1782 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 11	-85.25 ft	-26.285714 ft	1,765.0286 psf	3,409.1259 psf	697.87793 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 12	-78.75 ft	-26.285714 ft	1,765.0286 psf	3,448.468 psf	714.57766 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 13	-72.25 ft	-26.285714 ft	1,765.0286 psf	3,487.8102 psf	731.27739 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 14	-65.75 ft	-26.285714 ft	1,765.0286 psf	3,527.1523 psf	747.97713 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 15	-59.25 ft	-26.285714 ft	1,765.0286 psf	3,566.4944 psf	764.67686 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 16	-52.75 ft	-26.285714 ft	1,765.0286 psf	3,605.8365 psf	781.37659 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 17	-46.583333 ft	-26.285714 ft	1,765.0286 psf	3,643.161 psf	797.21993 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 18	-40.75 ft	-26.285714 ft	1,765.0286 psf	3,678.468 psf	812.20687 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 19	-34.916667 ft	-26.285714 ft	1,765.0286 psf	3,713.7751 psf	827.19381 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 20	-28.625 ft	-26.285714 ft	1,765.0286 psf	3,860.8036 psf	889.60371 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 21	-21.875 ft	-26.285714 ft	1,765.0286 psf	4,119.5536 psf	999.43657 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 22	-15.125 ft	-26.285714 ft	1,765.0286 psf	4,378.3036 psf	1,109.2694 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 23	-8.375 ft	-26.285714 ft	1,765.0286 psf	4,637.0536 psf	1,219.1023 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 24	-2.5 ft	-26.285714 ft	1,765.0286 psf	4,766.4286 psf	1,274.0187 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 25	2.5 ft	-24.535195 ft	1,655.7962 psf	4,354.5007 psf	1,145.5321 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 26	8.4166132 ft	-20.392338 ft	1,397.2819 psf	3,792.487 psf	1,016.7042 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 27	15.403596 ft	-15.5 ft	1,092 psf	3,047.2576 psf	829.95761 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 28	22.544336 ft	-10.5 ft	780 psf	2,308.2404 psf	648.69955 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 29	29.057353 ft	-5.9395365 ft	495.42708 psf	1,653.2438 psf	491.46404 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 30	36.198093 ft	-0.93953653 ft	183.42708 psf	1,089.0019 psf	384.39369 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 31	42.447316 ft	3.4362163 ft	-89.619898 psf	647.58373 psf	274.88299 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 32	47.555766 ft	7.0131916 ft	-312.82316 psf	242.4598 psf	102.91808 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Janbu S case

CASE: Low Water (LW) Block Front Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,490
Date: 07/19/2022
Time: 02:33:13 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - Janbu sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 02:33:46 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) front

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 10 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-117, -1) ft
Lower Left: (-117, -60) ft
Lower Right: (-167, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (-115, -1) ft
Lower Left: (-115, -60) ft
Lower Right: (-85, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft

Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 7407 of 23760 converged

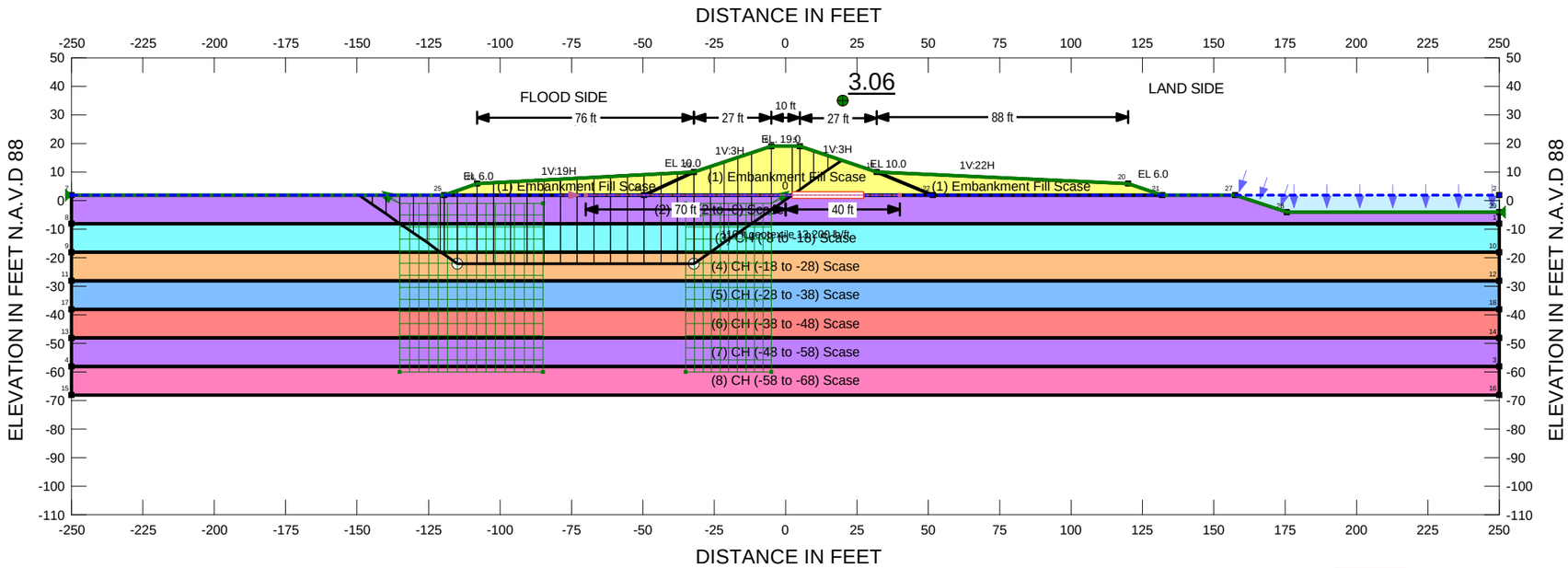
Current Slip Surface

Slip Surface: 1,626
Factor of Safety: 1.41
Volume: 218.00513 ft³
Weight: 21,571.789 lbf
Resisting Force: 4,995.8233 lbf
Activating Force: 3,552.3137 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-129.49551, 2) ft
Entry: (-91.763946, 6.8545292) ft

Radius: 17.345082 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-128.87079 ft	1.6393181 ft	22.506549 psf	34.555488 psf	5.1144713 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-127.62135 ft	0.91795437 ft	67.519647 psf	103.66647 psf	15.343414 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-126.37191 ft	0.19659061 ft	112.53275 psf	172.77744 psf	25.572357 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	-125.12247 ft	-0.52477314 ft	157.54584 psf	241.88842 psf	35.801299 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	-123.87304 ft	-1.2461369 ft	202.55894 psf	310.9994 psf	46.030242 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 6	-122.6236 ft	-1.9675007 ft	247.57204 psf	380.11037 psf	56.259184 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 7	-121.37416 ft	-2.6888644 ft	292.58514 psf	449.22135 psf	66.488127 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 8	-120.12472 ft	-3.4102282 ft	337.59824 psf	518.33233 psf	76.71707 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 9	-118.875 ft	-4.131754 ft	382.62145 psf	617.71789 psf	99.792519 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 10	-117.625 ft	-4.8534418 ft	427.65477 psf	747.37803 psf	135.71447 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 11	-116.33333 ft	-5.2142857 ft	450.17143 psf	775.95238 psf	138.28581 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 12	-115 ft	-5.2142857 ft	450.17143 psf	829.28571 psf	160.92447 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 13	-113.66667 ft	-5.2142857 ft	450.17143 psf	882.61905 psf	183.56312 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 14	-112.33333 ft	-5.2142857 ft	450.17143 psf	935.95238 psf	206.20178 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 15	-111 ft	-5.2142857 ft	450.17143 psf	989.28571 psf	228.84044 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 16	-109.66667 ft	-5.2142857 ft	450.17143 psf	1,042.619 psf	251.47909 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 17	-108.5 ft	-4.8641819 ft	428.32495 psf	948.1954 psf	220.67191 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 18	-107.3355 ft	-4.0487869 ft	377.4443 psf	898.56773 psf	221.20377 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 19	-106.00649 ft	-3.1182043 ft	319.37595 psf	825.93026 psf	215.01955 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 20	-104.67748 ft	-2.1876217 ft	261.30759 psf	753.29278 psf	208.83532 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 21	-103.34847 ft	-1.2570391 ft	203.23924 psf	680.65531 psf	202.6511 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 22	-102.01946 ft	-0.32645649 ft	145.17089 psf	608.01784 psf	196.46687 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 23	-100.69045 ft	0.60412611 ft	87.102531 psf	535.38036 psf	190.28265 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 24	-99.361437 ft	1.5347087 ft	29.034177 psf	462.74289 psf	184.09843 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 25	-98.119183 ft	2.4045441 ft	-25.243552 psf	390.88881 psf	165.92245 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 26	-96.963686 ft	3.2136323 ft	-75.730655 psf	319.81812 psf	135.75474 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 27	-95.808188 ft	4.0227205 ft	-126.21776 psf	248.74742 psf	105.58702 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 28	-94.65269 ft	4.8318087 ft	-176.70486 psf	177.67673 psf	75.419298 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 29	-93.497193 ft	5.6408969 ft	-227.19196 psf	106.60604 psf	45.251579 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 30	-92.341695 ft	6.4499851 ft	-277.67907 psf	35.535346 psf	15.08386 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Janbu S case

CASE: Low Water (LW) Block Through Flood Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (FS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,486
Date: 07/19/2022
Time: 02:10:21 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - Janbu sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 02:11:26 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (FS) through

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-85, -1) ft
Lower Left: (-85, -60) ft
Lower Right: (-135, -60) ft
X Increments: 15
Y Increments: 14
Starting Angle: 145 °
Ending Angle: 155 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 35 °
Upper Left: (-35, -1) ft
Lower Left: (-35, -60) ft
Lower Right: (-5, -60) ft
X Increments: 10
Y Increments: 14
Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (-70, 2) ft
Inside Point: (40, 2) ft
Length: 110 ft
Orientation: 0 °
Slip Surface Intersection: (2.3775627, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 37.622437 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft

Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

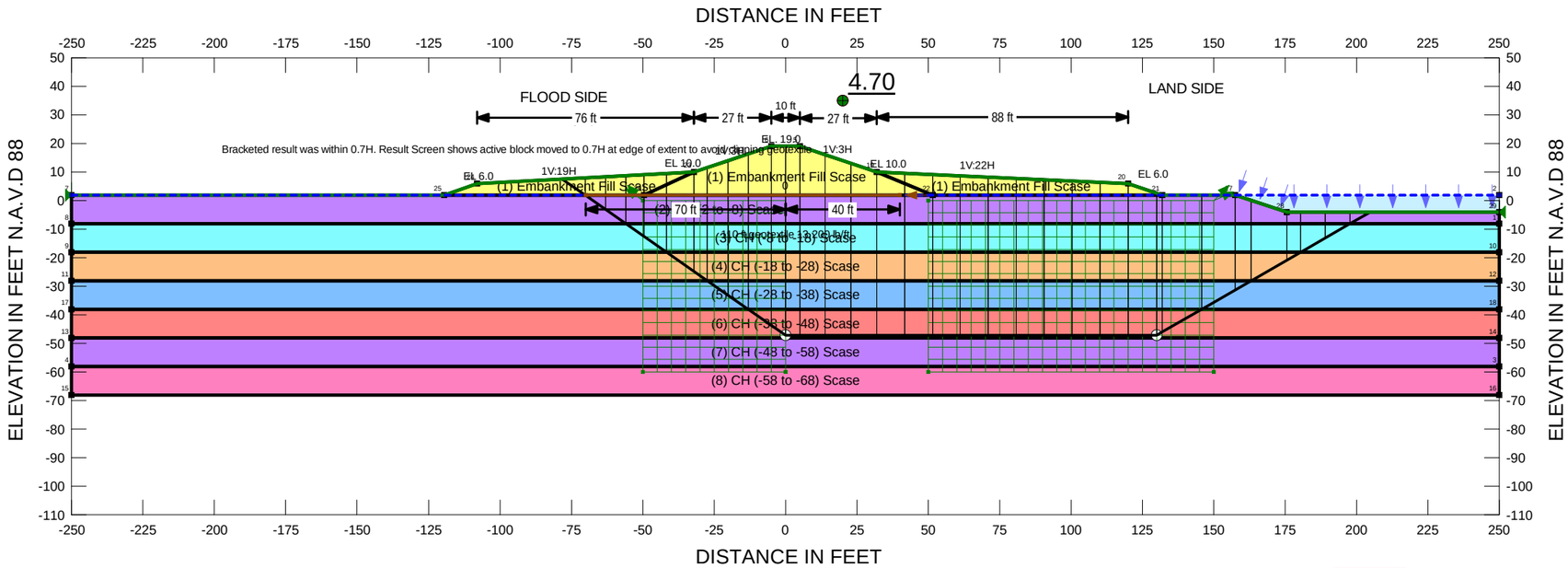
Slip Surfaces Analysed: 22434 of 23760 converged

Current Slip Surface

Slip Surface: 8,817
Factor of Safety: 3.06
Volume: 3,920.7765 ft³
Weight: 398,376.27 lbf
Resisting Force: 91,720.981 lbf
Activating Force: 29,939.864 lbf
Slip Rank: 1 of 23,760 slip surfaces
Exit: (-149.37756, 2) ft
Entry: (19.67165, 14.10945) ft
Radius: 69.890522 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-146.99732 ft	0.33333333 ft	104 psf	154.95156 psf	21.627654 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 2	-142.23682 ft	-3 ft	312 psf	464.85468 psf	64.882961 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-137.47633 ft	-6.3333333 ft	520 psf	774.7578 psf	108.13827 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	-132.71584 ft	-9.6666667 ft	728 psf	1,103.1216 psf	159.22968 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 5	-127.95534 ft	-13 ft	936 psf	1,449.9462 psf	218.1572 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 6	-123.19485 ft	-16.333333 ft	1,144 psf	1,796.7707 psf	277.08472 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 7	-120.1573 ft	-18.460247 ft	1,276.7194 psf	2,023.1684 psf	316.84878 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 8	-117.25 ft	-20.495962 ft	1,403.748 psf	2,357.2154 psf	404.72288 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 9	-111.5 ft	-22.071429 ft	1,502.0571 psf	2,667.8571 psf	494.85274 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 10	-105.075 ft	-22.071429 ft	1,502.0571 psf	2,825.5611 psf	561.79409 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 11	-99.225 ft	-22.071429 ft	1,502.0571 psf	2,860.969 psf	576.82385 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 12	-93.375 ft	-22.071429 ft	1,502.0571 psf	2,896.3769 psf	591.85361 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 13	-87.525 ft	-22.071429 ft	1,502.0571 psf	2,931.7848 psf	606.88337 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 14	-81.675 ft	-22.071429 ft	1,502.0571 psf	2,967.1927 psf	621.91313 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 15	-75.825 ft	-22.071429 ft	1,502.0571 psf	3,002.6006 psf	636.94289 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 16	-69.975 ft	-22.071429 ft	1,502.0571 psf	3,038.0085 psf	651.97265 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 17	-64.125 ft	-22.071429 ft	1,502.0571 psf	3,073.4164 psf	667.00241 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 18	-58.275 ft	-22.071429 ft	1,502.0571 psf	3,108.8242 psf	682.03217 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 19	-52.425 ft	-22.071429 ft	1,502.0571 psf	3,144.2321 psf	697.06193 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 20	-46.583333 ft	-22.071429 ft	1,502.0571 psf	3,179.5896 psf	712.07028 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 21	-40.75 ft	-22.071429 ft	1,502.0571 psf	3,214.8966 psf	727.05722 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 22	-34.916667 ft	-22.071429 ft	1,502.0571 psf	3,250.2036 psf	742.04416 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 23	-29.092699 ft	-20.035714 ft	1,375.0286 psf	2,997.6828 psf	688.77587 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 24	-23.805151 ft	-16.333333 ft	1,144 psf	2,805.9574 psf	705.45905 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 25	-19.044657 ft	-13 ft	936 psf	2,650.0474 psf	727.56997 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 26	-14.284164 ft	-9.6666667 ft	728 psf	2,494.1375 psf	749.68088 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 27	-8.4519587 ft	-5.5829125 ft	473.17374 psf	2,325.1581 psf	786.1207 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 28	-1.3112186 ft	-0.58291252 ft	161.17374 psf	2,007.9858 psf	783.92521 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 29	3.6887814 ft	2.9181252 ft	-57.291011 psf	1,685.6056 psf	715.49712 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 30	7.445275 ft	5.5484503 ft	-221.4233 psf	1,324.4777 psf	562.20742 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 31	12.335825 ft	8.9728502 ft	-435.10585 psf	794.68661 psf	337.32445 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 32	17.226375 ft	12.39725 ft	-648.78841 psf	264.89554 psf	112.44148 psf	0 psf	0 psf	(1) Embankment Fill Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Janbu S case

CASE: Low Water (LW) Block Around Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) around

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,486
Date: 07/19/2022
Time: 02:10:21 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - Janbu sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 02:10:54 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) around

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (-50, 0) ft
Lower Left: (-50, -60) ft
Lower Right: (0, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 0) ft
Lower Left: (50, -60) ft
Lower Right: (150, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft

Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 35081 of 51975 converged

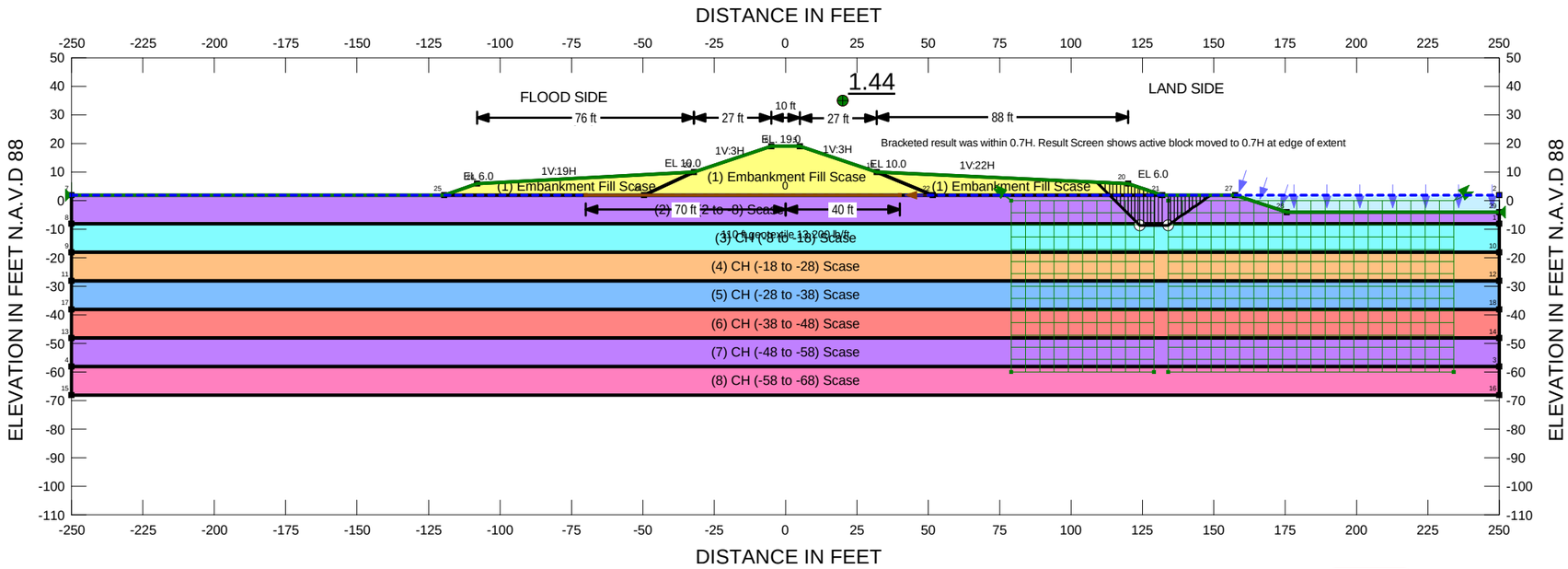
Current Slip Surface

Slip Surface: 41,557
Factor of Safety: 4.70
Volume: 11,631.945 ft³
Weight: 1,214,153.7 lbf
Resisting Force: 249,945.76 lbf
Activating Force: 53,174.419 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (204.72562, -4) ft
Entry: (-78.140291, 7.5715636) ft

Radius: 113.7478 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-74.161782 ft	4.7857818 ft	-173.83279 psf	323.92048 psf	137.49608 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-66.612903 ft	-0.5 ft	156 psf	889.05179 psf	311.16203 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 3	-59.472163 ft	-5.5 ft	468 psf	1,371.4735 psf	383.50174 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 4	-52.700897 ft	-10.241292 ft	763.85662 psf	1,850.0113 psf	461.04529 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 5	-45.560157 ft	-15.241292 ft	1,075.8566 psf	2,379.4535 psf	553.34406 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 6	-36.810157 ft	-21.368108 ft	1,458.1699 psf	3,059.8867 psf	679.88842 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 7	-29.669417 ft	-26.368108 ft	1,770.1699 psf	3,707.0994 psf	822.17778 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 8	-23.768463 ft	-30.5 ft	2,028 psf	4,362.612 psf	990.98401 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 9	-16.627723 ft	-35.5 ft	2,340 psf	5,155.8474 psf	1,195.2563 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 10	-9.0286766 ft	-40.82091 ft	2,672.0248 psf	5,997.3414 psf	1,411.5132 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 11	-2.5 ft	-45.392338 ft	2,957.2819 psf	6,628.1633 psf	1,558.1967 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 12	2.5 ft	-47.142857 ft	3,066.5143 psf	7,051.5714 psf	1,691.5564 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 13	9.5 ft	-47.142857 ft	3,066.5143 psf	6,879.0714 psf	1,618.3345 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 14	18.5 ft	-47.142857 ft	3,066.5143 psf	6,534.0714 psf	1,471.8907 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 15	27.5 ft	-47.142857 ft	3,066.5143 psf	6,189.0714 psf	1,325.4469 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 16	36.875 ft	-47.142857 ft	3,066.5143 psf	5,991.0885 psf	1,241.4081 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 17	46.625 ft	-47.142857 ft	3,066.5143 psf	5,940.1226 psf	1,219.7743 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 18	56.392857 ft	-47.142857 ft	3,066.5143 psf	5,889.0633 psf	1,198.101 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 19	66.178571 ft	-47.142857 ft	3,066.5143 psf	5,837.9107 psf	1,176.388 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 20	75.964286 ft	-47.142857 ft	3,066.5143 psf	5,786.7581 psf	1,154.675 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 21	85.75 ft	-47.142857 ft	3,066.5143 psf	5,735.6055 psf	1,132.962 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 22	95.535714 ft	-47.142857 ft	3,066.5143 psf	5,684.4529 psf	1,111.249 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 23	105.32143 ft	-47.142857 ft	3,066.5143 psf	5,633.3003 psf	1,089.536 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 24	115.10714 ft	-47.142857 ft	3,066.5143 psf	5,582.1477 psf	1,067.823 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 25	125 ft	-47.142857 ft	3,066.5143 psf	5,364.9048 psf	975.60887 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 26	131 ft	-46.565507 ft	3,030.4876 psf	5,184.5133 psf	914.32963 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 27	138.91795 ft	-41.994078 ft	2,745.2305 psf	4,634.0375 psf	801.75103 psf	0 psf	0 psf	(6) CH (-38 to -48) Scase
Slice 28	151.66795 ft	-34.632862 ft	2,285.8906 psf	3,809.2021 psf	646.60737 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 29	160.3282 ft	-29.632862 ft	1,973.8906 psf	3,218.6282 psf	528.35978 psf	0 psf	0 psf	(5) CH (-28 to -38) Scase
Slice 30	169.3282 ft	-24.43671 ft	1,649.6507 psf	2,546.0522 psf	380.49988 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 31	177.98845 ft	-19.43671 ft	1,337.6507 psf	1,923.0215 psf	248.47516 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 32	184.80704 ft	-15.5 ft	1,092 psf	1,506.0316 psf	175.74598 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 33	193.46729 ft	-10.5 ft	780 psf	995.66783 psf	91.545561 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 34	201.26152 ft	-6 ft	499.2 psf	557.44297 psf	24.722676 psf	0 psf	0 psf	(2) CH (2 to -8) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Janbu S case

CASE: Low Water (LW) Block Front Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) front

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,494
Date: 07/19/2022
Time: 02:42:59 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - Janbu sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 02:43:32 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) front

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 10 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

around check

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 500,000 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 5e+05 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (79, 0) ft
Lower Left: (79, -60) ft
Lower Right: (129, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (134, 0) ft
Lower Left: (134, -60) ft
Lower Right: (234, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: around check
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Max. Pullout Force: 500,000 lbf
Available Length: 0 ft
Required Length: 0 ft
Pullout Force: 0 lbf
Pullout Force per Length: 0 lbf/ft
Governing Component: (none)

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft
Point 9	-250 ft	-18 ft

Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 27772 of 51975 converged

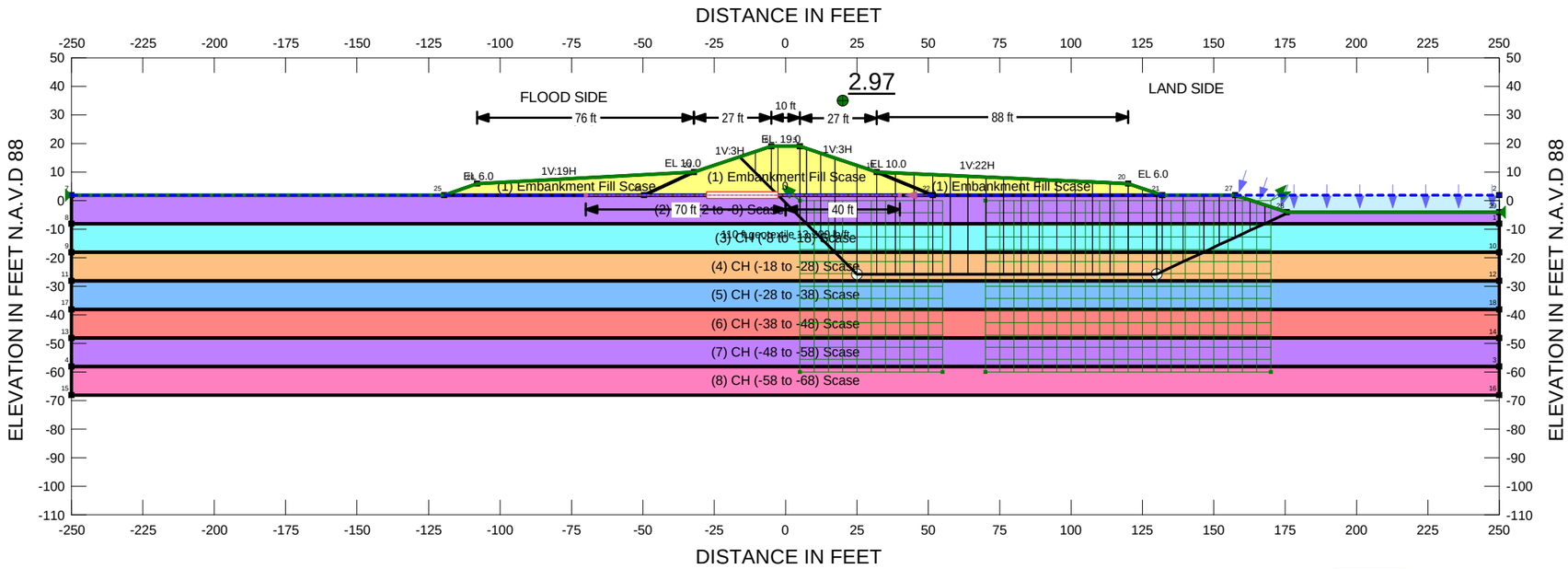
Current Slip Surface

Slip Surface: 9,768
Factor of Safety: 1.44
Volume: 302.3398 ft³
Weight: 28,795.353 lbf
Resisting Force: 5,366.0591 lbf
Activating Force: 3,724.3225 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (149.09756, 2) ft
Entry: (108.92517, 6.5034014) ft

Radius: 19.06555 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	109.67574 ft	5.7528345 ft	-234.17687 psf	63.72743 psf	27.050689 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	111.17687 ft	4.2517007 ft	-140.50612 psf	191.18229 psf	81.152067 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	112.678 ft	2.7505669 ft	-46.835374 psf	318.63715 psf	135.25344 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	114.08571 ft	1.3428571 ft	41.005714 psf	434.74188 psf	167.13109 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	115.4 ft	0.028571429 ft	123.01714 psf	539.4965 psf	176.785 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 6	116.71429 ft	-1.2857143 ft	205.02857 psf	644.25111 psf	186.43891 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 7	118.02857 ft	-2.6 ft	287.04 psf	749.00572 psf	196.09281 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 8	119.34286 ft	-3.9142857 ft	369.05143 psf	853.76033 psf	205.74672 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 9	120.57143 ft	-5.1428571 ft	445.71429 psf	937.05084 psf	208.55999 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 10	121.71429 ft	-6.2857143 ft	517.02857 psf	998.87725 psf	204.53263 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 11	122.85714 ft	-7.4285714 ft	588.34286 psf	1,060.7037 psf	200.50526 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 12	123.71429 ft	-8.2857143 ft	641.82857 psf	1,109.2834 psf	198.42279 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 13	124.66667 ft	-8.5714286 ft	659.65714 psf	1,238.254 psf	245.59978 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 14	126 ft	-8.5714286 ft	659.65714 psf	1,187.1429 psf	223.9044 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 15	127.33333 ft	-8.5714286 ft	659.65714 psf	1,136.0317 psf	202.20902 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 16	128.66667 ft	-8.5714286 ft	659.65714 psf	1,084.9206 psf	180.51364 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 17	130 ft	-8.5714286 ft	659.65714 psf	1,033.8095 psf	158.81826 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 18	131.33333 ft	-8.5714286 ft	659.65714 psf	982.69841 psf	137.12288 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 19	133 ft	-8.5714286 ft	659.65714 psf	957.14286 psf	126.27519 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 20	134.40804 ft	-8.2857143 ft	641.82857 psf	1,002.5455 psf	153.11527 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 21	135.46524 ft	-7.5454545 ft	595.63636 psf	927.05708 psf	140.67975 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 22	136.76356 ft	-6.6363636 ft	538.90909 psf	838.76593 psf	127.28168 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 23	138.06188 ft	-5.7272727 ft	482.18182 psf	750.47478 psf	113.8836 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 24	139.36019 ft	-4.8181818 ft	425.45455 psf	662.18363 psf	100.48553 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 25	140.65851 ft	-3.9090909 ft	368.72727 psf	573.89248 psf	87.087462 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 26	141.95682 ft	-3 ft	312 psf	485.60133 psf	73.689391 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 27	143.25514 ft	-2.0909091 ft	255.27273 psf	397.31018 psf	60.29132 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 28	144.55346 ft	-1.1818182 ft	198.54545 psf	309.01903 psf	46.893249 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 29	145.85177 ft	-0.27272727 ft	141.81818 psf	220.72788 psf	33.495178 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 30	147.15009 ft	0.63636364 ft	85.090909 psf	132.43673 psf	20.097107 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 31	148.44841 ft	1.5454545 ft	28.363636 psf	44.145575 psf	6.6990356 psf	0 psf	0 psf	(2) CH (2 to -8) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (2 to -8) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-8 to -18) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-18 to -28) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-28 to -38) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-38 to -48) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-48 to -58) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-58 to -68) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West 2082 Janbu S case

CASE: Low Water (LW) Block Through Land Side

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS) through

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,486
Date: 07/19/2022
Time: 02:10:21 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Cnl - 2082 - Janbu sgain - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/19/2022
Last Solved Time: 02:11:18 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS) through

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-8 to -18) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (2 to -8) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-38 to -48) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-18 to -28) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-28 to -38) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-48 to -58) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-58 to -68) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Reinforcements

2082 geotextile

Type: Geosynthetic
Interface Adhesion: 265 psf
Interface Shear Angle: 0 °
Surface Area Factor: 2
Pullout Resistance Reduction Factor: 1
Tensile Capacity: 13,200 lbf
Tensile Capacity Reduction Factor: 1
F of S Dependent: No
Force Distribution: Distributed
Face Anchorage: Yes
Factored Tensile Capacity: 13,200 lbf/ft

Slip Surface Limits

Left Coordinate: (-250, 2) ft
Right Coordinate: (250, -4) ft

Slip Surface Block

Left Grid
Upper Left: (5, 0) ft
Lower Left: (5, -60) ft
Lower Right: (55, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (70, 0) ft
Lower Left: (70, -60) ft
Lower Right: (170, -60) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	2 ft
Coordinate 2	250 ft	2 ft

Reinforcement Lines

Reinforcement Line 1

Reinforcement: 2082 geotextile
Lock to Ground Surface: No
Outside Point: (40, 2) ft
Inside Point: (-70, 2) ft
Length: 110 ft
Orientation: 180 °
Slip Surface Intersection: (-2.7142857, 2) ft
Max. Pullout Force: 13,200 lbf
Available Length: 67.285714 ft
Required Length: 24.90566 ft
Pullout Force: 13,200 lbf
Pullout Force per Length: 530 lbf/ft
Governing Component: Tensile Capacity

Points

	X	Y
Point 1	250 ft	-8 ft
Point 2	250 ft	2 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	2 ft
Point 8	-250 ft	-8 ft

Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	32 ft	10 ft
Point 20	120 ft	6 ft
Point 21	132 ft	2 ft
Point 22	51.5 ft	2 ft
Point 23	-32 ft	10 ft
Point 24	-108 ft	6 ft
Point 25	-119.5 ft	2 ft
Point 26	-49.5 ft	2 ft
Point 27	157.5 ft	2 ft
Point 28	175.5 ft	-4 ft
Point 29	250 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-58 to -68) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-28 to -38) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-38 to -48) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	22,19,5,6,23,26	993 ft²
Region 5	(2) CH (2 to -8) Scase	25,7,8,1,29,28,27,21,22,26	4,499 ft²
Region 6	(3) CH (-8 to -18) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-18 to -28) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-48 to -58) Scase	13,14,3,4	5,000 ft²
Region 9	(1) Embankment Fill Scase	19,22,21,20	474 ft²
Region 10	(1) Embankment Fill Scase	23,24,25,26	409 ft²

Slip Results

Slip Surfaces Analysed: 39843 of 51975 converged

Current Slip Surface

Slip Surface: 22,111
Factor of Safety: 2.97
Volume: 5,156.6983 ft³
Weight: 525,124.15 lbf
Resisting Force: 113,344.4 lbf
Activating Force: 38,200.128 lbf
Slip Rank: 1 of 51,975 slip surfaces

Exit: (176.56644, -4) ft
Entry: (-16.035714, 15.321429) ft
Radius: 80.545739 ft
Center: (20, 35) ft

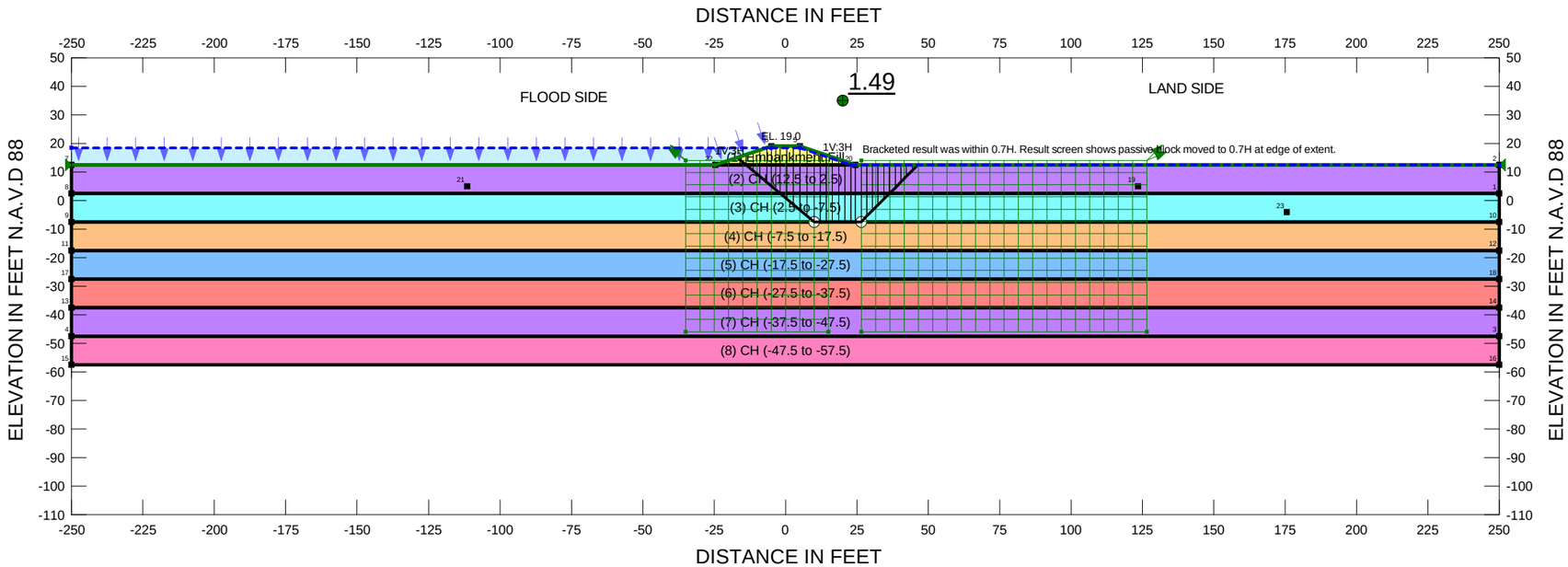
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-13.276786 ft	12.5625 ft	-659.1 psf	370.17668 psf	157.13068 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-7.7589286 ft	7.0446429 ft	-314.78571 psf	1,110.53 psf	471.39203 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	-3.8571429 ft	3.1428571 ft	-71.314286 psf	1,595.713 psf	677.34 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	1.1428571 ft	-1.8571429 ft	240.68571 psf	2,044.5602 psf	765.69931 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 5	6.1428571 ft	-6.8571429 ft	552.68571 psf	2,438.9815 psf	800.68504 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 6	9.7857143 ft	-10.5 ft	780 psf	2,653.9576 psf	795.44779 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 7	14.785714 ft	-15.5 ft	1,092 psf	2,962.7491 psf	794.08586 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 8	21.142857 ft	-21.857143 ft	1,488.6857 psf	3,389.1072 psf	806.68108 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 9	28.5 ft	-25.714286 ft	1,729.3714 psf	3,802.7381 psf	880.09193 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 10	35.25 ft	-25.714286 ft	1,729.3714 psf	3,651.5828 psf	815.93032 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 11	41.75 ft	-25.714286 ft	1,729.3714 psf	3,617.6055 psf	801.50782 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 12	48.25 ft	-25.714286 ft	1,729.3714 psf	3,583.6282 psf	787.08532 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 13	54.613636 ft	-25.714286 ft	1,729.3714 psf	3,550.3638 psf	772.9654 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 14	60.840909 ft	-25.714286 ft	1,729.3714 psf	3,517.8121 psf	759.14804 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 15	67.068182 ft	-25.714286 ft	1,729.3714 psf	3,485.2605 psf	745.33068 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 16	73.295455 ft	-25.714286 ft	1,729.3714 psf	3,452.7088 psf	731.51332 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 17	79.522727 ft	-25.714286 ft	1,729.3714 psf	3,420.1572 psf	717.69597 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 18	85.75 ft	-25.714286 ft	1,729.3714 psf	3,387.6055 psf	703.87861 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 19	91.977273 ft	-25.714286 ft	1,729.3714 psf	3,355.0539 psf	690.06125 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 20	98.204545 ft	-25.714286 ft	1,729.3714 psf	3,322.5022 psf	676.2439 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice	104.43182	-25.714286	1,729.3714	3,289.9506	662.42654	0 psf	0 psf	(4) CH (-18 to
21	ft	ft	psf	psf	psf			-28) Scase
Slice 22	110.65909 ft	-25.714286 ft	1,729.3714 psf	3,257.3989 psf	648.60918 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 23	116.88636 ft	-25.714286 ft	1,729.3714 psf	3,224.8473 psf	634.79183 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 24	122.5 ft	-25.714286 ft	1,729.3714 psf	3,112.7381 psf	587.20431 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 25	127.5 ft	-25.714286 ft	1,729.3714 psf	2,921.0714 psf	505.84664 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 26	131 ft	-25.247978 ft	1,700.2738 psf	2,809.4677 psf	470.82485 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 27	135.63583 ft	-23.086253 ft	1,565.3822 psf	2,523.2697 psf	406.59912 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 28	142.9075 ft	-19.695418 ft	1,353.7941 psf	2,138.7639 psf	333.19994 psf	0 psf	0 psf	(4) CH (-18 to -28) Scase
Slice 29	149.2825 ft	-16.722706 ft	1,168.2969 psf	1,815.3557 psf	274.66016 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 30	154.76083 ft	-14.168119 ft	1,008.8906 psf	1,553.0449 psf	230.9798 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 31	160.1221 ft	-11.668119 ft	852.89062 psf	1,270.4951 psf	177.26261 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 32	165.36631 ft	-9.2227063 ft	700.29687 psf	967.70633 psf	113.50858 psf	0 psf	0 psf	(3) CH (-8 to -18) Scase
Slice 33	171.7442 ft	-6.2486436 ft	514.71536 psf	618.22343 psf	43.93657 psf	0 psf	0 psf	(2) CH (2 to -8) Scase
Slice 34	176.03322 ft	-4.2486436 ft	389.91536 psf	397.26747 psf	3.1207863 psf	0 psf	0 psf	(2) CH (2 to -8) Scase

West Slidell Levees Tie-in to High Ground

Janbu Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (12.5 to 2.5)	Mohr-Coulomb	90		200	0
	(3) CH (2.5 to -7.5)	Mohr-Coulomb	100		200	0
	(4) CH (-7.5 to -17.5)	Mohr-Coulomb	110		250	0
	(5) CH (-17.5 to -27.5)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-27.5 to -37.5)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-37.5 to -47.5)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-47.5 to -57.5)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West High Ground Tie-in 2082 Janbu Q case

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (HW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,450
Date: 10/18/2022
Time: 04:28:04 PM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19 - janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (HW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (2.5 to -7.5)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (12.5 to 2.5)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-27.5 to -37.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-7.5 to -17.5)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-17.5 to -27.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °

Pore Water Pressure
Piezometric Line: 1

(7) CH (-37.5 to -47.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-47.5 to -57.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Slip Surface Block

Left Grid
Upper Left: (-35, 14) ft
Lower Left: (-35, -46) ft
Lower Right: (15, -46) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (26.5, 14) ft
Lower Left: (26.5, -46) ft
Lower Right: (126.5, -46) ft
X Increments: 20
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	18.5 ft
Coordinate 2	-5 ft	18.5 ft
Coordinate 3	5 ft	18.5 ft
Coordinate 4	23 ft	12.5 ft
Coordinate 5	250 ft	12.5 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

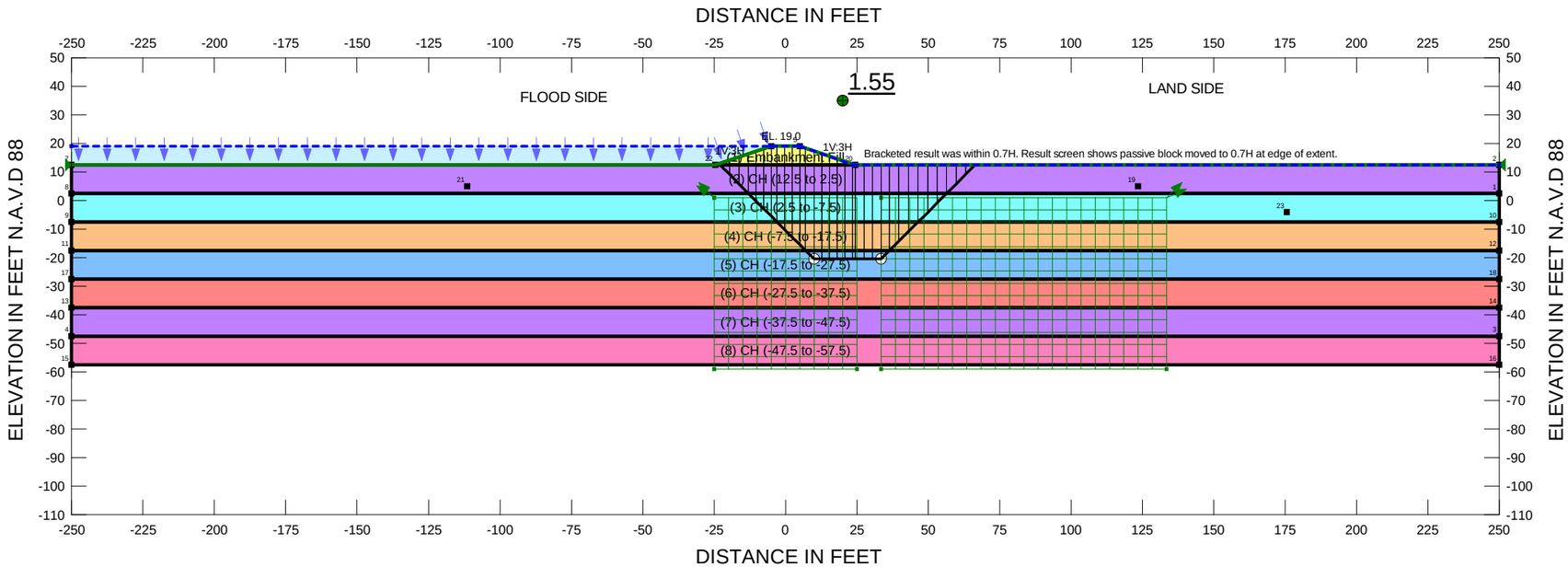
Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5)	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5)	13,14,3,4	5,000 ft²



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (12.5 to 2.5)	Mohr-Coulomb	90		200	0
	(3) CH (2.5 to -7.5)	Mohr-Coulomb	100		200	0
	(4) CH (-7.5 to -17.5)	Mohr-Coulomb	110		250	0
	(5) CH (-17.5 to -27.5)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-27.5 to -37.5)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-37.5 to -47.5)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-47.5 to -57.5)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West High Ground Tie-in 2082 Janbu Q case

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,447
Date: 07/13/2022
Time: 11:21:16 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19 - janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/13/2022
Last Solved Time: 11:21:46 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100

Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (2.5 to -7.5)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (12.5 to 2.5)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(6) CH (-27.5 to -37.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-7.5 to -17.5)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (-17.5 to -27.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(7) CH (-37.5 to -47.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(8) CH (-47.5 to -57.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Slip Surface Block

Left Grid
- Upper Left: (-25, 1) ft
- Lower Left: (-25, -59) ft
- Lower Right: (25, -59) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (33.5, 1) ft
- Lower Left: (33.5, -59) ft
- Lower Right: (133.5, -59) ft
- X Increments: 20
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	23.5 ft	12.5 ft
Coordinate 5	250 ft	12.5 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-68, 638)
- Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-58, 563)
- Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-48, 449)
- Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
- Curve Fit to Data: 100 %
- Segment Curvature: 100 %

Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
- Data Point: (-38, 348)
- Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5)	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5)	13,14,3,4	5,000 ft²

Slip Results

Slip Surfaces Analysed: 49835 of 51975 converged

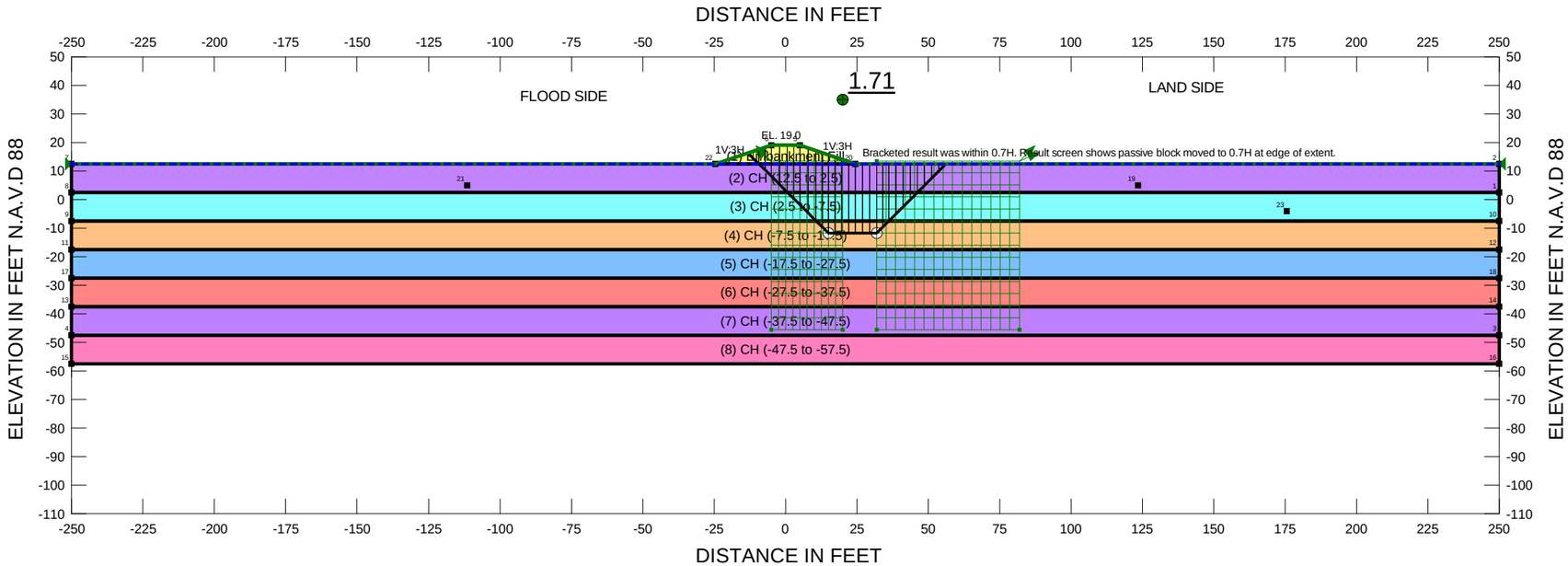
Current Slip Surface

Slip Surface: 19,535
Factor of Safety: 1.55
Volume: 2,049.5536 ft³
Weight: 204,600.96 lbf

Resisting Force: 20,575 lbf
Activating Force: 13,239.038 lbf
Slip Rank: 1 of 51,975 slip surfaces
Exit: (66.428571, 12.5) ft
Entry: (-23.321429, 12.892857) ft
Radius: 41.057479 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-23.125 ft	12.696429 ft	393.34286 psf	23.379749 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-21.261905 ft	10.833333 ft	509.6 psf	484.4615 psf	-0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 3	-17.928571 ft	7.5 ft	717.6 psf	842.90595 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 4	-14.595238 ft	4.1666667 ft	925.6 psf	1,201.3504 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 5	-11.607143 ft	1.1785714 ft	1,112.0571 psf	1,535.8845 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 6	-8.9642857 ft	-1.4642857 ft	1,276.9714 psf	1,846.5083 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 7	-6.3214286 ft	-4.1071429 ft	1,441.8857 psf	2,157.1321 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 8	-3.9642857 ft	-6.4642857 ft	1,588.9714 psf	2,416.0155 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 9	-1.6071429 ft	-8.8214286 ft	1,736.0571 psf	2,632.9658 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 10	1.0357143 ft	-11.464286 ft	1,900.9714 psf	2,923.6801 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 11	3.6785714 ft	-14.107143 ft	2,065.8857 psf	3,214.3943 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 12	6.0357143 ft	-16.464286 ft	2,190.2641 psf	3,433.9777 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 13	8.5357143 ft	-18.964286 ft	2,291.4533 psf	3,613.1443 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 14	11.35 ft	-20.428571 ft	2,321.1234 psf	3,826.2262 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 15	14.05 ft	-20.428571 ft	2,261.9277 psf	3,722.7262 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 16	16.75 ft	-20.428571 ft	2,202.732 psf	3,619.2262 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 17	19.45 ft	-20.428571 ft	2,143.5364 psf	3,515.7262 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 18	22.15 ft	-20.428571 ft	2,084.3407 psf	3,412.2262 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 19	24 ft	-20.428571 ft	2,054.7429 psf	3,341.3095 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 20	26 ft	-20.428571 ft	2,054.7429 psf	3,322.1429 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 21	29 ft	-20.428571 ft	2,054.7429 psf	3,322.1429 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 22	32 ft	-20.428571 ft	2,054.7429 psf	3,322.1429 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 23	34.964286 ft	-18.964286 ft	1,963.3714 psf	3,320.9628 psf	0 psf	250 psf	0 psf	(5) CH (-17.5 to -27.5)
Slice 24	38.095238 ft	-15.833333 ft	1,768 psf	2,976.558 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 25	41.428571 ft	-12.5 ft	1,560 psf	2,609.8914 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 26	44.761905 ft	-9.1666667 ft	1,352 psf	2,243.2247 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 27	48.095238 ft	-5.8333333 ft	1,144 psf	1,861.2464 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 28	51.428571 ft	-2.5 ft	936 psf	1,527.9131 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 29	54.761905 ft	0.83333333 ft	728 psf	1,194.5798 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 30	58.095238 ft	4.1666667 ft	520 psf	877.9131 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 31	61.428571 ft	7.5 ft	312 psf	577.9131 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 32	64.761905 ft	10.833333 ft	104 psf	277.9131 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115		600	0
	(2) CH (12.5 to 2.5)	Mohr-Coulomb	90		200	0
	(3) CH (2.5 to -7.5)	Mohr-Coulomb	100		200	0
	(4) CH (-7.5 to -17.5)	Mohr-Coulomb	110		250	0
	(5) CH (-17.5 to -27.5)	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-27.5 to -37.5)	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-37.5 to -47.5)	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-47.5 to -57.5)	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

Slidell West High Ground Tie-in 2082 Janbu Q case

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,447
Date: 07/13/2022
Time: 11:21:16 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19 - janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/13/2022
Last Solved Time: 11:21:36 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Slip Surface Block

Left Grid
Upper Left: (20, 13.5) ft
Lower Left: (20, -45.5) ft
Lower Right: (-5, -45.5) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (32, 13.5) ft
Lower Left: (32, -45.5) ft
Lower Right: (82, -45.5) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	12.5 ft
Coordinate 2	250 ft	12.5 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (2.5 to -7.5)

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (12.5 to 2.5)

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-27.5 to -37.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-7.5 to -17.5)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-17.5 to -27.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-37.5 to -47.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-47.5 to -57.5)

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft

Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5)	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5)	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5)	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5)	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5)	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5)	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5)	13,14,3,4	5,000 ft²

Slip Results

Slip Surfaces Analysed: 33523 of 39600 converged

Current Slip Surface

Slip Surface: 16,325
Factor of Safety: 1.71
Volume: 1,165.4688 ft³
Weight: 114,344.21 lbf
Resisting Force: 16,675 lbf
Activating Force: 9,758.1956 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (56.285714, 12.5) ft
Entry: (-13.089286, 16.303571) ft
Radius: 32.918116 ft
Center: (20, 35) ft

Slip Slices

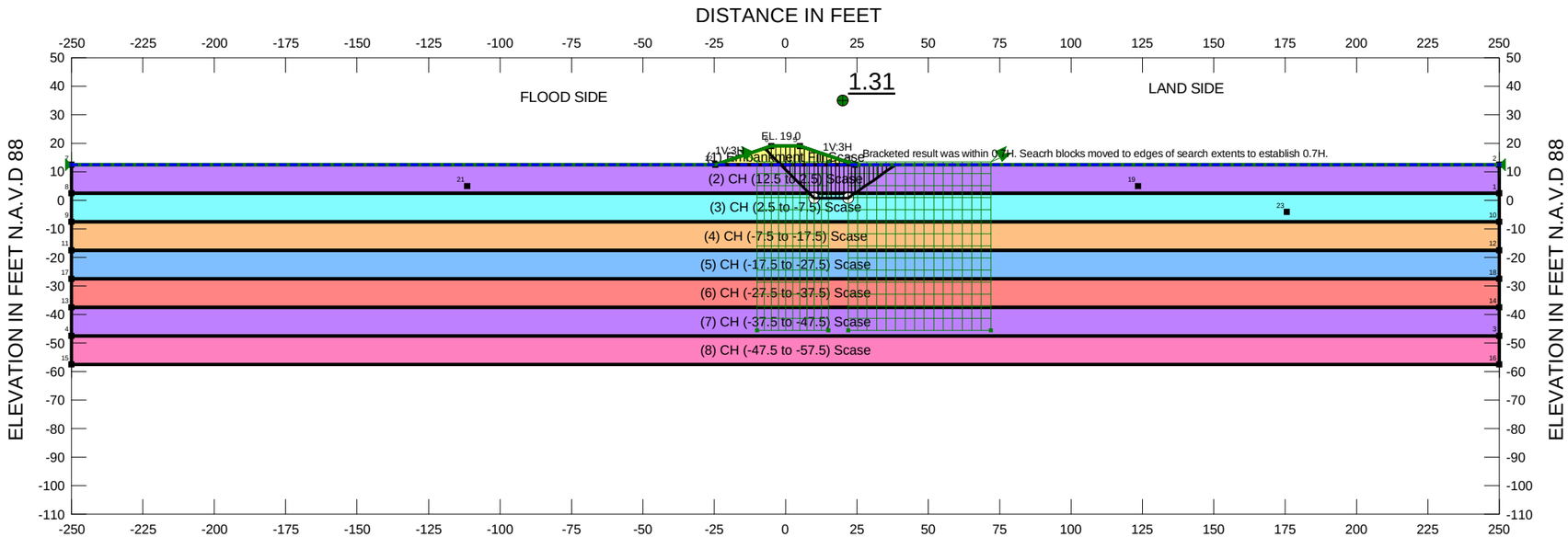
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-12.138393 ft	15.352679 ft	-178.00714 psf	-203.61213 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-10.236607 ft	13.450893 ft	-59.335714 psf	87.995008 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-8.2142857 ft	11.428571 ft	66.857143 psf	604.24238 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 4	-6.0714286 ft	9.2857143 ft	200.57143 psf	879.24238 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 5	-3.5714286 ft	6.7857143 ft	356.57143 psf	1,145.3138 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 6	-0.71428571 ft	3.9285714 ft	534.85714 psf	1,402.4567 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 7	1.7857143 ft	1.4285714 ft	690.85714 psf	1,638.171 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 8	3.9285714 ft	-0.71428571 ft	824.57143 psf	1,852.4567 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 9	6.4285714 ft	-3.2142857 ft	980.57143 psf	2,047.6948 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 10	9.2857143 ft	-6.0714286 ft	1,158.8571 psf	2,223.8852 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 11	11.785714 ft	-8.5714286 ft	1,314.8571 psf	2,359.6482 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 12	13.928571 ft	-10.714286 ft	1,448.5714 psf	2,513.2196 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 13	16.1875 ft	-11.785714 ft	1,515.4286 psf	2,690.0744 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 14	18.5625 ft	-11.785714 ft	1,515.4286 psf	2,599.0327 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 15	20.9375 ft	-11.785714 ft	1,515.4286 psf	2,507.9911 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 16	23.3125 ft	-11.785714 ft	1,515.4286 psf	2,416.9494 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 17	25.75 ft	-11.785714 ft	1,515.4286 psf	2,371.4286 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 18	28.25 ft	-11.785714 ft	1,515.4286 psf	2,371.4286 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 19	30.75 ft	-11.785714 ft	1,515.4286 psf	2,371.4286 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 20	33.071429 ft	-10.714286 ft	1,448.5714 psf	2,399.1613 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 21	35.214286 ft	-8.5714286 ft	1,314.8571 psf	2,163.447 psf	0 psf	250 psf	0 psf	(4) CH (-7.5 to -17.5)
Slice 22	37.535714 ft	-6.25 ft	1,170 psf	1,891.4719 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 23	40.035714 ft	-3.75 ft	1,014 psf	1,641.4719 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 24	42.535714 ft	-1.25 ft	858 psf	1,391.4719 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 25	45.035714 ft	1.25 ft	702 psf	1,141.4719 psf	0 psf	200 psf	0 psf	(3) CH (2.5 to -7.5)
Slice 26	47.535714 ft	3.75 ft	546 psf	903.9719 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 27	50.035714 ft	6.25 ft	390 psf	678.9719 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 28	52.535714 ft	8.75 ft	234 psf	453.9719 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)
Slice 29	55.035714 ft	11.25 ft	78 psf	228.9719 psf	0 psf	200 psf	0 psf	(2) CH (12.5 to 2.5)

West Slidell Levees

Tie-in to High Ground

Janbu Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (12.5 to 2.5) Scase	Mohr-Coulomb	90	0	23
	(3) CH (2.5 to -7.5) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-7.5 to -17.5) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-17.5 to -27.5) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-27.5 to -37.5) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-37.5 to -47.5) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-47.5 to -57.5) Scase	Spatial Mohr-Coulomb	97	0	23

Slidell West High Ground Tie-in 2082 Janbu S case

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,454
Date: 07/13/2022
Time: 09:00:13 AM
Tool Version: 10.0.0.17401
File Name: 0,1, and 2 West Slidell - 13965 - Canal - 2082 Tiein - 19 - janbu - S.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\0, 1, and 2 west side\berm\2082\
Last Solved Date: 07/13/2022
Last Solved Time: 09:00:26 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 16 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (2.5 to -7.5) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (12.5 to 2.5) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-27.5 to -37.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-7.5 to -17.5) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-17.5 to -27.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-37.5 to -47.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-47.5 to -57.5) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 12.5) ft
Right Coordinate: (250, 12.5) ft

Slip Surface Block

Left Grid
Upper Left: (15, 13.5) ft
Lower Left: (15, -45.5) ft
Lower Right: (-10, -45.5) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (22, 13.5) ft
Lower Left: (22, -45.5) ft
Lower Right: (72, -45.5) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	12.5 ft
Coordinate 2	250 ft	12.5 ft

Points

	X	Y
Point 1	250 ft	2.5 ft
Point 2	250 ft	12.5 ft
Point 3	250 ft	-47.5 ft
Point 4	-250 ft	-47.5 ft
Point 5	5 ft	19 ft
Point 6	-5 ft	19 ft
Point 7	-250 ft	12.5 ft
Point 8	-250 ft	2.5 ft
Point 9	-250 ft	-7.5 ft
Point 10	250 ft	-7.5 ft
Point 11	-250 ft	-17.5 ft
Point 12	250 ft	-17.5 ft
Point 13	-250 ft	-37.5 ft
Point 14	250 ft	-37.5 ft
Point 15	-250 ft	-57.5 ft
Point 16	250 ft	-57.5 ft
Point 17	-250 ft	-27.5 ft
Point 18	250 ft	-27.5 ft
Point 19	123.5 ft	5 ft
Point 20	24.5 ft	12.5 ft
Point 21	-111.5 ft	5 ft
Point 22	-24.5 ft	12.5 ft
Point 23	175.5 ft	-4 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-47.5 to -57.5) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-17.5 to -27.5) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-27.5 to -37.5) Scase	17,13,14,18	5,000 ft²
Region 4	(1) Embankment Fill Scase	20,5,6,22	191.75 ft²
Region 5	(2) CH (12.5 to 2.5) Scase	7,8,1,2,20,22	5,000 ft²
Region 6	(3) CH (2.5 to -7.5) Scase	9,8,1,10	5,000 ft²
Region 7	(4) CH (-7.5 to -17.5) Scase	11,9,10,12	5,000 ft²
Region 8	(7) CH (-37.5 to -47.5) Scase	13,14,3,4	5,000 ft²

Slip Results

Slip Surfaces Analysed: 24166 of 39600 converged

Current Slip Surface

Slip Surface: 8,403
Factor of Safety: 1.31
Volume: 430.73333 ft³
Weight: 42,157.007 lbf
Resisting Force: 8,893.9273 lbf
Activating Force: 6,796.6143 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (38.627723, 12.5) ft
Entry: (-7.3571429, 18.214286) ft
Radius: 21.976641 ft
Center: (20, 35) ft

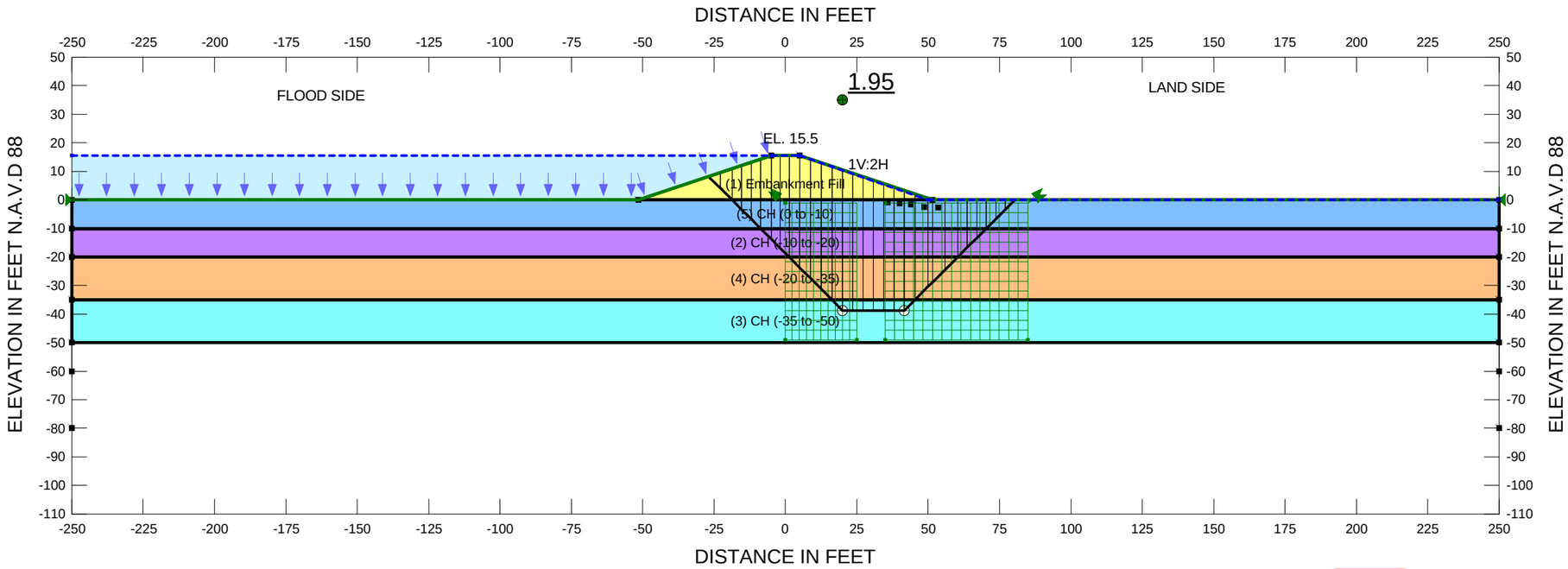
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-6.7678571 ft	17.625 ft	-319.8 psf	68.136069 psf	28.922045 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	-5.5892857 ft	16.446429 ft	-246.25714 psf	204.40821 psf	86.766136 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	-4.1607143 ft	15.017857 ft	-157.11429 psf	345.32599 psf	146.58218 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	-2.4821429 ft	13.339286 ft	-52.371429 psf	490.88941 psf	208.37019 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	-0.8125 ft	11.669643 ft	51.814286 psf	632.76719 psf	246.59988 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 6	0.84821429 ft	10.008929 ft	155.44286 psf	770.95933 psf	261.27124 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 7	2.5089286 ft	8.3482143 ft	259.07143 psf	909.15147 psf	275.94261 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 8	4.1696429 ft	6.6875 ft	362.7 psf	1,047.3436 psf	290.61397 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 9	5.8392857 ft	5.0178571 ft	466.88571 psf	1,162.0181 psf	295.06621 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 10	7.5178571 ft	3.3392857 ft	571.62857 psf	1,253.1751 psf	289.29933 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 11	9.1785714 ft	1.6785714 ft	675.25714 psf	1,349.5565 psf	286.22308 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 12	10.75 ft	0.85714286 ft	726.51429 psf	1,591.369 psf	367.10907 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 13	12.25 ft	0.85714286 ft	726.51429 psf	1,533.869 psf	342.70176 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 14	13.75 ft	0.85714286 ft	726.51429 psf	1,476.369 psf	318.29446 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 15	15.25 ft	0.85714286 ft	726.51429 psf	1,418.869 psf	293.88716 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 16	16.75 ft	0.85714286 ft	726.51429 psf	1,361.369 psf	269.47986 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 17	18.25 ft	0.85714286 ft	726.51429 psf	1,303.869 psf	245.07256 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 18	19.75 ft	0.85714286 ft	726.51429 psf	1,246.369 psf	220.66525 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 19	21.25 ft	0.85714286 ft	726.51429 psf	1,188.869 psf	196.25795 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 20	22.586561 ft	1.2678571 ft	700.88571 psf	1,213.6581 psf	217.65895 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 21	23.759682 ft	2.0892857 ft	649.62857 psf	1,064.0972 psf	175.93148 psf	0 psf	0 psf	(3) CH (2.5 to -7.5) Scase
Slice 22	24.423122 ft	2.5538309 ft	620.64095 psf	980.21313 psf	152.62933 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 23	25.284874 ft	3.1572361 ft	582.98847 psf	917.15901 psf	141.84698 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 24	26.854621 ft	4.2563848 ft	514.40159 psf	809.25795 psf	125.1591 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 25	28.424368 ft	5.3555335 ft	445.81471 psf	701.35689 psf	108.47122 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 26	29.994115 ft	6.4546822 ft	377.22783 psf	593.45583 psf	91.783339 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 27	31.563862 ft	7.5538309 ft	308.64095 psf	485.55477 psf	75.09546 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 28	33.133609 ft	8.6529796 ft	240.05408 psf	377.65371 psf	58.40758 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 29	34.703356 ft	9.7521283 ft	171.4672 psf	269.75265 psf	41.7197 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 30	36.273103 ft	10.851277 ft	102.88032 psf	161.85159 psf	25.03182 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase
Slice 31	37.84285 ft	11.950426 ft	34.293439 psf	53.95053 psf	8.34394 psf	0 psf	0 psf	(2) CH (12.5 to 2.5) Scase

Oak Harbor Levees

Janbu Q case

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2032 Janbu Qcase

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,381
Date: 06/30/2022
Time: 02:51:13 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - Janbu - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 02:51:26 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	15.5 ft
Coordinate 2	-5 ft	15.5 ft
Coordinate 3	5 ft	15.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

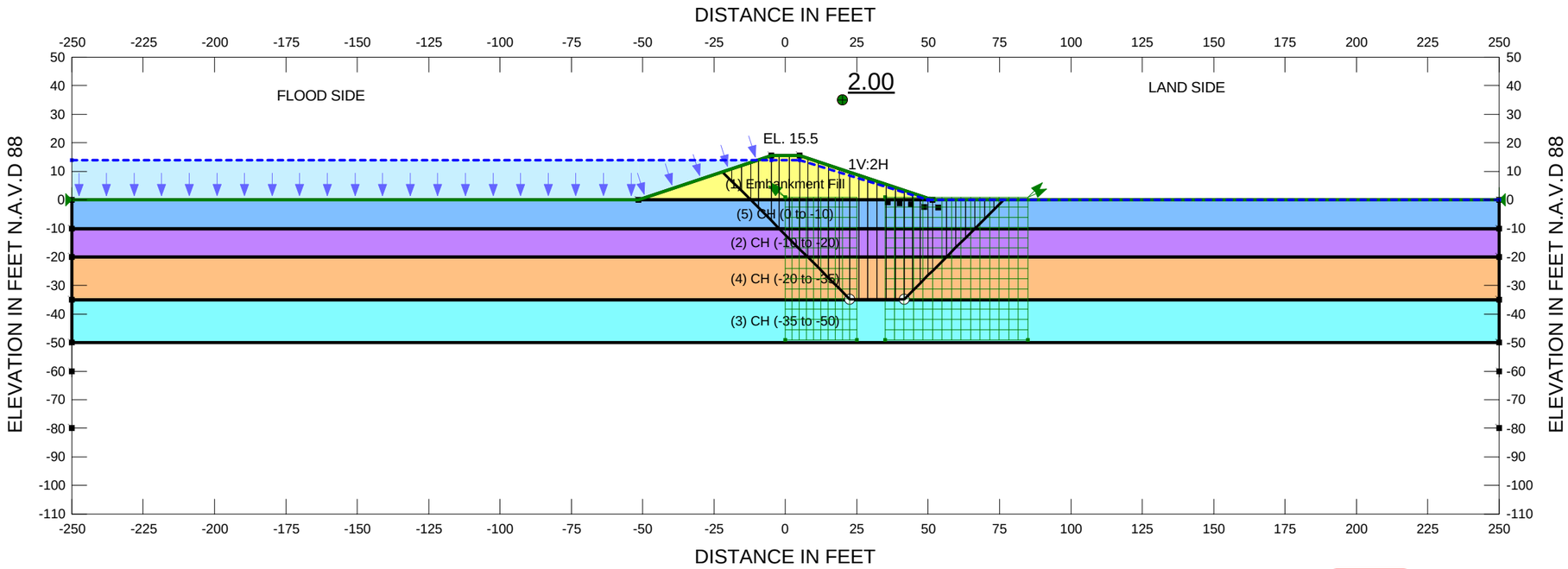
Current Slip Surface

Slip Surface: 30,975
Factor of Safety: 1.95
Volume: 3,078.9926 ft³
Weight: 365,404.21 lbf
Resisting Force: 77,580.238 lbf
Activating Force: 39,817.769 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (80.380952, 0) ft
Entry: (-26.910714, 8.1964286) ft
Radius: 52.423513 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-24.861607 ft	6.1473214 ft	583.60714 psf	420.73376 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-20.763393 ft	2.0491071 ft	839.33571 psf	963.88376 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-17.047619	-1.6666667	1,071.2 psf	1,452.5754	0 psf	640 psf	0 psf	(5) CH (0 to

3	ft	ft		psf				-10)
Slice 4	-13.714286 ft	-5 ft	1,279.2 psf	1,927.6865 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-10.380952 ft	-8.3333333 ft	1,487.2 psf	2,402.7976 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-6.8571429 ft	-11.857143 ft	1,707.0857 psf	2,819.5879 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-3.4285714 ft	-15.285714 ft	1,921.0286 psf	3,273.8641 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-0.28571429 ft	-18.428571 ft	2,117.1429 psf	3,660.4355 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	3.1428571 ft	-21.857143 ft	2,331.0857 psf	4,098.1871 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	6.8809524 ft	-25.595238 ft	2,523.9149 psf	4,441.0125 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	10.642857 ft	-29.357143 ft	2,677.8019 psf	4,714.3776 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	14.404762 ft	-33.119048 ft	2,831.6889 psf	4,987.7426 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	18.142857 ft	-36.857143 ft	2,984.6019 psf	5,239.6363 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 14	21.805556 ft	-38.714286 ft	3,021.764 psf	5,691.8585 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	25.416667 ft	-38.714286 ft	2,944.1492 psf	5,553.4325 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	29.027778 ft	-38.714286 ft	2,866.5344 psf	5,415.0066 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	32.638889 ft	-38.714286 ft	2,788.9196 psf	5,276.5807 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	36.25 ft	-38.714286 ft	2,711.3048 psf	5,138.1548 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	39.861111 ft	-38.714286 ft	2,633.6899 psf	4,999.7288 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	43.52381 ft	-36.857143 ft	2,439.0806 psf	5,043.3795 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	47.690476 ft	-32.690476 ft	2,089.5251 psf	4,405.1304 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	50.75 ft	-29.630952 ft	1,848.9714 psf	3,948.2415 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	53.720238 ft	-26.660714 ft	1,663.6286 psf	3,589.7951 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	58.160714 ft	-22.220238 ft	1,386.5429 psf	3,096.9022 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	62.047619 ft	-18.333333 ft	1,144 psf	2,683.7788 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 26	65.380952 ft	-15 ft	936 psf	2,273.7788 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 27	68.714286 ft	-11.666667 ft	728 psf	1,863.7788 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	72.047619 ft	-8.3333333 ft	520 psf	1,368.6897 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	75.380952 ft	-5 ft	312 psf	952.02304 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	78.714286 ft	-1.6666667 ft	104 psf	535.35637 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2032 Janbu Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,381
Date: 06/30/2022
Time: 02:51:13 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - Janbu - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 02:51:30 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
Upper Left: (0, 1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, 1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	14 ft
Coordinate 2	-5 ft	14 ft
Coordinate 3	5 ft	14 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

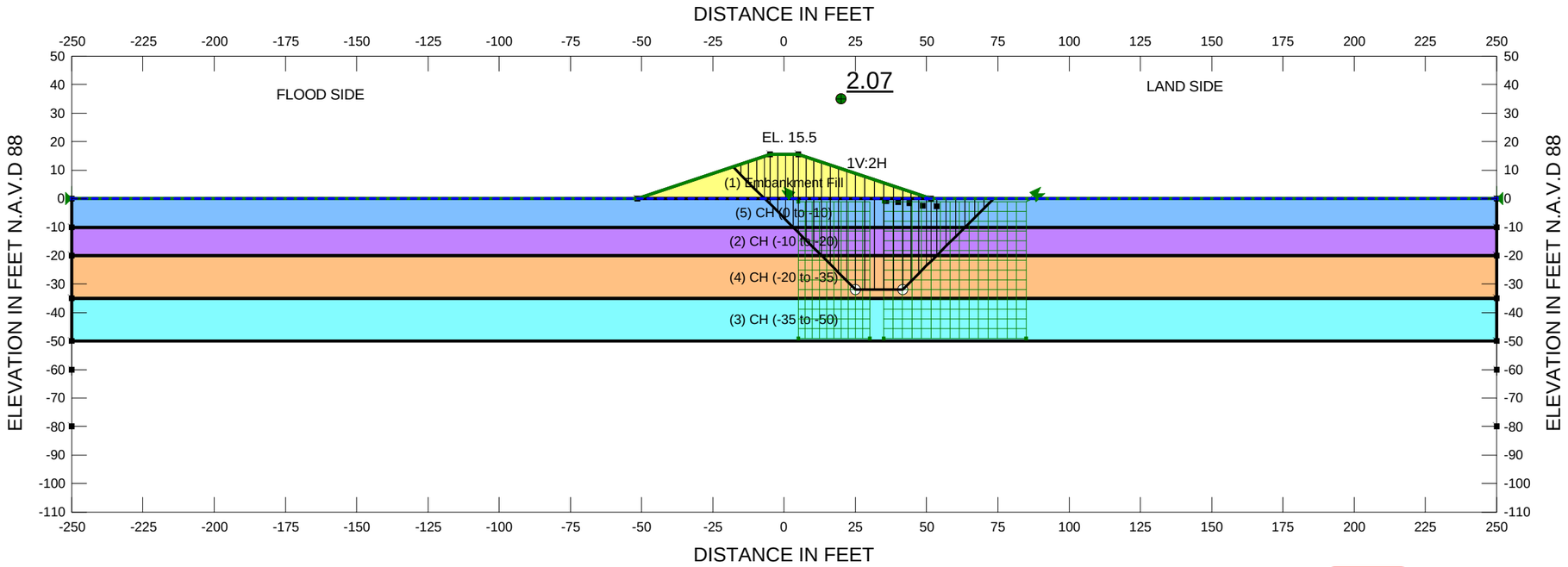
Current Slip Surface

Slip Surface: 28,575
Factor of Safety: 2.00
Volume: 2,553.2679 ft³
Weight: 304,178.81 lbf
Resisting Force: 69,924.405 lbf
Activating Force: 34,893.322 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (76.380952, 0) ft
Entry: (-22.035714, 9.8214286) ft
Radius: 49.001437 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-20.39881 ft	8.1845238 ft	362.88571 psf	179.56858 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-17.125 ft	4.9107143 ft	567.17143 psf	613.45747 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-13.85119 ft	1.6369048	771.45714	1,047.3464	0 psf	600 psf	0 psf	(1)

3		ft	psf	psf				Embankment Fill
Slice 4	-10.857143 ft	-1.3571429 ft	958.28571 psf	1,437.8543 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-7.25 ft	-4.9642857 ft	1,183.3714 psf	1,998.7924 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-3.6071429 ft	-8.6071429 ft	1,410.6857 psf	2,540.3996 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-0.41071429 ft	-11.803571 ft	1,610.1429 psf	2,856.8477 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	3.1964286 ft	-15.410714 ft	1,835.2286 psf	3,300.5262 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	6.3928571 ft	-18.607143 ft	2,007.6457 psf	3,640.2941 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	9.625 ft	-21.839286 ft	2,146.5848 psf	3,929.1423 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	13.303571 ft	-25.517857 ft	2,304.7143 psf	4,196.4518 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	16.982143 ft	-29.196429 ft	2,462.8438 psf	4,463.7613 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	20.660714 ft	-32.875 ft	2,620.9733 psf	4,731.0708 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	24.097222 ft	-34.714286 ft	2,669.0307 psf	5,163.7255 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	27.291667 ft	-34.714286 ft	2,607.0159 psf	5,041.2718 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	30.486111 ft	-34.714286 ft	2,545.0011 psf	4,918.8181 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	33.680556 ft	-34.714286 ft	2,482.9862 psf	4,796.3644 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	36.875 ft	-34.714286 ft	2,420.9714 psf	4,673.9107 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	40.069444 ft	-34.714286 ft	2,358.9566 psf	4,551.457 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	43.055556 ft	-33.325397 ft	2,214.3196 psf	4,643.0495 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	45.833333 ft	-30.547619 ft	1,987.0603 psf	4,228.2347 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	48.611111 ft	-27.769841 ft	1,759.8011 psf	3,813.4199 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	50.75 ft	-25.630952 ft	1,599.3714 psf	3,494.0125 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	53.940476 ft	-22.440476 ft	1,400.2857 psf	3,111.1196 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	58.047619 ft	-18.333333 ft	1,144 psf	2,672.4916 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 26	61.380952 ft	-15 ft	936 psf	2,262.4916 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 27	64.714286 ft	-11.666667 ft	728 psf	1,852.4916 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	68.047619 ft	-8.3333333 ft	520 psf	1,359.66 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	71.380952 ft	-5 ft	312 psf	942.99331 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	74.714286 ft	-1.6666667 ft	104 psf	526.32664 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2032 Janbu Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,381
Date: 06/30/2022
Time: 02:51:13 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - Janbu - 10120.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 02:51:32 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
- Upper Left: (5, -1) ft
- Lower Left: (5, -49) ft
- Lower Right: (30, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (35, -1) ft
- Lower Left: (35, -49) ft
- Lower Right: (85, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39598 of 39600 converged

Current Slip Surface

Slip Surface: 25,695
Factor of Safety: 2.07
Volume: 2,172.4568 ft³
Weight: 259,548.27 lbf
Resisting Force: 64,772.619 lbf
Activating Force: 31,351.603 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (73.52381, 0) ft
Entry: (-18.017857, 11.160714) ft
Radius: 46.522788 ft
Center: (20, 35) ft

Slip Slices

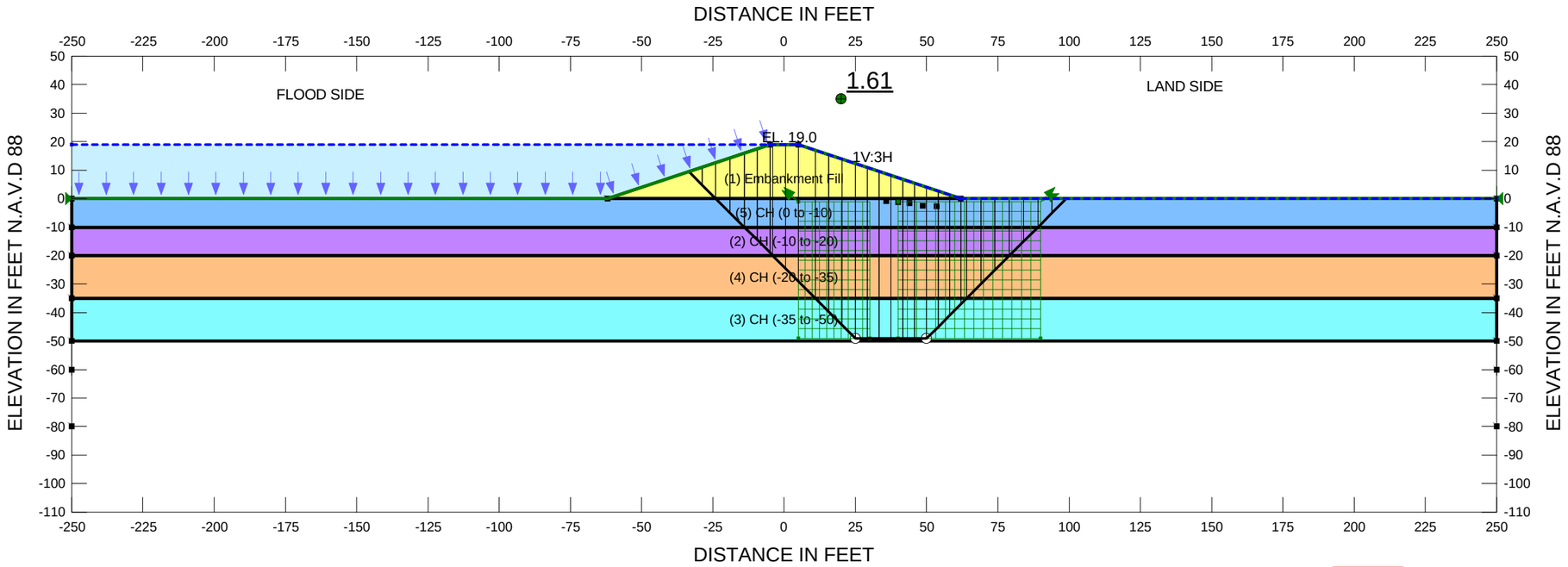
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-16.622768 ft	9.765625 ft	-609.375 psf	-75.299458 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-13.832589 ft	6.9754464 ft	-435.26786 psf	352.52792 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-11.042411 ft	4.1852679 ft	-261.16071 psf	780.3553 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-8.2522321 ft	1.3950893 ft	-87.053571 psf	1,208.1827 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-5.9285714	-0.92857143	57.942857	1,554.4822	0 psf	640 psf	0 psf	(5) CH (0 to

5	ft	ft	psf	psf				-10)
Slice 6	-3.6428571 ft	-3.2142857 ft	200.57143 psf	1,875.7917 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-0.92857143 ft	-5.9285714 ft	369.94286 psf	2,215.0774 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	1.7857143 ft	-8.6428571 ft	539.31429 psf	2,554.3631 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	4.0714286 ft	-10.928571 ft	681.94286 psf	2,761.0968 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	6.3571429 ft	-13.214286 ft	824.57143 psf	2,990.2158 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	9.0714286 ft	-15.928571 ft	993.94286 psf	3,220.0253 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	11.785714 ft	-18.642857 ft	1,163.3143 psf	3,449.8348 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 13	14.625 ft	-21.482143 ft	1,340.4857 psf	3,708.5936 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	17.589286 ft	-24.446429 ft	1,525.4571 psf	3,923.9984 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	20.553571 ft	-27.410714 ft	1,710.4286 psf	4,139.4032 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	23.517857 ft	-30.375 ft	1,895.4 psf	4,354.8079 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	26.666667 ft	-31.857143 ft	1,987.8857 psf	4,748.0873 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	30 ft	-31.857143 ft	1,987.8857 psf	4,620.3095 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	33.333333 ft	-31.857143 ft	1,987.8857 psf	4,492.5317 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	36.666667 ft	-31.857143 ft	1,987.8857 psf	4,364.754 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	40 ft	-31.857143 ft	1,987.8857 psf	4,236.9762 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	43.055556 ft	-30.468254 ft	1,901.219 psf	4,315.1458 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	45.833333 ft	-27.690476 ft	1,727.8857 psf	3,900.331 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	48.611111 ft	-24.912698 ft	1,554.5524 psf	3,485.5162 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	50.75 ft	-22.77381 ft	1,421.0857 psf	3,166.1087 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	52.511905 ft	-21.011905 ft	1,311.1429 psf	2,941.7873 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	55.190476 ft	-18.333333 ft	1,144 psf	2,660.6175 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	58.52381 ft	-15 ft	936 psf	2,250.6175 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	61.857143 ft	-11.666667 ft	728 psf	1,840.6175 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	65.190476 ft	-8.3333333 ft	520 psf	1,350.1607 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	68.52381 ft	-5 ft	312 psf	933.49403 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	71.857143 ft	-1.6666667 ft	104 psf	516.82736 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Oak Harbor

Janbu Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2082 Janbu Qcase

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,383
Date: 07/13/2022
Time: 02:24:09 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 07/13/2022
Last Solved Time: 02:24:26 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100

Tolerable difference in F of S: 0.01

Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
- Upper Left: (5, -1) ft
- Lower Left: (5, -49) ft
- Lower Right: (30, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (40, -1) ft
- Lower Left: (40, -49) ft
- Lower Right: (90, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	19 ft
Coordinate 2	-5 ft	19 ft
Coordinate 3	5 ft	19 ft
Coordinate 4	62 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

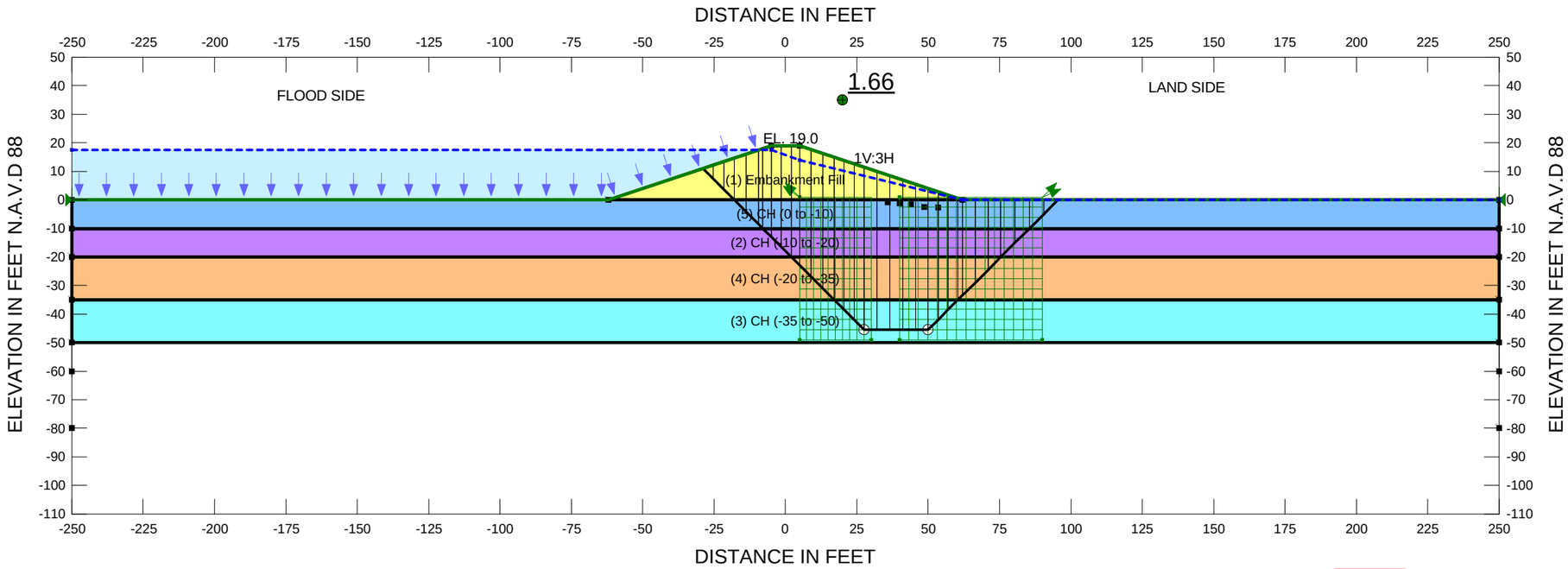
Current Slip Surface

Slip Surface: 38,900
Factor of Safety: 1.61
Volume: 4,718.5 ft³
Weight: 554,557.5 lbf
Resisting Force: 96,530 lbf
Activating Force: 59,992.536 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (99, 0) ft
Entry: (-33.5, 9.5) ft
Radius: 64.827768 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-31.125 ft	7.125 ft	741 psf	536.80182 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-26.375 ft	2.375 ft	1,037.4 psf	1,166.3352 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-21.5 ft	-2.5 ft	1,341.6 psf	1,812.7175	0 psf	640 psf	0 psf	(5) CH (0 to

3				psf				-10)
Slice 4	-16.5 ft	-7.5 ft	1,653.6 psf	2,525.3842 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-11.75 ft	-12.25 ft	1,950 psf	3,099.0469 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 6	-7.25 ft	-16.75 ft	2,230.8 psf	3,731.4469 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-4.5 ft	-19.5 ft	2,402.4 psf	4,109.1469 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-1.75 ft	-22.25 ft	2,574 psf	4,466.7425 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 9	2.75 ft	-26.75 ft	2,854.8 psf	4,966.2425 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	8 ft	-32 ft	3,120 psf	5,433.9925 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	13.333333 ft	-37.333333 ft	3,341.8667 psf	5,797.5867 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 12	18 ft	-42 ft	3,536 psf	6,132.0312 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 13	22.666667 ft	-46.666667 ft	3,730.1333 psf	6,466.4756 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 14	27.083333 ft	-49 ft	3,783.8667 psf	7,023.4722 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	31.25 ft	-49 ft	3,697.2 psf	6,863.75 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	35.416667 ft	-49 ft	3,610.5333 psf	6,704.0278 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	39.583333 ft	-49 ft	3,523.8667 psf	6,544.3056 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	43.75 ft	-49 ft	3,437.2 psf	6,384.5833 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	47.916667 ft	-49 ft	3,350.5333 psf	6,224.8611 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	52 ft	-47 ft	3,140.8 psf	6,317.9688 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	56 ft	-43 ft	2,808 psf	5,724.6355 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	60 ft	-39 ft	2,475.2 psf	5,131.3021 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	63 ft	-36 ft	2,246.4 psf	4,724.6355 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 24	66.5 ft	-32.5 ft	2,028 psf	4,315.5075 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	71.5 ft	-27.5 ft	1,716 psf	3,760.5075 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	76.5 ft	-22.5 ft	1,404 psf	3,205.5075 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	81.5 ft	-17.5 ft	1,092 psf	2,666.8531 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	86.5 ft	-12.5 ft	780 psf	2,051.8531 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	91.5 ft	-7.5 ft	468 psf	1,332.9825 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	96.5 ft	-2.5 ft	156 psf	707.9825 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2082 Janbu Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,383
Date: 07/13/2022
Time: 02:24:09 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 07/13/2022
Last Solved Time: 02:24:22 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100

Tolerable difference in F of S: 0.01

Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
- Upper Left: (5, 1) ft
- Lower Left: (5, -49) ft
- Lower Right: (30, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (40, 1) ft
- Lower Left: (40, -49) ft
- Lower Right: (90, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-5 ft	17.5 ft
Coordinate 3	5 ft	14 ft
Coordinate 4	62 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

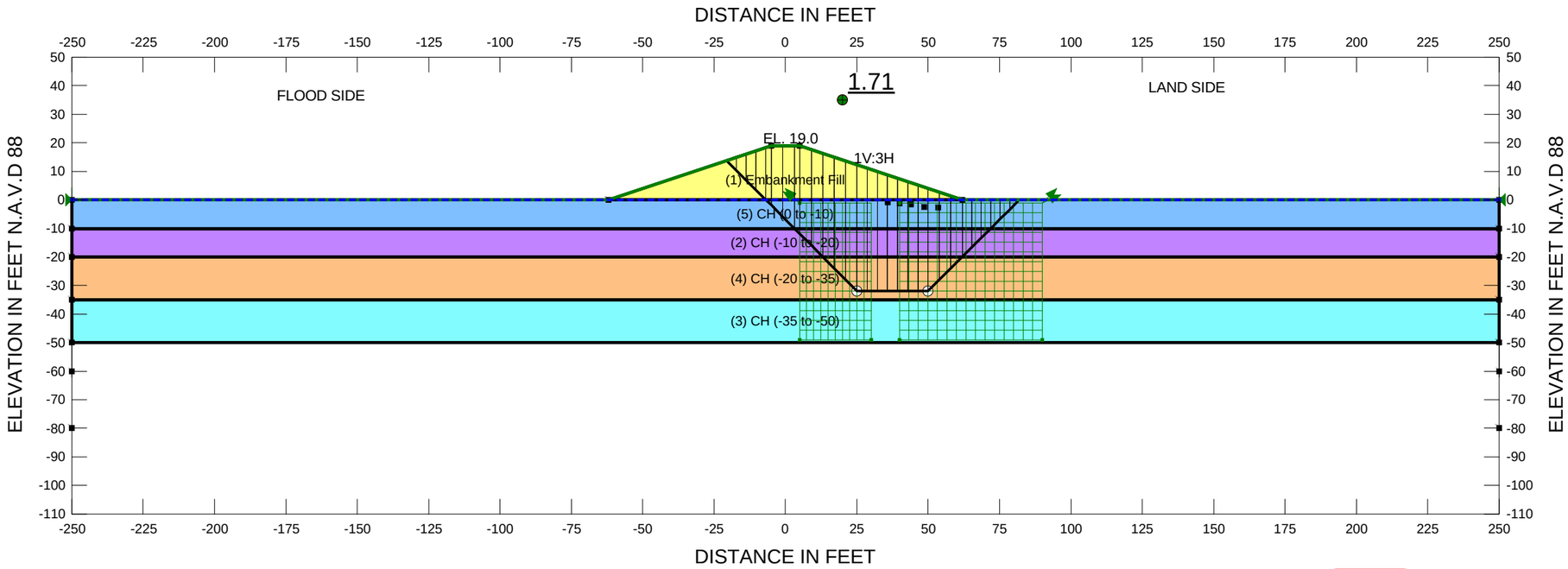
Current Slip Surface

Slip Surface: 36,500
Factor of Safety: 1.66
Volume: 4,116.1116 ft³
Weight: 485,138.7 lbf
Resisting Force: 90,112.143 lbf
Activating Force: 54,341.57 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (95.428571, 0) ft
Entry: (-28.946429, 11.017857) ft
Radius: 61.721661 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-27.110119 ft	9.1815476 ft	519.07143 psf	287.88705 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-23.4375 ft	5.5089286 ft	748.24286 psf	774.63149 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-19.764881	1.8363095	977.41429	1,261.3759	0 psf	600 psf	0 psf	(1)

3	ft	ft	psf	psf				Embankment Fill
Slice 4	-15.821429 ft	-2.1071429 ft	1,223.4857 psf	1,781.0882 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-11.607143 ft	-6.3214286 ft	1,486.4571 psf	2,381.7644 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-8.7142857 ft	-9.2142857 ft	1,666.9714 psf	2,810.4358 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-6.4642857 ft	-11.464286 ft	1,807.3714 psf	3,079.015 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-3.2321429 ft	-14.696429 ft	1,970.4471 psf	3,532.6995 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	0.30357143 ft	-18.232143 ft	2,113.8557 psf	3,967.5924 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	3.5357143 ft	-21.464286 ft	2,244.9514 psf	4,392.5709 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	7.0119048 ft	-24.940476 ft	2,399.0506 psf	4,701.305 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	11.035714 ft	-28.964286 ft	2,588.4662 psf	4,993.7018 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	15.059524 ft	-32.988095 ft	2,777.8817 psf	5,286.0987 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	18.809524 ft	-36.738095 ft	2,954.408 psf	5,535.8623 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	22.285714 ft	-40.214286 ft	3,118.0451 psf	5,784.9893 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	25.761905 ft	-43.690476 ft	3,281.6822 psf	6,034.1162 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	29.75 ft	-45.428571 ft	3,329.0165 psf	6,528.3929 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	34.25 ft	-45.428571 ft	3,260.0481 psf	6,355.8929 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	38.75 ft	-45.428571 ft	3,191.0797 psf	6,183.3929 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	43.25 ft	-45.428571 ft	3,122.1113 psf	6,010.8929 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	47.75 ft	-45.428571 ft	3,053.1429 psf	5,838.3929 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	51.738095 ft	-43.690476 ft	2,883.5629 psf	5,950.2885 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	55.214286 ft	-40.214286 ft	2,613.3714 psf	5,434.6536 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 24	58.690476 ft	-36.738095 ft	2,343.1799 psf	4,919.0187 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 25	61.214286 ft	-34.214286 ft	2,147.0135 psf	4,522.8696 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	64.238095 ft	-31.190476 ft	1,946.2857 psf	4,157.1077 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	68.714286 ft	-26.714286 ft	1,666.9714 psf	3,660.2505 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	73.190476 ft	-22.238095 ft	1,387.6571 psf	3,163.3934 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	77.928571 ft	-17.5 ft	1,092 psf	2,652.4612 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	82.928571 ft	-12.5 ft	780 psf	2,037.4612 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	87.928571 ft	-7.5 ft	468 psf	1,321.4689 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	92.928571 ft	-2.5 ft	156 psf	696.46895 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Oak Harbor 2082 Janbu Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,383
Date: 07/13/2022
Time: 02:24:09 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 07/13/2022
Last Solved Time: 02:24:24 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (5, -1) ft
Lower Left: (5, -49) ft
Lower Right: (30, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (40, -1) ft
Lower Left: (40, -49) ft
Lower Right: (90, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

Current Slip Surface

Slip Surface: 25,700
Factor of Safety: 1.71
Volume: 2,704.2143 ft³
Weight: 321,801.74 lbf
Resisting Force: 72,378.571 lbf
Activating Force: 42,210.893 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (81.857143, 0) ft
Entry: (-20.642857, 13.785714) ft
Radius: 51.538512 ft
Center: (20, 35) ft

Slip Slices

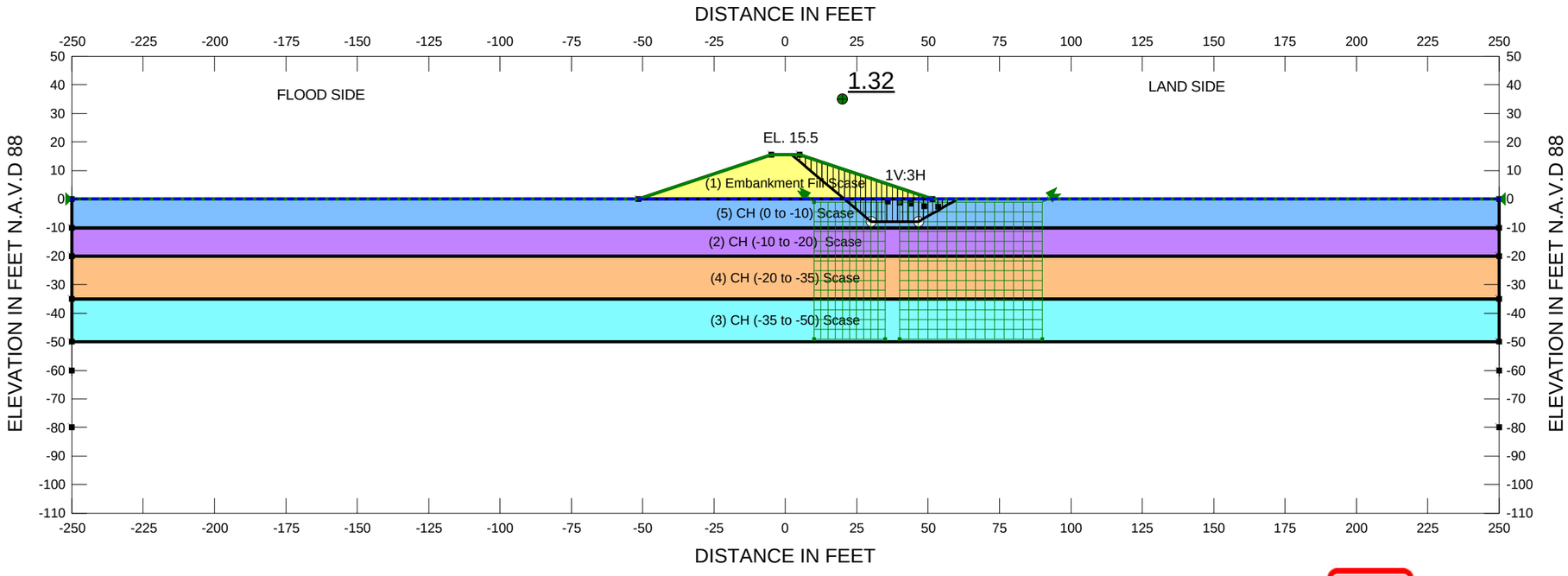
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-18.919643 ft	12.0625 ft	-752.7 psf	-83.892097 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-15.473214 ft	8.6160714 ft	-537.64286 psf	444.56028 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-12.026786 ft	5.1696429 ft	-322.58571 psf	973.01267 psf	0 psf	600 psf	0 psf	(1) Embankment Fill

Slice 4	-8.5803571 ft	1.7232143 ft	-107.52857 psf	1,501.465 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-5.9285714 ft	-0.92857143 ft	57.942857 psf	1,894.15 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-2.9642857 ft	-3.8928571 ft	242.91429 psf	2,300.281 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	1.1071429 ft	-7.9642857 ft	496.97143 psf	2,809.2095 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	4.0714286 ft	-10.928571 ft	681.94286 psf	3,085.0566 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	7.0357143 ft	-13.892857 ft	866.91429 psf	3,371.628 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	11.107143 ft	-17.964286 ft	1,120.9714 psf	3,716.3423 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	15.119048 ft	-21.97619 ft	1,371.3143 psf	4,075.8174 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	19.071429 ft	-25.928571 ft	1,617.9429 psf	4,363.0237 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	23.02381 ft	-29.880952 ft	1,864.5714 psf	4,650.2301 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	26.785714 ft	-31.857143 ft	1,987.8857 psf	5,146.0238 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	30.357143 ft	-31.857143 ft	1,987.8857 psf	5,009.119 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	33.928571 ft	-31.857143 ft	1,987.8857 psf	4,872.2143 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	37.5 ft	-31.857143 ft	1,987.8857 psf	4,735.3095 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	41.071429 ft	-31.857143 ft	1,987.8857 psf	4,598.4048 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	44.642857 ft	-31.857143 ft	1,987.8857 psf	4,461.5 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	48.214286 ft	-31.857143 ft	1,987.8857 psf	4,324.5952 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	51.97619 ft	-29.880952 ft	1,864.5714 psf	4,381.6747 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	55.928571 ft	-25.928571 ft	1,617.9429 psf	3,791.4525 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	59.952381 ft	-21.904762 ft	1,366.8571 psf	3,189.7064 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	63.642857 ft	-18.214286 ft	1,136.5714 psf	2,724.5149 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 25	66.928571 ft	-14.928571 ft	931.54286 psf	2,320.372 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 26	70.214286 ft	-11.642857 ft	726.51429 psf	1,916.2291 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 27	73.52381 ft	-8.3333333 ft	520 psf	1,412.9928 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	76.857143 ft	-5 ft	312 psf	996.32617 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	80.190476 ft	-1.6666667 ft	104 psf	579.65951 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Oak Harbor

Janbu Scase

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Oak Harbor 2032 Janbu Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,385
Date: 06/30/2022
Time: 01:57:25 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - Janbu - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 01:57:38 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
Upper Left: (10, -1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (40, -1) ft
Lower Left: (40, -49) ft
Lower Right: (90, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	51.5 ft	0 ft
Point 10	5 ft	15.5 ft
Point 11	-5 ft	15.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-51.5 ft	0 ft

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	875.75 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 34796 of 39600 converged

Current Slip Surface

Slip Surface: 7,292
Factor of Safety: 1.32
Volume: 482.37543 ft³
Weight: 57,685.199 lbf
Resisting Force: 16,867.3 lbf
Activating Force: 12,794.447 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (60.275637, 0) ft
Entry: (2.1640411, 15.5) ft
Radius: 30.7288 ft
Center: (20, 35) ft

Slip Slices

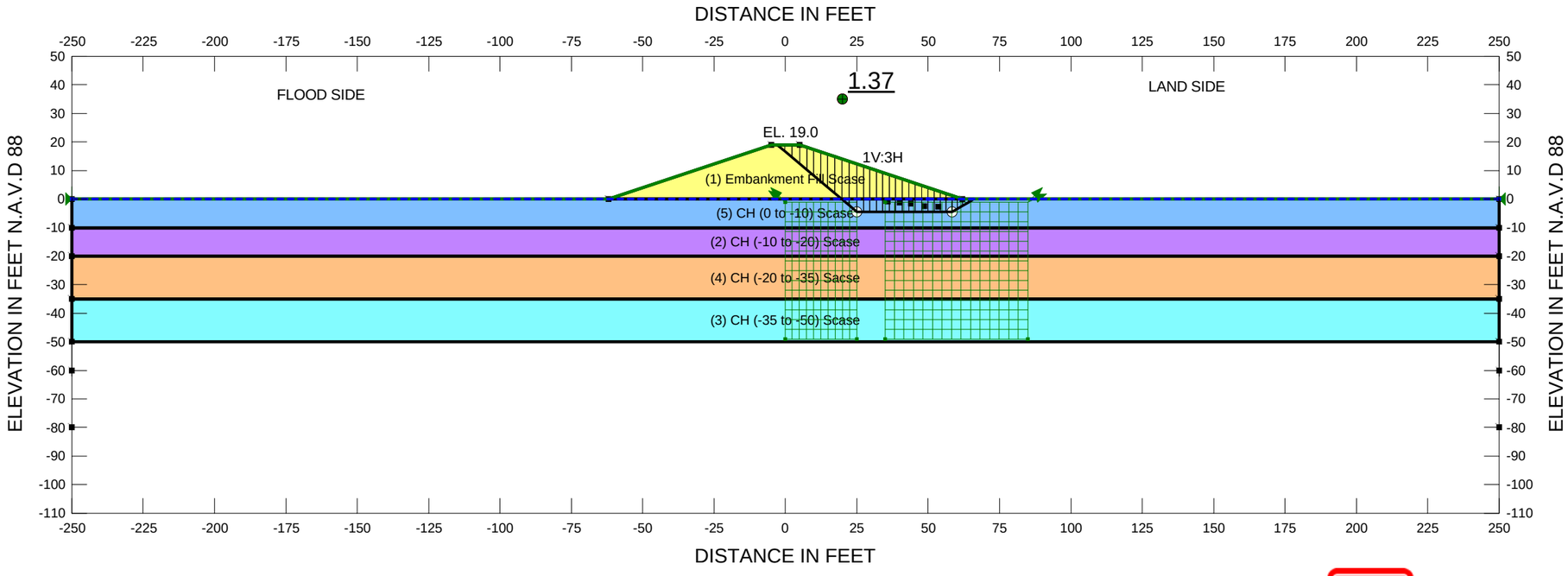
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	3.5820205 ft	14.310174 ft	-892.95486 psf	107.58247 psf	45.666048 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	5.9772639 ft	12.300326 ft	-767.54035 psf	259.8559 psf	110.30229 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	7.9317916 ft	10.660283 ft	-665.20164 psf	349.23784 psf	148.24267 psf	0 psf	0 psf	(1) Embankment Fill Scase

Slice 4	9.8863193 ft	9.0202392 ft	-562.86293 psf	438.61977 psf	186.18305 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	11.840847 ft	7.3801957 ft	-460.52421 psf	528.00171 psf	224.12343 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	13.795375 ft	5.7401522 ft	-358.1855 psf	617.38364 psf	262.06381 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	15.749902 ft	4.1001087 ft	-255.84678 psf	706.76557 psf	300.00419 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	17.70443 ft	2.4600652 ft	-153.50807 psf	796.14751 psf	337.94457 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	19.658958 ft	0.82002175 ft	-51.169357 psf	885.52944 psf	375.88495 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	21.5726 ft	-0.78571429 ft	49.028571 psf	989.6992 psf	399.29099 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 11	23.445355 ft	-2.3571429 ft	147.08571 psf	1,108.6568 psf	408.1627 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	25.318111 ft	-3.9285714 ft	245.14286 psf	1,227.6144 psf	417.03441 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	27.190867 ft	-5.5 ft	343.2 psf	1,346.5719 psf	425.90612 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	29.063622 ft	-7.0714286 ft	441.25714 psf	1,465.5295 psf	434.77783 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	30.925926 ft	-7.8571429 ft	490.28571 psf	1,770.8157 psf	543.55273 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	32.777778 ft	-7.8571429 ft	490.28571 psf	1,699.828 psf	513.42026 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	34.62963 ft	-7.8571429 ft	490.28571 psf	1,628.8404 psf	483.28779 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	36.481481 ft	-7.8571429 ft	490.28571 psf	1,557.8527 psf	453.15531 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	38.333333 ft	-7.8571429 ft	490.28571 psf	1,486.8651 psf	423.02284 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	40.185185 ft	-7.8571429 ft	490.28571 psf	1,415.8774 psf	392.89037 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	42.037037 ft	-7.8571429 ft	490.28571 psf	1,344.8898 psf	362.7579 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	43.888889 ft	-7.8571429 ft	490.28571 psf	1,273.9021 psf	332.62543 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	45.740741 ft	-7.8571429 ft	490.28571 psf	1,202.9145 psf	302.49296 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	47.5 ft	-7.3760176 ft	460.2635 psf	1,216.8625 psf	321.15723 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	49.166667 ft	-6.4137672 ft	400.21907 psf	1,004.1312 psf	256.3455 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	50.75 ft	-5.4996293 ft	343.17687 psf	802.03647 psf	194.77434 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	52.377564 ft	-4.5599549 ft	284.54119 psf	635.67664 psf	149.04816 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	54.132691 ft	-3.5466316 ft	221.30981 psf	494.41516 psf	115.92634 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	55.887819 ft	-2.5333083 ft	158.07844 psf	353.15369 psf	82.804531 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	57.642946 ft	-1.519985 ft	94.847062 psf	211.89221 psf	49.682719 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 31	59.398074 ft	-0.50666166 ft	31.615687 psf	70.630737 psf	16.560906 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

Oak Harbor

Janbu Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Sacse	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Oak Harbor 2082 Janbu Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,382
Date: 06/30/2022
Time: 01:35:48 PM
Tool Version: 10.0.0.17401
File Name: Oak Harbor FID5 - 10120 - 2082 - Janbu - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\5. Oak Harbor\
Last Solved Date: 06/30/2022
Last Solved Time: 01:36:06 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
- Upper Left: (0, -1) ft
- Lower Left: (0, -49) ft
- Lower Right: (25, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (35, -1) ft
- Lower Left: (35, -49) ft
- Lower Right: (85, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	62 ft	0 ft
Point 10	5 ft	19 ft
Point 11	-5 ft	19 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-62 ft	0 ft

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35) Sacse

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Sacse	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	1,273 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

Current Slip Surface

Slip Surface: 5,157
Factor of Safety: 1.37
Volume: 653.17931 ft³
Weight: 76,878.523 lbf
Resisting Force: 25,515.547 lbf
Activating Force: 18,605.002 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (66.003844, 0) ft
Entry: (-2.9210842, 19) ft
Radius: 35.272611 ft
Center: (20, 35) ft

Slip Slices

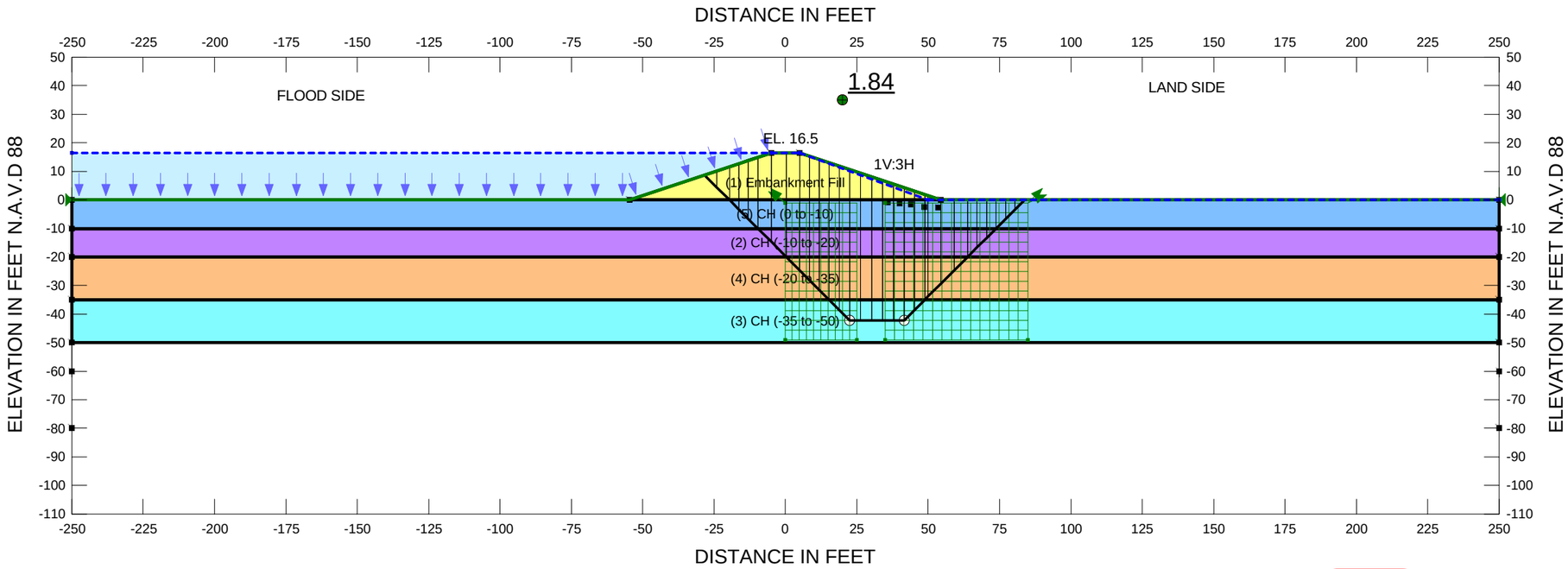
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-1.6009035 ft	17.892237 ft	-1,116.4756 psf	101.09711 psf	42.913177 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	1.0394579 ft	15.676711 ft	-978.22674 psf	303.29133 psf	128.73953 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	3.6798193 ft	13.461184 ft	-839.9779 psf	505.48555 psf	214.56589 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	6.2268528 ft	11.323969 ft	-706.61569 psf	663.21105 psf	281.51639 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	8.6805585 ft	9.2650659 ft	-578.14011 psf	776.46783 psf	329.59104 psf	0 psf	0 psf	(1) Embankment

								Fill Scase
Slice 6	11.134264 ft	7.2061624 ft	-449.66453 psf	889.7246 psf	377.66569 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	13.58797 ft	5.1472588 ft	-321.18895 psf	1,002.9814 psf	425.74034 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	16.041676 ft	3.0883553 ft	-192.71337 psf	1,116.2382 psf	473.81498 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	18.495381 ft	1.0294518 ft	-64.23779 psf	1,229.4949 psf	521.88963 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	21.041676 ft	-1.1071429 ft	69.085714 psf	1,370.0717 psf	552.23581 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 11	23.680559 ft	-3.3214286 ft	207.25714 psf	1,537.9686 psf	564.8535 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	26.136364 ft	-4.4285714 ft	276.34286 psf	1,928.3442 psf	701.23295 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	28.409091 ft	-4.4285714 ft	276.34286 psf	1,841.2229 psf	664.25219 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	30.681818 ft	-4.4285714 ft	276.34286 psf	1,754.1017 psf	627.27143 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	32.954545 ft	-4.4285714 ft	276.34286 psf	1,666.9805 psf	590.29067 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	35.227273 ft	-4.4285714 ft	276.34286 psf	1,579.8593 psf	553.30991 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	37.5 ft	-4.4285714 ft	276.34286 psf	1,492.7381 psf	516.32915 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	39.772727 ft	-4.4285714 ft	276.34286 psf	1,405.6169 psf	479.34838 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	42.045455 ft	-4.4285714 ft	276.34286 psf	1,318.4957 psf	442.36762 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	44.318182 ft	-4.4285714 ft	276.34286 psf	1,231.3745 psf	405.38686 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	46.590909 ft	-4.4285714 ft	276.34286 psf	1,144.2532 psf	368.4061 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	48.863636 ft	-4.4285714 ft	276.34286 psf	1,057.132 psf	331.42534 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	51.041667 ft	-4.4285714 ft	276.34286 psf	973.64087 psf	295.98545 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	53.125 ft	-4.4285714 ft	276.34286 psf	893.77976 psf	262.08642 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	55.208333 ft	-4.4285714 ft	276.34286 psf	813.91865 psf	228.18739 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	57.291667 ft	-4.4285714 ft	276.34286 psf	734.05754 psf	194.28836 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	59.25 ft	-3.8993337 ft	243.31842 psf	669.01947 psf	180.69938 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	61.083333 ft	-2.8408582 ft	177.26955 psf	436.67009 psf	110.109 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	63.000961 ft	-1.7337153 ft	108.18384 psf	240.37155 psf	56.110355 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	65.002883 ft	-0.57790511 ft	36.061279 psf	80.123849 psf	18.703452 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

I-10 Crossing

Janbu Q case

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2032 Janbu Qcase

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,377
Date: 07/13/2022
Time: 02:32:05 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 07/13/2022
Last Solved Time: 02:32:16 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100

Tolerable difference in F of S: 0.01

Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
- Upper Left: (0, -1) ft
- Lower Left: (0, -49) ft
- Lower Right: (25, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (35, -1) ft
- Lower Left: (35, -49) ft
- Lower Right: (85, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	16.5 ft
Coordinate 2	-5 ft	16.5 ft
Coordinate 3	5 ft	16.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

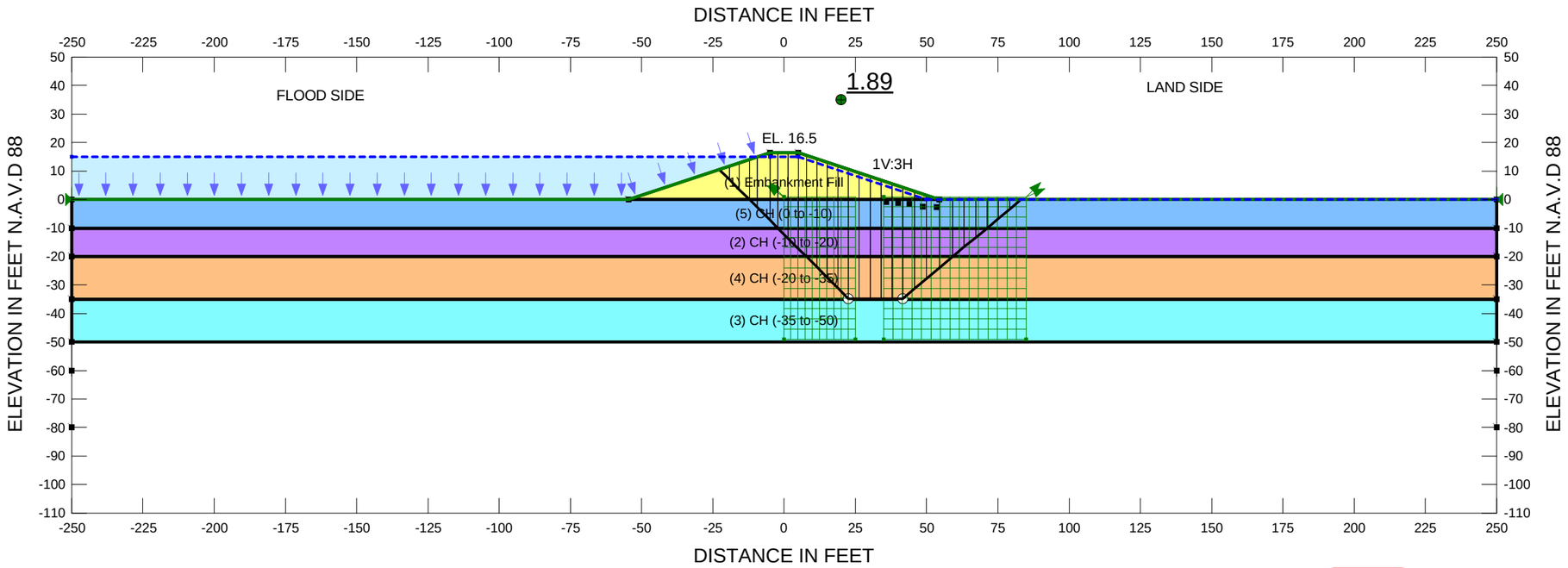
Current Slip Surface

Slip Surface: 33,855
Factor of Safety: 1.84
Volume: 3,413.631 ft³
Weight: 403,942.22 lbf
Resisting Force: 81,202.381 lbf
Activating Force: 44,157.877 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (83.809524, 0) ft
Entry: (-28.357143, 8.7142857) ft
Radius: 55.434725 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-26.178571 ft	6.5357143 ft	621.77143 psf	449.87845 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-21.821429 ft	2.1785714 ft	893.65714 psf	1,027.3451 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-17.97619	-1.6666667	1,133.6 psf	1,531.9884	0 psf	640 psf	0 psf	(5) CH (0 to

3	ft	ft		psf				-10)
Slice 4	-14.642857 ft	-5 ft	1,341.6 psf	2,007.0996 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-11.309524 ft	-8.3333333 ft	1,549.6 psf	2,482.2107 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-7.3214286 ft	-12.321429 ft	1,798.4571 psf	2,959.4221 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-2.3214286 ft	-17.321429 ft	2,110.4571 psf	3,615.1244 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	2.6785714 ft	-22.321429 ft	2,422.4571 psf	4,242.8527 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 9	6.7261905 ft	-26.369048 ft	2,635.5333 psf	4,625.9678 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	10.178571 ft	-29.821429 ft	2,771.9714 psf	4,876.8408 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	13.630952 ft	-33.27381 ft	2,908.4095 psf	5,127.7138 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	17.142857 ft	-36.785714 ft	3,047.2 psf	5,362.1867 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 13	20.714286 ft	-40.357143 ft	3,188.3429 psf	5,618.1391 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 14	24.416667 ft	-42.142857 ft	3,215.061 psf	6,083.9087 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	28.25 ft	-42.142857 ft	3,127.3543 psf	5,936.9643 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	32.083333 ft	-42.142857 ft	3,039.6476 psf	5,790.0198 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	35.916667 ft	-42.142857 ft	2,951.941 psf	5,643.0754 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	39.75 ft	-42.142857 ft	2,864.2343 psf	5,496.131 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	43.452381 ft	-40.357143 ft	2,668.0952 psf	5,569.0435 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	47.02381 ft	-36.785714 ft	2,363.5238 psf	5,039.2816 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	49.404762 ft	-34.404762 ft	2,160.4762 psf	4,666.5719 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	52.25 ft	-31.559524 ft	1,969.3143 psf	4,241.683 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	56.827381 ft	-26.982143 ft	1,683.6857 psf	3,647.3437 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	61.482143 ft	-22.327381 ft	1,393.2286 psf	3,130.6651 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	65.47619 ft	-18.333333 ft	1,144 psf	2,707.9113 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 26	68.809524 ft	-15 ft	936 psf	2,297.9113 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 27	72.142857 ft	-11.666667 ft	728 psf	1,887.9113 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	75.47619 ft	-8.3333333 ft	520 psf	1,387.9957 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	78.809524 ft	-5 ft	312 psf	971.32902 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	82.142857 ft	-1.6666667 ft	104 psf	554.66235 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2032 Janbu Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,377
Date: 07/13/2022
Time: 02:32:05 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 07/13/2022
Last Solved Time: 02:32:18 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
Upper Left: (0, 1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, 1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	15 ft
Coordinate 2	-5 ft	15 ft
Coordinate 3	5 ft	15 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

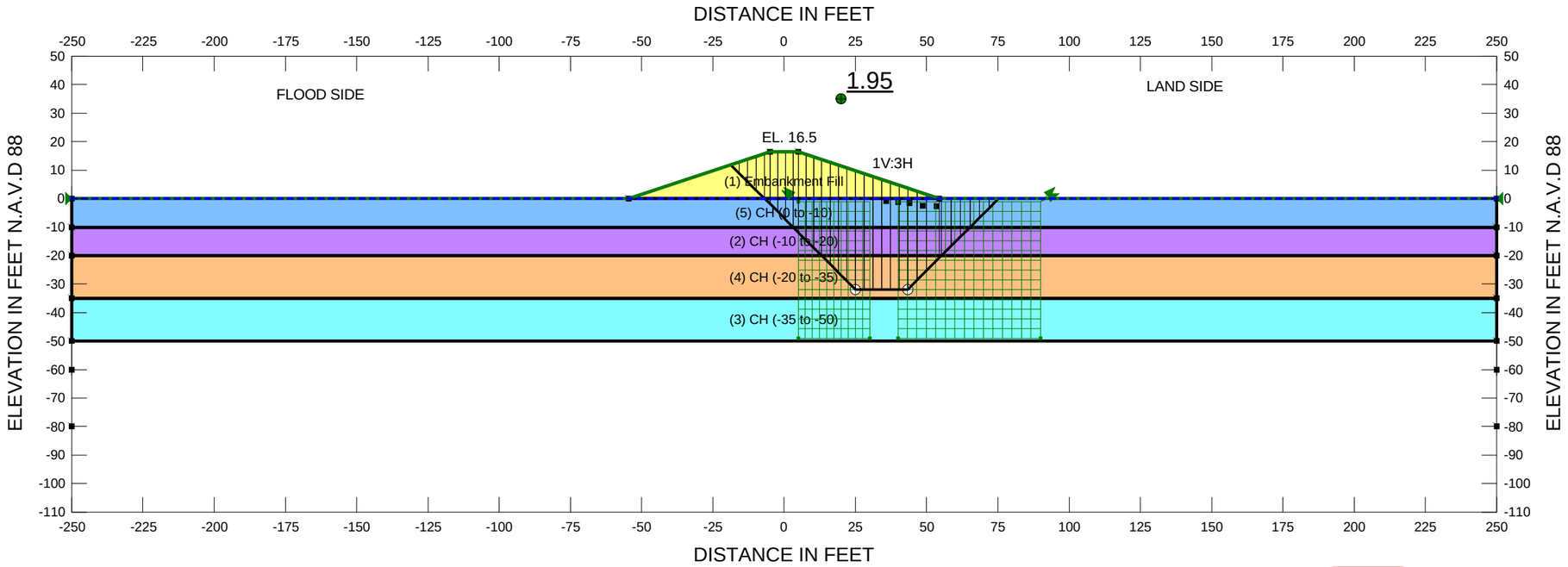
Current Slip Surface

Slip Surface: 28,574
Factor of Safety: 1.89
Volume: 2,744.2179 ft³
Weight: 326,927.24 lbf
Resisting Force: 75,181.256 lbf
Activating Force: 39,758.548 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (83.037541, 0) ft
Entry: (-22.785714, 10.571429) ft
Radius: 51.824145 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-21.02381 ft	8.8095238 ft	386.28571 psf	193.96697 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-17.5 ft	5.2857143 ft	606.17143 psf	660.98919 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-13.97619 ft	1.7619048	826.05714	1,128.0114	0 psf	600 psf	0 psf	(1)

3		ft	psf	psf				Embankment Fill
Slice 4	-10.857143 ft	-1.3571429 ft	1,020.6857 psf	1,533.9015 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-7.25 ft	-4.9642857 ft	1,245.7714 psf	2,094.8396 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-3.6071429 ft	-8.6071429 ft	1,473.0857 psf	2,636.4467 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-0.41071429 ft	-11.803571 ft	1,672.5429 psf	2,948.1566 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	3.1964286 ft	-15.410714 ft	1,897.6286 psf	3,391.8352 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	6.3928571 ft	-18.607143 ft	2,068.1143 psf	3,731.603 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	9.625 ft	-21.839286 ft	2,202.5714 psf	4,022.6723 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	13.303571 ft	-25.517857 ft	2,355.6 psf	4,289.9818 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	16.982143 ft	-29.196429 ft	2,508.6286 psf	4,557.2913 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	20.660714 ft	-32.875 ft	2,661.6571 psf	4,824.6008 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	24.416667 ft	-34.714286 ft	2,698.3048 psf	5,266.4802 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	28.25 ft	-34.714286 ft	2,618.5714 psf	5,119.5357 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	32.083333 ft	-34.714286 ft	2,538.8381 psf	4,972.5913 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	35.916667 ft	-34.714286 ft	2,459.1048 psf	4,825.6468 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	39.75 ft	-34.714286 ft	2,379.3714 psf	4,678.7024 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	43.75 ft	-32.966161 ft	2,187.0885 psf	4,651.6089 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	47.916667 ft	-29.469913 ft	1,882.2559 psf	4,103.8031 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	52.25 ft	-25.833815 ft	1,612.03 psf	3,534.0851 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	56.851235 ft	-21.97292 ft	1,371.1102 psf	3,019.2758 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	61.188726 ft	-18.333333 ft	1,144 psf	2,628.4142 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 24	65.161237 ft	-15 ft	936 psf	2,218.4142 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 25	69.133749 ft	-11.666667 ft	728 psf	1,808.4142 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 26	73.106261 ft	-8.3333333 ft	520 psf	1,324.398 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 27	77.078773 ft	-5 ft	312 psf	907.73138 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	81.051285 ft	-1.6666667 ft	104 psf	491.06471 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2032 Janbu Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,377
Date: 07/13/2022
Time: 02:32:05 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 07/13/2022
Last Solved Time: 02:32:22 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
- Upper Left: (5, -1) ft
- Lower Left: (5, -49) ft
- Lower Right: (30, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (40, -1) ft
- Lower Left: (40, -49) ft
- Lower Right: (90, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

Current Slip Surface

Slip Surface: 25,690
Factor of Safety: 1.95
Volume: 2,296.9449 ft³
Weight: 274,085.35 lbf
Resisting Force: 66,430.952 lbf
Activating Force: 34,066.662 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (75.190476, 0) ft
Entry: (-18.767857, 11.910714) ft
Radius: 47.722169 ft
Center: (20, 35) ft

Slip Slices

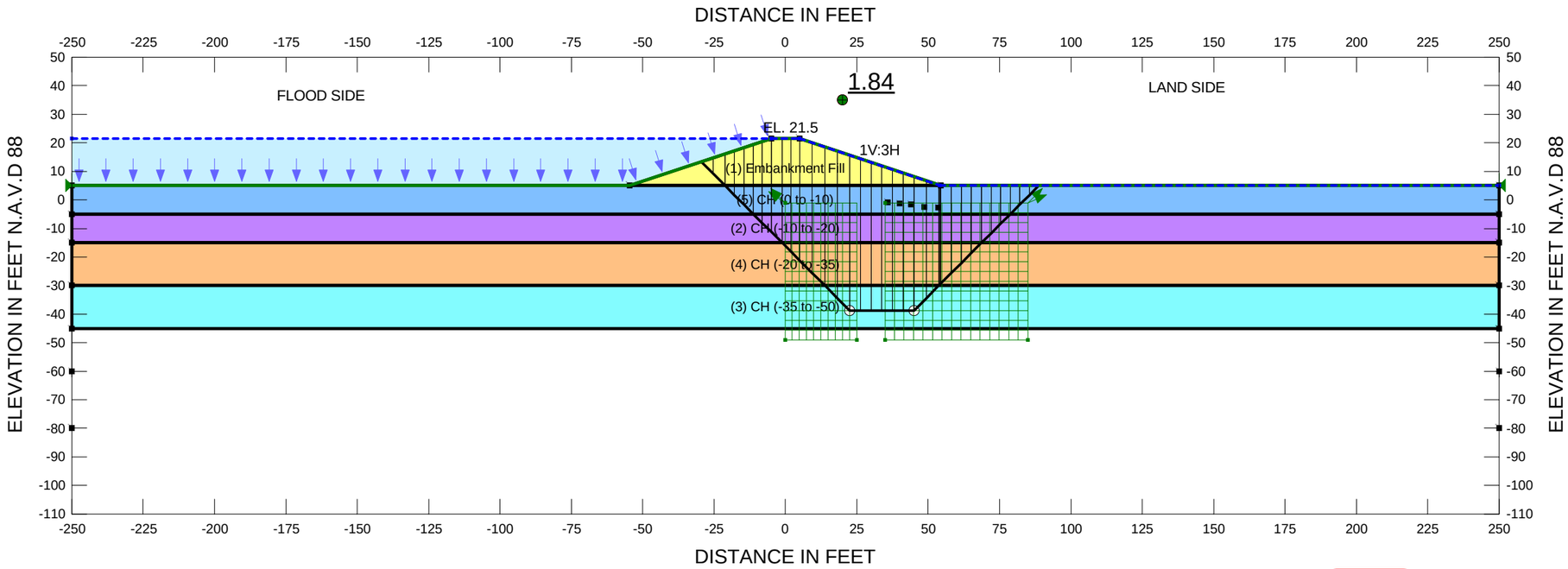
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-17.279018 ft	10.421875 ft	-650.325 psf	-78.104325 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.301339 ft	7.4441964 ft	-464.51786 psf	378.47306 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-11.323661 ft	4.4665179 ft	-278.71071 psf	835.05044 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 4	-8.3459821 ft	1.4888393 ft	-92.903571 psf	1,291.6278 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-5.9285714	-0.92857143	57.942857	1,651.157	0 psf	640 psf	0 psf	(5) CH (0 to

5	ft	ft	psf	psf				-10)
Slice 6	-3.6428571 ft	-3.2142857 ft	200.57143 psf	1,972.4665 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-0.92857143 ft	-5.9285714 ft	369.94286 psf	2,311.7522 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	1.7857143 ft	-8.6428571 ft	539.31429 psf	2,651.0379 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	4.0714286 ft	-10.928571 ft	681.94286 psf	2,853.1903 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	6.3571429 ft	-13.214286 ft	824.57143 psf	3,082.3093 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	9.0714286 ft	-15.928571 ft	993.94286 psf	3,312.1188 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	11.785714 ft	-18.642857 ft	1,163.3143 psf	3,541.9284 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 13	14.625 ft	-21.482143 ft	1,340.4857 psf	3,802.8346 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	17.589286 ft	-24.446429 ft	1,525.4571 psf	4,018.2394 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	20.553571 ft	-27.410714 ft	1,710.4286 psf	4,233.6442 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	23.517857 ft	-30.375 ft	1,895.4 psf	4,449.0489 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	26.527778 ft	-31.857143 ft	1,987.8857 psf	4,868.4114 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	29.583333 ft	-31.857143 ft	1,987.8857 psf	4,751.2817 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	32.638889 ft	-31.857143 ft	1,987.8857 psf	4,634.1521 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	35.694444 ft	-31.857143 ft	1,987.8857 psf	4,517.0225 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	38.75 ft	-31.857143 ft	1,987.8857 psf	4,399.8929 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	41.805556 ft	-31.857143 ft	1,987.8857 psf	4,282.7632 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	45 ft	-30.190476 ft	1,883.8857 psf	4,345.5344 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	48.333333 ft	-26.857143 ft	1,675.8857 psf	3,847.7566 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	52.25 ft	-22.940476 ft	1,431.4857 psf	3,262.8678 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	54.845238 ft	-20.345238 ft	1,269.5429 psf	2,888.5463 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	56.857143 ft	-18.333333 ft	1,144 psf	2,683.524 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	60.190476 ft	-15 ft	936 psf	2,273.524 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	63.52381 ft	-11.666667 ft	728 psf	1,863.524 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	66.857143 ft	-8.3333333 ft	520 psf	1,368.4859 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	70.190476 ft	-5 ft	312 psf	951.81922 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	73.52381 ft	-1.6666667 ft	104 psf	535.15255 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

I-10 Crossing

Janbu Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2082 Janbu Qcase

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,379
Date: 06/30/2022
Time: 02:42:22 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 06/30/2022
Last Solved Time: 02:42:36 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	21.5 ft
Coordinate 2	-5 ft	21.5 ft
Coordinate 3	5 ft	21.5 ft
Coordinate 4	54 ft	5 ft
Coordinate 5	250 ft	5 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

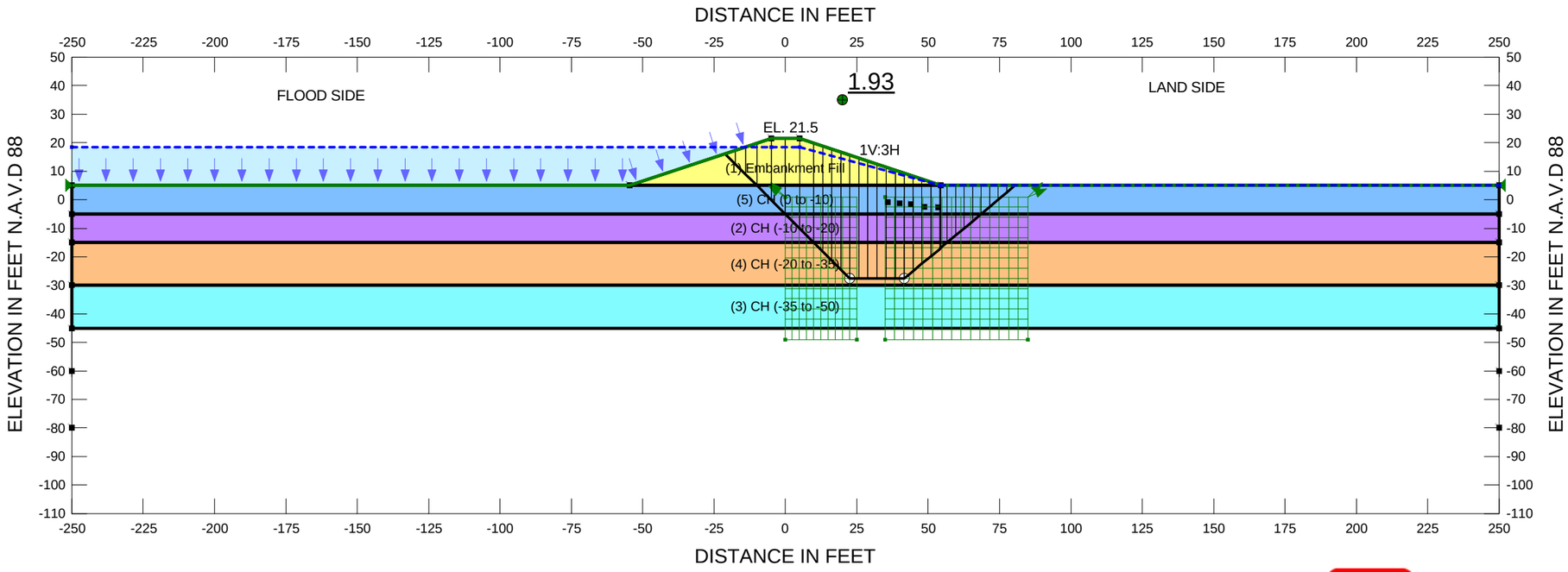
Current Slip Surface

Slip Surface: 31,220
Factor of Safety: 1.84
Volume: 3,737.7679 ft³
Weight: 441,574.68 lbf
Resisting Force: 85,888.571 lbf
Activating Force: 46,731.038 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (88.714286, 5) ft
Entry: (-29.535714, 13.321429) ft
Radius: 57.772959 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-27.455357 ft	11.241071 ft	640.15714 psf	461.28274 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-23.294643 ft	7.0803571 ft	899.78571 psf	1,012.7161 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-19.547619 ft	3.3333333 ft	1,133.6 psf	1,504.3365 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 4	-16.214286 ft	-1.1546319e-14 ft	1,341.6 psf	1,979.4476 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Slice 5	-12.880952 ft	-3.3333333 ft	1,549.6 psf	2,454.5587 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-9.6607143 ft	-6.5535714 ft	1,750.5429 psf	2,823.8357 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-6.5535714 ft	-9.6607143 ft	1,944.4286 psf	3,260.4929 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-3.1071429 ft	-13.107143 ft	2,159.4857 psf	3,711.6429 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	0.33928571 ft	-16.553571 ft	2,374.5429 psf	4,157.5078 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	3.4464286 ft	-19.660714 ft	2,568.4286 psf	4,502.4007 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	7.1964286 ft	-23.410714 ft	2,756.2767 psf	4,834.4542 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	11.589286 ft	-27.803571 ft	2,938.0872 psf	5,153.6685 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	15.964286 ft	-32.178571 ft	3,119.1586 psf	5,450.4613 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 14	20.321429 ft	-36.535714 ft	3,299.491 psf	5,762.7232 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	24.375 ft	-38.714286 ft	3,350.2592 psf	6,258.3631 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	28.125 ft	-38.714286 ft	3,271.4633 psf	6,114.6131 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	31.875 ft	-38.714286 ft	3,192.6673 psf	5,970.8631 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	35.625 ft	-38.714286 ft	3,113.8714 psf	5,827.1131 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	39.375 ft	-38.714286 ft	3,035.0755 psf	5,683.3631 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	43.125 ft	-38.714286 ft	2,956.2796 psf	5,539.6131 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	47.178571 ft	-36.535714 ft	2,735.1621 psf	5,555.9673 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	51.535714 ft	-32.178571 ft	2,371.723 psf	4,909.6577 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	53.857143 ft	-29.857143 ft	2,178.0875 psf	4,546.2243 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	54.25 ft	-29.464286 ft	2,150.5714 psf	4,487.5577 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	56.276786 ft	-27.4375 ft	2,024.1 psf	4,253.0011 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	59.830357 ft	-23.883929 ft	1,802.3571 psf	3,858.5547 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	63.383929 ft	-20.330357 ft	1,580.6143 psf	3,464.1083 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	66.9375 ft	-16.776786 ft	1,358.8714 psf	3,069.6618 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	70.380952 ft	-13.333333 ft	1,144 psf	2,708.0357 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	73.714286 ft	-10 ft	936 psf	2,298.0357 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	77.047619 ft	-6.6666667 ft	728 psf	1,888.0357 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 32	80.380952 ft	-3.3333333 ft	520 psf	1,388.0952 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 33	83.714286 ft	-2.8421709e-14 ft	312 psf	971.42857 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 34	87.047619 ft	3.3333333 ft	104 psf	554.7619 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2082 Janbu Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,379
Date: 06/30/2022
Time: 02:42:22 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 06/30/2022
Last Solved Time: 02:42:38 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Slip Surface Block

Left Grid
Upper Left: (0, 1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, 1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	18.5 ft
Coordinate 2	-5 ft	18.5 ft
Coordinate 3	5 ft	18.5 ft
Coordinate 4	54 ft	5 ft
Coordinate 5	250 ft	5 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

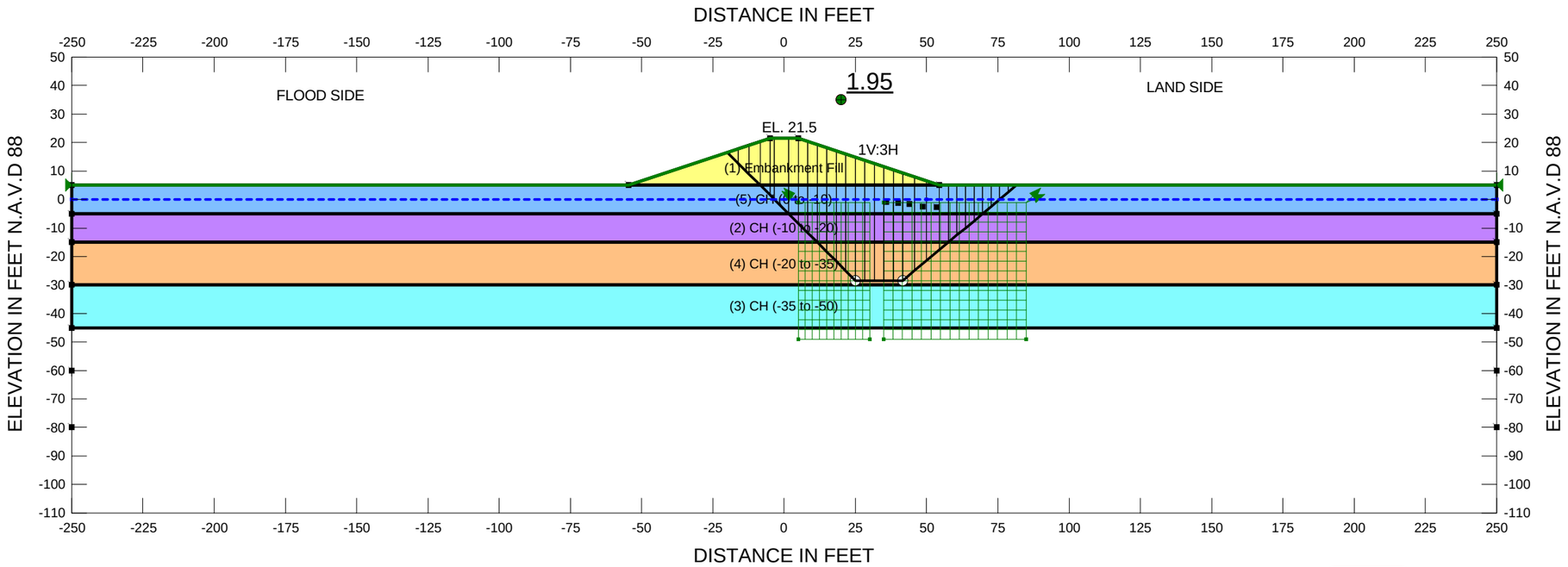
Current Slip Surface

Slip Surface: 23,294
Factor of Safety: 1.93
Volume: 2,521.9119 ft³
Weight: 300,937.25 lbf
Resisting Force: 72,097.639 lbf
Activating Force: 37,274.742 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (80.483784, 5) ft
Entry: (-21.178571, 16.107143) ft
Radius: 50.031937 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-19.383929 ft	14.3125 ft	261.3 psf	78.313902 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-15.794643 ft	10.723214 ft	485.27143 psf	554.0139 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-12.035714	6.9642857	719.82857	1,093.0544	0 psf	600 psf	0 psf	(1)

3	ft	ft	psf	psf				Embankment Fill
Slice 4	-7.5357143 ft	2.4642857 ft	1,000.6286 psf	1,787.8215 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-2.5357143 ft	-2.5357143 ft	1,312.6286 psf	2,510.0239 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	2.4642857 ft	-7.5357143 ft	1,624.6286 psf	3,047.5923 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	7.4642857 ft	-12.535714 ft	1,894.263 psf	3,568.1281 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	11.5 ft	-16.571429 ft	2,076.7102 psf	3,929.5677 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 9	14.642857 ft	-19.714286 ft	2,218.793 psf	4,157.9486 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	17.785714 ft	-22.857143 ft	2,360.8758 psf	4,386.3296 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	20.928571 ft	-26 ft	2,502.9586 psf	4,614.7105 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	24.097222 ft	-27.571429 ft	2,546.5408 psf	5,040.8684 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	27.291667 ft	-27.571429 ft	2,491.6224 psf	4,918.4147 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	30.486111 ft	-27.571429 ft	2,436.7041 psf	4,795.961 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	33.680556 ft	-27.571429 ft	2,381.7857 psf	4,673.5073 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	36.875 ft	-27.571429 ft	2,326.8673 psf	4,551.0536 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	40.069444 ft	-27.571429 ft	2,271.949 psf	4,428.5999 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	43.208333 ft	-26.277817 ft	2,137.2643 psf	4,477.832 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	46.291667 ft	-23.690593 ft	1,922.8134 psf	4,072.4557 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	49.375 ft	-21.103369 ft	1,708.3625 psf	3,667.0794 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	52.458333 ft	-18.516145 ft	1,493.9115 psf	3,261.7031 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	54.25 ft	-17.012758 ft	1,373.5961 psf	3,026.1466 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	55.574356 ft	-15.901492 ft	1,304.2531 psf	2,893.2127 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	58.138404 ft	-13.75 ft	1,170 psf	2,671.7917 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 25	61.117788 ft	-11.25 ft	1,014 psf	2,364.2917 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 26	64.097172 ft	-8.75 ft	858 psf	2,056.7917 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 27	67.076556 ft	-6.25 ft	702 psf	1,749.2917 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	70.05594 ft	-3.75 ft	546 psf	1,370.1833 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	73.035324 ft	-1.25 ft	390 psf	1,057.6833 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	76.014708 ft	1.25 ft	234 psf	745.18333 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	78.994092 ft	3.75 ft	78 psf	432.68333 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

I-10 Crossing Theoretical Levee Section

2082 Janbu Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,379
Date: 06/30/2022
Time: 02:42:22 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 06/30/2022
Last Solved Time: 02:42:42 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
Upper Left: (5, -1) ft
Lower Left: (5, -49) ft
Lower Right: (30, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39598 of 39600 converged

Current Slip Surface

Slip Surface: 23,054
Factor of Safety: 1.95
Volume: 2,498.1796 ft³
Weight: 298,067.06 lbf
Resisting Force: 71,893.586 lbf
Activating Force: 36,879.616 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (81.505287, 5) ft
Entry: (-19.946429, 16.517857) ft
Radius: 50.469778 ft
Center: (20, 35) ft

Slip Slices

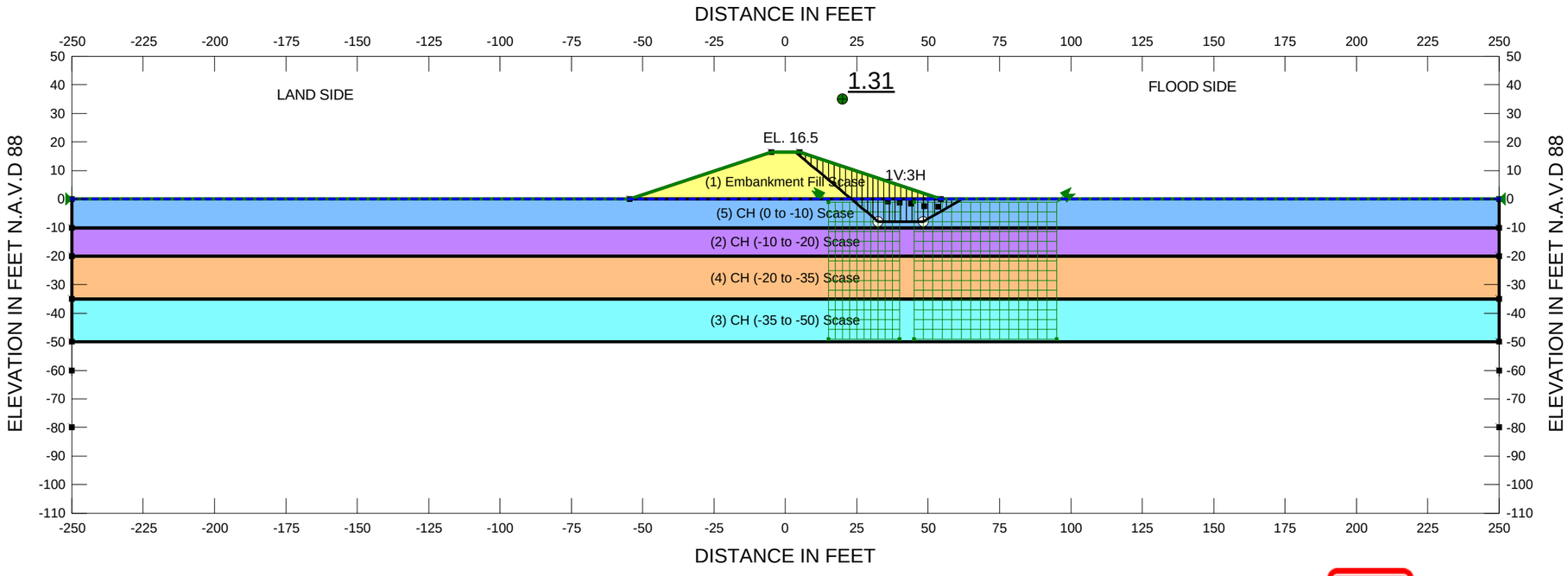
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-18.026786 ft	14.598214 ft	-910.92857 psf	-11.873833 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.1875 ft	10.758929 ft	-671.35714 psf	576.81664 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-10.348214 ft	6.9196429 ft	-431.78571 psf	1,165.5071 psf	0 psf	600 psf	0 psf	(1) Embankment Fill

Slice 4	-6.7142857 ft	3.2857143 ft	-205.02857 psf	1,719.4378 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-4.2142857 ft	0.78571429 ft	-49.028571 psf	2,097.652 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-0.92857143 ft	-2.5 ft	156 psf	2,508.3663 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	3.2857143 ft	-6.7142857 ft	418.97143 psf	2,950.065 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	6.6428571 ft	-10.071429 ft	628.45714 psf	3,300.0174 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	9.9285714 ft	-13.357143 ft	833.48571 psf	3,578.2079 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	13.25 ft	-16.678571 ft	1,040.7429 psf	3,877.5567 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	16.607143 ft	-20.035714 ft	1,250.2286 psf	4,121.5091 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	19.964286 ft	-23.392857 ft	1,459.7143 psf	4,365.4615 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	23.321429 ft	-26.75 ft	1,669.2 psf	4,609.4139 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	26.666667 ft	-28.428571 ft	1,773.9429 psf	5,037.5159 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	30 ft	-28.428571 ft	1,773.9429 psf	4,909.7381 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	33.333333 ft	-28.428571 ft	1,773.9429 psf	4,781.9603 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	36.666667 ft	-28.428571 ft	1,773.9429 psf	4,654.1825 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	40 ft	-28.428571 ft	1,773.9429 psf	4,526.4048 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	43.75 ft	-26.680447 ft	1,664.8599 psf	4,499.0922 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	47.916667 ft	-23.184199 ft	1,446.694 psf	3,951.2864 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	52.25 ft	-19.5481 ft	1,219.8015 psf	3,381.5683 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	56.085107 ft	-16.330063 ft	1,018.9959 psf	2,938.1162 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	59.159907 ft	-13.75 ft	858 psf	2,668.8477 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 24	62.139291 ft	-11.25 ft	702 psf	2,361.3477 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 25	65.118675 ft	-8.75 ft	546 psf	2,053.8477 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 26	68.098059 ft	-6.25 ft	390 psf	1,746.3477 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 27	71.077443 ft	-3.75 ft	234 psf	1,367.8282 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 28	74.056827 ft	-1.25 ft	78 psf	1,055.3282 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 29	77.036211 ft	1.25 ft	-78 psf	742.8282 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	80.015595 ft	3.75 ft	-234 psf	430.3282 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

I-10 Crossing

Janbu Scase

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

I-10 Crossing Theoretical Levee Section

2032 Janbu Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,384
Date: 06/30/2022
Time: 02:29:06 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3 - 10120 - Janbu - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 06/30/2022
Last Solved Time: 02:29:20 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
Upper Left: (15, -1) ft
Lower Left: (15, -49) ft
Lower Right: (40, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, -1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	0 ft
Point 10	5 ft	16.5 ft
Point 11	-5 ft	16.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-54.5 ft	0 ft

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 34553 of 39600 converged

Current Slip Surface

Slip Surface: 7,047
Factor of Safety: 1.31
Volume: 486.00965 ft³
Weight: 58,037.658 lbf
Resisting Force: 17,141.741 lbf
Activating Force: 13,067.059 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (61.942304, 0) ft
Entry: (3.4722875, 16.5) ft
Radius: 31.55589 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	4.2361437 ft	15.859049 ft	-989.60463 psf	57.877515 psf	24.567548 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	6.0075679 ft	14.372647 ft	-896.85318 psf	161.77104 psf	68.667731 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	8.0227036 ft	12.681748 ft	-791.34104 psf	253.80305 psf	107.733 psf	0 psf	0 psf	(1) Embankment Fill Scase

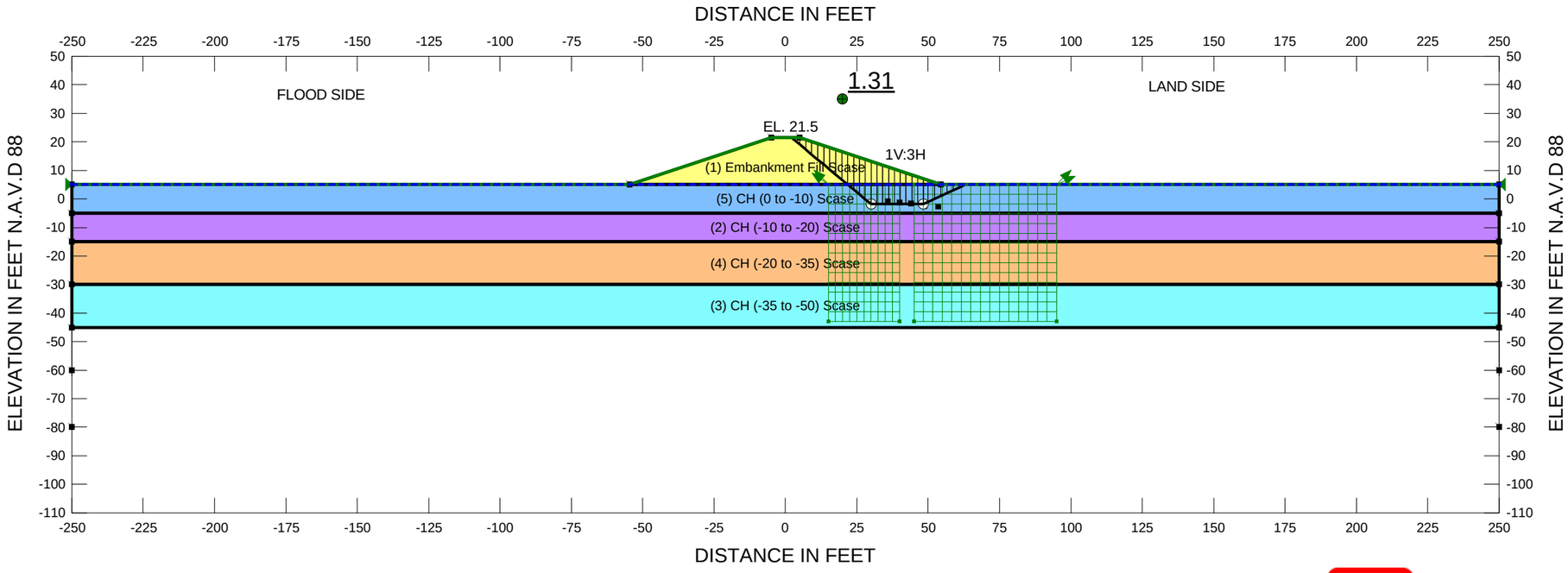
Slice 4	10.037839 ft	10.990848 ft	-685.8289 psf	345.83505 psf	146.79827 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	12.052975 ft	9.2999482 ft	-580.31677 psf	437.86706 psf	185.86354 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	14.068111 ft	7.6090485 ft	-474.80463 psf	529.89907 psf	224.92881 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	16.083247 ft	5.9181488 ft	-369.29249 psf	621.93108 psf	263.99408 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	18.098382 ft	4.2272492 ft	-263.78035 psf	713.96309 psf	303.05935 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	20.113518 ft	2.5363495 ft	-158.26821 psf	805.9951 psf	342.12462 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	22.128654 ft	0.84544983 ft	-52.75607 psf	898.02711 psf	381.18989 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	24.0726 ft	-0.78571429 ft	49.028571 psf	1,003.5081 psf	405.15253 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	25.945355 ft	-2.3571429 ft	147.08571 psf	1,122.4381 psf	414.01254 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	27.818111 ft	-3.9285714 ft	245.14286 psf	1,241.3681 psf	422.87254 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	29.690867 ft	-5.5 ft	343.2 psf	1,360.2981 psf	431.73255 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	31.563622 ft	-7.0714286 ft	441.25714 psf	1,479.2282 psf	440.59255 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	33.489583 ft	-7.8571429 ft	490.28571 psf	1,787.5422 psf	550.65269 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	35.46875 ft	-7.8571429 ft	490.28571 psf	1,711.6741 psf	518.44861 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	37.447917 ft	-7.8571429 ft	490.28571 psf	1,635.8061 psf	486.24453 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	39.427083 ft	-7.8571429 ft	490.28571 psf	1,559.938 psf	454.04046 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	41.40625 ft	-7.8571429 ft	490.28571 psf	1,484.0699 psf	421.83638 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	43.385417 ft	-7.8571429 ft	490.28571 psf	1,408.2019 psf	389.6323 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	45.364583 ft	-7.8571429 ft	490.28571 psf	1,332.3338 psf	357.42822 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	47.34375 ft	-7.8571429 ft	490.28571 psf	1,256.4658 psf	325.22414 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	49.166667 ft	-7.3760176 ft	460.2635 psf	1,280.9012 psf	348.34003 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	51.125 ft	-6.2453734 ft	389.7113 psf	1,030.6864 psf	272.07779 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	53.375 ft	-4.9463352 ft	308.65132 psf	743.20559 psf	184.45734 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

Slice 27	55.430288 ft	-3.7597142 ft	234.60616 psf	524.53204 psf	123.06623 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	57.290864 ft	-2.6855101 ft	167.57583 psf	374.66574 psf	87.904451 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	59.15144 ft	-1.6113061 ft	100.5455 psf	224.79944 psf	52.742671 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	61.012016 ft	-0.53710202 ft	33.515166 psf	74.933148 psf	17.58089 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

I-10 Crossing

Janbu Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

I-10 Crossing Theoretical Levee Section

2082 Janbu Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,388
Date: 06/30/2022
Time: 02:39:54 PM
Tool Version: 10.0.0.17401
File Name: I10 crossing FID3_2082 - 10120 - Janbu - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\3. I-10 crossing\
Last Solved Date: 06/30/2022
Last Solved Time: 02:40:08 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 5) ft
Right Coordinate: (250, 5) ft

Slip Surface Block

Left Grid
Upper Left: (15, 5) ft
Lower Left: (15, -43) ft
Lower Right: (40, -43) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, 5) ft
Lower Left: (45, -43) ft
Lower Right: (95, -43) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	5 ft
Coordinate 2	50 ft	5 ft
Coordinate 3	250 ft	5 ft

Points

	X	Y
Point 1	250 ft	5 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	54.5 ft	5 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	5 ft
Point 13	-250 ft	-5 ft
Point 14	250 ft	-5 ft
Point 15	-250 ft	-15 ft
Point 16	250 ft	-15 ft
Point 17	-250 ft	-45 ft
Point 18	250 ft	-45 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-30 ft
Point 22	250 ft	-30 ft
Point 23	-54.5 ft	5 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	981.75 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 33840 of 39600 converged

Current Slip Surface

Slip Surface: 6,806
Factor of Safety: 1.31
Volume: 497.09132 ft³
Weight: 59,207.006 lbf
Resisting Force: 17,838.213 lbf
Activating Force: 13,636.659 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (63.038524, 5) ft
Entry: (2.1640411, 21.5) ft
Radius: 31.923575 ft
Center: (20, 35) ft

Slip Slices

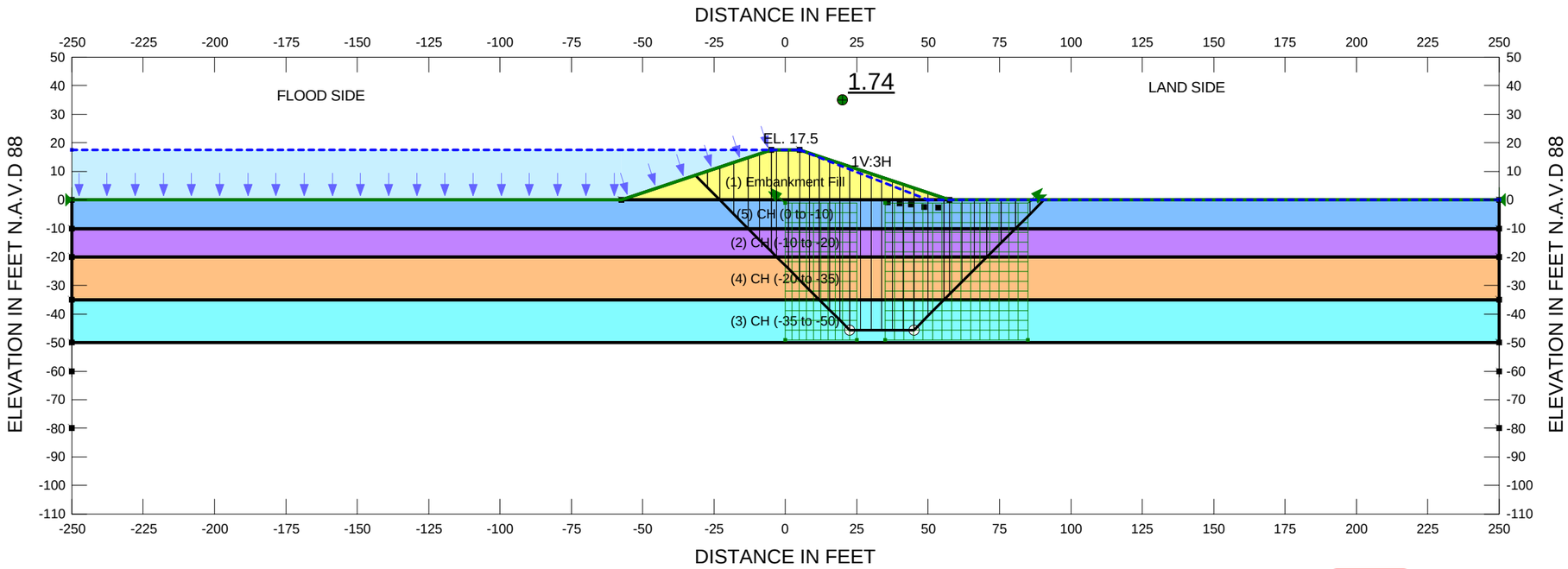
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	3.5820205 ft	20.310174 ft	-955.35486 psf	107.44911 psf	45.60944 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	6.0517485 ft	18.237826 ft	-826.04035 psf	262.93579 psf	111.60962 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	8.1552454 ft	16.472783 ft	-715.90164 psf	359.01095 psf	152.39111 psf	0 psf	0 psf	(1) Embankment Fill Scase

Slice 4	10.258742 ft	14.707739 ft	-605.76293 psf	455.08611 psf	193.17259 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	12.362239 ft	12.942696 ft	-495.62421 psf	551.16127 psf	233.95408 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 6	14.465736 ft	11.177652 ft	-385.4855 psf	647.23642 psf	274.73556 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	16.569233 ft	9.4126087 ft	-275.34678 psf	743.31158 psf	315.51705 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	18.67273 ft	7.6475652 ft	-165.20807 psf	839.38674 psf	356.29853 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	20.776227 ft	5.8825217 ft	-55.069357 psf	935.4619 psf	397.08002 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	22.849478 ft	4.1428571 ft	53.485714 psf	1,048.3713 psf	422.30387 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 11	24.892485 ft	2.4285714 ft	160.45714 psf	1,178.1149 psf	431.97011 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	26.935491 ft	0.71428571 ft	267.42857 psf	1,307.8586 psf	441.63634 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	28.978497 ft	-1 ft	374.4 psf	1,437.6022 psf	451.30257 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	31.018519 ft	-1.8571429 ft	427.88571 psf	1,757.2663 psf	564.28859 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	33.055556 ft	-1.8571429 ft	427.88571 psf	1,679.1799 psf	531.14287 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	35.092593 ft	-1.8571429 ft	427.88571 psf	1,601.0935 psf	497.99715 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	37.12963 ft	-1.8571429 ft	427.88571 psf	1,523.0071 psf	464.85143 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	39.166667 ft	-1.8571429 ft	427.88571 psf	1,444.9206 psf	431.70571 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	41.203704 ft	-1.8571429 ft	427.88571 psf	1,366.8342 psf	398.55999 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	43.240741 ft	-1.8571429 ft	427.88571 psf	1,288.7478 psf	365.41427 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	45.277778 ft	-1.8571429 ft	427.88571 psf	1,210.6614 psf	332.26855 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	47.314815 ft	-1.8571429 ft	427.88571 psf	1,132.575 psf	299.12284 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	49.166667 ft	-1.4685531 ft	403.63772 psf	1,122.205 psf	305.01373 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	51.125 ft	-0.55536731 ft	346.65492 psf	909.29275 psf	238.82559 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	53.375 ft	0.49382492 ft	281.18533 psf	664.67014 psf	162.77965 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	55.567315 ft	1.5161184 ft	217.39421 psf	474.56398 psf	109.16209 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	57.701946 ft	2.5115131 ft	155.28158 psf	338.97427 psf	77.972923 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	59.836577 ft	3.5069079 ft	93.168948 psf	203.38456 psf	46.783754 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	61.971208 ft	4.5023026 ft	31.056316 psf	67.794855 psf	15.594585 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

Slidell East/Northeast

Janbu Q case

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast Janbu 2032

Qcase CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,381
Date: 07/12/2022
Time: 04:38:03 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 07/12/2022
Last Solved Time: 04:38:16 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (0, -1) ft
Lower Left: (0, -49) ft
Lower Right: (25, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, -1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	17.5 ft
Coordinate 2	-5 ft	17.5 ft
Coordinate 3	5 ft	17.5 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

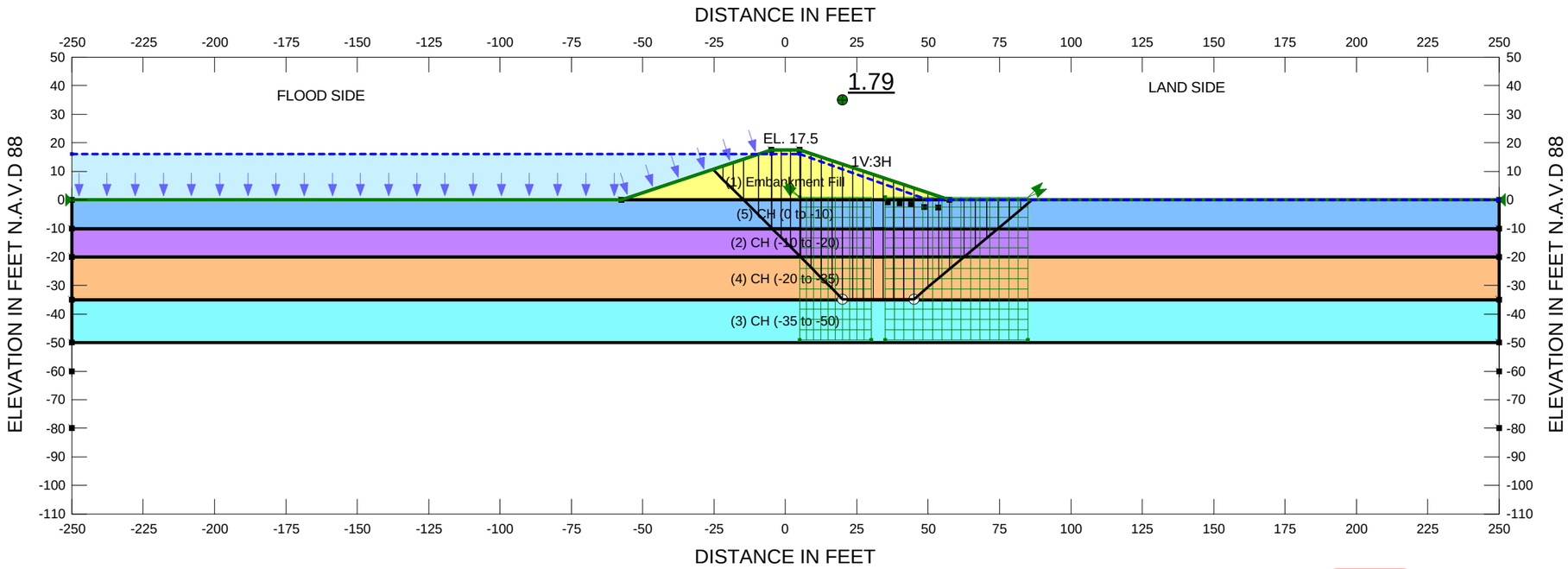
Current Slip Surface

Slip Surface: 36,500
Factor of Safety: 1.74
Volume: 4,047.6964 ft³
Weight: 477,274.17 lbf
Resisting Force: 88,882.857 lbf
Activating Force: 51,098.96 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (90.571429, 0) ft
Entry: (-31.678571, 8.6071429) ft
Radius: 59.85545 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-29.526786 ft	6.4553571 ft	689.18571 psf	497.07302 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-25.223214 ft	2.1517857 ft	957.72857 psf	1,067.4397 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-20.571429	-2.5 ft	1,248 psf	1,686.088	0 psf	640 psf	0 psf	(5) CH (0 to

3	ft			psf				-10)
Slice 4	-15.571429 ft	-7.5 ft	1,560 psf	2,398.7547 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-11.053571 ft	-12.017857 ft	1,841.9143 psf	2,947.191 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 6	-7.0178571 ft	-16.053571 ft	2,093.7429 psf	3,514.3434 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-4.0357143 ft	-19.035714 ft	2,279.8286 psf	3,916.5267 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-1.0535714 ft	-22.017857 ft	2,465.9143 psf	4,301.9941 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 9	2.9821429 ft	-26.053571 ft	2,717.7429 psf	4,749.9584 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	6.7321429 ft	-29.803571 ft	2,909.7095 psf	5,099.8096 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	10.196429 ft	-33.267857 ft	3,041.8143 psf	5,351.5477 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	13.690476 ft	-36.761905 ft	3,175.054 psf	5,583.6768 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 13	17.214286 ft	-40.285714 ft	3,309.4286 psf	5,836.2165 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 14	20.738095 ft	-43.809524 ft	3,443.8032 psf	6,088.7561 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	24.375 ft	-45.571429 ft	3,465.4905 psf	6,577.6488 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	28.125 ft	-45.571429 ft	3,374.4905 psf	6,433.8988 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	31.875 ft	-45.571429 ft	3,283.4905 psf	6,290.1488 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	35.625 ft	-45.571429 ft	3,192.4905 psf	6,146.3988 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	39.375 ft	-45.571429 ft	3,101.4905 psf	6,002.6488 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	43.125 ft	-45.571429 ft	3,010.4905 psf	5,858.8988 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	47.5 ft	-43.071429 ft	2,748.3238 psf	5,850.6883 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	52.785714 ft	-37.785714 ft	2,357.8286 psf	5,066.6407 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	56.535714 ft	-34.035714 ft	2,123.8286 psf	4,489.4166 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	59.678571 ft	-30.892857 ft	1,927.7143 psf	4,103.5952 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	64.035714 ft	-26.535714 ft	1,655.8286 psf	3,619.9523 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	68.392857 ft	-22.178571 ft	1,383.9429 psf	3,136.3095 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	73.071429 ft	-17.5 ft	1,092 psf	2,629.8661 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	78.071429 ft	-12.5 ft	780 psf	2,014.8661 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	83.071429 ft	-7.5 ft	468 psf	1,303.3929 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	88.071429 ft	-2.5 ft	156 psf	678.39291 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast Janbu 2032

Qcase CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,381
Date: 07/12/2022
Time: 04:38:03 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 07/12/2022
Last Solved Time: 04:38:20 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (5, 1) ft
Lower Left: (5, -49) ft
Lower Right: (30, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (35, 1) ft
Lower Left: (35, -49) ft
Lower Right: (85, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	16 ft
Coordinate 2	-5 ft	16 ft
Coordinate 3	5 ft	16 ft
Coordinate 4	50 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39599 of 39600 converged

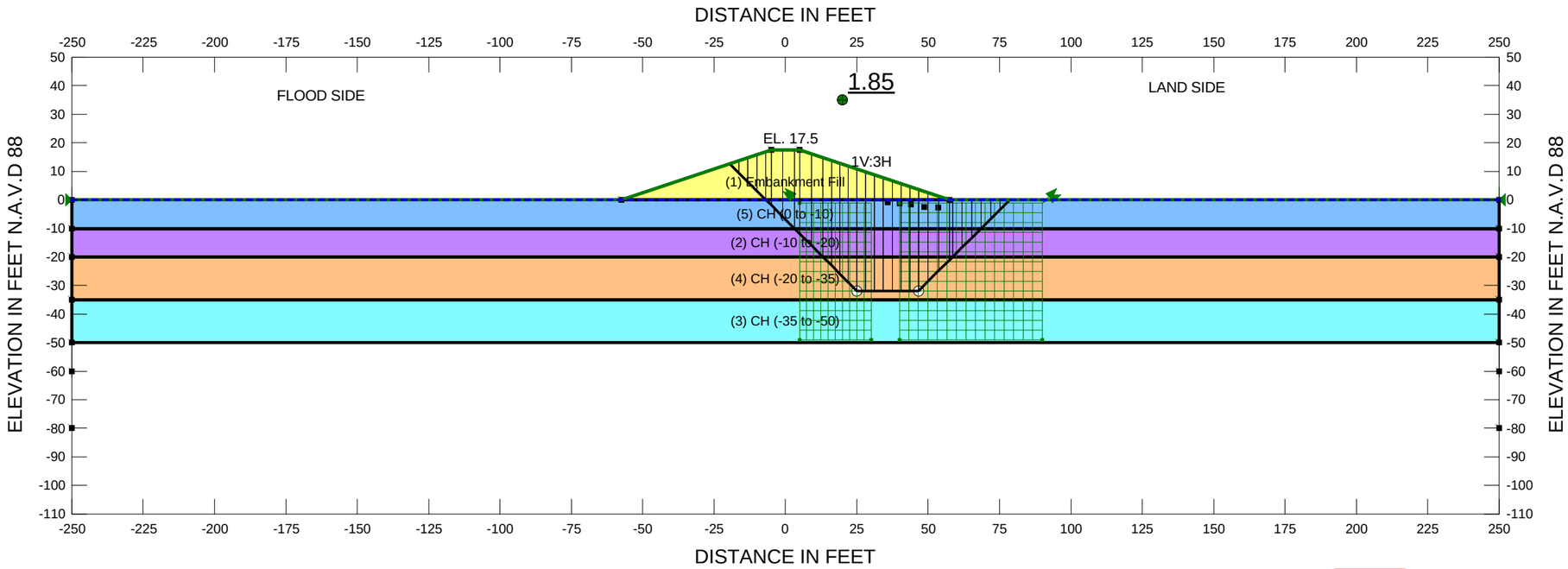
Current Slip Surface

Slip Surface: 27,859
Factor of Safety: 1.79
Volume: 3,053.401 ft³
Weight: 363,189.96 lbf
Resisting Force: 79,485.423 lbf
Activating Force: 44,345.422 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (86.370875, 0) ft
Entry: (-25.410714, 10.696429) ft
Radius: 53.844665 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-23.627976 ft	8.9136905 ft	442.18571 psf	234.02854 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-20.0625 ft	5.3482143 ft	664.67143 psf	706.57298 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-16.497024	1.7827381	887.15714	1,179.1174	0 psf	600 psf	0 psf	(1)

3	ft	ft	psf	psf				Embankment Fill
Slice 4	-12.107143 ft	-2.6071429 ft	1,161.0857 psf	1,764.782 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-7.25 ft	-7.4642857 ft	1,464.1714 psf	2,503.8867 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-4.8571429 ft	-9.8571429 ft	1,613.4857 psf	2,889.2439 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	-3.0952381 ft	-11.619048 ft	1,723.4286 psf	3,017.3941 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	0.14285714 ft	-14.857143 ft	1,925.4857 psf	3,415.6798 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	3.3809524 ft	-18.095238 ft	2,127.5429 psf	3,813.9656 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	5.1428571 ft	-19.857143 ft	2,234.3162 psf	4,025.2037 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	7.125 ft	-21.839286 ft	2,314.0248 psf	4,212.602 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	10.803571 ft	-25.517857 ft	2,461.9524 psf	4,479.9115 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	14.482143 ft	-29.196429 ft	2,609.88 psf	4,747.221 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	18.160714 ft	-32.875 ft	2,757.8076 psf	5,014.5305 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	21.785714 ft	-34.714286 ft	2,792.1524 psf	5,482.3333 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	25.357143 ft	-34.714286 ft	2,712.9143 psf	5,345.4286 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	28.928571 ft	-34.714286 ft	2,633.6762 psf	5,208.5238 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	32.5 ft	-34.714286 ft	2,554.4381 psf	5,071.619 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	36.071429 ft	-34.714286 ft	2,475.2 psf	4,934.7143 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	39.642857 ft	-34.714286 ft	2,395.9619 psf	4,797.8095 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	43.214286 ft	-34.714286 ft	2,316.7238 psf	4,660.9048 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	47.5 ft	-32.616537 ft	2,090.7386 psf	4,601.5908 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	51.875 ft	-28.945476 ft	1,806.1977 psf	4,026.3947 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	55.625 ft	-25.798852 ft	1,609.8484 psf	3,533.3694 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	60.017901 ft	-22.11277 ft	1,379.8369 psf	3,052.3393 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	64.522059 ft	-18.333333 ft	1,144 psf	2,647.7689 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 27	68.494571 ft	-15 ft	936 psf	2,237.7689 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	72.467083 ft	-11.666667 ft	728 psf	1,827.7689 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	76.439595 ft	-8.3333333 ft	520 psf	1,339.8818 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	80.412107 ft	-5 ft	312 psf	923.21515 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	84.384619 ft	-1.6666667 ft	104 psf	506.54848 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast Janbu 2032

Qcase CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,381
Date: 07/12/2022
Time: 04:38:03 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 07/12/2022
Last Solved Time: 04:38:24 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (5, -1) ft
Lower Left: (5, -49) ft
Lower Right: (30, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (40, -1) ft
Lower Left: (40, -49) ft
Lower Right: (90, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

Current Slip Surface

Slip Surface: 25,695
Factor of Safety: 1.85
Volume: 2,478.2783 ft³
Weight: 295,380.59 lbf
Resisting Force: 69,297.619 lbf
Activating Force: 37,542.079 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (78.52381, 0) ft
Entry: (-19.517857, 12.660714) ft
Radius: 49.464028 ft
Center: (20, 35) ft

Slip Slices

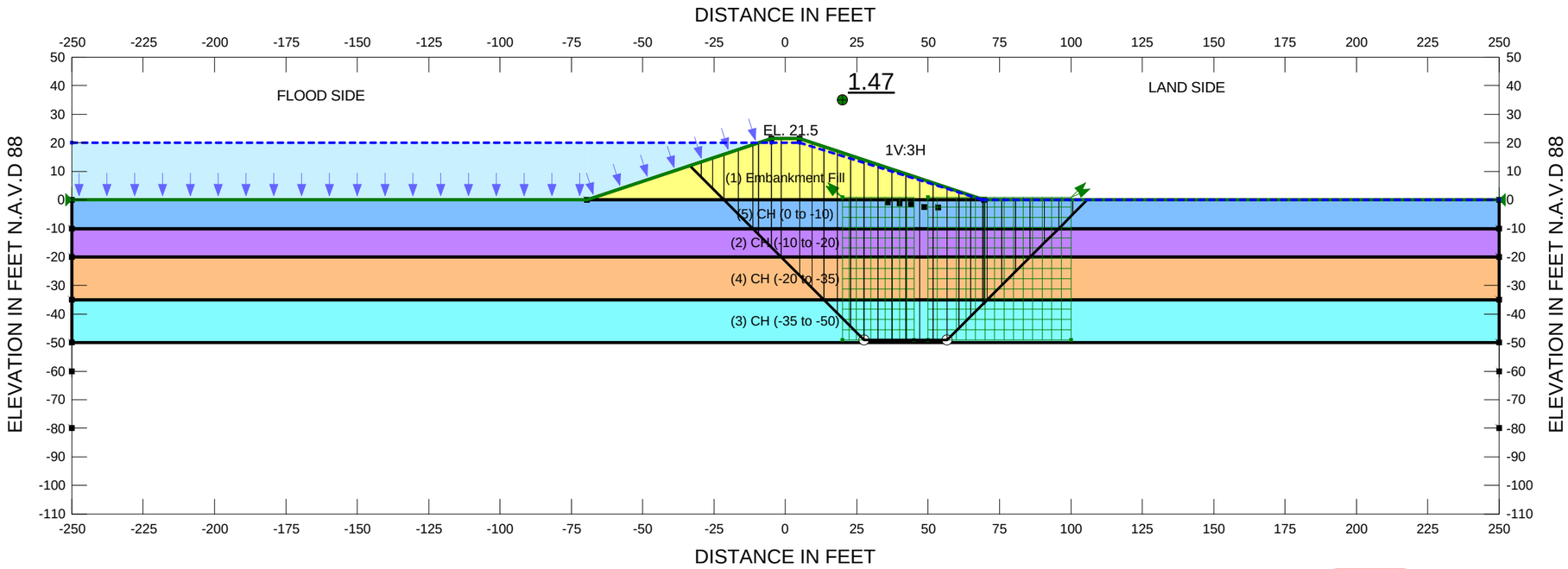
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-17.935268 ft	11.078125 ft	-691.275 psf	-80.655534 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.770089 ft	7.9129464 ft	-493.76786 psf	404.67185 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-11.604911 ft	4.7477679 ft	-296.26071 psf	889.99923 psf	0 psf	600 psf	0 psf	(1) Embankment Fill

Slice 4	-8.4397321 ft	1.5825893 ft	-98.753571 psf	1,375.3266 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-5.9285714 ft	-0.92857143 ft	57.942857 psf	1,748.1024 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-2.9642857 ft	-3.8928571 ft	242.91429 psf	2,154.2333 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	1.1071429 ft	-7.9642857 ft	496.97143 psf	2,663.1619 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	4.0714286 ft	-10.928571 ft	681.94286 psf	2,945.622 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	7.0357143 ft	-13.892857 ft	866.91429 psf	3,232.1934 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	11.107143 ft	-17.964286 ft	1,120.9714 psf	3,576.9077 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	14.625 ft	-21.482143 ft	1,340.4857 psf	3,897.3821 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	17.589286 ft	-24.446429 ft	1,525.4571 psf	4,112.7869 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	20.553571 ft	-27.410714 ft	1,710.4286 psf	4,328.1917 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	23.517857 ft	-30.375 ft	1,895.4 psf	4,543.5964 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	26.547619 ft	-31.857143 ft	1,987.8857 psf	4,982.6508 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	29.642857 ft	-31.857143 ft	1,987.8857 psf	4,864 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	32.738095 ft	-31.857143 ft	1,987.8857 psf	4,745.3492 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	35.833333 ft	-31.857143 ft	1,987.8857 psf	4,626.6984 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	38.928571 ft	-31.857143 ft	1,987.8857 psf	4,508.0476 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	42.02381 ft	-31.857143 ft	1,987.8857 psf	4,389.3968 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	45.119048 ft	-31.857143 ft	1,987.8857 psf	4,270.746 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	48.333333 ft	-30.190476 ft	1,883.8857 psf	4,353.2091 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	51.875 ft	-26.64881 ft	1,662.8857 psf	3,824.3203 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	55.625 ft	-22.89881 ft	1,428.8857 psf	3,264.3203 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	58.011905 ft	-20.511905 ft	1,279.9429 psf	2,927.4988 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	60.190476 ft	-18.333333 ft	1,144 psf	2,706.0923 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 27	63.52381 ft	-15 ft	936 psf	2,296.0923 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	66.857143 ft	-11.666667 ft	728 psf	1,886.0923 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	70.190476 ft	-8.3333333 ft	520 psf	1,386.5405 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	73.52381 ft	-5 ft	312 psf	969.87384 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	76.857143 ft	-1.6666667 ft	104 psf	553.20717 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Slidell East/Northeast

Janbu Qcase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Janbu Qcase

CASE: Project Grade (PG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (PG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,383
Date: 06/30/2022
Time: 02:45:49 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 06/30/2022
Last Solved Time: 02:46:02 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (PG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (20, 1) ft
Lower Left: (20, -49) ft
Lower Right: (45, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (50, 1) ft
Lower Left: (50, -49) ft
Lower Right: (100, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	20 ft
Coordinate 2	-5 ft	20 ft
Coordinate 3	5 ft	20 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39597 of 39600 converged

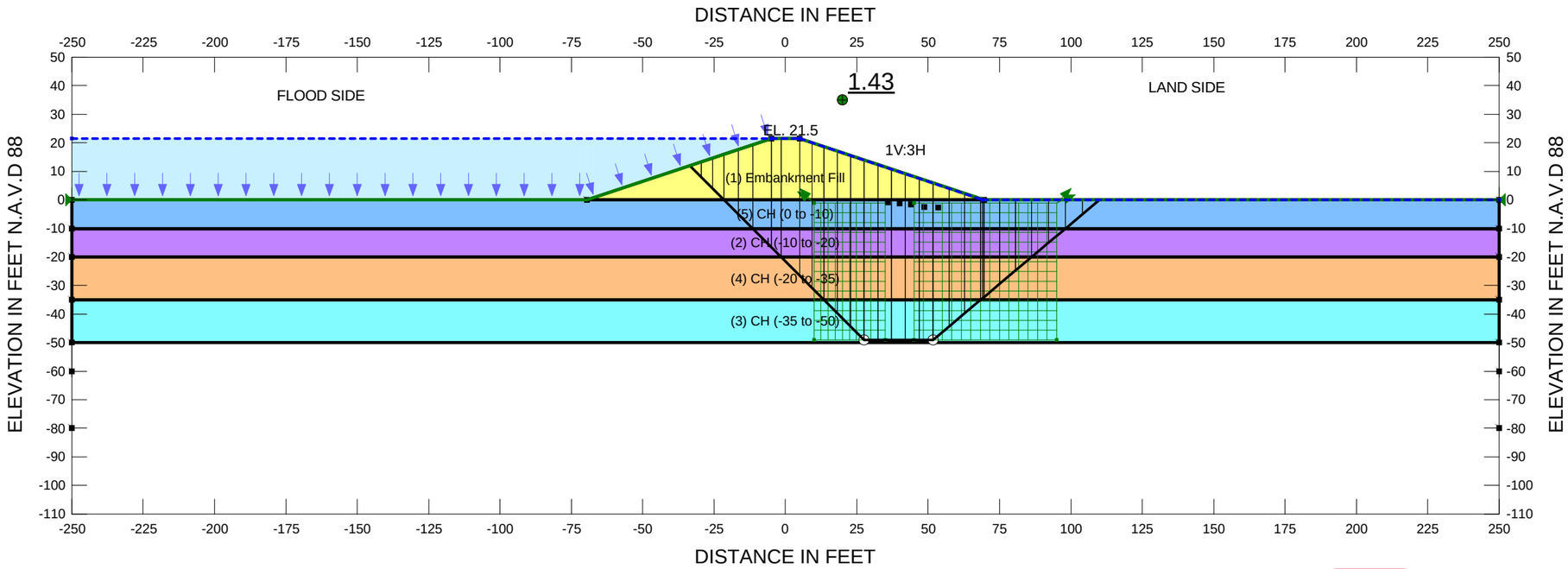
Current Slip Surface

Slip Surface: 37,695
Factor of Safety: 1.47
Volume: 5,143.9167 ft³
Weight: 603,688.75 lbf
Resisting Force: 101,196.67 lbf
Activating Force: 68,731.734 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (105.66667, 0) ft
Entry: (-33.5, 12) ft
Radius: 68.283775 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-31.5 ft	10 ft	624 psf	359.07821 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-27.5 ft	6 ft	873.6 psf	889.21155 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-23.5 ft	2 ft	1,123.2 psf	1,419.3449	0 psf	600 psf	0 psf	(1)

3				psf				Embankment Fill
Slice 4	-19 ft	-2.5 ft	1,404 psf	2,013.7323 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-14 ft	-7.5 ft	1,716 psf	2,726.399 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-10.5 ft	-11 ft	1,934.4 psf	3,115.2154 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-7.25 ft	-14.25 ft	2,137.2 psf	3,618.7487 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	-3.25 ft	-18.25 ft	2,386.8 psf	4,196.9987 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 9	1.75 ft	-23.25 ft	2,698.8 psf	4,823.6473 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	7.125 ft	-28.625 ft	2,992.7625 psf	5,338.814 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	11.375 ft	-32.875 ft	3,175.0875 psf	5,647.6473 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 12	15.833333 ft	-37.333333 ft	3,366.35 psf	5,945.6502 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 13	20.5 ft	-42 ft	3,566.55 psf	6,280.0946 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 14	25.166667 ft	-46.666667 ft	3,766.75 psf	6,614.5391 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	29.930556 ft	-49 ft	3,819.4542 psf	7,201.8287 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	34.791667 ft	-49 ft	3,724.6625 psf	7,015.4861 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	39.652778 ft	-49 ft	3,629.8708 psf	6,829.1435 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	44.513889 ft	-49 ft	3,535.0792 psf	6,642.8009 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	49.375 ft	-49 ft	3,440.2875 psf	6,456.4583 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	54.236111 ft	-49 ft	3,345.4958 psf	6,270.1157 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	58.722222 ft	-46.944444 ft	3,129.75 psf	6,385.2757 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	62.833333 ft	-42.833333 ft	2,793.05 psf	5,775.4609 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 23	66.944444 ft	-38.722222 ft	2,456.35 psf	5,165.6461 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 24	69.25 ft	-36.416667 ft	2,272.4 psf	4,823.6554 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 25	70.083333 ft	-35.583333 ft	2,220.4 psf	4,722.4054 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 26	73.166667 ft	-32.5 ft	2,028 psf	4,357.1027 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	78.166667 ft	-27.5 ft	1,716 psf	3,802.1027 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 28	83.166667 ft	-22.5 ft	1,404 psf	3,247.1027 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 29	88.166667 ft	-17.5 ft	1,092 psf	2,712.7513 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	93.166667 ft	-12.5 ft	780 psf	2,097.7513 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 31	98.166667 ft	-7.5 ft	468 psf	1,369.701 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	103.16667 ft	-2.5 ft	156 psf	744.70102 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Janbu Qcase

CASE: Top of Levee (CG) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (CG) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,382
Date: 06/30/2022
Time: 02:44:30 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 06/30/2022
Last Solved Time: 02:44:46 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (CG) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
Upper Left: (10, -1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, -1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	21.5 ft
Coordinate 2	-5 ft	21.5 ft
Coordinate 3	5 ft	21.5 ft
Coordinate 4	69 ft	0 ft
Coordinate 5	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

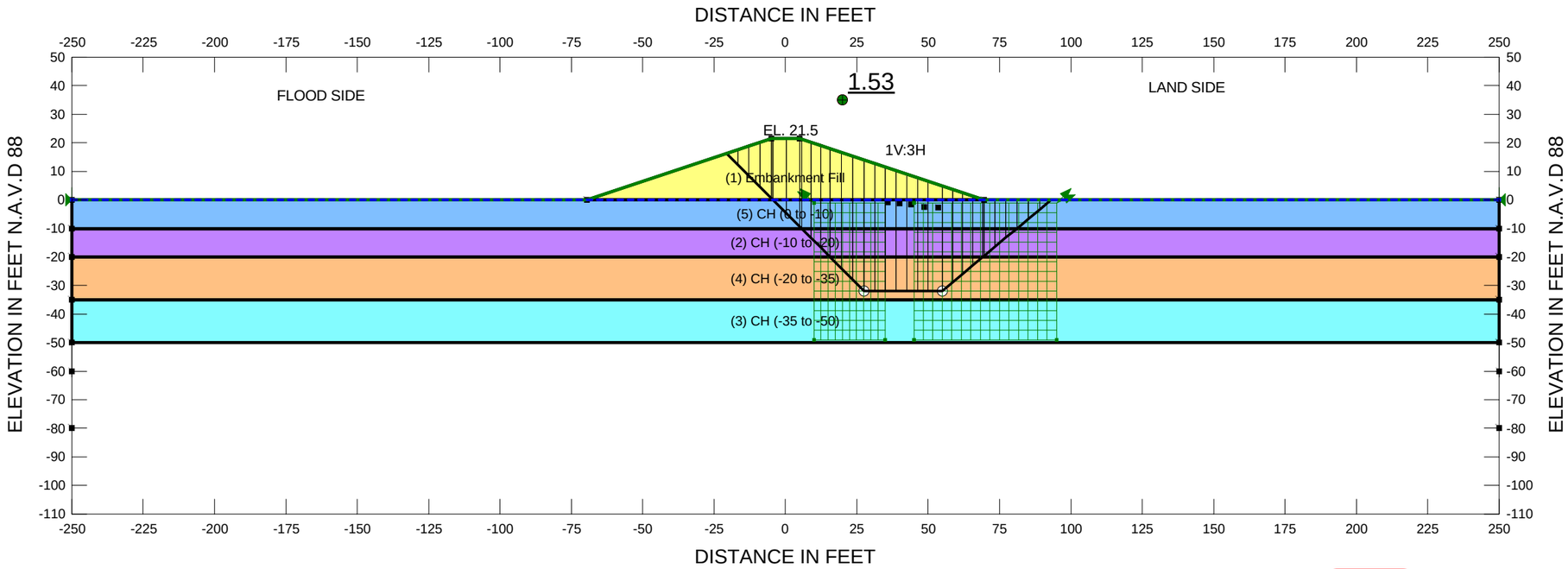
Current Slip Surface

Slip Surface: 38,654
Factor of Safety: 1.43
Volume: 5,129.1169 ft³
Weight: 602,760.74 lbf
Resisting Force: 104,283.5 lbf
Activating Force: 72,679.836 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (110.06259, 0) ft
Entry: (-33.5, 12) ft
Radius: 69.731871 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-31.5 ft	10 ft	717.6 psf	442.25727 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-27.5 ft	6 ft	967.2 psf	972.3906 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice	-23.5 ft	2 ft	1,216.8 psf	1,502.5239	0 psf	600 psf	0 psf	(1)

3				psf				Embankment Fill
Slice 4	-19 ft	-2.5 ft	1,497.6 psf	2,096.2166 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 5	-14 ft	-7.5 ft	1,809.6 psf	2,808.8833 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 6	-8.25 ft	-13.25 ft	2,168.4 psf	3,511.1208 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 7	-3.25 ft	-18.25 ft	2,480.4 psf	4,183.1041 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 8	1.75 ft	-23.25 ft	2,792.4 psf	4,811.0553 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 9	7.125 ft	-28.625 ft	3,083.2547 psf	5,326.222 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 10	11.375 ft	-32.875 ft	3,259.3641 psf	5,635.0553 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 11	15.833333 ft	-37.333333 ft	3,444.1062 psf	5,932.4503 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 12	20.5 ft	-42 ft	3,637.4812 psf	6,266.8948 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 13	25.166667 ft	-46.666667 ft	3,830.8562 psf	6,601.3392 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 14	29.916667 ft	-49 ft	3,876.8844 psf	7,202.3611 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 15	34.75 ft	-49 ft	3,775.5656 psf	7,017.0833 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 16	39.583333 ft	-49 ft	3,674.2469 psf	6,831.8056 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 17	44.416667 ft	-49 ft	3,572.9281 psf	6,646.5278 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 18	49.25 ft	-49 ft	3,471.6094 psf	6,461.25 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 19	54.447425 ft	-46.666667 ft	3,217.0584 psf	6,447.0831 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 20	60.008942 ft	-42 ft	2,809.2751 psf	5,720.5583 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 21	65.570459 ft	-37.333333 ft	2,401.4918 psf	4,994.0335 psf	0 psf	760 psf	0 psf	(3) CH (-35 to -50)
Slice 22	68.675608 ft	-34.727803 ft	2,173.815 psf	4,567.7792 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	69.25 ft	-34.245831 ft	2,136.9399 psf	4,492.262 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	72.28792 ft	-31.696714 ft	1,977.8749 psf	4,199.7266 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	77.86376 ft	-27.018028 ft	1,685.925 psf	3,680.3925 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	83.439601 ft	-22.339343 ft	1,393.975 psf	3,161.0584 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 27	89.206905 ft	-17.5 ft	1,092 psf	2,637.4836 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	95.165673 ft	-12.5 ft	780 psf	2,022.4836 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	101.12444 ft	-7.5 ft	468 psf	1,309.4869 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 30	107.08321 ft	-2.5 ft	156 psf	684.48687 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill	Mohr-Coulomb	115	600	0
	(2) CH (-10 to -20)	Mohr-Coulomb	123	800	0
	(3) CH (-35 to -50)	Mohr-Coulomb	110	760	0
	(4) CH (-20 to -35)	Mohr-Coulomb	111	725	0
	(5) CH (0 to -10)	Mohr-Coulomb	125	640	0

Slidell East/Northeast 2082 Janbu Qcase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,382
Date: 06/30/2022
Time: 02:44:30 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082 - Janbu.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 06/30/2022
Last Solved Time: 02:44:52 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Slip Surface Block

Left Grid
Upper Left: (10, -1) ft
Lower Left: (10, -49) ft
Lower Right: (35, -49) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (45, -1) ft
Lower Left: (45, -49) ft
Lower Right: (95, -49) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Materials

(1) Embankment Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 600 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(3) CH (-35 to -50)

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 760 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (-10 to -20)

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 800 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-20 to -35)

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 725 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (0 to -10)

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 640 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35)	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50)	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10)	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20)	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 39600 of 39600 converged

Current Slip Surface

Slip Surface: 25,459
Factor of Safety: 1.53
Volume: 3,059.5532 ft³
Weight: 363,720.21 lbf
Resisting Force: 80,111.434 lbf
Activating Force: 52,250.296 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (92.965864, 0) ft
Entry: (-20.642857, 16.285714) ft
Radius: 56.545641 ft
Center: (20, 35) ft

Slip Slices

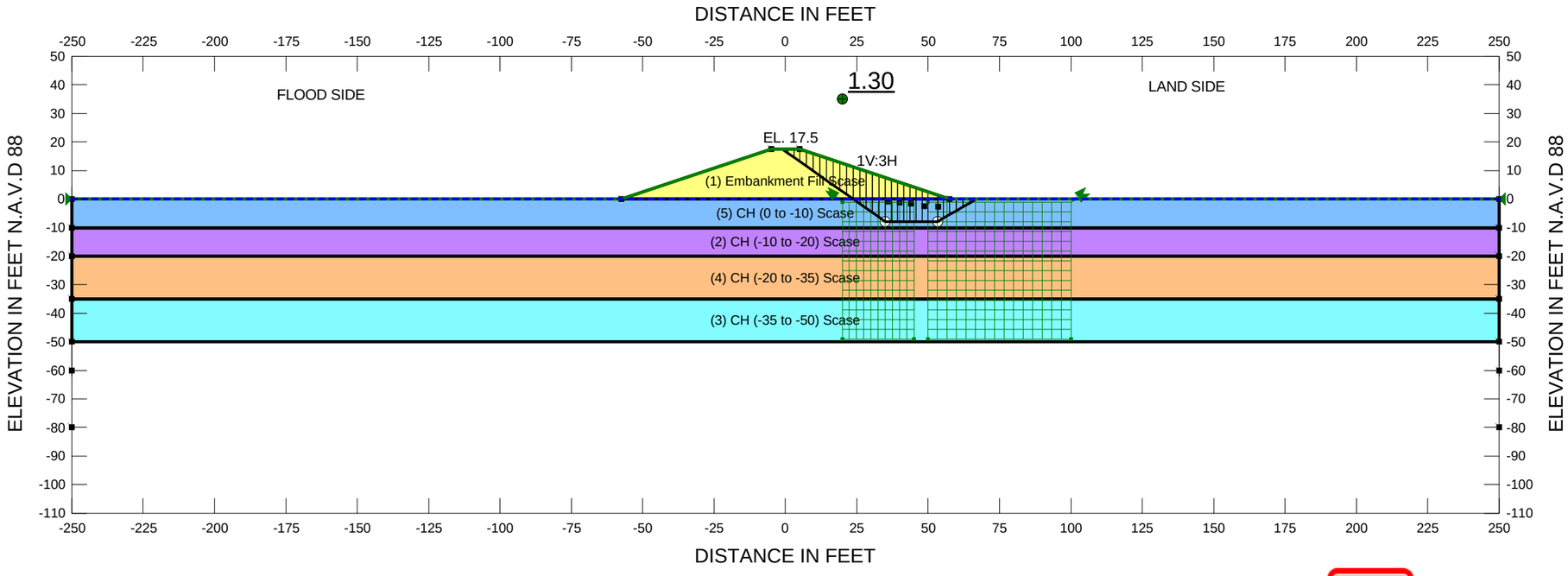
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-18.6875 ft	14.330357 ft	-894.21429 psf	-89.21314 psf	-0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 2	-14.776786 ft	10.419643 ft	-650.18571 psf	510.42972 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 3	-10.866071 ft	6.5089286 ft	-406.15714 psf	1,110.0726 psf	0 psf	600 psf	0 psf	(1) Embankment Fill

Slice 4	-6.9553571 ft	2.5982143 ft	-162.12857 psf	1,709.7154 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 5	-4.6785714 ft	0.32142857 ft	-20.057143 psf	2,046.5011 psf	0 psf	600 psf	0 psf	(1) Embankment Fill
Slice 6	-2.0178571 ft	-2.3392857 ft	145.97143 psf	2,349.9405 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 7	2.6607143 ft	-7.0178571 ft	437.91429 psf	2,934.7619 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 8	5.3214286 ft	-9.6785714 ft	603.94286 psf	3,255.0298 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 9	7.3095238 ft	-11.666667 ft	728 psf	3,320.2555 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 10	10.642857 ft	-15 ft	936 psf	3,602.4777 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 11	13.97619 ft	-18.333333 ft	1,144 psf	3,884.6999 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 12	17.619048 ft	-21.97619 ft	1,371.3143 psf	4,218.0435 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 13	21.571429 ft	-25.928571 ft	1,617.9429 psf	4,505.2499 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 14	25.52381 ft	-29.880952 ft	1,864.5714 psf	4,792.4562 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 15	29.375 ft	-31.857143 ft	1,987.8857 psf	5,334.2679 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 16	33.125 ft	-31.857143 ft	1,987.8857 psf	5,190.5179 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 17	36.875 ft	-31.857143 ft	1,987.8857 psf	5,046.7679 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 18	40.625 ft	-31.857143 ft	1,987.8857 psf	4,903.0179 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 19	44.375 ft	-31.857143 ft	1,987.8857 psf	4,759.2679 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 20	48.125 ft	-31.857143 ft	1,987.8857 psf	4,615.5179 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 21	52.5 ft	-31.857143 ft	1,987.8857 psf	4,447.8095 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 22	56.766349 ft	-30.375 ft	1,895.4 psf	4,514.1951 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 23	60.299047 ft	-27.410714 ft	1,710.4286 psf	4,049.7393 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 24	63.831745 ft	-24.446429 ft	1,525.4571 psf	3,585.2835 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 25	67.364444 ft	-21.482143 ft	1,340.4857 psf	3,120.8277 psf	0 psf	725 psf	0 psf	(4) CH (-20 to -35)
Slice 26	69.315396 ft	-19.845099 ft	1,238.3342 psf	2,903.2753 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 27	71.424721 ft	-18.075165 ft	1,127.8903 psf	2,678.497 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 28	75.274164 ft	-14.845099 ft	926.33418 psf	2,281.1989 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 29	79.123607 ft	-11.615033 ft	724.77806 psf	1,883.9007 psf	0 psf	800 psf	0 psf	(2) CH (-10 to -20)
Slice 30	83.034585 ft	-8.3333333 ft	520 psf	1,389.868 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 31	87.007096 ft	-5 ft	312 psf	973.20135 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)
Slice 32	90.979608 ft	-1.6666667 ft	104 psf	556.53468 psf	0 psf	640 psf	0 psf	(5) CH (0 to -10)

Slidell East/Northeast

Janbu Scase

2032 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Slidell East/Northeast 2032 Janbu Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,382
Date: 06/30/2022
Time: 02:21:42 PM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - Janbu - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 06/30/2022
Last Solved Time: 02:21:56 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 15 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Left Grid
- Upper Left: (20, -1) ft
- Lower Left: (20, -49) ft
- Lower Right: (45, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (50, -1) ft
- Lower Left: (50, -49) ft
- Lower Right: (100, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	57.5 ft	0 ft
Point 10	5 ft	17.5 ft
Point 11	-5 ft	17.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-57.5 ft	0 ft

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	1,093.8 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 34080 of 39600 converged

Current Slip Surface

Slip Surface: 6,887
Factor of Safety: 1.30
Volume: 591.02509 ft³
Weight: 70,383.831 lbf
Resisting Force: 21,210.354 lbf
Activating Force: 16,317.06 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (66.942304, 0) ft
Entry: (-1.213753, 17.5) ft
Radius: 34.614194 ft
Center: (20, 35) ft

Slip Slices

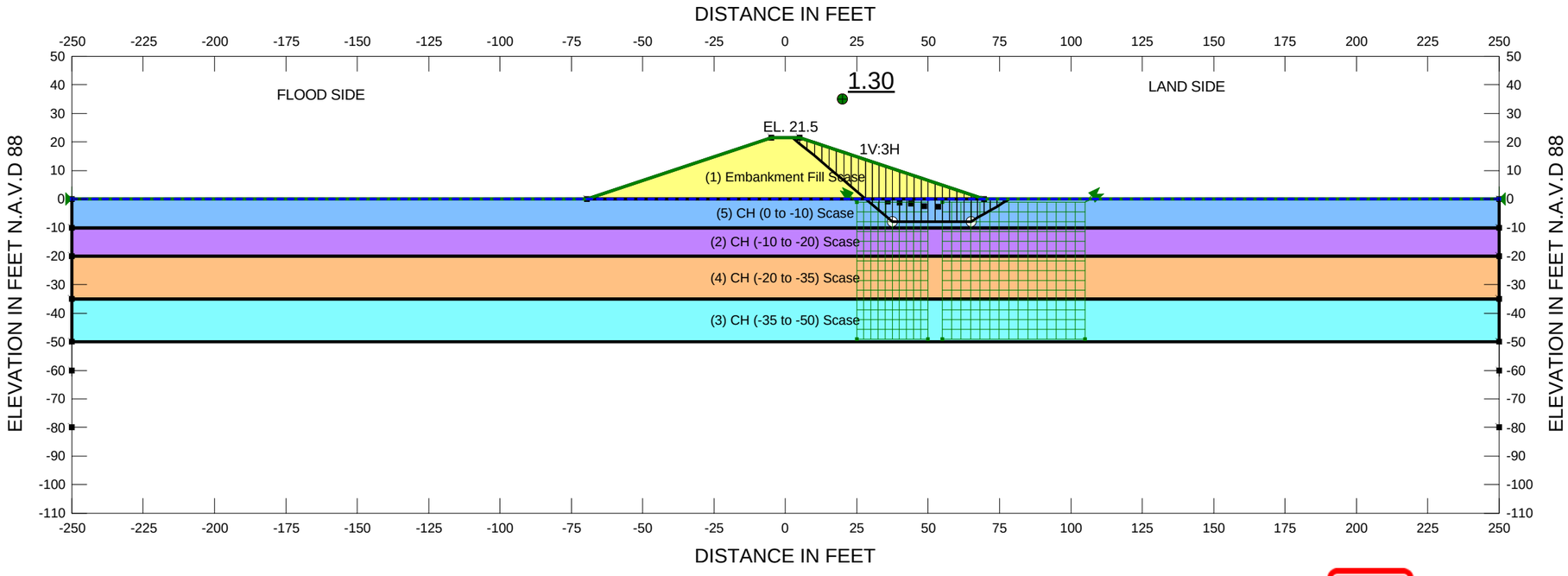
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-0.17812752 ft	16.774847 ft	-1,046.7505 psf	67.845857 psf	28.798858 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	1.8931235 ft	15.324542 ft	-956.2514 psf	203.53757 psf	86.396574 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	3.9643745 ft	13.874236 ft	-865.75233 psf	339.22929 psf	143.99429 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	6.1736773 ft	12.327266 ft	-769.22137 psf	447.36166 psf	189.89376 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 5	8.521032 ft	10.68363 ft	-666.65852 psf	527.93469 psf	224.09498 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice	10.868387 ft	9.0399948 ft	-564.09567	608.50772	258.2962	0 psf	0 psf	(1)

6			psf	psf	psf			Embankment Fill Scase
Slice 7	13.215741 ft	7.3963594 ft	-461.53282 psf	689.08075 psf	292.49743 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	15.563096 ft	5.7527239 ft	-358.96997 psf	769.65378 psf	326.69865 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	17.91045 ft	4.1090885 ft	-256.40712 psf	850.22681 psf	360.89987 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	20.257805 ft	2.4654531 ft	-153.84427 psf	930.79985 psf	395.10109 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	22.60516 ft	0.82181771 ft	-51.281425 psf	1,011.3729 psf	429.30232 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 12	24.900953 ft	-0.78571429 ft	49.028571 psf	1,105.7087 psf	448.53411 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	27.145186 ft	-2.3571429 ft	147.08571 psf	1,213.8074 psf	452.79649 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	29.389419 ft	-3.9285714 ft	245.14286 psf	1,321.9061 psf	457.05886 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	31.633651 ft	-5.5 ft	343.2 psf	1,430.0047 psf	461.32123 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	33.877884 ft	-7.0714286 ft	441.25714 psf	1,538.1034 psf	465.58361 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	36.071429 ft	-7.8571429 ft	490.28571 psf	1,803.5714 psf	557.45671 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	38.214286 ft	-7.8571429 ft	490.28571 psf	1,721.4286 psf	522.58914 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	40.357143 ft	-7.8571429 ft	490.28571 psf	1,639.2857 psf	487.72156 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	42.5 ft	-7.8571429 ft	490.28571 psf	1,557.1429 psf	452.85399 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	44.642857 ft	-7.8571429 ft	490.28571 psf	1,475 psf	417.98642 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	46.785714 ft	-7.8571429 ft	490.28571 psf	1,392.8571 psf	383.11884 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	48.928571 ft	-7.8571429 ft	490.28571 psf	1,310.7143 psf	348.25127 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	51.666667 ft	-7.8571429 ft	490.28571 psf	1,205.754 psf	303.69826 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	54.375 ft	-7.2557363 ft	452.75795 psf	1,160.4762 psf	300.40858 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	56.458333 ft	-6.0529233 ft	377.70241 psf	894.1185 psf	219.20562 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	58.680288 ft	-4.7700771 ft	297.65281 psf	665.82219 psf	156.27863 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	61.040864 ft	-3.407198 ft	212.60915 psf	475.58728 psf	111.62759 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	63.40144 ft	-2.0443188 ft	127.56549 psf	285.35237 psf	66.976556 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	65.762016 ft	-0.68143959 ft	42.521831 psf	95.117456 psf	22.325519 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

Slidell East/Northeast

Janbu Scase

2082 elevations



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(1) Embankment Fill Scase	Mohr-Coulomb	115	0	23
	(2) CH (-10 to -20) Scase	Mohr-Coulomb	123	0	23
	(3) CH (-35 to -50) Scase	Mohr-Coulomb	110	0	23
	(4) CH (-20 to -35) Scase	Mohr-Coulomb	111	0	23
	(5) CH (0 to -10) Scase	Mohr-Coulomb	125	0	23

Slidell East/Northeast 2082 Janbu Scase

CASE: Low Water (LW) Block

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,388
Date: 07/13/2022
Time: 09:35:10 AM
Tool Version: 10.0.0.17401
File Name: Slidell East_Northeast FID4&6 - 10120 - 2082 - Janbu - Scase.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\4 and 6 Slidell East and Northeast\
Last Solved Date: 07/13/2022
Last Solved Time: 09:35:22 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: Yes
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 18 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

(1) Embankment Fill Scase

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(3) CH (-35 to -50) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(2) CH (-10 to -20) Scase

Model: Mohr-Coulomb
Unit Weight: 123 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(4) CH (-20 to -35) Scase

Model: Mohr-Coulomb
Unit Weight: 111 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

(5) CH (0 to -10) Scase

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 0) ft
Right Coordinate: (250, 0) ft

Slip Surface Block

Left Grid
- Upper Left: (25, -1) ft
- Lower Left: (25, -49) ft
- Lower Right: (50, -49) ft
- X Increments: 10
- Y Increments: 14
- Starting Angle: 135 °
- Ending Angle: 145 °
- Angle Increments: 2

Right Grid
- Starting Angle: 25 °
- Ending Angle: 45 °
- Upper Left: (55, -1) ft
- Lower Left: (55, -49) ft
- Lower Right: (105, -49) ft
- X Increments: 15
- Y Increments: 14
- Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	0 ft
Coordinate 2	50 ft	0 ft
Coordinate 3	250 ft	0 ft

Points

	X	Y
Point 1	250 ft	0 ft
Point 2	250 ft	-60 ft
Point 3	-250 ft	-60 ft
Point 4	53.6 ft	-2.6 ft
Point 5	48.6 ft	-2.5 ft
Point 6	43.9 ft	-1.6 ft
Point 7	39.9 ft	-1.3 ft
Point 8	35.8 ft	-0.8 ft
Point 9	69.5 ft	0 ft
Point 10	5 ft	21.5 ft
Point 11	-5 ft	21.5 ft
Point 12	-250 ft	0 ft
Point 13	-250 ft	-10 ft
Point 14	250 ft	-10 ft
Point 15	-250 ft	-20 ft
Point 16	250 ft	-20 ft
Point 17	-250 ft	-50 ft
Point 18	250 ft	-50 ft
Point 19	-250 ft	-80 ft
Point 20	250 ft	-80 ft
Point 21	-250 ft	-35 ft
Point 22	250 ft	-35 ft
Point 23	-69.5 ft	0 ft

Regions

	Material	Points	Area
Region 1	(4) CH (-20 to -35) Scase	15,21,22,16	7,500 ft²
Region 2	(3) CH (-35 to -50) Scase	21,17,18,22	7,500 ft²
Region 3	(1) Embankment Fill Scase	23,11,10,9	1,601.8 ft²
Region 4	(5) CH (0 to -10) Scase	13,12,23,9,1,14	5,000 ft²
Region 5	(2) CH (-10 to -20) Scase	15,13,14,16	5,000 ft²

Slip Results

Slip Surfaces Analysed: 33360 of 39600 converged

Current Slip Surface

Slip Surface: 6,577
Factor of Safety: 1.30
Volume: 777.71179 ft³
Weight: 92,500.071 lbf
Resisting Force: 28,144.736 lbf
Activating Force: 21,619.573 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (78.608971, 0) ft
Entry: (2.5135195, 21.5) ft
Radius: 40.304163 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	3.7567598 ft	20.456798 ft	-1,276.5042 psf	94.106131 psf	39.945683 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 2	6.2853457 ft	18.335062 ft	-1,144.1079 psf	246.85566 psf	104.78401 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 3	8.856037 ft	16.177996 ft	-1,009.5069 psf	364.14247 psf	154.56931 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 4	11.426728 ft	14.02093 ft	-874.90602 psf	481.42927 psf	204.3546 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice	13.99742	11.863864 ft	-740.3051	598.71607	254.1399	0 psf	0 psf	(1)

5	ft		psf	psf	psf			Embankment Fill Scase
Slice 6	16.568111 ft	9.7067976 ft	-605.70417 psf	716.00288 psf	303.92519 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 7	19.138802 ft	7.5497314 ft	-471.10324 psf	833.28968 psf	353.71048 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 8	21.709494 ft	5.3926653 ft	-336.50232 psf	950.57648 psf	403.49578 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 9	24.280185 ft	3.2355992 ft	-201.90139 psf	1,067.8633 psf	453.28107 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 10	26.850876 ft	1.0785331 ft	-67.300463 psf	1,185.1501 psf	503.06637 psf	0 psf	0 psf	(1) Embankment Fill Scase
Slice 11	29.306694 ft	-0.98214286 ft	61.285714 psf	1,318.1117 psf	533.49097 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 12	31.647639 ft	-2.9464286 ft	183.85714 psf	1,466.748 psf	544.55488 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 13	33.988583 ft	-4.9107143 ft	306.42857 psf	1,615.3844 psf	555.61879 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 14	36.329528 ft	-6.875 ft	429 psf	1,764.0208 psf	566.6827 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 15	38.75 ft	-7.8571429 ft	490.28571 psf	2,160.8929 psf	709.13066 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 16	41.25 ft	-7.8571429 ft	490.28571 psf	2,065.0595 psf	668.45182 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 17	43.75 ft	-7.8571429 ft	490.28571 psf	1,969.2262 psf	627.77299 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 18	46.25 ft	-7.8571429 ft	490.28571 psf	1,873.3929 psf	587.09415 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 19	48.75 ft	-7.8571429 ft	490.28571 psf	1,777.5595 psf	546.41531 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 20	51.25 ft	-7.8571429 ft	490.28571 psf	1,681.7262 psf	505.73648 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 21	53.75 ft	-7.8571429 ft	490.28571 psf	1,585.8929 psf	465.05764 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 22	56.25 ft	-7.8571429 ft	490.28571 psf	1,490.0595 psf	424.3788 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 23	58.75 ft	-7.8571429 ft	490.28571 psf	1,394.2262 psf	383.69997 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 24	61.25 ft	-7.8571429 ft	490.28571 psf	1,298.3929 psf	343.02113 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 25	63.75 ft	-7.8571429 ft	490.28571 psf	1,202.5595 psf	302.34229 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 26	66.125 ft	-7.2076238 ft	449.75573 psf	1,165.7088 psf	303.90403 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 27	68.375 ft	-5.9085857 ft	368.69575 psf	878.00423 psf	216.18862 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 28	70.638621 ft	-4.6016833 ft	287.14504 psf	642.38296 psf	150.78955 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 29	72.915864 ft	-3.2869167 ft	205.1036 psf	458.84497 psf	107.70682 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 30	75.193107 ft	-1.97215 ft	123.06216 psf	275.30698 psf	64.624094 psf	0 psf	0 psf	(5) CH (0 to -10) Scase
Slice 31	77.470349 ft	-0.65738333 ft	41.02072 psf	91.768995 psf	21.541365 psf	0 psf	0 psf	(5) CH (0 to -10) Scase

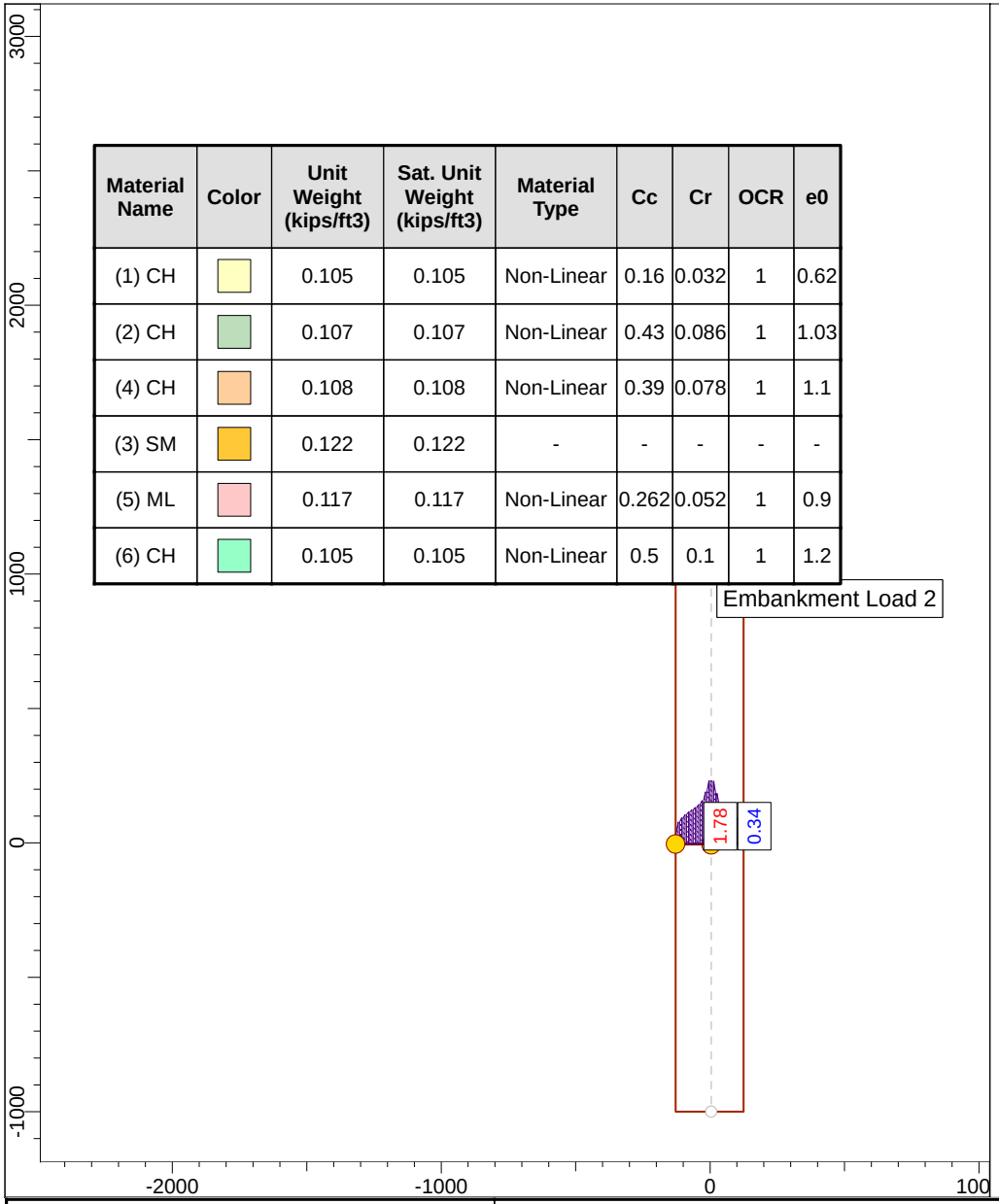
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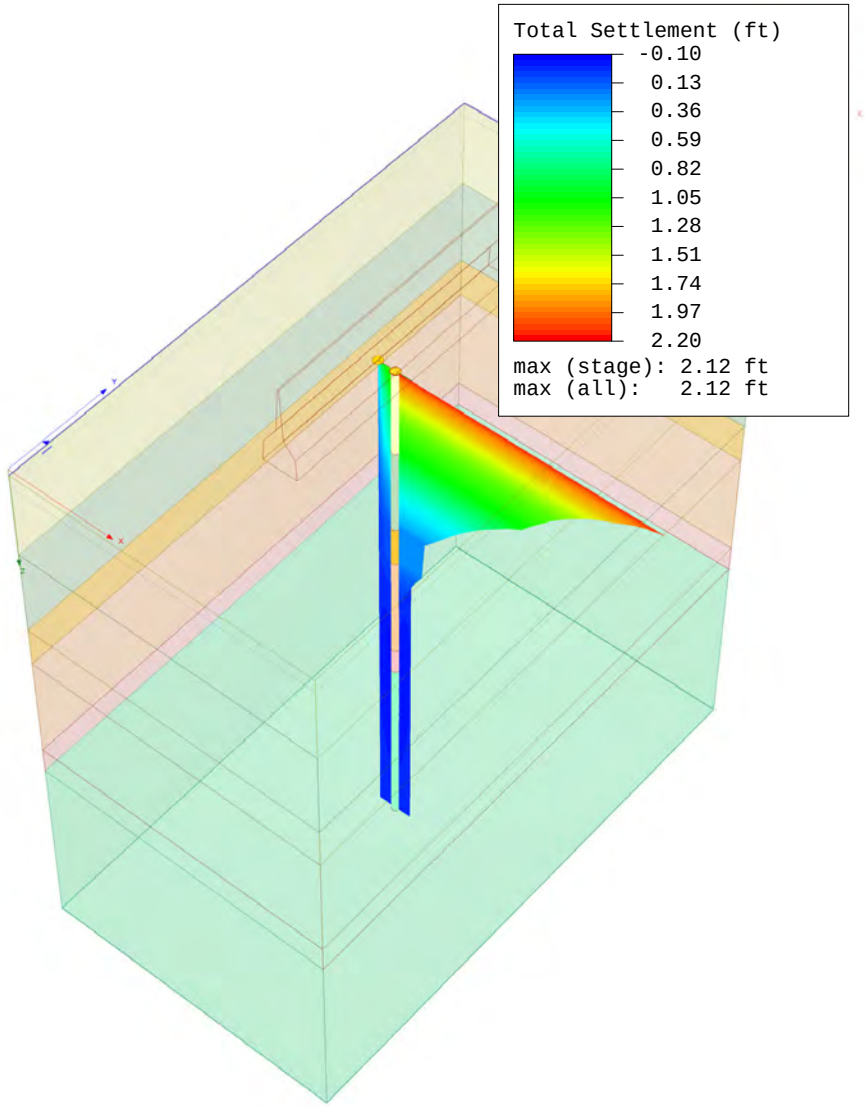
Settlement

West Slidell Levee

Bermed Section

Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Material Type	Cc	Cr	OCR	e0
(1) CH		0.105	0.105	Non-Linear	0.16	0.032	1	0.62
(2) CH		0.107	0.107	Non-Linear	0.43	0.086	1	1.03
(4) CH		0.108	0.108	Non-Linear	0.39	0.078	1	1.1
(3) SM		0.122	0.122	-	-	-	-	-
(5) ML		0.117	0.117	Non-Linear	0.262	0.052	1	0.9
(6) CH		0.105	0.105	Non-Linear	0.5	0.1	1	1.2





Project	SCCL		
Analysis Description			
Drawn By	SR	Company	MVN
Date	9/5/2019, 7:35:56 AM	File Name	Time Dependent.SCCL-Settlement.Stage 1 - 09318 - 1on3 - embankment.s3z

SETTLE3 5.001

Settle3 Analysis Information
SCCL

Project Settings

Document Name	Time Dependent.SCCL-Settlement.Stage 1 - 09318 - 1on3 - embankment.s3z
Project Title	SCCL
Author	SR
Company	MVN
Date Created	9/5/2019, 7:35:56 AM
Stress Computation Method	Boussinesq
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/year
Minimum settlement ratio for subgrade modulus	0.9

Include buoyancy effect when material settles below water table

Include vertical stress reduction due to settlement above a point

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Stage 1-Initial Load	0
2	Step 1	0.5
3	Step 2	1
4	Step 3	2
5	Step 4	4
6	Step 5	6
7	Step 6	8
8	Step 7	10
9	Step 8	12
10	Step 9	24
11	Stage 11	36
12	Stage 12	37

Results

Time taken to compute: 0 seconds

Stage: Stage 1-Initial Load = 0 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.000647808	0.022167
Total Consolidation Settlement [ft]	-0.00237875	0
Virgin Consolidation Settlement [ft]	0	0
Recompression Consolidation Settlement [ft]	-0.00237875	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	-0.0012675	3.6318
Effective Stress XX [ksf]	0.0506555	3.76925
Effective Stress YY [ksf]	0.0172273	3.85748
Total Stress ZZ [ksf]	0.0485012	9.34522
Total Stress XX [ksf]	0.0991566	9.4606
Total Stress YY [ksf]	0.0657285	9.57157
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	-0.00220511	0.00387988
Pore Water Pressure [ksf]	0.0485012	5.71453
Excess Pore Water Pressure [ksf]	0.0485012	1.43772
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.005538	3.63081
Over-consolidation Ratio	1	1.2931
Void Ratio	0	1.20003
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	2.77556e-017

Stage: Step 1 = 0.5 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0140918	0.650488
Total Consolidation Settlement [ft]	-0.0140918	0.627797
Virgin Consolidation Settlement [ft]	0	0.656938
Recompression Consolidation Settlement [ft]	-0.0291733	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.04852	3.62722
Effective Stress XX [ksf]	0.0991566	3.76766
Effective Stress YY [ksf]	0.0657285	3.85365
Total Stress ZZ [ksf]	0.0484959	9.31144
Total Stress XX [ksf]	0.0991326	9.4606
Total Stress YY [ksf]	0.0657039	9.57157
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	-0.0022808	0.237328
Pore Water Pressure [ksf]	-2.46379e-005	5.71832
Excess Pore Water Pressure [ksf]	0	1.33179
Degree of Consolidation [%]	0	24.0753
Pre-consolidation Stress [ksf]	0.0544597	3.63081
Over-consolidation Ratio	1	1.14406
Void Ratio	0	1.20088
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Step 2 = 1 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0169564	0.788587
Total Consolidation Settlement [ft]	-0.0169564	0.765896
Virgin Consolidation Settlement [ft]	0	0.796012
Recompression Consolidation Settlement [ft]	-0.030578	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485205	3.6266
Effective Stress XX [ksf]	0.0991566	3.76704
Effective Stress YY [ksf]	0.0657285	3.85199
Total Stress ZZ [ksf]	0.0484958	9.30411
Total Stress XX [ksf]	0.099132	9.4606
Total Stress YY [ksf]	0.0657032	9.57157
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	-0.00261858	0.237281
Pore Water Pressure [ksf]	-2.5285e-005	5.71997
Excess Pore Water Pressure [ksf]	0	1.28879
Degree of Consolidation [%]	0	27.4202
Pre-consolidation Stress [ksf]	0.054495	3.63081
Over-consolidation Ratio	1	1.15313
Void Ratio	0	1.20106
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Step 3 = 2 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0205973	0.980807
Total Consolidation Settlement [ft]	-0.0205973	0.958115
Virgin Consolidation Settlement [ft]	0	0.987744
Recompression Consolidation Settlement [ft]	-0.0306999	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485205	3.62572
Effective Stress XX [ksf]	0.0991566	3.76615
Effective Stress YY [ksf]	0.0657285	3.84958
Total Stress ZZ [ksf]	0.0484958	9.29387
Total Stress XX [ksf]	0.099132	9.4606
Total Stress YY [ksf]	0.0657032	9.57157
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	-0.00219022	0.237189
Pore Water Pressure [ksf]	-2.5285e-005	5.72235
Excess Pore Water Pressure [ksf]	0	1.25663
Degree of Consolidation [%]	0	32.8038
Pre-consolidation Stress [ksf]	0.0545152	3.63081
Over-consolidation Ratio	1	1.12643
Void Ratio	0	1.20132
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Step 4 = 4 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0235349	1.20924
Total Consolidation Settlement [ft]	-0.0235349	1.18655
Virgin Consolidation Settlement [ft]	0	1.20691
Recompression Consolidation Settlement [ft]	-0.0245185	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485205	3.62461
Effective Stress XX [ksf]	0.0991566	3.76496
Effective Stress YY [ksf]	0.0657285	3.84612
Total Stress ZZ [ksf]	0.0484958	9.28166
Total Stress XX [ksf]	0.099132	9.4606
Total Stress YY [ksf]	0.0657032	9.57157
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	-0.00073815	0.237113
Pore Water Pressure [ksf]	-2.5285e-005	5.72578
Excess Pore Water Pressure [ksf]	0	1.16104
Degree of Consolidation [%]	0	39.1799
Pre-consolidation Stress [ksf]	0.0545226	3.63081
Over-consolidation Ratio	1	1.04737
Void Ratio	0	1.20162
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Step 5 = 6 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0254886	1.36776
Total Consolidation Settlement [ft]	-0.0254886	1.34507
Virgin Consolidation Settlement [ft]	0	1.36669
Recompression Consolidation Settlement [ft]	-0.0259592	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485205	3.62392
Effective Stress XX [ksf]	0.0991566	3.76434
Effective Stress YY [ksf]	0.0657285	3.84346
Total Stress ZZ [ksf]	0.0484958	9.27315
Total Stress XX [ksf]	0.099132	9.4606
Total Stress YY [ksf]	0.0657032	9.57157
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	-0.000836142	0.237054
Pore Water Pressure [ksf]	-2.5285e-005	5.72841
Excess Pore Water Pressure [ksf]	0	1.09003
Degree of Consolidation [%]	0	43.6097
Pre-consolidation Stress [ksf]	0.0545226	3.63081
Over-consolidation Ratio	1	1.05733
Void Ratio	0	1.20184
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Step 6 = 8 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0263395	1.49281
Total Consolidation Settlement [ft]	-0.0263395	1.47012
Virgin Consolidation Settlement [ft]	0	1.49247
Recompression Consolidation Settlement [ft]	-0.0268697	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485205	3.62342
Effective Stress XX [ksf]	0.0991566	3.76391
Effective Stress YY [ksf]	0.0657285	3.84133
Total Stress ZZ [ksf]	0.0484958	9.26642
Total Stress XX [ksf]	0.099132	9.4606
Total Stress YY [ksf]	0.0657032	9.57157
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	-0.000913097	0.237006
Pore Water Pressure [ksf]	-2.5285e-005	5.73064
Excess Pore Water Pressure [ksf]	0	1.0121
Degree of Consolidation [%]	0	47.2559
Pre-consolidation Stress [ksf]	0.0545226	3.63081
Over-consolidation Ratio	1	1.06713
Void Ratio	0	1.20201
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Step 7 = 10 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.027121	1.59686
Total Consolidation Settlement [ft]	-0.027121	1.57417
Virgin Consolidation Settlement [ft]	0	1.59729
Recompression Consolidation Settlement [ft]	-0.0277206	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485205	3.62303
Effective Stress XX [ksf]	0.0991566	3.76354
Effective Stress YY [ksf]	0.0657285	3.84075
Total Stress ZZ [ksf]	0.0484958	9.26083
Total Stress XX [ksf]	0.099132	9.4606
Total Stress YY [ksf]	0.0657032	9.57157
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	-0.000973943	0.236966
Pore Water Pressure [ksf]	-2.5285e-005	5.73264
Excess Pore Water Pressure [ksf]	0	0.928755
Degree of Consolidation [%]	0	50.3328
Pre-consolidation Stress [ksf]	0.0545226	3.63081
Over-consolidation Ratio	1	1.07551
Void Ratio	0	1.20214
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Step 8 = 12 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0275419	1.68422
Total Consolidation Settlement [ft]	-0.0275419	1.66153
Virgin Consolidation Settlement [ft]	0	1.68507
Recompression Consolidation Settlement [ft]	-0.0298103	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485205	3.62271
Effective Stress XX [ksf]	0.0991566	3.76321
Effective Stress YY [ksf]	0.0657285	3.84032
Total Stress ZZ [ksf]	0.0484958	9.25613
Total Stress XX [ksf]	0.099132	9.4606
Total Stress YY [ksf]	0.0657032	9.57157
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	-0.00101295	0.236932
Pore Water Pressure [ksf]	-2.5285e-005	5.73447
Excess Pore Water Pressure [ksf]	0	0.874419
Degree of Consolidation [%]	0	53.0018
Pre-consolidation Stress [ksf]	0.0545226	3.63081
Over-consolidation Ratio	1	1.08285
Void Ratio	0	1.20223
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Step 9 = 24 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0275613	1.96459
Total Consolidation Settlement [ft]	-0.0275613	1.9419
Virgin Consolidation Settlement [ft]	0	1.96694
Recompression Consolidation Settlement [ft]	-0.030036	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485209	3.62189
Effective Stress XX [ksf]	0.0991566	3.76176
Effective Stress YY [ksf]	0.0657285	3.83864
Total Stress ZZ [ksf]	0.0484957	9.24103
Total Stress XX [ksf]	0.0991315	9.4606
Total Stress YY [ksf]	0.0657027	9.57157
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	-0.00104682	0.236822
Pore Water Pressure [ksf]	-2.58048e-005	5.74369
Excess Pore Water Pressure [ksf]	0	0.835585
Degree of Consolidation [%]	0	63.3423
Pre-consolidation Stress [ksf]	0.0545226	3.63081
Over-consolidation Ratio	1	1.10768
Void Ratio	0	1.2023
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Stage 11 = 36 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0263067	2.11434
Total Consolidation Settlement [ft]	-0.0263067	2.09165
Virgin Consolidation Settlement [ft]	0	2.11555
Recompression Consolidation Settlement [ft]	-0.0297656	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485212	3.62202
Effective Stress XX [ksf]	0.0991566	3.76081
Effective Stress YY [ksf]	0.0657285	3.83745
Total Stress ZZ [ksf]	0.0484956	9.23295
Total Stress XX [ksf]	0.0991311	9.4606
Total Stress YY [ksf]	0.0657023	9.57157
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	-0.00100363	0.236761
Pore Water Pressure [ksf]	-2.623e-005	5.75125
Excess Pore Water Pressure [ksf]	0	0.810271
Degree of Consolidation [%]	0	68.899
Pre-consolidation Stress [ksf]	0.0545226	3.63081
Over-consolidation Ratio	1	1.12114
Void Ratio	0	1.20221
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Stage: Stage 12 = 37 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.0261258	2.12389
Total Consolidation Settlement [ft]	-0.0261258	2.1012
Virgin Consolidation Settlement [ft]	0	2.12489
Recompression Consolidation Settlement [ft]	-0.0289738	0
Immediate Settlement [ft]	0	0.0226914
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.0485012	1.43772
Loading Stress XX [ksf]	0.0503521	0.600762
Loading Stress YY [ksf]	0.0172273	1.41173
Effective Stress ZZ [ksf]	0.0485212	3.62205
Effective Stress XX [ksf]	0.0991566	3.76075
Effective Stress YY [ksf]	0.0657285	3.83737
Total Stress ZZ [ksf]	0.0484956	9.23245
Total Stress XX [ksf]	0.099131	9.4606
Total Stress YY [ksf]	0.0657022	9.57157
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	-0.00100294	0.236758
Pore Water Pressure [ksf]	-2.62766e-005	5.75183
Excess Pore Water Pressure [ksf]	0	0.808997
Degree of Consolidation [%]	0	69.44
Pre-consolidation Stress [ksf]	0.0545226	3.63081
Over-consolidation Ratio	1	1.12203
Void Ratio	0	1.20221
Permeability [ft/y]	0	38.7078
Coefficient of Consolidation [ft^2/y]	0	80
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0329557

Embankments

1. Embankment: "Embankment Load 2"

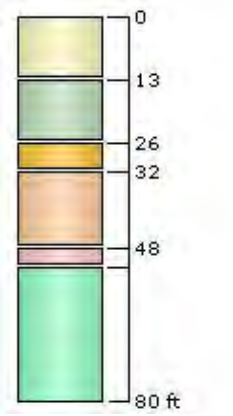
Label	Embankment Load 2
Center Line	(4.0678, 1000) to (4.0678, -1000)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Zones	4
Number of Sections	1

Zone	Name	Unit Weight (kips/ft^3)
1	New Zone	0.115
2	New Zone 2	0.115
3	New Zone 3	0.115
4	New Zone 4	0.115

Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	(1) CH	13	0	No
2	(2) CH	13	13	Yes
3	(3) SM	6	26	No
4	(4) CH	16	32	No
5	(5) ML	4	48	No
6	(6) CH	28	52	No



Soil Properties

Property	(1) CH	(2) CH	(4) CH	(3) SM
Color				
Unit Weight [kips/ft^3]	0.105	0.107	0.108	0.122
Saturated Unit Weight [kips/ft^3]	0.105	0.107	0.108	0.122
K0	1	1	1	1
Immediate Settlement	Disabled	Disabled	Disabled	Enabled
Es [ksf]	-	-	-	280
Esur [ksf]	-	-	-	280
Primary Consolidation	Enabled	Enabled	Enabled	Disabled
Material Type	Non-Linear	Non-Linear	Non-Linear	
Cc	0.16	0.43	0.39	-
Cr	0.032	0.086	0.078	-
e0	0.62	1.03	1.1	-
OCR	1	1	1	-
Cv [ft^2/y]	80	17	17	-
Cvr [ft^2/y]	80	17	17	-
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	2	2	2	2

Property	(5) ML	(6) CH
Color		
Unit Weight [kips/ft^3]	0.117	0.105
Saturated Unit Weight [kips/ft^3]	0.117	0.105
K0	1	1
Primary Consolidation	Enabled	Enabled
Material Type	Non-Linear	Non-Linear
Cc	0.262	0.5
Cr	0.052	0.1
e0	0.9	1.2
OCR	1	1
Cv [ft^2/y]	17	17
Cvr [ft^2/y]	17	17
B-bar	1	1
Undrained Su A [kips/ft2]	0	0
Undrained Su S	0.2	0.2
Undrained Su m	0.8	0.8
Piezo Line ID	1	1

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft^3

Piezometric Line Entities

ID	Depth (ft)
1	0 ft
2	0 ft

Query Points

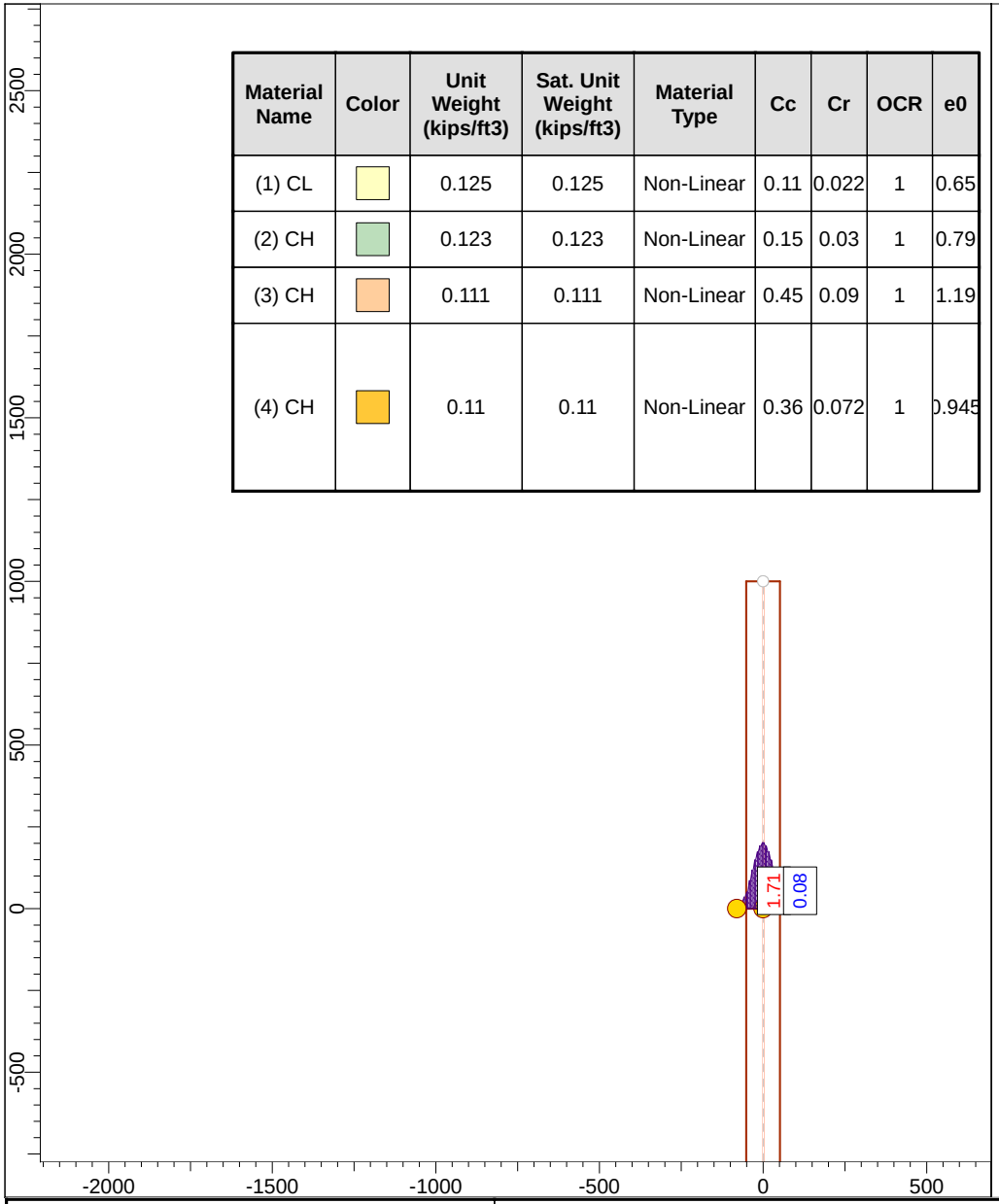
Point #	Query Point Name	(X,Y) Location	Number of Divisions
1	Query Point 1	4.0678, -7.68282	Auto: 61

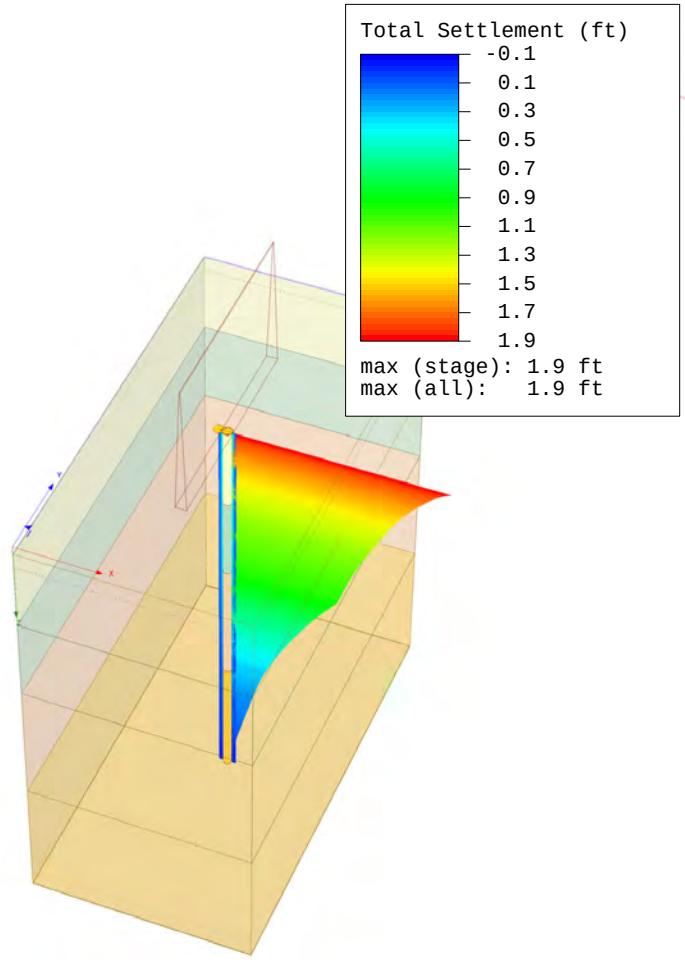
Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	-128.432, -4.41178	124.568, -4.41178	20	Auto: 61

Oak Harbor Levee

Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Material Type	Cc	Cr	OCR	e0
(1) CL		0.125	0.125	Non-Linear	0.11	0.022	1	0.65
(2) CH		0.123	0.123	Non-Linear	0.15	0.03	1	0.79
(3) CH		0.111	0.111	Non-Linear	0.45	0.09	1	1.19
(4) CH		0.11	0.11	Non-Linear	0.36	0.072	1	0.945





rocscience	Project: SCCL	
	Analysis Description:	
	Drawn By: SR	Company: MVN
	Date: 9/5/2019, 7:35:56 AM	File Name: Time Dependent.Oak Harbor-Settlement.Stage 1 - 10120_EL15.5 - 1on3.s3z

SETTLE3 5.001

Settle3 Analysis Information
SCCL

Project Settings

Document Name	Time Dependent.Oak Harbor-Settlement.Stage 1 - 10120_EL15.5 - 1on3.s3z
Project Title	SCCL
Author	SR
Company	MVN
Date Created	9/5/2019, 7:35:56 AM
Stress Computation Method	Boussinesq
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/year
Minimum settlement ratio for subgrade modulus	0.9

Include buoyancy effect when material settles below water table

Include vertical stress reduction due to settlement above a point

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Stage 1-Initial Load	0
2	Step 1	0.5
3	Step 2	1
4	Step 3	2
5	Step 4	4
6	Step 5	6
7	Step 6	8
8	Step 7	10
9	Step 8	12
10	Step 9	24
11	Stage 11	36
12	Stage 12	48
13	Stage 13	60
14	Stage 14	84
15	Stage 15	108
16	Stage 16	120

Results

Time taken to compute: 0 seconds

Stage: Stage 1-Initial Load = 0 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.000483218	0.0691637
Total Consolidation Settlement [ft]	-0.00418991	5.91637e-006
Virgin Consolidation Settlement [ft]	0	1.22162e-005
Recompression Consolidation Settlement [ft]	-0.00418991	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	-0.0041303	2.67487
Effective Stress XX [ksf]	-0.00210594	4.64144
Effective Stress YY [ksf]	-0.0188916	5.55604
Total Stress ZZ [ksf]	0	6.76459
Total Stress XX [ksf]	-0.00210594	8.73486
Total Stress YY [ksf]	-0.0188834	9.64946
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	-0.00613988	0.00512745
Pore Water Pressure [ksf]	0	4.09342
Excess Pore Water Pressure [ksf]	0	1.85582
Degree of Consolidation [%]	0	0.00642231
Pre-consolidation Stress [ksf]	0.00626	2.67429
Over-consolidation Ratio	1	2.8873
Void Ratio	0.65	1.18982
Permeability [ft/y]	0.0281659	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.55112e-017	2.77556e-017

Stage: Step 1 = 0.5 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.42415
Total Consolidation Settlement [ft]	0	0.353769
Virgin Consolidation Settlement [ft]	0	0.366934
Recompression Consolidation Settlement [ft]	-0.013354	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	1.10312e-008	3.62131
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.74131
Total Stress XX [ksf]	-0.00210595	8.73486
Total Stress YY [ksf]	-0.0188839	9.64946
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	-0.000490704	0.164447
Pore Water Pressure [ksf]	-4.9611e-007	3.95257
Excess Pore Water Pressure [ksf]	0	1.66382
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.06987
Void Ratio	0.378662	1.18977
Permeability [ft/y]	0.00650519	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-4.78236e-005	0.0342591

Stage: Step 2 = 1 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.498782
Total Consolidation Settlement [ft]	0	0.428401
Virgin Consolidation Settlement [ft]	0	0.442995
Recompression Consolidation Settlement [ft]	-0.0145942	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	3.55635e-008	3.61649
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.73649
Total Stress XX [ksf]	-0.00210597	8.73486
Total Stress YY [ksf]	-0.0188839	9.64946
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	-0.00045281	0.164435
Pore Water Pressure [ksf]	-4.9704e-007	3.86931
Excess Pore Water Pressure [ksf]	0	1.61168
Degree of Consolidation [%]	0	99.7936
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.06419
Void Ratio	0.378682	1.18976
Permeability [ft/y]	0.00650519	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-4.78236e-005	0.0342591

Stage: Step 3 = 2 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.595991
Total Consolidation Settlement [ft]	0	0.525611
Virgin Consolidation Settlement [ft]	0	0.540856
Recompression Consolidation Settlement [ft]	-0.0153849	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	1.01892e-007	3.61023
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.73023
Total Stress XX [ksf]	-0.00210604	8.73486
Total Stress YY [ksf]	-0.0188839	9.64946
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	-0.000530045	0.164418
Pore Water Pressure [ksf]	-4.99179e-007	3.82384
Excess Pore Water Pressure [ksf]	0	1.53251
Degree of Consolidation [%]	0	99.883
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.06099
Void Ratio	0.378711	1.18974
Permeability [ft/y]	0.00690302	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-4.78236e-005	0.0342591

Stage: Step 4 = 4 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.720738
Total Consolidation Settlement [ft]	0	0.650358
Virgin Consolidation Settlement [ft]	0	0.665675
Recompression Consolidation Settlement [ft]	-0.0155331	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	2.24658e-007	3.60227
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.72227
Total Stress XX [ksf]	-0.00210616	8.73486
Total Stress YY [ksf]	-0.0188839	9.64946
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	-0.000679926	0.164394
Pore Water Pressure [ksf]	-5.0416e-007	3.73378
Excess Pore Water Pressure [ksf]	0	1.43479
Degree of Consolidation [%]	0	99.9119
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.05553
Void Ratio	0.37875	1.18974
Permeability [ft/y]	0.00690302	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-4.78236e-005	0.0342591

Stage: Step 5 = 6 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.807342
Total Consolidation Settlement [ft]	0	0.736961
Virgin Consolidation Settlement [ft]	0	0.750783
Recompression Consolidation Settlement [ft]	-0.0139288	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	3.44503e-007	3.59679
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.71679
Total Stress XX [ksf]	-0.00210628	8.73486
Total Stress YY [ksf]	-0.0188839	9.64946
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	-0.000786486	0.164375
Pore Water Pressure [ksf]	-5.09653e-007	3.65577
Excess Pore Water Pressure [ksf]	0	1.37974
Degree of Consolidation [%]	0	99.9289
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.05287
Void Ratio	0.378782	1.18975
Permeability [ft/y]	0.00722411	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-4.78236e-005	0.0342591

Stage: Step 6 = 8 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.876977
Total Consolidation Settlement [ft]	0	0.806596
Virgin Consolidation Settlement [ft]	0	0.818725
Recompression Consolidation Settlement [ft]	-0.0121583	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	4.55311e-007	3.59245
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.71245
Total Stress XX [ksf]	-0.00210639	8.73486
Total Stress YY [ksf]	-0.0188839	9.64946
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	-0.000852587	0.164361
Pore Water Pressure [ksf]	-5.15105e-007	3.62278
Excess Pore Water Pressure [ksf]	0	1.3396
Degree of Consolidation [%]	0	99.9386
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.05586
Void Ratio	0.378804	1.18975
Permeability [ft/y]	0.00722411	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-4.78236e-005	0.0342591

Stage: Step 7 = 10 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.935031
Total Consolidation Settlement [ft]	0	0.86465
Virgin Consolidation Settlement [ft]	0	0.874946
Recompression Consolidation Settlement [ft]	-0.0103869	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	5.66655e-007	3.58888
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.70888
Total Stress XX [ksf]	-0.00210651	8.73486
Total Stress YY [ksf]	-0.018884	9.64946
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	-0.000877078	0.16435
Pore Water Pressure [ksf]	-5.66655e-007	3.58663
Excess Pore Water Pressure [ksf]	0	1.30434
Degree of Consolidation [%]	0	99.9546
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.06361
Void Ratio	0.378822	1.18976
Permeability [ft/y]	0.00722411	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-4.78236e-005	0.0342591

Stage: Step 8 = 12 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.985792
Total Consolidation Settlement [ft]	0	0.915412
Virgin Consolidation Settlement [ft]	0	0.923446
Recompression Consolidation Settlement [ft]	-0.00803426	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	6.73215e-007	3.5858
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.7058
Total Stress XX [ksf]	-0.00210661	8.73486
Total Stress YY [ksf]	-0.018884	9.64946
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	-0.000808045	0.164341
Pore Water Pressure [ksf]	-6.73215e-007	3.55479
Excess Pore Water Pressure [ksf]	0	1.27927
Degree of Consolidation [%]	0	99.9631
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.07075
Void Ratio	0.378838	1.18976
Permeability [ft/y]	0.00741285	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-4.78236e-005	0.0342591

Stage: Step 9 = 24 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.21079
Total Consolidation Settlement [ft]	0	1.14041
Virgin Consolidation Settlement [ft]	0	1.14078
Recompression Consolidation Settlement [ft]	-0.000587068	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	1.19428e-006	3.57229
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.69229
Total Stress XX [ksf]	-0.00210713	8.73486
Total Stress YY [ksf]	-0.018884	9.64946
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	-8.16955e-005	0.164296
Pore Water Pressure [ksf]	-1.19428e-006	3.41415
Excess Pore Water Pressure [ksf]	0	1.12228
Degree of Consolidation [%]	0	99.9764
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.10955
Void Ratio	0.378911	1.18975
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-4.78236e-005	0.0342591

Stage: Stage 11 = 36 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.37391
Total Consolidation Settlement [ft]	0	1.30353
Virgin Consolidation Settlement [ft]	0	1.3039
Recompression Consolidation Settlement [ft]	-0.000742415	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	1.63506e-006	3.56263
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.68263
Total Stress XX [ksf]	-0.00210757	8.73486
Total Stress YY [ksf]	-0.018884	9.64946
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	-5.38732e-005	0.164263
Pore Water Pressure [ksf]	-1.63506e-006	3.33312
Excess Pore Water Pressure [ksf]	-0.0481695	0.997242
Degree of Consolidation [%]	0	99.9964
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.14113
Void Ratio	0.378965	1.18958
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-3.02767e-005	0.0342591

Stage: Stage 12 = 48 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.50371
Total Consolidation Settlement [ft]	0	1.43333
Virgin Consolidation Settlement [ft]	0	1.43366
Recompression Consolidation Settlement [ft]	-0.00295712	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	2.01897e-006	3.55498
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.67498
Total Stress XX [ksf]	-0.00210796	8.73486
Total Stress YY [ksf]	-0.018884	9.64946
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	-4.11057e-005	0.164237
Pore Water Pressure [ksf]	-2.01897e-006	3.26407
Excess Pore Water Pressure [ksf]	-0.0145553	0.867945
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.16335
Void Ratio	0.379009	1.18927
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-3.02767e-005	0.0344102

Stage: Stage 13 = 60 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.60811
Total Consolidation Settlement [ft]	0	1.53773
Virgin Consolidation Settlement [ft]	0	1.53816
Recompression Consolidation Settlement [ft]	-0.00223621	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	2.37325e-006	3.5537
Effective Stress XX [ksf]	-0.00210594	5.61961
Effective Stress YY [ksf]	-0.0188834	6.53451
Total Stress ZZ [ksf]	0	6.66885
Total Stress XX [ksf]	-0.00210831	8.73486
Total Stress YY [ksf]	-0.0188841	9.64946
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	-3.01052e-005	0.164216
Pore Water Pressure [ksf]	-2.37325e-006	3.25721
Excess Pore Water Pressure [ksf]	-0.0179666	0.750999
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.1817
Void Ratio	0.379044	1.18893
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-3.02767e-005	0.0353461

Stage: Stage 14 = 84 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.75797
Total Consolidation Settlement [ft]	0	1.68759
Virgin Consolidation Settlement [ft]	0	1.68841
Recompression Consolidation Settlement [ft]	-0.00321273	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	2.90225e-006	3.54005
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.66005
Total Stress XX [ksf]	-0.00210884	8.73486
Total Stress YY [ksf]	-0.0188841	9.64946
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	-1.50038e-005	0.164185
Pore Water Pressure [ksf]	-2.90225e-006	3.26231
Excess Pore Water Pressure [ksf]	-0.0402317	0.556719
Degree of Consolidation [%]	0	99.9951
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.21072
Void Ratio	0.379094	1.18827
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-3.07109e-005	0.0366525

Stage: Stage 15 = 108 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.86341
Total Consolidation Settlement [ft]	0	1.79303
Virgin Consolidation Settlement [ft]	0	1.79406
Recompression Consolidation Settlement [ft]	-0.00281158	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	3.28494e-006	3.54035
Effective Stress XX [ksf]	-0.00210594	5.62086
Effective Stress YY [ksf]	-0.0188834	6.53696
Total Stress ZZ [ksf]	0	6.65389
Total Stress XX [ksf]	-0.00210922	8.73486
Total Stress YY [ksf]	-0.0188841	9.64946
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	-8.14459e-006	0.164163
Pore Water Pressure [ksf]	-3.28494e-006	3.21661
Excess Pore Water Pressure [ksf]	-0.0196616	0.418285
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.22975
Void Ratio	0.37913	1.18774
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-1.08859e-005	0.0375908

Stage: Stage 16 = 120 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.89883
Total Consolidation Settlement [ft]	0	1.82845
Virgin Consolidation Settlement [ft]	0	1.8301
Recompression Consolidation Settlement [ft]	-0.00269794	0
Immediate Settlement [ft]	0	0.0703807
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	1.85582
Loading Stress XX [ksf]	-0.256883	1.96644
Loading Stress YY [ksf]	-0.313685	2.94878
Effective Stress ZZ [ksf]	3.43241e-006	3.5362
Effective Stress XX [ksf]	-0.00210594	5.61486
Effective Stress YY [ksf]	-0.0188834	6.52946
Total Stress ZZ [ksf]	0	6.65184
Total Stress XX [ksf]	-0.00210937	8.73486
Total Stress YY [ksf]	-0.0188841	9.64946
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	-6.95724e-006	0.164156
Pore Water Pressure [ksf]	-3.43241e-006	3.20054
Excess Pore Water Pressure [ksf]	-0.0550802	0.364543
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.60997
Over-consolidation Ratio	1	1.23934
Void Ratio	0.379142	1.18753
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-1.08859e-005	0.0377292

Embankments

1. Embankment: "Embankment Load 1"

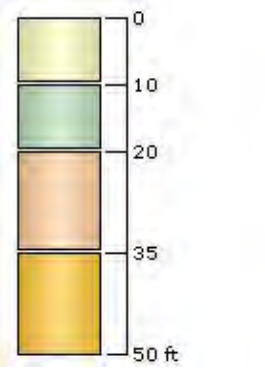
Label	Embankment Load 1
Center Line	(0, -1000) to (0, 1000)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Layers	1
Base Width	103

Layer	Stage	Left Bench Width (ft)	Left Angle (deg)	Height (ft)	Unit Weight (kips/ft^3)	Right Angle (deg)	Right Bench Width (ft)
1	Stage 1-Initial Load = 0 mon	0	18	15.5	0.115	18	0

Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	(1) CL	10	0	No
2	(2) CH	10	10	No
3	(3) CH	15	20	No
4	(4) CH	15	35	Yes



Soil Properties

Property	(1) CL	(2) CH	(3) CH	(4) CH
Color				
Unit Weight [kips/ft^3]	0.125	0.123	0.111	0.11
Saturated Unit Weight [kips/ft^3]	0.125	0.123	0.111	0.11
K0	1	1	1	1
Immediate Settlement	Disabled	Disabled	Enabled	Disabled
Es [ksf]	-	-	280	-
Esur [ksf]	-	-	280	-
Primary Consolidation	Enabled	Enabled	Enabled	Enabled
Material Type	Non-Linear	Non-Linear	Non-Linear	Non-Linear
Cc	0.11	0.15	0.45	0.36
Cr	0.022	0.03	0.09	0.072
e0	0.65	0.79	1.19	0.945
OCR	1	1	1	1
Cv [ft^2/y]	76	95	31	15
Cvr [ft^2/y]	76	95	31	15
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	2	2	2	2

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft^3

Piezometric Line Entities

ID	Depth (ft)
1	0 ft
2	0 ft

Query Points

Point #	Query Point Name	(X,Y) Location	Number of Divisions
1	Query Point 1	0, 0	Auto: 57

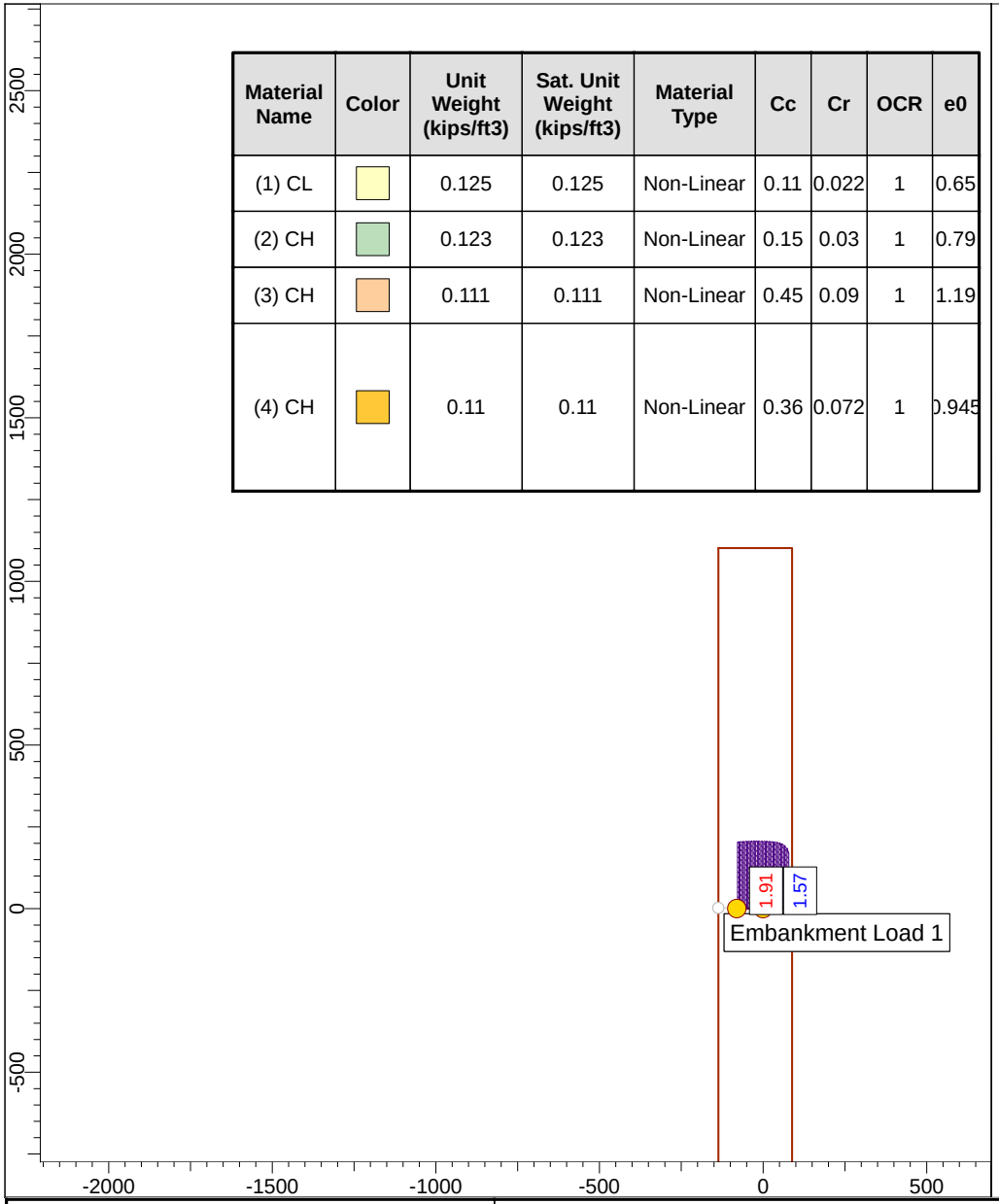
Query Lines

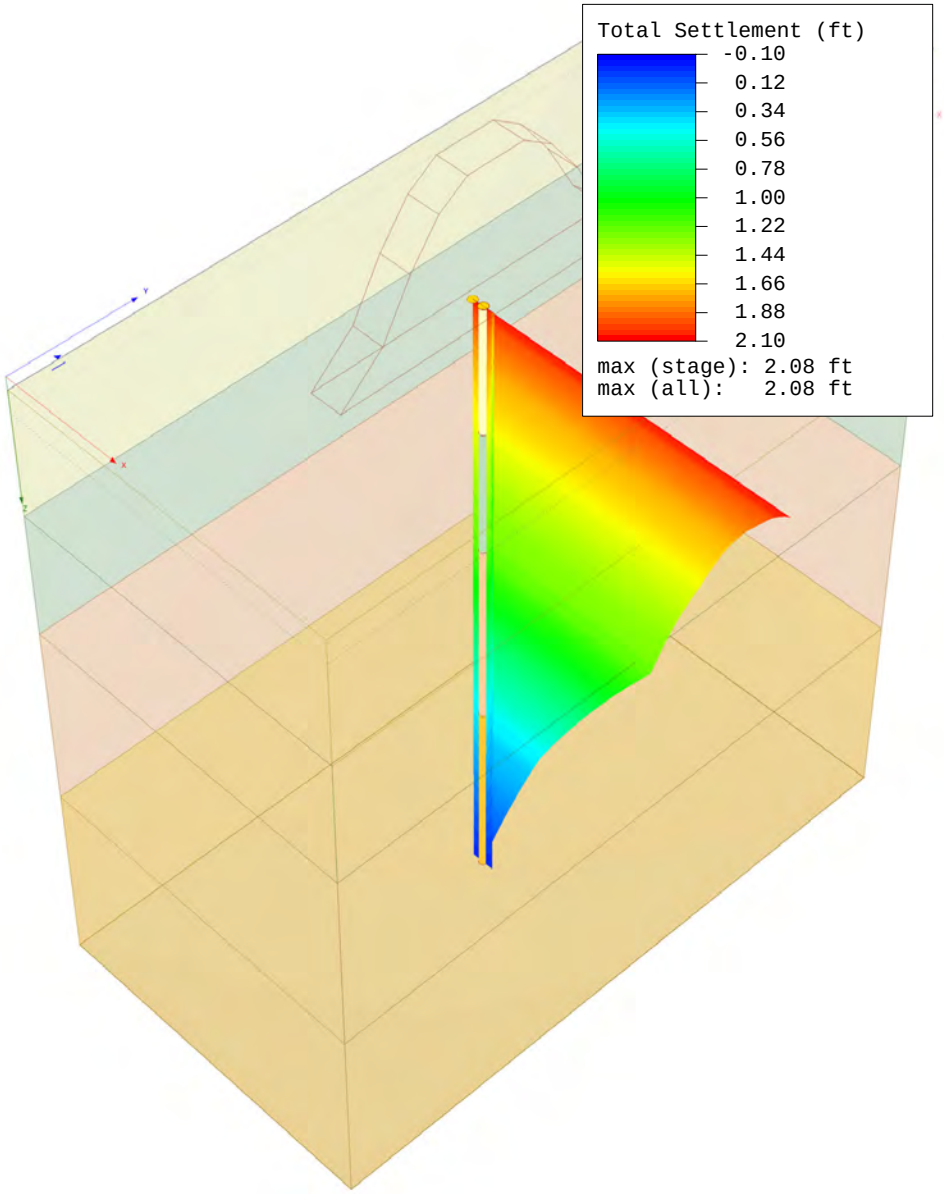
Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	-80, 0	80, 0	20	Auto: 57

I-10 Crossing

2,000 foot road section

Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Material Type	Cc	Cr	OCR	e0
(1) CL		0.125	0.125	Non-Linear	0.11	0.022	1	0.65
(2) CH		0.123	0.123	Non-Linear	0.15	0.03	1	0.79
(3) CH		0.111	0.111	Non-Linear	0.45	0.09	1	1.19
(4) CH		0.11	0.11	Non-Linear	0.36	0.072	1	0.945





Project	SCCL		
Analysis Description			
Drawn By	SR	Company	MVN
Date	9/5/2019, 7:35:56 AM	File Name	Time Dependent.I10 crossing-Settlement.Stage 1 - 10120_EL21.5 - 1on3 - GE5 - road ramp.s3z

SETTLE3 5.001

Settle3 Analysis Information
SCCL

Project Settings

Document Name	Time Dependent.I10 crossing-Settlement.Stage 1 - 10120_EL21.5 - 1on3 - GE5 - road ramp.s3z
Project Title	SCCL
Author	SR
Company	MVN
Date Created	9/5/2019, 7:35:56 AM
Stress Computation Method	Boussinesq
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/year
Minimum settlement ratio for subgrade modulus	0.9

Include buoyancy effect when material settles below water table

Include vertical stress reduction due to settlement above a point

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Stage 1-Initial Load	0
2	Step 1	0.5
3	Step 2	1
4	Step 3	2
5	Step 4	4
6	Step 5	6
7	Step 6	8
8	Step 7	10
9	Step 8	12
10	Step 9	24
11	Stage 11	36
12	Stage 12	48
13	Stage 13	60
14	Stage 14	84
15	Stage 15	108
16	Stage 16	120
17	Stage 17	180
18	Stage 18	240
19	Stage 19	300
20	Stage 20	360
21	Stage 21	480
22	Stage 22	600

Results

Time taken to compute: 0 seconds

Stage: Stage 1-Initial Load = 0 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.000751858	0.0687758
Total Consolidation Settlement [ft]	-0.00463112	0
Virgin Consolidation Settlement [ft]	0	0
Recompression Consolidation Settlement [ft]	-0.00463112	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	-0.00410785	2.67162
Effective Stress XX [ksf]	1.25461	3.39543
Effective Stress YY [ksf]	0.438893	3.06882
Total Stress ZZ [ksf]	1.3225	7.07535
Total Stress XX [ksf]	2.58118	7.80203
Total Stress YY [ksf]	1.76443	7.47612
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	-0.00608115	0.00465659
Pore Water Pressure [ksf]	1.32554	4.40743
Excess Pore Water Pressure [ksf]	0.845964	1.32255
Degree of Consolidation [%]	0	0
Pre-consolidation Stress [ksf]	0.00626	2.67429
Over-consolidation Ratio	1.00127	2.85816
Void Ratio	0.650045	1.18305
Permeability [ft/y]	0.0281659	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0

Stage: Step 1 = 0.5 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.385714
Total Consolidation Settlement [ft]	0	0.315252
Virgin Consolidation Settlement [ft]	0	0.330289
Recompression Consolidation Settlement [ft]	-0.0150369	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	0.445486	3.9169
Effective Stress XX [ksf]	1.47153	4.68203
Effective Stress YY [ksf]	0.802567	4.35612
Total Stress ZZ [ksf]	1.3225	7.0369
Total Stress XX [ksf]	2.60097	7.80203
Total Stress YY [ksf]	1.78379	7.47612
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	-0.000450841	0.154604
Pore Water Pressure [ksf]	0.0223525	4.21861
Excess Pore Water Pressure [ksf]	0	1.32144
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.478561	3.90247
Over-consolidation Ratio	1	1.0639
Void Ratio	0.394903	1.18363
Permeability [ft/y]	0.00650519	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Step 2 = 1 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.453535
Total Consolidation Settlement [ft]	0	0.383073
Virgin Consolidation Settlement [ft]	0	0.398787
Recompression Consolidation Settlement [ft]	-0.0157139	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	0.589027	3.90884
Effective Stress XX [ksf]	1.53605	4.68203
Effective Stress YY [ksf]	0.92554	4.35612
Total Stress ZZ [ksf]	1.3225	7.02884
Total Stress XX [ksf]	2.60514	7.80203
Total Stress YY [ksf]	1.78768	7.47612
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	-0.000444078	0.154589
Pore Water Pressure [ksf]	0.0262439	4.115
Excess Pore Water Pressure [ksf]	0	1.32027
Degree of Consolidation [%]	0	99.6107
Pre-consolidation Stress [ksf]	0.597135	3.90247
Over-consolidation Ratio	1	1.06071
Void Ratio	0.394928	1.18376
Permeability [ft/y]	0.00650519	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Step 3 = 2 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.543517
Total Consolidation Settlement [ft]	0	0.473055
Virgin Consolidation Settlement [ft]	0	0.488905
Recompression Consolidation Settlement [ft]	-0.0158495	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	0.733566	3.8982
Effective Stress XX [ksf]	1.65082	4.68203
Effective Stress YY [ksf]	1.06916	4.35612
Total Stress ZZ [ksf]	1.3225	7.0182
Total Stress XX [ksf]	2.61066	7.80203
Total Stress YY [ksf]	1.7927	7.47612
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	-0.000531474	0.154569
Pore Water Pressure [ksf]	0.0312626	4.05744
Excess Pore Water Pressure [ksf]	0	1.31851
Degree of Consolidation [%]	0	99.887
Pre-consolidation Stress [ksf]	0.734553	3.90247
Over-consolidation Ratio	1	1.05951
Void Ratio	0.394961	1.1841
Permeability [ft/y]	0.00690302	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Step 4 = 4 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.65888
Total Consolidation Settlement [ft]	0	0.588418
Virgin Consolidation Settlement [ft]	0	0.603126
Recompression Consolidation Settlement [ft]	-0.0147076	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	0.957726	3.88461
Effective Stress XX [ksf]	1.83673	4.68203
Effective Stress YY [ksf]	1.2877	4.35612
Total Stress ZZ [ksf]	1.3225	7.00461
Total Stress XX [ksf]	2.61778	7.80203
Total Stress YY [ksf]	1.79901	7.47612
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	-0.000645688	0.154542
Pore Water Pressure [ksf]	0.0375648	3.94528
Excess Pore Water Pressure [ksf]	0	1.31509
Degree of Consolidation [%]	0	99.9093
Pre-consolidation Stress [ksf]	0.96012	3.90247
Over-consolidation Ratio	1	1.05269
Void Ratio	0.395006	1.18423
Permeability [ft/y]	0.00690302	5.3328
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Step 5 = 6 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.740803
Total Consolidation Settlement [ft]	0	0.670341
Virgin Consolidation Settlement [ft]	0	0.68276
Recompression Consolidation Settlement [ft]	-0.0128147	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.1004	3.87513
Effective Stress XX [ksf]	1.97068	4.68203
Effective Stress YY [ksf]	1.43283	4.35612
Total Stress ZZ [ksf]	1.3225	6.99513
Total Stress XX [ksf]	2.62278	7.80203
Total Stress YY [ksf]	1.8033	7.47612
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	-0.000722665	0.15452
Pore Water Pressure [ksf]	0.0418614	3.84946
Excess Pore Water Pressure [ksf]	0	1.31218
Degree of Consolidation [%]	0	99.9278
Pre-consolidation Stress [ksf]	1.10684	3.90247
Over-consolidation Ratio	1	1.04951
Void Ratio	0.395042	1.18436
Permeability [ft/y]	0.00722411	5.3328
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Step 6 = 8 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.804729
Total Consolidation Settlement [ft]	0	0.734267
Virgin Consolidation Settlement [ft]	0	0.744322
Recompression Consolidation Settlement [ft]	-0.0109595	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.21001	3.86775
Effective Stress XX [ksf]	2.07337	4.68203
Effective Stress YY [ksf]	1.54403	4.35612
Total Stress ZZ [ksf]	1.3225	6.98775
Total Stress XX [ksf]	2.62673	7.80203
Total Stress YY [ksf]	1.80666	7.47612
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	-0.000762621	0.154506
Pore Water Pressure [ksf]	0.0452153	3.81164
Excess Pore Water Pressure [ksf]	0	1.30865
Degree of Consolidation [%]	0	99.9389
Pre-consolidation Stress [ksf]	1.21476	3.90247
Over-consolidation Ratio	1	1.05051
Void Ratio	0.395066	1.18449
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Step 7 = 10 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.860169
Total Consolidation Settlement [ft]	0	0.789707
Virgin Consolidation Settlement [ft]	0	0.797623
Recompression Consolidation Settlement [ft]	-0.00933328	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.26907	3.86142
Effective Stress XX [ksf]	2.15379	4.68203
Effective Stress YY [ksf]	1.62868	4.35612
Total Stress ZZ [ksf]	1.3225	6.98142
Total Stress XX [ksf]	2.63022	7.80203
Total Stress YY [ksf]	1.80946	7.47612
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	-0.000769172	0.154493
Pore Water Pressure [ksf]	0.0480211	3.76646
Excess Pore Water Pressure [ksf]	0	1.3014
Degree of Consolidation [%]	0	99.9456
Pre-consolidation Stress [ksf]	1.29516	3.90247
Over-consolidation Ratio	1	1.05104
Void Ratio	0.395086	1.18457
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Step 8 = 12 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.906548
Total Consolidation Settlement [ft]	0	0.836086
Virgin Consolidation Settlement [ft]	0	0.841913
Recompression Consolidation Settlement [ft]	-0.007177	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.26618	3.85617
Effective Stress XX [ksf]	2.21286	4.68203
Effective Stress YY [ksf]	1.69435	4.35612
Total Stress ZZ [ksf]	1.3225	6.97617
Total Stress XX [ksf]	2.63309	7.80203
Total Stress YY [ksf]	1.81195	7.47612
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	-0.000714484	0.154483
Pore Water Pressure [ksf]	0.0505101	3.72227
Excess Pore Water Pressure [ksf]	0	1.28791
Degree of Consolidation [%]	0	99.9499
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.04862
Void Ratio	0.395104	1.18455
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Step 9 = 24 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.12126
Total Consolidation Settlement [ft]	0	1.0508
Virgin Consolidation Settlement [ft]	0	1.05124
Recompression Consolidation Settlement [ft]	-0.00044835	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.25274	3.85418
Effective Stress XX [ksf]	2.41525	4.68538
Effective Stress YY [ksf]	1.76144	4.36798
Total Stress ZZ [ksf]	1.3225	6.95224
Total Stress XX [ksf]	2.6464	7.80203
Total Stress YY [ksf]	1.8226	7.47612
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	-2.96577e-005	0.154435
Pore Water Pressure [ksf]	0.061157	3.53882
Excess Pore Water Pressure [ksf]	-0.0411658	1.15955
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.03671
Void Ratio	0.395182	1.18307
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Stage 11 = 36 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.27762
Total Consolidation Settlement [ft]	0	1.2074
Virgin Consolidation Settlement [ft]	0	1.20896
Recompression Consolidation Settlement [ft]	-0.00155182	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.24297	3.81577
Effective Stress XX [ksf]	2.52048	4.68259
Effective Stress YY [ksf]	1.76144	4.35651
Total Stress ZZ [ksf]	1.3225	6.93544
Total Stress XX [ksf]	2.6561	7.80203
Total Stress YY [ksf]	1.83054	7.47612
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	0.00291715	0.154399
Pore Water Pressure [ksf]	0.0690983	3.44938
Excess Pore Water Pressure [ksf]	-0.0350183	1.0288
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.04479
Void Ratio	0.395242	1.17587
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Stage 12 = 48 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.39643
Total Consolidation Settlement [ft]	0	1.32621
Virgin Consolidation Settlement [ft]	0	1.32806
Recompression Consolidation Settlement [ft]	-0.00184331	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.23554	3.80273
Effective Stress XX [ksf]	2.55822	4.68276
Effective Stress YY [ksf]	1.76144	4.35668
Total Stress ZZ [ksf]	1.3225	6.92223
Total Stress XX [ksf]	2.66344	7.80203
Total Stress YY [ksf]	1.83674	7.47612
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	0.00622242	0.15437
Pore Water Pressure [ksf]	0.0752962	3.39291
Excess Pore Water Pressure [ksf]	-0.0496785	0.900795
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.051
Void Ratio	0.395289	1.1676
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Stage 13 = 60 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.4945
Total Consolidation Settlement [ft]	0	1.42428
Virgin Consolidation Settlement [ft]	0	1.42581
Recompression Consolidation Settlement [ft]	-0.00215969	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.22941	3.79215
Effective Stress XX [ksf]	2.57713	4.68203
Effective Stress YY [ksf]	1.76144	4.35612
Total Stress ZZ [ksf]	1.3225	6.91215
Total Stress XX [ksf]	2.66951	7.80203
Total Stress YY [ksf]	1.84196	7.47612
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	0.00902505	0.154346
Pore Water Pressure [ksf]	0.080522	3.45657
Excess Pore Water Pressure [ksf]	-0.0399784	0.789447
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.05619
Void Ratio	0.395329	1.16022
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Stage 14 = 84 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.63889
Total Consolidation Settlement [ft]	0	1.56857
Virgin Consolidation Settlement [ft]	0	1.56983
Recompression Consolidation Settlement [ft]	-0.00172306	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.22039	3.77636
Effective Stress XX [ksf]	2.57713	4.68203
Effective Stress YY [ksf]	1.76144	4.35612
Total Stress ZZ [ksf]	1.3225	6.89636
Total Stress XX [ksf]	2.67815	7.80203
Total Stress YY [ksf]	1.84974	7.47612
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	0.0133751	0.15431
Pore Water Pressure [ksf]	0.0883029	3.3916
Excess Pore Water Pressure [ksf]	-0.0448853	0.617324
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.06392
Void Ratio	0.395388	1.14853
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Stage 15 = 108 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.73775
Total Consolidation Settlement [ft]	0	1.66742
Virgin Consolidation Settlement [ft]	0	1.66918
Recompression Consolidation Settlement [ft]	-0.00188056	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.21423	3.76588
Effective Stress XX [ksf]	2.57713	4.68203
Effective Stress YY [ksf]	1.76144	4.35612
Total Stress ZZ [ksf]	1.3225	6.88588
Total Stress XX [ksf]	2.68376	7.80203
Total Stress YY [ksf]	1.85463	7.47612
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	0.0161449	0.154288
Pore Water Pressure [ksf]	0.0931889	3.32129
Excess Pore Water Pressure [ksf]	-0.044193	0.489446
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.06922
Void Ratio	0.395425	1.14031
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.0437371

Stage: Stage 16 = 120 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.77863
Total Consolidation Settlement [ft]	0	1.7083
Virgin Consolidation Settlement [ft]	0	1.70952
Recompression Consolidation Settlement [ft]	-0.00162595	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.21168	3.77596
Effective Stress XX [ksf]	2.57713	4.70329
Effective Stress YY [ksf]	1.76144	4.37291
Total Stress ZZ [ksf]	1.3225	6.88076
Total Stress XX [ksf]	2.68606	7.80203
Total Stress YY [ksf]	1.85662	7.47612
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	0.0171508	0.154278
Pore Water Pressure [ksf]	0.095182	3.28084
Excess Pore Water Pressure [ksf]	-0.0723191	0.430182
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.07148
Void Ratio	0.395441	1.13733
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.045108

Stage: Stage 17 = 180 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.92108
Total Consolidation Settlement [ft]	0	1.85062
Virgin Consolidation Settlement [ft]	0	1.85213
Recompression Consolidation Settlement [ft]	-0.00157081	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.20278	3.74791
Effective Stress XX [ksf]	2.57713	4.6856
Effective Stress YY [ksf]	1.76144	4.35925
Total Stress ZZ [ksf]	1.3225	6.86494
Total Stress XX [ksf]	2.69583	7.80203
Total Stress YY [ksf]	1.8632	7.47612
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	0.0187165	0.154247
Pore Water Pressure [ksf]	0.101762	3.16704
Excess Pore Water Pressure [ksf]	-0.0451299	0.22945
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.07938
Void Ratio	0.395492	1.12786
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.045108

Stage: Stage 18 = 240 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.99805
Total Consolidation Settlement [ft]	0	1.92784
Virgin Consolidation Settlement [ft]	0	1.92884
Recompression Consolidation Settlement [ft]	-0.001151	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.19797	3.74307
Effective Stress XX [ksf]	2.57713	4.68863
Effective Stress YY [ksf]	1.76144	4.36255
Total Stress ZZ [ksf]	1.3225	6.8567
Total Stress XX [ksf]	2.70072	7.80203
Total Stress YY [ksf]	1.8665	7.47612
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	0.0192258	0.154232
Pore Water Pressure [ksf]	0.105056	3.16652
Excess Pore Water Pressure [ksf]	-0.0414973	0.121534
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.08368
Void Ratio	0.395518	1.12326
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.045108

Stage: Stage 19 = 300 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	2.03766
Total Consolidation Settlement [ft]	0	1.96733
Virgin Consolidation Settlement [ft]	0	1.9683
Recompression Consolidation Settlement [ft]	-0.00109238	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.1955	3.73966
Effective Stress XX [ksf]	2.57713	4.68967
Effective Stress YY [ksf]	1.76144	4.36359
Total Stress ZZ [ksf]	1.3225	6.85225
Total Stress XX [ksf]	2.70307	7.80203
Total Stress YY [ksf]	1.86812	7.47612
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	0.0193119	0.154224
Pore Water Pressure [ksf]	0.106683	3.16559
Excess Pore Water Pressure [ksf]	-0.0410708	0.0640827
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.08589
Void Ratio	0.39553	1.12096
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.045108

Stage: Stage 20 = 360 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	2.0595
Total Consolidation Settlement [ft]	0	1.98904
Virgin Consolidation Settlement [ft]	0	1.99007
Recompression Consolidation Settlement [ft]	-0.00103641	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.19415	3.73808
Effective Stress XX [ksf]	2.57713	4.69045
Effective Stress YY [ksf]	1.76144	4.36437
Total Stress ZZ [ksf]	1.3225	6.8499
Total Stress XX [ksf]	2.70423	7.80203
Total Stress YY [ksf]	1.86894	7.47612
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	0.0193555	0.15422
Pore Water Pressure [ksf]	0.107498	3.16375
Excess Pore Water Pressure [ksf]	-0.0414495	0.0483
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.08709
Void Ratio	0.395537	1.11982
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.045108

Stage: Stage 21 = 480 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	2.07592
Total Consolidation Settlement [ft]	0	2.00546
Virgin Consolidation Settlement [ft]	0	2.00647
Recompression Consolidation Settlement [ft]	-0.00101034	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.19313	3.72972
Effective Stress XX [ksf]	2.57713	4.68422
Effective Stress YY [ksf]	1.76144	4.35787
Total Stress ZZ [ksf]	1.3225	6.84812
Total Stress XX [ksf]	2.70511	7.80203
Total Stress YY [ksf]	1.86955	7.47612
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	0.0193885	0.154217
Pore Water Pressure [ksf]	0.108114	3.15965
Excess Pore Water Pressure [ksf]	-0.0473002	0.0414739
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.088
Void Ratio	0.395541	1.11894
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.045108

Stage: Stage 22 = 600 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	2.08005
Total Consolidation Settlement [ft]	0	2.00959
Virgin Consolidation Settlement [ft]	0	2.01059
Recompression Consolidation Settlement [ft]	-0.000999017	0
Immediate Settlement [ft]	0	0.0704621
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0.845964	1.32255
Loading Stress XX [ksf]	0.588891	1.41261
Loading Stress YY [ksf]	0.256537	0.596889
Effective Stress ZZ [ksf]	1.19287	3.72936
Effective Stress XX [ksf]	2.57713	4.68432
Effective Stress YY [ksf]	1.76144	4.35797
Total Stress ZZ [ksf]	1.3225	6.84767
Total Stress XX [ksf]	2.70534	7.80203
Total Stress YY [ksf]	1.86973	7.47612
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	0.0193967	0.154217
Pore Water Pressure [ksf]	0.108284	3.15923
Excess Pore Water Pressure [ksf]	-0.0473366	0.0410483
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	1.30389	3.90247
Over-consolidation Ratio	1	1.08824
Void Ratio	0.395543	1.11872
Permeability [ft/y]	0.00563317	4.39172
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	0	0.045108

Embankments

1. Embankment: "Embankment Load 1"

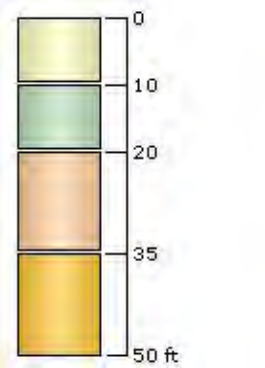
Label	Embankment Load 1
Center Line	(-136.594, 1.851) to (88.589, 1.851)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Zones	4
Number of Sections	1

Zone	Name	Unit Weight (kips/ft^3)
1	New Zone	0.115
2	New Zone 2	0.115
3	New Zone 3	0.115
4	New Zone 4	0.115

Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	(1) CL	10	0	No
2	(2) CH	10	10	No
3	(3) CH	15	20	No
4	(4) CH	15	35	Yes



Soil Properties

Property	(1) CL	(2) CH	(3) CH	(4) CH
Color				
Unit Weight [kips/ft^3]	0.125	0.123	0.111	0.11
Saturated Unit Weight [kips/ft^3]	0.125	0.123	0.111	0.11
K0	1	1	1	1
Immediate Settlement	Disabled	Disabled	Enabled	Disabled
Es [ksf]	-	-	280	-
Esur [ksf]	-	-	280	-
Primary Consolidation	Enabled	Enabled	Enabled	Enabled
Material Type	Non-Linear	Non-Linear	Non-Linear	Non-Linear
Cc	0.11	0.15	0.45	0.36
Cr	0.022	0.03	0.09	0.072
e0	0.65	0.79	1.19	0.945
OCR	1	1	1	1
Cv [ft^2/y]	76	95	31	15
Cvr [ft^2/y]	76	95	31	15
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	2	2	2	2

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft^3

Piezometric Line Entities

ID	Depth (ft)
1	0 ft
2	0 ft

Query Points

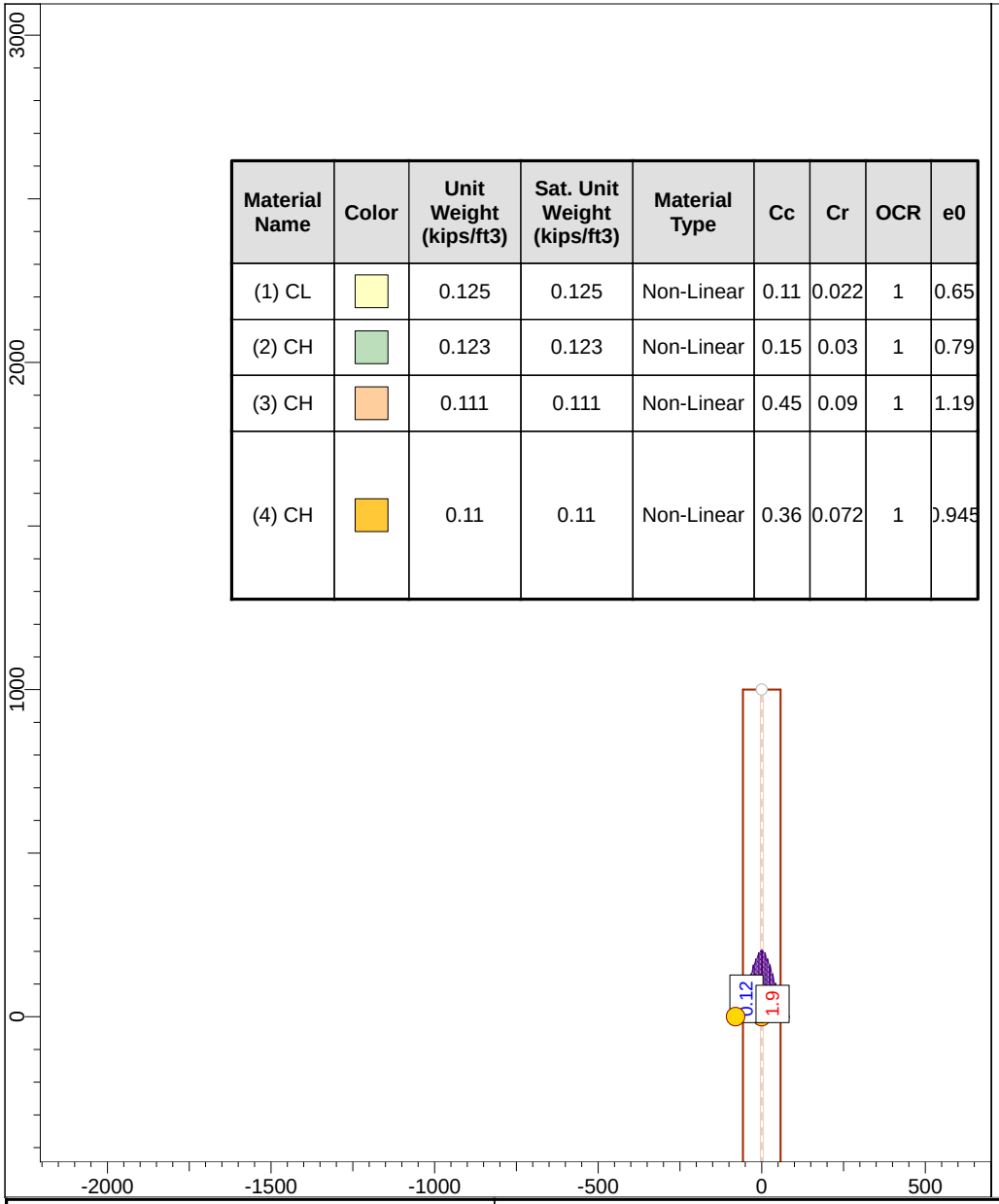
Point #	Query Point Name	(X,Y) Location	Number of Divisions
1	Query Point 1	0, 0	Auto: 57

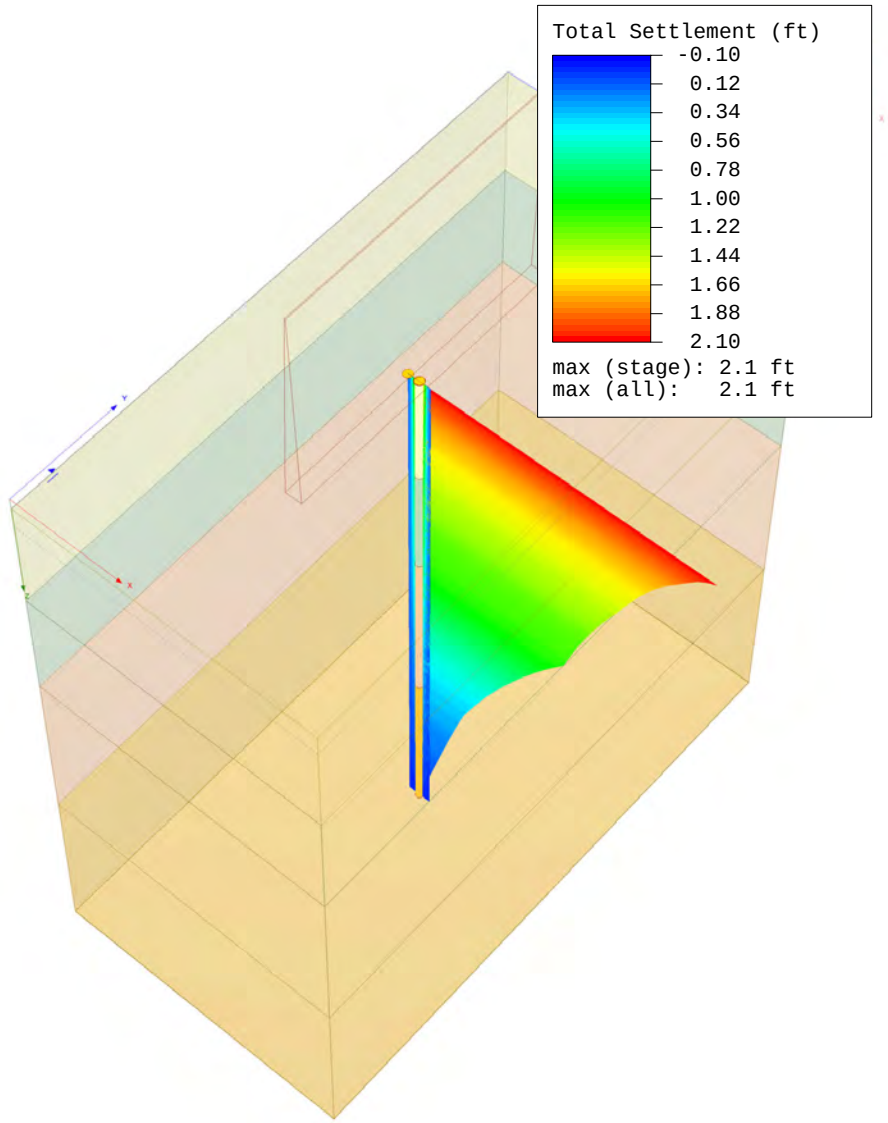
Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	-80, 0	80, 0	20	Auto: 57

Slidell East/Northeast

Material Name	Color	Unit Weight (kips/ft3)	Sat. Unit Weight (kips/ft3)	Material Type	Cc	Cr	OCR	e0
(1) CL		0.125	0.125	Non-Linear	0.11	0.022	1	0.65
(2) CH		0.123	0.123	Non-Linear	0.15	0.03	1	0.79
(3) CH		0.111	0.111	Non-Linear	0.45	0.09	1	1.19
(4) CH		0.11	0.11	Non-Linear	0.36	0.072	1	0.945





rocscience	Project: SCCL	
	Analysis Description:	
	Drawn By: SR	Company: MVN
	Date: 9/5/2019, 7:35:56 AM	File Name: Time Dependent.Slidell East_Northeast.Stage 1 - 10120_EL17.5 - 1on3.s3z

SETTLE3 5.001

Settle3 Analysis Information
SCCL

Project Settings

Document Name	Time Dependent.Slidell East_Northeast.Stage 1 - 10120_EL17.5 - 1on3.s3z
Project Title	SCCL
Author	SR
Company	MVN
Date Created	9/5/2019, 7:35:56 AM
Stress Computation Method	Boussinesq
Time-dependent Consolidation Analysis	
Time Units	months
Permeability Units	feet/year
Minimum settlement ratio for subgrade modulus	0.9

Include buoyancy effect when material settles below water table

Include vertical stress reduction due to settlement above a point

Use average properties to calculate layered stresses

Improve consolidation accuracy

Ignore negative effective stresses in settlement calculations

Stage Settings

Stage #	Name	Time [months]
1	Stage 1-Initial Load	0
2	Step 1	0.5
3	Step 2	1
4	Step 3	2
5	Step 4	4
6	Step 5	6
7	Step 6	8
8	Step 7	10
9	Step 8	12
10	Step 9	24
11	Stage 11	36
12	Stage 12	48
13	Stage 13	60
14	Stage 14	84
15	Stage 15	108
16	Stage 16	120

Results

Time taken to compute: 0 seconds

Stage: Stage 1-Initial Load = 0 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	-0.000588188	0.080478
Total Consolidation Settlement [ft]	-0.00511985	3.9634e-006
Virgin Consolidation Settlement [ft]	0	1.41355e-005
Recompression Consolidation Settlement [ft]	-0.00511985	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	-0.00479278	2.67482
Effective Stress XX [ksf]	0.00564298	4.86916
Effective Stress YY [ksf]	-0.02349	5.94649
Total Stress ZZ [ksf]	0	6.95354
Total Stress XX [ksf]	0.00564298	9.1524
Total Stress YY [ksf]	-0.0234631	10.2297
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	-0.00820193	0.00590891
Pore Water Pressure [ksf]	0	4.28323
Excess Pore Water Pressure [ksf]	0	2.10201
Degree of Consolidation [%]	0	0.00305089
Pre-consolidation Stress [ksf]	0.00626	2.67429
Over-consolidation Ratio	1	4.12235
Void Ratio	0.65	1.18972
Permeability [ft/y]	0.0281659	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-2.77556e-017	5.55112e-017

Stage: Step 1 = 0.5 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.456164
Total Consolidation Settlement [ft]	0	0.374237
Virgin Consolidation Settlement [ft]	0	0.388611
Recompression Consolidation Settlement [ft]	-0.0146031	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	5.58387e-009	3.80753
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.92753
Total Stress XX [ksf]	0.00564298	9.1524
Total Stress YY [ksf]	-0.0234636	10.2297
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	-0.000530302	0.168063
Pore Water Pressure [ksf]	-5.13804e-007	4.13942
Excess Pore Water Pressure [ksf]	0	1.88842
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.07558
Void Ratio	0.372695	1.18964
Permeability [ft/y]	0.00650519	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Step 2 = 1 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.536916
Total Consolidation Settlement [ft]	0	0.454988
Virgin Consolidation Settlement [ft]	0	0.47084
Recompression Consolidation Settlement [ft]	-0.0158521	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	2.06333e-008	3.80204
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.92204
Total Stress XX [ksf]	0.00564296	9.1524
Total Stress YY [ksf]	-0.0234636	10.2297
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	-0.000482769	0.168052
Pore Water Pressure [ksf]	-5.15491e-007	4.04419
Excess Pore Water Pressure [ksf]	0	1.83284
Degree of Consolidation [%]	0	99.7751
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.06858
Void Ratio	0.372715	1.18961
Permeability [ft/y]	0.00650519	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Step 3 = 2 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.64243
Total Consolidation Settlement [ft]	0	0.560503
Virgin Consolidation Settlement [ft]	0	0.576982
Recompression Consolidation Settlement [ft]	-0.0167037	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	5.63691e-008	3.79489
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.91489
Total Stress XX [ksf]	0.00564293	9.1524
Total Stress YY [ksf]	-0.0234636	10.2297
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	-0.00058763	0.168035
Pore Water Pressure [ksf]	-5.19298e-007	4.00753
Excess Pore Water Pressure [ksf]	0	1.75087
Degree of Consolidation [%]	0	99.8873
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.06466
Void Ratio	0.372742	1.18956
Permeability [ft/y]	0.00690302	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Step 4 = 4 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.779541
Total Consolidation Settlement [ft]	0	0.697613
Virgin Consolidation Settlement [ft]	0	0.714201
Recompression Consolidation Settlement [ft]	-0.0168831	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	1.22903e-007	3.78567
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.90567
Total Stress XX [ksf]	0.00564286	9.1524
Total Stress YY [ksf]	-0.0234636	10.2297
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	-0.000753307	0.168012
Pore Water Pressure [ksf]	-5.27399e-007	3.90111
Excess Pore Water Pressure [ksf]	0	1.65022
Degree of Consolidation [%]	0	99.9154
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.07535
Void Ratio	0.37278	1.18952
Permeability [ft/y]	0.00690302	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Step 5 = 6 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.875085
Total Consolidation Settlement [ft]	0	0.793158
Virgin Consolidation Settlement [ft]	0	0.807869
Recompression Consolidation Settlement [ft]	-0.0149422	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	1.88962e-007	3.7793
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.8993
Total Stress XX [ksf]	0.0056428	9.1524
Total Stress YY [ksf]	-0.0234636	10.2297
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	-0.00086989	0.167993
Pore Water Pressure [ksf]	-5.36191e-007	3.841
Excess Pore Water Pressure [ksf]	0	1.58973
Degree of Consolidation [%]	0	99.9316
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.09815
Void Ratio	0.372811	1.18953
Permeability [ft/y]	0.00722411	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Step 6 = 8 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	0.952653
Total Consolidation Settlement [ft]	0	0.870726
Virgin Consolidation Settlement [ft]	0	0.883633
Recompression Consolidation Settlement [ft]	-0.0129969	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	2.51878e-007	3.77422
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.89422
Total Stress XX [ksf]	0.00564273	9.1524
Total Stress YY [ksf]	-0.0234636	10.2297
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	-0.000940496	0.16798
Pore Water Pressure [ksf]	-5.44947e-007	3.80186
Excess Pore Water Pressure [ksf]	0	1.54839
Degree of Consolidation [%]	0	99.941
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.11905
Void Ratio	0.372832	1.18953
Permeability [ft/y]	0.00722411	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Step 7 = 10 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.01739
Total Consolidation Settlement [ft]	0	0.935467
Virgin Consolidation Settlement [ft]	0	0.946332
Recompression Consolidation Settlement [ft]	-0.011047	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	3.1542e-007	3.77003
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.89003
Total Stress XX [ksf]	0.00564267	9.1524
Total Stress YY [ksf]	-0.0234636	10.2297
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	-0.000963003	0.16797
Pore Water Pressure [ksf]	-5.5402e-007	3.75905
Excess Pore Water Pressure [ksf]	0	1.51479
Degree of Consolidation [%]	0	99.9557
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.13923
Void Ratio	0.37285	1.18953
Permeability [ft/y]	0.00722411	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Step 8 = 12 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.07397
Total Consolidation Settlement [ft]	0	0.992039
Virgin Consolidation Settlement [ft]	0	1.00033
Recompression Consolidation Settlement [ft]	-0.00830963	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	3.77309e-007	3.76641
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.88641
Total Stress XX [ksf]	0.00564261	9.1524
Total Stress YY [ksf]	-0.0234636	10.2297
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	-0.000878479	0.16796
Pore Water Pressure [ksf]	-5.63695e-007	3.72101
Excess Pore Water Pressure [ksf]	0	1.48474
Degree of Consolidation [%]	0	99.9627
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.1585
Void Ratio	0.372866	1.18953
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Step 9 = 24 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.32745
Total Consolidation Settlement [ft]	0	1.24553
Virgin Consolidation Settlement [ft]	0	1.24589
Recompression Consolidation Settlement [ft]	-0.000963494	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	6.95255e-007	3.75038
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.87038
Total Stress XX [ksf]	0.00564229	9.1524
Total Stress YY [ksf]	-0.0234637	10.2297
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	-7.08376e-005	0.167916
Pore Water Pressure [ksf]	-6.95255e-007	3.57681
Excess Pore Water Pressure [ksf]	-0.0100345	1.31115
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.26107
Void Ratio	0.372939	1.18935
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Stage 11 = 36 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.51287
Total Consolidation Settlement [ft]	0	1.43094
Virgin Consolidation Settlement [ft]	0	1.43131
Recompression Consolidation Settlement [ft]	-0.0022801	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	9.74345e-007	3.73881
Effective Stress XX [ksf]	0.00564298	6.0324
Effective Stress YY [ksf]	-0.0234631	7.10972
Total Stress ZZ [ksf]	0	6.85881
Total Stress XX [ksf]	0.00564201	9.1524
Total Stress YY [ksf]	-0.0234637	10.2297
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	-5.6983e-005	0.167883
Pore Water Pressure [ksf]	-9.74345e-007	3.47663
Excess Pore Water Pressure [ksf]	-0.0407365	1.16596
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.34696
Void Ratio	0.372993	1.18897
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Stage 12 = 48 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.65544
Total Consolidation Settlement [ft]	0	1.57351
Virgin Consolidation Settlement [ft]	0	1.57414
Recompression Consolidation Settlement [ft]	-0.00414997	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	1.21896e-006	3.73322
Effective Stress XX [ksf]	0.00564298	6.03533
Effective Stress YY [ksf]	-0.0234631	7.11345
Total Stress ZZ [ksf]	0	6.84995
Total Stress XX [ksf]	0.00564177	9.1524
Total Stress YY [ksf]	-0.0234638	10.2297
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	-4.57335e-005	0.167857
Pore Water Pressure [ksf]	-1.21896e-006	3.3953
Excess Pore Water Pressure [ksf]	-0.0245305	1.01545
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.41341
Void Ratio	0.373035	1.1885
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-6.04207e-005	0.0400629

Stage: Stage 13 = 60 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.76606
Total Consolidation Settlement [ft]	0	1.68413
Virgin Consolidation Settlement [ft]	0	1.68572
Recompression Consolidation Settlement [ft]	-0.00293223	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	1.44485e-006	3.74332
Effective Stress XX [ksf]	0.00564298	6.05249
Effective Stress YY [ksf]	-0.0234631	7.13014
Total Stress ZZ [ksf]	0	6.84309
Total Stress XX [ksf]	0.00564154	9.1524
Total Stress YY [ksf]	-0.0234638	10.2297
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	-3.29679e-005	0.167838
Pore Water Pressure [ksf]	-1.44485e-006	3.32603
Excess Pore Water Pressure [ksf]	-0.056181	0.877712
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.47129
Void Ratio	0.373068	1.18799
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-5.83595e-005	0.0400629

Stage: Stage 14 = 84 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	1.92961
Total Consolidation Settlement [ft]	0	1.84768
Virgin Consolidation Settlement [ft]	0	1.84883
Recompression Consolidation Settlement [ft]	-0.00358035	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	1.7949e-006	3.72895
Effective Stress XX [ksf]	0.00564298	6.04825
Effective Stress YY [ksf]	-0.0234631	7.1259
Total Stress ZZ [ksf]	0	6.83296
Total Stress XX [ksf]	0.00564119	9.1524
Total Stress YY [ksf]	-0.0234638	10.2297
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	-1.63604e-005	0.167808
Pore Water Pressure [ksf]	-1.7949e-006	3.31682
Excess Pore Water Pressure [ksf]	-0.0353692	0.663059
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.5655
Void Ratio	0.373117	1.18704
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-1.88131e-005	0.0402466

Stage: Stage 15 = 108 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	2.05103
Total Consolidation Settlement [ft]	0	1.9691
Virgin Consolidation Settlement [ft]	0	1.97025
Recompression Consolidation Settlement [ft]	-0.00388711	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	2.04947e-006	3.72414
Effective Stress XX [ksf]	0.00564298	6.05092
Effective Stress YY [ksf]	-0.0234631	7.12857
Total Stress ZZ [ksf]	0	6.82548
Total Stress XX [ksf]	0.00564093	9.1524
Total Stress YY [ksf]	-0.0234639	10.2297
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	-7.8447e-006	0.167786
Pore Water Pressure [ksf]	-2.04947e-006	3.29464
Excess Pore Water Pressure [ksf]	-0.0600417	0.503655
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.64081
Void Ratio	0.373153	1.18628
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-1.40826e-005	0.041401

Stage: Stage 16 = 120 mon

Data Type	Minimum	Maximum
Total Settlement [ft]	0	2.09592
Total Consolidation Settlement [ft]	0	2.01399
Virgin Consolidation Settlement [ft]	0	2.01553
Recompression Consolidation Settlement [ft]	-0.00402441	0
Immediate Settlement [ft]	0	0.0819274
Secondary Settlement [ft]	0	0
Loading Stress ZZ [ksf]	0	2.10201
Loading Stress XX [ksf]	-0.27822	2.19416
Loading Stress YY [ksf]	-0.348364	3.31796
Effective Stress ZZ [ksf]	2.14765e-006	3.7546
Effective Stress XX [ksf]	0.00564298	6.08394
Effective Stress YY [ksf]	-0.0234631	7.16206
Total Stress ZZ [ksf]	0	6.82275
Total Stress XX [ksf]	0.00564084	9.1524
Total Stress YY [ksf]	-0.0234639	10.2297
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	-6.49738e-006	0.167778
Pore Water Pressure [ksf]	-2.14765e-006	3.27032
Excess Pore Water Pressure [ksf]	-0.0872798	0.437389
Degree of Consolidation [%]	0	100
Pre-consolidation Stress [ksf]	0.00626	3.79412
Over-consolidation Ratio	1	1.6802
Void Ratio	0.373166	1.18597
Permeability [ft/y]	0.00563317	21.9586
Coefficient of Consolidation [ft^2/y]	15	95
Hydroconsolidation Settlement [ft]	0	0
Average Degree of Consolidation [%]	0	0
Undrained Shear Strength	-9.52274e-006	0.0415403

Embankments

1. Embankment: "Embankment Load 1"

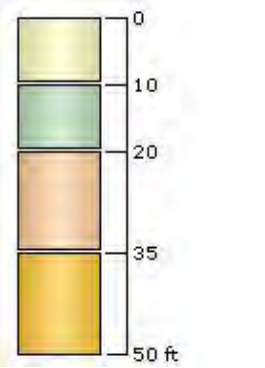
Label	Embankment Load 1
Center Line	(0, -1000) to (0, 1000)
Near End Angle	90 degrees
Far End Angle	90 degrees
Number of Layers	1
Base Width	115

Layer	Stage	Left Bench Width (ft)	Left Angle (deg)	Height (ft)	Unit Weight (kips/ft^3)	Right Angle (deg)	Right Bench Width (ft)
1	Stage 1-Initial Load = 0 mon	0	18	17.5	0.115	18	0

Soil Layers

Ground Surface Drained: Yes

Layer #	Type	Thickness [ft]	Depth [ft]	Drained at Bottom
1	(1) CL	10	0	No
2	(2) CH	10	10	No
3	(3) CH	15	20	No
4	(4) CH	15	35	Yes



Soil Properties

Property	(1) CL	(2) CH	(3) CH	(4) CH
Color				
Unit Weight [kips/ft^3]	0.125	0.123	0.111	0.11
Saturated Unit Weight [kips/ft^3]	0.125	0.123	0.111	0.11
K0	1	1	1	1
Immediate Settlement	Disabled	Disabled	Enabled	Disabled
Es [ksf]	-	-	280	-
Esur [ksf]	-	-	280	-
Primary Consolidation	Enabled	Enabled	Enabled	Enabled
Material Type	Non-Linear	Non-Linear	Non-Linear	Non-Linear
Cc	0.11	0.15	0.45	0.36
Cr	0.022	0.03	0.09	0.072
e0	0.65	0.79	1.19	0.945
OCR	1	1	1	1
Cv [ft^2/y]	76	95	31	15
Cvr [ft^2/y]	76	95	31	15
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	2	2	2	2

Groundwater

Groundwater method	Piezometric Lines
Water Unit Weight	0.0624 kips/ft^3

Piezometric Line Entities

ID	Depth (ft)
1	0 ft
2	0 ft

Query Points

Point #	Query Point Name	(X,Y) Location	Number of Divisions
1	Query Point 1	0, 0	Auto: 57

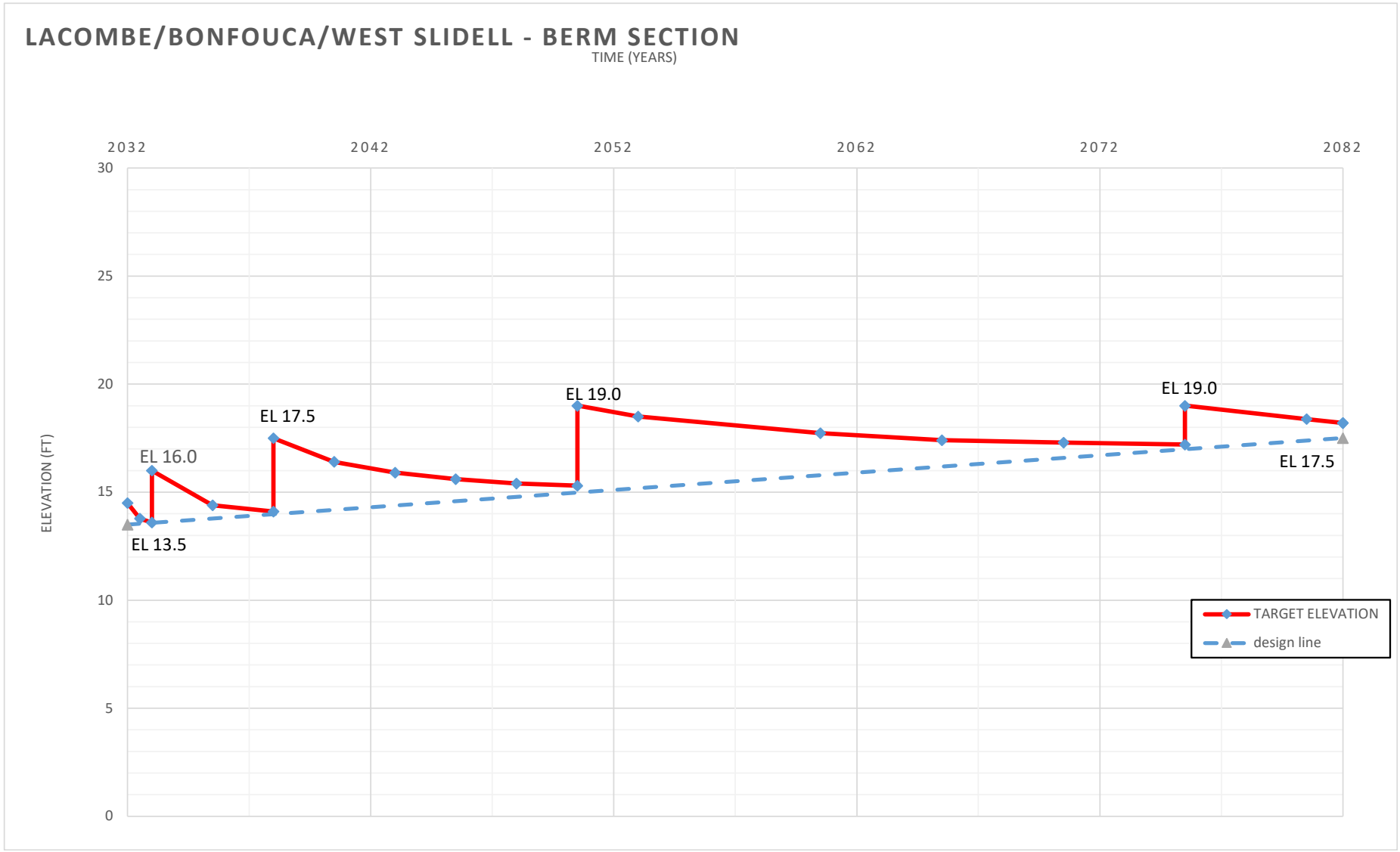
Query Lines

Line #	Query Line Name	Start Location	End Location	Horizontal Divisions	Vertical Divisions
1	Query Line 1	-80, 0	80, 0	20	Auto: 57

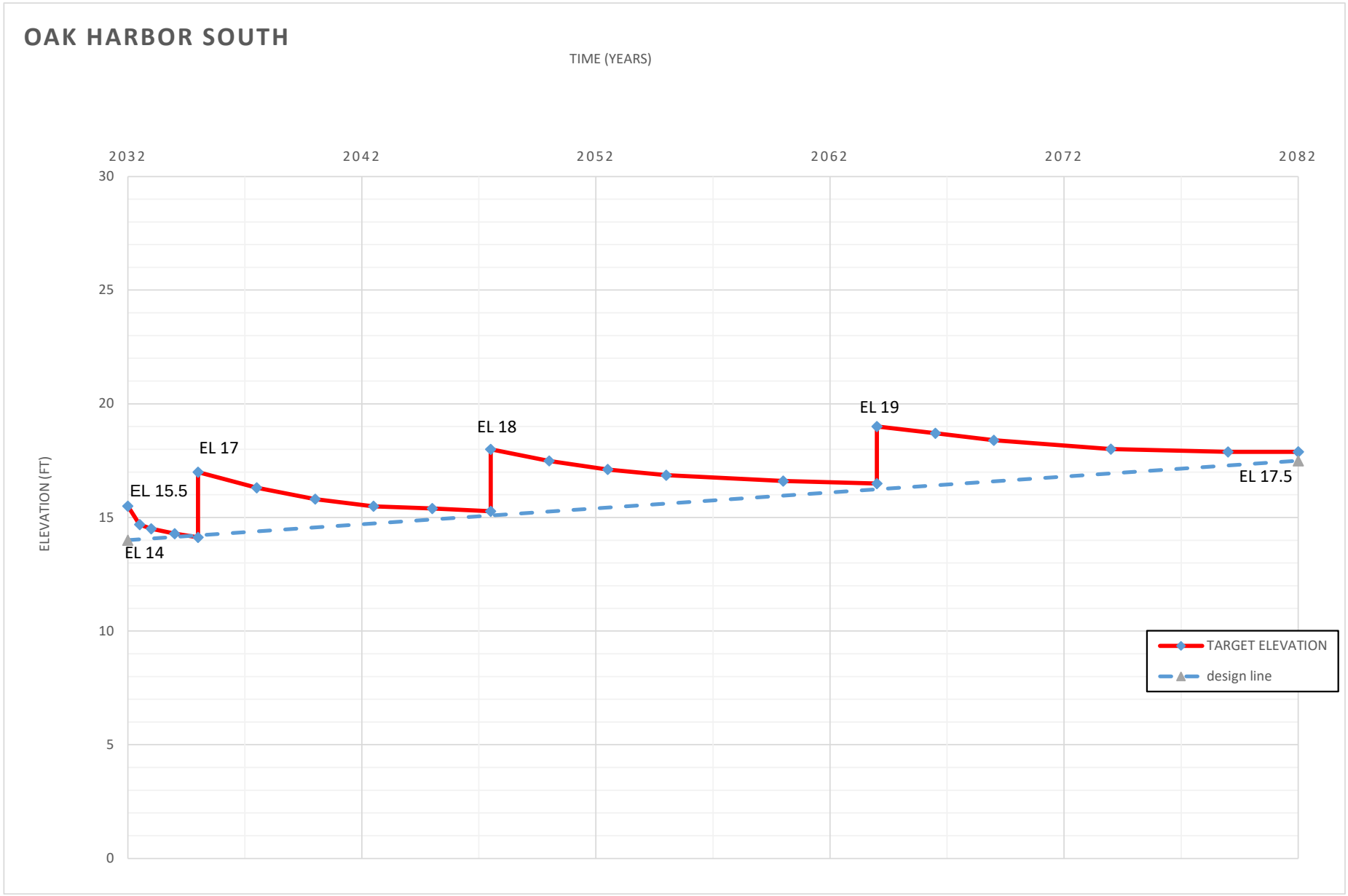
SECTION 7

Lift Schedules

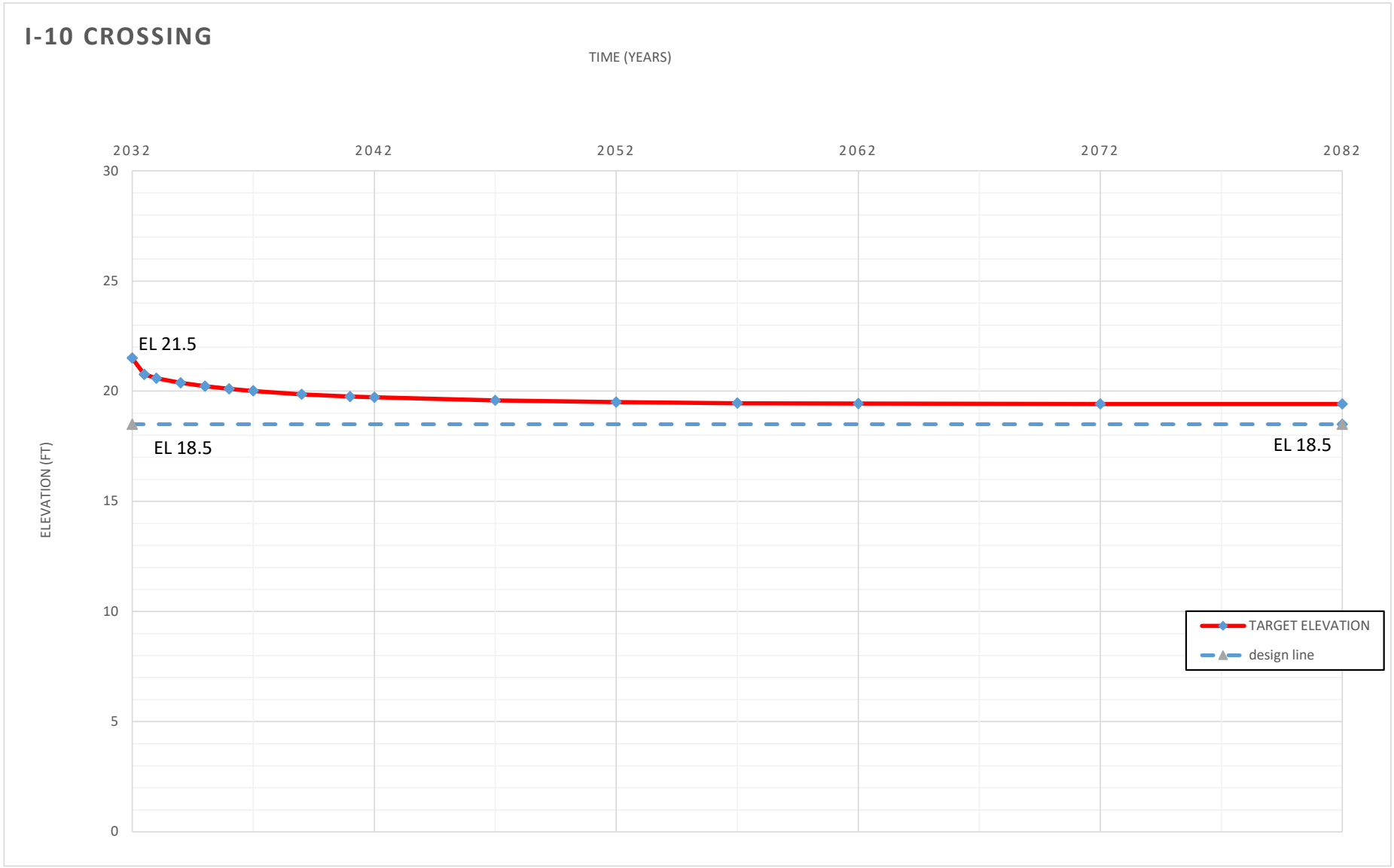
West Slidell Levees


LACOMBE/BONFOUCA/WEST SLIDELL - BERM SECTION
TIME (YEARS)
2032
2042
2052
2062
2072
2082
30
25
20
15
10
5
0
ELEVATION (FT)
EL 16.0
EL 13.5
EL 17.5
EL 19.0
EL 19.0
EL 17.5
TARGET ELEVATION
design line

Oak Harbor Levees

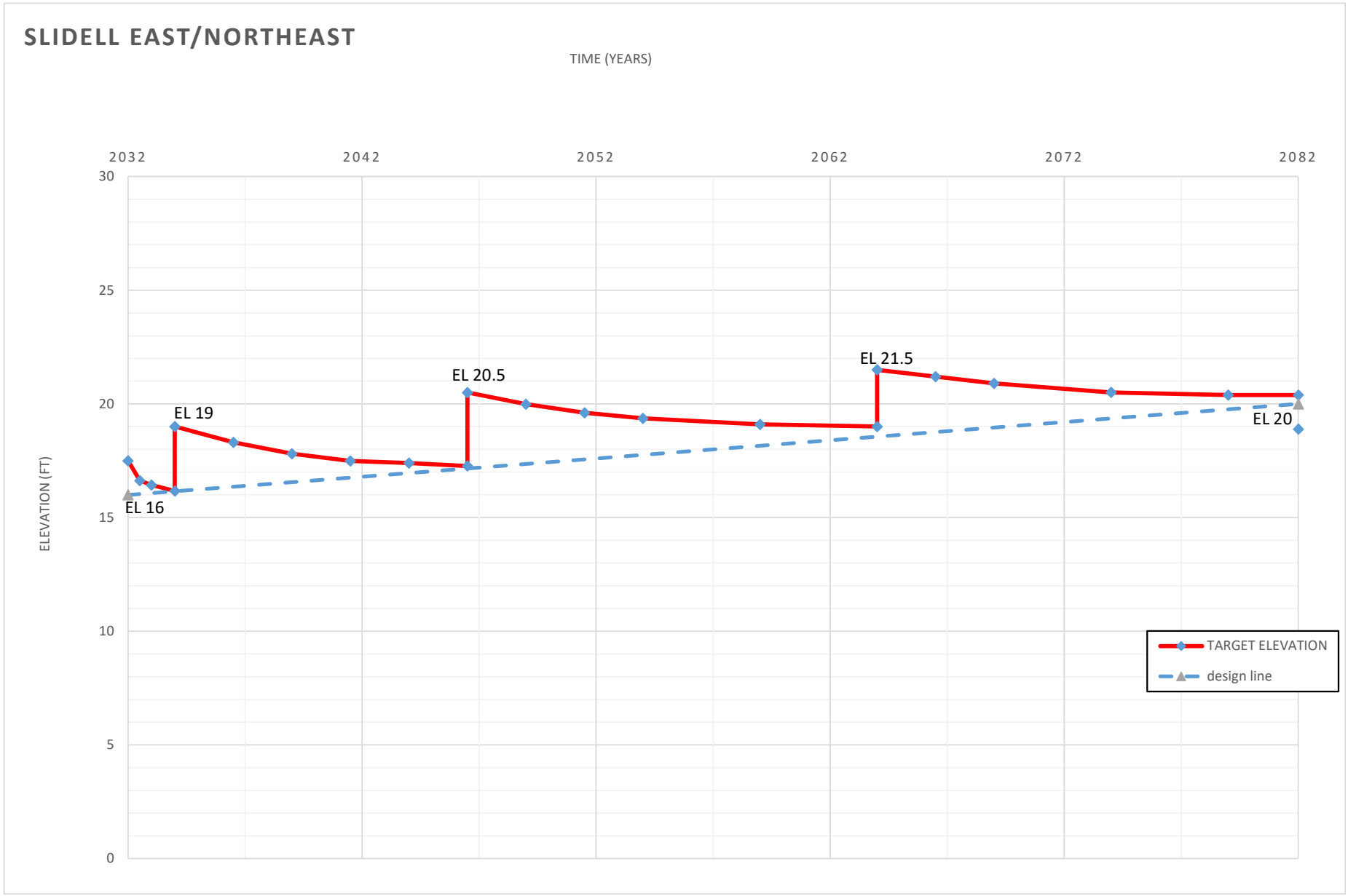

OAK HARBOR SOUTH
TIME (YEARS)
2032
2042
2052
2062
2072
2082
30
25
20
15
10
5
0
ELEVATION (FT)
EL 15.5
EL 17
EL 18
EL 19
EL 17.5
EL 14
TARGET ELEVATION
design line

I-10 crossing


I-10 CROSSING
TIME (YEARS)
2032
2042
2052
2062
2072
2082
30
25
20
15
10
5
0
ELEVATION (FT)
EL 21.5
EL 18.5
EL 18.5
TARGET ELEVATION
design line

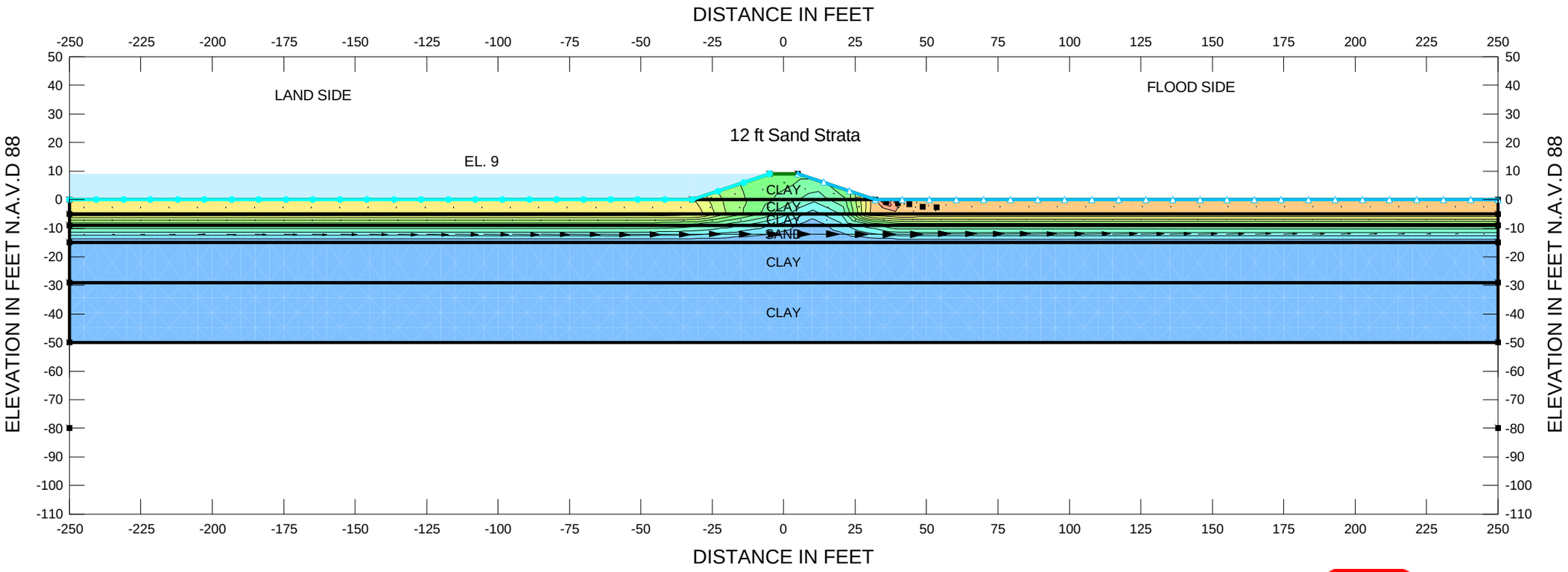
Slidell East/

Northeast


SLIDELL EAST/NORTHEAST
TIME (YEARS)
2032
2042
2052
2062
2072
2082
30
25
20
15
10
5
0
ELEVATION (FT)
EL 16
EL 19
EL 20.5
EL 21.5
EL 20
TARGET ELEVATION
design line

SECTION 8

Seepage

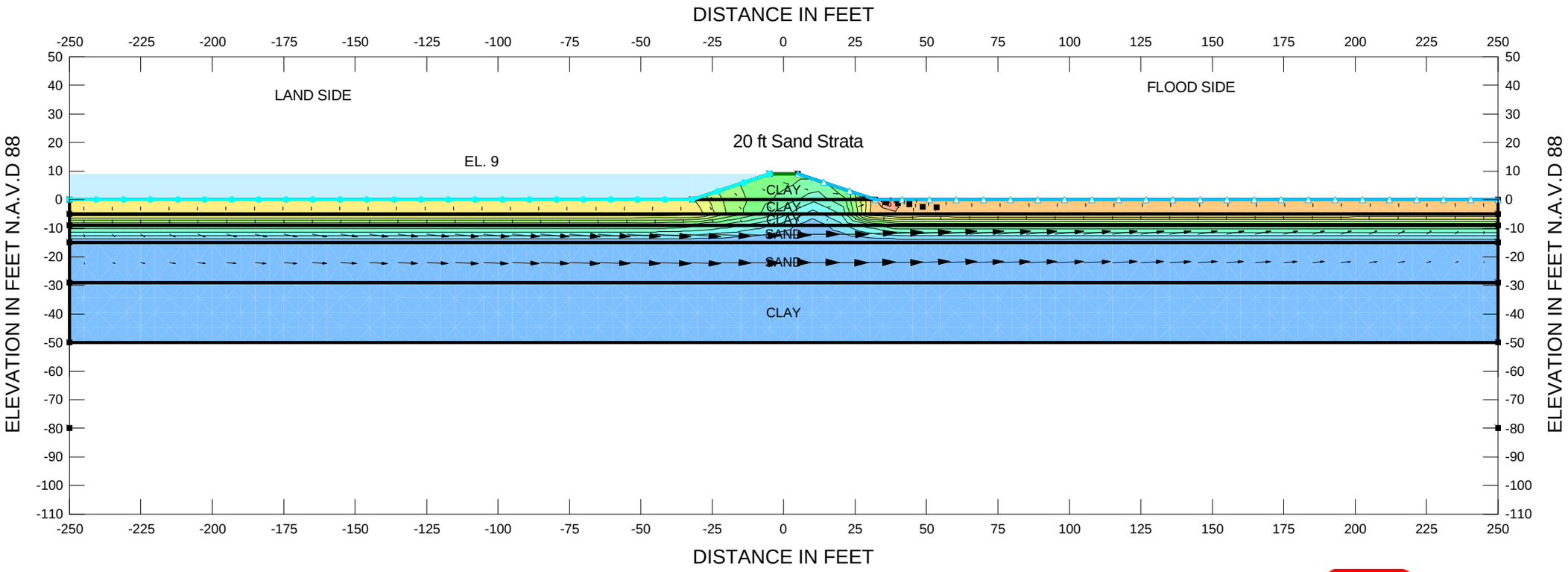


CAP SECTION-BAYOU PLAQUEMINES

CASE: Steady-State Seepage (12')

US Army Corps of Engineers®
New Orleans District

Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Rotation (°)	Volumetric Water Content	Compressibility (/psf)
	CLAY	Saturated Only	1.64e-08	0.25	0	0	0
	SAND	Saturated Only	0.0016404199	1	0	0	0

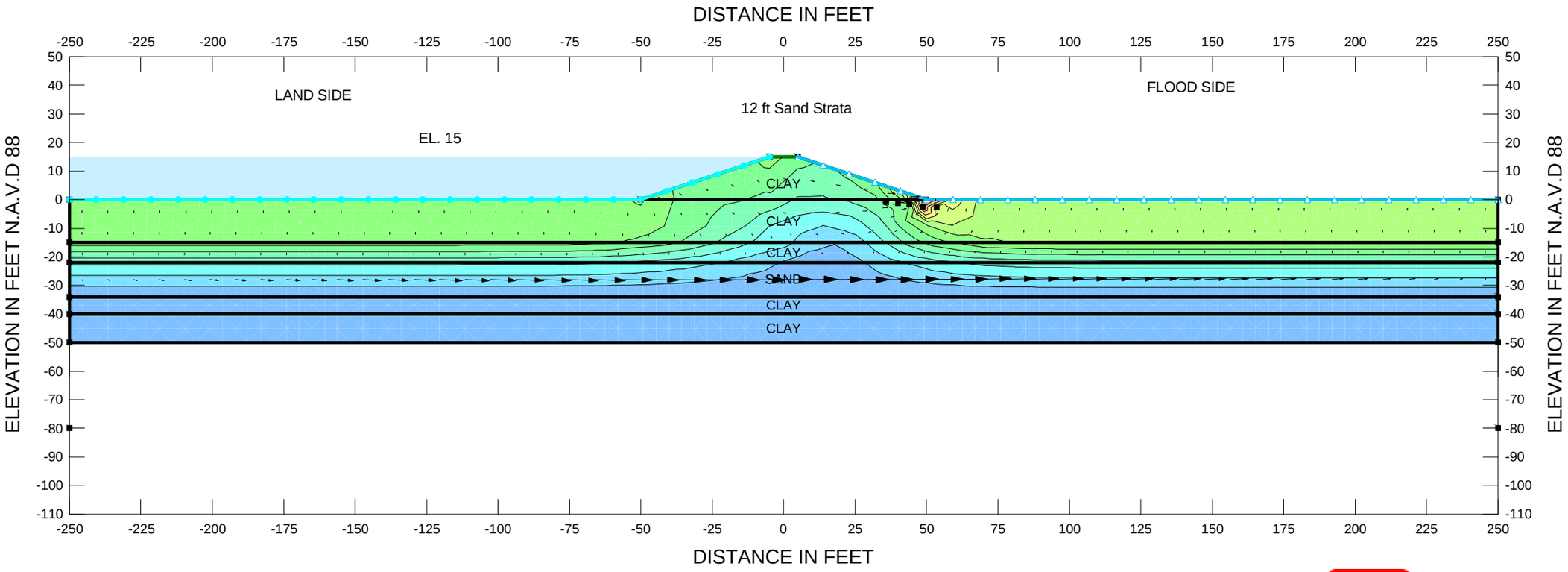


CAP SECTION-BAYOU PLAQUEMINES

CASE: Steady-State Seepage (20')

US Army Corps of Engineers®
New Orleans District

Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Rotation (°)	Volumetric Water Content	Compressibility (/psf)
	CLAY	Saturated Only	1.64e-08	0.25	0	0	0
	SAND	Saturated Only	0.0016404199	1	0	0	0

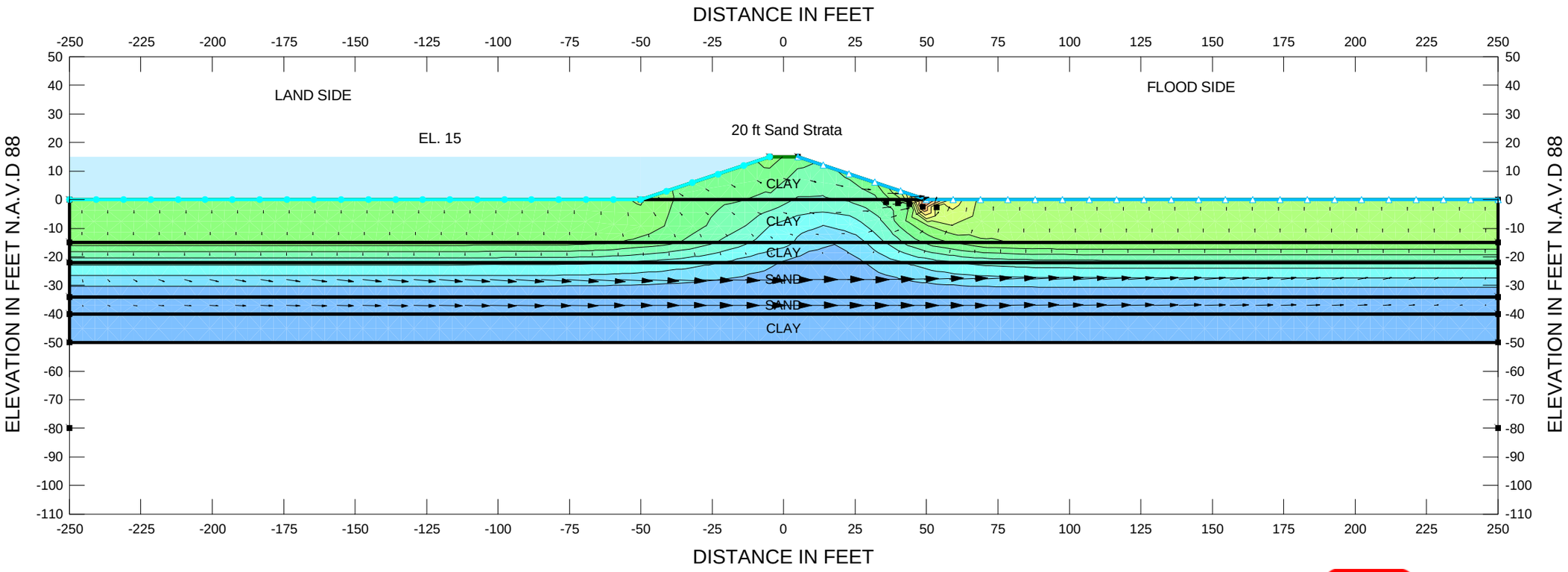


CAP SECTION-BAYOU PLAQUEMINES

CASE: Steady-State Seepage (12')

US Army Corps of Engineers®
New Orleans District

Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Rotation (°)	Volumetric Water Content	Compressibility (/psf)
	CLAY	Saturated Only	1.64e-08	0.25	0	0	0
	SAND	Saturated Only	0.0016404199	1	0	0	0



CAP SECTION-BAYOU PLAQUEMINES

CASE: Steady-State Seepage (20')

US Army Corps of Engineers®
New Orleans District

Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Rotation (°)	Volumetric Water Content	Compressibility (/psf)
	CLAY	Saturated Only	1.64e-08	0.25	0	0	0
	SAND	Saturated Only	0.0016404199	1	0	0	0

Analysis:	Project Grade 15 (15 ft height with 15 ft head differential)
Case:	Toe of Levee (12 ft sand strata)
y avg:	115
ym':	52.6
Icr:	0.84

Node	Exit Hydraulic Gradient
253	0.67475595
262	0.48163995
244	0.4050592
Avg:	0.520485033
FoS:	1.61

Analysis:	Project Grade 9 (9 ft height with 9 ft head differential)
Case:	Toe of Levee (12 ft sand strata)
y avg:	115
ym':	52.6
Icr:	0.84

Node	Exit Hydraulic Gradient
209	0.54857262
218	0.53305853
211	0.53174072
210	0.64138448
202	0.29150569
Avg:	0.509252408
FoS:	1.65

Analysis:	Project Grade 15 (15 ft height with 15 ft head differential)
Case:	Toe of Levee (20 ft sand strata)
y avg:	115
ym':	52.6
Icr:	0.84

Node	Exit Hydraulic Gradient
253	0.67476461
262	0.48165212
244	0.40506295
Avg:	0.520493227
FoS:	1.61

Analysis:	Project Grade 9 (9 ft height with 9 ft head differential)
Case:	Toe of Levee (20 ft sand strata)
y avg:	115
ym':	52.6
Icr:	0.84

Node	Exit Hydraulic Gradient
209	0.54865452
218	0.53320298
211	0.53188776
210	0.64149287
202	0.29151848
Avg:	0.509351322
FoS:	1.65

SECTION 9

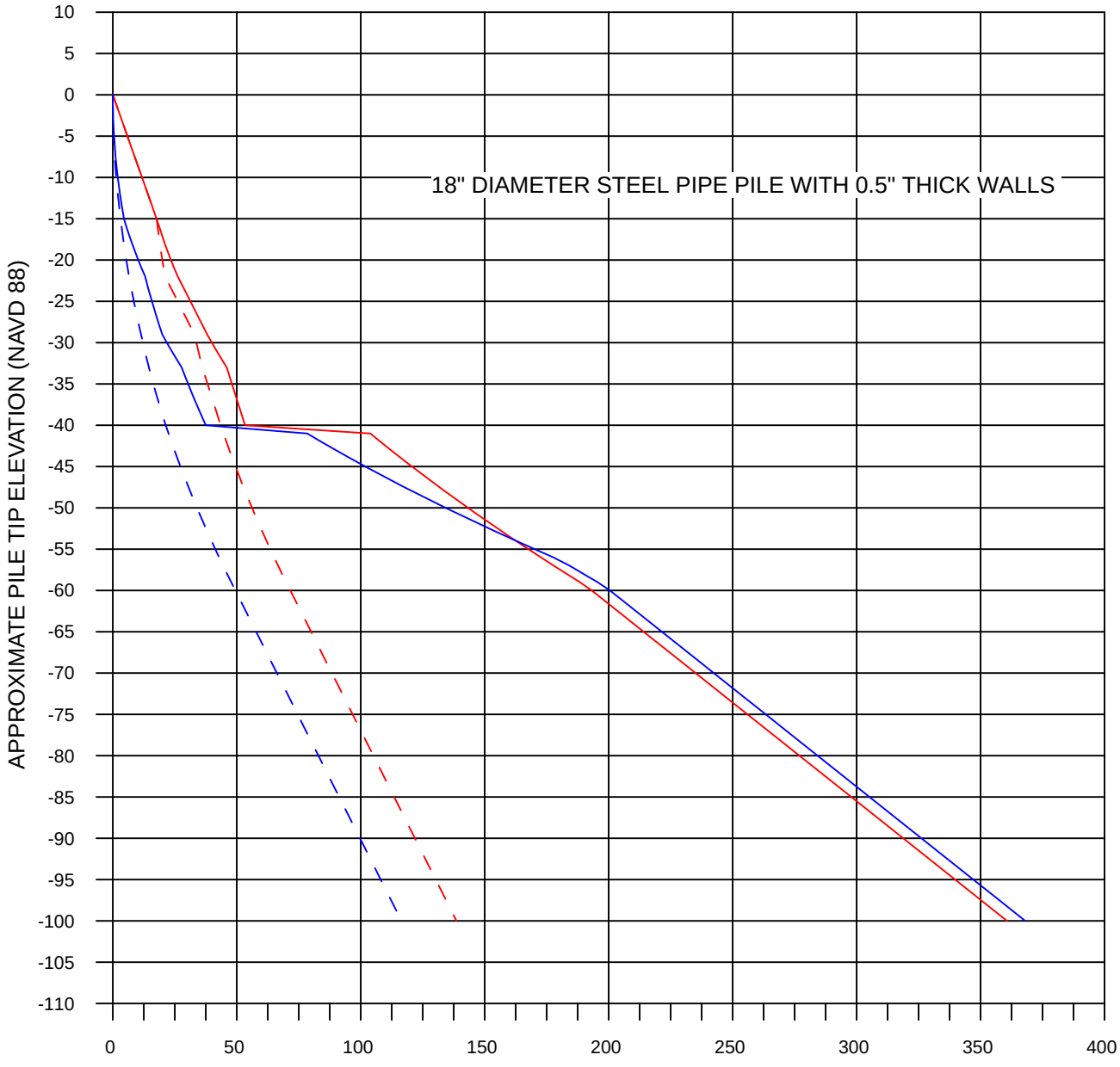
Pile Capacities

NORTHEAST TIE-IN

18 inch pipe

Pile Capacities

ESTIMATED ULTIMATE SINGLE PILE LOAD CAPACITIES
NORTHEAST TIE-IN:
18" DIAMETER STEEL PIPE PILE WITH 0.5" THICK WALLS



LEGEND

- Q-CASE: COMPRESSION PILE CAPACITY
- Q-CASE: TENSION PILE CAPACITY
- S-CASE: COMPRESSION PILE CAPACITY
- S-CASE: TENSION PILE CAPACITY

ULTIMATE PILE LOAD CAPACITIES 18" DIAMETER STEEL PIPE PILE W/ 0.5" THICK WALLS		
NORTHEAST TIE-IN		
DRAWN BY: E.R.G.	10 FEBRUARY 2022	CHECKED BY: M.C.M.

			Q-CASE						S-CASE					
Stratum	Tip	Increment	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	-1	1	1.178	0.000	0.000	0.000	1.178	1.178	0.000	0.020	0.014	0.000	0.020	0.014
1	-2	1	2.356	0.000	0.000	0.000	2.356	2.356	0.000	0.080	0.056	0.000	0.080	0.056
1	-3	1	3.534	0.000	0.000	0.000	3.534	3.534	0.000	0.180	0.126	0.000	0.180	0.126
1	-4	1	4.712	0.000	0.000	0.000	4.712	4.712	0.000	0.320	0.224	0.000	0.320	0.224
1	-5	1	5.890	0.000	0.000	0.000	5.890	5.890	0.000	0.499	0.349	0.000	0.499	0.349
1	-6	1	7.069	0.000	0.000	0.000	7.069	7.069	0.000	0.719	0.503	0.000	0.719	0.503
1	-7	1	8.247	0.000	0.000	0.000	8.247	8.247	0.000	0.979	0.685	0.000	0.979	0.685
1	-8	1	9.425	0.000	0.000	0.000	9.425	9.425	0.000	1.278	0.895	0.000	1.278	0.895
1	-9	1	10.603	0.000	0.000	0.000	10.603	10.603	0.000	1.618	1.132	0.000	1.618	1.132
1	-10	1	11.781	0.000	0.000	0.000	11.781	11.781	0.000	1.997	1.398	0.000	1.997	1.398
1	-11	1	12.959	0.000	0.000	0.000	12.959	12.959	0.000	2.416	1.691	0.000	2.416	1.691
1	-12	1	14.137	0.000	0.000	0.000	14.137	14.137	0.000	2.876	2.013	0.000	2.876	2.013
1	-13	1	15.315	0.000	0.000	0.000	15.315	15.315	0.000	3.375	2.363	0.000	3.375	2.363
1	-14	1	16.493	0.000	0.000	0.000	16.493	16.493	0.000	3.914	2.740	0.000	3.914	2.740
1	-15	1	17.671	0.000	0.000	0.000	17.671	17.671	0.000	4.493	3.145	0.000	4.493	3.145
2	-16	1	17.671	1.026	0.411	0.000	18.698	18.082	0.000	5.520	3.556	0.000	5.520	3.556
2	-17	1	17.671	2.117	0.847	0.000	19.788	18.518	0.000	6.610	3.992	0.000	6.610	3.992
2	-18	1	17.671	3.271	1.309	0.000	20.943	18.980	0.000	7.765	4.454	0.000	7.765	4.454
2	-19	1	17.671	4.490	1.796	0.000	22.162	19.468	0.000	8.983	4.941	0.000	8.983	4.941
2	-20	1	17.671	5.773	2.309	0.000	23.444	19.981	0.000	10.266	5.455	0.000	10.266	5.455
2	-21	1	17.671	7.120	2.848	0.000	24.791	20.519	0.000	11.613	5.993	0.000	11.613	5.993
2	-22	1	17.671	8.531	3.412	0.000	26.203	21.084	0.000	13.024	6.558	0.000	13.024	6.558
3	-23	1	19.368	8.531	3.412	0.000	27.899	22.780	0.000	13.911	7.178	0.000	13.911	7.178
3	-24	1	21.064	8.531	3.412	0.000	29.595	24.477	0.000	14.831	7.822	0.000	14.831	7.822
3	-25	1	22.761	8.531	3.412	0.000	31.292	26.173	0.000	15.784	8.489	0.000	15.784	8.489
3	-26	1	24.457	8.531	3.412	0.000	32.988	27.870	0.000	16.770	9.180	0.000	16.770	9.180
3	-27	1	26.154	8.531	3.412	0.000	34.685	29.566	0.000	17.791	9.894	0.000	17.791	9.894
3	-28	1	27.850	8.531	3.412	0.000	36.381	31.263	0.000	18.844	10.632	0.000	18.844	10.632
3	-29	1	29.547	8.531	3.412	0.000	38.078	32.959	0.000	19.931	11.392	0.000	19.931	11.392
4	-30	1	29.547	10.395	4.158	0.000	39.942	33.705	0.000	21.795	12.138	0.000	21.795	12.138
4	-31	1	29.547	12.323	4.929	0.000	41.870	34.476	0.000	23.723	12.909	0.000	23.723	12.909
4	-32	1	29.547	14.315	5.726	0.000	43.862	35.273	0.000	25.715	13.706	0.000	25.715	13.706
4	-33	1	29.547	16.371	6.548	0.000	45.918	36.095	0.000	27.771	14.528	0.000	27.771	14.528
5	-34	1	30.607	16.371	6.548	0.000	46.978	37.155	0.000	29.048	15.422	0.000	29.048	15.422
5	-35	1	31.667	16.371	6.548	0.000	48.038	38.216	0.000	30.362	16.342	0.000	30.362	16.342
5	-36	1	32.728	16.371	6.548	0.000	49.099	39.276	0.000	31.714	17.289	0.000	31.714	17.289
5	-37	1	33.788	16.371	6.548	0.000	50.159	40.336	0.000	33.103	18.261	0.000	33.103	18.261
5	-38	1	34.848	16.371	6.548	0.000	51.219	41.397	0.000	34.529	19.259	0.000	34.529	19.259
5	-39	1	35.908	16.371	6.548	0.000	52.279	42.457	0.000	35.993	20.284	0.000	35.993	20.284
5	-40	1	36.969	16.371	6.548	0.000	53.340	43.517	0.000	37.494	21.335	0.000	37.494	21.335
6	-41	1	36.969	19.207	7.683	47.703	103.878	44.651	0.000	40.330	22.469	38.089	78.419	22.469
6	-42	1	36.969	22.113	8.845	48.886	107.968	45.814	0.000	43.236	23.631	40.834	84.071	23.631
6	-43	1	36.969	25.091	10.036	50.069	112.129	47.005	0.000	46.214	24.823	43.647	89.861	24.823
6	-44	1	36.969	28.140	11.256	51.252	116.361	48.225	0.000	49.263	26.042	46.526	95.790	26.042
6	-45	1	36.969	31.260	12.504	52.435	120.664	49.473	0.000	52.384	27.290	49.473	101.857	27.290
6	-46	1	36.969	34.452	13.781	53.617	125.038	50.749	0.000	55.575	28.567	52.488	108.063	28.567
6	-47	1	36.969	37.715	15.086	54.800	129.484	52.055	0.000	58.838	29.872	55.569	114.407	29.872
6	-48	1	36.969	41.048	16.419	55.983	134.000	53.388	0.000	62.172	31.206	58.718	120.889	31.206

			Q-CASE						S-CASE					
Stratum	Tip	Increment	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)
6	-49	1	36.969	44.454	17.781	57.166	138.588	54.750	0.000	65.577	32.568	61.933	127.510	32.568
6	-50	1	36.969	47.930	19.172	58.349	143.247	56.141	0.000	69.053	33.958	65.217	134.269	33.958
6	-51	1	36.969	51.477	20.591	59.532	147.978	57.560	0.000	72.600	35.377	68.567	141.167	35.377
6	-52	1	36.969	55.096	22.038	60.715	152.779	59.007	0.000	76.219	36.824	71.985	148.203	36.824
6	-53	1	36.969	58.786	23.514	61.898	157.652	60.483	0.000	79.909	38.300	75.469	155.378	38.300
6	-54	1	36.969	62.547	25.019	63.080	162.596	61.987	0.000	83.670	39.805	79.021	162.691	39.805
6	-55	1	36.969	66.379	26.552	64.263	167.611	63.520	0.000	87.502	41.338	82.641	170.143	41.338
6	-56	1	36.969	70.282	28.113	65.446	172.697	65.082	0.000	91.405	42.899	86.327	177.733	42.899
6	-57	1	36.969	74.257	29.703	66.629	177.855	66.671	0.000	95.380	44.489	88.839	184.219	44.489
6	-58	1	36.969	78.303	31.321	67.812	183.083	68.290	0.000	99.426	46.107	90.416	189.842	46.107
6	-59	1	36.969	82.420	32.968	68.995	188.383	69.937	0.000	103.543	47.754	91.993	195.536	47.754
6	-60	1	36.969	86.608	34.643	69.581	193.158	71.612	0.000	107.731	49.429	92.775	200.506	49.429
6	-61	1	36.969	90.795	36.318	69.581	197.345	73.287	0.000	111.919	51.104	92.775	204.694	51.104
6	-62	1	36.969	94.983	37.993	69.581	201.533	74.962	0.000	116.106	52.779	92.775	208.882	52.779
6	-63	1	36.969	99.171	39.668	69.581	205.721	76.637	0.000	120.294	54.455	92.775	213.069	54.455
6	-64	1	36.969	103.359	41.344	69.581	209.909	78.312	0.000	124.482	56.130	92.775	217.257	56.130
6	-65	1	36.969	107.547	43.019	69.581	214.097	79.987	0.000	128.670	57.805	92.775	221.445	57.805
6	-66	1	36.969	111.735	44.694	69.581	218.285	81.663	0.000	132.858	59.480	92.775	225.633	59.480
6	-67	1	36.969	115.923	46.369	69.581	222.473	83.338	0.000	137.046	61.155	92.775	229.821	61.155
6	-68	1	36.969	120.111	48.044	69.581	226.661	85.013	0.000	141.234	62.830	92.775	234.009	62.830
6	-69	1	36.969	124.298	49.719	69.581	230.849	86.688	0.000	145.422	64.506	92.775	238.197	64.506
6	-70	1	36.969	128.486	51.395	69.581	235.036	88.363	0.000	149.609	66.181	92.775	242.385	66.181
6	-71	1	36.969	132.674	53.070	69.581	239.224	90.038	0.000	153.797	67.856	92.775	246.572	67.856
6	-72	1	36.969	136.862	54.745	69.581	243.412	91.714	0.000	157.985	69.531	92.775	250.760	69.531
6	-73	1	36.969	141.050	56.420	69.581	247.600	93.389	0.000	162.173	71.206	92.775	254.948	71.206
6	-74	1	36.969	145.238	58.095	69.581	251.788	95.064	0.000	166.361	72.881	92.775	259.136	72.881
6	-75	1	36.969	149.426	59.770	69.581	255.976	96.739	0.000	170.549	74.556	92.775	263.324	74.556
6	-76	1	36.969	153.614	61.445	69.581	260.164	98.414	0.000	174.737	76.232	92.775	267.512	76.232
6	-77	1	36.969	157.802	63.121	69.581	264.352	100.089	0.000	178.925	77.907	92.775	271.700	77.907
6	-78	1	36.969	161.989	64.796	69.581	268.539	101.765	0.000	183.113	79.582	92.775	275.888	79.582
6	-79	1	36.969	166.177	66.471	69.581	272.727	103.440	0.000	187.300	81.257	92.775	280.076	81.257
6	-80	1	36.969	170.365	68.146	69.581	276.915	105.115	0.000	191.488	82.932	92.775	284.263	82.932
6	-81	1	36.969	174.553	69.821	69.581	281.103	106.790	0.000	195.676	84.607	92.775	288.451	84.607
6	-82	1	36.969	178.741	71.496	69.581	285.291	108.465	0.000	199.864	86.283	92.775	292.639	86.283
6	-83	1	36.969	182.929	73.172	69.581	289.479	110.140	0.000	204.052	87.958	92.775	296.827	87.958
6	-84	1	36.969	187.117	74.847	69.581	293.667	111.815	0.000	208.240	89.633	92.775	301.015	89.633
6	-85	1	36.969	191.305	76.522	69.581	297.855	113.491	0.000	212.428	91.308	92.775	305.203	91.308
6	-86	1	36.969	195.492	78.197	69.581	302.043	115.166	0.000	216.616	92.983	92.775	309.391	92.983
6	-87	1	36.969	199.680	79.872	69.581	306.230	116.841	0.000	220.803	94.658	92.775	313.579	94.658
6	-88	1	36.969	203.868	81.547	69.581	310.418	118.516	0.000	224.991	96.334	92.775	317.766	96.334
6	-89	1	36.969	208.056	83.222	69.581	314.606	120.191	0.000	229.179	98.009	92.775	321.954	98.009
6	-90	1	36.969	212.244	84.898	69.581	318.794	121.866	0.000	233.367	99.684	92.775	326.142	99.684
6	-91	1	36.969	216.432	86.573	69.581	322.982	123.542	0.000	237.555	101.359	92.775	330.330	101.359
6	-92	1	36.969	220.620	88.248	69.581	327.170	125.217	0.000	241.743	103.034	92.775	334.518	103.034
6	-93	1	36.969	224.808	89.923	69.581	331.358	126.892	0.000	245.931	104.709	92.775	338.706	104.709
6	-94	1	36.969	228.996	91.598	69.581	335.546	128.567	0.000	250.119	106.384	92.775	342.894	106.384
6	-95	1	36.969	233.183	93.273	69.581	339.733	130.242	0.000	254.306	108.060	92.775	347.082	108.060
6	-96	1	36.969	237.371	94.949	69.581	343.921	131.917	0.000	258.494	109.735	92.775	351.270	109.735
6	-97	1	36.969	241.559	96.624	69.581	348.109	133.592	0.000	262.682	111.410	92.775	355.457	111.410

			Q-CASE						S-CASE					
Stratum	Tip	Increment	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)
6	-98	1	36.969	245.747	98.299	69.581	352.297	135.268	0.000	266.870	113.085	92.775	359.645	113.085
6	-99	1	36.969	249.935	99.974	69.581	356.485	136.943	0.000	271.058	114.760	92.775	363.833	114.760
6	-100	1	36.969	254.123	101.649	69.581	360.673	138.618	0.000	275.246	116.435	92.775	368.021	116.435

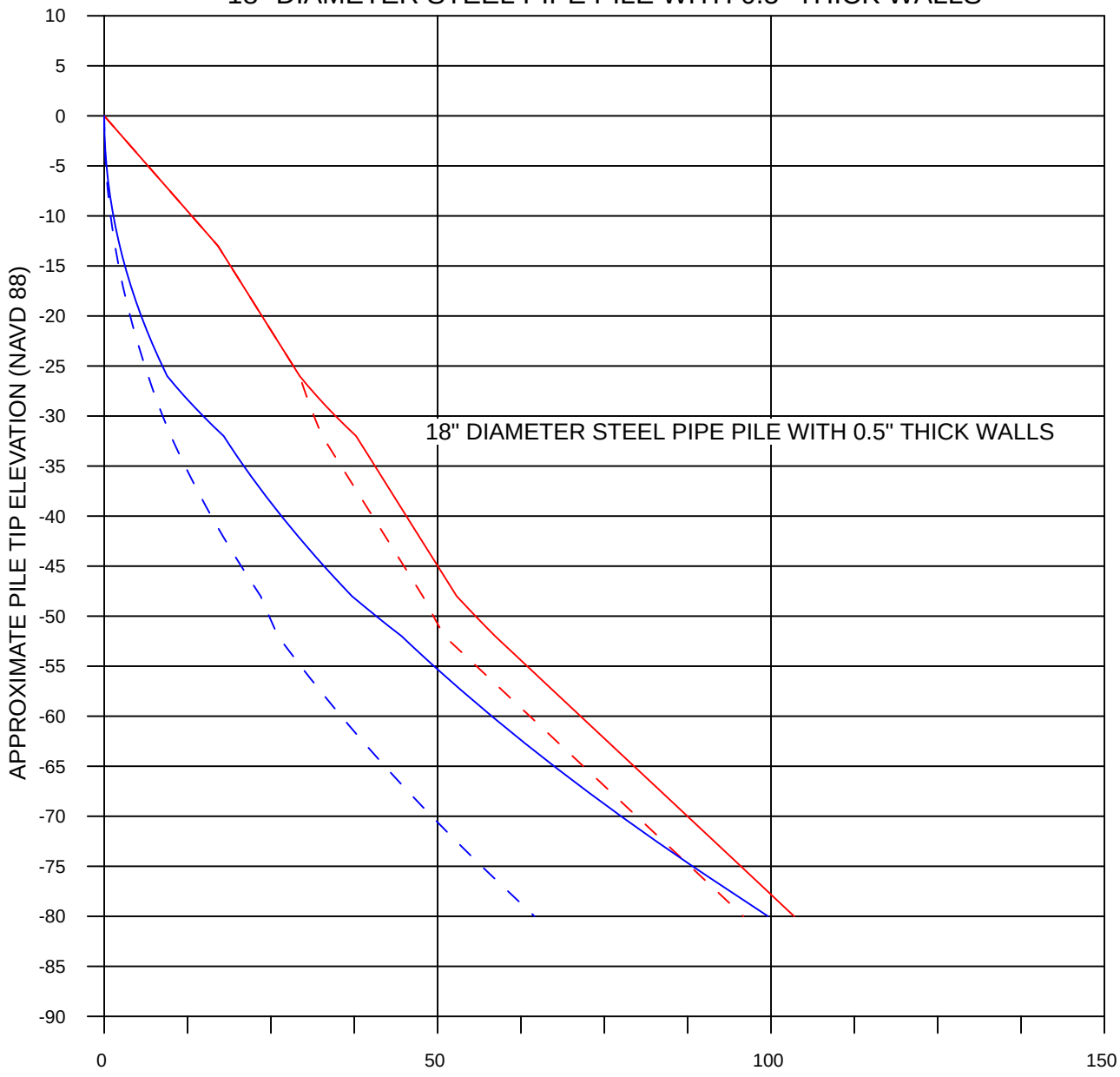
Stratum	Tip	Increment	Q-CASE						S-CASE					
			Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)

W DOUCETTE ROAD GATE, WEST BAYOU PAQUET ROAD, BAYOU PAQUET GATE, BAYOU LIBERTY GATE, BAYOU BONFOUCA GATE, SLIDELL RAILROAD

18-inch pipe

Pile Capacities

ESTIMATED ULTIMATE SINGLE PILE LOAD CAPACITIES
W DOUCETTE, BAYOU PAQUET, WEST BAYOU PAQUET, BAYOU LIBERTY, BAYOU BONFOUCA, SLIDELL RAILROAD:
18" DIAMETER STEEL PIPE PILE WITH 0.5" THICK WALLS



LEGEND

- Q-CASE: COMPRESSION PILE CAPACITY
- Q-CASE: TENSION PILE CAPACITY
- S-CASE: COMPRESSION PILE CAPACITY
- S-CASE: TENSION PILE CAPACITY

ULTIMATE PILE LOAD CAPACITIES
18" DIAMETER STEEL PIPE PILE W/
0.5" THICK WALLS

W DOUCETTE, BAYOU PAQUET, WEST BAYOU PAQUET,
BAYOU LIBERTY, BAYOU BONFOUCA, SLIDELL RAILROAD

DRAWN BY: E.R.G.	08 FEBRUARY 2022	CHECKED BY: M.C.M.

			Q-CASE						S-CASE					
Stratum	Tip	Increment	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	-1	1	1.312	0.000	0.000	0.000	1.312	1.312	0.000	0.014	0.010	0.000	0.014	0.010
1	-2	1	2.624	0.000	0.000	0.000	2.624	2.624	0.000	0.055	0.039	0.000	0.055	0.039
1	-3	1	3.936	0.000	0.000	0.000	3.936	3.936	0.000	0.124	0.087	0.000	0.124	0.087
1	-4	1	5.248	0.000	0.000	0.000	5.248	5.248	0.000	0.221	0.155	0.000	0.221	0.155
1	-5	1	6.560	0.000	0.000	0.000	6.560	6.560	0.000	0.345	0.242	0.000	0.345	0.242
1	-6	1	7.872	0.000	0.000	0.000	7.872	7.872	0.000	0.497	0.348	0.000	0.497	0.348
1	-7	1	9.184	0.000	0.000	0.000	9.184	9.184	0.000	0.676	0.473	0.000	0.676	0.473
1	-8	1	10.495	0.000	0.000	0.000	10.495	10.495	0.000	0.883	0.618	0.000	0.883	0.618
1	-9	1	11.807	0.000	0.000	0.000	11.807	11.807	0.000	1.118	0.783	0.000	1.118	0.783
1	-10	1	13.119	0.000	0.000	0.000	13.119	13.119	0.000	1.380	0.966	0.000	1.380	0.966
1	-11	1	14.431	0.000	0.000	0.000	14.431	14.431	0.000	1.670	1.169	0.000	1.670	1.169
1	-12	1	15.743	0.000	0.000	0.000	15.743	15.743	0.000	1.987	1.391	0.000	1.987	1.391
1	-13	1	17.055	0.000	0.000	0.000	17.055	17.055	0.000	2.332	1.633	0.000	2.332	1.633
2	-14	1	17.998	0.000	0.000	0.000	17.998	17.998	0.000	2.706	1.894	0.000	2.706	1.894
2	-15	1	18.940	0.000	0.000	0.000	18.940	18.940	0.000	3.108	2.175	0.000	3.108	2.175
2	-16	1	19.883	0.000	0.000	0.000	19.883	19.883	0.000	3.539	2.477	0.000	3.539	2.477
2	-17	1	20.825	0.000	0.000	0.000	20.825	20.825	0.000	3.999	2.799	0.000	3.999	2.799
2	-18	1	21.767	0.000	0.000	0.000	21.767	21.767	0.000	4.488	3.141	0.000	4.488	3.141
2	-19	1	22.710	0.000	0.000	0.000	22.710	22.710	0.000	5.005	3.504	0.000	5.005	3.504
2	-20	1	23.652	0.000	0.000	0.000	23.652	23.652	0.000	5.552	3.886	0.000	5.552	3.886
2	-21	1	24.595	0.000	0.000	0.000	24.595	24.595	0.000	6.128	4.289	0.000	6.128	4.289
2	-22	1	25.537	0.000	0.000	0.000	25.537	25.537	0.000	6.732	4.713	0.000	6.732	4.713
2	-23	1	26.480	0.000	0.000	0.000	26.480	26.480	0.000	7.366	5.156	0.000	7.366	5.156
2	-24	1	27.422	0.000	0.000	0.000	27.422	27.422	0.000	8.028	5.619	0.000	8.028	5.619
2	-25	1	28.365	0.000	0.000	0.000	28.365	28.365	0.000	8.719	6.103	0.000	8.719	6.103
2	-26	1	29.307	0.000	0.000	0.000	29.307	29.307	0.000	9.439	6.607	0.000	9.439	6.607
3	-27	1	29.307	1.251	0.500	0.000	30.558	29.808	0.000	10.690	7.108	0.000	10.690	7.108
3	-28	1	29.307	2.566	1.027	0.000	31.874	30.334	0.000	12.005	7.634	0.000	12.005	7.634
3	-29	1	29.307	3.946	1.578	0.000	33.253	30.886	0.000	13.385	8.186	0.000	13.385	8.186
3	-30	1	29.307	5.389	2.156	0.000	34.696	31.463	0.000	14.828	8.763	0.000	14.828	8.763
3	-31	1	29.307	6.897	2.759	0.000	36.204	32.066	0.000	16.336	9.366	0.000	16.336	9.366
3	-32	1	29.307	8.468	3.387	0.000	37.776	32.695	0.000	17.907	9.995	0.000	17.907	9.995
4	-33	1	30.250	8.468	3.387	0.000	38.718	33.637	0.000	18.889	10.681	0.000	18.889	10.681
4	-34	1	31.192	8.468	3.387	0.000	39.661	34.580	0.000	19.899	11.389	0.000	19.899	11.389
4	-35	1	32.135	8.468	3.387	0.000	40.603	35.522	0.000	20.939	12.117	0.000	20.939	12.117
4	-36	1	33.077	8.468	3.387	0.000	41.546	36.465	0.000	22.009	12.866	0.000	22.009	12.866
4	-37	1	34.020	8.468	3.387	0.000	42.488	37.407	0.000	23.109	13.636	0.000	23.109	13.636
4	-38	1	34.962	8.468	3.387	0.000	43.430	38.349	0.000	24.238	14.426	0.000	24.238	14.426
4	-39	1	35.905	8.468	3.387	0.000	44.373	39.292	0.000	25.396	15.237	0.000	25.396	15.237
4	-40	1	36.847	8.468	3.387	0.000	45.315	40.234	0.000	26.584	16.068	0.000	26.584	16.068
4	-41	1	37.790	8.468	3.387	0.000	46.258	41.177	0.000	27.802	16.921	0.000	27.802	16.921
4	-42	1	38.732	8.468	3.387	0.000	47.200	42.119	0.000	29.049	17.794	0.000	29.049	17.794
4	-43	1	39.675	8.468	3.387	0.000	48.143	43.062	0.000	30.325	18.687	0.000	30.325	18.687
4	-44	1	40.617	8.468	3.387	0.000	49.085	44.004	0.000	31.631	19.602	0.000	31.631	19.602
4	-45	1	41.560	8.468	3.387	0.000	50.028	44.947	0.000	32.967	20.537	0.000	32.967	20.537
4	-46	1	42.502	8.468	3.387	0.000	50.970	45.889	0.000	34.333	21.492	0.000	34.333	21.492
4	-47	1	43.444	8.468	3.387	0.000	51.913	46.832	0.000	35.727	22.469	0.000	35.727	22.469
4	-48	1	44.387	8.468	3.387	0.000	52.855	47.774	0.000	37.152	23.466	0.000	37.152	23.466

			Q-CASE						S-CASE					
Stratum	Tip	Increment	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)
5	-49	1	44.858	9.405	3.715	0.000	54.263	48.573	0.000	38.947	24.094	0.000	38.947	24.094
5	-50	1	45.329	10.365	4.051	0.000	55.694	49.380	0.000	40.786	24.738	0.000	40.786	24.738
5	-51	1	45.801	11.347	4.395	0.000	57.147	50.195	0.000	42.668	25.397	0.000	42.668	25.397
5	-52	1	46.272	12.352	4.747	0.000	58.624	51.018	0.000	44.594	26.071	0.000	44.594	26.071
6	-53	1	47.874	12.352	4.747	0.000	60.226	52.621	0.000	46.189	27.187	0.000	46.189	27.187
6	-54	1	49.476	12.352	4.747	0.000	61.828	54.223	0.000	47.811	28.322	0.000	47.811	28.322
6	-55	1	51.079	12.352	4.747	0.000	63.430	55.825	0.000	49.461	29.477	0.000	49.461	29.477
6	-56	1	52.681	12.352	4.747	0.000	65.033	57.427	0.000	51.138	30.651	0.000	51.138	30.651
6	-57	1	54.283	12.352	4.747	0.000	66.635	59.030	0.000	52.843	31.845	0.000	52.843	31.845
6	-58	1	55.885	12.352	4.747	0.000	68.237	60.632	0.000	54.576	33.058	0.000	54.576	33.058
6	-59	1	57.487	12.352	4.747	0.000	69.839	62.234	0.000	56.336	34.290	0.000	56.336	34.290
6	-60	1	59.090	12.352	4.747	0.000	71.441	63.836	0.000	58.124	35.541	0.000	58.124	35.541
6	-61	1	60.692	12.352	4.747	0.000	73.044	65.438	0.000	59.939	36.812	0.000	59.939	36.812
6	-62	1	62.294	12.352	4.747	0.000	74.646	67.041	0.000	61.782	38.102	0.000	61.782	38.102
6	-63	1	63.896	12.352	4.747	0.000	76.248	68.643	0.000	63.653	39.411	0.000	63.653	39.411
6	-64	1	65.498	12.352	4.747	0.000	77.850	70.245	0.000	65.551	40.740	0.000	65.551	40.740
6	-65	1	67.101	12.352	4.747	0.000	79.452	71.847	0.000	67.476	42.088	0.000	67.476	42.088
6	-66	1	68.703	12.352	4.747	0.000	81.055	73.449	0.000	69.430	43.455	0.000	69.430	43.455
6	-67	1	70.305	12.352	4.747	0.000	82.657	75.052	0.000	71.411	44.842	0.000	71.411	44.842
6	-68	1	71.907	12.352	4.747	0.000	84.259	76.654	0.000	73.419	46.248	0.000	73.419	46.248
6	-69	1	73.509	12.352	4.747	0.000	85.861	78.256	0.000	75.456	47.674	0.000	75.456	47.674
6	-70	1	75.112	12.352	4.747	0.000	87.464	79.858	0.000	77.519	49.118	0.000	77.519	49.118
6	-71	1	76.714	12.352	4.747	0.000	89.066	81.460	0.000	79.611	50.582	0.000	79.611	50.582
6	-72	1	78.316	12.352	4.747	0.000	90.668	83.063	0.000	81.730	52.065	0.000	81.730	52.065
6	-73	1	79.918	12.352	4.747	0.000	92.270	84.665	0.000	83.876	53.568	0.000	83.876	53.568
6	-74	1	81.521	12.352	4.747	0.000	93.872	86.267	0.000	86.050	55.090	0.000	86.050	55.090
6	-75	1	83.123	12.352	4.747	0.000	95.475	87.869	0.000	88.252	56.631	0.000	88.252	56.631
6	-76	1	84.725	12.352	4.747	0.000	97.077	89.472	0.000	90.482	58.192	0.000	90.482	58.192
6	-77	1	86.327	12.352	4.747	0.000	98.679	91.074	0.000	92.739	59.772	0.000	92.739	59.772
6	-78	1	87.929	12.352	4.747	0.000	100.281	92.676	0.000	95.012	61.363	0.000	95.012	61.363
6	-79	1	89.532	12.352	4.747	0.000	101.883	94.278	0.000	97.285	62.954	0.000	97.285	62.954
6	-80	1	91.134	12.352	4.747	0.000	103.486	95.880	0.000	99.558	64.545	0.000	99.558	64.545

Stratum	Tip	Increment	Q-CASE						S-CASE					
			Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)

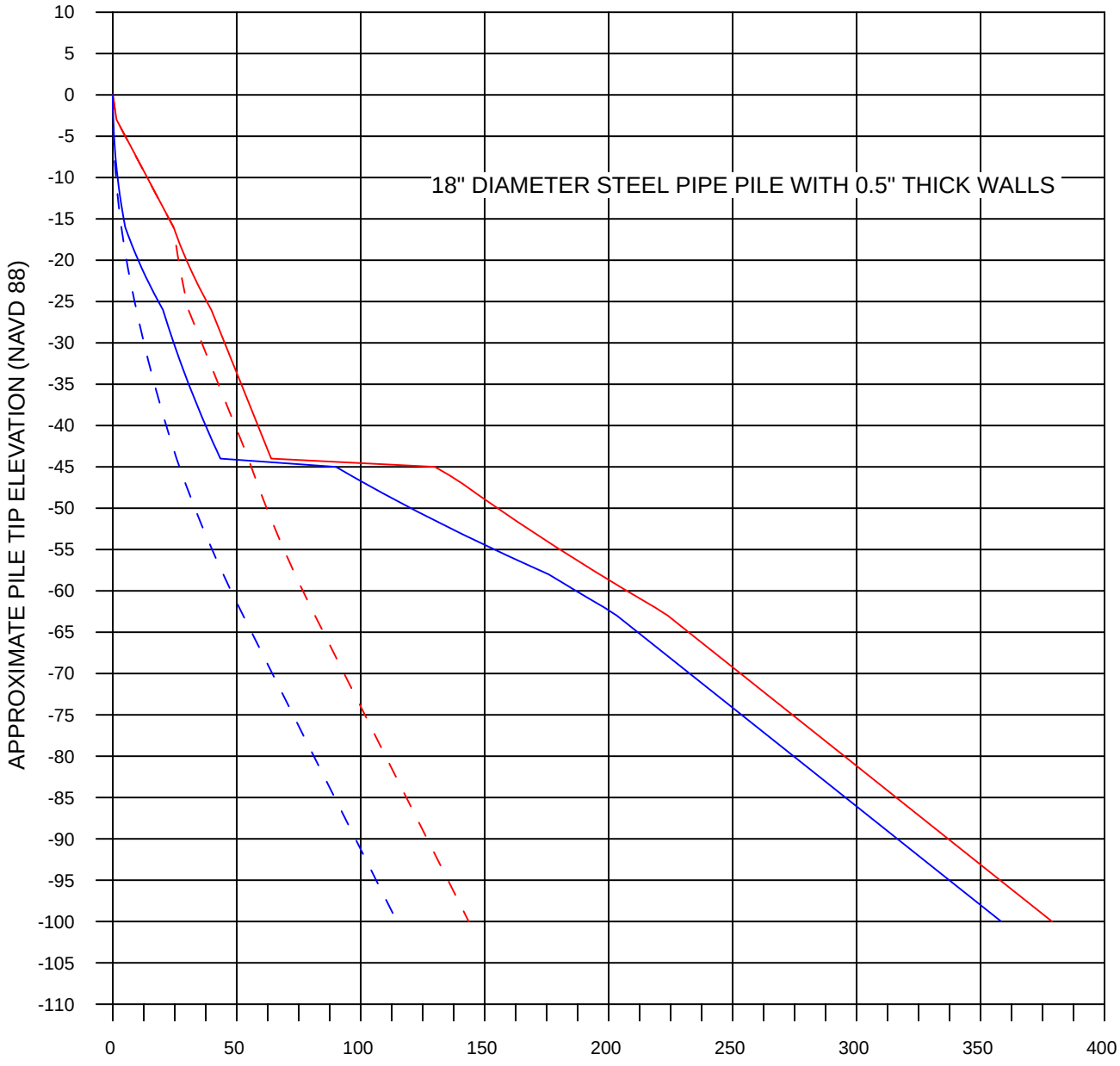
Stratum	Tip	Increment	Q-CASE						S-CASE					
			Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)

LAKESHORE ESTATES NORTHEAST GATE, KINGSPOINT W-14 CANAL GATE

18-inch pipe

Pile Capacities

ESTIMATED ULTIMATE SINGLE PILE LOAD CAPACITIES
LAKESHORE ESTATES NORTHEAST GATE, KINGSPOINT
W14 CANAL GATE:
18" DIAMETER STEEL PIPE PILE WITH 0.5" THICK WALLS



LEGEND

- Q-CASE: COMPRESSION PILE CAPACITY
- Q-CASE: TENSION PILE CAPACITY
- S-CASE: COMPRESSION PILE CAPACITY
- S-CASE: TENSION PILE CAPACITY

ULTIMATE PILE LOAD CAPACITIES
18" DIAMETER STEEL PIPE PILE W/
0.5" THICK WALLS

LAKESHORE ESTATES NORTHEAST GATE,
KINGSPOINT W14 CANAL GATE

DRAWN BY: E.R.G.	08 FEBRUARY 2022	CHECKED BY: M.C.M.

			Q-CASE						S-CASE					
Stratum	Tip	Increment	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	-1	1	0.471	0.011	0.004	0.000	0.483	0.475	0.000	0.022	0.008	0.000	0.022	0.008
1	-2	1	0.942	0.046	0.016	0.000	0.988	0.958	0.000	0.087	0.031	0.000	0.087	0.031
1	-3	1	1.414	0.102	0.036	0.000	1.516	1.450	0.000	0.196	0.069	0.000	0.196	0.069
2	-4	1	3.181	0.102	0.036	0.000	3.283	3.217	0.000	0.323	0.157	0.000	0.323	0.157
2	-5	1	4.948	0.102	0.036	0.000	5.050	4.984	0.000	0.490	0.274	0.000	0.490	0.274
2	-6	1	6.715	0.102	0.036	0.000	6.818	6.751	0.000	0.697	0.420	0.000	0.697	0.420
2	-7	1	8.482	0.102	0.036	0.000	8.585	8.518	0.000	0.946	0.593	0.000	0.946	0.593
2	-8	1	10.249	0.102	0.036	0.000	10.352	10.285	0.000	1.235	0.796	0.000	1.235	0.796
2	-9	1	12.017	0.102	0.036	0.000	12.119	12.052	0.000	1.564	1.026	0.000	1.564	1.026
2	-10	1	13.784	0.102	0.036	0.000	13.886	13.820	0.000	1.934	1.285	0.000	1.934	1.285
2	-11	1	15.551	0.102	0.036	0.000	15.653	15.587	0.000	2.345	1.573	0.000	2.345	1.573
2	-12	1	17.318	0.102	0.036	0.000	17.420	17.354	0.000	2.796	1.888	0.000	2.796	1.888
2	-13	1	19.085	0.102	0.036	0.000	19.188	19.121	0.000	3.288	2.233	0.000	3.288	2.233
2	-14	1	20.852	0.102	0.036	0.000	20.955	20.888	0.000	3.820	2.605	0.000	3.820	2.605
2	-15	1	22.619	0.102	0.036	0.000	22.722	22.655	0.000	4.393	3.006	0.000	4.393	3.006
2	-16	1	24.387	0.102	0.036	0.000	24.489	24.422	0.000	5.007	3.436	0.000	5.007	3.436
3	-17	1	24.387	1.306	0.517	0.000	25.692	24.904	0.000	6.210	3.917	0.000	6.210	3.917
3	-18	1	24.387	2.580	1.027	0.000	26.967	25.414	0.000	7.485	4.427	0.000	7.485	4.427
3	-19	1	24.387	3.926	1.565	0.000	28.313	25.952	0.000	8.830	4.965	0.000	8.830	4.965
3	-20	1	24.387	5.343	2.132	0.000	29.730	26.519	0.000	10.247	5.532	0.000	10.247	5.532
3	-21	1	24.387	6.831	2.727	0.000	31.218	27.114	0.000	11.736	6.128	0.000	11.736	6.128
3	-22	1	24.387	8.391	3.351	0.000	32.777	27.738	0.000	13.295	6.751	0.000	13.295	6.751
3	-23	1	24.387	10.021	4.003	0.000	34.408	28.390	0.000	14.926	7.403	0.000	14.926	7.403
3	-24	1	24.387	11.723	4.684	0.000	36.110	29.071	0.000	16.627	8.084	0.000	16.627	8.084
3	-25	1	24.387	13.496	5.393	0.000	37.883	29.780	0.000	18.400	8.793	0.000	18.400	8.793
3	-26	1	24.387	15.340	6.131	0.000	39.727	30.518	0.000	20.244	9.531	0.000	20.244	9.531
4	-27	1	25.730	15.340	6.131	0.000	41.070	31.861	0.000	21.280	10.256	0.000	21.280	10.256
4	-28	1	27.073	15.340	6.131	0.000	42.413	33.204	0.000	22.344	11.001	0.000	22.344	11.001
4	-29	1	28.416	15.340	6.131	0.000	43.756	34.547	0.000	23.438	11.767	0.000	23.438	11.767
4	-30	1	29.759	15.340	6.131	0.000	45.099	35.890	0.000	24.562	12.553	0.000	24.562	12.553
4	-31	1	31.102	15.340	6.131	0.000	46.442	37.233	0.000	25.715	13.361	0.000	25.715	13.361
4	-32	1	32.445	15.340	6.131	0.000	47.785	38.576	0.000	26.898	14.189	0.000	26.898	14.189
4	-33	1	33.788	15.340	6.131	0.000	49.128	39.919	0.000	28.110	15.037	0.000	28.110	15.037
4	-34	1	35.131	15.340	6.131	0.000	50.471	41.262	0.000	29.352	15.907	0.000	29.352	15.907
4	-35	1	36.474	15.340	6.131	0.000	51.814	42.605	0.000	30.624	16.797	0.000	30.624	16.797
4	-36	1	37.817	15.340	6.131	0.000	53.157	43.948	0.000	31.925	17.707	0.000	31.925	17.707
4	-37	1	39.160	15.340	6.131	0.000	54.500	45.291	0.000	33.255	18.639	0.000	33.255	18.639
4	-38	1	40.503	15.340	6.131	0.000	55.843	46.634	0.000	34.615	19.591	0.000	34.615	19.591
4	-39	1	41.846	15.340	6.131	0.000	57.186	47.977	0.000	36.005	20.563	0.000	36.005	20.563
4	-40	1	43.189	15.340	6.131	0.000	58.529	49.320	0.000	37.424	21.557	0.000	37.424	21.557
4	-41	1	44.532	15.340	6.131	0.000	59.872	50.663	0.000	38.873	22.571	0.000	38.873	22.571
4	-42	1	45.875	15.340	6.131	0.000	61.215	52.006	0.000	40.351	23.606	0.000	40.351	23.606
4	-43	1	47.218	15.340	6.131	0.000	62.558	53.349	0.000	41.859	24.661	0.000	41.859	24.661
4	-44	1	48.561	15.340	6.131	0.000	63.901	54.692	0.000	43.397	25.738	0.000	43.397	25.738
5	-45	1	48.561	18.236	7.289	63.086	129.883	55.850	0.000	46.292	26.896	43.720	90.012	26.896
5	-46	1	48.561	21.202	8.476	65.888	135.651	57.037	0.000	49.258	28.082	46.522	95.780	28.082
5	-47	1	48.561	24.240	9.691	68.084	140.885	58.252	0.000	52.296	29.297	49.391	101.687	29.297
5	-48	1	48.561	27.349	10.934	69.661	145.571	59.496	0.000	55.405	30.541	52.327	107.732	30.541

			Q-CASE						S-CASE					
Stratum	Tip	Increment	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)
5	-49	1	48.561	30.529	12.206	71.238	150.328	60.768	0.000	58.585	31.813	55.330	113.916	31.813
5	-50	1	48.561	33.780	13.507	72.815	155.157	62.068	0.000	61.836	33.113	58.401	120.238	33.113
5	-51	1	48.561	37.103	14.836	74.392	160.056	63.397	0.000	65.159	34.442	61.539	126.698	34.442
5	-52	1	48.561	40.496	16.193	75.970	165.027	64.755	0.000	68.553	35.800	64.744	133.297	35.800
5	-53	1	48.561	43.961	17.579	77.547	170.069	66.141	0.000	72.017	37.186	68.017	140.034	37.186
5	-54	1	48.561	47.497	18.994	79.124	175.182	67.555	0.000	75.554	38.600	71.356	146.910	38.600
5	-55	1	48.561	51.105	20.437	80.701	180.367	68.998	0.000	79.161	40.043	74.763	153.924	40.043
5	-56	1	48.561	54.783	21.908	82.278	185.622	70.469	0.000	82.839	41.515	78.237	161.076	41.515
5	-57	1	48.561	58.533	23.408	83.855	190.949	71.969	0.000	86.589	43.014	81.778	168.367	43.014
5	-58	1	48.561	62.354	24.936	85.433	196.347	73.497	0.000	90.410	44.543	85.387	175.797	44.543
5	-59	1	48.561	66.246	26.493	87.010	201.817	75.054	0.000	94.302	46.100	87.010	181.312	46.100
5	-60	1	48.561	70.209	28.078	88.587	207.357	76.640	0.000	98.265	47.685	88.587	186.852	47.685
5	-61	1	48.561	74.243	29.692	90.164	212.969	78.253	0.000	102.299	49.299	90.164	192.464	49.299
5	-62	1	48.561	78.349	31.334	91.741	218.651	79.896	0.000	106.405	50.941	91.741	198.146	50.941
5	-63	1	48.561	82.526	33.005	92.775	223.862	81.566	0.000	110.582	52.612	92.775	203.357	52.612
5	-64	1	48.561	86.714	34.680	92.775	228.050	83.241	0.000	114.770	54.287	92.775	207.545	54.287
5	-65	1	48.561	90.901	36.355	92.775	232.238	84.917	0.000	118.958	55.962	92.775	211.733	55.962
5	-66	1	48.561	95.089	38.031	92.775	236.426	86.592	0.000	123.146	57.637	92.775	215.921	57.637
5	-67	1	48.561	99.277	39.706	92.775	240.613	88.267	0.000	127.333	59.312	92.775	220.109	59.312
5	-68	1	48.561	103.465	41.381	92.775	244.801	89.942	0.000	131.521	60.987	92.775	224.296	60.987
5	-69	1	48.561	107.653	43.056	92.775	248.989	91.617	0.000	135.709	62.663	92.775	228.484	62.663
5	-70	1	48.561	111.841	44.731	92.775	253.177	93.292	0.000	139.897	64.338	92.775	232.672	64.338
5	-71	1	48.561	116.029	46.406	92.775	257.365	94.968	0.000	144.085	66.013	92.775	236.860	66.013
5	-72	1	48.561	120.217	48.081	92.775	261.553	96.643	0.000	148.273	67.688	92.775	241.048	67.688
5	-73	1	48.561	124.404	49.757	92.775	265.741	98.318	0.000	152.461	69.363	92.775	245.236	69.363
5	-74	1	48.561	128.592	51.432	92.775	269.929	99.993	0.000	156.649	71.038	92.775	249.424	71.038
5	-75	1	48.561	132.780	53.107	92.775	274.117	101.668	0.000	160.836	72.714	92.775	253.612	72.714
5	-76	1	48.561	136.968	54.782	92.775	278.304	103.343	0.000	165.024	74.389	92.775	257.800	74.389
5	-77	1	48.561	141.156	56.457	92.775	282.492	105.018	0.000	169.212	76.064	92.775	261.987	76.064
5	-78	1	48.561	145.344	58.132	92.775	286.680	106.694	0.000	173.400	77.739	92.775	266.175	77.739
5	-79	1	48.561	149.532	59.808	92.775	290.868	108.369	0.000	177.588	79.414	92.775	270.363	79.414
5	-80	1	48.561	153.720	61.483	92.775	295.056	110.044	0.000	181.776	81.089	92.775	274.551	81.089
5	-81	1	48.561	157.908	63.158	92.775	299.244	111.719	0.000	185.964	82.764	92.775	278.739	82.764
5	-82	1	48.561	162.095	64.833	92.775	303.432	113.394	0.000	190.152	84.440	92.775	282.927	84.440
5	-83	1	48.561	166.283	66.508	92.775	307.620	115.069	0.000	194.340	86.115	92.775	287.115	86.115
5	-84	1	48.561	170.471	68.183	92.775	311.807	116.745	0.000	198.527	87.790	92.775	291.303	87.790
5	-85	1	48.561	174.659	69.858	92.775	315.995	118.420	0.000	202.715	89.465	92.775	295.490	89.465
5	-86	1	48.561	178.847	71.534	92.775	320.183	120.095	0.000	206.903	91.140	92.775	299.678	91.140
5	-87	1	48.561	183.035	73.209	92.775	324.371	121.770	0.000	211.091	92.815	92.775	303.866	92.815
5	-88	1	48.561	187.223	74.884	92.775	328.559	123.445	0.000	215.279	94.491	92.775	308.054	94.491
5	-89	1	48.561	191.411	76.559	92.775	332.747	125.120	0.000	219.467	96.166	92.775	312.242	96.166
5	-90	1	48.561	195.598	78.234	92.775	336.935	126.795	0.000	223.655	97.841	92.775	316.430	97.841
5	-91	1	48.561	199.786	79.909	92.775	341.123	128.471	0.000	227.843	99.516	92.775	320.618	99.516
5	-92	1	48.561	203.974	81.585	92.775	345.310	130.146	0.000	232.030	101.191	92.775	324.806	101.191
5	-93	1	48.561	208.162	83.260	92.775	349.498	131.821	0.000	236.218	102.866	92.775	328.994	102.866
5	-94	1	48.561	212.350	84.935	92.775	353.686	133.496	0.000	240.406	104.541	92.775	333.181	104.541
5	-95	1	48.561	216.538	86.610	92.775	357.874	135.171	0.000	244.594	106.217	92.775	337.369	106.217
5	-96	1	48.561	220.726	88.285	92.775	362.062	136.846	0.000	248.782	107.892	92.775	341.557	107.892
5	-97	1	48.561	224.914	89.960	92.775	366.250	138.522	0.000	252.970	109.567	92.775	345.745	109.567

			Q-CASE						S-CASE					
Stratum	Tip	Increment	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)
5	-98	1	48.561	229.102	91.636	92.775	370.438	140.197	0.000	257.158	111.242	92.775	349.933	111.242
5	-99	1	48.561	233.289	93.311	92.775	374.626	141.872	0.000	261.346	112.917	92.775	354.121	112.917
5	-100	1	48.561	237.477	94.986	92.775	378.814	143.547	0.000	265.534	114.592	92.775	358.309	114.592

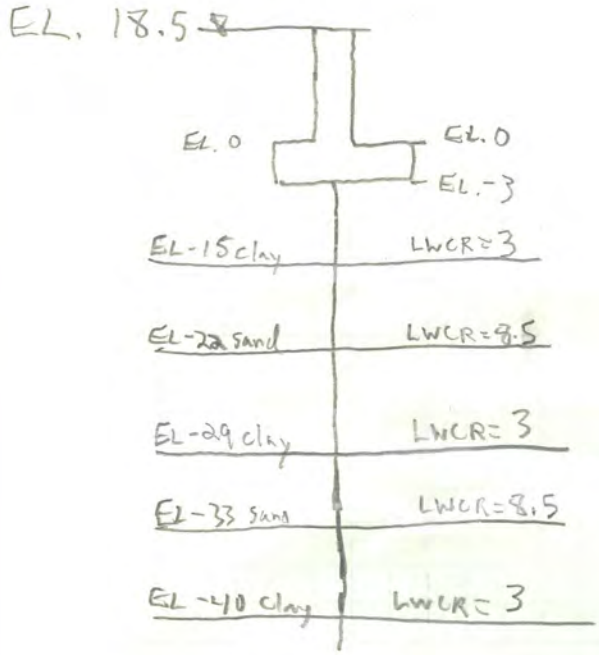
Stratum	Tip	Increment	Q-CASE						S-CASE					
			Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)	Coh./Adh Resistance (Tons)	Friction Compression (Tons)	Friction Tension (Tons)	End Bearing (Tons)	Pile Capacity Compression (Tons)	Pile Capacity Tension (Tons)

SECTION 10

Lane's Weighted Creep

Sheetpile Lengths

Northeast Tie-In



$LWCR = \frac{\frac{H}{3} + 2V}{h}$ => assume $H = 0$ for estimate on quantity

$$V = \frac{(LWCR)(h)}{2} = \frac{3(18.5')}{2} = 27.75'$$

Equivalent thickness:

clay = $\frac{3}{3}(12') = 12'$; $\frac{3}{3}(7') = 7'$; $\frac{3}{3}(7') = 7'$

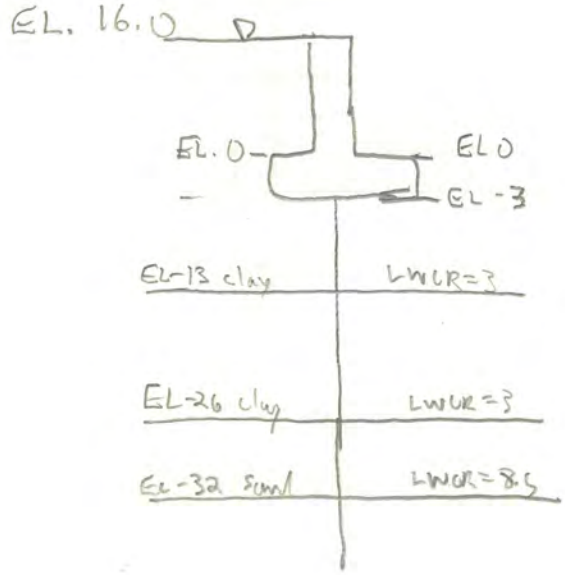
sand = $\frac{3}{8.5}(7') = 2.5'$; $\frac{3}{8.5}(4') = 1.4'$

Need to cut off ≈ 28'

$12' + 2.5' + 7' + 1.4' + 7' = 29.9'$ ← this is extended down to EL -40

So, use 37' sheet or round up to 40' for quantity estimate.

W Doucette Rd. Gate
West Bayou Paquet Gate
Bayou Paquet Gate
Bayou Liberty Gate
Bayou Bonfouca Gate



$LWCR = \frac{H}{h} + 2v$ ⇒ assume H=0 for estimate on quantity

$$V = \frac{(LWCR)(h)}{2} = \frac{3(16.0)}{2} = 24'$$

Equivalent thickness:

clay = $\frac{3}{3}(10') = 10'$; $\frac{3}{3}(13') = 13'$

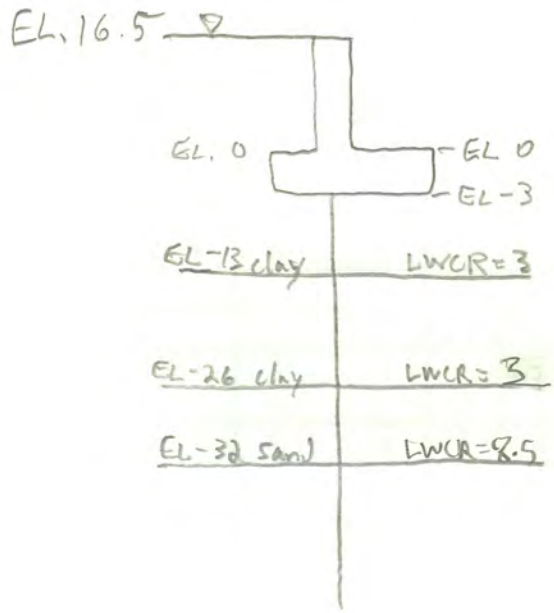
sand = $\frac{3}{8.5}(6') = 2.1'$

need to cut-off 24'

10' + 13' + 2.1 = 25.1' extend 5' into clay

So, use 30' sheetpile for quantity estimates for above listed gates.

Slidell Railroad



$LWCR = \frac{\frac{H}{3} + 2v}{h}$ ⇒ assume H = 0 for estimate on quantity

$$V = \frac{(LWCR)(h)}{2} = \frac{3(16.5)}{2} = 24.75'$$

Equivalent thickness:

clay = $\frac{3}{3}(10') = 10'$; $\frac{3}{3}(13') = 13'$

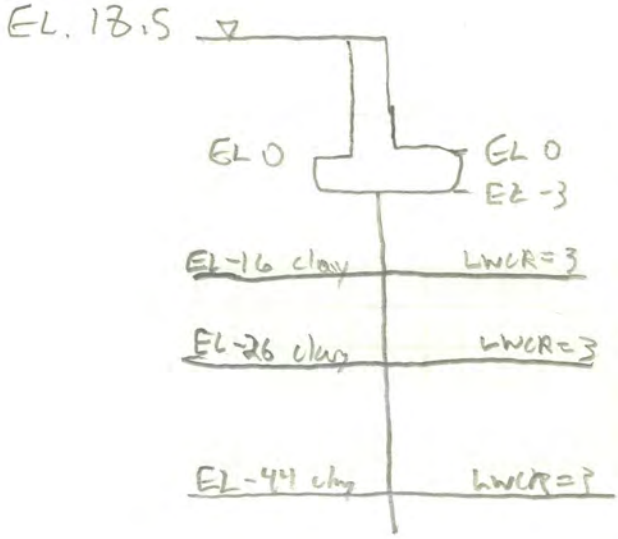
sand = $\frac{3}{8.5}(6') = 2.1'$

need to cut off 24.75'

10' + 13' + 2.1' = 25.1' extend 5' into clay

So, use 30' sheetpile for quantity estimate for Slidell Railroad.

Lakeshore Estates Northeast Gate
Kingspoint W-14 Canal Gate



All clay, so no equivalent thickness. Whatever the calculated V is is needed.

$LWCR = \frac{\frac{H}{3} + 2V}{h}$ ⇒ assume H=0 for estimate on quantity.

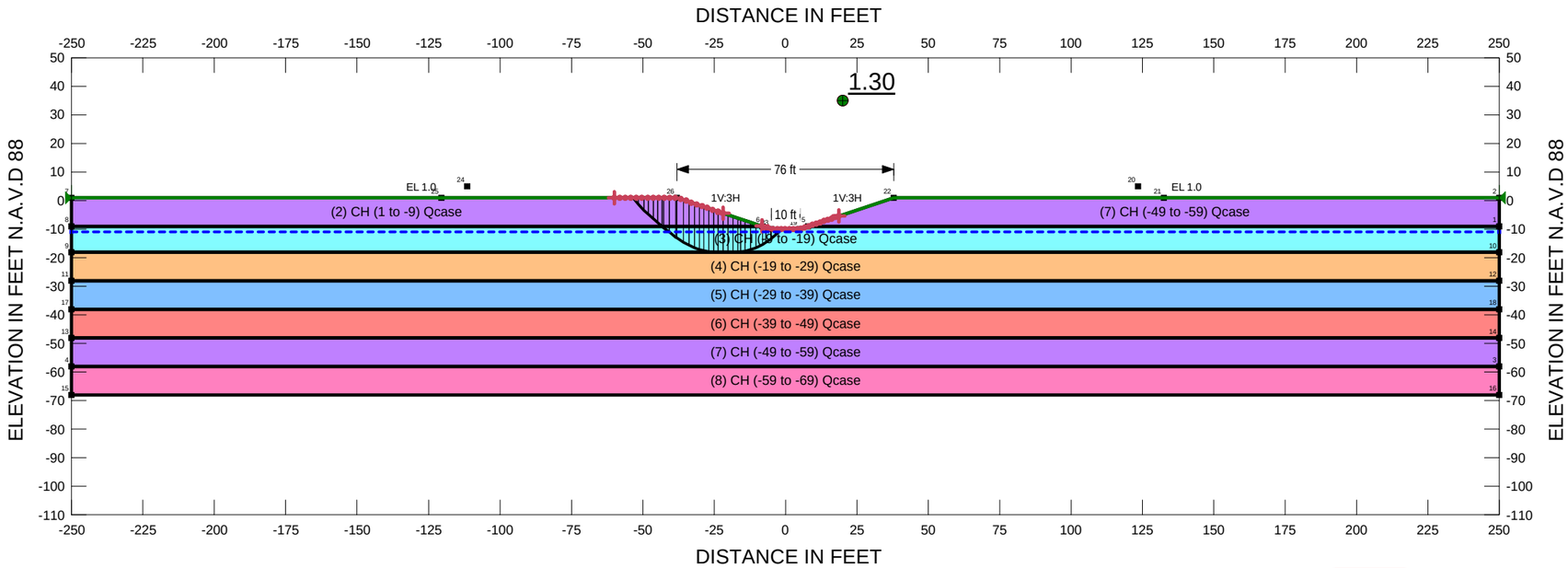
$V = \frac{(LWCR)(h)}{2} = \frac{3(18.5')}{2} = 27.75'$

heed to cutoff ≈ 28'

round up to 30' sheet for quantity estimate.

SECTION 11

Channel Stability



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(2) CH (1 to -9) Qcase	Mohr-Coulomb	90		200	0
	(3) CH (-9 to -19) Qcase	Mohr-Coulomb	100		200	0
	(4) CH (-19 to -29) Qcase	Mohr-Coulomb	110		250	0
	(5) CH (-29 to -39) Qcase	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-39 to -49) Qcase	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-49 to -59) Qcase	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-59 to -69) Qcase	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

MILE BRANCH
CHANNEL IMPROVEMENTS

CASE: SPENCERS QCASE CIRCULAR

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,454
Date: 04/11/2023
Time: 04:46:32 PM
Tool Version: 10.0.0.17401
File Name: Mile Branch - Qcase - proposed.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\Mile Branch channel improvement\
Last Solved Date: 04/11/2023
Last Solved Time: 04:47:00 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: (none)
Distribution

F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(3) CH (-9 to -19) Qcase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (1 to -9) Qcase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-39 to -49) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-19 to -29) Qcase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-29 to -39) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-49 to -59) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-59 to -69) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-60, 1) ft
Left-Zone Right Coordinate: (-21.8, -4.4) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (-8.3, -8.9) ft
Right-Zone Right Coordinate: (18.8, -5.4) ft
Right-Zone Increment: 20
Radius Increments: 10

Slip Surface Limits

Left Coordinate: (-250, 1) ft
Right Coordinate: (250, 1) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	-11 ft

Coordinate 2	250 ft	-11 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-9 ft
Point 2	250 ft	1 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft

Point 5	8 ft	-9 ft
Point 6	-8 ft	-9 ft
Point 7	-250 ft	1 ft
Point 8	-250 ft	-9 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	5 ft	-10 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	1 ft
Point 22	38 ft	1 ft
Point 23	-5 ft	-10 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	1 ft
Point 26	-38 ft	1 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-59 to -69) Qcase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-29 to -39) Qcase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-39 to -49) Qcase	17,13,14,18	5,000 ft²
Region 4	(2) CH (1 to -9) Qcase	25,26,6,8,7	2,270 ft²
Region 5	(3) CH (-9 to -19) Qcase	9,8,6,23,19,5,1,10	4,487 ft²
Region 6	(4) CH (-19 to -29) Qcase	11,9,10,12	5,000 ft²
Region 7	(7) CH (-49 to -59) Qcase	13,14,3,4	5,000 ft²
Region 8	(7) CH (-49 to -59) Qcase	5,22,21,2,1	2,270 ft²

Slip Results

Slip Surfaces Analysed: 511 of 4852 converged

Current Slip Surface

Slip Surface: 4,852
Factor of Safety: 1.30
Volume: 526.86966 ft³
Weight: 50,124.774 lbf
Resisting Moment: 701,583.8 lbf·ft
Activating Moment: 538,843 lbf·ft
Resisting Force: 10,435.63 lbf
Activating Force: 7,996.9669 lbf

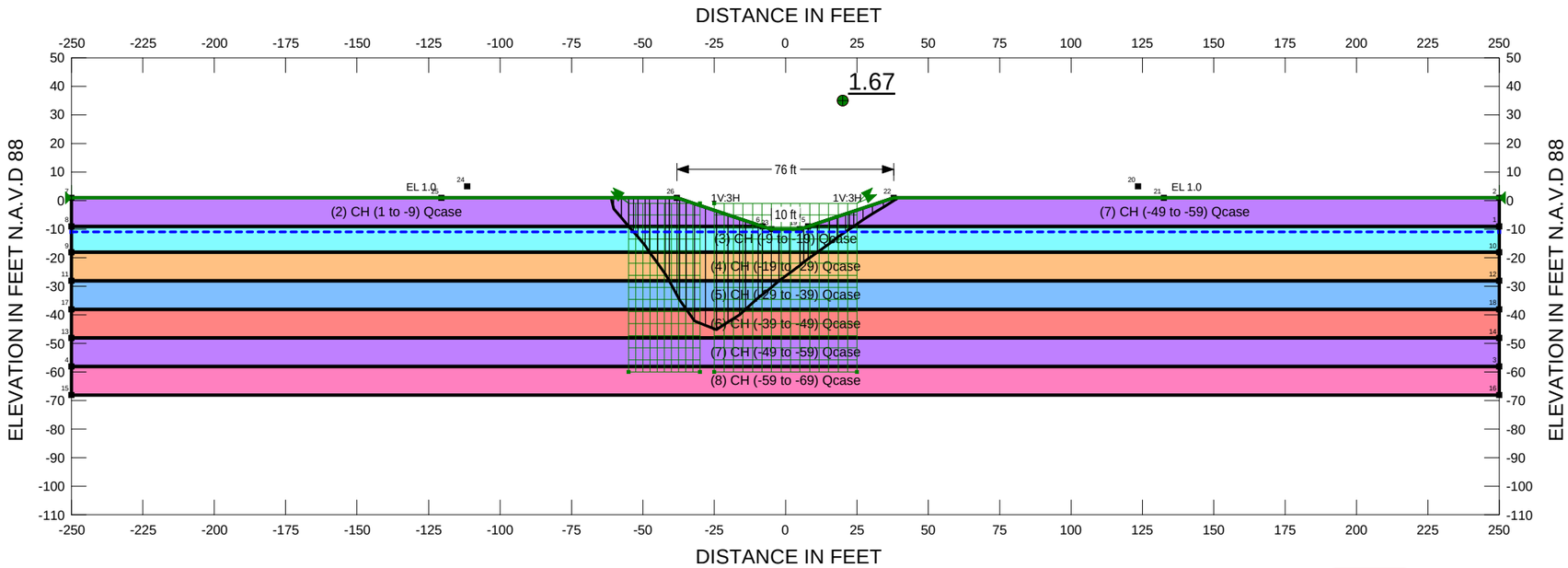
Slip Rank: 1 of 4,852 slip surfaces
Exit: (-1.17067, -10) ft
Entry: (-53.348818, 1) ft
Radius: 25.842493 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-52.390071 ft	-0.122059 ft	-678.78352 psf	-57.702846 psf	-0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 2	-50.472577 ft	-2.366177 ft	-538.75056 psf	123.10666 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 3	-48.718927 ft	-4.1772065 ft	-425.74231 psf	319.67173 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 4	-47.129122 ft	-5.5551475 ft	-339.7588 psf	433.79494 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 5	-45.539317 ft	-6.9330885 ft	-253.77528 psf	547.91814 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 6	-43.949511 ft	-8.3110295 ft	-167.79176 psf	662.04135 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 7	-42.861854 ft	-9.2537405 ft	-108.96659 psf	742.45315 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 8	-41.624545 ft	-10.25374 ft	-46.566593 psf	851.37899 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 9	-39.535995 ft	-11.90383 ft	56.398961 psf	1,004.3057 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 10	-38.196 ft	-12.939562 ft	121.02864 psf	1,129.308 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 11	-36.80668 ft	-13.874535 ft	179.37099 psf	1,183.3677 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 12	-34.670065 ft	-15.144466 ft	258.61466 psf	1,289.5716 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 13	-32.783475 ft	-16.078185 ft	316.87876 psf	1,324.6116 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 14	-31.020653 ft	-16.79757 ft	361.7684 psf	1,395.0822 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 15	-29.381598 ft	-17.302622 ft	393.28358 psf	1,396.3758 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19)

								Qcase
Slice 16	-27.67168 ft	-17.708624 ft	418.61817 psf	1,425.1066 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 17	-25.993665 ft	-17.929776 ft	432.41799 psf	1,422.5725 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 18	-24.359614 ft	-17.997704 ft	436.65674 psf	1,405.7448 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 19	-22.666761 ft	-17.998214 ft	436.68857 psf	1,355.0118 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 20	-20.973908 ft	-17.998725 ft	436.72041 psf	1,304.2788 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 21	-19.281055 ft	-17.999235 ft	436.75225 psf	1,253.5457 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 22	-17.576589 ft	-17.999748 ft	436.7843 psf	1,202.4647 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 23	-16.16961 ft	-17.96263 ft	434.46814 psf	1,175.1407 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 24	-14.92064 ft	-17.82896 ft	426.1271 psf	1,142.7481 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 25	-13.260515 ft	-17.447428 ft	402.31949 psf	1,096.2708 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 26	-11.340325 ft	-16.876951 ft	366.72176 psf	978.10686 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 27	-9.190115 ft	-15.949199 ft	308.83002 psf	876.5639 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 28	-7.39987 ft	-14.98269 ft	248.51983 psf	715.51027 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 29	-5.943465 ft	-14.011333 ft	187.90721 psf	610.72533 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 30	-5.043595 ft	-13.326528 ft	145.17537 psf	527.23853 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 31	-4.3337311 ft	-12.716813 ft	107.12912 psf	458.94824 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 32	-3.0011932 ft	-11.572271 ft	35.709708 psf	333.73965 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 33	-1.7527972 ft	-10.5 ft	-31.2 psf	216.43724 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19)

								Qcase



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(2) CH (1 to -9) Qcase	Mohr-Coulomb	90		200	0
	(3) CH (-9 to -19) Qcase	Mohr-Coulomb	100		200	0
	(4) CH (-19 to -29) Qcase	Mohr-Coulomb	110		250	0
	(5) CH (-29 to -39) Qcase	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-39 to -49) Qcase	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-49 to -59) Qcase	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-59 to -69) Qcase	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

MILE BRANCH
CHANNEL IMPROVEMENTS

CASE: SPENCERS QCASE BLOCK

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,454
Date: 04/11/2023
Time: 04:46:32 PM
Tool Version: 10.0.0.17401
File Name: Mile Branch - Qcase - proposed.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\Mile Branch channel improvement\
Last Solved Date: 04/11/2023
Last Solved Time: 04:47:04 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: Yes
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 3,000
Convergence Tolerance: 1e-07
Starting Points: 8
Ending Points: 16
Complete Passes per Insertion: 1
Driving Side Maximum Convex Angle: 8 °
Resisting Side Maximum Convex Angle: 3 °
Tension Crack Option: (none)

Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(3) CH (-9 to -19) Qcase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (1 to -9) Qcase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-39 to -49) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-19 to -29) Qcase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-29 to -39) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-49 to -59) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-59 to -69) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 1) ft
Right Coordinate: (250, 1) ft

Slip Surface Block

Left Grid
Upper Left: (-30, -1) ft
Lower Left: (-30, -60) ft
Lower Right: (-55, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (-25, -1) ft
Lower Left: (-25, -60) ft
Lower Right: (25, -60) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	-11 ft
Coordinate 2	250 ft	-11 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-9 ft
Point 2	250 ft	1 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	8 ft	-9 ft
Point 6	-8 ft	-9 ft
Point 7	-250 ft	1 ft
Point 8	-250 ft	-9 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	5 ft	-10 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	1 ft
Point 22	38 ft	1 ft
Point 23	-5 ft	-10 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	1 ft
Point 26	-38 ft	1 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-59 to -69) Qcase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-29 to -39) Qcase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-39 to -49) Qcase	17,13,14,18	5,000 ft²
Region 4	(2) CH (1 to -9) Qcase	25,26,6,8,7	2,270 ft²
Region 5	(3) CH (-9 to -19) Qcase	9,8,6,23,19,5,1,10	4,487 ft²
Region 6	(4) CH (-19 to -29) Qcase	11,9,10,12	5,000 ft²
Region 7	(7) CH (-49 to -59) Qcase	13,14,3,4	5,000 ft²
Region 8	(7) CH (-49 to -59) Qcase	5,22,21,2,1	2,270 ft²

Slip Results

Slip Surfaces Analysed: 3994 of 39601 converged

Current Slip Surface

Slip Surface: 39,601

Factor of Safety: 1.67
Volume: 1,916.5717 ft³
Weight: 197,993.06 lbf
Resisting Moment: 2,375,480.6 lbf·ft
Activating Moment: 1,414,387.6 lbf·ft
Resisting Force: 30,772.984 lbf
Activating Force: 18,427.54 lbf
Slip Rank: 1 of 39,601 slip surfaces
Exit: (39.550332, 1) ft
Entry: (-61.04335, 1) ft
Radius: 45.568509 ft
Center: (20, 35) ft

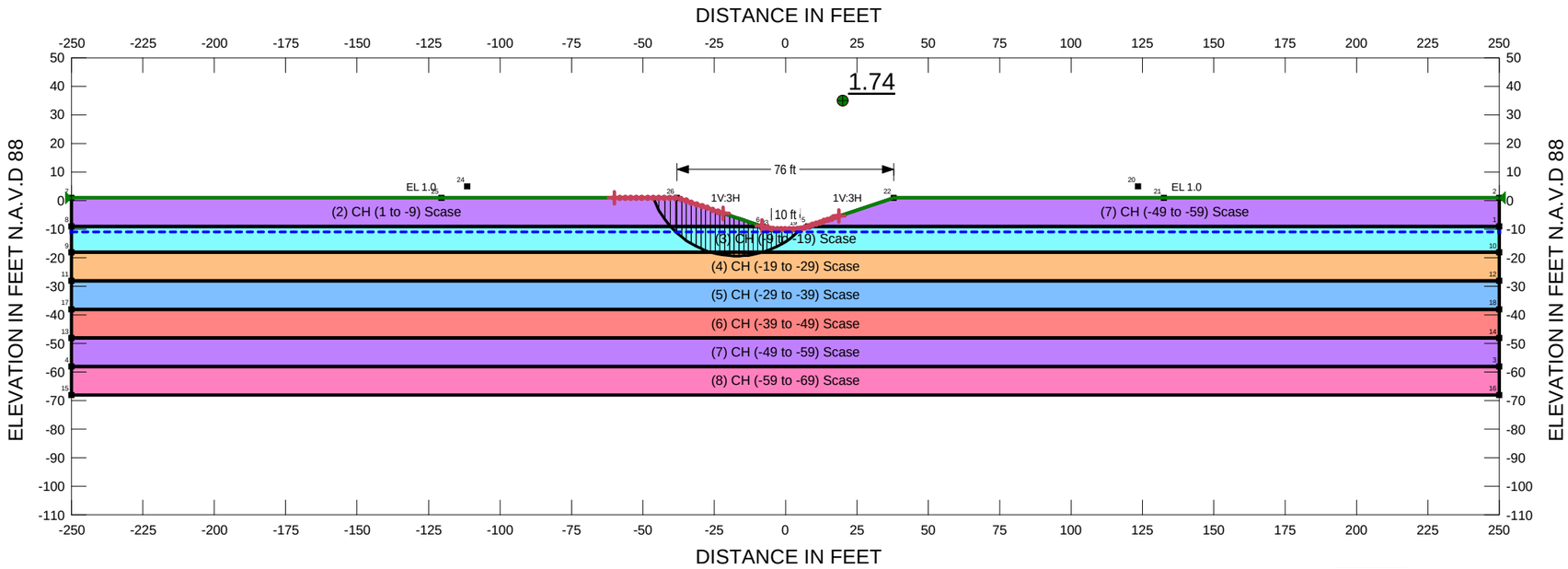
Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-60.545785 ft	-0.951894 ft	-627.00181 psf	-363.31725 psf	-0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 2	-58.744695 ft	-4.427841 ft	-410.10272 psf	362.26641 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 3	-56.137645 ft	-7.475947 ft	-219.90091 psf	651.83081 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 4	-53.978819 ft	-10 ft	-62.4 psf	902.1665 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 5	-52.377139 ft	-11.872649 ft	54.453329 psf	1,099.8312 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 6	-50.437 ft	-14.230333 ft	201.57278 psf	1,344.0204 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 7	-48.418273 ft	-16.857684 ft	365.51945 psf	1,615.3375 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 8	-46.204809 ft	-19.922625 ft	556.77178 psf	1,917.0893 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 9	-43.427816 ft	-23.767874 ft	796.71535 psf	2,368.1741 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 10	-41.411059 ft	-26.84525 ft	988.74357 psf	2,715.9581 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase

Slice 11	-39.391399 ft	-30.557404 ft	1,220.382 psf	3,130.3319 psf	0 psf	275.06256 psf	0 psf	(5) CH (-29 to -39) Qcase
Slice 12	-37.557535 ft	-33.928062 ft	1,430.7111 psf	3,479.4944 psf	0 psf	308.09501 psf	0 psf	(5) CH (-29 to -39) Qcase
Slice 13	-35.951775 ft	-36.370658 ft	1,583.1291 psf	3,705.695 psf	0 psf	332.03245 psf	0 psf	(5) CH (-29 to -39) Qcase
Slice 14	-33.32494 ft	-40.049873 ft	1,812.7121 psf	4,017.4863 psf	0 psf	368.70372 psf	0 psf	(6) CH (-39 to -49) Qcase
Slice 15	-29.91679 ft	-42.856556 ft	1,987.8491 psf	4,258.251 psf	0 psf	397.05122 psf	0 psf	(6) CH (-39 to -49) Qcase
Slice 16	-26.02757 ft	-44.370176 ft	2,082.299 psf	4,303.3761 psf	0 psf	412.33878 psf	0 psf	(6) CH (-39 to -49) Qcase
Slice 17	-22.084273 ft	-43.818517 ft	2,047.8755 psf	4,181.8188 psf	0 psf	406.76703 psf	0 psf	(6) CH (-39 to -49) Qcase
Slice 18	-18.086897 ft	-41.201581 ft	1,884.5786 psf	3,778.8875 psf	0 psf	380.33596 psf	0 psf	(6) CH (-39 to -49) Qcase
Slice 19	-15.030704 ft	-38.946556 ft	1,743.8651 psf	3,456.6211 psf	0 psf	357.56022 psf	0 psf	(6) CH (-39 to -49) Qcase
Slice 20	-11.774374 ft	-36.03187 ft	1,561.9887 psf	3,041.326 psf	0 psf	328.71233 psf	0 psf	(5) CH (-29 to -39) Qcase
Slice 21	-8.787775 ft	-33.420498 ft	1,399.0391 psf	2,661.9171 psf	0 psf	303.12088 psf	0 psf	(5) CH (-29 to -39) Qcase
Slice 22	-6.5 ft	-31.552461 ft	1,282.4736 psf	2,384.546 psf	0 psf	284.81412 psf	0 psf	(5) CH (-29 to -39) Qcase
Slice 23	-3.62534 ft	-29.205215 ft	1,136.0054 psf	2,077.0361 psf	0 psf	261.81111 psf	0 psf	(5) CH (-29 to -39) Qcase
Slice 24	-0.41034603 ft	-26.706304 ft	980.07338 psf	1,802.1139 psf	0 psf	250 psf	0 psf	(4) CH (-19 to

								-29) Qcase
Slice 25	3.214994 ft	-23.994766 ft	810.87342 psf	1,513.5568 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 26	5.725835 ft	-22.116807 ft	693.68877 psf	1,337.1144 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 27	7.225835 ft	-20.995426 ft	623.71455 psf	1,266.0897 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 28	9.6171972 ft	-19.208463 ft	512.20806 psf	1,160.8603 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 29	13.301577 ft	-16.455282 ft	340.40963 psf	999.13599 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 30	16.764031 ft	-13.932924 ft	183.01444 psf	879.90887 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 31	19.554574 ft	-11.977641 ft	61.004814 psf	794.05834 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 32	21.700573 ft	-10.473979 ft	-32.82371 psf	728.0371 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 33	23.153017 ft	-9.473979 ft	-95.22371 psf	682.8948 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 34	25.489789 ft	-7.8955938 ft	-193.71495 psf	691.65829 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase
Slice 35	28.759896 ft	-5.6867813 ft	-331.54485 psf	566.79428 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase
Slice 36	32.296213 ft	-3.4231049 ft	-472.79825 psf	429.81431 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase
Slice 37	36.098737 ft	-1.1045648 ft	-617.47516 psf	312.1735 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase

Slice 38	38.775166 ft	0.52735263 ft	-719.3068 psf	200.45021 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(2) CH (1 to -9) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-9 to -19) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-19 to -29) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-29 to -39) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-39 to -49) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-49 to -59) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-59 to -69) Scase	Spatial Mohr-Coulomb	97	0	23

MILE BRANCH
CHANNEL IMPROVEMENTS

CASE: SPENCERS SCASE CIRCULAR

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (circ) (LS)

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Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (circ) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(3) CH (-9 to -19) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (1 to -9) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-39 to -49) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-19 to -29) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-29 to -39) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-49 to -59) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-59 to -69) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (-60, 1) ft
Left-Zone Right Coordinate: (-21.8, -4.4) ft
Left-Zone Increment: 20
Right Type: Range
Right-Zone Left Coordinate: (-8.3, -8.9) ft
Right-Zone Right Coordinate: (18.8, -5.4) ft
Right-Zone Increment: 20
Radius Increments: 10

Slip Surface Limits

Left Coordinate: (-250, 1) ft
Right Coordinate: (250, 1) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	-11 ft
Coordinate 2	250 ft	-11 ft

Points

	X	Y
Point 1	250 ft	-9 ft
Point 2	250 ft	1 ft
Point 3	250 ft	-58 ft

Point 4	-250 ft	-58 ft
Point 5	8 ft	-9 ft
Point 6	-8 ft	-9 ft
Point 7	-250 ft	1 ft
Point 8	-250 ft	-9 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	5 ft	-10 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	1 ft
Point 22	38 ft	1 ft
Point 23	-5 ft	-10 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	1 ft
Point 26	-38 ft	1 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-59 to -69) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-29 to -39) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-39 to -49) Scase	17,13,14,18	5,000 ft²
Region 4	(2) CH (1 to -9) Scase	25,26,6,8,7	2,270 ft²
Region 5	(3) CH (-9 to -19) Scase	9,8,6,23,19,5,1,10	4,487 ft²
Region 6	(4) CH (-19 to -29) Scase	11,9,10,12	5,000 ft²
Region 7	(7) CH (-49 to -59) Scase	13,14,3,4	5,000 ft²
Region 8	(7) CH (-49 to -59) Scase	5,22,21,2,1	2,270 ft²

Slip Results

Slip Surfaces Analysed: 962 of 4851 converged

Current Slip Surface

Slip Surface: 1,735
Factor of Safety: 1.74
Volume: 529.33288 ft³
Weight: 51,036.561 lbf
Resisting Moment: 971,227.27 lbf·ft
Activating Moment: 557,420.92 lbf·ft
Resisting Force: 14,305.863 lbf

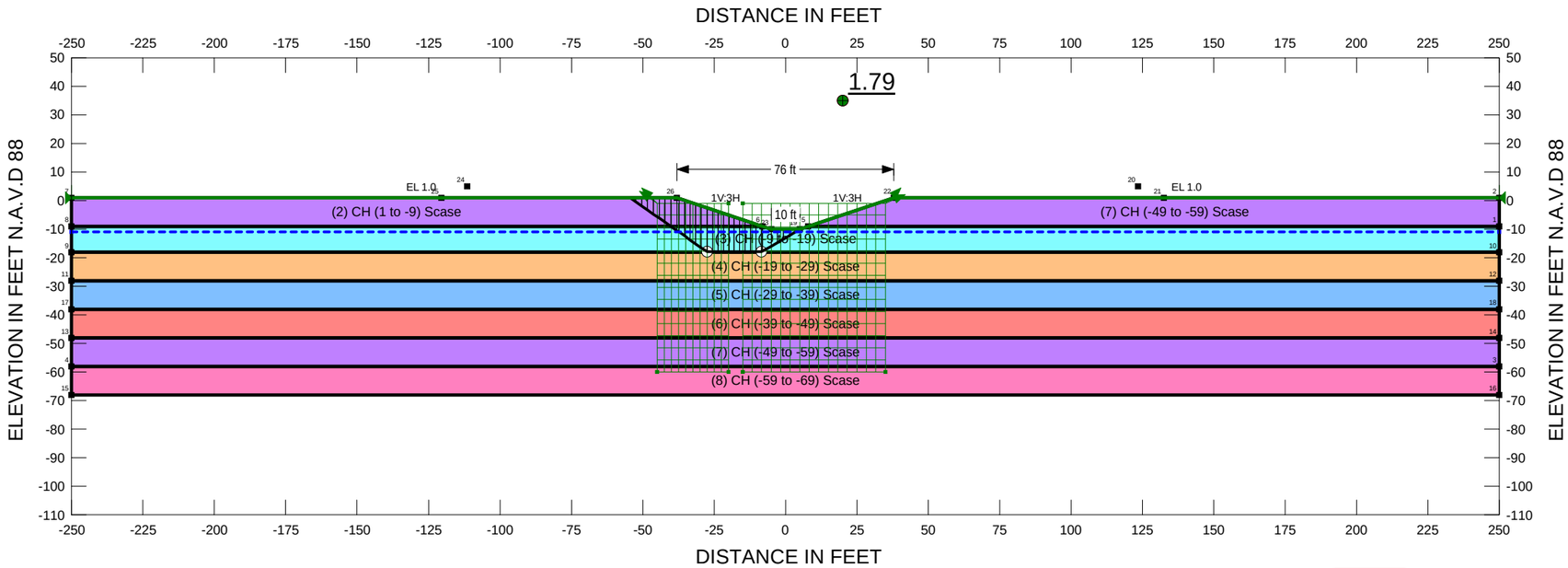
Activating Force: 8,248.9773 lbf
Slip Rank: 1 of 4,851 slip surfaces
Exit: (5.5065835, -9.8311388) ft
Entry: (-46.323295, 1) ft
Radius: 31.270098 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-45.317447 ft	-1.181502 ft	-612.67427 psf	107.06774 psf	45.44756 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 2	-43.305751 ft	-4.9367898 ft	-378.34432 psf	335.84537 psf	142.5579 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 3	-41.294055 ft	-7.7552877 ft	-202.47005 psf	539.91291 psf	229.17943 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 4	-39.307485 ft	-10 ft	-62.4 psf	728.93598 psf	309.41496 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 5	-38.163382 ft	-11.150152 ft	9.3695007 psf	838.79068 psf	352.0684 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 6	-37.160475 ft	-12.008853 ft	62.952403 psf	911.6343 psf	360.24409 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 7	-35.481425 ft	-13.332808 ft	145.56724 psf	1,017.1551 psf	369.9671 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 8	-33.802375 ft	-14.483278 ft	217.35654 psf	1,106.5196 psf	377.42734 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 9	-32.123326 ft	-15.482332 ft	279.6975 psf	1,181.4904 psf	382.78837 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 10	-30.444276 ft	-16.34616 ft	333.60037 psf	1,243.3577 psf	386.16908 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 11	-28.765226 ft	-17.086931 ft	379.8245 psf	1,293.0801 psf	387.65399 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 12	-27.086176 ft	-17.713933 ft	418.94941 psf	1,331.3705 psf	387.29978 psf	0 psf	0 psf	(3) CH (-9 to

								-19) Scase
Slice 13	-25.417258 ft	-18.231774 ft	451.26273 psf	1,360.807 psf	386.07864 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 14	-23.758471 ft	-18.647091 ft	477.1785 psf	1,381.57 psf	383.89141 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 15	-22.099685 ft	-18.967659 ft	497.18194 psf	1,391.5274 psf	379.62712 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 16	-20.440898 ft	-19.19642 ft	511.45661 psf	1,390.7711 psf	373.24684 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 17	-18.782112 ft	-19.335399 ft	520.12889 psf	1,379.2808 psf	364.68833 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 18	-17.123326 ft	-19.385796 ft	523.2737 psf	1,356.9229 psf	353.8631 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 19	-15.464539 ft	-19.348043 ft	520.9179 psf	1,323.4437 psf	340.652 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 20	-13.805753 ft	-19.221817 ft	513.04138 psf	1,278.4549 psf	324.89877 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 21	-12.146966 ft	-19.00603 ft	499.57626 psf	1,221.4111 psf	306.4007 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 22	-10.48818 ft	-18.69878 ft	480.40385 psf	1,151.5748 psf	284.89515 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 23	-8.8293932 ft	-18.297263 ft	455.34921 psf	1,067.9646 psf	260.03979 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 24	-7.8811142 ft	-18.036264 ft	439.06288 psf	1,014.488 psf	244.25348 psf	0 psf	0 psf	(4) CH (-19 to -29) Scase
Slice 25	-7.0716713 ft	-17.768598 ft	422.36051 psf	962.41014 psf	229.23747 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase

Slice 26	-5.6905571 ft	-17.269101 ft	391.19187 psf	867.11139 psf	202.01585 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 27	-4.0682116 ft	-16.577326 ft	348.02517 psf	778.61401 psf	182.77412 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 28	-2.2046347 ft	-15.652651 ft	290.32545 psf	693.10267 psf	170.96878 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 29	-0.34105779 ft	-14.564353 ft	222.41566 psf	584.99918 psf	153.90757 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 30	1.5225191 ft	-13.291027 ft	142.96006 psf	448.38806 psf	129.64649 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 31	3.386096 ft	-11.802501 ft	50.076044 psf	273.24863 psf	94.731142 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 32	4.6589422 ft	-10.672284 ft	-20.449452 psf	117.10437 psf	49.707857 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 33	5.2532918 ft	-10.087854 ft	-56.91792 psf	31.150682 psf	13.22268 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(2) CH (1 to -9) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-9 to -19) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-19 to -29) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-29 to -39) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-39 to -49) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-49 to -59) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-59 to -69) Scase	Spatial Mohr-Coulomb	97	0	23

MILE BRANCH
CHANNEL IMPROVEMENTS

CASE: SPENCERS SCASE BLOCK

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,460
Date: 04/11/2023
Time: 05:44:34 PM
Tool Version: 10.0.0.17401
File Name: Mile Branch - Scase - proposed - Spenc.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\Mile Branch channel improvement\
Last Solved Date: 04/11/2023
Last Solved Time: 05:45:05 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100

Tolerable difference in F of S: 0.01
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

(3) CH (-9 to -19) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (1 to -9) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-39 to -49) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-19 to -29) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-29 to -39) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure

Piezometric Line: 1

(7) CH (-49 to -59) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-59 to -69) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 1) ft
Right Coordinate: (250, 1) ft

Slip Surface Block

Left Grid
Upper Left: (-20, -1) ft
Lower Left: (-20, -60) ft
Lower Right: (-45, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (-15, -1) ft
Lower Left: (-15, -60) ft
Lower Right: (35, -60) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	-11 ft
Coordinate 2	250 ft	-11 ft

Points

	X	Y
Point 1	250 ft	-9 ft
Point 2	250 ft	1 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	8 ft	-9 ft
Point 6	-8 ft	-9 ft
Point 7	-250 ft	1 ft
Point 8	-250 ft	-9 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	5 ft	-10 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	1 ft
Point 22	38 ft	1 ft
Point 23	-5 ft	-10 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	1 ft
Point 26	-38 ft	1 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-59 to -69) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-29 to -39) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-39 to -49) Scase	17,13,14,18	5,000 ft²
Region 4	(2) CH (1 to -9) Scase	25,26,6,8,7	2,270 ft²
Region 5	(3) CH (-9 to -19) Scase	9,8,6,23,19,5,1,10	4,487 ft²
Region 6	(4) CH (-19 to -29) Scase	11,9,10,12	5,000 ft²

Region 7	(7) CH (-49 to -59) Scase	13,14,3,4	5,000 ft²
Region 8	(7) CH (-49 to -59) Scase	5,22,21,2,1	2,270 ft²

Slip Results

Slip Surfaces Analysed: 5480 of 39600 converged

Current Slip Surface

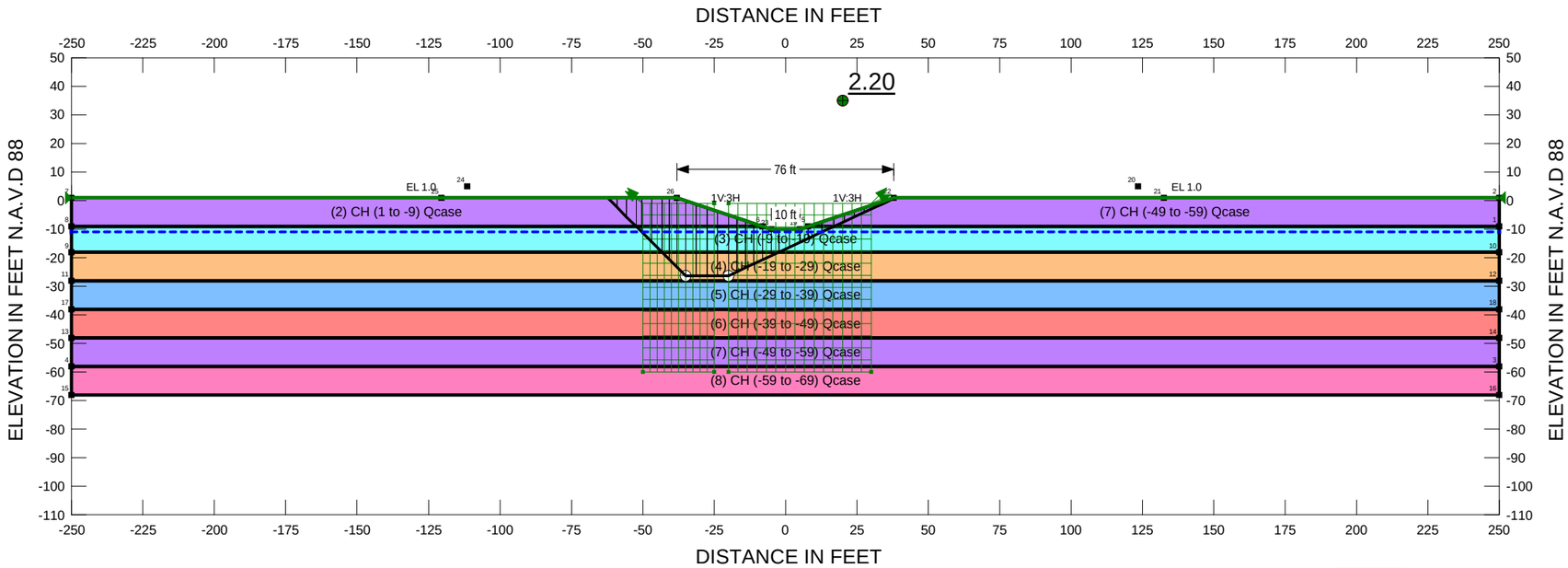
Slip Surface: 11,452
Factor of Safety: 1.79
Volume: 524.0079 ft³
Weight: 49,971.785 lbf
Resisting Moment: 978,037.01 lbf·ft
Activating Moment: 545,368.64 lbf·ft
Resisting Force: 14,921.157 lbf
Activating Force: 8,354.9804 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (5.6521648, -9.7826117) ft
Entry: (-54.430791, 1) ft
Radius: 28.272493 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-53.410685 ft	0.28571429 ft	-704.22857 psf	51.677476 psf	21.935787 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 2	-51.370474 ft	-1.1428571 ft	-615.08571 psf	155.03243 psf	65.807362 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 3	-49.330262 ft	-2.5714286 ft	-525.94286 psf	258.38738 psf	109.67894 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 4	-47.290051 ft	-4 ft	-436.8 psf	361.74233 psf	153.55051 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 5	-45.24984 ft	-5.4285714 ft	-347.65714 psf	465.09729 psf	197.42208 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 6	-43.209628 ft	-6.8571429 ft	-258.51429 psf	568.45224 psf	241.29366 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 7	-41.169417 ft	-8.2857143 ft	-169.37143 psf	671.80719 psf	285.16523 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 8	-39.074655 ft	-9.7524819 ft	-77.845132 psf	783.97456 psf	332.77746 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase

Slice 9	-37.646507 ft	-10.752482 ft	-15.445132 psf	855.83687 psf	363.2812 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 10	-36.313713 ft	-11.685714 ft	42.788571 psf	903.06095 psf	365.16396 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 11	-34.35511 ft	-13.057143 ft	128.36571 psf	974.7643 psf	359.27488 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 12	-32.396507 ft	-14.428571 ft	213.94286 psf	1,046.4676 psf	353.38581 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 13	-30.437904 ft	-15.8 ft	299.52 psf	1,118.171 psf	347.49673 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 14	-28.479301 ft	-17.171429 ft	385.09714 psf	1,189.8743 psf	341.60766 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 15	-26.541667 ft	-17.857143 ft	427.88571 psf	1,484.08 psf	448.32787 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 16	-24.625 ft	-17.857143 ft	427.88571 psf	1,424.192 psf	422.90691 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 17	-22.708333 ft	-17.857143 ft	427.88571 psf	1,364.3039 psf	397.48595 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 18	-20.791667 ft	-17.857143 ft	427.88571 psf	1,304.4159 psf	372.06499 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 19	-18.875 ft	-17.857143 ft	427.88571 psf	1,244.5279 psf	346.64403 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 20	-16.958333 ft	-17.857143 ft	427.88571 psf	1,184.6398 psf	321.22306 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 21	-15.041667 ft	-17.857143 ft	427.88571 psf	1,124.7518 psf	295.8021 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 22	-13.125 ft	-17.857143 ft	427.88571 psf	1,064.8638 psf	270.38114 psf	0 psf	0 psf	(3) CH (-9 to

								-19) Scase
Slice 23	-11.208333 ft	-17.857143 ft	427.88571 psf	1,004.9757 psf	244.96018 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 24	-9.2916667 ft	-17.857143 ft	427.88571 psf	945.0877 psf	219.53922 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 25	-8.1666667 ft	-17.760918 ft	421.88127 psf	1,110.8143 psf	292.43472 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 26	-6.5 ft	-16.798667 ft	361.83684 psf	917.14418 psf	235.71398 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 27	-3.9320517 ft	-15.316062 ft	269.32225 psf	666.6027 psf	168.63554 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 28	-1.7961551 ft	-14.082901 ft	192.37304 psf	515.50351 psf	137.16075 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 29	0.33974156 ft	-12.849741 ft	115.42382 psf	364.40433 psf	105.68596 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 30	2.4756382 ft	-11.61658 ft	38.474607 psf	213.30515 psf	74.211163 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 31	4.2717932 ft	-10.57957 ft	-26.234855 psf	79.838939 psf	33.889619 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 32	5.3260824 ft	-9.9708755 ft	-64.217369 psf	10.961159 psf	4.6527361 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase



Color	Name	Model	Unit Weight (pcf)	Cohesion Fn	Cohesion' (psf)	Phi' (°)
	(2) CH (1 to -9) Qcase	Mohr-Coulomb	90		200	0
	(3) CH (-9 to -19) Qcase	Mohr-Coulomb	100		200	0
	(4) CH (-19 to -29) Qcase	Mohr-Coulomb	110		250	0
	(5) CH (-29 to -39) Qcase	Spatial Mohr-Coulomb	110	CH, -28 to -38		0
	(6) CH (-39 to -49) Qcase	Spatial Mohr-Coulomb	109	CH, -38 to -48		0
	(7) CH (-49 to -59) Qcase	Spatial Mohr-Coulomb	115	CH, -48 to -58		0
	(8) CH (-59 to -69) Qcase	Spatial Mohr-Coulomb	97	CH, -58 to -68		0

MILE BRANCH
CHANNEL IMPROVEMENTS

CASE: JANBU QCASE BLOCK

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,458
Date: 04/11/2023
Time: 05:28:04 PM
Tool Version: 10.0.0.17401
File Name: Mile Branch - Qcase - proposed - Janb.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\Mile Branch channel improvement\
Last Solved Date: 04/11/2023
Last Solved Time: 05:28:19 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: Yes
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100

Tolerable difference in F of S: 0.01

Materials

(3) CH (-9 to -19) Qcase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (1 to -9) Qcase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 200 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-39 to -49) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion Fn: CH, -38 to -48
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-19 to -29) Qcase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 250 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-29 to -39) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion Fn: CH, -28 to -38
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-49 to -59) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf

Cohesion Fn: CH, -48 to -58
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-59 to -69) Qcase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion Fn: CH, -58 to -68
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 1) ft
Right Coordinate: (250, 1) ft

Slip Surface Block

Left Grid
Upper Left: (-25, -1) ft
Lower Left: (-25, -60) ft
Lower Right: (-50, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (-20, -1) ft
Lower Left: (-20, -60) ft
Lower Right: (30, -60) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	-11 ft
Coordinate 2	250 ft	-11 ft

Cohesion Functions

CH, -58 to -68

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 563 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-68, 638)
Data Point: (-58, 563)

CH, -48 to -58

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 449 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-58, 563)
Data Point: (-48, 449)

CH, -38 to -48

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 348 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-48, 449)
Data Point: (-38, 348)

CH, -28 to -38

Model: Spline Data Point Function
Function: Cohesion vs. Y
Curve Fit to Data: 100 %
Segment Curvature: 100 %
Y-Intercept: 250 psf
Data Points: Y (ft), Cohesion (psf)
Data Point: (-38, 348)
Data Point: (-28, 250)

Points

	X	Y
Point 1	250 ft	-9 ft
Point 2	250 ft	1 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	8 ft	-9 ft
Point 6	-8 ft	-9 ft
Point 7	-250 ft	1 ft

Point 8	-250 ft	-9 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	5 ft	-10 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	1 ft
Point 22	38 ft	1 ft
Point 23	-5 ft	-10 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	1 ft
Point 26	-38 ft	1 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-59 to -69) Qcase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-29 to -39) Qcase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-39 to -49) Qcase	17,13,14,18	5,000 ft²
Region 4	(2) CH (1 to -9) Qcase	25,26,6,8,7	2,270 ft²
Region 5	(3) CH (-9 to -19) Qcase	9,8,6,23,19,5,1,10	4,487 ft²
Region 6	(4) CH (-19 to -29) Qcase	11,9,10,12	5,000 ft²
Region 7	(7) CH (-49 to -59) Qcase	13,14,3,4	5,000 ft²
Region 8	(7) CH (-49 to -59) Qcase	5,22,21,2,1	2,270 ft²

Slip Results

Slip Surfaces Analysed: 5899 of 39600 converged

Current Slip Surface

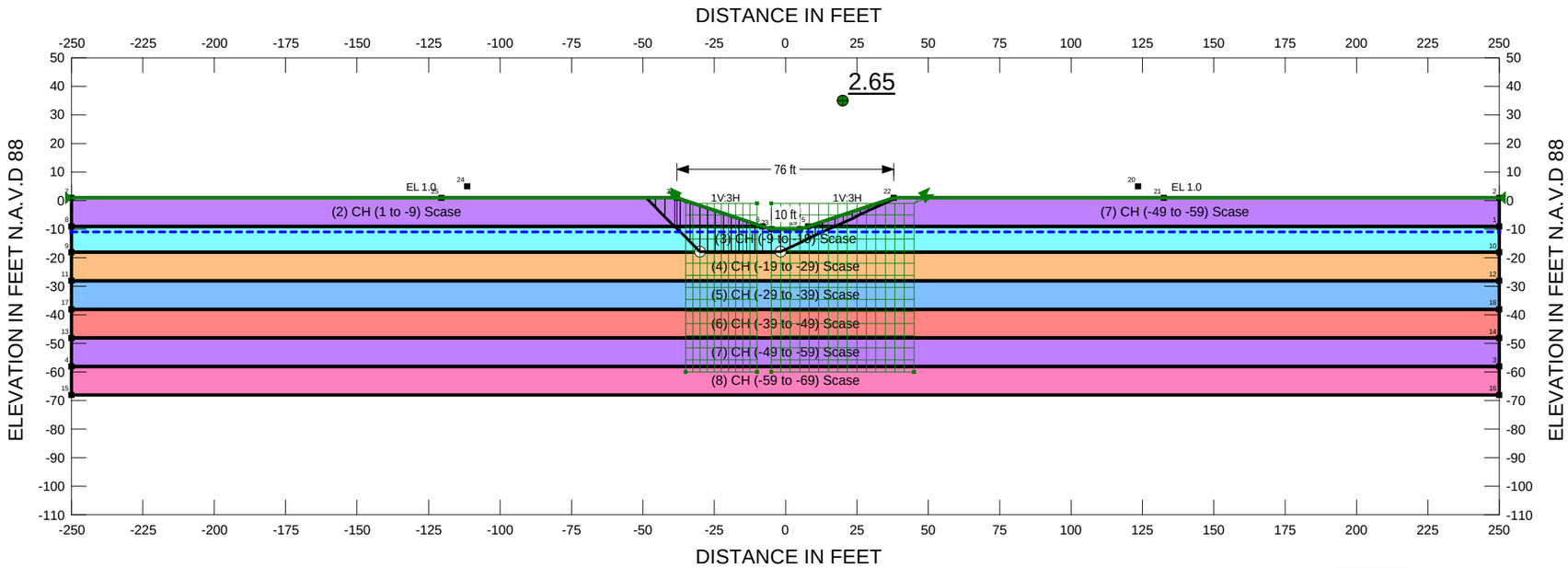
Slip Surface: 16,801
Factor of Safety: 2.20
Volume: 1,106.8445 ft³
Weight: 110,296.91 lbf
Resisting Force: 27,552.57 lbf
Activating Force: 12,524.202 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (38.514403, 1) ft
Entry: (-62.285714, 1) ft
Radius: 41.434017 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-60.619048 ft	-0.66666667 ft	-644.8 psf	59.374313 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 2	-57.285714 ft	-4 ft	-436.8 psf	359.37431 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 3	-53.952381 ft	-7.3333333 ft	-228.8 psf	659.37431 psf	0 psf	200 psf	0 psf	(2) CH (1 to -9) Qcase
Slice 4	-51.285714 ft	-10 ft	-62.4 psf	909.37431 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 5	-48.535714 ft	-12.75 ft	109.2 psf	1,184.3743 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 6	-45.035714 ft	-16.25 ft	327.6 psf	1,534.3743 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 7	-41.964286 ft	-19.321429 ft	519.25714 psf	1,832.075 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 8	-39.321429 ft	-21.964286 ft	684.17143 psf	2,122.7893 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 9	-36.5 ft	-24.785714 ft	860.22857 psf	2,388.1465 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 10	-33.125 ft	-26.285714 ft	953.82857 psf	2,565.1786 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 11	-29.375 ft	-26.285714 ft	953.82857 psf	2,452.6786 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 12	-25.625 ft	-26.285714 ft	953.82857 psf	2,340.1786 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 13	-21.875 ft	-26.285714 ft	953.82857 psf	2,227.6786 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 14	-18.5 ft	-25.586253 ft	910.18217 psf	2,102.3121 psf	0 psf	250 psf	0 psf	(4) CH (-19 to

								-29) Qcase
Slice 15	-15.5 ft	-24.18733 ft	822.88938 psf	1,858.4306 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 16	-12.5 ft	-22.788407 ft	735.59659 psf	1,614.5491 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 17	-9.5 ft	-21.389484 ft	648.30379 psf	1,370.6675 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 18	-6.5 ft	-19.990561 ft	561.011 psf	1,121.786 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 19	-3.6156142 ft	-18.64555 ft	477.0823 psf	923.83478 psf	0 psf	250 psf	0 psf	(4) CH (-19 to -29) Qcase
Slice 20	-0.42342128 ft	-17.157006 ft	384.19716 psf	757.96002 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 21	3.1921929 ft	-15.471017 ft	278.99147 psf	589.36116 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 22	6.5 ft	-13.928561 ft	182.74223 psf	485.11559 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 23	10.39016 ft	-12.11455 ft	69.547916 psf	445.33725 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 24	14.924827 ft	-10 ft	-62.4 psf	407.71115 psf	0 psf	200 psf	0 psf	(3) CH (-9 to -19) Qcase
Slice 25	18.813556 ft	-8.1866558 ft	-175.55268 psf	415.85754 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase
Slice 26	22.302 ft	-6.5599675 ft	-277.05803 psf	362.51208 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase
Slice 27	25.790445 ft	-4.9332792 ft	-378.56338 psf	309.16663 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase

Slice 28	29.278889 ft	-3.3065909 ft	-480.06873 psf	255.82117 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase
Slice 29	32.767333 ft	-1.6799026 ft	-581.57408 psf	202.47572 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase
Slice 30	36.255778 ft	-0.05321427 ft	-683.07943 psf	149.13026 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase
Slice 31	38.257202 ft	0.88006494 ft	-741.31605 psf	108.665 psf	0 psf	449 psf	0 psf	(7) CH (-49 to -59) Qcase



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	(2) CH (1 to -9) Scase	Mohr-Coulomb	90	0	23
	(3) CH (-9 to -19) Scase	Mohr-Coulomb	100	0	23
	(4) CH (-19 to -29) Scase	Mohr-Coulomb	110	0	23
	(5) CH (-29 to -39) Scase	Spatial Mohr-Coulomb	110	0	23
	(6) CH (-39 to -49) Scase	Spatial Mohr-Coulomb	109	0	23
	(7) CH (-49 to -59) Scase	Spatial Mohr-Coulomb	115	0	23
	(8) CH (-59 to -69) Scase	Spatial Mohr-Coulomb	97	0	23

MILE BRANCH
CHANNEL IMPROVEMENTS

CASE: JANBU SCASE BLOCK

US Army Corps of Engineers®
New Orleans District

CAP-BP (LW) (block) (LS)

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File Information

File Version: 10.00
Title: Alternative 5 West Slidell
Comments: Station 81+24.00 Boring B-1
Created By: Mark Middleton
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (USA)
Revision Number: 1,455
Date: 04/11/2023
Time: 04:41:17 PM
Tool Version: 10.0.0.17401
File Name: Mile Branch - Scase - proposed - Janb.GSZ
Directory: C:\Users\B2EDFMCM\Desktop\2022 desktop work\st tammany risk regisetr due 12 aug\2022 new analysis TSP\Mile Branch channel improvement\
Last Solved Date: 04/11/2023
Last Solved Time: 04:41:36 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

CAP-BP (LW) (block) (LS)

Kind: SLOPE/W
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: Yes
Slip Surface Option: Block
Critical slip surfaces saved: 1
Restrict Block Crossing: Yes
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 15 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100

Tolerable difference in F of S: 0.01

Materials

(3) CH (-9 to -19) Scase

Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(2) CH (1 to -9) Scase

Model: Mohr-Coulomb
Unit Weight: 90 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(6) CH (-39 to -49) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 109 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(4) CH (-19 to -29) Scase

Model: Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(5) CH (-29 to -39) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 110 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(7) CH (-49 to -59) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf

Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

(8) CH (-59 to -69) Scase

Model: Spatial Mohr-Coulomb
Unit Weight: 97 pcf
Cohesion': 0 psf
Phi': 23 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (-250, 1) ft
Right Coordinate: (250, 1) ft

Slip Surface Block

Left Grid
Upper Left: (-10, -1) ft
Lower Left: (-10, -60) ft
Lower Right: (-35, -60) ft
X Increments: 10
Y Increments: 14
Starting Angle: 135 °
Ending Angle: 145 °
Angle Increments: 2
Right Grid
Starting Angle: 25 °
Ending Angle: 45 °
Upper Left: (-5, -1) ft
Lower Left: (-5, -60) ft
Lower Right: (45, -60) ft
X Increments: 15
Y Increments: 14
Angle Increments: 4

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	-250 ft	-11 ft
Coordinate 2	250 ft	-11 ft

Points

	X	Y
Point 1	250 ft	-9 ft
Point 2	250 ft	1 ft
Point 3	250 ft	-58 ft
Point 4	-250 ft	-58 ft
Point 5	8 ft	-9 ft
Point 6	-8 ft	-9 ft
Point 7	-250 ft	1 ft
Point 8	-250 ft	-9 ft
Point 9	-250 ft	-18 ft
Point 10	250 ft	-18 ft
Point 11	-250 ft	-28 ft
Point 12	250 ft	-28 ft
Point 13	-250 ft	-48 ft
Point 14	250 ft	-48 ft
Point 15	-250 ft	-68 ft
Point 16	250 ft	-68 ft
Point 17	-250 ft	-38 ft
Point 18	250 ft	-38 ft
Point 19	5 ft	-10 ft
Point 20	123.5 ft	5 ft
Point 21	132.5 ft	1 ft
Point 22	38 ft	1 ft
Point 23	-5 ft	-10 ft
Point 24	-111.5 ft	5 ft
Point 25	-120.5 ft	1 ft
Point 26	-38 ft	1 ft

Regions

	Material	Points	Area
Region 1	(8) CH (-59 to -69) Scase	15,16,3,4	5,000 ft²
Region 2	(5) CH (-29 to -39) Scase	11,17,18,12	5,000 ft²
Region 3	(6) CH (-39 to -49) Scase	17,13,14,18	5,000 ft²
Region 4	(2) CH (1 to -9) Scase	25,26,6,8,7	2,270 ft²
Region 5	(3) CH (-9 to -19) Scase	9,8,6,23,19,5,1,10	4,487 ft²
Region 6	(4) CH (-19 to -29) Scase	11,9,10,12	5,000 ft²
Region 7	(7) CH (-49 to -59) Scase	13,14,3,4	5,000 ft²
Region 8	(7) CH (-49 to -59) Scase	5,22,21,2,1	2,270 ft²

Slip Results

Slip Surfaces Analysed: 1067 of 39600 converged

Current Slip Surface

Slip Surface: 12,486

Factor of Safety: 2.65
Volume: 620.36621 ft³
Weight: 60,708.418 lbf
Resisting Force: 18,196.917 lbf
Activating Force: 6,863.6479 lbf
Slip Rank: 1 of 39,600 slip surfaces
Exit: (38.772607, 1) ft
Entry: (-48.857143, 1) ft
Radius: 35.495631 ft
Center: (20, 35) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	-47.190476 ft	-0.66666667 ft	-644.8 psf	129.23813 psf	54.85833 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 2	-43.857143 ft	-4 ft	-436.8 psf	387.71438 psf	164.57499 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 3	-40.52381 ft	-7.3333333 ft	-228.8 psf	646.19063 psf	274.29165 psf	0 psf	0 psf	(2) CH (1 to -9) Scase
Slice 4	-38.428571 ft	-9.4285714 ft	-98.057143 psf	812.35394 psf	344.82379 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 5	-37.428571 ft	-10.428571 ft	-35.657143 psf	883.74262 psf	375.12649 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 6	-35.142857 ft	-12.714286 ft	106.97143 psf	1,036.4028 psf	394.52021 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 7	-31.714286 ft	-16.142857 ft	320.91429 psf	1,272.7962 psf	404.04989 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 8	-28.625 ft	-17.857143 ft	427.88571 psf	1,504.4643 psf	456.98049 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 9	-25.875 ft	-17.857143 ft	427.88571 psf	1,421.9643 psf	421.96132 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 10	-23.125 ft	-17.857143 ft	427.88571 psf	1,339.4643 psf	386.94215 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 11	-20.375 ft	-17.857143 ft	427.88571 psf	1,256.9643 psf	351.92297 psf	0 psf	0 psf	(3) CH (-9 to

								-19) Scase
Slice 12	-17.625 ft	-17.857143 ft	427.88571 psf	1,174.4643 psf	316.9038 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 13	-14.875 ft	-17.857143 ft	427.88571 psf	1,091.9643 psf	281.88463 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 14	-12.125 ft	-17.857143 ft	427.88571 psf	1,009.4643 psf	246.86546 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 15	-9.375 ft	-17.857143 ft	427.88571 psf	926.96429 psf	211.84628 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 16	-6.5 ft	-17.857143 ft	427.88571 psf	835.71429 psf	173.11296 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 17	-3.3333333 ft	-17.857143 ft	427.88571 psf	785.71429 psf	151.88922 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 18	0 ft	-17.079963 ft	379.38972 psf	734.60613 psf	150.78042 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 19	3.3333333 ft	-15.525605 ft	282.39772 psf	574.4376 psf	123.96357 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 20	6.5 ft	-14.048964 ft	190.25533 psf	476.32637 psf	121.42995 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 21	9.2596309 ft	-12.762127 ft	109.9567 psf	449.96937 psf	144.32681 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 22	11.778893 ft	-11.587376 ft	36.652234 psf	433.30928 psf	168.37093 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 23	15.183031 ft	-10 ft	-62.4 psf	405.74442 psf	172.22829 psf	0 psf	0 psf	(3) CH (-9 to -19) Scase
Slice 24	18.804142 ft	-8.311448 ft	-167.76564 psf	362.10081 psf	153.70267 psf	0 psf	0 psf	(7) CH (-49 to -59) Scase

Slice 25	21.757351 ft	-6.9343441 ft	-253.69693 psf	313.2832 psf	132.98083 psf	0 psf	0 psf	(7) CH (-49 to -59) Scase
Slice 26	24.71056 ft	-5.5572401 ft	-339.62821 psf	264.46559 psf	112.25898 psf	0 psf	0 psf	(7) CH (-49 to -59) Scase
Slice 27	27.663769 ft	-4.1801362 ft	-425.5595 psf	215.64798 psf	91.537135 psf	0 psf	0 psf	(7) CH (-49 to -59) Scase
Slice 28	30.616978 ft	-2.8030323 ft	-511.49079 psf	166.83037 psf	70.815289 psf	0 psf	0 psf	(7) CH (-49 to -59) Scase
Slice 29	33.570187 ft	-1.4259283 ft	-597.42207 psf	118.01276 psf	50.093443 psf	0 psf	0 psf	(7) CH (-49 to -59) Scase
Slice 30	36.523396 ft	-0.048824387 ft	-683.35336 psf	69.195145 psf	29.371596 psf	0 psf	0 psf	(7) CH (-49 to -59) Scase
Slice 31	38.386303 ft	0.81986379 ft	-737.5595 psf	22.39317 psf	9.5053366 psf	0 psf	0 psf	(7) CH (-49 to -59) Scase

SECTION 12

Geotech Report for

Final Array

2.0 GEOTECHNICAL

2.0.1 Background

This appendix summarizes the preliminary geotechnical design results for the St. Tammany BBA-18 Hurricane Risk Reduction Measures for the tentatively selected plan (TSP). The Optimized TSP consists of a combination of portions of the Slidell levee alignment proposed in Alternative 5 (except for the western portion of that alignment) and the South Slidell levee alignment proposed in Alternative 6a (except for the northwestern portion of that alignment), with the two alignments being connected by a new railroad gate across the existing Norfolk Southern Railway Corp. railroad tracks. The Optimized TSP consists of a total of 15 miles (79,100 feet) of levees constructed in two separate (non-continuous) segments,

The amount of information in the way of geotechnical investigations, associated testing, and geologic profiles was limited. Soil borings were not taken and soil testing was not performed for this study. Soil unit weights and shear strengths were assigned based on USACE geotechnical experience in the region and limited boring information in the vicinity of the TSP alignment. The results presented in this appendix are only intended for cost estimating purposes and determining the technical feasibility of the proposed alternatives.

Earthwork stability analyses, settlement, and lift schedules were performed on levee features of the various measures and used for elimination of alternatives in the determination of a TSP. Pile capacity analyses and Lane's weighted creep analyses were performed on structural features of the various measures to assist in quantity estimates for structural pile and sheet pile lengths in the final array.

2.0.2 Geology

Geologic profiles nor geolgic maps could be obtained for the tentative TSP project alignment made up of the different alternatives in the final array. Geoligical Conditions are inferred from the limited boring information obtained from Eustis Engineering LLC job reports from various projects in St. Tammany Parish. More information on these geotechnical investigations can be found in section 2.0.3 below.

The western part of the alignment designated as West Slidell starting at the Shannon Drive lift gate and terminating at the Norfolk Southern Railway Corp railroad tracks west of US Highway 11 in the vicinity of Delwood Pump Station in Slidell. These marsh deposits make up the top 2 to 10 feet of the subsurface and are comprised of soft organic clays with some sand layers. Below marsh deposits and in some places at the surface, Pleistocene Prairie Terrace deposits are present. These deposits span at least 40 feet below and are composed of predominantly medium to very stiff clay, however, some borings show an approximately 10-foot thick sand layer around 20 feet below the ground surface.

As the alignment runs eastward into the area designated as South Slidell alignments starting at the floodwall parallel to the railroad tracks and including the tie-ions with Oak Harbor levee and the Lakeshore Estates levee, the marsh deposits will transition into areas of fill deposits overlaying

shallow Pleistocene deposits. This is due to the system of filling used to develop the Slidell and Eden Isles areas. The top 5 to 15 feet of fill consists of silt and clay with some sands. A compressed marsh section mat exist under the fill section depending on how development occurred, and this is underlain by Pleistocene Prairie Terrace Deposits.

At the point that a thorough geotechnical investigation plan is conducted along the alignment, a geologic profile should be developed for the project alignment for future reference.

2.0.2 Furnished Information and Soil Design

USACE has very limited boring information in St. Tammany Parish. Eustis Engineering LLC provided all of their job reports for projects that they had completed. Projects that had boring information were taken and plotted in google earth. Borings of appropriate depth were considered. The closest available projects to levee or structural features which had geotechnical investigations were used to develop parameters. Levees were not broken into individual geotechnical reaches. Sections analyzed were based on hydraulic reaches. Whichever Eustis project was most appropriate was used to get soil information for development of parameters. Parameters were utilized throughout an entire levee or structural feature. Future analyses should take site specific information and a more refined parameter selection process should be developed. This could result in more geotechnical reaches needing more analyses within an individual levee feature in design for construction. Many of the levee features given in the alternatives are many miles long, so a levee feature may have multiple reaches requiring checks instead of one per feature as done for the selection of the TSP. The lack of subsurface information and the number of assumptions required as a result are noted in the risk register.

Alternatives that have features requiring geotechnical input are provided below. The Eustis project number, boring information including number and depth, proximity to feature and assumptions are contained within.

Alternative 4: Bayou Lacombe Levee.
The levee alignment consists of approximately 8 miles (39,000 ft) in the City of Lacombe, Louisiana to reduce coastal flooding. The levee extends on the south side of Highway 190 from Shelby Drive to east of Cypress Bayou. There is also a Bayou Lacombe floodgate as part of this alternative.

The closest boring to the Bayou Lacombe alignment is 2 40 ft borings taken at the Mandeville Marina as part of Eustis job No. 09318. This boring is 4.75 miles away from the westernmost section of the Bayou Lacombe alignment and is used for the entirety of the Bayou Lacombe alignment. The closest boring to the Bayou Lacombe floodgate is an 80 ft boring taken at Delwood Pump Station as part of Eustis job No. 13965. This boring is 3.7 miles away.

Alternative 5: Bayou Liberty/Bayou Vincent/Bayou Bonfouca and West Slidell Levee
This alternative includes levee with flood gate sections, channel improvements, and detention ponds. The alignment includes an 8.5 mile alignment consisting of approximately 6.5 miles (34,000 ft) of levees and 2 miles (9,400 ft) of floodwall. This alignment is located on the west

side of the City of Slidell, Louisiana. The levee extends on the south side of Highway 190 from southwest of Bayou Paquet to west of Highway 11.

The closest boring is an 80 ft boring taken at Delwood Pump Station as part of Eustis job No. 13965. This boring is right at the western terminus of the alignment and is utilized for the entire 8.5 mile alignment.

The same Delwood pump station boring was utilized for all the structural features along the West Slidell alignment. The 80 ft boring taken at Delwood Pump Station boring is closest to the West Slidell sluice gate at about 1 mile away. It is about 2.3 miles away from the Bayou Bonfouca floodgate, about 3.3 miles from the Bayou Liberty area, and about 4 miles from the Bayou Pacquet area.

No parameters were developed for channel improvements or detention ponds for this stage of the final array.

Alternative 6: South Slidell Storm Surge Risk Reduction.
This alternative reduces the risk of storm surge to Slidell including Eden Isles. It comprises 20.5 miles of alignment with a combination of levee and floodwall. The alignment will have 8.5 miles of levees (44,500 ft). The alignment also will have approximately 6 miles (31,000 ft) of floodwall at Eden Isles and 5.9 miles (30,800 ft) of floodwall in the Slidell levee alignment.

There is more geotechnical investigations in the Slidell area and 3 different Eustis projects were used for 3 different levee sections: one for Eden Isles levees, one for CPRA ring levee/Slidell levee segments, and one for Oak Harbor. The closest boring to the Eden Isles levee alignment is an 80 ft boring taken at St Tammany Event Center project as part of Eustis job No. 16613. This boring is 0.75 miles away from the eastern side of the Eden Isles alignment. The closest boring to the CPRA/Slidell levee alignment is an 80 ft boring taken 0.20 miles away at the Eden Isles expansion project as part of Eustis job No. 10120. It should be noted that this is closer to the Slidell levee alignment than the Eden Isles levee alignment as currently laid out. The two levee sections had the same overlapping alignment just north of the Eden Isles for the Eustis project versus the BBA-18 study. The Oak Harbor borings are taken from Eustis job No. 11044 and make up the southeastern portion of the Oak Harbor alignment. There are 9 borings in total that are 40 to 45 feet in depth.

There are 7 main structural features in 4 areas: the South Slidell Surge reduction on the western side, the W-14 floodgate to the east, the I-10 gates to the southeast, and the Eden Isles sections to the south.

The same boring at Delwood Pump Station as part of Eustis job No. 13965 was utilized for the South Slidell Surge reduction wall pile capacities. It is actually closer to this feature than the Lacombe/ West Slidell wall features. The boring is approximately 60 feet from the alignment's southern end.

The W-14 floodgate and Old Spanish Trail floodgate and any unmarked walls in their vicinity utilized the Oak Harbor pump station borings from Eustis job No. 10463. This has borings

ranging from 40 to 100 feet. The geotechnical investigations from Oak Harbor are 1.7 miles away from Old Spanish Trail floodgate and 1.9 miles away from W-14 floodgate.

The I-10 access gates and the Eden Isles features including the marina gate utilize the Event Center borings which are 60 feet and taken from Eustis job No. 16613. Deeper than 60 feet use the Oak Harbor geotechnical investigation information to inform on pile capacities. The event center boring is approximately 3500 feet from the I-10 floodgates, 1.5 miles from Marina floodgate and Lakeshore Drive gate and 2.8 miles from the Pontchartrain Drive gate. This is actually just as close as the Eden Isles borings in Eustis job No. 10120 and run 10 feet deeper, so the decision was made to utilize the Event Center boring.

Alternative 7: Eastern Slidell (Pearl River Levee)
Alternative 7 includes a levee, diversion channel and channel improvements to address riverine flooding. The features in this alternative are all separate and combinable and could all be implemented if justified. The overall length of the Pearl River levee is approximately 4.8 miles (25,000 ft). The levee extends from Interstate I-59 running east and turns south running along the Pearl River Tributaries to the intersection of the West Pearl River and Gum Bayou.

The closest boring are four 40 ft boring taken at Slidell Memorial Hospital as part of Eustis job No. 13418. These borings are 4 miles away from the southern terminus of the Pearl River levee alignment and is utilized for the entire 4.8 miles. There are four floodwall sections for a total of 0.5 miles (2,750 ft) for this alternative along the Pearl River alignment. The same memorial hospital borings from Eustis Project No. 13418 are also used for structural analyses.

No parameters were developed for channel improvements or diversion channel for this stage of the final array.

Alternative 9: Mandeville Lakefront Seawall
Alternative 9a replaces the existing lakefront seawall to elevation 7.3 ft NAVD88 and adds a passive drainage option on Bayou Ravine Aux Coquilles and Little Castine Bayou. Sub alternatives include pump stations at Girod Street and Ravine Aux Coquilles.

There is an existing Eustis geotech report for the Mandeville seawall. Eustis job No. 12464 which has bulkhead design for three reaches. This report was directly referenced to inform for the array.

Berm Section used for West Slidell :
The parts of the alignment that are west of Delwood Pump Station are in a non-developed area with little geotechnical information. It is probable that the borings utilized at the Marina and Delwood Pump Station are overestimating the strengths occurring in the undeveloped parts of the alignment where marsh deposits are more likely near the surface. An alternative section which utilized c/p values multiplied by a factor of 0.22 was used to estimate in-situ material strengths. This proved to also overestimate the strengths to estimate the need for berms, so strata was taken in 10 foot increments and starting with a typical weak value for marsh of 150 psf. Every 10 feet, 50 psf was added to the cohesion values until the strength line intersected the c/p value. From this point the c/p value was used. The parameters can be found in section 3 of Annex A3.This alternative will be further refined and utilized as part of the TSP development

with different design elevations, settlement analysis, lift schedules, and differing berm lengths. The current berm section was created to help give a more accurate fill quantity count for estimation purposes for berms would likely be utilized in actual construction.

2.0.3 Methodology and Assumptions

The Hurricane and Storm Damage Risk Reduction System (HSDRRS) design criteria was used as a reference to direct design criteria. For actual construction, a full geotechnical exploration plan should be developed with investigations taken at every 500 feet off center with borings alternating between 5-inch continuous Shelby tube borings (undisturbed) and 3-inch Shelby tube borings (general type) or cone penetrometer test (CPT). Full development of parameters from testing coming out of those explorations. The project areas across the alignment would be further refined which would divide into numerous reaches based on subsurface profiles, topography, and design elevations.

Stability and seepage analysis follows HSDRRS guidelines for factor of safety requirements. Levees were analyzed for 2032 elevation with some overbuild to account for settlement. The scope of this study only includes an evaluation of the Q-case (i.e., undrained) parameters for the top of levee for the levee, the 2032 design elevation, and low water cases. S-case (i.e. drained) analysis were also performed for low water cases. The same cases were checked for 2082 elevations with some overbuild. This was done to give an idea for future right of way (ROW) considerations.

For structure, HSDRRS criteria was followed to create pile capacity curves for 12x73 H-piles, 14x74 H-piles, and 18 inch pipe piles. These were used to help inform on pile lengths for quantity estimates in the final array. Lane's weighted creep analyses were performed assuming water loads to the top of the wall for 2082 design elevations. These were used to help inform on sheet pile lengths for quantity estimates in the final array.

2.0.4 Design Information

A simple levee section was analyzed on the different alternatives for stability and settlement. For stability, a ten-foot crown with 1V:3H slopes were analyzed to check stability for a minimum levee section. Stability was checked at the highest 2032 design elevation along a given levee alignment. With more site-specific data, and a full HSDRRS analysis, the levee as designed here may no longer be feasible and stability berms, reinforcement geotextile, or deep-soil mixing may be necessary to meet HSDRRS criteria.

For settlement, a ten-foot crown with 1V:3H slopes were analyzed to give the loading for a simple levee section. Settlement was checked on an overbuild section that was 2.5 feet above the 2032 design elevation and plotted on a 50-year gradient line with 2032 to 2082 design elevations.

Test information taken from the borings found in the reports mentioned in section 2.0.2 were used to create parameters for stability analysis. This test information can be found in annex 2 (section 2) Seven different strength lines were developed for the various features

(floodgates/levees) throughout the alignment in the different alternatives. These strength lines were plotted based on data acquired from unconfined compression tests (UCT) and one-point unconsolidated undrained overburden tests taken from the borings. Borings are 3-inch as they are not taken for U.S. Army Corps of Engineers (USACE) specific projects. For a typical USACE risk reduction project, 5-inch undisturbed borings would be taken and three-point unconsolidated undrained (Q) triaxial compression tests would be performed. Atterberg limit tests were also performed from these selected boring samples. The location of these borings can be found in the table below. Note that Eustis reports had one set of coordinates per job, so jobs that have more than one boring have the same coordinate. The boring information that was available can be found in section 2 of annex A3.

Table 1:Boring Information

Eustis Job No. 09318 Used For Bayou Lacombe				
Boring No.	Latitude	Longitude	Ground EL	Depth
B-1 (EE 09318)	30° 20’ 59.68” N	90° 3’ 33.02” W	NA	40’
B-2 (EE09318)	30° 20’ 59.68” N	90° 3’ 33.02” W	NA	40’
Eustis Job No. 13965 Used For West Slidell Levee, Bayou Lacombe Floodgate, Bayou Lacombe Floodgate, Bayou Bonfouca Floodgate, Bayou Liberty Floodgate, Bayou Vincent Floodgate, Bayou Pacquet Floodgate, South Slidell Surge Reduction Wall				
Boring No.	Latitude	Longitude	Ground EL	Depth
B-1 (EE 13965)	30° 15’ 15.73” N	89° 47’ 18.18” W	NA	80’
Eustis Job No. 16613 + 10463 from -54 to -100 Used For Eden Isles Levee, Eden Isles Marina Gate, Eden Isles South Floodwall, Eden Isles Southwest Floodwall, Eden Isles West Floodwall				
Boring No.	Latitude	Longitude	Ground EL	Depth
B-1 (EE 10463)	30° 14’ 29.80” N	89° 46’ 38.66” W	1.6	50’
B-2 (EE 10463)	30° 14’ 29.80” N	89° 46’ 38.66” W	2.15	100’
B-3 (EE 10463)	30° 14’ 29.80” N	89° 46’ 38.66” W	5	50’
B-27 (EE 16613)	30° 13’ 4.89” N	89° 46’ 18.33” W	NA	60’
B-28 (EE 16613)	30° 13’ 4.89” N	89° 46’ 18.33” W	NA	60’
B-29 (EE 16613)	30° 13’ 4.89” N	89° 46’ 18.33” W	NA	60’
B-30 (EE 16613)	30° 13’ 4.89” N	89° 46’ 18.33” W	NA	60’
Eustis Job No. 11044 Used For Oak Harbor Levee				
B-1 (EE 11044)	30° 12’ 50.07” N	89° 45’ 58.38” W	-1.5	40’
B-2 (EE 11044)	30° 12’ 50.07” N	89° 45’ 58.38” W	1	40’
B-3 (EE 11044)	30° 12’ 50.07” N	89° 45’ 58.38” W	6.78	45’
B-4 (EE 11044)	30° 12’ 50.07” N	89° 45’ 58.38” W	0.5	40’
B-5 (EE 11044)	30° 12’ 50.07” N	89° 45’ 58.38” W	-1.5	40’
B-6 (EE 11044)	30° 12’ 50.07” N	89° 45’ 58.38” W	5.55	45’
B-7 (EE 11044)	30° 12’ 50.07” N	89° 45’ 58.38” W	-1.5	40’
B-8 (EE 11044)	30° 12’ 50.07” N	89° 45’ 58.38” W	7.17	45’

B-9 (EE 11044)	30° 12’ 50.07” N	89° 45’ 58.38” W	1.25	40’
Eustis Job No.13418 Used For Pearl River Levee and Pearl River Floodgate				
B-1 (EE 13418)	30° 17’ 0.97” N	89° 46’ 6.10” W	NA	40’
B-2 (EE 13418)	30° 17’ 0.97” N	89° 46’ 6.10” W	NA	40’
B-3 (EE 13418)	30° 17’ 0.97” N	89° 46’ 6.10” W	NA	40’
A-1 (EE 13418)	30° 17’ 0.97” N	89° 46’ 6.10” W	NA	10’
A-2 (EE 13418)	30° 17’ 0.97” N	89° 46’ 6.10” W	NA	10’
Eustis Job No. 10120 Used For South Slidell Levee				
B-1 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	50’
B-2 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-3 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-4 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-5 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-6 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-7 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-8 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	50’
B-9 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-10 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-11 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-12 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-13 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-14 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-15 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	50’
B-16 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-17 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-18 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-19 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	20’
B-20 (EE 10120)	30° 14’ 17.50” N	89° 46’ 53.26” W	NA	50’
Eustis Job No. 10463 Used For W-14 Floodgate, Old Spanish Trail Floodgate				
Boring No.	Latitude	Longitude	Ground EL	Depth
B-1 (EE 10463)	30° 14’ 29.80” N	89° 46’ 38.66” W	1.6	50’
B-2 (EE 10463)	30° 14’ 29.80” N	89° 46’ 38.66” W	2.15	100’
B-3 (EE 10463)	30° 14’ 29.80” N	89° 46’ 38.66” W	5	50’

No settlement test data was available, so correlations which use water contents from the strength and compression tests and the liquid limits from the Atterberg tests that were taken in some areas.

The initial void ratio (or e0) was calculated by multiplying the water content results from the strength tests by the specific gravity and assuming the soil is saturated. The specific gravity was assumed to be 2.7, so the equation is as seen below.

$$E0 = wGs/S \text{ or } 2.7w/100$$

The compression index (or Cc) was calculated as a function of the in situ water content. For fat and lean clays (CH and CL) which all clays in analysis are classified as which is typical for southeast Louisiana. The Cc correlation data points were based on a Plasticity Index correlation found in "Correlation of Compression Index and Soil Properties of New Orleans Area Clays," Table 16, dated 04 September 2011. The equation can be seen below.

$$Cc = 0.017w - 0.299$$

Recompression index values were chosen as 20% of the Compression Index (or Cr) as recommended in the "Correlation of Compression Index and Soil Properties of New Orleans Area Clays" report. All soil was assumed as normally consolidated for this study, so the overconsolidation ratio (or OCR) is assumed as 1. This is a conservative assumption as OCR values are typically overconsolidated near the surface resulting in lower settlement estimates. Unit weights in the settlement analysis are taken from the same design values taken from the strength tests in the stability parameters.

The C_v correlation data points were based on a water content correlation which can be found in NAVFAC DM-7. 1, and is included as Figure 1 below. Since the correlation is only provided in graphical form in the NAVFAC DM, an equation was estimated for the C_V correlation using Microsoft Excel. The image was first imported into Microsoft Excel and points were manually added to match the C_V correlation line. Next, a trend line was added to these points and the power function option was selected. The resulting equation may be found below. In areas where no liquid limit values are not available, values between 10 and 50 which is in the Settle/3D recommended value range and among the high average of tested values from the available Atterberg test information. $C_{V\ and}\ C_{Vr}$ values were set to be equal to each other in the analysis.

$$C_V = 9809.9LL^{-2.847}$$

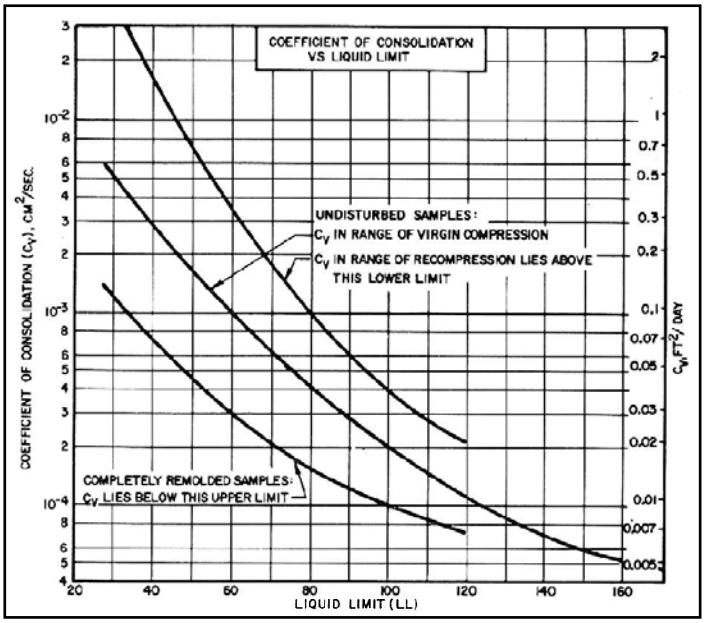


Figure 1: Approximate Correlations for Consolidation Characteristics of Silts and Clays (FIGURE 4 from the NAVFAC DM, 7.1-144)

Design parameters and strength plots can be found in section 3 of annex A3.

2.0.5 Stability Analysis

The stability of the earthen levees was analyzed in SLOPE/W version 10.0.0.17401 from the Geostudio Suite of programs used the Spencer method to determine typical cross sections to be used in the cost estimate. Entry-exit searches with tension cracks applied to the driving side were checked for water at the top of the levee and low water at the ground surface. A more complete HSDRRS design check will be conducted after the TSP is selected. The stability results for these levee sections can be found in table 2.1 below. Alternative number and feature as well as factors of safety for the two cases can be found here.

Table 2:Stability results

Alternative	***Feature***	***2032 Design Elevation Analyzed***	***Top of Levee FoS***	***Low Water FoS***
Alternative 4	Bayou Lacombe	+12.5	3.68	3.69
Alternative 5	West Slidell Levee Section	+14.5	1.75	1.81
Alternative 6	South Slidell Levee Section	+15.0	2.33	2.35
Alternative 6	Eden Isles Levee	+14.0	1.87	2.49
Alternative 6	Oak Harbor Levee	+13.5	2.58	2.57
Alternative 7	Pearl River Levee	+15.0	2.09	1.57
Alternative Berm Section	Alignment West of Delwood Pump Station	+14.5	1.40	1.40

2.0.5 Settlement Analysis

Settle3D Version 4.013 by Rocscience Inc., was used for the settlement analysis for the levee sections. Embankment sections with a ten-foot crown with 1V:4H slopes were used to model the loading on the soil. No settlement test data was available, so correlations were utilized from the test data. The lift schedules were created with a family of settlement curves based on CEMVN's experience with soft soils in southeastern Louisiana. Lift schedules were created for each levee feature except for Pearl River levee with which only settlement was calculated. The settlement output can be found in section 5 of Annex 3. The family of curves and lift schedule can be found in section 6 of Annex 3.

Alternative 4: Bayou Lacombe Levee.
The preliminary design elevation is 12.5 ft NAVD88 for the levee. A general levee section of 15 ft (2.5 ft above the 2032 design elevation) with an assumed ground surface of 3 (taken from LIDAR dataset), 1 on 3 slopes and a 10 foot crown was used as a cross section in the initial lift in 2032. The second lift is estimated to elevation +16.0 in 2035 followed by a lift to Elevation +16.5 in 2040, elevation +17.0 in 2053, and elevation +17.5 in 2068.

Alternative 5: Bayou Liberty/Bayou Vincent/Bayou Bonfouca and West Slidell Levee
The West Slidell levee section has two different 2032 design elevations. The preliminary design elevation is 13.0 ft NAVD88 for the Eastern and western sections and 14.5 ft NAVD88 for the central section. A general levee section of 15.5 ft for the Slidell Eastern and Western section and 17 for the central section with an assumed ground surface of 2 for all of the Slidell Levee (taken from LIDAR dataset), 1 on 3 slopes and a 10 foot crown was used as a cross section in the initial lift in 2032. Eastern and Western sections have three successive lifts afterwards: elevation +16.5 in 2039, elevation +17.5 in 2057, and elevation +18 in 2068. Central section has three successive lifts also: elevation +18.0 in 2037, elevation +19.0 in 2050, and elevation +20 in 2065.

Alternative 6: South Slidell Storm Surge Risk Reduction.
This alternative has three different levee alignments: the South Slidell alignment, the Eden Isles levees, and the Oak Harbor levees. There are four different preliminary design elevations between them.

The preliminary design elevation for the South Slidell levee section is 15.0 ft NAVD88 for the levee. A general levee section of +17.5 ft (2.5 ft above the 2032 design elevation) with an assumed ground surface of 0 (taken from LIDAR dataset), 1 on 3 slopes and a 10 foot crown was used as a cross section in the initial lift in 2032. The second lift is estimated to elevation +18.5 in 2038 followed by a lift to elevation +19.5 in 2051, and elevation +20.5 in 2067.

The Eden Isles levee section has two different 2032 design elevations. The preliminary design elevation is +13.5 ft NAVD88 for the Southeastern sections and 14.0 ft NAVD88 for the Eastern

section. A general levee section of +16.0 ft for the Southeastern section and +16.5 ft for the central section with an assumed ground surface of 5 for all of the Slidell Levee (taken from LIDAR dataset), 1 on 3 slopes and a 10 foot crown was used as a cross section in the initial lift in 2032. The Southeastern section has five successive lifts afterwards: elevation +17.5 in 2037, elevation +19.0 in 2047, elevation +20.5 in 2057, elevation +22 in 2067, and elevation +23 in 2075. The eastern section has three successive lifts: elevation +17.5 in 2042, elevation +18.5 in 2057, and elevation +19 in 2072.

The preliminary design elevation for the Oak Harbor levee section is 13.5 ft NAVD88 for the levee. A general levee section of +16.0 ft (2.5 ft above the 2032 design elevation) with an assumed ground surface of 0 (taken from LIDAR dataset), 1 on 3 slopes and a 10 foot crown was used as a cross section in the initial lift in 2032. The second lift is estimated to elevation +17.0 in 2037 followed by a lift to elevation +18.0 in 2047, a lift to elevation +19.0 in 2062, and elevation +19.0 in 2077.

Alternative 7: Pearl River Levee.

The preliminary design elevation for the Pearl River levee section is 15.0 ft NAVD88 for the levee. A general levee section of +17.0 ft (2.0 ft above the 2032 design elevation) with an assumed ground surface of 0 (taken from LIDAR dataset), 1 on 3 slopes and a 10 foot crown was used as a cross section in the initial lift in 2032. No lift was estimated to stay above the design grade in the future.

2.0.6 Seepage

As previously noted, little geotechnical information is located on the project alignment. The threat of seepage is highly dependent on the presence of aquifers: material with a granular makeup that allows water to freely flow through underneath the levee section. Because the scope of the project is large and the location, extent, depth and proliferation is largely unknown; the seepage analysis consisted of different iterations to see what kind of blanket would be required to meet factor of safety requirements against threats of seepage and piping at the toes of the levee.

Two different embankment sections were checked. A 15 foot embankment section with the largest head differential of fifteen feet like in South Slidell or Pearl River and a 9 foot embankment with the smallest head differential of nine feet like in Bayou Lacombe and Eden Isles. Two different aquifer sizes were checked. The first was a 12 foot aquifer which was representative for the larger end of sand strata found in geotechnical boring information that does exist on the northern shores of Lake Pontchartrain. The second was a 20 foot aquifer to represent what would represent a large strata of sand encountered in southeastern Louisiana.

Seepage parameters were estimated based upon Figure 2-5, “Approximate range in coefficient of permeability of soils and rocks” from EM 1110-2-1901, Seepage Analysis and Control for Dams. Conservative values for sand, silt, and clay were chosen and are shown in Table 2 below. A

Ky'/Kx' anisotropy ratio of 0.25 was used for silt and clay, and an anisotropy ratio of 1.0 was used for sand.

Table 3 - Seepage Parameters

MATERIAL	COEFFICIENT OF PERMEABILITY (cm/sec)	COEFFICIENT OF PERMEABILITY (ft/sec)
Sand	5.00E-02	1.64E-03
Silt	6.00E-05	1.97E-06
Clay	5.00E-07	1.64E-08

The analyses were aiming to achieve a 1.6 factor of safety and aquifers were adjusted to various elevations until a factor of safety of 1.6 was cleared. Overburden used for calculations was 115 pcf for total stress or 52.6 pcf for effective stress. The density of 115 pcf is what the levee would be constructed at and the low average of densities observed in the first 30 feet of the boring information at hand. Effective stress steady-state analysis was performed on the two representative levee sections.

The 9 foot embankment section met minimum factor of safety with a 9 foot clay blanket and the 20 foot embankment section met minimum factor of safety with a 22 foot clay blanket. Results were identical for the 12 foot aquifer and the 20 foot aquifer. Once a full geotechnical exploration program is developed, special attention should be made to the location of the sand. If it is located less than 9 feet down or overburden appears to trend less than 115 pcf total stress than a seepage berm may need to be considered. For the larger levee sections with potentially 15 feet of head differential, any sand encountered less than 22 feet down or similar weaker overburden should anticipate the need for a seepage berm. The levees will be constructed of compacted clay and erosion is not expected to occur at the toes.

Seepage results can be found in section 7 of Annex 3.

2.0.6 H-Piles and Sheet Piles

Pile capacities were performed on 12x73 and 14x74 H-piles for quantity estimates for the final array. A proprietary spreadsheet was used to calculate pile capacities. Densities were derived from the material tests from the individual Eustis reports.

Alternative 4: Bayou Lacombe Floodgate.

The preliminary design elevation for the Bayou Lacombe floodgate is 14.5 ft NAVD88. Soil properties such as unit weight, cohesion, and material type were taken from the boring at Delwood pump station and used for analyses. Pile capacity analyses and Lane's Weighted Creep Analysis were performed to help inform on pile lengths for quantity estimates in the final array. Sheet Pile length was recommended to be 35 ft.

Alternative 5: Bayou Liberty/Bayou Vincent/Bayou Bonfouca/ Bayou Paquet Structures

The preliminary design elevation for the Bayou Paquet floodgate and the floodwall is 14.5 ft NAVD88. The preliminary design for the Bayou Paquet and liberty floodwall is 16 ft NAVD88. The preliminary design for Bayou Liberty is 17 ft NAVD88. The preliminary design for Bayou Bonfouca was 16.5 NAVD88. All of these structural features also utilized the boring from the boring at Delwood pump station for soil properties such as unit weight, cohesion, and material type. Pile Capacity analyses and Lane's weighted Creep analyses were performed to determine sheet pile lengths and pile lengths for quantity estimates. Sheet pile length was recommended to be 35 ft.

Alternative 6: South Slidell Storm Surge Risk Reduction.

Alternative 6 alignment will have approximately 6 miles (31,000 ft) of floodwall at Eden Isles and 5.9 miles (30,800 ft) of floodwall in the Slidell levee alignment. There are 7 main structural features in 4 areas: the South Slidell Surge reduction on the western side, the W-14 floodgate to the east, the I-10 gates to the southeast, and the Eden Isles sections to the south.

The preliminary design elevation for the South Slidell surge reduction floodwall is 14.5 ft NAVD88. The two I-10 access gates have a design elevation of 16.5 NAVD88. For Eden Isles, the preliminary design elevation of the floodwall varies from 13.5 ft to 21 ft NAVD88 depending on the location. For the Slidell levee, the floodwall elevation will vary from 13.5 ft to 15 ft NAVD88. Soil properties such as unit weight, cohesion, and material type were taken from the borings taken from the previously referenced Eustis geotech reports. Pile Capacity analyses and Lane's weighted Creep analyses were performed to determine sheet pile lengths and pile lengths for quantity estimates. A 20 foot sheet pile length is recommended for the South Slidell surge reduction floodwall. The W-14 floodgate is recommended to have a 25 foot length. The Eden Isles I-10 walls are recommended to have 30 foot long sheets. The Eden Isles Marina Gate, South, Southwest, and West Structures are recommended to have 35 foot sheets.

Alternative 7: Pearl River Alignment.

There are four floodwall sections along the Pearl River alignment totalling 0.5 miles (2,750 ft) for this alternative. The preliminary design elevation for the structures is 19 ft NAVD88. Soil properties such as unit weight, cohesion, and material type were taken from the boring at Slidell Memorial Hospital and used for analyses. Pile Capacity analyses and Lane's weighted Creep analyses were performed to determine sheet pile lengths and pile lengths for quantity estimates. Pile Capacity curves revealed very limited capacity and were not used to estimate quantities. It is possible that the information used underestimated capacity at the site. Site specific information

will be needed to get a more accurate assessment of capacity in the area. A sheet pile length of 35 feet is recommended for the Pearl River floodwall.

Pile capacities and Lane's weighted Creep results can be found in section 8 and 9 respectively in Annex 3.

2.0.7 Conclusions and Recommendations

Geotechnical Analysis were performed on levee features and structural features on the alternatives that had these features. Geotechnical data was limited. For many features, the closest geotechnical investigations were utilized rather than site specific borings. Also, the number of borings that may have been available for a given feature may have been limited. This resulted in few borings not on the alignment to help inform decisions on the final array. As a consequence, analyses made a lot of assumptions to complete preliminary checks. These assumptions were fine for informing as to whether options used in the alternatives were even viable, but as the scope narrows, geotechnical investigations should be completed with associated testing to better inform soil conditions along an alignment.