U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT

Inner Harbor Navigational Canal
Lock Replacement Project
Cellular Cofferdam
Feasibility Study

GEOTECHNICAL ADDENDUM DESIGN REPORT

18 November 2016
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1.0 NOTE TO READER

Conclusions obtained in this report are for feasibility purposes only. Additional studies are needed for final design. All elevations mentioned in this report are referenced to the 1988 North American Vertical Datum (NAVD88) 2004.65 unless otherwise specified.

2.0 EXECUTIVE SUMMARY

The Inner Harbor Navigational Canal Lock is old and undersized. Recently, there have been several studies looking into different strategies for replacing the lock. These alternatives require a temporary retaining structure. For a project of this size, a cellular cofferdam wall approach is ideal. This report takes an already established layout from previous studies and looks at several alternatives for excavation depth and water load cases for a cellular cofferdam design. Analyses on the cofferdam investigated failure modes such as sliding, tilting, overturning, bearing, interlock tension, global stability. The information in this report is to be used for cost estimating purposes. A more detailed design can be performed in the design phase of the project.

3.0 BACKGROUND

The Inner Harbor Navigational Canal (IHNC) is a 5.5 mile waterway in New Orleans, Louisiana that connects Lake Pontchartrain to the Mississippi River. A lock system sits on the southern end of the canal by the Mississippi River mile 96.2. The Canal and the lock were constructed by the Port of New Orleans and put into service in 1923. The lock was owned by the Port of New Orleans until 1986, when it was acquired by the federal government. The canal served as a major confluence of boat traffic from the Gulf Intracoastal Waterway and the Mississippi River Gulf Outlet (MRGO) before the MRGO's closing in 2009. The IHNC lock is old and short and narrow for the increased traffic and larger vessels that currently navigate the waters. The IHNC existing lock is 75 feet wide, 640 feet long, and 31.5 feet over the sill at the low water in the river.

The IHNC replacement lock used for design of cofferdam would be a 110-foot wide lock good for ships and barges. It would have a usable length of 1200 feet and a maximum draft of 36 feet. The lock would be located 0.5 miles north up the canal from the current lock location and be within the eastern part of the City of New Orleans. Information can be found in Inner Harbor Navigation Canal Lock Replacement
Cast-In-Place Cofferdam 95% Feasibility Level Design, USACE Contract No. DACW29-02-D-0008, TO 0002, Sep 2006.

4.0 SCOPE OF WORK

Previous feasibility studies have been performed for the IHNC lock replacement project. The most recent study was a cast-in-place alternative in 2006. Information can be found in Inner Harbor Navigation Canal Lock Replacement Cast-In-Place Cofferdam 95% Feasibility Level Design, USACE Contract No. DACW29-02-D-0008, TO 0002, Sep 2006. This feasibility study will look at the cellular cofferdam approach taken in that study for traditional lock construction in-the-dry. Two different excavation depths will be analyzed for the cofferdam design in this report. One check is for the lock sill at elevation -22 with an excavation elevation at -33. Another check is done for the lock sill elevation at -16.5 with an excavation elevation at -27.5. These excavations are not as deep as those utilized in the 2006 feasibility report, and this analysis uses the same preliminary layout as was presented in the earlier report. That layout calls for a 110 foot bypass channel on the eastern bank side of the cofferdam with a bottom elevation of -31.0 to allow for barge traffic. The cofferdam analysis requires investigations with water level to the top of the cofferdam at EL +5.0 and using vessel impact loads of 160 kip at water elevation +3.0. Both of these load cases were checked with the differing excavation depths in the cofferdam.

Guidelines from Engineering Manual 1110-2-2503 were followed for design of cellular cofferdam design. Stability design follows the most current version of the HSDRRS Design Guidelines. These analyses will be summarized below as they relate specifically to this project.

1) Stability of cofferdam cell on eastern bank with excavation at EL -33.0 and the water level at EL +5.0.

2) Stability of cofferdam cell on eastern bank with excavation at EL -27.5 and the water level at EL +5.0.

3) Stability of cofferdam cell on eastern bank with excavation at EL -33.0 and the water level at EL +3.0 with a 160 kip impact load.

4) Stability of cofferdam cell on eastern bank with excavation at EL -27.5 and the water level at EL +3.0 with a 160 kip impact load.

5) Stability of cofferdam cell at southern end in the channel with excavation at EL -33.0 and the water level at EL +5.0.

6) Stability of cofferdam cell at southern end in the channel with excavation at EL -27.5 and the water level at EL +5.0.
7) Stability of cofferdam cell at southern end in the channel with excavation at EL -33.0 and the water level at EL +3.0 with a 160 kip impact load.

8) Stability of cofferdam cell at southern end in the channel with excavation at EL -27.5 and the water level at EL +3.0 with a 160 kip impact load.

9) Stability of western bank with excavation at EL -33.0.

10) Hand calculations of active and passive pressures for cofferdam cell with diameter of 61 feet and height of 95 feet.

11) Hand calculations for risk of overturning for cofferdam cell with diameter of 61 feet and height of 95 feet.

12) Hand calculation for risk against sliding of cofferdam cell with diameter of 61 feet and height of 95 feet.

13) Hand calculation for risk against bearing capacity of cofferdam cell with diameter of 61 feet and height of 95 feet.

14) Hand calculation for risk against tilting of cofferdam cell with diameter of 61 feet and height of 95 feet.

15) Hand calculation of vertical shear and interlock tension of cofferdam cell with diameter of 61 feet and height of 95 feet.

5.0 SUBSURFACE INVESTIGATIONS

To generally characterize the subsurface conditions, historical information was used from borings taken for the Inner Harbor Navigational Canal Lock Replacement Project Design Documentation Report No.3 from May 2002. Numerous undisturbed and general type borings were taken for the lock replacement project. Twelve (12) 5-inch undisturbed borings were taken in the vicinity of the lock replacement and seven (7) undisturbed borings were taken in the channel. More detailed information and boring logs can be found in the Inner Harbor Navigational Canal Lock Replacement Project Design Documentation Report No.3 from May 2002.

Visual classification and water content determinations were made for all samples taken from borings. Unconfined Compression (UCT), Unconsolidated-Undrained Triaxial (Q), Consolidated-Undrained Triaxial (R), Consolidated-Drained Direct (S) shear tests, and Consolidation (C) tests, and Atterberg Limits were performed on select samples from the undisturbed borings. Granular soils had grain–size analyses taken
from select samples of the undisturbed borings. Standard Penetration Test (SPT) blow counts were also recorded in granular soils. More detailed information on the test data can be found in the Inner Harbor Navigational Canal Lock Replacement Project Design Documentation Report No.3 from May 2002.

6.0 GEOLOGY

A generalized soil profile delineating the subsurface conditions was developed for the Inner Harbor Navigational Canal Lock Replacement Project Design Documentation Report No.3 from May 2002. The study area includes the section of the Inner Harbor Navigation Canal between the Claiborne Avenue Bridge to the South and Florida Avenue Bridge to the North. The detailed geologic write-up will not be repeated here, but can be found in the Inner Harbor Navigational Canal Lock Replacement Project Design Documentation Report No.3 from May 2002.

7.0 DESIGN SOIL PARAMETERS

Design shear strengths were created for the initial 2002 lock replacement design. The same strength parameters are used for this feasibility report. Strength attributes were created for the defining features of the area. These include the existing east bank, the existing west bank, and inside the channel. Cofferdam analysis on the eastern side utilized the strength line for the East bank to the bottom of the slope, then utilized the channel strength line for the channel section where the cofferdam sits. The geostudio program slope/w that the analysis was performed in linearly interpolates between the two. The southern cofferdam analysis uses only the channel strength line as the most conservative cell design in the southern portion would not utilize any strengths from the adjacent banks. The western bank stability check utilizes the strength line created for the western bank to the bottom of the slope, then utilizes the channel strength line for the channel. The geostudio program slope/w that the analysis was performed in linearly interpolates between the two. A summary of the stability design parameters for the east Bank, West Bank, and Channel Section are included below in Tables 4-6, respectively. A stability design parameter plot for each locations is included in the Inner Harbor Navigational Canal Lock Replacement Project Design Documentation Report No.3 from May 2002.
<table>
<thead>
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<th>MAT'L</th>
<th>ELEV.</th>
<th>UNDRAINED CONDITIONS</th>
<th>UNIT WEIGHT (pcf)</th>
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<td></td>
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<td></td>
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<td>cohesion, bottom (psf)</td>
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<td></td>
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<td>200</td>
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<td>6 SM</td>
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<td>7 CH</td>
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Table 1. Summary of the stability design parameters for the Channel section location.

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<th>UNDRAINED CONDITIONS</th>
<th>UNIT WEIGHT (pcf)</th>
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<td>G.S.E.</td>
<td>cohesion, top (psf)</td>
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<td>8 SM</td>
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<td>9 CH</td>
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<tr>
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Table 2. Summary of the stability design parameters for the east bank location.
Table 3. Summary of the stability design parameters for the west bank location.

### 8.0 ANALYSES AND RESULTS

#### 8.1 Global Stability

Stability was checked with the 2007 version of GeoStudio's Slope/W program to perform global stability analyses using the two water loadings: water at the top of the cell at EL +5.0 and water at elevation +3.0 with a 160 k impact load. The two different excavation elevations of -27.5 and -33 were checked for each water load cases. A factor of safety of 1.5 was the minimum threshold used for the cofferdam sections. The bank stability minimum factor of safety used in the analysis was 1.4. For each loading case, a non-circular (i.e. block-specified) and circular (entry-exit) slip surface analysis was performed.

The eastern cofferdam wall was checked with a 61 foot diameter cell made from PS-31 flat sheet piles. The sheets extend 95 feet down from EL +5.0 to EL -90. A jet grouted soil column was added to the design due to bearing capacity difficulties. The jet-grouted column extends 20 feet around the cofferdam for a length of 101 feet and extends 25 feet deep from EL -90 to EL -115. Analyses on this cell were performed with and without the soil column in place.

The factor of safety for the east bank was below 1.5 for the entry-exit non-circular search with the excavation at EL -33.0 without the jet grout column in place for both water load cases. With the jet grout column in place which it would need to be for the design to work with bearing capacity, the factor of safety increases to well above 1.5. See tables 4 and 5 below for a summary of the results for the east bank cofferdam with the water at EL +5.0 and at EL +3.0 with a 160 kip impact load. See appendix A and C for stability plates of the East bank cofferdam slope/w stability analyses.
The southern cofferdam wall was checked with a 61 foot diameter cell made from PS-31 flat sheet piles. The sheets extend 95 feet down from EL +5.0 to EL -90. A jet grouted soil column was added to the design due to bearing capacity difficulties. The jet-grouted column extends 20 feet around the cofferdam for a length of 101 feet and extends 25 feet deep from EL -90 to EL -115. Also, a berm was placed in the interior of the cofferdam to help against sliding and tilting. Analyses on this cell were performed with and without the soil column in place and with and without the rock berm in place.

The factor of safety for the southern cofferdam cell was below 1.5 for the entry-exit non-circular search with the excavation at EL -33.0 without the jet grout column in place for water EL +5.0. With either the jet grout column or rock berm in place, the factor of safety increases to well above 1.5. See tables 6 and 7 below for a summary of the results for the east bank cofferdam with the water at EL +5.0 and at EL +3.0 with a 160 kip impact load. See appendix B and D for stability plates of the East bank cofferdam slope/w stability analyses.
### SOUTH BANK – WATER EL. 5

<table>
<thead>
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<th>EXCAVATION DEPTH</th>
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<th>ROCK BERM</th>
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Table 6. Southern Cofferdam stability results for water elevation +5.0.

### SOUTH BANK – WATER EL. 3 + 160 KIP IMPACT LOAD

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<td>ENTRY EXIT</td>
<td>NO</td>
<td>NO</td>
<td>1.85</td>
</tr>
<tr>
<td>-27.5</td>
<td>ENTRY EXIT</td>
<td>YES</td>
<td>YES</td>
<td>2.52</td>
</tr>
<tr>
<td>-27.5</td>
<td>ENTRY EXIT</td>
<td>YES</td>
<td>NO</td>
<td>2.48</td>
</tr>
</tbody>
</table>

Table 7. Southern Cofferdam stability results for water elevation +3.0 with 160 kip impact load.
The West Bank stability was checked going into the empty excavation at the most critical elevation of -33.0. No cofferdam wall is in place on the western side as the west bank itself will be used as the western part of the cofferdam. Required factor of safety for analysis is 1.4. Slopes were arranged in three staggered zones with 1V:3H slopes up to the bottom of the excavation which employs a 1V:4H slope. All factors of safety are above 1.4. See table 8 for below for a summary of the stability results for the West Bank. See appendix E for stability plates of the East bank cofferdam slope/w stability analyses.

<table>
<thead>
<tr>
<th>EXCAVATION DEPTH</th>
<th>TYPE OF SEARCH</th>
<th>SLOPE</th>
<th>F.O.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-33.0</td>
<td>BLOCK</td>
<td>OVERALL</td>
<td>1.79</td>
</tr>
<tr>
<td>-33.0</td>
<td>BLOCK</td>
<td>OVERALL (OPT)</td>
<td>1.49</td>
</tr>
<tr>
<td>-33.0</td>
<td>ENTRY EXIT</td>
<td>BOTTOM</td>
<td>1.70</td>
</tr>
<tr>
<td>-33.0</td>
<td>ENTRY EXIT</td>
<td>BOTTOM (OPT)</td>
<td>1.63</td>
</tr>
<tr>
<td>-33.0</td>
<td>ENTRY EXIT</td>
<td>LOWER</td>
<td>3.70</td>
</tr>
<tr>
<td>-33.0</td>
<td>ENTRY EXIT</td>
<td>MIDDLE</td>
<td>3.54</td>
</tr>
<tr>
<td>-33.0</td>
<td>ENTRY EXIT</td>
<td>TOP</td>
<td>1.45</td>
</tr>
<tr>
<td>-33.0</td>
<td>ENTRY EXIT</td>
<td>TOP (OPT)</td>
<td>1.42</td>
</tr>
</tbody>
</table>

Table 8. West Bank stability results.

8.2 Internal Stability

The cofferdam cell was checked for a 61 foot diameter cell. The cofferdam was designed with the fill assumed as clean sand down to the ground surface. The top 18 inches would be crushed stone to serve as a cap for the cofferdam and protect against erosion due to overtopping at the top. All cofferdam cells will sit within the limits of the channel, so channel soil properties were used to determine the total weight used in internal stability calculations. Rankine’s active and passive pressures were also calculated using channel properties. Moments were checked for both water load cases and the larger moment of the two cases was used to calculate overturning. For the 61 foot diameter cell, the kern was 20.3 feet. The calculated eccentricity stays within the kern point keeping the structure from overturning. The bearing capacity of the heavy cell will not work when founded on the native soil alone. The in-situ clay will not take the weight. Bearing capacity checks were examined with a light weight fill, but the native soil would still not bear the weight. A jet grouted soil zone at the base of the cell extending 20 feet on both sides of the cell and 101 feet in total length and 25 feet in depth will be incorporated to bear the weight. The assumed value for the shear strength in the treated zone was 3500 psf. Discussions with Hayward Baker determined that an average unconfined compressive strength of 250 psi of treated soil was reasonable with an allowable shear strength of 75 psi was attainable. With a replacement ratio of 1/3 applied, 25 psi was determined as an average attainable strength of the treated zone which is 3600 psf. Details can be found in the Inner Harbor Navigation Canal Lock Replacement Cast-In-Place Cofferdam 95% Feasibility Level Design, USACE Contract No. DACW29-02-D-0008, TO 0002, Sep 2006 for further details on dewatering, pressure relief, or rewatering. The 95 foot high cell will not work alone.
when checking against sliding. It is then recommended that the jet-grouted soil that will be used at the base of the cell be inserted into the bottom ten feet of the interior of the cell. This helps secure the structure against sliding. Design checks were also done for tilting, vertical shear, and interlock tension. The cell, as designed, proved stable against those failure modes. All internal stability calculations were done by hand. See appendix F for internal stability hand calculations.

9.0 INSTRUMENTATION

The open cell cofferdam design will require dewatering for work in the interior of the TRS. This report does not include a dewatering plan and leaves the methods for dewatering up to the contractor whether it involve sumps or wellpoints. This plan would require the installation of several piezometers to measure the performance of the contractor’s system. Figure 31 in the URS design report from 2006 shows a proposed set-up for 4 shallow piezometers. Information can be found in Inner Harbor Navigation Canal Lock Replacement Cast-In-Place Cofferdam 95% Feasibility Level Design, USACE Contract No. DACW29-02-D-0008, TO 0002, Sep 2006.

The URS plan from 2006 also includes a pressure relief system of the sand stratum at elevation -130. This would involve a series of 26 pressure relief wells extending down to elevation -140 with 4 shallow and 4 deep piezometers for monitoring during construction. The layout for these piezometers can also be found on figure 31. Information can be found in Inner Harbor Navigation Canal Lock Replacement Cast-In-Place Cofferdam 95% Feasibility Level Design, USACE Contract No. DACW29-02-D-0008, TO 0002, Sep 2006.

10.0 CONSTRUCTION LIMITATIONS

The designs in this report took the existing design from the 2006 URS design report and adapted calculations for excavation depths at elevations -33 and -27.5. Construction limitations or techniques were not considered for this report, but can be found in Inner Harbor Navigation Canal Lock Replacement Cast-In-Place Cofferdam 95% Feasibility Level Design, USACE Contract No. DACW29-02-D-0008, TO 0002, Sep 2006.

11.0 SUMMARY

This report serves as a supplement to the Inner Harbor Navigation Canal Lock Replacement Cast-In-Place Cofferdam 95% Feasibility Level Design, USACE Contract No. DACW29-02-D-0008, TO 0002, Sep 2006. The same cell layout that was used in that design was incorporated in this feasibility study with more shallow excavations. A smaller cell diameter than was used in 2006 was analyzed for this study and passes all internal and external stability checks. At the feasibility stage, a 61 foot diameter cell, filled with a clean sand and capped with 18 inches of rock and tipped to elevation -90 is the recommended option. There should be a 101 foot long and 25 feet deep jet-grouted soil zone underneath the cell. The jet grout soil treatment should also extend 10 feet from the base into the interior of the cell. The rock berm option should not be needed with the jet grout soil section. No pile option was considered for this
study as it was believed to be more costly based on the 2006 report. No dewatering plan, pressure relief system, or rewatering plan is included with this report. See the Inner Harbor Navigation Canal Lock Replacement Cast-In-Place Cofferdam 95% Feasibility Level Design, USACE Contract No. DACW29-02-D-0008, TO 0002, Sep 2006 for further details on dewatering, pressure relief, or rewatering. The ends of the east cofferdam are tapered at the north and south ends to improve navigation for vessels in the channel and to limit chances of impact loads hitting the walls. Protection cells are also recommended to help protect against impact loads. This information in this report is to be used for cost estimating purposes for the completions of the GRR. A more detailed design can be performed in the design phase of the project. The layout of the cell wall system can be found in the Inner Harbor Navigation Canal Lock Replacement Cast-In-Place Cofferdam 95% Feasibility Level Design, USACE Contract No. DACW29-02-D-0008, TO 0002, Sep 2006. Figure 1 below shows the cell, bypass channel and eastern bank with dimensions.

![Cell Design Sketch](image)

Figure 1. Cell Design Sketch.

12.0 REFERENCES


APPENDIX A:

Global Stability Excavation EL -27.5 East Bank Cofferdam
DISTANCE IN FEET

PLATE/FIGURE-APPENDIX A-1

GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Outer Harbor Navigation Canal TFR feasibility study
Eastern Cofferdam Water EL +5.061 ft cell
Block Search No jet grout

PLATE/FIGURE: APPENDIX A-1

Inner Harbor Navigation Canal TFR feasibility study

US Army Corps of Engineers
New Orleans District

ELEVATION IN FEET N.A.V.D. 88

DISTANCE IN FEET

PLATE/FIGURE: APPENDIX A-1

Inferred notes: Classification stratification

Name: CH EL. -21.0 TO -50.0 EAST BANK  Model: Spatial Mohr-Coulomb  Unit Weight: 100 pcf  Cohesion Spatial Fn: CH EL. -21.0 TO -50.0  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -100.0 TO -136.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH. -100 to -136  Cohesion Fn: CH. -100 to -136  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH. -185 to -240  Cohesion Spatial Fn: CH EL. -197.0 TO -240.0  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH. -50 to -58  Cohesion Spatia Fn: CH EL. -50 TO -58.0  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH. -165 to -178  Cohesion Spatial Fn: CH EL. -165.0 TO -178.0  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -65.0 TO -100.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH. -65 to -100  Cohesion Spatia Fn: CH EL. -65 TO -100  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH. -142 to -155  Cohesion Spatial Fn: CH EL. -142.0 TO -155.0  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -27.5 TO -50.0 CHANNEL  Model: Mohr-Coulomb  Unit Weight: 98 pcf  Cohesion: 200 psf  Phi: 15 °  Piezometric Line: 1
Name: CH EL. -185.0 TO -197.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH. -185 to -197  Cohesion Spatial Fn: CH EL. -185.0 TO -197.0  Phi: 0 °  Piezometric Line: 1
Name: CELL  Model: Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion: 10000 psf  Phi: 45 °  Piezometric Line: 1

Name: ML  Model: Mohr-Coulomb  Unit Weight: 117 pcf  Cohesion: 200 psf  Phi: 15 °  Piezometric Line: 1
Name: SM  Model: Mohr-Coulomb  Unit Weight: 120 pcf  Cohesion: 0 psf  Phi: 30 °  Piezometric Line: 1
Name: CH EL. -27.5 TO -50.0 CHANNEL  Model: Mohr-Coulomb  Unit Weight: 98 pcf  Cohesion: 200 psf  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -185.0 TO -197.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH. -185 to -197  Cohesion Spatial Fn: CH EL. -185.0 TO -197.0  Phi: 0 °  Piezometric Line: 1
Name: CELL  Model: Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion: 10000 psf  Phi: 45 °  Piezometric Line: 1
GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORING AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Name: CH  EL. -27.5 TO -50.0 CHANNEL  Model: Mohr-Coulomb  Unit Weight: 120 pcf  Cohesion: 3500 psi  Phi: 0°  Piezometric Line: 1
Name: JET GROUTED SOIL ZONE  Model: Mohr-Coulomb  Unit Weight: 120 pcf  Cohesion: 3500 psi  Phi: 0°  Piezometric Line: 1
Name: CELL  Model: Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion: 10000 psi  Phi: 45°  Piezometric Line: 1
Name: ML  Model: Mohr-Coulomb  Unit Weight: 117 pcf  Cohesion: 200 psi  Phi: 15°  Piezometric Line: 1
Name: SM  Model: Mohr-Coulomb  Unit Weight: 122 pcf  Cohesion: 0 psi  Phi: 30°  Piezometric Line: 1
Name: CH  EL. -142.0 TO -155.0 CHANNEL  Model: Spatial Mohr-Coulomb  Weight Fn: CH -142 to -155  Cohesion Spatial Fn: CH EL. -142.0 TO -155.0  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -165.0 TO -178.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -165 to -178  Cohesion Spatial Fn: CH EL. -165.0 TO -178.0  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -100.0 TO -136.0 Model: Spatial Mohr-Coulomb  Weight Fn: CH -100 to -136  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -185.0 TO -197.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -185 to -197  Cohesion Spatial Fn: CH EL. -185.0 TO -197.0  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -50.0 TO -58.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -50 to -58  Cohesion Spatial Fn: CH EL. -50.0 TO -58.0  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -197.0 TO -240.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -197 to -240  Cohesion Spatial Fn: CH EL. -197.0 TO -240.0  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -120.0 TO -128.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -120 to -128  Cohesion Spatial Fn: CH EL. -120.0 TO -128.0  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -65.0 TO -100.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -65 to -100  Cohesion Fn: CH -65 to -100  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -50.0 TO -58.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -50 to -58  Cohesion Spatial Fn: CH EL. -50.0 TO -58.0  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -180.0 TO -197.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -180 to -197  Cohesion Spatial Fn: CH EL. -180.0 TO -197.0  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -210.0 TO -50.0 EAST BANK  Model: Spatial Mohr-Coulomb  Weight Fn: CH -210 to -50  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -3.0 TO -21.0 EAST BANK  Model: Mohr-Coulomb  Unit Weight: 100 pcf  Cohesion Spatial Fn: CH EL. -3.0 TO -21.0  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -27.5 TO -50.0 EAST BANK  Model: Mohr-Coulomb  Unit Weight: 98 pcf  Cohesion: 200 psi  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -210.0 TO -50.0 EAST BANK  Model: Mohr-Coulomb  Unit Weight: 96 pcf  Cohesion: 215 psi  Phi: 0°  Piezometric Line: 1
Name: CH  EL. -50.0 TO -58.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -50 to -58  Cohesion Spatial Fn: CH EL. -50.0 TO -58.0  Phi: 0°  Piezometric Line: 1
Name: Inner Harbor Navigation Canal TRS feasibility study

EAST BANK

COFFERDAM
COFFERDAM

DISTANCE IN FEET

INNER HARBOR NAVIGATIONAL CANAL TRS feasibility study

EAST BANK

INNER HARBOR NAVIGATIONAL CANAL CONSTRUCTION

CLASIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

PLATE/FIGURE-APPENDIX A-3
DISTANCE IN FEET

GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

COFFERDAM

EAST BANK

INNER HARBOR

NAVIGATION CANAL

RTS feasibility study

EASTERN COFFERDAM

WATER EL. +5.061 ft cell

ENTRY AND EXIT

JET GROUTED SOIL ZONE

CELL

PLATE/FIGURE: APPENDIX A-4

INNER HARBOR

NAVIGATION CANAL

RTS feasibility study

EASTERN COFFERDAM

WATER EL. +5.061 ft cell

ENTRY AND EXIT

JET GROUTED SOIL ZONE

CELL

PLATE/FIGURE: APPENDIX A-4
DISTANCE IN FEET

Name: Block no jet grout
File Name: East bank coff el-27.5 160k_new channel EL.gsz
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (US)

PLATE/FIGURE-APPENDIX A-5

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Impact Load: Coordinate: (132, 5) ft  Magnitude: 2600 lbs

Name: ML       Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Piezometric Line: 1
Name: SM       Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Piezometric Line: 1
Name: CH       Model: Mohr-Coulomb      Unit Weight: 98 pcf     Cohesion: 200 psi     Phi: 0 °     Piezometric Line: 1
Name: CELL     Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 10000 psi     Phi: 0 °     Piezometric Line: 1

Inner Harbor Harbor Channel
TRS Feasibility Study
Eastern Cofferdam
Water EL +5.061 ft cell
Block Search
No jet grout

LWL-EE
DISTANCE IN FEET

INNER HARBOR NAVIGATIONAL CANAL

COFFERDAM

EAST BANK

GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Impact Load: Coordinate: (132, 5) ft  Magnitude: 2600 lbs
1. DISTANCE IN FEET

2. GENERAL NOTES

3. CLASSIFICATION STRATIFICATION

4. SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES

5. SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

6. Impact Load: Coordinate: (132, 5) ft Magnitude: 2650 lbs
DISTANCE IN FEET

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

GENERAL NOTES

Impact Load: Coordinate: (132, 5) ft Magnitude: 2650 lbs
DISTANCE IN FEET

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

DISTANCE IN FEET

EAST BANK

VERT. 1

VERT. 2

EL. 5

2.44

INNER HARBOR

EAST BANK

PLATE/FIGURE-APPENDIX A-9

LWL-EE
Name: CH EL -210 TO -50.0 EAST BANK      Model: Spatial Mohr-Coulomb      Unit Weight: 100 pcf     Cohesion Spatial Fn: CH EL -210 TO -50.0     Phi: 0 °     Piezometric Line: 1
Name: CH EL -100.0 TO -136.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -100 to -136     Cohesion Fn: CH -100 to -136     Phi: 0 °     Piezometric Line: 1
Name: CH EL -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -185 to -240     Cohesion Spatial Fn: CH EL -197.0 TO -240.0     Phi: 0 °     Piezometric Line: 1
Name: CH EL -50.0 TO -60.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -50 to -60     Cohesion Spatial Fn: CH EL -50 TO -60.0     Phi: 0 °     Piezometric Line: 1
Name: CH EL -160.0 TO -178.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -165 to -178      Cohesion Spatial Fn: CH EL -160.0 TO -178.0      Phi: 0 °     Piezometric Line: 1
Name: CH EL -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -142 to -155      Cohesion Spatial Fn: CH EL -142.0 TO -155.0      Phi: 0 °     Piezometric Line: 1
Name: Ml      Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Piezometric Line: 1
Name: CH EL -27.5 TO -50.0 CHANNEL      Model: Mohr-Coulomb      Unit Weight: 98 pcf     Cohesion: 200 psf     Phi: 0 °     Piezometric Line: 1
Name: CH EL -185.0 TO -197.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -185 to -240     Cohesion Spatial Fn: CH EL -185.0 TO -197.0      Phi: 0 °     Piezometric Line: 1
Name: CELL      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 10000 psf     Phi: 45 °     Piezometric Line: 1

**GENERAL NOTES**

**CLASSIFICATION STRATIFICATION**

Shear strengths and unit weight of the soil were based on the results of undisturbed borings and CPT data. See both boring and CPT data plates.

Shear strengths between verticals were assumed to vary linearly between the values indicated for these locations.

**COFFERDAM**

Inner Harbor Navigation Canal

TRS feasibility study

Eastern Cofferdam

Water EL +5.061 ft cell

Entry and Exit

No jet grout

Impact Load: Coordinate: (132, 5) ft     Magnitude: 2600 lbs

Name: EE no jet grout (slope in channel check)
File Name: East bank cif el27.5 160_r new channel EL.gpz
Last Edited By: Middleton, Mark C MVN

LWL-EE
APPENDIX B:

Global Stability Excavation EL -27.5 South Cofferdam
1.84

DISTANCE IN FEET

The Passive Mode: Yes

Name: rock      Model: Spatial Mohr-Coulomb      Unit Weight: 130 pcf     Cohesion: 0 psf     Phi: 40 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -197.0 TO -240.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -165.0 TO -178.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -65.0 to -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 900 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -142.0 TO -155.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: ML      Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1
Name: cell      Model: Mohr-Coulomb      Unit Weight: 100000 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: Block no jet grout

GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Inner Harbor
Navigational Canal
TRIS Feasibility Study

North and South Cofferdam
Water EL +5.0
Excavation at EL -27.5
61 ft rail
Bottom Search
No Jet Grout

LWL-EE
Use Passive Mode: Yes

Name: CH EL. -100 TO -136 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 1200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -197.0 TO -240.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 600 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -165.0 TO -178.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -165.0 TO -178.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -65.0 to -100.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 900 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -142.0 TO -155.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -142.0 TO -155.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: ML Model: Mohr-Coulomb Unit Weight: 117 pcf Cohesion: 200 psf Phi: 15 ° Phi-B: 0 ° Piezometric Line: 1

Name: SM Model: Mohr-Coulomb Unit Weight: 122 pcf Cohesion: 0 psf Phi: 30 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. ground TO -50.0 channel Model: Mohr-Coulomb Unit Weight: 98 pcf Cohesion: 200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: cell Model: Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 10000 psf Phi: 45 ° Phi-B: 0 ° Piezometric Line: 1

CLASSIFICATION STRATIFICATION
SHAKE STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORING AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

GENERAL NOTES

PLATE/FIGURE - APPENDIX B-2

X:
Y:

W:\NIPUS\Design\Ext2\Drafts\Draft0\Inner Harbor\NavCanal\TRS\Feasibility\Inner Harbor NavCanal TRS Feasibility Study - North and South Cofferdam Water EL -5.2 Excavation at EL -27.5 61 ft rail Block Search No Jet Grout

File Name: South-elt-27.5 - Channel.psd
Last Edited By: Alrehleh, Hashim I CIV USARMY CEMVN (US)
DISTANCE IN FEET

COFFERDAM

VERT. 1

EAST BANK

GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

PLATE/FIGURE - APPENDIX B-3

INNER HARBOR

NORTH AND SOUTH COFFERDAM

WATER EL +5.0

EXCAVATION AT EL -27.561 FT CELL

BLOCK SEARCH

JET GROUT

US ARMY CORPS OF ENGINEERS - NEW ORLEANS DISTRICT

US ARMY CORPS OF ENGINEERS - NEW ORLEANS DISTRICT

NAME: Block w jet grout

FILE NAME: South cell el-27.5 - Channel.gsz

LAST EDITED BY: Alrahahleh, Hashim I CIV USARMY CEMVN (US)

INNER HARBOR

NAVIGATIONAL CANAL

TRS FEASIBILITY STUDY

NORTH AND SOUTH COFFERDAM

WATER EL +5.0

EXCAVATION AT EL -27.561 FT CELL

BLOCK SEARCH

JET GROUT

PLATE/FIGURE - APPENDIX B-3

LWL-EE

-300 -280 -260 -240 -220 -200 -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440

VERT. 1

-300 -280 -260 -240 -220 -200 -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440

ELEVATION IN FEET N.A.V.D. 88

DISTANCE IN FEET

-300 -280 -260 -240 -220 -200 -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440

PLATE/FIGURE - APPENDIX B-3

INNER HARBOR

NAVIGATIONAL CANAL

TRS FEASIBILITY STUDY

NORTH AND SOUTH COFFERDAM

WATER EL +5.0

EXCAVATION AT EL -27.561 FT CELL

BLOCK SEARCH

JET GROUT

US ARMY CORPS OF ENGINEERS - NEW ORLEANS DISTRICT

US ARMY CORPS OF ENGINEERS - NEW ORLEANS DISTRICT

US ARMY CORPS OF ENGINEERS - NEW ORLEANS DISTRICT

NAME: Block w jet grout

FILE NAME: South cell el-27.5 - Channel.gsz

LAST EDITED BY: Alrahahleh, Hashim I CIV USARMY CEMVN (US)

INNER HARBOR

NAVIGATIONAL CANAL

TRS FEASIBILITY STUDY

NORTH AND SOUTH COFFERDAM

WATER EL +5.0

EXCAVATION AT EL -27.561 FT CELL

BLOCK SEARCH

JET GROUT

PLATE/FIGURE - APPENDIX B-3

LWL-EE
2.17 DISTANCE IN FEET
Use Passive Mode: Yes
Name: CH EL. -100 TO -136 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 1200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -197.0 TO -240.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0 Model: Spatial Mohr-Coulomb Unit Weight: 108 pcf Cohesion: 600 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -165.0 TO -178.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -65.0 TO -100.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -65.0 TO -100.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL -142.0 TO -155.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -142.0 TO -155.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: ML Model: Mohr-Coulomb Unit Weight: 117 pcf Cohesion: 200 psf Phi: 15 ° Phi-B: 0 ° Piezometric Line: 1
Name: SM Model: Mohr-Coulomb Unit Weight: 122 pcf Cohesion: 0 psf Phi: 30 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. ground TO -30.0 channel Model: Mohr-Coulomb Unit Weight: 98 pcf Cohesion: 200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL -185 to -197 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -185.0 TO -197.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: Jet grouted soil zone Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion: 3500 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: cell Model: Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 10000 psf Phi: 45 ° Phi-B: 0 ° Piezometric Line: 1

GENERAL NOTES
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES
SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Name: Block w jet grout (no rock) File Name: South coff el-27.5 - Channel.gz
Last Edited By: Alrahahleh, Hashim I CIV USARMY CEMVN (US)
Use Passive Mode: Yes

Name: rock      Model: Spatial Mohr-Coulomb      Unit Weight: 130 pcf     Cohesion: 0 psf     Phi: 40 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -197.0 TO -240.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -255 TO -197.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -255 TO -197.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -142.0 TO -155.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: ML       Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1
Name: EE no jet grout

GENERAL NOTES
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.
### General Notes

*Shear strengths and unit weight of the soil were based on the results of undisturbed borings and CPT data. See both boring and CPT data plates.*

*Shear strengths between verticals were assumed to vary linearly between the values indicated for these locations.*

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**Classification Stratification**

The soil was classified as follows:

- **Class A**: High Plasticity Clays
- **Class B**: High Plasticity Clay
- **Class C**: Medium Plasticity Clay
- **Class D**: Low Plasticity Clay
- **Class E**: Silt
- **Class F**: Sand
- **Class G**: Gravel

**Unit Weight**

- **ML**: 117 pcf
- **SM**: 122 pcf
- **CE**: 115 pcf
- **Cell**: 115 pcf

**Cohesion and Friction Angle**

- **ML**: Cohesion: 200 psi, Phi: 15°
- **SM**: Cohesion: 0 psi, Phi: 30°
- **CE**: Cohesion: 1200 psi, Phi: 0°
- **Cell**: Cohesion: 10000 psi, Phi: 45°

---

**Elevation in Feet N.A.V.D. 88**

- **-240** to **-220**
- **-200** to **-180**
- **-160** to **-140**
- **-120** to **-100**
- **-80** to **-60**
- **-40** to **-20**
- **0** to **20**
- **40** to **60**
- **80** to **100**
- **120** to **140**
- **160** to **180**
- **200** to **220**
- **240** to **260**
- **280** to **300**

---

**Passive Mode:** Yes

- **Name:** CH EL. -100 TO -136
  - **Model:** Spatial Mohr-Coulomb
  - **Unit Weight:** 115 pcf
  - **Cohesion:** 1200 psi
  - **Phi:** 0°
  - **Piezometric Line:** 1

- **Name:** CH EL. -197.0 TO -240.0
  - **Model:** Spatial Mohr-Coulomb
  - **Unit Weight:** 115 pcf
  - **Cohesion Spatial Fn:** CH EL. -197.0 TO -240.0
  - **Phi:** 0°
  - **Piezometric Line:** 1

- **Name:** CH EL. -50.0 TO -58.0
  - **Model:** Spatial Mohr-Coulomb
  - **Unit Weight:** 108 pcf
  - **Cohesion:** 600 psi
  - **Phi:** 0°
  - **Piezometric Line:** 1

- **Name:** CH EL. -165.0 TO -178.0
  - **Model:** Spatial Mohr-Coulomb
  - **Unit Weight:** 115 pcf
  - **Cohesion Spatial Fn:** CH EL. -165.0 TO -178.0
  - **Phi:** 0°
  - **Piezometric Line:** 1

- **Name:** CH EL. -65.0 TO -100.0
  - **Model:** Spatial Mohr-Coulomb
  - **Unit Weight:** 115 pcf
  - **Cohesion:** 900 psi
  - **Phi:** 0°
  - **Piezometric Line:** 1

- **Name:** CH EL. -142.0 TO -155.0
  - **Model:** Spatial Mohr-Coulomb
  - **Unit Weight:** 115 pcf
  - **Cohesion Spatial Fn:** CH EL. -142.0 TO -155.0
  - **Phi:** 0°
  - **Piezometric Line:** 1

- **Name:** ML
  - **Model:** Mohr-Coulomb
  - **Unit Weight:** 117 pcf
  - **Cohesion:** 200 psi
  - **Phi:** 15°
  - **Piezometric Line:** 1

- **Name:** SM
  - **Model:** Mohr-Coulomb
  - **Unit Weight:** 122 pcf
  - **Cohesion:** 0 psi
  - **Phi:** 30°
  - **Piezometric Line:** 1

- **Name:** cell
  - **Model:** Mohr-Coulomb
  - **Unit Weight:** 115 pcf
  - **Cohesion:** 10000 psi
  - **Phi:** 45°
  - **Piezometric Line:** 1

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**PLATE/FIGURE - APPENDIX B-6**

**ENTRY AND EXIT**

- **No Jet Grout**

**FLOODWAY**

- **No Jet Grout**

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**US Army Corps of Engineers**

**New Orleans District**

**North and South Cofferdam**

**Entry and Exit**

---

**Last Edited By:** Middleton, Mark C MVN

---

**File Name:** South cell e-27.5 - Channel.gsz

---

**Range:** -100 to -136
2.47 DISTANCE IN FEET

Use Passive Mode: Yes

Name: rock      Model: Spatial Mohr-Coulomb      Unit Weight: 130 pcf     Cohesion: 0 psf     Phi: 40 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -197.0 TO -240.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Unit Weight: 108 pcf     Cohesion: 600 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -165.0 TO -178.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -65.0 to -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 900 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -142.0 TO -155.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: ML       Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. ground TO -50.0 channel Model: Mohr-Coulomb      Unit Weight: 98 pcf     Cohesion Spatial Fn: CH EL. -50.0 channel      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -185 to -197 Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -185.0 TO -197.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: cell Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 10000 psf     Phi: 45 °     Phi-B: 0 °     Piezometric Line: 1

VERT. 1

GENERAL NOTES
CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF
THE SOIL WERE BASED ON THE RESULTS OF
UNDISTURBED BORINGS AND CPT DATA. SEE
BOTH BORING AND CPT DATA PLATES

SHEAR STRENGTHS BETWEEN VERTICALS
WERE ASSUMED TO VARY LINEARLY BETWEEN
THE VALUES INDICATED FOR THESE LOCATIONS

PLATE/FIGURE - APPENDIX B-7

LWL-EE

File Name: South cpl-e-27.5 - Channel.pst
Last Edited By: Moebes, Mark C 5/06/13
2.37

DISTANCE IN FEET

Use Passive Mode: Yes

Name: CH EL. -100 TO -136  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion: 1200 psf  Phi: 0°  Phi-B: 0°  Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Spatial Fn: CH EL. -197.0 TO -240.0  Phi: 0°  Phi-B: 0°  Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0  Model: Spatial Mohr-Coulomb  Unit Weight: 108 pcf  Cohesion: 600 psf  Phi: 0°  Phi-B: 0°  Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Spatial Fn: CH EL. -165.0 TO -178.0  Phi: 0°  Phi-B: 0°  Piezometric Line: 1
Name: CH EL. -65.0 TO -100.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Spatial Fn: CH EL. -65.0 TO -100.0  Phi: 0°  Phi-B: 0°  Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Spatial Fn: CH EL. -142.0 TO -155.0  Phi: 0°  Phi-B: 0°  Piezometric Line: 1
Name: ML  Model: Mohr-Coulomb  Unit Weight: 117 pcf  Cohesion: 200 psf  Phi: 15°  Phi-B: 0°  Piezometric Line: 1
Name: SM  Model: Mohr-Coulomb  Unit Weight: 122 pcf  Cohesion: 0 psf  Phi: 30°  Phi-B: 0°  Piezometric Line: 1
Name: CH EL. ground TO -50.0 channel  Model: Mohr-Coulomb  Unit Weight: 98 pcf  Cohesion: 200 psf  Phi: 0°  Phi-B: 0°  Piezometric Line: 1
Name: CH EL. -185 TO -197  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Spatial Fn: CH EL. -185.0 TO -197.0  Phi: 0°  Phi-B: 0°  Piezometric Line: 1
Name: cell  Model: Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion: 10000 psf  Phi: 45°  Phi-B: 0°  Piezometric Line: 1

GENERAL NOTES

CLASSIFICATION STRATIFICATION

Shear strengths and unit weight of the soil were based on the results of undisturbed borings and CPT data. See both boring and CPT data plates.

Shear strengths between verticals were assumed to vary linearly between the values indicated for these locations.

Name: EE with jet grout (no rock)

File Name: South cell w-27.5 - Channel.png
Last Edited By: Middleton, Mark C MVN

North and South Cofferdam
Water EL +5.0
Excavation at EL -27.5
Dry and Exit
Jet Grout

PLATE/FIGURE - APPENDIX B-B

US Army Corps of Engineers.
New Orleans District

LWL-EE
1.89

DISTANCE IN FEET

Use Passive Mode: Yes
Name: rock      Model: Spatial Mohr-Coulomb      Unit Weight: 130 pcf     Cohesion: 0 psf     Phi: 40 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -197.0 TO -240.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Unit Weight: 108 pcf     Cohesion: 600 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -165.0 TO -178.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -65.0 TO -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 900 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -142.0 TO -155.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: ML Model: Mohr-Coulomb      Unit Weight: 117 pdf     Cohesion: 200 pdf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1
Name: SM Model: Mohr-Coulomb      Unit Weight: 122 pdf     Cohesion: 0 pdf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. ground TO -56.0 channel Model: Mohr-Coulomb      Unit Weight: 98 pdf     Cohesion: 200 pdf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -185 to -197 Model: Spatial Mohr-Coulomb      Unit Weight: 115 pdf     Cohesion Spatial Fn: CH EL. -185.0 TO -197.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: cell Model: Mohr-Coulomb      Unit Weight: 115 pdf     Cohesion: 10000 pdf     Phi: 45 °     Phi-B: 0 °     Piezometric Line: 1
Impact Load Coordinate: (-49, 9) ft     Magnitude: 2600 lbs

PLATE/FIGURE - APPENDIX B-9

GENERAL NOTES
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOILS WERE BASED ON THE RESULTS OF UNDISTURBED BORINGs AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.
SHEAR STRENGTHs BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.
DISTANCE IN FEET

Use Passive Mode: Yes

Name: CH EL. -100 TO -136
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 1200 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 900 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0
Model: Spatial Mohr-Coulomb
Unit Weight: 108 pcf
Cohesion: 600 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -165.0 TO -178.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 1200 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -142.0 TO -155.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 900 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: ML
Model: Mohr-Coulomb
Unit Weight: 117 pcf
Cohesion: 200 psf
Phi: 15 °
Phi-B: 0 °
Piezometric Line: 1

Name: SM
Model: Mohr-Coulomb
Unit Weight: 122 pdf
Cohesion: 0 psf
Phi: 30 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. ground TO -56.0 channel
Model: Mohr-Coulomb
Unit Weight: 98 pdf
Cohesion: 200 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: cell
Model: Mohr-Coulomb
Unit Weight: 115 pdf
Cohesion: 10000 psf
Phi: 45 °
Phi-B: 0 °
Piezometric Line: 1

Impact Load Coordinate: (-49, 5) ft
Magnitude: 2600 lbs

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

PLATE/FIGURE - APPENDIX B-10

Name: Block no jet grout (no rock)
File Name: South coff el-27.5 - Channel - 160 k.gsz
Last Edited By: Alrahahleh, Hashim I CIV USARMY CEMVN (US)
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

Impact Load Coordinate: (-49, 5) ft  Magnitude: 2600 lbs

Name: rock Model: Spatial Mohr-Coulomb Unit Weight: 130 pcf Cohesion: 0 psf Phi: 40 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -100 TO -136 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 1200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -197.0 TO -240.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 600 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -165.0 TO -178.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -142.0 TO -155.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -65.0 TO -100.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -65.0 TO -100.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: ML Model: Mohr-Coulomb Unit Weight: 117 pcf Cohesion: 200 psf Phi: 30 ° Phi-B: 0 ° Piezometric Line: 1
Name: SM Model: Mohr-Coulomb Unit Weight: 122 pdf Cohesion: 0 psf Phi: 30 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. ground TO -50.0 channel Model: Mohr-Coulomb Unit Weight: 98 pdf Cohesion: 200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -185 TO -197 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -185.0 TO -197.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: jet grouted soil zone Model: Mohr-Coulomb Unit Weight: 120 pdf Cohesion: 3500 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: cell Model: Mohr-Coulomb Unit Weight: 115 pdf Cohesion: 10000 psf Phi: 45 ° Phi-B: 0 ° Piezometric Line: 1

GENERAL NOTES
Shear Stresses Between Verticals were assumed to vary linearly between the values indicated for these locations.

Inner Harbor Navigational Canal TRS Feasibility Study
North and South Cofferdam Water EL +3.0
Excavation at EL -27.5 61 ft sail
Block Search
Jet Grout

US Army Corps of Engineers
New Orleans District

PLATE/FIGURE - APPENDIX B-11

File Name: South coff el -27.5 - Channel -160 kg.sxd
Last Edited By: Arabshahi, Hazem CIV USARMY CEMVN (US)
DISTANCE IN FEET

ELEVATION IN FEET NAVD 88

Use Passive Mode: Yes
Name: CH EL. -100 TO -136
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 1200 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -197.0 TO -240.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0
Model: Spatial Mohr-Coulomb
Unit Weight: 108 pcf
Cohesion: 600 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -165.0 TO -178.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -165.0 TO -178.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -65.0 TO -100.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -65.0 TO -100.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: ML
Model: Mohr-Coulomb
Unit Weight: 117 pcf
Cohesion: 200 psf
Phi: 15 °
Phi-B: 0 °
Piezometric Line: 1

Name: SM
Model: Mohr-Coulomb
Unit Weight: 122 pcf
Cohesion: 0 psf
Phi: 30 °
Phi-B: 0 °
Piezometric Line: 1

Name: cell
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 10000 psf
Phi: 45 °
Phi-B: 0 °
Piezometric Line: 1

Impact Load Coordinate: (-49, 5) ft
Magnitude: 2600 lbs

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

North and South Cofferdam
Inner Harbor Navigation Canal
TRG Feasibility Study

ELEVATION IN FEET NAVD 88

VERT. 1

INNER HARBOR NAVIGATION CANAL

COFFERDAM

EAST BANK

PLATE/FIGURE - APPENDIX B-12

INNER HARBOR NAVIGATION CANAL TRG FEASIBILITY STUDY

NAME: Block w jet grout (no rock)

File Name: South coff el-27.5 - Channel - 160 kg.gz

Last Edited By: Alrahahleh, Hashim I CIV USARMY CEMVN (US)
CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORING AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.
Use Passive Mode: Yes

Name: CH EL. -100 TO -136
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 1200 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -197.0 TO -240.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0
Model: Spatial Mohr-Coulomb
Unit Weight: 108 pcf
Cohesion: 600 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -165.0 TO -178.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -165.0 TO -178.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -65.0 to -100.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -65.0 to -100.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -142.0 TO -155.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -142.0 TO -155.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: ML
Model: Mohr-Coulomb
Unit Weight: 117 pcf
Cohesion: 200 psf
Phi: 15 °
Phi-B: 0 °
Piezometric Line: 1

Name: SM
Model: Mohr-Coulomb
Unit Weight: 122 pcf
Cohesion: 200 psf
Phi: 30 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. ground TO -50.0 channel
Model: Mohr-Coulomb
Unit Weight: 96 psf
Cohesion: 200 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -185 to -197
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -185.0 TO -197.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: cell
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 10000 psf
Phi: 45 °
Phi-B: 0 °
Piezometric Line: 1

Impact Load Coordinate: (-49, 5) ft
Magnitude: 2650 lbs

Use Passive Mode: Yes

Name: CH EL. -100 TO -136
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 1200 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -197.0 TO -240.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0
Model: Spatial Mohr-Coulomb
Unit Weight: 108 pcf
Cohesion: 600 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -165.0 TO -178.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -165.0 TO -178.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -65.0 to -100.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -65.0 to -100.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -142.0 TO -155.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -142.0 TO -155.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: ML
Model: Mohr-Coulomb
Unit Weight: 117 pcf
Cohesion: 200 psf
Phi: 15 °
Phi-B: 0 °
Piezometric Line: 1

Name: SM
Model: Mohr-Coulomb
Unit Weight: 122 pcf
Cohesion: 200 psf
Phi: 30 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. ground TO -50.0 channel
Model: Mohr-Coulomb
Unit Weight: 96 psf
Cohesion: 200 psf
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: CH EL. -185 to -197
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Spatial Fn: CH EL. -185.0 TO -197.0
Phi: 0 °
Phi-B: 0 °
Piezometric Line: 1

Name: cell
Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion: 10000 psf
Phi: 45 °
Phi-B: 0 °
Piezometric Line: 1

Impact Load Coordinate: (-49, 5) ft
Magnitude: 2650 lbs

LWL-EE
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

ELEVATION IN FEET NAVD 88

DISTANCE IN FEET

COFFERDAM

VERT. 1

EAST BANK

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

ELEVATION IN FEET NAVD 88

DISTANCE IN FEET

COFFERDAM

VERT. 1

EAST BANK

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.
Use Passive Mode: Yes

Name: CH EL. -100 TO -136 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 1200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -197.0 TO -240.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0 Model: Spatial Mohr-Coulomb Unit Weight: 108 pcf Cohesion: 600 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -165.0 TO -178.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -165.0 TO -178.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -65.0 TO -100.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -65.0 TO -100.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -142.0 TO -155.0 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -142.0 TO -155.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: ML Model: Mohr-Coulomb Unit Weight: 117 pcf Cohesion: 200 psf Phi: 15 ° Phi-B: 0 ° Piezometric Line: 1

Name: SM Model: Mohr-Coulomb Unit Weight: 122 pcf Cohesion: 0 psf Phi: 30 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. ground TO -50.0 channel Model: Mohr-Coulomb Unit Weight: 98 pcf Cohesion: 200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: CH EL. -185 TO -197 Model: Spatial Mohr-Coulomb Unit Weight: 115 pcf Cohesion Spatial Fn: CH EL. -185.0 TO -197.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: jet grouted soil zone Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion: 3500 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1

Name: cell Model: Mohr-Coulomb Unit Weight: 115 pcf Cohesion: 10000 psf Phi: 45 ° Phi-B: 0 ° Piezometric Line: 1

Impact Load Coordinate: (-49, 5) ft Magnitude: 2600 lbs

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES
SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

NAME: EE w jet grout (no rock)
File Name: South coff el-27.5-Channel-160k.ps
Last Edited By: Middleton, Mark C MVN

US Army Corps of Engineers
New Orleans District
Plate/figure: Appendix B-16

INNER HARBOR
North and South Cofferdam
Water EL +3.0
Excavation at EL -27.5
Entry and Exit
Jet Grout
APPENDIX C:

Global Stability Excavation EL -33.0 East Bank Cofferdam
CLASSIFICATION STRATIFICATION

The soils were based on the results of undisturbed borings and CPT data. See both boring and CPT data plates.

Shear strengths between verticals were assumed to vary linearly between the values indicated for these locations.

GENERAL NOTES

Name: Block w jet grout
File Name: East bank coff w EL-33_new channel EL.gsz
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (US)
DISTANCE IN FEET

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

PLATE/FIGURE - APPENDIX C-3

INNER HARBOR
Navigational Canal
TFR feasibility study

Eastern Cofferdam
Water EL +5.061 ft cell
Entry and Exit
No jet grout

COFFERDAM
EL. 5

INNER HARBOR
Navigational Canal
TFR feasibility study

Eastern Cofferdam
Water EL +5.061 ft cell
Entry and Exit
No jet grout

COFFERDAM
EL. 5
DISTANCE IN FEET

1.60

DISTANCE IN FEET

GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.
DISTANCE IN FEET

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES. SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Inner Harbor Navigational Canal
TRSS feasibility study

Block Search
Jet grout

1.87 DISTANCE IN FEET

PLATE/FIGURE - APPENDIX C-6

Impact Load Coordinate: (132, 5) ft Magnitude: 2600 lbs

Name: Block w jet grout
File Name: East bank coff el-33 160k_new channel EL.gsz
Last Edited By: Middleton, Mark C CIV USARMY CEMVN (US)
DISTANCE IN FEET

Name: EE no jet grout
File Name: East bank coff cell-33 160k_new channel EL.gsz
Last Edited By: Middleton, Mark C MVN

GENERAL NOTES

CLASSIFICATION STRATIFICATION
Shear Strengths and Unit Weight of the soil were based on the results of undisturbed borings and CPT data. See both boring and CPT data plates.

Shear Strengths between Verticals were assumed to vary linearly between the values indicated for these locations.

Inner Harbor
Navigational Canal
TSS feasibility study

Eastern Cofferdam
Water EL +5.061 ft cell
Entry and Exit
No jet grout

COFFERDAM

Impact Load Coordinate: (132, 5) ft
Magnitude: 2600 lbs

Name: CH EL -21.0 TO -50.0 EAST BANK   Model: Spatial Mohr-Coulomb   Unit Weight: 100 pcf   Cohesion: 215 psf   Phi: 0 °   Piezometric Line: 1
Name: CH EL -165.0 TO -178.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -165 to -178   Cohesion Spatial Fn: CH EL. -165.0 TO -178.0   Phi: 0 °   Piezometric Line: 1
Name: CH EL -142.0 TO -155.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -142 to -155   Cohesion Spatial Fn: CH EL. -142.0 TO -155.0   Phi: 0 °   Piezometric Line: 1
Name: CH EL -122.0 TO -136.0   Model: Spatial Mohr-Coulomb   Unit Weight: 95 pcf   Cohesion: 10000 psf   Phi: 45 °   Piezometric Line: 1
Name: CH EL -65.0 TO -100.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -65 to -100   Cohesion Fn: CH -65 to -100   Phi: 0 °   Piezometric Line: 1
Name: CH EL -197.0 TO -240.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -185 to -240   Cohesion Spatial Fn: CH EL. -185.0 TO -240.0   Phi: 0 °   Piezometric Line: 1
Name: CH EL -100.0 TO -136.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -100 to -136   Cohesion Fn: CH -100 to -136   Phi: 0 °   Piezometric Line: 1
Name: CH EL -3.0 TO -21.0 EAST BANK   Model: Mohr-Coulomb   Unit Weight: 117 pcf   Cohesion: 200 psf   Phi: 15 °   Piezometric Line: 1
Name: CH EL -50.0 TO -58.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -50 to -58   Cohesion Spatial Fn: CH EL. -50  TO -58.0   Phi: 0 °   Piezometric Line: 1
Name: CH EL -142.0 TO -155.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -142 to -155   Cohesion Spatial Fn: CH EL. -142.0 TO -155.0   Phi: 0 °   Piezometric Line: 1
Name: CH EL -122.0 TO -136.0   Model: Spatial Mohr-Coulomb   Unit Weight: 95 pcf   Cohesion: 200 psf   Phi: 15 °   Piezometric Line: 1
Name: CH EL -65.0 TO -100.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -65 to -100   Cohesion Fn: CH -65 to -100   Phi: 0 °   Piezometric Line: 1
Name: CH EL -197.0 TO -240.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -185 to -240   Cohesion Spatial Fn: CH EL. -185.0 TO -240.0   Phi: 0 °   Piezometric Line: 1
Name: CH EL -100.0 TO -136.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -100 to -136   Cohesion Fn: CH -100 to -136   Phi: 0 °   Piezometric Line: 1
Name: CH EL -3.0 TO -21.0 EAST BANK   Model: Mohr-Coulomb   Unit Weight: 117 pcf   Cohesion: 200 psf   Phi: 15 °   Piezometric Line: 1
Name: CH EL -50.0 TO -58.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -50 to -58   Cohesion Spatial Fn: CH EL. -50  TO -58.0   Phi: 0 °   Piezometric Line: 1
Name: CH EL -142.0 TO -155.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -142 to -155   Cohesion Spatial Fn: CH EL. -142.0 TO -155.0   Phi: 0 °   Piezometric Line: 1
Name: CH EL -122.0 TO -136.0   Model: Spatial Mohr-Coulomb   Unit Weight: 95 pcf   Cohesion: 200 psf   Phi: 15 °   Piezometric Line: 1
Name: CH EL -65.0 TO -100.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -65 to -100   Cohesion Fn: CH -65 to -100   Phi: 0 °   Piezometric Line: 1
Name: CH EL -197.0 TO -240.0   Model: Spatial Mohr-Coulomb   Weight Fn: CH -185 to -240   Cohesion Spatial Fn: CH EL. -185.0 TO -240.0   Phi: 0 °   Piezometric Line: 1

ELEVATION IN FEET N.A.V.D. 88

PLATE/FIGURE - APPENDIX C-7

LWL-EE
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

GENERAL NOTES

DISTANCE IN FEET
GENERAL NOTES

CLASSIFICATION STRATIFICATION
Shear Strengths and Unit Weight of the soil were based on the results of undisturbed borings and CPT data. See both borings and CPT data plates.

Shear Strengths between Verticals were assumed to vary linearly between the values indicated for these locations.

DISTANCE IN FEET

PLATE/FIGURE - APPENDIX C-9
GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

IMPACT LOAD COORDINATE: (132, 5) ft  Magnitude: 2600 lbs

EAST BANK

DISTANCE IN FEET

PLATE/FIGURE - APPENDIX C-10

COFFERDAM

INNER HARBOR NAVIGATIONAL CANAL TSS FEASIBILITY STUDY

EASTERN COFFERDAM

WATER EL +5.061 ft cell

ENTRY AND EXIT

NO JET GROUT

LWL-EE
APPENDIX D:

Global Stability Excavation EL -33.0 South Cofferdam
Distance in Feet

Use Passive Mode: Yes

Name: rock      Model: Mohr-Coulomb      Unit Weight: 140 pcf     Cohesion: 0 psf     Phi: 40 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -100 TO -136      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 600 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -97.0 TO -240.0      Model: Mohr-Coulomb      Unit Weight: 108 pcf     Cohesion: 0 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -65.0 TO -100.0      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: ML       Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1
Name: cell      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 10000 psf     Phi: 45 °     Phi-B: 0 °     Piezometric Line: 1

General Notes

Classification Stratifcation
Shear Stiffness and Unit Weight of the Soil were Based on the Results of Undisturbed Borings and CPT Data. See Both Boring and CPT Data Plates

Inner Harbor
Navigational Canal
TRG Feasibility Study
North and South Cofferdam
Water EL -5.0
Excavation at EL -33
6 ft spel
Block Search
No Jet Grout

US Army Corps of Engineers
New Orleans District

Plate/figure - Appendix D-1

Inner Harbor
Navigational Canal
TRG Feasibility Study
North and South Cofferdam
Water EL -5.0
Excavation at EL -33
6 ft spel
Block Search
No Jet Grout

File Name: South Cell Ref-33 - Channel.pcs
Last Edited By: Alrahahleh, Hashim I CIV USARMY CEMVN (US)
GENERAL NOTES
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Name: CH EL. -100 TO -136 Model: Spatial Mohr-Coulomb Unit Weight: 115pcf Cohesion: 1200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0 Model: Spatial Mohr-Coulomb Unit Weight: 115pcf Cohesion Spatial Fr: CH EL. -197.0 TO -240.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0 Model: Spatial Mohr-Coulomb Unit Weight: 108pcf Cohesion: 600 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0 Model: Spatial Mohr-Coulomb Unit Weight: 115pcf Cohesion Spatial Fn: CH EL. -165.0 TO -178.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -65.0 to -100.0 Model: Spatial Mohr-Coulomb Unit Weight: 115pcf Cohesion: 900 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0 Model: Spatial Mohr-Coulomb Unit Weight: 115pcf Cohesion Spatial Fr: CH EL. -142.0 TO -155.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: ML Model: Mohr-Coulomb Unit Weight: 117pcf Cohesion: 200 psf Phi: 15 ° Phi-B: 0 ° Piezometric Line: 1
Name: SM Model: Mohr-Coulomb Unit Weight: 122pcf Cohesion: 0 psf Phi: 30 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. ground TO -30.0 channel Model: Mohr-Coulomb Unit Weight: 98pcf Cohesion: 200 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: CH EL. -185 to -197 Model: Spatial Mohr-Coulomb Unit Weight: 115pcf Cohesion Spatial Fr: CH EL. -185.0 TO -197.0 Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: jet grouted soil zone Model: Mohr-Coulomb Unit Weight: 120pcf Cohesion: 3500 psf Phi: 0 ° Phi-B: 0 ° Piezometric Line: 1
Name: cell Model: Mohr-Coulomb Unit Weight: 115pcf Cohesion: 10000 psf Phi: 45 ° Phi-B: 0 ° Piezometric Line: 1

PLATE/FIGURE - APPENDIX D-3

INNER HARBOR Navigational Canal
WATER EL. -20
Excavation at EL. -33
Jet Grout

BLOCK W JET GROUT
File Name: South cell e-33 -Channel.jpg
Last Edited By: Alrahleh, Hashim I CIV USARMY CEMVN (US)
DISTANCE IN FEET

INNER HARBOR Navigational CanalTRS Feasibility Study
North and South Cofferdam
Water EL +5.0
Excavation at EL -33
1 ft cell

Block Search
Jet Grout

US Army Corps of Engineers
New Orleans District
Inner Harbor
Navigational Canal
TRG Feasibility Study
North and South Cofferdam
Water EL +5.0
Excavation at EL -33
6 ft cell
Block Search
Jet Grout

LWL-EE

ELEVATION IN FEET N.A.V.D. 88

DISTANCE IN FEET

INNER HARBOR Navigational Canal

PLATE/FIGURE - APPENDIX D-4

GENERAL NOTES
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.
SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Name: CH EL. -100 TO -136
Model: Spatial Mohr-Coulomb
Unit Weight: 115pcf
Cohesion: 1200 psf
Phi: 0°
Phi-B: 0°
Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115pcf
Cohesion Spatial Fn: CH EL. -197.0 TO -240.0
Phi: 0°
Phi-B: 0°
Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0
Model: Spatial Mohr-Coulomb
Unit Weight: 108pcf
Cohesion: 600 psf
Phi: 0°
Phi-B: 0°
Piezometric Line: 1

Name: CH EL. -165.0 TO -178.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115pcf
Cohesion Spatial Fn: CH EL. -165.0 TO -178.0
Phi: 0°
Phi-B: 0°
Piezometric Line: 1

Name: CH EL. -65.0 TO -100.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115pcf
Cohesion Spatial Fn: CH EL. -65.0 TO -100.0
Phi: 0°
Phi-B: 0°
Piezometric Line: 1

Name: CH EL. ground TO -50.0
Model: Mohr-Coulomb
Unit Weight: 98pcf
Cohesion: 200 psf
Phi: 15°
Phi-B: 0°
Piezometric Line: 1

Name: SM
Model: Mohr-Coulomb
Unit Weight: 122pcf
Cohesion: 0 psf
Phi: 30°
Phi-B: 0°
Piezometric Line: 1

Name: CH EL. -185 TO -197
Model: Spatial Mohr-Coulomb
Unit Weight: 115pcf
Cohesion Spatial Fn: CH EL. -185 TO -197
Phi: 0°
Phi-B: 0°
Piezometric Line: 1

Name: jet grouted soil zone
Model: Mohr-Coulomb
Unit Weight: 120pcf
Cohesion: 3500 psf
Phi: 0°
Phi-B: 0°
Piezometric Line: 1

Name: cell
Model: Mohr-Coulomb
Unit Weight: 115pcf
Cohesion: 10000 psf
Phi: 45°
Phi-B: 0°
Piezometric Line: 1

Use Passive Mode: Yes
1.72 DISTANCE IN FEET

Use Passive Mode: Yes

Name: rock      Model: Spatial Mohr-Coulomb      Unit Weight: 140 pcf     Cohesion: 0 psf     Phi: 40 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -197.0 TO -240.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Unit Weight: 108 pcf     Cohesion: 600 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -165.0 TO -178.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -65.0 TO -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -65.0 TO -100.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -142.0 TO -155.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: ML      Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1
Name: cell      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 10000 psf     Phi: 45 °     Phi-B: 0 °     Piezometric Line: 1

Name: EE no jet grout

File Name: South Coff. e-33 - Channel.gsz
Last Edited By: Middleton, Mark C MVN

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Inner Harbor Navigation Canal TID Feasibility Study
North and South Cofferdam
Water EL +5.0
Excavation at EL -33
Entry and Exit
No Jet Grout

PLATE/FIGURE - APPENDIX D-5

LWL-EE
Use Passive Mode: Yes

- Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
- Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -197.0 TO -240.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
- Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Unit Weight: 108 pcf     Cohesion: 600 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
- Name: CH EL. -165.0 TO -178.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -165.0 TO -178.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
- Name: CH EL. -65.0 TO -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 900 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
- Name: CH EL. -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -142.0 TO -155.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
- Name: ML      Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1
- Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1
- Name: CH EL. ground TO -50.0 channel      Model: Mohr-Coulomb      Unit Weight: 98 pcf     Cohesion: 200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
- Name: cell      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 10000 psf     Phi: 45 °     Phi-B: 0 °     Piezometric Line: 1
DISTANCE IN FEET

Use Passive Mode: Yes

Name: rock      Model: Spatial Mohr-Coulomb      Unit Weight: 140 pcf     Cohesion: 0 psf     Phi: 40 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 0 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Unit Weight: 108 pcf     Cohesion: 600 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 0 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: ML       Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1

Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. ground TO -50.0 channel Model: Mohr-Coulomb      Unit Weight: 88 pcf     Cohesion: 0 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -185 to -197 Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 0 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: jet grouted soil zone Model: Mohr-Coulomb      Unit Weight: 120 pcf     Cohesion: 3500 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: cell Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 10000 psf     Phi: 45 °     Phi-B: 0 °     Piezometric Line: 1

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOILS WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

US Army Corps of Engineers   New Orleans District
Inner Harbor Navigational Canal
TRG Feasibility Study
North and South Cofferdam
Water EL -5.0 Excavation at EL -33
Entry and Exit
Jet Grout

PLATE/FIGURE - APPENDIX D-7

File Name: South coff el-33 - Channel.gz
Last Edited By: Middleton, Mark C MVN

LWL-EE
Name: CH EL. -100 TO -136  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion: 1200 psf  Phi: 0 °  Phi-B: 0 °  Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Spatial Fn: CH EL. -197.0 TO -240.0  Phi: 0 °  Phi-B: 0 °  Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0  Model: Spatial Mohr-Coulomb  Unit Weight: 108 pcf  Cohesion: 600 psf  Phi: 0 °  Phi-B: 0 °  Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Spatial Fn: CH EL. -165.0 TO -178.0  Phi: 0 °  Phi-B: 0 °  Piezometric Line: 1
Name: CH EL. -65.0 to -100.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Spatial Fn: CH EL. -65.0 to -100.0  Phi: 0 °  Phi-B: 0 °  Piezometric Line: 1
Name: ML  Model: Mohr-Coulomb  Unit Weight: 117 pcf  Cohesion: 200 psf  Phi: 15 °  Phi-B: 0 °  Piezometric Line: 1
Name: SM  Model: Mohr-Coulomb  Unit Weight: 122 pcf  Cohesion: 0 psf  Phi: 30 °  Phi-B: 0 °  Piezometric Line: 1
Name: CH EL. -185 to -197  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Spatial Fn: CH EL. -185.0 TO -197.0  Phi: 0 °  Phi-B: 0 °  Piezometric Line: 1
Name: cell  Model: Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion: 10000 psf  Phi: 45 °  Phi-B: 0 °  Piezometric Line: 1

Inner Harbor Navigation Canal TRS Feasibility Study
North and South Cofferdam Water EL +5.0 Excavation at EL -3361 ft cell Entry and Exit Jet Grout

GENERAL NOTES
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOILS WERE BASED ON THE RESULTS OF UNDISTURBED BORING AND CPT DATA SEE BOTH BORING AND CPT DATA PLATES
SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

FILE NAME: South coff el-33 - Channel.gz
Last Edited By: Middleton, Mark C MVN

LWL-EE
GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA PLATES. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

DISTANCE IN FEET

VERT. 1

Inner Harbor Navigational Canal
TRC Feasibility Study

North and South Cofferdam
Water EL +3.0
Excavation at EL -33
61 ft rail
No Jet Grout

US Army Corps of Engineers
New Orleans District

PLATE/FIGURE - APPENDIX D-9
Use Passive Mode: Yes

Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -197.0 TO -240.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Unit Weight: 108 pcf     Cohesion: 600 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -165.0 TO -178.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -165.0 TO -178.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -65.0 TO -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 900 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -142.0 TO -155.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: ML       Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1
Name: CH EL. ground TO -50.0 channel      Model: Mohr-Coulomb      Unit Weight: 98 pcf     Cohesion: 200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1
Name: cell      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -185.0 TO -197.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Impact Load Coordinate: (-49, 5) ft     Magnitude: 2660 lbs

GENERAL NOTES
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF
THE SOIL WERE BASED ON THE RESULTS OF
UNDISTURBED BORINGS AND CPT DATA PLATES.
SHEAR STRENGTHS BETWEEN VERTICALS
WERE ASSUMED TO VARY LINEARLY BETWEEN
THE VALUES INDICATED FOR THESE LOCATIONS.

LWL-EE
GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

Inner Harbor
Navigational Canal
TRS Feasibility Study
North and South Cofferdam
Water EL +3.0
Excavation at EL -33
61 ft rake
Block Search
Jet Grout

PLATE/FIGURE - APPENDIX D-11

LWL-EE
DISTANCE IN FEET

User Passive Mode: Yes

Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -197.0 TO -240.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Unit Weight: 108 pcf     Cohesion: 600 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -165.0 TO -178.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -165.0 TO -178.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -65.0 to -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -65.0 to -100.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. ground TO -50.0 channel      Model: Mohr-Coulomb      Unit Weight: 98 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1

Name: ML       Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1

Name: SM Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1

Name: jet grouted soil zone      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 3500 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: cell Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 10000 psf     Phi: 45 °     Phi-B: 0 °     Piezometric Line: 1

Impact Load Coordinate: (-49, 5) ft     Magnitude: 2650 lbs

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

PLATE/Figure - Appendix D-12
GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

INNER HARBOR
Navigational Canal
TRS Feasibility Study
North and South Cofferdam
Water EL +3.0
Excavation at EL -33

ENTRY AND EXIT
No Jet Grout

ELEVATION IN FEET NAVD 88

DISTANCE IN FEET

VERT. 1

Impact Load Coordinate: (-49, 5) ft Magnitude: 2650 lbs

<file name="South cft ex-33 - Channel - 180 h.gps" last edited by: Medeiros, Mark C 04/07>

Name: COFFERDAM
File Name: South coff ex-33 - Channel - 180 h.gps
Last Edited By: Middleton, Mark C MVN
GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

INNER HARBOR NAVIGATION CANAL

TRRS FEASIBILITY STUDY

NORTH AND SOUTH COFFERDAM

WATER EL +3.0

EXCAVATION AT EL -3361 ft cell

ENTRY AND EXIT

NO JET GROUT

LWL-EE

PLATE/FIGURE - APPENDIX D-14
Use Passive Mode: Yes

Name: CH EL. -100 TO -136      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 1200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -197.0 TO -240.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -197.0 TO -240.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Unit Weight: 108 pcf     Cohesion: 600 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -165.0 TO -178.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -165.0 TO -178.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -65.0 to -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 900 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. -142.0 TO -155.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Spatial Fn: CH EL. -142.0 TO -155.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: ML       Model: Mohr-Coulomb      Unit Weight: 117 pcf     Cohesion: 200 psf     Phi: 15 °     Phi-B: 0 °     Piezometric Line: 1

Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Phi-B: 0 °     Piezometric Line: 1

Name: ML       Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 200 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: CH EL. ground TO -50.0 channel      Model: Mohr-Coulomb      Unit Weight: 98 pcf     Cohesion Spatial Fn: CH EL. -50.0 TO -100.0      Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: jet grouted soil zone      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 300 psf     Phi: 0 °     Phi-B: 0 °     Piezometric Line: 1

Name: cell      Model: Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion: 10000 psf     Phi: 45 °     Phi-B: 0 °     Piezometric Line: 1

Impact Load Coordinate: (-49, 5) ft     Magnitude: 2650 lbs

GENERAL NOTES

CLASSIFICATION STRATIFICATION
THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA PLATES. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

PLATE/FIGURE - APPENDIX D-16

LWL-EE
APPENDIX E:

West Bank Stability Excavation EL-33.0
GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

DISTANCE IN FEET
Name: CH EL. -21.0 TO -33.0 WEST BANK      Model: Mohr-Coulomb      Unit Weight: 100 pcf     Cohesion: 400 psf     Phi: 0 °     Piezometric Line: 1
Name: CH EL. -100.0 TO -136.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Fn: CH -100 to -136      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -3.0 TO -21.0      Model: Mohr-Coulomb      Unit Weight: 100 pcf     Cohesion: 215 psf     Phi: 0 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Piezometric Line: 1
Name: CH EL. -33.0 TO-40.0       Model: Spatial Mohr-Coulomb      Weight Fn: CH -33 to -50      Cohesion Fn: CH -33 to -40      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -40.0 TO -50.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -33 to -50      Cohesion Fn: CH -40 to -50      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -80.0 TO -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Fn: CH -80 to -100      Phi: 0 °     Piezometric Line: 1

GENERAL NOTES
CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.
SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF
THE SOIL WERE BASED ON THE RESULTS OF
UNDISTURBED BORINGS AND CPT DATA. SEE
BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS
WERE ASSUMED TO VARY LINEARLY BETWEEN
THE VALUES INDICATED FOR THESE LOCATIONS.

GENERAL NOTES

DISTANCE IN FEET

ELEVATION IN FEET N.A.V.D. 88

VERT. 1

1.70

VERTICAL 1: V:4H

VERTICAL 2: V:3H

VERTICAL 3: V:2H

VERTICAL 4: V:1H

WEST BANK

EXCAVATION ELEVATION 33.0

CHANNEL

1.70
CH EL. -50.0 TO -58.0
CH EL. -100.0 TO -136.0
CH EL. -65.0 TO -80.0
CH EL. -33.0 TO -40.0
CH EL. -40.0 TO -50.0
CH EL. -3.0 TO -21.0
CH EL. -50.0 TO -58.0
SM
CH EL. -80.0 TO -100.0
CH EL. -100.0 TO -136.0

DISTANCE IN FEET

EXCAVATION ELEVATION 33.0

VERT. 1

-140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100

ELEVATION IN FEET N.A.V.D. 88

-140 -120 -100 -80 -60 -40 -20 0 20 40 60 80

Name: CH EL. -21.0 TO -33.0 WEST BANK      Model: Mohr-Coulomb      Unit Weight: 100 pcf     Cohesion: 400 psf     Phi: 0 °     Piezometric Line: 1
Name: CH EL. -100.0 TO -136.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Fn: CH -100 to -136      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -3.0 TO -21.0      Model: Mohr-Coulomb      Unit Weight: 100 pcf     Cohesion: 215 psf     Phi: 0 °     Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -50 to -58      Cohesion Fn: CH -50 to -58      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -65.0 TO -80.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Fn: CH -65 to -80      Phi: 0 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Piezometric Line: 1
Name: CH EL. -33.0 TO -40.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -33 to -40      Cohesion Fn: CH -33 to -40      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -40.0 TO -50.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -33 to -50      Cohesion Fn: CH -40 to -50      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -80.0 TO -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Fn: CH -80 to -100      Phi: 0 °     Piezometric Line: 1

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF
THE SOIL WERE BASED ON THE RESULTS OF
UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.
SHEAR STRENGTHS BETWEEN VERTICALS
WERE ASSUMED TO VARY LINEARLY BETWEEN
THE VALUES INDICATED FOR THESE LOCATIONS.
Name: CH EL. -21.0 TO -33.0 WEST BANK  Model: Mohr-Coulomb  Unit Weight: 100 pcf  Cohesion: 400 psf  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -100.0 TO -136.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Fn: CH -100 to -136  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -3.0 TO -21.0  Model: Mohr-Coulomb  Unit Weight: 100 pcf  Cohesion Fn: CH -3 to -21  Phi: 0 °  Piezometric Line: 1
Name: SM  Model: Mohr-Coulomb  Unit Weight: 122 pcf  Cohesion: 0 psf  Phi: 30 °  Piezometric Line: 1
Name: CH EL. -33.0 TO -50.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -33 to -50  Cohesion Fn: CH -33 to -50  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -40.0 TO -50.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -40 to -50  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -80.0 TO -100.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Fn: CH -80 to -100  Phi: 0 °  Piezometric Line: 1

GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.
GENERAL NOTES

CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.
Classifications and stratifications of the soil were based on the results of undisturbed borings and CPT data. See both boring and CPT data plates. Shear strengths between verticals were assumed to vary linearly between the values indicated for these locations.
CLASSIFICATION STRATIFICATION
SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.
SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

GENERAL NOTES

Name: CH EL. -21.0 TO -33.0 WEST BANK
Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 400 psf
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -100.0 TO -136.0
Model: Spatial Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion Fn: CH -100 to -136
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -3.0 TO -21.0
Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 215 psf
Phi: 0 °
Piezometric Line: 1

Name: SM
Model: Mohr-Coulomb
Unit Weight: 122 pcf
Cohesion: 0 psf
Phi: 30 °
Piezometric Line: 1

Name: CH EL. -33.0 TO -40.0
Model: Spatial Mohr-Coulomb
Weight Fn: CH -33 to -50
Cohesion Fn: CH -33 to -40
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -40.0 TO -50.0
Model: Spatial Mohr-Coulomb
Weight Fn: CH -40 to -50
Cohesion Fn: CH -40 to -50
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -80.0 TO -100.0
Model: Spatial Mohr-Coulomb
Weight Fn: CH -80 to -100
Cohesion Fn: CH -80 to -100
Phi: 0 °
Piezometric Line: 1
GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORINGS AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

DISTANCE IN FEET

WEST BANK

EXCAVATION ELEVATION 33.0

CHANNEL

Name: CH EL. -21.0 TO -33.0 WEST BANK
Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 400 psf
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -100.0 TO -136.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH -100 to -136
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -3.0 TO -21.0
Model: Mohr-Coulomb
Unit Weight: 100 pcf
Cohesion: 215 psf
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -50.0 TO -58.0
Model: Spatial Mohr-Coulomb
Weight Fn: CH -50 to -58
Cohesion Fn: CH -50 to -58
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -65.0 TO -80.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH -65 to -80
Phi: 0 °
Piezometric Line: 1

Name: SM
Model: Mohr-Coulomb
Unit Weight: 122 pcf
Cohesion: 0 psf
Phi: 30 °
Piezometric Line: 1

Name: CH EL. -33.0 TO -40.0
Model: Spatial Mohr-Coulomb
Weight Fn: CH -33 to -50
Cohesion Fn: CH -33 to -40
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -40.0 TO -50.0
Model: Spatial Mohr-Coulomb
Weight Fn: CH -33 to -50
Cohesion Fn: CH -40 to -50
Phi: 0 °
Piezometric Line: 1

Name: CH EL. -60.0 TO -100.0
Model: Spatial Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion Fn: CH -80 to -100
Phi: 0 °
Piezometric Line: 1
GENERAL NOTES

CLASSIFICATION STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORING AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

INNER HARBOR

NAVIGATIONAL CANAL

TRACT FEASIBILITY STUDY

WATER EL. +5.0

EXCAVATION AT EL. -33

BLOCK SEARCH

NO JET GROUT

PLATE/FIGURE APPENDIX E10

LWL-EE
**GENERAL NOTES**

CLASSIFICATION:

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORING AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

**DISTANCE IN FEET**

**EXCAVATION ELEVATION 33.0**

**Channel**

**WEST BANK**

**VERT. 1**

**US Army Corps of Engineers**

**New Orleans District**

**PLATE/FIGURE APPENDIX E12**

**LWL-EE**
Name: CH EL. -21.0 TO -33.0 WEST BANK  Model: Mohr-Coulomb  Unit Weight: 100 pcf  Cohesion: 400 psf  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -100.0 TO -136.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Fn: CH -100 to -136  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -3.0 TO -21.0  Model: Mohr-Coulomb  Unit Weight: 100 pcf  Cohesion: 215 psf  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -50 to -58  Cohesion Fn: CH -50 to -58  Phi: 0 °  Piezometric Line: 1
Name: SM  Model: Mohr-Coulomb  Unit Weight: 122 pcf  Cohesion: 0 psf  Phi: 30 °  Piezometric Line: 1
Name: CH EL. -33.0 TO -40.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -33 to -50  Cohesion Fn: CH -33 to -40  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -40.0 TO -50.0  Model: Spatial Mohr-Coulomb  Weight Fn: CH -33 to -50  Cohesion Fn: CH -40 to -50  Phi: 0 °  Piezometric Line: 1
Name: CH EL. -60.0 TO -100.0  Model: Spatial Mohr-Coulomb  Unit Weight: 115 pcf  Cohesion Fn: CH -80 to -100  Phi: 0 °  Piezometric Line: 1

GENERAL NOTES

CLASSIFICATION/STRATIFICATION

SHEAR STRENGTHS AND UNIT WEIGHT OF THE SOIL WERE BASED ON THE RESULTS OF UNDISTURBED BORING AND CPT DATA. SEE BOTH BORING AND CPT DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.
Name: CH EL. -21.0 TO -33.0 WEST BANK      Model: Mohr-Coulomb      Unit Weight: 100 pcf     Cohesion: 400 psf     Phi: 0 °     Piezometric Line: 1
Name: CH EL. -100.0 TO -136.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Fn: CH -100 to -136      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -3.0 TO -21.0      Model: Mohr-Coulomb      Unit Weight: 100 pcf     Cohesion: 215 psf     Phi: 0 °     Piezometric Line: 1
Name: CH EL. -50.0 TO -58.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -50 to -58      Cohesion Fn: CH -50 to -58      Phi: 0 °     Piezometric Line: 1
Name: SM      Model: Mohr-Coulomb      Unit Weight: 122 pcf     Cohesion: 0 psf     Phi: 30 °     Piezometric Line: 1
Name: CH EL. -33.0 TO -40.0       Model: Spatial Mohr-Coulomb      Weight Fn: CH -33 to -50      Cohesion Fn: CH -33 to -40      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -40.0 TO -50.0      Model: Spatial Mohr-Coulomb      Weight Fn: CH -33 to -50      Cohesion Fn: CH -40 to -50      Phi: 0 °     Piezometric Line: 1
Name: CH EL. -60.0 TO -100.0      Model: Spatial Mohr-Coulomb      Unit Weight: 115 pcf     Cohesion Fn: CH -80 to -100      Phi: 0 °     Piezometric Line: 1

GENERAL NOTES

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SHEAR STRENGTHS BETWEEN VERTICALS WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

LWL-EE
CH. EL. -50.0 TO -58.0
CH. EL. -100.0 TO -136.0
CH. EL. -65.0 TO -80.0
CH. EL. -33.0 TO -40.0
CH. EL. -40.0 TO -50.0
CH. EL. -80.0 TO -100.0
CH. EL. -100.0 TO -136.0

GENERAL NOTES
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SHEAR STRENGTHS AND UNIT WEIGHT OF
THE SOIL WERE BASED ON THE RESULTS OF
UNDISTURBED BORINGS AND CPT DATA. SEE
BOTH BORING AND CPT DATA PLATES
SHEAR STRENGTHS BETWEEN VERTICALS
WERE ASSUMED TO VARY LINEARLY BETWEEN
THE VALUES INDICATED FOR THESE LOCATIONS.
APPENDIX F:

Cofferdam Internal Stability Hand Calculations
<table>
<thead>
<tr>
<th>EL</th>
<th>Description</th>
<th>C Value</th>
<th>Density</th>
<th>Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>450</td>
<td>18&quot; stone cap</td>
<td>140</td>
<td>215 pcf</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>Cell Fill</td>
<td>122</td>
<td>200 pcf</td>
<td>30°</td>
</tr>
<tr>
<td>33</td>
<td>CH</td>
<td>95 pcf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>CH</td>
<td>98 pcf</td>
<td>210 pcf</td>
<td>0</td>
</tr>
<tr>
<td>32</td>
<td>CH</td>
<td>98 pcf</td>
<td>200 pcf</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>CH</td>
<td>107 pcf</td>
<td>600 pcf</td>
<td>0</td>
</tr>
<tr>
<td>93</td>
<td>CH</td>
<td>122 pcf</td>
<td>0 pcf</td>
<td>30°</td>
</tr>
<tr>
<td>65</td>
<td>SM</td>
<td>115 pcf</td>
<td>900 pcf</td>
<td>0</td>
</tr>
</tbody>
</table>
Cell Weight: Y1A

Stone Cap: \((140 \text{pcf})(1.5')\left(\frac{\pi}{4} (61')^2\right)\)
\[= 613,717.97 \text{ lb} = 613.7 \text{ k}\quad 292.25\]

Cell Fill: \((122 - 62.4')(10.25')\left(\frac{\pi}{4} (61')^2\right) = 1785 \text{ k}\)
\((122 \text{pcf})(10.25')\left(\frac{\pi}{4} (61')^2\right) = 3,655 \text{ k}\)

In-Situ Soil: \((95 - 62.4')(4')\left(\frac{\pi}{4} (61')^2\right) = 3.81 \text{ k}\)
\((98 - 62.4')(2')\left(\frac{\pi}{4} (61')^2\right) = 3,017.2 \text{ k}\)
\((108 - 62.4')(1')\left(\frac{\pi}{4} (61')^2\right) = 1,066.0 \text{ k}\)
\((132 - 62.4')(7')\left(\frac{\pi}{4} (61')^2\right) = 1,219.3 \text{ k}\)
\((115 - 62.4')(25')\left(\frac{\pi}{4} (61')^2\right) = 3,843.1 \text{ k}\)
\[
\frac{\text{wet}}{\text{dry}} = \frac{5,414.0 \text{ k}}{7320}
\]

Sheet Pile:
\((31 \text{ psf})(95')\left(\frac{\pi}{4} (61')\right)\)
\[= 564,371.4 \text{ lb} = 564.4 \text{ k}\]

Total Weight:
\[613.7 \text{ k} + 5,440 \text{ k} + 9,526.7 \text{ k} + 564.4 \text{ k}\]
\[= 16,144.1 \text{ k}\]

or 18,014 k dry condition (most conservative estimate)
Rankine's Active Earth Pressure

At EL -21: \( K_a = \tan^2(45 - \frac{\gamma a}{\gamma}) \)

\[
P_a = 8'h(K_a) - 2k\sqrt{K_a}
\]

\[
= (95 - 62.4\text{ psi})(4') + (98 - 62.4)(12') (1) - 2(200\text{ psi})\sqrt{1}
\]

\[
= 300 \text{ no Pa}
\]

At EL -33: \( k_a = 1 \)

\[
P_a = \left[(95 - 62.4)(4') + (98 - 62.4)(12') + (98 - 62.4)(17')\right] (1) - 2(600\text{ psi})\sqrt{1}
\]

\[
= 157.6 \text{ psi or 0.16 ksi}
\]

At EL -50: \( k_a = 1 \)

\[
P_a = \left[(95 - 62.4)(4') + (98 - 62.4)(12') + (98 - 62.4)(17') + (108 - 62.4)(8')\right] (1) - 2(600\text{ psi})\sqrt{1}
\]

\[
= 762.8 \text{ psi or 0.76 ksi}
\]

At EL -58: \( k_a = 1 \)

\[
P_a = \left[(95 - 62.4)(4') + (98 - 62.4)(12') + (98 - 62.4)(17') + (108 - 62.4)(8') + (122 - 62.4)(17')\right] (0.33) - 2(600\text{ psi})\sqrt{0.33}
\]

\[
= 327.6 \text{ psi or 0.33 ksi}
\]

At EL -65: \( k_a = \tan^2(45 - \frac{\gamma a}{\gamma}) = 0.33 \)

\[
P_a = \left[(95 - 62.4)(4') + (98 - 62.4)(12') + (98 - 62.4)(17') + (108 - 62.4)(8') + (122 - 62.4)(17')\right] (0.33) - 2(600\text{ psi})\sqrt{0.33}
\]

\[
= 641.8 \text{ psi or 0.64 ksi}
\]

At EL -90: \( k_a = 1 \)

\[
P_a = \left[(95 - 62.4)(4') + (98 - 62.4)(12') + (98 - 62.4)(17') + (108 - 62.4)(8') + (122 - 62.4)(25')\right] (1) - 2(900\text{ psi})\sqrt{1}
\]

\[
= 1459.8 \text{ psi or 1.46 ksi}
\]
Water Pressure Active and Passive

Water Pressure for active side at EL + 5

\[
\frac{1}{2} \left( 62.4 \text{pcf} \right) (95')^2 - \frac{1}{2} \left( 62.4 \text{pcf} \right) (57')^2
\]

\[
= 281,580 \text{ lb} - 101,369 \text{ lb}
\]

\[
= 180,211 \text{ lb. or 180.2 k net}
\]

Passive Water Pressure

\[
\frac{1}{2} \left( 62.4 \text{pcf} \right) (57')^2 = 101,369 \text{ lb or 101.4 k}
\]

Water Pressure for active side at EL + 3

\[
\frac{1}{2} \left( 62.4 \text{pcf} \right) (93')^2 = 269.8 \text{k}
\]
Rankine's Active Earth Pressure elevations

\[ P_a = x' h K_a - 2 \cdot \sqrt{h K_a} \]

For \( h = 2 \),

For \( EL = -2 \) to -33

\[ O = [(95 - 62.4)(4') + (98 - 62.4)(17')] (1) - 2(200 \text{psi}) \sqrt{h} \]

\[ h = 7.5 \quad EL = -20.1 - 7.5 = -27.5 \]

Pa goes from -28.5 to -33

For \( EL = -33 \) to -50

\[ O = [(95 - 62.4)(4') + (98 - 62.4)(12') + (98 - 62.4)(h)] (1) - 2(200 \text{psi}) \sqrt{h} \]

\[ h = 4.5 \quad EL = -33 - 4.5 = -37.5 \]

Pa goes from -37.5 to -50

For \( EL = -50 \) to -58

\[ O = [(95 - 62.4)(4') + (98 - 62.4)(12') + (108 - 62.4)(h)] (1) - 2(200 \text{psi}) \sqrt{h} \]

\[ h = 1 \quad EL = -50 - 1 = -51 \]

Pa goes from -51 to -58

For \( EL = -65 \) to -90

\[ O = [(95 - 62.4)(4') + (98 - 62.4)(12') + (98 - 62.4)(17') + (108 - 62.4)(8')] \]
\[ + (122 - 62.4)(h') + (115 - 62.4)(h)] (1) - 2(200 \text{psi}) \sqrt{h} \]

\[ h = 3 \quad EL = -65 - 3 = -68 \]

Pa goes from -68 to -90

SM Pa from EL -58 to EL -65
Rankine's Passive Earth Pressure:

\[ K_p = \tan^2(45 + \theta) = 1 \text{ for clay and } 3 \text{ for sand} \]

At EL -33:

\[ P_p = b'hK_p + \frac{1}{2}c\sqrt{K_p} = 0 \]

At EL -50:

\[ P_p = 1055 \text{ psf or } 1.05 \text{ ksf above} \]

At EL -58:

\[ P_p = 2170 \text{ psf or } 2.17 \text{ ksf above} \]

At EL -65:

\[ P_p = 4167 \text{ psf or } 4.16 \text{ ksf above} \]

At EL -90:

\[ P_p = 4502 \text{ psf or } 4.5 \text{ ksf below} \]
Overturning: \( M_0 = M_{\text{impact}} + M_{\text{active}} \)

**M_{\text{active}}:** (Water EL +5)

\[
M_{w_a} = (281.5 \text{ k}) \left( \frac{1}{3} (95') \right) = 8,971 \text{ k-ft}. \text{ for water at EL +5.0}
\]

\[
M_{A_1} = (0.4 \text{ k}) \left( \frac{1}{3} (15') + 57' \right) = 23.4 \text{ k-ft.}
\]

\[
M_{A_2} = (4.8 \text{ k}) \left( \frac{1}{3} (25') + 40' \right) = 212 \text{ k-ft.}
\]

\[
M_{A_3} = (1.3 \text{ k}) \left( \frac{1}{3} (7') + 32' \right) = 49.6 \text{ k-ft.}
\]

\[
M_{A_4} = (2.2 \text{ k}) \left( \frac{1}{3} (7') + 25' \right) = 60.1 \text{ k-ft.}
\]

\[
M_{A_5} = (16.1 \text{ k}) \left( \frac{1}{3} (22') \right) = 118 \text{ k-ft.}
\]

\[
M_A = 9372 \text{ k-ft. for water at EL +5.0}
\]

For water at EL +3 + 160 k impact

\[
M_{w_a} = (269.3 \text{ k}) \left( \frac{1}{3} (93') \right) = 8,364 \text{ k-ft.}
\]

\[
M_{\text{impact}} = \left( \frac{160 \text{ k}}{61} \right) (95') = 249.2 \text{ k-ft.}
\]

\[
M_A = 8,364 + 249.2 = 8,613 \text{ k-ft.}
\]

or \( M_{\text{impact}} \) for smaller diameter cell:

\[
M_{\text{impact}} = \left( \frac{160 \text{ k}}{541.75'} \right) (95') = 277.6 \text{ k-ft.}
\]

\[
M_A = 8,364 + 277.6 = 8,642 \text{ k-ft.}
\]

Use \( M_A \) at water EL = 5.0 for analyses as that is worst case.
Overturning: \( M_R = M_{\text{weight}} + M_{\text{passive}} \)

\[
M_{\text{passive}} = (101.4 \text{ k})(\frac{1}{3} (5\text{ y'})) = 19.27 \text{ k-ft}
\]

Moment arm of passive forces:

\[
h_{6.6k} = \frac{2(150) + 1.01 \text{ ksf}}{3(0.5 + 1.01 \text{ ksf})} (17') + (90' - 50'') = 45.7'
\]

\[
h_{15.9k} = \frac{2(1.81) + 2.17 \text{ ksf}}{3(1.81 + 2.17 \text{ ksf})} (8') + (90' - 58'') = 35.9'
\]

\[
h_{24.7k} = \frac{2(2.91) + 4.16 \text{ ksf}}{3(2.91 + 4.16 \text{ ksf})} (14') + (90' - 65'') = 28.3'
\]

\[
h_{96.1k} = \frac{2(3.19) + 4.5 \text{ ksf}}{3(3.19 + 4.5 \text{ ksf})} (25') = 11.8'
\]

\[
M_{\text{passive}} = 6.6k(45.7') + 15.9k(35.9') + 24.7k(28.3') + 96.1k(11.8') + 19.27 \text{ k-ft} = 41632 \text{ k-ft}
\]

\[
M_{\text{weight}} = (16,144 \text{ k})(\frac{61'}{2}) = 492,392 \text{ k-ft}
\]

\[
M_{\text{weight}} = (13,053 \text{ k})(\frac{54.75'}{2}) = 357,326 \text{ k-ft}
\]

Check eccentricity of both cell diameters.
eccentricity of 60' diameter cell:

\[ M = M_{\text{weight}} + M_{\text{passive}} - M_{\text{active}} \]
\[ = 498,392 \text{ k-ft} + 146,32 \text{ k-ft} - 9372 \text{ k-ft} = 487,652 \text{ k-ft} \]
\[ M = \frac{487,652 \text{ k-ft}}{16,194 \text{ k}} = 30.2 \quad \frac{B}{3} = \frac{61}{3} = 20.3 \]

*inside kern by 10'*

---

eccentricity of 54.75' diameter cell:

\[ M = 357,326 \text{ k-ft} + 4,632 \text{ k-ft} - 9372 \text{ k-ft} = 352,586 \text{ k-ft} \]
\[ M = \frac{352,586 \text{ k-ft}}{13,053 \text{ k}} = 27.1 \quad \frac{B}{3} = \frac{54.75}{3} = 18.25' \]

*inside kern by 8.75'*

---

Either option is good for moment.
Sliding:

\[
F_{o.s.} = \frac{\sum W \tan \theta + \sum P_o + cL}{\sum P_i + \sum P_o}
\]

\[P_i = 0 \text{ since checking water at EL +5}\]

\[\text{When } \theta = 0, \text{ because } \theta = 0 \text{ for clay}\]

\[
0 + \left(\frac{6.6k + 15.9k + 24.7k + 96.1k + 900 \text{ psf}}{0 + (180k + 0.4k + 4.8k + 1.3k + 2.2k + 10.1k)}\right)
\]

\[= 0.97\]

Cell will not work when sliding along clay with c = 900 psf. Will try to add jet grout to the interior of the cell for 10 ft. Jet grouted soil will be the same as jet grouted base that is recommended to help with bearing.

\[
F_{o.s.} = \frac{0 + (6.6k + 15.9k + 24.7k + 96.1k + 3500 \text{ psf})}{0 + (180k + 0.4k + 4.8k + 1.3k + 2.2k + 16.1k)}
\]

\[= 1.75\]
Bearing Capacity:

\[ q_v = 1.3cN_c + q'N_q + 0.3qD_N_D \]

For soil that sheets are tipped in: \( c = 900 \text{ psf} \) & \( \phi = 0 \)

\[ q = \Sigma q'h \]

\[ = (9.5 - 62.4 \text{pcf})(5') + (98 - 62.4 \text{pcf})(28') + (108 - 62.4 \text{pcf})(8') \]

\[ + (122 - 62.4 \text{pcf})(7') + (115 - 62.4 \text{pcf})(25') \]

\[ = 3,259.8 \text{ psf} \]

For \( \phi = 0 \): \( N_c = 5.70, N_q = 1.0 \), \( N_D = 0 \) & from EM 1110-1-1905

\[ q_v = 1.3(900 \text{ psf})(5.7) + (3,259.8 \text{ psf})(1) + 0 \]

\[ = 9,929 \text{ psf or } 9.93 \text{ ksf} \]

\[ M_{net} = M_0 - M_R = 9372 - 492,392 - 4632 < 0 \], so \( M_{net} = 0 \)

For 61' diameter

\[ W_{ng} = \frac{16,174 \text{ k}}{\frac{1}{4} (61')^2} = 5.5 \text{ ksf} \]

\[ F_{o.5} = \frac{9.93 \text{ ksf}}{5.5 \text{ ksf}} = 1.81 < 3 \), so not okay
Bearing capacity with jet-grouted base of cell.

\[ q_u = 1.3 \times N_c + q_N_b + 0.3 \times D_N_b \]

For jet-grouted base with \( c = 3500 \) psf and \( \phi = 0 \)

\[ q = \Sigma N'_h = 3,259.8 \text{ psf} \] (see page)

for \( \phi = 0 \):
\( N_c = 5.71, N_b = 1.0, N_d = 0 \)

\[ q_u = 1.3 \times (3500 \text{ psf}) \times (5.7) + (3,259.8 \text{ psf}) \times (1) + 0 \]

\[ = 29,191.8 \text{ psf or 29.2 ksf} \]

\[ W_{avg} = \frac{180,141 \text{ k}}{\pi \times (61')^2} = 6.2 \text{ ksf for 61' diameter} \]

for most conservative weight

\[ W_{avg} = \frac{141,558 \text{ k}}{\pi \times (54.75')^2} = 6.2 \text{ ksf for 54.75' diameter} \]

for most conservative weight

\[ F_{os} = \frac{29.2 \text{ ksf}}{6.2 \text{ ksf}} = 4.7 > 3 \text{ so, okay} \]

Will work for 61' diameter or 54.75' diameter

Will work with grout base with \( c = 2500 \)
Weight of cell and jet-grouted soil:

Cell Weight: 8 kN

Stone Cap: \((140 \text{pcf})(1.5')(\tfrac{\pi}{4} (61\text{')^2})\) = 613.77 lb = 613.7 kN

Cell Fill: \((122 - 62.4)(10.25')(\tfrac{\pi}{4} (61\text{')^2}) = 1785 \text{ kN}
\((122 \text{pcf})(10.25')(\tfrac{\pi}{4} (61\text{')^2}) = \frac{3655 \text{ kN}}{5.44 \text{ kN/m}^3 \text{ wet/dry}}\)

all dry 7.310

In-situ soil:
\((95 - 62.4)(4')(\tfrac{\pi}{4} (61\text{')^2}) = 381 \text{ kN}
\((98 - 62.4)(2.9')(\tfrac{\pi}{4} (61\text{')^2}) = 3017.2 \text{ kN}
\((103 - 62.4)(8')(\tfrac{\pi}{4} (61\text{')^2}) = 1060.1 \text{ kN}
\((122 - 62.4)(7')(\tfrac{\pi}{4} (61\text{')^2}) = 1219.3 \text{ kN}
\((115 - 62.4)(25')(\tfrac{\pi}{4} (61\text{')^2}) = \frac{3813.1 \text{ kN}}{9526.7 \text{ kN}}\)

Sheet Pile:
\((31 \text{pcf})(95')(\tfrac{\pi}{4} (61\text{')^2}) = 564.4 \text{ kN}

Jet Grouted Soil Zone:
\((120 - 62.4 \text{pcf})(25')(\tfrac{\pi}{4} (101\text{')^2}) = 11,537 \text{ kN}

Total Weight: 613.7 kN + 5440 kN + 9526.7 kN + 564.4 kN + 11,537 kN

= 27,681 kN \text{ wet/dry fill}

or 29,551 kN \text{ all dry fill}
Bearing Capacity under soil zone:

\[ q_u = 1.3cN_c + q_N_b + 0.3YDN_d \]

For bearing soil \( c = 1200 \text{ pcf} \) and \( Y = 0 \)

\[ q = \sum y_i' h_i \]

\[ = (95 - 62.4 \text{ pcf})(4') + (98 - 62.4 \text{ pcf})(29') + (108 - 62.4 \text{ pcf})(8') \]
\[ + (122 - 62.4 \text{ pcf})(9') + (115 - 62.4 \text{ pcf})(25') + (120 - 62.4 \text{ pcf})(25') \]

\[ = 4700 \text{ psf} \]

For \( Y = 0 \): \( N_c = 5.70, N_b = 1.0, N_d = 0 \) from EM 1110-1-1905

\[ q_u = 1.3(1200 \text{ pcf})(5.7) + 4700 \text{ psf}(1) + 0 \]

\[ = 13,592 \text{ psf or 13.6 ksf} \]

For 61' diameter

\[ W_{ay} = \frac{21,056 \text{ k}}{\pi (101')^2} = 3.7 \text{ ksf} \]

\[ F.O.S. = \frac{13.6 \text{ ksf}}{3.7 \text{ ksf}} = 3.67, \text{ so ok for soil zone 101'} \times 25' \]

For 54.74' diameter

\[ W_{ay} = \frac{21,056 \text{ k}}{\pi (84.75')^2} = 3.71, \text{ so ok for soil zone 84.75'} \times 20' \]
Tilting: $F_o S = \frac{M_r + M_f}{M_o}$

$M_r = 492,392 + 4632 = 497,024$ k-ft. (see page 10)

$M_o = 9372$ k-ft. (see page 8)

$F_o S = 53$ with just $\frac{M_r}{M_o}$. $M_f$ will only bring $F_o S$ up.

Tilting is okay.

Vertical Shear:

$M_o - M_c < 0$, so vertical shear is okay.

Interlock tension:

Rock: $\phi = 45^\circ$, $Ka = 0.22$, Factor applied 1.2

Fill: $\phi = 30^\circ$, $Ka = 0.33$, Factor applied 1.3

$\sigma_T = Ka \gamma h = 1.2(0.22)(140pcf)(1.5) + 1.3(0.33)(122-62.4pcf)(20.5)$

$\sigma_T = 580$ pcf

$t = \frac{\sigma_T R}{12} = \frac{580pcf \ (6')} {12 \text{ in/ft}} = 1474$

$F_o S = \frac{20,000 \text{ lb/in}} {1474 \text{ ft/in}} \Leftarrow$ interlock strength of sheets

$= 13.6 > 2.0$ so, okay.