Placement Area 8 - Dike Relocation

September 18, 2025

1. CHANGES TO BID FORM:

- a. The **Bid Form** has changed the line items for the Base Bid.
- b. A line item for the relocation of 1,500 L.F. of chain link fence has been added to the Base Bid.
- c. A line item for the Excavation for Dike Construction has been added to the Base Bid.
- d. The quantity for line item 3 has been updated.

2. PUBLISH GEOTECHNICAL REPORT:

a. The **Geotechnical Report** has been issued and uploaded to the Port of Brownsville's website.

Bid Form

PLACEMENT AREA 8 - DIKE RELOCATION

Place:	Board of Commissioners 1000 Foust Road Brownsville, Texas 7852	- Brownsville Navigation D	District
Due Date:	Before 3:00 P.M., Tuesd	ay, September 30, 2025.	
Propo corporation o or an individu	osal of organized and existing under oral doing business as	er the laws of the State of	hereinafter called BIDDER, a, or a partnership
To: T	he Brownsville Navigation	District, Texas, hereinafter	called OWNER.
Gentlemen:			
documents a surrounding to labor, hereby accordance we prices. These the contract of	ON" project, having examined the site of the propositive construction of the proposes to furnish all laborith the contract documents e price(s) are to cover all educuments, of which this prostructions.	mined the drawings an sed work, and being fam posed project, including the or, materials and supplies, within the time set forth lexpenses incurred in perforoposal is a part. These presed work, and the set for	ACEMENT AREA 8 - DIKE d specifications with related diliar with all of the conditions he availability of materials and and to construct the project in herein, and at the attached unit rming the work required under ice(s) are firm and shall not be nety (90) days after the time set
specified in a project within specifications	written "Notice to Proceed (270) <u>two hundred sevent</u> B. BIDDER further agrees l <u>ars</u> for each consecutive c	d" to be issued by the OW \underline{y} calendar days after notic to pay as liquidated dama	ntract on or before a date to be YNER and to fully complete the se to proceed, as defined in the ages, the sum of <u>five hundred</u> nereinafter provided in Article 3
	ER agrees to perform as and as shown on the plar		ontracts as described in the ces:
the project si		that specific portions of	form the majority of the work at the work not performed by the poontractors.
Sub	contracted Work	Name of	Subcontractor

PLACEMENT AREA 8 - DIKE RELOCATION

BIDDER Agrees to perform all the work described in the Contract Documents for the following Unit Prices (which include any and all applicable taxes and fees):

Tuesday, September 30, 2025

BASE WORK:

#	DESCRIPTION	EST. QTY.	UNIT COST	AMOUNT	
1	Mobilization & Demobilization	1 LS			
2	Construction Surveying	1 LS			
3	Degrading North Dike	47,500 CY			
4	Excavation for Dike Construction	530,000 CY			
5	Dike Construction and Maintenance	424,200 CY			
6	Post-Construction Aerial Photography	1 LS			
7	Remove and Reinstall Chain Link Fence	1,500 LF			
	TOTAL BASE BID:				

TOTAL BASE BID:

ADDITIVE WORK:

ADL	DITIVE WORK.			
#	DESCRIPTION	EST. QTY.	UNIT COST	AMOUNT
A1	Degrading 5,250 L.F. of Interior Dikes	31,400 CY		

INTENTIONALLY LEFT BLANK

BIDDER Acknowledges receipt of the following adder	ada:		
Addendum No. 1 (08/27/2025)	iua.		
Addendum No. 2 (08/28/2025)			
Addendum No. 3 (09/18/2025)			
,			
In case of discrepancy, the unit price amount	shall govern.		
The above included prices shall include all la removal, backfill, overhead, profit, insurance, etc., to called for.			
BIDDER understands that the OWNER reservaive any informalities in the bidding.	rves the right to reject any or all bids and to		
BIDDER agrees that this Bid shall be good and (90) days after the scheduled closing time for receiving			
The undersigned hereby declares that only the persons or firms interested in the proposal as principal or principals are named herein, and that no other persons or firms than are herein mentioned have any interest in this Proposal or in the contract to be entered into; that this Proposal is made without connection with any other person, company, or parties likewise submitting a Bid or proposal; and that it is in all respects for and in good faith, without collusion or fraud.			
Upon receipt of written notice of the accep formal contract attached within ten (10) days and de and Insurance Certificates as required under the Gattached in the sum of	eliver the Performance and Payment Bonds		
(\$) is to become the property of the OWNER in the event the contract,			
bonds, and insurance certificates are not executed or delivered within the time above set forth, as mutually agreed to liquidated damages and not as a penalty for the delay and additional administrative expense to the OWNER caused thereby; otherwise the Bid security will be returned upon the signing of the contract and delivering the approved bonds and insurance certificates.			
Respectfully submitted,			
Ву:			
Seal affixed here			
if BID is by a Corporation	Title		
	Address		

Attest:

MEG GEOTECHNICAL ENGINEERING SOIL BORINGS REPORT

PROPOSED DMPA 8 LEVEE RELOCATION BROWNSVILLE, CAMERON COUNTY, TEXAS



Geotechnical Engineering • Construction Materials Engineering & Testing
Environmental • Consulting • Forensics

GEOTECHNICAL ENGINEERING SOIL BORINGS REPORT DMPA 8 LEVEE RELOCATION BROWNSVILLE, CAMERON COUNTY, TEXAS

Prepared For Mr. Ariel Chavez II, P.E., R.P.L.S.

MEG Report No. 02-23-29125

March 12, 2024





MILLENNIUM ENGINEERS GROUP, INC. TBPE FIRM NO. F-3913 5804 N. GUMWOOD AVENUE PHARR, TEXAS 78577 TEL:956-702-8500 FAX:956-702-8140 WWW.MEGENGINEERS.COM



March 12, 2024

Mr. Ariel Chavez II, P.E., R.P.L.S. Director of Engineering Services Port of Brownsville 1000 Foust Road Brownsville, TX 78521 (956)838-7002 achavez@portofbrownsville.com

Subject: Geotechnical Engineering Soil Borings Report

MEG Report No. 02-23-29125 DMPA 8 Levee Relocation

Brownsville, Cameron County, Texas

Dear Mr. Chavez (Client):

Millennium Engineers Group, Inc. is pleased to submit the enclosed geotechnical engineering report that was prepared for the above subject project. This report addresses the procedures and findings of our geotechnical engineering study. Our recommendations should be incorporated into the design and construction documents for the proposed development.

We want to emphasize the importance that all our recommendations presented in this report and/or addendums to this report be followed. We look forward to continuing our involvement in the project by providing construction monitoring in accordance with the report recommendations and materials testing services during construction. We strongly recommend that we be a part of the preconstruction meeting to address any specific issues that are pertinent to this project.

Thank you for the opportunity to be of service to you in this phase of the project and we would like the opportunity to assist you in the upcoming phases of the project. If you have any questions, please contact our office at the address, telephone, fax or electronic address listed below.

Amos Emerson

Geotechnical Department Manager

Cordially,

Millennium Engineers Group, Inc.

TBPE Firm No. F-3913

Quyet Thang Pham, Ph.D, P.E. Senior Geotechnical Engineer

MEG Project No.: 02-23-29125

Forensics

Page II

The seal appearing on this document was authorized by Quyet Thang Pham, P.E. 131836 on March 12, 2024. Alteration of a sealed document without proper notification to the responsible engineer is an offence under the Texas Engineering Practice Act

QUYET THANG PHAM

Cc: 1 Original and PDF Document

Millennium Engineers Group, Inc. 5804 N. Gumwood Avenue Pharr, Texas 78577

www.megengineers.com Tel:956-702-8500 Fax:956-702-8140

Geotechnical Engineering ■ Construction Material Testing ■ Consulting ■

Geotechnical Engineering Soil Borings Report

MEG Project No.: 02-23-29125

March 12, 2024



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Forensics



1.0 INTRODUCTION

Millennium Engineers Group, Inc. (MEG) has completed and is pleased to submit this document that presents our findings as a result of a geotechnical study of this project to our client. The project site is located approximately 1,000 feet south of the intersection of Coffee Road and RL Ostos Road in Brownsville, Cameron County, Texas. The project location is shown on the Project Location Map, found in the Appendix section of this report. This report briefly describes the procedures utilized during this study and presents our findings.

2.0 PROJECT DESCRIPTION

It is our understanding that the proposed levee will be relocated south of its existing location (see figure 1).



Figure 1 – Project Extend Limits (Showing Approximate Location)

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3.0 SCOPE AND LIMITATIONS OF STUDY

This engineering report has been prepared in accordance with accepted geotechnical engineering practices currently exercised by geotechnical engineers in this area. No warranty, expressed or implied, is made or intended. This report is intended for the exclusive use by the client and client's authorized project team for use in preparing design and construction documents for this project only. This report may only be reproduced in its entirety for inclusion in construction documents. This report in its entirety shall not be reproduced or used for any other purposes without the written consent of our firm. This report may not contain sufficient information for purposes of other parties or other uses and is not intended for use in determining construction means and methods.

The data presented in this report are based on data obtained from the soil borings drilled at this site and our understanding of the project information provided to us by our client and other project team members, and the assumption that site grading will result in only minor changes in the existing topography. Subsurface soil conditions have been observed and interpreted at the boring locations only.

This report may not reflect the actual variations of the subsurface conditions across the subject site. It is important to understand that variations may occur due to real geologic conditions or previous uses of the site. The nature and extent of variations across the subject site may not become evident until specific design locations are identified and/or construction commences. The construction process itself may also alter subsurface conditions. If variations appear evident at the time during the design phase and/or construction phase, we should be notified immediately to determine if our opinions, conclusions and recommendations need to be reevaluated. It may be necessary to perform additional field and laboratory tests and engineering analyses to establish the engineering impact of such variations. These services are additional and are not a part of our project scope.

The engineering report was conducted for the proposed project site described in this report. The conclusions and recommendations contained in this report are not valid for any other project sites. If the project information described in this report is incorrect, is altered, or if new information becomes available, we should be retained to review and modify our recommendations. These services are additional and are not a part of our project scope.

Our scope of services was limited to the proposed work described in this report, and did not address other items or areas. The scope of our geotechnical engineering study does not include environmental assessment of the air, soil, rock or water conditions on or adjacent to the site. No environmental opinions are presented in this report. If the client is concerned with environmental risk at this project site, the client should perform an environmental site assessment.

If final grade elevations are significantly different from existing grades at the time of our field activities (more than plus or minus one (1) foot), our office should be informed about

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these changes. If desired, we will reexamine our analyses and make supplemental recommendations.

4.0 FIELD EXPLORATION PROCEDURES

Subsurface conditions at the subject site were evaluated by fourteen (14) 75-foot soil boring, two (2) 30-foot soil borings, five (5) 75-foot Cone Penetration Testing (CPT) soundings, and eight (8) 30-foot CPT soundings. The Borings were drilled at the locations shown on Tables 4.1 and 4.2, and on the Borings Location Map, found in Appendix B of this report. These locations are approximate and distances were measured using a combination of hand-held GPS instrument with the assistance of Google Earth. The soil borings were drilled in general accordance with American Society of Testing Materials (ASTM) D420 procedures. The CPT soundings were performed in general accordance with American Society of Testing Materials (ASTM) D5778 procedures.

Table 4.1 Coordinates of Soil Borings

Soil Boring	Coordinates	Elevation (ft) ¹	Depth (ft)	Drill Rig Used
B-1	25.945736, -97.393186	19.4	75	CME - 75
B-2	25.946003, -97.391394	20.9	75	CME - 75
B-3	25.946617, -97.389589	18.6	75	CME - 75
B-4	25.946883, -97.387881	18.5	75	CME - 75
B-5	25.947503, -97.386228	17.2	75	CME - 75
B-6	25.947781,-97.384325	18.2	75	CME - 75
B-7	25.948425, -97.382553	18.2	75	CME - 75
B-8	25.948675, -97.380803	19.6	75	CME - 75
B-9	25.949239, -97.379267	19.7	75	CME - 75
B-10	25.942989, -97.393542	12.9	75	CME - 75
B-11	25.939764, -97.393522	17.0	75	CME - 75
B-12	25.939767, 97.389942	16.6	75	CME - 75
B-13	25.939808, -97.386336	16.0	75	CME - 75
B-14	25.939828, -97.383189	14.9	75	CME - 75
B-15	25.941253, -97.393714	12.1	30	CME - 75
B-16	25.939639, -97.387897	13.0	30	CME - 75

Note 1: Elevations provided by HDR on January 11, 2024.

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Table 4.2 Coordinates of Cone Penetration Testing (CPT) Soundings

CPT Sounding	Coordinates	Elevation (ft) ¹	Depth (ft)	Cone
C-1	25.944547, -97.393578	13.7	75	573.T1500F15U35
C-2	25.941336, -97.393542	12.3	75	573.T1500F15U35
C-3	25.939750, -97.391769	16.9	70	573.T1500F15U35
C-4	25.939797, -97.388067	15.8	70	573.T1500F15U35
C-5	25.939794, -97.384600	13.6	75	573.T1500F15U35
C-6	25.944469, -97.393756	12.0	30	573.T1500F15U35
C-7	25.942894, 97.3937310	12.0	30	573.T1500F15U35
C-8	25.939725, -97.393686	13.	30	573.T1500F15U35
C-9	25.939753, -97.391539	16.7	30	573.T1500F15U35
C-10	25.939769, -97.389736	16.8	30	573.T1500F15U35
C-11	25.939800, -97.386139	16.0	30	573.T1500F15U35
C-12	25.939819, -97.384428	15.0	30	573.T1500F15U35
C-13	25.939844, -97.383094	15.2	30	573.T1500F15U35

Note 1: Elevations provided by HDR on January 11, 2024

As part of our sampling procedures, the samples were collected in general conformance with ASTM D1586 procedures for Standard Penetration Testing and Split-Barrel samples and ASTM D1587 procedures for Thin Walled Tube Sampling of Fine Grained Soils. Representative portions of the samples were sealed in containers to reduce moisture loss, identified, packaged, and transported to our laboratory for subsequent testing. In the laboratory, each sample was evaluated and visually classified by a member of our Geotechnical Engineering staff. The geotechnical engineering properties of the strata were evaluated by a series of laboratory tests. The results of the laboratory and field-testing are tabulated on the boring logs and Summary of Soil Sample Analyses which are found in the Attachments section of this report.

Standard penetration test results are noted on the boring logs as blows per 12 inches of penetration. Three 6 inch increments are performed for each standard penetration test. The sum of the blows for the last two 6 inch increments is considered the "standard penetration resistance value" or "N-value." Where hard or very dense materials were encountered, the tests are terminated as follows: (1) when a total of 50 blows have been applied in any of the 6 inch increments, or (2) when a total of 100 blows have been applied, or (3) when there is no observed advance of the sampler in the application of 10 successive blows. The boring logs in the case of hard or very dense materials will be noted as follows: 50/3", where 50 is the number of blows applied in 3 inches of penetration, or $100/7\frac{1}{2}$ " where 100 is the number of blows applied in 0 inches of penetration.

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Samples will be retained in our laboratory for 90 days after submittal of a final report. Other arrangements may be provided at the request of the Client.

4.1 Laboratory Testing

A laboratory testing program was conducted on selected samples to assist in classification of the soils encountered in the soil borings, and to evaluate the engineering properties of the soils pertinent to the DMPA 8 Levee relocation investigation parameters for this project.

4.2 Soil Classification Tests

All samples obtained during the field program were visually classified in the laboratory according to procedures outlined in ASTM D 2488. In addition, tests for natural moisture content, atterberg limits, and minus 200 were conducted on selected samples obtained from the soil borings. These laboratory test results were used to classify the soils encountered in general accordance with the Unified Soil Classification System (ASTM D 2487). Results of the classification tests are presented on the Boring Logs and/or Summary of Sample Analysis in the Appendix of this report.

4.3 Soil Strength Tests

The approximate undrained shear strength of selected samples of cohesive soils obtained in the soil borings are determined by performing unconfined compression (UC) tests, and unconsolidated undrained (UU) triaxial tests. Natural moisture content and dry unit weight were determined for samples tested for shear strength. Results of the shear strength tests are presented on Boring Logs and Summary of Sample Analysis in the Appendix of this report.

4.4 Laboratory Procedures

Laboratory tests were performed in general accordance with ASTM Standards to measure physical and engineering properties of the samples obtained for this project. The types of laboratory tests performed for this project are presented in Table 4.3 laboratory testing program.

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Table 4.3 Laboratory Testing Program

Type of Test	Testing Method
Natural Water (Moisture) Content	ASTM D 2216
Material Finer than No. 200 Sieve	ASTM D 1140
Unconfined Compressive Strength	ASTM D 2166
Consolidated Undrained Triaxial Compression Test of Cohesive soils	ASTM D 4767
Direct Shear Test of Soils Under Consolidated Drained Conditions	ASTM D 3080
Unconsolidated Undrained Triaxial Compression Test of Cohesive soils	ASTM D 2850
One-Dimensional Consolidation Properties of Soils Using Incremental Loading	ASTM D 2435
Atterberg Limits	ASTM D 4318

The tests results are shown on the Boring Logs and Summary of Soil Sample Analysis in the Appendix of this report.

Samples will be retained in our laboratory for 90 days after submittal of a final report. Other arrangements may be provided at the request of the Client.

5.0 GENERAL SITE CONDITIONS

5.1 Site Description

The project site is located approximately 1,000 feet south of the intersection of Coffee Road and RL Ostos Road in Brownsville, Cameron County, Texas. The project locations are shown on the Project Location Maps, found in the Appendix section of this report. At the time of our field operations, the subject site is being used as dredge material placement area within the confines of the Port of Brownsville. The general topography of the site is relatively flat, with the exception of the dikes surrounding the levee, with a visually estimated vertical relief of about three (3) to five (5) feet. Surface drainage is visually estimated to be poor.

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Figure 2.1 – Project Extend Limits (Showing Approximate Location)

5.2 Site Surface Soil Survey

According to the Soil Survey of Cameron County, Texas, published by the United States Department of Agriculture – Soil Conservation Service, the project site appears to be located within the three (3) soil associations.

- The Chargo series consist of deep, moderately well drained, calcareous, saline soils that are nearly level. These soils are on old flood plains and deltas. Slopes are less than 0.5 percent, and the surface is plane or slightly concave. Areas of this soil range from 10 to about 100 acres in size. Permeability is slow and runoff is slow. The corresponding soil symbol is CH, Chargo silt clay.
- The Lomalta series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey deltaic sediments. These soils are on nearly level coastal plains slightly above sea level. Slopes are less than 1 percent. The corresponding soil symbol is LM, Lomalta clay.
- The Ustifluvents, clayey consist of nearly level to steep areas of silty and clayey
 materials that have been excavated from canals and ditches or from the floor of
 lagoons and bays and deposited on other soils. Slopes range from 1 to 25 percent.

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Geotechnical Engineering Soil Borings Report MEG Project No.: 02-23-29125 March 12, 2024



The steeper, short-gully areas have cut into the larger mounds of soil material. The corresponding soil symbol is USX, Ustifluvents, Clayey.



Figure 2.2 – Map from USDA Web Soil Survey (Showing Approximate Location)

5.3 Subsurface Conditions

On the basis of our borings and CPT soundings, eleven (11) generalized strata that possess similar physical and engineering characteristics can describe the subsurface stratigraphy at this site. Tables 5.1, 5.2, and 5.3 summarizes the generalized subsurface conditions of our boring logs and CPT sounding logs. The subsurface conditions were visually classified and further classified by laboratory analyses of selected soil samples. The lines designating the interfaces between strata on the boring logs represent approximate boundaries. Transitions between strata may be gradual details for each of the borings can be found on the boring logs in the appendix of this report.

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Figure 2.3 – Soil Borings Location Map (Showing Approximate Location)

Table 5.1 Approximate Subsurface Stratigraphy Depths. (Borehole B-1 thru B-9)

Stratum	Range in Depth, ft ¹	Stratum Description ¹
ı	0 – 10	clayey SAND to lean CLAY, light brown to brown, dry, med. Stiff to stiff
II	10 - 35	lean CLAY, greyish brown to brown, moist to wet, very soft to stiff
III	35 - 50	clayey SILT to clayey SAND, brown, wet, very soft to med. stiff
IV	50 - 75	lean CLAY to fat CLAY, brown, moist, med. stiff to hard

Note 1: The stratum thickness and depths to strata interfaces are approximate. Our measurements are rounded off to the nearest foot increment and are referenced from ground surface at the time of our drilling activities. Subsurface conditions may vary between the boring locations.

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Geotechnical Engineering Soil Borings Report

MEG Project No.: 02-23-29125

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Table 5.2 Approximate Subsurface Stratigraphy Depths. (Borehole B-10 thru B-14)

Stratum	Range in Depth, ft ¹	Stratum Description ¹
V	0 – 10	lean CLAY to fat CLAY, brown to grey, dry to moist, soft to stiff
VI	10 - 35	sandy lean CLAY to clayey SAND, greyish brown to brown, moist to wet, very soft to stiff
VII	35 - 55	silty CLAY to fat CLAY, brown, wet, very soft to hard
VIII	55 - 75	clayey SAND to fat CLAY, brown, wet to moist, med. stiff to hard

Note 1: The stratum thickness and depths to strata interfaces are approximate. Our measurements are rounded off to the nearest foot increment and are referenced from ground surface at the time of our drilling activities. Subsurface conditions may vary between the boring locations.

Table 5.3 Approximate Subsurface Stratigraphy Depths. (Borehole B-15 and B-16)

Stratum	Range in Depth, ft ¹	Stratum Description ¹	
IX ²	0 – 6	clayey SAND, brown, dry, med. stiff	
X ²	6 - 13	fat CLAY, grey to brown, moist to wet, med.	
ΧI	0 - 30	lean CLAY to sandy lean CLAY, brown, wet, med stiff to stiff	

Note 1: The stratum thickness and depths to strata interfaces are approximate. Our measurements are rounded off to the nearest foot increment and are referenced from ground surface at the time of our drilling activities. Subsurface conditions may vary between the boring locations.

Note 2: Stratum IX applies to Borehole B-16 only

5.4 Groundwater Conditions

The dry auger drilling technique was used to complete the soil borings in an attempt to observe the presence of groundwater. During our drilling operations, we encountered the groundwater table at a depth of ten (10) to twenty-three (23) feet below natural ground elevation for short term conditions. Moisture content test exhibited high moisture content at a depth of six (6) feet below natural ground elevation. Table 5.2 summarizes the approximate groundwater and cave in depths measured in our explorations. It should be noted that the groundwater level measurements recorded are accurate only for the specific dates on which measurement were obtained and does not show fluctuations throughout the year.

Fluctuations in Groundwater levels are influenced by variations in rainfall and surface water run-off from season to season. The construction process itself may also cause variations in the groundwater level. If the groundwater elevation is critical to the construction process the contractor should check the subsurface water conditions just prior to construction excavation activities.

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Table 5.2. Approximate Groundwater and Cave-in Depths.

Boring	Depth to Gro	undwater, Ft ¹	Depth to Cave In, Ft ¹
No.	Time of Drilling	15 Min. Reading	After Bore Termination
B-1	20	17	55
B-2	15	13	50
B-3	15	13	15
B-4	17	12	55
B-5	15	14	60
B-6	15	13	55
B-7	17	13	50
B-8	17	17	65
B-9	23	23	60
B-10	23	23	14
B-11	16	15	15
B-12	16	11	43
B-13	14	10	24
B-14	17	11	39
B-15	10	9	8
B-16	15	11	30

Groundwater levels and cave-in depths have been rounded to the nearest foot.

Based on the findings in our borings and on our experience in this region, we believe that groundwater seepage may be encountered during site earthwork activities. If groundwater seepage is encountered during site earthwork activities, it may be controlled using temporary earthen berms and/or conventional sump-and-pump dewatering methods.

5.5 Unforeseen Conditions

During the subsurface soil boring exploration, the drilling crew experienced a loss of water at Borehole B-5 during drilling utilizing the mud rotary method. The water appeared to the drill crew to be seeping into the soil. A check was ensured that the issue did not come from drilling equipment. This was noticed up until boring termination. The exact cause of the water loss into the soil has not been determined at the time of this report.

In addition to the loss of water, loose surface soils caused the drilling rigs to lose traction. This facilitated the need for assistance to get the rigs out of the area. This issue was mainly seen in the east side of the levee, specifically at soil borings B-7 through B-9. Multiple attempts to pull the drilling rigs were necessary after the drilling of the three borings.

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6.0 LABORATORY TESTING ANALYSIS

6.1 General

The analyses presented in this report are applicable specifically to the DMPA 8 Levee relocation project. The data gathered from both the field and laboratory testing programs on soil samples obtained from the borings was utilized to establish geotechnical engineering parameters for the proposed project.

6.2 Moisture Content Testing

The moisture content of a soil is defined as the ratio of the weight of the water in the sample to the dry weight of the soil sample expressed as a percentage. The moisture contents for the samples obtained as part of our geotechnical study were performed in accordance with ASTM D2216. The results varied from two (2) percent to thirty-nine (39) percent. The borings and corresponding soil samples exhibited dry to wet soil conditions. A list of all the moisture contents by corresponding depth can be found on the boring log.

6.3 Plasticity Index Testing

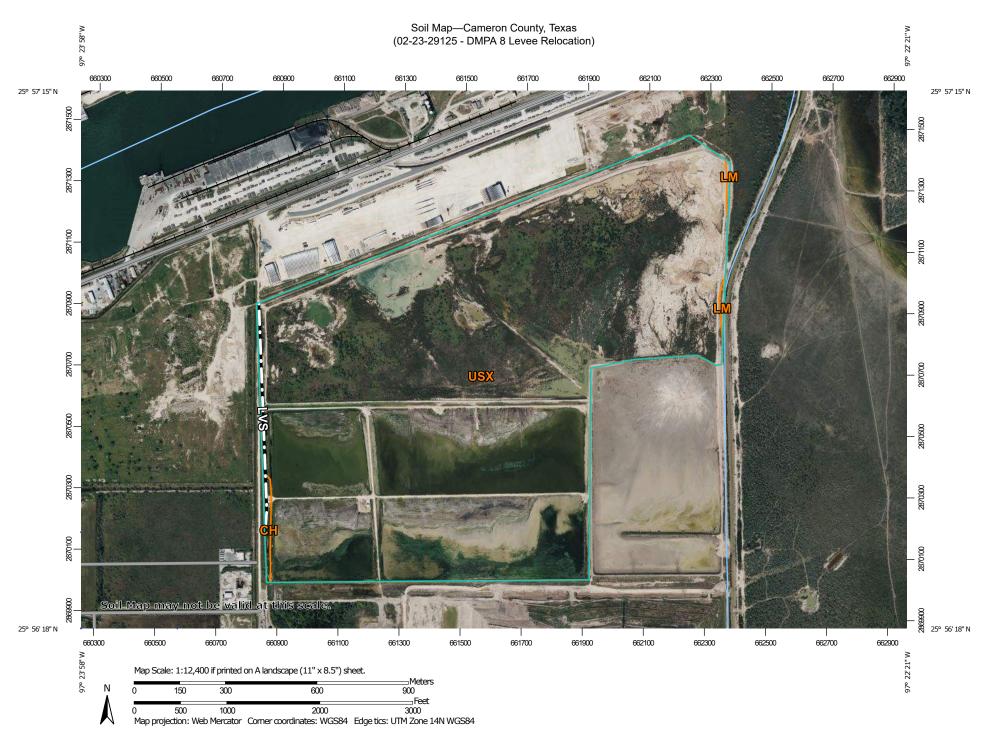
The Plasticity Index (PI) is known as the difference between the liquid limit and the plastic limit of a soil. These limits are commonly referred to as the Atterberg limits, which describe the consistency of soils with respect to their varying moisture contents. The liquid limit is defined as the moisture content at which soil begins to transition from a plastic to a liquid state, and begins to behave as a liquid material. The plastic limit refers to the water content of a soil at the point of transition from a semisolid to a plastic state where soil starts to exhibit plastic behavior. The plasticity index testing performed in accordance with ASTM D4318 shows the range in which a soil acts in a plastic state. Plasticity Index values for the soils samples performed for this report were found to have a value of zero (0) percent having a low to moderate plasticity to fifty eight (58) percent having a high plasticity.

6.4 Particle Size Analysis Testing (Determination of Fines Content)

Standard grain size analysis is used to determine the relative proportions of different grain sizes as they are distributed along a range of different sized sieves. The minus 200 sieve analysis is used commonly as a tool for soil classification and identification using the Unified Soil Classification System. Results for this test are reported as a percentage of soil passing the No. 200 sieve, which has openings 0.075mm wide. This test is also used to determine the suitability of soil for construction purposes and to estimate probable seepage through soils. Generally, a %- 200 greater than 50% indicates a cohesive soil with large amounts of fine sized grains in the soil composition having low seepage potential. Sieve analysis testing was performed in accordance with ASTM D1140. The % -200 soil values for the samples collected ranged from 22% passing (cohesionless coarse grained materials such as clayey sands/gravels) to 100% passing (cohesive fine grained materials such as clays).

MEG Page 12 of 12

APPENDIX A CUSTOM SOIL RESOURCE REPORT IVIECTENGINEERS Strong Leaders! Geotechnical | Environmental | Testing 5840 N. Gumwood Avenue Pharr, Texas 78577 Tel: 956-702-8500 Fax: 956-702-8140



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons



Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot
Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot
Other

Special Line Features

Water Features

Δ

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20.000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cameron County, Texas Survey Area Data: Version 20, Aug 31, 2023

Soil map units are labeled (as space allows) for map scales 1:50.000 or larger.

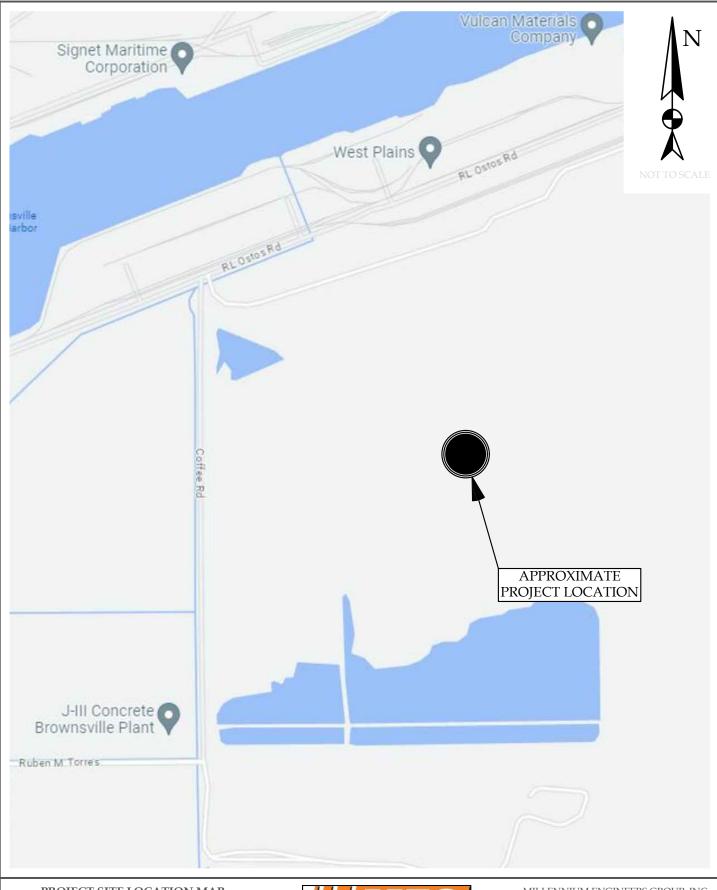
Date(s) aerial images were photographed: Dec 21, 2021—Mar 2, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
СН	Chargo silty clay	1.7	0.4%
LM	Lomalta clay, 0 to 1 percent slopes, occasionally ponded	0.9	0.2%
USX	Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent slopes	370.7	99.3%
Totals for Area of Interest		373.3	100.0%

APPENDIX B PROJECT LOCATION, TOPOGRAPHIC AND BOREHOLE LOCATION MAPS INTEGENGINEERS Strong Leaders! Geotechnical | Environmental | Testing 5840 N. Gumwood Avenue Pharr, Texas 78577 Tel: 956-702-8500 Fax: 956-702-8140



PROJECT SITE LOCATION MAP

PROPOSED DMPA 8 LEVEE RELOCATION BROWNSVILLE, CAMERON COUNTY, TEXAS



MILLENNIUM ENGINEERS GROUP, INC. 5804 N. GUMWOOD AVENUE PHARR, TEXAS 78577 WWW.MEGENGINEERS.COM TEL: 956-702-8500

FAX: 956-702-8140

PROJECT TOPOGRAPHY MAP

PROPOSED
DMPA 8 LEVEE RELOCATION
BROWNSVILLE, CAMERON COUNTY, TEXAS



MILLENNIUM ENGINEERS GROUP, INC. 5804 N. GUMWOOD AVENUE PHARR, TEXAS 78577 WWW.MEGENGINEERS.COM TEL: 956-702-8500 FAX: 956-702-8140



PROPOSED DMPA 8 LEVEE RELOCATION

BROWNSVILLE, CAMERON COUNTY, TEXAS



MILLENNIUM ENGINEERS GROUP, INC. 5804 N. GUMWOOD AVENUE PHARR, TEXAS 78577 WWW.MEGENGINEERS.COM TEL: 956-702-8500 FAX: 956-702-8140 = 75' = 30'

PROJECT CPT SOUNDINGS LOCATION MAP

PROPOSED
DMPA 8 LEVEE RELOCATION

BROWNSVILLE, CAMERON COUNTY, TEXAS



MILLENNIUM ENGINEERS GROUP, INC. 5804 N. GUMWOOD AVENUE PHARR, TEXAS 78577 WWW.MEGENGINEERS.COM TEL: 956-702-8500 FAX: 956-702-8140

APPENDIX C PROJECT BORING LOGS AND PROFILE IVIECTENGINEERS Strong Leaders! Geotechnical | Environmental | Testing 5840 N. Gumwood Avenue Pharr, Texas 78577 Tel: 956-702-8500 Fax: 956-702-8140

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-1 Sheet 1 of 2

Date(s) August 21, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
	Drilling Contractor RGV Drilling	Approximate Surface Elevation 19.40 feet NAVD88
Groundwater Level 20 feet ATD, 17 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

19.4	o Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
18.4	1 —		1	13	CH		fat CLAY, brown, dry, stiff	11	61	39	92		_
17.4 — 16.4 — 15.4 —	3— 4—	Z	2	8	SC		clayey SAND, light brown to brown, dry, med. stiff to stiff	14			31		_ _ _
14.4	5 —		3	14			- -	28	22	9	23		- -
12.4 — 11.4 — 10.4 —	7— 8— 9—	11	4 5	14 6			- - -	29 35	22	6	42		— — —UU Remolded,
9.4	10 — 11 —		6	1	CL		lean CLAY, greyish brown to brown, moist to wet, very soft to stiff	38	22	0	42		Su = 1.9 ksf
7.4 — 6.4 — 5.4 —	12 — 13 — 14 —		7				- -	28	34	17	96	PP=0.5	
4.4 — 3.4 — 2.4 —	15 — 16 — 17 —												15 minutes
0.4	18 —	M	8				_ _ _ ATD <u>√</u> _	37			91	PP=0.5	 ATD
-0.6 -1.6 -2.6	20 — 21 — 22 —						- - -						- - -
-3.6 - -4.6 - -5.6 -	23 — 24 — 25 —	M	9				- - -	37	33	18		PP=4.5+	── ──UU, Su = 3.46 —ksf
-6.6 	26 - 27 -						- -						- -
-8.6 - -9.6 -	28 — 29 — 30 —	M	10				- - -	23	30	13		PP=0.5	— CU, phi' = 29.5, —c' = 150 psf
-11.6 -	31 — 32 —						- -						- -
-13.6 — -14.6 — -15.6 —	33 — 34 — 35 —	X	11					26	34	13	96	PP=4.5	—UU, Su = 1.9 ksf

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-1 Sheet 2 of 2

Sampling Resistance, blows/ft Water Content, % Sample Number Material Type Percent Fines Graphic Log Depth (feet) ksf % % **REMARKS AND** UC, Ľ, ₫ MATERIAL DESCRIPTION OTHER TESTS SILT with sand, brown, wet, very soft to med. ksf PP=2.75 12 29 25 2 85 40 -20.6 13 27 PP=0.5 -25.6 45 ML sandy SILT, brown, wet, soft LS = 1 23 53 PP=0.5 14 -30.6 CL sandy lean CLAY, light brown, wet, very stiff 21 15 23 54 -35.6 55 silty SAND, light brown, wet, med stiff to very 16 LS = 1 -40.6 17 10 28 -45.6 65 CL lean CLAY with sand, light brown to brown, 30 -50.6 wet, med. stiff 19 8 26 32 13 78 **Bore Termination** -60.6 80 -65.6 85

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-2 Sheet 1 of 2

	1	
Date(s) Drilled August 25, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 20.90 feet NAVD88
Groundwater Level 15 feet ATD, 13 feet @ and Date Measured 15min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

	. Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	РІ,%	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
20.9 — 19.9 — 18.9 — 17.9 —	0— 1— 2— 3— 4—	11111111	1 2	13 7	SC		clayey SAND, light brown, dry, med. stiff to stiff — — — — — — —	2	27	12	37		- - -
15.9 — 14.9 — 13.9 — 12.9 —	5— 6— 7— 8— 9—		3 4 5	9				5 23	24 49	11	58		_ _ _ _
9.9 — 8.9 — 7.9 — 6.9 —	11 — 12 — 13 — 14 —		6	1	CH		sandy lean CLAY , brown to greyish brown, moist, very soft 15 minutes ———————————————————————————————————	31	49 51	32	94	PP=0.5	
5.9 — 4.9 — 3.9 — 2.9 —	15 — 16 — 17 — 18 —				СН		ATD □ sandy fat CLAY, brown to grey, moist to wet, - soft to stiff						
0.9 -0.1 -1.1 -2.1	20 — 21 — 22 — 23 —	X	8		sc		- - - -	25	69	46		PP=1.0	ksf
-3.1 -4.1 -5.1 -6.1 -7.1	24 — 25 — 26 — 27 — 28 —		9	2	SC		—clayey SAND, grey, wet, very soft — — — — — — — — — — — —	20			25		- - - -
-8.1 -9.1 -10.1 -11.1	29 — 30 — 31 — 32 — 33 —		10	11	CL		—lean CLAY with sand, grey, wet, med. stiff to — _very hard	17	36	23			- - - -
-13.1	34 — 35 —	X	11					14	40	26	83	PP=4.5+	

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-2 Sheet 2 of 2

		Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
-14.1	35 -	×	11		CL		lean CLAY with sand, grey, wet, med. stiff to very hard	14	40	26	83	PP=4.5+	-
-19.1 -	40 —	X	12		SC		- clayey SAND, brown, wet, very soft to very hard	23	3 39	25	42	PP=0.25	- - DS, phi' = 38.5, c' = 250 psf -
-24.1	45 -	X	13				: - - :	18	3 41	26		PP=4.5+	- - - -
-29.1 -	50 —	X	14		CL		lean CLAY with sand, brown, moist, med. stiff	26	30	10	77	PP=1.0	
-34.1 ·	55 -	X	15		CL		ean CLAY, brown, moist, soft to hard	28	3		89	PP=0.5	- - UU, Su = 0.5 ksf -
-39.1 -	60 -	Z	16	9			_	20) 26	11			
-44.1	65 -	X	17				_	24	ı		96	PP=0.75	- - UU, Su = 0.45 ksf -
-49.1 -	70 —	X	18					30				PP=4.0	- - - -
-54.1 -	75 -	X	19		СН		fat CLAY, brown, moist, very hard Bore Termination	- 26	6 69	44	100	PP=4.5	- - UU, Su = 3.4 ksf -
-59.1 -	80 —						_	- - - - - -					
-64.1	85 -						- -	-					
-69.1	90 —	}					•	-					-

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-3 Sheet 1 of 2

Date(s) August 21, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 18.60 feet NAVD88
Groundwater Level 15 feet ATD, 13 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

18.6		Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log		Water Content, %	%	9	Percent Fines	ksf	
18.6		Depi	Sam	Sam	Sam blow	Mate	Grap	MATERIAL DESCRIPTION	Wate		PI, %	Perc	UC, ksf	REMARKS AND OTHER TESTS
16.6	11	0 — 1 —	K	1		SC-CL		lean CLAY to clayey SAND, light brown,	22	E2	24	OF.		
14.6	16.6	2—		'	5			— —		33	34	95		-
12.6		3 		2	5			- -	18					
11.6		5 —		3	2			_	26	22	4	41		_
9		7 -	V	4	1	CL			29	35	23			_
8.6		8 — 9 —	H					- 						- - IIC Su - 0.21
15 minutes \(\frac{\text{V}}{\text{S}} \) 16 minutes \(\frac{\text{V}}{\text{S}} \) 17 minutes \(\frac{\text{V}}{\text{S}} \) 18 minutes \(\frac{\text{V}}{\text{S}} \) 19 minutes \(\frac{\text{V}}{\text{S}} \) 10 minutes \(\frac{\text{V}}{\text{S}} \) 10 minutes \(\frac{\text{V}}{\text{S}} \) 11 minutes \(\frac{\text{V}}{\text{S}} \) 12 minutes \(\frac{\text{V}}{\text{S}} \) 15 minutes \(\frac{\text{V}}{\text{S}} \) 16 minutes \(\frac{\text{V}}{\text{S}} \) 17 minutes \(\frac{\text{V}}{\text{S}} \) 10 minutes \(\frac{\text{V}}{\text{S}} \) 10 minutes \(\frac{\text{V}}{\text{S}} \) 11 minutes \(\frac{\text{V}}{\text{S}} \) 12 minutes \(\frac{\text{V}}{\text{S}} \) 13 minutes \(\frac{\text{V}}{\text{S}} \) 14 minutes \(\frac{\text{V}}{\text{S}} \) 15 minutes \(\frac{\text{V}}{\text{S}} \) 10 minutes \(\frac{\text{V}}{\text{S}} \) 11 minutes \(\frac{\text{V}}{\text{S}} \) 12 minutes \(\frac{\text{V}}{\text{S}} \) 13 minutes \(\frac{\text{V}}{\text{S}} \) 14 minutes \(\frac{\text{V}}{\text{S}} \) 15 minutes \(\frac{\text{V}}{\text{S}} \) 16 minutes \(\frac{\text{V}}{\text{S}} \) 17 minutes \(\frac{\text{V}}{\text{S}} \) 18 minutes \(\frac{\text{V}}{\text{S}} \) 19 minutes \(\frac{\text{V}}{\text{S}} \) 10 minutes \(\t	8.6		X							49	30	95		_ksf
4.6			И	6				_ 	34				PP=1.0	ksf
3.6			Ц					15 minutes ∑						<u></u> 15 minutes
2.6			M	7				_ ATD <u>型</u> _	30	50	32		PP=1.0	_ ATD
0.6														_
-1.4 20			Ц											_
2.4 21			M	8					30				PP=0.5	
-4.4 23	-2.4	21 —												_
3.4 25								- 						- -
-7.4 26			M	9		CL		-sandy lean CLAY, light brown, wet, med. stiff -	28	29	8	52	PP=1.75	-
-9.4 28			H					_ _						_
-10.4 29 10 10 CL —lean CLAY, light brown, wet, med stiff to hard — 28 42 29 99 PP=4.5+ — 13.4 32 — 14.4 33 — 15.4 34 — 15.4 35 — 24 97 PP=4.5+ — UU, Su = 4.5 ksf														
-11.4 30 -12.4 31 -13.4 32 -14.4 33 -15.4 34 -15.4 35 -16			М	10		CL		-lean CLAY, light brown, wet, med stiff to hard -	28	42	20	ga	PP=4 5.4	-
-13.4 32			Μ	10				_ _	20	44	29	33	FF-4.0+	<u> </u>
-15.4 34 34 11 97 PP=4.5+ UU, Su = 4.5 ksf	11		$ \ $						-					-
-16.4 35 11 1 97 FF=4.54 ksf			Н	4.2				_ 	ļ <i></i>				DD 15	— —UU, Su = 4.5
			M	11			///		24			97	PP=4.5+	

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-3 Sheet 2 of 2

-16.4	% Depth (feet)	X Sample Type	1 Sample Number	Sampling Resistance, blows/ft	P Material Type	Graphic Log	MATERIAL DESCRIPTION Lean CLAY, light brown, wet, med stiff to hard	₩ Water Content, %	% 'TT' %	PI, %	Percent Fines	+5.+ +6.+	REMARKS AND OTHER TESTS UIL, Su = 4.5 - ksf
-21.4 -	40 —	X	12				- - - - -	26				PP=1.5	- - - -
-26.4 -	45 	X	13		СН		fat CLAY, light brown, wet, very hard to med stiff	22	57	35	99	PP=4.5	- - UU, Su = 4.1 ksf -
-31.4	50 -	X	14				- - - -	22				PP=4.0	- - -
-36.4	55 —	X	15					25	59	43		PP=4.5	- - CU, phi' = 33, c' = 230 psf
-41.4 -41.4	60 —	X	16				- - - -	23			99	PP=4.5	- - UU, Su = 4.3 ksf -
-46.4 -	- 65 	X	17		ML		SILT, brown, wet, med. dense	29	69	52		PP=0.5	-
-51.4 -	70 -	Z	18	7				31		LS = 0	100		
-56.4	- - 75 —	Z	19	11			Bore Termination	29					- - - -
-61.4 -	- - 80 —	- - - - - - -											
-66.4 -	- - 85 —	- - - - - -					- - - -						
-71.4	- - 90 —	-					- - - -	<u> </u>					
							IIIMEG -						

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-4 Sheet 1 of 2

Date(s) August 25, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 18.50 feet NAVD88
Groundwater Level 17 feet ATD, 12 feet @ 15 and Date Measured min.	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

	_ DESCRIPTION	Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
18.5 17.5 1 1 8 CL lean CLAY with san moist, very soft to m	d, light brown, dry to ed. stiff	6	28	13			_
16.5	_						
14.5	-	10			80		-
13.5 5 3 3 3	_	14					_
11.5	-	21					-
9.5 9 5 2 CL-ML sandy silty CLAY, light	ght brown, moist, soft —	22	22	4	55		- -
8.5 10 CH fat CLAY, light brow	n, moist to wet, soft		22	-			- II
7.5 11 6 3	— 15 minutes <u></u> —	28	52	33	86		- 15 minutes
5.5 13 CH fat CLAY, brown to	grey, wet, med. stiff to stiff						- ⁻
4.5 14 7 7 7		31	59	38	99		_
2.5							
1.5 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	ATD <u>⊈</u> —						_ <u></u> ZATD
-0.5	-	26					- II
-1.5 20 -2.5 21	_						_
-3.5 22	-						– II
-4.5 + 235.5 + 24 - V							<u> </u>
-6.5 25 9 9	_	36	54	34	97	PP=0.5	─UU, Su = 1.94 —ksf
-7.5 26 -	-						-
-8.5 27 -9.5 28 1 1 1 1 1 1 1 1 1							_
-10.5 29 10 11	-	28			80		-
-11.5 30 CL lean CLAY, brown to stiff to very hard	o light brown, wet, med.						
-13.5 32 Still to Very hard	-						-
-14.5 33 -15.5 34 -14.1							— —UU, Su = 3.89
-16.5		21			94	PP=4.5	ksf = 3.00

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-4 Sheet 2 of 2

10.5	R Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION		Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS UU, Su = 3.89
-16.5	35 —		11		CL		lean CLAY, brown to light brown, wet, med. stiff to very hard	- 2	21			94	PP=4.5	- ksf
-21.5 -	40 —	X	12				- - - - -		19	44	27	99	PP=4.0	- - - -
-26.5 -	45 -	X	13				- - - -	2	21				PP=4.5+	- - UU, Su = 3.1 ksf -
-31.5 — -	50 	X	14				- - - - -	- - - -	20			100	PP=4.0	- - - -
-36.5 —	55 —	X	15		CL-ML		silty CLAY, light brown, wet, med stiff to stiff	- - - -	18	26	6	99	PP=2.0	- CU, phi' = 26, c' = 790 psf
-41.5 — - -41.5 —	60 — -	Z	16	16			- - - - -	- - - -	21			98		- - - -
-46.5 -	65 -	X	17		CL		lean CLAY with sand, light brown, wet, med stiff to hard	- - - -	25	34	10		PP=4.0	- UU, Su = 2.38 ksf
-51.5 -	70 -	X	18				- - -	-] ²	23			74	PP=1.0	- - - -
-56.5 -	75 -	X	19				Bore Termination	- - -	21				PP=1.75	- UU = Su = 2.59 ksf -
-61.5 -	80 	- - - - -					- - - - -	- - - - - -						- - - -
-66.5 - -66.5 - -	85 -	1					- - - - - -	1						- - - - -
-71.5	90 —	1												<u> </u>

ENGINEERS

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-5 Sheet 1 of 2

Date(s) August 28, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 17.20 feet NAVD88
Groundwater Level 15 feet ATD, 14 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

17.2-	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	PI,%	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
16.2	1 —		1	6	CL		lean CLAY with sand, light brown, moist to wet, very soft to hard	18			73		-
15.2	2— 3—	7	2	2			- 	26	39	22	80		_
13.2	4 —										00		_
11.2	6—		3	3				24					_
9.2	7 — 8 —		4	HW	CL		—sandy lean CLAY, light brown, moist, very soft ——	31			65		_
8.2 7.2	9 — 10 —		5	HW			_	35	43	25			_
6.2	11 —		6	3	CL		lean CLAY, light brown to dark brown, moist to wet, soft to very stiff	34			93		_
5.2 4.2	12 -						- 						
3.2	14 — 15 —	M	7				15 minutes <u>型</u> ATD <u>V</u>	31				PP=1.5	15 minutes
1.2	16 —	H					_ = _						_
-0.8	17 — 18 —	1					- -						_
-1.8 -2.8	19 —	M	8					20	33	20	52	PP=0.5	_
-3.8	21 —	H											-
-4.8 -	22 — 23 —						- 						_
-6.8 -7.8	24 — 25 —	M	9		SC		—clayey SAND, brown, wet, med. dense todense	22	32	18	47	PP=3.5	─UU, Su = 1.94 —ksf
-8.8	26 —	H											_
-9.8 -	27 — 28 —	1					- 						_
-11.8	29 — 30 —	M	10					22	31	15	36	PP=0.5	_
-13.8	31 —	H											-
-14.8 -15.8	32 -						- 						_
-16.8 -17.8	34 — 35 —		11	16			_	22					_
-17.0	35 —												

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-5
Sheet 2 of 2

-17.8	용 Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	% Material Type	Graphic Log	MATERIAL DESCRIPTION clayey SAND, brown, wet, med. dense to	Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
-22.8	40 —	X	12				_ dense	25	38	22	34	PP=2.0	- - - CU, phi = 43, c' = 1 psf -
-27.8	45 	X	13				- - - - -	25	35	20	32	PP=0.5	- - - - -
-32.8 -	50 -	Z	14	13			- · · · · · · · · · · · · · · · · · · ·	23					- - - -
-37.8 -	55 -	Z	15	11	СН		fat CLAY with sand, brown, moist, med. stiff to hard	22					
-42.8 —	60 —	Z	16	21			- - -	21	61	39			- - - -
-47.8 —	65 -	X	17					22				PP=3.0	
-52.8 -	70 - -	X	18		CL		sandy lean CLAY, brown, moist, med. stiff	22	41	24	64	PP=1.0	- - UU, Su = 3.67 ksf - -
-57.8 — -	75 	X	19		СН		fat CLAY, brown, moist, stiff Bore Termination	23	54	32		PP=2.75	- - - -
-62.8 -	80 —						- - -						- - -
-67.8 -	85 -	- - - - -					- - - - -						- - - -
-72.8	90 —							1					<u> </u>

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-6 Sheet 1 of 2

Date(s) August 28, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 18.20 feet NAVD88
Groundwater Level 15 feet ATD, 13 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

18.2	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	PI,%	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
17.2	1 —	7	1	6	CL		lean CLAY to lean CLAY with sand, light brown to brown, soft to med. stiff	11					_
16.2 — 15.2 —	2— 3—												_
14.2	4—		2	6				17			87		-
13.2	5 —		3	4				19	22	5			_
11.2	7—	Z	4	5				23					-
9.2	8 9 	3	5	3			_ _	30	63	34	81		-
8.2	10 —	H	5	3	СН		fat CLAY with sand, brown, moist to wet, med	30	63	34	01		
7.2 - 6.2 -	11 		6	4			dense to hard	32	66	42			- -
5.2	13 —						15 minutes ∑						<u></u> 15 minutes
3.2	14 15 	X	7				 ATD∑	35	75	53	81	PP=0.5	_UU, Su = 0.86 _ <u>K</u> ATD
2.2	16—	П					_						_
0.2	17 												_
-0.8	19 —	M	8					39			72	PP=0.5	
-1.8 -	20 — 21 —	Н											_
-3.8 -	22 												
-5.8	24 —	М	9		CL		—lean CLAY with sand, brown, wet, hard —	26	40	26	73	PP=4.5	CU, phi' = 26, c' = 430 psf;
-6.8 -	25 — 26 —	M	Ĭ				_ _	_0					—UU, Su = 1.8 _ksf
-8.8	27 —	$\ \ $											_
-9.8 -	28 — 29 —	Н			ML		— ——sandy SILT, brown, wet, med. stiff —						── ──UU, Su = 0.43
-11.8	30 —	И	10					19	24	2	52	PP=0.75	_ksf
-12.8 -	31 - 32 -	$ \ $					- 						-
-14.8	33 —	Ц			CM								-
-15.8 -16.8	34 — 35 —	<u>N</u>	11	22	SM		—silty SAND, brown, wet to moist, dense to very—	20		LS=0	22		

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-6
Sheet 2 of 2

-16.8	% Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	% Material Type	Graphic Log	MATERIAL DESCRIPTION silty SAND, brown, wet to moist, dense to very	Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
-21.8 -	40 —	Z	12	21			_ dense	24					-
-26.8	45 	Z	13	36	СН		fat CLAY, brown, moist, very hard -	28	54	36	92		- - -
-31.8 - -	50 -	Z	14	38	SM		silty SAND, brown, moist, dense to very dense =	25			30		
-36.8	55 -	Z	15	20				23					- - -
-41.8 -	60 —	Z	16	37			<u>-</u>	23			27		-
-46.8	65 -	Z	17	42			- - - -	24	22	2	40		- - -
-51.8 -	70 -	Z	18	39			- - - -	24					- - -
-56.8 —	75 -	Z	19	31			Bore Termination	22			26		- -
-61.8 —	80 	1 1 1 1 1					- - - -						-
-66.8 - -	85 						- - - - - - -						- - - - -
-71.8	90 —	11											-

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-7 Sheet 1 of 2

Date(s) August 29, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 18.20 feet NAVD88
Groundwater Level 17 feet ATD, 13 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

18.2	o Depth (feet) I	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	۲۲, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
17.2	1 —		1	5	CL		lean CLAY to lean CLAY with sand, light brown to brown, dry to wet, very soft to med	20	42	26			_
16.2 15.2	2— 3—	1					—stiff —						
14.2	4—		2	4				26					-
13.2	5 — 6 —		3	3			- -	23			89		_
11.2	7—		4	1				32					-
9.2	8 — 9 —	3	5	2			_ 	31	28	9			_
8.2	10 —		J	2				31	20	9			-
7.2 6.2	11 —		6	2				35					
5.2	13 —						15 minutes ∑						15 minutes
3.2	14 	M	7					30			83	PP=1.0	─UU, Su = 0.66 —ksf
2.2	16 						_ ATD <u>\</u>						— ATD
0.2	18 —	Ц					_ =						_
-0.8 -1.8	19 	M	8		00		-	25	23	10		PP=0.5	─UU, Su = 0.37 —ksf
-2.8	21 —	П			SC		clayey SAND, brown, wet to moist, med. dense to very dense.						-
-3.8 -	22 — 23 —						_ 						_
-5.8	24—		9	4				21			44		-
-6.8 -7.8	25 — 26 —						- -						_
-8.8	27 —												
-9.8 -10.8	28 — 29 —	М	10		CL		— — — — — — — — — — — — — — — — — — —	22	31	13	87	PP=1.75	─ ─UU, Su = 1.69
-11.8 - -12.8 -	30 	И	10				_ _		"	13	or .	1 -1.73	—ksf —
-13.8	32—	$ \ $											-
-14.8 -15.8 	33 -	Ħ	14		ML		SILT, brown, wet, med. stiff	22		18.4	07	DD: 4.0	_
-16.8	35 —	M	11				IIIMEC	22		LS=1	87	PP=1.0	

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-7
Sheet 2 of 2

-16.8	% Depth (feet)	X Sample Type	1 Sample Number	Sampling Resistance, blows/ft	≥ Material Type	Graphic Log	MATERIAL DESCRIPTION SILT, brown, wet, med. stiff	™ Water Content, %	LL, %	% 'ld =1	[®] Percent Fines	DC, ksf	REMARKS AND OTHER TESTS
					SC		<u>. </u>						-
-21.8	40 —		12	13	30		clayey SAND, brown, wet to moist, med. dense to very dense	22			93		_ -
-26.8	45 -	Z	13	51			- - - -	22			34		- - - - -
-31.8	50 -	Z	14	35				23	43	26			- - - -
-36.8 - -	55 -	Z	15	16			- - - -	24			35		- - - - -
-41.8	60 —	Z	16	9	SM		- silty SAND, brown, moist, med stiff to very stiff	22		LS=1	48		-
-46.8	65 -	Z	17	31			- - - - -	22			30		- - - - -
-51.8 -	70 -	Z	18	23			- - - -	20					- - - -
-56.8	75 —	X	19		CL-ML		silty CLAY, brown, moist, very stiff	23	28	7	99	PP=3.0	- UU, Su = 2.99 - ksf
		\prod					Bore Termination						- - -
-61.8 -	80 —	- - - -											- - -
-66.8 -	85 -	- - - - -					<u> </u>						- - - -
-71.8	90 —	Ш					-	_					<u> </u>

ENGINEERS

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-8 Sheet 1 of 2

Date(s) August 29, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 19.60 feet NAVD88
Groundwater Level 17 feet ATD, 17 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

9.6-	o Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
8.6	1—	7	1	4	CL		sandy lean CLAY, light brown, moist, soft to	6			55		-
7.6 — 6.6 — 5.6 —	2— 3— 4—		2	5			- - 	22					- - -
4.6	5 —		3	3			_ _	21	33	19	64		- -
2.6	7—		4	2	CL-ML		-sandy silty CLAY, light brown, moist, very soft -	32	26	6			-
1.6 — 0.6 — 9.6 —	9 — 10 —		5	3	СН		fat CLAY, light brown, moist to wet, very soft to hard — — ————————————————————————————————	33	55	34	87		_
7.6	11 — 12 —		6	2			_ _ _	30					- -
i.6 —	13 — 14 — 15 —	Z	7	4				26	63	42			_ _
.6	16 — 17 —						 ATD and 15 minutes ∑						— — ∑ATD and 15 minu —
.6 —	18 — 19 — 20 —	X	8		CL			26	36	17	83	PP=1.0	—UU, Su = 0.58 —ksf
.4 — .4 —	21 — 22 — 23 —						- - - -						- - -
.4 —	24 — 25 —	X	9				_ _	18			72	PP=3.75	_
.4 —	26 — 27 — 28 —						- - -						
.4	29 — 30 —	X	10		CL		—lean CLAY, light brown, wet, med. stiff —	19	39	26	91	PP=4.0	─UU = Su = 2.56 —ksf
.4 -	31 — 32 — 33 —						- - -						- - -
5.4	34 — 35 —	X	11					23			90	PP=2.0	—UU = Su = 1.33 ksf

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-8 Sheet 2 of 2

-15.4	% Depth (feet)	X Sample Type	1 Sample Number	Sampling Resistance, blows/ft	의 Material Type	Graphic Log	MATERIAL DESCRIPTION _ lean CLAY, light brown, wet, med. stiff	מ Water Content, %	, "IT" %	PI, %	% Percent Fines	OC, ksf	REMARKS AND OTHER TESTS UIU = Su = 1.33 - ksf
-20.4 	40 —	Z	12	14			- - - - - -	24	36	18	98		
-25.4	45 -	Z	13	18	SM		silty SAND, light brown, wet, med dense to very dense	- - 23		LS=1			<u>-</u> -
-30.4	50 -	Z	14	17			- - - -	- - 26			36		-
-35.4	55 —	Z	15	15			- - - -	24		LS=1			
-40.4·-	60 —	Z	16	48	SC		clayey SAND, brown, moist, med stiff to hard	- - 23			41		- - -
-45.4 -	65 -	Z	17	24			- - - -	23	58	37	42		- -
-50.4	70 —	X	18				- - - -	24				PP=4.0	
- -55.4	75 -	X	19				Bore Termination	- 24				PP=1.0	
-60.4 -	80 -	- - - -					- - - -	- - - -					-
-65.4 -	85 						- - - - -						- - - -
-70.4	90 —							<u>]</u>					

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-9 Sheet 1 of 2

Date(s) September 5, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 19.70 feet NAVD88
Groundwater Level 23 feet ATD, 23 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

10.7	, Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
19.7 18.7	1 1-	R	1	6	CL		lean CLAY, brown, dry to wet, very soft to very stiff	9					
17.7	2-		•	Ů				3					-
16.7	3-		2	1				33	25	5	86		-
15.7 - 14.7 -	4- 5-	B	2	4			_ _	44					
13.7	6-	<u>4</u>	3	1			-	41					- II
12.7	7—		4	10			-	40			91		-
11.7	8 — 9 —	K											
9.7	10 —		5	5			_	27					⊢ II
8.7	11 —	2	6	4			-	31			95		
7.7 6.7	12 — 13 —]											
5.7	14 —	М	_				_						UU, Su = 0.73
4.7	15 —	М	7				-	30				PP=1.5	—ksf
3.7	16 —	11					-						-
2.7	17 — 18 —]											[
0.7	19 —	Z	8	7	CL		—lean CLAY with sand, brown, moist, med stiff —	31	32	15	74		-
-0.3	20 —						_to stiff						-
-1.3 -2.3	21 — 22 —]					- -						
-3.3	23 —	Ш					ATD and 15 minutes ∑						ATD and 15 minutes
-4.3	24 —		9	5			-	22					-
-5.3 -	25 — 26 —												
-7.3	27 —	$\ \cdot \ $					_						L
-8.3	28 —	Ц					-						-
-9.3 -10.3	29 — 30 —	0	10	11				28	39	24	74		
-11.3	31 —	$ \ $					_						_
-12.3	32 —	$\mid \mid$					-						-
-13.3	33 —	H					_						— —UU, Su = 1.26
-14.3 -15.3	34 — 35 —	X	11					26				PP=2.5	ksf
							III MEGI						

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-9
Sheet 2 of 2

-15.3	% Depth (feet)	X Sample Type	Sample Number	Sampling Resistance, blows/ft	의 Material Type	Graphic Log	MATERIAL DESCRIPTION lean CLAY with sand, brown, moist, med stiff	₩ Water Content, %	LL, %	PI, %	Percent Fines	C, ksf	REMARKS AND OTHER TESTS UU, Su = 1.26 - ksf
-20.3	40 	Z	12	20			_ to stiff	26					
-25.3 —	45 —	Z	13	11	CL		lean CLAY, brown, wet, med. stiff to stiff	24	35	19	88		- - -
-30.3	50 -	Z	14	15			- - - -	22					-
-35.3 -	- - 55 — -	Z	15	13				26					-
-40.3 -	60 	X	16		CL		sandy lean CLAY, brown, wet, med stiff to stiff	21	28	13	68	PP=1.5	- - UU, Su = 0.67 ksf - -
-45.3 -	65 -	X	17		СН		fat CLAY, brown, moist, hard to med. stiff	27	27	11	72	PP=2.5	
-50.3 -	70 -	X	18					27	69	41	100	PP=4.5	-
-55.3 -	75 -	X	19				Bore Termination	28				PP=0.75	- - UU, Su = 2.66 ksf -
-60.3 -	80 —	- - - -					- - - -						- - -
-65.3 -	85 	- - - - - -					 						- - - -
-70.3	90—												-

ENGINEERS

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-10 Sheet 1 of 2

Date(s) September 8, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 12.90 feet NAVD88
Groundwater Level 23 feet ATD, 23 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

12.9	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	PI,%	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
11.9	1-	N	1	7	CL		lean CLAY with sand, brown, dry to moist, very soft to med. stiff	18			87		
10.9	2-						-						-
9.9	3-		2	2				28	47	29	72		
7.9	5—	Z	3	5				27					_
6.9	6-						-						-
5.9	7-	M	4		CH		—fat CLAY, brown, moist, med. stiff to stiff —	34	74	46	91	PP=1.5	─UC, Su = 1.07 —ksf
4.9 3.9	8 - 9 -	\mathbb{H}											—KSI —CU, phi' = 37,
2.9	10 —	M	5		SC		clayey SAND, brown, wet to moist, med	38	61	38		PP=0.5	-c' = 180 psf
1.9	11 —		6	11	00		dense to dense.	27	33	19	33		-
0.9	12 —												-
-0.1	13 —	R											
-2.1	15 —	2	7	7			_	24					_
-3.1	16 —	$\ \ $											-
-4.1	17 —	┧╽					_						-
-5.1	18 — 19 —	H											
-6.1 -7.1	20 —	7	8	5				24	33	19	40		
-8.1	21 —	$\ \ $					_						_
-9.1	22 —	$\ \ $											—
-10.1	23 —	\forall					ATD and 15 minutes ∑						ATD and 15 minutes
-11.1	24 - 25 -		9	8				26					
-13.1	26 —	$\ \ $											_
-14.1	27 —	$\ \ $											-
-15.1	28 —	H											-
-16.1 -17.1	29 — 30 —	0	10	9				26			45		
-18.1	31 —						_						_ []
-19.1	32 —	$\mid \mid$											
-20.1	33 —	Ц											-
-21.1	34 — 35 —	0	11	6				29					
-22.1	30 —												

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-10 Sheet 2 of 2

-22.1	路 Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	% Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	, "IT" %	Ы, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
-27.1	40 —	Z	12	10	30		clayey SAND, brown, wet to moist, med dense to dense.	28			42		- - - -
-32.1 -	45 	Z	13	16			- - - - - -	27					- - - -
-37.1 - -	50 	Z	14	17	SM			24		LS=1	25		- - -
-42.1 · - - - - -	55 — - - -	Z	15	21 19	СН		fat CLAY, brown, moist, med stiff to very stiff	23	34	19	92		
-47.1 — — — — — —	60 —	Z	17	7			- - - - -	24					- - - - -
-57.1 -	- - - 70 —	Z	18	13			- - - - -	23			99		
-62.1 -	- - 75 — -	Z	19	10			Bore Termination	21					-
-67.1 - -	80 80	- - - - - - - -					- - - -	-					- - - - -
-72.1 · - - - -	- 85 — - - -	- - - - - - -					- - - - -	- - - -					- - - - -
-77.1	90 —	1_1							l	l			

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-11 Sheet 1 of 2

Date(s) September 8, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 17.0 feet NAVD88
Groundwater Level 16 feet ATD, 15 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

o Depth (feet)	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	РІ, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
1 2	1	5	СН		fat CLAY, dark brown, soft to med stiff — — — —	31	68	43	89		_
3-4	2	2			_ - -	30					_
5 - 6	3	6	CL		lean CLAY, brown, moist to wet, very soft to	35			94		- -
7 - 8 - 2	4		J <u>-</u>		stiff, — — —	37				PP=1.5	- -
9-10	5	1			- -	41	46	28	87		- -
11 12 13	6	3			- - -	26					_
13 14 15 16 17	7	9	CL		—sandy lean CLAY, brown, moist to wet, med —stiff to stiff 15 minutes ∑—ATD ∑—	31	35	20	55		
18 — 19 — 20 — 21 —	8	15			- - - -	23					- - -
22 - 23 - 24 - 24 - 24 - 24 - 24 - 24 -	9	16	CL			23	41	25	92		_ _ _
25 — 26 — 27 —					- - -						- - -
28 — 29 — 30	10	16			- - -	25					- - -
31 — 32 — 32 —					- - -						<u> </u>
33 34 35	11	18	SC			26			78		_

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-11
Sheet 2 of 2

	3	땷 Depth (feet) I	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	РІ, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
-18 -] ; -	35 — - -				SM		silty SAND, brown, wet to moist, med. dense to very dense						-
-23	- - - - -	40 —	Z	12	28				25					-
-28 -		45 —	Z	13	46				23		LS = 0	42		-
-33 -		50 —	Z	14	17			- - - - -	24					- - - -
-38 		55 —	Z	15	26			- - - - -	20		LS = 1	28		- - - -
-43 	 	60 —	Z	16	39			- - - - -	27					- - - -
-48 -	- - - - -	65 —	Z	17	23			- - - -	18			48		- - - - -
-53 +		- - 70 —	Z	18	79			- - - -	22					- - - -
		-	7	19	49			- - -	20					- - -
-58 -		75 — - -						Bore Termination -						-
-63] - - -	80 -												- -
-68	 	85 —						- - - -	<u> </u> 					- - -
-73	<u> </u> 	90—						-						-
	I MEG													

ENGINEERS

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-12 Sheet 1 of 2

Date(s) September 11, 2023	Logged By Ayme Guerrero	Checked By Raul Palma				
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs				
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 16.60 feet NAVD88				
Groundwater Level 16 feet ATD, 15 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop				
Borehole Backfill Soil Cuttings	Location See Boring Location Map					

	0-	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	% 'TT'	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
15.6	1 —		1	21	CH		fat CLAY with sand, brown, dry to moist, very	5	51	32			_
14.6	2— 3—		2	12			- -	33	63	42	83		- -
12.6	4—		_		СН		–– fat CLAY, brown to grey, moist, med stiff to						_
11.6	5 — 6 —	X	3		0		stiff	35	72	47		PP=1.5	─CU, phi' = 39.5, —c' = 58 psf
9.6	7 — 8 —	M	4				<u> </u>	33			96	PP=1.5	─UC, Su = 1.53 —ksf
7.6	9—	M	5					26				PP=0.5	UC, Su = 0.98
6.6 - 5.6 -	10 — 11 —				CL		lean CLAY, brown, moist, soft						_
4.6	12—		6	2				27	39	23	97		-
2.6	13 	7	7	5	CL		sandy lean CLAY, brown, moist to wet, soft to	37					-
1.6	15 —	2					15 minutes <u>▽</u>						15 minutes ATD
0.6 - -0.4 - -1.4 -	16 — 17 — 18 —												- -
-2.4 -	19 		8	2			_ _	26			68		_
-4.4	21 —												_
-5.4 - -6.4 -	22 — 23 —						- 						
-7.4	24 —		9	10				26	37	24	71		-
-8.4 - -9.4 -	25 — 26 —												_
-10.4	27 —						_						_
-11.4	28 —												_
-12.4	29 —		10		CL-ML		—silty CLAY, brown, wet to moist, med stiff to — _very stiff	24				PP=0.75	UU, Su = 0.41
-13.4	30 —	Д					very sum						—ksf
-14.4	31 —												
-15.4 - -16.4 -	32 — 33 —												
-17.4	34 —	4	11	24			_	18			98		<u> </u>
-18.4	35 —		' '	4				10			30		

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-12 Sheet 2 of 2

-18.4	% Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
-23.4	40—	X	12		CL-ML		silty CLAY, brown, wet to moist, med stiff to very stiff	24	26	5		PP=2.0	
-28.4	45 —	Z	13	11			- - - - -	- - 24			100		- - - -
-33.4 	50 —	Z	14	13			- - - -	_ 26 _ 26					-
-38.4	- 55 	X	15		СН		fat CLAY with sand, brown, moist, stiff to hard	- 25	26	6	99	PP=0.75	- - -
-43.4 	- 60 —	X	16				- - - -	24	51	28		PP=4.5+	- - - UU, Su = 4.97 ksf -
-48.4	65 —		17				-	28				PP=2.5	- UU, Su = 2.3 ksf
-53.4 -53.4	70 —	X	18				- - -	- - - 22			75	PP=1.5	-
-58.4	75 —	Z	19	11			Bore Termination	25	55	34			-
-63.4 -	80 —							- - - - -					
-68.4 - -68.4 - -	85 — - - 85 —						- - - - -	- - - - - - -					- - - - - -
-73.4													

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-13 Sheet 1 of 2

Date(s) August 21, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 16.00 feet NAVD88
Groundwater Level 14 feet ATD, 10 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

o Depth (feet)	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	РІ, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
5 1 2 3 3	1	9	CH		fat CLAY, brown, dry to moist, med. stiff — — — — —	16 16	51	33	54 94		
5 6	3	5			- - -	29					_ _ _
7 7 8 8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10	4 5					32	68	46	96	PP=2.0 PP=1.0	UC, Su = 0.91 <u>X</u> f15 minutes
5 11 12 13 13 13 13 13 13 13 13 13 13 13 13 13	6		SC-CL		Clayey SAND to sandy lean CLAY, brown TD ✓	28			98	PP=0.5	
14 15 16 17 17 17 17 17 17 17 17 17 17 17 17 17	7	3			moist to wet, loose to dense.	33	48	28			ATD - - -
18 19 20 21 -	8	3	SC		— ————————————————————————————————————	23	28	16	28		- - -
22 - 23 - 24 - 25 - 25	9	21			- - - 	17					- - -
26 — 27 — 28 — 29 — 29 — 29 — 29 — 29 — 29 — 29	10	40	CL		— — — — — — — — — — — — — — — — — — —		40	- 00			_ _ _
30 31 31 32	10	16	CH		fat CLAY, brown, wet, stiff to hard	20	42	26	71		_ _ _
33 34 34 35	11					24				PP=4.5	— —UU, Su = 3.35 ksf

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-13 Sheet 2 of 2

		~- I	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	, "F	РІ, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS UU, Su = 3 35
-19 -		35 — - -	X	11		СН		fat CLAY, brown, wet, stiff to hard	24				PP=4.5	- ksf
-24 -		40 —	X	12				- - - -	24	54	34		PP=3.0	- - - -
-29		45 —	X	13				: - -	24			99	PP=4.5	- - UU, Su = 3.82 ksf -
-34 ·		50 —	X	14				_	23				PP=4.5	- - UU, Su = 2.95 ksf -
-39		55 —	Z	15	17			- - - -	23	58	37	99		-
-44 -		60 —	X	16				·	24			100	PP=2.5	- - - UU, Su = 3.10 ksf -
		-				SM								-
-49		65 —	А	17					27		LS=1	48	PP=1.0	<u> </u>
-54 -		70 —	Z	18	10			- -	31					- - -
		-		19	20			· 	26					- - -
-59		75 — -		13	20		•	Bore Termination _	20					-
[:		-												
-64		80 —						_ 	1					<u> </u>
-		-						- - -						-
-69		85 —						- 						
		-												-
-74	74 90 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1													

ENGINEERS

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-14 Sheet 1 of 2

Date(s) September 11, 2023	Logged By Ayme Guerrero	Checked By Raul Palma				
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 75 feet bgs				
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 14.90 feet NAVD88				
Groundwater Level 17 feet ATD, 11 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop				
Borehole Backfill Soil Cuttings	Location See Boring Location Map					

	, Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
14.9 — 13.9 — 12.9 — 11.9 —	0— 1— 2— 3—	Z	1 2	15 7	СН		fat CLAY with sand, dark brown to brown, moist, med stiff to stiff — — —	16 26	52	37	77		- - -
10.9 — 9.9 — 8.9 —	4 — 5 — 6 —		3	5	СН			29	75	50	96		- - -
7.9 — 6.9 — 5.9 — 4.9 —	8 — 9 — 10 —		5	6	CL		sandy lean CLAY, brown, moist to wet soft to	34	79	58	95		- -
3.9 — 2.9 — 1.9 —	11 — 12 — 13 —		6	5			stiff 	30	35	20			15 minutes
-0.1 — -1.1 — -2.1 — -3.1 —	15— 16— 17— 18—		7	3				34	41	25			_
-4.1 — -5.1 — -6.1 — -7.1 — -8.1 —	19 — 20 — 21 — 22 — 23 —		8	2			- - - - -	21					- - -
-9.1 — -10.1 — -11.1 — -12.1 —	24 — 25 — 26 — 27 —		9	15			- - - -	17	32	21	54		- - -
-13.1 — -14.1 — -15.1 — -16.1 — -17.1 —	28 — 29 — 30 — 31 — 32 —		10	12	CL		 lean CLAY, brown, wet to moist, stiff to very stiff — 	24	43	26			- - -
-18.1 — -19.1 — -20.1	33 — 34 — 35 —		11	16				22	40	23	99		

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-14 Sheet 2 of 2

Sampling Resistance, blows/ft Water Content, % Sample Number Percent Fines Material Type Depth (feet) Graphic Log ksf % % **REMARKS AND** UC, Ľ, ₫ MATERIAL DESCRIPTION OTHER TESTS -20. lean CLAY, brown, wet to moist, stiff to very UU, Su = 0.85PP=1.5 11 12 27 28 40 • -25. -ksf 13 13 28 -30. 14 13 25 -35. СН fat CLAY, brown, moist, stiff UU, Su = 3.89PP=2.5 15 27 62 43 99 55 -40. ·ksf 16 25 PP=2.0 -45. 17 15 25 41 100 64 -50. 65 ML sandy SILT, brown, moist, med. dense to 24 PP=1.0 LS=1 -55. 70 dense. 19 21 35 -60. **Bore Termination** -65.1 80 -70.1 85

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-15 Sheet 1 of 1

Date(s) Drilled August 23, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 30 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 12.10 feet NAVD88
Groundwater Level 10 feet ATD, 9 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

12.1	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
11.1	1—		1	11	CL		lean CLAY, brown to grey, moist to wet, very	11	46	31	89		_
9.1	3—		2	3			- -	22					_
7.1	4 — 5 —	M	3		CL		––lean CLAY with sand, grey, moist to wet, very –_soft to med. stiff	33			80	PP=0.5	UC = Su = 0.17
5.1	6— 7—	M	4					25	48	26	75	PP=0.5	
3.1	9 —		5	HW				25	27	16			
1.1	11 —		6	HW	CL		sandy lean CLAY, grey to brown, wet, very =	23	40	27	55		_
-0.9	13 — 14 —												
-2.9	15 — 16 —	[7	2				22					
-4.9 -	17 — 18 —												_
-6.9 -	19 —	Z	8	5	SC		—clayey SAND, brown, wet, loose —	18	22	9	45		—CU, phi' = 31.5, _c' = 35 psf
-8.9	21 22 						_ _						- -
-10.9 -11.9	23 — 24 —	\bigcup			CL		––lean CLAY, brown, wet, very stiff to hard						CU, phi' = 33, c' = 480 psf;
-12.9 -13.9	25 	Й	9				- -	19				PP=3.5	—UU, Su = 1.85 _ksf
-14.9 -	27 — 28 —						_ _						<u> </u>
-16.9 -	29 — 30 —	M	10				_	21	43	23	86	PP=4.0	−CU, phi' = 37, −c' = 170 psf
-18.9 -	31 — 32 —						Bore Termination						- -
-20.9 -21.9	33 — 34 —						_ _						- -
-22.9	35 —												

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Log of Boring B-16 Sheet 1 of 1

Date(s) September 12, 2023	Logged By Ayme Guerrero	Checked By Raul Palma
Drilling Method SFA & Mud Rotary	Drill Bit Size/Type 4" soil bit	Total Depth of Borehole 30 feet bgs
Drill Rig Type CME-75	Drilling Contractor RGV Drilling	Approximate Surface Elevation 13.0 feet NAVD88
Groundwater Level 15 feet ATD, 11 feet @ 15 and Date Measured min	Sampling Method(s) SPT/Tube	Hammer Data 140 lb. auto, 30 in. drop
Borehole Backfill Soil Cuttings	Location See Boring Location Map	

12		Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION		Water Content, %	LL, %	PI, %	Percent Fines	UC, ksf	REMARKS AND OTHER TESTS
13 — 12 — 11 — 10 — 9 —	0 1 2 3 4		1	10 6	SC		clayey SAND, brown, dry, med. stiff 		7 28			43		- - -
8 — 7 — 6 — 5 — 4 —	5— 6— 7— 8— 9—		3 4 5		СН		—fat CLAY, grey to brown, moist to wet, medstiff — —		31 29 27	75 70	52 45	92 94	PP=1.5 PP=2.0 PP=1.5	-UC, Su = 2.09 -ksf CU, phi' = 20.5, -c' = 350 psf; -UC, Su = 2.40 -ksf Su = 1.02
3 — 2 — 1 — 0 —	10 — 11 — 12 — 13 — 14 — 14 —		6	5	CL		— — — —lean CLAY to sandy lean CLAY, brown, wet,		26	42	23	96	PP=1.5 PP=1.0	—ksf _UU, Su = 0.54 _ksf _
-2 -3 -4 -5	15 — 16 — 17 — 18 —		,	5			_med stiff to stiff 		31	42	23	96		- - -
-6 -7 - -8 - -9 - 10 -	19 — 20 — 21 — 22 — 23 —	<u>S</u>	8	5			- - - -		19					- - - -
11 — 12 — 13 — 14 —	24 — 25 — 26 — 27 — 28 —		9	13	CL		—sandy lean CLAY, brown, wet, stiff — — —		18	36	24	51		- - - -
-16 — -17 — -18 — -19 —	29 — 30 — 31 — 32 —		10	14			Bore Termination	- - -	20					- - -
-21 -21 -22	33 — 34 — 35							<u> </u>						

Project Location: Brownsville, Cameron County, Texas

Project Number: 02-23-29125

Key to Log of Boring Sheet 1 of 1

Depth (fee	Sample Type	Sample Number Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	☑ Water Content, %	2 LL, %	% 'Id h 1	Percent Fines	UC, ksf	REMARKS AN OTHER TEST h⊿l
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COLUMN DESCRIPTIONS

- 1 Elevation (feet): Elevation (MSL, feet).
- 2 Depth (feet): Depth in feet below the ground surface.
- 3 Sample Type: Type of soil sample collected at the depth interval shown.
- 4 Sample Number: Sample identification number.
- 5 Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
- 6 Material Type: Type of material encountered.
- Graphic Log: Graphic depiction of the subsurface material encountered.
- MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.

- Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
- 10 LL, %: Liquid Limit, expressed as a water content.
- 1 PI, %: Plasticity Index, expressed as a water content.
- 12 Percent Fines: The percent fines (soil passing the No. 200 Sieve) in the sample. WA indicates a Wash Sieve, SA indicates a Sieve Analysis.
- **13** UC, ksf: Unconfined compressive strength, in kips per square foot.
- REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity

COMP: Compaction test

CONS: One-dimensional consolidation test

LL: Liquid Limit, percent

PI: Plasticity Index, percent

SA: Sieve analysis (percent passing No. 200 Sieve) UC: Unconfined compressive strength test, Qu, in ksf WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)

Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)

SILTY CLAY (CL-ML)

SILT, SILT w/SAND, SANDY SILT (ML)

Clayey SAND (SC)

Clayey SAND to Sandy CLAY (SC-CL)

Silty SAND (SM)

TYPICAL SAMPLER GRAPHIC SYMBOLS

Auger sampler

Bulk Sample

3-inch-OD California w/ brass rings

CME Sampler

Grab Sample

Hand auger sampler

2.5-inch-OD Modified California w/ brass liners

Pitcher Sample

2-inch-OD unlined split spoon (SPT)

Texas Cone Penetrometer

Shelby Tube (Thin-walled, fixed head)

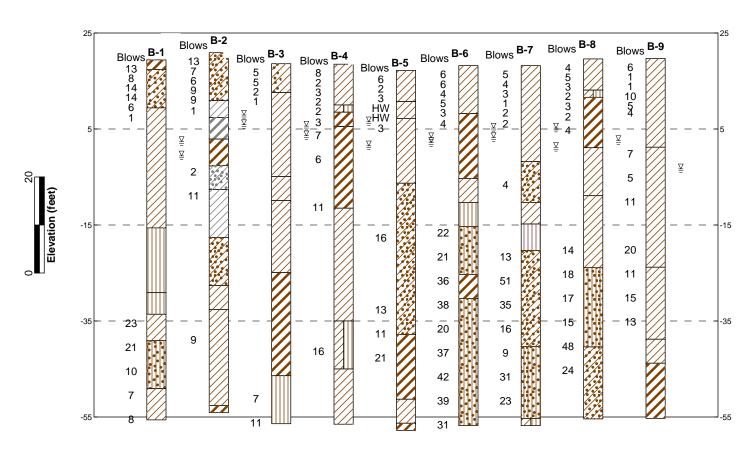
OTHER GRAPHIC SYMBOLS

- Water level (after waiting, AW)
 Minor change in material properties within a stratum
- - Inferred/gradational contact between strata
- -?- Queried contact between strata

GENERAL NOTES

- 1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
- 2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.





Profiles are developed baded on the Soil Boring ID's, not locations, assuming equal distances between the borings. Refer to the Soil Boring/CPT Soundings locations maps for the approximate boring locations.

MATERIAL GRAPHIC SYMBOLS

Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)

Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)

SILTY CLAY (CL-ML)

SILT, SILT w/SAND, SANDY SILT (ML)



Clayey SAND (SC)

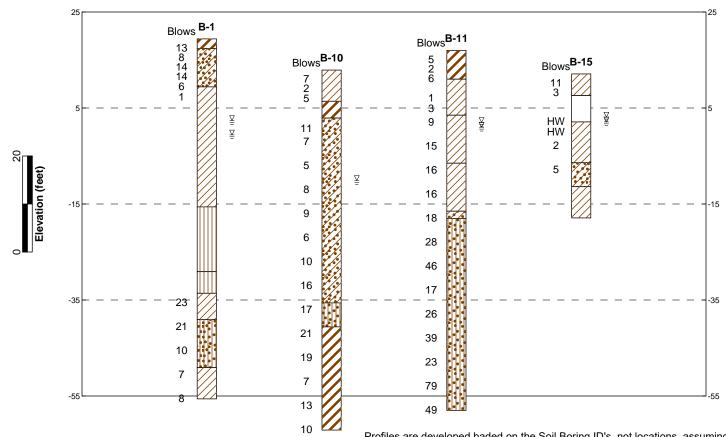
Clayey SAND to Sandy CLAY (SC-CL)

Silty SAND (SM)

MEG Engineers							
Project No.	Figure No.						

F-1

02-23-29125



Profiles are developed baded on the Soil Boring ID's, not locations, assuming equal distances between the borings. Refer to the Soil Boring/CPT Soundings locations maps for the approximate boring locations.

MATERIAL GRAPHIC SYMBOLS

Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)

Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)

SILT, SILT w/SAND, SANDY SILT (ML)

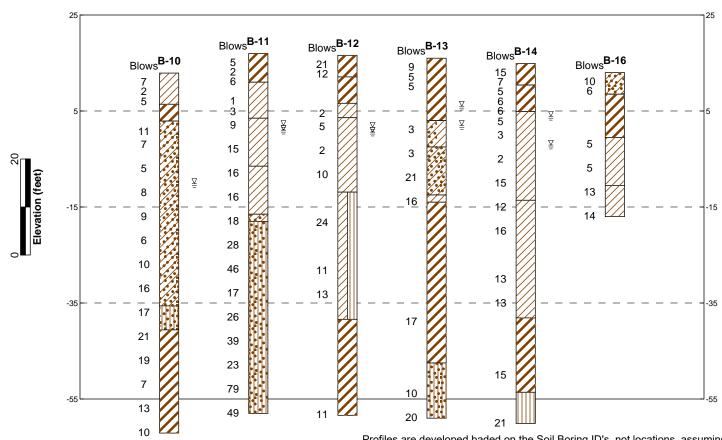


Clayey SAND (SC)

Silty SAND (SM)

MEG E	ngineers
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Project No.	Figure No.
02-23-29125	F-2



Profiles are developed baded on the Soil Boring ID's, not locations, assuming equal distances between the borings. Refer to the Soil Boring/CPT Soundings locations maps for the approximate boring locations.

MATERIAL GRAPHIC SYMBOLS

Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)

Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)

SILTY CLAY (CL-ML)

SILT, SILT w/SAND, SANDY SILT (ML)



Clayey SAND (SC)

Clayey SAND to Sandy CLAY (SC-CL)

Silty SAND (SM)

Project No.	Figure No.
02-23-29125	F-3

APPENDIX D SUMMARY OF SOIL SAMPLE ANALYSIS IVIECTENGINEERS Strong Leaders! Geotechnical | Environmental | Testing 5840 N. Gumwood Avenue Pharr, Texas 78577 Tel: 956-702-8500 Fax: 956-702-8140



Summary of Soil Sample Analyses

Project	Name: DMP		Relocation	n 				Chaar	Dm. Hm.'4	
Davina	Sample	Blows	Majatuwa	انسننما	Disatia	Disatisity	2000/	Shear	Dry Unit	LICCC
Boring	Depth	Per	Moisture	Liquid	Plastic	Plasticity	-200%	Strength	Weight	USCS
No.	(ft)	(ft)	Content	Limit	Limit	Index	Sieve	(tsf)	(pcf)	011
B-1	.5 - 2	13	11	61	22	39	92			CH
	2.5 - 4	8	14			_	31			
	4.5 - 6	14	28	22	13	9	23			CL
	6.5 - 8	14	9		4.0		4.0			0.
	8.5 - 10	6	15	22	16	6	42			CL
	10 - 13	1	38							<u>.</u> .
	13.5 - 15		28	34	17	17	96	PP=0.5		CL
	18.5 - 20		37				91	PP=0.5		
	23.5 - 25		17	33	15	18		PP=4.5		CL
	28.5 - 30		23	30	17	13		PP=0.5		CL
	33.5 - 35		16	34	21	13	96	PP=4.5		CL
	38.5 - 40		29	25	23	2	85	PP=2.75		CL
	43.5 - 45		27					PP=0.5		
	48.5 - 50		23			LS = 1	53	PP=0.5		
	53.5 - 55	23	21				54			
	58.5 - 60	21	29			LS = 1	21			
	63.5 - 65	10	28							
	68.5 - 70	7	30				72			
	73.5 - 75	8	26	32	19	13	78			CL
D O	F 0	40	۱ ۵							
B-2	.5 - 2	13	2	07	4.5	40	27			CI
	2.5 - 4	7	3	27	15	12	37			CL
	4.5 - 6	6 9	8 5	0.4	40	44	F0			CI
	6.5 - 8	9		24 49	13	11	58			CL
	8.5 - 10 10 - 13	1	23		18	30				CL CL
	13.5 - 15	!	31	49	18	32	0.4	PP=0.5		CH
			24	51	19	32	94	PP=0.5 PP=1.0		
	18.5 - 20 23.5 - 25	_	25 20	69	23	46	25	PP=1.0		CH
		2		26	12	22	25			CI
	28.5 - 30	11	17	36	13	23	02	DD-4 5 :		CL
	33.5 - 35		14	40	14	26	83	PP=4.5+		CL
	38.5 - 40		23	39	14	25	42	PP=0.25		CL
	43.5 - 45		18	41	16	26	77	PP=4.5+		CL
	48.5 - 50		26	30	20	10	77	PP=1.0		CL
	53.5 - 55	_	28	00	45	44	89	PP=0.5		01
	58.5 - 60	9	20	26	15	11	00	DD 0.75		CL
	63.5 - 65		24				96	PP=0.75		
	68.5 - 70		30	00	0.5	4.4	400	PP=4.0		0
	73.5 - 75		26	69	25	44	100	PP=4.5		CH



Fiojecti	Sample	Blows	e ivelocatio					Shear	Dry Unit	
Boring	Depth	Per	Moisture	Liquid	Plastic	Plasticity	-200%	Strength	Weight	uscs
No.	(ft)	(ft)	Content	Limit	Limit	Index	Sieve	(tsf)	(pcf)	
B-3	.5 - 2	5	22	53	19	34	95		. ,	СН
	2.5 - 4	5	18							
	4.5 - 6	2	26	22	18	4	41			CL
	6.5 - 8	1	43	35	12	23				CL
	8.5 - 10		37	49	18	30	95	PP=1.75		CL
	10 - 13		34					PP=1.0		
	13.5 - 15		30	50	18	32		PP=1.0		
	18.5 - 20		40					PP=0.5		
	23.5 - 25		18	29	22	8	52	PP=1.75		CL
	28.5 - 30		18	42	14	29	99	PP=4.5+		CL
	33.5 - 35		24				97	PP=4.5		
	38.5 - 40		26					PP=1.5		
	43.5 - 45		22	57	22	35	99	PP=4.5		CH
	48.5 - 50		22		4.5	40		PP=4.0		011
	53.5 - 55		25	59	15	43	00	PP=4.5		CH
	58.5 - 60		23	60	0.7	50	99	PP=4.5		CII
	63.5 - 65 68.5 - 70	7	29 31	69	27	52 LS = 0	100	PP=0.5		СН
	73.5 - 75	11	29			LS - 0	100			
	13.3 - 13	11	29							
B-4	.5 - 2	8	6	28	16	13				CL
٠,	2.5 - 4	2	26				80			OL.
	4.5 - 6	3	14							
	6.5 - 8	2	21							
	8.5 - 10	2	32	22	18	4	55			CL
	10 - 13	3	28	52	19	33	86			CH
	13.5 - 15	7	31	59	21	38	99			CH
	18.5 - 20	6	26							
	23.5 - 25		36	54	20	34	97	PP=0.5		CH
	28.5 - 30	11	28				80			
	33.5 - 35		21				94	PP=4.5+		
	38.5 - 40		19	44	17	27	99	PP=4.0		CL
	43.5 - 45		21					PP=4.5+		
	48.5 - 50		20				100	PP=4.0		
	53.5 - 55		18	26	20	6	99	PP=2.0		CL
	58.5 - 60	16	21	0.1	0.1	4.0	98	DD 4.0		01
	63.5 - 65		25	34	24	10	7.	PP=4.0		CL
	68.5 - 70		23				74	PP=1.0		
	73.5 - 75		21					PP=1.75		



Project Name: DMPA 8 Levee Relocation										
	Sample	Blows						Shear	Dry Unit	
Boring	Depth	Per	Moisture	Liquid	Plastic	Plasticity	-200%	Strength	Weight	USCS
No.	(ft)	(ft)	Content	Limit	Limit	Index	Sieve	(tsf)	(pcf)	
B-5	.5 - 2	6	18				73			
	2.5 - 4	2	26	39	17	22	80			CL
	4.5 - 6	3	24							
	6.5 - 8	HW	31				65			
	8.5 - 10	HW	35	43	19	25				CL
	10 - 13	3	34				93			
	13.5 - 15		31					PP=1.5		
	18.5 - 20		20	33	13	20	52	PP=0.5		CL
	23.5 - 25		16	32	14	18	47	PP=3.5		
	28.5 - 30		22	31	15	15	36	PP=0.5		CL
	33.5 - 35	16	22							
	38.5 - 40		19	38	16	22	34	PP=2.0		CL
	43.5 - 45		25	35	16	20	32	PP=0.5		CL
	48.5 - 50	13	23							
	53.5 - 55	11	18							
	58.5 - 60	21	21	61	22	39				CH
	63.5 - 65		31					PP=3.0		
	68.5 - 70		22	41	17	24	64	PP=1.0		CL
	73.5 - 75		23	54	22	32		PP=2.75		CH
	ı	ı	ı		ı					
B-6	.5 - 2	6	11							
	2.5 - 4	6	17			_	87			
	4.5 - 6	4	19	22	17	5				CL
	6.5 - 8	5	23							
	8.5 - 10	3	30	63	29	34	81			CH
	10 - 13	4	32	66	23	42				CH
	13.5 - 15		35	75	21	53	81	PP=0.5		
	18.5 - 20		39		4.5		72	PP=0.5		0.
	23.5 - 25		26	40	15	26	73	PP=4.5		CL
	28.5 - 30		19	24	22	2	52	PP=0.75		CL
	33.5 - 35	22	20			LS = 0	22			
	38.5 - 40	21	24	- 4	40	00	00			011
	43.5 - 45	36	28	54	18	36	92			CH
	48.5 - 50	38	19				30			
	53.5 - 55	20	23				07			
	58.5 - 60	37	23	00	00	_	27			0:
	63.5 - 65	42	17	22	20	2	40			CL
	68.5 - 70	39	24				00			
	73.5 - 75	31	22				26			



Trojecti	Sample	Blows	e itelocati					Shear	Dry Unit	
Boring	Depth	Per	Moisture	Liquid	Plastic	Plasticity	-200%	Strength	Weight	USCS
No.	(ft)	(ft)	Content	Limit	Limit	Index	Sieve	(tsf)	(pcf)	
B-7	.5 - 2	5	20	42	16	26				CL
	2.5 - 4	4	26							
	4.5 - 6	3	23				89			
	6.5 - 8	1	32							
	8.5 - 10	2	31	28	19	9				CL
	10 - 13	2	45							
	13.5 - 15		30				83	PP=1.0		
	18.5 - 20		25	23	13	10		PP=0.5		CL
	23.5 - 25	4	21				44			
	28.5 - 30		22	31	18	13	87	PP=1.75		CL
	33.5 - 35		22			LS = 1	87	PP=1.0		
	38.5 - 40	13	22				93			
	43.5 - 45	51	22				34			
	48.5 - 50	35	23	43	17	26				CL
	53.5 - 55	16	24				35			
	58.5 - 60	9	22			LS = 1	48			
	63.5 - 65	31	22				30			
	68.5 - 70	23	20	00	04	_	00	DD 0.0		01
	73.5 - 75		23	28	21	7	99	PP=3.0		CL
B-8	.5 - 2	4	6				55			
20	2.5 - 4	5	22							
	4.5 - 6	3	21	33	13	19	64			CL
	6.5 - 8	2	32	26	21	6				CL
	8.5 - 10	3	33	55	21	34	87			СН
	10 - 13	2	30							
	13.5 - 15	4	46	63	21	42				CH
	18.5 - 20		26	36	19	17	83	PP=1.0		CL
	23.5 - 25		18				72	PP=3.75		
	28.5 - 30		19	39	13	26	91	PP=4.0		CL
	33.5 - 35		23				90	PP=2.0		
	38.5 - 40	14	24	36	18	18	98			CL
	43.5 - 45	18	23			LS = 1				
	48.5 - 50	17	26				36			
	53.5 - 55	15	24			LS = 1				
	58.5 - 60	48	23				41			
	63.5 - 65	24	23	58	21	37	42			CH
	68.5 - 70		24					PP=4.0		
	73.5 - 75							PP=1.0		



Fiojecti	Sample	Blows	LE VEINCULI					Shear	Dry Unit	
Boring	Depth	Per	Moisture	Liquid	Plastic	Plasticity	-200%	Strength	Weight	USCS
No.	(ft)	(ft)	Content	Limit	Limit	Index	Sieve	(tsf)	(pcf)	
B-9	.5 - 2	6	9					• •		
	2.5 - 4	1	33	25	20	5	86			CL
	4.5 - 6	1	41							
	6.5 - 8	10	40				91			
	8.5 - 10	5	27							
	10 - 13	4	31				95			
	13.5 - 15		30					PP=1.5		
	18.5 - 20	7	31	32	17	15	74			CL
	23.5 - 25	5	22							
	28.5 - 30	11	18	39	14	24	74			CL
	33.5 - 35		26					PP=2.5		
	38.5 - 40	20	26							
	43.5 - 45	11	24	35	16	19	88			CL
	48.5 - 50	15	22							
	53.5 - 55	13	26	00	4.5	40	00	DD 4.5		01
	58.5 - 60		21	28	15	13	68	PP=1.5		CL
	63.5 - 65		27	27	16	11	72	PP=2.5		CL
	68.5 - 70		27 28	69	28	41	100	PP=4.5 PP=0.75		CH
	73.5 - 75		20					PP-0.75		
B-10	.5 - 2	7	18				87			
D-10	2.5 - 4	2	28	47	18	29	72			CL
	4.5 - 6	5	27	47	10	29	12			CL
	6.5 - 8		34	74	28	46	91	PP=1.5		СН
	8.5 - 10		38	61	22	38		PP=0.5		CH
	10 - 13	11	17	33	14	19	33	11 0.0		CL
	13.5 - 15	7	24			.0				02
	18.5 - 20	5	24	33	14	19	40			CL
	23.5 - 25	8	26							
	28.5 - 30	9	26				45			
	33.5 - 35	6	29							
	38.5 - 40	10	28				42			
	43.5 - 45	16	27							
	48.5 - 50	17	24			LS = 1	25			
	53.5 - 55	21	23							
	58.5 - 60	19	26	34	15	19	92			CL
	63.5 - 65	7	24							
	68.5 - 70	13	23				99			
	73.5 - 75	10	31							



	Sample	Blows						Shear	Dry Unit	
Boring	Depth	Per	Moisture	Liquid	Plastic	Plasticity	-200%	Strength	Weight	USCS
No.	(ft)	(ft)	Content	Limit	Limit	Index	Sieve	(tsf)	(pcf)	
B-11	.5 - 2	5	31	68	25	43	89			CH
	2.5 - 4	2	30							
	4.5 - 6	6	35				94			
	6.5 - 8		37					PP=1.5		
	8.5 - 10	1	41	46	19	28	87			CL
	10 - 13	3	26							
	13.5 - 15	9	31	35	15	20	55			CL
	18.5 - 20	15	23							
	23.5 - 25	16	23	41	16	25	92			
	28.5 - 30	16	25				70			
	33.5 - 35	18	26				78			
	38.5 - 40 43.5 - 45	28 46	25 23			LS = 0	42			
	48.5 - 50	17	23			L3 - U	42			
	53.5 - 55	26	20			LS = 1	28			
	58.5 - 60	39	27				20			
	63.5 - 65	23	18				48			
	68.5 - 70	79	22							
	73.5 - 75	49	20							
B-12	.5 - 2	21	5	51	19	32				CL
	2.5 - 4	12	33	63	21	42	83			CH
	4.5 - 6		35	72	24	47		PP=1.5		CH
	6.5 - 8		33				96	PP=1.5		
	8.5 - 10	_	26					PP=0.5		
	10 - 13	2	27	39	16	23	97			CL
	13.5 - 15	5	37				00			
	18.5 - 20	2	26	27	10	24	68			CI
	23.5 - 25	10	26	37	13	24	71	DD-0.75		CL
	28.5 - 30 33.5 - 35	24	24 18				98	PP=0.75		
	38.5 - 40	24	24	26	21	5	90	PP=2.0		CL
	43.5 - 45	11	24	20	21	3	100	FF-2.0		OL
	48.5 - 50	13	26				100			
	53.5 - 55	10	25	26	21	6	99	PP=0.75		CL
	58.5 - 60		24	51	22	28		PP=4.5		CH
	63.5 - 65		28	Ξ.	_ _			PP=2.5		=
	68.5 - 70		22				75	PP=1.5		
	73.5 - 75	11	25	55	21	34				СН

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Project Name: DMPA 8 Levee Relocation

			e Reiocati	•	1					
	Sample	Blows						Shear	Dry Unit	
Boring	Depth	Per	Moisture	Liquid	Plastic	Plasticity	-200%	Strength	Weight	USCS
No.	(ft)	(ft)	Content	Limit	Limit	Index	Sieve	(tsf)	(pcf)	
B-13	.5 - 2	9	16				54		., ,	
	2.5 - 4	5	16	51	18	33	94			СН
	4.5 - 6	5	29	01	10		54			011
	6.5 - 8	0	32				96	PP=2.0		
	8.5 - 10		39	68	23	46	90	PP=1.0		СН
	10 - 13		28	00	23	40	98	PP=0.5		CII
	13.5 - 15	2	33	48	21	28	90	PP-0.5		CL
	1	3 3	23		14	16	20			CL
	18.5 - 20	21		29	14	10	28			CL
	23.5 - 25		17	40	10	0.0	74			CI
	28.5 - 30	16	20	42	16	26	71	DD-4.5		CL
	33.5 - 35		24	5 4	00	2.4		PP=4.5		011
	38.5 - 40		24	54	20	34	00	PP=3.0		СН
	43.5 - 45		24				99	PP=4.5		
	48.5 - 50	4-	23					PP=4.5		011
	53.5 - 55	17	23	58	21	37	99			СН
	58.5 - 60		24				100	PP=2.5		
	63.5 - 65		27			LS = 1	48	PP=1.0		
	68.5 - 70	10	31							
	73.5 - 75	20	26							
								I		
B-14	.5 - 2	15	16	52	15	37	77			CL
	2.5 - 4	7	26							
	4.5 - 6	5	29	75	25	50	96			CH
	6.5 - 8	6	34							
	8.5 - 10	6	37	79	20	58	95			СН
	10 - 13	5	30	35	15	20				CL
	13.5 - 15	3	34	41	16	25				CL
	18.5 - 20	2	21							
	23.5 - 25	15	17	32	11	21	54			
	28.5 - 30	12	24	43	18	26				CL
	33.5 - 35	16	22	40	17	23	99			CL
	38.5 - 40		27	28	17	11		PP=1.5		CL
	43.5 - 45	13	28				98			
	48.5 - 50	13	25							
	53.5 - 55		27	62	20	43	99	PP=2.5		CH
	58.5 - 60		25					PP=2.0		
	63.5 - 65	15	25	64	23	41	100			CH
	68.5 - 70		24			LS = 1	55	PP=1.0		
	73.5 - 75	21	35							

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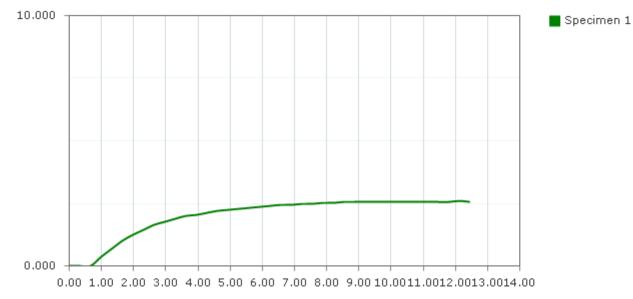
Project Name: DMPA 8 Levee Relocation

FIUJECLI	vallie. Divir	A O LEVE	e ivelocatio	/11						
	Sample	Blows						Shear	Dry Unit	
Boring	Depth	Per	Moisture	Liquid	Plastic	Plasticity	-200%	Strength	Weight	USCS
No.	(ft)	(ft)	Content	Limit	Limit	Index	Sieve	(tsf)	(pcf)	
B-15	.5 - 2	11	11	46	15	31	89			CL
	2.5 - 4	3	22							
	4.5 - 6		33				80	PP=0.5		
	6.5 - 8		25	48	22	26	75	PP=0.5		CL
	8.5 - 10	HW	25	27	11	16				CL
	10 - 13	HW	23	40	13	27	55			CL
	13.5 - 15	2	22							
	18.5 - 20	5	18	22	13	9	45			CL
	23.5 - 25		19					PP=3.5		
	28.5 - 30		21	43	19	23	86	PP=4.0		CL
B-16	.5 - 2	10	7				43			
	2.5 - 4	6	28							
	4.5 - 6		31	75	23	52	92	PP=1.5		CH
	6.5 - 8		29	70	25	45	94	PP=2.0		CH
	8.5 - 10		27					PP=1.5		
	10 - 13		26					PP=1.0		
	13.5 - 15	5	31	42	19	23	96			
	18.5 - 20	5	19							
	23.5 - 25	13	18	36	12	24	51			CL
	28.5 - 30	14	20							

APPENDIX E UNCONFINED COMPRESSION TESTING IVIECTENGINEERS Strong Leaders! Geotechnical | Environmental | Testing 5840 N. Gumwood Avenue Pharr, Texas 78577 Tel: 956-702-8500 Fax: 956-702-8140



Stress-Strain Graph
Corrected Compressive Stress (psi)

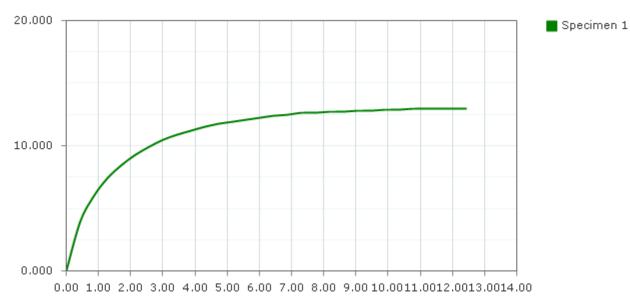


BEFORE TEST	1	2	3	4	5	6	7	8
Moisture Content (%)	29.9							
Dry Density (pcf)	90.28							
Saturation (%)	92.3							
Void Ratio	0.881							
Diameter (in)	2.7043							
Height (in)	6.1597							
TEST DATA	1	2	3	4	5	6	7	8
Unconfined Strength (psi)	2.938							
Undrained Shear Strength (psi)	1.469							
Rate of Strain (in/min)	0.061597							
Strain at Failure (%)	12.4							
DDOIECT INFORMATION CDECIMEN DESCRIPTION								

PROJECT INFORI	MATION	SPECIMEN DESCRIPTION
Project Number	02-23-29125	1
		2
Project	DMPA 8 Levee Reconstruction	3
		4
Sampling Date		5
Sample Number	B-3 @ 10'	6
Client Name	Port of Brownsville	7
		8
Remarks		

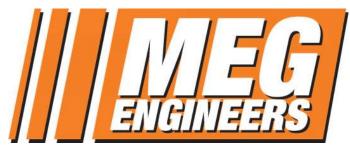


Stress-Strain Graph
Corrected Compressive Stress (psi)

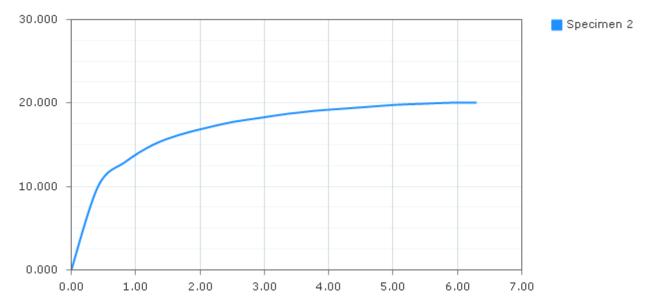


BEFORE TEST	1	2	3	4	5	6	7	8
Moisture Content (%)	33.3							
Dry Density (pcf)	87.90							
Saturation (%)	97.3							
Void Ratio	0.932							
Diameter (in)	2.7270							
Height (in)	4.7033							
TEST DATA	1	2	3	4	5	6	7	8
Unconfined Strength (psi)	14.830							
Undrained Shear Strength (psi)	7.415							
Rate of Strain (in/min)	0.047033							
Strain at Failure (%)	12.4							
PROJECT INFORMATION SPECIMEN DESCRIPTION								

PROJECT INFOR	MATION	SPECIMEN DESCRIPTION
Project Number	02-23-29125	1
		2
Project	DMPA 8 Levee Reconstruction	3
		4
Sampling Date		5
Sample Number	B-10 @ 8'	6
Client Name	Port of Brownsville	7
		8
Remarks		





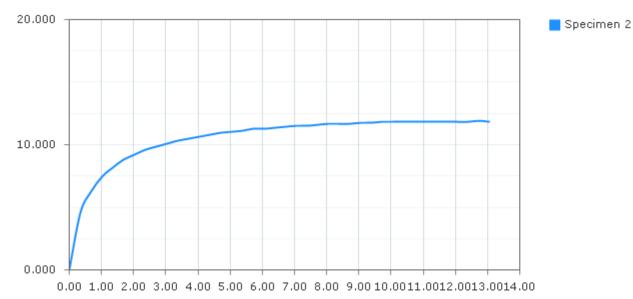


The state of the s										
BEFORE TEST	1	2	3	4	5	6	7	8		
Moisture Content (%)		33.9								
Dry Density (pcf)		87.51								
Saturation (%)		98.0								
Void Ratio		0.940								
Diameter (in)		2.7697								
Height (in)		4.8067								
TEST DATA	1	2	3	4	5	6	7	8		
Unconfined Strength (psi)		21.353								
Undrained Shear Strength (psi)		10.676								
Rate of Strain (in/min)		0.048067								
Strain at Failure (%)		6.3								
PROJECT INEOPMATION SPECIMENI DESCRIPTION										

PROJECT INFORI	MATION	SPECIMEN DESCRIPTION
Project Number	02-23-29125	1
		2
Project	DMPA 8 Levee Reconstruction	3
		4
Sampling Date		5
Sample Number	B-12 @ 8'	6
Client Name	Port of Brownsville	7
		8
Remarks		





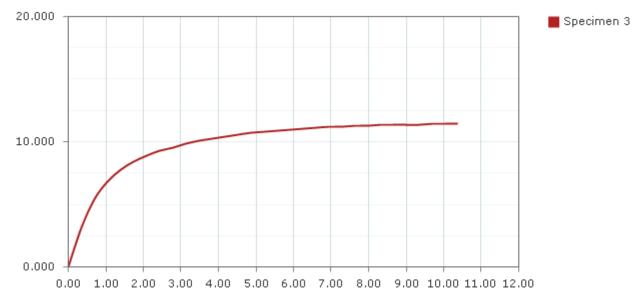


BEFORE TEST	1	2	3	4	5	6	7	8
Moisture Content (%)		26.0						
Dry Density (pcf)		90.93						
Saturation (%)		81.5						
Void Ratio		0.867						
Diameter (in)		2.7663						
Height (in)		6.0257						
TEST DATA	1	2	3	4	5	6	7	8
Unconfined Strength (psi)		13.655						
Undrained Shear Strength (psi)		6.827						
Rate of Strain (in/min)		0.060257						
Strain at Failure (%)		13.1						
PROJECT INFORMATION			SPECIM	IEN DESCRIF	TION			
Project Number 02-23-29125			1					

PROJECT INFOR	MATION	SPECIMEN DESCRIPTION
Project Number	02-23-29125	1
		2
Project	DMPA 8 Levee Reconstruction	3
		4
Sampling Date		5
Sample Number	B-12 @ 10'	6
Client Name	Port of Brownsville	7
		8
Remarks		



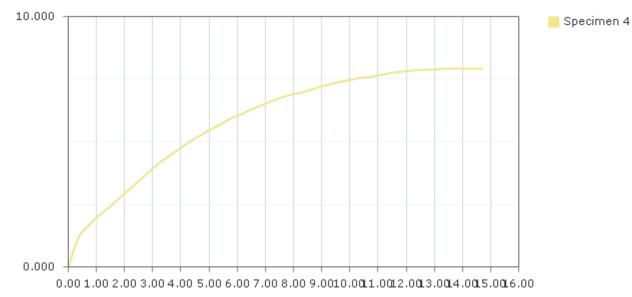




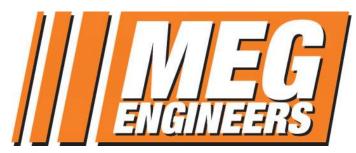
		Axial Str					
BEFORE TEST	1	2 3	4	5	6	7	8
Moisture Content	(%)	39.5					
Dry Density (pcf)		79.49					
Saturation (%)		94.6					
Void Ratio		1.136					
Diameter (in)		2.7720					
Height (in)		5.8343					
TEST DATA	1	2 3	4	5	6	7	8
Unconfined Streng	gth (psi)	12.721					
Undrained Shear S	Strength (psi)	6.361					
Rate of Strain (in/	min)	0.058343					
Strain at Failure (9	%)	10.4					
PROJECT INFORI	MATION	SPECIME	N DESCRIP	TION			
Project Number	02-23-29125	1					
		2					
Project	DMPA 8 Levee Reconstruction	3					
		4					
Sampling Date		5					
Sample Number	B-13 @ 10'	6					
Client Name	Port of Brownsville	7					
		8					
Remarks							



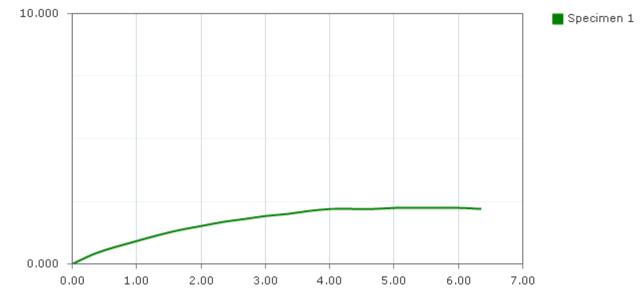
Stress-Strain Graph
Corrected Compressive Stress (psi)



BEFORE TEST	1	2	3	4	5	6	7	8	
Moisture Content	(%)			28.5					
Dry Density (pcf)				92.92					
Saturation (%)				93.7					
Void Ratio				0.827					
Diameter (in)				2.7093					
Height (in)				5.6190					
TEST DATA	1	2	3	4	5	6	7	8	
Unconfined Strength (psi)				9.299					
Undrained Shear	4.649								
Rate of Strain (in/	Rate of Strain (in/min)								
Strain at Failure (9	%)			14.7					
PROJECT INFOR	MATION		SPECIMEN DESCRIPTION						
Project Number	02-23-29125		1						
			2						
Project	DMPA 8 Levee Reconst	truction	3						
			4						
Sampling Date			5						
Sample Number	B-13 @ 13'		6						
Client Name	Port of Brownsville		7						
			8						
Remarks									







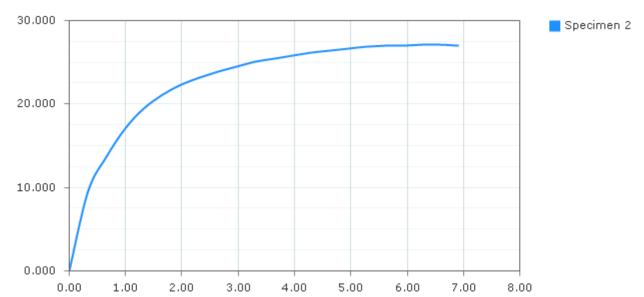
Axial	Strain	(%)

BEFORE TEST	1	2	3	4	5	6	7	8
Moisture Content (%)	32.6							
Dry Density (pcf)	93.31							
Saturation (%)	108.1							
Void Ratio	0.820							
Diameter (in)	2.7507							
Height (in)	6.0343							
TEST DATA	1	2	3	4	5	6	7	8
Unconfined Strength (psi)	2.367							
Undrained Shear Strength (psi)	1.183							
Rate of Strain (in/min)	0.060343							
Strain at Failure (%)	6.4							

PROJECT INFORI	MATION	SPECIMEN DESCRIPTION
Project Number	02-23-29125	1
		2
Project	DMPA 8 Levee Reconstruction	3
		4
Sampling Date		5
Sample Number	B-15 @ 6'	6
Client Name	Port of Brownsville	7
		8
Remarks		



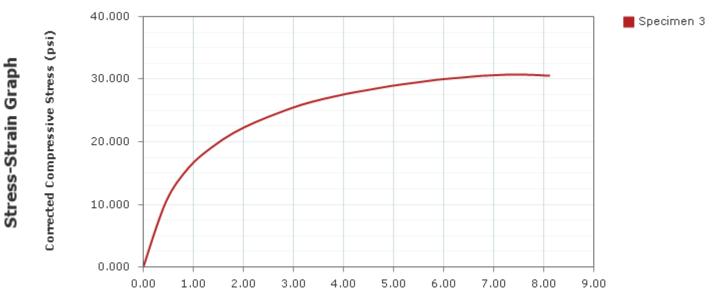




BEFORE TEST	1	2	3	4	5	6	7	8
Moisture Content (%)		31.4						
Dry Density (pcf)		88.13						
Saturation (%)		92.2						
Void Ratio		0.927						
Diameter (in)		2.7797						
Height (in)		6.1277						
TEST DATA	1	2	3	4	5	6	7	8
Unconfined Strength (psi)		29.065						
Undrained Shear Strength (psi)		14.533						
Rate of Strain (in/min)		0.061277						
Strain at Failure (%)		6.9						
PROIECT INFORMATION			SPECIM	IEN DESCRIF	TION			

PROJECT INFORI	MATION	SPECIMEN DESCRIPTION
Project Number	02-23-29125	1
		2
Project	DMPA 8 Levee Reconstruction	3
		4
Sampling Date		5
Sample Number	B-16 @ 6'	6
Client Name	Port of Brownsville	7
		8
Remarks		



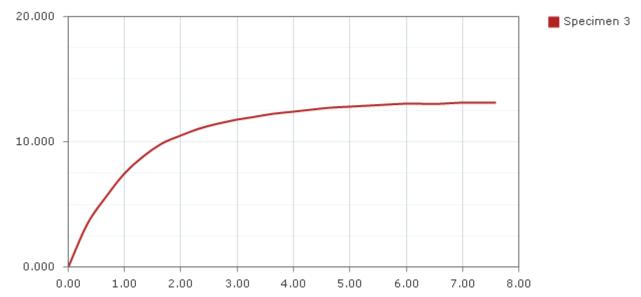


Avia	Strain	10%
MXId	ı ətraiii	1.770 /

		Axiai Str	ain (%)				
BEFORE TEST	1	2 3	4	5	6	7	8
Moisture Content	(%)	28.4					
Dry Density (pcf)		93.32					
Saturation (%)		94.3					
Void Ratio		0.820					
Diameter (in)		2.7507					
Height (in)		4.4723					
TEST DATA	1	2 3	4	5	6	7	8
Unconfined Streng	gth (psi)	33.315					
Undrained Shear S	Strength (psi)	16.658					
Rate of Strain (in/	min)	0.044723					
Strain at Failure (9	%)	8.1					
PROJECT INFORI	MATION	SPECIME	N DESCRIP	TION			
Project Number	02-23-29125	1					
		2					
Project	DMPA 8 Levee Reconstruction	3					
		4					
Sampling Date		5					
Sample Number	B-16 @ 8'	6					
Client Name	Port of Brownsville	7					
		8					
Remarks							







Axial Strain (%)

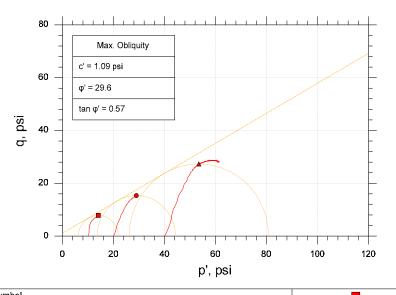
			MAIGI SU	am (70)				
BEFORE TEST	1	2	3	4	5	6	7	8
Moisture Content	: (%)		28.3					
Dry Density (pcf)			90.27					
Saturation (%)			87.2					
Void Ratio			0.881					
Diameter (in)			2.7487					
Height (in)			6.1117					
TEST DATA	1	2	3	4	5	6	7	8
Unconfined Stren	gth (psi)		14.179					
Undrained Shear	Strength (psi)		7.090					
Rate of Strain (in/	min)		0.061117					
Strain at Failure (%)		7.6					
PROJECT INFOR			SPECIME	N DESCRIF	TION			
Project Number	02-23-29125		1					
			2					
Project	DMPA 8 Levee Reconstruction		3					
			4					
Sampling Date			5					
Sample Number	B-16 @ 10'		6					
Client Name	Port of Brownsville		7					
			8					
D 1								

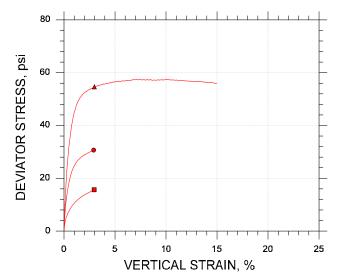
Remarks

APPENDIX F CONSOLIDATED UNDRAINED TRIAXIAL TESTING IVIECTENGINEERS Strong Leaders! Geotechnical | Environmental | Testing 5840 N. Gumwood Avenue Pharr, Texas 78577 Tel: 956-702-8500 Fax: 956-702-8140

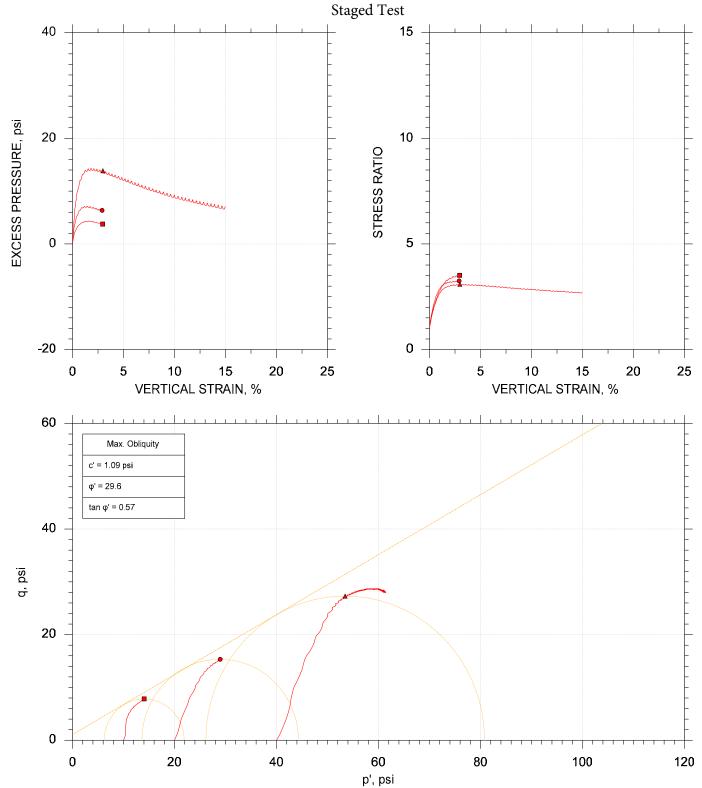


Client: Millenium Engineers Grou[p, Inc.						
Project Name: DMPA 8 Levee Relocation						
Project Location: Brownsville, Cameron County, TX						
Project Number: GTX-318274						
Tested By: cag	Checked By: mcm					
Boring ID: B-1						
Preparation: intact						
Description: Moist, brown clay						
Classification:						
Group Symbol:						
Liquid Limit:	Plastic Limit:					
Plasticity Index:	Estimated Specific Gravity: 2.7					





	20 0 20 40 60 80 p', psi	20 0 0 5 10 15 20 25 VERTICAL STRAIN, %				
Syr	nbol			A		
Sar	nple ID	S-9	S-9	S-9		
De	oth, ft	28.5-30 ft	28.5-30 ft	28.5-30 ft		
Tes	t Number	CU-1-1	CU-1-2	CU-1-3		
	Height, in	6.120	5.899	5.749		
	Diameter, in	2.790	2.790	2.790		
Initial	Moisture Content (from Cuttings), %	18.7				
≣	Dry Density, pcf	109.				
	Saturation (Wet Method), %	91.5				
	Void Ratio	0.551				
	Moisture Content, %			16.2		
ä	Dry Density, pcf			117.		
SP	Cross-sectional Area (Method A), in ²			5.987		
Before Shear	Saturation, %			100.0		
Be	Void Ratio			0.437		
	Back Pressure, psi	64.99	69.01	75.59		
Ver	tical Effective Consolidation Stress, psi	9.972	20.02	40.04		
Hot	izontal Effective Consolidation Stress, psi	9.994	19.98	39.99		
Ver	tical Strain after Consolidation, %	0.4110	-0.5705	-0.7074		
Vol	umetric Strain after Consolidation, %	1.694	1.311	1.385		
Tim	e to 50% Consolidation, min			14.40		
She	ar Strength, psi	7.826	15.33	27.31		
Stra	in at Failure, %	2.95	2.90	2.98		
Stra	in Rate, %/min	0.01600	0.01600	0.01600		
Dev	riator Stress at Failure, psi	15.65	30.67	54.61		
Effe	ctive Minor Principal Stress at Failure, psi	6.220	13.62	26.14		
Effe	ctive Major Principal Stress at Failure, psi	21.87	44.29	80.76		
	alue	0.96	777	777		
Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Deviator Stress includes membrane correction Values for c and ø determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.						
Kei	narks:			443H > >0		



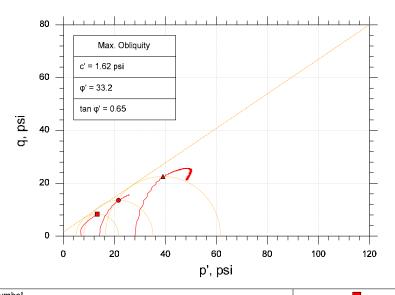
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
-	S-9	CU-1-1	28.5-30 ft	cag	12/12/23	mcm	12/19/23	318274-CU-1-1m.dat
•	S-9	CU-1-2	28.5-30 ft	cag	12/13/23	mcm	12/19/23	318274-CU-1-2m.dat
A	S-9	CU-1-3	28.5-30 ft	cag	12/13/23	mcm	12/19/23	318274-CU-1-3m.dat

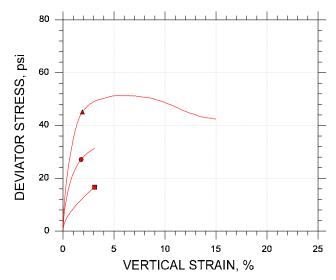


	Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274			
	Boring No.; B-1	Sample Type: intact				
	Description: Moist, brown clay					
Remarks: System I						



Client: Millenium Engineers Grou[p, Inc.					
Project Name: DMPA 8 Levee Relocation					
Project Location: Brownsville, Cameron County, TX					
Project Number: GTX-318274					
Tested By: cag Checked By: mcm					
Boring ID: B-3					
Preparation: intact	Preparation: intact				
Description: Moist, brown clay					
Classification:					
Group Symbol:					
Liquid Limit: Plastic Limit:					
Plasticity Index: Estimated Specific Gravity: 2.7					





20 do 60 80 p', psi	100 120	DEVIA:	5 10 15 VERTICAL STRAIN,	20 25 %
Symbol		•	A	
Sample ID	S-15	S-15	S-15	
Depth, ft	53.5-55 ft	53.5-55 ft	53.5-55 ft	
Test Number	CU-2-1	CU-2-2	CU-2-3	
Height, in	6.290	6.095	5.952	
Diameter, in	2.790	2.790	2.790	
Moisture Content (from Cuttings), % Dry Density, pcf	21.5			
Dry Density, pcf	104.			
Saturation (Wet Method), %	93.0			
Void Ratio	0.623			
Moisture Content, %			19.4	
By Dry Density, pcf			111.	
Dry Density, pct Cross-sectional Area (Method A), in² Saturation, % Void Ratio			5.994	
Saturation, %			100.0	
Void Ratio		0.561	0.523	
Back Pressure, psi	117.0	117.8	121.9	
Vertical Effective Consolidation Stress, psi	6.986	14.04	28.05	
Horizontal Effective Consolidation Stress, psi	7.001	13.99	27.98	
Vertical Strain after Consolidation, %	0.2759	0.7727	1.115	
Volumetric Strain after Consolidation, %	1.042	0.7839	0.8562	
T me to 50% Consolidation, min			256.0	
Shear Strength, psi	8.316	13.55	22.56	
Strain at Failure, %	3.10	1.78	1.90	
Strain Rate, %/min	0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi	16.63	27.10	45.12	
Effective Minor Principal Stress at Failure, psi	4.894	7.991	16.41	
Effective Major Principal Stress at Failure, psi	21.52	35.09	61.53	
B-Value	0.97			
Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Deviator Stress includes membrane correction Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions. Remarks:				
	t .		I .	

CONSOLIDATED UNDRAINED TRIAXIAL TEST Staged Test EXCESS PRESSURE, psi STRESS RATIO 10 15 VERTICAL STRAIN, % VERTICAL STRAIN, % Max. Obliquity c' = 1.62 psi $\phi' = 33.2$ tan φ' = 0.65 q, psi

	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
-	S-15	CU-2-1		cag	12/18/23	mcm	1/10/24	318274-CU-2-1m.dat
•	S-15	CU-2-2		cag	12/18/23	mcm	1/10/24	318274-CU-2-2m.dat
A	S-15	CU-2-3		cag	12/18/23	mcm	1/10/24	318274-CU-2-3m.dat

p', psi

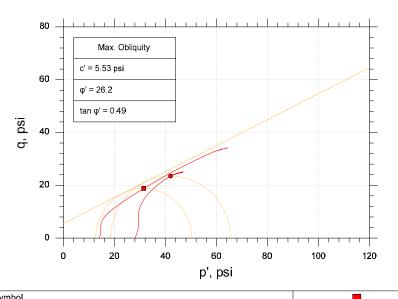


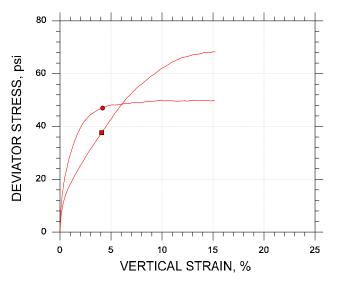
Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274			
Boring No.: B-3					
Description: Moist, brown clay					
Remarks: System J					



Client: Millenium Engineers Group, Inc.					
Project Name: DMPA 8 Levee Relocation					
	Project Location: Brownsville, Cameron County, TX				
	Project Number: GTX-318274				
	Tested By: cag	Checked By: mcm			
	Boring ID: B-4 Preparation: intact Description: Moist, brown clay Classification: Group Symbol:				
	Liquid Limit:	Plastic Limit:			
	Plasticity Index:	Estimated Specific Gravity: 2.7			

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

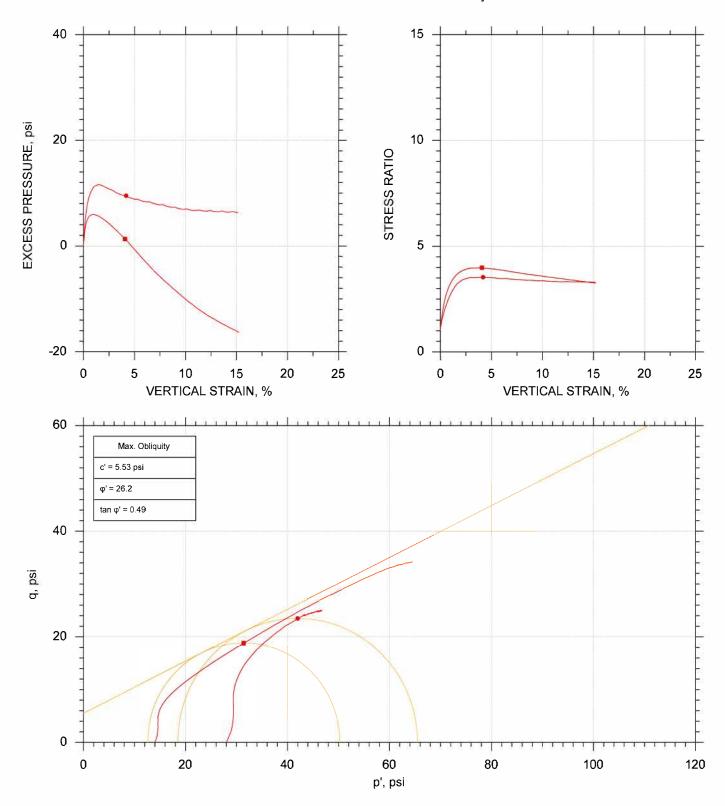




	20 0 20 40 60 80 p', psi	100 120	0 DEVIA	5 10 15 20 25 VERTICAL STRAIN, %
Svr	nbol			
	nple ID	S-15	S-15	
	pth, ft	53.5-55 ft	53.5-55 ft	
	t Number	CU-3-1	CU-3-2	
	Height, in	4.230	4.430	
	Diameter, in	2.050	2.070	
ā	Moisture Content (from Cuttings), %	19.0	19.7	
Initia	Dry Density, pcf	109.	102.	
	Saturation (Wet Method), %	94.4	81.9	
	Void Ratio	0.544	0.650	
	Moisture Content, %	18.9	21.8	
iar	Dry Density, pcf	112.	106.	
Before Shear	Cross-sectional Area (Method A), in²	3.243	3.270	
ore	Saturation, %	100.0	100.0	
Bef	Void Ratio	0.510	0.588	
	Back Pressure, psi	131.0	62.99	
Ver	tical Effective Consolidation Stress, psi	13.97	28.02	
Ho	izontal Effective Consolidation Stress, psi	13.97	28.01	
	tical Strain after Consolidation, %	0.2709	0.6564	
Vol	umetric Strain after Consolidation, %	1.688	2.824	
Tim	e to 50% Consolidation, min		0.4000	
She	ar Strength, psi	18.82	23.48	
Str	nin at Failure, %	4.08	4.18	
Strain Rate, %/min		0.06000	0.06000	
Deviator Stress at Failure, psi		37.65	46.97	
Effective Minor Principal Stress at Failure, psi		12.59	18.50	
Effective Major Principal Stress at Failure, psi		50.24	65.47	
B-\	alue	0.97	0.95	
Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Deviator Stress includes membrane correction Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.				

Remarks:

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



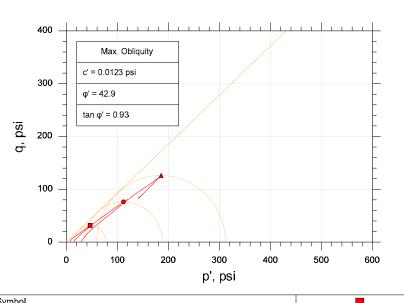
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•	S-15	CU-3-1	53.5-55 ft	cag	12/11/23	mcm	12/19/23	318274-CU-3-1m.dat
•	S-15	CU-3-2	53.5-55 ft	cag	12/11/23	mcm	12/19/23	318274-CU-3-2m.dat
	8							

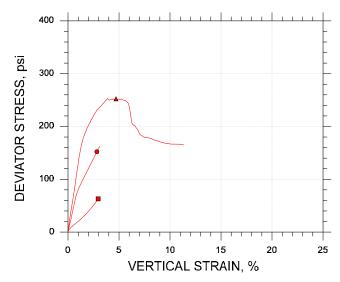


	Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274
	Boring No.: B-4	Sample Type: intact	
Ī	Description: Moist, brown clay		
Ī	Remarks: System D		

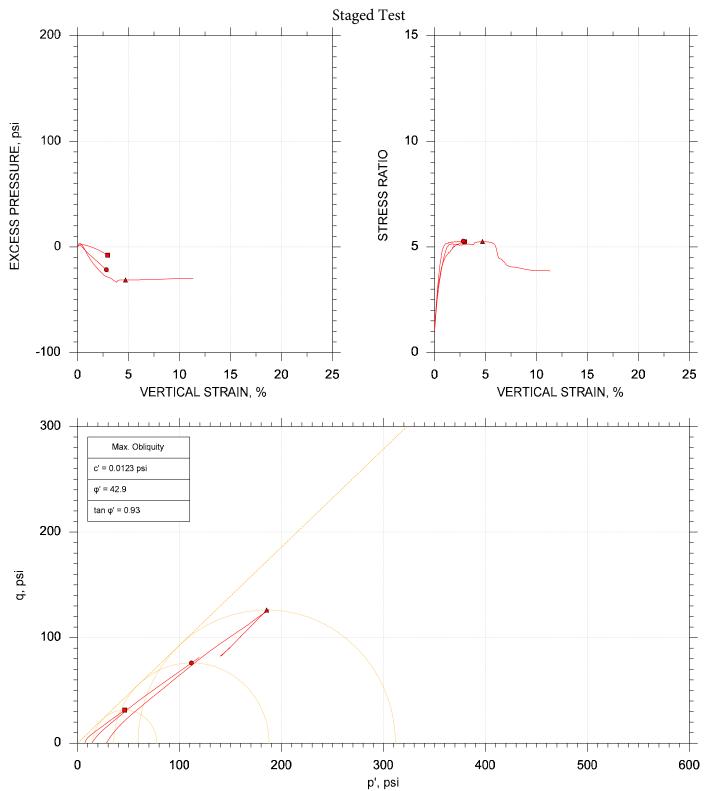


Client: Millenium Engineering Group, Inc.					
Project Name: DMPA 8 Levee Relocation					
Project Location: Brownsville, Cameron County, TX	Project Location: Brownsville, Cameron County, TX				
Project Number: GTX-318274					
Tested By: cag Checked By: mcm					
Boring ID: B-5	Boring ID: B-5				
Preparation: intact	Preparation: intact				
Description: Moist, light brown sandy clay					
Classification:					
Group Symbol:					
Liquid Limit:	Plastic Limit:				
Plasticity Index:	Estimated Specific Gravity: 2.7				





	0 100 200 300 400 p', psi	500 600	100 - 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 10 15 VERTICAL STRAIN,	20 25
Syr	nbol		•	A	
Sar	nple ID	777			
Dep	oth, ft	38-40 ft	38-40 ft	38-40 ft	
Tes	t Number	CU-8-1	CU-8-2	CU-8-3	
	Height, in	4.470	4.329	4.225	
	Diameter, in	2.070	2.070	2.070	
Initial	Moisture Content (from Cuttings), %	19.1			
Ξ	Dry Density, pcf	108.			
	Saturation (Wet Method), %	92.7			
	Void Ratio	0.557			
	Moisture Content, %			17.2	
igi	Dry Density, pcf			115.	
Before Shear	Cross-sectional Area (Method A), in²			3.311	
fore	Saturation, %			100.0	
Be	Void Ratio			0.464	
	Back Pressure, psi	54.96	48.51	28.58	
Ver	tical Effective Consolidation Stress, psi	7.046	13.94	28.54	
	izontal Effective Consolidation Stress, psi	7.033	14.00	27.99	
Ver	tical Strain after Consolidation, %	0.02529	-0.7117	-1.102	
Vol	umetric Strain after Consolidation, %	0.4736	0.4005	0.5350	
Tim	e to 50% Consolidation, min			2.890	
She	ar Strength, psi	31.43	76.08	126.1	
	in at Failure, %	2.95	2.83	4.70	
Stra	in Rate, %/min	0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		62.86	152.2	252.3	
Effective Minor Principal Stress at Failure, psi		14.82	35.56	59.28	
Effective Major Principal Stress at Failure, psi		77.68	187.7	311.6	
	alue	0.96			
Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.					



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•		CU-8-1	38-40 ft	cag	2/14/24	mcm	2/23/24	318274-CU-8-1m.dat
•		CU-8-2	38-40 ft	cag	2/15/24	mcm	2/23/24	318274-CU-8-2m.dat
A		CU-8-3	38-40 ft	cag	2/15/24	mcm	2/23/24	318274-CU-8-3m.dat

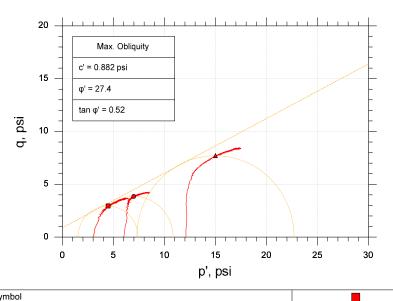


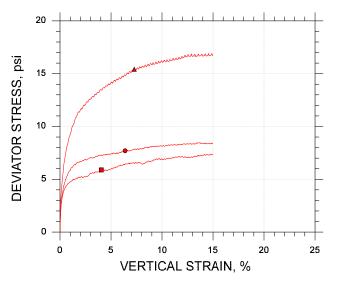
Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274
Boring No.: B-5	Sample Type: intact	
Description: Moist, light brown sandy clay		
Remarks: System C		



	Client: Millenium Engineers Group, Inc.			
	Project Name: DMPA 8 Levee Relocation			
	Project Location: Brownsville, Cameron County, TX			
	Project Number: GTX-318274			
	Tested By: cag	Checked By: mcm		
	Boring ID: B-6			
	Preparation: Reconstit.			
	Description: Moist, grayish brown clay			
	Classification:			
Group Symbol:				
	Liquid Limit:	Plastic Limit:		
	Plasticity Index:	Estimated Specific Gravity: 2.7		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

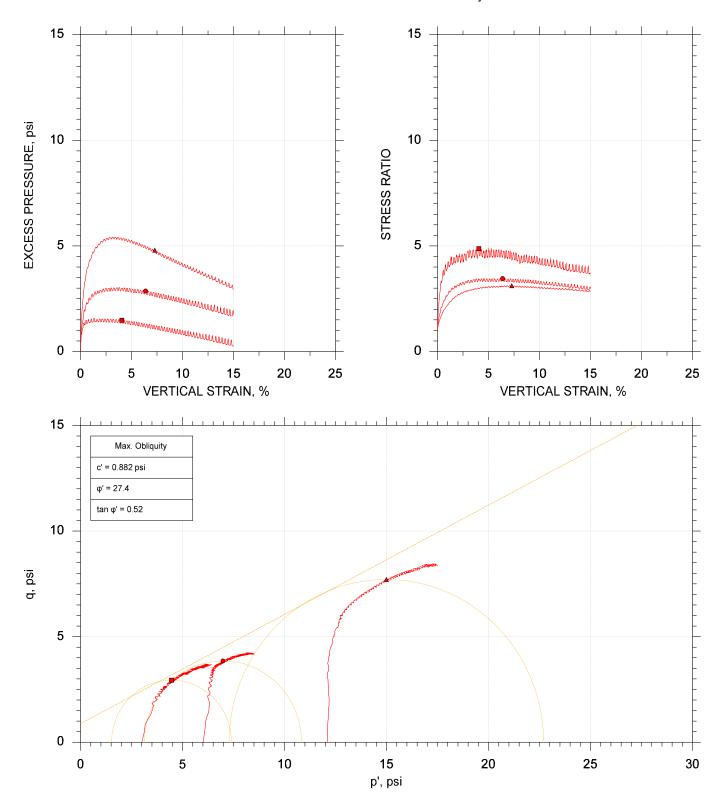




	0	-	0 -		
	0 5 10 15 20	25 30	0	5 10 15 20	25
	p', psi			VERTICAL STRAIN, %	
Syr	nbol		•	A	
Sar	nple ID	BULK	BULK	BULK	
Dep	oth, ft				
Tes	t Number	CU-11-1	CU-11-2	CU-11-3	
	Height, in	4.100	4.080	4.040	
	Diameter, in	2.030	2.030	2.020	
Initial	Moisture Content (from Cuttings), %	20.4	20.4	20.4	
Ξ	Dry Density, pcf	96.4	96.5	96.5	
	Saturation (Wet Method), %	73.7	73.9	73.9	
	Void Ratio	0.749	0.747	0.747	
	Moisture Content, %	27.7	26.2	26.0	
ğ	Dry Density, pcf	96.4	98.8	99.0	
She	Cross-sectional Area (Method A), in²	3.237	3.185	3.160	
Before Shear	Saturation, %	100.0	100.0	100.0	
Bef	Void Ratio	0.749	0.707	0.702	
	Back Pressure, psi	105.0	123.0	132.9	
Ver	ical Effective Consolidation Stress, psi	3.014	5.980	12.04	
Hor	izontal Effective Consolidation Stress, psi	3.001	5.998	12.09	
Ver	ical Strain after Consolidation, %	0.06427	0.4799	0.9341	
Vol	umetric Strain after Consolidation, %	0.1426	1.546	1.874	
Tim	e to 50% Consolidation, min			10.89	
She	ar Strength, psi	2.940	3.850	7.706	
Stra	in at Failure, %	4.05	6.38	7.28	
Stra	in Rate, %/min	0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		5.880	7.700	15.41	
Effe	ctive Minor Principal Stress at Failure, psi	1.519	3.131	7.286	
Effe	ctive Major Principal Stress at Failure, psi	7.399	10.83	22.70	
B-V	alue	0.96	0.96	0.96	
B-Value Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Deviator Stress includes membrane correction Values for c and ϕ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.					

Remarks:

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



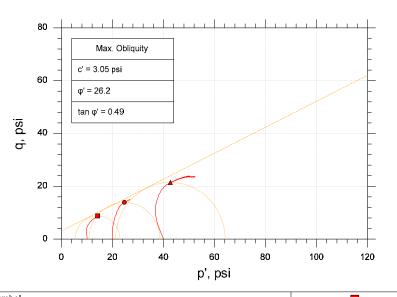
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•	BULK	CU-11-1		cag	3/6/24	mcm	3/8/24	318274-CU-11-1m.dat
•	BULK	CU-11-2		cag	3/6/24	mcm	3/8/24	318274-CU-11-2m.dat
A	BULK	CU-11-3		cag	3/6/24	mcm	3/8/24	318274-CU-11-3m.dat

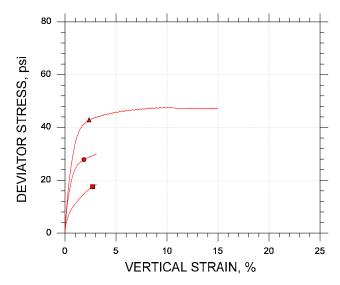


	Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274		
,	Boring No.: B-6	Sample Type: Reconstit.			
Description: Moist, grayish brown clay					
	Remarks: System I, Target Compaction: 95% of (101.7 pcf) @ optimum moisture content (20.4%) values provided by client.				



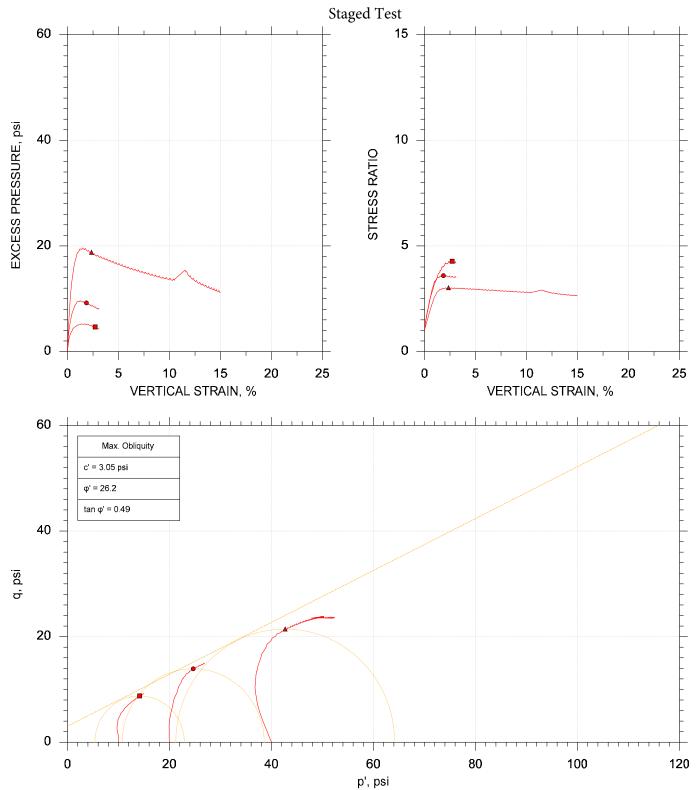
Client: Millenium Engineers Group, Inc.				
Project Name: DMPA 8 Levee Relocation				
Project Location: Brownsville, Cameron County, TX				
Project Number: GTX-318274				
Tested By: cag	Checked By: mcm			
Boring ID: B-6				
Preparation: intact				
Description: Moist, brown clay				
Classification:				
Group Symbol:				
Liquid Limit:	Plastic Limit:			
Plasticity Index:	Estimated Specific Gravity: 2.7			





	20 0 20 40 60 80 p', psi	100 120	20 DEVINE 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 10 15 VERTICAL STRAIN, %	20 25
Syn	nbol		•	A	
Sar	nple ID	S-9	S-9	S-9	
Dep	th, ft	23.5-25 ft	23.5-25 ft	23.5-25 ft	
Tes	t Number	CU-4-1	CU-4-2	CU-4-3	
	Height, in	6.190	5.965	5.816	
	Diameter, in	2.780	2.780	2.780	
Initial	Moisture Content (from Cuttings), %	20.1			
≟	Dry Density, pcf	109.			
	Saturation (Wet Method), %	99.9			
	Void Ratio	0.543			
	Moisture Content, %			16.5	
iea	Dry Density, pcf			117.	
S.	Cross-sectional Area (Method A), in²			6.075	
Before Shear	Saturation, %			100.0	
Be	Void Ratio			0.444	
	Back Pressure, psi	105.0	108.8	104.9	
Ver	ical Effective Consolidation Stress, psi	10.04	19.98	39.95	
Hor	zontal Effective Consolidation Stress, psi	10.07	19.94	40.01	
Ver	ical Strain after Consolidation, %	0.5244	-0.6323	0.5787	
Vol	umetric Strain after Consolidation, %	1.124	0.5286	0.7015	
Tim	e to 50% Consolidation, min			20.25	
She	ar Strength, psi	8.770	13.92	21.45	
Stra	in at Failure, %	2.70	1.85	2.35	
Stra	in Rate, %/min	0.01600	0.01600	0.01600	
Dev	iator Stress at Failure, psi	17.54	27.83	42.89	
Effe	ctive Minor Principal Stress at Failure, psi	5.354	10.73	21.23	
Effective Major Principal Stress at Failure, psi		22.89	38.56	64.12	
	alue	0.95			
- Moi - Dev - Vali stre	ore Shear Saturation set to 100% for phase calculation. sture Content determined by ASTM D2216. ideo Stress includes membrane correction. ues for c and φ determined from best-fit straight line for the specific test conditions. Actual night parameters may vary and should be determined by an engineer for site conditions.				
Rer	narks:				

System I)



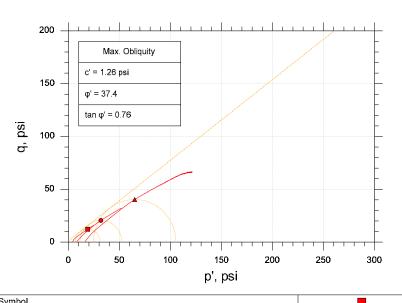
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
-	S-9	CU-4-1	23.5-25 ft	cag	12/12/23	mcm	12/19/23	318274-CU-4-1m.dat
•	S-9	CU-4-2	23.5-25 ft	cag	12/13/23	mcm	12/19/23	318274-CU-4-2m.dat
A	S-9	CU-4-3	23.5-25 ft	cag	12/14/23	mcm	12/19/23	318274-CU-4-3m.dat

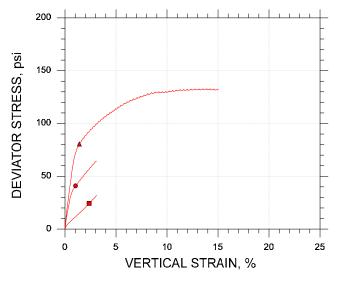
GeoTesting	
EXPRESS	

Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274
Boring No.: B-6	Sample Type: intact	
Description: Moist, brown clay		
Remarks: System D		



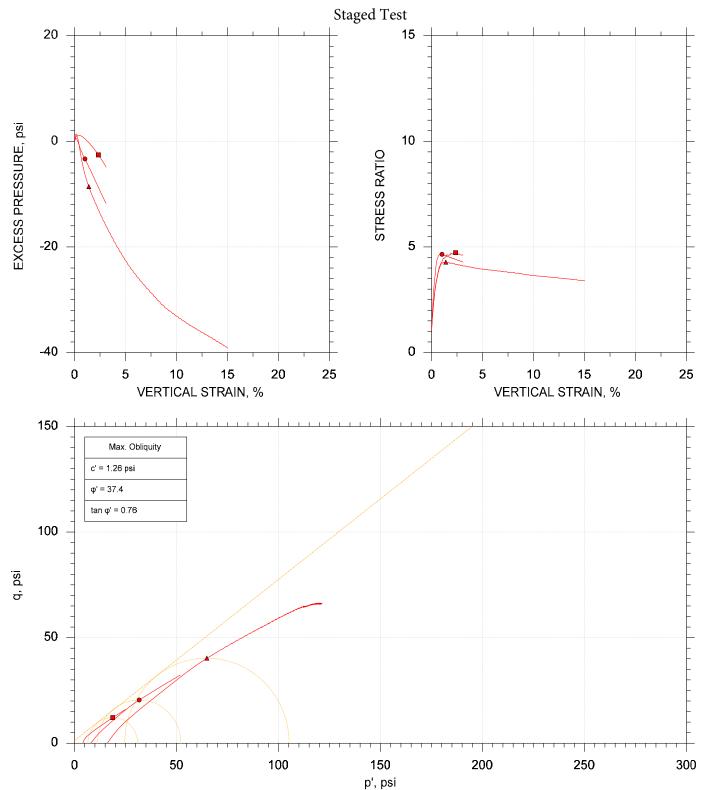
Client: Millenium Engineering Group, Inc.				
Project Name: DMPA 8 Levee Relocation				
Project Location: Brownsville, Cameron County, TX				
Project Number: GTX-318274				
Tested By: cag	Checked By: mcm			
Boring ID: B-10				
Preparation: intact				
Description: Moist, light brown sandy clay				
Classification:				
Group Symbol:				
Liquid Limit:	Plastic Limit:			
Plasticity Index:	Estimated Specific Gravity: 2.7			





	50 0 0 50 100 150 200 p', psi	250 300	DEVIATO	5 10 15 VERTICAL STRAIN,	20 25
Syr	nbol		•	<u> </u>	
Sai	nple ID	333			
De	oth, ft	8-10 ft	8-10 ft	8-10 ft	
Tes	st Number	CU-9-1	CU-9-2	CU-9-3	
	Height, in	4.230	4.088	3.982	
	Diameter, in	2.050	2.050	2.050	
ā	Moisture Content (from Cuttings), %	20.9			
Initia	Dry Density, pcf	106.			
	Saturation (Wet Method), %	96.1			
	Void Ratio	0.588			
	Moisture Content, %			18.1	
ar	Dry Density, pcf			113.	
Before Shear	Cross-sectional Area (Method A), in²			3.263	
fore	Saturation, %			100.0	
Be	Void Ratio			0.490	
	Back Pressure, psi	128.8	122.0	113.9	
	tical Effective Consolidation Stress, psi	3.971	7.924	16.06	
	rizontal Effective Consolidation Stress, psi	3.972	7.874	15.99	
Ver	tical Strain after Consolidation, %	0.05184	-0.5268	-0.8126	
Vol	umetric Strain after Consolidation, %	0.1730	0.1548	0.3285	
Tin	ne to 50% Consolidation, min			1.440	
She	ear Strength, psi	12.18	20.48	40.29	
	ain at Failure, %	2.35	1.03	1.40	
Stra	ain Rate, %/min	0.01600	0.01600	0.01600	
	viator Stress at Failure, psi	24.36	40.95	80.59	
	ective Minor Principal Stress at Failure, psi	6.533	11.21	24.58	
	ective Major Principal Stress at Failure, psi	30.89	52.17	105.2	
	/alue	0.97			
- Mo - De - Va	(es: fore Shear Saturation set to 100% for phase calculation. isture Content determined by ASTM D2216. viator Stress includes membrane correction. ues for c and φ determined from best-fit straight line for the specific test conditions. Actual ength parameters may vary and should be determined by an engineer for site conditions.				
l na	marka:			V	

Remarks:



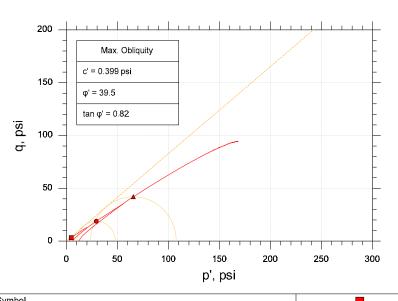
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
-		CU-9-1	8-10 ft	cag	2/14/24	mcm	2/26/24	318274-CU-9-1m.dat
•		CU-9-2	8-10 ft	cag	2/15/24	mcm	2/26/24	318274-CU-9-2m.dat
A		CU-9-3	8-10 ft	cag	2/15/24	mcm	2/24/24	318274-CU-9-3m.dat

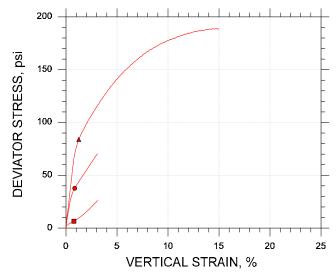


Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274			
Boring No.: B-10					
Description: Moist, light brown sandy clay					
Remarks: System D					

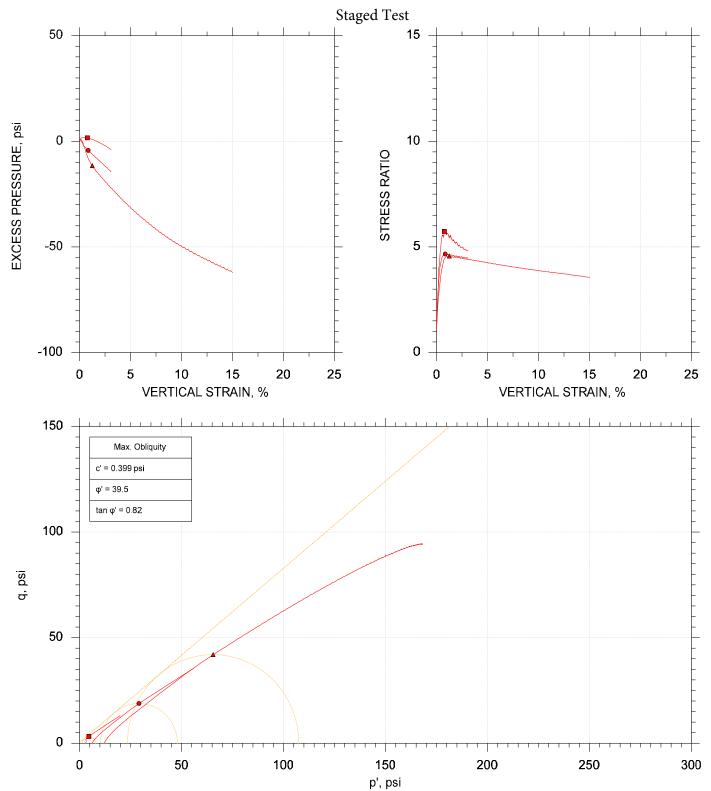


Client: Millenium Engineering Group, Inc.				
Project Name: DMPA 8 Levee Relocation				
Project Location: Bownsville, Cameron County, TX				
Project Number: GTX-318274				
Tested By: cag Checked By: mcm				
Boring ID: B-12				
Preparation: reconstit.				
Description: Moist, light brown sandy clay				
Classification:				
Group Symbol:				
Liquid Limit: Plastic Limit:				
Plasticity Index:	Estimated Specific Gravity: 2.7			





	0 50 100 150 200 p', psi	250 300	0 DE 0	5 10 15 VERTICAL STRAIN,	20 25
_	<u> </u>	_			T.
Syr	nple ID				
	the in the initial state of th	4.5-6 ft	4.5-6 ft	4.5-6 ft	
	t Number	CU-10-1	CU-10-2	CU-10-3	
103	Height, in	4.430	4.276	4.161	-
	Diameter, in	2.030	2.030	2.030	
	Moisture Content (from Cuttings), %	22.4	2.000	2.000	
Initia	Dry Density, pcf	101.			
	Saturation (Wet Method), %	90.5			
	Void Ratio	0.669			
	Moisture Content, %			20.8	
Ħ	Dry Density, pcf			108.	
Before Shear	Cross-sectional Area (Method A), in ²			3.201	
ore	Saturation, %			100.0	
Bef	Void Ratio			0.562	
	Back Pressure, psi	133.0	122.0	113.1	
Ver	tical Effective Consolidation Stress, psi	3.022	6.079	12.11	
Hor	izontal Effective Consolidation Stress, psi	3.010	5.997	11.97	
Ver	tical Strain after Consolidation, %	0.01106	-0.4121	-0.7274	
	umetric Strain after Consolidation, %	0.2375	0.3081	0.3869	
Tim	e to 50% Consolidation, min			0.8100	
	ar Strength, psi	3.232	18.84	41.97	
	in at Failure, %	0.775	0.850	1.25	
	in Rate, %/min	0.01600	0.01600	0.01600	
	riator Stress at Failure, psi	6.464	37.68	83.94	
	ctive Minor Principal Stress at Failure, psi	1.365	10.28	23.50	
	ective Major Principal Stress at Failure, psi	7.829	47.96	107.4	
	alue	0.95			
- Mo - Dev - Val	es: ore Shear Saturation set to 100% for phase calculation. sture Content determined by ASTM D2216, indoor Stress includes membrane correction. ues for c and \(\phi\) determined from best-fit straight line for the specific test conditions. Actual ngth parameters may vary and should be determined by an engineer for site conditions.				



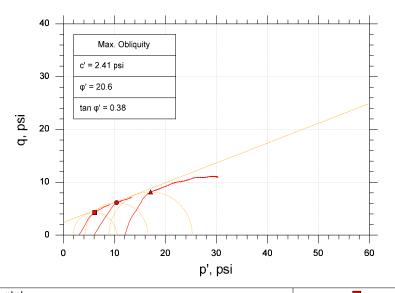
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•		CU-10-1	4.5-6 ft	cag	2/15/24	mcm	2/26/24	318274-CU-10-1m.dat
•		CU-10-2	4.5-6 ft	cag	2/15/24	mcm	2/26/24	318274-CU-10-2m.dat
A		CU-10-3	4.5-6 ft	cag	2/15/24	mcm	2/26/24	318274-CU-10-3m.dat

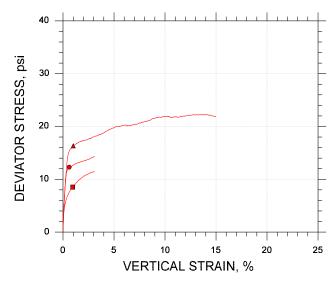


Project: DMPA 8 Levee Relocation	Location: Bownsville, Cameron County, TX	Project No.: GTX-318274				
Boring No.: B-12						
Description: Moist, light brown sandy clay						
Remarks: System I						

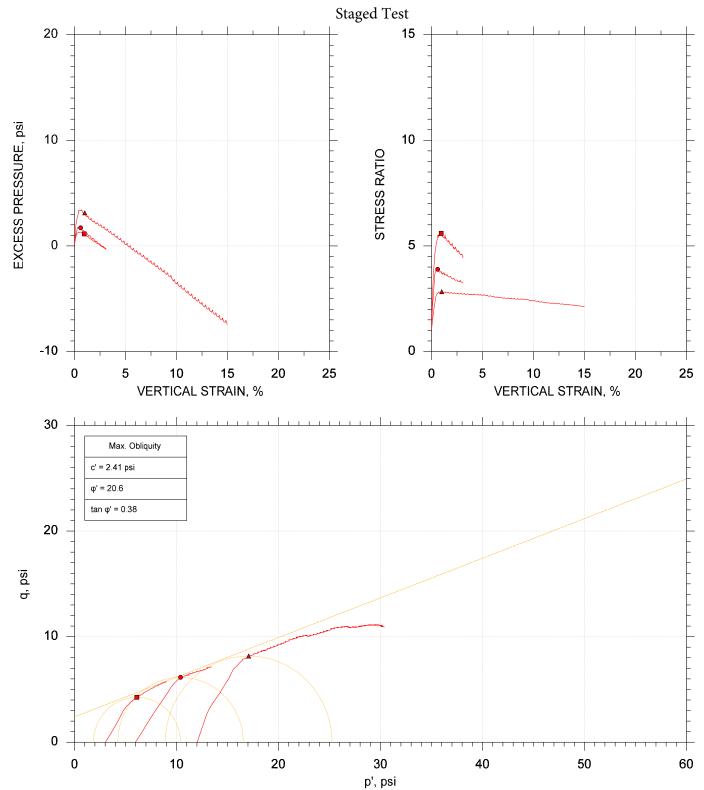


Client: Millennium Engineers Group, Inc.				
Project Name: DMPA 8 Levee Relocation				
Project Location: Brownsville, Cameron County, TX				
Project Number: GTX-318274				
Tested By: cag Checked By: mcm				
Boring ID: B-15				
Preparation: intact				
Description: Moist, brown sandy clay				
Classification: Group Symbol:				
				Liquid Limit: Plastic Limit:
Plasticity Index: Estimated Specific Gravity: 2.7				





	10 0 10 20 30 40 p', psi	50 60	OBVI	5 10 15 2 VERTICAL STRAIN, %	20 25
Syr	nbol		•	<u> </u>	
Sai	nple ID				
De	oth, ft	6-8 ft	6-8 ft	6-8 ft	
Tes	st Number	CU-12-1	CU-12-2	CU-12-3	
	Height, in	5.020	4.883	4.750	
	Diameter, in	2.030	2.030	2.030	
Initial	Moisture Content (from Cuttings), %	27.8			
Ξ	Dry Density, pcf	92.9			
	Saturation (Wet Method), %	92.1			
	Void Ratio	0.814			
	Moisture Content, %			26.5	
Shear	Dry Density, pcf			98.2	
ري م	Cross-sectional Area (Method A), in ²			3.220	
Before	Saturation, %			100.0	
å	Void Ratio			0.716	
	Back Pressure, psi	133.1	133.0	132.5	
	tical Effective Consolidation Stress, psi	3.047	6.046	12.04	
	izontal Effective Consolidation Stress, psi	3.031	5.966	12.02	
	tical Strain after Consolidation, %	0.0009652	-0.3795	-0.4997	
	umetric Strain after Consolidation, %	0.02469	0.02816	0.02129	
	e to 50% Consolidation, min	0.0000	0.0000	4.000	
	ear Strength, psi	4.261	6.148	8.164	
	ain at Failure, %	0.951	0.600	1.00	
	ain Rate, %/min	0.01600	0.01600	0.01600	
	viator Stress at Failure, psi	8.521	12.30	16.33	
	ective Minor Principal Stress at Failure, psi	1.855	4.246	8.907	
	ective Major Principal Stress at Failure, psi	10.38	16.54	25.23	
Not - Be - Mo - De - Va	es: ore Shear Saturation set to 100% for phase calculation. sture Content determined by ASTM D2216. viator Stress includes membrane correction. ues for c and φ determined from best-fit straight line for the specific test conditions. Actual ength parameters may vary and should be determined by an engineer for site conditions.	0.96			



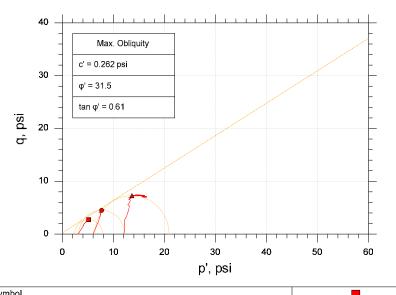
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•		CU-12-1	6-8 ft	cag	3/4/24	mcm	3/8/24	318274-CU-12-1m.dat
•		CU-12-2	6-8 ft	cag	3/5/24	mcm	3/8/24	318274-CU-12-2m.dat
A		CU-12-3	6-8 ft	cag	3/5/24	mcm	3/8/24	318274-CU-12-3m.dat

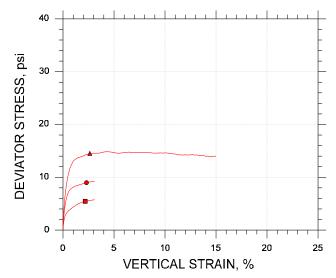
GeoTesting	
EXPRESS	L

	Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274				
	Boring No.: B-15	Sample Type: intact					
	Description: Moist, brown sandy clay						
Remarks: System G							



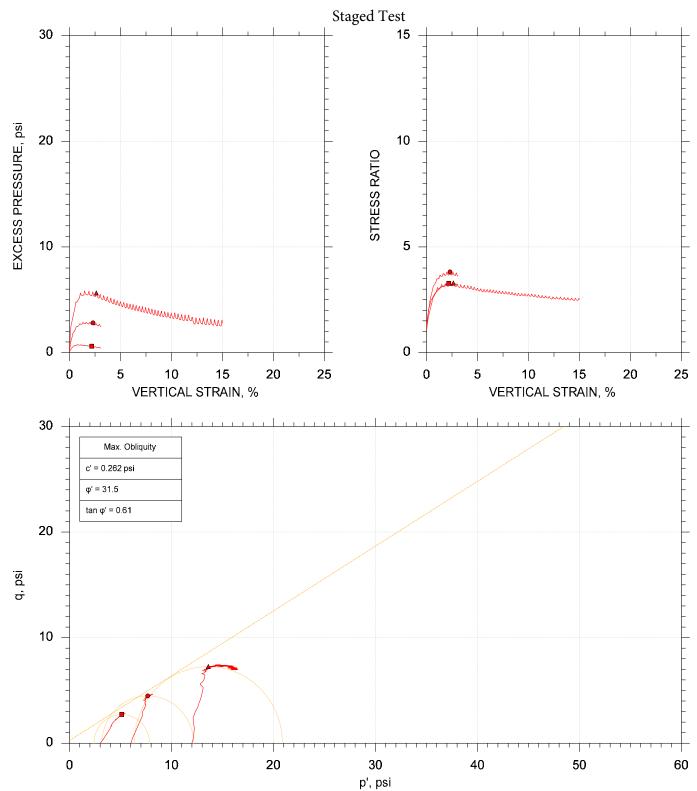
Client: Millenium Engineers Grou[p, Inc.				
Project Name: DMPA 8 Levee Relocation				
Project Location: Brownsville, Cameron County, TX				
Project Number: GTX-318274				
Tested By: cag Checked By: mcm				
Boring ID: B-15				
Preparation: intact				
Description: Moist, brown clay				
Classification:				
Group Symbol:				
Liquid Limit: Plastic Limit:				
Plasticity Index: Estimated Specific Gravity: 2.7				





	10 0 10 20 30 40 p', psi	50 60	DEVIATION	5 10 15 VERTICAL STRAIN,	20 25 %
Syr	nbol		•	A	
Sar	nple ID	S-8	S-8	S-8	
De	oth, ft	18.5-20 ft	18.5-20 ft	18.5-20 ft	
Tes	t Number	CU-6-1	CU-6-2	CU-6-3	
	Height, in	6.330	6.141	5.977	
	Diameter, in	2.740	2.740	2.740	
Initial	Moisture Content (from Cuttings), %	32.2			
Ξ	Dry Density, pcf	85.4			
	Saturation (Wet Method), %	89.2			
	Void Ratio	0.974			
	Moisture Content, %			31.2	
jeg	Dry Density, pcf			91.4	
Before Shear	Cross-sectional Area (Method A), in²			5.802	
fore	Saturation, %			100.0	
Be	Void Ratio			0.844	
	Back Pressure, psi	107.0	112.4	115.7	
	ical Effective Consolidation Stress, psi	3.016	6.051	12.02	
	izontal Effective Consolidation Stress, psi	3.016	6.013	11.98	
Ver	ical Strain after Consolidation, %	0.05113	0.4515	0.5131	
Vol	umetric Strain after Consolidation, %	0.3047	0.7326	1.080	
Tim	e to 50% Consolidation, min			324.0	
She	ar Strength, psi	2.725	4.485	7.263	
Stra	in at Failure, %	2.18	2.30	2.63	
	in Rate, %/min	0.01600	0.01600	0.01600	
De	iator Stress at Failure, psi	5.449	8.971	14.53	
Effe	ctive Minor Principal Stress at Failure, psi	2.394	3.183	6.342	
Effe	ctive Major Principal Stress at Failure, psi	7.843	12.15	20.87	
	alue	0.96			
- Mo - De - Va	es: ore Shear Saturation set to 100% for phase calculation. sture Content determined by ASTM D2216. iator Stress includes membrane correction. ues for c and φ determined from best-fit straight line for the specific test conditions. Actual night parameters may vary and should be determined by an engineer for site conditions.				

Remarks: System J



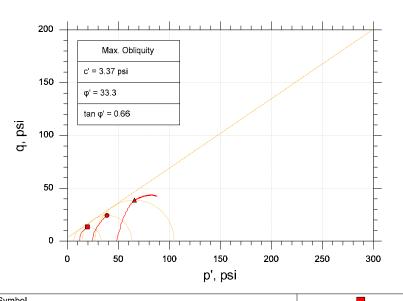
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•	S-8	CU-6-1	18.5-20 ft	cag	12/27/23	mcm	1/10/24	318274-CU-6-1m.dat
•	S-8	CU-6-2	18.5-20 ft	cag	12/27/23	mcm	1/10/24	318274-CU-6-2m.dat
A	S-8	CU-6-3	18.5-20 ft	cag	12/27/23	mcm	1/10/24	318274-CU-6-3m.dat

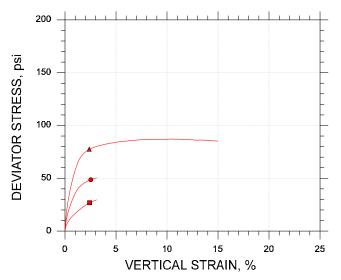


Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274			
Boring No.: B-15	Sample Type: intact				
Description: Moist, brown clay					
Remarks: System J					



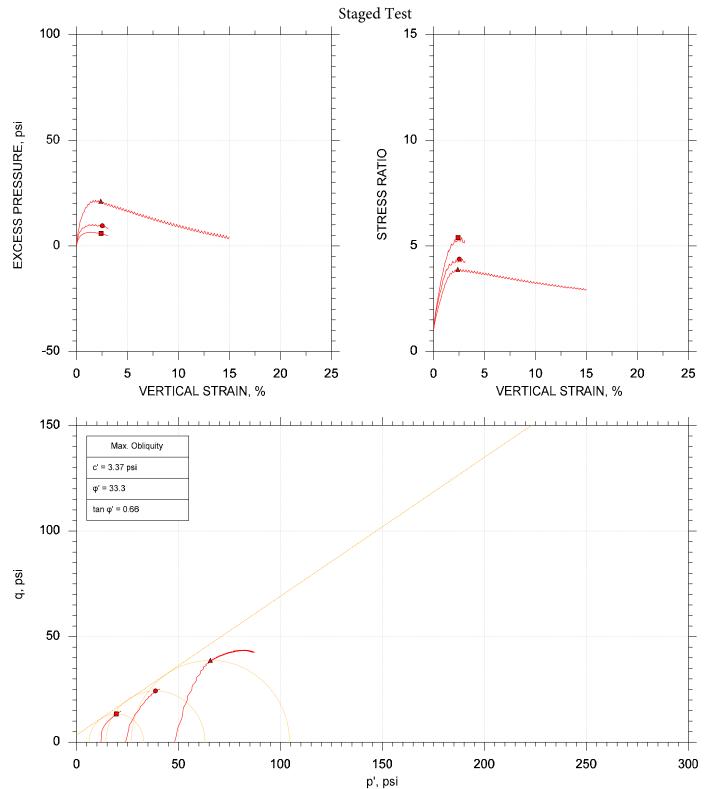
Client: Millenium Engineers Group, Inc.				
Project Name: DMPA 8 Levee Relocation				
Project Location: Brownsville, Cameron County, TX				
Project Number: GTX-318274				
Tested By: cag Checked By: mcm				
Boring ID: B-15				
Preparation: intact				
Description: Moist, brown clay				
Classification:				
Group Symbol:				
Liquid Limit: Plastic Limit:				
Plasticity Index: Estimated Specific Gravity: 2.7				





	50 0 50 100 150 200 p', psi	250 300	DEVIATION OF STATE OF	5 10 15 VERTICAL STRAIN, %	20 25
Symbol		I		A	
Sample		S-9	S-9	S-9	
Depth, f		25 ft	25 ft	25 ft	
Test Nu		CU-5-1	CU-5-2	CU-5-3	
	eight, in	6.370	6.144	6.013	
Dia	ameter, in	2.790	2.790	2.790	
<u></u> Mo	pisture Content (from Cuttings), %	15.7			
Dr Mc	y Density, pcf	116.			
Sa	aturation (Wet Method), %	93.8			
Vo	oid Ratio	0.452			
Mo	pisture Content, %			13.2	
ig Dr	y Density, pcf			124.	
1.1 ⊨—	oss-sectional Area (Method A), in²			5.986	
Sa Sa	aturation, %			100.0	
	oid Ratio		0.198	0.357	
	ack Pressure, psi	85.00	89.20	99.15	
	Effective Consolidation Stress, psi	11.98	24.01	48.04	
	tal Effective Consolidation Stress, psi	12.01	23.95	47.97	
	Strain after Consolidation, %	0.5038	1.009	1.121	
	tric Strain after Consolidation, %	1.487	0.9894	0.9929	
	50% Consolidation, min			196.0	
	Strength, psi	13.41	24.30	38.78	
	t Failure, %	2.40	2.53	2.38	
	Rate, %/min	0.01600	0.01600	0.01600	
	r Stress at Failure, psi	26.81	48.61	77.56	
	e Minor Principal Stress at Failure, psi	6.096	14.38	26.82	
	e Major Principal Stress at Failure, psi	32.91	62.99	104.4	
B-Value		0.96			
Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Deviator Stress includes membrane correction - Values for c and ϕ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.					

Remarks: System I



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•	S-9	CU-5-1	25 ft	cag	12/18/23	mcm	1/10/24	318274-CU-5-1m.dat
•	S-9	CU-5-2	25 ft	cag	12/18/23	mcm	1/10/24	318274-CU-5-2m.dat
A	S-9	CU-5-3	25 ft	cag	12/18/23	mcm	1/10/24	318274-CU-5-3m.dat

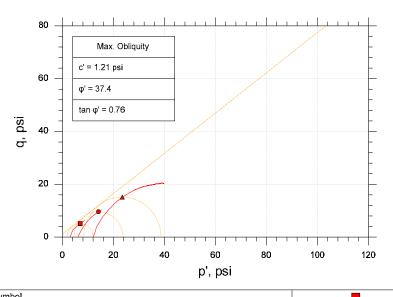


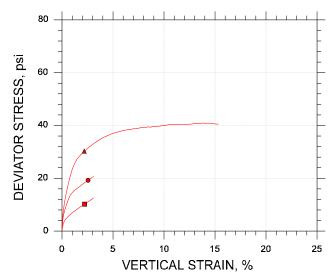
Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274			
1 Toject. Divil A o Levee Nelocation	Education: Brownsville, Carrieron County, 17	1 Toject No.: GTX-316274			
Boring No.: B-15	Sample Type: intact				
Description: Moist, brown clay					
Remarks: System I					



Client: Millenium Engineers Group, Inc.	
Project Name: DMPA 8 Levee Relocation	
Project Location: Brownsville, Cameron County, TX	
Project Number: GTX-318274	
Tested By: cag	Checked By: mcm
Boring ID: B-15	
Preparation: intact	
Description: Moist, brown clay	
Classification:	
Group Symbol:	
Liquid Limit:	Plastic Limit:
Plasticity Index:	Estimated Specific Gravity: 2.7

${\tt CONSOLIDATED\ UNDRAINED\ TRIAXIAL\ TEST\ Staged\ Test}$





20 0 0 20 40 60 80 p', psi	100 120	DEVIATION O S	5 10 15 VERTICAL STRAIN,	20 25
Symbol		•	<u> </u>	
Sample ID	S-20	S-20	S-20	
Depth, ft	30 ft	30 ft	30 ft	
Test Number	CU-7-1	CU-7-2	CU-7-3	
Height, in	6.490	6.273	6.123	
Diameter, in	2.730	2.730	2.730	
Moisture Content (from Cuttings), % Dry Density, pcf	18.7			
Dry Density, pcf	110.			
Saturation (Wet Method), %	94.4			
Void Ratio	0.534			
Moisture Content, %			16.1	
Dry Density, pcf			117.	
ে Cross-sectional Area (Method A), in²			5.749	
Dry Density, pct Cross-sectional Area (Method A), in² Saturation, % Void Ratio			100.0	
Void Ratio		0.473	0.435	
Back Pressure, psi	62.99	70.79	71.87	
Vertical Effective Consolidation Stress, psi	3.020	6.096	12.36	
Horizontal Effective Consolidation Stress, psi	3.012	5.995	12.02	
Vertical Strain after Consolidation, %	0.02175	0.7317	0.9346	
Volumetric Strain after Consolidation, %	0.1064	0.6490	0.8326	
Time to 50% Consolidation, min			56.25	
Shear Strength, psi	5.102	9.615	15.13	
Strain at Failure, %	2.20	2.55	2.18	
Strain Rate, %/min	0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi	10.20	19.23	30.26	
Effective Minor Principal Stress at Failure, psi	1.826	4.466	8.297	
Effective Major Principal Stress at Failure, psi	12.03	23.70	38.56	
B-Value	0.95			
Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216. - Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.				
Remarks:				

System I

CONSOLIDATED UNDRAINED TRIAXIAL TEST Staged Test EXCESS PRESSURE, psi STRESS RATIO -20 10 15 VERTICAL STRAIN, % VERTICAL STRAIN, % Max. Obliquity c' = 1.21 psi $\phi' = 37.4$ tan φ' = 0.76 q, psi

	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•	S-20	CU-7-1	30 ft	cag	12/27/23	mcm	1/10/24	318274-CU-7-1m.dat
•	S-20	CU-7-2	30 ft	cag	12/27/23	mcm	1/10/24	318274-CU-7-2m.dat
A	S-20	CU-7-3	30 ft	cag	12/27/23	mcm	1/10/24	318274-CU-7-3m.dat

p', psi



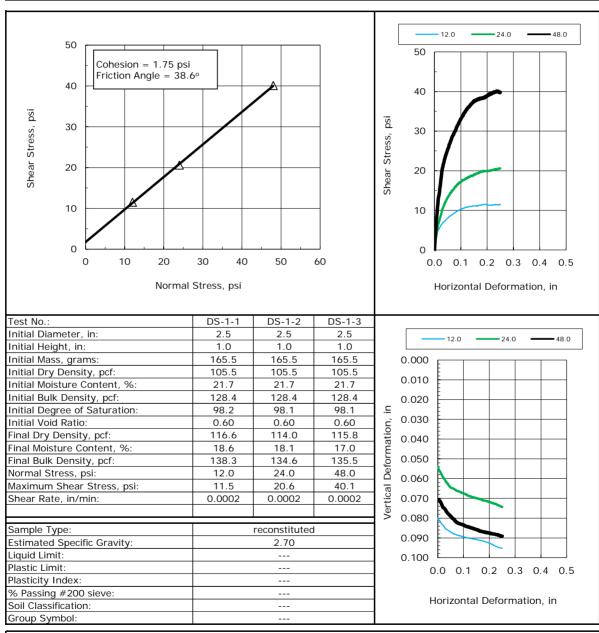
Project: DMPA 8 Levee Relocation	Location: Brownsville, Cameron County, TX	Project No.: GTX-318274
Boring No.: B-15+	Sample Type: intact	
Description: Moist, brown clay		
Remarks: System I		





Client: Millenium Engineers Group, Inc. Project Name: DMPA 8 Levee Relocation Project Location: Brownsville, Cameron County, TX GTX # 318274 Test Date: 02/26/24 Tested By: mcm Checked By ibh Boring ID: B-2 Sample ID: Depth, ft: 38.5-40 Visual Description: Moist, yellowish brown sandy clay

Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



Notes: Material greater than #5 sieve screened out of sample prior to testing

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

As instructed by the client, the was material placed at the as-received moisture content with moderate compactive effort.

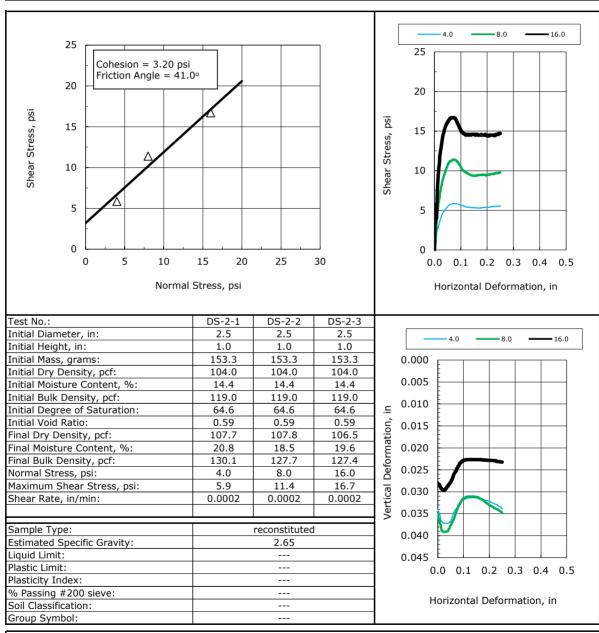
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" indicates testing required to determine these values was not requested.



Client: Millenium Engineers Group Project Name: DMPA 8 Levee Relocation Project Location: Brownsville, Cameron County, Texas GTX #· 318274 Test Date: 3//8/24 Tested By: cag Checked By: mcm Boring ID: B-1 **BULK** Sample ID: Depth, ft: 0-1 Visual Description: Moist, light yellowish brown sand with silt

Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



Notes: Material greater than #5 sieve screened out of sample prior to testing

Moisture content obtained before shear from sample trimmings

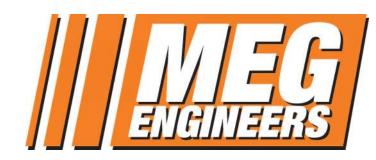
Moisture Content determined by ASTM D2216

Target Compaction: 95% of (109.0) @ optimum mosture content (14.9%), as specified by client.

Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

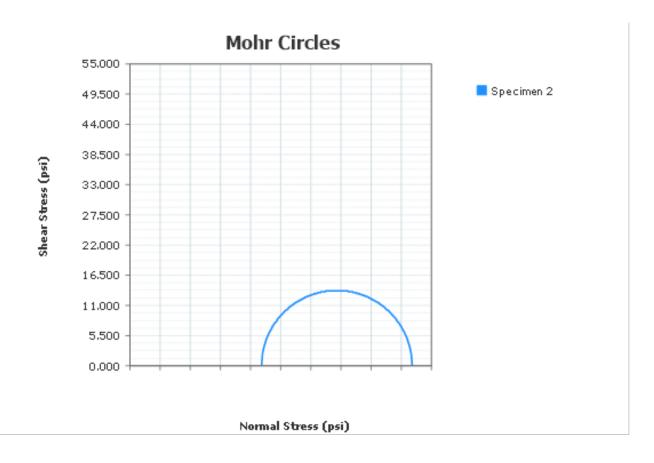
"---" indicates testing required to determine these values was not requested.

APPENDIX H UNCONSOLIDATED UNDRAINED TRIAXIAL TESTING Geotechnical | Environmental | Testing 5840 N. Gumwood Avenue Pharr, Texas 78577 Tel: 956-702-8500 Fax: 956-702-8140



Unconsolidated Undrained Test

ASTM D2850



Project: DMPA 8 Levee Reconsruction
Project Number: 02-23-29125
Sampling Date: S-5
Sample Number: S-5
Sample Depth: B-1 @ 10
Location: Brownsville, Cameron County, Texas
Client Name: Port of Brownsville
Remarks: Remolded



Unconsolidated Undrained Test

ASTM D2850

Pofoso Tock				Specimer	n Numbei			
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		24.000						
Height (in)		6.0547						
Diameter (in)		2.8077						
Water Content (%)		38.35						
Wet Density (Units)								
Dry Density (pcf)		87.65						
Saturation (%)		111.29						
Degree of Saturation (%)								
Void Ratio		0.937						
Height To Diameter Ratio		2.156						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		27.431						
o1 at Failure (psi)		51.431						
o3 at Failure (psi)		24.000						
Rate of Strain (in/min)		0.060547						
Axial Strain at Failure (%)		11.999						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		38.35						

Project: DMPA 8 Levee Reconsruction

Project Number: 02-23-29125

Sampling Date: S-5

Sample Number: S-5

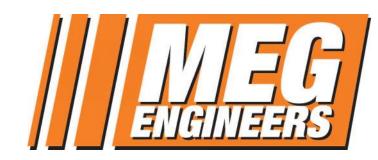
Sample Depth: B-1 @ 10

Location: Brownsville, Cameron County, Texas

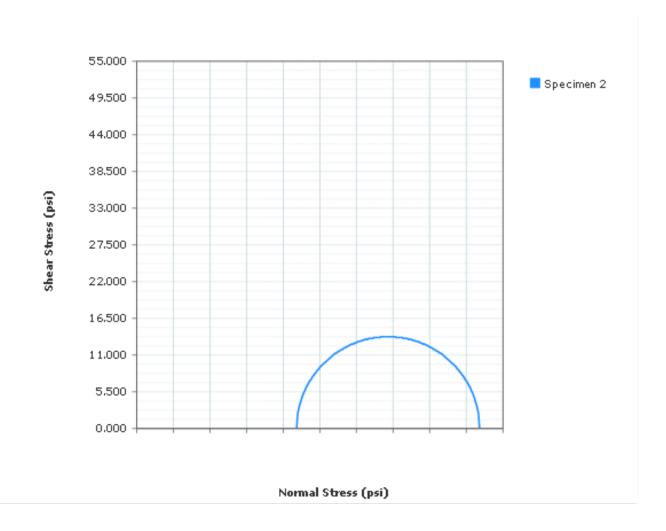
Client Name: Port of Brownsville

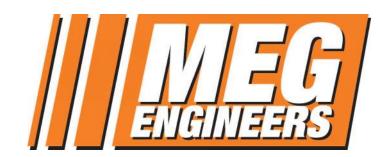
Project Remarks: Remolded

Specimen I	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8	
Failure Sketch								
r	F	FI	Li	F	Li	F	F	1
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<u>ii</u>	i ii	ii	<u> </u>	<u>ii</u>	Li	L	i i	Ĺ

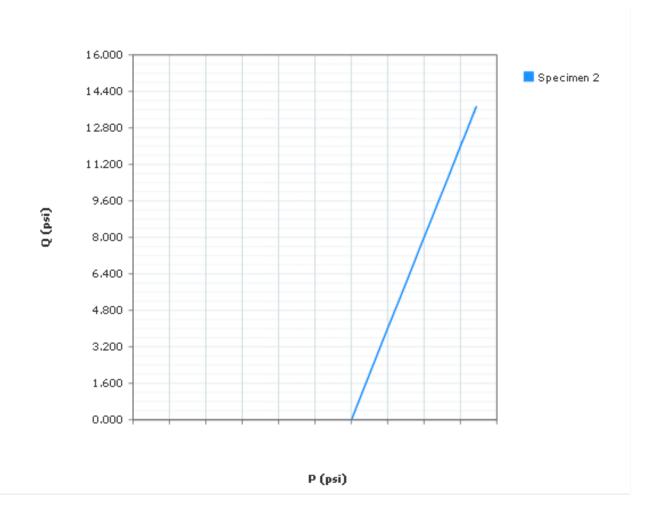


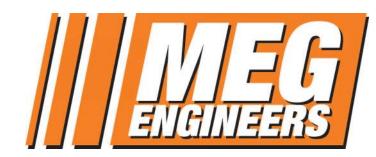
Mohr Circles (Total Stress) Graph



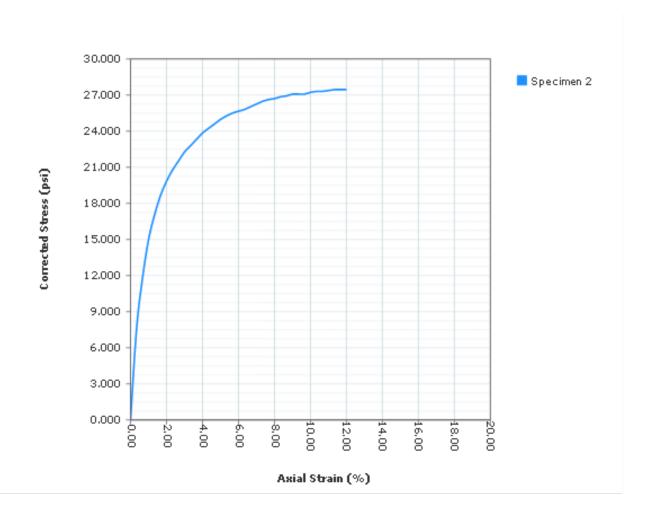


PQ Graph



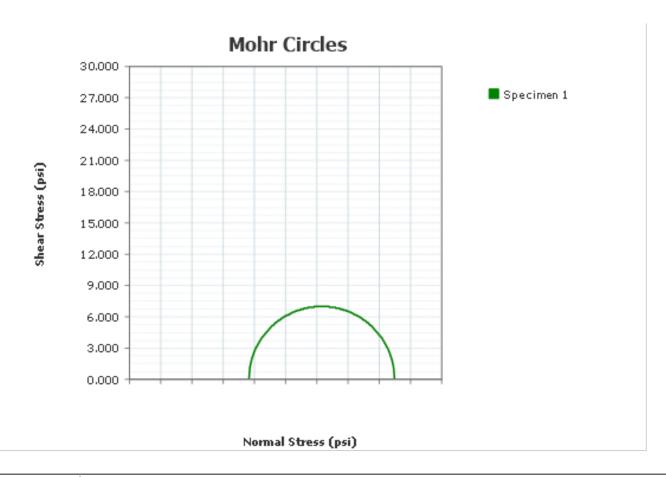


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction	
Project Number:	02-23-29125	
Sampling Date:		
Sample Number:	S-7	
Sample Depth:	B-1 @ 15	
Location:	Brownsville, Cameron County, Texas	
Client Name:	Port of Brownsville	
Remarks:		



Unconsolidated Undrained Test

Dofous Tost				Specimer	n Number	A -		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	11.470							
Height (in)	6.0370							
Diameter (in)	2.7463							
Water Content (%)	28.45							
Wet Density (Units)								
Dry Density (pcf)	91.87							
Saturation (%)	91.23							
Degree of Saturation (%)								
Void Ratio	0.848							
Height To Diameter Ratio	2.198							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	13.969							
o1 at Failure (psi)	25.439							
σ3 at Failure (psi)	11.470							
Rate of Strain (in/min)	0.06037							
Axial Strain at Failure (%)	12.703							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	28.45							

Final Water Content (%)	28.45					
Project:	DMPA 8 Le	vee Reconstr	uction				
Project Number:	02-23-29125						
Sampling Date:							
Sample Number:	S-7						
Sample Depth:	B-1 @15						
Location:	Brownsville	e, Cameron C	ounty, Texas				
Client Name:	Port of Brov	vnsville					
Project Remarks:							
Specimen 1 Specim	en 2 S ₁	pecimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch Failure S	ketch Fai	lure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch

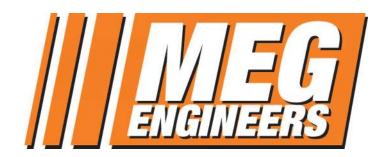


Unconsolidated Undrained Test

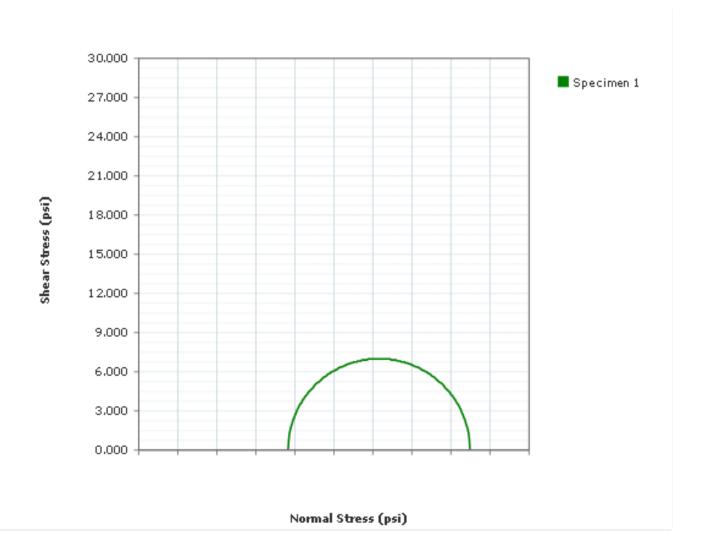
ASTM D2850

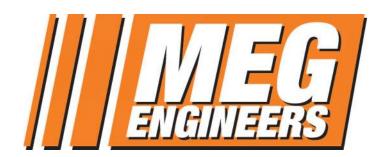
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/4/2023 2:44:52 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-1	Specimen Lab #:	S-7
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	17	Liquid Limit:	34
Height (in):	6.0370	Diameter (in):	2.7463
Area (in²):	5.924	Volume (in³):	35.7617
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1107.8		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

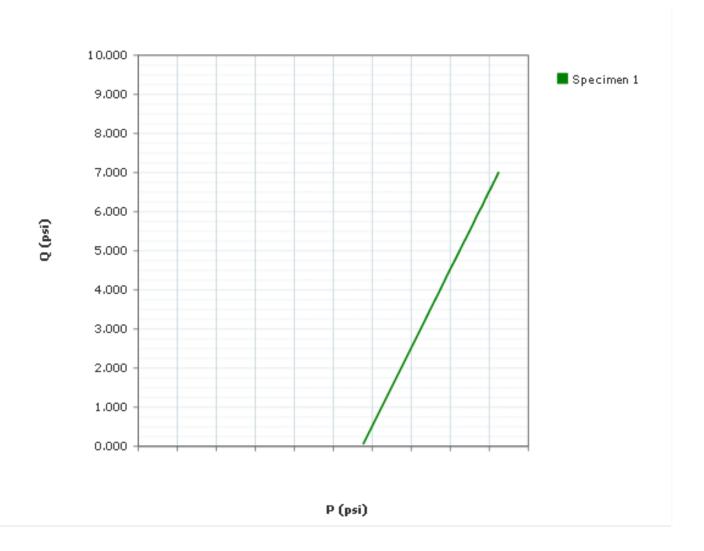


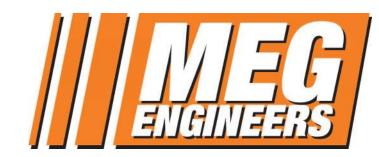
Mohr Circles (Total Stress) Graph



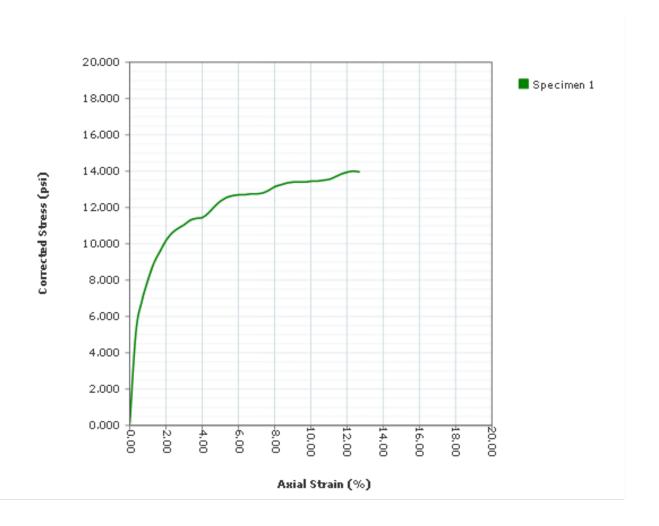


PQ Graph



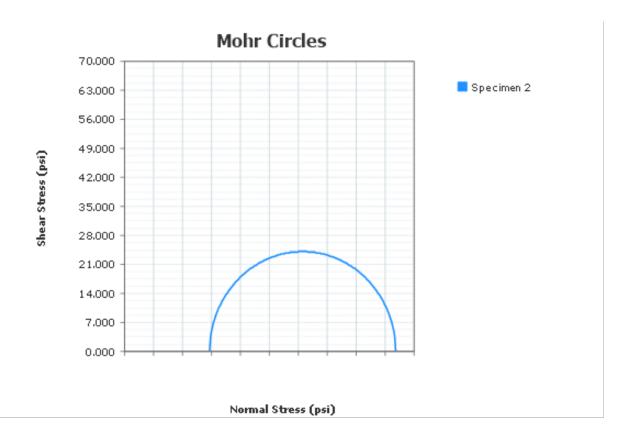


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-9
Sample Depth:	B-1 @ 25
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



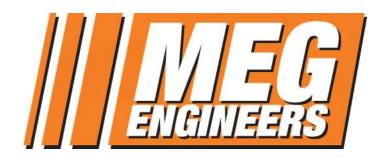
Unconsolidated Undrained Test

ASTM D2850

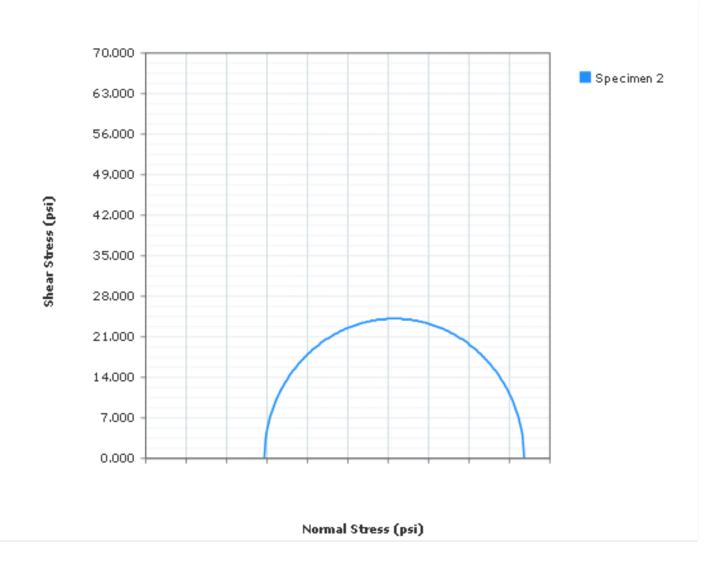
Pofoso Tost				Specimer	n Numbei	:		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		21.990						
Height (in)		5.9720						
Diameter (in)		2.7783						
Water Content (%)		37.17						
Wet Density (Units)								
Dry Density (pcf)		96.17						
Saturation (%)		132.05						
Degree of Saturation (%)								
Void Ratio		0.766						
Height To Diameter Ratio		2.149						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		48.224						
o1 at Failure (psi)		70.214						
σ3 at Failure (psi)		21.990						
Rate of Strain (in/min)		0.05972						
Axial Strain at Failure (%)		14.200						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		37.17						

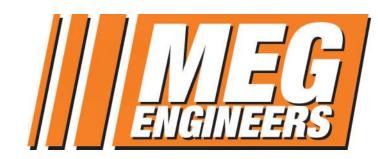
Project: DMPA 8 Levee Reconstruction Project Number: 02-23-29125 Sampling Date: Sample Number: S-9 Sample Depth: B-1 @25 Location: Brownsville, Cameron County, Texas Client Name: Port of Brownsville Project Remarks: Specimen 1 Specimen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8

| Failure Sketch |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Failure Sketch |
| <u> </u> | | | | | | | <u> </u> |

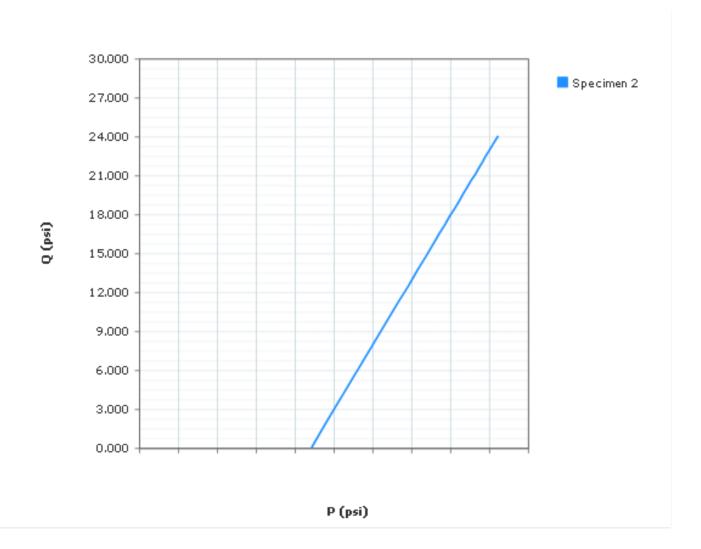


Mohr Circles (Total Stress) Graph



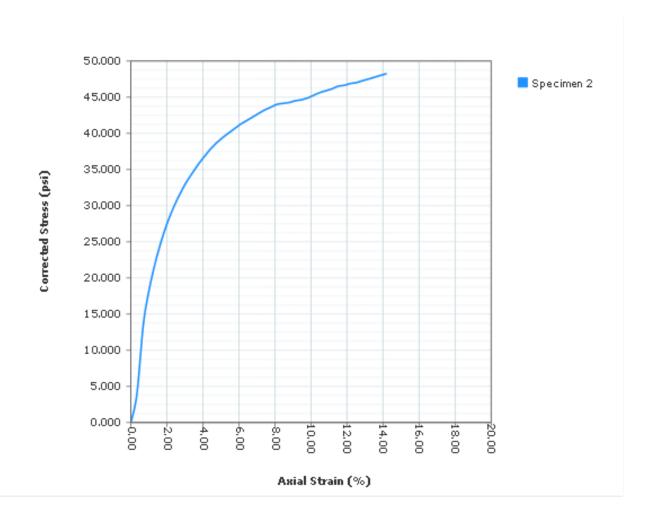


PQ Graph



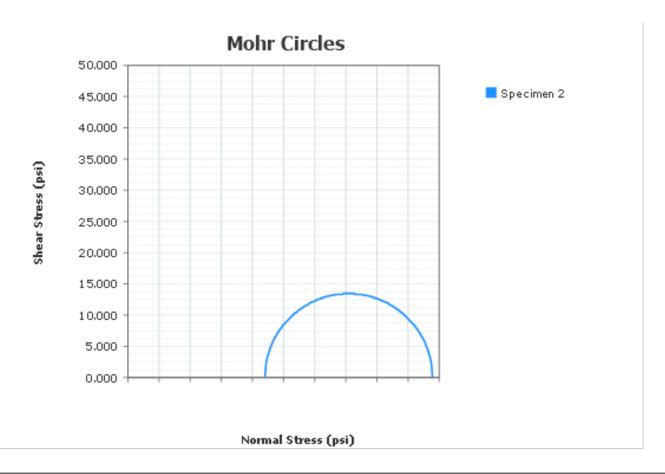


Stress-Strain Graph





Unconsolidated Undrained Test



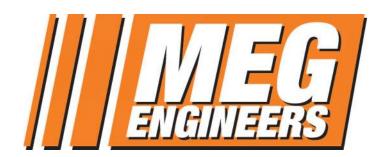
Project:	DMPA 8 Levee Reconstruction			
Project Number:	02-23-29125			
Sampling Date:				
Sample Number:	S-11			
Sample Depth:	B-1 @ 35			
Location:	Brownsville, Cameron County, Texas			
Client Name:	Port of Brownsville			
Remarks:				



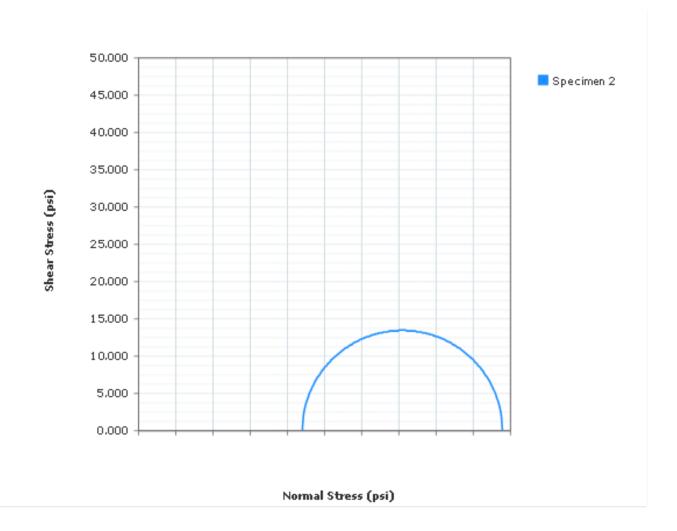
Unconsolidated Undrained Test

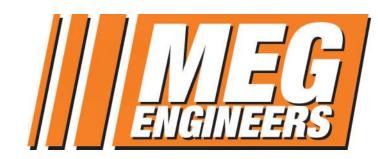
Pofoso Tock				Specimer	n Numbei	:		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		22.000						
Height (in)		4.6940						
Diameter (in)		2.7873						
Water Content (%)		16.28						
Wet Density (Units)								
Dry Density (pcf)		108.85						
Saturation (%)		79.08						
Degree of Saturation (%)								
Void Ratio		0.560						
Height To Diameter Ratio		1.684						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		26.897						
o1 at Failure (psi)		48.897						
o3 at Failure (psi)		22.000						
Rate of Strain (in/min)		0.04694						
Axial Strain at Failure (%)		15.175						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		16.28						

Axial Strain at Failure (<u>,</u> %)		15.175						
After Test		1	2	3	4	5	6	7	8
Final Water Content (%)		16.28						
		_							
Project:	DMPA 8 L	evee Reconsti	ruction						
Project Number:	02-23-2912	5							
Sampling Date:									
Sample Number:	S-11								
Sample Depth:	B-1 @ 35								
Location:	Brownsvill	le, Cameron C	County, Texas						
Client Name:	Port of Bro	wnsville							
Project Remarks:									
Specimen 1 Specim		Specimen 3	Specimen 4		Specimen 5	Specimen 6	Specim		Specimen 8
Failure Sketch Failure S	ketch Fa	ilure Sketch	Failure Sketc	h l	Failure Sketch	Failure Sketch	Failure S	ketch	Failure Sketch
					į	İ		- !!	
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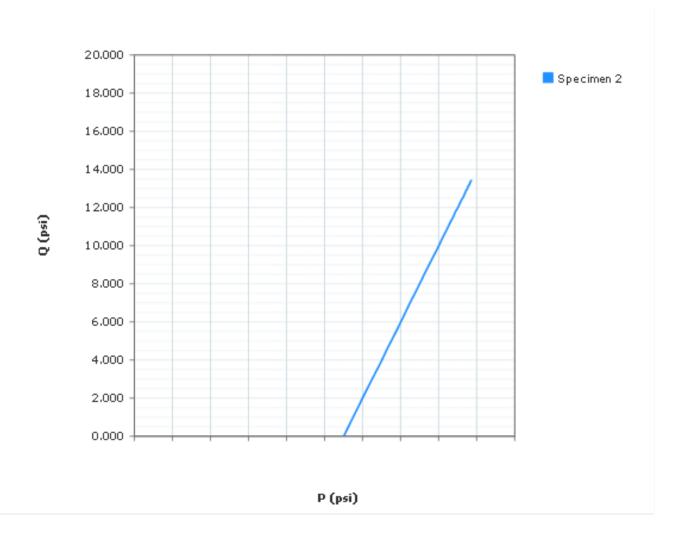


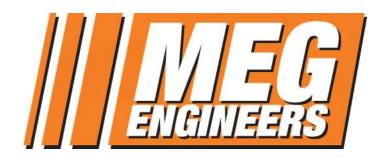
Mohr Circles (Total Stress) Graph



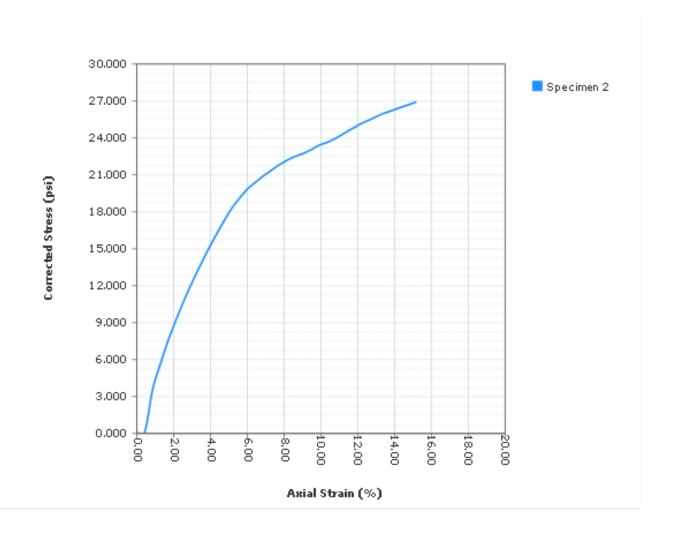


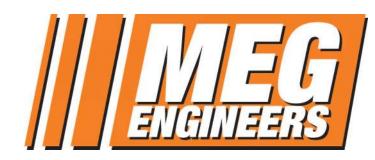
PQ Graph



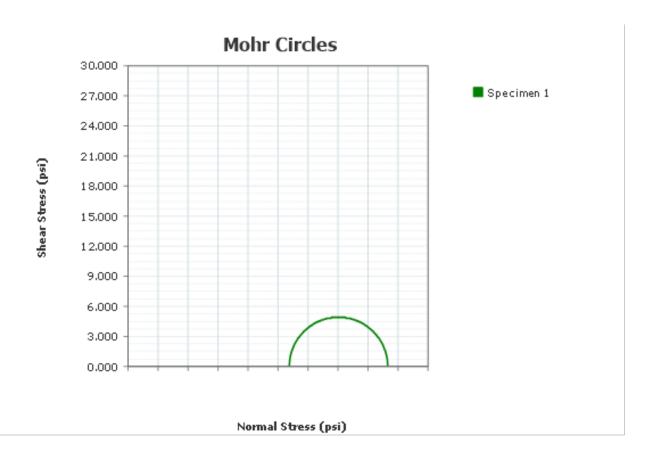


Stress-Strain Graph





Unconsolidated Undrained Test



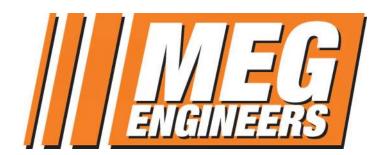
Project:	DMPA 8 Levee Reconstruction			
Project Number:	02-23-29125			
Sampling Date:				
Sample Number:	S-8			
Sample Depth:	B-2 @ 20'			
Location:	Brownsville, Cameron County, Texas			
Client Name:	Port of Brownsville			
Remarks:				



Unconsolidated Undrained Test

		Specimen Number						
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	16.120							
Height (in)	6.0953							
Diameter (in)	2.7540							
Water Content (%)	25.32							
Wet Density (Units)								
Dry Density (pcf)	97.52							
Saturation (%)	92.89							
Degree of Saturation (%)								
Void Ratio	0.741							
Height To Diameter Ratio	2.213							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	9.808							
o1 at Failure (psi)	25.928							
σ3 at Failure (psi)	16.120							
Rate of Strain (in/min)	0.060953							
Axial Strain at Failure (%)	11.588							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	25.32							

-/ : : :	<u> </u>	: :		
DMPA 8 Levee Reconstruction				
02-23-29125				
S-8				
B-2 @ 20'				
Brownsville, Cameron County, Texas				
Port of Brownsville				
nen 2 Specimen 3 Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Sketch Failure Sketch Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
	02-23-29125 S-8 B-2 @ 20' Brownsville, Cameron County, Texas Port of Brownsville	02-23-29125 S-8 B-2 @ 20' Brownsville, Cameron County, Texas Port of Brownsville en 2 Specimen 3 Specimen 4 Specimen 5	02-23-29125 S-8 B-2 @ 20' Brownsville, Cameron County, Texas Port of Brownsville en 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6	S-8 B-2 @ 20' Brownsville, Cameron County, Texas Port of Brownsville

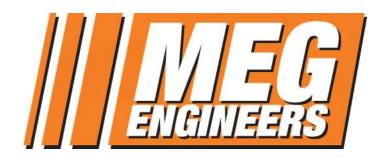


Unconsolidated Undrained Test

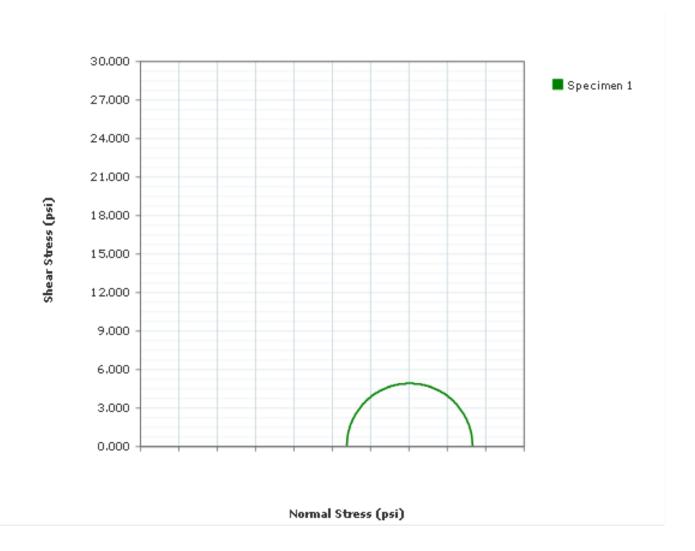
ASTM D2850

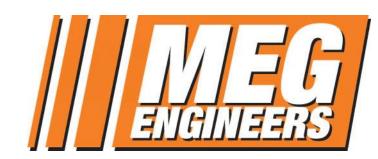
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/4/2023 5:17:34 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-2	Specimen Lab #:	S-8
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	23	Liquid Limit:	69
Height (in):	6.0953	Diameter (in):	2.7540
Area (in²):	5.957	Volume (in³):	36.3091
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1164.7		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

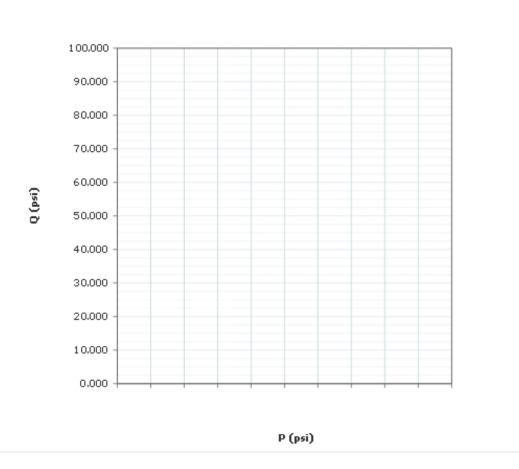


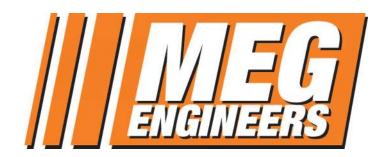
Mohr Circles (Total Stress) Graph



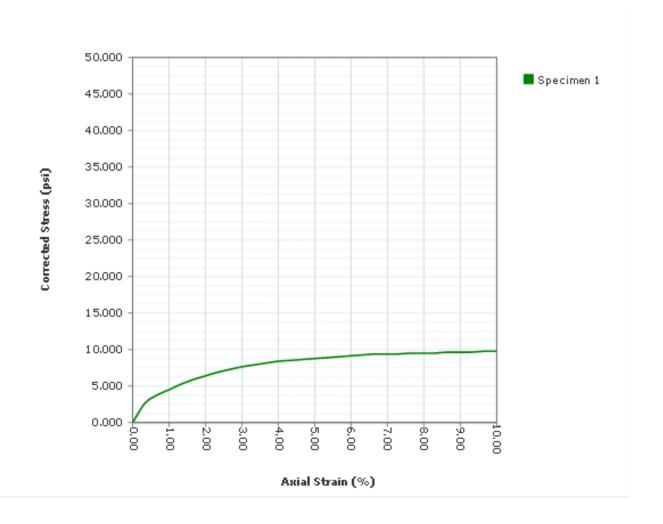


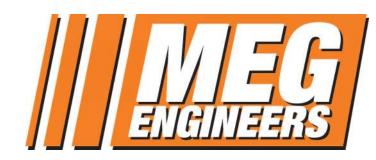
PQ Graph





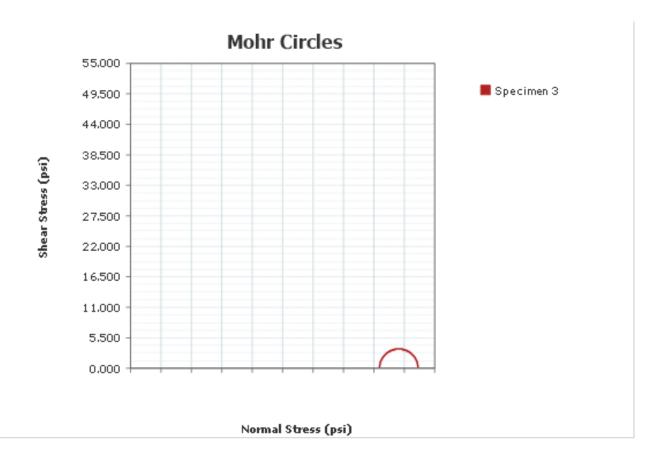
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



Project: DMPA 8 Levee Relocation
Project Number: 02-23-29125
Sampling Date: S-15
Sample Depth: B-2 @ 53-55
Location: Client Name: Port of Brownsville
Remarks: DMPA 8 Levee Relocation
Project: DMPA 8 Levee Relocation
DMPA 8 Levee Relocation
Portof Brownsville



Unconsolidated Undrained Test

ASTM D2850				Specimen	n Numbei	и		
Before Test	1	2	3	4	1 Mullibei 5	6	7	8
Membrane Thickness (in)	1		0.0010		<u> </u>	U	/	0
Initial Cell Pressure (psi)			45.000					
Height (in)			6.6420					
Diameter (in)			2.8000					
Water Content (%)			26.76					
Wet Density (Units)			200					
Dry Density (pcf)			97.66					
Saturation (%)			98.54					
Degree of Saturation (%)			00.01					
Void Ratio			0.739					
Height To Diameter Ratio			2.372					
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	-	_	6.980	-				
o1 at Failure (psi)			51.980					
o3 at Failure (psi)			45.000					
Rate of Strain (in/min)			0.065503					
Axial Strain at Failure (%)			14.888					
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)			26.76					

Project:	DMPA 8 Levee Relocation
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-15
Sample Depth:	B-2 @ 53-55
Location:	
Client Name:	Port of Brownsville
Project Remarks:	
Specimen 1 Specim	en 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8

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Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
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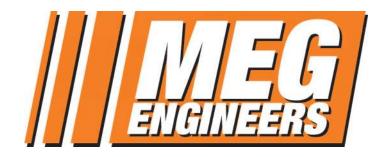


Unconsolidated Undrained Test

ASTM D2850

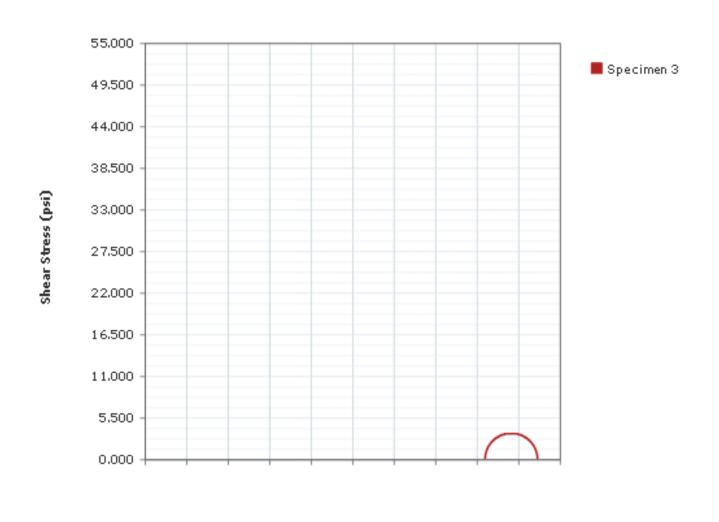
		Specimen 3	
Test Description:			
Other Associated Tests:			
Device Details:			
Test Specification:			
Test Time:	10/24/2023 9:46:54 PM		
Technician:		Sampling Method:	
Specimen Code:		Specimen Lab #:	
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limi	t:	Liquid Limit:	
Height (in):	6.6420	Diameter (in):	2.8000
Area (in²):	6.158	Volume (in³):	40.8983
Large Particle:			
Moisture Material:			
Moist Weight (g):	1329.0		
Test Remarks:			

Project Name: DMPA 8 Levee Relocation Project Number: 02-23-29125

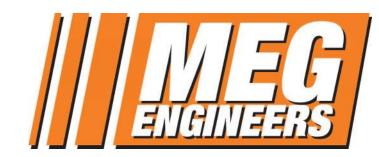


Mohr Circles (Total Stress) Graph

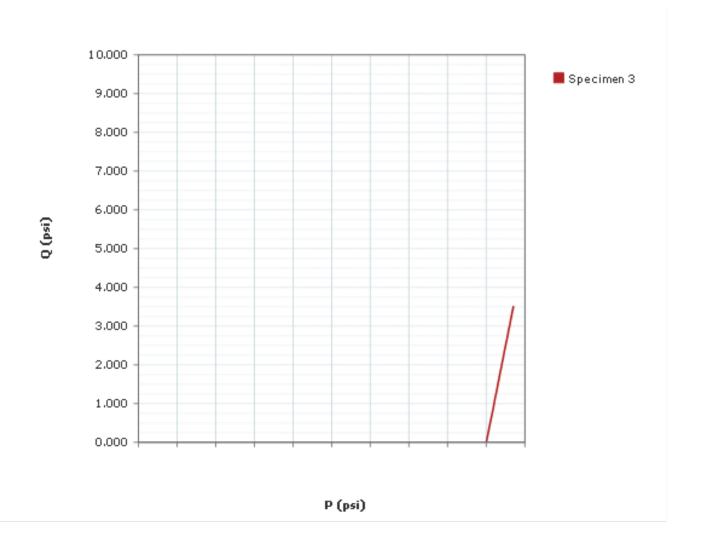
ASTM D2850

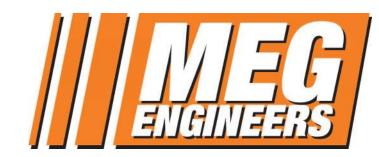


Normal Stress (psi)

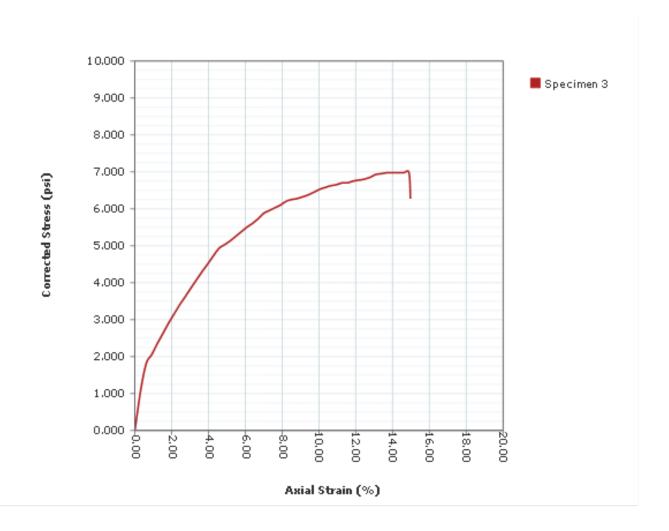


PQ Graph



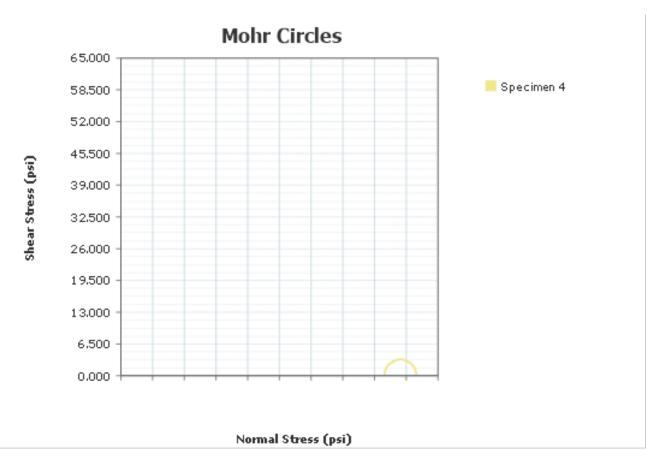


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Relocation
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-17
Sample Depth:	B-2 @ 63-65
Location:	
Client Name:	Port of Brownsville
Remarks:	



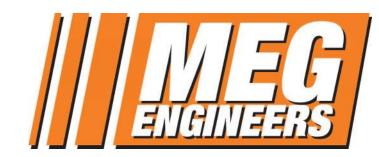
Unconsolidated Undrained Test

ASTM D2850

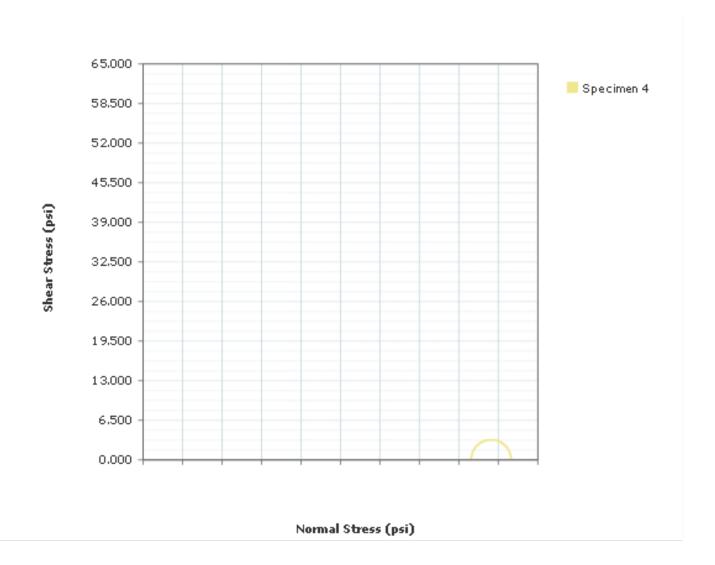
Defeue Teet	Specimen Number								
Before Test	1	2	3	4	5	6	7	8	
Membrane Thickness (in)				0.0010					
Initial Cell Pressure (psi)				54.000					
Height (in)				6.7657					
Diameter (in)				2.8140					
Water Content (%)				22.35					
Wet Density (Units)									
Dry Density (pcf)				102.26					
Saturation (%)				92.06					
Degree of Saturation (%)									
Void Ratio				0.660					
Height To Diameter Ratio				2.404					
Test Data	1	2	3	4	5	6	7	8	
Comp. Strength at Failure (psi)				6.515					
σ1 at Failure (psi)				60.515					
σ3 at Failure (psi)				54.000					
Rate of Strain (in/min)				0.067657					
Axial Strain at Failure (%)				13.422					
After Test	1	2	3	4	5	6	7	8	
Final Water Content (%)				22.35					

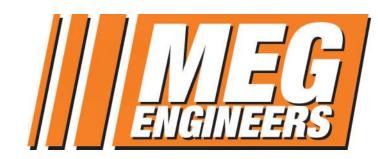
Project: DMPA 8 Levee Relocation Project Number: 02-23-29125 Sampling Date: Sample Number: S-17 Sample Depth: B-2 @ 63-65 Location: Client Name: Port of Brownsville Project Remarks: Specimen 1 Specimen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8

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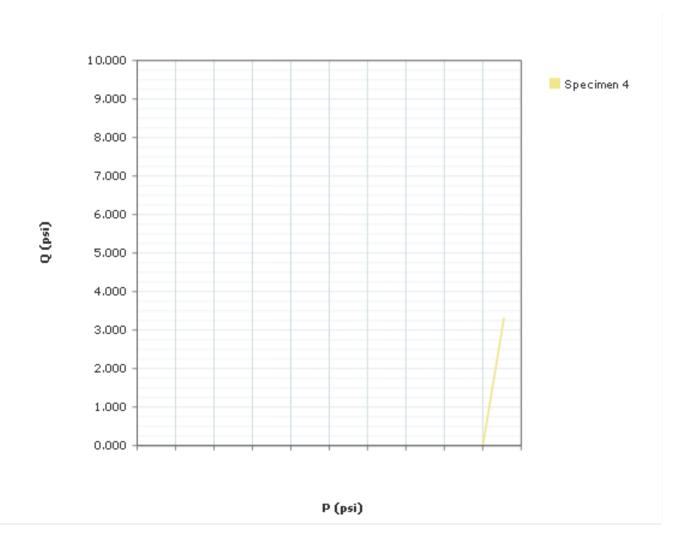


Mohr Circles (Total Stress) Graph



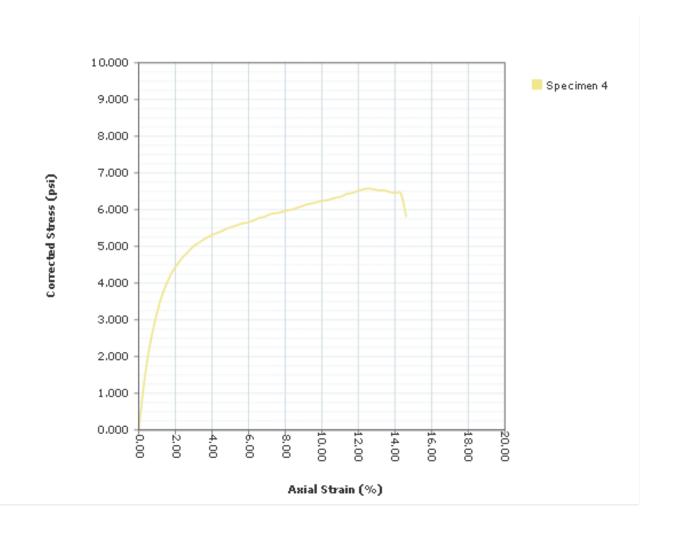


PQ Graph



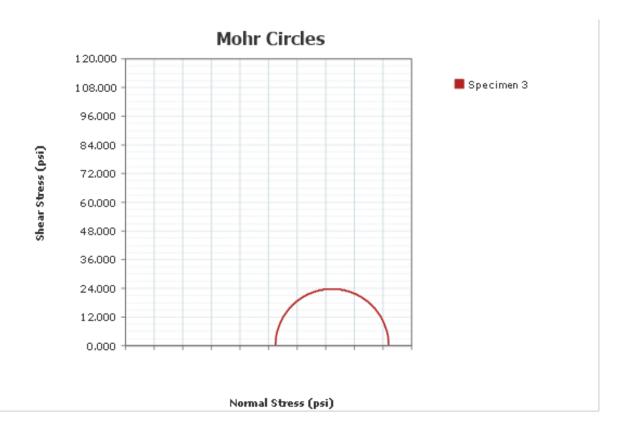


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-19
Sample Depth:	B-2 @75
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	

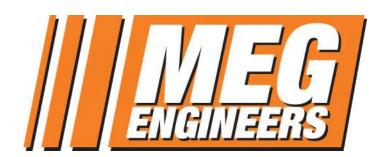


Unconsolidated Undrained Test

Refere Test	Specimen Number									
Before Test	1	2	3	4	5	6	7	8		
Membrane Thickness (in)			0.0010							
Initial Cell Pressure (psi)			62.850							
Height (in)			6.0463							
Diameter (in)			2.7760							
Water Content (%)			26.43							
Wet Density (Units)										
Dry Density (pcf)			96.73							
Saturation (%)			95.17							
Degree of Saturation (%)										
Void Ratio			0.755							
Height To Diameter Ratio			2.178							
Test Data	1	2	3	4	5	6	7	8		
Comp. Strength at Failure (psi)			47.477							
σ1 at Failure (psi)			110.327							
σ3 at Failure (psi)			62.850							
Rate of Strain (in/min)			0.060463							
Axial Strain at Failure (%)			8.010							
After Test	1	2	3	4	5	6	7	8		
Final Water Content (%)			26.43							

Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-19
Sample Depth:	B-2 @ 75
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Project Remarks:	
Specimen 1 Specim	

Specimen 1	Specimen 2	Specifien 5	Specimen 4	Specimen 5	Specimeno	Specimen 7	Specimen o
Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
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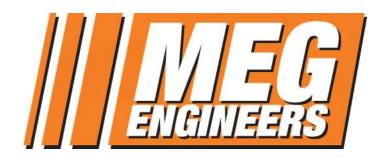


Unconsolidated Undrained Test

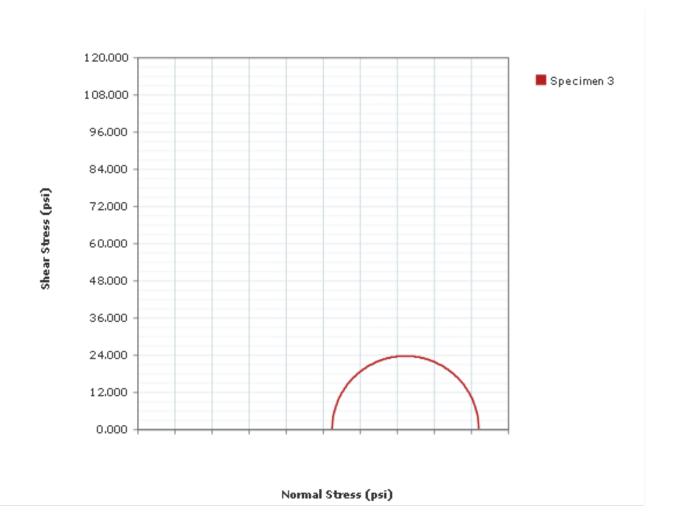
ASTM D2850

		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/4/2023 6:44:26 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-2	Specimen Lab #:	S-19
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	25	Liquid Limit:	69
Height (in):	6.0463	Diameter (in):	2.7760
Area (in²):	6.052	Volume (in³):	36.5949
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1174.8		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

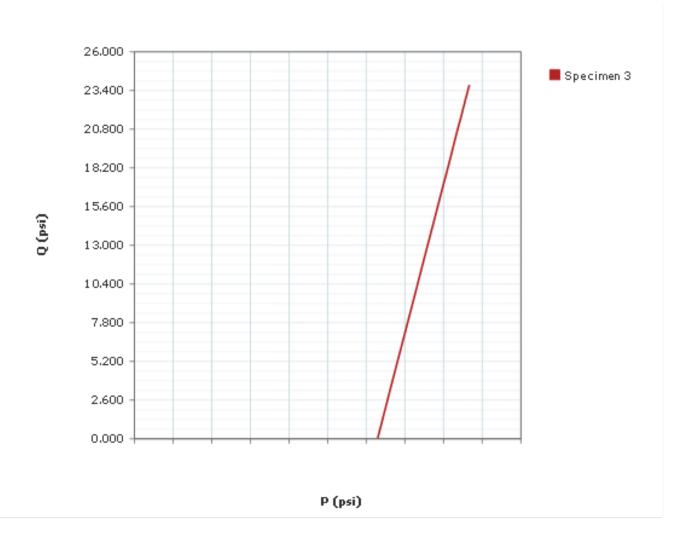


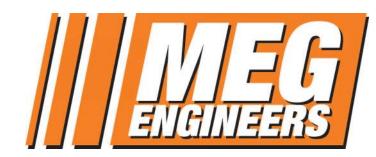
Mohr Circles (Total Stress) Graph



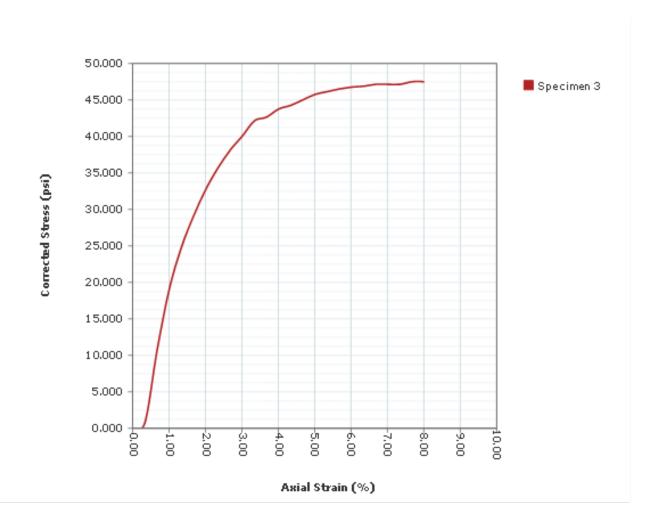
PQ Graph





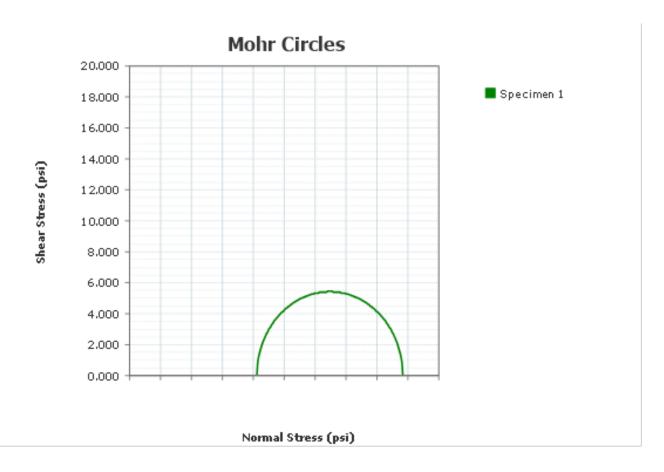


Stress-Strain Graph

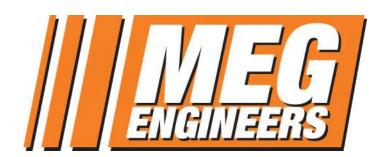




Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction					
Project Number:	02-23-29125					
Sampling Date:						
Sample Number:	S-6					
Sample Depth:	B-3 @ 13					
Location:	Brownsville, Cameron County, Texas					
Client Name:	Port of Brownsville					
Remarks:						



Unconsolidated Undrained Test

Dofoso Toot		Specimen Number								
Before Test	1	2	3	4	5	6	7	8		
Membrane Thickness (in)	0.0010									
Initial Cell Pressure (psi)	9.460									
Height (in)	6.0147									
Diameter (in)	2.7377									
Water Content (%)	34.42									
Wet Density (Units)										
Dry Density (pcf)	88.09									
Saturation (%)	100.93									
Degree of Saturation (%)										
Void Ratio	0.928									
Height To Diameter Ratio	2.197									
Test Data	1	2	3	4	5	6	7	8		
Comp. Strength at Failure (psi)	10.842									
o1 at Failure (psi)	20.302									
σ3 at Failure (psi)	9.460									
Rate of Strain (in/min)	0.060147									
Axial Strain at Failure (%)	10.066									
After Test	1	2	3	4	5	6	7	8		
Final Water Content (%)	34.42									

Axial Strain at Failure ((%)	10.066							
After Test		1	2	3	4	5	6	7	8
Final Water Content (%	5)	34.42							
Project:	DMPA 8 Le	evee Reconstr	uction						
Project Number:	02-23-29125	5							
Sampling Date:									
Sample Number:	S-6								
Sample Depth:	B-3 @ 13								
Location:	Brownsville	e, Cameron C	ounty, Texas						
Client Name:	Port of Brow	wnsville							
Project Remarks:									
Specimen 1 Specim	ien 2 S	Specimen 3	Specimen 4	l Sp	ecimen 5	Specimen 6	Specir	men 7	Specimen 8
Failure Sketch Failure S	Sketch Fa	ilure Sketch	Failure Sket	ch Fail	ure Sketch	Failure Sketch	Failure	Sketch	Failure Sketch
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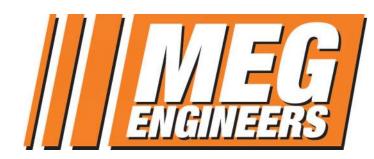


Unconsolidated Undrained Test

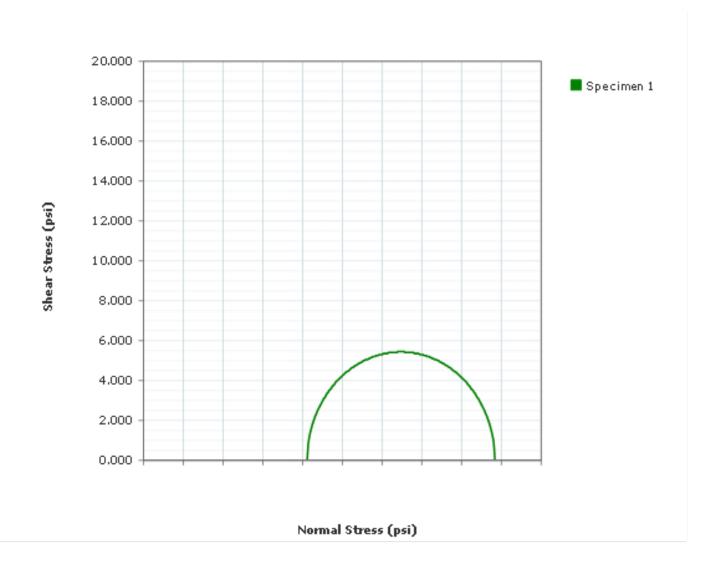
ASTM D2850

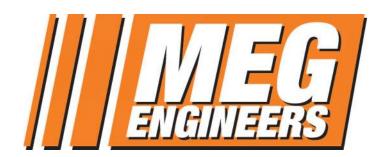
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/4/2023 4:21:07 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-3	Specimen Lab #:	S-6
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	6.0147	Diameter (in):	2.7377
Area (in²):	5.886	Volume (in³):	35.4048
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1100.5		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

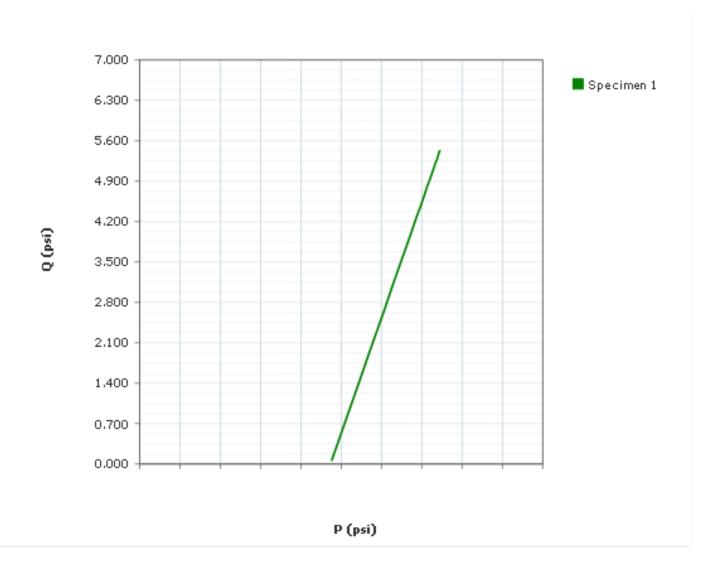


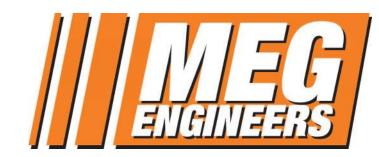
Mohr Circles (Total Stress) Graph



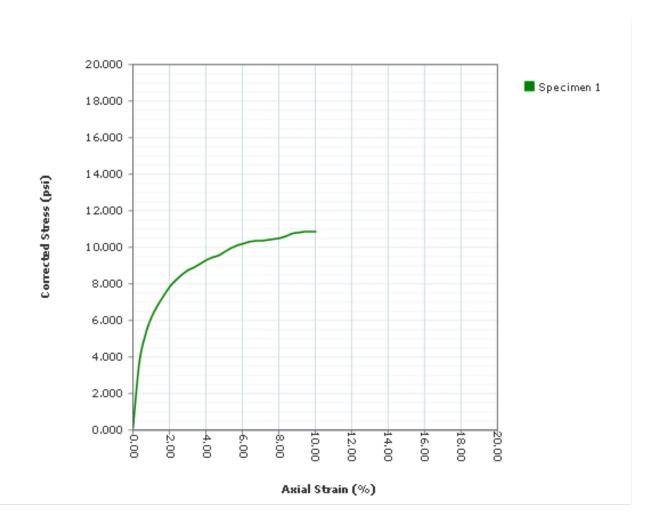


PQ Graph





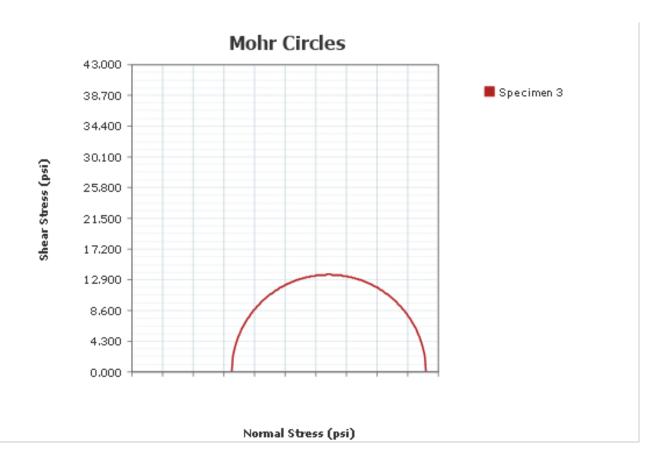
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



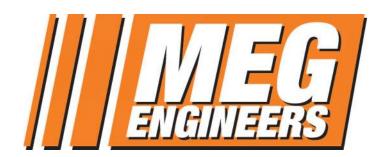
Project: DMPA 8 Levee Reconsruction
Project Number: 02-23-29125
Sampling Date: S-8
Sample Number: S-8
Sample Depth: B-3 @ 20
Location: Brownsville, Cameron County, Texas
Client Name: Port of Brownsville
Remarks: Remolded



Unconsolidated Undrained Test

Before Test	Specimen Number							
before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)			0.0010					
Initial Cell Pressure (psi)			14.000					
Height (in)			4.7890					
Diameter (in)			2.8027					
Water Content (%)			30.49					
Wet Density (Units)								
Dry Density (pcf)			94.72					
Saturation (%)			104.64					
Degree of Saturation (%)								
Void Ratio			0.793					
Height To Diameter Ratio			1.709					
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)			27.239					
σ1 at Failure (psi)			41.239					
σ3 at Failure (psi)			14.000					
Rate of Strain (in/min)			0.04789					
Axial Strain at Failure (%)			13.484					
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)			30.49					

Rate of Strain (III/ IIIII)			0.04769				
Axial Strain at Failure ((%)		13.484				
After Test	1	2	3	4	5	6 7	8
Final Water Content (%	5)		30.49				
Project:	DMPA 8 Levee Reconsr	uction					
Project Number:	02-23-29125						
Sampling Date:							
Sample Number:	S-8						
Sample Depth:	B-3 @ 20						
Location:	Brownsville, Cameron (County, Texas					
Client Name:	Port of Brownsville						
Project Remarks:	Remolded						
Specimen 1 Specim Failure Sketch Failure S		Specimen 4 Failure Sketo		cimen 5 re Sketch	Specimen 6 Failure Sketch	Specimen 7 Failure Sketch	Specimen 8 Failure Sketch

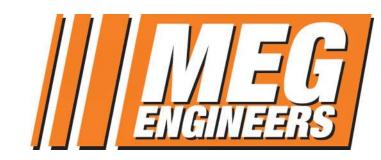


Unconsolidated Undrained Test

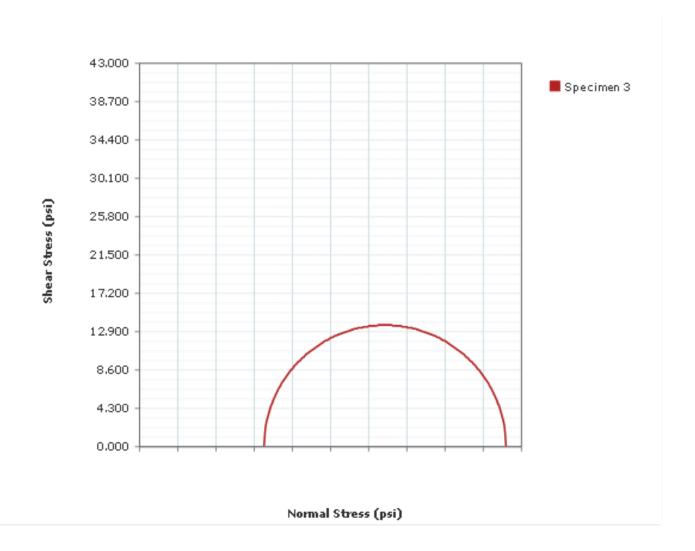
ASTM D2850

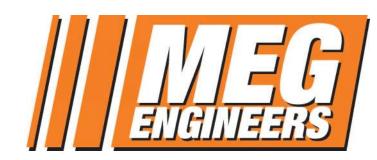
		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	11/3/2023 10:56:54 AM		
Technician:	MG	Sampling Method:	Remolded
Specimen Code:	B-3	Specimen Lab #:	S-8
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	4.7890	Diameter (in):	2.8027
Area (in²):	6.169	Volume (in³):	29.5446
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	958.6		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

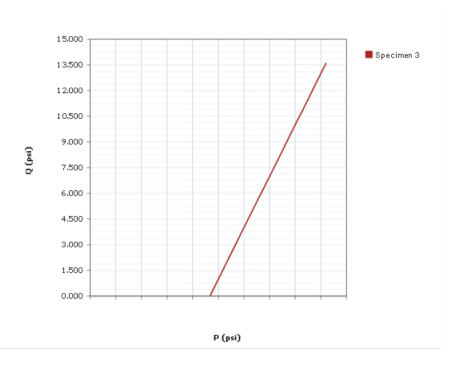


Mohr Circles (Total Stress) Graph



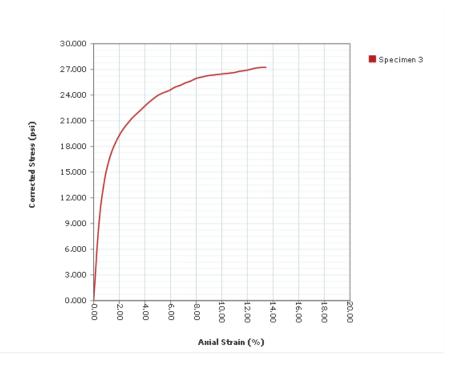


PQ Graph



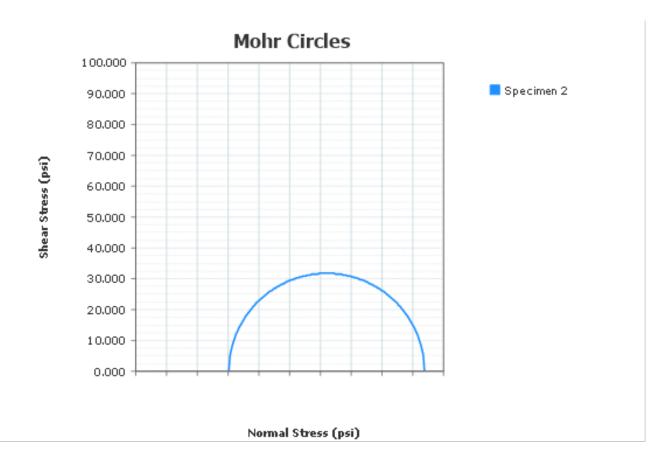


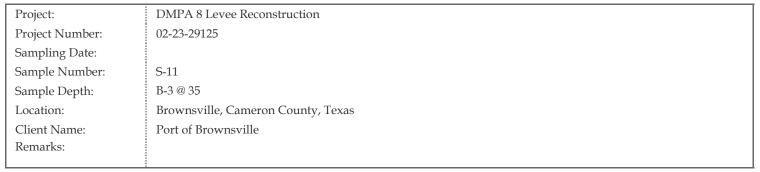
Stress-Strain Graph





Unconsolidated Undrained Test







Unconsolidated Undrained Test

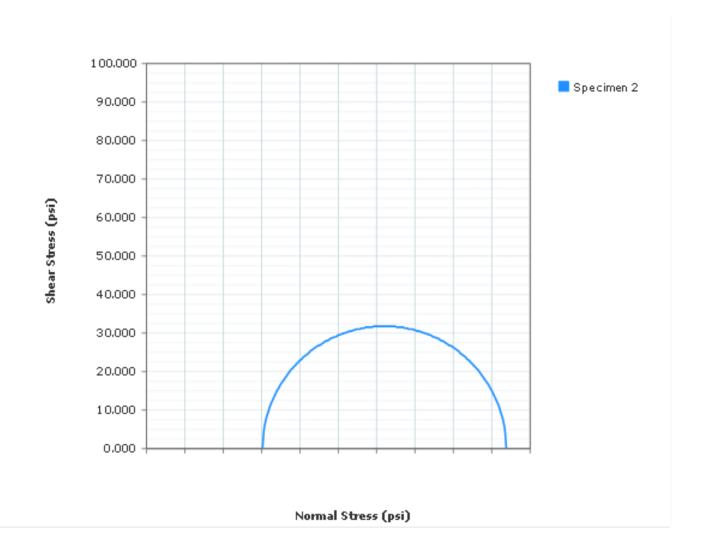
AS1M D2850	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		30.230						
Height (in)		6.1817						
Diameter (in)		2.7770						
Water Content (%)		23.90						
Wet Density (Units)								
Dry Density (pcf)		103.32						
Saturation (%)		101.05						
Degree of Saturation (%)								
Void Ratio		0.643						
Height To Diameter Ratio		2.226						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		63.311						
o1 at Failure (psi)		93.541						
σ3 at Failure (psi)		30.230						
Rate of Strain (in/min)		0.061817						
Axial Strain at Failure (%)		10.447						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		23.90						

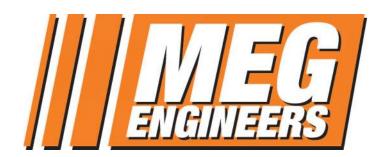
Project:		DMPA	8 Levee Reconstr	uction				
Project Number	:	02-23-2	9125					
Sampling Date:								
Sample Number	r:	S-11						
Sample Depth:		B-3 @ 3	5					
Location:		Browns	wille, Cameron C	ounty, Texas				
Client Name:		Port of	Brownsville					
Project Remarks	s:							
Specimen 1	Specim	en 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch	Failure S	ketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch

Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
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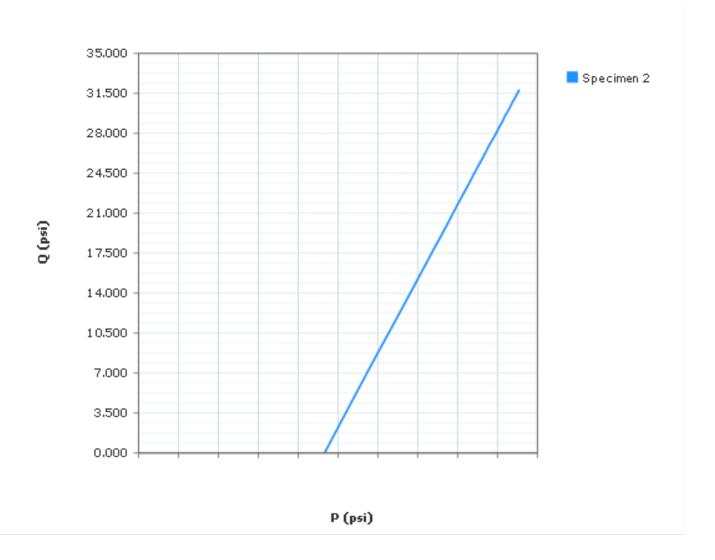


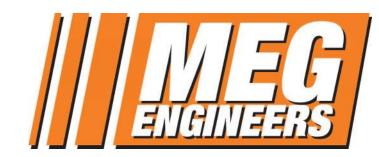
Mohr Circles (Total Stress) Graph



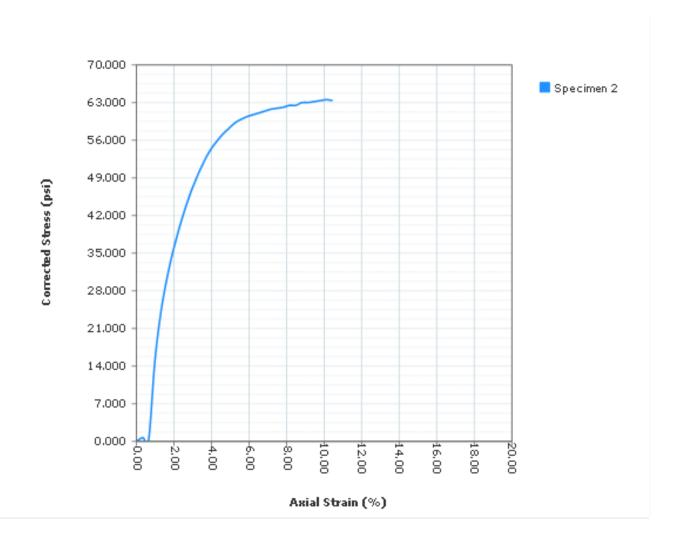


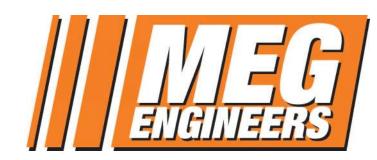
PQ Graph





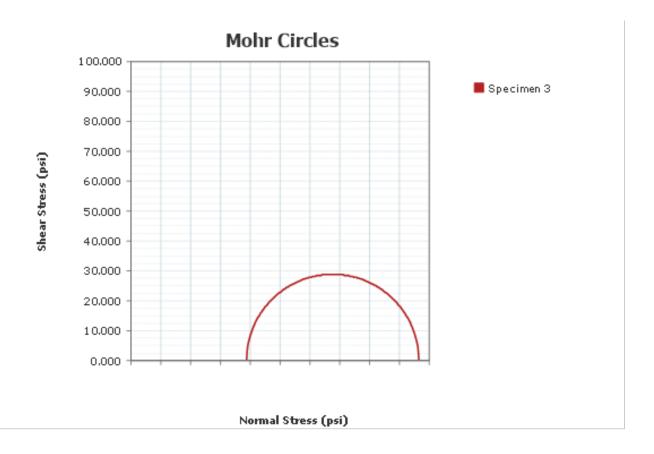
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



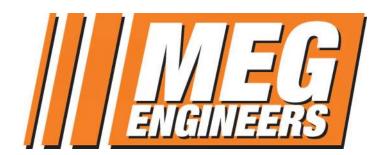
Project: DMPA 8 Levee Reconstruction
Project Number: 02-23-29125
Sampling Date: S-13
Sample Depth: B-3 @ 45
Location: Brownsville, Cameron County, Texas
Client Name: Port of Brownsville
Remarks: Port of Brownsville



Unconsolidated Undrained Test

Dofous Tost	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)			0.0010					
Initial Cell Pressure (psi)			38.720					
Height (in)			5.9157					
Diameter (in)			2.7770					
Water Content (%)			22.55					
Wet Density (Units)								
Dry Density (pcf)			103.41					
Saturation (%)			95.54					
Degree of Saturation (%)								
Void Ratio			0.642					
Height To Diameter Ratio			2.130					
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)			57.773					
σ1 at Failure (psi)			96.493					
σ3 at Failure (psi)			38.720					
Rate of Strain (in/min)			0.059157					
Axial Strain at Failure (%)			12.281					
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)			22.55					

That water Content (70	0) 22.00						
Project:	DMPA 8 Levee Reconstruction						
Project Number:	02-23-29125						
Sampling Date:							
Sample Number:	S-13						
Sample Depth:	B-3 @45						
Location:	Brownsville, Cameron County, Texas						
Client Name:	Port of Brownsville						
Project Remarks:							
Specimen 1 Specim	nen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8						
Failure Sketch Failure S	Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch						
ii							

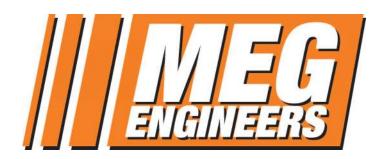


Unconsolidated Undrained Test

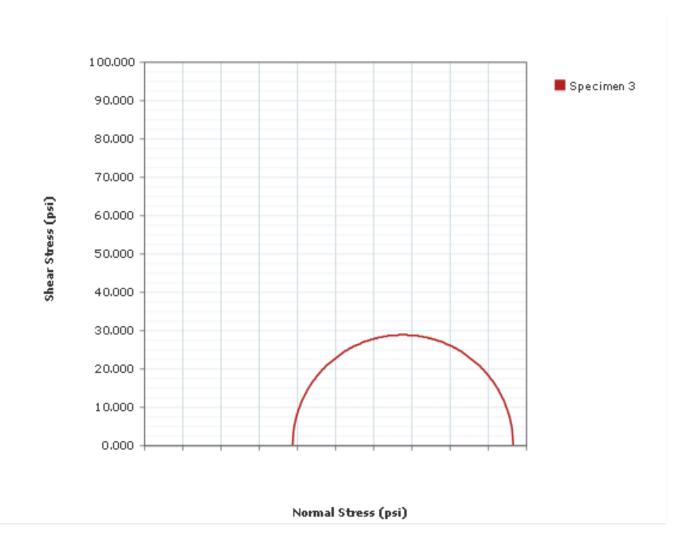
ASTM D2850

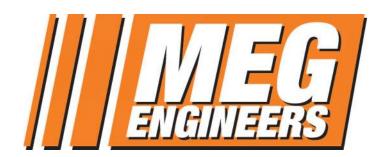
		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/7/2023 8:02:03 AM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-3	Specimen Lab #:	S-13
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.9157	Diameter (in):	2.7770
Area (in²):	6.057	Volume (in³):	35.8299
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1191.9		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

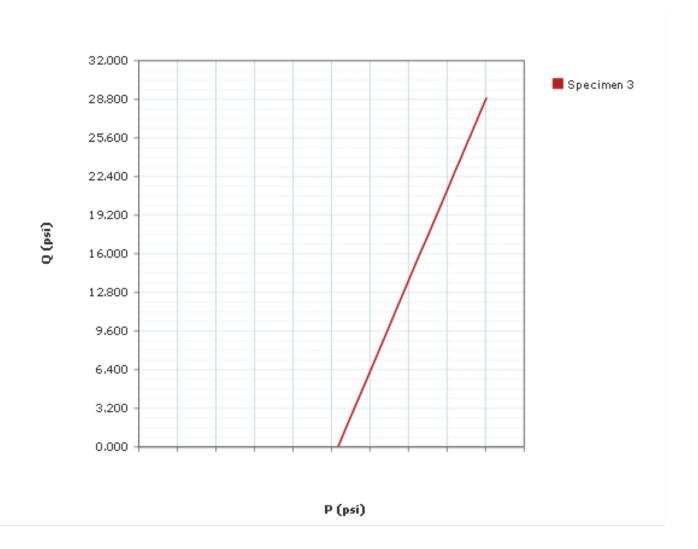


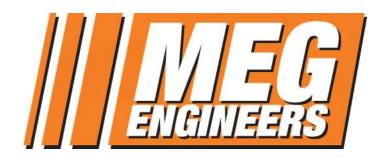
Mohr Circles (Total Stress) Graph



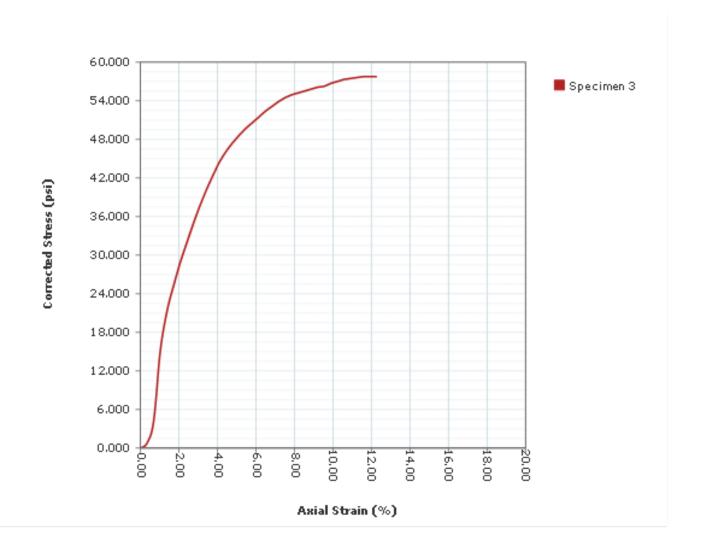


PQ Graph



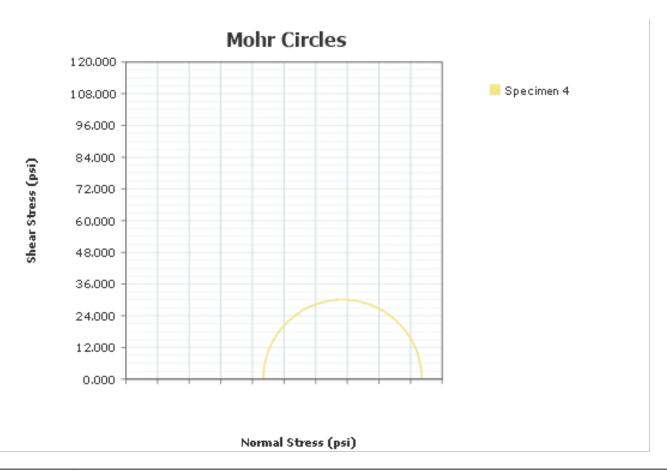


Stress-Strain Graph





Unconsolidated Undrained Test



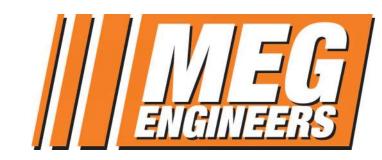
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-16
Sample Depth:	B-3 @ 60
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



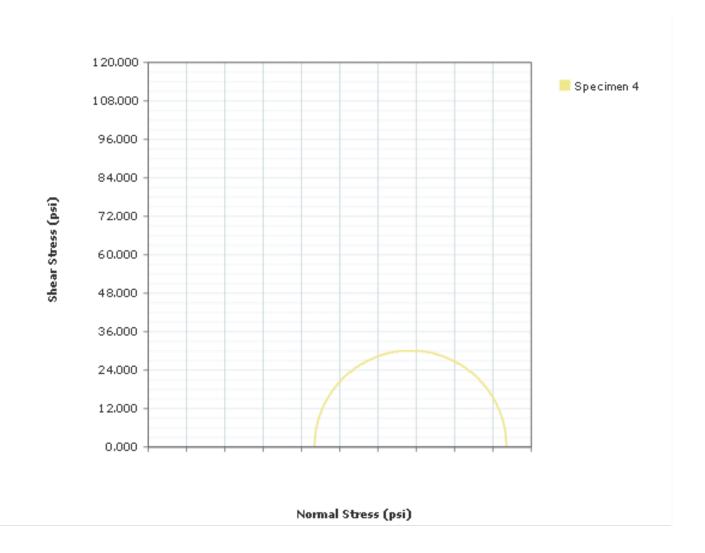
Unconsolidated Undrained Test

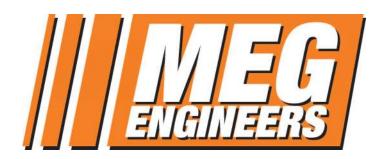
Dofono Toot				Specimen	Number	:		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)				0.0010				
Initial Cell Pressure (psi)				52.060				
Height (in)				5.6263				
Diameter (in)				2.7787				
Water Content (%)				23.69				
Wet Density (Units)								
Dry Density (pcf)				102.73				
Saturation (%)				98.69				
Degree of Saturation (%)								
Void Ratio				0.653				
Height To Diameter Ratio				2.025				
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)				60.157				
σ1 at Failure (psi)				112.217				
o3 at Failure (psi)				52.060				
Rate of Strain (in/min)				0.056263				
Axial Strain at Failure (%)				6.456				
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)				23.69				

After Test		1	2	3 4	5	6 7	8
Final Water Content (%	(a)			23.69			
Project:	DMPA 8	Levee Reconstr	uction				
Project Number:	02-23-291	25					
Sampling Date:							
Sample Number:	S-16						
Sample Depth:	B-3 @60						
Location:	Brownsvi	lle, Cameron C	ounty, Texas				
Client Name:	Port of Br	ownsville					
Project Remarks:							
Specimen 1 Specim		Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch Failure S	ketch I	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
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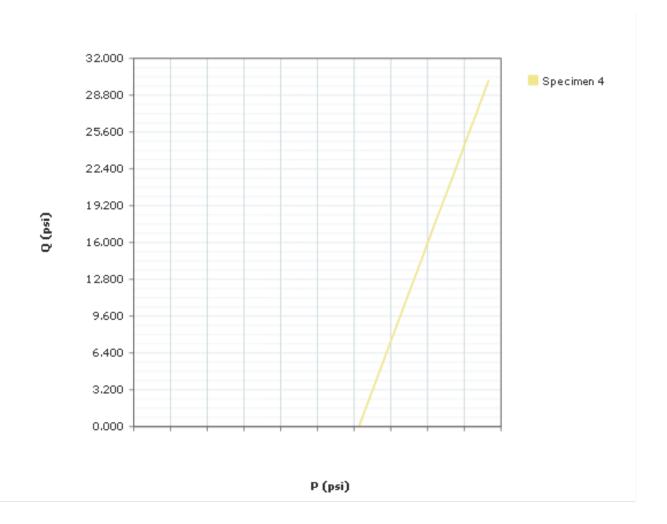


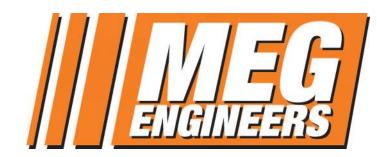
Mohr Circles (Total Stress) Graph



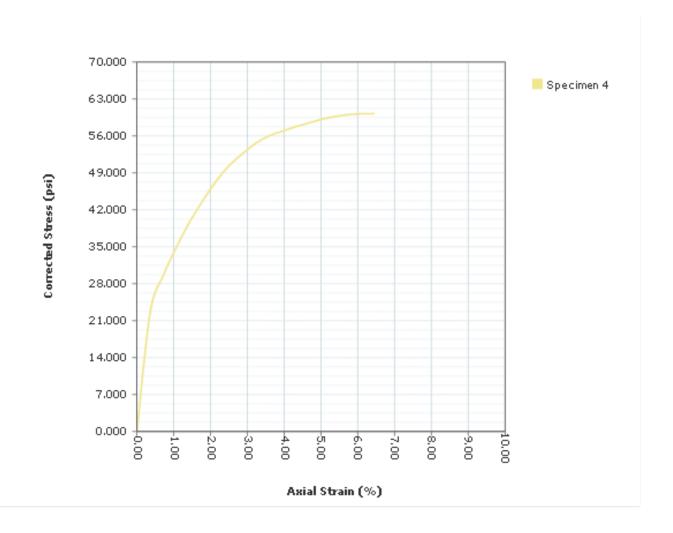


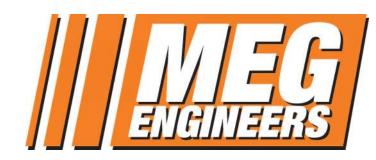
PQ Graph





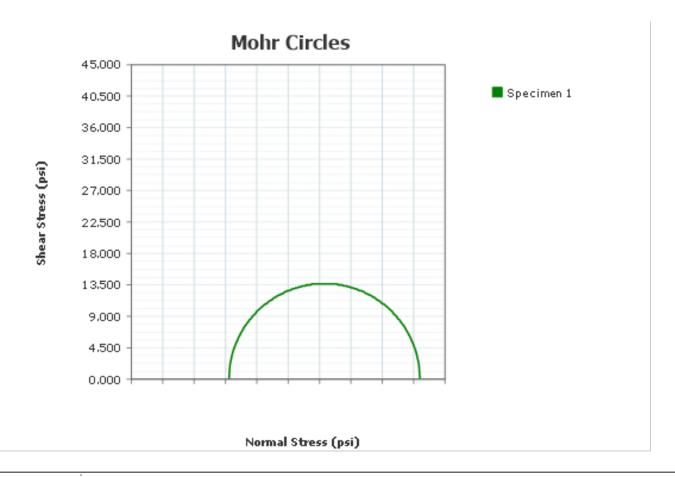
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



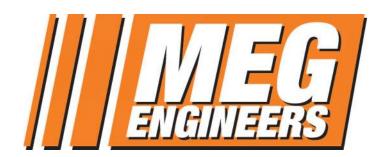
Project: DMPA 8 Levee Reconstruction
Project Number: 02-23-29125
Sampling Date: S-9
Sample Depth: B-4@25
Location: Brownsville, Cameron County, Texas
Client Name: Port of Brownsville
Remarks: Remolded



Unconsolidated Undrained Test

Pofovo Tock				Specimer	ı Numbei	a -		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	14.000							
Height (in)	5.1320							
Diameter (in)	2.8087							
Water Content (%)	36.17							
Wet Density (Units)								
Dry Density (pcf)	87.20							
Saturation (%)	103.87							
Degree of Saturation (%)								
Void Ratio	0.947							
Height To Diameter Ratio	1.827							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	27.385							
o1 at Failure (psi)	41.385							
o3 at Failure (psi)	14.000							
Rate of Strain (in/min)	0.05132							
Axial Strain at Failure (%)	15.177							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	36.17							

	, ; ; ;			<u> </u>		i
Project:	DMPA 8 Levee Reconstr	ruction				
Project Number:	02-23-29125					
Sampling Date:						
Sample Number:	S-9					
Sample Depth:	B-4 @ 25					
Location:	Brownsville, Cameron C	County, Texas				
Client Name:	Port of Brownsville					
Project Remarks:	Remolded					
Specimen 1 Specim	en 2 Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch Failure S	Sketch Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
1 \ 1						

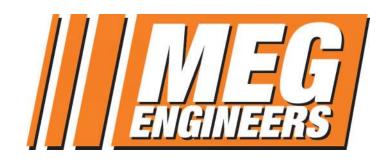


Unconsolidated Undrained Test

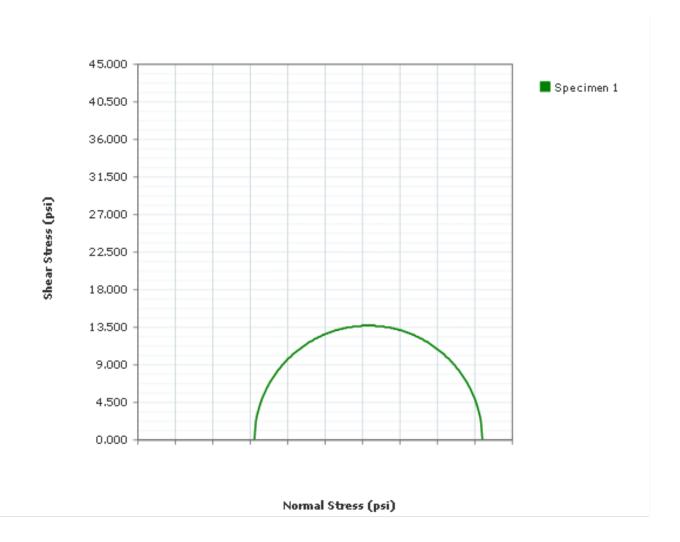
ASTM D2850

		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/28/2023 12:35:55 PM		
Technician:	MG	Sampling Method:	Remolded
Specimen Code:	B-4	Specimen Lab #:	S-9
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	20	Liquid Limit:	54
Height (in):	5.1320	Diameter (in):	2.8087
Area (in²):	6.196	Volume (in³):	31.7963
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	991.1		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

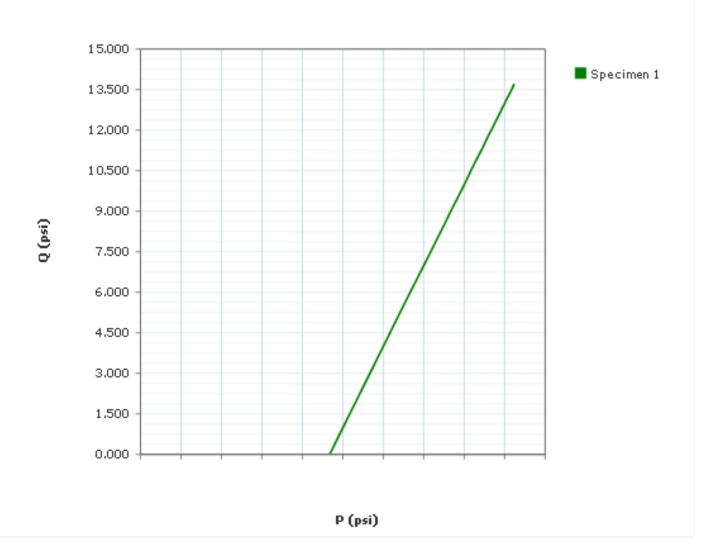


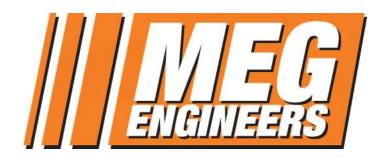
Mohr Circles (Total Stress) Graph



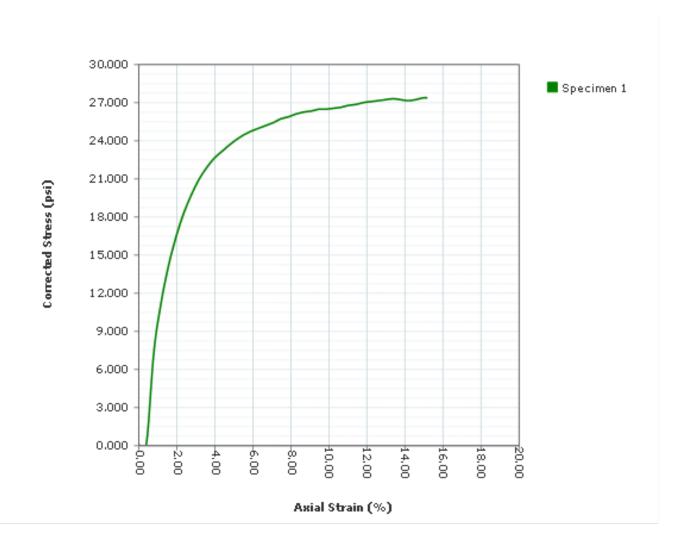


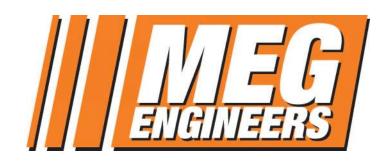
PQ Graph



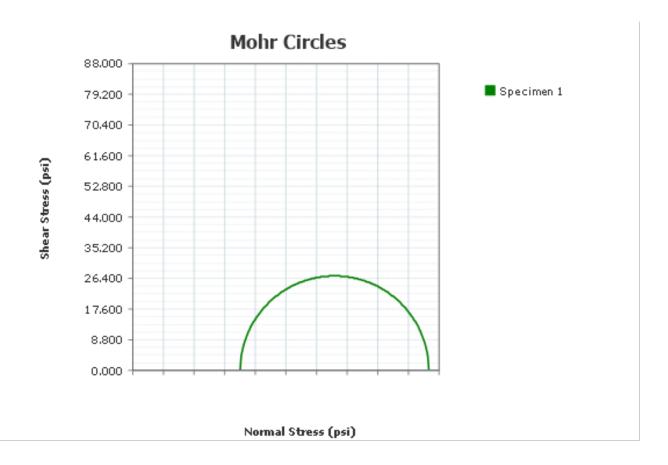


Stress-Strain Graph

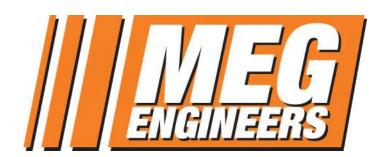




Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-11
Sample Depth:	B-4 @ 35
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

Defens Test				Specimer	n Number	4		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	30.830							
Height (in)	5.3257							
Diameter (in)	2.7827							
Water Content (%)	21.05							
Wet Density (Units)								
Dry Density (pcf)	107.88							
Saturation (%)	99.74							
Degree of Saturation (%)								
Void Ratio	0.574							
Height To Diameter Ratio	1.914							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	54.220							
o1 at Failure (psi)	85.050							
σ3 at Failure (psi)	30.830							
Rate of Strain (in/min)	0.053257							
Axial Strain at Failure (%)	15.157							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	21.05							

Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-11
Sample Depth:	B-4 @ 35
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Project Remarks:	
Specimen 1 Specim	en 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8

opecimen i	opecimen 2	opecinien 5	opecimen i	opeemieno	opecimieno	opecimen /	opecimen o
Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
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i	i i	i i	i i	i i	i i	i i	i i
!!!	1 1	!!!	1 1	!!!	1 1	1 1	1 1
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Unconsolidated Undrained Test

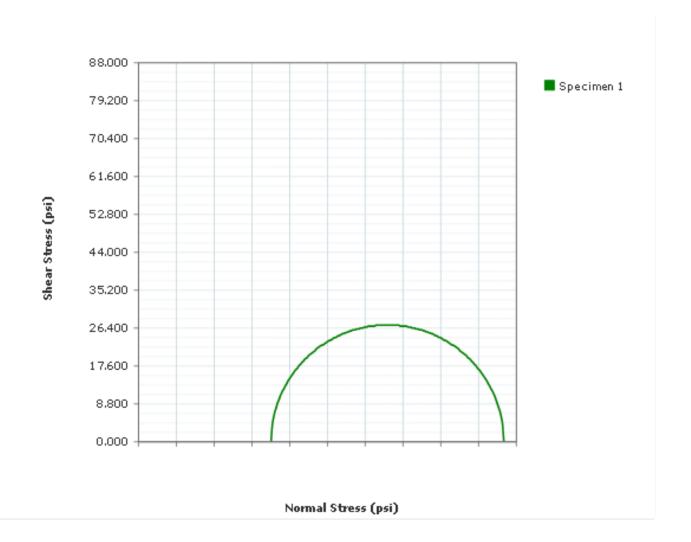
ASTM D2850

		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/7/2023 9:23:18 AM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-4	Specimen Lab #:	S-11
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.3257	Diameter (in):	2.7827
Area (in²):	6.082	Volume (in³):	32.3882
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1110.2		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

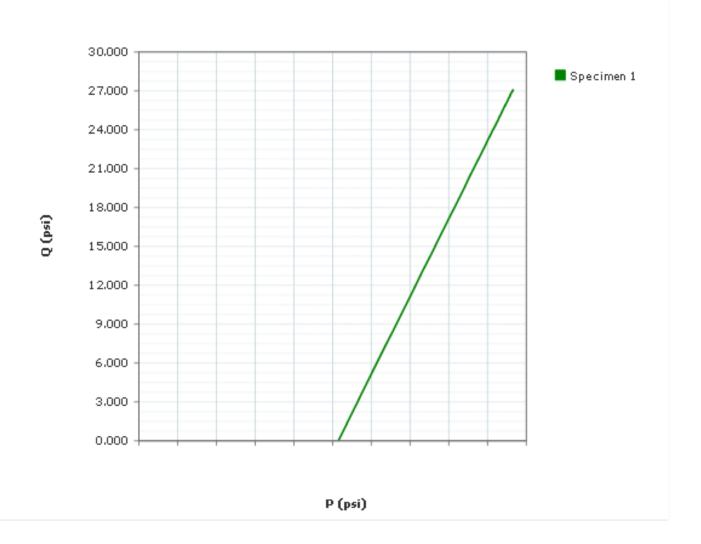


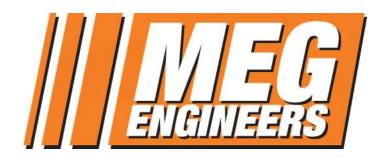
Mohr Circles (Total Stress) Graph



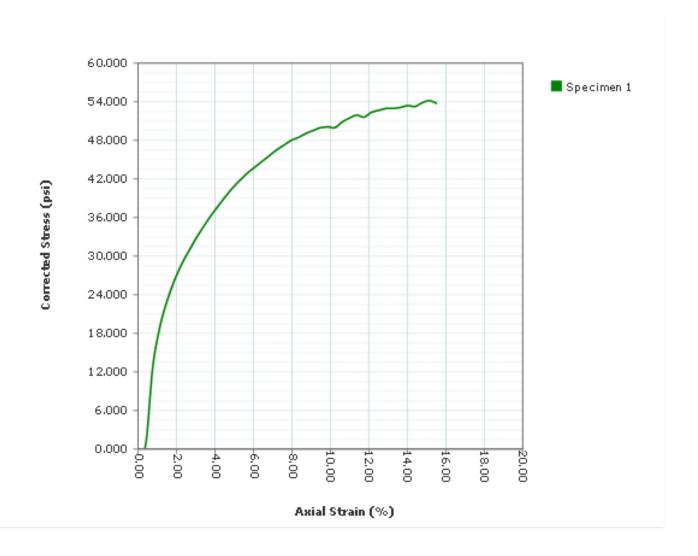


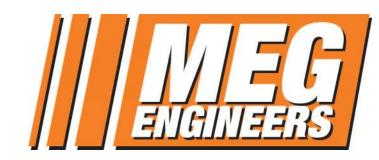
PQ Graph



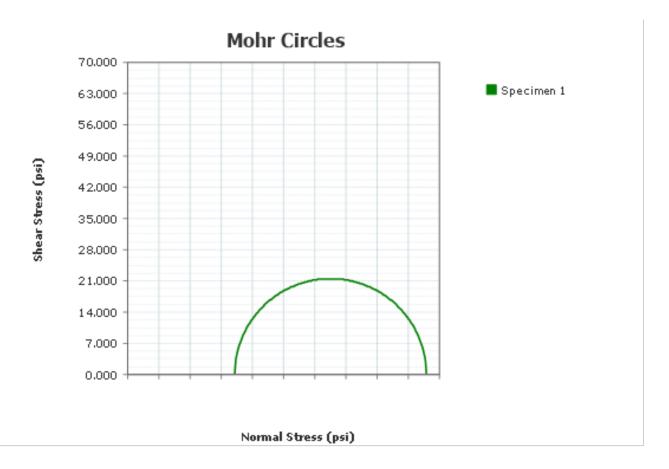


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-13
Sample Depth:	B-4 @ 45
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

Pofoso Tock				Specimer	n Number			
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	24.000							
Height (in)	4.7457							
Diameter (in)	2.7730							
Water Content (%)	21.35							
Wet Density (Units)								
Dry Density (pcf)	105.44							
Saturation (%)	95.13							
Degree of Saturation (%)								
Void Ratio	0.610							
Height To Diameter Ratio	1.711							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	43.014							
o1 at Failure (psi)	67.014							
σ3 at Failure (psi)	24.000							
Rate of Strain (in/min)	0.047457							
Axial Strain at Failure (%)	18.710							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	21.35							

Rate of Strain (in/min)		0.047457							
Axial Strain at Failure ((%)	18.710							
After Test		1	2	3	4	5	6	7	8
Final Water Content (%	5)	21.35							
Project:	DMPA 8 L	evee Reconsti	ruction						
Project Number:	02-23-2912	5							
Sampling Date:									
Sample Number:	S-13								
Sample Depth:	B-4 @ 45								
Location:	Brownsvill	e, Cameron C	County, Texas	s					
Client Name:	Port of Bro	wnsville							
Project Remarks:									
Specimen 1 Specim Failure Sketch Failure S		Specimen 3 ilure Sketch	Specimer Failure Ske		ecimen 5 ure Sketch	Specimen 6 Failure Sketo		imen 7 e Sketch	Specimen 8 Failure Sketch

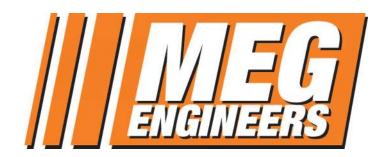


Unconsolidated Undrained Test

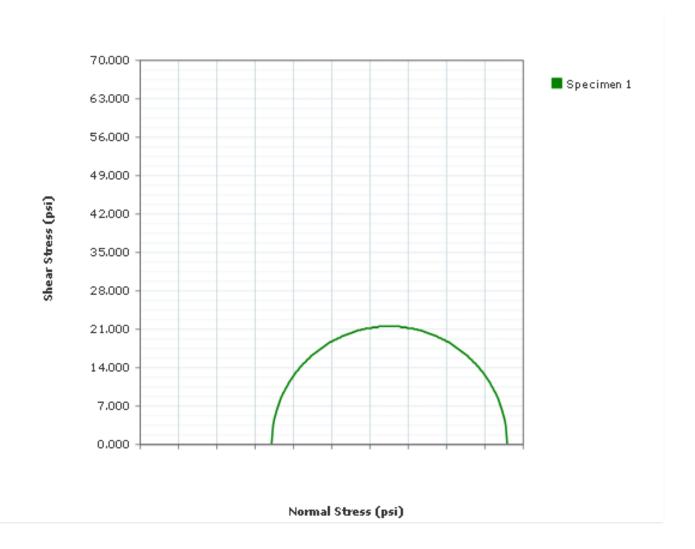
ASTM D2850

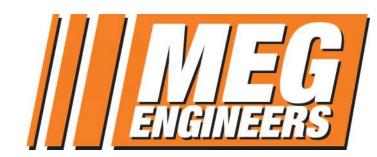
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	11/4/2023 9:45:10 AM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-4	Specimen Lab #:	S-13
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	4.7457	Diameter (in):	2.7730
Area (in²):	6.039	Volume (in³):	28.6607
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	962.6		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

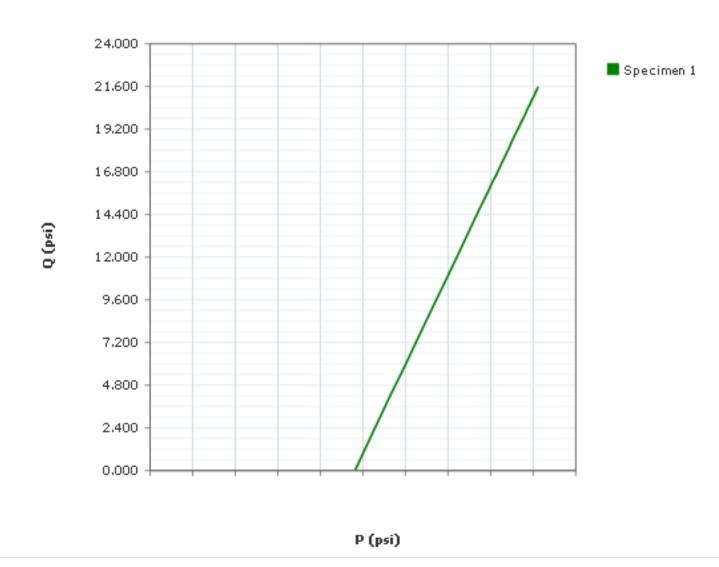


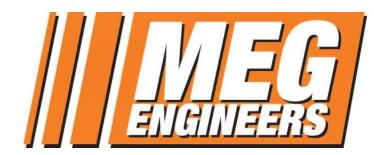
Mohr Circles (Total Stress) Graph



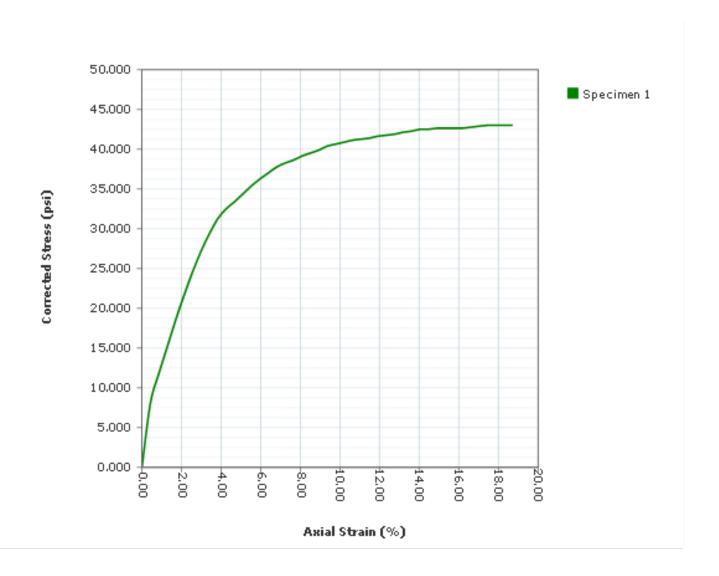


PQ Graph



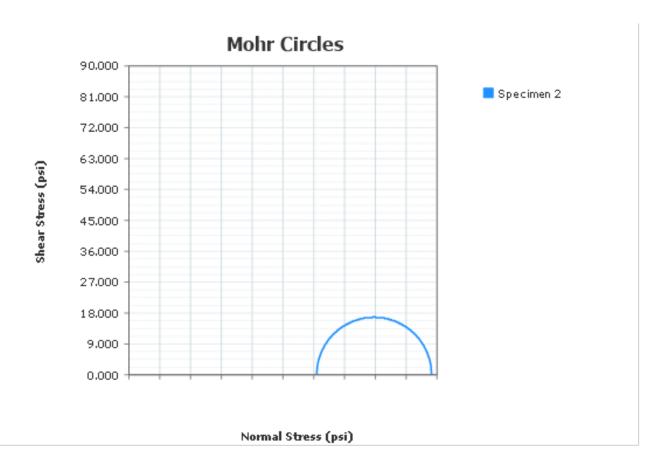


Stress-Strain Graph

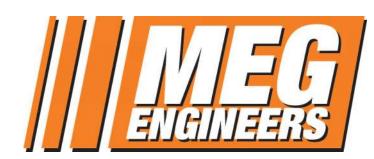




Unconsolidated Undrained Test



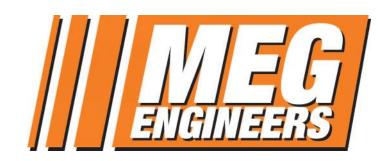
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-17
Sample Depth:	B-4 @ 65
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



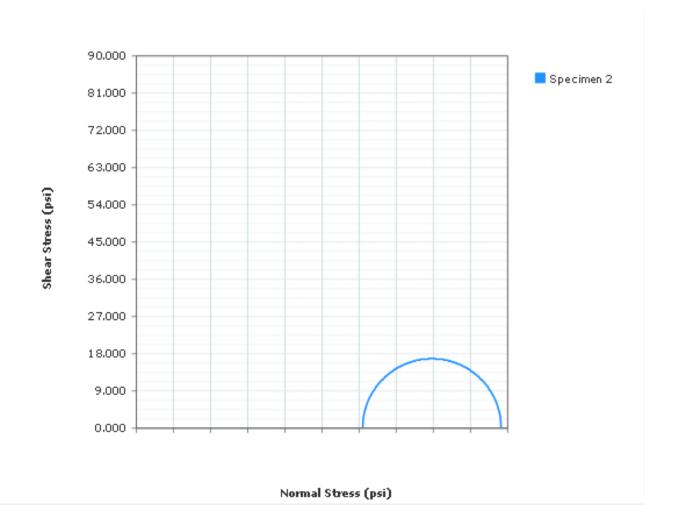
Unconsolidated Undrained Test

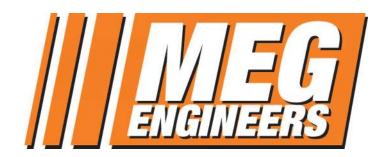
Defens Test				Specimer	n Number	•		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		54.830						
Height (in)		5.7490						
Diameter (in)		2.7777						
Water Content (%)		24.68						
Wet Density (Units)								
Dry Density (pcf)		98.94						
Saturation (%)		93.74						
Degree of Saturation (%)								
Void Ratio		0.716						
Height To Diameter Ratio		2.070						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		33.498						
σ1 at Failure (psi)		88.328						
o3 at Failure (psi)		54.830						
Rate of Strain (in/min)		0.05749						
Axial Strain at Failure (%)		12.644						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		24.68						

Axial Strain at Failure ((%)	12.644				
After Test	1	2	3 4	5	6 7	8
Final Water Content (%	(a)	24.68				
Project:	DMPA 8 Levee Recons	truction				
Project Number:	02-23-29125					
Sampling Date:						
Sample Number:	S-17					
Sample Depth:	B-4 @ 65					
Location:	Brownsville, Cameron	County, Texas				
Client Name:	Port of Brownsville					
Project Remarks:						
Specimen 1 Specim	en 2 Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch Failure S	Sketch Failure Sketch		Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
	$\supset \square$					
	-					
		<u> </u>				

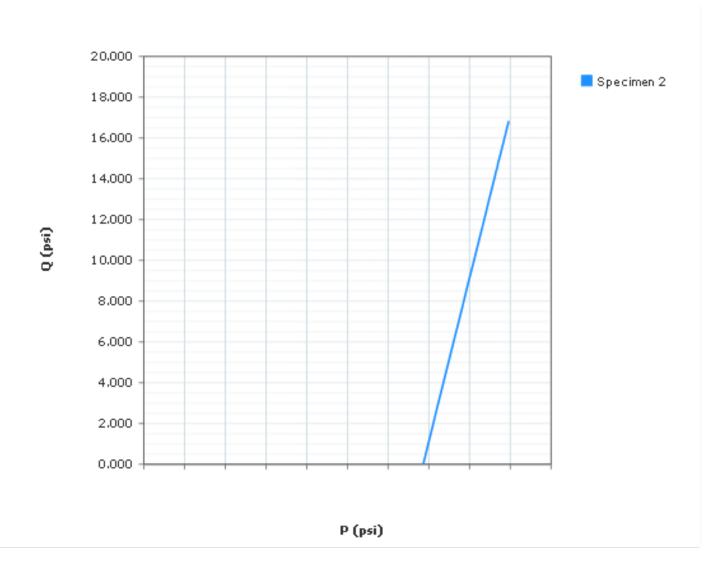


Mohr Circles (Total Stress) Graph



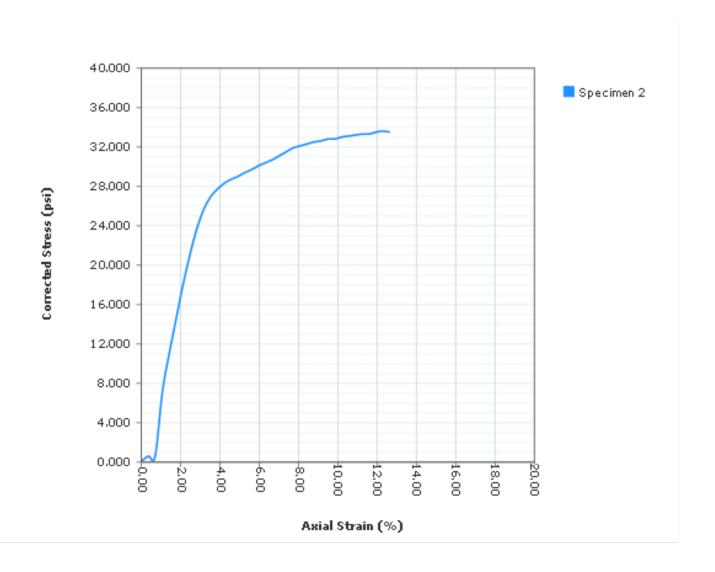


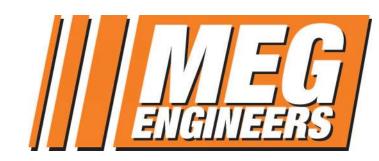
PQ Graph



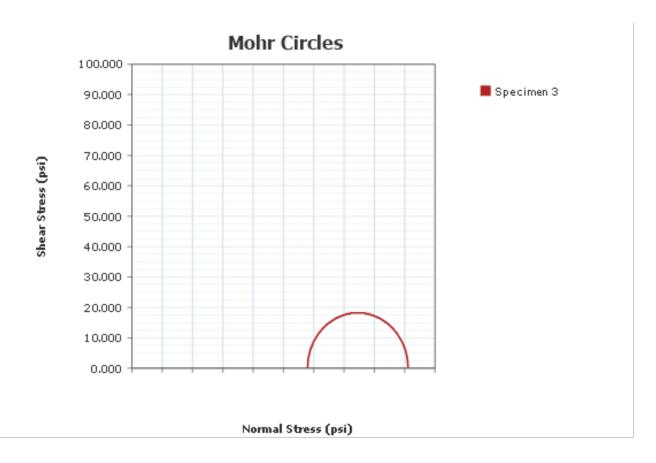


Stress-Strain Graph

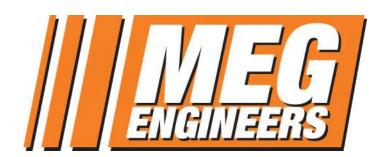




Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-19
Sample Depth:	B-4 @ 75
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

Part Tark				Specimer	n Number			
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)			0.0010					
Initial Cell Pressure (psi)			63.730					
Height (in)			5.4503					
Diameter (in)			2.7667					
Water Content (%)			21.68					
Wet Density (Units)								
Dry Density (pcf)			101.92					
Saturation (%)			88.55					
Degree of Saturation (%)								
Void Ratio			0.666					
Height To Diameter Ratio			1.970					
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)			36.465					
σ1 at Failure (psi)			100.195					
σ3 at Failure (psi)			63.730					
Rate of Strain (in/min)			0.054503					
Axial Strain at Failure (%)			15.173					
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)			21.68					

Rate of Strain (III)				0.054505					
Axial Strain at Failure ((%)			15.173					
After Test		1	2	3	4	5	6	7	8
Final Water Content (%	5)			21.68					
Project:	DMPA 8 Lev	ee Reconstru	uction						
Project Number:	02-23-29125								
Sampling Date:									
Sample Number:	S-19								
Sample Depth:	B-4 @ 75								
Location:	Brownsville,	Cameron Co	ounty, Texas	3					
Client Name:	Port of Brown	nsville							
Project Remarks:									
Specimen 1 Specim Failure Sketch Failure S		ecimen 3 ure Sketch	Specimen Failure Ske		ecimen 5 ure Sketch	Specimen 6 Failure Sketch	Specimen Failure Skei		ecimen 8 are Sketch

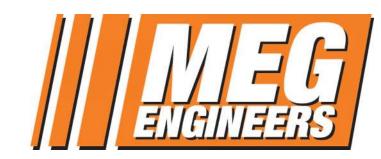


Unconsolidated Undrained Test

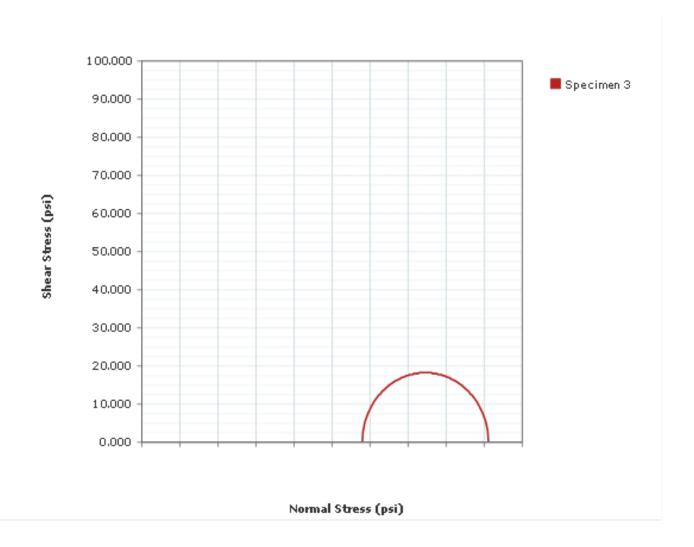
ASTM D2850

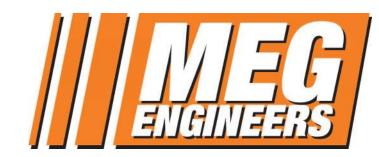
		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/7/2023 10:46:16 AM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-4	Specimen Lab #:	S-19
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.4503	Diameter (in):	2.7667
Area (in²):	6.012	Volume (in³):	32.7662
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1066.7		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

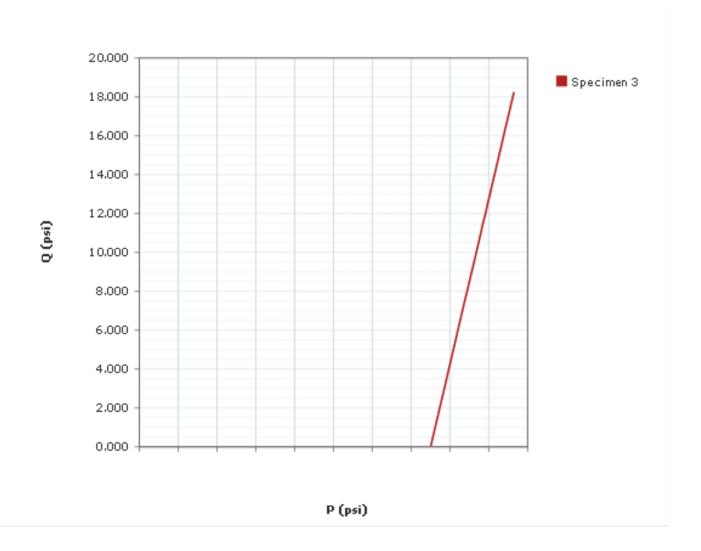


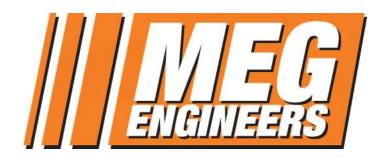
Mohr Circles (Total Stress) Graph



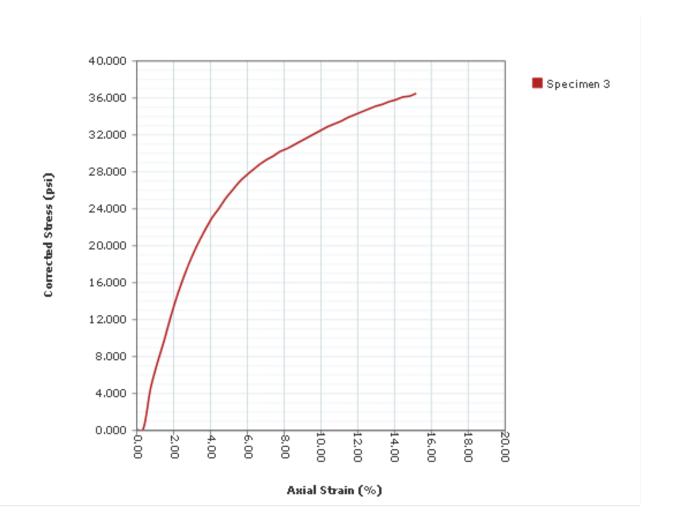


PQ Graph



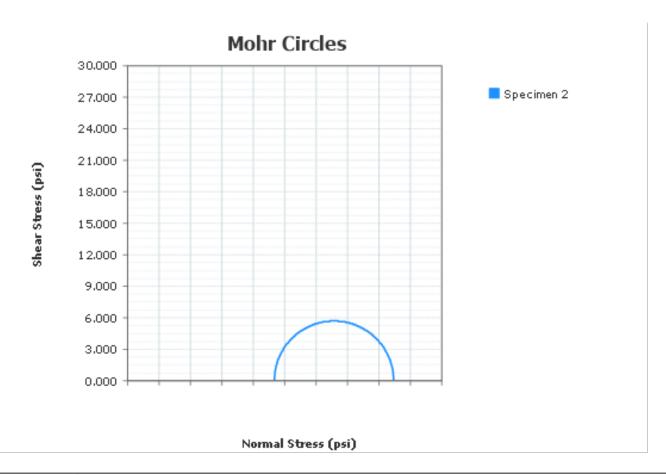


Stress-Strain Graph





Unconsolidated Undrained Test



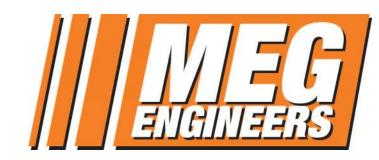
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-7
Sample Depth:	B-5 @ 15
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



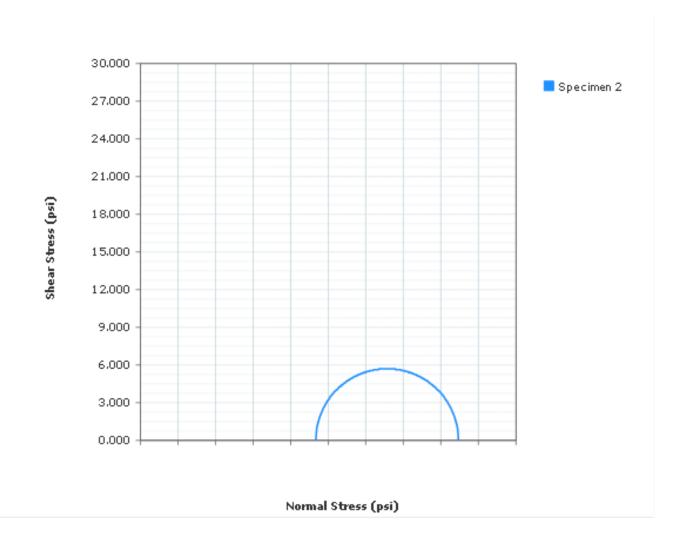
Unconsolidated Undrained Test

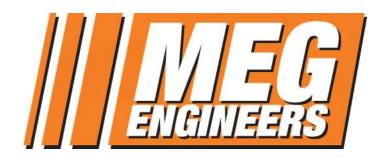
D.C. T. T.				Specimer	n Numbei	<u> </u>		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		14.000						
Height (in)		5.9357						
Diameter (in)		2.6737						
Water Content (%)		24.48						
Wet Density (Units)								
Dry Density (pcf)		102.06						
Saturation (%)		100.33						
Degree of Saturation (%)								
Void Ratio		0.664						
Height To Diameter Ratio		2.220						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		11.397						
o1 at Failure (psi)		25.397						
σ3 at Failure (psi)		14.000						
Rate of Strain (in/min)		0.059357						
Axial Strain at Failure (%)		15.169						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		24.48						

Rate of Strain (in/min)		0.059357						
Axial Strain at Failure (%)	15.169						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%	<u>)</u>	24.48						
Project:	DMPA 8 Levee Rec	onstruction						
Project Number:	02-23-29125							
Sampling Date:								
Sample Number:	S-7							
Sample Depth:	B-5 @ 15							
Location:	Brownsville, Came	ron County, Texa	s					
Client Name:	Port of Brownsville	<u> </u>						
Project Remarks:								
Specimen 1 Specim				ecimen 5	Specimen 6		imen 7	Specimen 8
Failure Sketch Failure S	ketch Failure Sk	etch Failure Sk	etch Fail	ure Sketch	Failure Sketch	n Failure	Sketch	Failure Sketch

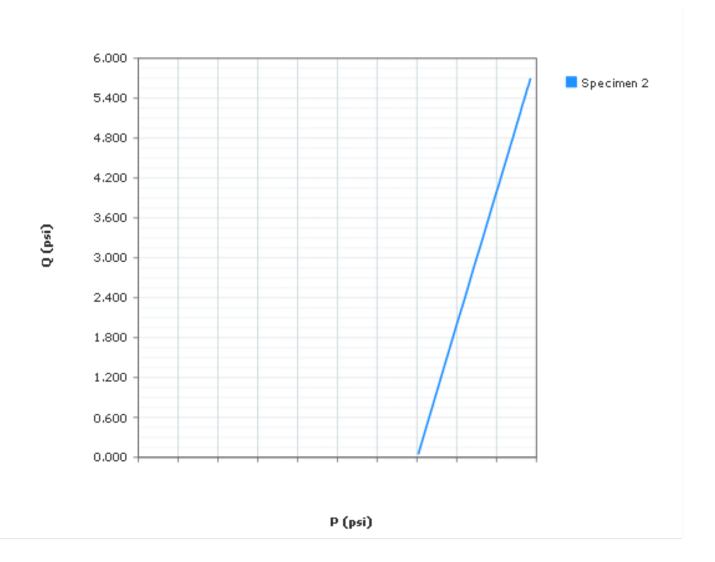


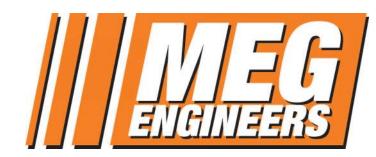
Mohr Circles (Total Stress) Graph



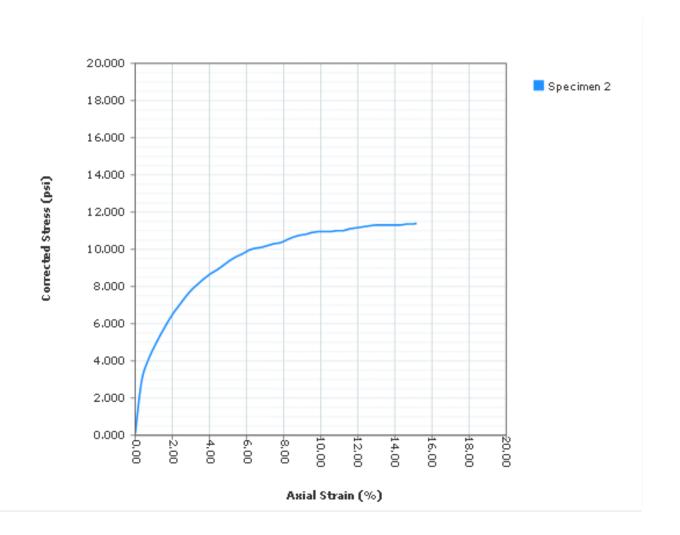


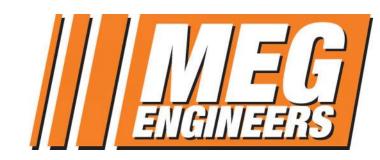
PQ Graph



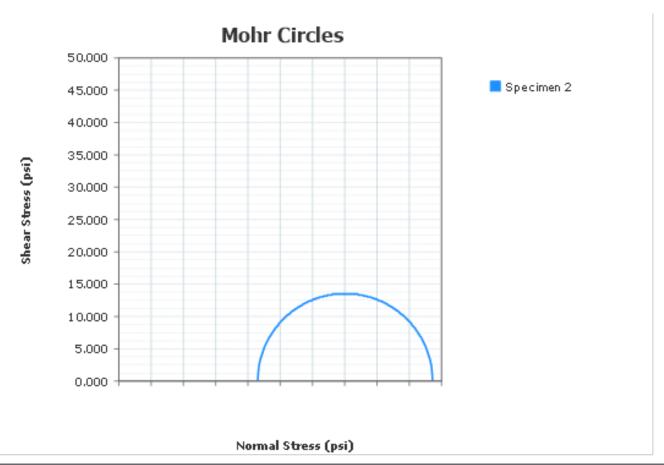


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-9
Sample Depth:	B-5 @ 25
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



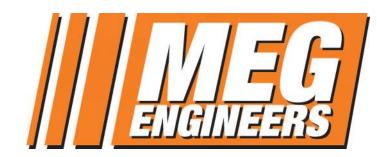
Unconsolidated Undrained Test

ASTM D2850

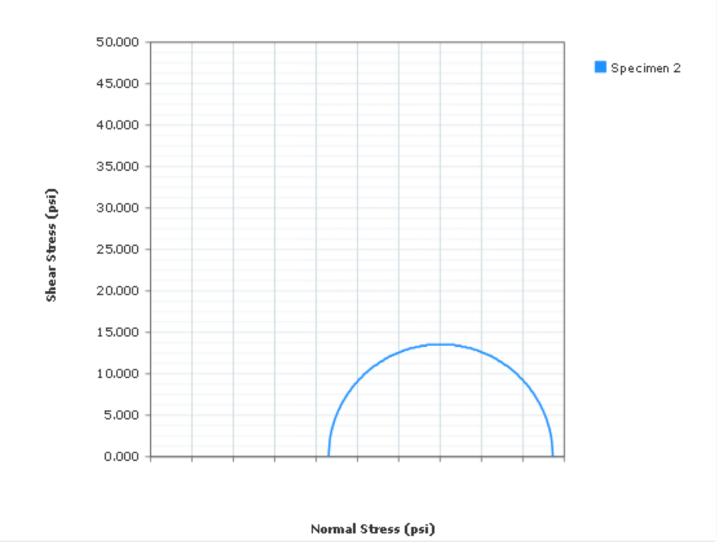
Defense Test				Specimer	n Numbei	4		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		21.500						
Height (in)		5.8040						
Diameter (in)		2.7713						
Water Content (%)		28.18						
Wet Density (Units)								
Dry Density (pcf)		100.62						
Saturation (%)		111.49						
Degree of Saturation (%)								
Void Ratio		0.688						
Height To Diameter Ratio		2.094						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		27.107						
σ1 at Failure (psi)		48.607						
σ3 at Failure (psi)		21.500						
Rate of Strain (in/min)		0.05804						
Axial Strain at Failure (%)		10.438						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		28.18						

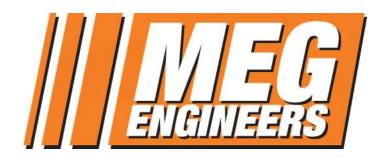
Project: DMPA 8 Levee Reconstruction Project Number: 02-23-29125 Sampling Date: Sample Number: S-9 Sample Depth: B-5 @ 25 Location: Brownsville, Cameron County, Texas Client Name: Port of Brownsville Project Remarks: Specimen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 1 Specimen 7 Specimen 8

opecinien i	Specimen 2	opecinien o	Specimen 4	opecinien o	opecimen o	Specimen 7	opecinien o
Failure Sketch F	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
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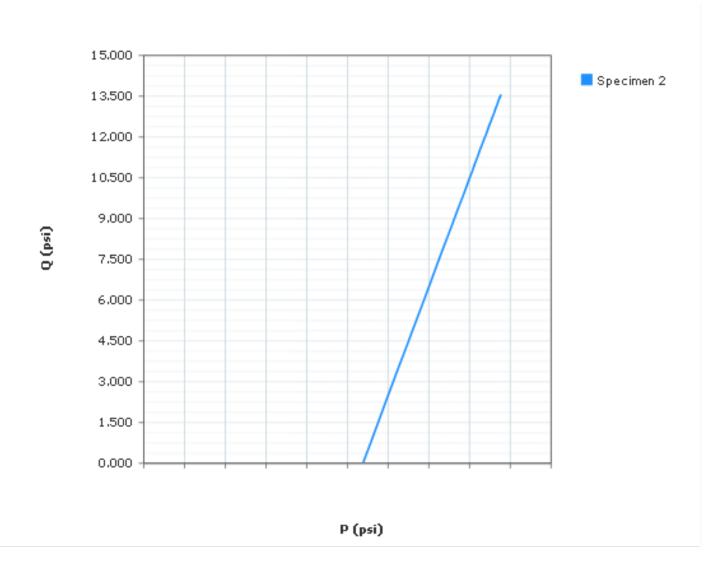


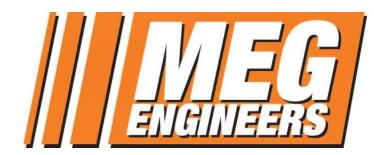
Mohr Circles (Total Stress) Graph



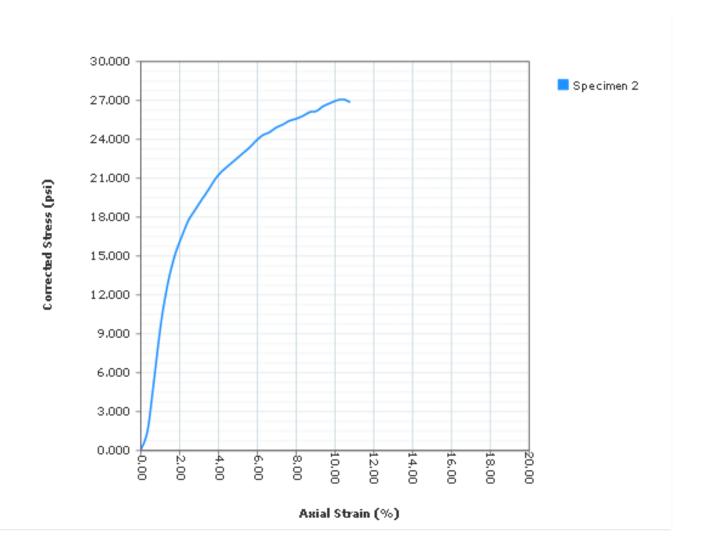


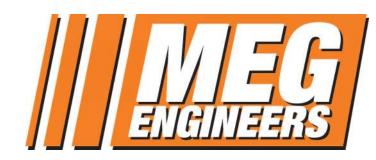
PQ Graph



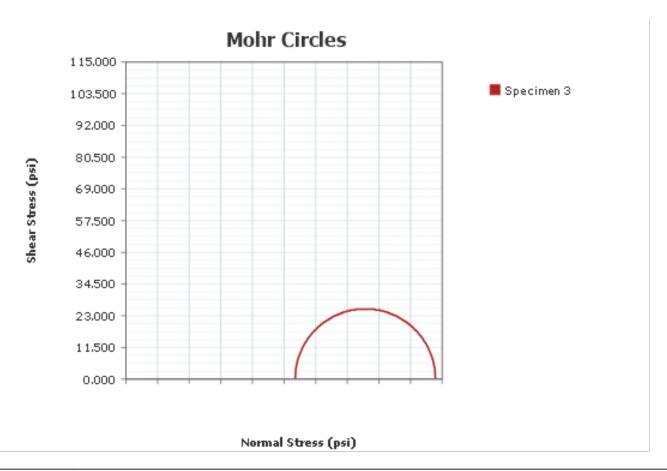


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-18
Sample Depth:	B-5 @ 70
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

Dofous Tost			1	Specimer	n Numbei	ſ		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)			0.0010					
Initial Cell Pressure (psi)			61.490					
Height (in)			5.9827					
Diameter (in)			2.7797					
Water Content (%)			30.48					
Wet Density (Units)								
Dry Density (pcf)			98.35					
Saturation (%)			114.10					
Degree of Saturation (%)								
Void Ratio			0.727					
Height To Diameter Ratio			2.152					
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)			51.027					
o1 at Failure (psi)			112.518					
σ3 at Failure (psi)			61.490					
Rate of Strain (in/min)			0.059827					
Axial Strain at Failure (%)			15.179					
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)			30.48					

Rate of Strain (in/min))			0.059827					
Axial Strain at Failure	Failure (%)			15.179					
After Test		1	2	3	4	5	6	7	8
Final Water Content (%	6)			30.48					
Project:	DMPA 8 L	evee Reconstr	ruction						
Project Number:	02-23-2912	5							
Sampling Date:									
Sample Number:	S-18								
Sample Depth:	B-5 @ 70								
Location:	Brownsvill	e, Cameron C	County, Texas	s					
Client Name:	Port of Bro	wnsville							
Project Remarks:									
Specimen 1 Specim Failure Sketch Failure S		Specimen 3	Specimer Failure Ske		pecimen 5 Ilure Sketch	Specimen 6 Failure Sketch		men 7 Sketch	Specimen 8 Failure Sketch

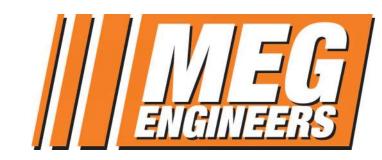


Unconsolidated Undrained Test

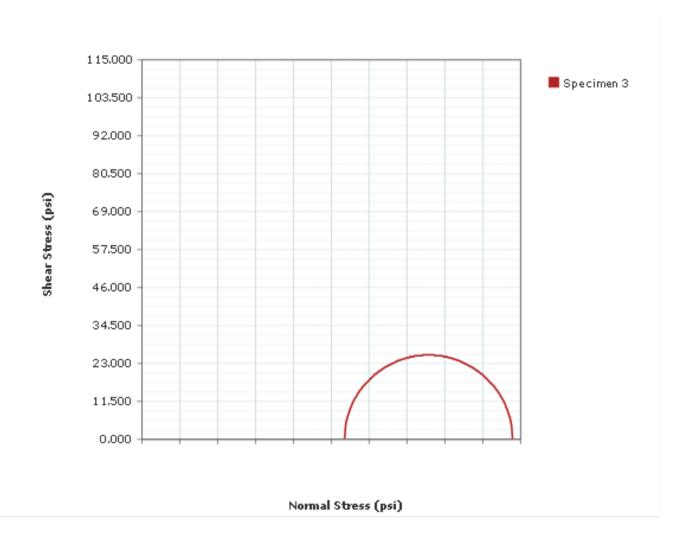
ASTM D2850

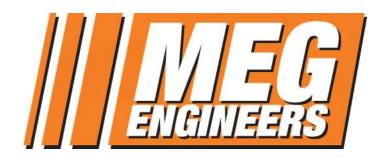
		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/7/2023 12:38:17 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-2	Specimen Lab #:	S-18
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.9827	Diameter (in):	2.7797
Area (in²):	6.068	Volume (in³):	36.3053
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1222.9		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

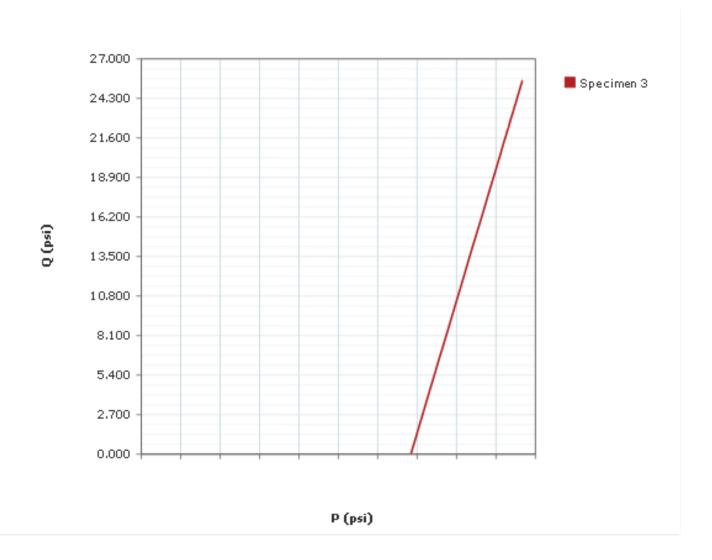


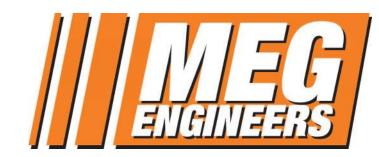
Mohr Circles (Total Stress) Graph



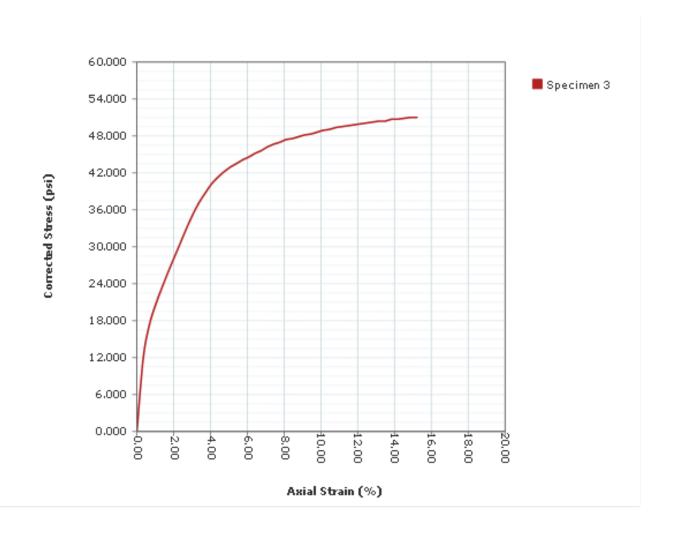


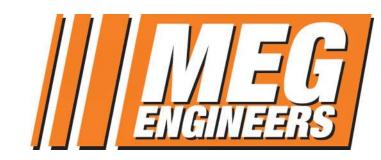
PQ Graph



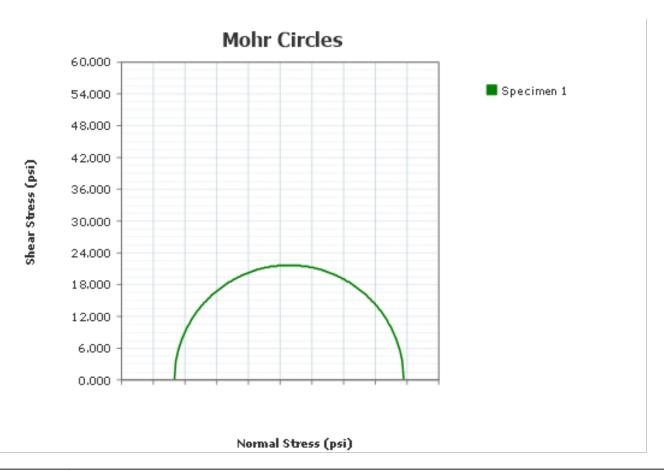


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	B-6
Sample Depth:	0.5-2
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	Remolded



Unconsolidated Undrained Test

Pofoso Tock				Specimer	n Number			
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	10.000							
Height (in)	6.0540							
Diameter (in)	2.8070							
Water Content (%)	20.21							
Wet Density (Units)								
Dry Density (pcf)	97.46							
Saturation (%)	74.07							
Degree of Saturation (%)								
Void Ratio	0.742							
Height To Diameter Ratio	2.157							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	43.270							
o1 at Failure (psi)	53.270							
o3 at Failure (psi)	10.000							
Rate of Strain (in/min)	0.06054							
Axial Strain at Failure (%)	9.000							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	20.21							

Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	B-6
Sample Depth:	0.5-2
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Project Remarks:	Remolded
Specimen 1 Specim	nen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8
Failure Sketch Failure S	Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch

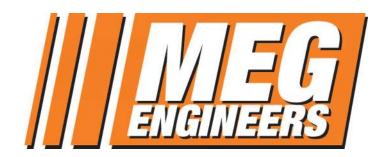


Unconsolidated Undrained Test

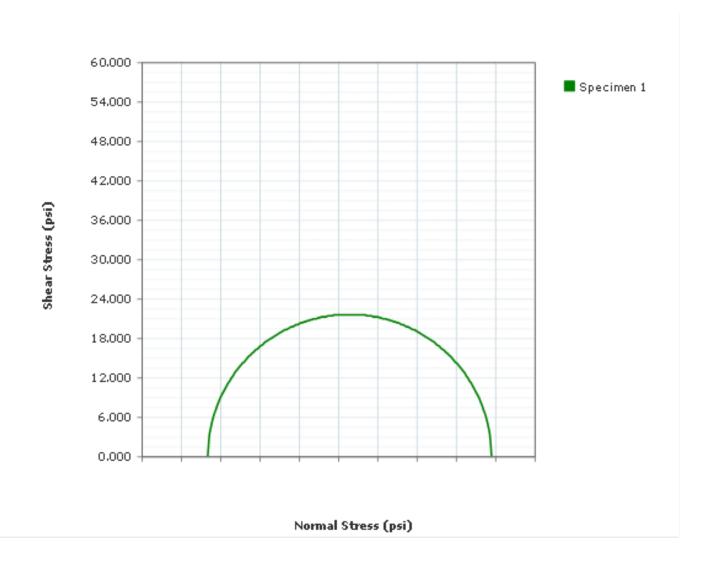
ASTM D2850

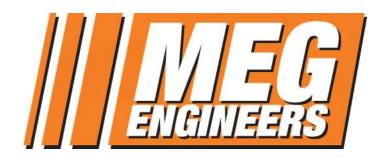
Specimen 1							
Test Description:	ASTM D2850						
Other Associated Tests:	ASTM D2850						
Device Details:							
Test Specification:	D2850						
Test Time:	11/3/2023 9:20:42 AM						
Technician:	MG	Sampling Method:	Remolded				
Specimen Code:	Bulk	Specimen Lab #:	B-6				
Specimen Description:							
Specific Gravity:	2.72						
Plastic Limit:	0	Liquid Limit:	0				
Height (in):	6.0540	Diameter (in):	2.8070				
Area (in²):	6.188	Volume (in³):	37.4643				
Large Particle:							
Moisture Material:	Excess						
Moist Weight (g):	1152.2						
Test Remarks:							

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

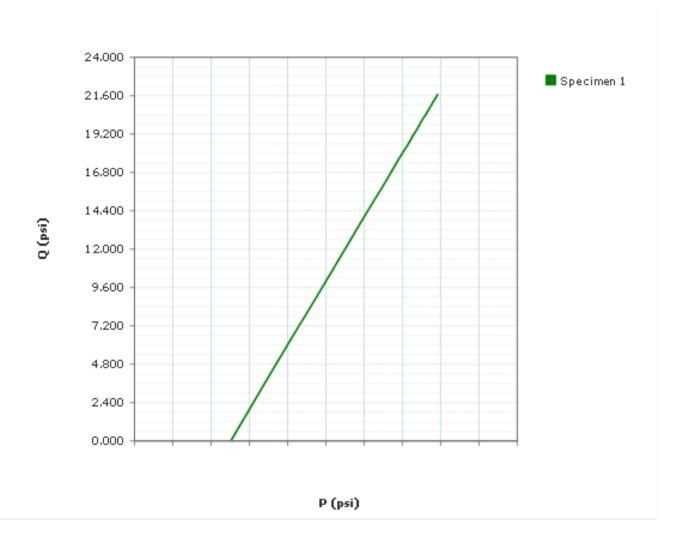


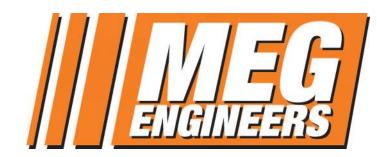
Mohr Circles (Total Stress) Graph



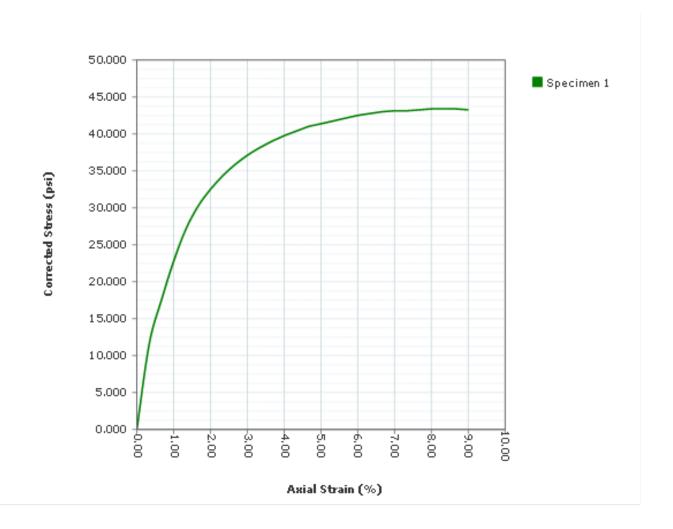


PQ Graph



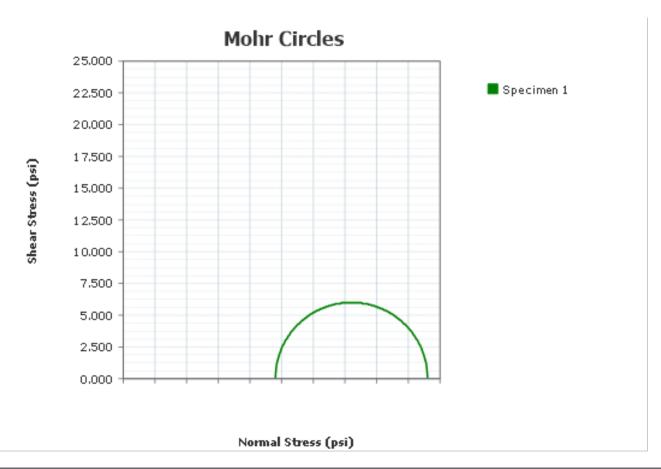


Stress-Strain Graph

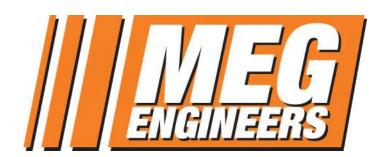




Unconsolidated Undrained Test



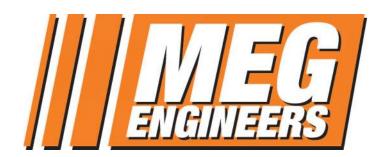
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-7
Sample Depth:	B-6 @ 15
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

Dofoso Toot	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	12.000							
Height (in)	5.8783							
Diameter (in)	2.6610							
Water Content (%)	34.87							
Wet Density (Units)								
Dry Density (pcf)	87.71							
Saturation (%)	101.33							
Degree of Saturation (%)								
Void Ratio	0.936							
Height To Diameter Ratio	2.209							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	12.010							
σ1 at Failure (psi)	24.010							
σ3 at Failure (psi)	12.000							
Rate of Strain (in/min)	0.058783							
Axial Strain at Failure (%)	12.702							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	34.87							

That water content (70)				
Project:	DMPA 8 Levee Reconstruction				
Project Number:	02-23-29125				
Sampling Date:					
Sample Number:	S-7				
Sample Depth: B-16 @ 15					
Location:	Brownsville, Cameron County, Texas				
Client Name:	Port of Brownsville				
Project Remarks:					
Specimen 1 Specim					
Failure Sketch Failure S	sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch				

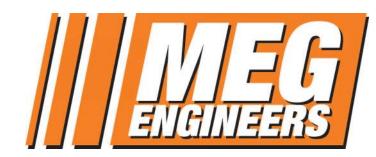


Unconsolidated Undrained Test

ASTM D2850

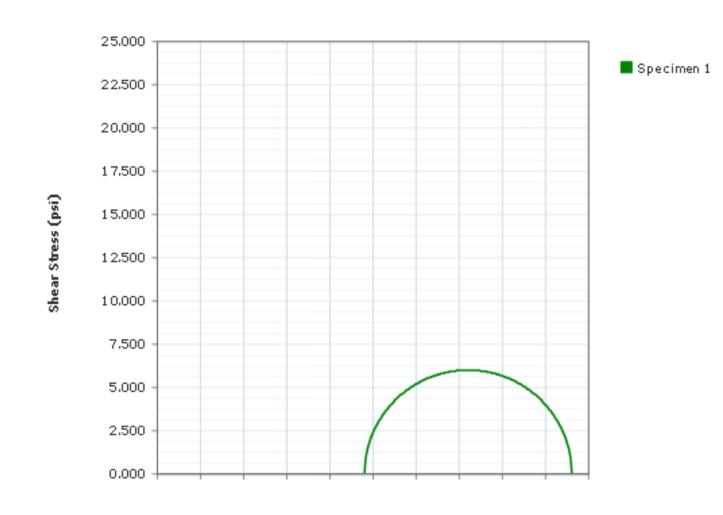
Specimen 1								
Test Description:	ASTM D2850							
Other Associated Tests:	ASTM D2850							
Device Details:	HM Masterloader 3000							
Test Specification:	D2850							
Test Time:	10/14/2023 12:42:46 PM							
Technician:	MG	Sampling Method:	Undisturbed					
Specimen Code:	В-6	Specimen Lab #:	S-7					
Specimen Description:								
Specific Gravity:	2.72							
Plastic Limit:	0	Liquid Limit:	0					
Height (in):	5.8783	Diameter (in):	2.6610					
Area (in²):	5.561	Volume (in³):	32.6914					
Large Particle:								
Moisture Material:	Cuttings							
Moist Weight (g):	1015.1							
Test Remarks:								

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

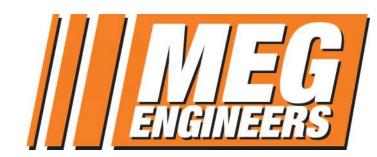


Mohr Circles (Total Stress) Graph

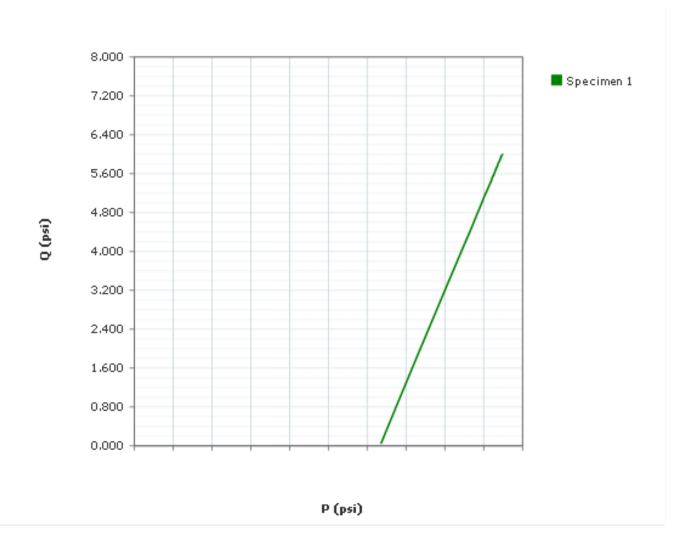
ASTM D2850

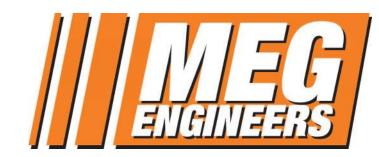


Normal Stress (psi)

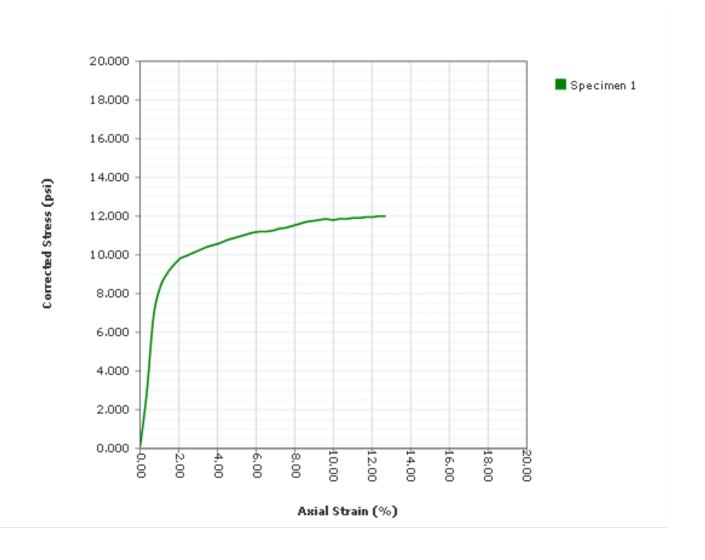


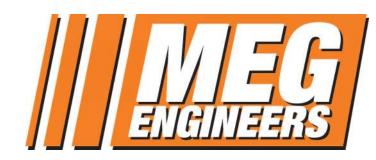
PQ Graph



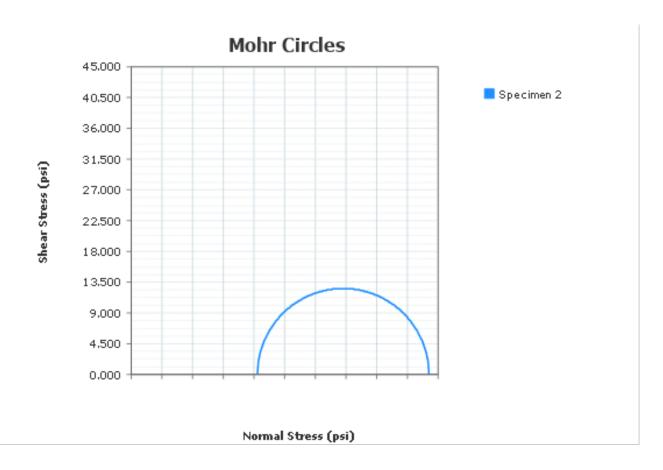


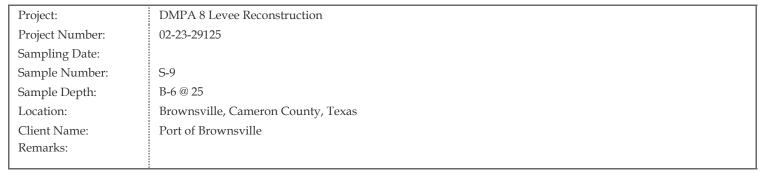
Stress-Strain Graph





Unconsolidated Undrained Test



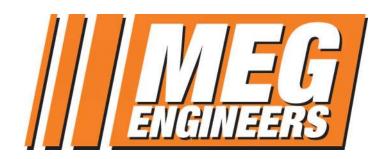




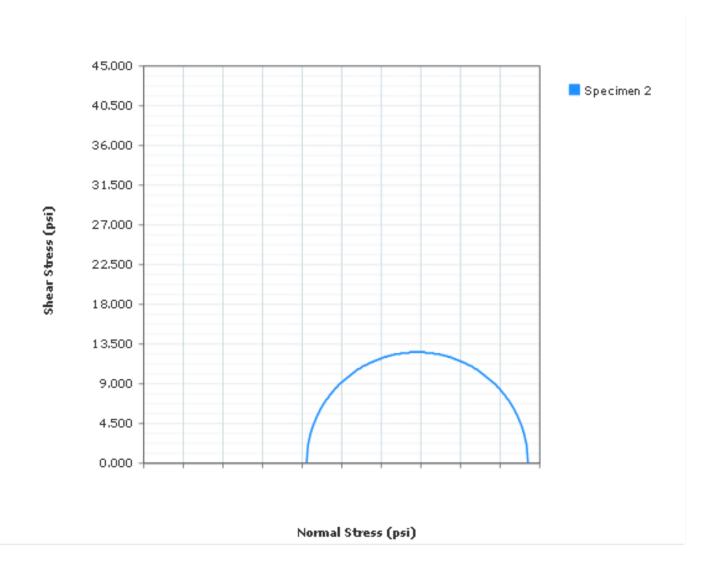
Unconsolidated Undrained Test

Polovo Tool	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		18.500						
Height (in)		6.1520						
Diameter (in)		2.7527						
Water Content (%)		18.20						
Wet Density (Units)								
Dry Density (pcf)		108.97						
Saturation (%)		88.70						
Degree of Saturation (%)								
Void Ratio		0.558						
Height To Diameter Ratio		2.235						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		25.149						
o1 at Failure (psi)		43.649						
σ3 at Failure (psi)		18.500						
Rate of Strain (in/min)		0.06152						
Axial Strain at Failure (%)		15.180						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		18.20						

Rate of Strain (in/min)		0.06152							
Axial Strain at Failure ((%)		15.180						
After Test		1	2	3	4	5	6	7	8
Final Water Content (%	5)		18.20						
Project:	DMPA 8 Lev	ree Reconstr	uction						
Project Number:	02-23-29125								
Sampling Date:									
Sample Number:	S-9								
Sample Depth: B-6 @ 25									
Location:	Brownsville,	Cameron C	ounty, Texas						
Client Name:	Port of Brown	nsville							
Project Remarks:									
Specimen 1 Specim		ecimen 3	Specimen		ecimen 5	Specimen 6		imen 7	Specimen 8
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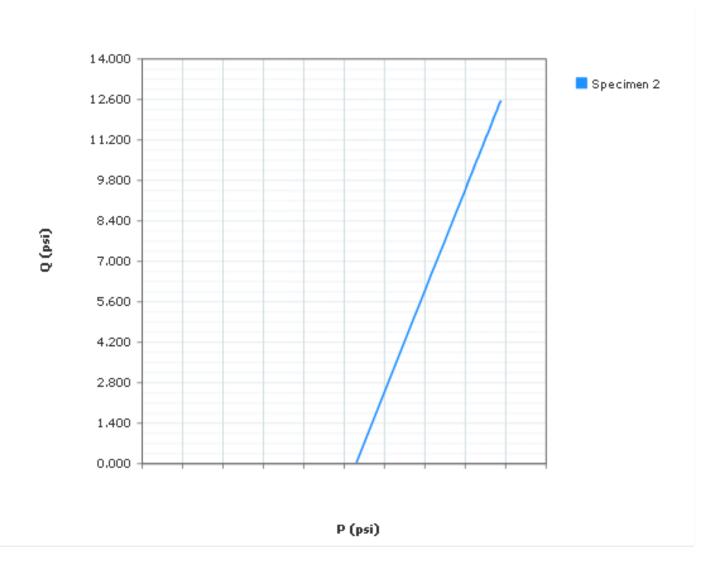


Mohr Circles (Total Stress) Graph



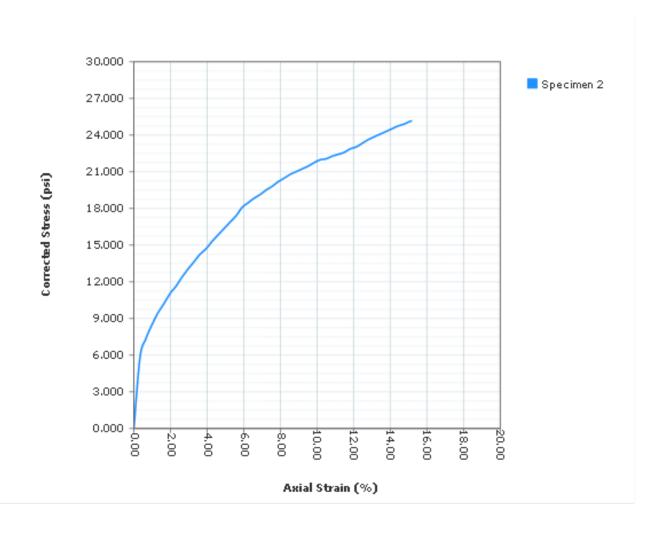


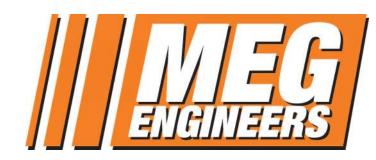
PQ Graph



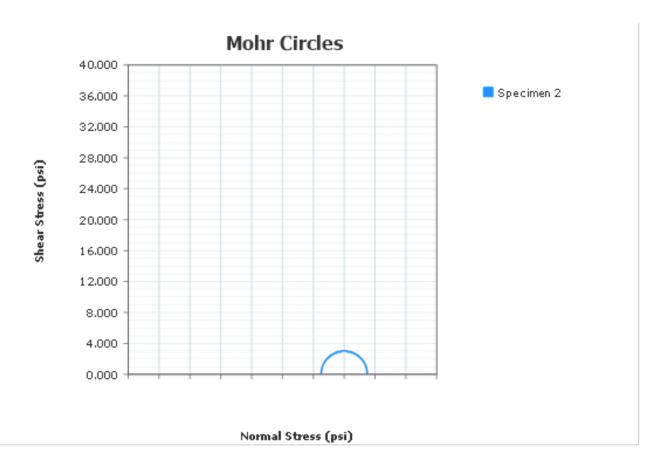


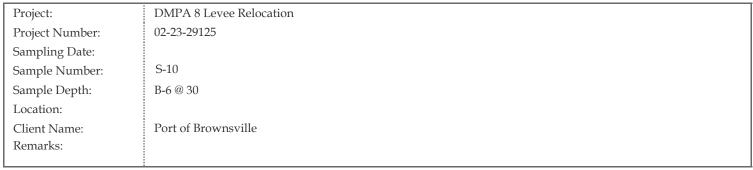
Stress-Strain Graph





Unconsolidated Undrained Test







Unconsolidated Undrained Test

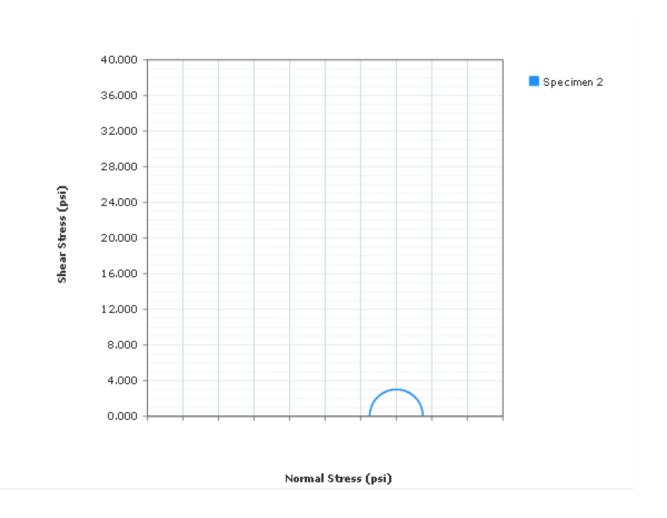
A51W1 D2630	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		25.000						
Height (in)		6.5203						
Diameter (in)		2.8100						
Water Content (%)		18.53						
Wet Density (Units)								
Dry Density (pcf)		99.81						
Saturation (%)		71.86						
Degree of Saturation (%)								
Void Ratio		0.701						
Height To Diameter Ratio		2.320						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		6.000						
σ1 at Failure (psi)		31.000						
σ3 at Failure (psi)		25.000						
Rate of Strain (in/min)		0.065203						
Axial Strain at Failure (%)		14.856						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		18.53						

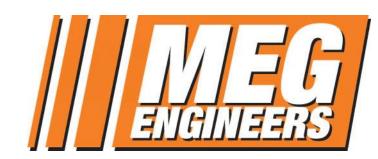
Project:	DMPA 8 Levee Relocation							
Project Number:	02-23-29125							
Sampling Date:								
Sample Number:	S-10							
Sample Depth:	B-6 @ 30							
Location:								
Client Name:	Port of Brownsville							
Project Remarks:								
Specimen 1 Specimen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 7 Specimen 7 Specimen 7 Specimen 8 Specimen 8 Specimen 9								

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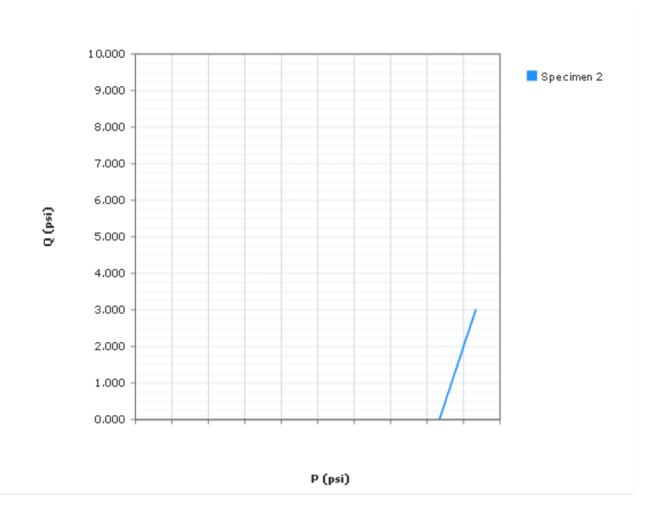


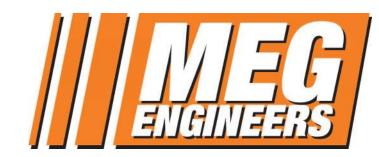
Mohr Circles (Total Stress) Graph



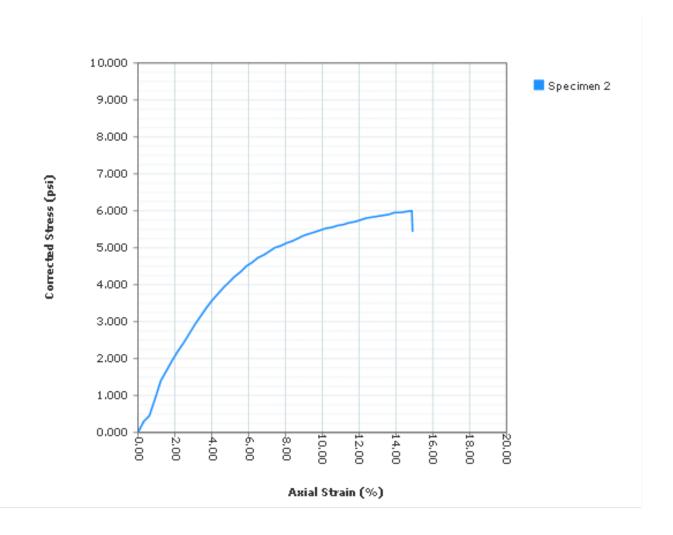


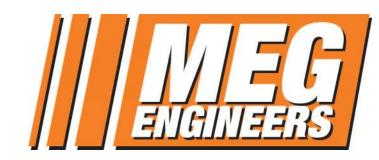
PQ Graph



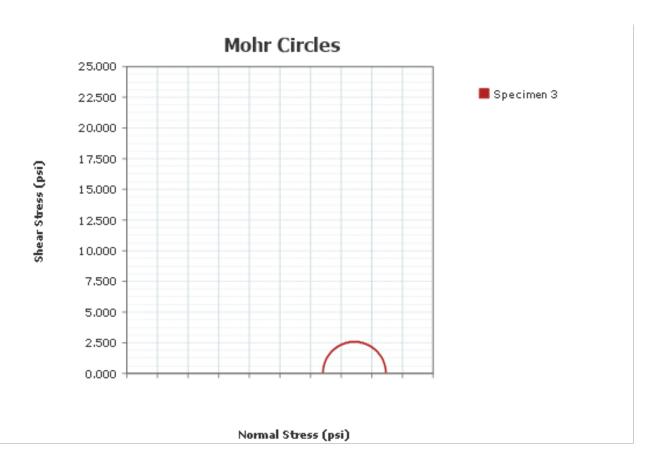


Stress-Strain Graph





Unconsolidated Undrained Test





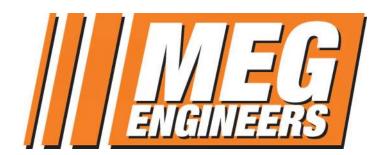


Unconsolidated Undrained Test

Dofous Took				Specimen Number						
Before Test	1	2	3	4	5	6	7	8		
Membrane Thickness (in)			0.0010							
Initial Cell Pressure (psi)			16.000							
Height (in)			6.3510							
Diameter (in)			2.8080							
Water Content (%)			23.89							
Wet Density (Units)										
Dry Density (pcf)			97.54							
Saturation (%)			87.72							
Degree of Saturation (%)										
Void Ratio			0.741							
Height To Diameter Ratio			2.262							
Test Data	1	2	3	4	5	6	7	8		
Comp. Strength at Failure (psi)			5.151							
o1 at Failure (psi)			21.151							
σ3 at Failure (psi)			16.000							
Rate of Strain (in/min)			0.06351							
Axial Strain at Failure (%)			15.157							
After Test	1	2	3	4	5	6	7	8		
Final Water Content (%)			23.89							

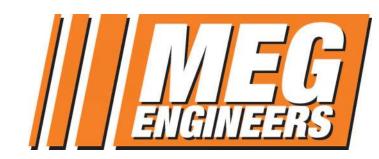
Project:		DMPA 8	8 Levee Relocatio	n				
Project Number:		02-23-29	0125					
Sampling Date:								
Sample Number:		S-8						
Sample Depth:		B-7 @ 20)					
Location:								
Client Name:		Port of I	Brownsville					
Project Remarks:								
Specimen 1	Specimo	en 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8

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	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	
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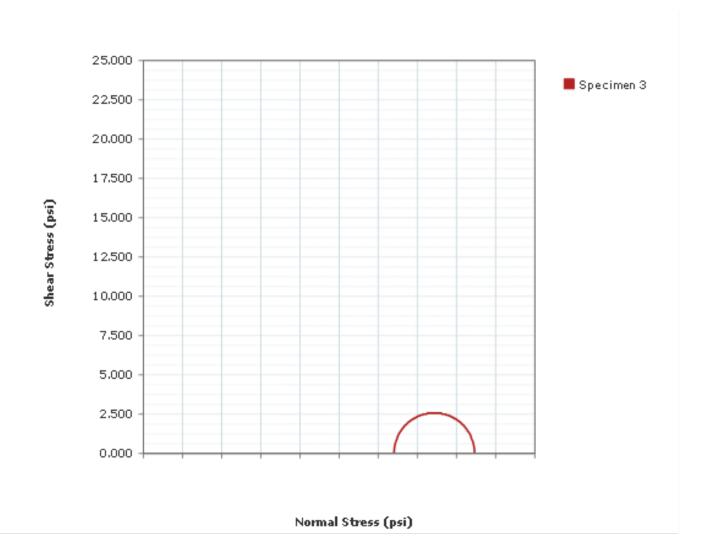


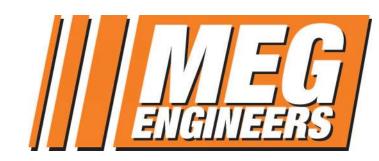
Unconsolidated Undrained Test

	Specimen 3									
Test Description:										
Other Associated Tests:										
Device Details:										
Test Specification:										
Test Time:	10/5/2023 10:28:00 AM									
Technician:		Sampling Method:								
Specimen Code:		Specimen Lab #:								
Specimen Description:										
Specific Gravity:	2.72									
Plastic Limit:	13	Liquid Limit:	23							
Height (in):	6.3510	Diameter (in):	2.8080							
Area (in²):	6.193	Volume (in³):	39.3302							
Large Particle:										
Moisture Material:										
Moist Weight (g):	1247.6									
Test Remarks:										

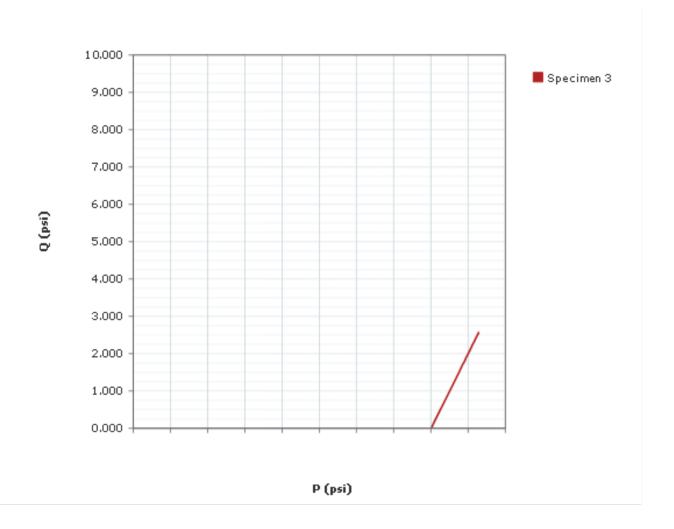


Mohr Circles (Total Stress) Graph



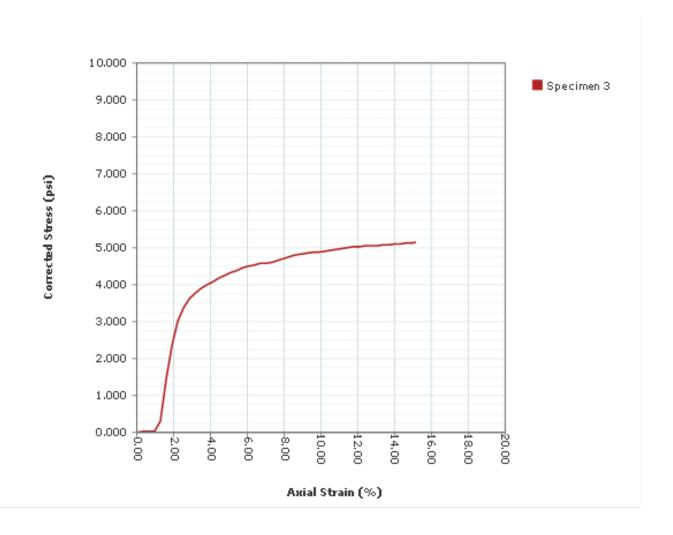


PQ Graph



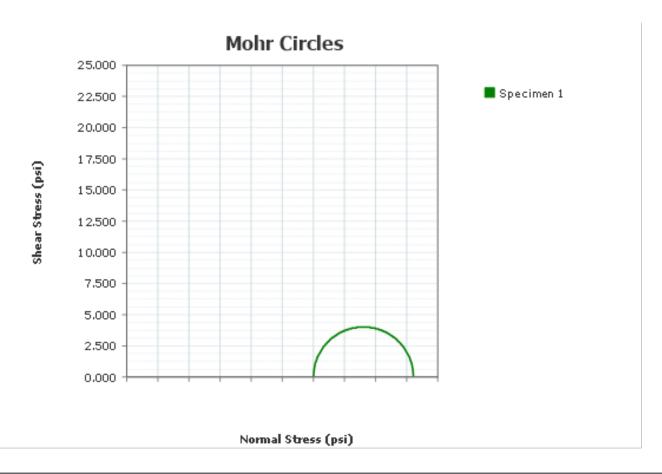


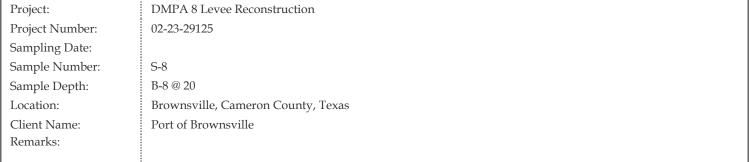
Stress-Strain Graph





Unconsolidated Undrained Test







Unconsolidated Undrained Test

Before Test				Specimer	n Numbei	r		
before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	15.000							
Height (in)	5.5500							
Diameter (in)	2.5803							
Water Content (%)	25.86							
Wet Density (Units)								
Dry Density (pcf)	94.98							
Saturation (%)	89.29							
Degree of Saturation (%)								
Void Ratio	0.788							
Height To Diameter Ratio	2.151							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	8.036							
o1 at Failure (psi)	23.036							
σ3 at Failure (psi)	15.000							
Rate of Strain (in/min)	0.0555							
Axial Strain at Failure (%)	15.171							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	25.86							

Rate of Strain (in/min)	rain (in/min) 0.0555								
Axial Strain at Failure (%)		15.171							
After Test 1			2	3	4	5	6	7	8
Final Water Content (%)	25.86							
Project:	DMPA 8 Le	evee Reconst	ruction						
Project Number:	02-23-29125	5							
Sampling Date:									
Sample Number:	S-8								
Sample Depth:	B-8 @ 20								
Location:	Brownsville	e, Cameron C	County, Texas	S					
Client Name:	Port of Bro	wnsville							
Project Remarks:									
Specimen 1 Specimer Failure Sketch Failure S		pecimen 3 ilure Sketch	Specimer Failure Ske		pecimen 5 Iure Sketch	Specimen 6 Failure Sketc		imen 7 e Sketch	Specimen 8 Failure Sketch



Unconsolidated Undrained Test

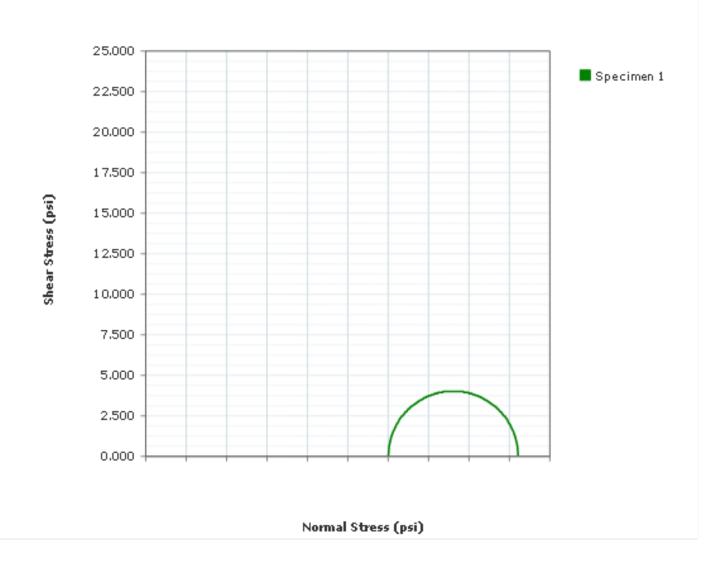
ASTM D2850

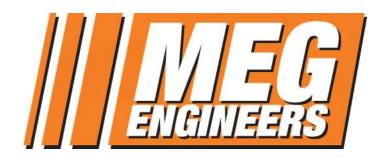
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/16/2023 5:14:04 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-8	Specimen Lab #:	S-8
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.5500	Diameter (in):	2.5803
Area (in²):	5.229	Volume (in³):	29.0225
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	910.7		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

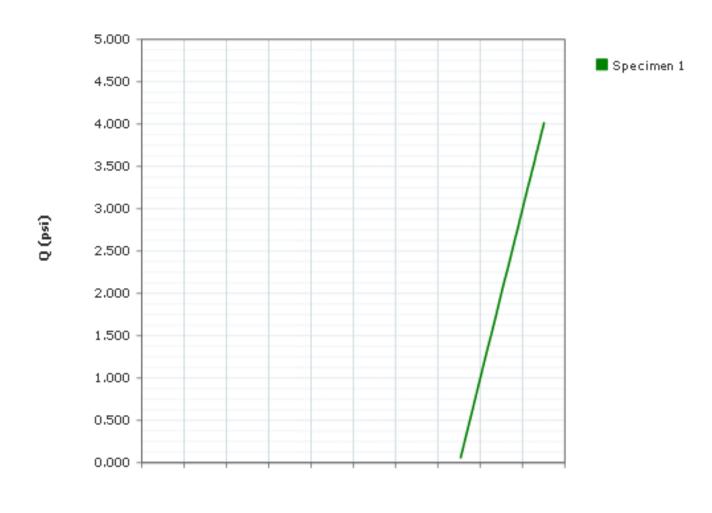


Mohr Circles (Total Stress) Graph





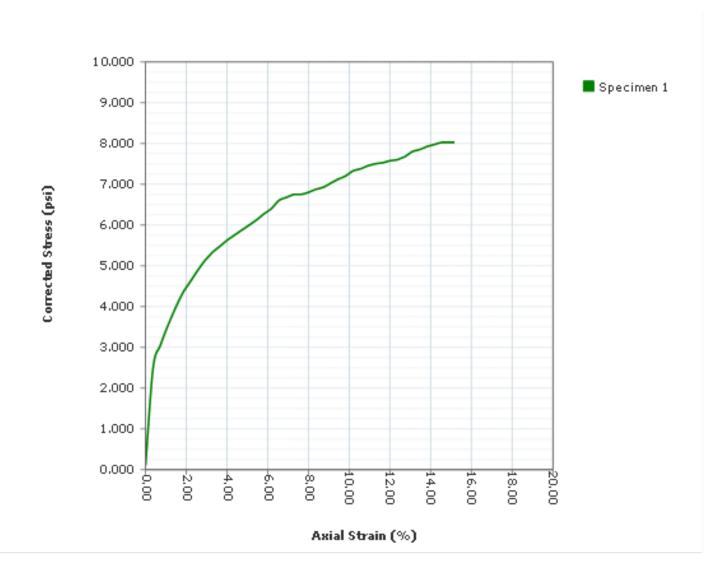
PQ Graph



P (psi)



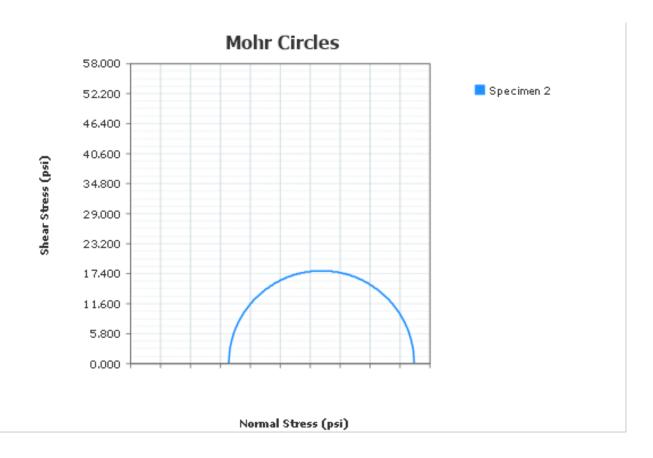
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



Project: DMPA 8 Levee Reconstruction
Project Number: 02-23-29125
Sampling Date: S-10
Sample Depth: B-8 @ 30
Location: Brownsville, Cameron County, Texas
Client Name: Port of Brownsville
Remarks:



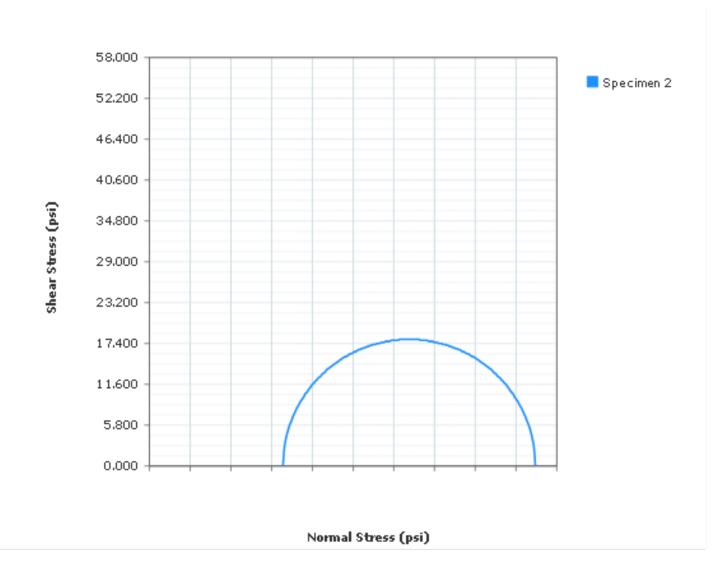
Unconsolidated Undrained Test

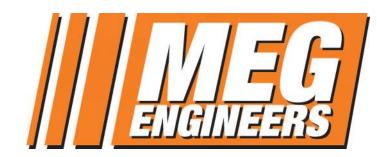
Dofous Took				Specimer	n Number	4		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		19.000						
Height (in)		6.0517						
Diameter (in)		2.7637						
Water Content (%)		18.76						
Wet Density (Units)								
Dry Density (pcf)		109.00						
Saturation (%)		91.50						
Degree of Saturation (%)								
Void Ratio		0.558						
Height To Diameter Ratio		2.190						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		35.852						
o1 at Failure (psi)		54.852						
σ3 at Failure (psi)		19.000						
Rate of Strain (in/min)		0.060517						
Axial Strain at Failure (%)		15.205						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		18.76						

Final Water Content (%	6) 18.76
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-10
Sample Depth:	B-8 @ 30
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Project Remarks:	
Specimen 1 Specim Failure Sketch Failure S	

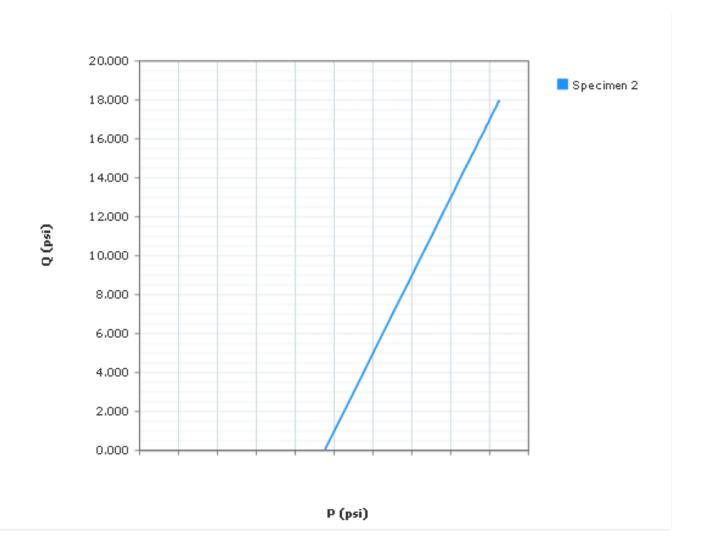


Mohr Circles (Total Stress) Graph



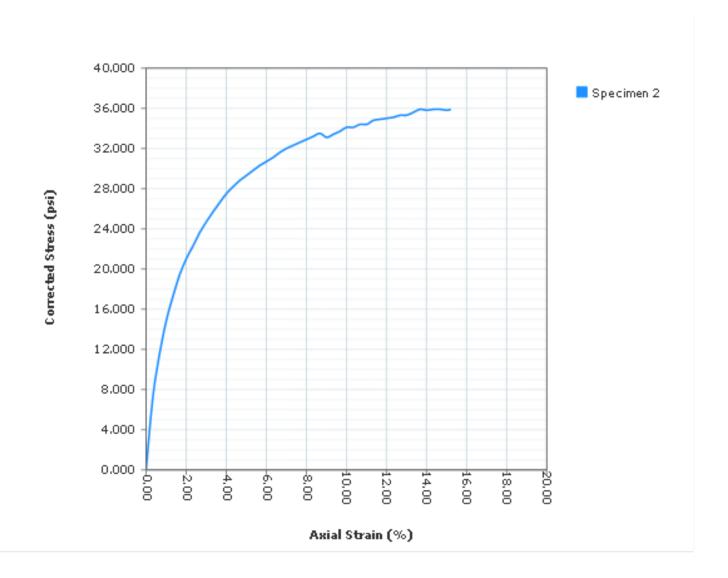


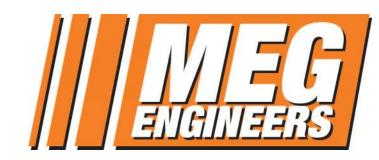
PQ Graph



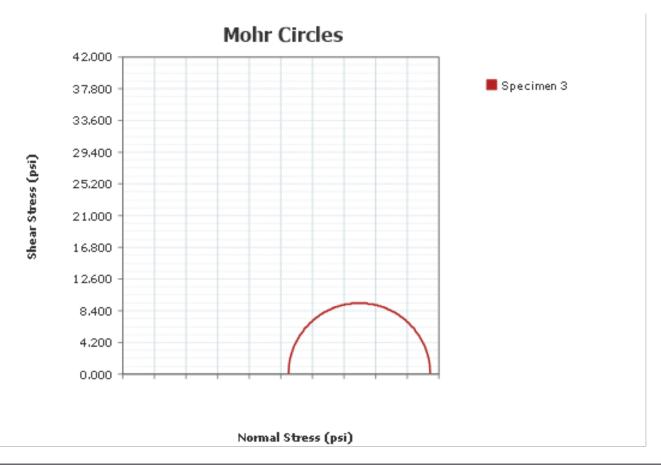


Stress-Strain Graph





Unconsolidated Undrained Test



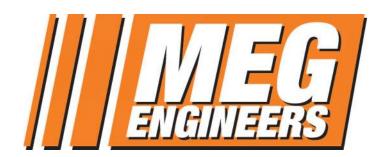
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-11
Sample Depth:	B-8 @ 35
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

Dofous Took		Specimen Number								
Before Test	1	2	3	4	5	6	7	8		
Membrane Thickness (in)			0.0010							
Initial Cell Pressure (psi)			22.000							
Height (in)			5.9830							
Diameter (in)			2.6860							
Water Content (%)			23.80							
Wet Density (Units)										
Dry Density (pcf)			102.61							
Saturation (%)			98.87							
Degree of Saturation (%)										
Void Ratio			0.655							
Height To Diameter Ratio			2.227							
Test Data	1	2	3	4	5	6	7	8		
Comp. Strength at Failure (psi)			18.846							
o1 at Failure (psi)			40.846							
σ3 at Failure (psi)			22.000							
Rate of Strain (in/min)			0.05983							
Axial Strain at Failure (%)			15.178							
After Test	1	2	3	4	5	6	7	8		
Final Water Content (%)			23.80							

After Test	1	2	3 4	5	6 7	8
Final Water Content (%	5)	23	3.80			
Project:	DMPA 8 Levee Reconstr	ruction				
Project Number:	Project Number: 02-23-29125					
Sampling Date:						
Sample Number:	S-11					
Sample Depth:	B-8 @ 35					
Location:	Brownsville, Cameron C	County, Texas				
Client Name:	Port of Brownsville					
Project Remarks:						
Specimen 1 Specim Failure Sketch Failure S		Specimen 4 Failure Sketch	Specimen 5 Failure Sketch	Specimen 6 Failure Sketch	Specimen 7 Failure Sketch	Specimen 8 Failure Sketch

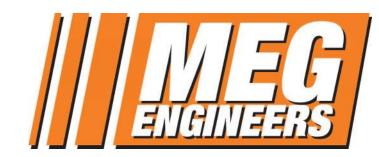


Unconsolidated Undrained Test

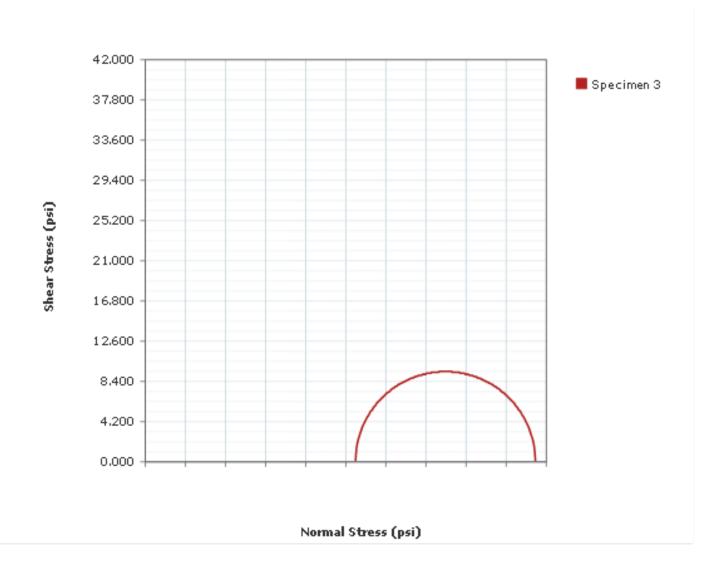
ASTM D2850

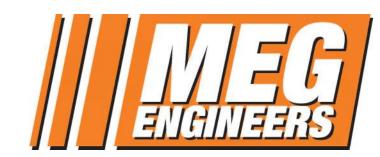
		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/16/2023 7:07:03 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-8	Specimen Lab #:	S-11
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.9830	Diameter (in):	2.6860
Area (in²):	5.666	Volume (in³):	33.9017
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1130.5		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

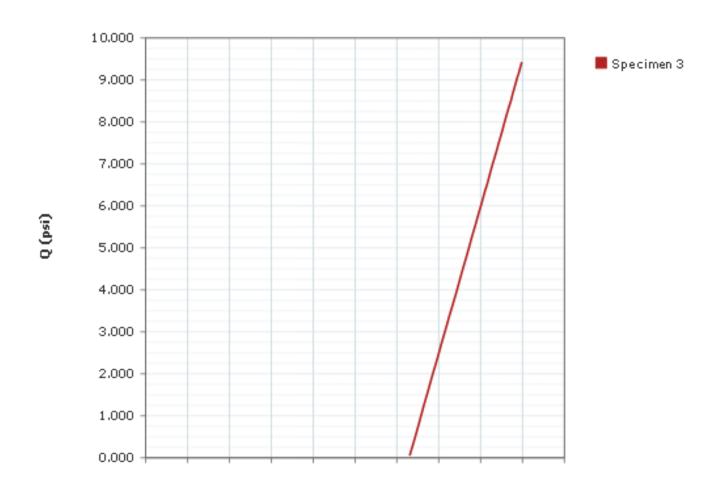


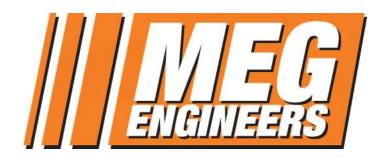
Mohr Circles (Total Stress) Graph



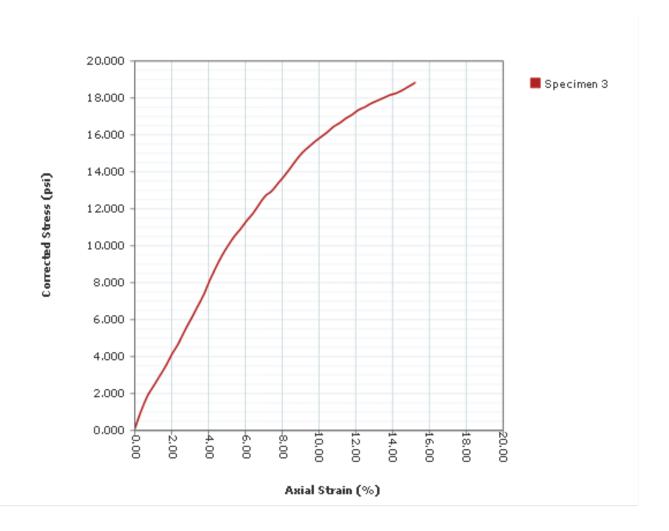


PQ Graph



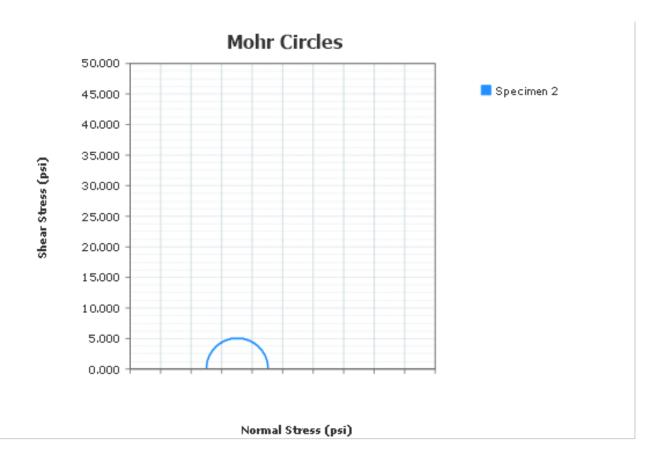


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Relocation
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-7
Sample Depth:	B-9 @ 13 - 15
Location:	
Client Name:	Port of Brownsville
Remarks:	

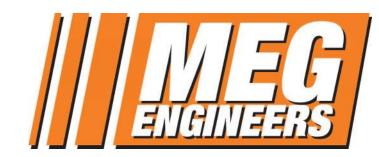


Unconsolidated Undrained Test

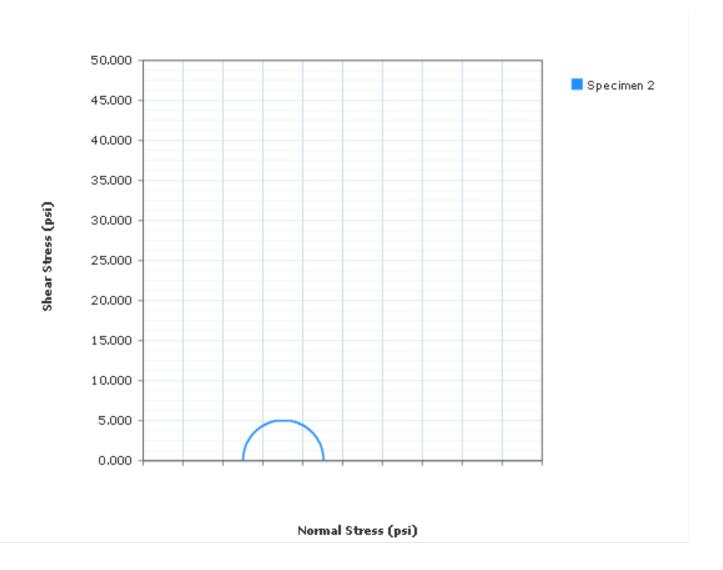
A51W1 D26500	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		12.500						
Height (in)		6.2180						
Diameter (in)		2.8143						
Water Content (%)		28.75						
Wet Density (Units)								
Dry Density (pcf)		94.14						
Saturation (%)		97.29						
Degree of Saturation (%)								
Void Ratio		0.804						
Height To Diameter Ratio		2.209						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		10.103						
σ1 at Failure (psi)		22.603						
σ3 at Failure (psi)		12.500						
Rate of Strain (in/min)		0.06218						
Axial Strain at Failure (%)		14.605						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		28.75						

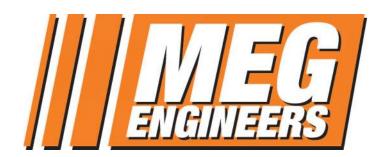
Project:	DMPA 8 Levee Relocation
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-7
Sample Depth:	B-9 @ 13 - 15
Location:	
Client Name:	Port of Brownsville
Project Remarks:	
0 1 1 0 1	
Specimen 1 Specim	nen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8

opecimien i	opecimen 2	Specimeno	opecimien i	opecimen o	opecimien o	opecimen,	opecimien o
Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
[i	Fi		[i	[i	F	[F
1 1	1 1	; ;	1 1	: :	1 1	1 1	1 1
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1 1	1 1	: :	: :	: :	: :	1 1	: :
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i i	i i	i i	i i	i i	i i	i i	i i
!!!	! !	!!!	!!!	!!	!!	! !	!!!
1 1	1 1	1 1	1 1	: :	: :	1 1	: :
i i	i i	i i	i i	i i	i i	i i	i i
i i	i i	i i	i i	i i	i i	i i	i i
!!!	! !	!!!	!!!	!!!	!!!	!!!!	!!!
: :	: :	!!!	!!!	!!	: :	: :	: :
i i	1 1	; ;	1 1	i i	1 1	i :	1 1
i i	i i	i i	i i	i i	i i	i i	i i
	1 1	!!!	1 1	!!!	1 1	1 1	1 1
L!	L!	L!	L!	L!	L!	L!	L

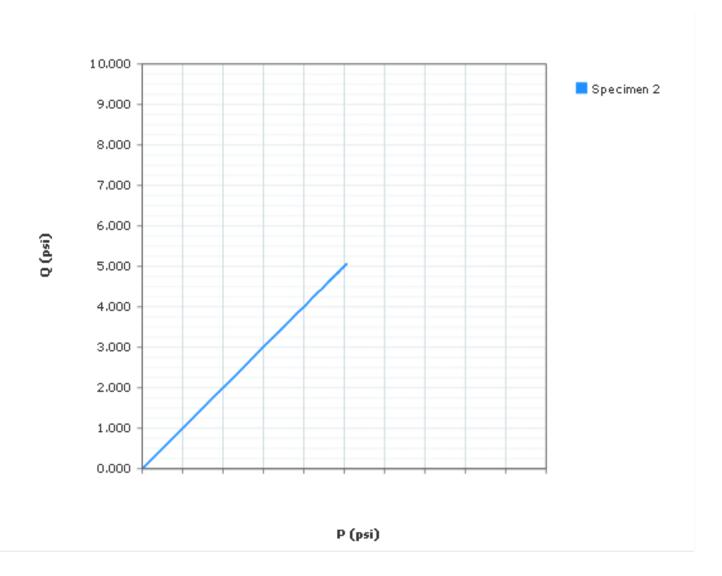


Mohr Circles (Total Stress) Graph



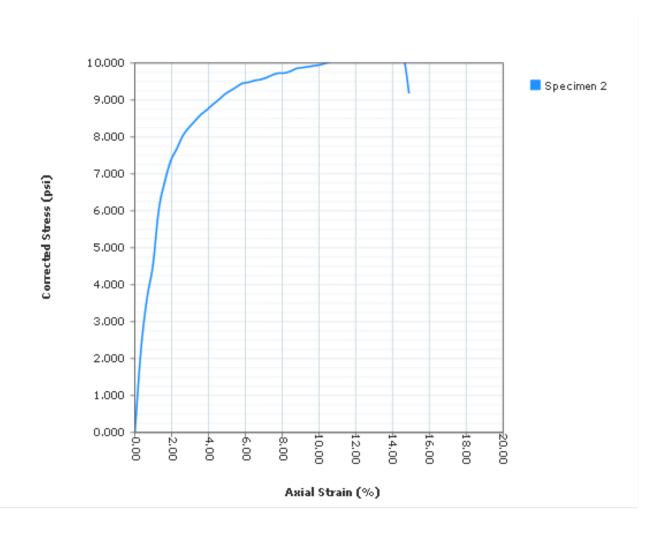


PQ Graph



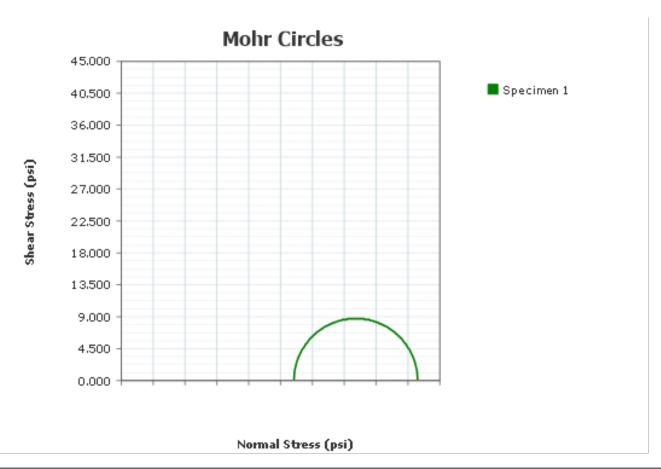


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Relocation
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-11
Sample Depth:	B-9 @ 33-35
Location:	
Client Name:	Port of Brownsville
Remarks:	

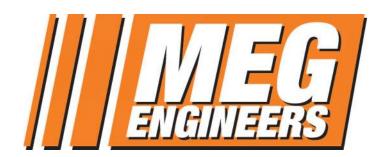


Unconsolidated Undrained Test

Dofoso Took	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	24.380							
Height (in)	6.4167							
Diameter (in)	2.7910							
Water Content (%)	25.47							
Wet Density (Units)								
Dry Density (pcf)	95.29							
Saturation (%)	88.59							
Degree of Saturation (%)								
Void Ratio	0.782							
Height To Diameter Ratio	2.299							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	17.486							
o1 at Failure (psi)	41.866							
σ3 at Failure (psi)	24.380							
Rate of Strain (in/min)	0.064167							
Axial Strain at Failure (%)	15.149							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	25.47							

Project:		DMPA	8 Levee Relocation	on				
Project Number:		02-23-2	9125					
Sampling Date:								
Sample Number	:	S-11						
Sample Depth:		B-9 @ 3	3-35					
Location:								
Client Name:		Port of	Brownsville					
Project Remarks	:							
Specimen 1	Specim	en 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch	Failure S	ketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch

	- r			- F	- F		- F	
Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	
r	r	r	r	r	r	r	F	
i i	i i	i i	i i	i i	i i	i i	i i	i.
i i	i i	i i	i i	i i	i i	i i	i i	i.
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!!	!!	!!!	! !	!!!	: :	: :	!	1
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i i	i i	i i	i i	i i	i i	i i	i i	i.
1	1	1 1	1 1	1 1	1 1	1 1	1	1
1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	4
!!	!!	!!!	!!!	!!!	!!!	!!!	!	4
!!	!!	!!!	! !	!!!	!!!	:	!	
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i i	i i	i i	i i	i i	i i	i i	i i	í.
i i	i i	i i	i i	i i	i i	i i	i i	i.
i i	i i	i i	i i	i i	i i	i i	i i	i .
1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1
L!	<u> </u>	L!	L!	L!	L!	L!	L	4



Unconsolidated Undrained Test

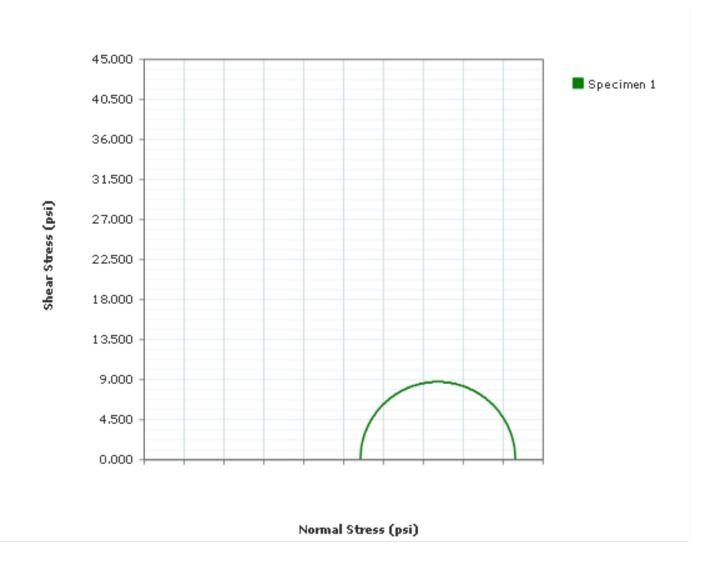
ASTM D2850

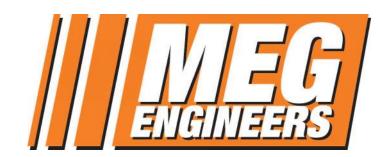
	Specimen 1						
Test Description:							
Other Associated Tests:							
Device Details:							
Test Specification:							
Test Time:	10/5/2023 9:28:06 AM						
Technician:		Sampling Method:					
Specimen Code:		Specimen Lab #:					
Specimen Description:							
Specific Gravity:	2.72						
Plastic Limit:	0	Liquid Limit:	0				
Height (in):	6.4167	Diameter (in):	2.7910				
Area (in²):	6.118	Volume (in³):	39.2572				
Large Particle:							
Moisture Material:							
Moist Weight (g):	1232.0						
Test Remarks:							

Project Name: DMPA 8 Levee Relocation Project Number: 02-23-29125

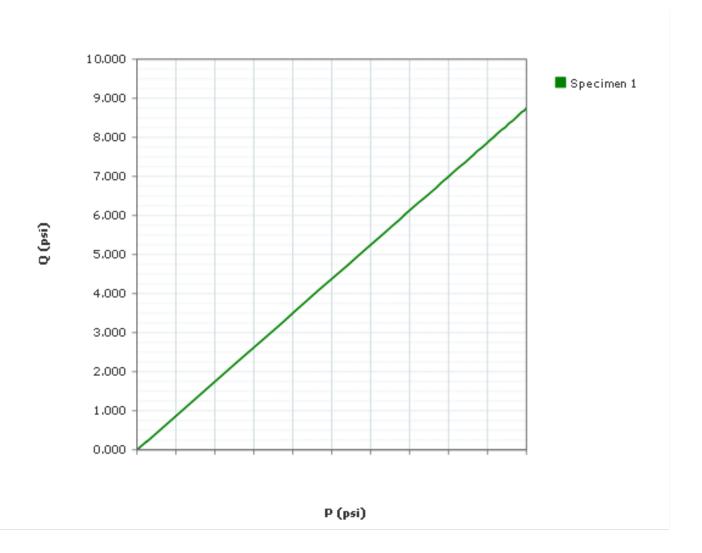


Mohr Circles (Total Stress) Graph



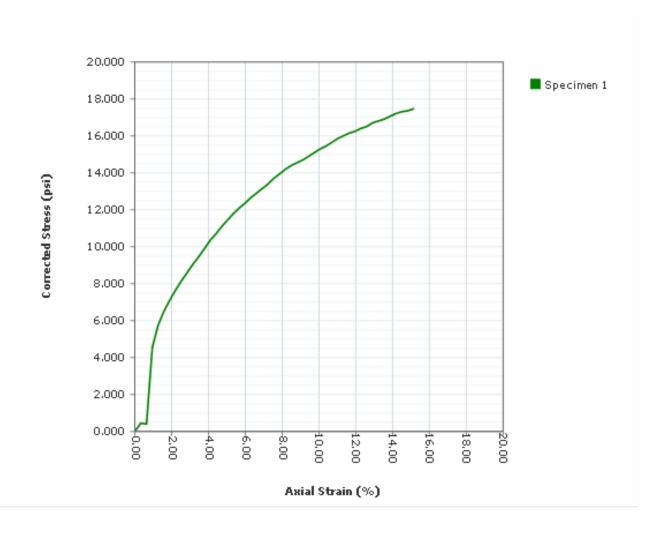


PQ Graph





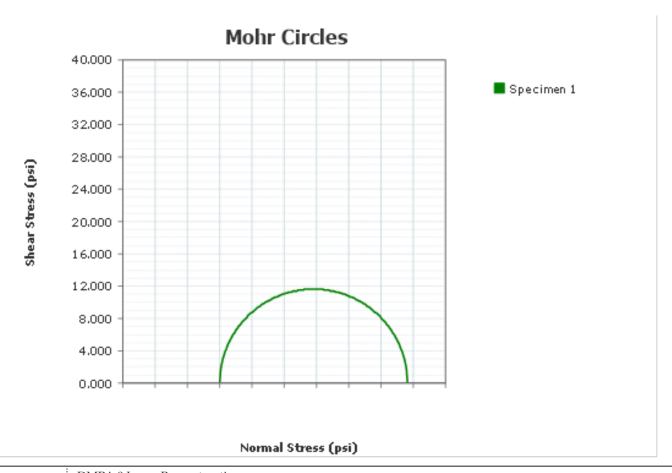
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



Project: DMPA 8 Levee Reconstruction
Project Number: 02-23-29125
Sampling Date: S-12
Sample Depth: B-9 @ 40
Location: Brownsville, Cameron County, Texas
Client Name: Port of Brownsville
Remarks: Port of Brownsville



Unconsolidated Undrained Test

Pofovo Tost				Specimer	n Numbei	r		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	12.000							
Height (in)	5.8897							
Diameter (in)	2.7407							
Water Content (%)	26.48							
Wet Density (Units)								
Dry Density (pcf)	98.68							
Saturation (%)	99.92							
Degree of Saturation (%)								
Void Ratio	0.721							
Height To Diameter Ratio	2.149							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	23.274							
o1 at Failure (psi)	35.274							
σ3 at Failure (psi)	12.000							
Rate of Strain (in/min)	0.058897							
Axial Strain at Failure (%)	15.186							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	26.48							

Final Water Content (%)	26.48					
_ :							
Project:	DMPA 8 Lev	ee Reconstru	action				
Project Number:	02-23-29125						
Sampling Date:							
Sample Number:	S-12						
Sample Depth:	B-9 @ 40						
Location:	Brownsville,	Cameron Co	ounty, Texas				
Client Name:	Port of Brown	nsville					
Project Remarks:							
Specimen 1 Specim	en 2 Spe	ecimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch Failure S		ure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch

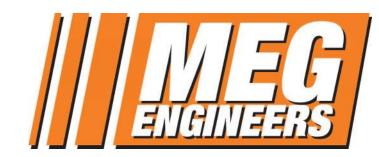


Unconsolidated Undrained Test

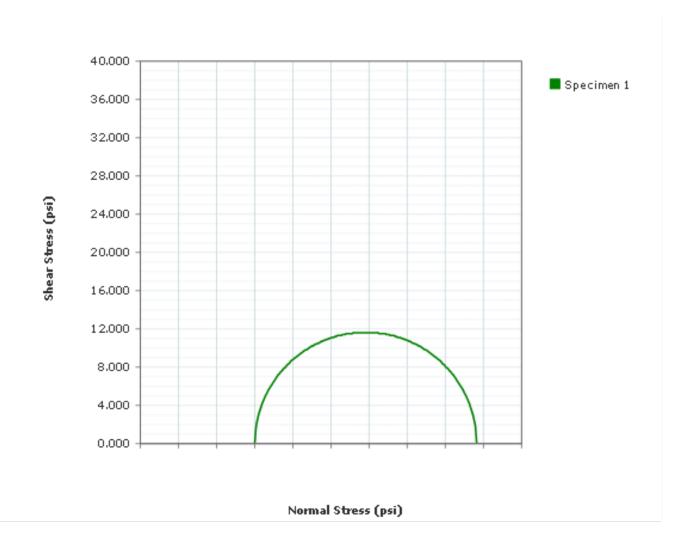
ASTM D2850

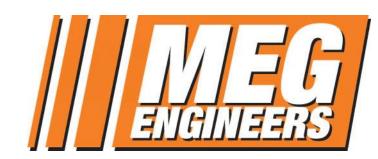
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/16/2023 8:21:19 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-3	Specimen Lab #:	S-12
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.8897	Diameter (in):	2.7407
Area (in²):	5.899	Volume (in³):	34.7451
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1138.3		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

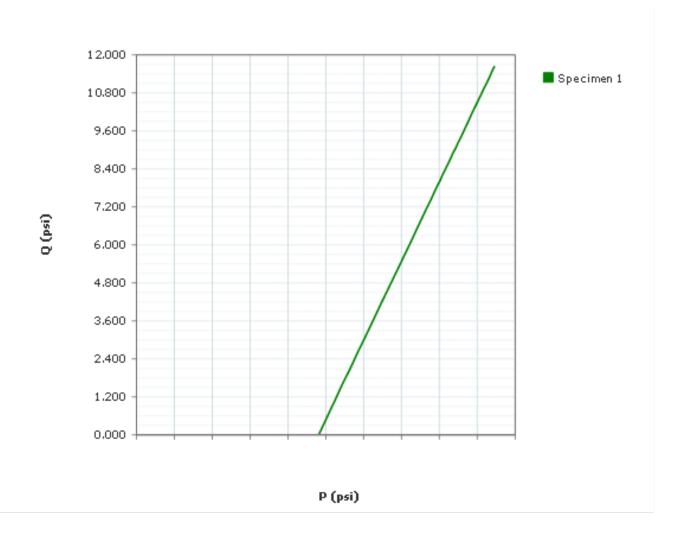


Mohr Circles (Total Stress) Graph



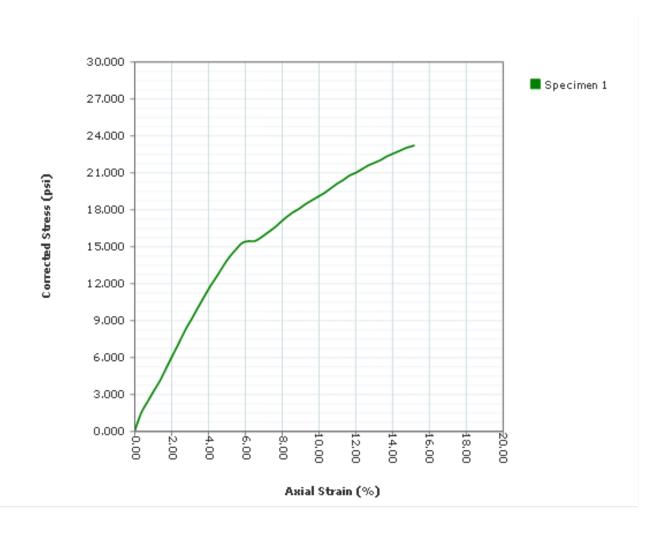


PQ Graph





Stress-Strain Graph

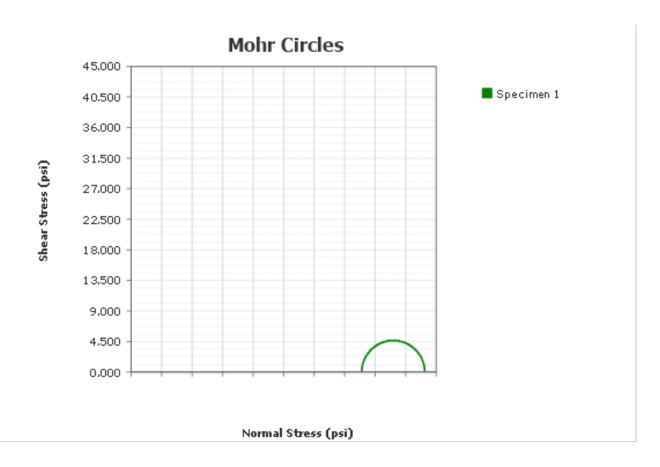


Unconsolidated Undrained Test - Results - Section 1
Standard Test Method for
Unconsolidated - Undrained
Triaxial Compression Test on
Cohesive Soils



Unconsolidated Undrained Test

ASTM D2850



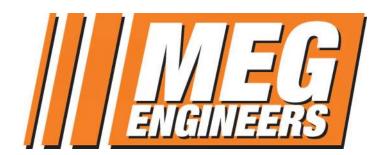
Project: DMPA 8 Levee Reconstruction
Project Number: 02-23-29125
Sampling Date: S-16
Sample Number: S-16
Sample Depth: B-9 @ 60
Location: Brownsville, Cameron County, Texas
Client Name: Port of Brownsville
Remarks: Remolded



Unconsolidated Undrained Test

Dofoso Toot				Specimer	n Number	A -		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	34.000							
Height (in)	5.3197							
Diameter (in)	2.7870							
Water Content (%)	21.18							
Wet Density (Units)								
Dry Density (pcf)	106.18							
Saturation (%)	96.14							
Degree of Saturation (%)								
Void Ratio	0.599							
Height To Diameter Ratio	1.909							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	9.315							
o1 at Failure (psi)	43.315							
σ3 at Failure (psi)	34.000							
Rate of Strain (in/min)	0.053197							
Axial Strain at Failure (%)	15.174							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	21.18							

Project:	DMPA 8 Levee Reconstruction	
Project Number:	02-23-29125	
Sampling Date:		
Sample Number:	S-16	
Sample Depth:	B-9 @ 60	
Location:	Brownsville, Cameron County, Texas	
Client Name:	Port of Brownsville	
Project Remarks:	Remolded	
Specimen 1 Specim	nen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8	
Failure Sketch Failure S	Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch	1

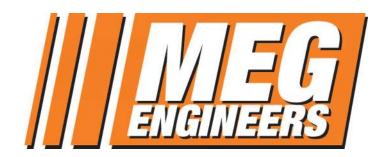


Unconsolidated Undrained Test

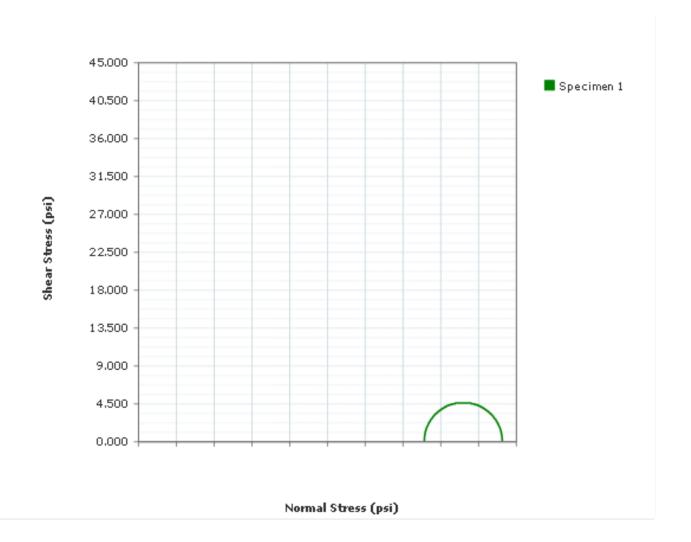
ASTM D2850

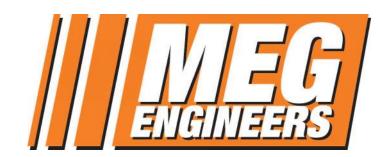
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/28/2023 9:40:35 AM		
Technician:	MG	Sampling Method:	Remolded
Specimen Code:	B-9	Specimen Lab #:	S-16
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	15	Liquid Limit:	28
Height (in):	5.3197	Diameter (in):	2.7870
Area (in²):	6.100	Volume (in³):	32.4525
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1096.1		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

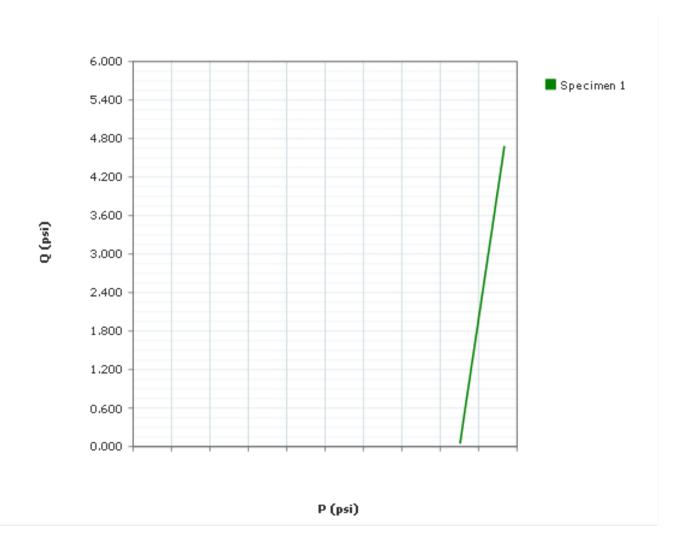


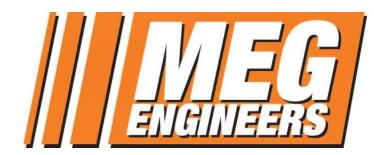
Mohr Circles (Total Stress) Graph



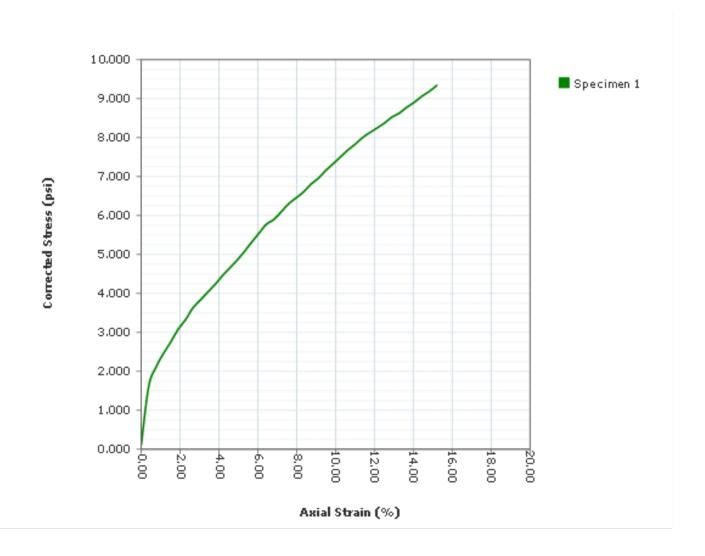


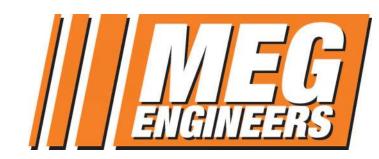
PQ Graph



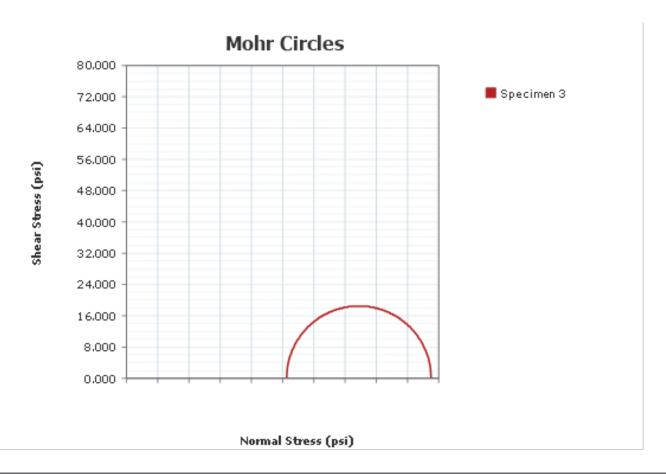


Stress-Strain Graph

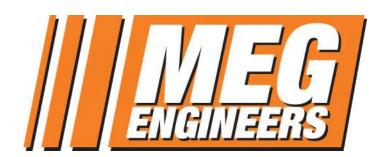




Unconsolidated Undrained Test



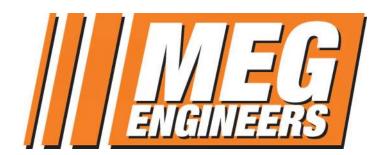
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-19
Sample Depth:	B-9 @ 75
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

Pofoso Tock	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)			0.0010					
Initial Cell Pressure (psi)			41.000					
Height (in)			5.8650					
Diameter (in)			2.7500					
Water Content (%)			23.14					
Wet Density (Units)								
Dry Density (pcf)			100.30					
Saturation (%)			90.83					
Degree of Saturation (%)								
Void Ratio			0.693					
Height To Diameter Ratio			2.133					
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)			37.046					
o1 at Failure (psi)			78.046					
σ3 at Failure (psi)			41.000					
Rate of Strain (in/min)			0.05865					
Axial Strain at Failure (%)			15.183					
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)			23.14					

Rate of Strain (in/min)				0.0586	5			
Axial Strain at Failure ((%)			15.183	3			
After Test		1	2	3	4	5	6 7	8
Final Water Content (%	5)			23.14				
Project:	DMPA 8 L	evee Reconstr	uction					
Project Number:	02-23-2912	5						
Sampling Date:								
Sample Number:	S-19							
Sample Depth:	B-9 @ 75							
Location:	Brownsvil	le, Cameron C	ounty, Texas	S				
Client Name:	Port of Bro	ownsville						
Project Remarks:								
Specimen 1 Specim	en 2	Specimen 3	Specimen	n 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch Failure S	Sketch Fa	ailure Sketch	Failure Ske	etch F	ailure Sketch	Failure Sketch	Failure Sketch	Failure Sketch



Unconsolidated Undrained Test

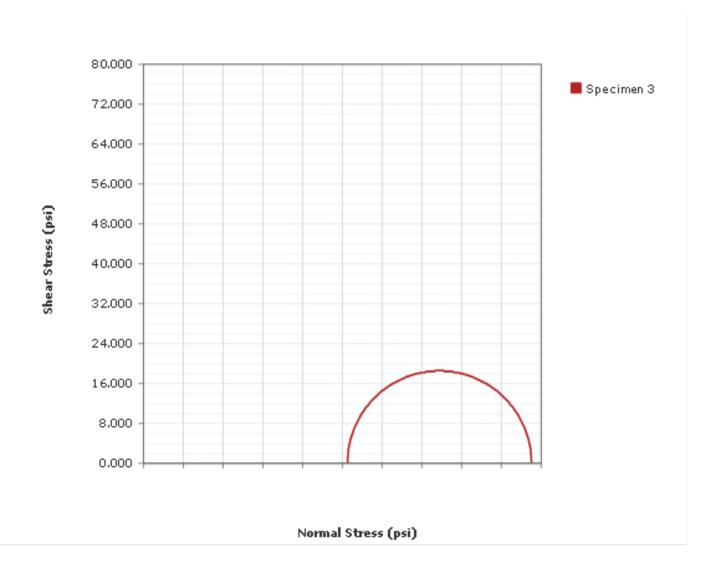
ASTM D2850

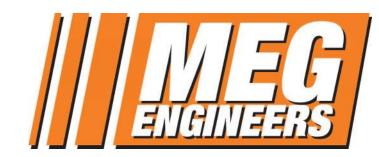
		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/16/2023 9:33:33 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-5	Specimen Lab #:	S-19
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	22	Liquid Limit:	54
Height (in):	5.8650	Diameter (in):	2.7500
Area (in²):	5.940	Volume (in³):	34.8356
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1129.4		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

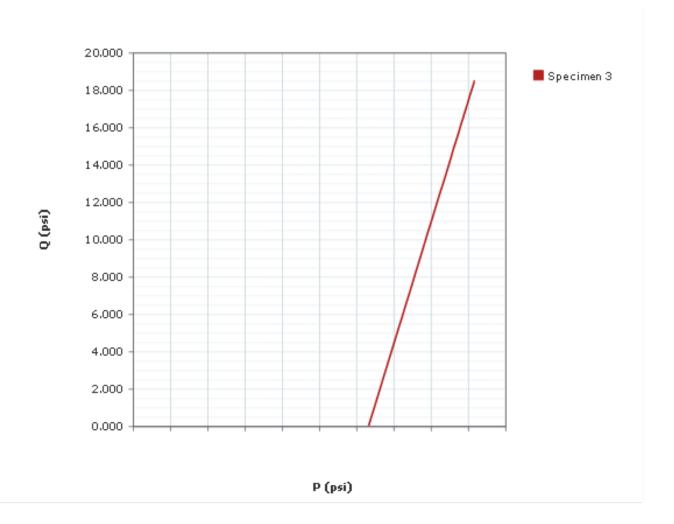


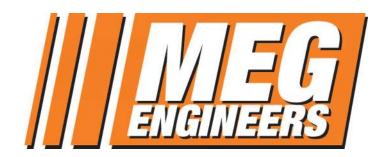
Mohr Circles (Total Stress) Graph



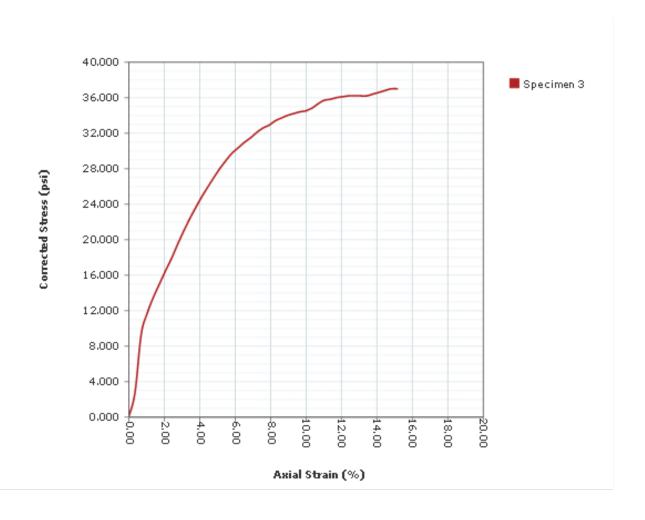


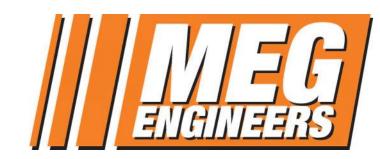
PQ Graph



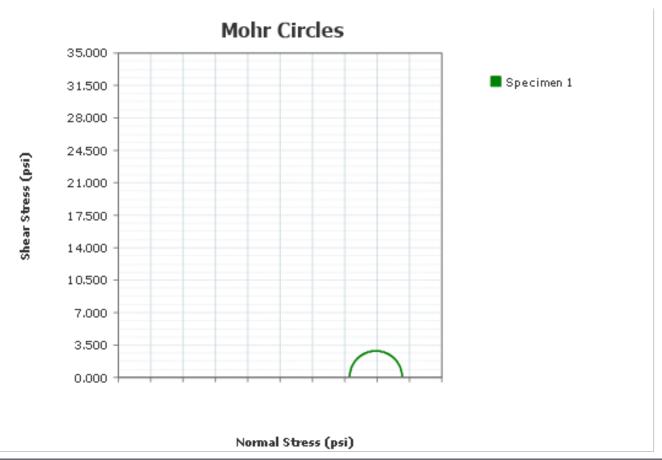


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Relocation
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-10
Sample Depth:	B-12 @ 28-30
Location:	
Client Name:	Port of Brownsville
Remarks:	

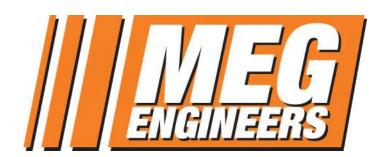


Unconsolidated Undrained Test

ASTM D2850				Specimer	Number	4		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	25.000							
Height (in)	5.8777							
Diameter (in)	2.7837							
Water Content (%)	49.64							
Wet Density (Units)								
Dry Density (pcf)	71.17							
Saturation (%)	97.42							
Degree of Saturation (%)								
Void Ratio	1.386							
Height To Diameter Ratio	2.111							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	5.628							
o1 at Failure (psi)	30.628							
σ3 at Failure (psi)	25.000							
Rate of Strain (in/min)	0.058777							
Axial Strain at Failure (%)	15.173							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	49.64							

Project:		DMPA	8 Levee Relocation	n				
Project Number:		02-23-2	9125					
Sampling Date:								
Sample Number	:	S-10						
Sample Depth:		B-12 @	28-30					
Location:								
Client Name:		Port of	Brownsville					
Project Remarks	:							
Specimen 1	Specim	en 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch	Failure S	ketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch

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Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch		Failure Sketch	Failure Sketch	Failu	ıre Sketch	Failure Sketch	
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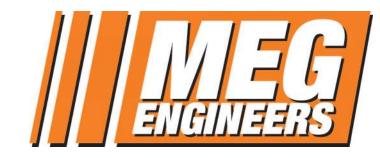


Unconsolidated Undrained Test

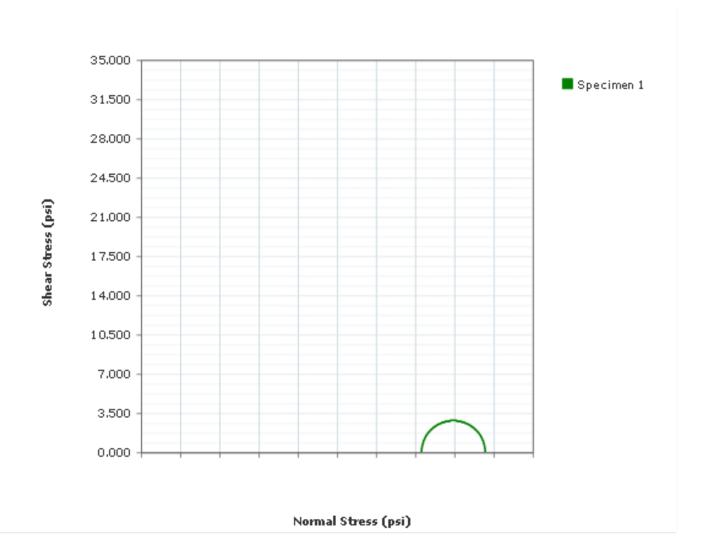
ASTM D2850

		Specimen 1	
Test Description:			
Other Associated Tests:			
Device Details:			
Test Specification:			
Test Time:	10/4/2023 3:32:45 PM		
Techni	Technician:		Undisturbed
Specimen	Specimen Code:		
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.8777	Diameter (in):	2.7837
Area (in²):	6.086	Volume (in³):	35.7709
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1000.0		
Test Remarks:			
1			

Project Name: DMPA 8 Levee Relocation Project Number: 02-23-29125

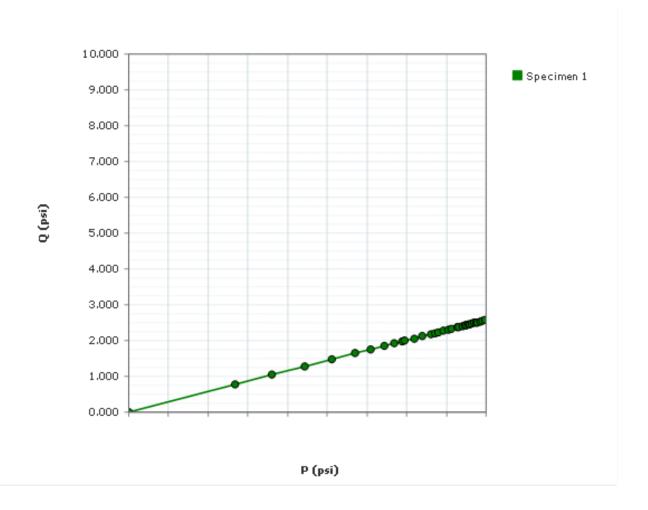


Mohr Circles (Total Stress) Graph



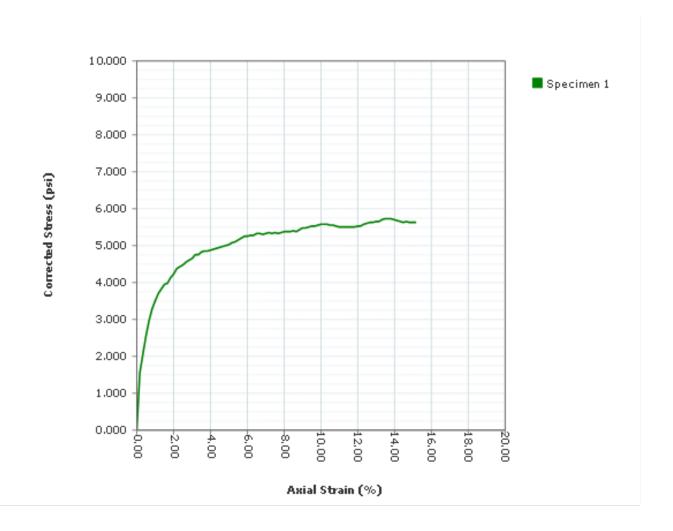


PQ Graph



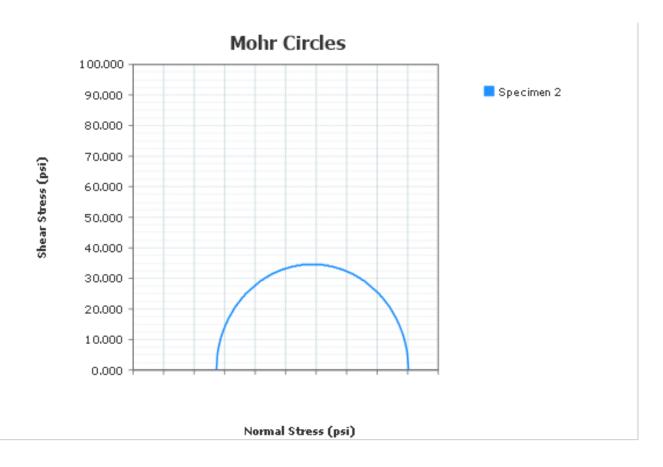


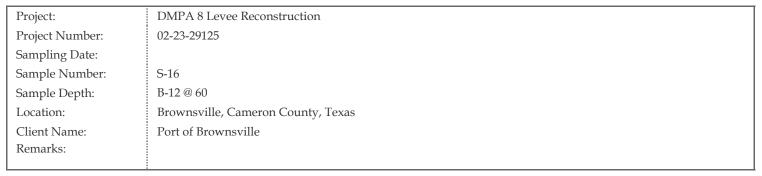
Stress-Strain Graph





Unconsolidated Undrained Test







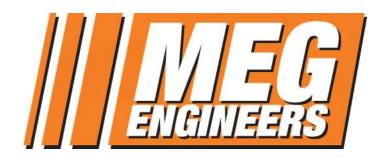
Unconsolidated Undrained Test

ASTM D2850

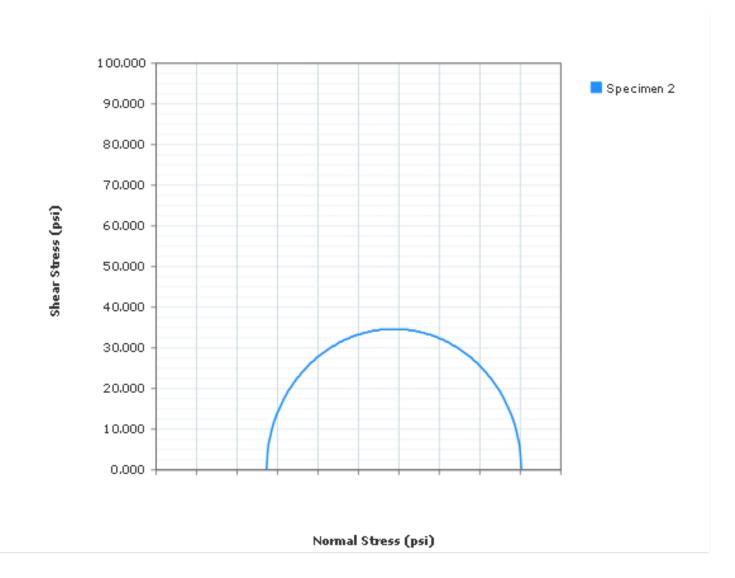
Before Test	Specimen Number									
before Test	1	2	3	4	5	6	7	8		
Membrane Thickness (in)		0.0010								
Initial Cell Pressure (psi)		30.000								
Height (in)		6.0010								
Diameter (in)		2.7803								
Water Content (%)		24.58								
Wet Density (Units)										
Dry Density (pcf)		101.56								
Saturation (%)		99.51								
Degree of Saturation (%)										
Void Ratio		0.672								
Height To Diameter Ratio		2.158								
Test Data	1	2	3	4	5	6	7	8		
Comp. Strength at Failure (psi)		69.133								
o1 at Failure (psi)		99.133								
σ3 at Failure (psi)		30.000								
Rate of Strain (in/min)		0.06001								
Axial Strain at Failure (%)		11.097								
After Test	1	2	3	4	5	6	7	8		
Final Water Content (%)		24.58								

Project: DMPA 8 Levee Reconstruction Project Number: 02-23-29125 Sampling Date: Sample Number: S-16 Sample Depth: B-12 @ 60 Brownsville, Cameron County, Texas Location: Client Name: Port of Brownsville Project Remarks: Specimen 5 Specimen 1 Specimen 2 Specimen 3 Specimen 4 Specimen 6 Specimen 7 Specimen 8

Specimen i	Specimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen o	Specimen 7	Specimen o
Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
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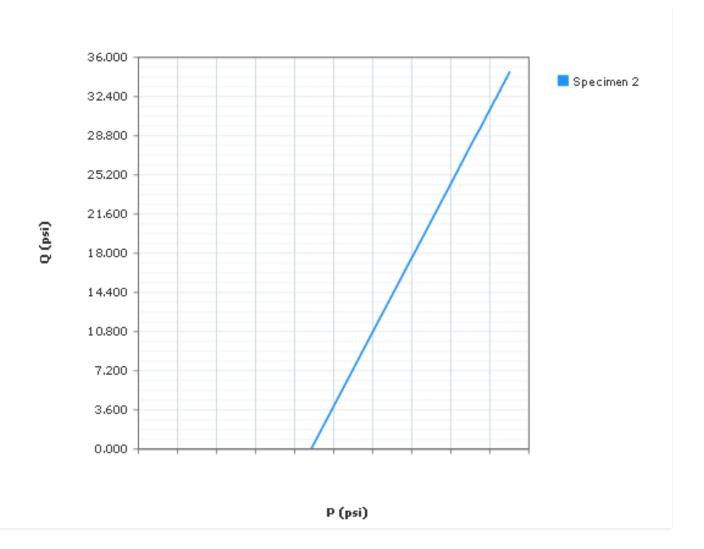


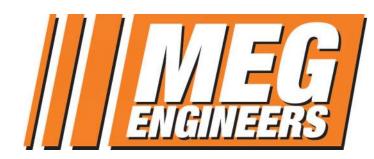
Mohr Circles (Total Stress) Graph



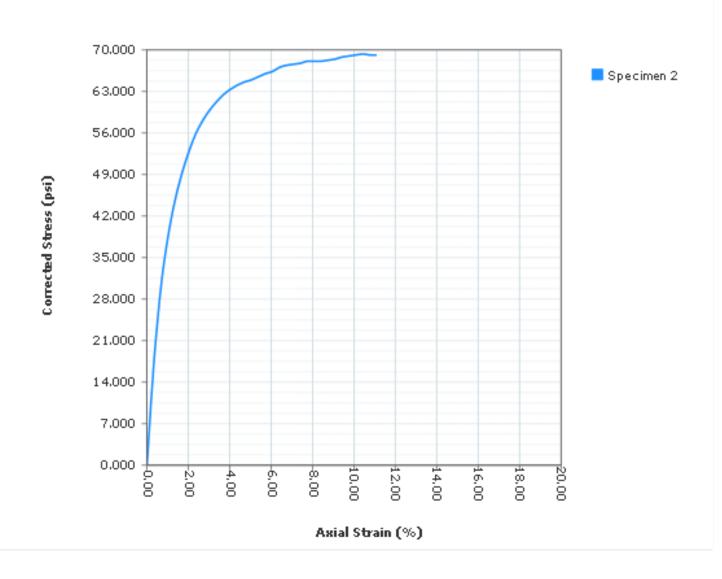


PQ Graph

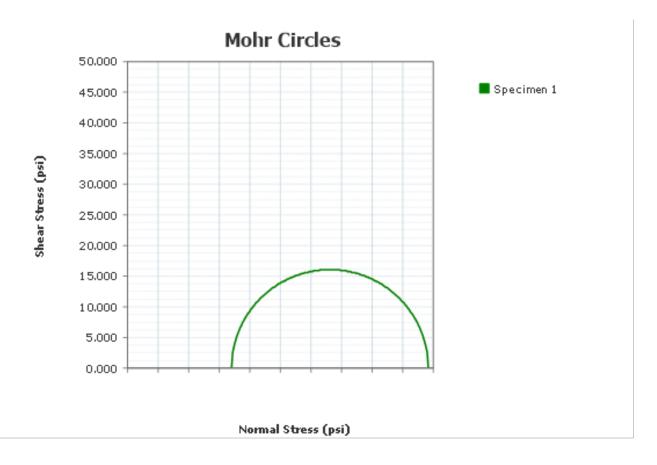


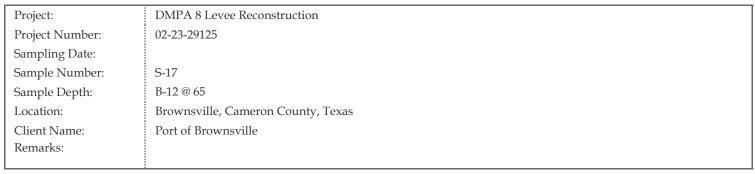


Stress-Strain Graph



Unconsolidated Undrained Test





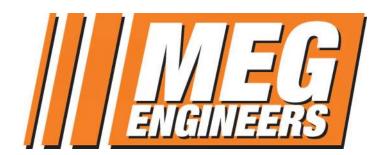


Unconsolidated Undrained Test

Pofoso Tock				Specimer	n Numbei	r		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	17.000							
Height (in)	6.0800							
Diameter (in)	2.7933							
Water Content (%)	22.36							
Wet Density (Units)								
Dry Density (pcf)	100.97							
Saturation (%)	89.21							
Degree of Saturation (%)								
Void Ratio	0.682							
Height To Diameter Ratio	2.177							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	32.167							
o1 at Failure (psi)	49.167							
o3 at Failure (psi)	17.000							
Rate of Strain (in/min)	0.0608							
Axial Strain at Failure (%)	16.271							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	22.36							

Project:		DMPA	8 Levee Reconstr	uction				
Project Number:		02-23-2	2-23-29125					
Sampling Date:								
Sample Number	:	S-17						
Sample Depth:		B-12 @ 65						
Location:		Browns	sville, Cameron C	ounty, Texas				
Client Name:		Port of	Brownsville					
Project Remarks:	:							
Specimen 1	Specim	en 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch	Failure S	ketch Failure Sketch		Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch

1	1	1	1	1	1	1	1
Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
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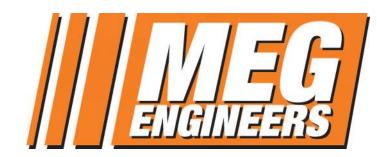


Unconsolidated Undrained Test

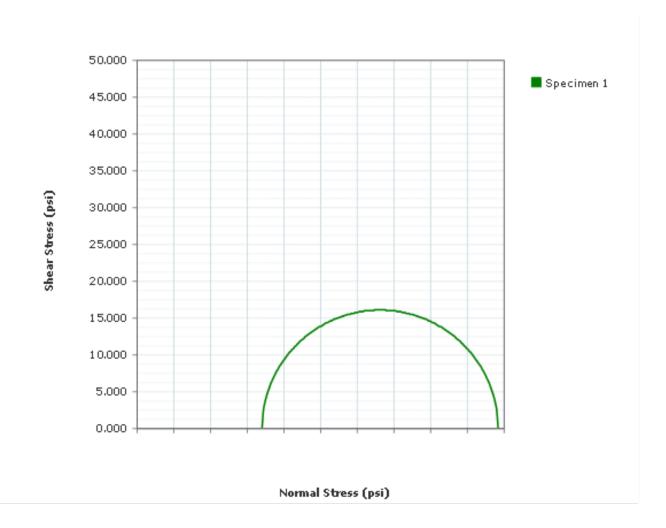
ASTM D2850

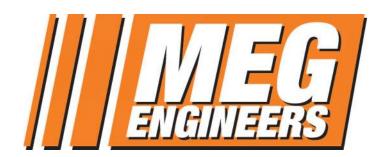
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/18/2023 6:51:42 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-5	Specimen Lab #:	S-17
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	6.0800	Diameter (in):	2.7933
Area (in²):	6.128	Volume (in³):	37.2597
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1208.3		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

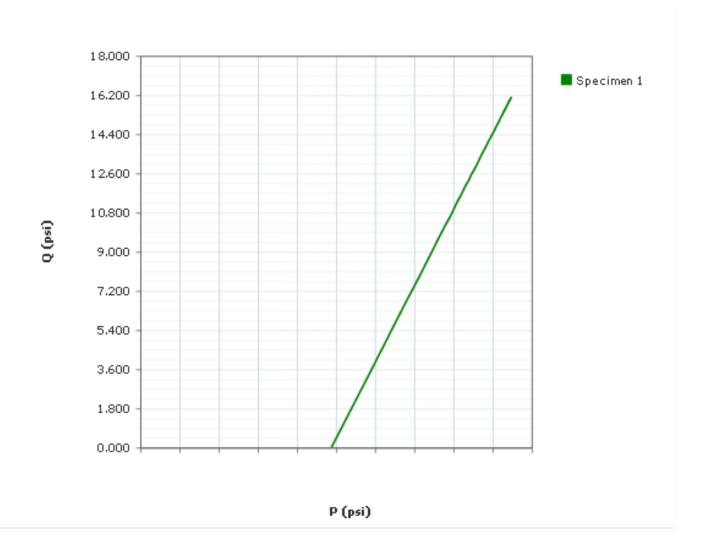


Mohr Circles (Total Stress) Graph



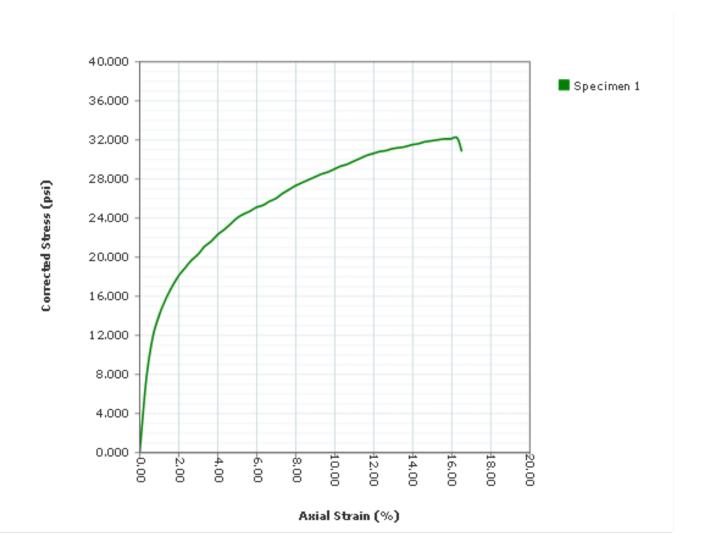


PQ Graph



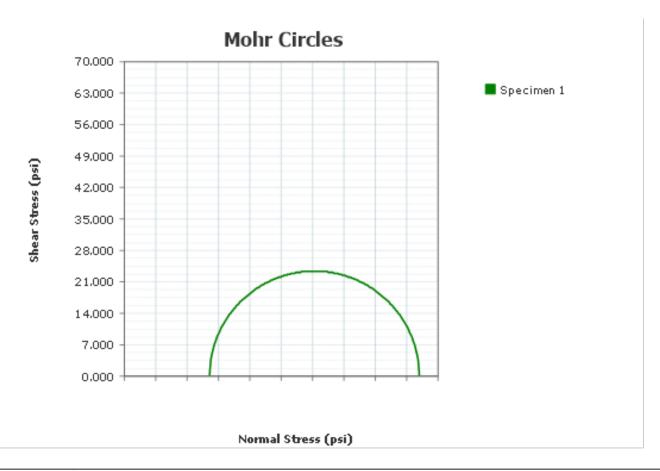


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-11
Sample Depth:	B-13 @ 35
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	

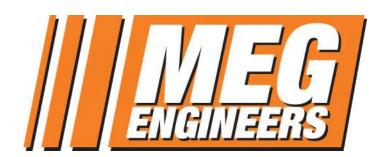


Unconsolidated Undrained Test

Dofoso Toot				Specimer	n Number	A -		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	19.000							
Height (in)	5.9297							
Diameter (in)	2.7917							
Water Content (%)	24.32							
Wet Density (Units)								
Dry Density (pcf)	101.17							
Saturation (%)	97.50							
Degree of Saturation (%)								
Void Ratio	0.678							
Height To Diameter Ratio	2.124							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	46.588							
σ1 at Failure (psi)	65.588							
σ3 at Failure (psi)	19.000							
Rate of Strain (in/min)	0.059297							
Axial Strain at Failure (%)	10.210							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	24.32							

Project:	DMPA 8 Levee Reconstruction						
Project Number:	02-23-29125						
Sampling Date:							
Sample Number:	S-11						
Sample Depth:	B-13 @ 35						
Location:	Brownsville, Cameron County, Texas						
Client Name:	Port of Brownsville						
Project Remarks:							
Specimen 1 Specim	en 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8						

opecimen i	opecimen 2	5pecinien 5	Specimen 4	Specificity	Specimeno	opecinien /	Specificito
Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch

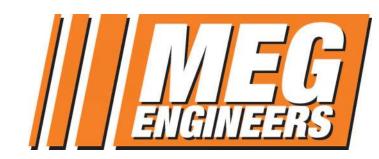


Unconsolidated Undrained Test

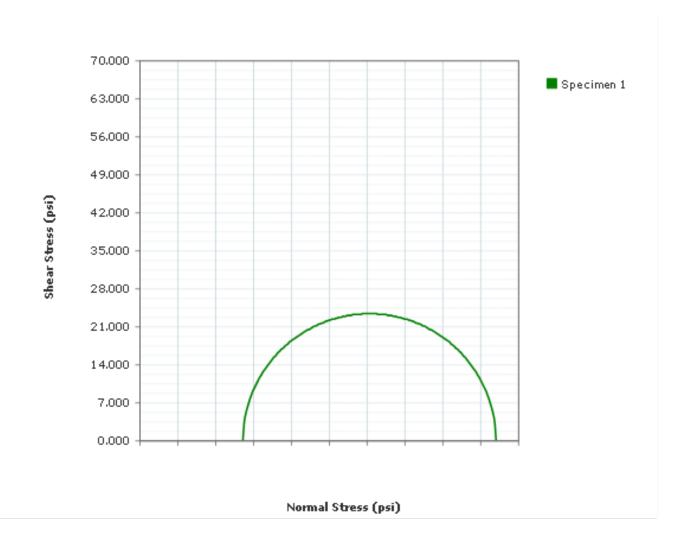
ASTM D2850

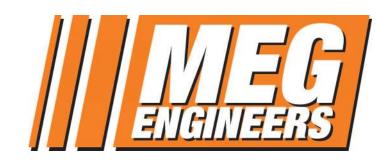
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/18/2023 8:07:18 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-13	Specimen Lab #:	S-11
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	5.9297	Diameter (in):	2.7917
Area (in²):	6.121	Volume (in³):	36.2950
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1198.3		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

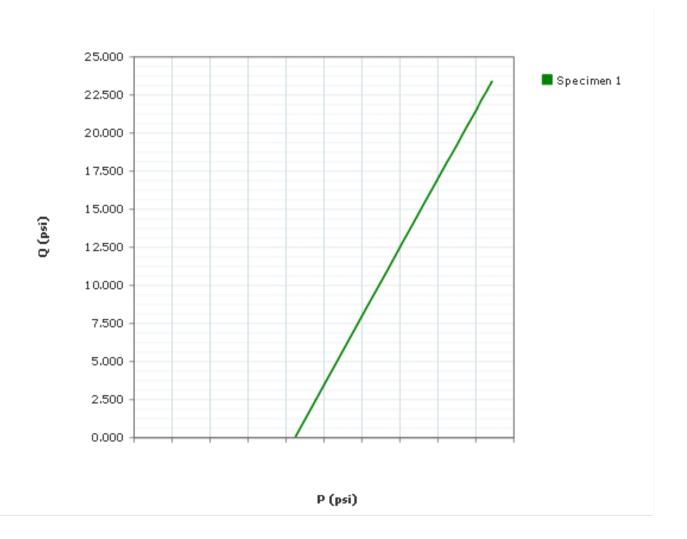


Mohr Circles (Total Stress) Graph



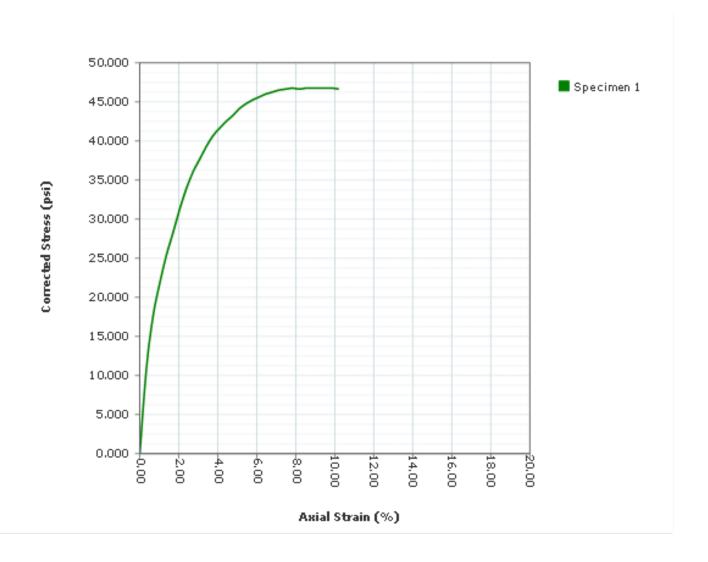


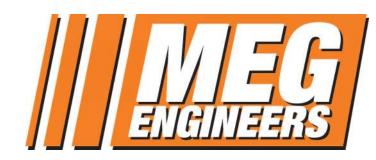
PQ Graph





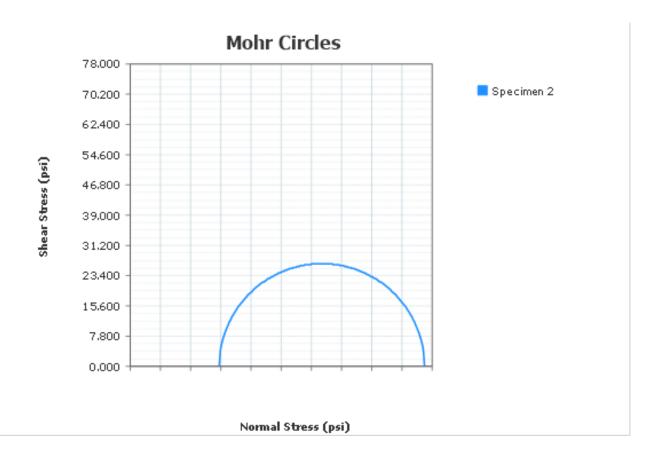
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



Project: DMPA 8 Levee Reconstruction

Project Number: 02-23-29125

Sampling Date: S-13

Sample Depth: B-13 @ 45

Location: Brownsville, Cameron County, Texas

Client Name: Port of Brownsville

Remarks: Port of Brownsville



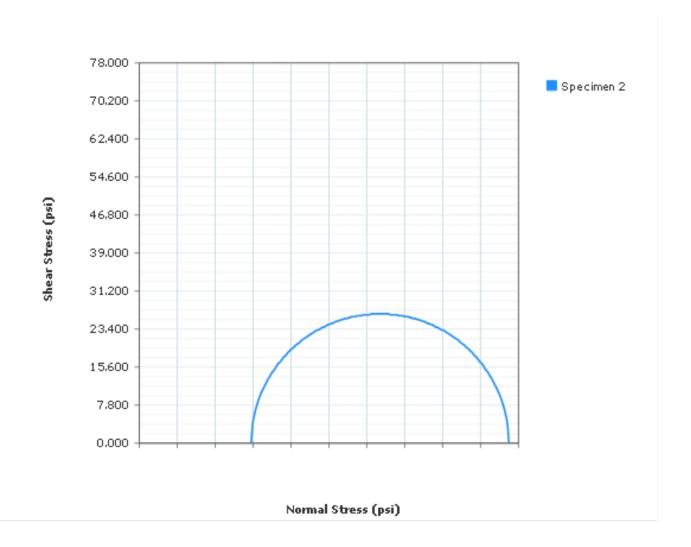
Unconsolidated Undrained Test

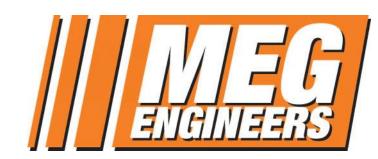
Before Test	Specimen Number							
before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)		0.0010						
Initial Cell Pressure (psi)		23.000						
Height (in)		5.3760						
Diameter (in)		2.7720						
Water Content (%)		24.43						
Wet Density (Units)								
Dry Density (pcf)		103.07						
Saturation (%)		102.66						
Degree of Saturation (%)								
Void Ratio		0.647						
Height To Diameter Ratio		1.939						
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)		53.001						
o1 at Failure (psi)		76.001						
σ3 at Failure (psi)		23.000						
Rate of Strain (in/min)		0.05376						
Axial Strain at Failure (%)		18.394						
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)		24.43						

Rate of Strain (in/min)		0.05376				
Axial Strain at Failure ((%)	18.394				
After Test	1	2	3 4	5	6 7	8
Final Water Content (%	5)	24.43				
Project:	DMPA 8 Levee Reconst	ruction				
Project Number:	02-23-29125					
Sampling Date:						
Sample Number:	S-13					
Sample Depth:	B-13 @ 45					
Location:	Brownsville, Cameron (County, Texas				
Client Name:	Port of Brownsville					
Project Remarks:						
Specimen 1 Specim Failure Sketch Failure S		Specimen 4 Failure Sketch	Specimen 5 Failure Sketch	Specimen 6 Failure Sketch	Specimen 7 Failure Sketch	Specimen 8 Failure Sketch
Panule Sketch Francie S)	ranure sketch	ranure sketti	ranure sketch	ranure sketti	ranure sketch

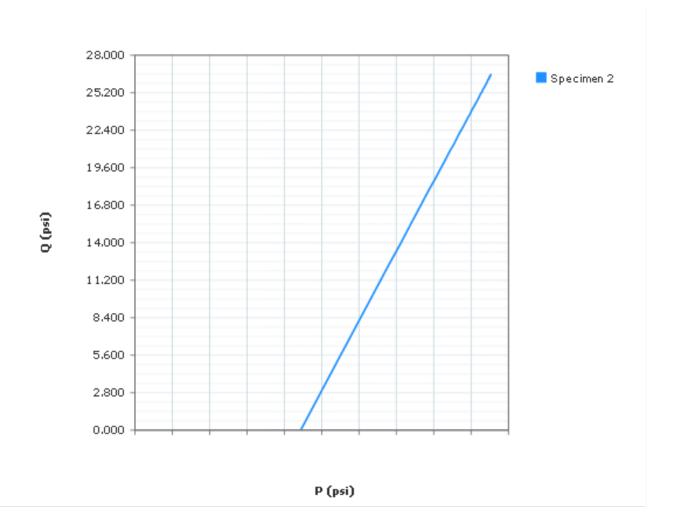


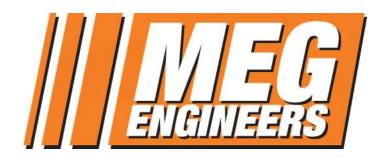
Mohr Circles (Total Stress) Graph



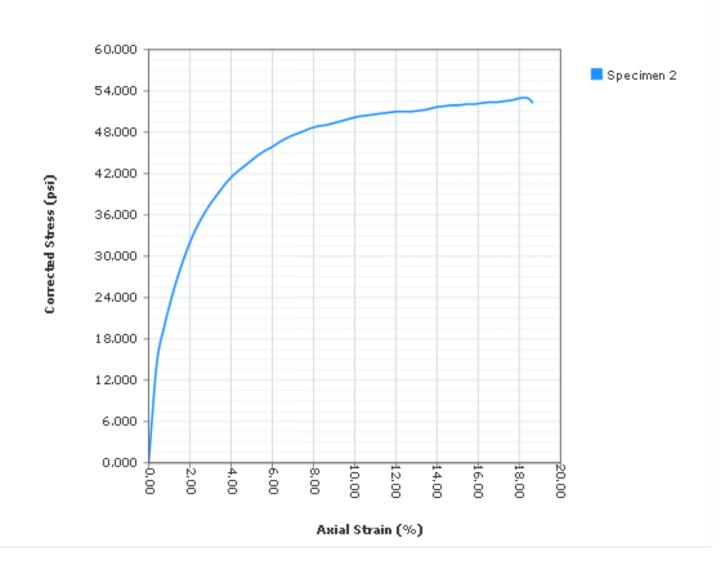


PQ Graph





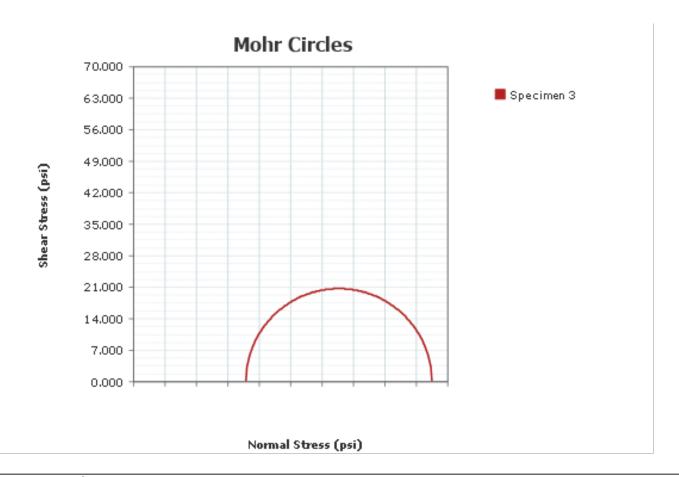
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



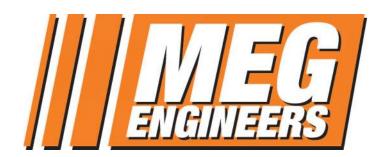
Project: DMPA 8 Levee Reconstruction
Project Number: 02-23-29125
Sampling Date: S-13
Sample Depth: B-13 @ 50
Location: Brownsville, Cameron County, Texas
Client Name: Port of Brownsville
Remarks: Remolded



Unconsolidated Undrained Test

A51W D2650	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)			0.0010					
Initial Cell Pressure (psi)			25.000					
Height (in)			6.0817					
Diameter (in)			2.7943					
Water Content (%)			23.47					
Wet Density (Units)								
Dry Density (pcf)			97.87					
Saturation (%)			86.85					
Degree of Saturation (%)								
Void Ratio			0.735					
Height To Diameter Ratio			2.176					
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)			41.442					
σ1 at Failure (psi)			66.442					
σ3 at Failure (psi)			25.000					
Rate of Strain (in/min)			0.060817					
Axial Strain at Failure (%)			15.179					
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)			23.47					

Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-13
Sample Depth:	B-13 @ 50
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Project Remarks:	Remolded
Specimen 1 Specim	nen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8
Failure Sketch Failure S	Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch
	[[[[[[[[[[[[[

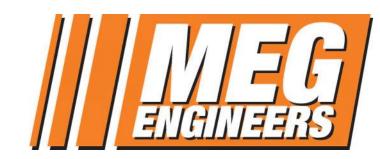


Unconsolidated Undrained Test

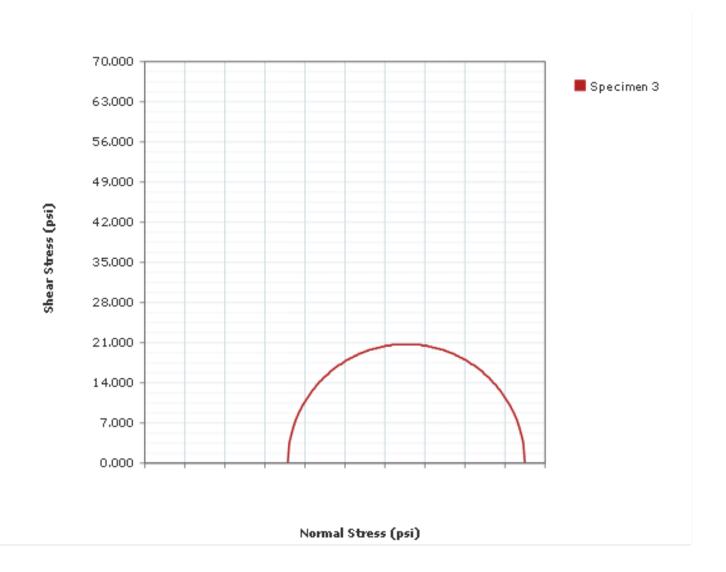
ASTM D2850

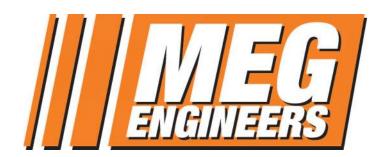
		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/28/2023 11:22:41 AM		
Technician:	MG	Sampling Method:	Remolded
Specimen Code:	B-13	Specimen Lab #:	S-14
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	6.0817	Diameter (in):	2.7943
Area (in²):	6.133	Volume (in³):	37.2966
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1183.0		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

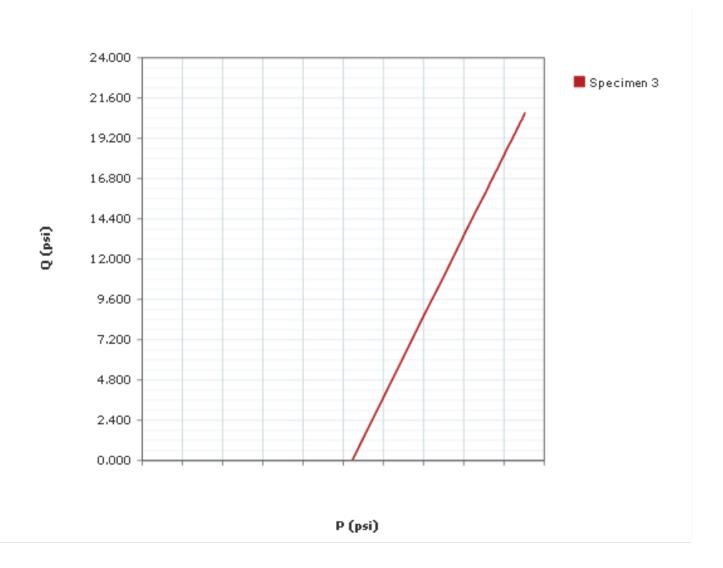


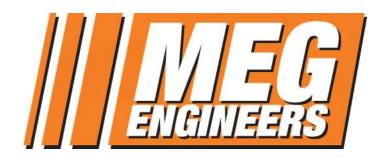
Mohr Circles (Total Stress) Graph





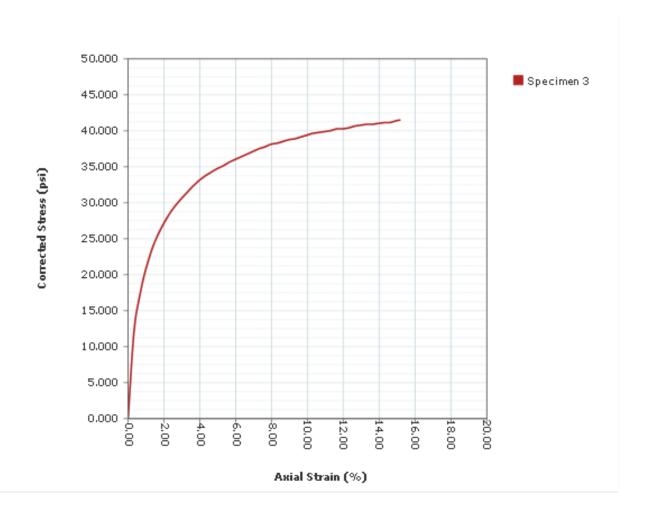
PQ Graph



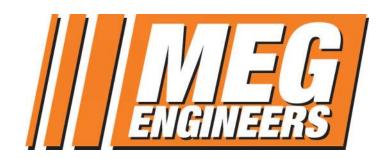


Stress-Strain Graph

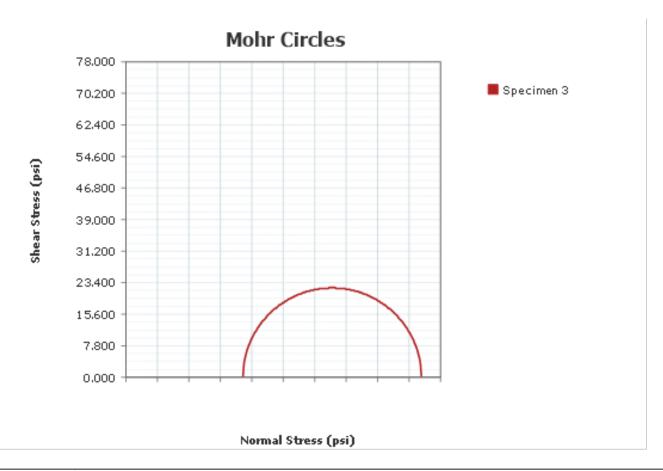
ASTM D2850



Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125



Unconsolidated Undrained Test



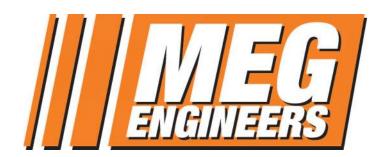
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-16
Sample Depth:	B-13 @ 60
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

ASTM D2850	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)			0.0010					
Initial Cell Pressure (psi)			29.000					
Height (in)			6.1710					
Diameter (in)			2.7840					
Water Content (%)			24.38					
Wet Density (Units)								
Dry Density (pcf)			100.64					
Saturation (%)			96.52					
Degree of Saturation (%)								
Void Ratio			0.687					
Height To Diameter Ratio			2.217					
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)			44.123					
σ1 at Failure (psi)			73.123					
σ3 at Failure (psi)			29.000					
Rate of Strain (in/min)			0.06171					
Axial Strain at Failure (%)			9.811					
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)			24.38					

Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-16
Sample Depth:	B-13 @ 60
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Project Remarks:	
Specimen 1 Specim	nen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8
Failure Sketch Failure S	Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch Failure Sketch
	[[[[[[

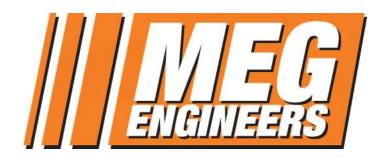


Unconsolidated Undrained Test

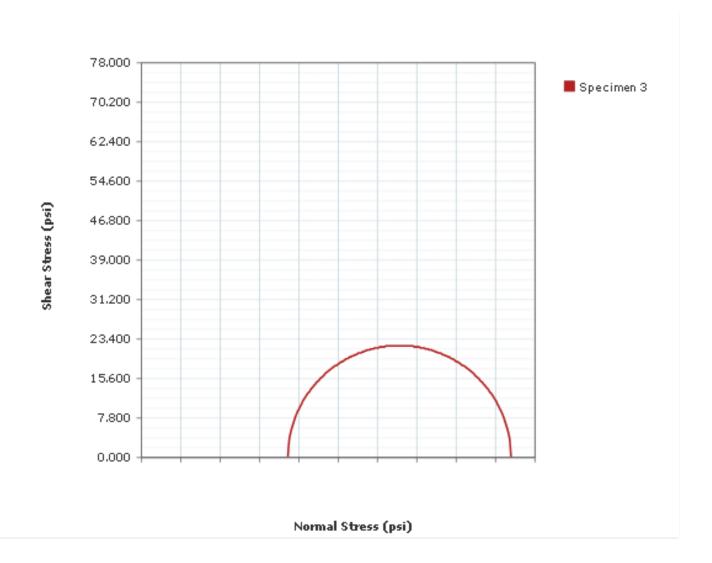
ASTM D2850

		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/18/2023 9:20:13 PM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-13	Specimen Lab #:	S-16
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	6.1710	Diameter (in):	2.7840
Area (in²):	6.087	Volume (in³):	37.5651
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1234.4		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

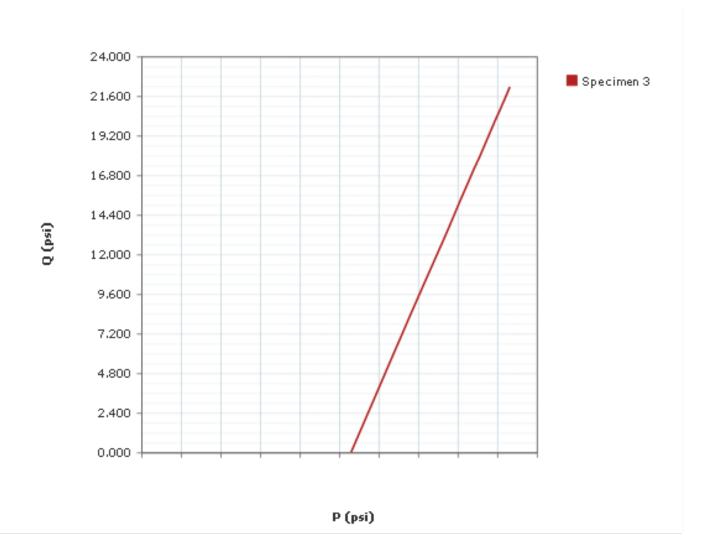


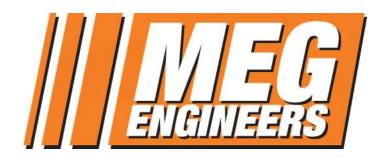
Mohr Circles (Total Stress) Graph



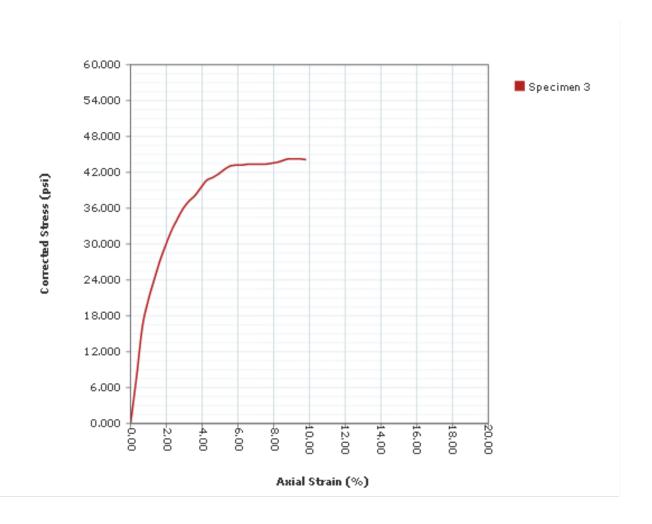


PQ Graph



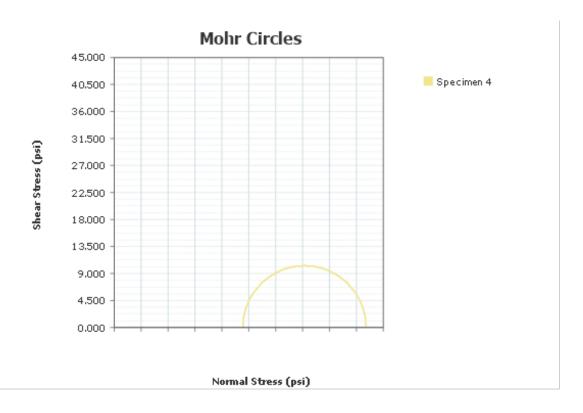


Stress-Strain Graph





Unconsolidated Undrained Test



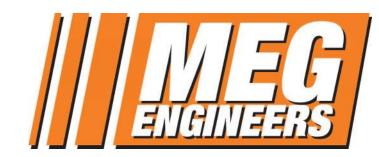
Project:	DMPA 8 Levee Reconstruction	
Project Number:	02-23-29125	
Sampling Date:		
Sample Number:	S-3	
Sample Depth:	B-14 @ 6	
Location:	Brownsville, Cameron County, Texas	
Client Name:	Port of Brownsville	
Remarks:		



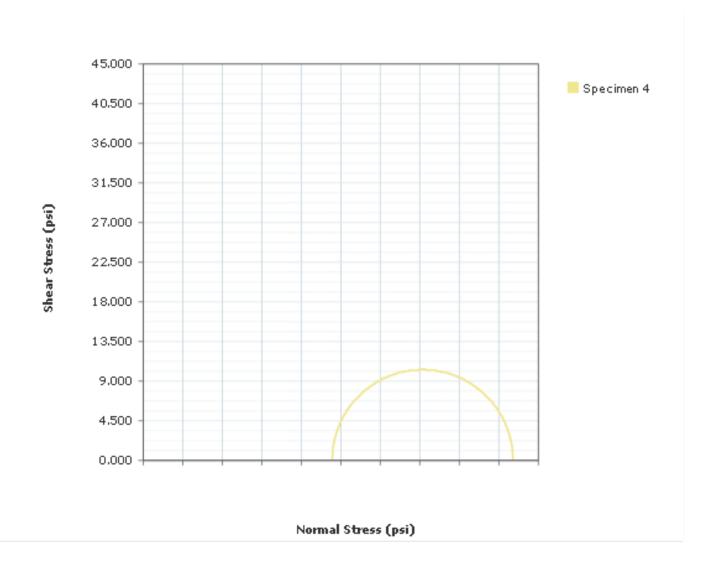
Unconsolidated Undrained Test

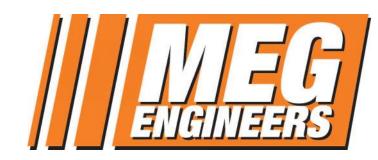
AS1M D2850				.	3.T 1			
Before Test	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)				0.0010				
Initial Cell Pressure (psi)				21.500				
Height (in)				5.7623				
Diameter (in)				2.7580				
Water Content (%)				34.62				
Wet Density (Units)								
Dry Density (pcf)				86.97				
Saturation (%)				98.85				
Degree of Saturation (%)								
Void Ratio				0.953				
Height To Diameter Ratio				2.089				
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)				20.555				
σ1 at Failure (psi)				42.055				
σ3 at Failure (psi)				21.500				
Rate of Strain (in/min)				0.057623				
Axial Strain at Failure (%)				11.214				
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)				34.62				

Final Water Content (%	(b)		34.62			
Project:	DMPA 8 Levee Reconst	ruction				
Project Number:	02-23-29125					
Sampling Date:						
Sample Number:	S-3					
Sample Depth:	B-14 @ 6					
Location:	Brownsville, Cameron (County, Texas				
Client Name:	Port of Brownsville					
Project Remarks:						
Specimen 1 Specim	nen 2 Specimen 3	Specimen 1	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch Failure S	1	Specimen 4 Failure Sketch	Failure Sketch	Specimen 6 Failure Sketch	Failure Sketch	Specimen 8 Failure Sketch
		(3)				

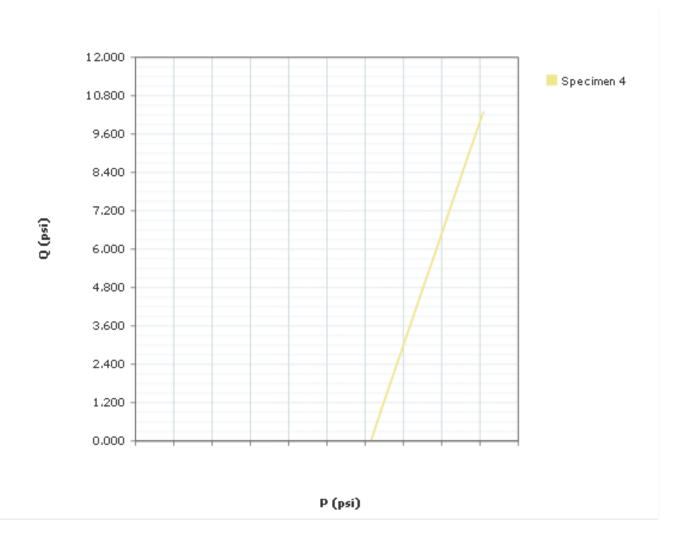


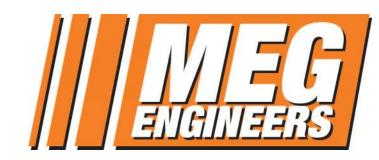
Mohr Circles (Total Stress) Graph



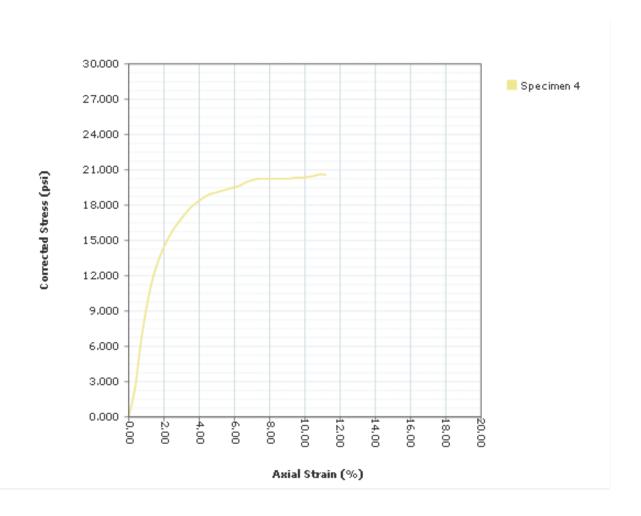


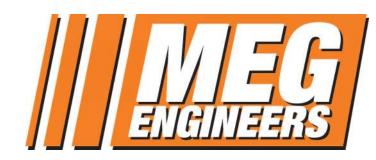
PQ Graph



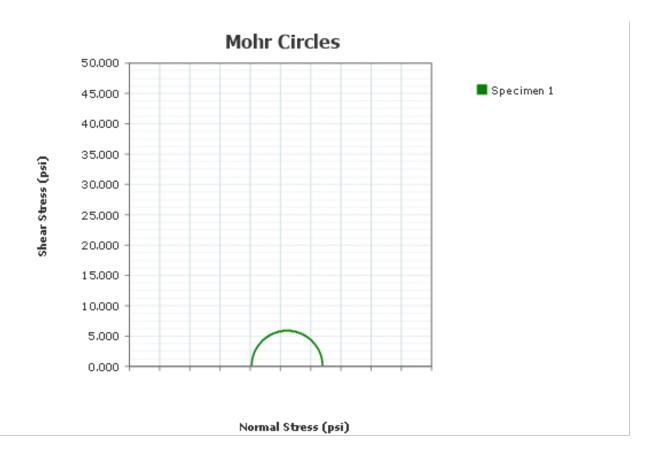


Stress-Strain Graph





Unconsolidated Undrained Test



Project:	DMPA 8 Levee Relocation
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-12
Sample Depth:	B-14 @ 40
Location:	
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

Dofoso Toot	Specimen Number								
Before Test	1	2	3	4	5	6	7	8	
Membrane Thickness (in)	0.0010								
Initial Cell Pressure (psi)	20.210								
Height (in)	6.6627								
Diameter (in)	2.8497								
Water Content (%)	26.11								
Wet Density (Units)									
Dry Density (pcf)	92.70								
Saturation (%)	85.39								
Degree of Saturation (%)									
Void Ratio	0.832								
Height To Diameter Ratio	2.338								
Test Data	1	2	3	4	5	6	7	8	
Comp. Strength at Failure (psi)	11.769								
o1 at Failure (psi)	31.979								
σ3 at Failure (psi)	20.210								
Rate of Strain (in/min)	0.066627								
Axial Strain at Failure (%)	14.242								
After Test	1	2	3	4	5	6	7	8	
Final Water Content (%)	26.11								

Project:		DMPA	8 Levee Relocation	n				
Project Number:		02-23-2	9125					
Sampling Date:								
Sample Number	:	S-12						
Sample Depth:		B-14 @	40					
Location:								
Client Name:		Port of Brownsville						
Project Remarks	:							
Specimen 1	Specim	en 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8
Failure Sketch	Failure S	ketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
!!		i	F	F	·i	Li	[i	·

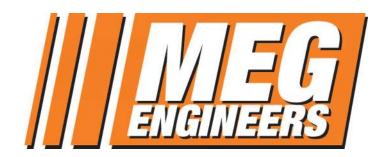


Unconsolidated Undrained Test

ASTM D2850

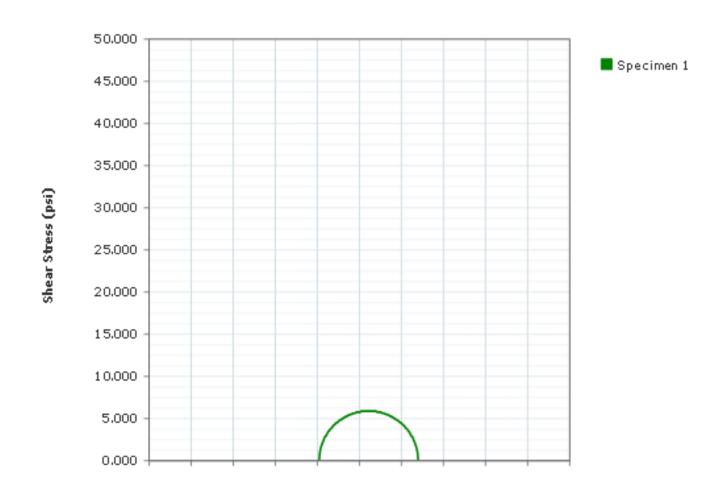
Specimen 1								
Test Description:								
Other Associated Tests:								
Device Details:								
Test Specification:								
Test Time:	10/4/2023 5:07:47 PM							
Technician:		Sampling Method:						
Specimen Code:		Specimen Lab #:						
Specimen Description:								
Specific Gravity:	2.72							
Plastic Limit:	17	Liquid Limit:	28					
Height (in):	6.6627	Diameter (in):	2.8497					
Area (in²):	6.378	Volume (in³):	42.4939					
Large Particle:								
Moisture Material:								
Moist Weight (g):	1304.0							
Test Remarks:								

Project Name: DMPA 8 Levee Relocation Project Number: 02-23-29125



Mohr Circles (Total Stress) Graph

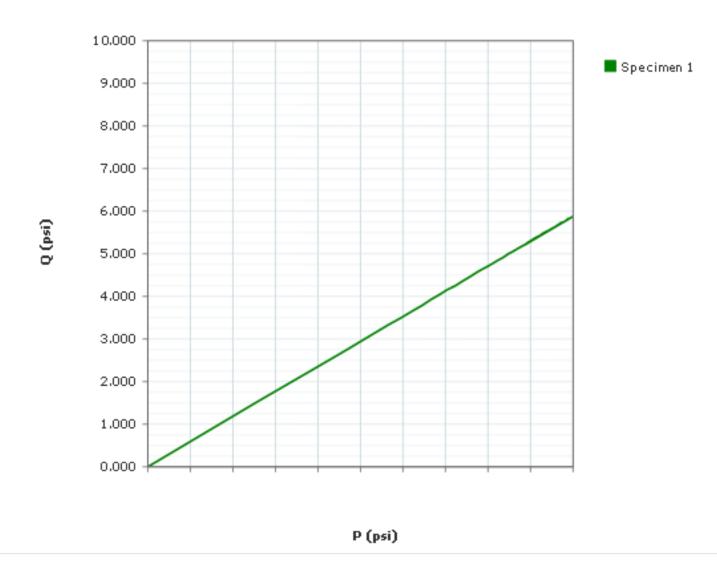
ASTM D2850

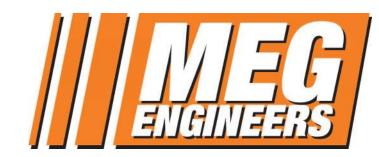


Normal Stress (psi)

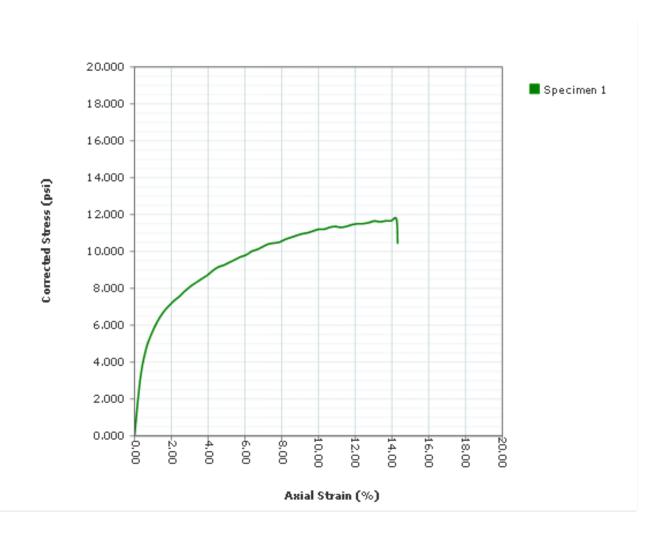


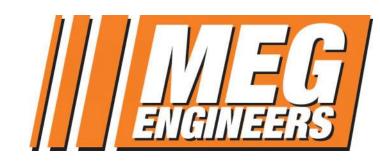
PQ Graph



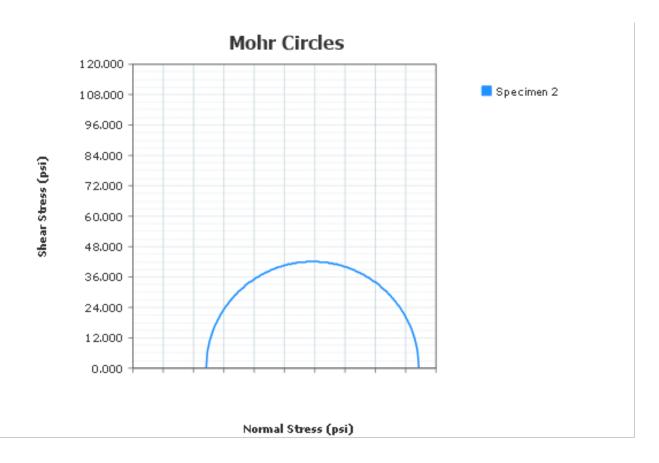


Stress-Strain Graph





Unconsolidated Undrained Test



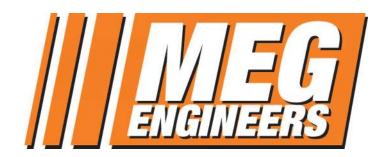
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-13
Sample Depth:	B-14 @ 45
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



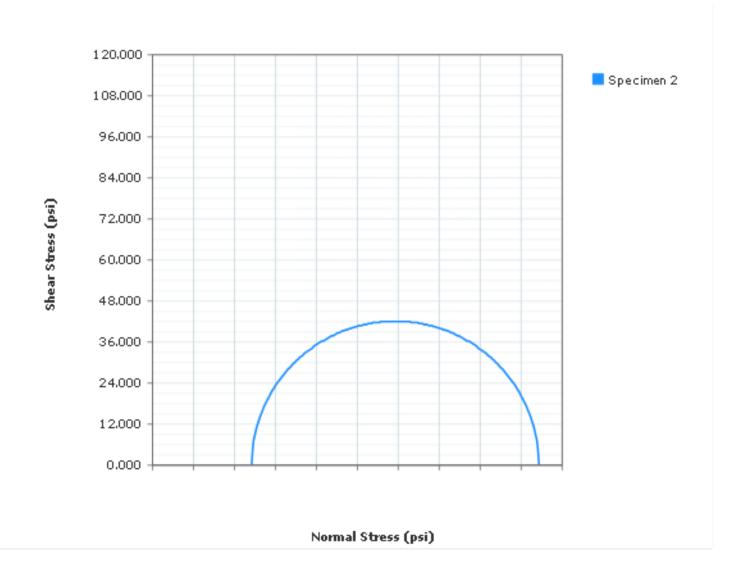
Unconsolidated Undrained Test

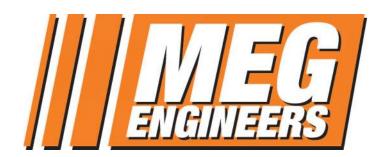
Pofoso Took	Specimen Number								
Before Test	1	2	3	4	5	6	7	8	
Membrane Thickness (in)		0.0010							
Initial Cell Pressure (psi)		29.000							
Height (in)		6.0303							
Diameter (in)		2.7857							
Water Content (%)		17.89							
Wet Density (Units)									
Dry Density (pcf)		111.10							
Saturation (%)		92.11							
Degree of Saturation (%)									
Void Ratio		0.528							
Height To Diameter Ratio		2.165							
Test Data	1	2	3	4	5	6	7	8	
Comp. Strength at Failure (psi)		84.128							
σ1 at Failure (psi)		113.128							
σ3 at Failure (psi)		29.000							
Rate of Strain (in/min)		0.060303							
Axial Strain at Failure (%)		15.180							
After Test	1	2	3	4	5	6	7	8	
Final Water Content (%)		17.89							

After Test		1	2	3	4		5	6	7	8
Final Water Content (%)		17.89							
Project:	e Reconstrue	ction								
Project Number:		Reconstru	Ction							
· · · · · · · · · · · · · · · · · · ·	02-23-29125									
Sampling Date:										
Sample Number:	S-13									
Sample Depth:	B-14 @ 45									
Location:	Brownsville, Ca	ameron Co	unty, Texa	s						
Client Name:	Port of Browns	sville								
Project Remarks:										
Specimen 1 Specim	en 2 Spec	imen 3	Specime	n 4	Specimen	5	Specimen 6	Spec	eimen 7	Specimen 8
Failure Sketch Failure S			Failure Sk		Failure Ske		Failure Sketc		e Sketch	Failure Sketch
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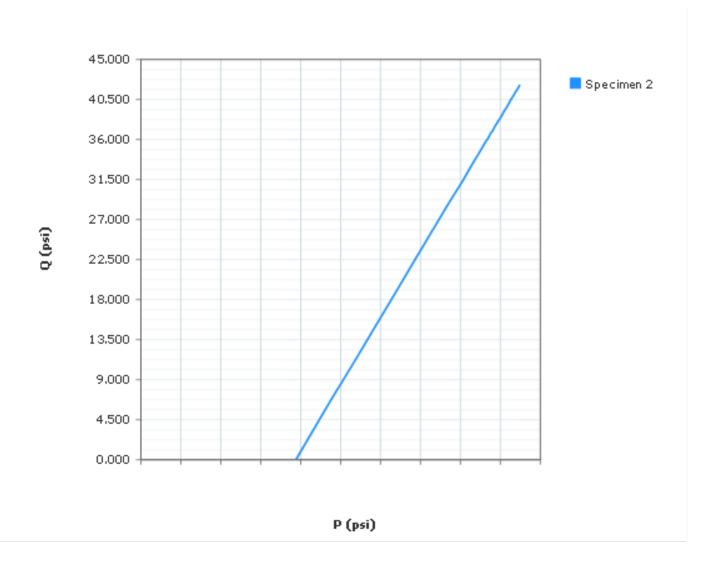


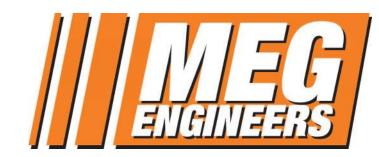
Mohr Circles (Total Stress) Graph



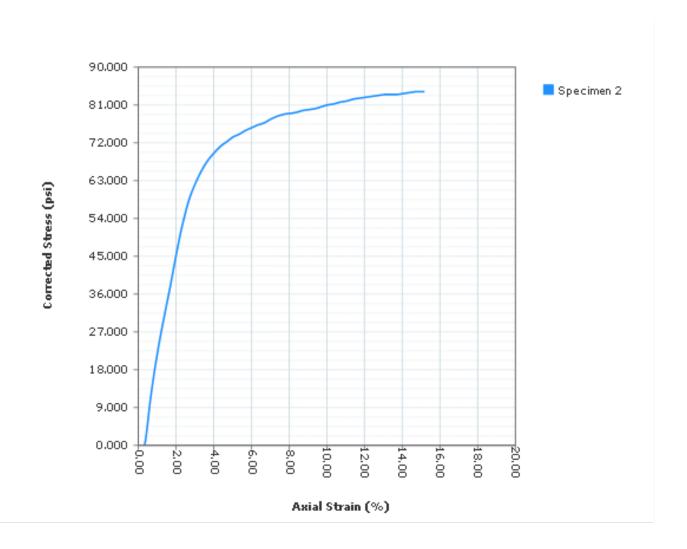


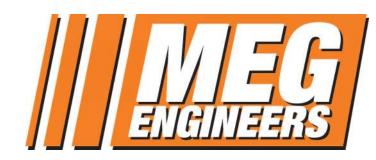
PQ Graph



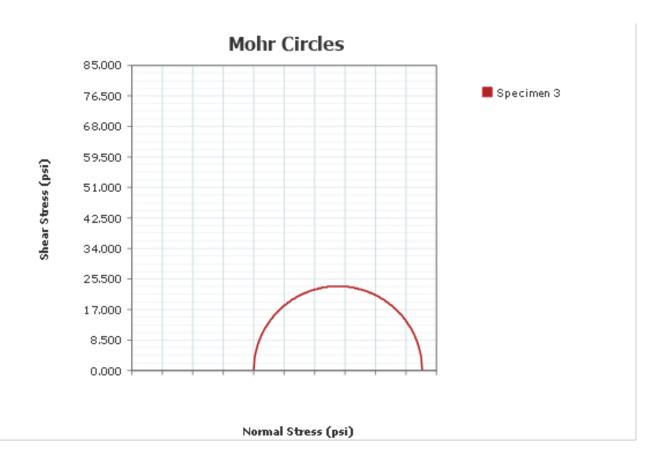


Stress-Strain Graph





Unconsolidated Undrained Test



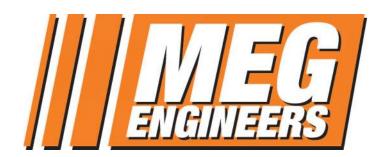
Project:	DMPA 8 Levee Reconstruction
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-14
Sample Depth:	B-14 @ 50
Location:	Brownsville, Cameron County, Texas
Client Name:	Port of Brownsville
Remarks:	



Unconsolidated Undrained Test

Dofous Took				Specimei	n Numbei	:		
Before Test Membrane Thickness (in) Initial Cell Pressure (psi) Height (in) Diameter (in) Water Content (%) Wet Density (Units) Dry Density (pcf) Saturation (%) Degree of Saturation (%) Void Ratio Height To Diameter Ratio Test Data Comp. Strength at Failure (psi) of at Failure (psi) of at Failure (psi) Rate of Strain (in/min) Axial Strain at Failure (%)	1	2	3	4	5	6	7	8
Membrane Thickness (in)			0.0010					
Initial Cell Pressure (psi)			34.000					
Height (in)			6.1730					
Diameter (in)			2.7927					
Water Content (%)			20.44					
Wet Density (Units)								
Dry Density (pcf)			105.52					
Saturation (%)			91.26					
Degree of Saturation (%)								
Void Ratio			0.609					
Height To Diameter Ratio			2.210					
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)			46.877					
σ1 at Failure (psi)			80.877					
σ3 at Failure (psi)			34.000					
Rate of Strain (in/min)			0.06173					
Axial Strain at Failure (%)			8.827					
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)			20.44					

rinai vvatei Content (70	9) : :	: 20.44			:				
Project:	DMPA 8 Levee Reconstruction	DMPA 8 Levee Reconstruction							
Project Number:	02-23-29125								
Sampling Date:									
Sample Number:	S-14								
Sample Depth:	B-14 @ 50	3-14 @ 50							
Location:	Brownsville, Cameron County, Texas								
Client Name:	Port of Brownsville								
Project Remarks:									
Specimen 1 Specim	nen 2 Specimen 3 Spe	ecimen 4 Specii	men 5 Specimen 6	Specimen 7	Specimen 8				
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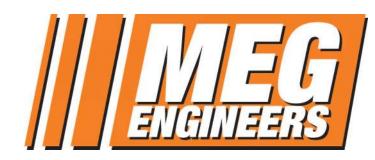


Unconsolidated Undrained Test

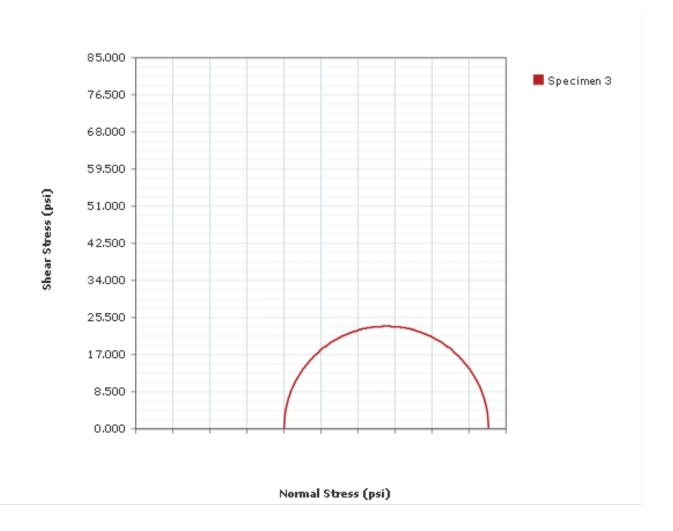
ASTM D2850

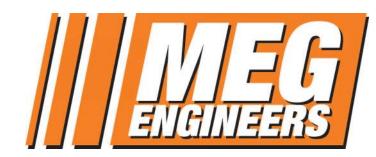
		Specimen 3	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/21/2023 8:47:14 AM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-14	Specimen Lab #:	S-14
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	6.1730	Diameter (in):	2.7927
Area (in²):	6.125	Volume (in³):	37.8115
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1261.4		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

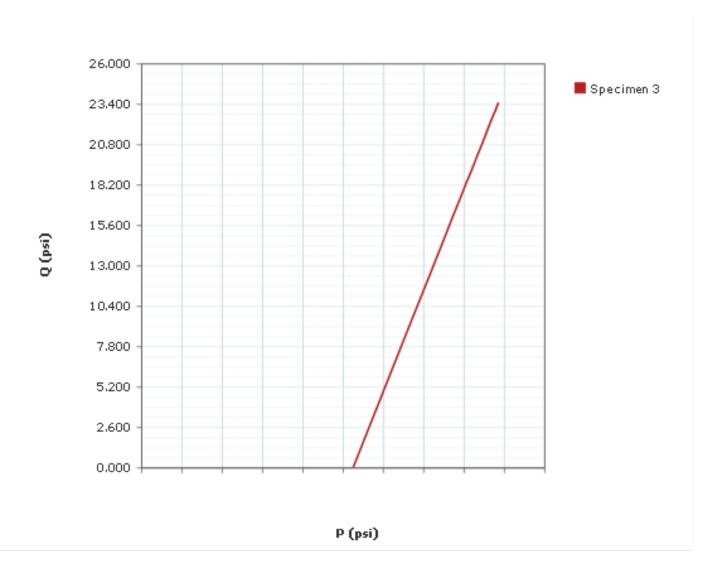


Mohr Circles (Total Stress) Graph



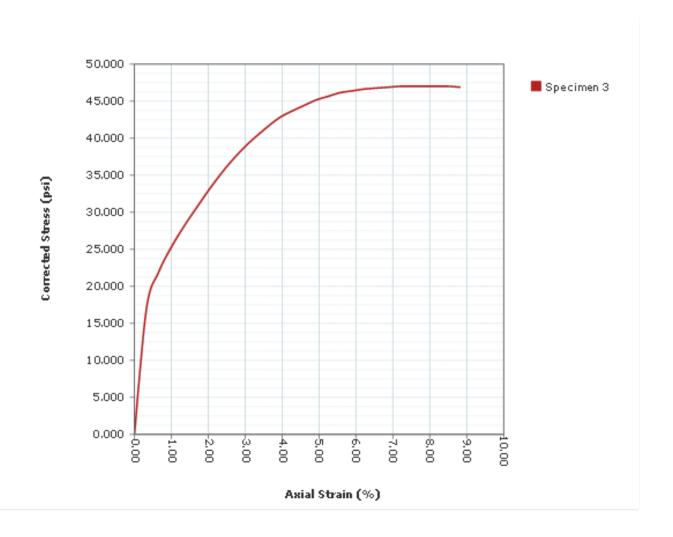


PQ Graph





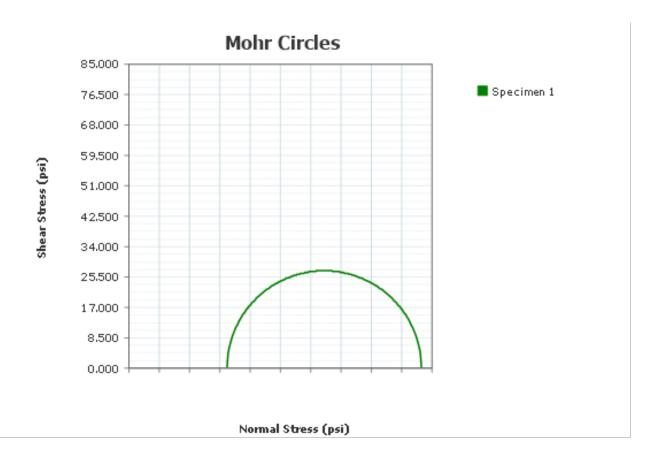
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



Project: DMPA 8 Levee Reconstruction

Project Number: 02-23-29125

Sampling Date: S-15

Sample Number: S-15

Sample Depth: B-14 @ 55

Location: Brownsville, Cameron County, Texas

Client Name: Port of Brownsville

Remarks:

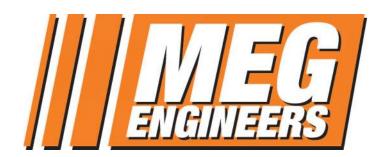


Unconsolidated Undrained Test

Pofoso Tock				Specimer	ı Numbei	a -		
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)	0.0010							
Initial Cell Pressure (psi)	27.500							
Height (in)	6.1680							
Diameter (in)	2.7907							
Water Content (%)	27.68							
Wet Density (Units)								
Dry Density (pcf)	99.39							
Saturation (%)	106.29							
Degree of Saturation (%)								
Void Ratio	0.708							
Height To Diameter Ratio	2.210							
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)	54.492							
σ1 at Failure (psi)	81.992							
σ3 at Failure (psi)	27.500							
Rate of Strain (in/min)	0.06168							
Axial Strain at Failure (%)	11.451							
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)	27.68							

Project:	DMPA 8 Levee Reconstruction								
Project Number:	02-23-29125								
Sampling Date:									
Sample Number:	S-15								
Sample Depth:	B-14 @ 55								
Location:	Brownsville, Cameron County, Texas								
Client Name:	Port of Brownsville								
Project Remarks:									
Specimen 1 Specim	nen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8								

opecimen i	opecimen 2	opecimens	opecimen i	Specimeno	opecimien o	opecimen,	opecimien o
Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch
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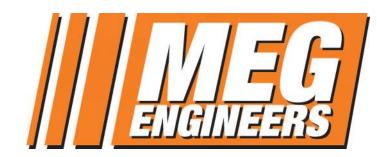


Unconsolidated Undrained Test

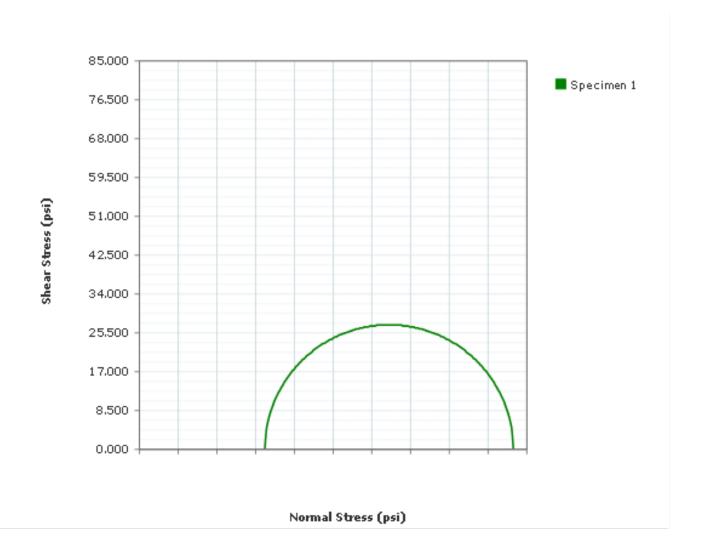
ASTM D2850

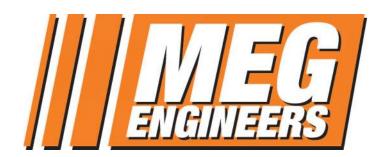
		Specimen 1	
Test Description:	ASTM D2850		
Other Associated Tests:	ASTM D2850		
Device Details:	HM Masterloader 3000		
Test Specification:	D2850		
Test Time:	10/21/2023 6:54:12 AM		
Technician:	MG	Sampling Method:	Undisturbed
Specimen Code:	B-14	Specimen Lab #:	S-15
Specimen Description:			
Specific Gravity:	2.72		
Plastic Limit:	0	Liquid Limit:	0
Height (in):	6.1680	Diameter (in):	2.7907
Area (in²):	6.117	Volume (in³):	37.7268
Large Particle:			
Moisture Material:	Cuttings		
Moist Weight (g):	1256.8		
Test Remarks:			

Project Name: DMPA 8 Levee Reconstruction Project Number: 02-23-29125

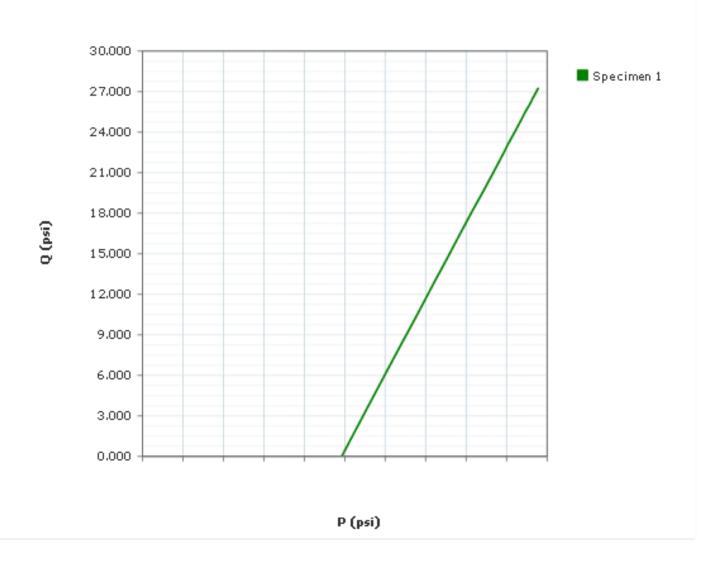


Mohr Circles (Total Stress) Graph



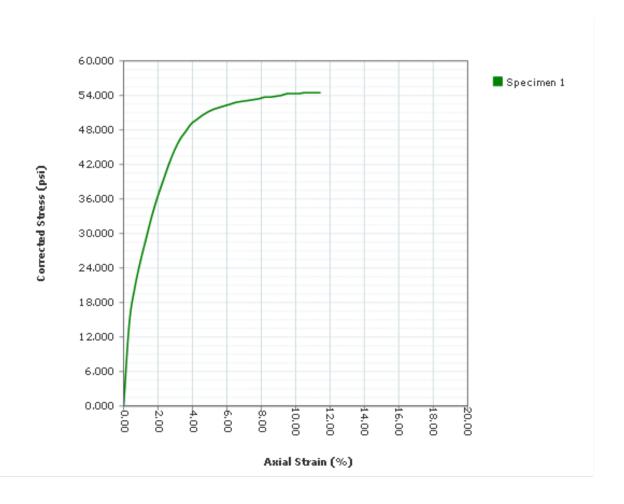


PQ Graph





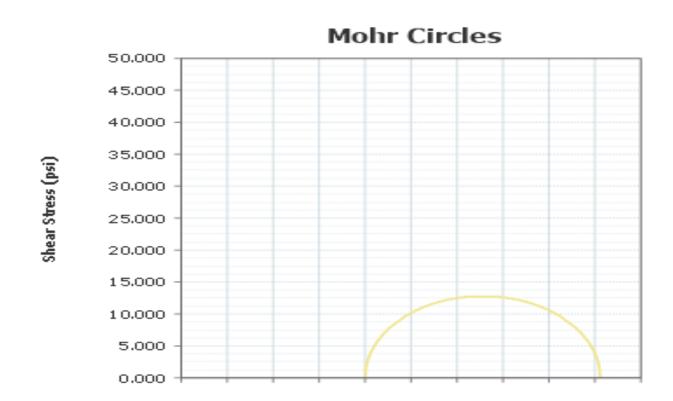
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



Normal Stress (psi)

Project:	DMPA 8 Levee Relocation	
Project Number:	02-23-29125	
Sampling Date:		
Sample Number:	S-9	
Sample Depth:	B-15 @ 25	
Location:		
Client Name:	Port of Brownsville	
Remarks:		

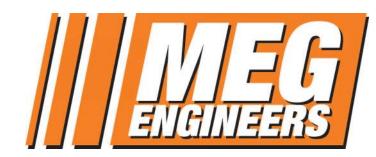


Unconsolidated Undrained Test

Pofoso Took	0.0010 20.000 6.7680 2.7790 0.00 119.27 0.00 0.424 2.435 re (psi)							
Initial Cell Pressure (psi) Height (in) Diameter (in) Water Content (%) Wet Density (Units) Dry Density (pcf) Saturation (%) Degree of Saturation (%) Void Ratio Height To Diameter Ratio Test Data Comp. Strength at Failure (psi) of at Failure (psi) of at Failure (psi) Rate of Strain (in/min) Axial Strain at Failure (%) After Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)				0.0010				
Initial Cell Pressure (psi)				20.000				
Height (in)				6.7680				
Diameter (in)				2.7790				
Water Content (%)				0.00				
Wet Density (Units)								
Dry Density (pcf)				119.27				
Saturation (%)				0.00				
Degree of Saturation (%)								
Void Ratio				0.424				
Height To Diameter Ratio				2.435				
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)				25.574				
o1 at Failure (psi)				45.574				
o3 at Failure (psi)				20.000				
Rate of Strain (in/min)				0.06768				
Axial Strain at Failure (%)				14.617				
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)				0.00				

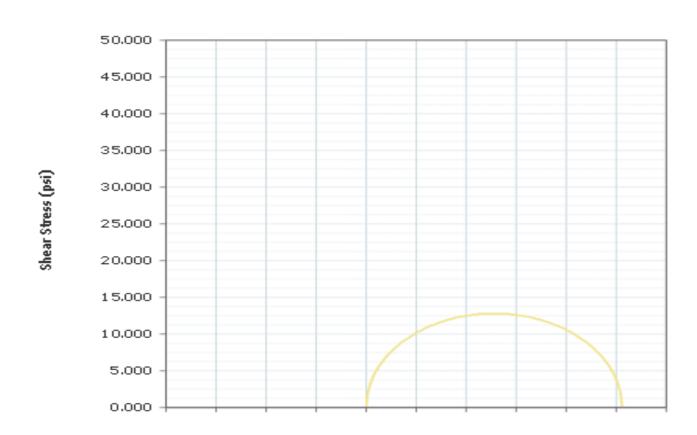
Project:	DMPA	8 Levee Relocatio	n				
Project Number:	02-23-2	9125					
Sampling Date:							
Sample Number:	S-9						
Sample Depth:	B-15 @	25					
Location:							
Client Name:	Port of	Brownsville					
Project Remarks:							
Specimen 1 Sp	ecimen 2	Specimen 3	Specimen 4	Specimen 5	Specimen 6	Specimen 7	Specimen 8

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Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch		Failure Sketch	Failure Sketch		Failure Sketch Failure	Sketch	
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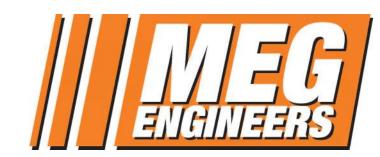


Mohr Circles (Total Stress) Graph

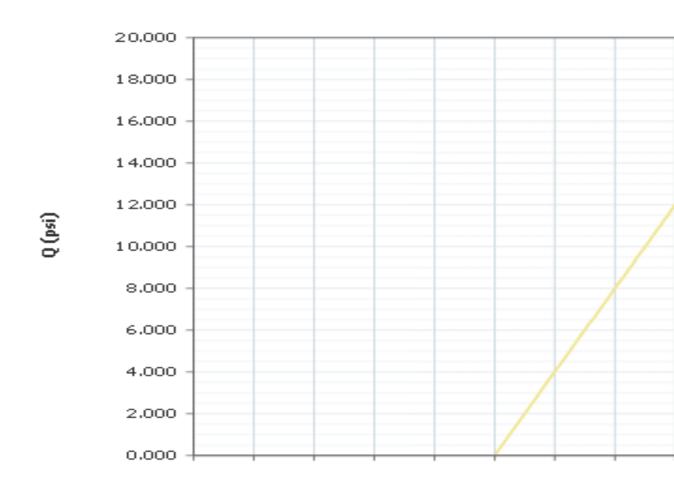
ASTM D2850

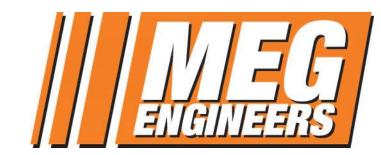


Normal Stress (psi)

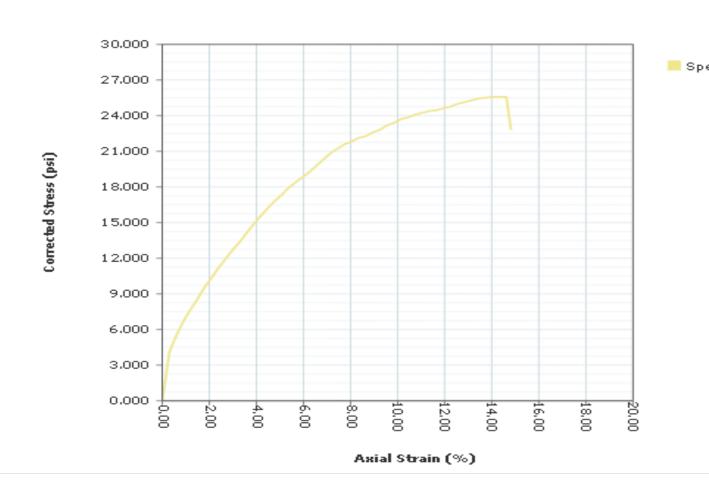


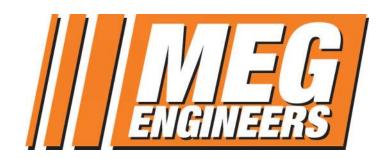
PQ Graph





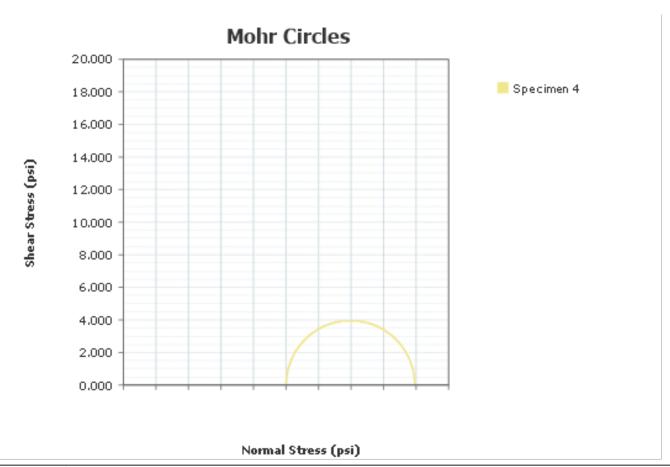
Stress-Strain Graph





Unconsolidated Undrained Test

ASTM D2850



Project: DMPA 8 Levee Reconstruction

Project Number: 02-23-29125

Sampling Date: S-6

Sample Depth: B-16 @ 13

Location: Brownsville, Cameron County, Texas

Client Name: Port of Brownsville

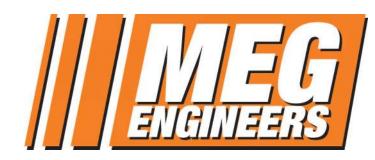
Remarks: Port of Brownsville



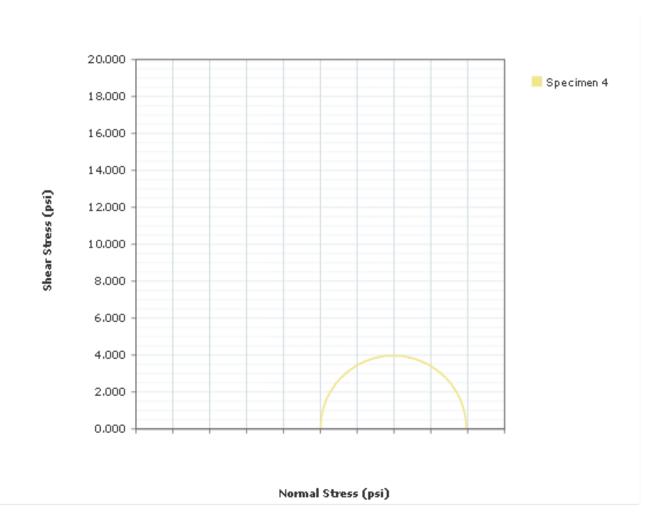
Unconsolidated Undrained Test

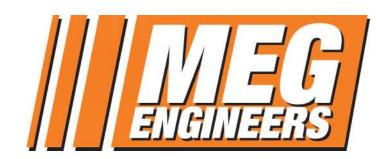
AS1M D2850				Specimen	Number			
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)				0.0010				
Initial Cell Pressure (psi)				10.000				
Height (in)				5.6827				
Diameter (in)				2.7240				
Water Content (%)				25.96				
Wet Density (Units)								
Dry Density (pcf)				96.66				
Saturation (%)				93.31				
Degree of Saturation (%)								
Void Ratio				0.757				
Height To Diameter Ratio				2.086				
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)				7.891				
σ1 at Failure (psi)				17.891				
σ3 at Failure (psi)				10.000				
Rate of Strain (in/min)				0.056827				
Axial Strain at Failure (%)				9.588				
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)				25.96				

Axial Strain at Failure ((%)			9.588					
After Test		1 2	3	4	5	6 7	8		
Final Water Content (%	b)			25.96					
Project:	DMPA 8 Levee R	DMPA 8 Levee Reconstruction							
Project Number:	02-23-29125								
Sampling Date:									
Sample Number:	S-6								
Sample Depth:	B-16 @ 13	B-16 @ 13							
Location:	Brownsville, Cameron County, Texas								
Client Name:	Port of Brownsvi	le							
Project Remarks:									
Specimen 1 Specim	en 2 Specim	en 3 Specimer	n 4 Spe	cimen 5	Specimen 6	Specimen 7	Specimen 8		
Failure Sketch Failure S	ketch Failure S	ketch Failure Sk	etch Failu	re Sketch 🛮 Fa	ailure Sketch	Failure Sketch	Failure Sketch		

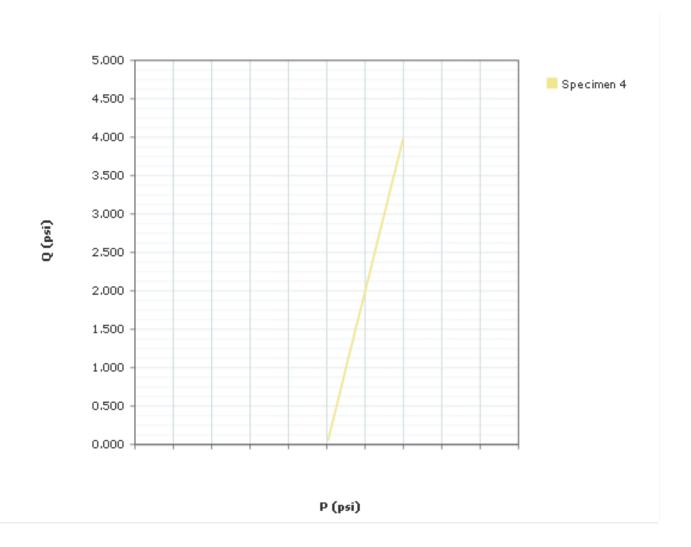


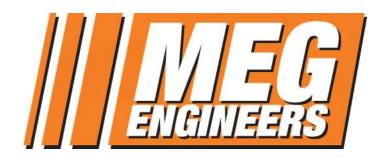
Mohr Circles (Total Stress) Graph



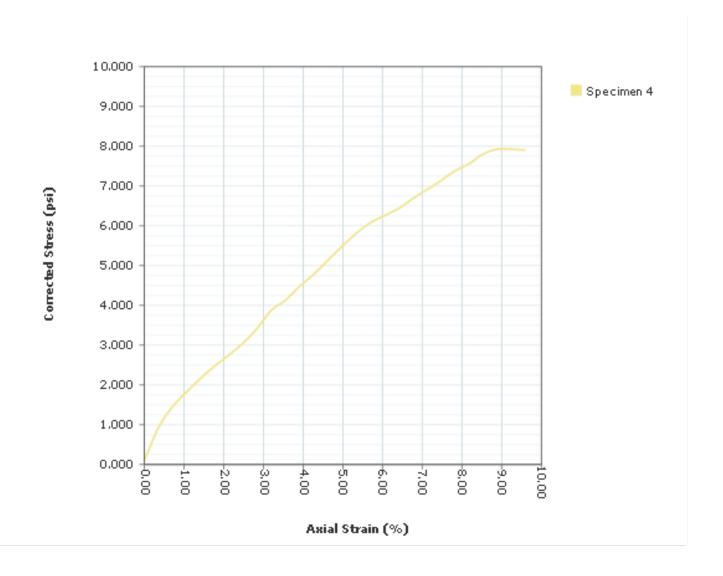


PQ Graph





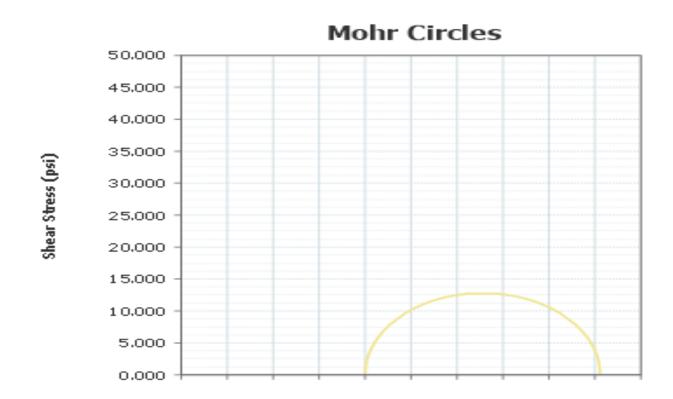
Stress-Strain Graph





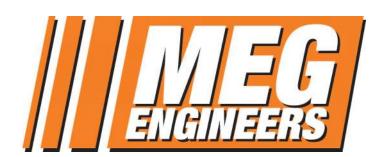
Unconsolidated Undrained Test

ASTM D2850



Normal Stress (psi)

Project:	DMPA 8 Levee Relocation
Project Number:	02-23-29125
Sampling Date:	
Sample Number:	S-9
Sample Depth:	B-15 @ 23-25
Location:	
Client Name:	Port of Brownsville
Remarks:	



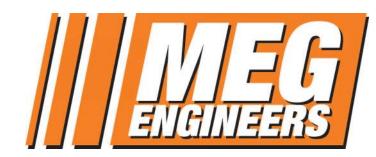
Unconsolidated Undrained Test

ASTM D2850

Pofoso Took	Specimen Number							
Before Test	1	2	3	4	5	6	7	8
Membrane Thickness (in)				0.0010				
Initial Cell Pressure (psi)				20.000				
Height (in)				6.7680				
Diameter (in)				2.7790				
Water Content (%)				0.00				
Wet Density (Units)								
Dry Density (pcf)				119.27				
Saturation (%)				0.00				
Degree of Saturation (%)								
Void Ratio				0.424				
Height To Diameter Ratio				2.435				
Test Data	1	2	3	4	5	6	7	8
Comp. Strength at Failure (psi)				25.574				
o1 at Failure (psi)				45.574				
o3 at Failure (psi)				20.000				
Rate of Strain (in/min)				0.06768				
Axial Strain at Failure (%)				14.617				
After Test	1	2	3	4	5	6	7	8
Final Water Content (%)				0.00				

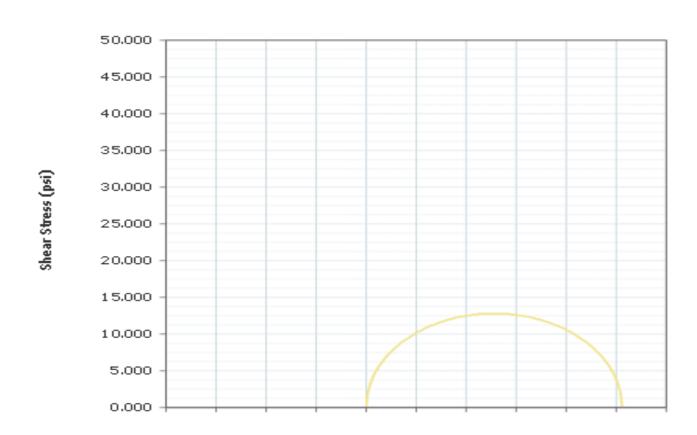
Project: DMPA 8 Levee Relocation Project Number: 02-23-29125 Sampling Date: S-9 Sample Number: Sample Depth: B-15 @ 23-25 Location: Client Name: Port of Brownsville Project Remarks: Specimen 1 Specimen 2 Specimen 3 Specimen 4 Specimen 5 Specimen 6 Specimen 7 Specimen 8

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Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	Failure Sketch	
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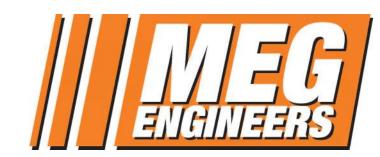


Mohr Circles (Total Stress) Graph

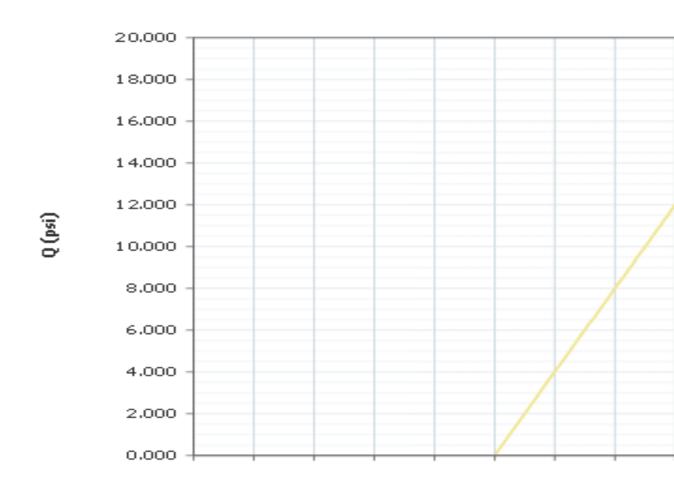
ASTM D2850

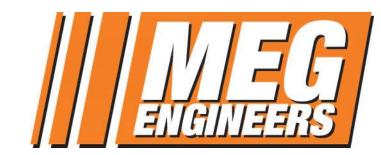


Normal Stress (psi)

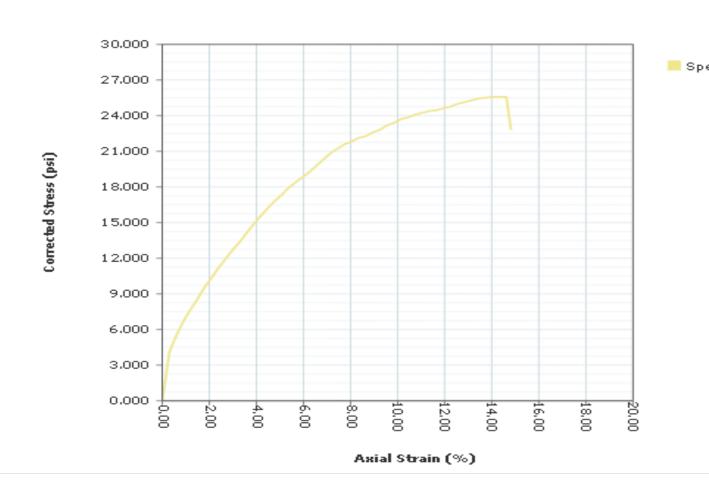


PQ Graph





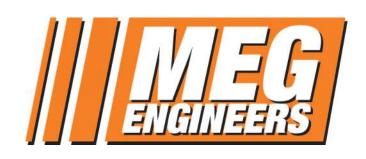
Stress-Strain Graph

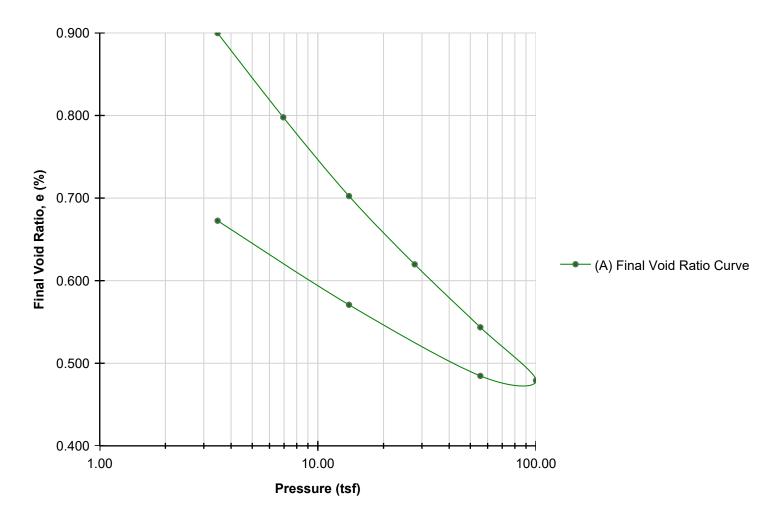


APPENDIX I ONE-DIMENSIONAL CONSOLIDATION TESTING Geotechnical | Environmental | Testing 5840 N. Gumwood Avenue Pharr, Texas 78577 Tel: 956-702-8500 Fax: 956-702-8140

Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

Final Voids





0.000			Cc	0.000	Cr	0.000
BEFORE	AFTER	Liquid Limits	0	Test Date		
30.03	28.65	Plastic Limits	0			
98.60	89.54					
91.23	107.74					
0.895	0.723	Specific Gravity	2.72	ASSUMED)	
; 3,0,0		1-1				
	30.03 98.60 91.23	BEFORE AFTER 30.03 28.65 98.60 89.54 91.23 107.74	BEFORE AFTER Liquid Limits 30.03 28.65 Plastic Limits 98.60 89.54 91.23 107.74	BEFORE AFTER Liquid Limits 0 30.03 28.65 Plastic Limits 0 98.60 89.54 91.23 107.74	BEFORE AFTER Liquid Limits 0 Test Date 30.03 28.65 Plastic Limits 0 98.60 89.54 91.23 107.74	BEFORE AFTER Liquid Limits 0 Test Date 30.03 28.65 Plastic Limits 0 98.60 89.54 91.23 107.74

Sample Description				
Project Number	02-23-29125	Depth (ft)	13.5-15	Remarks
Sample Number	B-2	Boring Number		
Project	DMPA 8 Levee Reconst			
Client				
Location				

Summary

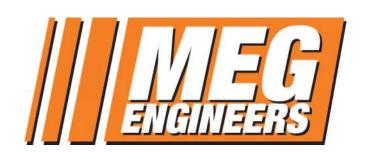
Consolidation Test - Results Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

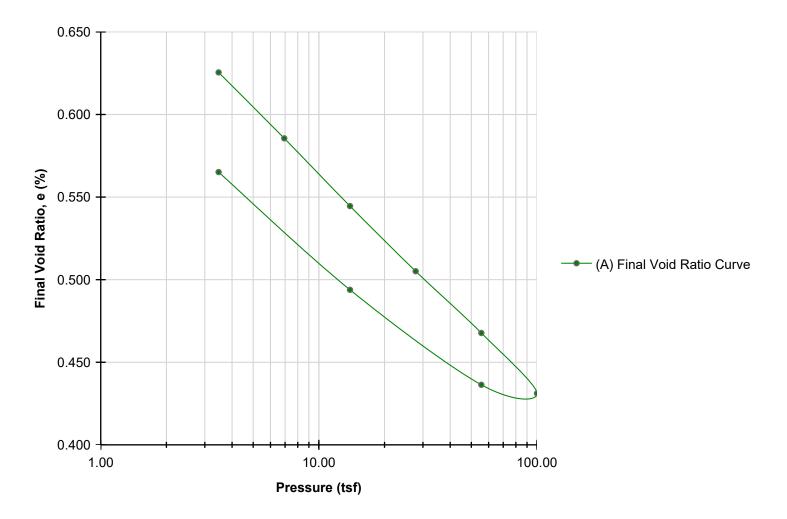
Sample Description			
Project Number	02-23-29125	Depth (ft) 13.5-15	Remarks
Sample Number	B-2	Boring Number	
Project	DMPA 8 Levee Rec	construction	
Client			
Location			

Index	Loading Sequence (tsf)	Cummulative Change in Height (in)	Specimen Height (in)	Height of Voids (in)	Vertical Strain (%)	Void Ratio	T90 Fitting Time (Hr)	T50 Fitting Time (Hr)	T90 Cv (in²/Min)	T50 Cv (in²/Min)	Sequence Status
0	0.000	0.0000	1.0000	0.0000	0.00	0.90	0.000	0.000	0.00000	0.00000	ENABLED
1	3.470	0.0039	0.9961	0.4675	0.39	0.88	95.626	53.126	0.00004	0.00000	ENABLED
2	6.940	0.0498	0.9502	0.4216	4.98	0.80	1.023	0.568	0.00345	0.00000	ENABLED
3	13.890	0.1004	0.8996	0.3710	10.04	0.70	4.804	2.669	0.00074	0.00000	ENABLED
4	27.780	0.1441	0.8559	0.3273	14.41	0.62	49.880	27.711	0.00007	0.00000	ENABLED
5	55.560	0.1844	0.8156	0.2870	18.44	0.54	58.422	32.457	0.00006	0.00000	ENABLED
6	100.000	0.2184	0.7816	0.2530	21.84	0.48	47.072	26.151	0.00008	0.00000	ENABLED
7	55.560	0.2155	0.7845	0.2559	21.55	0.48	0.000	0.000	0.00000	0.00000	ENABLED
8	13.890	0.1700	0.8300	0.3014	17.00	0.57	0.000	0.000	0.00000	0.00000	ENABLED
9	3.470	0.1162	0.8838	0.3552	11.62	0.67	0.000	0.000	0.00000	0.00000	ENABLED

Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

Final Voids





Preconsolidation Stress (tsf)	0.000			Cc	0.000	Cr 0.000
	BEFORE	AFTER	Liquid Limits	0	Test Date	10/13/2023
Moisture (%)	22.63	20.20	Plastic Limits	0		
Dry Density (pcf)	107.02	108.02				
Saturation (%)	99.63	95.58				
Void Ratio	0.587	0.572	Specific Gravity	2.72	ASSUMED	1

Sample Description					
Project Number	02-23-29125	Depth (ft)	28.5-30	Remarks	
Sample Number	B-3	Boring Number			
Project	DMPA 8 Levee Reconst	DMPA 8 Levee Reconstruction			
Client					
Location					

Summary

Consolidation Test - Results Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

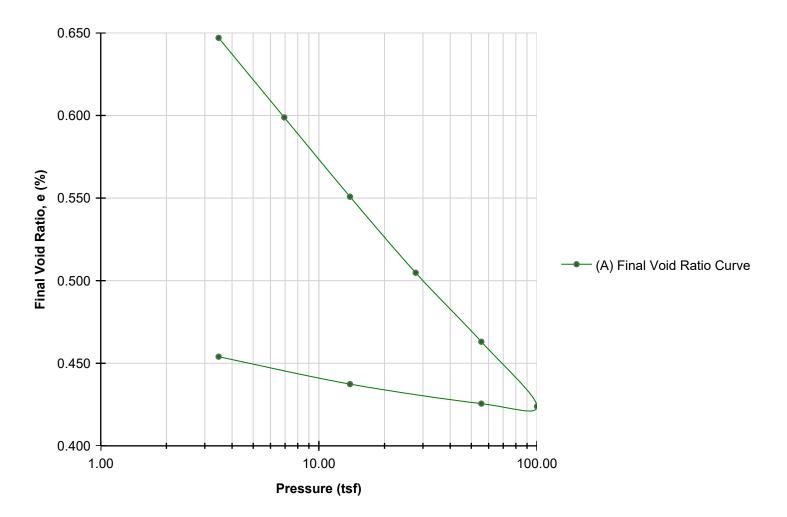
Sample Description			
Project Number	02-23-29125	Depth (ft) 28.5-30	Remarks
Sample Number	B-3	Boring Number	
Project	DMPA 8 Levee Rec	onstruction	
Client			
Location			

Index	Loading Sequence (tsf)	Cummulative Change in Height (in)	Specimen Height (in)	Height of Voids (in)	Vertical Strain (%)	Void Ratio	T90 Fitting Time (Hr)	T50 Fitting Time (Hr)	T90 Cv (in²/Min)	T50 Cv (in²/Min)	Sequence Status
0	0.000	0.0000	1.0000	0.0000	0.00	0.59	0.000	0.000	0.00000	0.00000	ENABLED
1	3.470	-0.0263	1.0263	0.3949	-2.63	0.63	211.403	117.446	0.00002	0.00000	ENABLED
2	6.940	-0.0011	1.0011	0.3697	-0.11	0.59	0.000	0.000	0.00000	0.00000	ENABLED
3	13.890	0.0248	0.9752	0.3438	2.48	0.54	6.182	3.435	0.00057	0.00000	ENABLED
4	27.780	0.0497	0.9503	0.3189	4.97	0.51	6.693	3.718	0.00053	0.00000	ENABLED
5	55.560	0.0733	0.9267	0.2953	7.33	0.47	34.143	18.968	0.00010	0.00000	ENABLED
6	100.000	0.0964	0.9036	0.2722	9.64	0.43	13.600	7.556	0.00026	0.00000	ENABLED
7	55.560	0.0931	0.9069	0.2755	9.31	0.44	0.000	0.000	0.00000	0.00000	ENABLED
8	13.890	0.0568	0.9432	0.3118	5.68	0.49	0.000	0.000	0.00000	0.00000	ENABLED
9	3.470	0.0118	0.9882	0.3568	1.18	0.57	0.000	0.000	0.00000	0.00000	ENABLED

Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

Final Voids





Preconsolidation Stress (tsf)		0.000	Cc	0.000	Cr	0.000	
	BEFORE	AFTER	Liquid Limits	0	Test Date	<u> </u>	
Moisture (%)	20.50	19.33	Plastic Limits	0			
Dry Density (pcf)	103.10	115.23					
Saturation (%)	95.19	86.03					
Void Ratio	0.647	0.474	Specific Gravity	2.72	ASSUMED)	

Sample Description				
Project Number	02-23-29125	Depth (ft)	40	Remarks
Sample Number	B-4	Boring Number		
Project	DMPA 8 Levee Reonstr	uction]
Client				
Location				

Summary

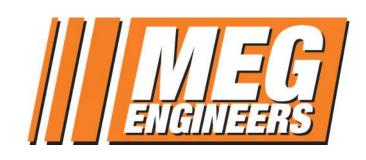
Consolidation Test - Results Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

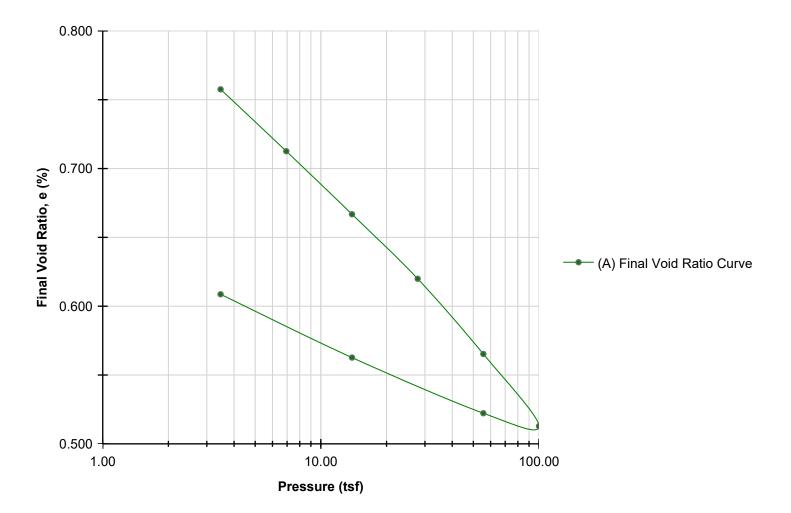
Sample Description			
Project Number	02-23-29125	Depth (ft) 40	Remarks
Sample Number	B-4	Boring Number	
Project	DMPA 8 Levee Reo	nstruction	
Client			
Location			

Index	Loading Sequence (tsf)	Cummulative Change in Height (in)	Specimen Height (in)	Height of Voids (in)	Vertical Strain (%)	Void Ratio	T90 Fitting Time (Hr)	T50 Fitting Time (Hr)	T90 Cv (in²/Min)	T50 Cv (in²/Min)	Sequence Status
0	0.000	0.0000	1.0000	0.0000	0.00	0.65	0.000	0.000	0.00000	0.00000	ENABLED
1	3.470	0.0068	0.9932	0.3849	0.68	0.63	0.026	0.014	0.13713	0.00000	ENABLED
2	6.940	0.0278	0.9722	0.3639	2.78	0.60	0.056	0.031	0.06300	0.00000	ENABLED
3	13.890	0.0570	0.9430	0.3347	5.70	0.55	0.437	0.243	0.00809	0.00000	ENABLED
4	27.780	0.0850	0.9150	0.3067	8.50	0.50	0.169	0.094	0.02093	0.00000	ENABLED
5	55.560	0.1104	0.8896	0.2813	11.04	0.46	0.615	0.341	0.00575	0.00000	ENABLED
6	100.000	0.1342	0.8658	0.2575	13.42	0.42	0.611	0.339	0.00578	0.00000	ENABLED
7	55.560	0.1297	0.8703	0.2620	12.97	0.43	0.000	0.000	0.00000	0.00000	ENABLED
8	13.890	0.1238	0.8762	0.2679	12.38	0.44	0.000	0.000	0.00000	0.00000	ENABLED
9	3.470	0.1159	0.8841	0.2758	11.59	0.45	0.000	0.000	0.00000	0.00000	ENABLED

Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

Final Voids





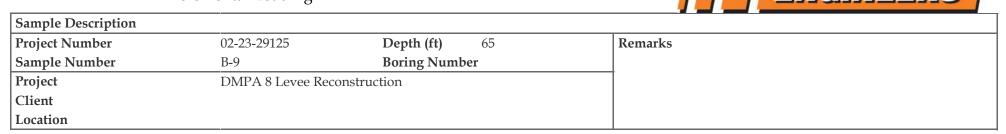
Preconsolidation Stress (tsf)		0.000	Cc	0.000	Cr	0.000	
	BEFORE	AFTER	Liquid Limits	0	Test Date		
Moisture (%)	26.51	25.16	Plastic Limits	0			
Dry Density (pcf)	97.68	104.42					
Saturation (%)	99.12	92.67					
Void Ratio	0.738	0.626	Specific Gravity	2.72	ASSUMED)	

Sample Description				
Project Number	02-23-29125	Depth (ft)	65	Remarks
Sample Number	B-9	Boring Number		
Project	DMPA 8 Levee Reconst	1		
Client				
Location				

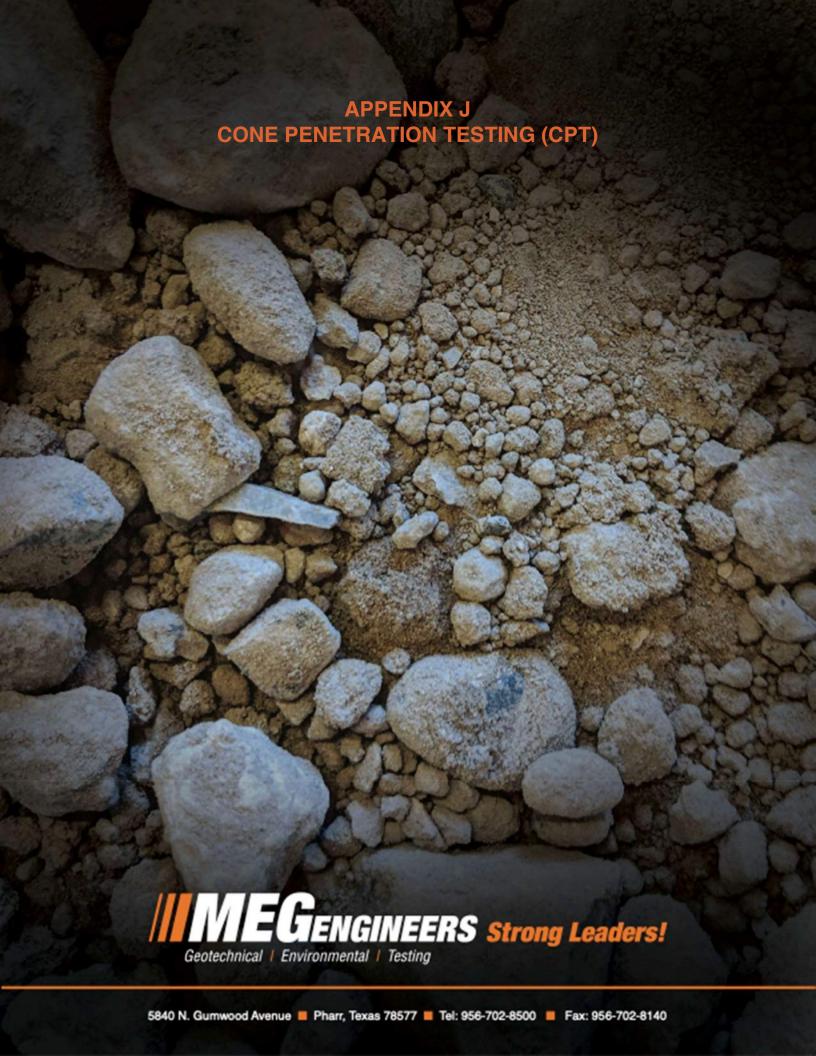
Summary

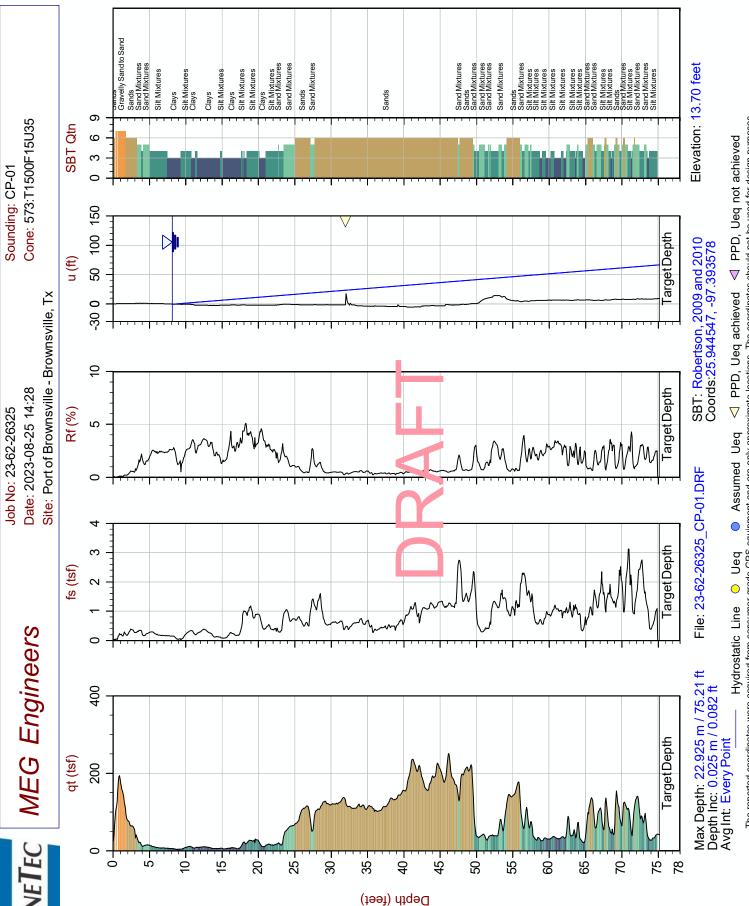
Consolidation Test - Results Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

ASTM D2435

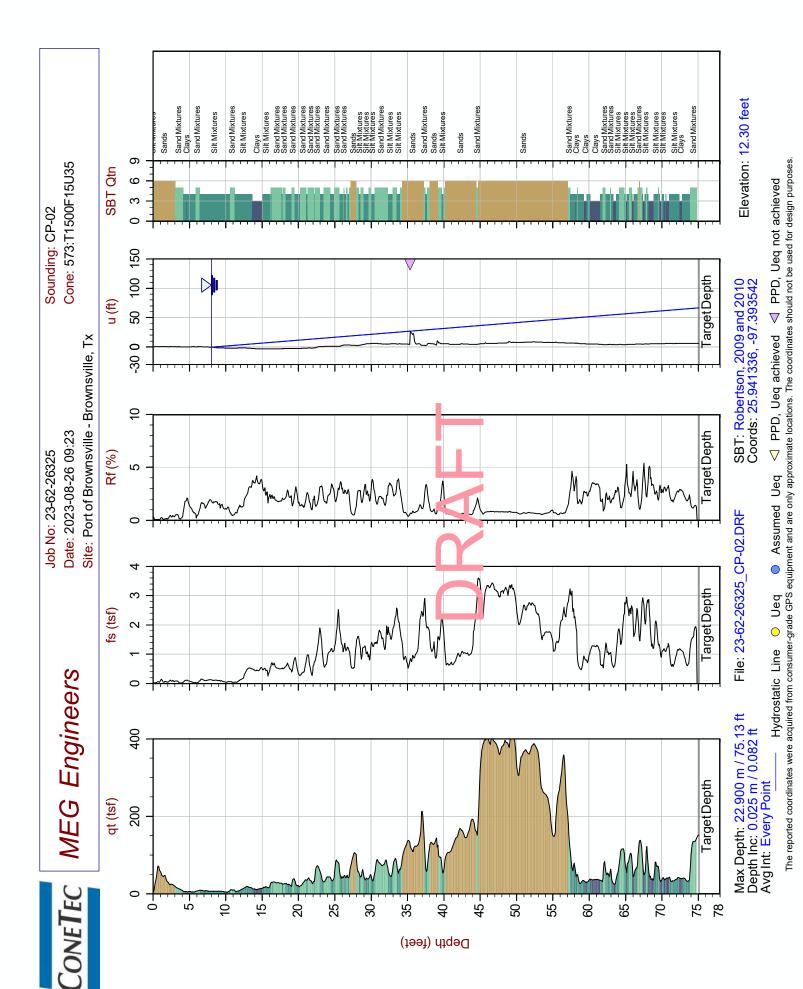


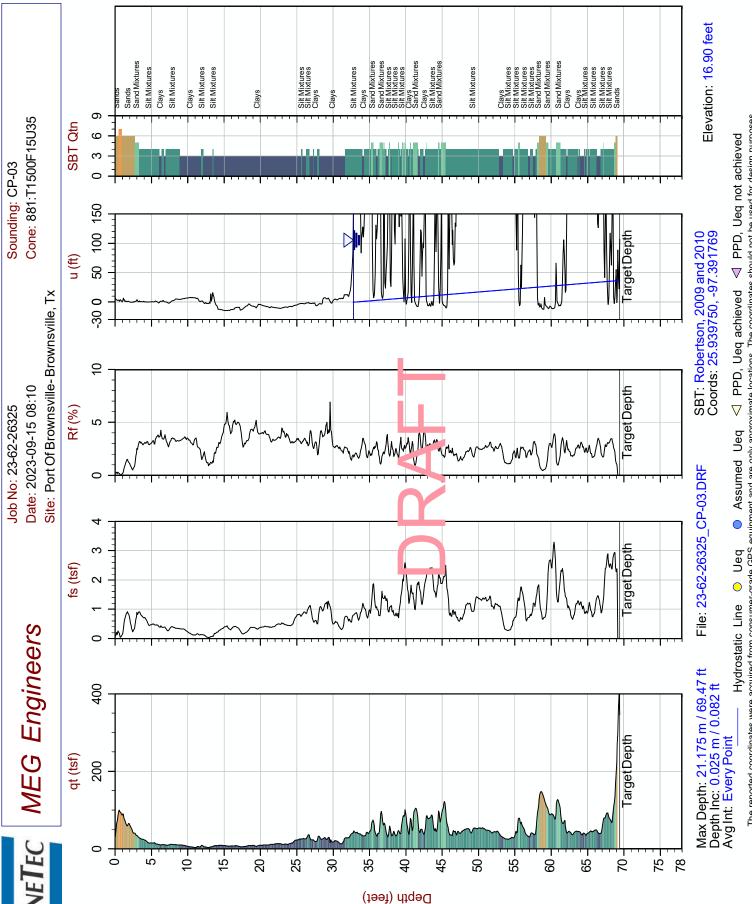
Index	Loading Sequence (tsf)	Cummulative Change in Height (in)	Specimen Height (in)	Height of Voids (in)	Vertical Strain (%)	Void Ratio	T90 Fitting Time (Hr)	T50 Fitting Time (Hr)	T90 Cv (in²/Min)	T50 Cv (in²/Min)	Sequence Status
0	0.000	0.0000	1.0000	0.0000	0.00	0.74	0.000	0.000	0.00000	0.00000	ENABLED
1	3.470	0.0025	0.9975	0.4212	0.25	0.73	0.000	0.000	0.00000	0.00000	ENABLED
2	6.940	0.0136	0.9864	0.4101	1.36	0.71	0.000	0.000	0.00000	0.00000	ENABLED
3	13.890	0.0400	0.9600	0.3837	4.00	0.67	5.672	3.151	0.00062	0.00000	ENABLED
4	27.780	0.0670	0.9330	0.3567	6.70	0.62	21.835	12.131	0.00016	0.00000	ENABLED
5	55.560	0.0985	0.9015	0.3252	9.85	0.56	36.696	20.386	0.00010	0.00000	ENABLED
6	100.000	0.1287	0.8713	0.2950	12.87	0.51	61.941	34.412	0.00006	0.00000	ENABLED
7	55.560	0.1233	0.8767	0.3004	12.33	0.52	0.000	0.000	0.00000	0.00000	ENABLED
8	13.890	0.1000	0.9000	0.3237	10.00	0.56	0.000	0.000	0.00000	0.00000	ENABLED
9	3.470	0.0735	0.9265	0.3502	7.35	0.61	0.000	0.000	0.00000	0.00000	ENABLED



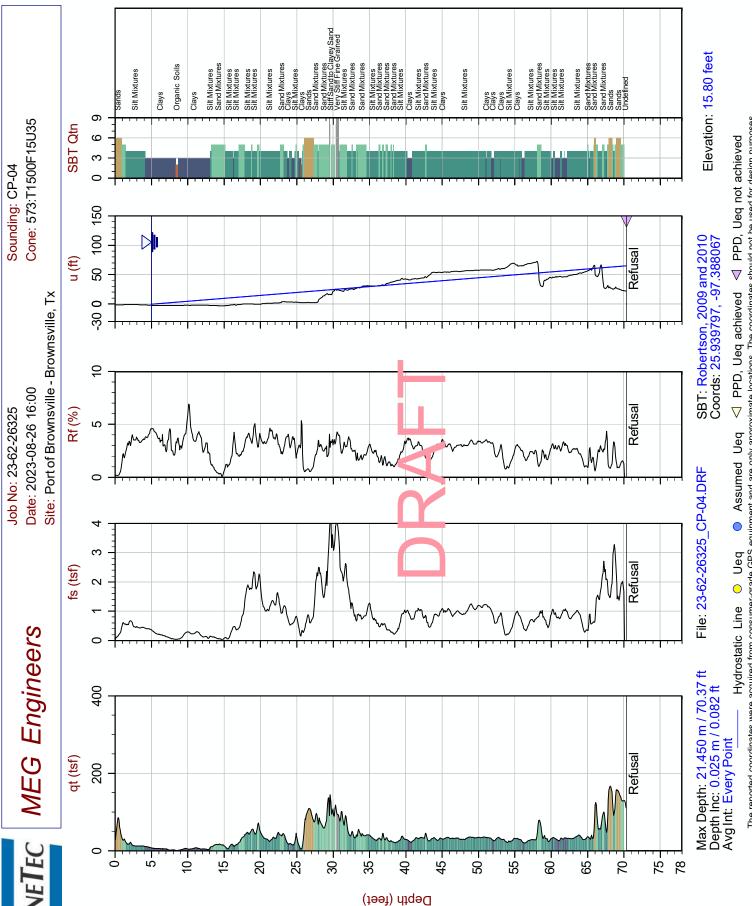


The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

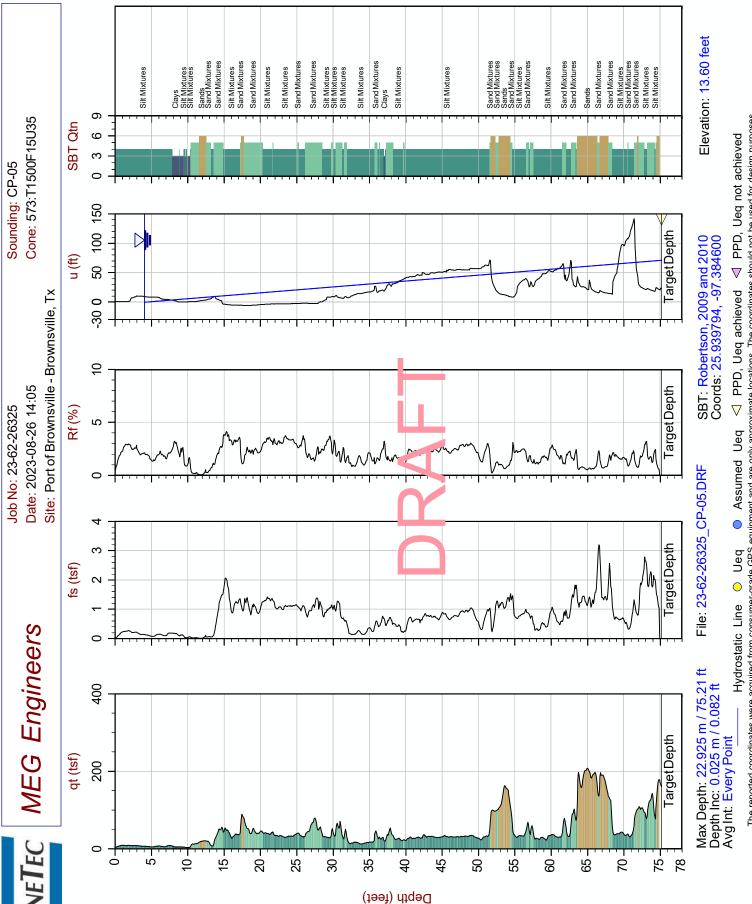




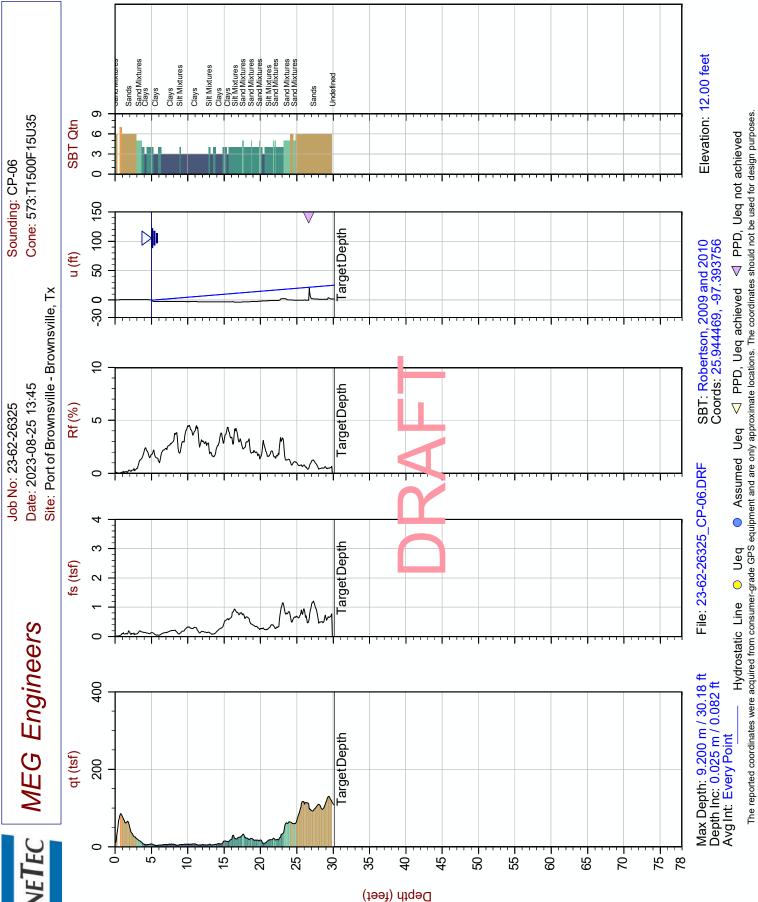
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

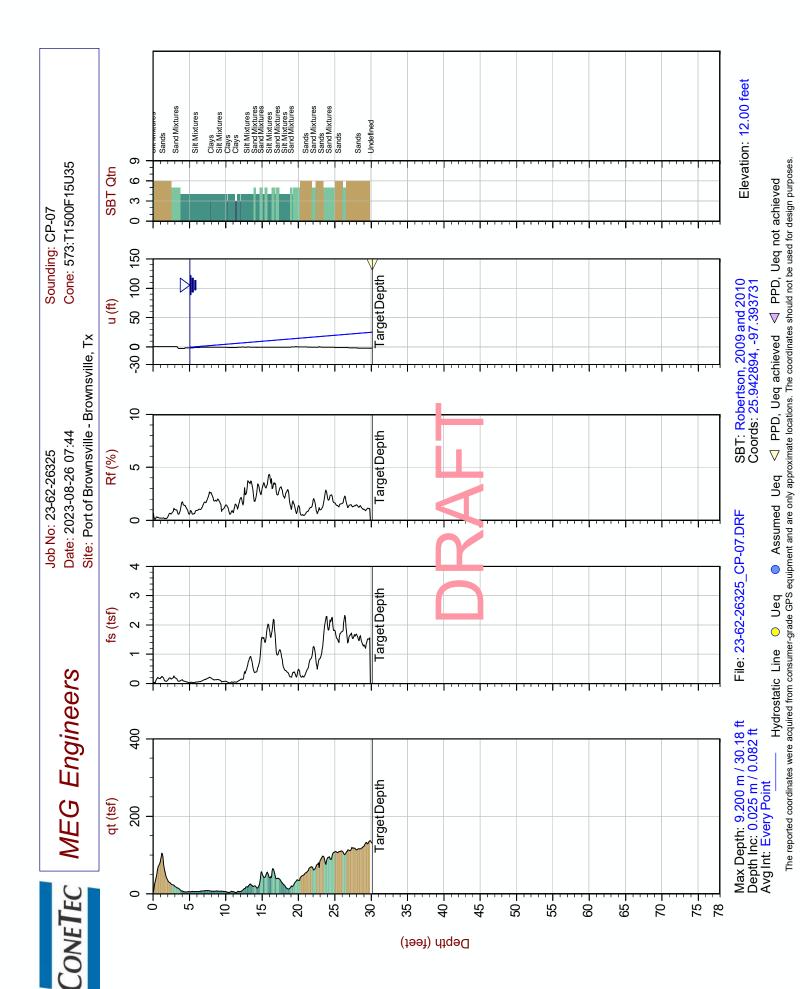


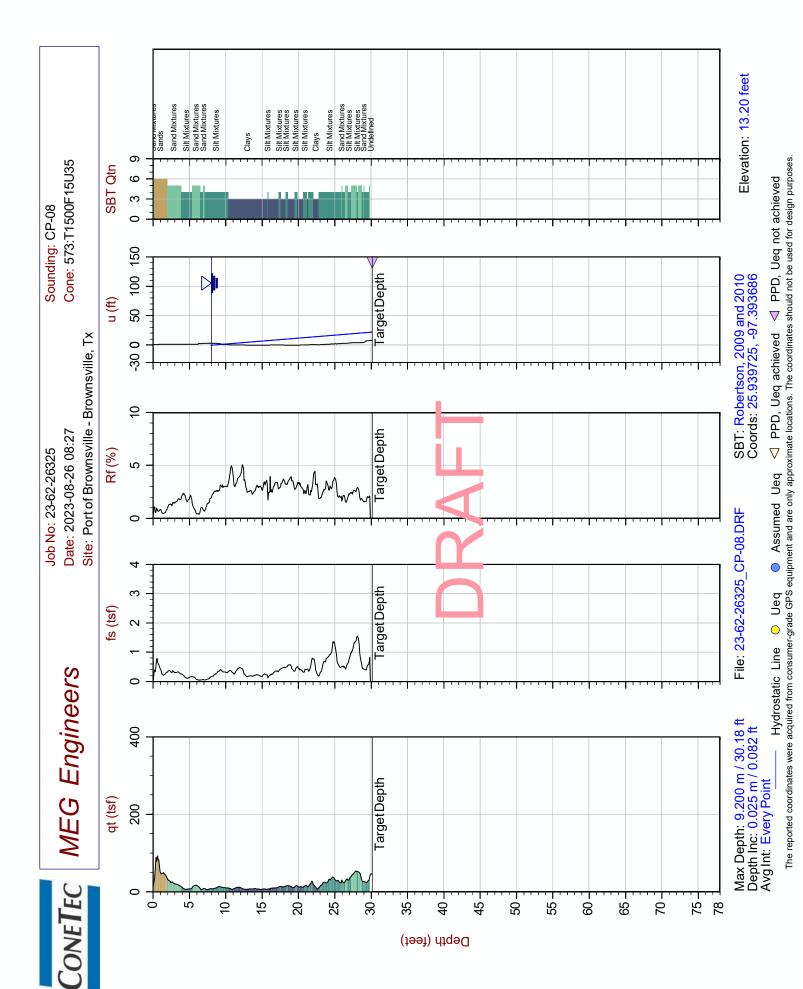
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

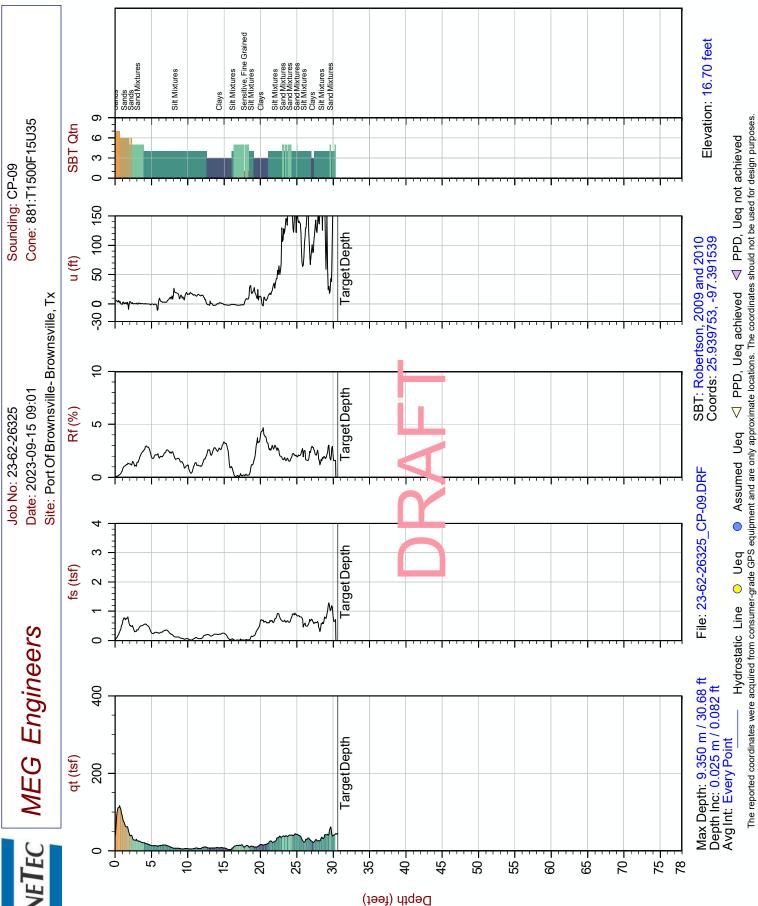


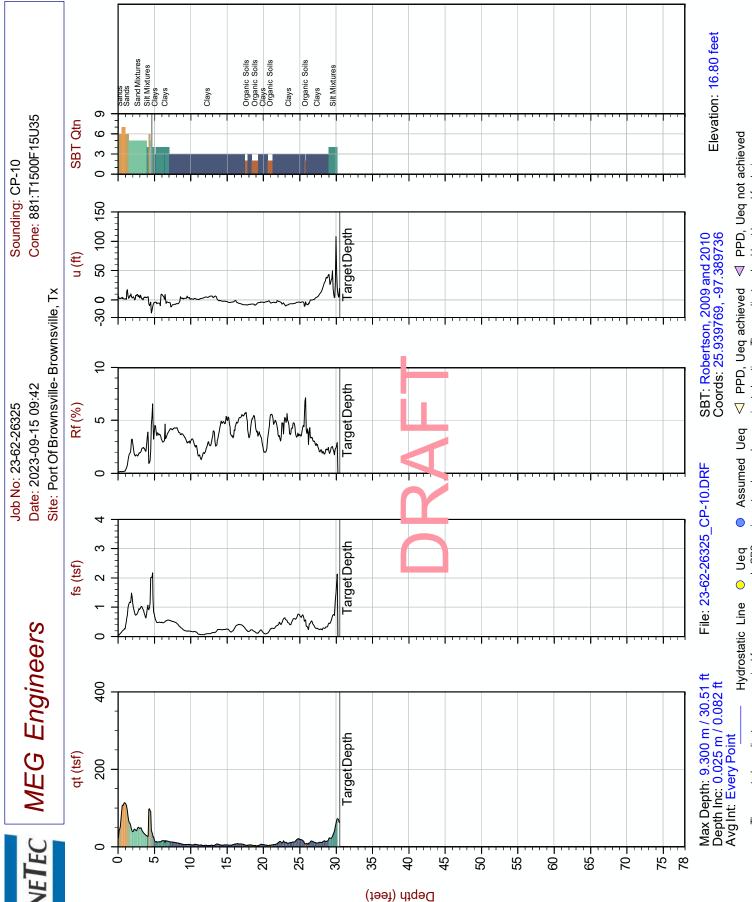
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



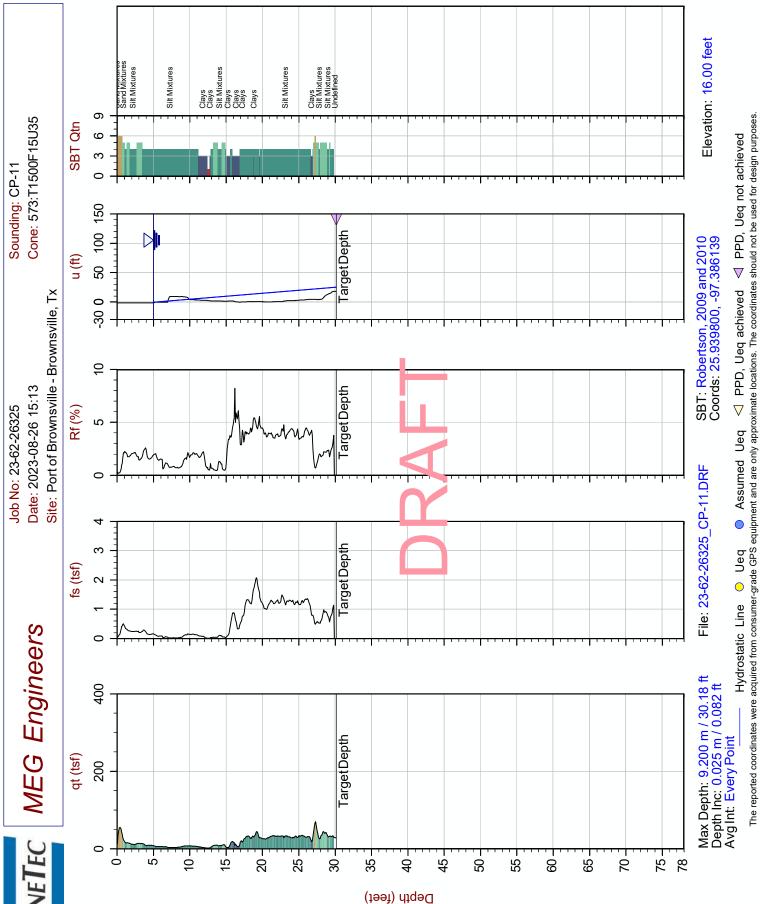


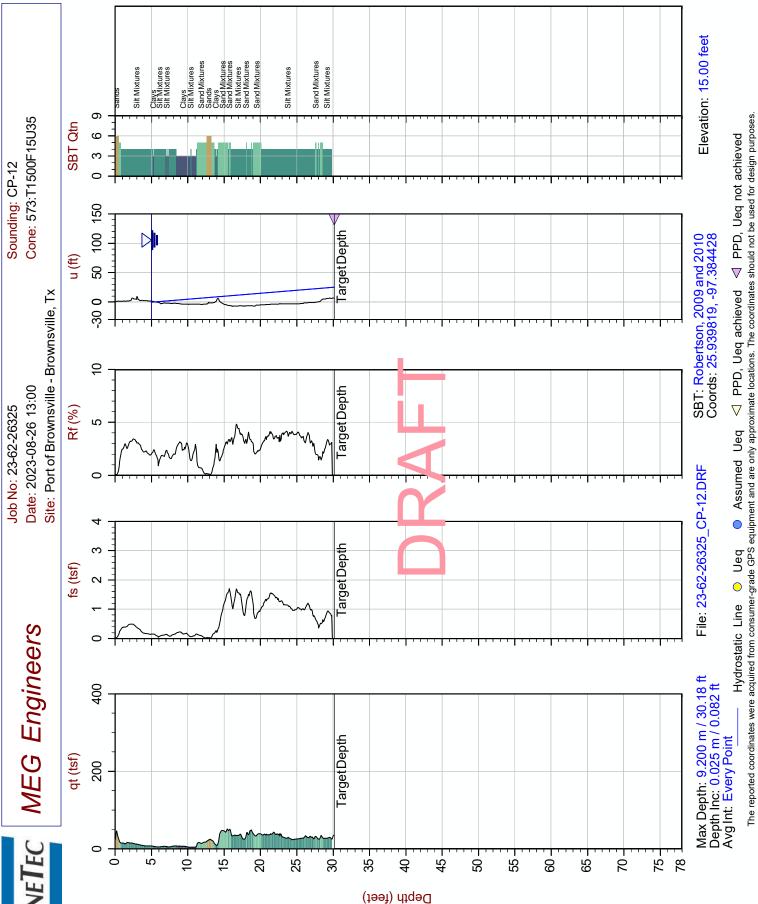


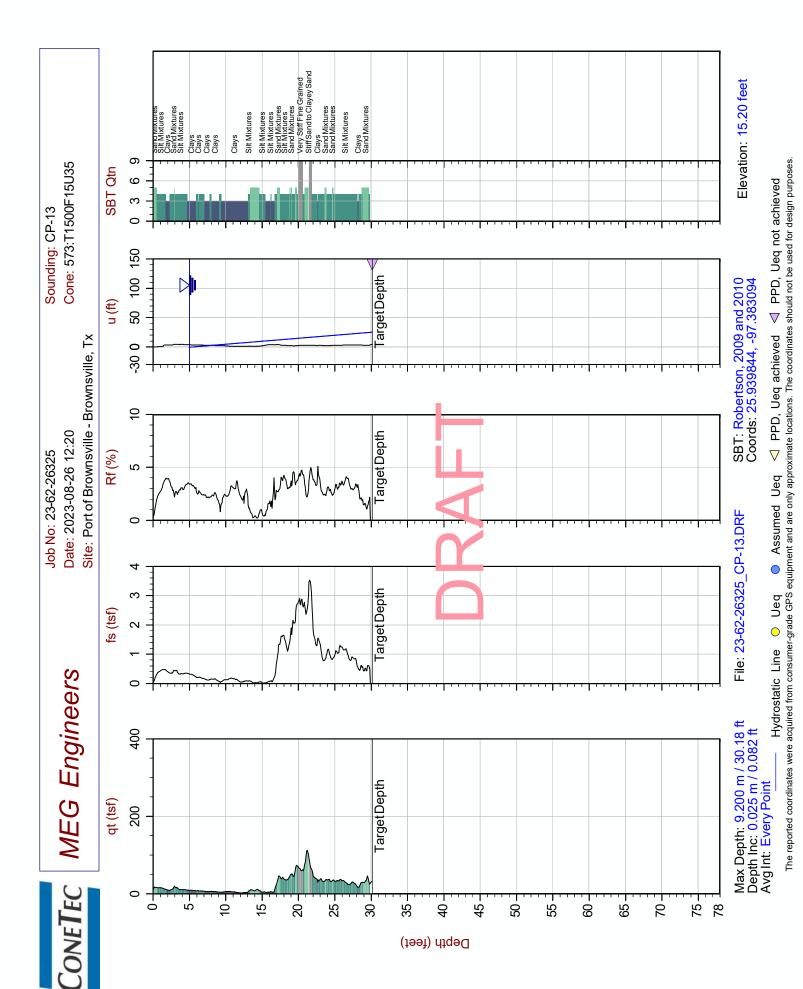




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30745 E. Exp 83 5804 N. Gumwood Ave. 5918 McPherson Rd., Ste. 5 Area Offices

San Benito, Texas 78586 956-300-2500 Pharr, Texas 78577 956-702-8500 956-568-1664 Laredo, Texas 78041

Lab No: 2057-1

Report No: 2057-1

Page 1 of 1

Client: Port of Brownsville Project: DMPA 8 Levee Relocation

No.

Ariel Chavez II 1000 Foust Road Brownsville, TX 78521

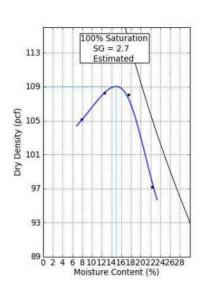
Project No: 02-23-29125

Report Date: 09/26/2023 Revised B-1 @ 0-1 Prev. Rpt. Date: 09/26/2023 Test Report Location:

> Sample Date: 09/05/2023

Sampled By: Material: On-Site Fill

Acct. No.: PB2019



%	% Moisture		Dry D	ensity Lbs.	/Cu.Ft.	_
	7.9			105.2		
	12.6			108.3		
	17.5			108.1		
	22.3			97.20		
	14.9	Optimum		109.0	Maximum	
<u>Sieve</u>	% Pass	sing Low	<u>Hi</u>			
No. 200	17			Description: Silty Sand		

Liquid Limit: NP Plastic Limit: NP Plasticity Index: NP Group Symbol: SM

Desc of Rammer: Manual Preparation Method: Moist

Remarks: PI value of 1 based on Linear Shrinkage.

Test Method (As Applicable): ASTM D 1140, ASTM D 2487, ASTM D 4318, ASTM D-698 Method-B

Respectfully Submitted, Millennium Engineers Group, Inc.

Raul Palma, P.E.



30745 E. Exp 83 5804 N. Gumwood Ave. 5918 McPherson Rd., Ste. 5 Area Offices

 San Benito, Texas 78586
 956-300-2500

 Pharr, Texas 78577
 956-702-8500

 Laredo, Texas 78041
 956-568-1664

Lab No: 2057-2

Page 1 of 1

Report No: 2057-2

Project No: 02-23-29125 **Acct. No.:** PB2019

Client: Port of Brownsville
Ariel Chavez II
1000 Foust Road
Brownsville, TX 78521

B-6 @ 0-1.5

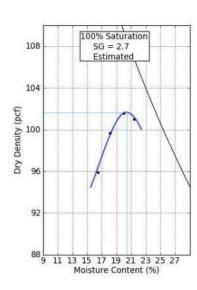
Location:

Project: DMPA 8 Levee Relocation

Report Date: 09/20/2023

Sample Date: 09/05/2023

Material: On-Site Fill Sampled By:



% Moisture	Dry Density Lbs	./Cu.Ft.		
16.5	95.90			
18.1	99.70			
20.0	101.6			
21.4	101.0			
20.4 Optim	um 101.7	Maximum		
Sieve % Passing Lo	<u>w Hi</u>			
No. 200 97	Descriptio	n: Fat Clay		
	Liquid	Liquid Limit: 53		
	Plastic	Plastic Limit: 20		
	Plasticity	Index: 33		
	Group S	vmbol: CH		

Desc of Rammer:Manual Preparation Method:Moist

Test Method (As Applicable): ASTM D 1140, ASTM D 2487, ASTM D 4318, ASTM D-698 Method-B

Respectfully Submitted,
Millennium Engineers Group, Inc.

Raul Palma, P.E.

APPENDIX L LABORATORY AND FIELD PROCEDURES Geotechnical | Environmental | Testing 5840 N. Gumwood Avenue Pharr, Texas 78577 Tel: 956-702-8500 Fax: 956-702-8140

Geotechnical Engineering Soil Borings Report

MEG Project No.: 02-23-29125

March 12, 2024



Laboratory and Field Test Procedures

Soil Classification Per ASTM D2487-93:

This soil-testing standard was used for classifying soils according to the Unified Soil Classification System. The soil classifications of the earth materials encountered are as noted in the attached boring logs.

Soil Water Content Per ASTM D2216-92:

This test determines the water content of soil or rock expressed as a percentage of the solid mass of the soil. The test results are listed under **MC** in the attached boring logs.

Soil Liquid Limit Per ASTM D4318-93:

The soil Liquid Limit identifies the upper limit soil water content at which the soil changes from a moldable (plastic) physical state to a liquid state. The Liquid Limit water content is expressed as a percentage of the solid mass of the soil. The test results are listed under **LL** in the attached boring logs.

Soil Plastic Limit Per ASTM D4318-93:

The soil Plastic Limit identifies lower limit soil water content at which the soil changes from a moldable (plastic) physical state to a non-moldable (semi-solid) physical state. The Plastic Limit water content is expressed as a percentage of the solid mass of the soil. The test results are listed under **PL** in the attached boring logs.

Plasticity Index Per ASTM D4318-93:

This is the numeric difference between the Liquid Limit and Plastic Limit. This index also defines the range of water content over which the soil-water system acts as a moldable (plastic) material. Higher Plasticity Index (PI) values indicate that the soil has a greater ability to change in soil volume or shrink and swell with lower or higher water contents, respectively. The test results are listed under **PI** in the attached boring logs.

Standard Penetration Test (SPT) and Split Spoon Sampler (SS) per ASTM D 1586:

This is the standard test method for both the penetration test and split-barrel (spoon) sampling of soils. This sampling method is used for soils or rock too hard for sampling using Shelby Tubes. The method involves penetration of a split spoon sampler into the soil or rock through successive blows of a 140-pound hammer in a prescribed manner.

Blow Counts (N) per ASTM D 1586:

This is the number of blows required to drive a Split Spoon Sampler by means of a 140 pound hammer for a distance of 12 inches in accordance with the variables stated in the test procedures.

Geotechnical Engineering Soil Borings Report

MEG Project No.: 02-23-29125

March 12, 2024



Shelby Tube (ST) per ASTM D 1587:

This procedure is for using a thin-walled metal tube to recover relatively undisturbed soil samples suitable for laboratory tests of physical properties.

Dry Density (DD) per ASTM D 2937:

This procedure is for the determination of in-place density of soil. The test results are measured in pounds per cubic foot, pcf.

Unconfined Compression Test (Uc) per ASTM D 2166:

This test method covers the determination of the unconfined compressive strength of cohesive soil in the undisturbed, remolded, or compacted condition, using strain-controlled application of the axial load.

Minus No. 200 Sieve per ASTM D 1140:

This test method covers determination of the amount of material finer than a Number 200 sieve by washing. The results are stated as a percent of the total dry weight of the sample.

Pocket Penetrometer (PP):

This test method is an accepted modification of ASTM D 1558 test method for establishing the moisture-penetration resistance relationships of fine-grained soils. The test results are measured in tons per square foot, tsf. The strength values provided by this method should be considered qualitatively.

Rock Quality Designation (RQD):

The measure of the quality of a rock mass defined by adding intact rock core pieces greater than four inches in length by the total length of core advance.

Recovery Ratio (REC):

The Recovery Ratio is equal to the total length of core recovered divided by the total length of core advance.

Boring Logs:

This is a summary of the above-described information at each boring location.