



**CITY COUNCIL REGULAR MEETING
MONDAY, JUNE 6, 2022 – 5:30 P.M.
COUNCIL CHAMBERS, CITY HALL
910 S. FRIENDSWOOD DRIVE
FRIENDSWOOD, TEXAS 77546**

AGENDA

1. CALL TO ORDER

2. INVOCATION

3. PLEDGE OF ALLEGIANCE – United States and State of Texas

4. COUNCIL COMMENTS AND REPORTS

Notice is hereby given in accordance with Section 551.0415 of the Texas Government Code, the City Council of the City of Friendswood may receive reports about items of community interest from City staff and/or a member of the City Council, but no action or possible action shall be taken or discussed concerning the subject of such report, except as provided by Section 551.042 of the Texas Government Code.

5. PUBLIC COMMENT

In order to comply with the provisions of the Texas Open Meetings Act, the City Council may not deliberate any item not listed on the agenda, as such, the City Council will listen to public comment and may (i) refer the item to City Management for further action or (ii) direct staff for the placement of said item on a future agenda. During public comment, the public shall refrain from any outbursts, or interjections including but not limited to: applause, disparaging noises and remarks. Furthermore, any personnel complaints against a City employee, aside from the City Manager, City Attorney or Municipal Judge, shall not be discussed and shall be referred to City Management.

6. COMMITTEES OR SPECIAL REPORTS

A. Receive the Library Board's Annual Report.

7. WORK SESSION TOPICS

A. Receive and discuss an update regarding the Drainage Update.

8. CITY MANAGER'S REPORT

- A. Present an update regarding the City's 4th of July Celebration.
- B. Present an update regarding the Waste Connections 2022 Scholarship recipients.
- C. Present an update regarding the Memorial Day Ceremony.

9. BUSINESS ITEM

- A. Consider approving a License and Maintenance Agreement with Azteca Systems, LLC, and a Master Agreement for Material and Services with NewEdge Services, LLC, for the purchase and implementation of CityWorks software for the Community Development Department.
- B. Consider awarding the Forest Bend Detention Pond Construction Project (Bid 2022-05) to Jerdon Enterprise, L.P.
- C. Consider approving the Property Sales Agreement with Roger and Shannon Weaver to purchase 0.9470 acres, being a part of Frenchman's Creek Townhomes, Section 2, City of

Friendswood, Galveston County, Texas.

- D. Consider approving an Interlocal Agreement with Galveston County Consolidated Drainage District for a shelving/flood mitigation project located at 212 East Heritage Drive, Friendswood, TX 77546.
- E. Consider approving an interlocal agreement with the Harris-Galveston Subsidence District for an Advance Metering Infrastructure (AMI) Large Meter Enhancement Project Grant.

10. PROPOSED RESOLUTIONS & ORDINANCES

- A. Consider a resolution verifying the percentage of completion of cybersecurity training and authorizing the City Manager or his designee to submit all documentation required by Section 2054.5191 of the Texas Government Code.
- B. Consider a resolution authorizing the adoption of the Galveston County Multi-Jurisdiction Hazard Mitigation Plan.
- C. Consider the first and final reading of an ordinance amending the City's General Budget for Fiscal Year 2021-2022 by approving "Budget Amendment IX" and providing for supplemental appropriation and/or transfer of certain funds.

11. CONSENT AGENDA

- A. Consider the second and final reading of an ordinance approving a request to vacate 20-foot drainage easement and a 10-foot drainage access easement for maintenance located at 1309 Falling Leaf Drive, Friendswood, Galveston County, Texas.
- B. Consider the first reading of an ordinance amending Chapter 82 "Traffic and Vehicles," Article I "In General," Section 82-1 "Unreasonable acceleration" of the Friendswood City Code to add an offense for unreasonable acceleration.
- C. Consider excusing City Manager Morad Kabiri's absence from the May 18, 2022, Special City Council Meeting.
- D. Consider the reappointment of Judge James Wotlz and Associate Judge Robert J. Barfield to serve another two-year term as municipal judges for the City of Friendswood, for a term beginning July 1, 2022, and ending June 30, 2024.
- E. Consider accepting the April 2022 tax report.

12. ADJOURNMENT

PUBLIC NOTICE IS GIVEN THAT IN ADDITION TO ANY EXECUTIVE SESSION LISTED ABOVE, THE CITY COUNCIL RESERVES THE RIGHT TO ADJOURN INTO EXECUTIVE SESSION AT ANY TIME AS AUTHORIZED BY THE TEXAS GOVERNMENT CODE SECTIONS 551.071 - 551.090 TO DISCUSS ANY MATTERS LISTED ABOVE.

THE CITY OF FRIENDSWOOD IS COMMITTED TO COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT. REASONABLE ACCOMMODATIONS AND EQUAL ACCESS TO COMMUNICATIONS WILL BE PROVIDED UPON REQUEST. PLEASE CONTACT THE CITY SECRETARY'S OFFICE BY PHONE AT (281) 996-3270, FAX (281) 482-1634, OR CONTACT (281) 996-3270 VIA RELAY TEXAS AT 711 OR 1-800-735-2988 FOR TTY SERVICES. FOR MORE INFORMATION CONCERNING RELAY TEXAS, PLEASE VISIT: [HTTP://RELAYTEXAS.COM](http://RELAYTEXAS.COM).



Posted by: Leticia Brysch, City Secretary
Posted this 2th day of June, 2022, at 6:30 P.M.



FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 03/24/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Receive the Library Board's Annual Report.

Originating Department: Library

Degree of importance:

SUMMARY / ORIGINATING CAUSE

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

1. Annual Library Board Report 2022 (004)

CITY OF FRIENDSWOOD

Library Board Annual Report



Friendswood Library Board Highlights

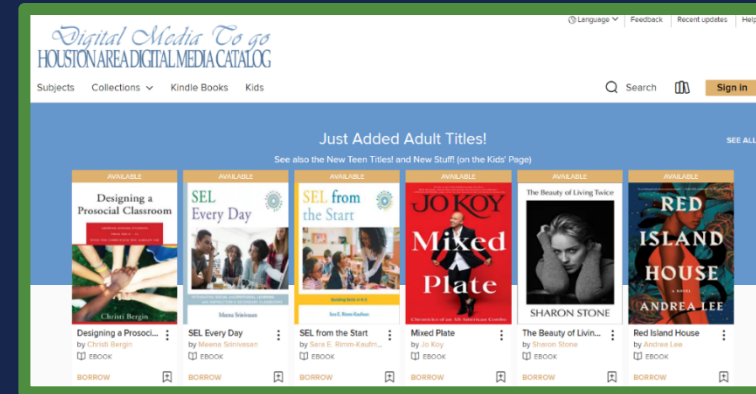
Library Board Highlights:

- Added FISD and CCISD librarian liaisons to our library board to receive input on local school activities and learn how Friendswood Library can assist in achieving their goals.
- Continued to assist Friendswood Library with long-range strategic planning.
- A long-range planning Town Hall is scheduled for July 19th.



Library Board Highlights:

- Reviewed and discussed library needs assessment surveys that went out to the public.
 - The Friendswood community continues to value both physical and electronic library resources.



- The Friendswood community continues to value meeting, study, and program spaces for citizen use and library programming.
- Recognized patron needs for additional workspace, study rooms, and technology space.

Friends of the Library Highlights

Friends of the Library Highlights

- Friends of the Library Night Circus Gala raised over \$43,000.00 for a new Outreach Van.
- Annual Book Sales raised \$5,908.45.
- The Friends have sold over 200 poetry books from Friendswood Library's annual event.



Friendswood Library Highlights

Friendswood Library Highlights

- 8th consecutive year to win the TMLDA Achievement in Library Excellence Award.
- Hosted our annual Summer Reading Programs, World Film Festival, ZakiCon anime event, and our Ekphrastic Poetry Contest with poets submitting work locally and from Canada, England, India, Macedonia, Thailand, and the United States.
- Created a monthly *Library Lines* newsletter for improved promotion of library services.
- Added a new full-time Digital Media Specialist position to the library staff.

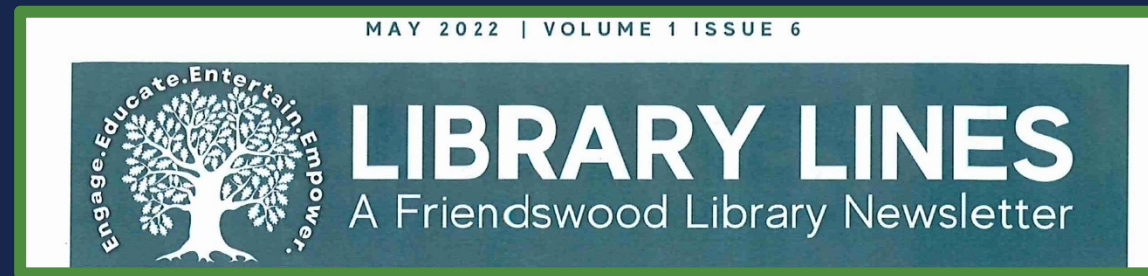
Digital Media Specialist Highlights

Digital Media Specialist Highlights

- Maintains all online databases, website, and social media.
- Keeps usage statistics and makes recommendations for new online services and resources.
- Contacts online vendors to troubleshoot for user issues.
- Runs and maintains 3D printer, poster printer, and other library technology.
- In charge of library service promotion and conducts library surveys for needs assessments.

Digital Media Specialist Highlights

- Works one-on-one with the computer needs of library patrons.
- Creates monthly *Library Lines* newsletter.



- Meets with staff to implement online service needs for staff and customers.
- Is cross trained to work at service desks as needed.
- With increased efficiency and support from the digital media specialist, staff has been able to add new requested programming including new book clubs and language learning classes among other programs and services.

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 04/05/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Receive and discuss an update regarding the Drainage Update.

Originating Department: Engineering

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

The Drainage Update will provide a general overview of ongoing Community Development Block Grant Disaster Recovery flood control and acquisition projects. The presentation will provide updated information regarding the 1959 Detention Basin, the Whitcomb tract, and the Blackhawk Detention Basin. The City's pursuit of stakeholders for these projects at the local, regional, state and national level will be discussed. Additional topics covered will include the Interlocal Agreement with Galveston County Consolidated Drainage District for 212 E Heritage Dr and the upcoming grant funds in the amount of \$488,762,000 that will be available through the Houston Galveston Area Council via a developing Method of Distribution (from Hurricane Harvey Community Development Block Grant Mitigation Funds).

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Updating Council on pertinent drainage topics to Friendswood enables them to make critical decisions regarding drainage and flood control projects the City's Engineering Department is pursuing. The Engineering Department recommends Council actively listen and participate in the discussion.

RECOMMENDATIONS

Recommend Council listen to the Drainage Update and ask questions and/or discuss concerns.

ATTACHMENTS

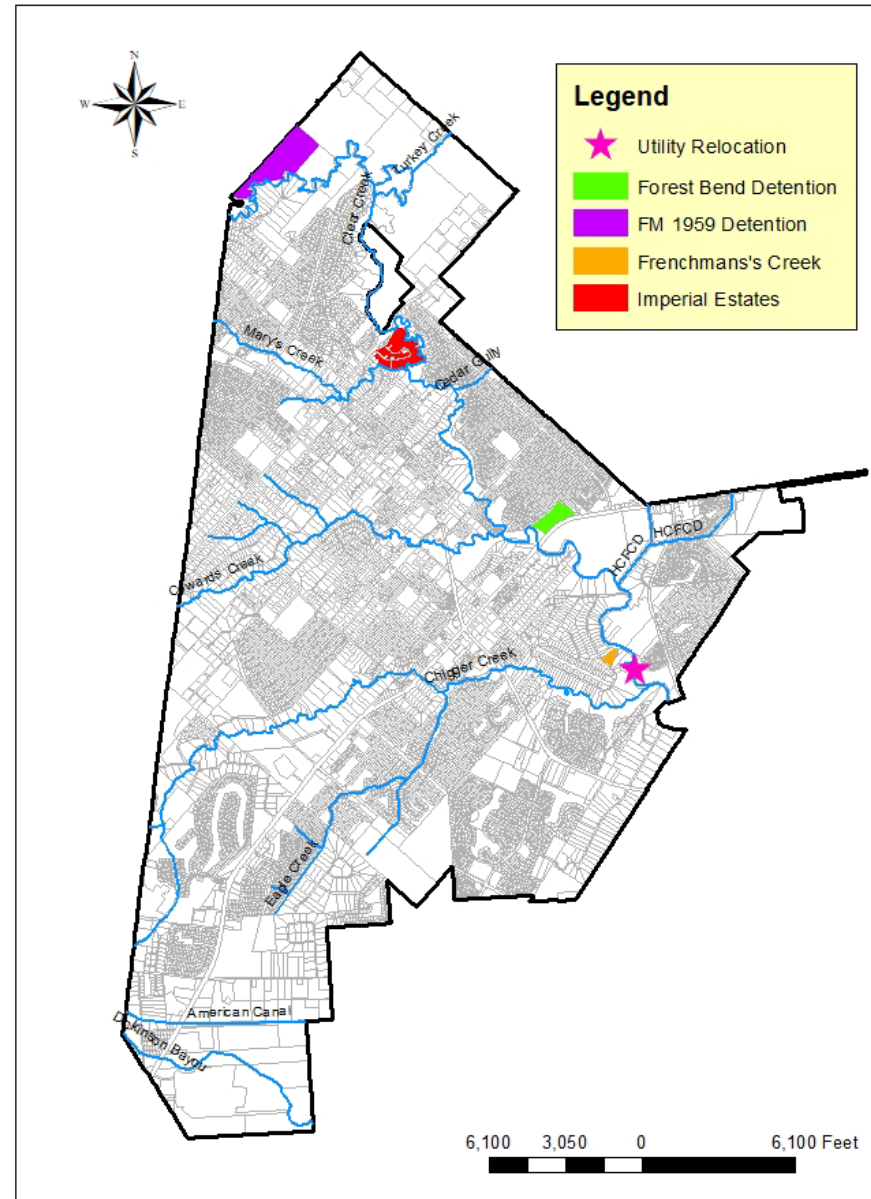
1. June 2022 Drainage Update - 5-27

CITY OF FRIENDSWOOD

June 2022 Drainage Update
Samantha Haritos – Deputy Director of Engineering



City of Friendswood Flood Control Projects



Community Development Block Grant Disaster Recovery - Acquisition

Frenchman's Creek

- **Building 5 – Offers Made and Accepted (30 Days to Close)**
- **Building 4 – Offers in Progress**

Property Adjacent to Frenchman's Creek

- **Final Owner Signature on Sales Agreement**
- **Contract Submitted to Title**
- **Sale Contingent on Building 5 Closing and Council Approval**

Deepwood Acquisition

- **Received Approvals from TX GLO for 8 Structures.**
- **Offers Once Environmental Assessment Completed**

Remaining Tasks - Demolition, Hydromulching

Community Development Block Grant Disaster Recovery - Flood Control Infrastructure Projects

Forest Bend Detention Pond

- **Construction (Pending Contract Documents)**
- **Project Features: 53 Ac-Ft Capacity; Meandering Layout with Wetland Plantings; Concrete Trails with Solar Lighting**

Deepwood Flood Control Project (Terracing)

- **LiDAR Survey Completed**
- **Engineering Design in Progress**

Utility Relocation Project

- **Engineering Complete**
- **Awaiting Authorization of Grant Funds**

212 East Heritage Acquisition

Location: Southeast Curve of Mary's Creek (0.33 Acres)

Repetitive Loss Property

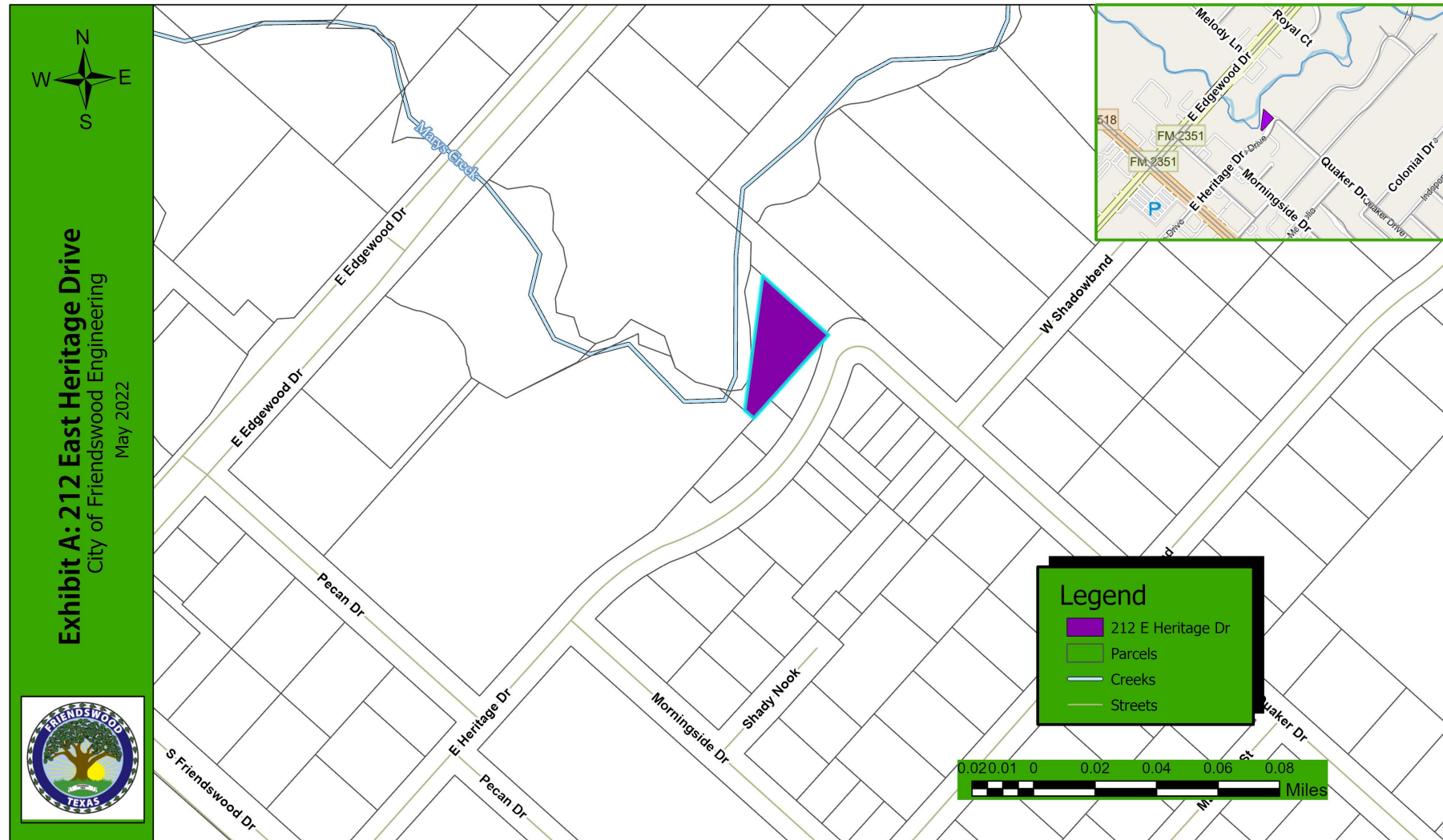
Total Cost: \$281,956

City's 50 % Share: \$140,978

Interlocal Agreement with Galveston County Consolidated Drainage District (GCCDD) on Tonight's Agenda

Flood Control Project (Terracing)

212 East Heritage Drive Site Map



FM 1959 Detention Basin

Location: Friendswood/Pearland Border
Along Harris County Side of Clear Creek

Features: 1000 - 1800 Ac-Ft Detention
Basin

Status: Harris County working on
Interlocal Agreement for 1959 Detention
Basin. Will contribute \$14 Million.

Partnering Agency

City of Friendswood

Galveston County

Galveston County Consolidated Drainage District
(GCCDD)

Harris County Flood Control District (HCFCD)

State of Texas (Potentially)

Net Project Cost: \$38,000,000

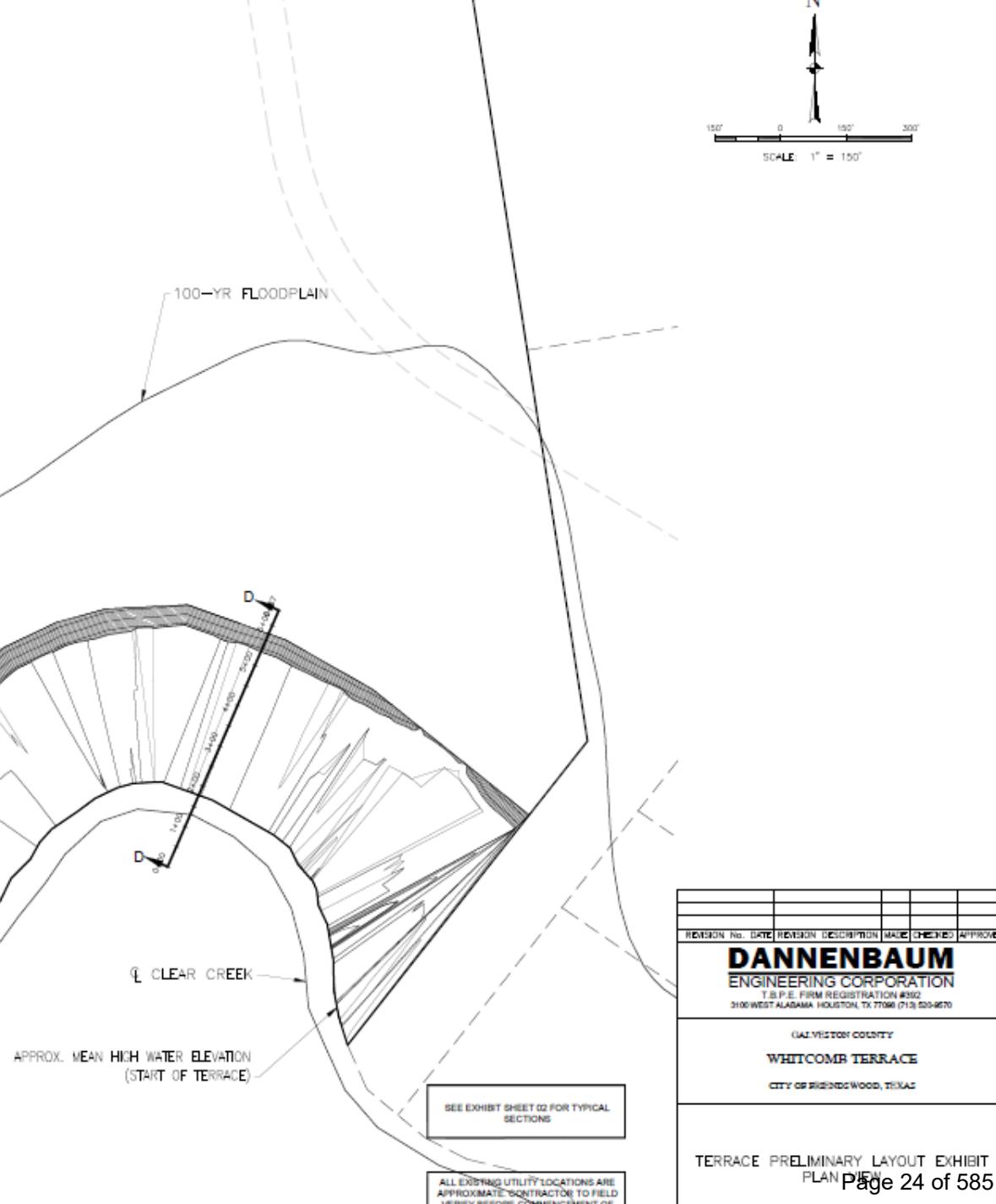
Friendswood Alternative – Lower Clear Creek and Dickinson Bayou Study

Adding Friendswood Alternative into State Flood Plan which Includes Three Measures:

- FM 1959 Detention Basin**
- Whitcomb Terracing (and Detention)**
- Blackhawk Detention (and Terracing)**

Freese and Nichols is Modeling Cost and Benefit for Each Measure Independently and Collectively

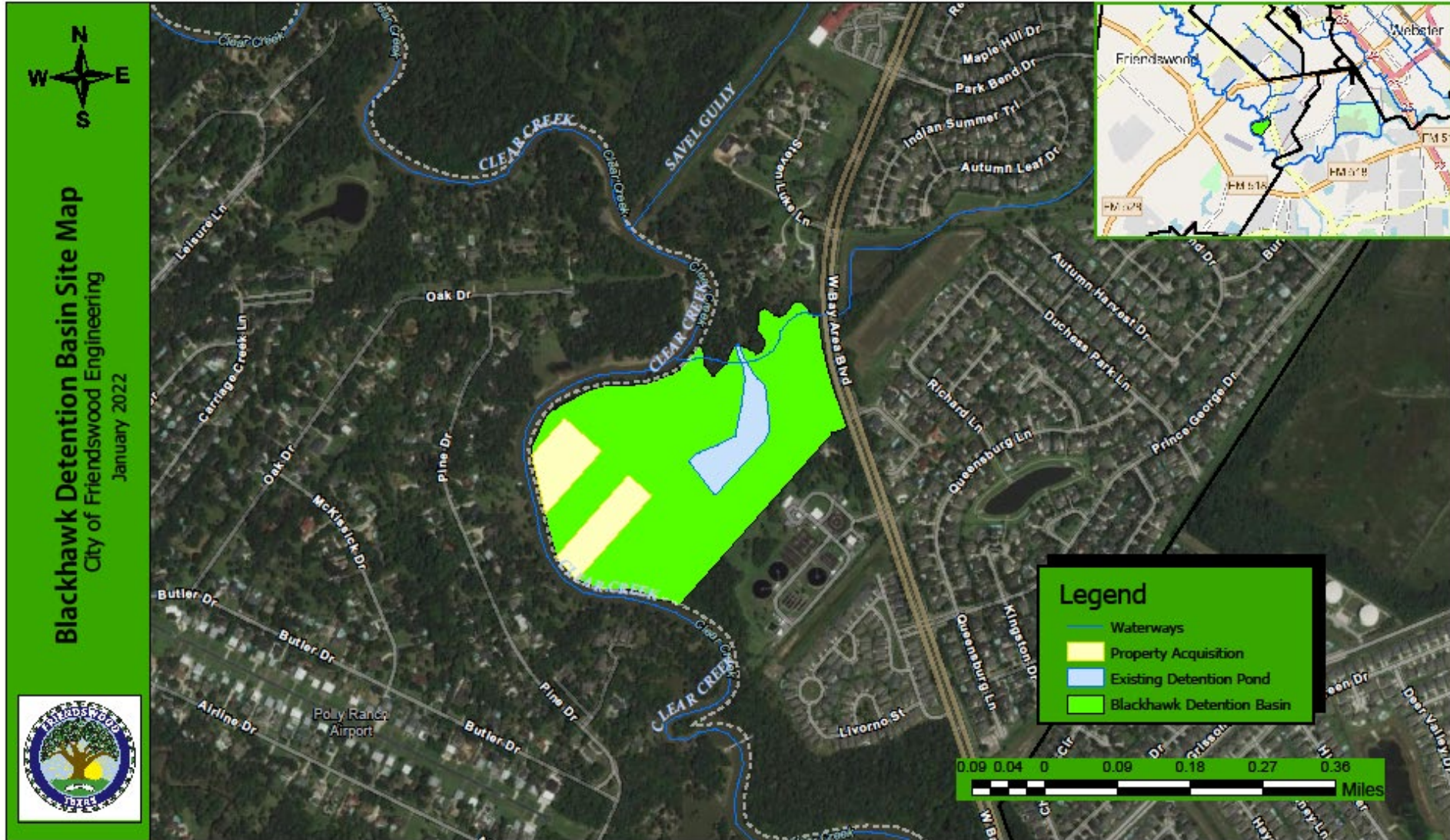
Seeking Funding from State (Direct Allocation) towards 1959 Detention Basin and Whitcomb



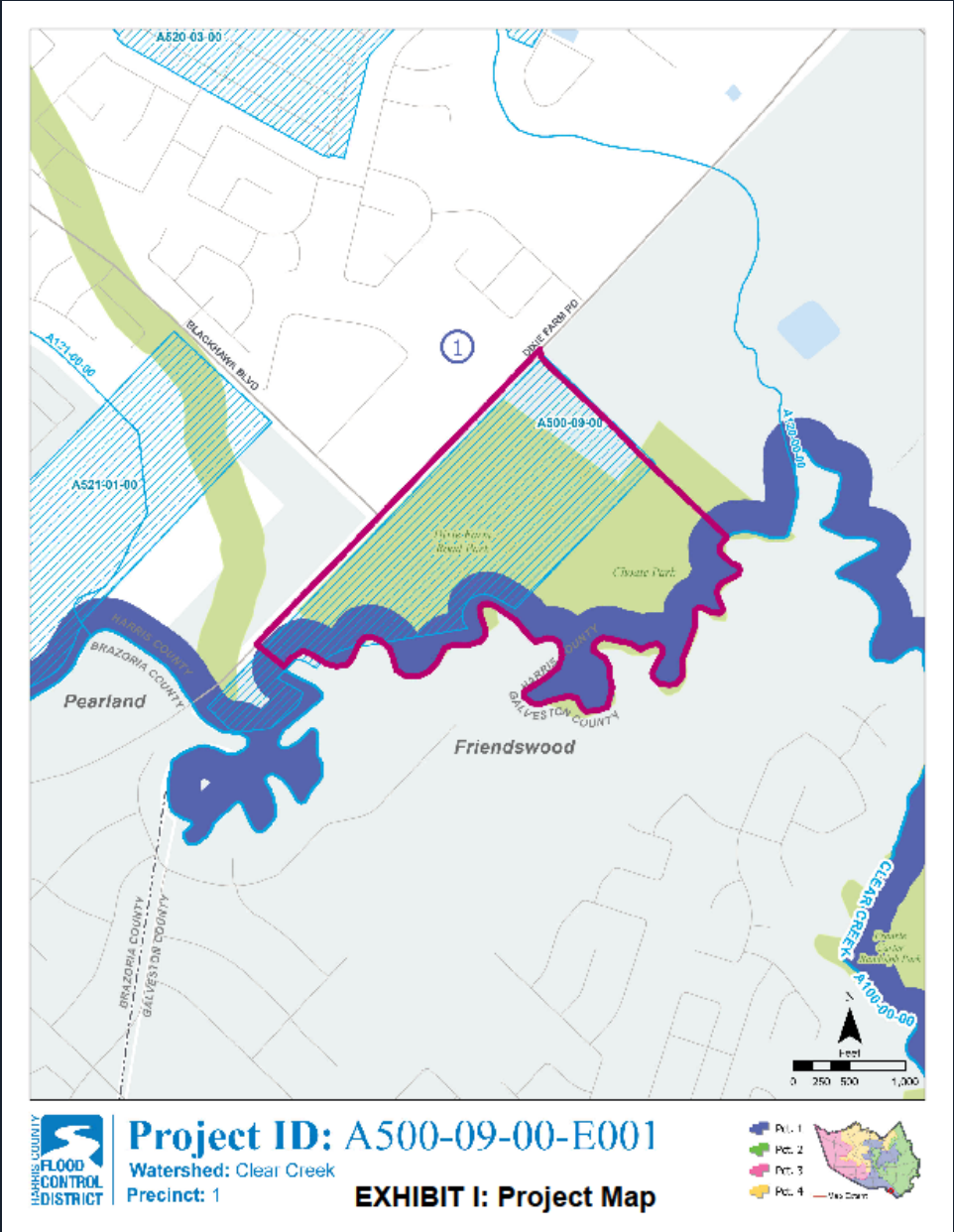
REVISION	No.	DATE	REVISION DESCRIPTION	MADE	CHECKED	APPROVED	
DANNENBAUM ENGINEERING CORPORATION T.S.P.E. FIRM REGISTRATION #3932 3100 WEST ALABAMA HOUSTON, TX 77006 (713) 525-4670							
(CALVESTON COUNTY) WHITCOMB TERRACE CITY OF RICHMOND WOOD, TEXAS							
TERRACE PRELIMINARY LAYOUT EXHIBIT PLAN SHEET							

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Blackhawk Detention Basin



1959 Detention Basin



State Flood Plan – Region 6 (San Jacinto)

Lower Clear Creek and Dickinson Bayou Study is in the State Plan

Working to Add Additional Friendswood Alternative (1959 Detention Basin, Whitcomb Terracing and Detention, and Blackhawk Terracing and Detention)

Public Input: <https://sanjacintofloodplanning.org/>

- Can identify areas that flood and sign up for distribution list.

Public Meetings: May 24th, May 26th, and May 31st

Water Resources Development Act (WRDA) Update

SENATE

May 18, 2022 - Senate Environment and Public Works (EPW) Committee Passed WRDA Bill 2022

- Authorizes construction of 16 Pending Corps Chief's Reports Received Since WRDA 2020**
- Authorizes 72 Feasibility Studies for Water Resources Projects**
- Directs Corps to Expedite Completion of 15 Feasibility Studies Currently Underway**

Includes Lower Clear Creek and Dickinson Bayou Watershed Study (Pg. 76 Under Authorization of Feasibility Studies)

Water Resources Development Act (WRDA) Update

HOUSE

May 18 – House Committee on Transportation and Infrastructure Voted to Advance the WRDA 2022 Out of Committee. Heads to House Floor for Vote.

Lower Clear Creek and Dickinson Bayou, Texas Flood Risk Management (Under Authorization of Proposed Feasibility Studies – Pg 69)

IF THE PROJECT MAKES IT INTO WRDA 2022 FUNDING WILL STILL NEED TO BE AUTHORIZED.

Houston-Galveston Area Council - Method of Distribution (MOD) - \$488,762,000

Public Meetings Held February 3rd

Process

HGAC will prepare and submit preliminary MOD to GLO for review.

Preliminary MOD will post on above website for review.

Public will have 15 days to submit comments.

Public hearing will be conducted.

At this time, Friendswood may be Eligible for Up to \$6,000,000.

Low to Moderate Income (LMI) Requirements. Hoping to reduce the LMI from 50% to 40%.

Expect to Hear More on Distribution Method in June 2022

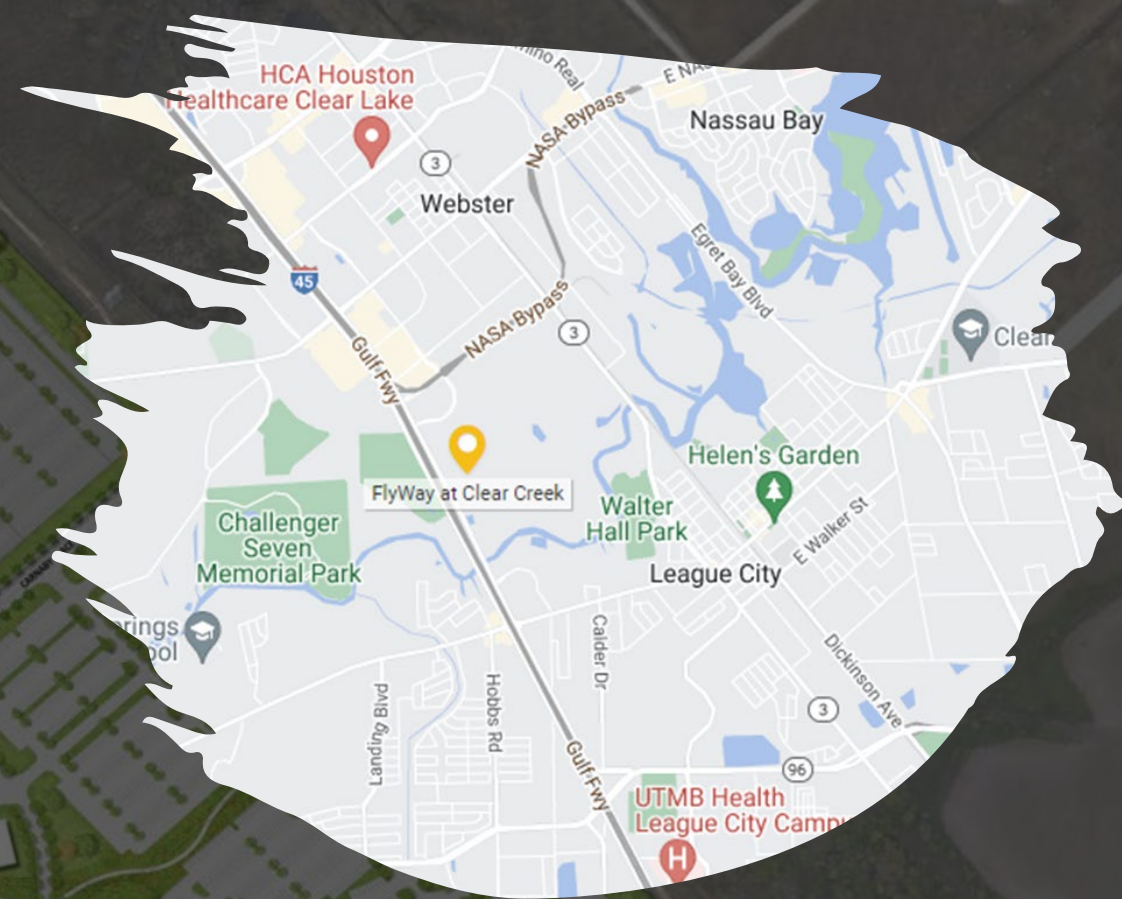
FlyWay Mixed Use Development and Great Wolf Lodge (Webster, TX)

120 Acre Mixed Use Development
Boardwalk, Restaurants, Open Space, Concert Venue

Drainage Studies

- Fill Study 2015 (IDS Engineering)
- Hydrologic/Hydraulic Study Summer 2022 (IDS Engineering)

Expected Completion in 2024



Riverview Mixed Use Development (League City, TX)



68.5 Acre
Mixed Use
Development



Features
Include:
Apartments,
Senior
Homes,
Townhomes,
Boardwalk,
Marina,
Retail,
Amphitheater



Planning and
Engineering
Studies
Ongoing



Timeline
January 2024:
Apartments, Dog
Park, Boardwalk
and Amphitheater

September 2029:
Estimated
Completion

May 27, 2022



AMENITIES G A L O R E

By the time it is built out in September 2029, the 68.5-acre Riverview development will include various amenities for residents and visitors.

RESIDENTIAL

- 1 Aloft Hotel
Rooms: 150
- 2 Multifamily housing
One-bedroom units: 181
Two-bedroom units: 101
- 3 Townhomes
Units: 53
- 4 Senior living apartments
One-bedroom units: 89
Two-bedroom units: 41
- 5 Marina Bend at Clear
Creek Apartments
(pre-existing)
One-bedroom units: 123
Two-bedroom units: 80

COMMERCIAL/AMENITIES

- 6 Restaurants/retail/offices
- 7 Garden office buildings
- 8 Marina
- 9 Amphitheater
- 10 Boat ramp
- 11 Pickleball courts
- 12 Life-size chess board
- 13 Outdoor gym
- 14 Yoga lawn
- 15 Boardwalk



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Date requested for City Council consideration: June 6, 2022

Date submitted: 05/05/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Present an update regarding the City's 4th of July Celebration.

Originating Department: City Manager

Degree of importance:

SUMMARY / ORIGINATING CAUSE

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

1. July 4th 2022



FRIENDSWOOD 4TH OF JULY STEERING COMMITTEE PRESENTS

★ ★ FREEDOM ★ ★ FOR ONE & ALL

127TH ANNUAL FRIENDSWOOD 4TH OF JULY CELEBRATION

MONDAY, JULY 4, 2022



GRAND PARADE

ON FRIENDSWOOD DR. BETWEEN
HERITAGE DR. & STEVENSON PARK

10:00 AM

STEVENSON PARK

RIDES, GAMES, FOOD,
AND ENTERTAINMENT

11:00 AM

CENTENNIAL PARK

FOOD AND ENTERTAINMENT
BY "PARTY CRASHERS"

7:30 PM

FIREWORKS SHOW

FOLLOWING FEATURED ENTERTAINMENT
STARTING AT APPROXIMATELY

9:20 PM



FRIENDSWOOD.COM/JULY4



FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

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Date requested for City Council consideration: June 6, 2022

Date submitted: 05/05/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Present an update regarding the Waste Connections 2022 Scholarship recipients.

Originating Department: City Manager

Degree of importance:

SUMMARY / ORIGINATING CAUSE

As part of their commitment to community involvement within the City of Friendswood, Waste Connections provides scholarships to CCISD and FISD graduating seniors. \$500 is contributed to both Clear Brook and Clear Springs High School, the two CCISD high schools serving the Harris County portion of Friendswood, and \$1,000 to Friendswood High School. Each school's scholarship committee selects the recipients and the scholarships are awarded according to financial need, academics, and community service.

Friendswood High School's 2022 Waste Connections scholarship recipient is Grant Newmann and he will be a Business major at either Texas State University or Texas Tech University.

Clear Brook High School's 2022 Waste Connections scholarship recipient is Erica Boehner and she will be a Sign Language Interpreting major at Tyler Junior College.

Clear Springs High School's 2022 Waste Connections scholarship recipient is Emma Wallace and she will be an engineering major at Texas A&M – College Station.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

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Date requested for City Council consideration: June 6, 2022

Date submitted: 05/05/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Present an update regarding the Memorial Day Ceremony.

Originating Department: City Manager

Degree of importance:

SUMMARY / ORIGINATING CAUSE

Fidencio Leija Jr. was the speaker

After graduating from Santa Fe High School in 1996, Leija enlisted in the United States Navy. He served as a Radioman and Force Protection Petty Officer traveling to fifteen countries over his nine years of active-duty service. He received numerous accolades for his professional skills and competence while maintaining a Secret security clearance and upholding the highest standards of the Navy. Leija received an honorable discharge after numerous Western Pacific deployments and serving in Japan after 9/11.

U.S. Navy 1996–2005

Operation Enduring Freedom

Radioman and Force Protection Petty Officer

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

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Date requested for City Council consideration: June 6, 2022

Date submitted: 04/21/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider approving a License and Maintenance Agreement with Azteca Systems, LLC, and a Master Agreement for Material and Services with NewEdge Services, LLC, for the purchase and implementation of CityWorks software for the Community Development Department.

Originating Department: Information Technology

Degree of importance: High

SUMMARY / ORIGINATING CAUSE

This item allows Council to approve the following for services associated with the Community Development Department:

1. License and Maintenance Agreement with Azteca Systems, LLC, for CityWorks software in the amount of \$8,906.25 for Year 1 of a three-year agreement, and
2. Master Agreement for Material and Services with NewEdge Services, LLC, for the implementation of CityWorks software in the amount of \$164,540.00.

Cityworks PLL is an application that can improve the City of Friendswood's posture by moving our processes to a Smart City design. A Smart City for Friendswood would be defined as "using information and communication technology (ICT) to improve operational efficiency, share information with the public and provide a better quality of government service and citizen welfare." Moving to Cityworks will allow for improvements with permits, inspections, and plan review submissions to move to the digital world with an all electronic process. The citizen/customer will be able to track their requests with an online portal to improve transparency with the process. Staff will be able to process requests in a timely manner, moving them along the process without the hassle of paperwork to transfer from one department to another.

As the City has experienced unresolved issues with the current software solution for these services, CDD and IT support moving to Cityworks PLL program. This move will progress the City of Friendswood with the Smart City initiatives that improve efficiencies with staff as well as improve citizen and customer experiences.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

Staff recommends approval.

ATTACHMENTS

1. Cityworks PLL Q-24758-20220311-1505 Friendswood, TX - Standard PLL ELA (1)

2. Friendswood TX - Cityworks License Agreement_2022_signed
3. Friendswood_NewEdge_MSA_PLL Implementation_Updated05192022_NESSigned

Contact Information

Contact Name: James O'Brien
Customer: Friendswood, TX, City of
Contact Address: 910 South Friendswood Drive
Friendswood, TX
77546

Prepared By Name: Veronica Schindler
Prepared By Phone: (801) 523-2751

Quote Lines

Product Name	Quantity/ Population	Net Unit Price
ELA - Server PLL STANDARD	1.00	USD 8,906.25
TOTAL:		USD 8,906.25

Notes

Year 1 Dollar Value	USD 8,906.25	Year 1 Date Range	06/01/2022 - 10/13/2022*
Year 2 Dollar Value	USD 84,250.00	Year 2 Date Range	10/14/2022 - 10/13/2023
Year 3 Dollar Value	USD 95,500.00	Year 3 Date Range	10/14/2023 - 10/13/2024

Notes:

Quote adds Standard PLL ELA to current licensing.

Updated License:

Server AMS Standard Enterprise License Agreement (ELA), Includes Unlimited Quantities of the Identified Products:
Respond
Mobile Native Apps (for iOS/Android)

--Includes the following Add-ons:

Storeroom
Equipment Checkout
Contracts
Cityworks for Excel
Cityworks Analytics for AMS
eURL (Enterprise URL)
Workload
Web Hooks
Citizen Engagement API
Use of Cityworks AMS Application Programming Interfaces (APIs) with commercially available Cityworks-centric applications that are licensed and maintained by authorized Cityworks partners

Server PLL Standard Enterprise License Agreement (ELA), Includes Unlimited Quantities of the Identified Products:
Respond
Mobile Native Apps (for iOS/Android)

--Includes the following Add-ons:

eURL (Enterprise URL)
Public Access for PLL
Cityworks Analytics for PLL
Workload
Web Hooks

Use of Cityworks PLL Application Programming Interfaces (APIs) with commercially available Cityworks-centric applications that are licensed and maintained by authorized Cityworks partners

Annual fee herein is based on 25,001 - 50,000 population range

*Fee for Year 1 reflects products added at a 50% discount and is pro-rated for a period of 06/01/2022 - 10/13/2022. Current Renewal Amount for period 10/14/2021 - 10/13/2022 has previously been paid.

Terms and Conditions

Payment Terms

Payment due within 30 days

IF YOUR ORGANIZATION REQUIRES A PURCHASE ORDER, PLEASE CONTACT YOUR FINANCE DEPARTMENT TO BEGIN THE APPROVAL PROCESS TO AVOID PAYMENT DELAYS.

All quotations are valid for ninety-days (90) from the date above, unless otherwise stated in this quotation form. All prices quoted are in USD, unless specifically provided otherwise, above. These prices and terms are valid only for items purchased for use and delivery for the Customers listed above.

Unless otherwise referenced, this quotation is for the Cityworks software products referenced above only. Pricing for implementation services (installation, configuration, training, etc.), or other software applications is provided separately and upon request.

The procurement, installation and administration of the Esri software or any other third-party software utilized in conjunction with Cityworks will be the responsibility of the Customer.

For "on-prem" installations, the procurement, installation and administration of the RDBMS utilized in conjunction with Cityworks will be the responsibility of the Customer. Currently, Cityworks supports Oracle and SQL Server. The procurement, installation and administration of the infrastructure (hardware and networking) utilized in conjunction with Cityworks will be the responsibility of the Customer.

This quotation and the pricing information herein is confidential and proprietary and may not be copied or released other than for the express purpose of the current system Software and Product selection and purchase. This information may not be given to outside parties or used for any other purpose without written consent from Azteca Systems, LLC or unless otherwise specifically permitted by law. If a "public access" or similar request is made, Customer, shall notify Azteca Systems, prior to any disclosure.

Software Licensing

All Azteca Systems software offered in this quotation are commercial off-the-shelf (COTS) software developed at private expense, and is subject to the terms and conditions of the signed "Cityworks Software License and Maintenance Agreement" ("Agreement") and any and all addendums or amendments thereto. A fully executed copy of the Agreement and any addendum(s) is required before delivery and installation and usage of the software is subject to the terms of the current license agreement.

The terms and conditions of the executed Cityworks Software License Agreement apply to this Quote unless otherwise specifically stated herein. Any additional or conflicting terms set forth in any purchase orders, invoices, or other standard form documents exchanged during the ordering process, other than product descriptions, quantities, pricing, and dates are void and of no effect.

Delivery method is by way of download through Azteca Systems, LLC. customer support web portal.

Taxes

Prices quoted do not include any applicable state, sales, local, or use taxes unless so stated. In preparing your budget and/or Purchase Order, please allow for any applicable taxes, including, sales, state, local or use taxes as necessary. Azteca Systems reserves the right to collect any applicable sales, use or other taxes tax assessed by or as required by law. Azteca Systems reserves the right to add any applicable tax to the invoice, unless proof with the order is shown that your organization or entity is tax exempt or if it pays any applicable tax directly.

International Customers

These items are controlled by the U.S. government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. government or as otherwise authorized by U.S. law and regulations.

Your signature indicates your acceptance of this Quote, and that you have read and accepted the Terms and Conditions set forth above.

Accepted by:

Title

____/____/____
Date

Azteca Systems, LLC - Cityworks | 11075 South State Street Suite 24, Sandy, UT 84070 | Corporate Main 801-523-2751 | Corporate Fax 801-523-3734

CITYWORKS® SOFTWARE LICENSE AND MAINTENANCE AGREEMENT

This Software License and Maintenance Agreement ("Agreement") is made by and between Azteca Systems, LLC ("Azteca Systems" or "Azteca") a Delaware limited liability company, with a place of business set forth on Addendum #1 below, and **City of Friendswood, TX**, (hereinafter referred to as "Licensee" or "Customer"), using certain of Azteca Systems Licensed Products. This Software License and Maintenance Agreement is effective upon the date of signature by Licensee below (the "Effective Date").

Azteca Systems Products are licensed under the terms and conditions of this Agreement. This Agreement, when executed by the Licensee and Azteca Systems, as licensor of the Software, or the Online Services, and Documentation licensed under this Agreement, will supersede any previous agreements.

This Agreement includes (i) this Software License and Maintenance Agreement, (ii) Addendum #1 – Product Licensing, (iii) Addendum #2 – Standard Maintenance and Support, and (iv) Addendum #3 – Third-Party Contractor Acknowledgment.

This Agreement may be executed in duplicate by the Parties. An executed Agreement, modification, amendment, or separate signature page shall constitute a duplicate if it is transmitted through electronic means, such as fax or email, and reflects the signing of the document by any Party. Duplicates are valid and binding even if an original paper document bearing each Party's original signature is not delivered.

ARTICLE 1—DEFINITIONS

1.1 Definitions. The terms used are defined as follows:

- a. "Agreement" means this Software License and Maintenance Agreement between Azteca Systems and Licensee, inclusive of all schedules, exhibits, attachments, addenda, and other documents incorporated by reference.
- b. "Authorization Code(s)" means any key, authorization number, enablement code, login credential, activation code, token, account username and password, or other mechanism required for use of a Product.
- c. "Authorized User" or "User" shall mean: (i) a direct user of the Licensed Products, including but not limited to Licensee's employees; (ii) Licensee's consultants who have agreed to maintain the Licensed Property in confidence and use it only for the benefit of Licensee, or (iii) members of the public gaining access to, and only limited use of, the Licensed Products via the Software's public web portal (if applicable). Other than limited use of the Products through the software's web portal, the public is not considered an authorized user.
- d. "Beta" means any alpha, beta, or other prerelease version of a Product.
- e. "Client Data" means the data provided or inputted by or on behalf of Licensee, including personally identifiable information, for use with the Software.
- f. "Cloud Services" means both Azteca Systems Managed Cloud Services and Online Services.
- g. "Covered Software" shall mean the particular Cityworks Software, scripts, interfaces and custom code identified in Addendum #1.
- h. "Concurrent Use License" means that Licensee may install and use the Software on computer(s) on a network, but the number of simultaneous users (logins) may not exceed the number of licenses required.
- i. "Testing Server License" means a license that authorizes Licensee to install and use the Software on a server in Licensee's internal use to provide testing License rights prior to deployment.
- j. "Documentation" means all user reference documentation that is supplied to the Licensee by Azteca Systems pursuant to this Agreement for aiding or enabling the use of the Software and is deemed to include any Azteca Systems-provided revisions thereof.
- k. "Internal Use" means use of the Licensed Products by employees of Licensee in Licensee's internal operations but does not include access of the Licensed Products by or use of the Licensed Products in the provisions of services to Licensee's clients or customers. Internal Use also includes use of the Licensed Products by contractors of Licensee, including contractors providing outsourcing or hosting services, as long as Licensee assumes full responsibility for the compliance with this Agreement in such use. Use of the Licensed Products (or any part thereof) for the benefit of others, whether by means of a software as a

- service offering, service bureau application, application service provider, outsourcing, or other means of providing service to any third party shall not be considered Internal Use.
- l. "Licensed Products" or "Products" shall mean the portion of the Cityworks Software and the Documentation to which Licensee has purchased a License as identified in Addendum #1 attached hereto. Licensed Products shall include any updates or upgrades to the Licensed Products that Azteca Systems may at its discretion deliver to Licensee. Products includes but is not limited to Software and Documentation licensed under the terms of this Agreement.
 - m. "Login" means a license that allows Licensee to permit a single authorized named end user to use the Software, Data, and Documentation installed on a server and accessed from a computer device.
 - n. "Malicious Code" means software viruses; worm time bombs; Trojan horses; or any other computer code, files, denial of service, or programs designed to interrupt, destroy, or limit the functionality of any computer software, hardware, or telecommunications equipment.
 - o. "Named User(s)" is Licensee's employee, agent, consultant, or contractor to whom Licensee has assigned a unique, secure login credential (identity) enabling access to a Product that requires such identity in order to access identity-managed capabilities within a Product or subscription to Online Services for Licensee's exclusive benefit.
 - p. "Online Services" means the commercially available, internet-based asset management system that Azteca Systems provides (commonly known as Cityworks Online), including applications and associated APIs, for storing, managing, publishing, and using maps, data, and other information. Online services exclude Data and Content.
 - q. "Online Services Subscription" means a limited-term subscription conveying the right for one or more named users to access and use Online Services.
 - r. "Ordering Document(s)" means a sales quotation, purchase order, or other document identifying the Products that Licensee orders.
 - s. "Preview" means any alpha, beta, or prerelease Product.
 - t. "Product(s)" means Software and Documentation licensed under the terms of this Agreement.
 - u. "Sample(s)" means sample code, sample applications, sample add-ons, or sample extensions of Products.
 - v. "Server" means each single instance of an operating system, whether physically installed on a computer or within a virtualized environment.
 - w. "Software" or "Cityworks Software" means all or any portion of Azteca Systems proprietary software technology, excluding data, accessed or downloaded from an Azteca Systems (Cityworks) authorized website or delivered on any media in any format including backups, documentation, updates, upgrades, and service packs. Without limitation, the Software is deemed to include any alpha, beta, prerelease or restricted version(s), or final commercial release(s), provided in source, object, or executable code format(s), inclusive of backups, updates, service packs, sample code, or merged copies permitted hereunder or subsequently supplied under this Agreement. Unless otherwise indicated by the context herein, the term Software is also deemed to include its associated Documentation.
 - x. "Standard Maintenance" or "Maintenance Addendum" shall mean the Standard Software Maintenance & Support Addendum #2.
 - y. "Term License" means a license or access provided for use of a Product for a limited time period ("Term") or on a subscription or maintenance basis as specified herein.

ARTICLE 2—INTELLECTUAL PROPERTY RIGHTS AND RESERVATION OF OWNERSHIP

All Azteca Systems Offerings are the copyrighted works of Azteca Systems. Azteca Systems or its licensors own the Products and all copies, which are protected by United States and applicable international laws, treaties, and conventions regarding intellectual property and proprietary rights, including trade secrets. This Agreement does not transfer ownership rights of any description in the software, materials, products, or services to Licensee or any third party. Licensee agrees to use reasonable means to protect Products from unauthorized use, reproduction, distribution, or publication. All rights not specifically granted in this Agreement are reserved to Azteca Systems and its licensor(s). Azteca Systems does not acquire any rights in Customer Content under this Agreement other than as needed to provide Azteca Offerings and Services to Customer.

ARTICLE 3—GRANT OF LICENSE

- 3.1 **Grant of License.** Subject to the terms of this Agreement, Azteca Systems grants to Licensee a personal, nonexclusive, nontransferable license solely to use the Products as set forth in Addendum #1 – Product Licensing (i)

for which the applicable license fees have been paid; (ii) for Licensee's own internal use; (iii) in accordance with this Agreement and the configuration ordered by Licensee or as authorized by Azteca Systems; and (iv) for the applicable Term or until terminated in accordance with Article 6. License types may include, but are not limited to Login, Workgroup, Departmental, ELA (Enterprise License) licenses. Licensee may allow Third-Party Contractors to access and use the licensed Software, provided Licensee and Third-Party Contractor agree to and are bound by the terms set forth in Addendum 3. In addition to the Scope of Use in Article 4, Addendum #1 – Product Licensing which applies to specific Products, Addendum #2 – Standard Maintenance and Support, and Addendum #3 – Third-Party Contractor Acknowledgment (if applicable) collectively, are incorporated by reference into this Agreement.

- a. *Software.* Use and license for specific Software products are set forth in Addendum #1– Product Licensing, which is incorporated by reference.
- b. *Maintenance.* Maintenance terms are set forth in Section 10.10 below and in Addendum #2 – Standard Maintenance and Support, which terms are incorporated by reference.
- c. *Third Party Contractor.* Terms of use for Third-Party Contractor software usage (if applicable) are set forth in Addendum #3 – Third-Party Contractor Acknowledgment, which is incorporated by reference.

3.2 Delivery. Unless otherwise agreed, Azteca Systems shall provide an electronic link to make available to Licensee the Licensed Products by electronic download and a license key to activate the Licensed Products.

ARTICLE 4—SOFTWARE AND ONLINE SERVICES

4.1 Software Terms of Use

- a. For Products delivered to Licensee, Licensee may:
 1. Install, access, and store Products on electronic storage device(s);
 2. Make archival copies and routine computer backups;
 3. Install and use a newer version of Software concurrently with the version to be replaced during a reasonable transition period not to exceed 6 months, provided that the deployment of either version does not exceed the Licensee's licensed quantity; thereafter, Licensee shall not use more Software in the aggregate than Licensee's total licensed quantity;
 4. Move the Software in the licensed configuration to a replacement server; and
 5. Governmental or not-for-profit organization that operate a website or offer internet services may use server Software for revenue-generating purposes on a cost-recovery basis and not for profit.
- b. Licensee may use, copy, or prepare derivative works of Documentation supplied in digital format and thereafter reproduce, display, and redistribute the customized documentation only for Licensee's own internal use. Portions of Documentation supplied in digital format merged with other software and printed or digital documentation are subject to this Agreement. Licensee shall include the following copyright attribution notice acknowledging the proprietary rights of Azteca Systems and its licensors: "Portions of this document include intellectual property of Azteca and its licensors and are used herein under license. Copyright © [Licensee will insert the actual copyright date(s) from the source materials] Azteca Systems, LLC. and its licensors. All rights reserved."
- c. *Consultant or Contractor Access.* Subject to Section 3.1 and Addendum #3, Azteca Systems grants Licensee the right to permit Licensee's Third-Party Consultants or Contractors to use the Products exclusively and solely for Licensee's benefit. Licensee must comply with terms and provisions of Addendum #3 and provide a copy to Azteca Systems. Licensee shall be solely responsible for compliance by Third-Party Consultants and Contractors with this Agreement and shall ensure that the Third-Party Consultant or Contractor discontinues Product use upon completion of work for Licensee. Access to or use of Products by Third-Party Consultants or Contractors not exclusively for Licensee's benefit is prohibited.

4.2 Online Services Terms of Use

- a. **Use of Online Services** is also subject to the Cloud Services Terms found in Addendum #2.
- b. **Modification of Online Services.** Azteca Systems may change Online Services and associated APIs at any time, subject to 30 days' notice of material changes and 90 days' notice for deprecations. If any

modification, discontinuation, or deprecation of Online Services causes a material, adverse impact to Customer's operations, Azteca Systems may, at its discretion, attempt to repair, correct, or provide a workaround for Online Services. If a viable solution is not commercially reasonable, Customer may cancel its subscription to Online Services, and Azteca Systems will issue a prorated refund.

4.3 Named User Licenses. Except as expressly set forth in this Agreement, the following terms apply to Software and Online Services for which Customer acquires Named User Licenses.

a. Named Users.

1. Named User login credentials are for designated users only and may not be shared with other individuals.
2. Customer may reassign a Named User License to another user if the former user no longer requires access to the Software or Online Services.
3. Customer may not add third parties as Named Users, other than third parties included within the definition of Named Users.

4.4 Limited-Use Programs.

a. Trial, Evaluation, and Beta Programs. Products acquired under a trial, evaluation, or beta program are licensed for evaluation and testing purposes only and not for commercial use. Any such use is at Customer's own risk and the Products do not qualify for Maintenance. If Customer does not convert to a purchased license or subscription prior to the expiration of the trial, evaluation, or beta license, Customer may lose any Customer Content and customizations made during the license term. If Customer does not wish to purchase a license or subscription, Customer should export such Customer Content before the license expires.

b. Educational Programs. Licensee agrees to use Products provided under an educational program solely for educational purposes during the educational use Term. Licensee shall not use Products for any Administrative Use unless Customer has acquired an Administrative Use license. "Administrative Use" means administrative activities that are not directly related to instruction or education, such as asset mapping, facilities management, demographic analysis, routing, campus safety, and accessibility analysis. Customer shall not use Products for revenue-generating or for-profit purposes.

c. Other Azteca Systems Emergency or Limited-Use Programs. If Licensee acquires Products under any limited-use program not listed above, Licensee's use of the Products may be subject to the terms set forth in the applicable launching page, letter, or enrollment form or as described on Azteca's website in addition to the nonconflicting terms of this Agreement.

4.5 Uses Not Permitted. Except to the extent that applicable law prohibits or overrides these restrictions, or as provided herein, Licensee shall not:

- a. Sell, rent, lease, sublicense, lend, assign, or time-share Licensed Software or Products;
- b. Permit persons other than Authorized Users to access or use the Licensed Products (or any part thereof);
- c. Act as a service bureau or Commercial ASP;
- d. Use Software, Data, or Documentation for a site or service and operate the site or service for profit or generate revenue through direct or indirect methods (e.g., advertising or by charging for access to the site or service);
- e. Redistribute Software, Data, or Online Services to third parties, in whole or in part, including, but not limited to, extensions, components, or APIs;
- f. Distribute Authorization Codes to third parties;
- g. Reverse engineer, decompile, or disassemble Products;
- h. Make any attempt to circumvent the technological measure(s) that controls access to or use of Licensed Products;
- i. Upload or transmit content or otherwise use Products in violation of third-party rights, including intellectual property rights, privacy rights, nondiscrimination laws, or any other applicable law or government regulation;
- j. Remove or obscure any Azteca Systems (or its licensors') patent, copyright, trademark, proprietary rights notices, and/or legends contained in or affixed to any Product, Product output, metadata file, or online and/or hard-copy attribution page of any Data or Documentation delivered hereunder;
- k. Unbundle or independently use the individual or component parts of Software or Online Services;

- l. Incorporate any portion of the Software into a product or service that competes with the Software;
- m. Publish the results of benchmark tests run on Software without the prior written permission of Azteca Systems; or
- n. Use, incorporate, modify, distribute, provide access to, or combine any computer code provided with the Software in a manner that would subject such code or any part of the Software to open source license terms, which includes any license terms that require computer code to be (i) disclosed in source code form to third parties, (ii) licensed to third parties for the purpose of making derivative works, or (iii) redistributable to third parties at no charge.

ARTICLE 5—AZTECA SYSTEMS MANAGED CLOUD SERVICES

5.1 **Definitions.** The following are supplemental definitions provided in Article 1.

- a. “Azteca Managed Cloud Services” means the hardware, Software, Data, network platform that Azteca Systems or its third-party supplier provides as part of Azteca Managed Cloud Services.
- b. “Hosting” means the business of housing and making accessible Licensee Content via the internet.

5.2 **Provision of Azteca Managed Cloud Services.**

- a. **General Terms.** Use of Azteca Systems Managed Cloud Services is subject to the Cloud Services terms found in Addendum #2 of this Agreement.
- b. **Requirements Planning.** It is Customer's responsibility to plan for and address with Azteca Systems changes to Customer's requirements, such as the need for additional capacity, the update of an application or dataset, or increased level of system availability.
- c. **Compensation and Expenses.** Azteca Systems will invoice Customer annually for the Azteca Systems Managed Cloud Services to be provided the upcoming year. Customer will pay invoices within 30 days of receipt. Customer is responsible for any shipping or temporary storage costs incurred during the delivery of Customer Content to Azteca Systems or removal of Customer Content from the Azteca Systems Managed Cloud Services environment.
- d. **Risk of Loss.** Risk of loss for all Customer Content shall at all times remain with Customer, and it is Customer's sole responsibility to maintain regular backups of Customer Content.
- e. **Personally Identifiable Information.** Prior to providing any Customer Content under this Agreement, Customer shall notify Azteca Systems if Customer Content includes personally identifiable information.
- f. **Public Software.** Customer may not use, and may not authorize its end users or contractors to combine or use any Azteca Systems Offerings with any software (including any underlying dependencies), documentation, or other material distributed under an open source or other similar licensing or distribution model that requires as a condition of such model that any component of the Azteca Systems Offering to be (i) disclosed or distributed in source code form, (ii) made available free of charge to third parties, or (iii) modifiable without restriction by third parties.
- g. **Monitoring.** Licensee will provide information and other materials related to its Licensee Content as reasonably requested by Azteca Systems or its Hosting partner to verify Azteca's or Licensee's compliance with this Agreement. Azteca Systems or its Hosting partner, as applicable, may browse, index, or otherwise monitor the external interfaces of any Licensee Content solely for the purpose of verifying compliance with this Agreement.

ARTICLE 6—TERM AND TERMINATION

6.1. The initial term of this Agreement will begin on the Effective Date, or upon such latter dates set forth in Addendum #1, and in each case provided a valid purchase authorization is issued. This Agreement may then be renewed annually by payment of the then current maintenance fees for the next annual maintenance period as set forth in Addendum #1.

6.2. Either party may terminate this Agreement or any Product license for a material breach that is not cured within thirty (30) days of written notice to the breaching party, except that termination shall be deemed to have immediate effect for a material breach that is impossible to cure.

6.3. **Termination by Licensee for Convenience.** In the event that either funding from Licensee or other sources is

withdrawn, reduced, or limited, or the authority of Licensee to perform any of its duties is withdrawn, reduced, or limited in any way after the Effective Date of this Agreement, or for convenience, Licensee may terminate subsequent Term Maintenance Periods by giving Azteca Systems at least thirty (30) days' written notice prior to the end of the current Term Maintenance Period. The effective date of such termination will be the start of the subsequent Term. If terminated prior to current term, no refund is provided unless termination is made prior to the first 90 days of the initial term period.

6.4. Termination by Azteca Systems. Azteca Systems may terminate this Software License and Maintenance Agreement and/or any license granted hereunder if:

- a. Licensee violates its obligations under this Software License and Maintenance Agreement and fails to cure the breach within thirty (30) days after Azteca Systems' written notification, provided however, that no cure period prior to termination will be required as noted in section 6.2.
- b. Licensee ceases to do business in the ordinary course, or becomes insolvent, enters bankruptcy, reorganization, composition or other similar proceedings under applicable laws, whether voluntary or involuntary, or admits in writing its inability to pay its debts, or makes or attempts to make an assignment for the benefit of creditors. Such termination shall be effective upon notice to such party or as soon thereafter as is permitted by applicable law.

6.5. Upon termination of the License and Maintenance Agreement, all Product licenses granted hereunder terminate as well. Upon termination of a License or the Software License and Maintenance Agreement, Licensee will (i) stop accessing and using affected Product(s); (ii) clear any client-side data cache derived from Online Services; and (iii) uninstall, remove, and destroy all copies of affected Product(s) in Licensee's possession or control, including any modified or merged portions thereof, in any form, and execute and deliver evidence of such actions to Azteca Systems.

6.6. If this Agreement is terminated per section 6.3, the Licensee is only liable for payment required by the terms of this Agreement for license, maintenance, and support services rendered or products and software received and accepted prior to the effective date of termination.

6.7. If this Agreement is terminated per section 6.3 or 6.4, Licensee shall then return to Azteca Systems all of the Software, related modules, related updates, and any whole or partial copies, codes, modifications, and merged portions in any form. Azteca will then, for no additional charge to Licensee and at Licensee's option, either grant a license to the Licensee for a period of one (1) year, which will allow Licensee to retain the ability to access records and data contained in the Software, or allow Licensee to create digital copies of all files needed by the Licensee for the same period. Upon termination, Azteca Systems will no longer provide updates, patches, or support. If Licensee needs to retain access to records or data for a period longer than one (1) year, in order to transfer data to another system, Azteca will consider reasonable requests to extend beyond one (1) year.

6.8. If Licensee has an Online Services Subscription, Managed Cloud Services, or Online Services Product, then upon termination per section 6.3 or 6.4, Azteca Systems will provide Licensee the ability for 30 days to download, backup, or otherwise archive all Licensee Data.

6.9. The parties hereby agree that all provisions which operate to protect the intellectual rights of Azteca Systems shall remain in force should breach or termination of any kind occur.

ARTICLE 7—LIMITED WARRANTIES AND DISCLAIMERS

7.1 Limited Warranties. Except as otherwise provided in this Article 7, Azteca Systems warrants for a period of ninety (90) days from the date Azteca Systems issues the Authorization Code enabling use of Software and that the unmodified Software will substantially conform to the published Documentation under normal use and service.

7.2 Special Disclaimer. Third-Party Content; Data; Samples; hot fixes; patches; updates; Online Services provided at no charge; and trial, evaluation, and beta Products are delivered "as is" and without warranty of any kind.

7.3 Disclaimers.

- a. **Internet Disclaimer.** Neither party will be liable for damages under any theory of law related to the performance or discontinuance of operation of the internet or to regulation of the internet that might restrict or prohibit the operation of Cloud Services.
- b. **Third-Party Websites; Third-Party Content.** Azteca Systems is not responsible for any third-party website or third-party content that appears in or is referenced by Azteca Systems Products or Azteca Systems websites, including www.cityworks.com and <https://mycityworks.force.com>. Providing links to third-party websites and resources does not imply an endorsement, affiliation, or sponsorship of any kind.

7.4 General Disclaimer. Except for the express limited warranties set forth in this Agreement, Azteca Systems disclaims all other warranties or conditions of any kind, whether express or implied, including, but not limited to, warranties or conditions of merchantability, fitness for a particular purpose, or non-infringement of intellectual property rights. Azteca Systems is not responsible for any nonconformities with Specifications or loss, deletion, modification, or disclosure of Licensee Content caused by Licensee's modification of any Azteca Systems Product or Service other than as specified in the Documentation. Azteca Systems does not warrant that Products and Services hereunder or Licensee's operation of the same, will be uninterrupted, error free, fault-tolerant, or fail-safe or that all nonconformities can or will be corrected. Products are not designed, manufactured, or intended for use in environments or applications that may lead to death, personal injury, or physical property/environmental damage. Licensee should not follow any suggestions or instructions that appear to be hazardous, unsafe, or illegal. Any such use shall be at Licensee's own risk and cost.

7.5 If Licensee utilizes data fields available in the Licensed Products to store data not required for the normal use and operation of our Licensed Products and Software for their intended purpose, Licensee agrees (i) that Azteca Systems is not responsible for compliance with laws, rules and regulations specific to such Data (eg. HIPAA or PCI Rules); and (ii) Licensee assumes all risks associated with, related to, or arising from Licensee's use of data fields to store such data.

7.6 Exclusive Remedy. Licensee's exclusive remedy and Azteca Systems' entire liability for breach of the limited warranties set forth in this Section shall be limited to replace any defective media; (i) repair, correct, or provide a workaround for the applicable Products or Services and subject to the Azteca Systems Maintenance Services and Support Addendum; or (ii) at Azteca Systems election, terminate Licensee's right to use and refund the fees paid for Azteca Systems Products or Services that do not meet Azteca Systems limited warranties, provided that Licensee uninstalls, removes, and destroys all copies of Software or Documentation; ceases using the Software or Online Services; and executes and delivers evidence of such actions to Azteca Systems.

ARTICLE 8—LIMITATION OF LIABILITY

8.1 Disclaimer of Liability. Neither Licensee, Azteca Systems, nor any Azteca Systems distributor or third party licensor will be liable for any indirect, special, incidental, or consequential damages; lost profits; lost sales; loss of goodwill; costs of procurement of substitute goods or services; or damages exceeding the applicable license fees paid for the current Term support period, or current Subscription fees, or Services fees actually paid to Azteca Systems for the Azteca Systems Products or Services giving rise to the cause of action.

8.2 The limitations and exclusions of liability in the preceding paragraph do not apply to Licensee's infringement, misuse, or misappropriation of Azteca Systems or Azteca Systems licensors' intellectual property rights, either party's indemnification obligations, gross negligence, willful misconduct, or violations of the Export Compliance clause of this Agreement or any applicable law or regulation.

8.3 Applicability of Disclaimers and Limitations. Azteca Systems (or its authorized distributor if any) has set its fees and entered into this Agreement in reliance on the disclaimers and limitations in this Agreement; the fees reflect an allocation of risk that is an essential basis of the bargain between the parties. **These limitations will apply whether or not a party is aware of the possibility of any damage and notwithstanding any failure of essential purpose of any exclusive, limited remedy.**

8.4 The foregoing warranties, limitations, and exclusions may be invalid in some jurisdictions and apply only to the extent permitted by applicable law or regulation in Licensee's jurisdiction. Licensee may have additional rights under

law that may not be waived or disclaimed. Azteca Systems does not seek to limit Licensee's warranty or remedies to any extent not permitted by law.

ARTICLE 9—INDEMNIFICATIONS

9.1 Definitions. The following definitions supplement the definitions provide in Article 1:

- a. "Claim" means any claim, action, or demand by a third party.
- b. "Indemnitees" means Customer and its directors, officers, and employees.
- c. "Infringement Claim(s)" means any Claim alleging that Customer's use of or access to any Azteca Systems Products or Services infringes a patent, copyright, trademark, or trade secret.
- d. "Loss(es)" means expenditure, damage award, settlement amount, cost, or expense, including awarded attorney's fees.

9.2 Infringement Indemnity.

- a. Azteca Systems will defend, hold all indemnitees harmless from and against any Loss arising out of an Infringement Claim.
- b. If Azteca Systems determines that an Infringement Claim is valid, Azteca Systems may, at its expense, either (i) obtain rights for Customer to continue using the Azteca Systems Products or Services or (ii) modify the Azteca Systems Products or Services while maintaining substantially similar functionality. If neither alternative is commercially reasonable, Azteca Systems may terminate Licensee's right to use the Azteca Systems Products or Services and will refund any unused portion of fees paid for Term Licenses, Subscriptions, and Maintenance.
- c. Azteca Systems has no obligation to defend an Infringement Claim or to indemnify Customer to the extent the Infringement Claim arises out of (i) the combination or integration of Azteca Systems Products or Services with a product, process, or system or element not supplied by Azteca Systems or specified by Azteca Systems in its Documentation, (ii) alteration of Azteca Systems Products or Services by anyone other than Azteca Systems or its subcontractors, (iii) compliance with Licensee's specifications, or (iv) use of Products or Services after Azteca Systems either provides a modified version to avoid infringement or terminates Licensee's right to use the Products or Services.

9.3 General Indemnity. Azteca Systems will defend and hold all Indemnitees harmless from, and indemnify any Loss arising out of, any Claim for bodily injury, death, or tangible or real property damage brought against any of the Indemnitees to the extent arising from any negligent act or omission or willful misconduct by Azteca Systems or its directors, officers, employees, or agents performing Services while on Customer's site.

9.4 Conditions for Indemnification. As conditions for indemnification, Indemnitee will (i) promptly notify Azteca Systems in writing of the Claim, (ii) provide all available documents describing the Claim, (iii) give Azteca Systems sole control of the defense of any action and negotiation related to the defense or settlement of any Infringement Claim, and (iv) reasonably cooperate in the defense of the Infringement Claim at Azteca Systems request and expense.

9.5 This section sets forth the entire obligation of Azteca Systems, its authorized distributor (if any), and its third-party licensors (if any) regarding any Claim for which Azteca Systems must indemnify Licensee.

ARTICLE 10—GENERAL PROVISIONS

10.1 Export Control Regulations. Licensee expressly acknowledges and agrees that Licensee shall not export, re-export, import, transfer, or release Products, in whole or in part, to (i) any US embargoed country, (ii) any person on the US Treasury Department's list of Specially Designated Nationals, (iii) any person or entity on the US Commerce Department's Denied Persons List, Entity List, or Unverified List, or (iv) any person or entity or into any country where such export, re-export, or import violates any US, local, or other applicable import/export control laws or regulations including, but not limited to, the terms of any import/export license or license exemption and any amendments and supplemental additions to those import/export laws as they may occur from time to time.

10.2 Taxes and Fees, Shipping Charges. License and Subscription fees quoted to Licensee are exclusive of any and all taxes or fees, including, but not limited to, sales tax, use tax, value-added tax (VAT), customs, duties, or tariffs, and shipping and handling charges.

10.3 No Implied Waivers. The failure of either party to enforce any provision of this Agreement shall not be deemed a waiver of the provisions or of the right of such party thereafter to enforce that or any other provision.

10.4 Severability. The parties agree that if any provision of this Agreement is held to be unenforceable for any reason, such provision shall be reformed only to the extent necessary to make the intent of the language enforceable.

10.5 Successor and Assigns. Licensee shall not assign, sublicense, or transfer Licensee's rights or delegate Licensee's obligations under this Agreement without Azteca Systems' prior written consent, and any attempt to do so without consent shall be void. This Agreement shall be binding on the respective successors and assigns of the parties to this Agreement. Notwithstanding, a government contractor under contract to the government to deliver Products may assign this Agreement and Products acquired for delivery to its government customer upon written notice to Azteca Systems, provided the government customer assents to the terms of this Agreement.

10.6 Survival of Terms. The provisions of Articles 2, 6, 7, 8, 9 and 10 of this Agreement, and the provisions of section 4.1 of Addendum #2, shall survive the expiration or termination of this Software License and Maintenance Agreement.

10.7 US Government Licensee. The Products are commercial items, developed at private expense, provided to Licensee under this Agreement. If Licensee is a US government entity or US government contractor, Azteca Systems licenses Products to Licensee in accordance with this Agreement under FAR Subparts 12.211/12.212 or DFARS Subpart 227.7202. Azteca Systems Data and Online Services are licensed under the same subpart 227.7202 policy as commercial computer software for acquisitions made under DFARS. The commercial license rights in this Agreement strictly govern Licensee's use, reproduction, or disclosure of Products. Azteca Systems Software source code is unpublished, and all rights to Products are reserved by Azteca Systems and its licensors. Licensee may transfer Software to any licensed government procuring agency facility to which computer(s) on which Software is installed are transferred. If any court, arbitrator, or board holds that Licensee has greater rights to any portion of Products under applicable public procurement law, such rights shall extend only to the portions affected.

10.8 Governing Law. This Agreement is not subject to the United Nations Convention on Contracts for the International Sale of Goods.

- **Government Entities.** If Licensee is a government entity, the applicable laws of the Licensee's jurisdiction govern this Agreement.
- **Nongovernment Entities.** US federal law and the law of the State of Utah exclusively govern this Agreement, excluding their respective choice of law principles.

10.9 Dispute Resolution. The parties will use the following dispute resolution process:

- **Equitable Relief.** Either party will have the right to seek an injunction, specific performance, or other equitable relief in any court of competent jurisdiction without the requirement of posting a bond or proving injury as a condition for relief.
- **US Government Agencies.** This Agreement is subject to the Contract Disputes Act of 1978, as amended (41 USC 601-613).
- **Other Government Entities.** Azteca Systems will comply with mandatory dispute resolutions under applicable law.
- **Negotiation and Litigation.** The parties will attempt negotiation in good faith and a spirit of mutual cooperation. Except as noted above, if the parties are unable to resolve any dispute through negotiation, then the governing law shall be as set forth in section 10.8.

10.10 Maintenance. Maintenance for qualifying Software consists of updates (provided on a when-and-if available basis) and other benefits, such as access to technical support, which are provided during the Term. Maintenance is specified as set forth in Addendum #2.

10.11 Audit. Upon Azteca System's written request, Licensee shall certify in a signed writing that its use of the Licensed Product is in full compliance with the terms of this Agreement (including any restrictions herein). Azteca

Systems, or its authorized representative, may, upon prior reasonable notice of at least ten (10) days, inspect and audit Licensee's records and use of the Licensed Products to confirm compliance with this Agreement. All such inspections and audits will be conducted during regular business hours and in a manner that does not unreasonably interfere with ordinary business activities. Licensee shall be responsible for any audit costs only in the event that such audit reveals that Licensee's use is not in accordance with the permitted uses under this Agreement, and for unpaid license fees.

10.12 Feedback. Azteca Systems may freely use any feedback, suggestions, or requests for Product improvements that Licensee provides to Azteca Systems. Regardless of the source of any feedback or suggestions, any improvements to Software or Products, and any related intellectual property, are owned by Azteca Systems.

10.13 Patents. Licensee may not seek, and may not permit any other user to seek, a patent or similar right worldwide that is based on or incorporates any Azteca Systems technology or services. This express prohibition on patenting shall not apply to Licensee's software and technology except to the extent that Azteca Systems technology or services, or any portion thereof, are a part of any claim or preferred embodiment in a patent application or a similar application.

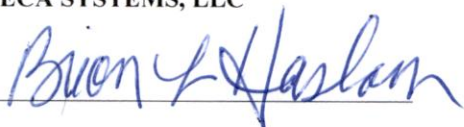
10.14 Force Majeure. A party will not be liable for any failure of or delay in the performance of this Agreement for the period that such failure or delay is due to causes beyond the party's reasonable control. Such causes may include, but are not limited to, acts of God, war, strikes, labor disputes, cyber-attacks, laws, regulations, government orders, or any other force majeure event.

10.15 Independent Contractor. Azteca Systems is and at all times will be an independent contractor. Nothing in this Agreement creates an employer/employee, principal/agent, or joint venture relationship between Azteca Systems and the Licensee. No party has any authority to enter into contracts on behalf of another party or otherwise act on behalf of another party.

10.16 Entire Agreement. This Agreement, including its incorporated documents, addendums, and exhibits constitutes the sole and entire agreement of the parties as to the subject matter set forth herein and supersedes any previous license agreements, understandings, and arrangements between the parties relating to such subject matter. Additional or conflicting terms set forth in any purchase orders, invoices, or other standard form documents exchanged during the ordering process, other than product descriptions, quantities, pricing, and delivery instructions, are void and of no effect. Any modification(s) or amendment(s) to this Agreement must be in writing and signed by each party or as otherwise provided in Addendum #1.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and made effective by their respective authorized representatives.

AZTECA SYSTEMS, LLC

By: 

Name: Brian L. Haslam

Title: President - CEO

Date: _____

CITY OF FRIENDSWOOD, TX – (LICENSEE)

By: _____

Name: _____

Title: _____

Date: _____

ADDENDUM #1

PRODUCT LICENSING

1. Licensed Software:

Server AMS Standard Enterprise License Agreement (ELA), Includes Unlimited Quantities of the Identified Products:

Office
Respond
Mobile Native Apps (for iOS/Android)

--Includes the following Add-ons:

Storeroom
Equipment Checkout
Contracts
Cityworks for Excel
Cityworks Analytics for AMS
eURL (Enterprise URL)
Workload
Web Hooks
Citizen Engagement API
Use of Cityworks AMS Application Programming Interfaces (APIs) with commercially available Cityworks-centric applications that are licensed and maintained by authorized Cityworks partners

Server PLL Standard Enterprise License Agreement (ELA), Includes Unlimited Quantities of the Identified Products:

Respond
Mobile Native Apps (for iOS/Android)
Office (limited use for Admin and Reporting only)

--Includes the following Add-ons:

eURL (Enterprise URL)
Public Access for PLL
Cityworks Analytics for PLL
Workload
Web Hooks
Use of Cityworks PLL Application Programming Interfaces (APIs) with commercially available Cityworks-centric applications that are licensed and maintained by authorized Cityworks partners

Additional Software Products & Licenses & Annual Renewals: Additional Software Products & Licenses may be added to this Agreement as well as annual renewals of this Agreement with either an acknowledgement of an official Cityworks quote signed by Licensee and additional fees, if necessary or applicable being paid, or receipt of Purchase Order from Licensee in response to an official Cityworks quote and additional fees, if applicable, being paid.

2. **Notices & Licensee Information:** Until or unless otherwise modified, all notices relevant to this agreement shall be sent to the following address:

Azteca Systems, LLC 11075 South State, Suite 24 Sandy, Utah 84070	City of Friendswood, TX
	910 S. Friendswood Dr. Friendswood, TX 77546
	Attn: James O'Brien
	E-mail: jobrien@friendswood.com
	Phone: 281-996-3217

3. **Effective Date of Software (Date Software made available)**

MM/DD/YYYY

06/01/2022

4. **Schedule of Payments and/or Fees under Agreement**

Annual Period	Date From/To (mm/dd/yyyy)	Amount
Period 1	06/01/2022 – 10/13/2022	\$8,906.25
Period 2	10/14/2022 – 10/13/2023	\$84,250.00
Period 3	10/14/2023 – 10/13/2024	\$95,500.00

*Fee for Year 1 reflects products added at a 50% discount and is pro-rated for a period of 06/01/2022 - 10/13/2022. Current Renewal Amount of \$36,750.00 for period 10/14/2021 - 10/13/2022 has previously been paid.

5. **Additional Items (If Any):**

- a. Annual fee herein is based on 25,001 - 50,000 population range
- b. If Licensee is receiving an Online product, the following apply:
 - i. **CWOL – Cityworks Online:** Cityworks Online (CWOL) – is a Cityworks Online hosted services subscription for the right to access and use the Online Services for the products identified hereinabove. CWOL is a highly scalable hosted services product offering.
 - ii. **CWOL** is hosted on Azteca Systems' servers and completely scaled, managed, updated, backed up, and maintained by Azteca Systems. Because Azteca Systems controls the update schedule, users are not responsible for upgrading, managing, or patching the system themselves.

ADDENDUM #2
STANDARD MAINTENANCE AND SUPPORT

Standard Maintenance and Support Addendum provisions are between the Licensee and Azteca Systems, LLC ("Azteca Systems" or "Azteca"). Maintenance and support are provided subject to the terms and conditions of the signed Software License and Maintenance Agreement, and which is incorporated by reference.

1. **MAINTENANCE & SUPPORT:** Azteca Systems will provide maintenance and support services to Licensee for qualifying Products during the applicable Term for such Products provided the applicable license and maintenance fees have been paid for the times and periods and amounts specified in Addendum #1. Maintenance and Support services consist of the following benefits: maintenance items (provided on a when-and-if available basis) which may include subsequent version releases of the licensed software, service packs, upgrades and updates, and technical support.

1.1. Azteca Systems will ensure upward compatibility for the licensed software applications within a reasonable timeframe for minor Esri® ArcGIS and Cityworks supported database revisions. Azteca Systems will not ensure upward compatibility for licensed software applications when there are major Esri ArcGIS revisions (for example, from rev 10.x to rev 11.x), however Azteca Systems will make all reasonable efforts to provide upward compatibility.

1.2. Azteca Systems shall, without additional charge (except as allowed for in paragraph 3.4), during the term of this Agreement provide the following:

- a. **Software Updates.** Software Updates includes upgrades and service packs which are a collection of files that enhance or correct the licensed software, and which will be available for Licensee to download during the Maintenance Term/Period. Updates and upgrades may also include new versions;
- b. Provide Telephone Support, Email Support, Web Support, during normal business hours, 8 AM to 5 PM Mountain Time, Monday through Friday (excepting Holidays) and after hour emergency support line, and other benefits deemed appropriate by Azteca Systems (as set forth in Section 2 below); and
- c. Implement and maintain a means of secure, remote direct network access (VPN, Web-access, etc.) to the Licensee's systems in order to perform thorough remote diagnostics.

1.3 The following items, among others, however, are specifically excluded as support services under this Addendum:

- a. Support for applying or installing upgrades and service packs (except for Online Products);
- b. Assistance with questions related to third-party software, computer hardware, networking, and other similar items that are not provided by Azteca;
- c. Assistance with computer operating system questions not directly pertinent to the licensed software;
- d. Licensee Data debugging and/or correcting;
- e. Services necessitated as a result of any cause other than authorized ordinary and proper use by the Licensee of the licensed software, including but not limited to neglect, abuse, unauthorized modifications, and/or unauthorized updates;
- f. Consulting regarding customizations created to function with the licensed software unless the customization is identified and listed as licensed software in Addendum #1;
- g. Assistance with applications which are not part of a standard life cycle, such as preview, beta, or candidate releases; and
- h. Questions such as configuration, implementation, and walk-throughs.

1.4 Support Periods are renewable unless terminated as provided in Section 3 below.

1.5. Technical support provided pursuant these maintenance provisions shall be performed in a professional and workmanlike manner. Azteca Systems will use commercially reasonable efforts to provide corrections to a

technical issue or provide a workaround, but Azteca Systems cannot guarantee that all technical issues can be fixed or resolved.

1.6. **Authorized Callers.** Licensee may designate a limited number of authorized callers per software product listed in Addendum #1. Licensee may replace Authorized Callers at any time by notifying Azteca Systems Support services. Authorized callers may be designated in this Addendum #2 or by email. Azteca may limit the total number of authorized callers as may be reasonably necessary and may request an updated list of authorized callers.

1.7. **Cityworks Online Support and Customer Portal.** Azteca has created a self-help support website center for Authorized Callers to submit technical issues, chat with technical specialists, track technical support incidents through the 'MyCityworks' portal, and view technical articles, updated product documentation, blogs, links to forums, and technology announcements. The support and care website can be found at <http://www.mycityworks.com>.

1.8. **Additional Support Items.**

- a. On a when-and-if available basis, updates to the licensed software (Addendum #1) means subsequent releases of the program which Azteca generally makes available to its customers who are under an active Software License and Maintenance Agreement for which fees have been paid for the relevant support period.
- b. Occasionally, Azteca changes the name of its licensed software as part of its ongoing process to improve and increase the functionality of the software. In the event the software licensed or listed in Addendum #1 changes in name, and/or improvements are made, Azteca will provide software with functionality that is similar to or with substantially the same or greater functionality of the originally licensed software, provided all current license or maintenance fees have been paid.
- c. Updates may not always include any release, option, or future program that Azteca licenses separately. Updates are provided on a when-and-if available basis as determined by Azteca Systems. Azteca Systems is under no obligation to develop any future programs or functionality. Any updates made available will be made available to you for download. Customer is responsible for copying, downloading, and installing the updates.

2. PROCEDURES FOR ACCESSING SUPPORT

2.1. All problem categories from routine, non-critical and critical, that occur during normal business hours shall procedurally occur as follows: 1) Licensee's system administration staff as first line of support, and then 2) Azteca Systems staff as the second line of support. Azteca Systems will make all reasonable efforts to acknowledge all requests for support during normal business hours within four (4) hours.

2.2. Prior to calling Azteca Systems for support services, the Licensee will first attempt to isolate any problems that occur within the Licensee's System. The Licensee will try to reduce the problem down to a specific software or system component. If it is determined that the problem is the Cityworks Software component, Licensee will first try and resolve the problem without Azteca Systems' involvement. If Licensee cannot resolve the problem or isolate the problem, Licensee may contact Azteca Systems via telephone, chat, or self-service portal. In each case, Cityworks technical support will log the information and provide an answer to the question, a resolution to the problem, or submit a verified bug to the development group. Any support request that is not quickly resolved will be assigned to a technical support representative. Phone calls and chat requests are accepted during normal business hours as outlined on the Contact Support page of MyCityworks.com. Voicemails and requests submitted via the self-service portal outside of the posted business hours will be responded to on a first come, first served basis the next business day.

2.3. For critical problems that occur outside of Azteca Systems' normal business hours (8 AM to 5 PM, Mountain Time) and cannot be isolated and resolved by the Licensee, Azteca Systems will provide an after-hours phone number that will forward the call to the currently assigned Azteca Systems support representative.

Azteca Systems will make all reasonable efforts to acknowledge and respond to the request for support for critical problems that occur outside of normal business hours within four (4) hours of receipt of the call from a designated and authorized Licensee representative. Critical problems are defined as problems that cause several users to be unable to perform their duties. For routine and non-critical problems, Licensee will submit support requests during normal business hours as outlined in 2.2 above.

2.4. After a Technical Support Incident is logged, Azteca Systems will use commercially reasonable efforts to provide corrections to a technical issue or provide a work around. While it is Azteca's goal to provide an acceptable solution to technical issues, Azteca cannot guarantee that all technical issues can be fixed or resolved.

2.5. Azteca will use all reasonable efforts to utilize remote support-type services. However, in the event Licensee and Azteca Systems agree it becomes necessary for Azteca Systems to be on-site to provide support for the covered Software, the parties by mutual negotiation, shall develop a separate agreement that will govern the terms and conditions for any on-site work or services.

3. CHARGES/FEES

3.1. License, Maintenance, and Support Services herein are included in the payment of annual fees as set forth in Addendum #1 and shall be paid by Licensee. The annual fee for each twelve (12) month period is set forth in Addendum #1 and shall be paid prior to the start for each License and Maintenance Period unless otherwise specified. The annual fee for successive Terms/Periods (twelve-month periods) commencing upon the anniversary of the first maintenance period, shall become due prior to the end of the preceding paid-up Maintenance Period.

3.2. Upon sixty (60) days written notice, the fee for the License and Maintenance Periods listed in Addendum #1 subsequent to year three (3) of the Maintenance Period, may be adjusted by Azteca Systems to reflect increases in costs of providing the services; provided, however, that the fee shall not increase by more than the CPI from the previous annual fee. "CPI" shall mean for all Urban Consumers, the U.S. City Average, for all items, 1982-84=100 (the "CPI-U"), as published by the Bureau of Labor Statistics, U.S. Department of Labor. Azteca Systems will notify Licensee in writing of the new pricing no later than sixty (60) days prior to the annual renewal date of the year preceding the year for which such adjusted pricing applies.

3.3. **Maintenance Expiration.** Azteca Systems will send Licensee a notice of expiration approximately sixty (60) days before the Maintenance term expires. If Azteca Systems does not receive a purchase order prior to the expiration date, Azteca will send the notification to Licensee upon expiration of the Maintenance term. All other Maintenance benefits and Support services will end with the expiration of the Maintenance term.

3.4. **Reinstatement Fee for Lapsed Maintenance.** Azteca Systems will reinstate Maintenance if Licensee sends a purchase order or payment within thirty (30) days of the expiration date. If Licensee does not renew Maintenance within thirty (30) days of the expiration date but at a later date wants to reinstate Maintenance, Maintenance fees will include the Maintenance fees that Licensee would have paid since the expiration date.

4. MANAGED CLOUD AND ONLINE SERVICES

4.1. **Prohibited Uses.** Licensee shall not provide Customer Content or otherwise access or use Cloud Services in a manner that:

- a. Creates or transmits spam, spoofings, phishing emails, or offensive or defamatory material; or stalks or makes threats of physical harm;
- b. Stores or transmits any Malicious Code;
- c. Violates any law or regulation;
- d. Infringes or misappropriates the rights of any third party;

- e. Probes, scans, or tests the vulnerability of Cloud Services or breaches any security or authentication measures used by Cloud Services without written approval from Azteca Systems product security officer; or
- f. Benchmarks the availability, performance, or functionality of Cloud Services for competitive purposes.

4.2. **Service Interruption.** System failures or other events beyond Azteca's reasonable control may interrupt Customer's access to Cloud Services. Azteca Systems may not be able to provide advance notice of such interruptions.

4.3. **Licensee Content.**

- a. Licensee grants Azteca Systems and its subcontractors a nonexclusive, nontransferable, worldwide right to host, run, modify, and reproduce Licensee Content as needed to provide Cloud Services to Licensee. Azteca Systems will not access, use, or disclose Customer Content without Customer's written permission except as reasonably necessary to support Customer's use of Cloud Services. Except for the limited rights granted to Azteca Systems under this Agreement, Customer retains all its rights, title, and interest in the Customer Content.
- b. If Customer accesses Cloud Services with an application provided by a third party, Azteca Systems may disclose Customer Content to such third party as necessary to enable interoperability between the application, Cloud Services, and Customer Content.
- c. Azteca Systems may disclose Customer Content if required to do so by law or regulation or by order of a court or other government body, in which case Azteca Systems will reasonably attempt to limit the scope of disclosure.
- d. When Customer's use of Cloud Services ends, Azteca Systems will either:
 - 1. Make Customer Content available to Customer for download for a period of thirty (30) days unless Customer requests a shorter window of availability or Azteca Systems is legally prohibited from doing so; or
 - 2. Download all Customer Content in Azteca Systems' possession to a medium of Customer's choosing and deliver such Customer Content to Customer.

Azteca Systems will have no further obligations to store or return Customer Content at the conclusion of the Cloud Services.

4.4. **Removal of Customer Content.** Azteca Systems may remove or delete Customer Content if there is reason to believe that uploading Customer Content to or using it with Cloud Services materially violates this Agreement. If reasonable under these circumstances, Azteca Systems will notify Customer before removing Customer Content. Azteca Systems will respond to any Digital Millennium Copyright Act takedown notices in accordance with Azteca Systems copyright policy, available at www.cityworks.com/legal.

4.5. **Service Suspension.** Azteca Systems may suspend access to Cloud or Online Services (i) if Customer materially breaches this Agreement and fails to timely cure the breach, (ii) if Azteca Systems reasonably believes that Customer's use of Cloud Services will subject Azteca Systems to immediate liability or adversely affect the integrity, functionality, or usability of the Cloud Services, (iii) for scheduled maintenance, (iv) to enjoin a threat or attack on Cloud Services, or (v) if Cloud Services become prohibited by law or regulated to a degree that continuing to provide them would impose a commercial hardship. When feasible, Azteca Systems will notify Customer of any Cloud Services suspension beforehand and give Customer reasonable opportunity to take remedial action.

Azteca Systems is not responsible for any damages, liabilities, or losses that may result from any interruption or suspension of Cloud Services or removal of Customer's content as described above.

4.6. **Notice to Azteca Systems.** Licensee will promptly notify Azteca Systems if Customer becomes aware of any unauthorized use of Customer's subscription or any other breach of security regarding Cloud Services.

4.7. **Security Breach Notification.** Azteca Systems will promptly notify Customer if Azteca Systems becomes aware of any actual unauthorized disclosure, access, or use of Customer Data ("Security Breach"). The notification will be sent using the contact information on file with Azteca Systems at the time of the Security Breach and will include information related to the cause of the Security Breach (if known) and steps Azteca Systems has or will take to mitigate the risk of a similar Security Breach from occurring in the future. To the extent that the Security Breach was caused by any act or omission of Azteca Systems, Azteca Systems agrees to reasonably cooperate with Customer in investigating the Security Breach and provide information and documents reasonably requested by Customer to the extent such information and documents can aid Customer in investigating the Security Breach. If the Security Breach was not caused by an act or omission of Azteca Systems, Customer may request reasonable assistance from Azteca Systems subject to the availability of Azteca Systems' resources and at Azteca Systems' standard hourly rates

5. MISCELLANEOUS

5.1. **Data Confidentiality Statement.** Azteca Systems will take reasonable measures to ensure that any Licensee data and/or confidential information provided to Azteca Systems is not inappropriately accessed or distributed to any third-party. Data provided to Azteca Systems by the Licensee may be loaded onto Azteca Systems servers or employee computers for the purpose of testing the Cityworks Software, database structure, or database values, and related Esri® software to resolve database or software performance issues, software enhancements, and software defects. At no time will the data be distributed to individuals or organizations who are not Azteca Systems employees without first receiving written approval from Licensee. If requested by the Licensee, and once the testing has been completed, Azteca Systems will delete all data provided by the Licensee.

5.2. **No Implied Waivers.** No failure or delay by Azteca Systems or Licensee in enforcing any right or remedy under this Agreement shall be construed as a waiver of any future or other exercise of such right or remedy by Azteca Systems.

5.3. Azteca Systems will use commercially reasonable efforts to ensure that Azteca Systems Products and Offerings will not transmit any Malicious Code to Licensee. Azteca Systems is not responsible for Malicious Code that Licensee introduces to Azteca Systems Products or Offerings or that is introduced through Third-Party Content. Malicious Code means software viruses; worms, time bombs, Trojan horses; or any other computer code, files, denial of service, or programs designed to interrupt, destroy, or limit the functionality of any computer software, hardware, or telecommunications equipment.

ADDENDUM #3

THIRD-PARTY CONSULTANT/CONTRACTOR ACKNOWLEDGMENT

If Licensee engages any third party or contractor (Third Party) and desires to grant access to use the Licensed Software, the access may be granted subject to the following terms conditions and provisions:

1. Access and use of the Licensed Products by Third Party is solely for Licensee's benefit;
2. Third Party (or, if applicable, its employee) shall be considered the Authorized User for purposes of the applicable license type, and all use shall be in accordance with the terms and conditions of the Cityworks Software License and Maintenance Agreement with Licensee;
3. Before accessing the Licensed Products, Third Party agrees that (i) the software shall be used solely in accordance with the terms of this Agreement, and (ii) said contractor shall be liable to Azteca Systems for any breach by it of this Agreement;
4. Licensee hereby agrees and acknowledges that Licensee will be responsible for all use by Third Party with respect to the use of the Licensed Products;
5. Upon expiration or termination of this Agreement, the rights of usage of Third Party shall immediately terminated;
6. Use of the Products by Third Party will be governed by the terms of this Agreement, and will require that Licensee purchase the appropriate license for each user utilized by Third Party; and
7. Licensee will ensure that Third-Party Contractor agrees to comply with and does comply with the terms of this Agreement on the same basis as the terms apply to Licensee.

The rights granted under Third-Party Contractor Addendum, do not modify the license or increase the number of licenses granted under this Agreement. Third Party, by their signature below, acknowledges that it has a copy of the License Agreement and agrees to the terms herein. Licensee shall provide a signed copy of this Addendum to Azteca Systems at contracts@cityworks.com.

Third Party (Print): _____

Licensee: City of Friendswood, TX

By: _____
Third Party/Contractor Authorized Signature

Title: _____

Date: _____

Third Party Information

Address	
City, State, Zip	
Contact Name	
Phone Number	
Email	

NewEdge Services, LLC

Master Agreement for Material and Services

This Material and Services Agreement (hereinafter “Agreement”), is between NewEdge Services, LLC, a Texas limited liability company, and its subsidiaries, parents, affiliates, successors, and assigns (“NewEdge”), and the City of Friendswood and its subsidiaries, parents, affiliates, successors, and assigns, each of them (“Client”), each of which may be referred to in the singular as “Party” or in the plural as “Parties.”

Article I. SCOPE OF AGREEMENT

NewEdge shall provide to Client such Materials and Services as described in Appendix A – Statement of Work at the prices set therein, or any Order executed under this Agreement in the form of Appendix B - Order, subject to the terms and conditions of this Agreement. Any Order in effect on the date when this Agreement expires or is terminated shall continue in effect until such Order either (i) expires by its own terms or (ii) is separately terminated, prior to its own scheduled expiration, as provided in this Agreement. The terms and conditions of this Agreement shall continue to apply to such Order as if this Agreement were still in effect.

Article II. TERM OF AGREEMENT

This Agreement shall commence and be effective on the date when signed by the last Party (“Effective Date”) and shall continue for a term of 1 year.

DEFINITIONS

“Affiliate” with respect to either Party to this Agreement or any Order under this Agreement means a business association that has legal capacity to contract on its own behalf, to sue in its own name, and to be sued, if and only if either (a) such business association owns, directly or indirectly, a majority interest in such Party (its “parent company”), or (b) a thirty percent (30%) or greater interest in such business association is owned, either directly or indirectly, by such Party or its parent company.

“Documentation” means all tangible and intangible written materials including user instructions and training materials or other such materials as necessary in NewEdge’s sole and exclusive judgment shall be required to demonstrate or explain a requirement, provision, or other detail.

“Information” means without limitation, with respect to a Party, all information of any sort in any form including without limitation confidential, proprietary or trade secret information of such Party or of a third party that is in the possession of such Party, including discoveries, ideas, concepts, know-how, techniques, processes, procedures, designs, specifications, strategic information, proposals, requests for proposals, proposed products, drawings, blueprints, tracings, diagrams, models, samples, flow charts, data, computer programs, marketing plans, employee personal information, health or financial information, authentication credentials, operations, infrastructure, network and system configurations and settings, user interface designs, class libraries, objects, facilities, products, pricing whether expressed as fixed price or hourly rates, customer lists, regulatory compliance, competitors and other technical, financial or business information, whether disclosed in writing, orally, or visually, in tangible or intangible form, including in electronic mail or by other electronic communication.

“Laws” includes all federal, state, provincial, regional, territorial and local laws, statutes, ordinances, regulations, rules, executive orders, supervisory requirements, directives, circulars, opinions, interpretive letters and other official releases of or by governmental authority.

“Material” means a unit of Documentation or software, whether created by NewEdge for Client as a custom application, un-modified commercial off the shelf software, or commercial off the shelf software modified by NewEdge at NewEdge’s election, purchased or licensed hereunder by Client from NewEdge or otherwise provided by or on behalf of NewEdge, including third party Material provided or furnished by NewEdge. “Material” shall be deemed to include any working or preliminary draft or revised draft whenever it shall be provided by NewEdge.

“Services” means anything that is not otherwise Material, including any labor or service, provided in connection with this Agreement or any Order under this Agreement.

“Specifications” means (a) NewEdge’s applicable specifications and detailed descriptions in whatever form such may be described in Appendix A – Statement of Work or any Order executed under this Agreement, and (b) Client’s requirements, requests, and descriptions specified in, or attached to, Appendix A – Statement of Work or any Order executed under this Agreement, which shall control over an inconsistency with Client’s specifications and descriptions wherever they may be stated except as expressly stated in this Agreement or any Order under this Agreement.

“Subcontractor” or “subcontractor” means any person or entity (including an agent) supplying labor or materials to perform any or all of either Party’s obligations under this Agreement or any Order under this Agreement, including any person or entity at any tier of subcontractors, and shall not be limited to those persons or entities with a direct relationship with such Party.

Article III. TERMS AND CONDITIONS

1.0 Delivery of Materials and Performance of Services

- 1.1 Delivery of Materials – NewEdge shall deliver Materials conforming to the Specifications provided in Appendix A – Statement of Work or any Order executed under this Agreement as provided in the section entitled Electronic Data Transmission and, as determined solely and exclusively in the discretion of NewEdge, such delivery of Materials shall constitute notice of completion (“Notice of Completion”) of the NewEdge promise of Materials.
- 1.2 Delivery of Services – NewEdge shall deliver Services conforming to the Specifications provided in Appendix A – Statement of Work and, as determined solely and exclusively in the discretion of NewEdge, such delivery of Services shall constitute Notice of Completion of NewEdge promise of Services.
- 1.3 Acceptance by Client – Client shall notify NewEdge in writing of non-acceptance of any such Materials or Services within 20 business days of receipt of Notice of Completion and, as determined solely and exclusively in the discretion of NewEdge, should any revisions, additions, conversions, or any other such adjustments be required, NewEdge in its sole and exclusive discretion shall deliver such Materials and Services within a time period determined by NewEdge as required to achieve reasonable compliance with the Specifications provided in Appendix A – Statement of Work. At such time as NewEdge determines the Materials and Services have achieved reasonable compliance with the Specifications provided in Appendix A – Statement of Work, NewEdge shall have no further obligation to provide to Client any revisions, additions, conversions, or any other such adjustments. At such time NewEdge shall be deemed to have completely fulfilled its obligations under the Agreement or any Order under this Agreement.

2.0 License Grant

- 2.1 Client is granted a limited, nonexclusive, non-transferable license to use and distribute NewEdge’s Materials solely and exclusively for the purposes of the objectives stated in Appendix A – Statement of Work, provided Client performs its obligations as described in the Agreement, including without limitation, payment of fees as provided in the Agreement. Except as provided in the Agreement, no other license or right shall be granted or implied.

Client shall not transfer any license granted by this Agreement or any Order under this Agreement to another without prior express consent of NewEdge. Any use, except as granted in this Agreement, shall be at sole risk of Client without liability to NewEdge.

- 2.2 Should Client utilize NewEdge's Materials in whole or part for any purpose, except as provided in the Agreement, or expressly authorized by NewEdge in a signed writing, Client hereby expressly releases NewEdge from all claims and causes of action resulting from such use. Client's duty under this provision shall not constitute a waiver of any of NewEdge's rights or remedies under this Agreement or any Order under this Agreement or elsewhere.

3.0 Invoicing and Payment

- 3.1 Invoice Contents – NewEdge shall render an invoice for Materials and Services delivered as provided in Appendix A – Statement of Work specifying in detail: [i] Materials and Services to which the invoice applies, [ii] total amount due for each such Materials and Services delivered, [iii] total amount due for the invoice, [iv] date on which invoice was submitted ("Invoice Date"), and [v] either the physical address or direct deposit account via electronic fund transfer (EFT) to which payments must be remitted.
- 3.2 Invoice Payment Deadline – Client must remit payment in full for each invoice submitted pursuant to the Agreement or any Order under this Agreement for Materials and Services delivered as provided in Appendix A – Statement of Work no later than 30 calendar days after Client's receipt of the invoice.
- a. Temporary Suspension of NewEdge Performance – Should Client fail to pay any invoice within 30 calendar days of the Client's receipt of the invoice, NewEdge may at its sole and exclusive election, upon written notice to Client, suspend further work until all outstanding invoices are paid in full..
 - b. Termination of the Agreement or any Order under this Agreement – Should Client fail to pay any invoice within 90 calendar days of the Invoice Date, NewEdge may at its sole and exclusive election, upon written notice to Client, terminate the Agreement; provided (i) NewEdge has given Client notice of such failure and a thirty (30) day opportunity to cure and (ii) Client has failed to cure within such thirty (30) day period. Upon such written notice of termination, Client shall pay in full all fees due under the Agreement up to the date of termination or any Order under this Agreement for that portion of the Materials and Services provided in Appendix A – Statement of Work that were actually delivered by NewEdge.
 - c. Deemed Valid Invoices – Each invoice will be deemed valid when received by Client and shall be timely paid as provided herein.
 - d. Unpaid Invoices and Collections – For any invoice not timely paid as provided in this provision, NewEdge may charge and Client agrees to pay interest on any such unpaid at the rate specified in Section 2251.025 of the Texas Government Code.
- 3.3 Taxes Included in Invoice – Except as specifically noted on any invoice, all payment made by Client to NewEdge shall be deemed to exclude all taxes and other charges levied by any government agency on NewEdge relating to its services. Client is a tax exempt entity and shall provide evidence of same to NewEdge prior to receipt of the first invoice.

4.0 Personnel and Provision of Materials and Services

- 4.1 NewEdge Personnel – Personnel provided by NewEdge shall be considered solely the employees of NewEdge or its Subcontractors and not employees or agents of Client. NewEdge has and shall retain the right to exercise full control of and supervision over the creation of Materials and performance of the Services and full control over the employment, direction, assignment, compensation, and discharge of all personnel creating the Materials and performing the Services. NewEdge and its Subcontractors are and shall be solely responsible for all matters relating to compensation and benefits for all personnel provided by NewEdge.

- 4.2 Materials and Services Provided by Others – If any part of NewEdge Materials or Services is dependent upon work, information or other condition precedent Materials or Services by others under control of Client, then Client shall inspect to ensure such work, information or other condition precedent Materials or Services sufficiently fulfills the quality needed for NewEdge to create subsequent Materials and or perform subsequent Services. Each Party shall promptly report to the other Party any defect or other deficiency in work, information or other condition precedent materials or services by others under control of Client that renders such materials or services unsuitable for NewEdge’s proper performance. In such case, the Parties shall work together to remedy such defects or deficiencies and NewEdge shall not be held in breach of any provision of the Agreement or any Order under this Agreement as a result of such defects or deficiencies.
- 4.3 Use of Subcontractors – NewEdge may, in its sole and exclusive discretion, use Subcontractors to create any portion of the Materials or perform any portion of the Services. NewEdge shall provide to Client, upon request, information about the Subcontractor including the identity, the location, and a complete description, of the activities to be performed by such Subcontractor. NewEdge shall remain responsible for the acts or omissions of its approved Subcontractors to the same extent as if such acts or omissions were performed by NewEdge.

5.0 Intellectual Property

- 5.1 Definitions – For purposes of this provision, the following terms govern:
- a. “Items” shall mean any or all inventions, discoveries, ideas, (whether patentable or not), and all works and materials, including but not limited to products, devices, computer programs, source codes, designs, files, specifications, texts, drawings, processes, data or other information or Documentation in preliminary or final form, and all Intellectual Property Rights in or to any of the foregoing.
 - b. “Excluded Materials” shall mean: [i] Client’s Pre-Existing Materials; [ii] Client’s Independently Developed Materials; and [iii] Client’s Mere Reconfigurations.
 - c. “Client’s Pre-Existing Materials” shall mean those Items owned by Client to the extent and in the form that they both existed prior to the date NewEdge began any work under this Agreement or any Order under this Agreement and were created without any use of any NewEdge Items. Client’s Pre-Existing Materials shall not, however, include Paid-For Enhancements thereto.
 - d. “Client’s Independently Developed Materials” shall mean those Items that have been developed by Client, or on Client’s behalf, both [i] without use of any NewEdge Items; and [ii] independently of any work performed under any Agreements between or among the Parties.
 - e. “Client’s Mere Reconfigurations” means those specific reconfigurations of Client’s Pre-Existing Materials performed by NewEdge, or on NewEdge’s behalf, but only to the extent that such reconfiguration is an alteration to such Materials required to permit Client’s Materials to function as a precondition as described in Appendix A – Statement of Work. In no event shall Mere Reconfigurations include enhancements, modifications, or updates that are not contained in Client’s Pre-Existing Materials and that add any features, functionality, or capabilities.
 - f. “Intellectual Property Rights” means all patents (including all reissues, divisions, continuations, and extensions thereof) and patent applications, trade names, trademarks, service marks, logos, trade dress, copyrights, trade secrets, mask works, rights in technology, know-how, rights in content, or other intellectual property rights, protected under the Laws of any governmental authority having jurisdiction.
 - g. “Paid-For Development” means any and all Items to the extent produced or developed by or on behalf of Clients or its employees, agents, or direct or indirect contractors or suppliers (and whether completed or in-progress), or forming part of any Materials pursuant to this Agreement or any Order under this Agreement for the development of which NewEdge has been paid monies pursuant to this Agreement. Paid-For Development shall always exclude all Excluded Materials, but shall include (without limitation) any modifications, alterations or updates of any Excluded Materials that otherwise fall within the definition of

Paid-For Development. NewEdge's ownership of Paid-For Development shall, of course, be subject to Client's underlying rights and ownership in Client's Excluded Materials.

- h. "Provided Items" means Items created by or on behalf of NewEdge or directly or indirectly provided to Client (in any form, including, without limitation, verbally) by or on behalf of NewEdge.

5.2 **Reservation of Rights** – The Parties hereby acknowledge and agree that notwithstanding any other provision in the Agreement, NewEdge is not transferring or granting to Client any right, title, or interest in or to (or granting to Client any license or other permissions in or to) any or all: a) Items created by or on behalf of Client or directly or indirectly provided to Client (in any form, including, without limitation, verbally) by or on behalf of NewEdge; b) Paid For Development or c) Intellectual Property Rights, including, without limitation, any Intellectual Property Rights in or to any NewEdge Provided Items or Paid-For Development. The sole exceptions to the foregoing reservation of rights are that [1] NewEdge hereby grants Client such license as is described in Section 2.0 License Grant, [2] raw data collected [a] by client without NewEdge assistance or [b] by NewEdge for compensation on Client's behalf, and [3] customized Crystal Reports' reports created by NewEdge for compensation on Client's behalf. In no way expanding the foregoing license, said license in no manner permits Client to (and Client hereby promises not to without the explicit prior written and signed consent of NewEdge) make use of any NewEdge Provided Items, Paid-For Development or Intellectual Property Rights either for the benefit of any third party or other than as agreed in a signed writing by NewEdge or expressly provided in the Agreement.

5.3 **Client Acts and Obligations** – Client shall promptly take or secure such action (including, but not limited to, the execution, acknowledgment, delivery of documents) as may be reasonably requested by NewEdge to evidence, transfer, perfect, vest or confirm NewEdge's right, title and interest in any Paid-For Development. Client shall, in all events and without the need of NewEdge's request, secure all Intellectual Property Rights in any Paid-For Development (and any licenses specified above in any Excluded Materials) from each employee, agent, subcontractor or sub-supplier of Client who has or will have any rights in the Paid-For Development or Excluded Materials.

5.4 **License Grant to Excluded Materials** – If and to the extent that Client embeds any Excluded Materials in the Paid-For Development, Client hereby grants and promises to grant and have granted to NewEdge and its Affiliates a royalty-free, nonexclusive, sublicensable, assignable, transferable, irrevocable, perpetual world-wide license, in and to the Excluded Materials and any applicable Intellectual Property Rights of Client to use, copy, modify, distribute, display, perform, import, make, sell, offer to sell, and exploit (and have others do any of the foregoing on or for NewEdge's or any of its Affiliates behalf or benefit) the Excluded Materials but only for purposes of creating the Materials and performing the Services as provided in this Agreement.

6.0 Compliance

6.1 **Compliance With Laws** – Both Parties shall comply with all Laws attendant upon this Agreement or any Order under this Agreement and Client utilization of the Materials and Services provided in Appendix A – Statement of Work. Client shall procure all approvals, bonds, certificates, insurance, inspections, licenses, and permits that such Laws require for the performance of NewEdge under this Agreement. Client shall create and maintain any necessary records, provide any certificate, affidavit or other information or documentation requested or as otherwise required by NewEdge (a) to show compliance by Client with Laws, (b) to comply or otherwise establish Client's compliance with Laws or (c) to allow NewEdge to timely respond to any complaints, filings, or other proceedings. Client shall, to the extent it becomes aware of any new or previously unknown Law or other such requirement which may affect NewEdge's performance under this Agreement, promptly inform NewEdge of such requirement.

7.0 Warranties

- 7.1 General Warranties - Each Party to this Agreement represents and warrants that such party is duly authorized and has legal capacity to execute and deliver this Agreement. Each Party further represents and warrants to the other that the execution and delivery of the Agreement or any Order under this Agreement and the performance of such Party's obligations hereunder have been duly authorized and that the Agreement is a valid and legal agreement binding on such party and enforceable in accordance with its terms. Client further represents and warrants that: (a) all information provided to NewEdge is complete, accurate and correct and any additional time or expense incurred by NewEdge to reperform, revise or otherwise redo work performed by NewEdge on any incomplete, inaccurate or incorrect information provided by Client to NewEdge shall be solely at Client's expense.
- 7.2 Warranty of Execution - Each Party represents and warrants that the execution and performance of this Agreement or any Order under this Agreement does not violate any applicable law or other contract or obligation to which Client is a party or is otherwise bound.
- 7.3 Warranty of Quality - NewEdge's services shall be performed in a manner consistent with that degree of skill and care ordinarily exercised by professionals performing similar services in the same locality, at the same site and under the same or similar circumstances and conditions. NewEdge makes no other representations or warranties, whether expressed or implied, with respect to the services rendered hereunder.
- 7.4 Warranty Disclaimers – Notwithstanding any assurance of any type elsewhere in the Agreement, NewEdge does not guarantee any specific result from the Materials or Services provided under the Agreement or any Order under this Agreement or that Client will achieve any specific result or end as a result of the Materials or Services provided by NewEdge to Client. THE MATERIALS AND SERVICES ARE PROVIDED "AS IS" AND NewEdge SPECIFICALLY DISCLAIMS ANY AND ALL WARRANTIES OF ANY KIND WITH RESPECT TO THE SERVICES AND THE SUBJECT MATTER OF THIS AGREEMENT, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING WITHOUT LIMITATION WARRANTIES OF QUALITY, PERFORMANCE, NONINFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. THE FOREGOING EXCLUSIONS AND DISCLAIMERS ARE AN ESSENTIAL PART OF THIS AGREEMENT AND FORMED THE BASIS FOR DETERMINING THE PRICE CHARGED FOR THE SERVICES. THIS DISCLAIMER SHALL BE ENFORCED TO THE EXTENT PERMITTED BY LAW IN THOSE JURISDICTIONS THAT MAY LIMIT THE EXCLUSION OF IMPLIED WARRANTIES.
- 7.5 Unascertainable Conditions - NewEdge shall not be required to sign any documents, no matter by whom requested, that would result in NewEdge's having to certify, guaranty, or warrant the existence of conditions that NewEdge cannot independently ascertain with certainty.

8.0 Confidentiality

- 8.1 General Confidentiality - Both Parties agree that any Information either provides to the other shall be deemed confidential, and shall be the providing Party's property. The receiving Party shall use such Information for the sole purpose of providing the Materials and performing the Services under this Agreement or any Order under this Agreement and such Information shall not be used for any other purpose except as expressly permitted under this Agreement. Upon expiration or termination of this Agreement or any Order under this Agreement or upon the providing Party's request, receiving Party shall promptly (i) return all copies of such Information in written, graphic or other tangible form, or (ii) certify the destruction of all documents and other material in the possession, custody or control of receiving Party, its affiliates, employees, representatives, subcontractors or agents that bear or incorporate any part of providing Party's Information.
- 8.2 Confidentiality Waivers - Neither Party shall not have an obligation to the other with respect to Information which: (a) at the time of disclosure was already known to the other free of any obligation to keep it confidential (as evidenced by the other Party's written records prepared prior to such disclosure); (b) is or becomes publicly

known through no wrongful act (such obligations ceasing at the time such Information becomes publicly known); (c) is lawfully received from a third party, free of any obligation to keep it confidential; (d) is independently developed by a third party or by the Party against whom an obligation to protect such Information is to be enforced, as evidenced by Party's written records, and wherein such development occurred without any direct or indirect use of or access to the Information received from the Party seeking to enforce such obligation; or (e) the providing Party consents in writing to be free of restriction.

8.3 Required Disclosures of Confidential Information

- a. **Compelled Disclosures of Confidential Information** - If either Party is required to provide or disclose Information to any court or government agency pursuant to a written court order, subpoena, regulatory demand, or process of law, such Party must, unless prohibited by applicable law, first provide the other Party with prompt written notice of such requirement. The Parties understand and agree that should the Customer receive a public information request for Confidential Information of NewEdge,, NewEdge shall have the sole responsibility to make arguments to the Texas Attorney General ("AG") as to why the information should not be disclosed. Customer is entitled to rely on the decision of the AG and shall not be deemed to be in breach of this Agreement should the AG require disclosure.
- b. **Limiting Disclosure of Confidential Information** – Both Parties will limit the disclosure of Information to employees, representatives, subcontractors or agents with a need to know who: (i) have been advised of the proprietary nature thereof.

9.0 Limitation of Damages and Indemnity

- 9.1 **Limitation of Type of Damages** - In no event shall either Party be liable to the other or any third party for any consequential or incidental damages regardless of whether either Party or third party has been apprised of such damages, however caused, based on any theory of liability including without limitation breach of contract or tort.
- 9.2 **Limitation of Amount of Damages** - THE MAXIMUM LIABILITY OF NewEdge AND NewEdge's OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, CONSULTANTS, SUPPLIERS, AFFILIATES AND SUBCONTRACTORS ARISING OUT OF OR IN ANY WAY CONNECTED TO THIS AGREEMENT SHALL NOT EXCEED THE FEES PAID BY CLIENT TO NewEdge PURSUANT TO THE AGREEMENT DURING THE TWELVE (12) MONTHS IMMEDIATELY PRECEDING THE EVENTS GIVING RISE TO THE CLAIM. THE EXISTENCE OF ONE OR MORE CLAIMS SHALL IN NO EVENT INCREASE NewEdge's TOTAL LIABILITY BEYOND THE TOTAL FEES PAID BY CLIENT TO NewEdge UNDER THE AGREEMENT AND IN NO EVENT SHALL ANY OF NewEdge's OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, CONSULTANTS, SUPPLIERS, AFFILIATES OR SUBCONTRACTORS HAVE ANY LIABILITY ARISING OUT OF OR IN ANY WAY CONNECTED TO THE MATERIALS AND SERVICES PROVIDED UNDER THE AGREEMENT.
- 9.3 **NewEdge Reliance on Client Information** - NewEdge shall be entitled to rely, without liability, on the accuracy and completeness of any and all information provided by Client, Client's consultants and contractors, manufacturers, suppliers, publishers of technical standards, and information from public records, without the need for independent verification. To the extent such information appears to be incomplete or inaccurate, NewEdge shall in good faith advise client accordingly and Client shall promptly cooperate to resolve such inaccuracies or provide such information as need to provide NewEdge complete information.
- 9.4 **Client General Indemnity of NewEdge** – To the extent allowed by law, Client agrees to indemnify, hold harmless and defend NewEdge, NewEdge's officers, directors, employees, agents, subcontractors and third-party suppliers or affiliates, at Client's expense, against any and all third-party claims, actions, proceedings, and suits brought against NewEdge or any of NewEdge's officers, directors, employees, agents, subcontractors, third-party suppliers or affiliates, and pay all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, without limitation, reasonable attorneys' fees and other litigation expenses) incurred by NewEdge or any of NewEdge's officers, directors, employees, agents, subcontractors, third-party suppliers or affiliates, arising out of

or relating to: (a) Client's breach of any term or condition of this Agreement; (b) Client's fraudulent, illegal or malicious use of the Materials or Services; (c) Client's violation of applicable Laws, rules or regulations in connection with the Materials or Services; (d) NewEdge's use of any content or information provided by Client to NewEdge; or (e) the disclosure of this Agreement. In such a case, NewEdge shall provide Client written or electronic notice of such claim, suit or action. Client shall cooperate as fully as reasonably required in the defense of any claim. NewEdge reserves the right, at NewEdge's own expense, to assume the exclusive defense and control of any matter subject to indemnification by Client.

10.0 Termination

10.1 Termination for Cause

- a. This Agreement or any Order under this Agreement may be terminated in part or whole by either Party for [1] failure to comply with the terms and conditions of the Agreement, or [2] as provided elsewhere in the Agreement.
- b. In such case as Client elects to terminate for alleged deficiency in Materials provided or Services performed or alleged failure of NewEdge to comply with the terms and conditions of the Agreement or any Order under this Agreement and such alleged failure relates directly to the quality or consistency of the performance by NewEdge under the Agreement, Client shall provide written notice to NewEdge thirty (30) days in advance of the date of proposed termination. On receipt of such notice, Client shall work with NewEdge in good faith to allow NewEdge a reasonable time, exceeding such thirty (30) day period if reasonably necessary as determined by Client, to remedy such alleged deficiency or failure. If after such remedial effort, the alleged deficiency or failure, as determined by the Parties working together in good faith, has not been reasonably cured, the Agreement or any Order under this Agreement shall be deemed terminated.
- c. In such case as NewEdge elects to terminate for an alleged failure of Client to comply with the terms and conditions of the Agreement or any Order under this Agreement, NewEdge shall provide written notice to Client thirty (30) days in advance of the date of proposed termination. On receipt of such notice, NewEdge shall work with City in good faith to allow NewEdge a reasonable time, exceeding such thirty (30) day period if reasonably necessary as determined by NewEdge, to remedy such alleged deficiency or failure. If after such remedial effort, the alleged deficiency or failure, as determined by the Parties working together in good faith, has not been reasonably cured, the Agreement or any Order under this Agreement shall be deemed terminated.

10.2 Termination by Agreement – The Agreement or any Order under this Agreement may be terminated by a writing signed by both Parties. In such case, Client shall pay fees for work performed up to and including the date of agreed termination in compliance with the terms of the Agreement.

10.3 Temporary Suspension of Work – Should the Client desire to temporarily suspend work under this Agreement or any Order under this Agreement without terminating the Agreement or any Order under the Agreement, Client shall provide NewEdge thirty (30) days written notice of such suspension, the reasons for such suspension, and the proposed date on which work may recommence. Such temporarily suspended work may be resumed on a mutually agreed date but in no event shall NewEdge be required to agree to a date which unreasonably interferes with previous or anticipated commitments or scheduled events. In such case, Client shall pay fees for work performed up to and including the date of agreed suspension in compliance with the terms of the Agreement.

11.0 Miscellaneous Terms

11.1 Electronic Data Transmission

The Parties may exchange communications, documents, and other relevant Materials ("Data") electronically, in place of tangible documents, and unless otherwise agreed in a signed writing, shall direct such Data to the

respective contact listed in the Notices provision of this Agreement. The following additional conditions apply to any such exchanges:

- a. Statute of Frauds. All Data transmitted pursuant to this clause shall be deemed to be a “writing” or “in writing” for purposes of the Uniform Commercial Code. Any such Data containing or having affixed to it a Signature shall be deemed for all purposes to: (i) to have been “signed” and “executed,” and (ii) to constitute an “original” when printed from electronic files or records established and maintained in the normal course of business.
- b. Method of Exchange. Data shall be exchanged by direct electronic or computer systems communication between NewEdge and Client or by indirect communications using a third-party service provider to translate, forward and/or store such Data. Each Party shall be responsible for the cost(s) and associated cost(s) of any such third-party service provider with which it contracts.

11.2 Independent Contractor - The relationship of the Parties established by this Agreement is that of independent contractors, and nothing contained in this Agreement or any Order under this Agreement shall be construed to (a) constitute Parties as partners, joint venturers, co-owners or otherwise as participants in a joint or common undertaking, or (b) except to the extent expressly set forth in this Agreement, allow any Party hereto to create or assume any obligation on behalf of another Party hereto for any purpose whatsoever.

11.3 Cumulative Remedies - The rights and remedies of the Parties set forth in this Agreement are not exclusive of, but are cumulative to, any rights or remedies now or subsequently existing at law, in equity, by statute or otherwise, except in those cases where this Agreement or any Order under this Agreement specifies that a particular remedy is sole or exclusive, but neither Party may retain the benefit of inconsistent remedies. No single or partial exercise of any right or remedy with respect to one breach of this Agreement or any Order under this Agreement precludes the simultaneous or subsequent exercise of any other right or remedy with respect to the same or a different breach.

11.4 Assignment and Delegation - Neither Party may assign, delegate, or otherwise transfer its rights or obligations under this Agreement, voluntarily or involuntarily, whether by merger, consolidation, dissolution, operation of law, or any other manner, without the prior written consent of the other Party, except as follows:

- a. Permitted Assignment of Rights or Delegation of Duties - Without securing the consent of the other, either Party may assign its rights, or delegate its duties, or both, in whole or in part: to any present or future Affiliate of assigning Party, to any lender providing financing to assigning Party, or to any third party that assumes the operation of or otherwise acquires any substantial portion of the business of assigning Party affected by this Agreement.
- b. Delegation Permitted by this Agreement - NewEdge may subcontract its performance subject to the Section entitled “Use of Subcontractors.”
- c. Assignment of Right to Receive Money – Either Party may assign its right to receive money due hereunder, but any assignment of money is void to the extent (a) the assignor fails to give the non-assigning Party at least thirty (30) days prior notice, (b) the assignment purports to impose upon the non-assigning Party additional costs or obligations in addition to the payment of such money, or (c) the assignment purports to preclude non-assigning Party from dealing solely and directly with assigning Party in all matters pertaining to this Agreement.
- d. Non-Compliant Assignment and Delegations are Void - Any assignment, delegation or transfer for which consent is required hereby and which is made without such consent given in writing is void.

11.5 Entire Agreement - This Agreement, including all appendices, exhibits, attachments and documents incorporated by reference, constitutes the final, complete, and exclusive expression of the Parties’ agreement on the matters contained in this Agreement. The terms of this Agreement or any Order under this Agreement shall govern in lieu

of all other pre-printed, standardized or other provisions that may otherwise appear in any other paper or electronic record of either Party. All prior written and oral negotiations and agreements, and all contemporaneous oral negotiations and agreements, between the Parties on the matters contained in this Agreement or any Order under this Agreement are expressly merged into and superseded by this Agreement or any Order under this Agreement. The Parties do not intend that the provisions of this Agreement or any Order under this Agreement be explained, supplemented, or qualified through evidence of trade usage or any prior course of dealings or any course of performance under any prior agreement. In entering into this Agreement or any Order under this Agreement, neither Party has relied upon any statement, estimate, forecast, projection, representation, warranty, action or agreement of the other Party except for those expressly contained in this Agreement or any Order under this Agreement. There are no conditions precedent to the effectiveness of this Agreement or any Order under this Agreement other than any expressly stated in this Agreement or any Order under this Agreement.

- 11.6 Orders – Client may order Materials or Services by submitting Orders in connection with this Agreement that are substantially in the form of Appendix B – Order Form.
- 11.7 Force Majeure - If a Force Majeure Event prevents a party from complying with any one or more obligations under this agreement, that inability to comply will not constitute breach if (1) that party uses reasonable efforts to perform those obligations, (2) that party's inability to perform those obligations is not due to its failure to (a) take reasonable measures to protect itself against events or circumstances of the same type as that Force Majeure Event or (B) develop and maintain a reasonable contingency plan to respond to events or circumstances of the same type as that Force Majeure Event, and (3) that party complies with its obligations under this provision.
- a. Definition of Force Majeure Event - For purposes of this agreement, "Force Majeure Event" means, with respect to a Party, any event or circumstance, whether or not foreseeable, that was not caused by that Party (other than a strike or other labor unrest that affects only that Party, an increase in prices or other change in general economic conditions, a change in law, ordinance, or other statutory or regulatory provision with which such Party must comply, or an event or circumstance that results in that party's not having sufficient funds to comply with an obligation to pay money) and any consequences of that event or circumstance.
 - b. Force Majeure Event Notice Requirement - If a Force Majeure Event occurs, the noncomplying party shall promptly notify the other party of occurrence of that Force Majeure Event, its effect on performance, and how long the noncomplying party expects it to last. Thereafter the noncomplying party shall update that information as reasonably necessary. During a Force Majeure Event, the noncomplying Party shall use reasonable efforts to limit damages to the other Party and to resume its performance under this Agreement.
- 11.8 Time Not of the Essence – Time is not of the essence.
- 11.9 Governing Law - This Agreement and all Orders under the Agreement shall be construed in accordance with the Laws of the state of Texas, without regard to principles of conflicts of law and excluding the United Nations Convention on Contracts for the International Sale of Goods. For purposes of applying its Uniform Commercial Code, the Materials and Services provided under this Agreement or any Order under this Agreement shall be deemed to be "goods."
- 11.10 Forum
- Forum for Judicial Actions - Other than to the extent expressly set forth below in this provision, any legal action or proceeding arising out of or relating to this Agreement or the transactions it contemplates shall be brought only in the Houston Division of the United States District Court for the Southern District of Texas or in any Texas state court sitting in Fort Worth, Texas, and each Party consents to the exclusive jurisdiction of such courts (and of the appropriate appellate courts) in any such Judicial Action and waives any claim of

forum non conveniens in connection therewith and objection to venue laid therein. Process in any such judicial action may be served on a Party anywhere in the world, whether within or without the State of Texas. The choice of forum above shall not prohibit the enforcement of any judgment obtained in that forum or any other appropriate forum.

11.11 Amendments and Waivers

- a. General Amendment - The Parties may not amend this Agreement or any Order under this Agreement except by a written agreement of the Parties that identifies itself as an amendment to this Agreement or any Order under this Agreement and is signed by both Parties.
- b. General Waivers of Rights - No waiver of any right or condition is effective unless given in writing and signed by the Party waiving such right or condition. No delay or omission by either Party to exercise any right or power it has under this Agreement or any Order under this Agreement shall impair or be construed as a waiver of such right or power. A waiver by any Party of any breach, condition or covenant shall not be construed to be a waiver of any succeeding breach or condition or of any other covenant. All waivers must be in writing and signed by the Party waiving its rights.
- c. Changes to Scope of Materials or Services - Changes to scope of the Materials or Services as described in this Agreement or any Order under this Agreement must be expressly stated and comply with the terms of this Agreement.

11.12 Severability - If any provision of this Agreement or any Order under this Agreement is determined to be invalid, illegal, or unenforceable, then the remaining provisions of this Agreement or any Order under this Agreement shall remain in full force to the extent both the economic and legal substance of the transactions contemplated by this Agreement or any Order under this Agreement are not affected in any manner that is materially adverse to either Party by severing the provision determined to be invalid, illegal, or unenforceable.

11.13 Construction and Interpretation

- a. Joint Drafting and Understanding - This Agreement has been prepared jointly and has been the subject of arm's length and careful negotiation. Each Party has been given the opportunity to independently review this Agreement with legal counsel and other consultants, and each Party has the requisite experience and sophistication to understand, interpret and agree to the particular language of its provisions. Accordingly, the drafting of this Agreement is not to be attributed to either Party.
- b. General Construction
 - (1) Headings contained in this Agreement or any Order under this Agreement are for reference purposes only and are not to affect the meaning or interpretation of this Agreement.
 - (2) The word "include" in every form means to include without limitation by virtue of enumeration and a derivative of a defined term shall have the meaning appropriate to the context of its use.
 - (3) References to content posted on any website referred to in this Agreement or any Order under this Agreement shall mean such content as it may be revised from time to time.
 - (4) Whenever this Agreement or any Order under this Agreement refers to a consent or approval to be given by either Party, such consent or approval is effective only if given in writing and signed by the Party giving approval or consent.
 - (5) The use of singular words includes the plural and vice versa.

11.14 Third Party Beneficiaries - Except as expressly set forth to the contrary in this Agreement, there are no third-party beneficiaries of this Agreement or any Order under this Agreement, and this Agreement or any Order under this Agreement shall not provide any third person or entity with any remedy, claim, liability, reimbursement, claim of

action or other legal or equitable right in excess of those existing without reference to this Agreement. NewEdge's Materials and Services provided through this Agreement or any Order under this Agreement are solely for the benefit of the Client.

11.15 Survival of Obligations - Obligations and rights under this Agreement or any Order under this Agreement that by their nature would reasonably continue beyond the termination or expiration of this Agreement or any Order under this Agreement (including without limitation those in the Sections entitled "Intellectual Property," "Compliance," "Warranties," "Confidentiality," Limitation of Damages and Indemnity," and "Miscellaneous Terms") shall survive the termination or expiration of this Agreement or any Order under this Agreement.

11.16 Notices

a. Each Party giving or making any notice, consent, request, demand, or other communication pursuant to this Agreement or any Order under this Agreement must give the notice in writing and use one of the following methods, each of which for purposes of this provision is a writing: by hand; certified mail (return receipt requested and postage prepaid); U.S. Postal Service overnight or priority mail; internationally recognized overnight courier (in either case with all fees prepaid); or email. Each Party giving a notice shall address the notice to the appropriate person (the "Addressee") at the receiving Party at the address listed below:

(1) **NewEdge:**

Laura Carr, Chief Operating Officer
9191 Kyser Way, Suite 103
Frisco, TX 75033
972.814.4871 - lcarr@newedgeservices.com

(2) **CLIENT:**

James O'Brien, Director of information Technology
City of Friendswood
910 S. Friendswood Dr.
Friendswood, TX 77546
281-996-3217 – jobrien@friendswood.com

b. A notice is effective only if the Party giving notice has complied with the foregoing requirements of this Section and the Addressee has received the notice. A notice is deemed to have been received as follows:

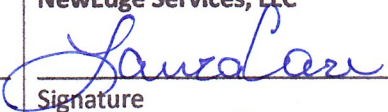
- (1) If a notice is furnished by hand, on the date of delivery if delivered during business hours on a business day (otherwise on the next business day);
- (2) If a notice is sent by certified mail, U.S. Postal Service overnight or priority mail, or internationally recognized overnight courier, upon the date of delivery as indicated by the receipt or other tracking record;
- (3) If a notice is sent by e-mail, upon successful transmission to the recipient's email account, if such notice is sent in time to allow it to be accessible by the Addressee before the time allowed for giving such notice expires, and a confirmation copy is sent by one of the other methods.
- (4) The addresses and telephone numbers to which notices may be given to either Party may be changed by written notice given by such Party to the other pursuant to this Section.

12.0 Transmission of Original Signatures and Executing Multiple Counterparts

Original signatures transmitted and received via facsimile or other electronic transmission of a scanned document (e.g., pdf or similar format) are true and valid signatures for all purposes hereunder and shall bind the Parties to

the same extent as that of original signatures. This Agreement may be executed in multiple counterparts, each of which shall be deemed to constitute an original but all of which together shall constitute only one document.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of the Effective Date.

City of Friendswood	NewEdge Services, LLC
Signature	 Signature
Printed Name	Laura Carr Printed Name
Title	Chief Operating Officer Title
Date	May 26, 2022 Date

APPENDIX A – STATEMENT OF WORK

Task Order #1 – Implementation of Cityworks Server PLL

1) Description of Materials and Services:

a) **Implementation of the Cityworks Server PLL software for the City of Friendswood including the Public Access Portal**

As an Authorized Business Partner of Azteca Systems, NewEdge Services will work with Friendswood staff to implement Cityworks Server PLL for the following Divisions/Departments:

- Permitting and Inspections
- Planning and Zoning
- Code Enforcement

NewEdge Service's implementation process includes the following tasks:

- Conduct on-site kick off meeting and workflow analysis
- Configure Cityworks Server PLL database to include the following for each permit and case:
 - Application Intake
 - Contractor / People
 - Fees
 - Ability to Print Permit or Cases Data
 - Workflow
 - Inspections
- On-site database review
- One week of on-site Training/Coaching/Support
- Implementation and configuration of the Public Access Portal
- Continued support after the client is live

Implementation fees are based on 3 departments / divisions being implemented and approximately 25 users. This number includes users who will perform plan reviews for permits.

Assumptions

- Client is responsible for all purchases of the Cityworks software and hardware devices for the users.
- NewEdge will assist the City with deployment of the Cityworks site but is not responsible for configuration of hardware or the network required to run the Cityworks software.
- Client is responsible for all Esri software and the configuration of ArcGIS Server for use with the Cityworks Server PLL software.
- Client is responsible for configuration and set up of ArcGIS On-line accounts and/or Portal logins for use with Cityworks if necessary.

Schedule

Implementation of PLL for Building Permits, including release of Public Access, takes approximately 8 months. Additional tasks listed below for historical imports and integrations can extend the go-live based on timelines for those tasks and the need for them to be live when Cityworks PLL is live.

b) **Import of Legacy Data into Cityworks.**

NewEdge will import data from one legacy system into the Cityworks database.

- Import from Energov for building permits and inspections.

NewEdge will work with the client's IT Specialist to develop scripts to harvest data from the legacy system. NewEdge will define the attributes needed for import into Cityworks and will assist the client in locating and exporting those fields from the current database. NewEdge will develop scripts to export the data so that the process can be repeated and adjusted throughout the project. The historical data import will be tested multiple times after the database review and before the go-live date.

The import process includes:

- Review of how current software/system is used
- Field mapping between legacy system to Cityworks
- Script Development and Testing
- Final Import / Testing into Production

Assumptions

- Client will provide copies of legacy databases in a format suitable for import – such Access, Excel or csv files.
- Imported records into the Cityworks database will not be attached to GIS features. Imported records will be searchable in the Cityworks interface but will not be seen in the Cityworks map.

Schedule

Will correspond with Phases in Task A

c) **NewEdge Permit Progressor**

The Permit Progressor is a custom-built web page that uses the PLL Case API to complete tasks on numerous PLL Permits/Cases at once. It connects to the Cityworks database to bring SQL views into a grid format where the user can multi select Permits/Cases that have an available task in common and can be completed all at once instead of opening the permits one by one in the Cityworks interface. The web page can be embedded into an inbox or the site menu so it can be accessed through Cityworks. The updates and processing are done using the PLL Case API. Example uses include:

- Sending out Renewal letters or invoices in bulk and needing to document on the case when the letters were sent
- Documenting hearing dates/hearing results that are scheduled for the same date/time

The base price for the Permit Progressor is \$4,180.00 that includes:

- Installation and Configuration of the Permit Progressor
- 3 Tasks in PLL configured to be used with the Progressor

Maintenance for the Permit Progressor is \$1,250.00 per year. Additional tasks added to the Permit Progressor will be a base price of \$1,000.00 per task and an increase of \$250.00 per year, per task on the maintenance.

Assumptions

- Client must be licensed for the Cityworks PLL API

Schedule

Will correspond with Phases in Task A

d) **Nightly Export of PLL Financial Information**

NewEdge will create a script that will generate a nightly export, in csv format, of the daily financial information put into the PLL software. This would include permit fees and fines associated with Code and Health cases.

Assumptions

- CSV file will be imported by Friendswood staff into the financial software on a daily basis.

Schedule

Will correspond with Phases in Task A

e) **Crystal Reports Training for Cityworks PLL**

Cityworks software utilizes the Crystal Reports software for generating custom reports. NewEdge Crystal Training includes how to utilize the Cityworks search engine and out of the box reporting tools and how to generate custom user reports through the Crystal Reports software.

Should Friendswood choose to not have Crystal Reports Training, the City has several options:

- NewEdge Report Services - \$130.00/hour for custom reports. Deliverable will be a .rpt file.

Assumptions

- Client is responsible for the purchase of the required number of licenses of the Crystal Reports software.
- Client is responsible for the installation of the Crystal Reports software on user machines.

Schedule

Crystal Reports training is generally conducted 3-4 months after the go-live of the Cityworks software.

f) **Cityworks PLL Refresher Training**

NewEdge offers on-site refresher training. The training agenda can be modified as the client sees fit to include but not limited to:

- General Cityworks usage – for new employees, etc.
- Specific topics
- Administrator refresher training
- Minor system configuration changes such as template changes or custom fields.

NewEdge staff will work with the City to identify areas of focus and the best use of the 3-day training.

This quote is for 1 NewEdge staff to be on-site for 3 days. The 24 hours can be divided as NewEdge and the City see fit.

Assumptions

N/A

Schedule

Refresher training is generally conducted 6-8 months after the go-live of the Cityworks software.

2) **Pricing / Payment Schedule:**

Pricing: Total cost for implementation of Cityworks PLL for Building Permits: **\$164,540.00**

Task Name / Description	Price Estimate
-------------------------	----------------

Cityworks Server PLL Implementation including Public Access	\$131,100.00
Import of Legacy Energov Data	\$15,580.00
Nightly Export of PLL Financial Information	\$7,695.00
NewEdge Permit Progressor	\$4,180.00
Crystal Reports Training for PLL	\$2,660.00
Cityworks Server PLL Refresher Training	\$3,325.00

Payment Schedule:

Task Completed	Billing
Pre-Kickoff (10% of Task Totals) - Implementation Services (\$13,110.00) - Historical Import (\$1,558.00) - Nightly Export (\$769.50)	\$15,437.50
Kickoff (33% of Task Totals) - Implementation Services (\$30,153.00) - Historical Import (\$3,583.40) - Nightly Export (\$1,769.85)	\$35,506.25
Workflow Assessment (66% of Task Totals) - Implementation Services (\$43,262.00) - Historical Import (\$5,141.40) - Nightly Export (\$2,935.35)	\$50,943.75
Database Review (75% of Task Totals) - Implementation Services (\$11,799.00) - Historical Import (\$1,402.20) - Nightly Export (\$692.55)	\$18,073.75
NewEdge Permit Progressor (100% of Task Total)	
Training/Support (90% of Task Totals) - Implementation Services (\$19,665.00) - Historical Import (\$2,337.00) - Nightly Export (\$1,154.25)	\$23,156.25
Go-Live (100% of Task Totals) - Implementation Services (\$13,110.00) - Historical Import (\$1,558.00) - Nightly Export (\$769.50)	\$15,437.50
Crystal Reports Training (100% of Task Total)	\$2,660.00
Cityworks PLL Refresher Training (100% of Task Total)	\$3,325.00
Total	\$164,540.00

3) **Invoices/Billing Information:**

Invoices and billing information are to be sent to Client at: accounts-payable@friendswood.com, 281-996-3200

4) **Project Manager/Point of Contact:**

The Client project manager and/or point of contact shall be: James O'Brien, jobrien@friendswood.com, 281-996-3217

5) **Special Terms and Conditions**

N/A

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 05/03/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider awarding the Forest Bend Detention Pond Construction Project (Bid 2022-05) to Jerdon Enterprise, L.P.

Originating Department: Engineering

Degree of importance:

SUMMARY / ORIGINATING CAUSE

In December 2019, the City of Friendswood was awarded \$3,426,022.00 in Hurricane Harvey 2017 Community Development Block Grant - Disaster Recovery (CDBG-DR) Round One Funds for the Forest Bend Detention Pond Project.

The project, consisting of meandering trails, detention ponds, and associated appurtenances, has been engineered and designed and is now ready for construction. Construction will consist of site work, excavation, installation of concrete and pipes, lighting, wetland plantings, and associated park features at Forest Bend Park.

The City held a bid opening for this project in March 2022, where three bids were received. Jerdon Enterprise, L.P, of Stafford, Texas, was the apparent low bidder, with a total bid of \$3,631,982.25. The project is to be funded via a combination of the block grant and flood bonds.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

This project will provide 53 acre-feet of offline detention. The construction and completion of this flood control project is beneficial to neighboring floodprone areas. The contract allows 365 days for construction upon commencement.

RECOMMENDATIONS

Staff recommends approval.

ATTACHMENTS

1. Jerdon Enterprise LP - Standard Agreement (1)
2. Harris County Concurrence Letter
3. Government Code Verifications Form
4. Jerdon Enterprise - Form 1295
5. COI Jerdon Enterprise LP

CITY OF FRIENDSWOOD

FRIENDSWOOD, TEXAS

CONTRACT DOCUMENTS
FOR

FOREST BEND DETENTION POND CONSTRUCTION PROJECT

BID NO. 2022-05



Prepared by:
City of Friendswood
Engineering Department
15355 Blackhawk Boulevard
Friendswood, Texas 77546

DOCUMENT 00110B

INVITATION TO BIDDERS

Sealed Competitive Bids shall be submitted via two (2) electronic copies, each copy on one flash drive or CD. Each flash drive/CD must contain only one (1) file in PDF format and must match identically. The PDF files must include the ink signature of a person with the authority to bind the vendor into a contract. All submitted materials must be clearly marked with BID NO. 2022-05, and addressed to the City of Friendswood, Attn: City Secretary, and are to be received at Friendswood City Hall, City Secretary's Office, 910 S. Friendswood Dr., Friendswood, TX, 77546 before 2:00 P.M., Monday, March 14, 2022.

This project will be federally funded by the U.S. Housing and Urban Development (HUD) Department through the Texas General Land Office (GLO) and administered by the Harris County Community Services Department (HCCSD). Bidders shall comply with regulations governing the CDBG Disaster Recovery Program (Regulation 24 CFR 570). Applicable requirements include but are not limited to compliance with the Davis-Bacon and Related Acts, Fair Labor Standards, Equal Employment Opportunity, Affirmative Action, Section 3 of the HUD Act of 1968, and contracting with small, minority, and disadvantage firms, as detailed in the project manual.

Bidders will be required to furnish verifiable references with their bids/proposals and to have a payment and performance bond.

A Non-Mandatory Pre-Bid Meeting is scheduled for Thursday, March 3, 2022 at 4:00 P.M. via a virtual meeting at the following link:

<http://friendswood.com/ForestBendDetentionPondPreBid>

A public bid opening will be held at Friendswood City Hall, City Secretary's Office, 910 S. Friendswood Dr., Friendswood, TX, 77546 at 2:00 pm, Monday, March 14, 2022.

The City of Friendswood reserves the right to reject any and all bids and to waive any informality in the bids received. The City of Friendswood pays for goods and services according to the provisions of Chapter 2251 of the Government Code.

The successful bidder must furnish a Performance Bond and a Payment Bond in the amount of one hundred percent (100%) of the Contract Price and upon the forms which are attached hereto. A Payment Bond shall be furnished for any contract in excess of Twenty-Five Thousand Dollars (\$25,000) and a Performance Bond shall be furnished for contracts in excess of One Hundred Thousand Dollars (\$100,000), and each shall be furnished within five days (5 D) after receipt of the Contract Documents. Payment and Performance Bonds shall be issued from sureties with a minimum "A-" rating from Best's Key Rating Guide and who are licensed by the Texas Department of Insurance to do business in the State of Texas and to issue said bonds. The bonds must be signed by

00110B-1

City of Friendswood

City Attorney Approved: 8/6/2010

an authorized representative of the surety, who is licensed by the State Board of Insurance.

Bid Documents may be found on the City of Friendswood Bids website located at <https://www.ci.friendswood.tx.us/Bids.aspx>. Technical Specifications may be found on the City of Friendswood Publications and Forms website at <https://www.ci.friendswood.tx.us/350/Publications-Forms>.

In conformance with applicable statutes, the general prevailing wage rates in the locality in which the Work is to be performed have been ascertained, and such rates shall be the minimum paid for labor employed upon this project. The Contractor shall forfeit as a penalty, to the City of Friendswood, Sixty Dollars (\$60.00) for each laborer, workman or mechanic employed, for each working day, or portion thereof, if such laborer, workman or mechanic is found to be paid less than the stipulated rates for any work done under this Contract.

This Contract is issued by an organization which qualifies for exemption pursuant to the provisions of Section 151.309 of the Texas Limited Sales, Excise and Use Tax Act as codified in Chapter 151 of the Texas Tax Code. Because of Amendments to Section 151.311 of the Tax Code made by Section 14.07 of Chapter 5 (House Bill No. 11), 72nd Leg., 1st C.S., Acts 1991 at 188, in order for non-consumable materials and equipment to qualify for resale to the City and be exempt from sales tax, the contract and proposals must comply with the following requirements:

- A. The proposal and contract must separately identify:
 - 1. the charges for non-consumable materials and equipment that are permanently incorporated into the project and
 - 2. charges for skill, labor and consumable materials, tools and equipment that are permanently incorporated into the project. Bidders are required to have a sales tax permit issued by the Comptroller of the State of Texas in order to qualify under separated contract procedure.
- B. The City will issue to the Contractor a specific exemption certificate for this Contract in order that he does not have to pay taxes on qualifying materials, equipment or other tangible personal property purchased for and permanently incorporated into City realty in performing this Contract. The Contractor performing this contract must issue to his suppliers an exemption certificate complying with all applicable State Comptroller's rulings, along with a copy of the certificate issued to him by the City.
- C. Total Stipulate Price contract, in which the above charges are not separated, do not qualify for sales tax and use exemption.

00110B-2

Attention is directed to the liquidated damages provision of this Contract (as specified in the General Conditions) and the fact that rainy weather shall constitute justification for any delay in the time for completion only under certain conditions (as specified in the General Conditions).

The City reserves the right to reject any proposal and to waive informalities in the proposals. In case of ambiguity or lack of clearness in stating the prices in any proposal, the City reserves the right to consider the most advantageous construction thereof, or to reject the proposal. The award shall be made to the most responsible Bidder submitting the best value for the City of Friendswood.

The City shall, after review and approval of the City Council, enter into Contract negotiations with the apparent lowest responsible Bidder using City Contracts and Documents contained in the Specification Books. Bidder shall not send their own Contract Documents or in any way alter, change or amended the City's Contract Documents.

City of Friendswood

Morad Kabiri, PE, AICP
City Manager

END OF DOCUMENT

**DOCUMENT 00115B
INSTRUCTIONS TO BIDDERS**

PART I: DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders are defined in the General Conditions. The term "Successful Bidder" means the lowest, qualified, responsible Bidder to whom the City (on the basis of the City's evaluation as hereinafter provided) makes an award.

PART II: COPIES OF BIDDING DOCUMENTS

- 2.1 Complete sets of the Bidding Documents can be viewed and downloaded at the City of Friendswood's website at the following link:
<https://www.ci.friendswood.tx.us/Bids.aspx>
- 2.2 Complete sets of Bidding Documents shall be used in preparing Bids; the City shall not assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.3 The City in making copies of Bidding Documents available on the above terms does so only for the purpose of obtaining Bids on the Work and does not confer a license or grant permission for any other use.
- 2.4 Copies of the City of Friendswood Technical Specifications (CFTS) and City of Friendswood Standard Details may be acquired at no cost on the City's website:
<https://www.ci.friendswood.tx.us/350/Publications-Forms>
- 2.5 Assistance finding these documents may also be provided at the City Secretary's Office located at City Hall, 910 S. Friendswood Dr., Friendswood, TX 77546.

PART III: QUALIFICATION OF BIDDER

- 3.1 To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit within five (5) days of the City's request written evidence of the types of insurance and other data as set forth in the Supplementary Conditions, such as financial data, previous experience and evidence of authority to conduct business in the jurisdiction where the Project is located. Each Bid shall contain evidence of Bidder's qualification to do business in the State of Texas or covenant to obtain such qualification prior to award of the Contract.

PART IV: EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- 4.1 Before submitting a Bid, each Bidder shall:
- A. Examine the Contract Documents and Drawings thoroughly.
 - B. Visit the site to familiarize themselves with local conditions that may in any manner affect cost, progress, or performance of the Work.
 - C. Familiarize themselves with federal, state, and local laws, ordinances, rules and regulations that may in any manner affect cost, progress, or performance of the Work.
 - D. Study and carefully correlate Bidder's observations with the Contract

Documents.

E. Perform Constructability Review.

- 4.2 Bidders Responsibility - Bidders are required to inform themselves of the conditions under which the work is to be performed and all other factors that might affect the manner or method of work. The City does not make any representations as to the conditions under which the Work is to be performed. The Bidder, if awarded the contract, shall not be allowed any extra compensation by reason of any condition which affects the work if such condition could have been discernible by the Bidder prior to the bidding.
- 4.3 The City shall provide reports of investigations and tests of subsurface and latent physical conditions at the site that might otherwise affect cost, progress, or performance of the Work, and which have been relied upon by the Engineer in preparing the Drawings or the Technical Specifications. The City shall make copies of such reports available to any Bidder requesting them. These reports are not guaranteed as to accuracy or completeness, nor are they part of the Contract Documents. Before submitting his Bid, each Bidder shall, at his own expense, make such additional investigations and tests as the Bidder may deem necessary to determine his Bid for performance of the Work in accordance with the time, price and other terms and conditions of the Contract Documents.
- 4.4 Upon request, the City shall provide each Bidder access to the site to conduct such investigations and tests, as each Bidder deems necessary for submission of his Bid.
- 4.5 The lands upon which the Work is to be performed, rights-of-way for access thereto and other lands designated for use by the Contractor in performing the Work are identified in the Supplementary Conditions, the General Requirements or the Drawings.
- 4.6 The submission of a Bid shall constitute an incontrovertible representation by the Bidder that they has complied with every requirement, scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

PART V: INTERPRETATIONS

- 5.1 All questions about the meaning or intent of the Contract Documents shall be submitted to the City in writing. Replies shall be issued by Addenda by the City. Questions received less than five (5) days prior to the date for opening of Bids shall not be answered. Only questions answered by formal written Addenda shall be binding. Oral and other interpretations or clarifications shall be without legal effect.

PART VI: BID SECURITY

- 6.1 Bid Security shall be made payable to the City, in amount of five percent (5%) of the Bidder's maximum Bid price and in the form of a cashiers or certified check from a state or local bank or a Bid Bond issued by a Surety meeting the requirements of the General Conditions.

00115B-2

- 6.2 The Bid Security of the Successful Bidder shall be retained until such Bidder has executed the Agreement and furnished the required Contract Security, whereupon it shall be returned; if the successful Bidder fails to execute and deliver the Agreement and furnish the required Contract Security within five (5) days of the Notice of Award, the City may chose to annul the Notice of Award and the Bid Security of that Bidder shall be forfeited. The Bid Security of any Bidder whom the City believes to have a reasonable chance of receiving the award shall be retained by the City until the earlier of the seventh (7th) day after the "effective date of the Agreement" (which term is defined in the General Conditions) or the sixty-first (61st) day after the Bid opening. Bid Security of other bidders shall be returned within seven (7) days of the Bid opening.

PART VII: CONTRACT TIME

- 7.1 The number of working days within which, or the date by which, the Work is to be completed is set forth in the Bid Form and shall be included in the Agreement.

PART VIII: LIQUIDATED DAMAGES

- 8.1 Provisions for liquidated damages, if any, are set forth in Article IV of Document 00400 – Standard Agreement for Contracting Services.

PART IX: SUBSTITUTE MATERIAL AND EQUIPMENT

- 9.1 The Contract, if awarded, shall be on the basis of material and equipment described in the Drawings or specified in the Specifications without considerations of possible substitute or "or-equal" items. Whenever it is indicated in the drawings or specified in the Technical Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by the Contractor if acceptable to the City, application for such acceptance shall not be considered by the City until after the "effective date of the Agreement". Appropriate adjustment to the price or time of the Contract shall be made thereafter. The procedure for submittal of any such application by the Contractor and consideration by the City is set forth in the General Conditions.

PART X: SUBCONTRACTORS, ETC.

- 10.1 If the Supplementary Conditions require the identity of certain Subcontractors and other persons and organizations to be submitted to the City in advance of the Notice of Award, the apparent Successful Bidder, and any other Bidder so requested, shall within seven (7) days after the day of the Bid opening submit to the City a list of all Subcontractors and other persons and organizations (including those who are to furnish the principal items of material and equipment) proposed for those portions of the Work as to which such identification is so required. Such list shall be accompanied by an experience statement with pertinent information as to similar projects and other evidence of qualification for each such Subcontractor, person and organization if requested by the City. If the City, after due investigation, has reasonable objection to any proposed Subcontractor, other person or organization, may before giving the Notice of Award request the apparent Successful Bidder to submit an acceptable

substitute without an increase in Bid price. If the apparent Successful Bidder declines to make any such substitution, the Contract shall not be awarded to such Bidder, but his declining to make any such substitution shall not constitute grounds for sacrificing his Bid Security. Any Subcontractor, other person, or organization so listed and to whom the City does not make written objection prior to the giving of the Notice of Award shall be deemed acceptable to the City.

- 10.2 No Contractor shall be required to employ any Subcontractor, other person, or organization against whom they has reasonable objection.

PART XI: BID FORM

- 11.1 The Bid Form is attached hereto; additional copies may be obtained from the City.
- 11.2 Bid Forms shall be completed by typewriter or computer. The Bid price of each item on the form must be stated in words and numerals; in case of a conflict, words shall take precedence.
- 11.3 Bids by Corporations shall be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.
- 11.4 Bids by partnerships shall be executed in the partnership name and signed by a partner, whose title shall appear under the signature and the official address of the partnership shall be shown below the signature.
- 11.5 All names shall be typed or printed below the signature.
- 11.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in on the Bid Form).
- 11.7 The address to which communications regarding the Bid are to be directed shall be shown.
- 11.8 The Bid Form includes supplemental pay items to facilitate payment for charges and alterations that may be required to complete work. Quantities have been established for Supplemental Items shown on Document 00300B – Unit Price Form Document 00305B – Total Stipulated Price Form. The Contractor shall bid unit prices and provide extension of unit prices and quantities for total amount bid. The actual work as provided by the General Provisions, Technical Specifications, and shown on the Drawings and/or the Exhibits is described in the Bid Form items other than supplemental pay items. When work covered by supplemental items is requested by the City or the Contractor and approved by the City, payment shall be based on the quantity actually constructed and unit prices bid in Bid Form. Award shall be based on Total Base Bid.

PART XII: SUBMISSION OF BIDS

- 12.1 Bids shall be submitted at the time and place indicated in the Invitation to Bidders and shall be included in an opaque sealed envelope, marked with the Project title and name and address of the bidder and accompanied by the Bid Security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face thereof.
- 12.2 The City Secretary's Office shall receive Bids at 910 South Friendswood Drive, Friendswood, Texas, 77546 until **2:00 P.M.** local time as shown on the atomic clock in the City Secretary's Office, on **Monday, March 14th, 2022.**

PART XIII: MODIFICATION AND WITHDRAWAL OF BIDS

- 13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.
- 13.2 If within twenty-four (24) hours after Bids are opened, any Bidder who files a duly signed written notice with the City and promptly thereafter demonstrates to the reasonable satisfaction of the City that there was a material and substantial mistake in the preparation of his Bid, that Bidder may withdraw his Bid and his Bid Security shall be returned. Thereafter, that Bidder shall be disqualified from further bidding on the Work.

PART XIV: OPENING OF BIDS - BIDS SHALL BE OPENED PUBLICLY

- 14.1 When Bids are opened publicly, they shall be read aloud and an abstract of the amounts of the base Bids and major alternates (if any) shall be made available after the date of Bid opening.

PART XV: BIDS TO REMAIN OPEN

- 15.1 All Bids shall remain open for sixty (60) days after the day of the Bid opening, but the City may, at the City's sole discretion, release any Bid and return the Bid Security prior to the end of the sixty (60) day period.

PART XVI: AWARD OF CONTRACT

- 16.1 The City reserves the right to reject any and all Bids, to waive any and all informalities and to negotiate contract terms with the Apparent Low Bidder, and the right to disqualify all nonconforming, nonresponsive or conditional Bids. Discrepancies between words and figures shall be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof shall be resolved in favor of the correct sum.
- 16.2 In evaluating Bids, the City shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements and alternates and unit prices if requested in the Bid Forms. It is the City's intent to accept alternates (if any are accepted) in the order in which they are listed in the Bid form but the City may accept them in any order or combination to the benefit of the City.

- 16.3 The City may consider the qualifications and experience of Subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment) proposed for those portions of the Work as to which the identity of Subcontractors and other persons and organizations shall be submitted as provided in the Supplementary Conditions. Operating costs, maintenance considerations, performance data, and guarantees of materials and equipment may also be considered by the City.
- 16.4 The City may conduct such investigations as they deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Bidders, proposed Subcontractors and other persons and organizations to do the Work in accordance with the Contract Documents to the City's satisfaction within the prescribed time.
- 16.5 The City reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to the City's satisfaction.
- 16.6 If the Contract is to be awarded, it shall be awarded to the lowest responsible Bidder who has met all requirements of the bidding process and whose evaluation by the City indicates to the City that the award shall be in the best value for the City.
- 16.7 If the Contract is to be awarded, the City shall give the Successful Bidder a Notice of Award within sixty (60) days after the day of the Bid opening.

PART XVII: REQUIRED BONDS

- 17.1 The General Conditions and the Supplementary Conditions set forth the City's requirements as to required Bonds. When the Successful Bidder delivers the executed Agreement to the City it shall be accompanied by the required Contract Security.
- 17.2 If the Contract exceeds Twenty-five Thousand Dollars (\$25,000.00), a Payment Bond shall be furnished, and if the contract exceeds One Hundred Thousand Dollars (\$100,000.00) a Performance Bond also, shall be furnished on the prescribed forms in the amount of one hundred percent (100%) corporate surety duly authorized to do business in the State of Texas. Attorneys-in-fact who sign Bonds must file with each Bond a certified and effective date copy of their Power of Attorney.

PART XVIII: INSURANCE

- 18.1 All insurance shall be written by an insurer licensed to conduct business in the State of Texas. The Contractor shall, at his own expense, purchase, maintain and keep in force insurance that will protect against injury and/or damages which may arise out of or result from operations under this Contract, whether the operations be himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable of the following types and limits [No insurance policy or certificate of insurance required below shall contain any aggregate policy year limit unless a specific

dollar amount (or specified formula for determining a specific dollar amount) aggregate policy year limit is expressly provided in Section 00320 – Insurance Requirements]. The City of Friendswood, its officers, agents and employees must be named as an additional Insured on all insurance policies. Proof of such shall be verified before Contract is executed.

- A. Standard Worker's Compensation Insurance (with waiver of subrogation in favor of the City of Friendswood, its officers, agents and employees). (The City and the Contractor and all persons providing services shall comply with the workers compensation insurance requirements of Section 406.096 of the Texas Labor Code and 28 TAC Section 110.110 (c)(2), a copy of which is provided in Section 00425 – Texas Workers' Compensation).
 - B. Commercial General Liability occurrence type insurance. No. "XCU" restrictions shall be applicable. Products/completed operations coverage must be included.
 - C. Comprehensive Automobile Liability (including owned, non-owned, and hired vehicle coverage).
 - D. Contractual Liability Insurance covering the indemnity provision of this Contract in the same amount and coverage as provided for Commercial General Liability Policy, specifically referring to this Contract by date, bid number, and location.
 - E. All-Risk Builder's Risk of the non-reporting type (not required for paving projects, water and sewer line projects or projects involving lump sum payments).
- 18.2 The Contractor shall cause the Contractors insurance company or insurance agent to fill in all information required (including names of insurance agency, the Contractor and insurance companies, and policy numbers, effective dates and expiration dates) and to date and sign and do all other things necessary to complete and make into a valid certificate of insurance and pertaining to the above listed items in Paragraph 18.1 of this Document before commencing any of the work and within the time specified. The Contractor shall file said forms with the City.
- 18.3 Said Certificate of Insurance coverages afforded under the policies shall not be altered, modified or cancelled unless at least fifteen (15) days prior written notice has been given to the City. The Contractor shall also file with the City valid Certificate(s) of Insurance for all from or for all Subcontractors and showing Subcontractor(s) as the Insured.
- 18.4 The original Builder's Risk policy shall provide for fifteen (15) days written notice of alteration, modification, or cancellation and shall be furnished to the City. Provided, however, until the Original Policy is issued and furnished to the City a Certified Insurance Binder with the identical notice shall be acceptable in place of the original policy, which original policy shall be received by the City not later than thirty (30) days after the issuance of the Notice to Proceed for the project. Notwithstanding any other provision in the Contract Documents, it is further

mutually understood and agreed that no payment will be due and owing or made to the Contractor for any work performed under the Contract until after all of the required insurance documentation, including the original policy specified above, are received by the City.

PART XIX: SIGNING OF THE AGREEMENT

- 19.1 When the City gives a Notice of Award to the Successful Bidder, it shall be accompanied by at least three (3) unsigned counterparts of the Agreement and all other Contract Documents attached. Within ten (10) working days thereafter the City shall deliver one (1) fully signed counterpart to the Contractor.

PART XX: SPECIAL REQUIREMENTS

- 20.1 Preparation of Bids: Unless otherwise directed in the Invitation of Bidders, bids shall be submitted in duplicate upon the forms provided, or copies thereof. The bids shall be prepared in compliance with the requirements of the Invitation to Bidders, these instructions, and any instructions printed on the prescribed forms. All blank spaces on the Bid Forms shall be filled in as noted, typed, with both words and figures; amounts shall be extended and totaled and no change shall be made in the phraseology of the forms or of the bid items thereon. If optional items are shown on the Bid form, and the Bidder elects not to bid on these optional items, then "No Bid" shall be entered in the blank spaces provided. Any bid may be deemed irregular which contains any omission, alteration, erasure, addition, or change of any nature or which does not include prices for each and every bid item (excluding optional items). In order to ensure consideration, the bid must be enclosed in a sealed envelope that is clearly marked with the notation "Bid Enclosed" and further identified by the name and number of the project. Unless directed otherwise in the Invitation and to Bidders, the bid shall be addressed to the City.

- A. A Bidder may withdraw his bid before the time of closing by submitting a written request for its withdrawal to the person who holds the bid.
- B. Further, any bid in which the prices are obviously unbalanced, or which fails in any manner to conform to the bidding procedures as set forth, shall also be considered irregular.
- C. The Bids shall have the Cashier's or Certified check or Bid Bond at the front of the Bid Documents.

- 20.2 Irregular bids as described in Paragraph 19.1 of this Document shall conform to the following rules:

- A. Bid Forms having blank spaces or change in phraseology shall be rejected.
- B. Bid Forms with a conflict between the written amount and the figures; the written amount shall be used.
- C. Bid Forms with a conflict between Individual Unit Prices and the Extension of that Unit price; the Individual Unit Price times the Estimated Quantity shall be

used.

- D. Bid Forms with a conflict between Unit Price Extensions and the total of the Unit Price Extensions; the sum of all of the Unit Price Extensions shall be used.
- E. Bid Forms with a conflict between Individual Alternate and total of all Alternates; the sum of all individual Alternates shall be used.
- F. Bid Forms with a conflict between Individual subtotals for Stipulated Price, Base Unit Prices, Cash Allowances and Alternates; the sum of Individual subtotals for Stipulated Price, Base Unit Prices, Extra Unit Prices, Cash Allowances, and Alternates.

20.3 Subsurface Information: Any information provided in regard to subsurface data, test borings, etc., shall be considered approximate. Any soils report that the City has obtained shall be provided to the Bidders for their use. The interpretation of soils information, results of soil borings, etc., is in no way guaranteed.

20.4 Open Specifications: Where equipment or materials are specified by a trade or brand name, it is not the intention of the City to discriminate against an equal product of another manufacturer, but rather to set a definite standard of quality and/or performance; and to establish an equal basis for the evaluation of bids. Where the words "equivalent", or "equal to" are used, they shall be understood to mean that the product or item referred to shall be the equivalent to or equal to, in the opinion or judgment of the City, the product, or item specified by name. Unless otherwise specified, all materials shall be the best of their respective kinds and shall be, in all cases, fully equivalent to approved samples. Notwithstanding that the words "equivalent", "equal to", or other such expressions may be used in the specifications in connection with a material, manufactured article or process, the material, article, or process, specifically designated shall be used. The City has the right to require the use of such specifically designated materials, articles, or processes.

20.5 Price of Materials and Sales Tax: The Contractor shall be responsible for compliance with all current State Laws and Provisions of the State Comptroller's office on price of materials and sales tax. The City is a tax-exempt organization and materials that become the property of the City upon acceptance of contract may be provided without tax if the Contractor maintains proper records and procedures.

PART XXI: MANDATORY PRE-BID CONFERENCE

21.1 A Mandatory Pre-Bid Conference will not be required.

**PART XXII: FINANCIAL STATEMENT AND STATEMENT OF
QUALIFICATIONS**

22.1 The Bidder shall, upon request by the City, furnish such information and date as the City may request to determine the ability of the Bidder to perform the Work, including, without limitation, a list of all jobs completed within the last twenty-four

(24) months giving the name of the Owner, amount of the Contract, description of the job, and name of the Owners representative who is familiar with the work performed by the Contractor.

PART XXIII: CONFLICT HIERARCHY

- 23.1 Conflicts of the Drawings shall rule as follows:
 - A. Details shall overrule the Drawings.
 - B. COF Standard Details shall overrule Details.
 - C. Special Details shall overrule all.
 - D. Dimensions or Stationing shall overrule scaled measurements.
- 23.2 Conflicts in Bidding Instructions shall rule as follows:
 - A. Special Instructions to Bidders shall overrule Instructions to Bidders.
 - B. Addenda shall overrule Special Instructions.
- 23.3 Conflicts in the Conditions shall rule as follows:
 - A. Supplemental Conditions shall overrule General Conditions.
 - B. Addenda shall overrule Supplemental Conditions.
- 23.4 Conflicts in the Technical Specifications shall rule as follows:
 - A. Special Specifications shall overrule Technical Specifications.
 - B. Special Provisions shall overrule Special Specifications.
 - C. Addenda shall overrule all.
- 23.5 Conflicts between Instructions to Bidders, Drawings, Conditions, and Technical Specifications shall rule as follows:
 - A. All Bidders Instructions shall overrule all Conditions.
 - B. All drawings shall overrule all Bidders Instructions.
 - C. All Specifications shall overrule all Drawings.
 - D. Addenda shall overrule all.

PART XXIV: LAWS

- 24.1 All applicable laws, ordinances and the rules and regulations of all authorities having jurisdiction over the construction of the project shall apply to the Contract throughout.

PART XXV: PERMITS, FEES, AND REGISTRATION

- 25.1 All contractors and subcontractors that are bidding on portions of work that is residential or commercial in nature and is not an integral part of public infrastructure shall register with the City of Friendswood.
 - A. The registration fee is \$100.00 and is a one (1) time fee.
 - B. All contractors and subcontractors must fill out the "Contractors Registration Form" which can be obtained at the City of Friendswood Building Department.
 - C. All contractors and subcontractors shall provide proof of General Liability insurance.
- 25.2 The following trades must also have in addition to the above:
 - A. General Contractor – the owner shall provide drivers license number and

- contractors license.
 - B. Electrical Contractor – the owner shall provide drivers license number and Master License.
 - C. HVAC – the owner shall provide drivers license number and Master License.
 - D. Plumbing - the owner shall provide drivers license number and Master License.
 - E. Irrigation - the owner shall provide drivers license number and Irrigation License.
- 25.3 The trades listed in Paragraph 25.2 of this Section must also apply for their permits (i.e. Building, Electrical, HVAC, Plumbing, and Irrigation) and all fees shall be waived for City projects.

END OF DOCUMENT

City of Friendswood

Acknowledgement of Addendums

Date: March 7, 2022

To: Potential Consultants

From: Bria A. Whitmire, PE, CFM, Projects Coordinator

Re: RFQ 2022-05 Forest Bend Detention Pond Addenda

This signed document shall be included in the final Bid submittal. This is to serve as an official acknowledgment any addenda that were issued have been received and the contents understood.

Please list addenda by number and date.

Name: _____
(signature)

Name: _____
(printed name)

Name: _____
(company name)

DOCUMENT 00085B

ADDENDUM

ADDENDUM NO. 1

Date of Addendum: 3/7/2022

PROJECT NAME: Forest Bend Detention Pond

PROJECT NO: FBDETPOND

BID DATE: 3/14/2022

FROM: City of Friendswood
Engineering Department
15355 Blackhawk Boulevard
Friendswood, TX 77546

TO: Prospective Bidders

This Addendum forms a part of the Bidding Documents and shall be incorporated into the Contract documents, as applicable. Insofar as the original Project Manual and Drawings may conflict, this Addendum governs.

ANSWERS TO QUESTIONS RECEIVED:

- 1) Is there a geotechnical report?
 - a. Yes. Both the Geotechnical Report and the Map for Extent of Cohesionless Soils are attached to this Addendum and have also been added to the bid documents.
- 2) Will the Clay Liner material come from onsite or imported?
 - a. Importing or using onsite material is up to the contractor depending on if there is anything acceptable onsite. Please reference the Geotechnical Report for further information.
- 3) Is there an engineer's estimate?
 - a. The most recent engineer's estimate is attached.

CHANGE IN MANDATORY PRE-BID MEETING TIME

None

CHANGES TO PROJECT MANUAL

1. Add geotechnical report and information (2 documents).

BIDDING REQUIREMENTS

None

SPECIFICATIONS

None

CHANGES TO DRAWINGS

None

CLARIFICATIONS

None

END OF ADDENDUM NO. 1:

END OF DOCUMENT

**GEOTECHNICAL INVESTIGATION
FOREST BEND DETENTION POND
CITY OF FRIENDSWOOD, TEXAS**

REPORT NO. 1140258201

Reported to:

RPS INFRASTRUCTURE, INC.

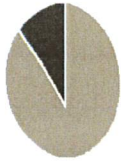
Houston, Texas

Submitted by:

**GEOTEST ENGINEERING, INC.
TBPE Registration No. F-410**

Houston, Texas

Key Map Nos. 657 B, F



GEOTEST ENGINEERING, INC.

Geotechnical Engineers & Materials Testing

5600 Bintliff Drive

Houston, Texas 77036

Telephone: (713) 266-0588

Fax: (713) 266-2977

Report No. 1140258201

April 7, 2021

Ms. Natalie Chaney, P.E.
Senior Project Manager – Sustainability Team Lead
RPS | North America
575 N. Dairy Ashford, Suite 700
Houston, Texas 77079

Reference: **Geotechnical Investigation
Forest Bend Detention Pond
City of Friendswood, Texas**

Dear Ms. Chaney,

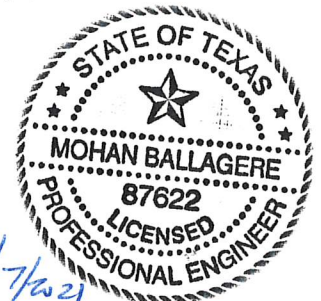
Presented herein is the final geotechnical investigation report for the above-referenced project. Preliminary boring logs were submitted to you on December 9, 2020. Preliminary geotechnical recommendations pertaining to the design and construction of the proposed detention pond was submitted to you through e-mail on December 23, 2020. A draft report was submitted to you on January 19, 2021. This final report supersedes all previously submitted reports, transmittals, e-mails, etc. for the above referenced project. This study was authorized by subcontract agreement for consulting services on October 12, 2020 and by accepting our Proposal No. 1140508099 dated August 6, 2020.

We appreciate this opportunity to be of service to you. If you have any questions regarding the report, or if we can be of further service to you, please call us.

Very truly yours,
GEOTEST ENGINEERING, INC.
TBPE Registration No. F-410

D. Guruprasad Varma
Guruprasad Varma Dommaraju, E.I.T
Graduate Engineer

B.C. 15
Mohan Ballagere, P.E.
Vice President



MB/GD/ego
Copies Submitted: (1 pdf)
PC31\Geotechnical\1140258201F.DOC

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1.0 EXECUTIVE SUMMARY

A geotechnical investigation was conducted by Geotest Engineering, Inc. (GEI) for the design and construction of Forest Bend Detention Pond in the City of Friendswood, Texas.

The purposes of this investigation were to evaluate subsurface soil and groundwater conditions and to develop geotechnical recommendations for the design and construction of the proposed detention pond. This investigation included drilling and sampling of six (6) 35-foot soil borings, performing appropriate laboratory tests on selected recovered soil samples, performing slope stability analyses and preparing a geotechnical report.

- Based on the Houston Street of Geologic Atlas of Texas, the location of the detention pond lies within the boundary of the Beaumont Formation.
- Based on the available information, no known surface faults exist near the detention pond. The nearest known faults are the faults associated with the Friendswood Salt Dome, which is located approximately 1 mile north of the project site location.
- The generalized subsurface conditions, as encountered in borings GB-1 through GB-6, consists of predominantly cohesive soils with intermittent and/or underlain by cohesionless soils to the explored depth of 35 feet. The cohesive soils consist of firm to hard dark gray, gray, brown, yellowish brown and reddish brown Fat Clay (CH), Fat Clay with Sand (CH), Lean Clay (CL) and Sandy Lean Clay (CL). The cohesionless soils consist of loose to very dense gray, brown and yellowish brown Silty Sand (SM) and Sandy Silt (ML). The details of subsurface conditions are given in Section 7.1 of this report.
- The groundwater was first encountered at the depths ranging from 16.0 to 25.0 feet during drilling in borings GB-1 through GB-6. Water depth, measured 20 minutes after water was first encountered, was at depths ranging from 14.0 to 15.7 feet in these borings. The water depth, measured 24-hours after completion of drilling, was at depths ranging from 14.0 to 16.2 feet in these borings. The water depth was measured at 14.2 and 16.3 feet in Piezometers GB-1P and GB-3P respectively on November 20, 2020.

- Based on the soils encountered, the recommended side slope for the proposed detention pond is 3.5(H):1(V). Slope stability analyses for the pond slopes are presented in Section 8.2 of this report.
- Dewatering or other appropriate ground water control method will be required during the excavation of detention pond to maintain the bottom stability and to prevent excavation bottom blow up due to water bearing sandy silt and silty sands encountered at the bottom or within the 3 feet of bottom of detention pond.
- Due to cohesionless soils (silty sand and sand silt) encountered near the toe and bottom (between El. 11.5 and El. 4.5 feet), it is recommended that a 24-inch compacted clay liner be installed near the toe and extended minimum of 10 feet into the basin (where necessary).
- Borrow material analyses are described in Section 8.5 of this report.

2.0 INTRODUCTION

2.1 Authorization

Geotest Engineering, Inc. (Geotest) was authorized by Mr. Ralph E. Cox of the RPS Infrastructure, Inc. by signing Subcontract Agreement for Consulting Services on October 12, 2020, to perform geotechnical services for the design and construction of proposed detention pond at the existing private park for Forest Bend residents in the City of Friendswood, Texas.

2.2 Background

The project calls for the design and construction of proposed detention pond at the existing private park for Forest Bend residents which is bounded by Clear Creek (Harris County Flood Control [HCFCD] Channel ID A100-00-00) to the west, HCFCD Ditch Unit A115-00-00 to the north, Townes Road to the east and E. Parkwood Drive to the south, in the City of Friendswood, Texas. The proposed detention consists of four (4) ponds, approximately 12 acres in area with grass-lined slopes and approximate depths ranging from 7 to 18 feet. The detention ponds also include pedestrian trail along the berm. The proposed trail along the berm will be a 5-foot wide concrete trail and will have minor vehicular traffic, such as lawn mowers and maintenance vehicles. A Vicinity Map is shown on Figure 1.

3.0 PURPOSE AND SCOPE OF WORK

3.1 Purpose

The purpose of this study was to provide geotechnical engineering support for the design and construction activities associated with the proposed Forest Bend Detention Pond on E. Parkwood Drive in the City of Friendswood, Texas.

3.2 Scope of Work

The purposes of this investigation were to evaluate subsurface soil and groundwater conditions and to develop geotechnical recommendations for the design and construction of the proposed Forest Bend Detention Pond at E. Parkwood Drive and Townes Road.

The scope of work for this study included the following:

- drilling and continuous and intermittently sampling six (6) soil borings, each to a depth of 35 feet at the proposed detention pond location to determine site soil stratigraphy and soil properties, groundwater conditions during and 24-hours or more after drilling;
- performing appropriate laboratory tests including Consolidated Undrained (CU) Triaxial tests on selected representative soil samples to evaluate the engineering properties of soils and to select design soil parameters for slope stability analyses;
- performing engineering analyses to develop geotechnical recommendations for the design and construction of proposed detention pond; and
- preparing a geotechnical engineering report summarizing our findings and recommendations.

4.0 SITE EXPLORATION

4.1 Physical Description

The subject of this study is construction of a new detention pond southwest E. Parkwood Drive and Townes Road in the City of Friendswood. The pond site is bounded by Clear Creek (Harris County Flood Control [HCFCD] Channel ID A100-00-00) to the west, HCFCD Ditch Unit A115-00-00 to the north, Townes Road to the east and E. Parkwood Drive to the south.

4.2 Existing Site Conditions

The existing site area (private park for forest bend residents) is relatively flat and covered with grass. There is dense vegetation with trees in the central portion of the proposed pond area. There is an existing pond on the north western end (adjacent to Clear Creek) and an existing lift station on southeastern end.

4.3 Geology

The geology of Harris County is characterized by two formations. The Beaumont Formation and the Lissie Formation. The Beaumont Formation is located in the southeastern portion of the county and the Lissie Formation is located in the northwest portion of the county.

Both the Beaumont and Lissie formations are part of the fluvial and marine coastal complex resulting from the glacial cycles within the Pleistocene (10,000 years to 2 million years ago)/Holocene (2,500 years to 10,000 years ago) epoch. Seaward the lithologies are primarily dominated by clays, often interspersed with coarser sediments, primarily silts and sands. The clays of the Beaumont formation are overconsolidated and slickensided as a result of exposure to weathering during glacial retrenchment and cyclic wetting and drying. Northern portions of Harris County are under the influence of the drainage systems established by rivers such as the Brazos and the San Jacinto. The lithologic pattern generally includes silt, sand and clay with minor amounts of calcareous nodules and iron oxide. Various mineral impregnations are associated with the lithologies. Primary among these are the ferruginous-iron-based and calcareous minerals, which include calcium carbonate. These minerals impart an acidic or alkaline characteristic to soils.

Based on the Houston Sheet of Geologic Atlas of Texas (Bureau of Economic Geology, University of Texas, 1982), the location of the detention pond lies within the boundaries of the Beaumont Formation. The clays and sands of the Beaumont Formation are over-consolidated as a result of desiccation from frequent rising and lowering of the sea level and the groundwater table. Consequently, clays of this formation have moderate to high shear strength and relatively low compressibility. The sands of the Beaumont Formation are typically very fine and often silty. Further, there is occasional evidence in the Houston area of the occurrence of cemented material (sandstone and siltstone) deposits within the Beaumont Formation.

4.4 General Fault Information

A review of information in the Geotest library, relating to known surface and subsurface geologic faults in the general area of the project location, was undertaken. The available information consisted of U.S. Geological and NASA maps, open file reports and information contained in our files relating to geologic faults for project sites.

Based on the available information from U.S. Geological Survey (USGS) Maps and information contained in house relating to geologic faults, no known surface faults exist near the detention pond. The nearest known faults are the faults associated with the Friendswood Salt Dome, which is located approximately 1 mile north of the project site location. Hence, a Phase I Geological Fault Study is not warranted for this project.

5.0 FIELD WORK

5.1 Soil Borings and Sampling

The subsurface conditions, at proposed detention pond at E. Parkwood Drive and Townes Road, were explored by drilling a total of six (6) soil borings designated as GB-1 through GB-6. Each boring was drilled to a depth of 35 feet using a buggy mounted drill rig. The approximate boring locations are shown on Figure 2, Plan of Borings.

Samples were obtained continuously to a 20-foot depth and at 5-foot intervals thereafter. Cohesive samples were obtained with a 3-inch diameter thin-walled tube sampler in accordance with ASTM Method D 1587. Granular samples were obtained with a 2-inch split spoon barrel in accordance with ASTM Method D 1586. The split spoon samples were collected using a rope-cathead hammer with a weight of 140 lb and 30-inch free drop. At each of the boring locations, samples were removed from the sampler in the field and carefully examined and logged by an experienced soils technician. Suitable portions of each sample were then sealed and packaged for transportation to Geotest's laboratory. Undrained shear strengths of cohesive soil samples were estimated using a calibrated hand penetrometer in the field. The borings were backfilled with cement bentonite grout after completion of the 24-hour water level measurements.

Detailed descriptions of the soils encountered in the borings, including depths at which groundwater was encountered, are given on the boring logs presented on Figures A-1 through A-6 in Appendix A. The terms used on the boring logs and classification of soils for engineering purposes are presented following the logs of borings on Figures A-7 and A-8, respectively, in Appendix A. The survey information (Northing and Easting grid coordinates and ground surface elevation) of the completed borings were provided to us by RPS.

5.2 Piezometer Installation

During field investigation, two piezometers were installed in the open bore hole of Borings GB-1 and GB-3. The location of the piezometers, designated as GB-1P and GB-3P are shown on Figure 2, Plan of Borings. Piezometer installation record showing the details of the construction of

piezometer along with water level measurements are shown on Figures A-9 and A-10 in Appendix A.

5.3 Groundwater Measurements

The groundwater was first encountered at the depths ranging from 16.0 to 25.0 feet during drilling in borings GB-1 through GB-6. Water depth, measured 20 minutes after water was first encountered, was at depths ranging from 14.0 to 15.7 feet in these borings. The water depth, measured 24-hours after completion of drilling, was at depths ranging from 14.0 to 16.2 feet in these borings. The water depth was measured at 14.2 and 16.3 feet in Piezometers GB-1P and GB-3P, respectively on November 20, 2020.

5.4 Environmental Issues

Based on the field observation and visual examination of soils samples retrieved from borings GB-1 through GB-6, Geotest did not notice any hydrocarbons during drilling of soil borings.

6.0 LABORATORY TESTING

The laboratory testing program was designed to evaluate the pertinent physical properties and shear strength characteristics of the subsurface soils. Classification tests were performed on selected samples to aid in soil classification.

6.1 Tests Performed

Undrained shear strengths of selected cohesive samples were measured by unconsolidated-undrained (U-U) triaxial compression tests (ASTM D2850). Results of U-U triaxial compression tests are plotted on the boring logs as solid triangles. Undrained shear strengths were measured in the field with a calibrated hand penetrometer and in the laboratory with a Torvane. The penetrometer values are tabulated on the logs. The shear strength values obtained from the penetrometer and Torvane are plotted on the boring logs as solid squares and diamonds, respectively.

Moisture content and dry density were measured for each U-U triaxial compression test sample. Moisture content (ASTM D2216) determinations were also made on most of the other samples to define the moisture profile at each boring location. Liquid and plastic limit tests (ASTM D4318) were performed on selected samples to quantify soil plasticity characteristics. Sieve analyses (ASTM D6913) and measurement of the percent passing the No. 200 sieve (ASTM D1140) were performed to measure the gradation characteristics of cohesionless soils and to aid in classification of cohesive soils. The summary of laboratory test results is presented on Figures B-1 through B-6 in Appendix B. Grain size distribution curves are presented on Figures B-7 through B-10 in Appendix B.

Two (2) multi-stage Consolidated-Undrained (CU) triaxial compression tests (ASTM D4767) were conducted on two undisturbed soil samples. Each soil sample was prepared into three (3) separate specimens. Each specimen was sheared with pore pressure measurements under different confining pressures following the process of back saturation and consolidation corresponding to approximately 50%, 100%, 200% of estimated in-situ overburden pressures. Results of consolidated-undrained (C-U) triaxial compression tests with pore pressure

measurements are presented on Figures B-11 and B-12 in Appendix B.

Three (3) double hydrometer tests (ASTM D4221) were performed on samples obtained from borings and the test results are presented on Figures B-13 through B-15 in Appendix B. Double hydrometer tests provide a qualitative evaluation of the potential for soil dispersion in the presence of distilled water. According to ASTM D4221, less than 30% dispersion indicates the soils to be nondispersive, 30 to 50% dispersion indicates the soils to be intermediate dispersive and greater than 50% dispersion indicates the soils to be dispersive.

Nine (9) crumb tests were performed in accordance with ASTM D6572, respectively to measure the potential for dispersion of soils in distilled water and the test results are presented on Figures B-16 and B-17 in Appendix B. The dispersion characteristics can be used to evaluate the potential of the erodability of the cohesive soils.

6.2 Table of Results

The results of most tests are plotted or tabulated on the boring logs on Figures A-1 through A-5 in Appendix A. Grain size distribution curves from sieve analyses are presented on Figures B-7 through B-10 in Appendix B. D_{50} and D_{90} (where applicable) are also presented on these grain size distribution curves. Results of consolidated-undrained (C-U) triaxial compression tests with pore pressure measurements are presented on Figures B-11 and B-12 in Appendix B. The test results for the double hydrometer tests performed on samples from Borings GB-1P, GB-3P and GB-5 are presented on Figures B-13 through Figure B-15, respectively in Appendix B. The test results for crumb tests performed on samples from Borings GB-1 through GB-6 are presented on Figures B-16 and B-17 in Appendix B.

The summary of D_{90} and D_{50} , C-U triaxial compression and dispersion test results are given below:

Summary of D_{50} and D_{90} (where applicable) Values				
Boring No.	Soil Description	Depth (feet)	D_{90}, mm	D_{50}, mm
GB-1P	Sandy silt	6.5-8.0	0.1194	<0.0740
GB-1P	Silty sand	23.5-25.0	0.1774	0.1100

Summary of D ₅₀ and D ₉₀ (where applicable) Values				
Boring No.	Soil Description	Depth (feet)	D ₉₀ , mm	D ₅₀ , mm
GB-2	Silty sand	12.5-14.0	0.1407	0.1070
GB-2	Silty sand	28.5-30.0	0.1454	0.1052
GB-3P	Silty sand	14.5-16.0	0.1410	0.1074
GB-3P	Silty sand	33.5-35.0	0.2155	0.1312
GB-4	Silty sand	33.5-35.0	0.1407	0.1063
GB-5	Silty sand	12.5-14.0	0.1390	0.0858
GB-5	Silty sand	33.5-35.0	0.2125	0.1288
GB-6	Silty sand	10.5-12.0	0.1443	0.1121
GB-6	Lean clay	16.5-18.0	0.0920	<0.0740
GB-6	Silty sand	28.5-30.0	0.2086	0.1257

Summary of C-U Triaxial Compression Test Results

Sample ID	Total Stress		Effective Stress	
	C _{cu} (psf)	φ _{cu} (deg)	C' (psf)	φ' (deg)
GB-2, 4-6, Fat Clay (CH)	227	8.6	172	15.2
GB-6, 6-8, Lean Clay (CL)	209	20.7	186	28.2

Summary of Dispersive Test Results

Boring No.	Depth (feet)	Soil Description	Dispersive Test Results	
			Double Hydrometer (ASTM D 4221)	Crumb Tests (ASTM D 6572)
GB-1P	4-6	Lean Clay (CL)	Nondispersive	--
	12-14	Fat Clay (CH)	--	Grade 1 – Nondispersive
GB-2	6-8	Lean Clay (CL)	--	Grade 2 – Intermediate
	16-18	Fat Clay (CH)	--	Grade 1 - Nondispersive
GB-3P	10-12	Lean Clay (CL)	Nondispersive	--
	12-14	Lean Clay (CL)	--	Grade 3 - Dispersive
GB-4	4-6	Fat Clay (CH)	--	Grade 1 - Nondispersive
	14-16	Fat Clay with Sand (CH)	--	Grade 3 - Dispersive
GB-5	2-4	Fat Clay (CH)	--	Grade 1 - Nondispersive
	8-10	Lean Clay (CL)	Nondispersive	--
GB-6	8-10	Lean Clay (CL)	--	Grade 1 - Nondispersive
	18-20	Fat Clay (CH)	--	Grade 1 - Nondispersive

7.0 SUBSURFACE SOIL AND GROUND WATER CONDITIONS

7.1 Soil Stratigraphy

Based on the laboratory test results and the reoccurrence of generally similar soil types at various elevations within the discrete boreholes advanced over the detention pond, boring log profile was developed and is presented on Figure 3. The soil classification is based on ASTM D2487. The interpreted soil stratigraphy at the detention pond is given below:

Detention Pond (Borings GB-1 through GB-6). The subsurface soils as encountered in borings GB-1 through GB-6 and as shown on boring log profile presented on Figure 3 are described below:

<u>Depth, below existing grade, feet</u>		<u>Elevation below grade, feet</u>		<u>Soil Description</u>
<u>From</u>	<u>To</u>	<u>From</u>	<u>To</u>	
0	6 - 14	22.6	11.4 ~ 7.1	Firm to hard dark gray, gray, brown, reddish brown and yellowish brown Fat Clay (CH), Fat Clay with Sand (CH) and Lean Clay (CL).
6 - 14	10-18	11.4 ~7.1	7.4 ~ 4.6	Loose to very dense gray, brown and yellowish brown Silty Sand (SM) and Sandy Silt (ML). Stiff to very stiff brown and gray Fat Clay with Sand (CH) was encountered in boring GB-4.
10 - 18	23 - 33	7.4 ~ 4.6	-5.6 ~ -11.9	Stiff to hard gray, brown and yellowish brown Fat Clay (CH), Lean Clay (CL) and Sandy Lean Clay (CL).
23 - 33	35	-5.6 ~ -11.9	-12.4 ~ -17.6	Medium dense to very dense gray and brown Silty Sand (SM). Very stiff to hard gray and brown Fat Clay with Sand (CH) was encountered between depths of 33 and 35 feet in boring GB-1P.

7.2 Soil Properties

The soil properties at the detention pond are given below:

The Fat Clay, Fat Clay with Sand are of high to very high plasticity with liquid limits ranging from 50 to 74 and plasticity indices ranging from 28 to 46. The Lean Clay and Sandy Lean Clay are of medium to high plasticity with liquid limits ranging from 33 to 49 and plasticity indices ranging from 13 to 27. The fines content (percent passing No. 200 sieve) of Fat Clay and Lean Clay ranged from 85.4 to 98.9 percent. The fines content of Fat Clay with Sand ranged from 82.0 to 84.5 percent. The fines content of Sandy Lean Clay and Sandy Silt ranged from 51.5 to 63.7 percent. The fines content of Silty Sand ranged from 12.6 to 43.0 percent.

The double hydrometer and crumb tests show that the clays are generally non-dispersive, however in borings GB-2 (6'-8'), GB-3P (12'-14') and GB-4 (14'-16') crumb test performed on samples (as shown on Figures B-16 and B-17 in Appendix B) show clays are intermediate to dispersive in nature.

7.3 Groundwater Conditions

The groundwater was first encountered at the depths ranging from 16.0 to 25.0 feet during drilling in borings GB-1 through GB-6. Water depth, measured 20 minutes after water was first encountered, was at depths ranging from 14.0 to 15.7 feet in these borings. The water depth, measured 24-hours after completion of drilling, was at depths ranging from 14.0 to 16.2 feet in these borings. The water depth was measured at 14.2 and 16.3 feet in Piezometers GB-1P and GB-3P, respectively on November 20, 2020. A summary of the water level conditions as observed in the borings are given below:

Boring No.	Water First Encountered at time of drilling, feet	Water Level 20 minutes after water was first encountered during drilling, feet	Water Level 24 hours or more after drilling	
			Reading Date	Water Level Reading, feet
GB-1P*	25.0	15.7	10-17-20 11-20-20	14.0 14.2*
GB-2	16.0	15.1	10-20-20	15.2
GB-3P*	18.0	15.3	10-16-20 11-20-20	14.5 16.3*
GB-4	18.0	15.0	10-16-20	14.6
GB-5	18.0	14.0	10-16-20	14.2
GB-6	17.0	15.3	10-20-20	16.2

Note: * Water level was measured in piezometers.

Depth at which ground water was encountered in each boring are also shown on the boring logs presented on Figures A-1 through A-6 in Appendix A.

8.0 ENGINEERING ANALYSES

8.1 Engineering Methods and Assumptions

The engineering method used for the slope stability analysis was based on the Simplified Bishop Method by utilizing a computer program GEOSTASE (Reference 1)

The general assumption used for the engineering analyses is described below:

- The top of the bank was considered as the water surface elevation during the flood for the slope stability analyses.
- The pond side slopes were assumed to be grass-lined earthen slopes with the slope soils consisting of the natural in situ site soils.
- Depth of seasonal moisture variation zone: 7 feet (wetting-drying in weathering zone).

More details of the methods and assumptions used for each of the geotechnical engineering analyses are discussed in the following sections.

8.2 Slope Stability Analyses

Based on the information provided to us by RPS on March 9, 2021 (see Appendix C), the proposed detention consists of four (4) ponds with Top of Bank and Bottom of pond elevations as presented below.

<u>Detention Basin</u>	<u>Section</u>	<u>Elevation (ft)</u>	
		<u>Top of The Basin</u>	<u>Bottom of the Basin</u>
Pond 1	A	21.5	7.5±2
	B	20.6	7.5±2
Pond 2	A	22.3	9±2
	B	22.6	9±2
Pond 3	A	23.8	12.5±1
Pond 4	A	21.2	14.5

Based on the elevations provided, a critical section with Top of the Bank elevation of El. +22.6 and Bottom of Pond elevation of El. +5.5 with steepest side slope of 3.5(H):1(V) was considered for Ponds 1 and 2, and critical section with Top of the Bank elevation of El. +23.8 and Bottom of Pond elevation of El. +11.5 with steepest side slope of 3.5(H):1(V) was considered for Ponds 3 and 4, and these configurations were analyzed for slope stability.

8.2.1 Method of Analyses. Experience indicates that the failure of a slope occurs by slippage along a surface of nearly circular cross section. Sufficiently accurate estimates of the stability of such slopes can be made if the surface of sliding is assumed to be a circular. Several methods of slope stability analysis are available. The most commonly used method is known as the Bishop Method. For this study, the slope stability analyses were performed using a computer software program GEOSTASE and the Simplified Bishop Method of analysis. The software program with a built-in critical section search algorithm performs a search of circular failure surface and computes factors of safety for each generated surface based on a two-dimensional limiting equilibrium approach. The critical failure surface is the surface that gives the lowest factor of safety for the input soil parameters, ground water levels and external conditions.

8.2.2 Soil Parameters and Water Level. To evaluate the potential stability of a slope or to assess the effectiveness of a slope, it requires the physical properties of the subsurface soil involved be measured. Based on borings GB-1 through GB-6, three (3) soil cases based on physical properties and shear strength characteristics of the predominant soil types within the predominant soil stratum were developed for the slope stability analyses. The soil parameters used for the analysis of end of construction (EOC), rapid drawdown (RD), and long-term (LT) conditions are discussed below.

- End of Construction: The end-of-construction case models the initial undrained condition of the soil at the end of construction after the completion of the slope excavation. For analysis of this case, the water level in the pond was assumed to be at the pond bottom and along the slope to top of bank. The soil parameter of angle of internal friction for granular/cohesionless soils was based on the Standard Penetration Test (SPT) data obtained in the field. For cohesive soil, unconsolidated-undrained shear strength parameters were used for the analysis. The selected unconsolidated-undrained shear strength parameters were based on a lower bound value of the

undrained shear strength profile developed from the laboratory unconsolidated-undrained triaxial compression tests, torvanes and pocket penetrometers. The selected soil parameters used for the analysis of end-of-construction condition are presented on Tables 2.1 through 2.3.

- Rapid Drawdown: The rapid drawdown case models the condition where high floodwater saturates and piezometrically "loads" the slope and then quickly recedes leaving a large unbalanced piezometric head in the bank slope. This unbalanced force increases the shear stresses in the soils behind the slope. For this case, completely saturated slope from top of slope was considered and the water level within the pond was assumed to instantaneously drop from the top of bank (approximate El +22.6 feet for Ponds 1 and 2, and approximate El +23.8 feet for Ponds 3 and 4) to the slope bottom (approximate El +5.5 feet for Ponds 1 and 2, and approximate El +11.5 feet for Ponds 3 and 4), subsequent to the saturation of the embankment soils.

The rapid drawdown condition was analyzed for 3-stage rapid drawdown analyses with Duncan, Wright and Wong (1990) procedure. In the 3-stage rapid drawdown analyses, both total stress and effective stress strength parameters were utilized for the analyses. The total stress strength parameters include undrained cohesion (c_{cu}) and undrained angle of internal friction (ϕ_{cu}) and effective strength parameters include drained cohesion (c') and drained angle of internal friction (ϕ').

For earthen slopes, a most critical rapid drawdown case occurs when shrinkage cracks develop all through the slope soils due to the drying of the soil, the shrinkage cracks are filled with water as the water level rises in the bayou and the slopes become "saturated" and then the water level in the channel drops rapidly. This case is most common in high plasticity clay soils. As shrinkage cracks develop in the high plasticity clay after long periods of exposure to environmental conditions (wetting-drying, swelling-shrinking, etc.), the high plasticity clay shear strength degrades to a fully softened shear strength, which may lie between the peak strength and residual strength. Experience with shallow slope failure associated with metric suction loss and strength degradation suggests that realistic crack depths will vary between 3 and 8 feet with an average of about 6 feet (Reference 2). Thus, based on the depth of assumed seasonal moisture

variation zone, a crack depth of 7 feet was used for developing the weathered soil parameters. In order to incorporate the effects of weathering on the high plasticity clay shear strength, we used a weathered angle of internal friction (ϕ'_w for effective stress and total stress) and a weathered cohesion (c'_w for effective stress and total stress) for the rapid drawdown condition analyses. The ϕ'_w was assumed to be the residual secant friction angle of the soil (Reference 3) and the c'_w was assumed to be the mobilized cohesion intercept of the soil (Reference 4). Below the crack depth of 7 feet, effective stress cohesion (c') and effective stress angle of internal friction (ϕ') and total stress cohesive (c_{cu}) and total stress angle of internal friction (ϕ_{cu}) from the results of CU triaxial compression tests were used for this condition. The soil parameters used for the analyses of rapid drawdown case are presented on Tables 2.1 through 2.3.

- Long-Term: The long-term design case represented steady state piezometric and stress conditions. When a slope is excavated, altered stress conditions create pore pressure changes within the slope and the undrained strength of the bank soils is mobilized. With time, the soil pore pressures adjust to the imposed stress and piezometric conditions and the bank soils rely on their available strength for long-term stability. For the long-term condition, static water level of 1-foot above critical slope bottom was considered.

Weathered effective stress shear strength parameters consisting of a weathered effective stress angle of internal friction (ϕ'_w) and a weathered effective stress cohesion (c'_w) were used to analyze the long-term condition in order to account for the degradation of the slope soil shear strength due to weathering. The ϕ'_w was assumed to be the residual secant friction angle of the soil (Reference 3) and the c'_w was assumed to be the mobilized cohesion intercept (Reference 4). Below the crack depth of 7 feet, effective stress cohesion (c') and effective stress angle of internal friction (ϕ') were used for this condition. The soil parameters used for the analyses of long-term condition case are presented on Tables 2.1 through 2.3.

The backup of the calculations justifying the soil parameters used for analyses are provided in Appendix C.

8.2.3 Loading Conditions. A surcharge load (construction or maintenance equipment) of 250 psf was considered at top of pond for both short-term (end of construction) and long-term conditions.

8.2.4 Factors of Safety. Based on the soil parameters and water level conditions discussed previously, slope stability analyses were performed for a 3.5(H):1(V) grass lined slope for the end of construction, rapid drawdown and long-term cases described above. The results of these analyses are presented on Figures 4.1 through 4.9. The computer output for all these cases is provided in Appendix D. The computed factors of safety are also summarized in the table below:

Pond	Soil Case	Pond Bottom Elevation	Slope Configuration	Borings Used	Factor of Safety			Figure Nos.
					EOC	RD	LT	
Pond 2	Case-1	+5.5	3.5(H):1(V) Grass Lined Slope	GB-4	2.13	1.59	1.64	4.1 thru 4.3
Pond 1 and Pond 2	Case-2	+5.5	3.5(H):1(V) Grass Lined Slope w/clay liner	GB-1P, GB-2, GB-5 and GB-6	2.28	1.40	1.68	4.4 thru 4.6
Pond 3 and Pond 4	Case-3	+11.5	3.5(H):1(V) Grass Lined Slope	GB-3P	3.45	1.34	1.58	4.7 thru 4.9

The minimum factors of safety of 1.3, 1.25 and 1.5 for end of construction (EC), rapid drawdown (RD) and long-term (LT) conditions, respectively were considered. Based on the results presented above, the proposed 3.5(H):1(V) or flatter grass lined slope with and/or without clay liner will meet minimum safety factor for end of construction, rapid drawdown and long-term conditions. Due to cohesionless soils (silty sand and sand silt) encountered along the slope and near the toe and bottom (between El. 11.5 and El. 4.5 feet), it is recommended that a 24-inch compacted clay liner be installed along the slope where cohesionless soils were encountered and extended minimum of 10 feet into the basin (where necessary) as presented in Case-2 of slope stability analyses for Ponds 1 and 2. However, on the eastern end of Pond 2, predominantly cohesive soils were encountered (as shown in boring GB-4) along the proposed slope and pond bottom elevations, hence, further delineation of cohesionless soils in this Pond 2 area will be required during construction to determine the clay liner extent.

8.3 Clay Liner Material Requirements

The properties of the constructed clay liner to be used for erosion protection at the locations where cohesionless or granular soils are encountered should meet the following criteria:

Property	Criteria
Coefficient of Permeability	$< 4 \times 10^{-7}$ cm/sec
Soil Fines	> 65% passing No. 200 sieve
Liquid Limit	> 35 and ≤ 49 (HCFCD Select Fill)
Moisture/Density Relationship	> 95% of maximum dry density at or above optimum moisture content
Thickness	Minimum 24 inches over granular/cohesionless soils

8.4 Groundwater Control

The groundwater level, measured 24 hours or more after drilling was completed, ranged from 14.0 to 16.2 feet in borings GB-1 through GB-6. The excavations required to the proposed depth of the detention pond may encounter ground water seepage depending upon ground water conditions at the time of construction and the location and depth of excavation. In general, for cohesive soils as encountered to excavation depths, the groundwater may be managed by collection in trench bottom sumps for pumped disposal. However, in the area near borings GB-1P, GB-2, GB-3, GB-5 and GB-6, where water bearing silty sand and sandy silt were encountered at or near the bottom of detention basin, dewatering such as vacuum well points for excavation up to 15 feet and/or deep wells with submersible pumps for excavation greater than 15 feet will be required. The dewatering will be required to lower the groundwater level to at least 3 to 5 feet below the progressive level of excavation. It is recommended that the actual ground water conditions be verified at the time of construction and approximate ground water control be applied.

Adequate drainage shall be maintained at all times during construction and any drainage ditch or structure disturbed during construction shall be restored to the satisfaction of the HCFCD requirements.

8.5 Borrow Material Analysis

The on-site excavated soils that are designated as lean clay (CL), lean clay with sand (CL) or sandy lean clay (CL) can be used as fill material. Based on these criteria, the site soils that can be used as fill material are:

Boring No.	Range of Depth, feet	Soil Type
GB-1P	4-6	Lean Clay
GB-2	6-12	Lean Clay
GB-3P	10-14 28-33	Lean Clay Sandy Lean Clay
GB-5	8-12	Lean Clay
GB-6	6-10 16.5-18	Lean Clay Lean Clay

8.6 Slope Protection

Attention should be given for the erosion protection of the detention ponds to prevent over-bank runoff. Excessive erosion can cause substantial ground loss and progressive movement of soil that may cause slope failure. A properly installed and maintained grass cover can serve as a protection for the detention slope by reducing soil erosion. Furthermore, routine maintenance of the slope surface including removal of undesirable vegetation growth on or around the cover, repair minor cracks or spalling, regrade and repair eroded areas should also be performed on a regular basis to enhance the integrity of the slope protective system. It should be noted that the dispersive clays found near boring location GB-2 between depths 6 and 8 feet, should be removed and replaced with structural fill material. In addition, if the exposed soils at other areas consist of highly dispersive cohesive soils, these soils should be over excavated and replaced with structural fill material.

8.7 Storm Sewer and Inlet Structures

The project also includes construction of grate inlet structure tie into the existing 60-inch outfall structure leading into Clear Creek (HCFCD Unit A100-00-00) and storm sewer (if any). Based on the information provided to us, the proposed pond on the northeast corner of the project ties into the existing swale of HCFCD Ditch Unit A115-00-00 and the flow from this ditch will be directed into the existing 60-inch outfall structure through the proposed grate inlet structure.

8.7.1 Open-Cut Excavation The following subsections provide information for the design and construction of the inlet structure and storm sewer (if any). Geotechnical parameters for the open excavations were developed based on borings GB-1 through GB-6 drilled for pond and are provided in Table 3. For design, groundwater should be assumed at surface, since these conditions may exist after a heavy rain or flooding.

8.7.1.1 Excavation Stability. The trench stability may be shored, laid back to a stable slope or some other equivalent means used to provide safety for workers and adjacent structures. The excavating and trenching operations should be in accordance with OSHA Standards, OSHA 2207, Subpart P (latest revision) and as per Harris County Engineering Department (HCED) requirements.

- Excavation Shallower Than 5 Feet – Excavations that are less than 5-foot deep should be appropriately protected when any indication of hazardous ground movement is anticipated.
- Excavation Deeper Than 5 Feet – Excavations that are deeper than 5 feet should be sloped, shored, shielded or provided with some appropriate means of protection where workers might be exposed to moving ground or cave-ins. The slopes and shoring should be in accordance with HCED and OSHA requirements. The following items provide design criteria for trench stability.
 - (i) OSHA Soil Type. Based on the soil conditions revealed by the geotechnical borings and assumed groundwater level at surface, OSHA's soil type "C" should be used for the design and construction of trench operations to a depth of 20 feet below existing grade. For shoring deeper than 20 feet, an engineering evaluation is required.
 - (ii) Excavation Support Earth Pressure. Lateral earth pressure diagrams were developed based on the subsurface conditions indicated by our field and laboratory investigations. The earth pressure diagrams developed for excavation support are presented on Figures 5.1 and 5.2. The pressure diagrams can be used for the design of temporary trench bracing. Design of trench boxes for resisting

lateral earth pressures can be based on an equivalent fluid unit weight of 98 pcf. The computation of the equivalent fluid pressure assumes that groundwater level is at ground surface, since these conditions may exist after a heavy rain or flooding. The effects of any surcharge loads at the ground surface should be added to the computed lateral earth pressures. A surcharge load, q , will typically result in a lateral load equal to $0.5q$.

- (iii) Bottom Stability. In braced cuts, if tight sheeting is terminated at the base of the cut, the bottom of the excavation can become unstable under certain conditions. The stability of the excavation bottom is governed by the shear strength of the soils and by the differential hydrostatic head. For cuts in cohesive soils (such as fat clay, fat clay with sand and lean clay) as encountered in the borings drilled for this study, for the maximum excavation depth of about 18 feet, stability of the bottom can be evaluated in accordance with these procedures outlined on Figure 6. However, due to cohesionless soils (sandy silt and silty sand) encountered at or near the invert in borings GB-1P, GB-2, GB-3P, GB-5 and GB-6 for the proposed excavation depths, dewatering will be required to prevent bottom stability issues.

8.7.2 Groundwater Control. Excavations for the proposed inlet structure and storm sewer (if any) will encounter groundwater seepage to varying degrees depending upon groundwater conditions at the time of construction and the location and depth of excavation. In cohesive soils (such as fat clay, fat clay with sand and lean clay) as encountered in the borings drilled for this study for maximum excavation depth of 18 feet, groundwater may be managed by collection in trench bottom sumps for pumped disposal. However, excavations performed for this study near boring locations GB-1P, GB-2, GB-3P, GB-5 and GB-6 might encounter cohesionless soils at or near the invert, therefore dewatering maybe required. In such case, water is typically controlled by well points for excavation shallower than 15 feet and by deep wells with submersible pumps for excavations deeper than 15 feet. The dewatering system should be pumping well ahead of time before excavation starts so that a steady state condition (groundwater elevation at least 3 feet below the proposed excavation bottom) is achieved. It is recommended that the actual groundwater conditions should be verified by the contractor at the time of construction and appropriate groundwater control be applied.

8.7.3 Bedding and Backfill. In general, bedding and backfill for the storm sewer (if any) should be designed and constructed in accordance with the Harris County Standard Specification Item 430 and Harris County Specification Drawing "Storm Sewer Construction Details." Based on the storm sewer pipe diameter, 4 to 6 inches of Cement Stabilized Sand should be installed for the entire width of trench (as outlined in Section 8.7.1 Excavation) on firm soil at grade. After the pipe is placed, Cement Stabilized Sand is placed up to the midpoint of the pipe. The remaining depth can be backfilled with in-situ material, compacted to 90% of standard proctor density and conform to Harris County Specification Item 430.5. The installation of Cement Stabilized Sand should be in accordance with Harris County Standard Specification Item 433 "Cement Stabilized Sand Bedding and Backfill Material." Bedding and backfill for Inlet structures should be designed and constructed in accordance with the Harris County Flood Control District (HCFCD) Standard Specifications Section 02316 "Structural Excavation and Backfill."

8.7.4 Structures. It is understood that the structures associated with this project will be inlet structure. The following items provide recommendations and design criteria for construction of the proposed structures.

- Allowable Bearing Pressures. The foundation for supporting the mat foundation of inlet structure(s) placed at approximate depth of 18 feet may be designed for an allowable (net) bearing pressure of 2,500 psf for total dead and sustained live loads. The allowable bearing pressure includes a safety factor of 2.0. The above recommendations assume that the final bearing surfaces consist of undisturbed natural soils and that any underlying semi-transmissive zones are properly pressure-relieved prior to and during construction.
- Bottom Stability. Bottom stability is described earlier in Section 8.7.1 under Excavation Stability.
- Lateral Earth Pressure. The pressure diagrams presented on Figure 5.1 and 5.2 can be used for the design of braced excavation. The lateral earth pressure diagrams presented on Figures 7.1 and 7.2 are applicable for the design of the permanent walls.
- Hydrostatic Uplift Resistance. Structures extending below the groundwater level should be designed to resist uplift pressure resulting from excess piezometric head. Design

uplift pressures should be computed based on the assumption that the water table is at ground surface. To resist the hydrostatic uplift at the bottom of the structures, one of the following sources of resistance can be utilized in each of the designs.

- a. Dead weight of structure,
- b. Weight of soil above base extensions plus weight of structure, or
- c. Soil-wall friction plus dead weight of structure.

The uplift force and resistance to uplift should be computed as detailed on Figure 8. In determining the configuration and dimensions of the structure using one of the approaches presented on Figure 8, the following factors of safety are recommended.

- a. Dead weight of concrete structure, $S_{f1} = 1.1$,
- b. Weight of soil (backfill) above base extension, $S_{f2} = 1.5$, and
- c. Soil-wall friction, $S_{f3} = 3.0$.

Friction resistance should be discounted for the upper 5 feet, since this zone is affected by seasonal moisture changes.

- Structural Backfill. Excavations for the proposed structures should be backfilled in accordance with Harris County Flood Control District Section 02316 "Structural Excavating and Backfill."

8.8 Recommended Pavement Section for Hike and Bike Trail

The recommended pavement section for the trail is given below.

Pavement Course	Thickness, inches
Reinforced Concrete Pavement.	5
7% Lime Stabilized Subgrade	6

8.8.1 Preparation of Pavement Subgrade. Based on the field and laboratory test data, the subgrade soils at the finished grade of the project site consists of predominantly high to very high plasticity fat clay and fat clay with sand, with high volume change potential. Hence, lime

stabilization of the clay subgrade soils will be required to reduce the swelling and shrinkage potential, to accelerate the construction and provide a stable subgrade on which to construct the pavement sections. The fat clay subgrade soils should be stabilized with 7 percent lime (by dry unit weight of soil) to a depth of at least 6 inches for the hike and bike trail pavement. This corresponds to approximately 32 pounds of lime per square yard based on a dry unit weight of 100 pcf for hike and bike trail pavement. The actual percentages of lime should be confirmed by laboratory tests at the time of construction. It should be noted that quantity of lime was estimated based on the dry unit weight determined from the specific boring locations only.

The subgrade preparation for the proposed pavement should consist of stripping, backfilling, proof-rolling and stabilization. The following procedures for subgrade are recommended:

1. Strip the surface soil to a suitable depth to remove all surficial vegetation along the trail alignment and achieve grade. In any isolated area where soft, compressible or very loose soils are encountered, additional stripping may be required. Stripping should extend to a minimum of 2 feet beyond the edge of the proposed pavement.
2. Surface exposed after stripping should be proof-rolled with a minimum of 3 passes of a 30-ton pneumatic-tired roller or a heavy loaded truck utilizing a tire pressure of approximately 90 psi. The purpose of the proof-rolling operation is to identify any underlying zones or pockets of soft soils and to remove such weak materials.
3. Lime Stabilization of subgrade should be performed in accordance with Harris County Specification Item No. 220, "Lime Stabilized Subgrade."

9.0 REFERENCES

1. Garry H. Gregory (January 2019), GEOSTASE, Version 2.7 Slope Stability Analysis Systems Software.
2. Charles Aubeny and Robert Lytton (February 2003) "Estimating Strength Versus Location and Time in High-Plasticity Clays," Report No. FHWA/TX-03/2100-P1, Texas Transportation Institute, The Texas A & M University System, College Station, Texas
3. A. A. Saleh and Stephen G. Wright (October 1997) "Shear Strength Correlations and Remedial Measure Guidelines for Long-Term Stability of Slopes Constructed of Highly Plastic Clay Soils," Research Report 1435-2F, Center for Transportation Research, Bureau of Engineering Research, The University of Texas at Austin, Figure 3.2.
4. G. Mesri and M. E. M. Abdel-Ghaffar (August 1993) "Cohesion Intercept in Effective Stress-Stability Analysis," Journal of Geotechnical Engineering, Volume 119, No.8, Figure 13.

10.0 PROVISIONS

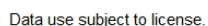
The description of subsurface conditions, analyses and the recommendations in this report are based on the test borings made at the time of drilling at specific locations. However, some variation in soil conditions may occur between test borings. Should any subsurface conditions other than those described in the boring logs be encountered, Geotest should be immediately notified so that further investigation and supplemental recommendations can be provided. The depth of the ground water level may vary with changes in environmental conditions such as frequency and magnitude of rainfall. The stratification lines on the log of borings represent the approximate boundaries between soil types, however, the transition between soil types may be more gradual than depicted.

This report has been prepared for the exclusive use of RPS Infrastructure, Inc. and the City of Friendswood for Forest Bend Detention Pond in Friendswood, Texas.

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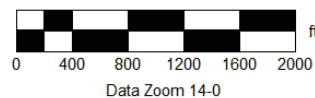
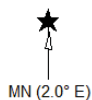
ILLUSTRATIONS

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VICINITY MAP

FIGURE 1

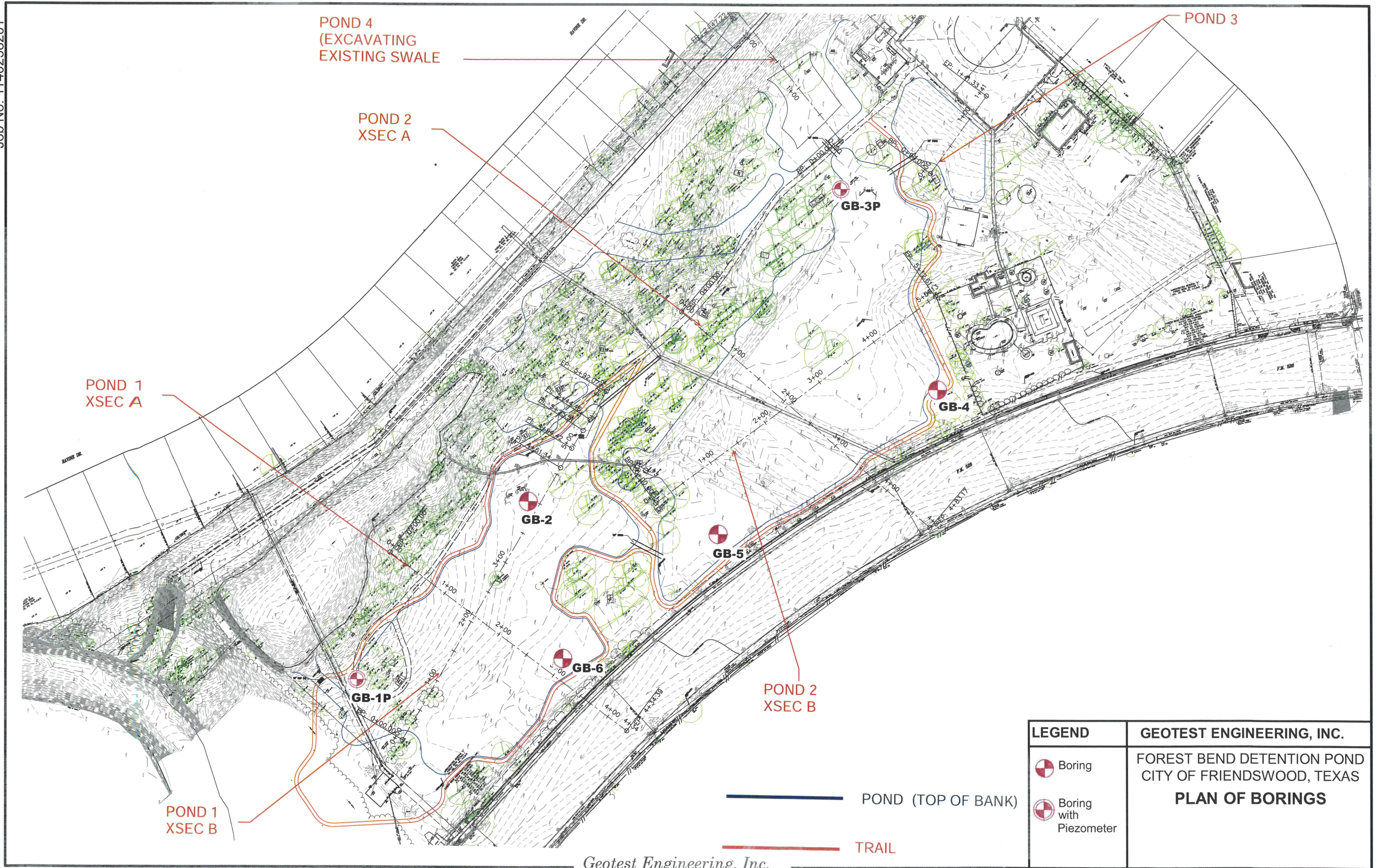
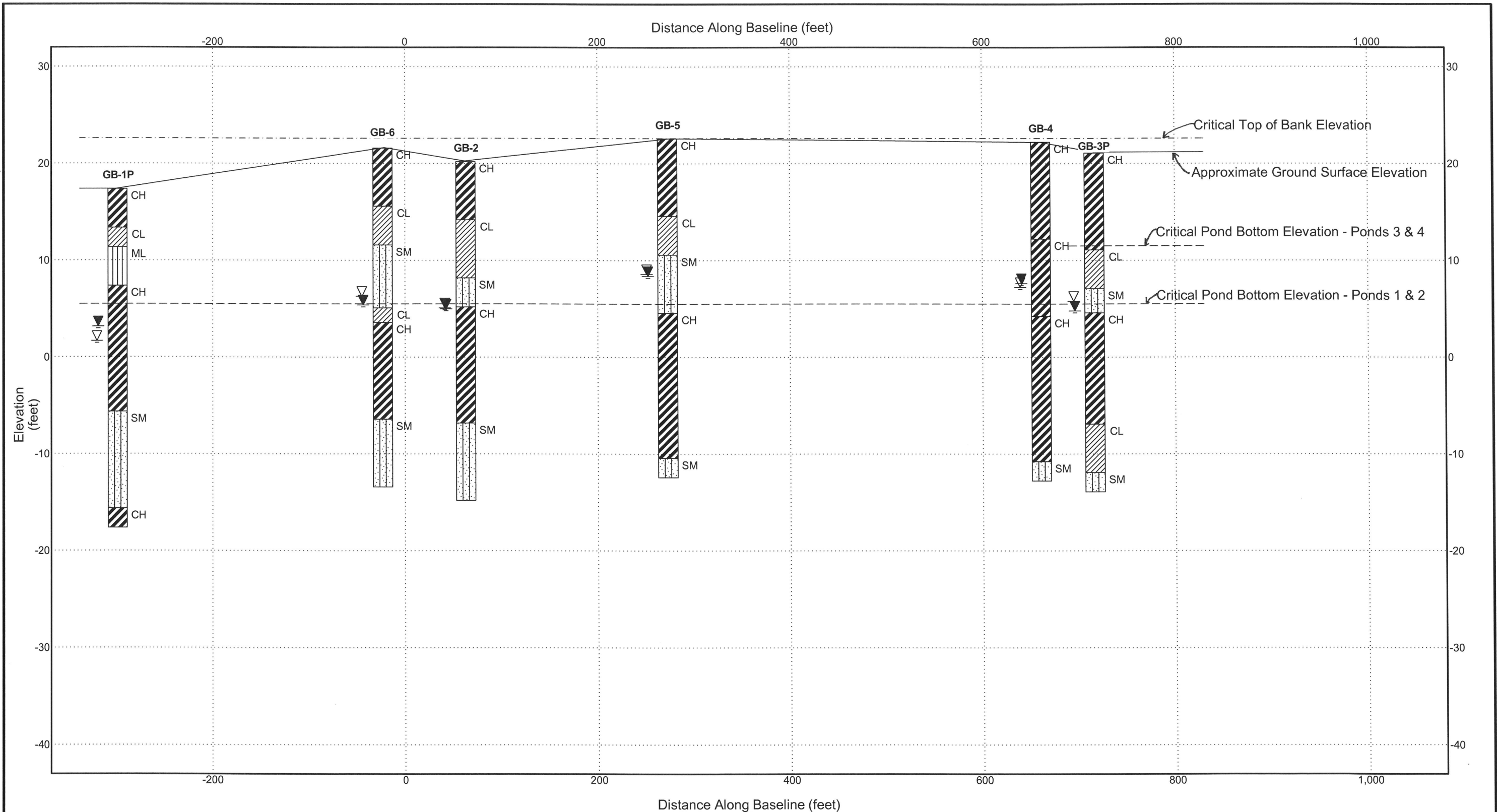


FIGURE 2



LEGEND

Fat Clay (CH) Lean Clay (CL) Sandy Silt (ML) Silty Sand (SM)

Water Level Encountered During Drilling Water Level Measured 24 Hours After Drilling Completion

BORING LOG PROFILE

Forest Bend Detention Pond
City of Friendswood, Texas

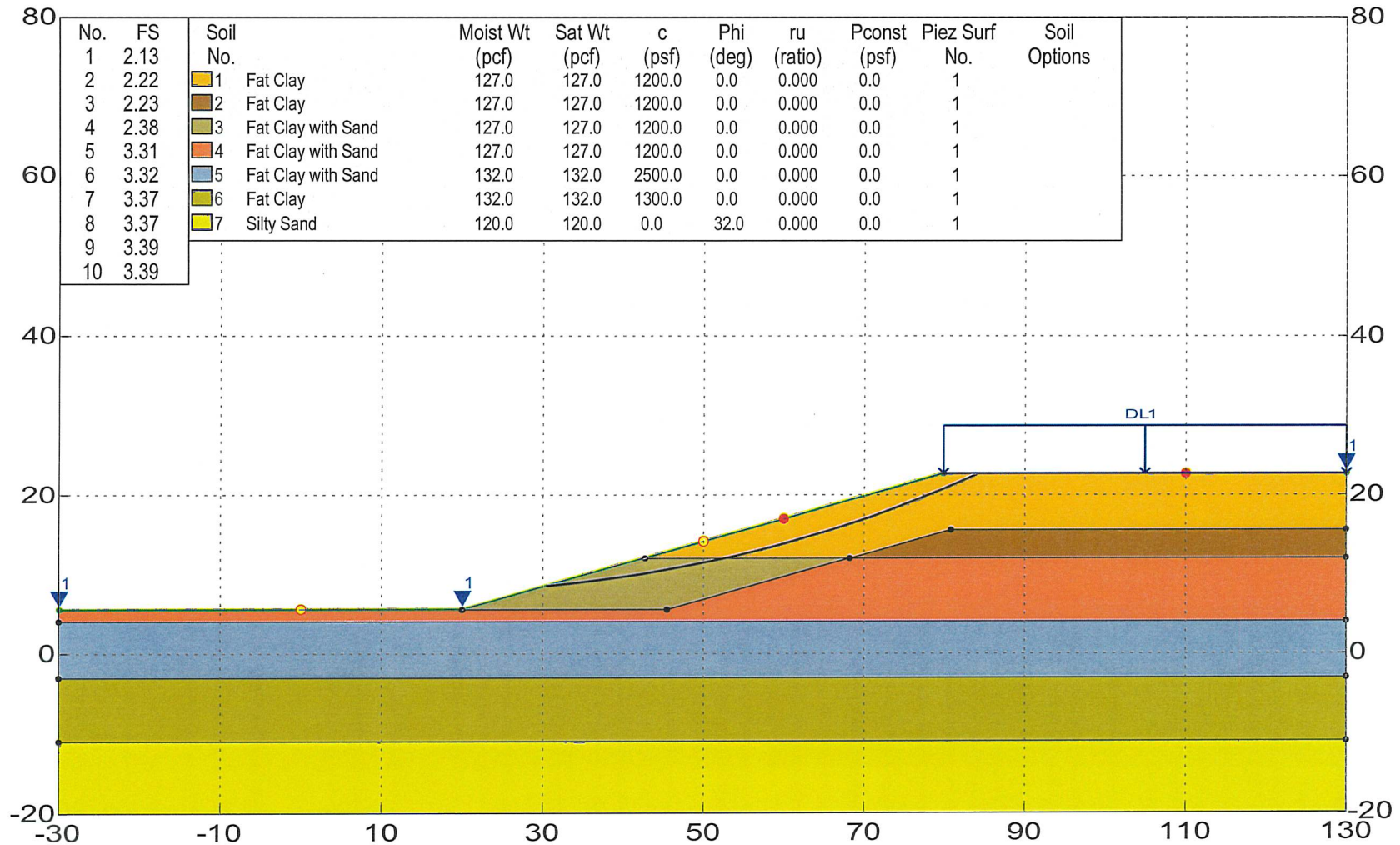
Scale
Horizontal 1"=100'
Vertical 1"=10'



Forest Bend Detention Pond Case-1 - Boring GB-4 - 3.5(H):1(V) - EOC

GEI Job No. 1140258201

\\case1_3.5to1_eoc.gsd



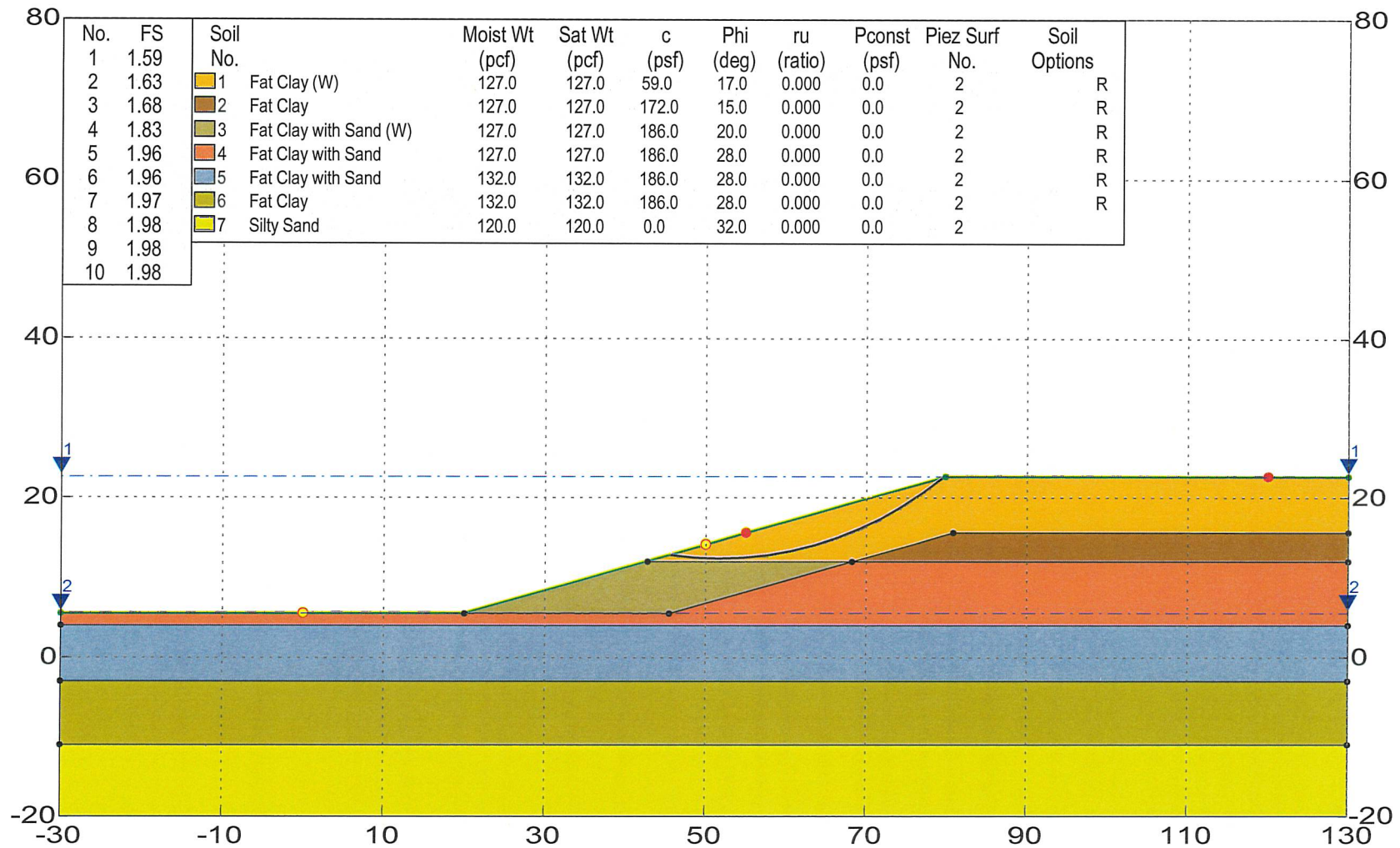
GEOSTASE FS = 2.13

Simplified Bishop Method

Forest Bend Detention Pond Case-1 - Boring GB-4 - 3.5(H):1(V) - RD

GEI Job No. 1140258201

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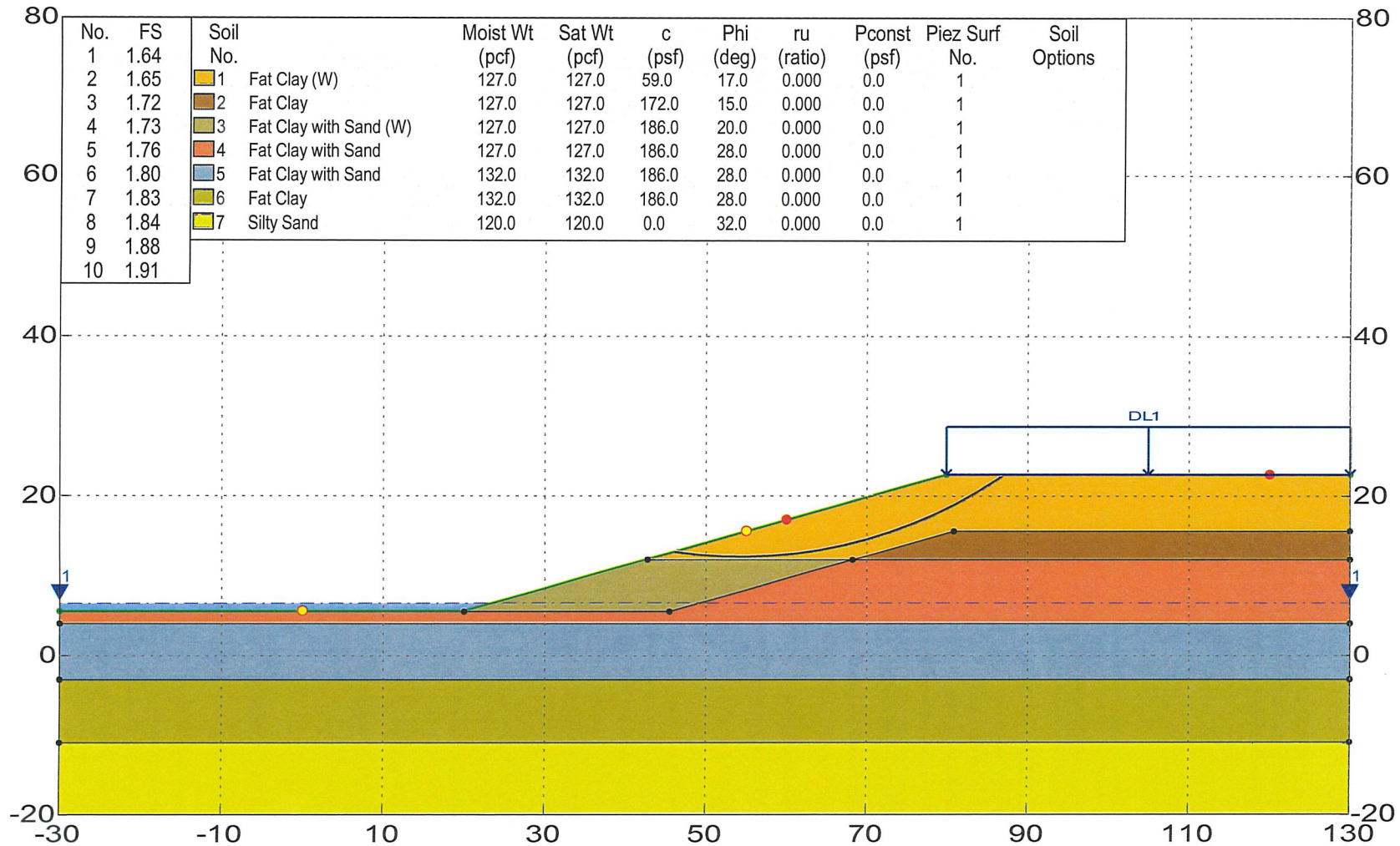
GEOSTASE FS = 1.59

Simplified Bishop Method

Forest Bend Detention Pond Case-1 - Boring GB-4 - 3.5(H):1(V) - LT

GEI Job No. 1140258201

\\case1_3.5to1_lt.gsd



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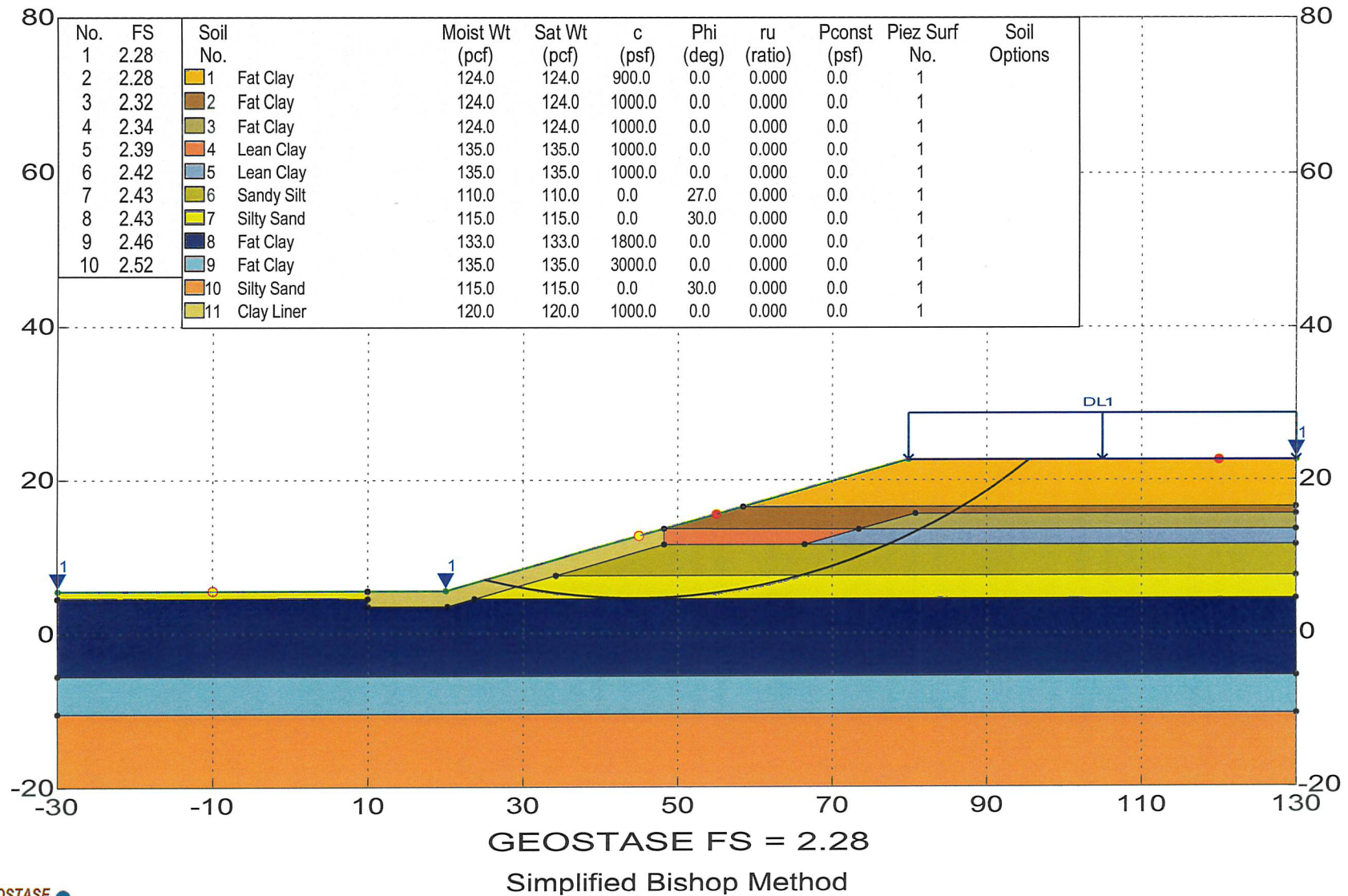
Simplified Bishop Method

Forest Bend Detention Pond

Case-2 - Borings GB-1P, GB-2, GB-5 & GB-6 - 3.5(H):1(V) - EOC

GEI Job No. 1140258201

\\case2_3.5to1_eoc.gsd

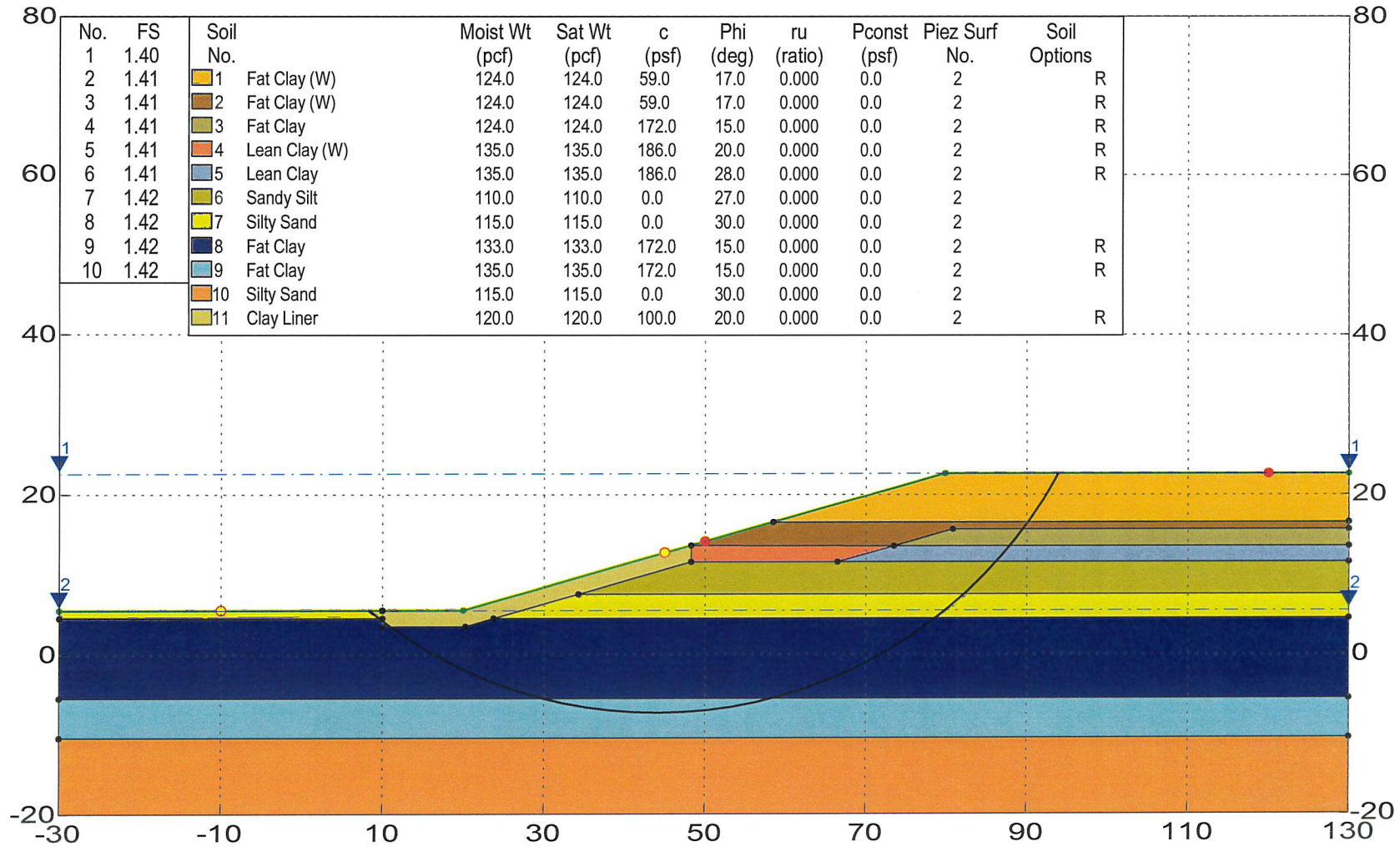


Forest Bend Detention Pond

Case-2 - Borings GB-1P, GB-2, GB-5 & GB-6 - 3.5(H):1(V) - RD

GEI Job No. 1140258201

\\case2_3.5to1_rd.gsd



GEOSTASE FS = 1.40

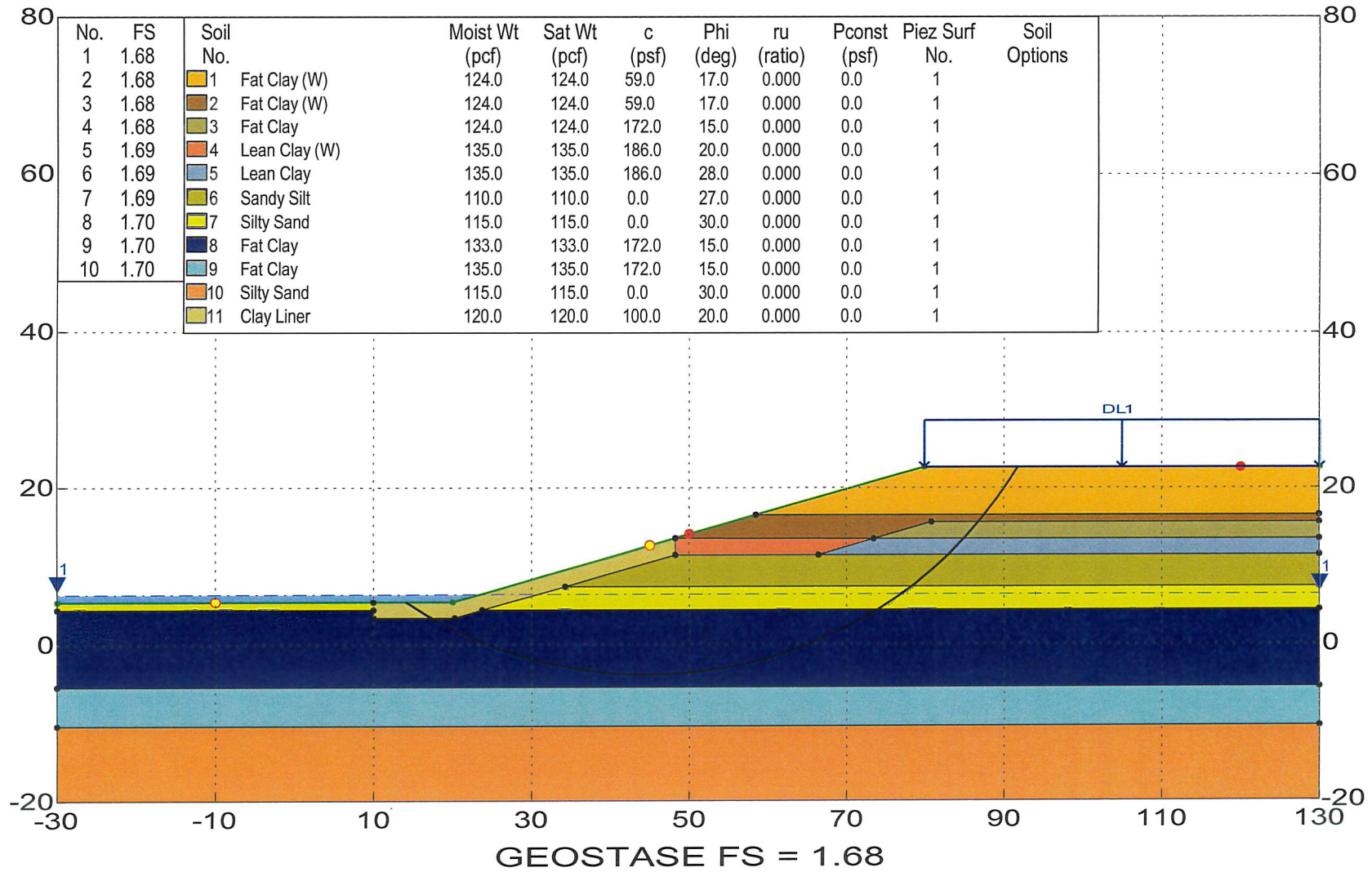
Simplified Bishop Method

Forest Bend Detention Pond

Case-2 - Borings GB-1P, GB-2, GB-5 & GB-6 - 3.5(H):1(V) - LT

GEI Job No. 1140258201

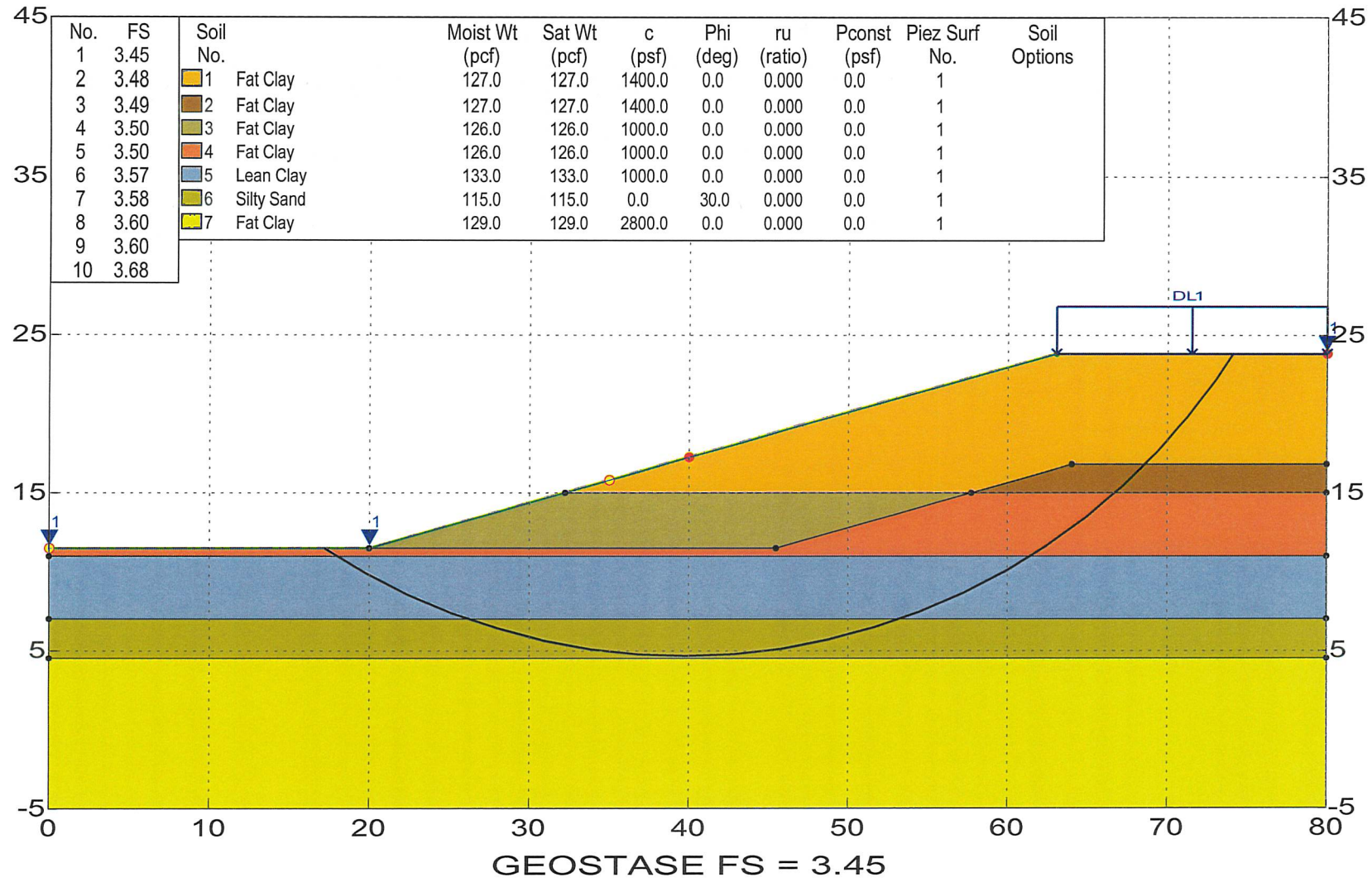
\\case2_3.5to1_lt.gsd



Forest Bend Detention Pond Case-3 - Boring GB-3P - 3.5(H):1(V) - EOC

GEI Job No. 1140258201

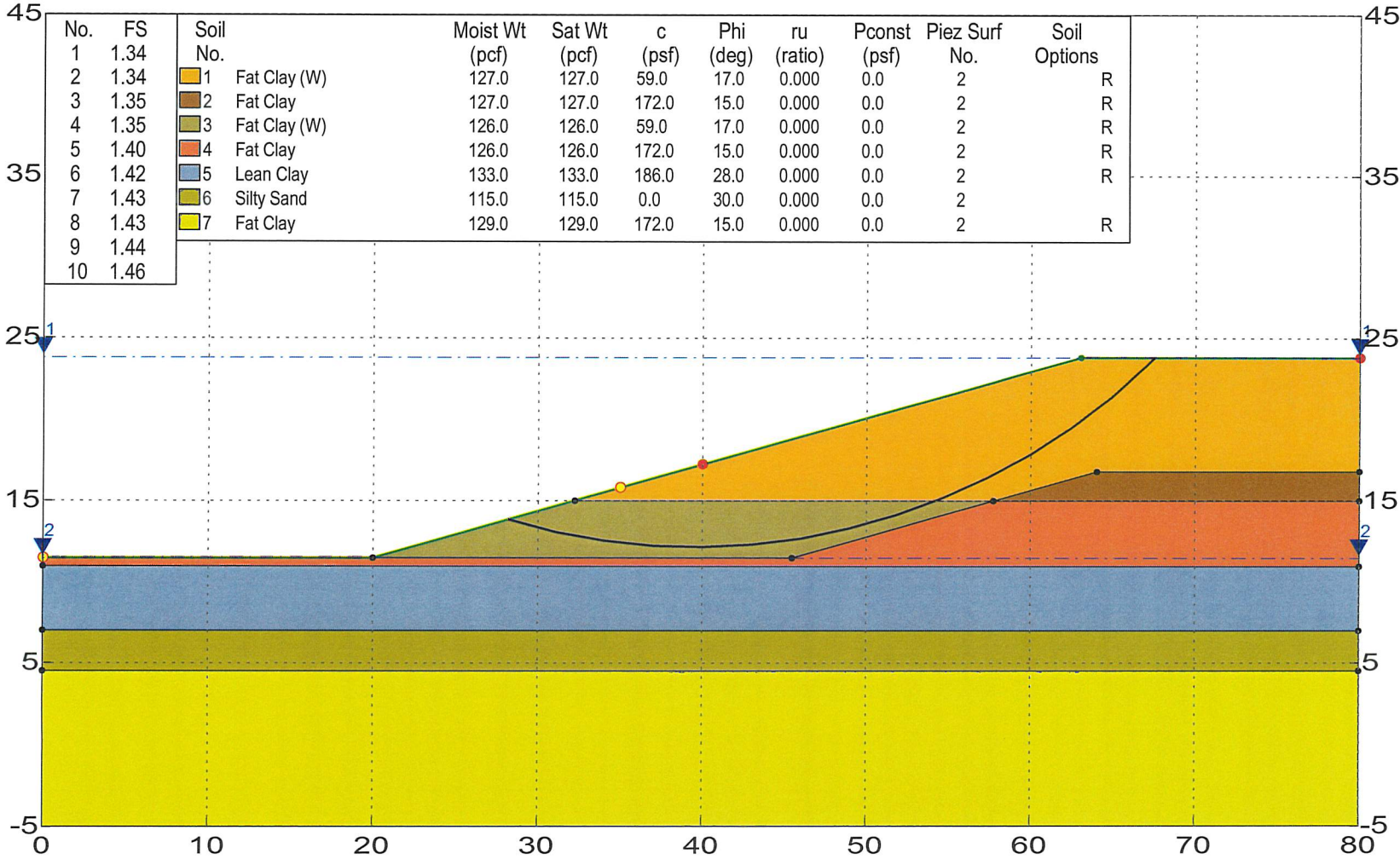
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Forest Bend Detention Pond
Case-3 - Boring GB-3P - 3.5(H):1(V) - RD

GEI Job No. 1140258201

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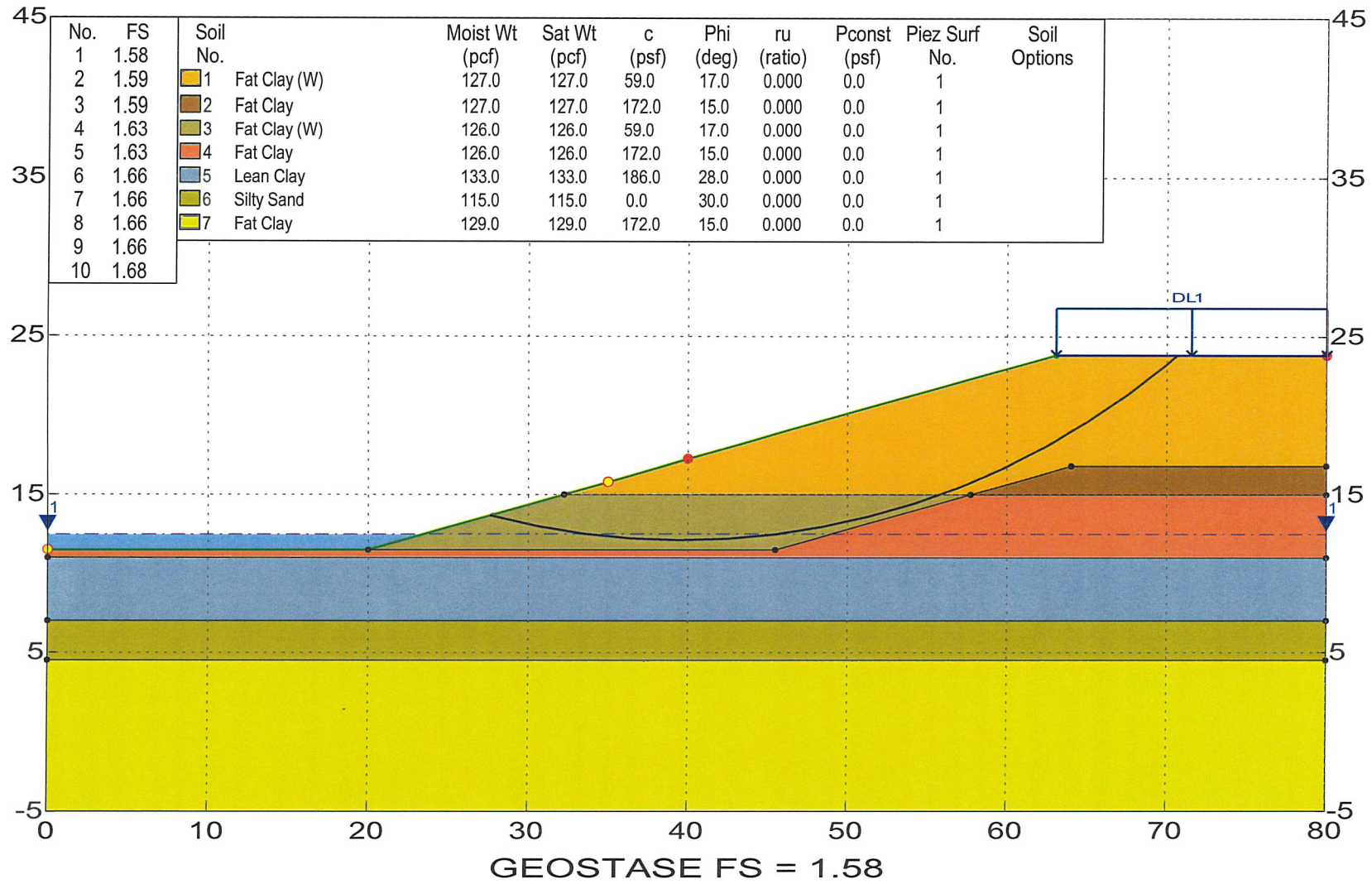


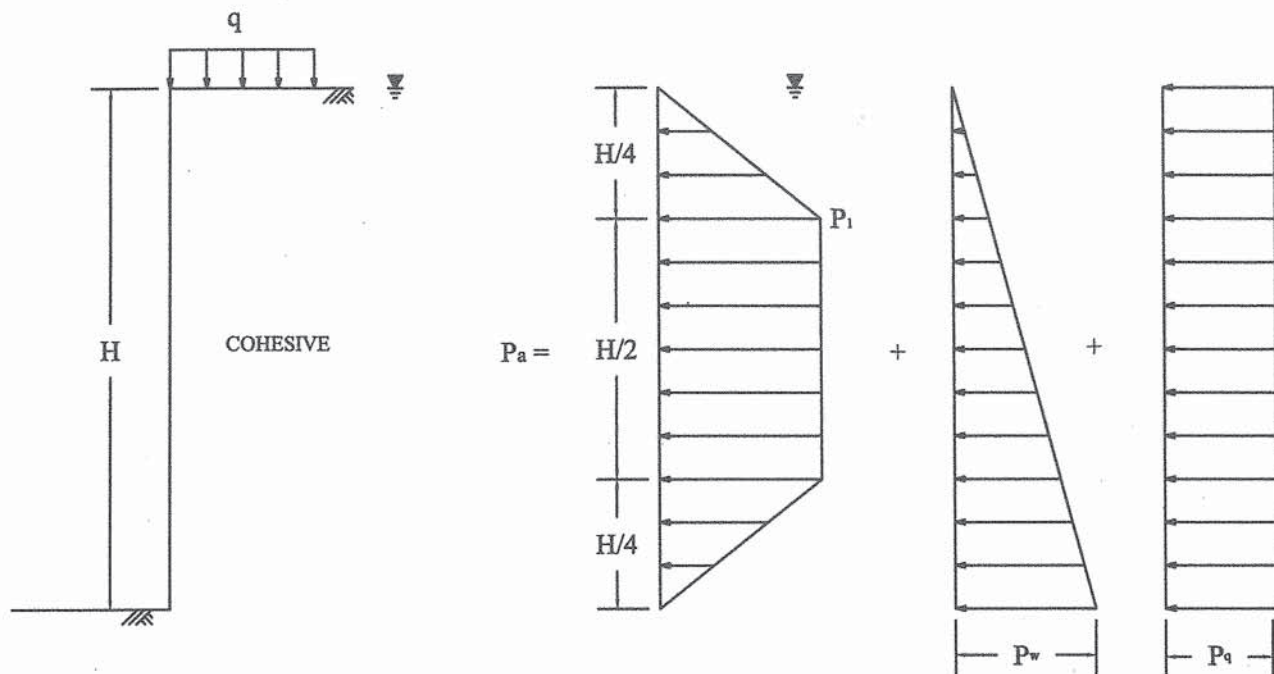
GEOSTASE FS = 1.34
Simplified Bishop Method

Forest Bend Detention Pond Case-3 - Boring GB-3P - 3.5(H):1(V) - LT

GEI Job No. 1140258201

\\case3_3.5to1_lt_u.gsd





TYPICAL SOIL PARAMETERS

See Table 3 for typical values of soil parameters

BRACED WALL

For $\gamma H/c \leq 4$

$$P_1 = 0.3 \gamma'_c H$$

$$P_w = \gamma_w H = 62.4 H$$

$$P_q = 0.5 q$$

Where:

γ'_c = Submerged unit weight of cohesive soil, pcf;

γ_w = Unit weight of water, pcf;

q = Surcharge load at surface, psf;

P_a = Lateral pressure, psf;

P_1 = Active earth pressure, psf;

P_q = Horizontal pressure due to surcharge, psf;

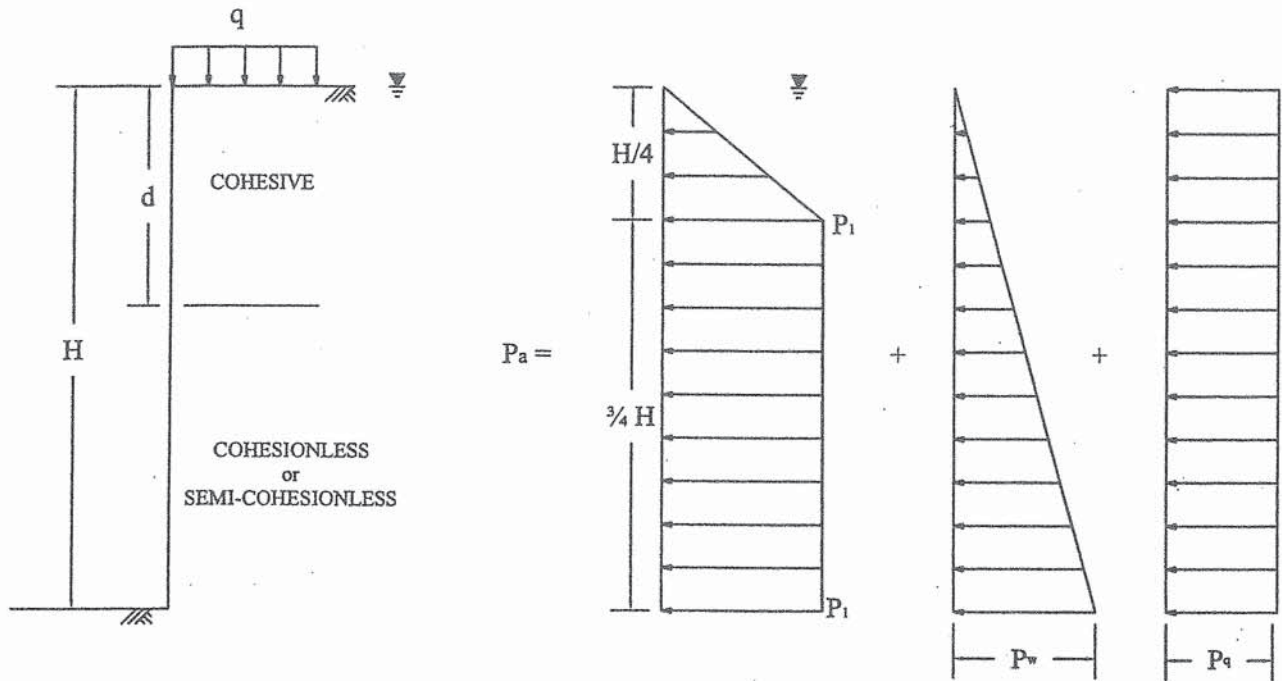
P_w = Hydrostatic pressure due to groundwater, psf;

H = Depth of braced excavation, feet

c = Shear strength of cohesion soil, psf;

EXCAVATION SUPPORT EARTH PRESSURE

SUBMERGED COHESIVE SOIL



TYPICAL SOIL PARAMETERS

See Table 3 for typical values of soil parameters

$$\gamma'_{avg} = \frac{\gamma'_c d + \gamma'_s (H-d)}{H}$$

BRACED WALL

$$\begin{aligned} P_1 &= 0.3 \gamma'_{avg} H \\ P_w &= 62.4 H \\ P_q &= 0.5 q \end{aligned}$$

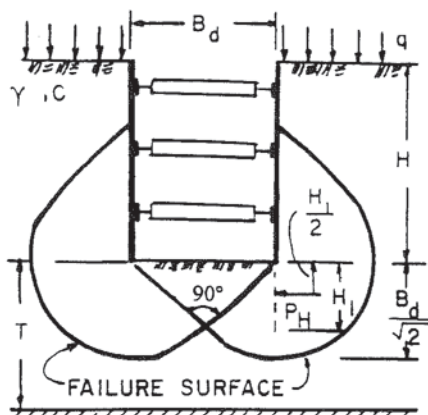
Where:

- γ'_c = Submerged unit weight of cohesive soil, pcf;
- γ'_s = Submerged unit weight of cohesionless soil, pcf;
- γ'_{avg} = Average submerged unit weight of soils, pcf;
- q = Surcharge load at surface, psf;
- P_a = Lateral pressure, psf;
- P_1 = Active earth pressure, psf;
- P_q = Horizontal pressure due to surcharge, psf;
- P_w = Hydrostatic pressure due to groundwater, psf;
- H = Depth of braced excavation, feet

EXCAVATION SUPPORT EARTH PRESSURE

SUBMERGED COHESIVE SOIL OVER
COHESIONLESS OR SEMI-COHESIONLESS SOIL

CUT IN COHESIVE SOIL,
DEPTH OF COHESIVE SOIL UNLIMITED ($T > 0.7 B_d$)
 L = LENGTH OF CUT



If sheeting terminates at base of cut:

$$\text{Safety factor, } F_s = \frac{N_c C}{\gamma H + q}$$

N_c = Bearing capacity factor, which depends on dimensions of the excavation : B_d , L and H (use N_c from graph below)

C = Undrained shear strength of clay in failure zone beneath and surrounding base of cut

γ = Unit weight of soil (see Table 3)

q = Surface surcharge (assumed $q = 500$ psf)

If safety factor is less than 1.5, sheeting or soldier piles must be carried below the base of cut to insure stability - (see note)

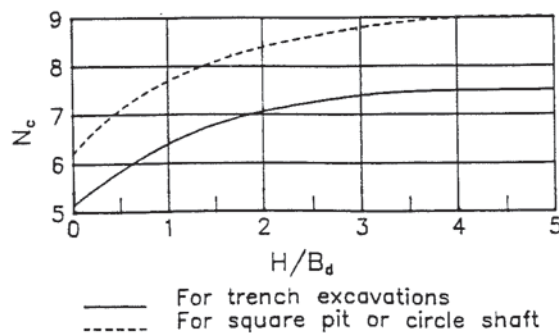
$$H_1 = \text{Buried length} = \frac{B_d}{2} \geq 5 \text{ feet}$$

Note : If soldier piles are used, the center to center spacing should not exceed 3 times the width or diameter of soldier pile .

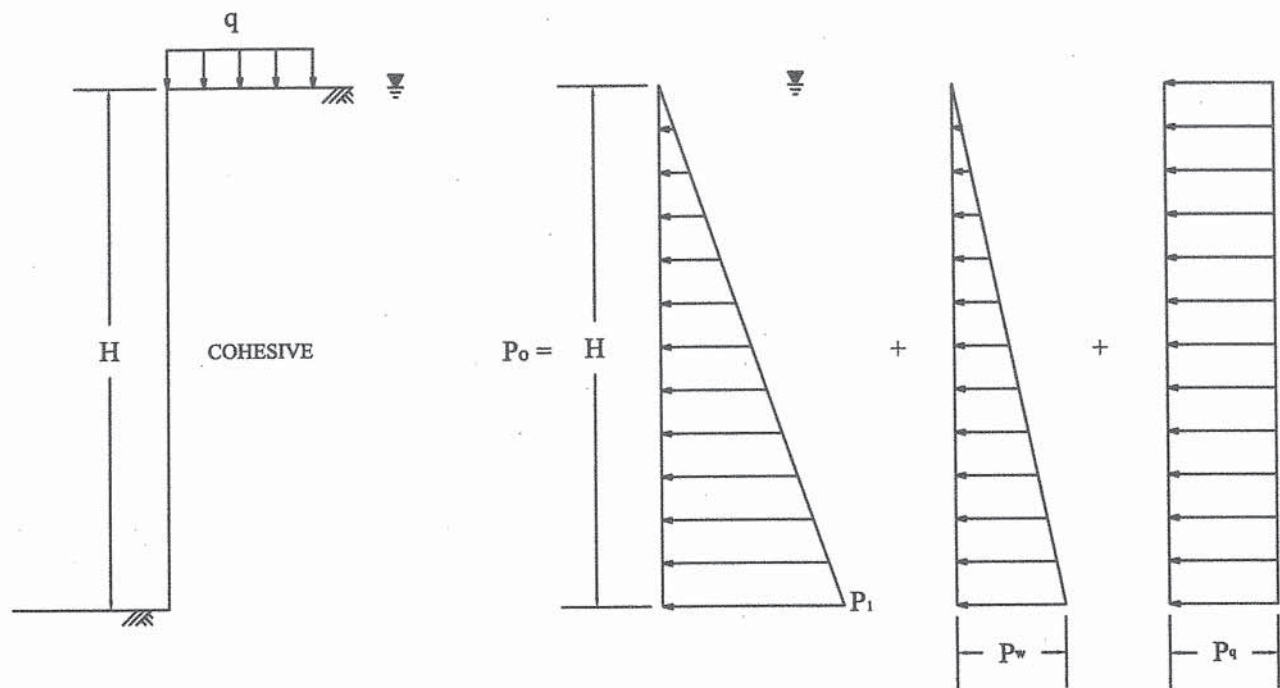
Force on buried length, P_H :

$$\text{If } H_1 > \frac{2}{3} \frac{B_d}{\sqrt{2}}, \quad P_H = 0.7 (\gamma H B_d - 1.4 C H - \pi C B_d) \text{ in lbs/ linear foot}$$

$$\text{If } H_1 < \frac{2}{3} \frac{B_d}{\sqrt{2}}, \quad P_H = 1.5 H_1 \left(\gamma H - \frac{1.4 C H}{B_d} - \pi C \right) \text{ in lbs/ linear foot}$$



STABILITY OF BOTTOM
FOR
BRACED CUT



TYPICAL SOIL PARAMETERS

See Table 3 for typical values of soil parameters

$$K_{oc} = 1.0$$

PERMANENT WALL

$$P_1 = K_{oc} \gamma_c' H$$

$$P_w = \gamma_w H = 62.4 H$$

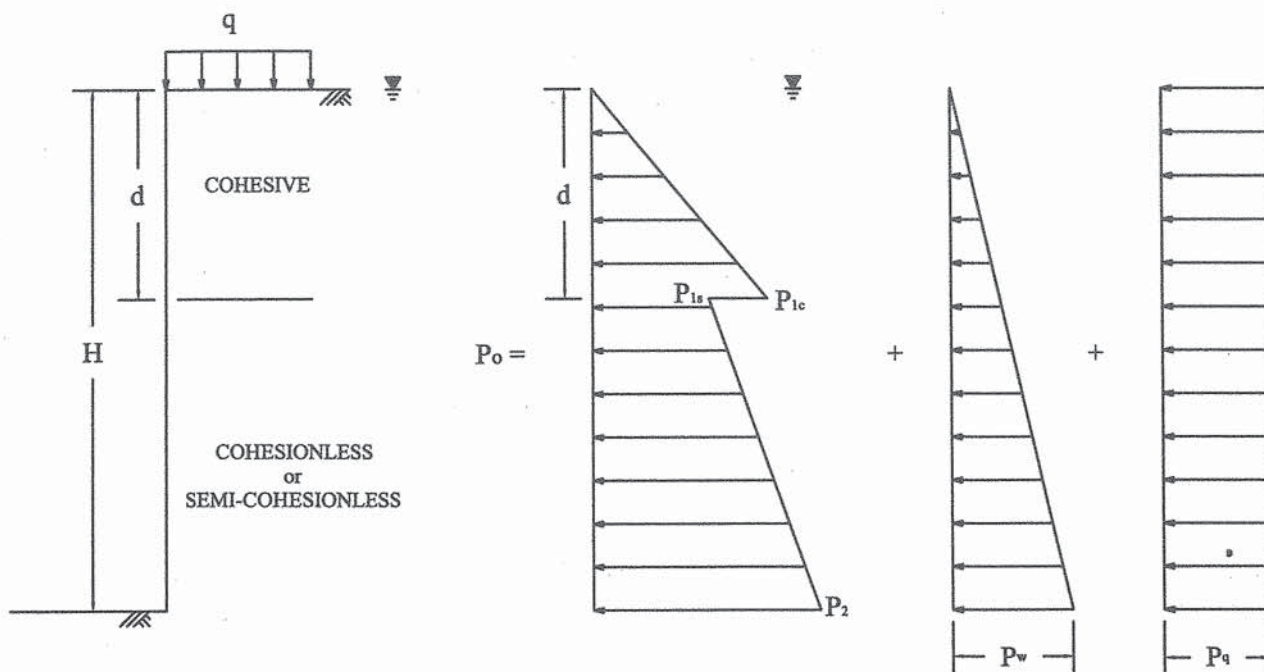
$$P_q = 0.5 q$$

Where:

- γ_c' = Submerged unit weight of cohesive soil, pcf;
- K_{oc} = Coefficient of at-rest earth pressure in cohesive soil;
- γ_w = Unit weight of water, pcf;
- q = Surcharge load at surface, psf;
- P_0 = Lateral pressure, psf;
- P_1 = At-rest earth pressure, psf;
- P_q = Horizontal pressure due to surcharge, psf;
- P_w = Hydrostatic pressure due to groundwater, psf;
- H = Depth of excavation, feet

LATERAL EARTH PRESSURE DIAGRAM FOR PERMANENT WALL

SUBMERGED COHESIVE SOIL



TYPICAL SOIL PARAMETERS

See Table 3 for typical values of soil parameters

$$K_{oc} = 1.0$$

$$K_{os} = 1 - \sin \phi_s$$

PERMANENT WALL

$$P_{1c} = \gamma'_c d K_{oc}$$

$$P_{1s} = \gamma'_c d K_{os}$$

$$P_2 = [\gamma'_c d + \gamma'_s (H-d)] K_{os}$$

$$P_w = \gamma_w H = 62.4 H$$

$$P_q = 0.5 q$$

Where:

- γ'_c = Submerged unit weight of cohesive soil, pcf;
- γ'_s = Submerged unit weight of cohesionless or semi-cohesionless soil, pcf;
- ϕ_s = Internal friction angle of cohesionless or semi-cohesionless soil, degree;
- K_{oc} = Coefficient of at-rest earth pressure in cohesive soil;
- K_{os} = Coefficient of at-rest earth pressure in cohesionless or semi-cohesionless soil;
- γ_w = Unit weight of water, pcf;
- q = Surcharge load at surface, psf;
- P_o = Lateral pressure, psf;
- P_i, P_{1c}, P_{1s} = At-rest earth pressure, psf; $i = 1, 2$;
- P_q = Horizontal pressure due to surcharge, psf;
- P_w = Hydrostatic pressure due to groundwater, psf;
- H = Height of wall, feet

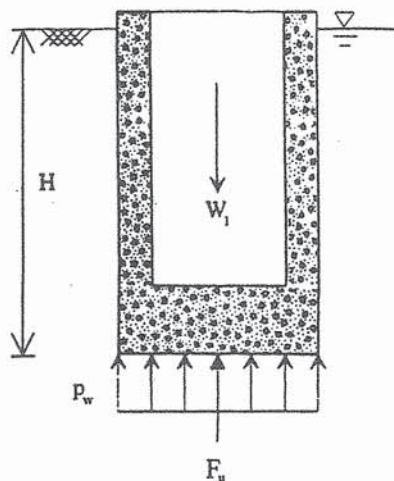
LATERAL EARTH PRESSURE DIAGRAM FOR PERMANENT WALL

SUBMERGED COHESIVE SOIL OVER
COHESIONLESS OR SEMI-COHESIONLESS SOIL

Geotest Engineering, Inc.

FIGURE 7.2

(a) DEAD WEIGHT OF STRUCTURE



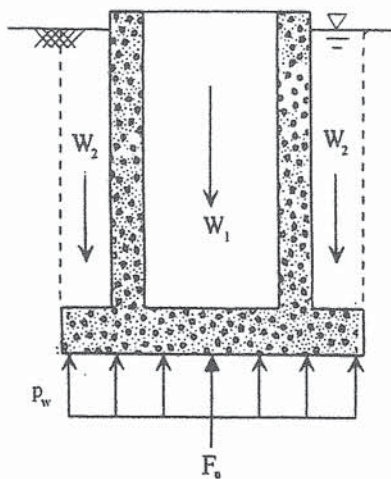
$$p_w = H\gamma_w$$

$$F_u = A_b p_w$$

$$\frac{W_1}{S_{f_1}} = F_u$$

See Table 3 for typical values of soil parameters

(b) WEIGHT OF SOIL ABOVE BASE EXTENSION PLUS DEAD WEIGHT OF STRUCTURE

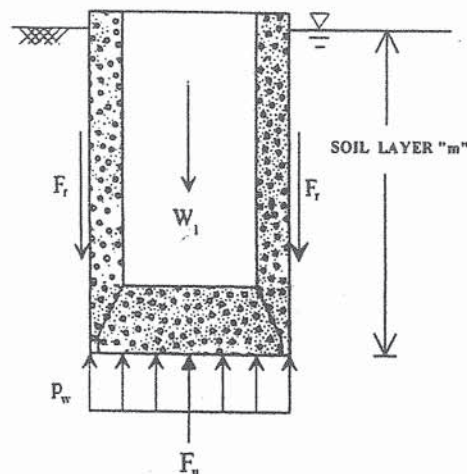


$$p_w = H\gamma_w$$

$$F_u = A_b p_w$$

$$\frac{W_1 + W_2}{S_{f_2}} = F_u$$

(c) SOIL-WALL FRICTION PLUS DEAD WEIGHT OF STRUCTURE



$$p_w = H\gamma_w$$

$$F_u = A_b p_w$$

$$\frac{W_1 + F_r}{S_{f_1} S_{f_3}} = F_u$$

Predominantly Cohesive Soils, $F_r = \alpha c_m A_m$

Predominantly Cohesionless Soils, $F_r = p_m A_m K \tan \delta_m$

Where:	A_b	=	area of base, sq. ft.
	A_m	=	cylindrical surface area of layer "m", sq. ft.
	c_m	=	undrained cohesion of soil layer "m", psf.
	F_u	=	hydrostatic uplift force, lbs.
	F_r	=	frictional resistance, lbs.
	H	=	height of buried structure, ft.
	K	=	coefficient of lateral pressure = 0.5.
	p_m	=	average overburden pressure for layer "m," psf.
	p_w	=	hydrostatic uplift pressure, psf.
	$S_{f_1, 2, 3}$	=	factor of safety.
	W_1	=	dead weight of concrete structure, lbs.
	W_2	=	weight of backfill above base extension, lbs.
	α	=	cohesion reduction factor = 0.5.
	δ_m	=	friction angle between soil layer "m" and concrete wall, degrees = $0.75 \phi_m$
	ϕ_m	=	internal angle of friction of soil layer "m", degrees.
	γ_w	=	unit weight of water = 62.4 pcf.

UPLIFT PRESSURE AND RESISTANCE

TABLES

	<u>Table</u>
Summary of Boring Information	1
Summary of Soil Parameters used for Slope Stability Analyses	2.1 thru 2.3
Geotechnical Design Parameter Summary – Open-Cut Excavation	3

TABLE 1

SUMMARY OF BORING INFORMATION

Boring No.	Northing⁽¹⁾ (ft)	Easting⁽¹⁾ (ft)	Surface ⁽¹⁾ Elevation (ft)	Depth (ft)
GB-1P	13756395.60	3183696.39	17.36	35
GB-2	13756669.98	3183948.38	20.18	35
GB-3P	13757145.50	3184414.59	21.09	35
GB-4	13756836.10	3184558.77	22.21	35
GB-5	13756631.34	3184229.39	22.56	35
GB-6	13756440.50	3184000.96	21.58	35

Note: The survey information was provided by RPS Infrastructure, Inc.

1) Coordinates and distances are US survey feet displayed in GRID values using a surface adjustment factor of 1.00013.

2) Horizontal control is based on the Texas State Plane Coordinate System, NAD83(2011). South Central Zone (4204).

3) All elevations are based on GPS derived ellipsoid heights utilizing NAVD 88. GEOVD 99p

TABLE 2.1

**SUMMARY OF SOIL PARAMETERS FOR SLOPE STABILITY ANALYSES
CASE-1 - BASED ON BORING GB-4**

Layer No.	Elevation (ft)	Layer (depth, ft)	Material Description	Wet Density (pcf)	Shear Strength											
					End of Construction		Rapid Drawdown						Long Term			
					Cohesion (psf) = c_{uu}	Friction Angle (deg) = ϕ_{uu}	Total		Effective		Weathered		Effective		Weathered	
							c_{cu}	ϕ_{cu}	c'	ϕ'	c'_w	ϕ'_w	c'	ϕ'	c'_w	ϕ'_w
1	22~12	0-10	Fat Clay	127	1,200	--	227	8	172	15	59	17	172	15	59	17
2	12~4	10-18	Fat Clay with Sand	127	1,200	--	209	20	186	28	186	20	186	28	186	20
3	4~3	18-25	Fat Clay with Sand	132	2,500	--	209	20	186	28	--	--	186	28	--	--
4	-3~-11	25-33	Fat Clay	132	1,300	--	209	20	186	28	--	--	186	28	--	--
5	-11~-13	33-35	Silty Sand	120	--	32	--	--	--	32	--	--	--	32	--	--

Where c_{uu} : Unconsolidated-Undrained Cohesion
 ϕ_{uu} : Unconsolidated-Undrained Friction Angle
 c' : Effective Stress Cohesion
 ϕ' : Effective Stress Friction Angle
 c'_w : Weathered Effective Stress Cohesion
 ϕ'_w : Weathered Effective Stress Friction Angle
 c_{cu} : Total Stress Cohesion
 ϕ_{cu} : Total Stress Friction Angle

Note: For rapid drawdown and long-term conditions, weathered effective stress parameters were used within 7-foot zone below top of the bank, slope surface and bottom of slope wherever is applicable within each layer.

TABLE 2.2

**SUMMARY OF SOIL PARAMETERS FOR SLOPE STABILITY ANALYSES
CASE-2 - BASED ON BORINGS GB-1P, GB-2, GB-5 AND GB-6**

Layer No.	Elevation (ft)	Layer (depth, ft)	Material Description	Wet Density (pcf)	Shear Strength											
					End of Construction		Rapid Drawdown						Long Term			
					Cohesion (psf) = c_{uu}	Friction Angle (deg) = ϕ_{uu}	Total		Effective		Weathered		Effective		Weathered	
c_{cu}	ϕ_{cu}	c'	ϕ'	c'_w			ϕ'_w	c'	ϕ'	c'_w	ϕ'_w					
1	21.5~16.5	0-5	Fat Clay	124	900	--	227	8	172	15	59	17	172	15	59	17
2	16.5~13.5	5-8	Fat Clay	124	1000	--	227	8	172	15	59	17	172	15	59	17
3	13.5~11.5	8-10	Lean Clay	135	1,000	--	209	20	186	28	186	20	186	28	186	20
4	11.5~7.5	10-14	Sandy Silt	110	--	27	--	27	--	27	--	--	--	27	--	--
5	7.5~4.5	14-17	Silty Sand	115	--	30	--	30	--	30	--	--	--	30	--	--
6	4.5~-5.5	17-27	Fat Clay	133	1,800	--	227	8	172	15	--	--	172	15	--	--
7	-5.5~-10.5	27-32	Fat Clay	135	3,000	--	227	8	172	15	--	--	172	15	--	--
8	-10.5~-15.5	32-37	Silty Sand	115	--	30	--	30	--	30	--	--	--	30	--	--

Where

- c_{uu} : Unconsolidated-Undrained Cohesion
- ϕ_{uu} : Unconsolidated-Undrained Friction Angle
- c' : Effective Stress Cohesion
- ϕ' : Effective Stress Friction Angle
- c'_w : Weathered Effective Stress Cohesion
- ϕ'_w : Weathered Effective Stress Friction Angle
- c_{cu} : Total Stress Cohesion
- ϕ_{cu} : Total Stress Friction Angle

Note: For rapid drawdown and long-term conditions, weathered effective stress parameters were used within 7-foot zone below top of the bank, slope surface and bottom of slope wherever is applicable within each layer.

TABLE 2.3

**SUMMARY OF SOIL PARAMETERS FOR SLOPE STABILITY ANALYSES
CASE-3 - BASED ON BORING GB-3P**

Layer No.	Elevation (ft)	Layer (depth, ft)	Material Description	Wet Density (pcf)	Shear Strength											
					End of Construction		Rapid Drawdown						Long Term			
					Cohesion (psf) = c_{uu}	Friction Angle (deg) = ϕ_{uu}	Total		Effective		Weathered		Effective		Weathered	
							c_{cu}	ϕ_{cu}	c'	ϕ'	c'_w	ϕ'_w	c'	ϕ'	c'_w	ϕ'_w
1	21.0~15.0	0-6	Fat Clay	127	1,500	--	227	8	172	15	59	17	172	15	59	17
2	15.0~11.0	6-10	Fat Clay	126	2,000	--	227	8	172	15	59	17	172	15	59	17
3	11.0~7.0	10-14	Lean Clay	133	1,200	--	209	20	186	28	186	20	186	28	186	20
4	7.0~4.5	14-16.5	Silty Sand	115	--	30	--	30	--	30	--	--	--	30	--	--
5	4.5~-7.0	16.5-28	Fat Clay	129	2,800	--	227	8	172	15	--	--	172	15	--	--
6	-7.0~-12.0	28-33	Sandy Lean Clay	130	1,500	--	209	20	186	28	--	--	186	28	--	--
7	-12.0~-15.5	33-36.5	Silty Sand	120	--	32	--	32	--	32	--	--	--	32	--	--

Where c_{uu} : Unconsolidated-Undrained Cohesion
 ϕ_{uu} : Unconsolidated-Undrained Friction Angle
 c' : Effective Stress Cohesion
 ϕ' : Effective Stress Friction Angle
 c'_w : Weathered Effective Stress Cohesion
 ϕ'_w : Weathered Effective Stress Friction Angle
 c_{cu} : Total Stress Cohesion
 ϕ_{cu} : Total Stress Friction Angle

Note: For rapid drawdown and long-term conditions, weathered effective stress parameters were used within 7-foot zone below top of the bank, slope surface and bottom of slope wherever is applicable within each layer.

TABLE 3
GEOTECHNICAL DESIGN PARAMETER SUMMARY
OPEN-CUT EXCAVATION

Boring No.	Stratigraphic Unit	Range of Depths, ft	Wet Unit Weight, γ, pcf	Submerged Unit Weight, γ', pcf	Undrained Cohesion, psf	Internal Friction Angle, ϕ, degree
GB-1	Cohesive	0-4	135	73	3,000	--
		4-6	135	73	2,000	--
	Cohesionless	6-10	110	55	--	27
	Cohesive	10-23	133	71	2,000	--
	Cohesionless	23-33	115	58	--	30
	Cohesive	33-35	135	73	2,500	--
GB-2 and GB-6	Cohesive	0-10	127	65	1,000	--
	Cohesionless	10-16.5	115	58	--	29
	Cohesive	16.5-27	127	65	1,800	--
	Cohesionless	27-35	120	60	--	32
GB-3P and GB-5	Cohesive	0-6	124	62	900	--
		6-8	124	62	2,000	--
		8-12	132	70	1,000	--
	Cohesionless	12-18	120	60	--	29
	Cohesive	18-28	135	73	2,800	--
		28-33	135	73	1,500	--
	Cohesionless	33-35	120	60	--	32
GB-4	Cohesive	0-18	127	65	1,200	--
		18-25	132	70	2,500	--
		25-33	132	70	1,300	--
	Cohesionless	33-35	120	60	--	32

Notes: Cohesive soils include fat clay, fat clay with sand, lean clay and sandy lean clay.
Cohesionless soils include silty sand and sandy silt.

APPENDIX A

	<u>Figure</u>
Logs of Borings	A-1 thru A-6
Terms Used on Boring Logs	A-7
Classification of Soils for Engineering Purposes.....	A-8
Piezometer Installation Reports.....	A-9 and A-10



GEOTEST ENGINEERING, INC.
Houston, Texas

LOG OF BORING GB-1P

PAGE 1 OF 1

DATE: 10-16-20
SURFACE ELEVATION: 17.36 ft.

PROJECT: Forest Bend Detention Pond
City of Friendswood, Texas

PROJECT NO.: 1140258201

BORING TYPE: DRY AUGER / WET ROTARY

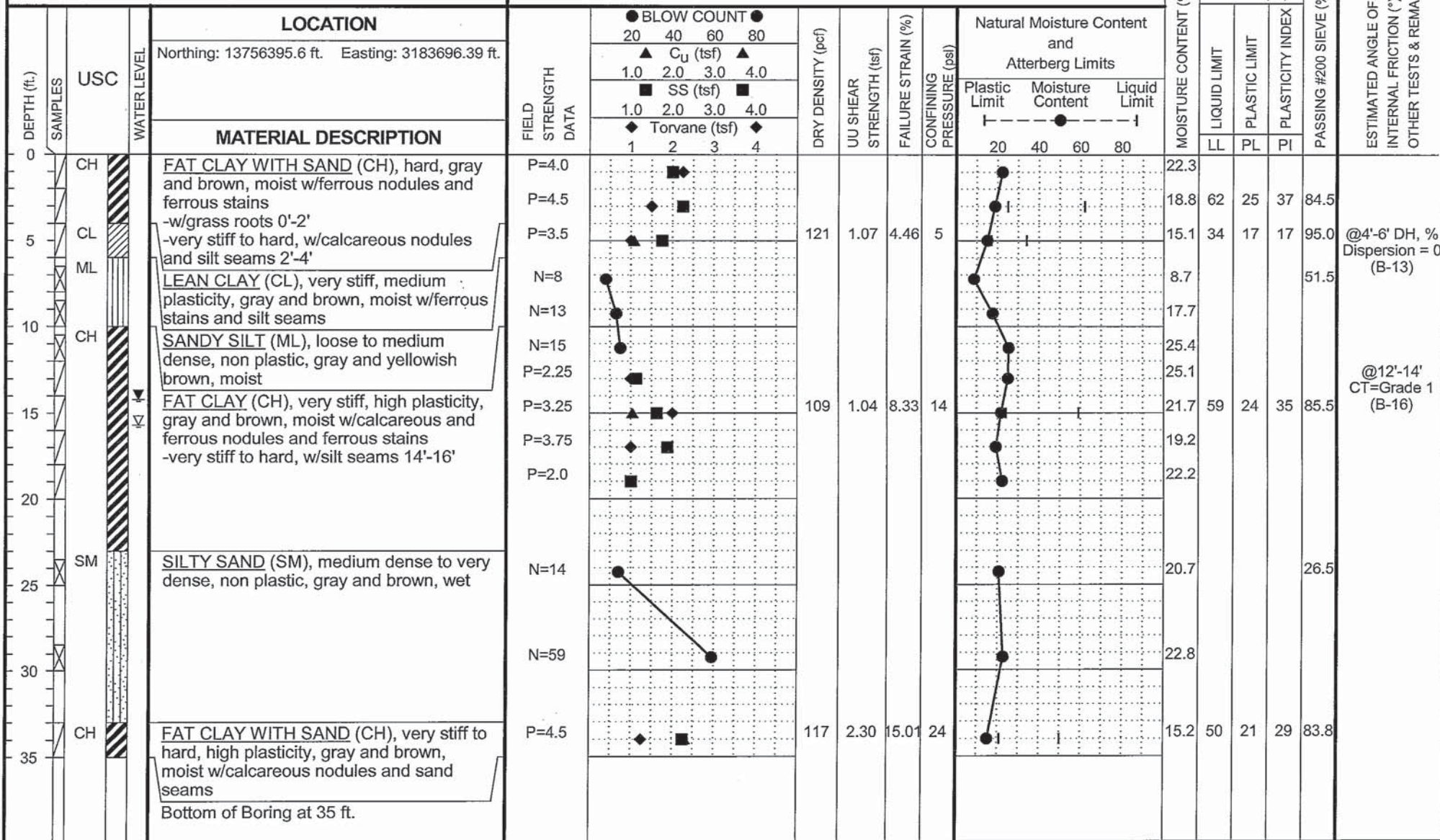


FIGURE A - 1

Water Level Est.: ☒ Measured: ☒ Perched: ☒
Water Observations: Free water first encountered at 25.0 ft. and after 20 min. at 15.7 ft. during drilling. Water depth at 14.2 ft., hole open to 35.0 ft. on 11-20-20.
Sample Key: ☒ SPT ☒ Shelby Tube ☒ Disturbed

Key to Abbreviations:
N - SPT Data (Blows/Ft)
P - Pocket Penetrometer (tsf)
T - Torvane (tsf)
C_u - Undrained Cohesion (tsf)
SS - Shear Strength (P/2, tsf)

Notes:
Dry Auger 0'-25', Wet Rotary 25'-35', CT=Crumb Test (Figure Number),
DH=Double Hydrometer (Figure Number)



GEOTEST ENGINEERING, INC.
Houston, Texas

PROJECT: Forest Bend Detention Pond
City of Friendswood, Texas

PROJECT NO.: 1140258201

BORING TYPE: DRY AUGER / WET ROTARY

LOG OF BORING GB-2

PAGE 1 OF 1

DATE: 10-19-20
SURFACE ELEVATION: 20.18 ft.

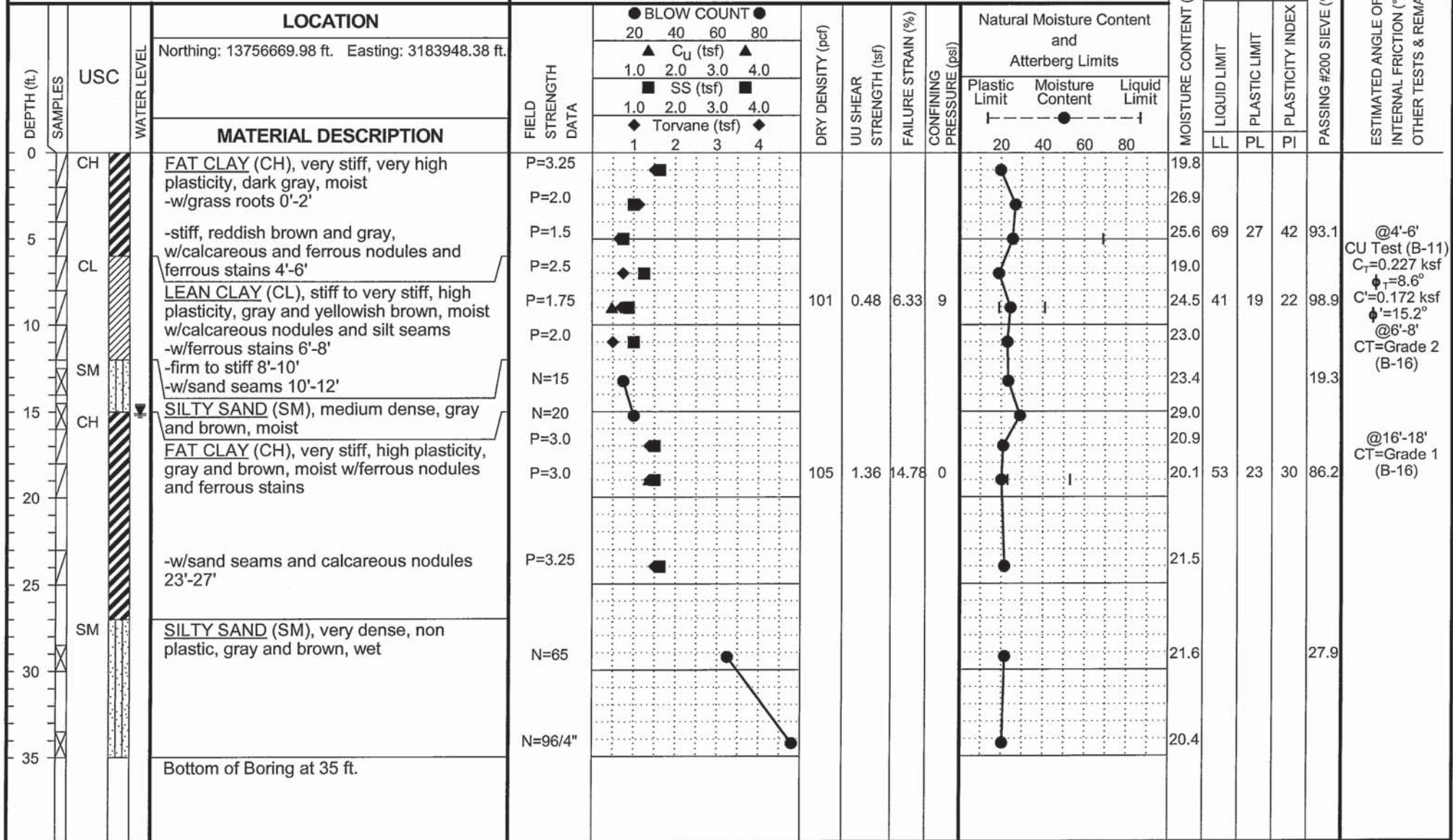


FIGURE A-2

Water Level Est.: ☒ Measured: ☒ Perched: ☒
Water Observations: Free water first encountered at 16.0 ft. and after 20 min. at 15.1 ft. during drilling. Water depth at 15.2 ft., hole open to 16.6 ft. on 10-20-20.
Sample Key: ☒ SPT ☒ Shelby Tube ☒ Disturbed

Key to Abbreviations:
N - SPT Data (Blows/Ft)
P - Pocket Penetrometer (tsf)
T - Torvane (tsf)
C_u - Undrained Cohesion (tsf)
SS - Shear Strength (P/2, tsf)

Notes:
Dry Auger 0'-16', Wet Rotary 16'-35', CT=Crumb Test (Figure Number), CU Test=Consolidated Undrained Triaxial Test (Figure Number)



GEOTEST ENGINEERING, INC.
Houston, Texas

LOG OF BORING GB-3P

PAGE 1 OF 1

DATE: 10-15-20
SURFACE ELEVATION: 21.09 ft.

PROJECT: Forest Bend Detention Pond
City of Friendswood, Texas

PROJECT NO.: 1140258201

BORING TYPE: DRY AUGER / WET ROTARY

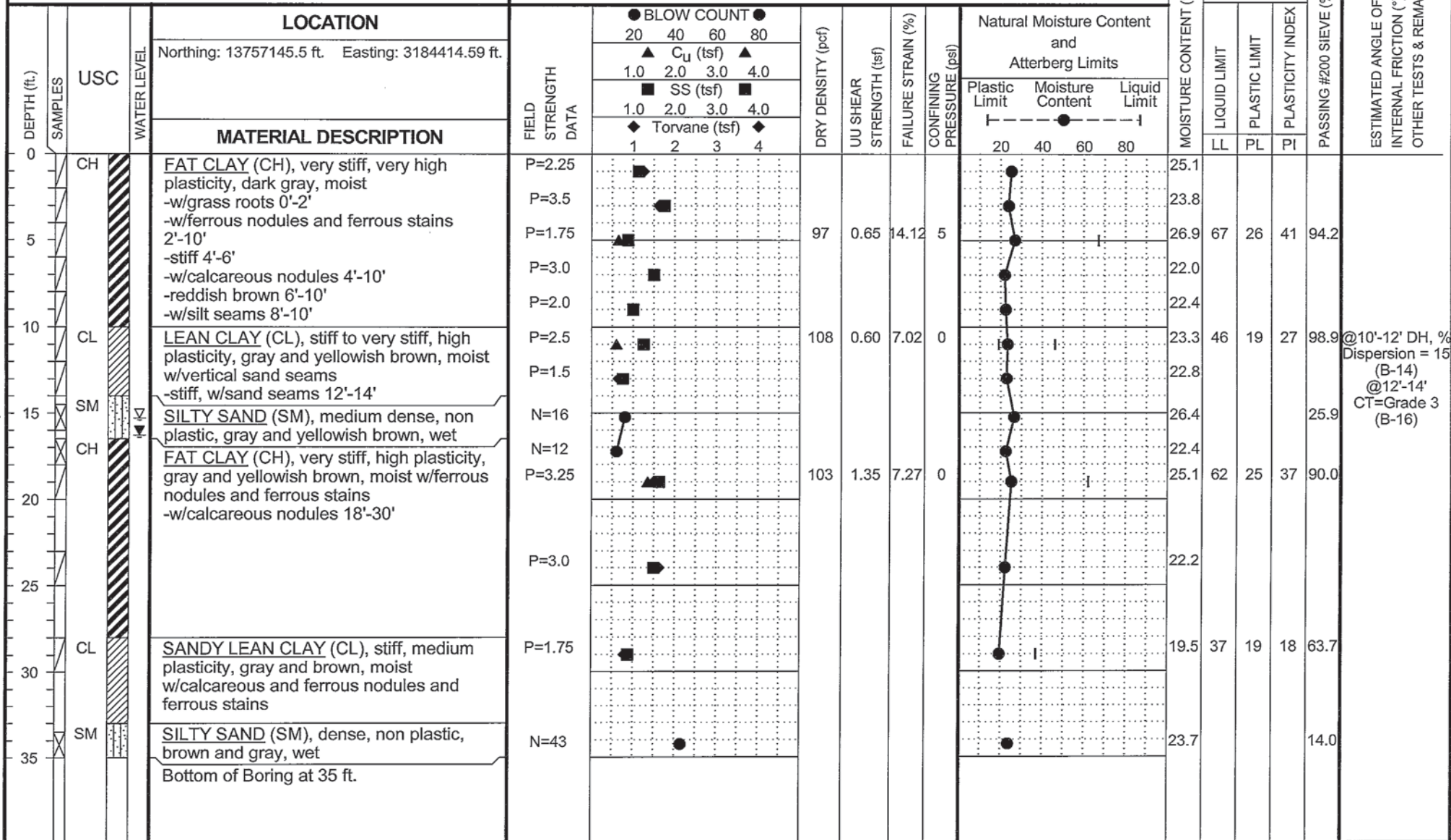


FIGURE A-3

Water Level Est.: ▽ Measured: ▼ Perched: ▼
 Water Observations: Free water first encountered at 18.0 ft. and after 20 min. at 15.3 ft. during drilling. Water depth at 16.3 ft., hole open to 35.0 ft. on 11-20-20.
 Sample Key: ☒ SPT ☒ Shelby Tube ☒ Disturbed



GEOTEST ENGINEERING, INC.

Houston, Texas

LOG OF BORING GB-4

PAGE 1 OF 1

DATE 10-15-20

SURFACE ELEVATION 22.21 ft.

PROJECT: Forest Bend Detention Pond
City of Friendswood, Texas

PROJECT NO.: 1140258201

BORING TYPE: DRY AUGER / WET ROTARY

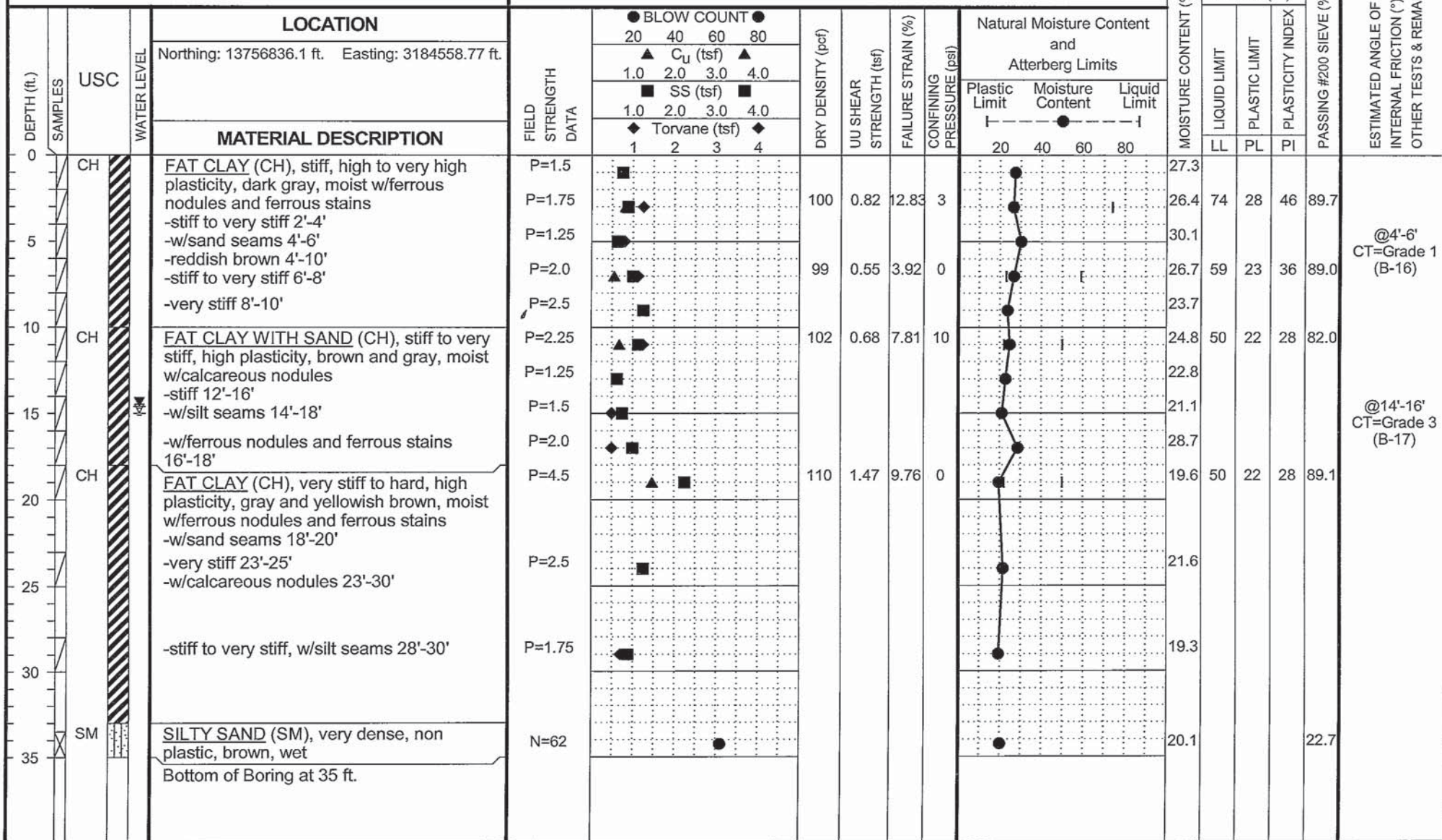


FIGURE A-4

Water Level Est.: ☒ Measured: ☒ Perched: ☒
Water Observations: Free water first encountered at 18.0 ft. and after 20 min. at 15.0 ft. during drilling. Water depth at 14.6 ft., hole open to 29.1 ft. on 10-16-20.
Sample Key: ☒ SPT ☒ Shelby Tube ☒ Disturbed

Key to Abbreviations:
N - SPT Data (Blows/Ft)
P - Pocket Penetrometer (tsf)
T - Torvane (tsf)
C_u - Undrained Cohesion (tsf)
SS - Shear Strength (P/2, tsf)

Notes:
Dry Auger 0'-18', Wet Rotary 18'-35', CT=Crumb Test (Figure Number)



GEOTEST ENGINEERING, INC.
Houston, Texas

LOG OF BORING GB-5

PAGE 1 OF 1

DATE: 10-15-20
SURFACE ELEVATION: 22.56 ft.

PROJECT: Forest Bend Detention Pond
City of Friendswood, Texas

PROJECT NO.: 1140258201

BORING TYPE: DRY AUGER / WET ROTARY

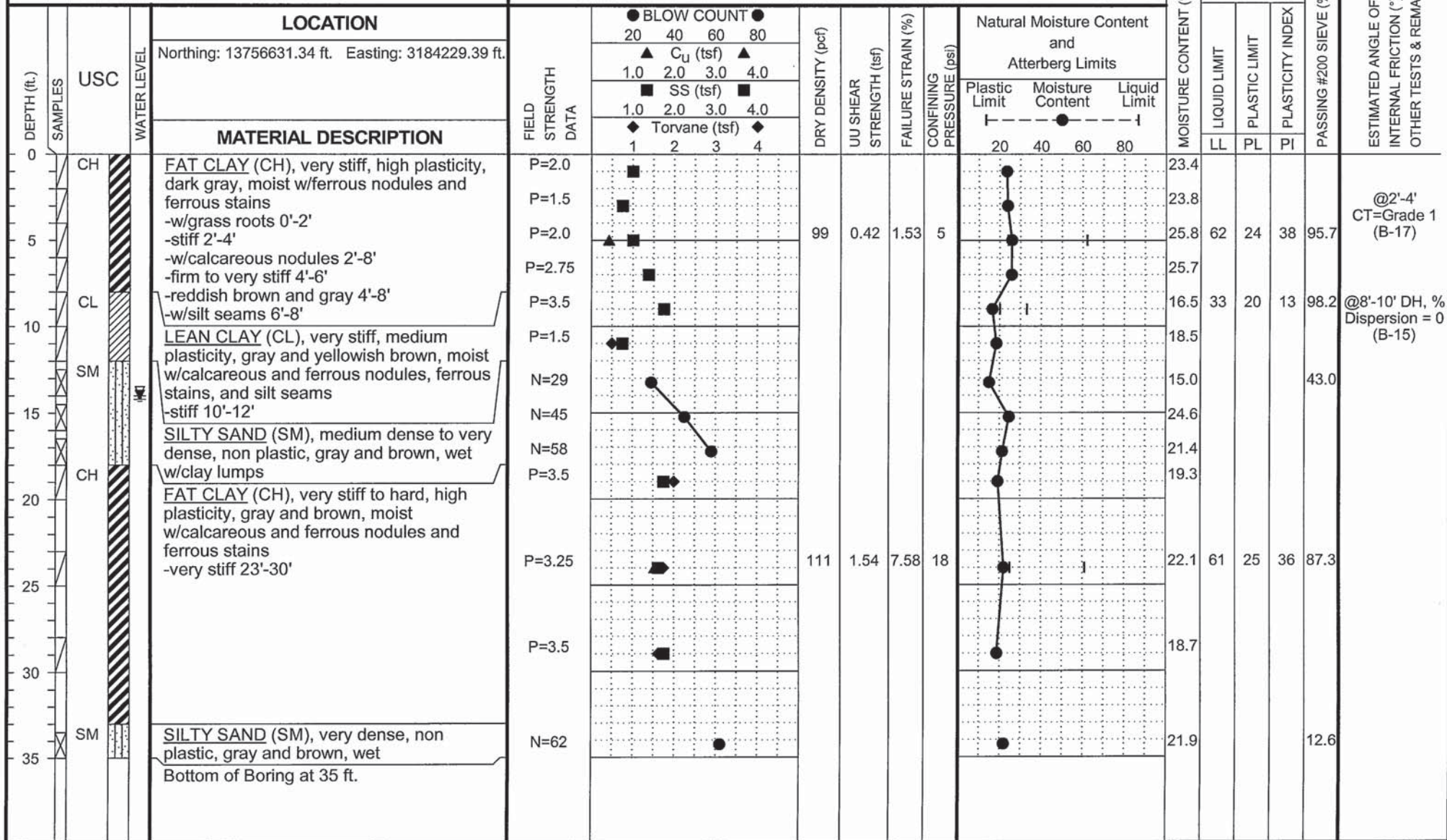


FIGURE A-5

Water Level Est.: ☒ Measured: ☒ Perched: ☒
 Water Observations: Free water first encountered at 18.0 ft. and after 20 min. at 14.0 ft. during drilling. Water depth at 14.2 ft., hole open to 28.5 ft. on 10-16-20.
 Sample Key: ☒ SPT ☒ Shelby Tube ☒ Disturbed



GEOTEST ENGINEERING, INC.
Houston, Texas

LOG OF BORING GB-6

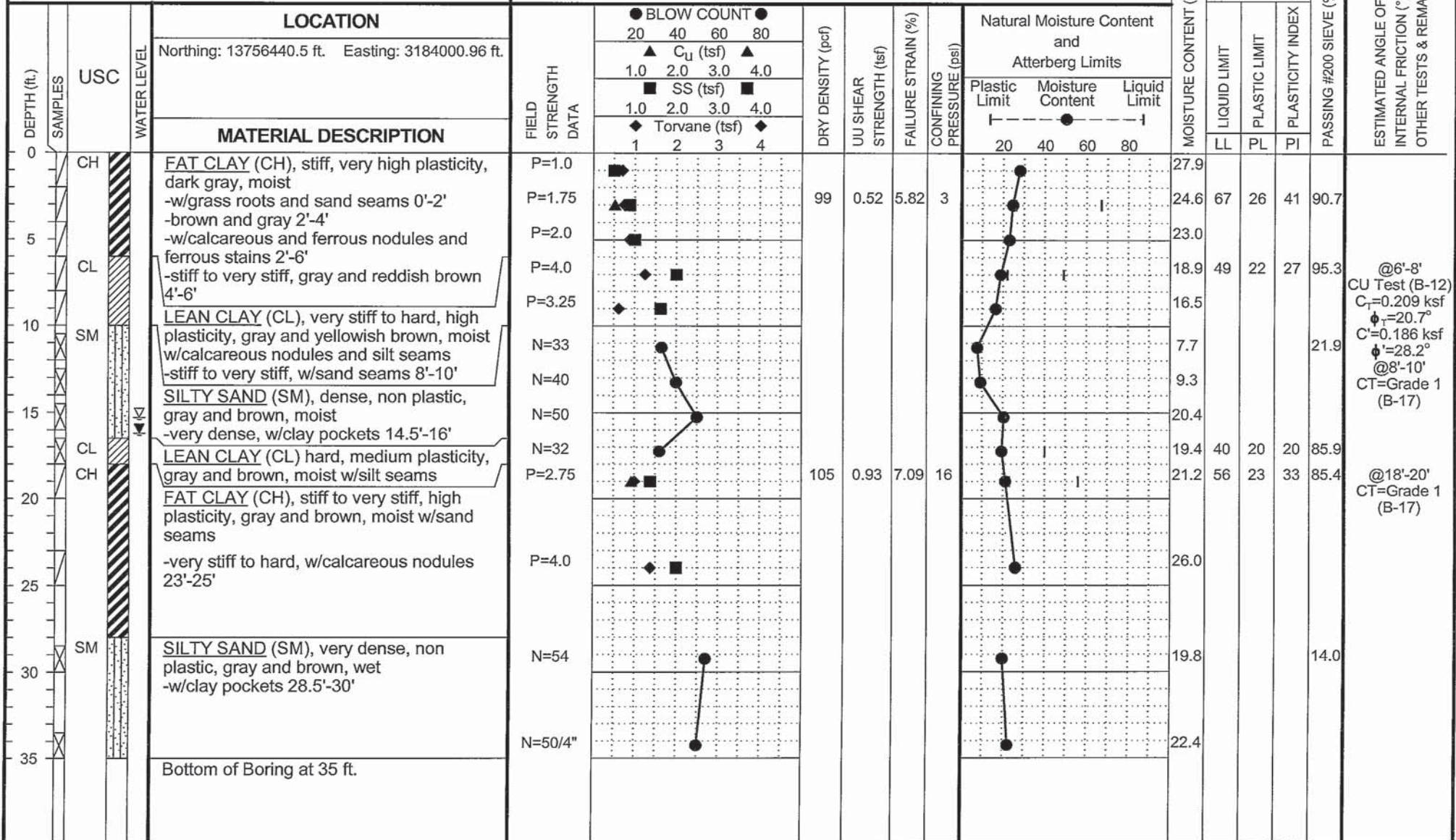
PAGE 1 OF 1

DATE: 10-19-20
SURFACE ELEVATION: 21.58 ft.

PROJECT: Forest Bend Detention Pond
City of Friendswood, Texas

PROJECT NO.: 1140258201

BORING TYPE: DRY AUGER / WET ROTARY



Water Level Est.: ☒ Measured: ☒ Perched: ☒
 Water Observations: Free water first encountered at 17.0 ft. and after 20 min. at 15.3 ft. during drilling. Water depth at 16.2 ft., hole open to 17.1 ft. on 10-20-20.
 Sample Key: ☒ SPT ☒ Shelby Tube ☒ Disturbed

Key to Abbreviations:
 N - SPT Data (Blows/Ft)
 P - Pocket Penetrometer (tsf)
 T - Torvane (tsf)
 C_u - Undrained Cohesion (tsf)
 SS - Shear Strength (P/2, tsf)

Notes:
 Dry Auger 0'-18', Wet Rotary 18'-35', CT=Crumb Test (Figure Number), CU Test=Consolidated Undrained Triaxial Test (Figure Number)

FIGURE A - 6

TERMS USED ON BORING LOGS

SOIL GRAIN SIZE							
U.S. STANDARD SIEVE							
6"	3"	3/4"	#4	#10	#40	#200	
BOULDERS	COBBLES	GRAVEL		SAND			SILT
		COARSE	FINE	COARSE	MEDIUM	FINE	
		152	76.2	19.1	4.76	2.00	0.420
							0.074
							0.002
SOIL GRAIN SIZE IN MILLIMETERS							

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength, Kips per Sq. ft
Very Soft	less than 0.25
Soft	0.25 to 0.50
Firm	0.50 to 1.00
Stiff	1.00 to 2.00
Very Stiff	2.00 to 4.00
Hard	greater than 4.00

RELATIVE DENSITY OF COHESIONLESS
SOILS FROM STANDARD PENETRATION TEST

Very Loose	< 4 bpf
Loose	5-10 bpf
Medium Dense	11-30 bpf
Dense	31-50 bpf
Very Dense	>50 bpf

(bpf = blow per foot, ASTM D 1586)

SPLIT-BARREL SAMPLER DRIVING RECORD

Blows per Foot	Description
25	25 blows driving sampler 12 inches, after initial 6 inches of seating.
50/7"	50 blows driving sampler 7 inches, after initial 6 inches of seating.
Ref/3"	50 blows driving sampler 3 inches during initial 6-inch seating interval

Note: To avoid change to sampling tools, driving is limited to 50 blows during or after seating interval.

DRY STRENGTH ASTM D2488		MOISTURE CONDITION ASTM D2488	
None	Dry Specimen crumbles into powder with mere pressure of handling	Dry	Absence of moisture, dusty, dry to the touch
Low	Dry specimen crumbles into powder with some finger pressure	Moist	Damp but no visible water
Medium	Dry specimen breaks into pieces or crumbles with considerable pressure	Wet	Visible free water
High	Dry specimen cannot be broken with finger pressure, it can be broken between thumb and hard surface		
Very High	Dry Specimen cannot be broken between the thumb and hard surface		

SOIL STRUCTURE

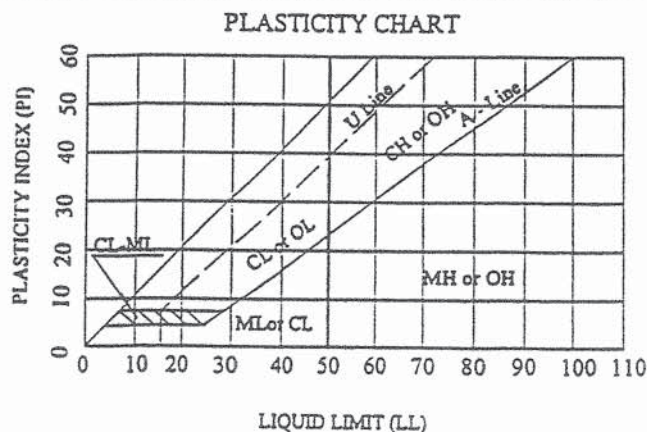
Slickensided	Having planes of weakness that appear slick and glossy. The degree of slickensidedness depends upon the spacing of slickensides and the easiness of breaking along these planes.
Fissured	Containing shrinkage or relief cracks, often filled with fine sand or silt; usually more or less vertical.
Pocket	Inclusion of material of different texture that is smaller than the diameter of the sample.
Parting	Inclusion less than 1/8 inch thick extending through the sample.
Seam	Inclusion 1/8 inch to 3 inches thick extending through the sample.
Layer	Inclusion greater than 3 inches thick extending through the sample.
Laminated	Soil sample composed of alternating partings or seams of different soil types.
Interlayered	Soil sample composed of alternating layers of different soil types.
Intermixed	Soil sample composed of pockets of different soil types and layered or laminated structure is not evident.
Calcareous	Having appreciable quantities of calcium material.

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation D-2487

MAJOR DIVISIONS				GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (Less than 50% of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (less than 5% passes No. 200 sieve)		GW	Well-graded gravel, well-graded gravel with sand
				GP	Poorly graded gravel, poorly graded gravel with sand
		GRAVELS WITH FINES More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart	GM	Silty gravel, silty gravel with sand
			Limits plot above "A" line & hatched zone on plasticity chart	GC	Clayey gravel, clayey gravel with sand.
	SANDS (50% or more of coarse fraction passes No. 4 sieve)	CLEAN SANDS (less than 5% passes No. 200 sieve)		SW	Well-graded sand, well-graded sand with gravel
				SP	Poorly graded sand, poorly graded sand with gravel
		SANDS WITH FINES More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart	SM	Silty sand, silty sand with gravel
			Limits plot above "A" line & hatched zone on plasticity chart	SC	Clayey sand, clayey sand with gravel
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS AND CLAYS (Liquid Limit Less Than 50%)			ML	Silt, silt with sand, silt with gravel, sandy silt, gravelly silt
				CL	Lean clay, lean clay with sand, lean clay with gravel, sandy lean clay, gravelly lean clay
				OL	Organic clay, organic clay with sand, sandy organic clay, organic silt, sandy organic silt
	SILTS AND CLAYS (Liquid Limit 50% or More)			MH	Elastic silt, elastic silt with sand, sandy elastic silt, gravelly elastic silt
				CH	Fat clay, fat clay with sand, fat clay with gravel, sandy fat clay, gravelly fat clay
				OH	Organic clay, organic clay with sand, sandy organic clay organic silt, sandy organic silt

NOTE: Coarse soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone of the plasticity chart are to have dual symbols.



Equation of A-Line Horizontal at $PI=4$ to $LL=25.5$, then $PI=0.73(LL-20)$

Equation of U-Line: Vertical at $LL=16$ to $PI=7$, then $PI=0.9(LL-8)$

DEGREE OF PLASTICITY
OF COHESIVE SOILS

Degree of Plasticity	Plasticity Index
None	0 - 4
Slight	5 - 10
Medium	11 - 20
High	21 - 40
Very High	> 40

SOIL SYMBOLS

	Fill		Sand
	Clay (CH)		Silt
	Clay (CL)		

PIEZOMETER INSTALLATION REPORT

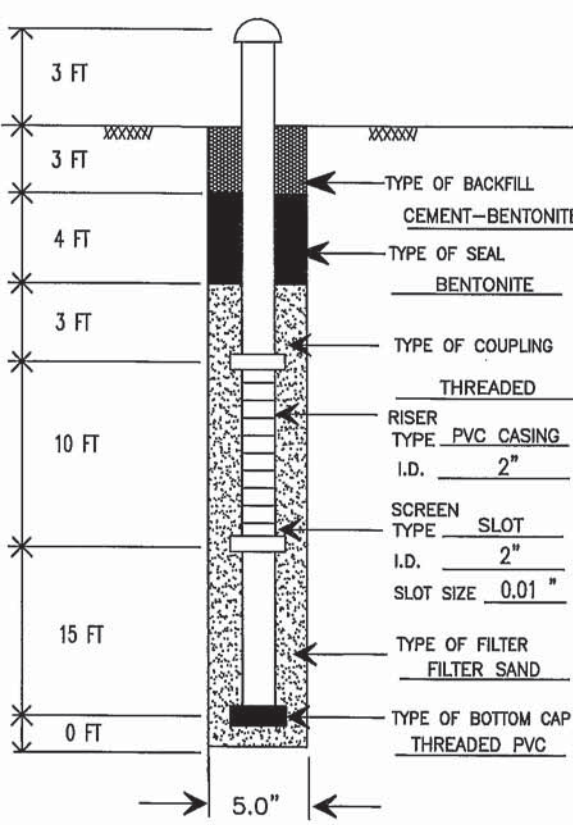
PROJECT NAME: FOREST BEND DETENTION POND		PIEZOMETER NUMBER: GB-1P
GEOTECHNICAL CONSULTANT GEOTEST ENGINEERING, INC.	DESIGN CONSULTANT RPS INFRASTRUCTURE, INC.	CITY OF FRIENDSWOOD, TEXAS

COMPLETION DATE <u>10-16-20</u> DRY AUGERED <u>0</u> TO <u>25</u> FT WASH BORED <u>25</u> TO <u>35</u> FT DRILLING FLUID: <u>WATER</u>	DEPTH (FT) ELEV. (FT) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>0</td><td>17.36</td></tr> <tr><td>11</td><td>6.36</td></tr> <tr><td>13</td><td>4.36</td></tr> <tr><td>15</td><td>2.36</td></tr> <tr><td>35</td><td>-17.64</td></tr> <tr><td>35</td><td>-17.64</td></tr> </table> (NOT TO SCALE) TYPE OF BACKFILL <u>CEMENT-BENTONITE</u> RISER TYPE <u>PVC CASING</u> I.D. <u>2"</u> TYPE OF COUPLING <u>THREADED</u> TYPE OF SEAL <u>BENTONITE</u> TYPE OF FILTER <u>FILTER SAND</u> SCREEN TYPE <u>SLOT</u> I.D. <u>2"</u> SLOT SIZE <u>0.01"</u> TYPE OF BOTTOM CAP <u>THREADED PVC</u>	0	17.36	11	6.36	13	4.36	15	2.36	35	-17.64	35	-17.64
0	17.36												
11	6.36												
13	4.36												
15	2.36												
35	-17.64												
35	-17.64												
DEVELOPMENT DATE: <u>10-16-20</u> METHOD OF DEVELOPMENT: <u>BAILING</u>													
WATER LEVEL READINGS: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DATE</th><th>DEPTH (TOG)</th><th>ELEVATION</th></tr> </thead> <tbody> <tr> <td>10-17-20</td><td>14.0</td><td>3.4</td></tr> <tr> <td>11-20-20</td><td>14.2</td><td>3.2</td></tr> </tbody> </table>	DATE	DEPTH (TOG)	ELEVATION	10-17-20	14.0	3.4	11-20-20	14.2	3.2				
DATE	DEPTH (TOG)	ELEVATION											
10-17-20	14.0	3.4											
11-20-20	14.2	3.2											
REMARKS:													

NOTES: 1. DIMENSIONS NOMINAL UNLESS OTHERWISE NOTED 2. TOG = TOP OF GROUND	DRILLED BY: MG	STARTED: 10-16-20	NORTHING: 13756395.60 EASTING: 3183696.39
	LOGGED BY: SA	COMPLETED: 10-16-20	GROUND LEVEL (MSL): 17.36
	CHECKED BY: GD	APPROVED BY: MB	SHEET <u>1</u> OF <u>1</u>

PIEZOMETER INSTALLATION REPORT

PROJECT NAME: FOREST BEND DETENTION POND		PIEZOMETER NUMBER: GB-3P
GEOTECHNICAL CONSULTANT GEOTEST ENGINEERING, INC.	DESIGN CONSULTANT RPS INFRASTRUCTURE, INC.	CITY OF FRIENDSWOOD, TEXAS

COMPLETION DATE <u>10-15-20</u> DRY AUGERED <u>0</u> TO <u>18</u> FT WASH BORED <u>18</u> TO <u>35</u> FT DRILLING FLUID: <u>WATER</u>		DEPTH (FT) ELEV. (FT) 0 21.09 3 18.09 7 14.09 10 11.09 20 1.09 35 -13.91 35 -13.91		3 FT 3 FT 4 FT 3 FT 10 FT 15 FT 0 FT							
DEVELOPMENT DATE: <u>10-15-20</u> METHOD OF DEVELOPMENT: <u>BAILING</u>		(NOT TO SCALE)									
WATER LEVEL READINGS: DATE DEPTH (TOG) ELEVATION 10-16-20 14.5 6.6 11-20-20 16.3 4.8		REMARKS:									

NOTES: 1. DIMENSIONS NOMINAL UNLESS OTHERWISE NOTED 2. TOG = TOP OF GROUND	DRILLED BY: RM	STARTED: 10-15-20	NORTHING: 13757145.50 EASTING: 3184414.59
	LOGGED BY: AE	COMPLETED: 10-15-20	GROUND LEVEL (MSL): 21.09
	CHECKED BY: GD	APPROVED BY: MB	SHEET <u>1</u> OF <u>1</u>

GEOTEST ENGINEERING, INC.

APPENDIX B

	<u>Figure</u>
Summary of Laboratory Tests	B-1 thru B-6
Grain Size Distribution Curves	B-7 thru B-10
CU Triaxial Test with Pore Pressure Measurements	B-11 and B-12
Double Hydrometer Test Results	B-13 thru B-15
Crumb Tests (ASTM D 6572).....	B-16 and B-17
Crumb Tests Backup Results.....	B-18a thru B-18i

SUMMARY OF LABORATORY TEST RESULTS GEOTEST ENGINEERING, INC.								PROJECT NAME:		Forest Bend Detention Pond City of Friendswood, Texas							
								PROJECT NUMBER:		1140258201							
Boring No.	Sample					SPT (blows/ft.)	Passing No. 200 Sieve (%)	Dry Density (pcf)	Water Content (%)	Atterberg Limits			Unconfined Compression Test	Triaxial Compression Test (U-U)	Torvane	Hand Penetrometer	
	Sample No.	Depth		Length	Type					LL	PL	PI	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	
		Top	Bottom														
GB-1P	1	0	2	2	SH				22.3						2.25	2.00	
GB-1P	2	2	4	2	SH		84.5		18.8	62	25	37			1.5	2.25	
GB-1P	3	4	6	2	SH		95.0	121	15.1	34	17	17		1.07	1.0	1.75	
GB-1P	4	6.5	8	1.5	SPT	8	51.5		8.7								
GB-1P	5	8.5	10	1.5	SPT	13			17.7								
GB-1P	6	10.5	12	1.5	SPT	15			25.4								
GB-1P	7	12	14	2	SH				25.1						1.0	1.13	
GB-1P	8	14	16	2	SH		85.5	109	21.7	59	24	35		1.04	2.0	1.63	
GB-1P	9	16	18	2	SH				19.2						1.0	1.88	
GB-1P	10	18	20	2	SH				22.2						1.0	1	
GB-1P	11	23.5	25	1.5	SPT	14	26.5		20.7								
GB-1P	12	28.5	30	1.5	SPT	59			22.8								
GB-1P	13	33	35	2	SH		83.8	117	15.2	50	21	29		2.30	1.25	2.25	

FIGURE B-1

SUMMARY OF LABORATORY TEST RESULTS GEOTEST ENGINEERING, INC.							PROJECT NAME: Forest Bend Detention Pond City of Friendswood, Texas									
							PROJECT NUMBER: 1140258201									
Boring No.	Sample					SPT (blows/ft.)	Passing No. 200 Sieve (%)	Dry Density (pcf)	Water Content (%)	Atterberg Limits			Unconfined Compression Test	Triaxial Compression Test (U-U)	Torvane	Hand Penetrometer
	Sample No.	Depth		Length	Type					LL	PL	PI	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)
GB-2	1	0	2	2	SH				19.8						1.50	1.63
GB-2	2	2	4	2	SH				26.9						1.125	1.00
GB-2	3	4	6	2	SH		93.1		25.6	69	27	42			0.65	0.75
GB-2	4	6	8	2	SH				19.0						0.75	1.25
GB-2	5	8	10	2	SH		98.9	101	24.5	41	19	22		0.48	0.70	0.88
GB-2	6	10	12	2	SH				23.0						0.50	1.00
GB-2	7	12.5	14	1.5	SPT	15	19.3		23.4							
GB-2	8	14.5	16	1.5	SPT	20			29.0							
GB-2	9	16	18	2	SH				20.9						1.375	1.50
GB-2	10	18	20	2	SH		86.2	105	20.1	53	23	30		1.36	1.375	1.5
GB-2	11	23	25	2	SH				21.5						1.50	1.625
GB-2	12	28.5	30	1.5	SPT	65	27.9		21.6							
GB-2	13	33.5	35	1.5	SPT	96			20.4							

FIGURE B-2

SUMMARY OF LABORATORY TEST RESULTS GEOTEST ENGINEERING, INC.								PROJECT NAME:		Forest Bend Detention Pond City of Friendswood, Texas							
								PROJECT NUMBER:		1140258201							
Boring No.	Sample					SPT (blows/ft.)	Passing No. 200 Sieve (%)	Dry Density (pcf)	Water Content (%)	Atterberg Limits			Unconfined Compression Test	Triaxial Compression Test (U-U)	Torvane	Hand Penetrometer	
	Sample No.	Depth		Length	Type					LL	PL	PI	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	
		Top	Bottom										Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	
GB-3P	1	0	2	2	SH				25.1						1.25	1.13	
GB-3P	2	2	4	2	SH				23.8						1.625	1.75	
GB-3P	3	4	6	2	SH		94.2	97	26.9	67	26	41		0.65	0.9	0.88	
GB-3P	4	6	8	2	SH				22.0						1.5	1.50	
GB-3P	5	8	10	2	SH				22.4						1.0	1.00	
GB-3P	6	10	12	2	SH		98.9	108	23.3	46	19	27		0.60	1.25	1.25	
GB-3P	7	12	14	2	SH				22.8						0.65	0.75	
GB-3P	8	14.5	16	1.5	SPT	16	25.9		26.4								
GB-3P	9	16.5	18	1.5	SPT	12			22.4								
GB-3P	10	18	20	2	SH		90.0	103	25.1	62	25	37		1.35	1.5	1.625	
GB-3P	11	23	25	2	SH				22.2						1.625	1.5	
GB-3P	12	28	30	2	SH		63.7		19.5	37	19	18			0.8	0.875	
GB-3P	13	33.5	35	1.5	SPT	43	14.0		23.7								

FIGURE B-3

SUMMARY OF LABORATORY TEST RESULTS GEOTEST ENGINEERING, INC.								PROJECT NAME:		Forest Bend Detention Pond City of Friendswood, Texas							
								PROJECT NUMBER:		1140258201							
Boring No.	Sample					SPT (blows/ft.)	Passing No. 200 Sieve (%)	Dry Density (pcf)	Water Content (%)	Atterberg Limits			Unconfined Compression Test	Triaxial Compression Test (U-U)	Torvane	Hand Penetrometer	
	Sample No.	Depth		Length	Type					LL	PL	PI	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	
		Top	Bottom														
GB-4	1	0	2	2	SH				27.3						0.75	0.75	
GB-4	2	2	4	2	SH		89.7	100	26.4	74	28	46		0.82	1.25	0.88	
GB-4	3	4	6	2	SH				30.1						0.8	0.63	
GB-4	4	6	8	2	SH		89.0	99	26.7	59	23	36		0.55	1.125	1.00	
GB-4	5	8	10	2	SH				23.7						1.25	1.25	
GB-4	6	10	12	2	SH		82.0	102	24.8	50	22	28		0.68	1.25	1.13	
GB-4	7	12	14	2	SH				22.8						0.65	0.63	
GB-4	8	14	16	2	SH				21.1						0.5	0.75	
GB-4	9	16	18	2	SH				28.7						0.5	1.00	
GB-4	10	18	20	2	SH		89.1	110	19.6	50	22	28		1.47	2.25	2.25	
GB-4	11	23	25	2	SH				21.6						1.25	1.25	
GB-4	12	28	30	2	SH				19.3						0.7	0.875	
GB-4	13	33.5	35	1.5	SPT	62	22.7		20.1								

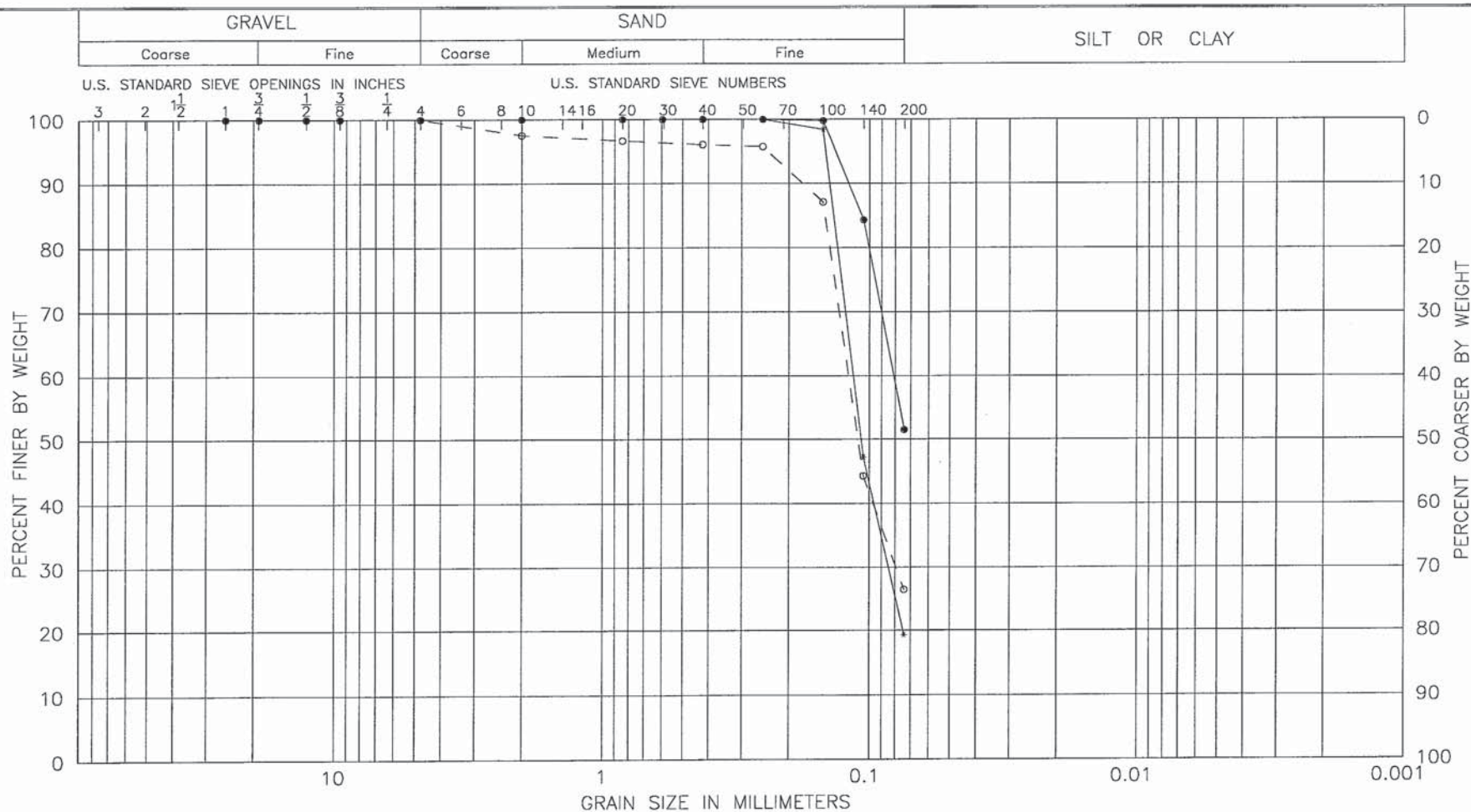
FIGURE B-4

SUMMARY OF LABORATORY TEST RESULTS GEOTEST ENGINEERING, INC.							PROJECT NAME: Forest Bend Detention Pond City of Friendswood, Texas									
							PROJECT NUMBER: 1140258201									
Boring No.	Sample					SPT (blows/ft.)	Passing No. 200 Sieve (%)	Dry Density (pcf)	Water Content (%)	Atterberg Limits			Unconfined Compression Test	Triaxial Compression Test (U-U)	Torvane	Hand Penetrometer
	Sample No.	Depth		Length	Type					LL	PL	PI	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)
GB-5	1	0	2	2	SH				23.4						1.0	1.00
GB-5	2	2	4	2	SH				23.8						0.75	0.75
GB-5	3	4	6	2	SH		95.7	99	25.8	62	24	38	-	0.42	1.0	1.00
GB-5	4	6	8	2	SH				25.7						1.375	1.38
GB-5	5	8	10	2	SH		98.2		16.5	33	20	13			1.75	1.75
GB-5	6	10	12	2	SH				18.5						0.5	0.75
GB-5	7	12.5	14	1.5	SPT	29	43.0		15.0							
GB-5	8	14.5	16	1.5	SPT	45			24.6							
GB-5	9	16.5	18	1.5	SPT	58			21.4							
GB-5	10	18	20	2	SH				19.3						2.0	1.75
GB-5	11	23	25	2	SH		87.3	111	22.1	61	25	36		1.54	1.75	1.625
GB-5	12	28	30	2	SH				18.7						1.625	1.75
GB-5	13	33.5	35	1.5	SPT	62	12.6		21.9							

FIGURE B-5

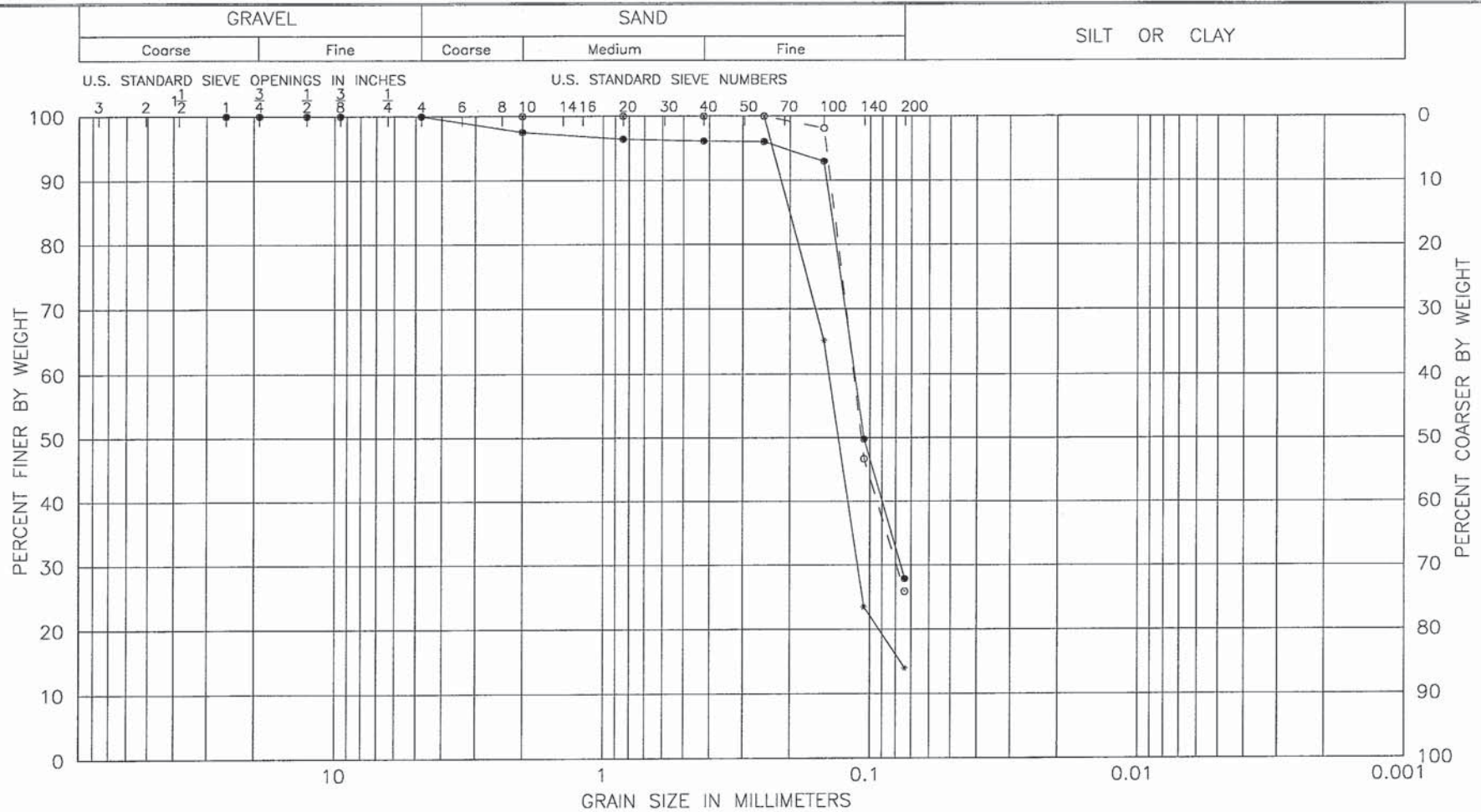
SUMMARY OF LABORATORY TEST RESULTS GEOTEST ENGINEERING, INC.								PROJECT NAME:		Forest Bend Detention Pond City of Friendswood, Texas							
								PROJECT NUMBER:		1140258201							
Boring No.	Sample					SPT (blows/ft.)	Passing No. 200 Sieve (%)	Dry Density (pcf)	Water Content (%)	Atterberg Limits			Unconfined Compression Test	Triaxial Compression Test (U-U)	Torvane	Hand Penetrometer	
	Sample No.	Depth		Length	Type					LL	PL	PI	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	Shear Strength (tsf)	
		Top	Bottom														
GB-6	1	0	2	2	SH				27.9						0.70	0.50	
GB-6	2	2	4	2	SH		90.7	99	24.6	67	26	41		0.52	0.75	0.88	
GB-6	3	4	6	2	SH				23.0						0.875	1.00	
GB-6	4	6	8	2	SH		95.3		18.9	49	22	27			1.25	2.00	
GB-6	5	8	10	2	SH				16.5						0.625	1.63	
GB-6	6	10.5	12	1.5	SPT	33	21.9		7.7								
GB-6	7	12.5	14	1.5	SPT	40			9.3								
GB-6	8	14.5	16	1.5	SPT	50			20.4								
GB-6	9	16.5	18	1.5	SPT	32	85.9		19.4	40	20	20					
GB-6	10	18	20	2	SH		85.4	105	21.2	56	23	33		0.93	1.0	1.375	
GB-6	11	23	25	2	SH				26.0						1.375	2	
GB-6	12	28.5	30	1.5	SPT	54	14.0		19.8								
GB-6	13	33.5	35	1.5	SPT	50			22.4								

FIGURE B-6

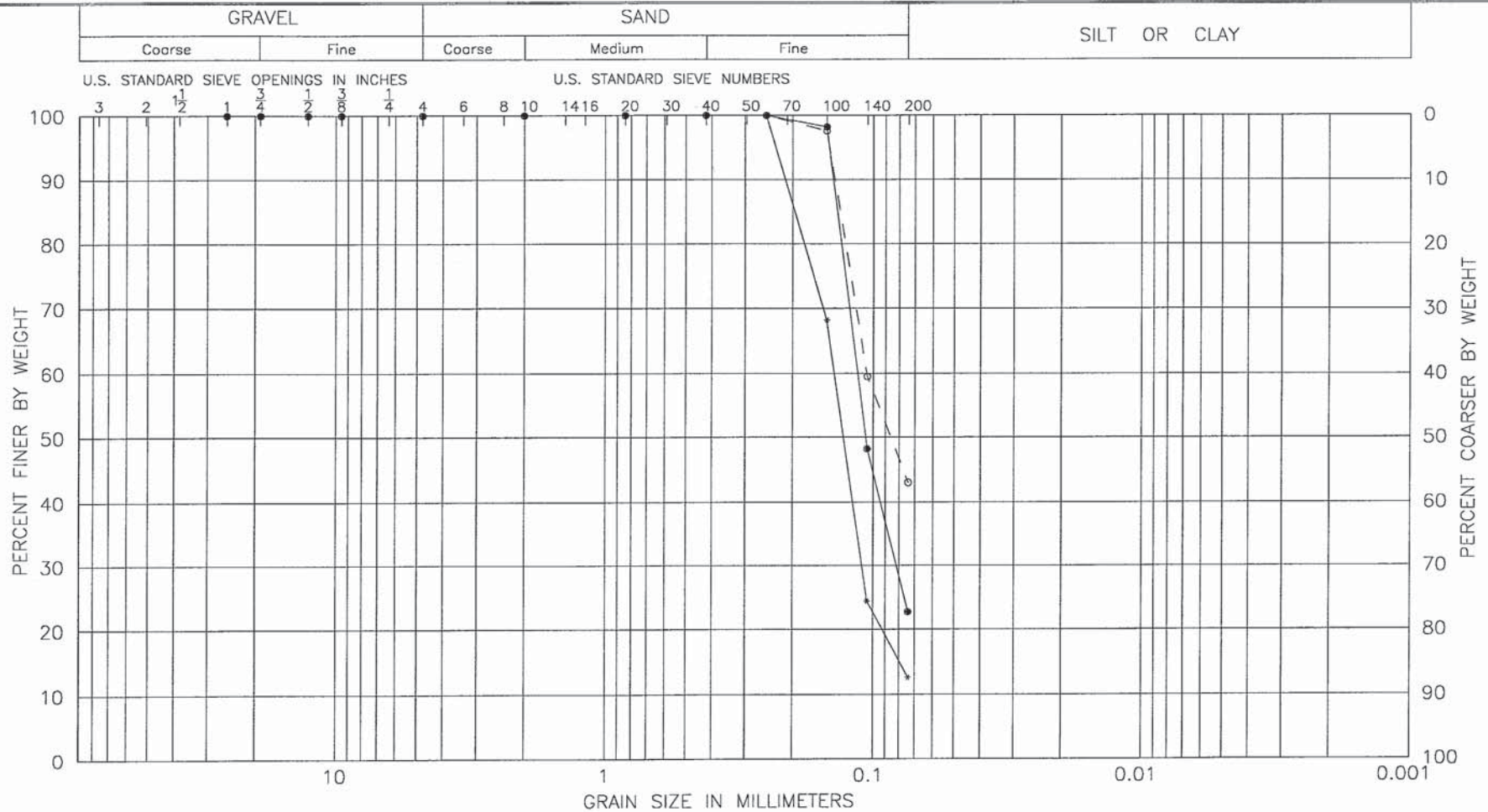


LEGEND	BORING NO.	SAMPLE NO.	DEPTH FT.	SAMPLE DESCRIPTION	D ₉₀ , mm	D ₅₀ , mm
•••••	GB-1P	S-4	6.5-8.0	Gray and yellowish brown sandy silt	0.1194	<0.0740
○-○-○-○	GB-1P	S-11	23.5-25.0	Gray and brown silty sand	0.1774	0.1100
×-×-×-×	GB-2	S-7	12.5-14.0	Gray and brown silty sand	0.1407	0.1070

GRAIN SIZE DISTRIBUTION CURVES

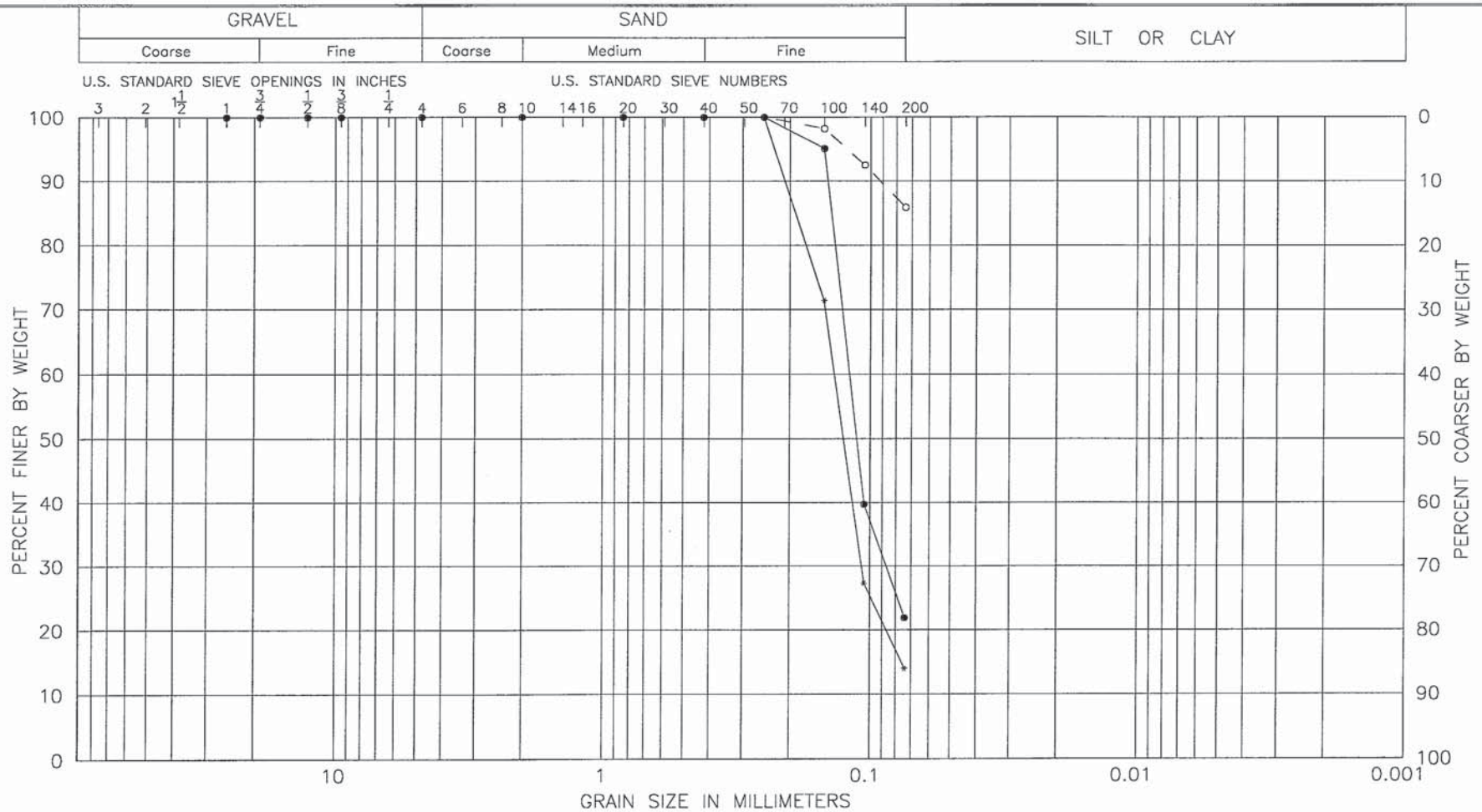


GRAIN SIZE DISTRIBUTION CURVES



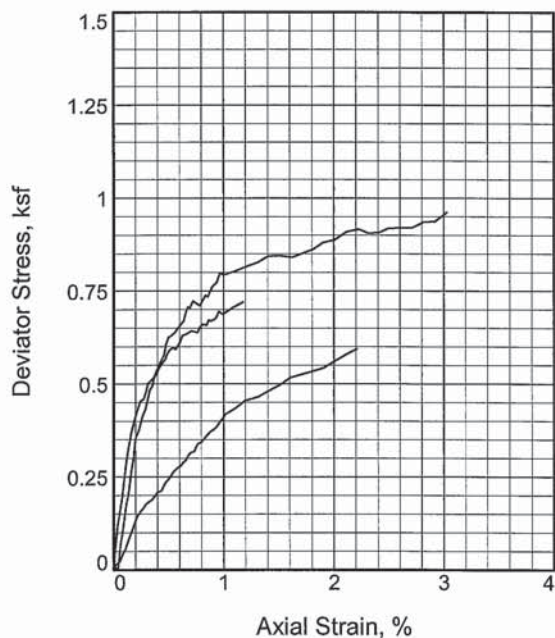
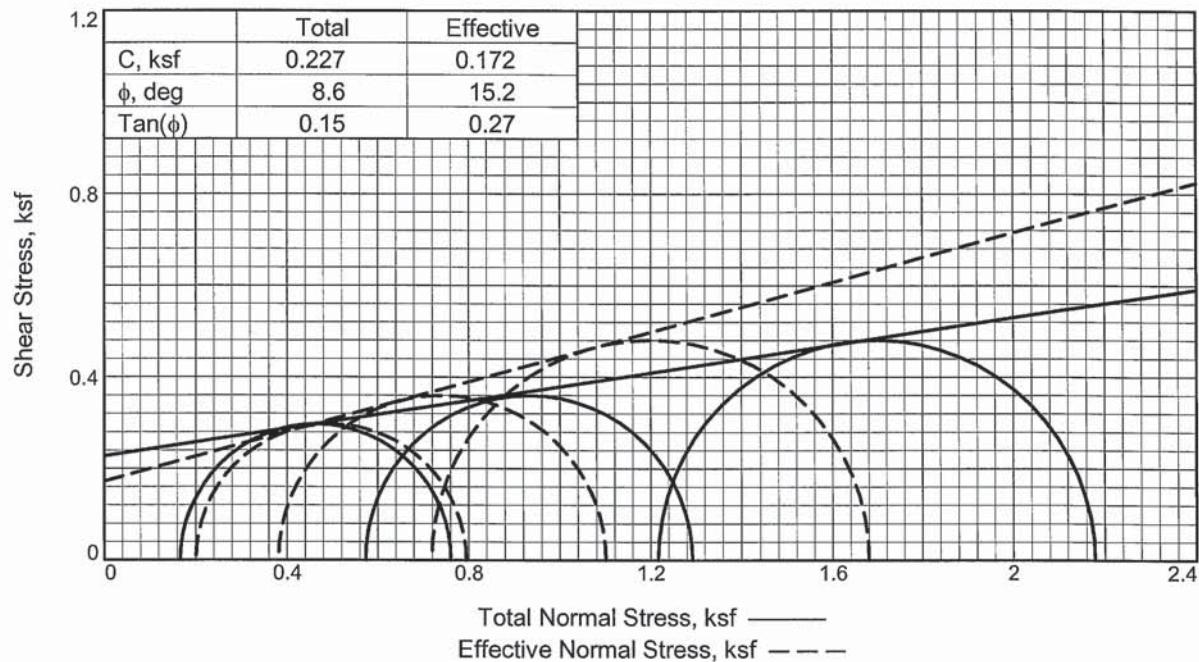
LEGEND	BORING NO.	SAMPLE NO.	DEPTH FT.	SAMPLE DESCRIPTION	D ₉₀ , mm	D ₅₀ , mm
●●●●●	GB-4	S-13	33.5-35.0	Brown silty sand	0.1407	0.1063
○○○○○	GB-5	S-7	12.5-14.0	Gray and brown silty sand	0.1390	0.0858
×××××	GB-5	S-13	33.5-35.0	Gray and brown silty sand	0.2125	0.1288

GRAIN SIZE DISTRIBUTION CURVES



LEGEND	BORING NO.	SAMPLE NO.	DEPTH FT.	SAMPLE DESCRIPTION	D ₉₀ , mm	D ₅₀ , mm
●●●●●	GB-6	S-6	10.5-12.0	Gray and brown silty sand	0.1443	0.1121
○-○-○-○	GB-6	S-9	16.5-18.0	Gray and brown lean clay	0.0920	<0.0740
●-●-●-●	GB-6	S-12	28.5-30.0	Gray and brown silty sand	0.2086	0.1257

GRAIN SIZE DISTRIBUTION CURVES



Sample No.		1	2	3
Initial	Water Content, %	24.0	24.3	24.5
	Dry Density, pcf	98.2	99.5	99.3
	Saturation, %	90.2	94.3	94.4
	Void Ratio	0.7226	0.6996	0.7029
	Diameter, in.	1.490	1.480	1.493
	Height, in.	2.990	2.990	2.990
At Test	Water Content, %	26.3	25.4	25.9
	Dry Density, pcf	98.8	100.3	99.4
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7131	0.6872	0.7027
	Diameter, in.	1.487	1.477	1.496
	Height, in.	2.987	2.981	2.977
Strain at peak, %		2.2	1.2	3.0
Back Pressure, ksf		7.770	7.645	7.584
Cell Pressure, ksf		7.937	8.218	8.801
Fail. Stress, ksf		0.594	0.719	0.962
Excess Pore Pr., ksf		-0.033	0.192	0.498
Ult. Stress, ksf		0.594	0.719	0.962
Excess Pore Pr., ksf		-0.033	0.192	0.498
$\bar{\sigma}_1$ Failure, ksf		0.794	1.100	1.680
$\bar{\sigma}_3$ Failure, ksf		0.200	0.381	0.719

Type of Test:

CU with Pore Pressures

Sample Type: UNDISTURBED

Description: Reddish Brown Fat Clay (CH)

LL= 69 PL= 27 PI= 42

Specific Gravity= 2.71

Remarks: ASTM D4767 Method B, Moisture

Content ASTM D2216, LL and PL ASTM D4318,
Initial Water Content from Trimming, Specific
Gravity ASTM D854

Client: RPS Infrastructure, Inc.

Project: Forest Bend Detention Pond

City of Friendswood, Texas

Source of Sample: GB-2

Depth: 4'-6'

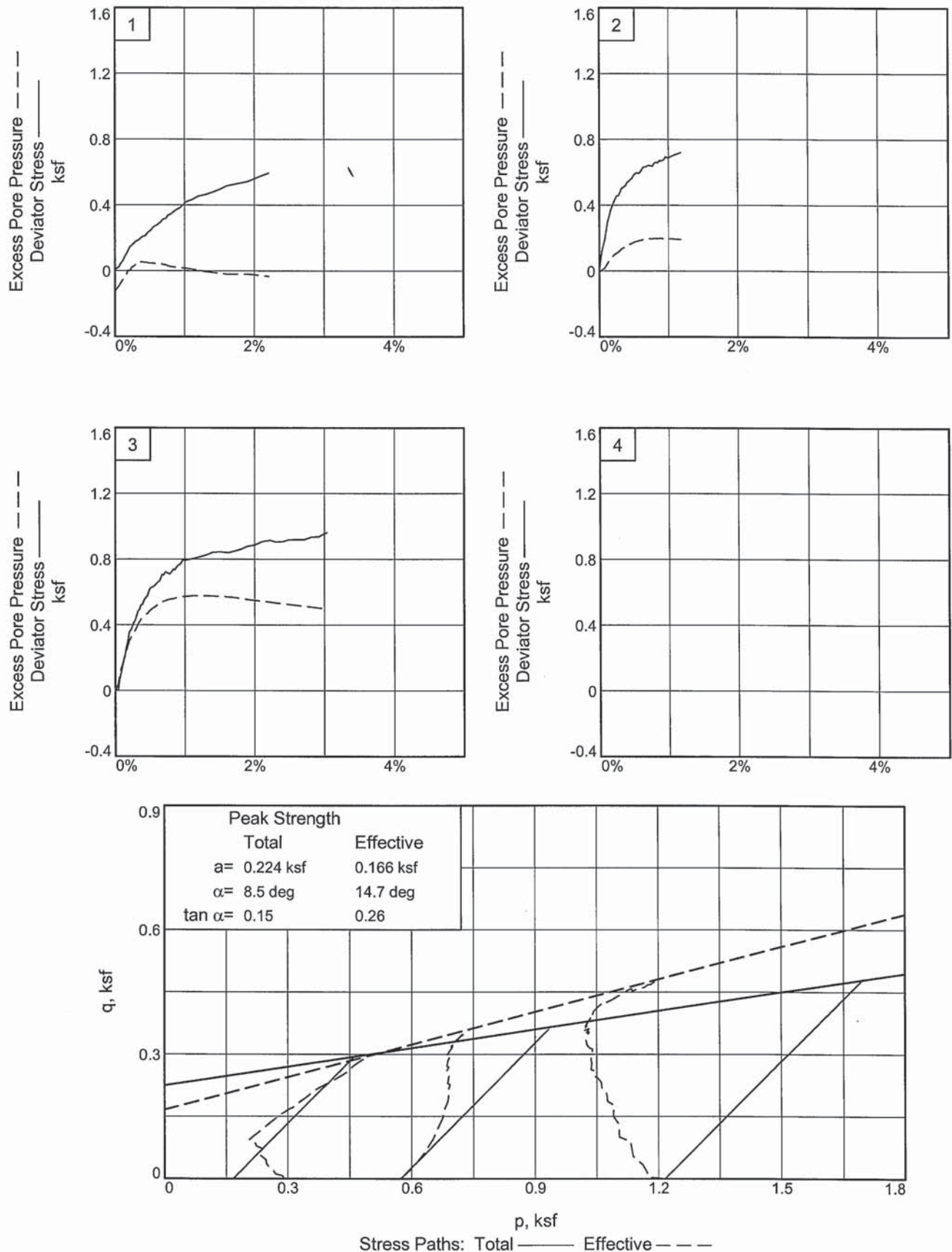
Sample Number: S-3

Proj. No.: 1140258201

Date Sampled: 10-19-2020

TRIAXIAL SHEAR TEST REPORT
GEOTEST ENGINEERING, INC.
Houston, TX

FIGURE B-11



Client: RPS Infrastructure, Inc.

Project: Forest Bend Detention Pond

Source of Sample: GB-2

Depth: 4'-6'

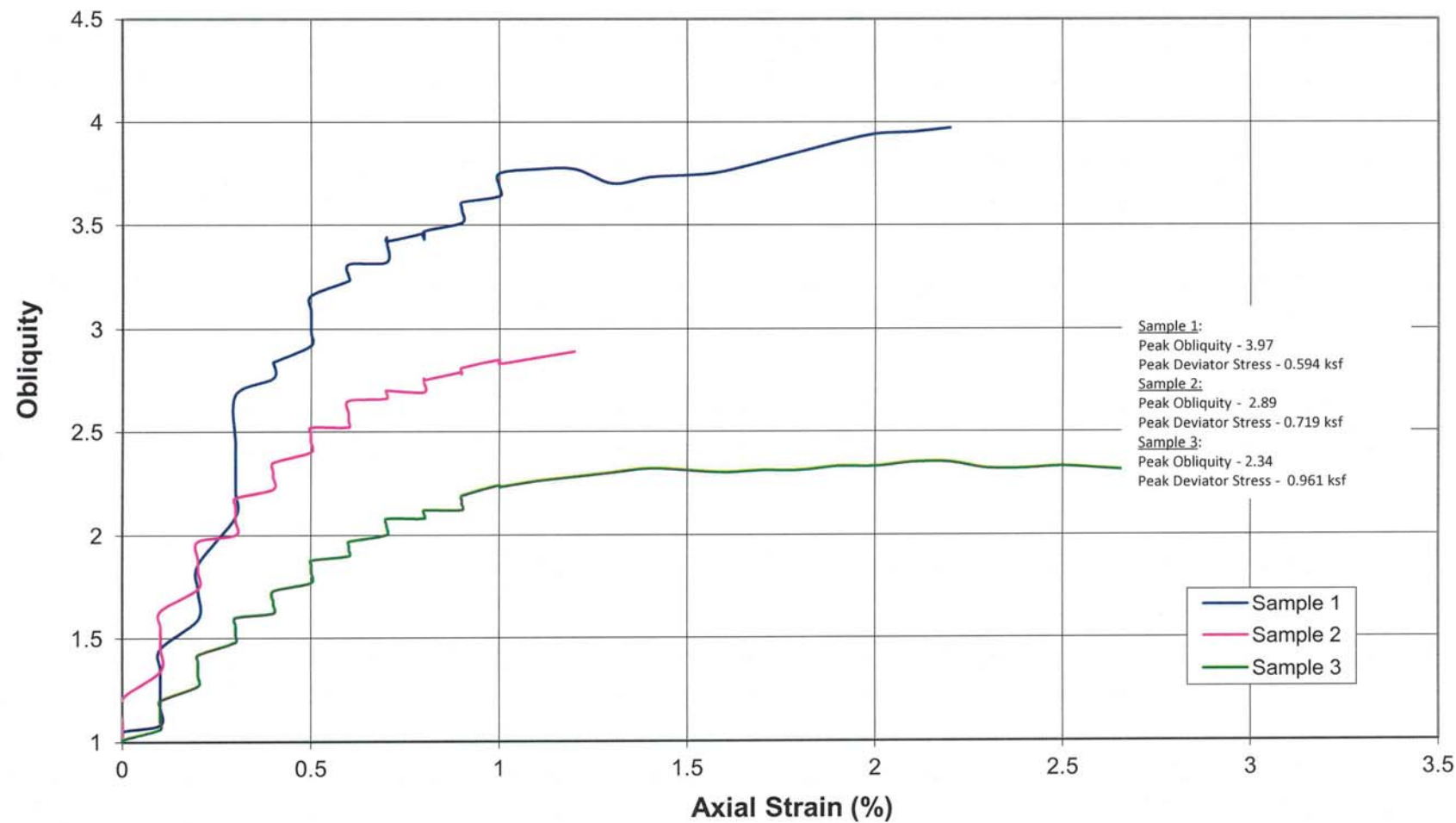
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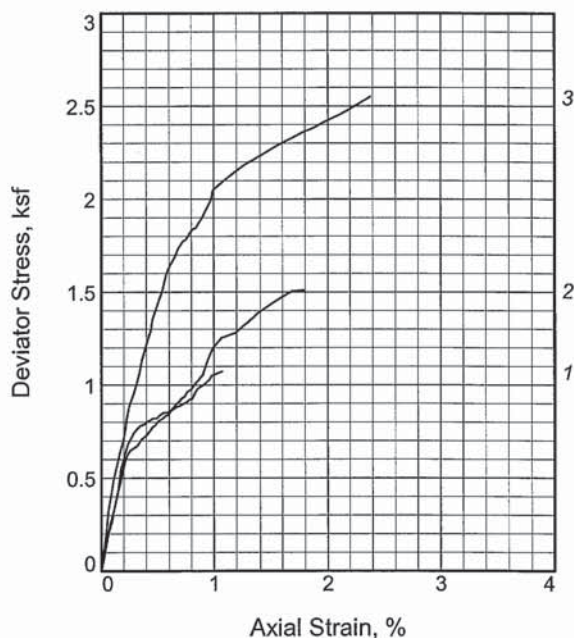
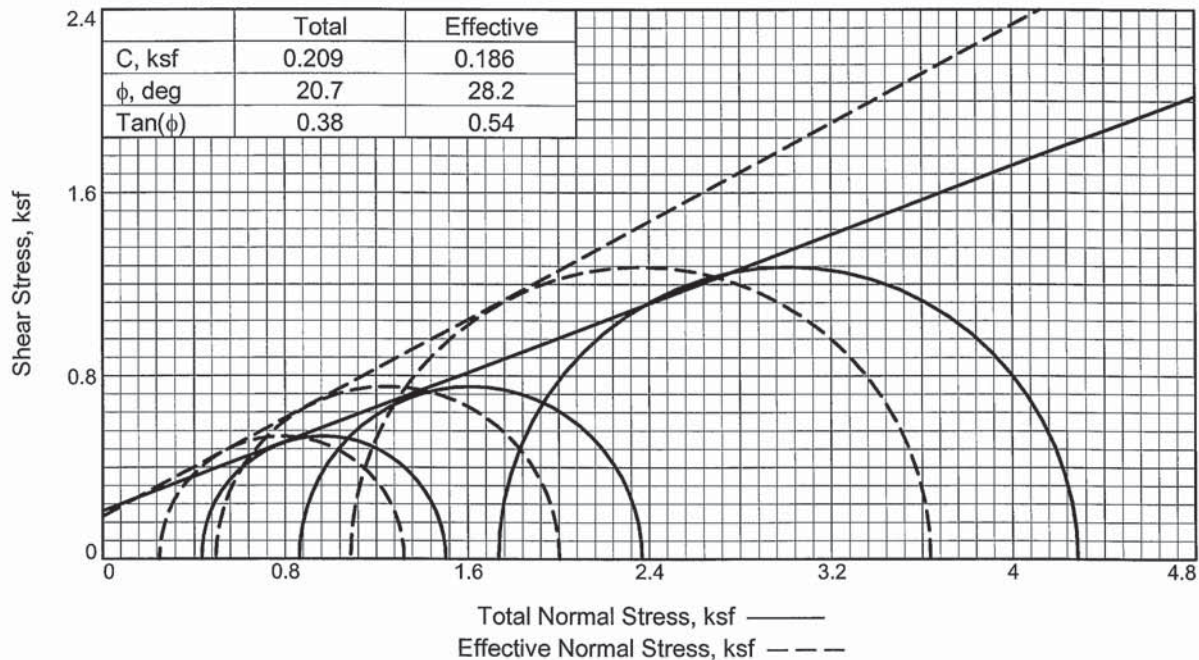
Project No.: 1140258201

GEOTEST ENGINEERING, INC.

FIGURE B-11a

Boring: GB-2
Sample No.: S-3
Depth: 4'-6'





Sample No.		1	2	3
Initial	Water Content, %	18.3	18.3	17.8
	Dry Density, pcf	110.9	111.7	112.3
	Saturation, %	97.3	99.2	98.1
	Void Ratio	0.5028	0.4923	0.4844
	Diameter, in.	1.500	1.494	1.479
	Height, in.	2.980	2.990	2.970
At Test	Water Content, %	18.7	18.2	18.0
	Dry Density, pcf	111.2	112.2	112.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4986	0.4857	0.4815
	Diameter, in.	1.499	1.492	1.480
	Height, in.	2.977	2.984	2.960
Strain at peak, %		1.1	1.7	2.4
Back Pressure, ksf		7.658	7.619	7.639
Cell Pressure, ksf		8.090	8.482	9.373
Fail. Stress, ksf		1.071	1.505	2.551
Excess Pore Pr., ksf		0.181	0.365	0.647
Ult. Stress, ksf		1.071	1.505	2.551
Excess Pore Pr., ksf		0.181	0.365	0.647
$\bar{\sigma}_1$ Failure, ksf		1.322	2.002	3.637
$\bar{\sigma}_3$ Failure, ksf		0.251	0.497	1.086

Type of Test:

CU with Pore Pressures

Sample Type: UNDISTURBED

Description: Gray Lean Clay (CL)

LL= 49 PL= 22 PI= 27

Specific Gravity: 2.67

Remarks: ASTM D4767 Method B, Moisture

Content ASTM D2216, LL and PL ASTM D4318,

Initial Water Content from Trimming, Specific

Gravity ASTM D854

Client: RPS Infrastructure, Inc.

Project: Forest Bend Detention Pond

City of Friendswood, Texas

Source of Sample: GB-6

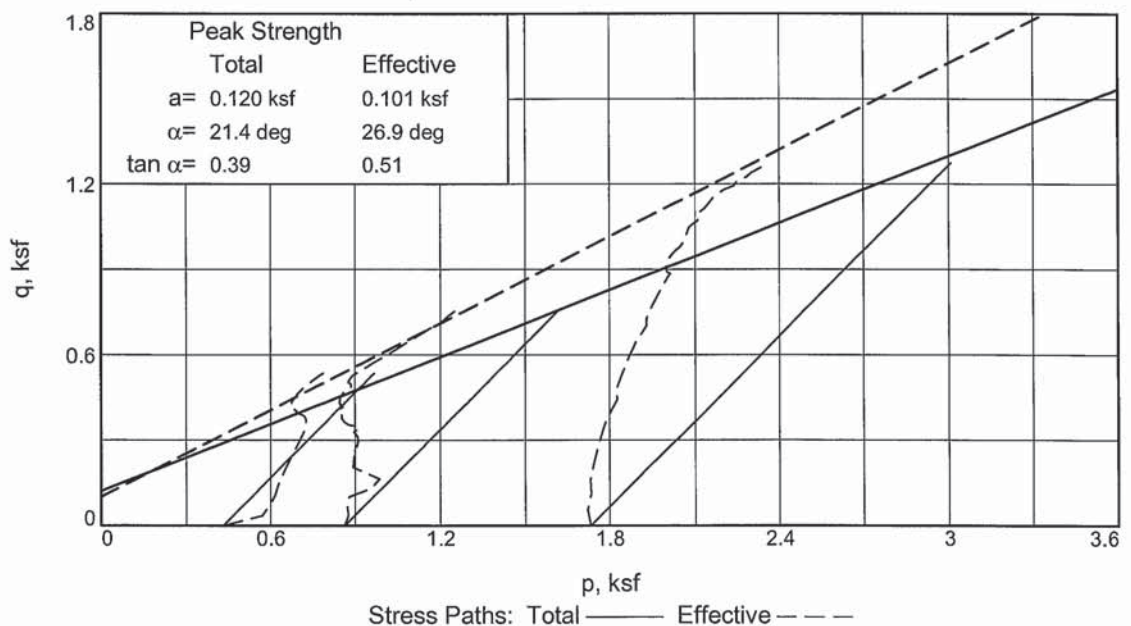
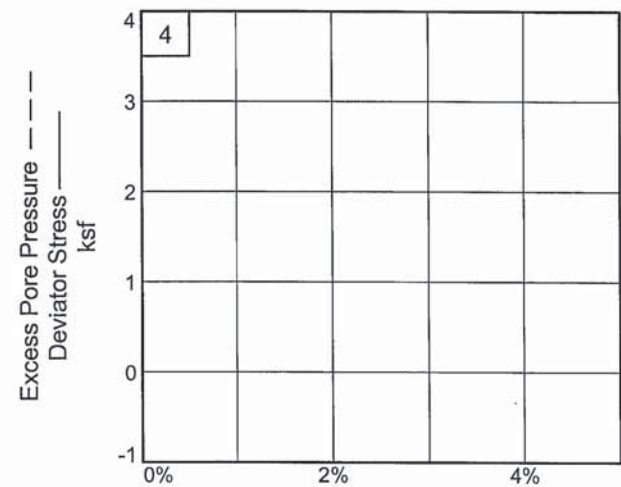
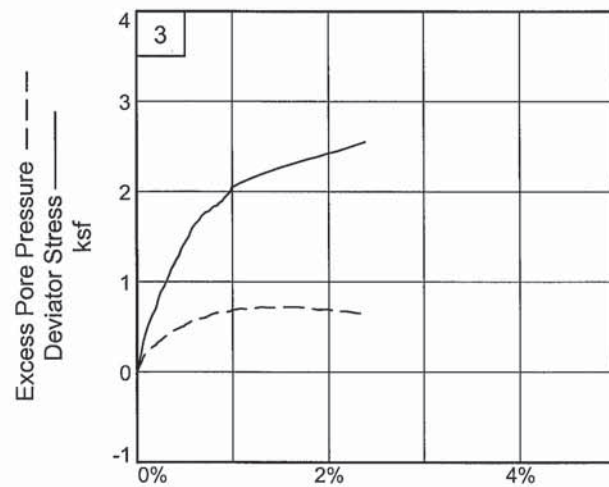
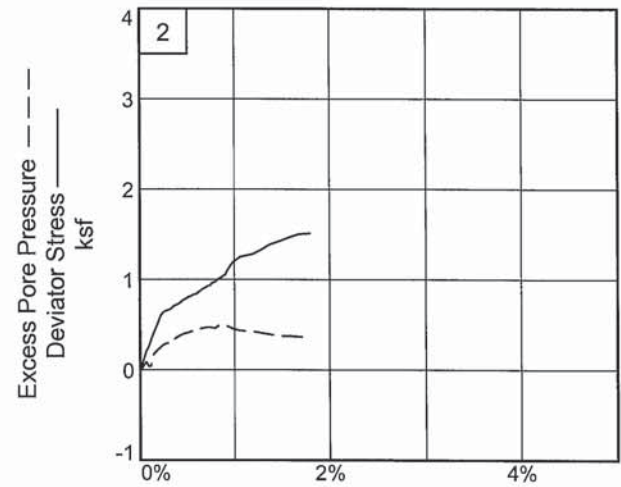
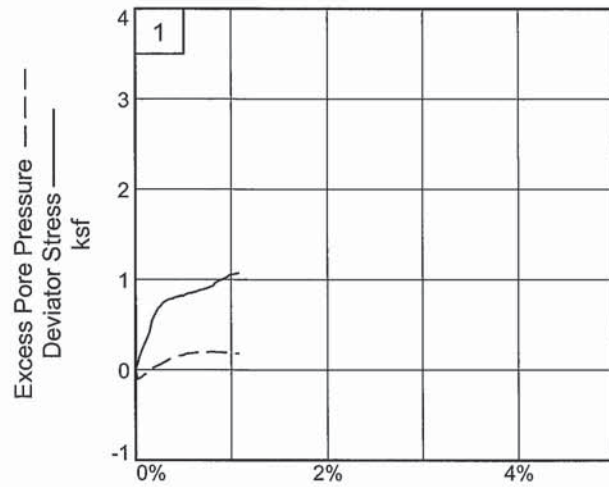
Depth: 6'-8'

Sample Number: S-4

Proj. No.: 1140258201

Date Sampled: 10-19-2020

TRIAXIAL SHEAR TEST REPORT
GEOTEST ENGINEERING, INC.
Houston, TX



Client: RPS Infrastructure, Inc.

Project: Forest Bend Detention Pond

Source of Sample: GB-6

Depth: 6'-8'

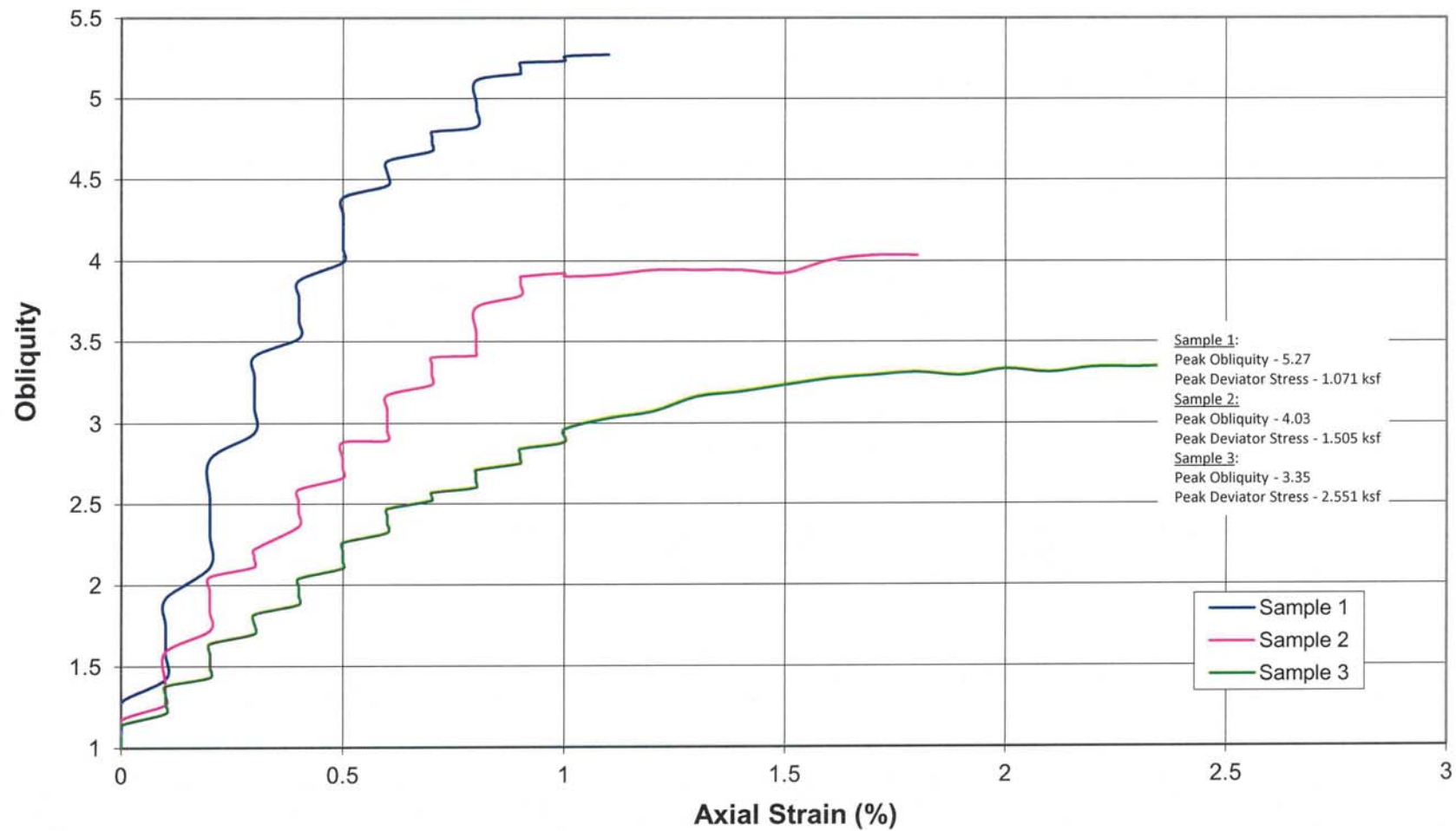
Sample Number: S-4

Project No.: 1140258201

GEOTEST ENGINEERING, INC.

FIGURE B-12a

Boring: GB-6
Sample No.: S-4
Depth: 6'-8'



Project No. 1140258201
Project: Forest Bend Detention Pond
City of Friendswood, Texas

GEOTEST ENGINEERING, INC.

FIGURE B-12b

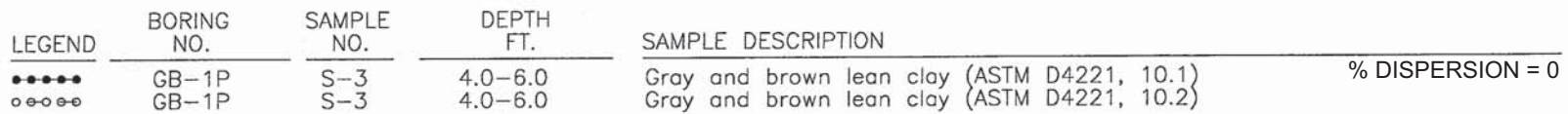
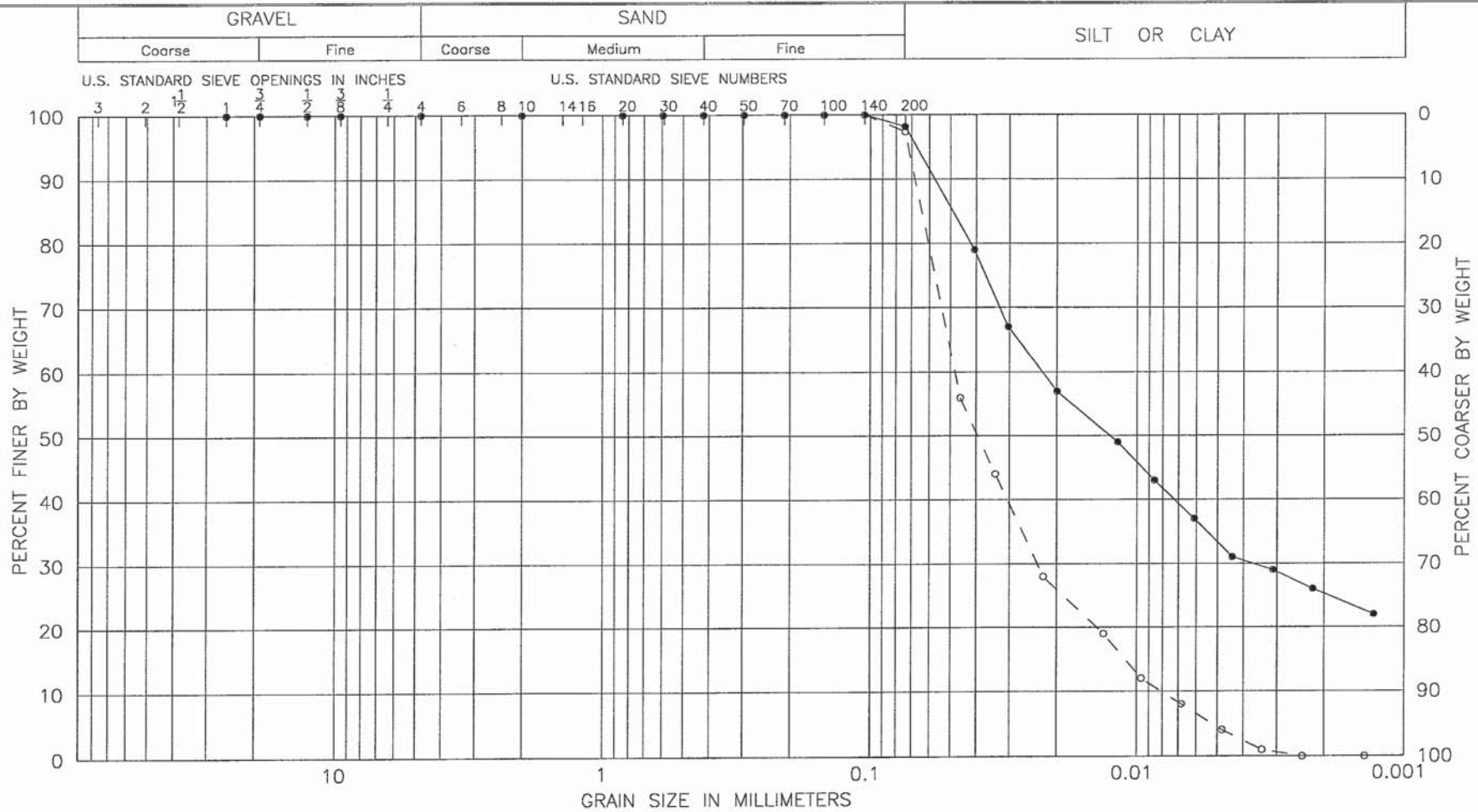


FIGURE B-13



LEGEND	BORING NO.	SAMPLE NO.	DEPTH FT.	SAMPLE DESCRIPTION	% DISPERSION = 0
•••••	GB-5	S-5	8.0-10.0	Gray and yellowish brown lean clay (ASTM D4221, 10.1)	
○-○-○-○	GB-5	S-5	8.0-10.0	Gray and yellowish brown lean clay (ASTM D4221, 10.2)	

DOUBLE HYDROMETER

TEST REPORT, CRUMB TESTS (ASTM D 6572)

CRUMB TESTS					
Boring No.	GB-1P	GB-2	GB-2	GB-3P	GB-4
Sample No.	S-7	S-4	S-9	S-7	S-3
Depth (ft)	12-14	6-8	16-18	12-14	4-6
Visual Classification	Fat Clay (CH) Gray and brown	Lean Clay (CL) Gray and yellowish brown	Fat Clay (CH) Gray and brown	Lean Clay (CL) Gray and yellowish brown	Fat Clay (CH) Reddish brown
	Very Stiff	Stiff to Very Stiff	Very Stiff	Stiff	Stiff
Water Content	25	19	21	23	30
Unit Dry Weight (pcf)	N/A	N/A	N/A	N/A	N/A
Turbidity	No Reaction	Slight Reaction	No Reaction	Moderate Reaction	No Reaction
Classification	Grade 1	Grade 2	Grade 1	Grade 3	Grade 1

Note:

Crumb Test -

Grade 1-Nondispersive.

Grade 2-Intermediate.

Grade 3- Dispersive.

Grade 4-Highly Dispersive.

CRUMB TEST

Forest Bend Detention Pond
City of Friendswood, Texas

TEST REPORT, CRUMB TESTS (ASTM D 6572)

CRUMB TESTS				
Boring No.	GB-4	GB-5	GB-6	GB-6
Sample No.	S-8	S-2	S-5	S-10
Depth (ft)	14-16	2-4	8-10	18-20
Visual Classification	Fat Clay with Sand (CH) Brown and gray	Fat Clay (CH) Dark gray	Lean Clay (CL) Gray and yellowish brown	Fat Clay (CH) Gray and brown
	Stiff	Stiff	Stiff to very stiff	Stiff to very stiff
Water Content	21	24	17	21
Unit Dry Weight (pcf)	N/A	N/A	N/A	105
Turbidity	Moderate Reaction	No Reaction	No Reaction	No Reaction
Classification	Grade 3	Grade 1	Grade 1	Grade 1

Note:

Crumb Test -

Grade 1-Nondispersive.

Grade 2-Intermediate.

Grade 3- Dispersive.

Grade 4-Highly Dispersive.

CRUMB TEST
Forest Bend Detention Pond
City of Friendswood, Texas

CRUMB TEST (ASTM D6572)

Project No. 1140258201 Project Name: _____ Location: _____
 Boring No. GP-1P Sample No. 7 Depth: 12-14

Visual Classification: Cl w/ s & su Color: Gray brown

Moisture Content of Sample: ☐ As-received ☐ In-situ ☐ Air-Dried

Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)
K-5	152.48	129.43	37.43	25.05

Specimen Identification: 7

Specimen Container Identification: M

Method	☐ Natural	Water Type	☐ Distilled	Initial Water Temperature	21.8
	☐ Remolded		☐ Type IV		

Start Time (hh:mm:ss) 8:30 am

Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	8:32 am	1	21.8	Non-Dispersive
1 hour (+/-) 8 min	9:30 am	1	22.5	Non-Dispersive
6 hour (+/-) 45 min	2:30 pm	1	23.2	Non-dispersive

Additional water added to remold the specimen (Method B) ☐ Y ☒ N

Remarks: Photo taken at 6:00 Hrs. Reading

Prepared by	<u>Offelia</u>	Tested By:	<u>Sonal</u>	Reviewed By:	<u>SI</u>
Date:	<u>11/10/20</u>	Date:	<u>11/13/20</u>	Date:	<u>11/13/20</u>





CRUMB TEST (ASTM D6572)						
Project No. <u>1140258201</u>		Project Name: _____		Location: _____		
Boring No. <u>GP 1P</u>		Sample No. <u>7</u>		Depth: <u>12-14</u>		
Visual Classification: <u>Cl w/ S & Sa</u>				Color: <u>Gray brown</u>		
Moisture Content of Sample:		☐	As-received	☐	In-situ	☐
		☐		☐		Air-Dried
Tare No.	Wet mass + Tare (g)		Dry Mass + Tare (g)		Tare Mass (g)	Water Content (%)
<u>K-5</u>	<u>152.48</u>		<u>129.43</u>		<u>37.43</u>	<u>25.05</u>
Specimen Identification:		<u>7</u>				
Specimen Container Identification:		<u>M</u>				
Method	☐ Natural	Water Type	☐ Distilled	Initial Water Temperature	<u>21.8</u>	
	☐ Remolded		☐ Type IV			
Start Time (hh:mm:ss)		<u>8:30 am</u>				
Target Reading		Time Taken	Grade	Temperature (°C)	Dispersive Classification	
2 min (+/-) 15 sec		<u>8:32 am</u>	<u>1</u>	<u>21.8</u>	<u>Non-Dispersive</u>	
1 hour (+/-) 8 min		<u>9:30 am</u>	<u>1</u>	<u>22.5</u>	<u>Non-Dispersive</u>	
6 hour (+/-) 45 min		<u>2:30 pm</u>	<u>1</u>	<u>23.2</u>	<u>Non-dispersive</u>	
Additional water added to remold the specimen (Method B)		☐	Y	☒	N	
Remarks		<u>Photo taken at 6:00 Hrs. Reading</u>				
Prepared by	<u>infelina</u>	Tested By:		Reviewed By:		

FIGURE B-18a(i)

CRUMB TEST (ASTM D6572)

Project No. 1140258201 Project Name: _____ Location: _____
 Boring No. GB 2 Sample No. 4 Depth: 6-8

Visual Classification: Silty clay Color: Gray Port + Ye. Br.

Moisture Content of Sample: ☒ As-received ☐ In-situ ☐ Air-Dried

Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)
123F	152.66	134.04	36.18	19.03

Specimen Identification: 4

Specimen Container Identification: J

Method: ☐ Natural ☐ Remolded Water Type: ☐ Distilled ☐ Type IV Initial Water Temperature: 21.8

Start Time (hh:mm:ss) 8:30 am

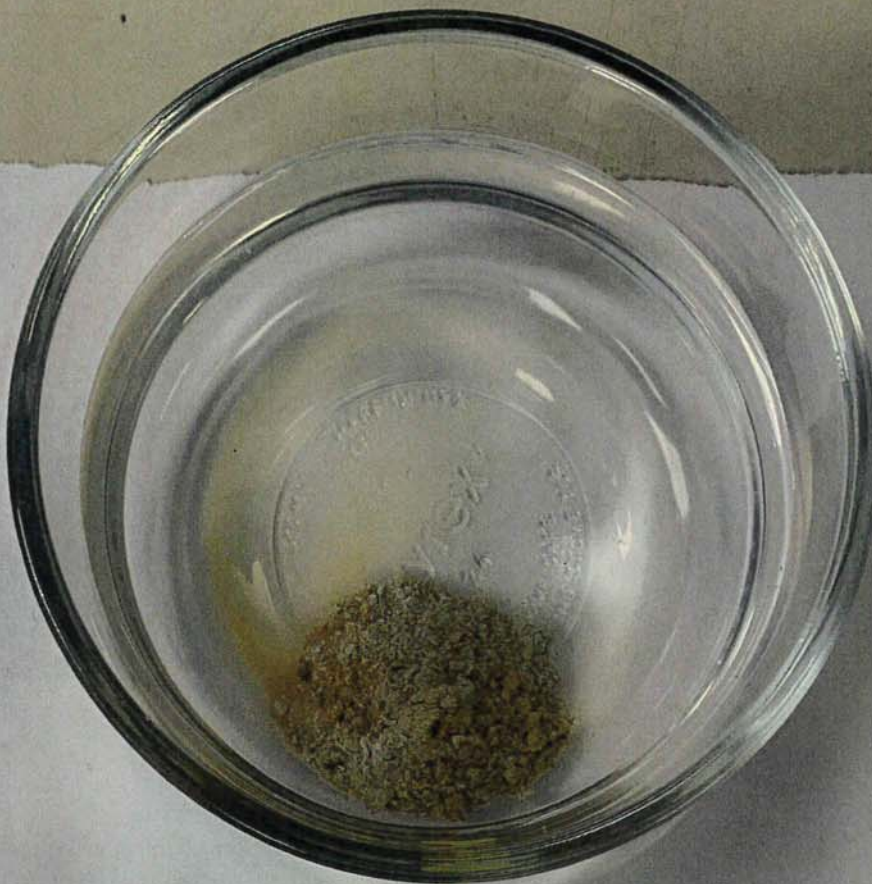
Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	<u>8:32 am</u>	<u>1</u>	<u>21.8</u>	<u>Non-dispersive</u>
1 hour (+/-) 8 min	<u>9:30 am</u>	<u>1</u>	<u>22.5</u>	<u>Non-dispersive</u>
6 hour (+/-) 45 min	<u>2:30 pm</u>	<u>2</u>	<u>23.2</u>	<u>Intermediate</u>

Additional water added to remold the specimen (Method B) ☐ Y ☒ N

Remarks: Photo taken at 6:00 Hrs. Receding

Prepared by: [Signature] Tested By: Sonal Reviewed By: [Signature]
 Date: 11/10/20 Date: 11/13/20 Date: 11/13/20





CRUMB TEST (ASTM D6572)

Project No. <u>1140258201</u>		Project Name: _____		Location: _____	
Boring No. <u>GP 2</u>		Sample No. <u>4</u>		Depth: <u>6-8</u>	
Visual Classification: <u>Silty clay</u>				Color: <u>Gray + Ye. Br.</u>	
Moisture Content of Sample:		☒ As-received	☐ In-situ	☐ Air-Dried	
Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)	
123 F	152.66	134.04	36.18	19.03	
Specimen Identification:		4			
Specimen Container Identification		J			
Method	☐ Natural	Water Type	☐ Distilled	Initial Water Temperature	21.8
	☐ Remolded		☐ Type IV		
Start Time (hh:mm:ss)		8:30 am			
Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification	
2 min (+/-) 15 sec	8:32 am	1	21.8	Non-dispersive	
1 hour (+/-) 8 min	9:30 am	1	22.5	Non-dispersive	
6 hour (+/-) 45 min	2:30 pm	2	23.2	Intermediate	
Additional water added to remold the specimen (Method B)		☐ Y	☒ N		
Remarks		Photo taken at 6:00 Hrs. Reading			

FIGURE B-18b(i)

CRUMB TEST (ASTM D6572)

Project No. 1140258201 Project Name: _____ Location: _____
 Boring No. GB-2 Sample No. 9 Depth: 16.18

Visual Classification: clay Color: Gray + Brown

Moisture Content of Sample: ☒ As-received ☐ In-situ ☐ Air-Dried

Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)
<u>G7</u>	<u>151.33</u>	<u>131.47</u>	<u>36.65</u>	<u>20.94</u>

Specimen Identification: 9

Specimen Container Identification: C

Method: ☐ Natural ☐ Remolded Water Type: ☐ Distilled ☐ Type IV Initial Water Temperature: 21.8

Start Time (hh:mm:ss) 8:30 am

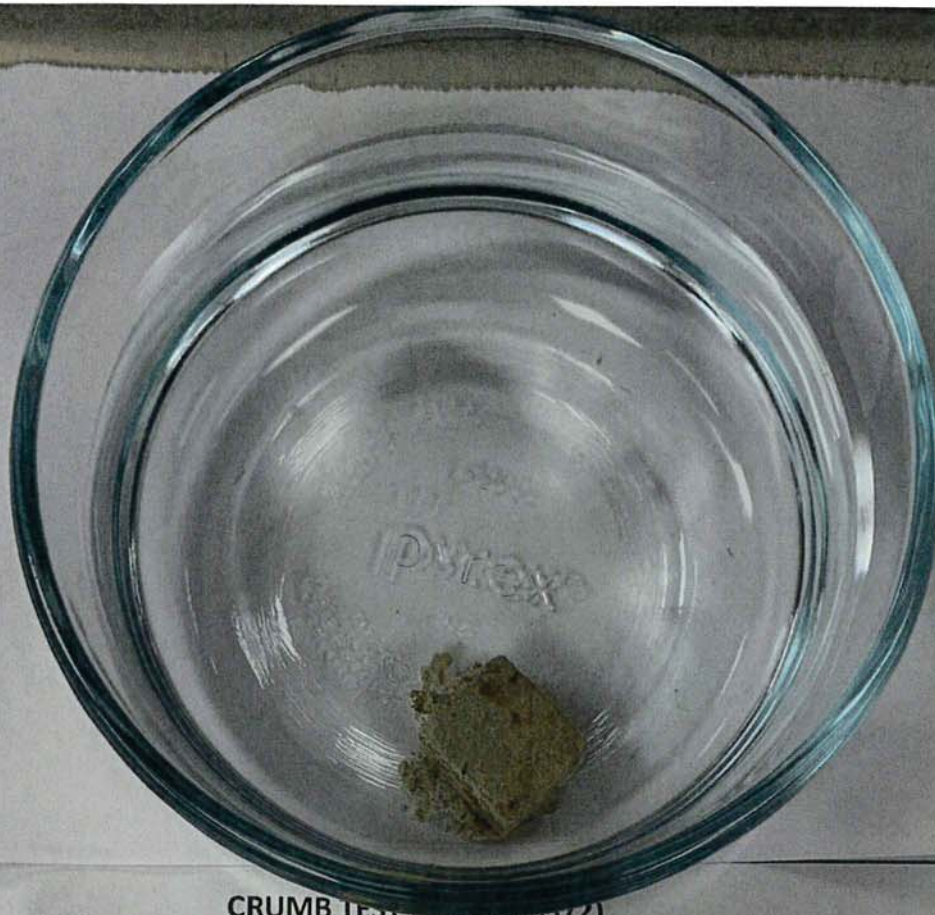
Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	<u>8:32 am</u>	<u>1</u>	<u>21.8</u>	<u>Non Dispersive</u>
1 hour (+/-) 8 min	<u>9:30 am</u>	<u>1</u>	<u>22.5</u>	<u>Non Dispersive</u>
6 hour (+/-) 45 min	<u>2:30 pm</u>	<u>1</u>	<u>23.2</u>	<u>Non Dispersive</u>

Additional water added to remold the specimen (Method B) ☐ Y ☒ N

Remarks: Photo taken at 6:00 Hrs. pending

Prepared by: [Signature] Tested By: Sonal Reviewed By: SJ
 Date: 11/10/20 Date: 11/13/20 Date: 11/14/20





CRUMB TEST (ASTM D6572)

Project No. <u>114025820</u>		Project Name: _____		Location: _____	
Boring No. <u>GB-2</u>		Sample No. <u>9</u>		Depth: <u>16.18</u>	
Visual Classification: <u>clay</u>			Color: <u>Gray + Brown</u>		
Moisture Content of Sample:		☒ As-received	☐ In-situ	☐ Air-Dried	
Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)	
<u>G7</u>	<u>151.33</u>	<u>131.47</u>	<u>36.65</u>	<u>20.94</u>	
Specimen Identification:		<u>9</u>			
Specimen Container Identification:		<u>C</u>			
Method	☐ Natural	Water Type	☐ Distilled	Initial Water Temperature	<u>21.8</u>
	☐ Remolded		☐ Type IV		
Start Time (hh:mm:ss)		<u>8:30 am</u>			
Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification	
2 min (+/-) 15 sec	<u>8:32 am</u>	<u>1</u>	<u>21.8</u>	<u>Non Dispersive</u>	
1 hour (+/-) 8 min	<u>9:30 am</u>	<u>1</u>	<u>22.5</u>	<u>Non Dispersive</u>	
6 hour (+/-) 45 min	<u>2:30 pm</u>	<u>1</u>	<u>23.2</u>	<u>Non Dispersive</u>	
Additional water added to remold the specimen (Method B)		☐ Y	☒ N		
Remarks		<u>Photo taken at 6:00 Hrs. pending</u>			

CRUMB TEST (ASTM D6572)

Project No. 1140258201 Project Name: _____ Location: _____
 Boring No. GB-3P Sample No. 7 Depth: 12-14

Visual Classification: sic Color: Grtyebr

Moisture Content of Sample: ☒ As-received ☐ In-situ ☐ Air-Dried

Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)
80F	167.90	143.50	36.60	22.83

Specimen Identification: 7

Specimen Container Identification: B

Method: ☒ Natural ☐ Remolded Water Type: ☒ Distilled ☐ Type IV Initial Water Temperature: 21.8

Start Time (hh:mm:ss) 6:30 am

Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	6:32 am	2	21.8	intermediate
1 hour (+/-) 8 min	9:30 am	3	22.5	dispersive
6 hour (+/-) 45 min	2:30 pm	4	23.2	highly dispersive

Additional water added to remold the specimen (Method B) ☐ Y ☒ N

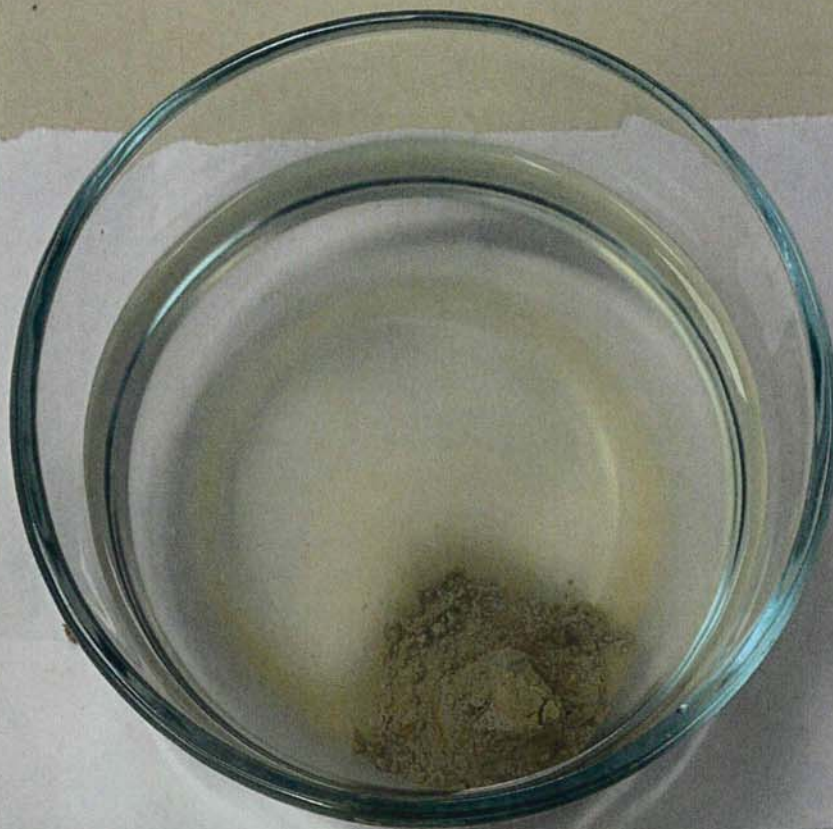
Remarks: Photo taken at 6:00 Hrs. Reading

Prepared by: <u>Ashish</u>	Tested By: <u>Sonal</u>	Reviewed By: <u>SI</u>
Date: <u>11/9/20</u>	Date: <u>11/13/20</u>	Date: <u>11/3/20</u>



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FIGURE B-18d



CRUMB TEST (ASTM D6572)						
Project No. <u>1140258201</u>		Project Name: _____		Location: _____		
Boring No. <u>GB-3P</u>		Sample No. <u>7</u>		Depth: <u>12-14</u>		
Visual Classification: <u>silt</u>			Color: <u>GrtyeBr</u>			
Moisture Content of Sample:		☒ As-received	☐ In-situ	☐ Air-Dried		
Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)		
<u>80F</u>	<u>167.90</u>	<u>143.50</u>	<u>36.60</u>	<u>22.83</u>		
Specimen Identification:		<u>7</u>				
Specimen Container Identification:		<u>B</u>				
Method	☒ Natural	Water Type	☒ Distilled	Initial Water Temperature	<u>21.8</u>	
	☐ Remolded		☐ Type IV			
Start Time (hh:mm:ss)		<u>6:30 am</u>				
Target Reading		Time Taken	Grade	Temperature (°C)	Dispersive Classification	
2 min (+/-) 15 sec		<u>69.32 gm</u>	<u>2</u>	<u>21.8</u>	<u>Intermediate</u>	
1 hour (+/-) 8 min		<u>9:30 am</u>	<u>3</u>	<u>22.5</u>	<u>Dispersive</u>	
6 hour (+/-) 45 min		<u>2:30 pm</u>	<u>4</u>	<u>23.2</u>	<u>Highly dispersive</u>	
Additional water added to remold the specimen (Method B)		☐ Y	☒ N			
Remarks		<u>Photo taken at 6:00 Hrs. Reading</u>				
Prepared by	<u>Ashish</u>	Tested By:		Reviewed By:		

FIGURE B-18d(i)

CRUMB TEST (ASTM D6572)

Project No. 1140258201 Project Name: _____ Location: _____
 Boring No. GB-4 Sample No. 3 Depth: 4-6

Visual Classification: clay Color: REBY

Moisture Content of Sample: ☒ As-received ☐ In-situ ☐ Air-Dried

Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)
AS 1	142.41	118.05	37.05	30.07

Specimen Identification: 3

Specimen Container Identification: P

Method: ☒ Natural ☐ Remolded Water Type: ☒ Distilled ☐ Type IV Initial Water Temperature: 21.8

Start Time (hh:mm:ss): 8:30 am

Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	<u>8:32 am</u>	<u>1</u>	<u>21.8</u>	<u>Non-dispersive</u>
1 hour (+/-) 8 min	<u>9:30 am</u>	<u>1</u>	<u>22.5</u>	<u>Non-dispersive</u>
6 hour (+/-) 45 min	<u>2:30 pm</u>	<u>1</u>	<u>23.2</u>	<u>Non-dispersive</u>

Additional water added to remold the specimen (Method B): ☐ Y ☒ N

Remarks: Photo taken at 6:00 hrs. Reading

Prepared by: Philan Tested By: Sonal Reviewed By: SJ
 Date: 11/9/20 Date: 11/13/20 Date: 11/13/20





CRUMB TEST (ASTM D6572)

Project No. <u>1140258201</u>		Project Name: _____		Location: _____	
Boring No. <u>GB 4</u>		Sample No. <u>3</u>		Depth: <u>4-6</u>	
Visual Classification: <u>clay</u>			Color: <u>REBY</u>		
Moisture Content of Sample: ☒		As-received ☐		In-situ ☐	
				Air-Dried ☐	
Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)	
AS 1	142.41	118.05	37.05	30.07	
Specimen Identification:		<u>3</u>			
Specimen Container Identification		<u>P</u>			
Method	☒ Natural	Water Type	☒ Distilled	Initial Water Temperature	<u>21.8</u>
	☐ Remolded		☐ Type IV		
Start Time (hh:mm:ss)		<u>8:30 am</u>			
Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification	
2 min (+/-) 15 sec	<u>5:32 am</u>	<u>1</u>	<u>21.8</u>	<u>Non-dispersive</u>	
1 hour (+/-) 8 min	<u>9:30 am</u>	<u>1</u>	<u>22.5</u>	<u>Non-dispersive</u>	
6 hour (+/-) 45 min	<u>2:30 pm</u>	<u>1</u>	<u>23.2</u>	<u>Non-dispersive</u>	
Additional water added to remold the specimen (Method B)		☐	Y	☒	N
Remarks		<u>Photo taken at 6:00 hrs. Reading</u>			

FIGURE B-18e(i)

CRUMB TEST (ASTM D6572)

Project No. 1140258201 Project Name: _____ Location: _____
 Boring No. GB 4 Sample No. 8 Depth: 14-16

Visual Classification: sandy silt Color: Gray Br

Moisture Content of Sample: ☒ As-received ☐ In-situ ☐ Air-Dried

Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)
<u>G54</u>	<u>161.56</u>	<u>139.66</u>	<u>36.00</u>	<u>21.13</u>

Specimen Identification: 8

Specimen Container Identification: N

Method: ☒ Natural ☐ Remolded Water Type: ☒ Distilled ☐ Type IV Initial Water Temperature: 21.8

Start Time (hh:mm:ss): 8:30 am

Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	<u>8:32 am</u>	<u>2</u>	<u>21.8</u>	<u>Intermediate</u>
1 hour (+/-) 8 min	<u>9:30 am</u>	<u>3</u>	<u>22.5</u>	<u>Dispersive</u>
6 hour (+/-) 45 min	<u>2:30 pm</u>	<u>3</u>	<u>23.2</u>	<u>Dispersive</u>

Additional water added to remold the specimen (Method B): ☐ Y ☐ N

Remarks: Photo taken at 6:00 Hrs. Reading

Prepared by: Alister Tested By: Sonal Reviewed By: SI
 Date: 11/9/20 Date: 11/13/20 Date: 11/13/20





CRUMB TEST (ASTM D6572)					
Project No. 1140258201		Project Name:		Location:	
Boring No. GP 4		Sample No. 8		Depth: 14-16	
Visual Classification: sandy silt			Color: Gray PR		
Moisture Content of Sample:		☒ As-received	☐ In-situ	☐ Air-Dried	
Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)	
G54	161.56	139.66	36.00	21.13	
Specimen Identification:		8			
Specimen Container Identification		N			
Method	☒ Natural	Water Type	☒ Distilled	Initial Water Temperature	21.8
	☐ Remolded		☐ Type IV		
Start Time (hh:mm:ss)		8:30 am			
Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification	
2 min (+/-) 15 sec	8:32 am	2	21.8	Intermediate	
1 hour (+/-) 8 min	9:30 am	3	22.5	Dispersive	
6 hour (+/-) 45 min	2:30 pm	3	23.2	Dispersive	
Additional water added to remold the specimen (Method B)		☐ Y	☐ N		
Remarks		Photo taken at 6:00 Hrs. Reading			

FIGURE B-18f(i)

CRUMB TEST (ASTM D6572)

Project No. 1140258201 Project Name: _____ Location: _____
 Boring No. GB 5 Sample No. 2 Depth: 2-4

Visual Classification: Clay Color: dk grey

Moisture Content of Sample: ☐ As-received ☒ In-situ ☐ Air-Dried

Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)
127F	121.00	104.71	36.22	23.78

Specimen Identification: 2

Specimen Container Identification: Q

Method: ☒ Natural ☐ Remolded Water Type: ☒ Distilled ☐ Type IV Initial Water Temperature: 21.8

Start Time (hh:mm:ss): 8:30 am

Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	<u>8:32 am</u>	<u>1</u>	<u>21.8</u>	<u>Non-Dispersive</u>
1 hour (+/-) 8 min	<u>9:30 am</u>	<u>1</u>	<u>22.5</u>	<u>Non-Dispersive</u>
6 hour (+/-) 45 min	<u>2:30 pm</u>	<u>1</u>	<u>23.2</u>	<u>Non-Dispersive</u>

Additional water added to remold the specimen (Method B): ☐ Y ☒ N

Remarks: Photo taken at 6:00 Hrs. Reading

Prepared by: [Signature] Tested By: Sonal Reviewed By: [Signature]
 Date: 11/9/20 Date: 11/13/20 Date: 11/13/20





CRUMB TEST (ASTM D6572)

Project No. 1140258201 Project Name: _____ Location: _____
 Boring No. GB 5 Sample No. 2 Depth: 2-4

Visual Classification: Clay Color: dk grey

Moisture Content of Sample: ☐ As-received ☒ In-situ ☐ Air-Dried

Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)
127F	121.00	104.71	36.22	23.78

Specimen Identification: 2

Specimen Container Identification: Q

Method: ☒ Natural ☐ Remolded Water Type: ☒ Distilled ☐ Type IV Initial Water Temperature: 21.8

Start Time (hh:mm:ss) 8:30 am

Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	8:32 am	1	21.8	Non-Dispersive
1 hour (+/-) 8 min	9:30 am	1	22.5	Non-Dispersive
6 hour (+/-) 45 min	2:30 pm	1	23.2	Non-Dispersive

Additional water added to remold the specimen (Method B) ☐ Y ☒ N

Remarks: Photo taken at 6:00 Hrs Reading

FIGURE B-18g(i)

CRUMB TEST (ASTM D6572)

Project No. 1140258201 Project Name: _____ Location: _____
 Boring No. GB 6 Sample No. 5 Depth: 8.10

Visual Classification: Sa. clay Color: Br. + Ye. Brn

Moisture Content of Sample: ☒ As-received ☐ In-situ ☐ Air-Dried

Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)
<u>G160</u>	<u>150.44</u>	<u>134.36</u>	<u>36.63</u>	<u>16.45</u>

Specimen Identification: 5

Specimen Container Identification: 2

Method: ☒ Natural ☐ Remolded Water Type: ☒ Distilled ☐ Type IV Initial Water Temperature: 22.0

Start Time (hh:mm:ss): 8:50 am

Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	<u>8:52 am</u>	<u>1</u>	<u>22.0</u>	<u>Non-Dispersive</u>
1 hour (+/-) 8 min	<u>9:50 am</u>	<u>1</u>	<u>22.6</u>	<u>Non-Dispersive</u>
6 hour (+/-) 45 min		<u>1</u>	<u>23.2</u>	<u>Non-Dispersive</u>

Additional water added to remold the specimen (Method B): ☐ Y ☒ N

Remarks: Photo taken at 6:0 Hrs. 04 min. Reading

Prepared by: [Signature] Tested By: Sonal Reviewed By: [Signature]
 Date: 11/9/20 Date: 11/13/20 Date: 11/14/20





CRUMB TEST (ASTM D6572)					
Project No. <u>1140258201</u>		Project Name: _____		Location: _____	
Boring No. <u>GB 6</u>		Sample No. <u>5</u>		Depth: <u>8.10</u>	
Visual Classification: <u>So. clay</u>			Color: <u>Gr + Ye. Brn</u>		
Moisture Content of Sample:		☒ As-received	☐ In-situ	☐ Air-Dried	
Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)	
<u>G160</u>	<u>150.44</u>	<u>134.36</u>	<u>36.63</u>	<u>16.45</u>	
Specimen Identification:		<u>5</u>			
Specimen Container Identification:		<u>2</u>			
Method	☒ Natural	Water Type	☒ Distilled	Initial Water Temperature <u>22.0</u>	
	☐ Remolded		☐ Type IV		
Start Time (hh:mm:ss)		<u>8:50 am</u>			
Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification	
2 min (+/-) 15 sec	<u>8:52 am</u>	<u>1</u>	<u>22.0</u>	<u>Non-dispersive</u>	
1 hour (+/-) 8 min	<u>9:50 am</u>	<u>1</u>	<u>22.6</u>	<u>Non-dispersive</u>	
6 hour (+/-) 45 min		<u>1</u>	<u>23.2</u>	<u>Non-dispersive</u>	
Additional water added to remold the specimen (Method B)		☐ Y	☒ N		
Remarks		<u>Photo taken at 6:0 Hrs. 04 min. Reading</u>			
Prepared by	<u>[Signature]</u>	Tested By:		Reviewed By:	

FIGURE B-18h(i)

CRUMB TEST (ASTM D6572)

Project No. 114025820 Project Name: _____ Location: _____
 Boring No. GB-6 Sample No. 10 Depth: 18.20

Visual Classification: clay + silts Color: Bm + Gm

Moisture Content of Sample:	☒	As-received	☐	In-situ	☐	Air-Dried
Tare No.	Wet mass + Tare (g)		Dry Mass + Tare (g)		Tare Mass (g)	Water Content (%)
<u>HP-A</u>	<u>232.50</u>		<u>199.29</u>		<u>42.43</u>	<u>21.17</u>

Specimen Identification:	<u>10</u>
Specimen Container Identification	<u>E</u>

Method	☒ Natural ☐ Remolded	Water Type	☒ Distilled ☐ Type IV	Initial Water Temperature	<u>22.0</u>
--------	--	------------	---	---------------------------	-------------

Start Time (hh:mm:ss)	<u>8:50 am</u>			
Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification
2 min (+/-) 15 sec	<u>8:52 am</u>	<u>1</u>	<u>22.0</u>	<u>Non-Dispersive</u>
1 hour (+/-) 8 min	<u>9:50 am</u>	<u>1</u>	<u>22.6</u>	<u>Non-Dispersive</u>
6 hour (+/-) 45 min		<u>1</u>	<u>23.2</u>	<u>Non-Dispersive</u>

Additional water added to remold the specimen (Method B)	☐	Y	☒	N
--	--------------------------	---	-------------------------------------	---

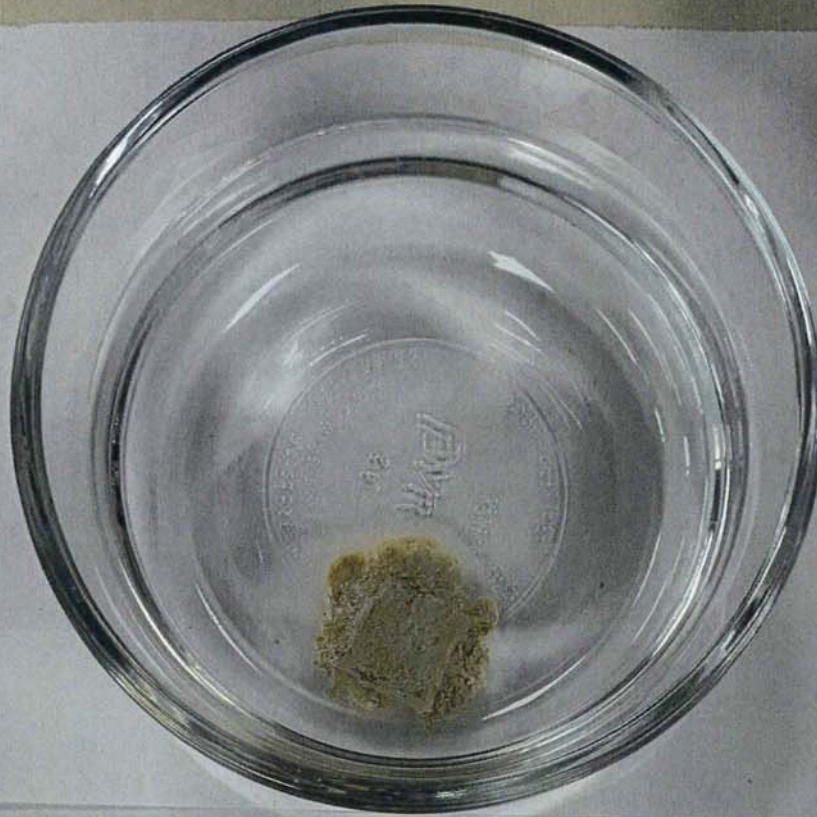
Remarks: Photo taken at 6:00 Hrs. 04 min. Reading

Prepared by	<u>18</u>	Tested By:	<u>Sonal</u>	Reviewed By:	<u>S</u>
Date:	<u>11/9/20</u>	Date:	<u>11/13/20</u>	Date:	<u>11/14/20</u>



\\gei-fs01\SAVIN C4040 Files\Scans\Geotechnical Engineering September 2020

FIGURE B-18i

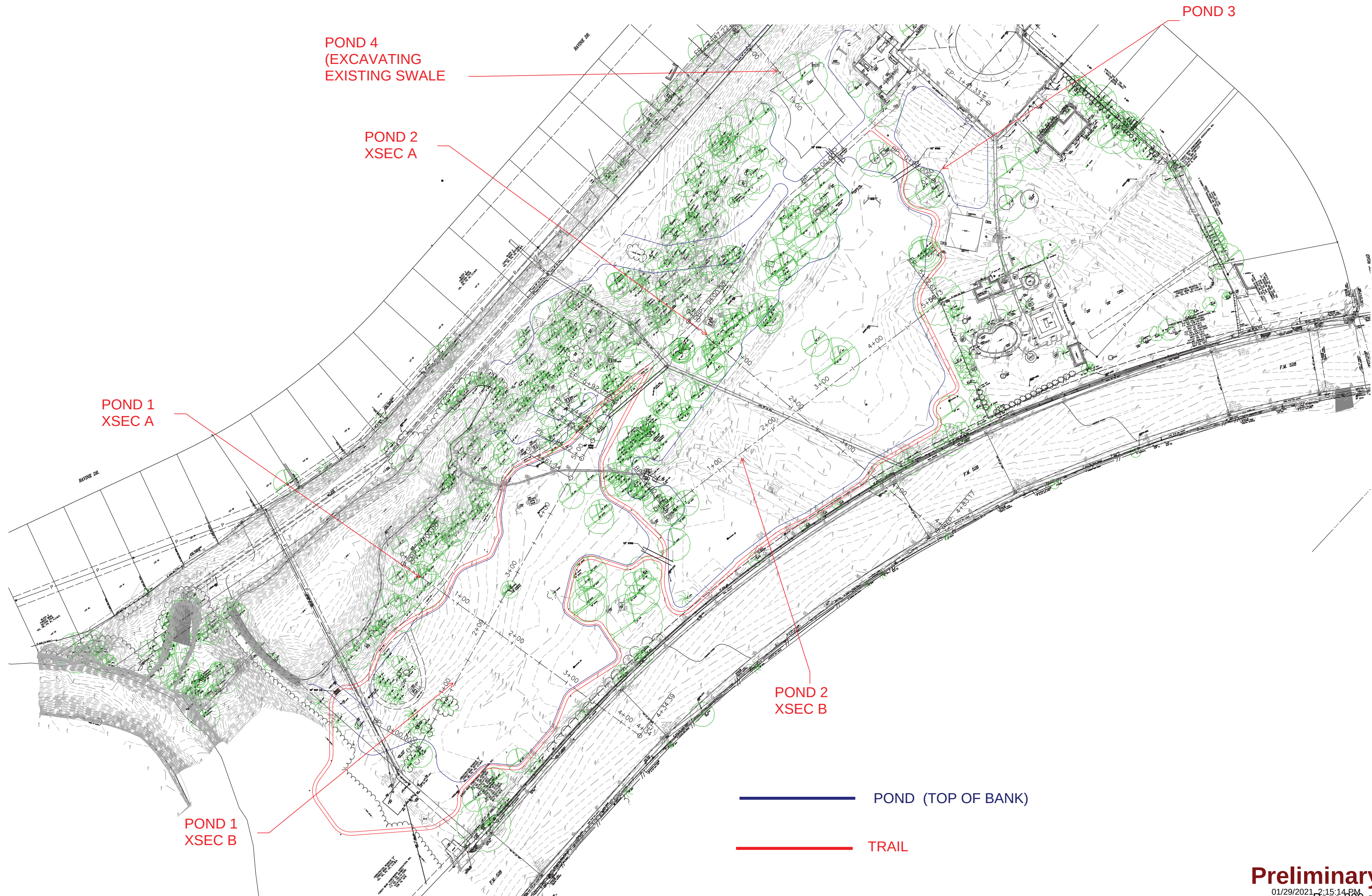


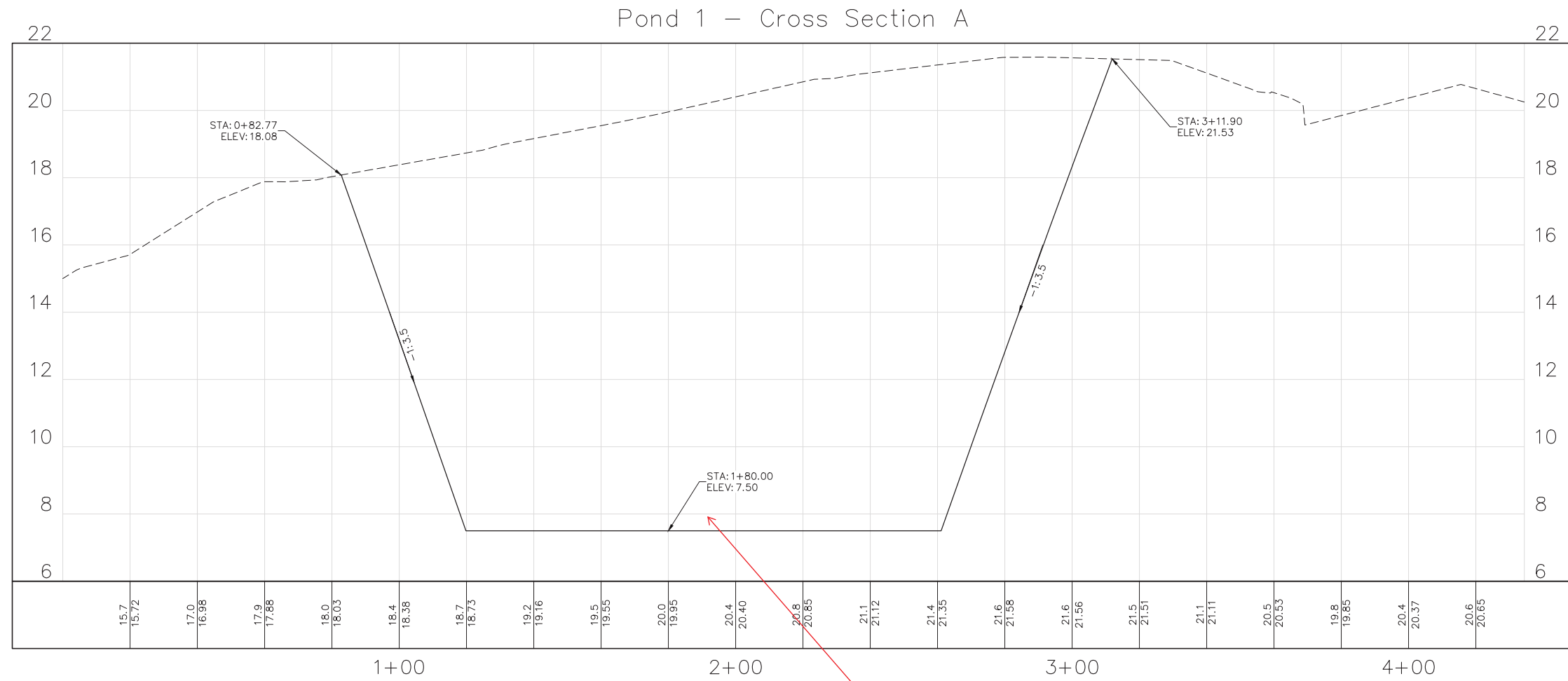
CRUMB TEST (ASTM D6572)					
Project No. <u>1140258201</u>		Project Name: _____		Location: _____	
Boring No. <u>GB-6</u>		Sample No. <u>10</u>		Depth: <u>18.20</u>	
Visual Classification: <u>Clayey + Silty</u>			Color: <u>Brown + Grey</u>		
Moisture Content of Sample:		☒ As-received	☐ In-situ	☐ Air-Dried	
Tare No.	Wet mass + Tare (g)	Dry Mass + Tare (g)	Tare Mass (g)	Water Content (%)	
<u>H.P. 4</u>	<u>232.50</u>	<u>149.29</u>	<u>42.43</u>	<u>21.17</u>	
Specimen Identification:		<u>10</u>			
Specimen Container Identification:		<u>E</u>			
Method	☒ Natural	Water Type	☒ Distilled	Initial Water Temperature	<u>22.0</u>
	☐ Remolded		☐ Type IV		
Start Time (hh:mm:ss)		<u>8:50 am</u>			
Target Reading	Time Taken	Grade	Temperature (°C)	Dispersive Classification	
2 min (+/-) 15 sec	<u>8:52 am</u>	<u>1</u>	<u>22.0</u>	<u>Non-Dispersive</u>	
1 hour (+/-) 8 min	<u>9:50 am</u>	<u>1</u>	<u>21.6</u>	<u>Non-Dispersive</u>	
6 hour (+/-) 45 min		<u>1</u>	<u>23.2</u>	<u>Non-Dispersive</u>	
Additional water added to remold the specimen (Method B)		☐ Y	☒ N		
Remarks		<u>Photo taken at 6:00 Hrs. 04 min. Reading</u>			

FIGURE B-18i(i)

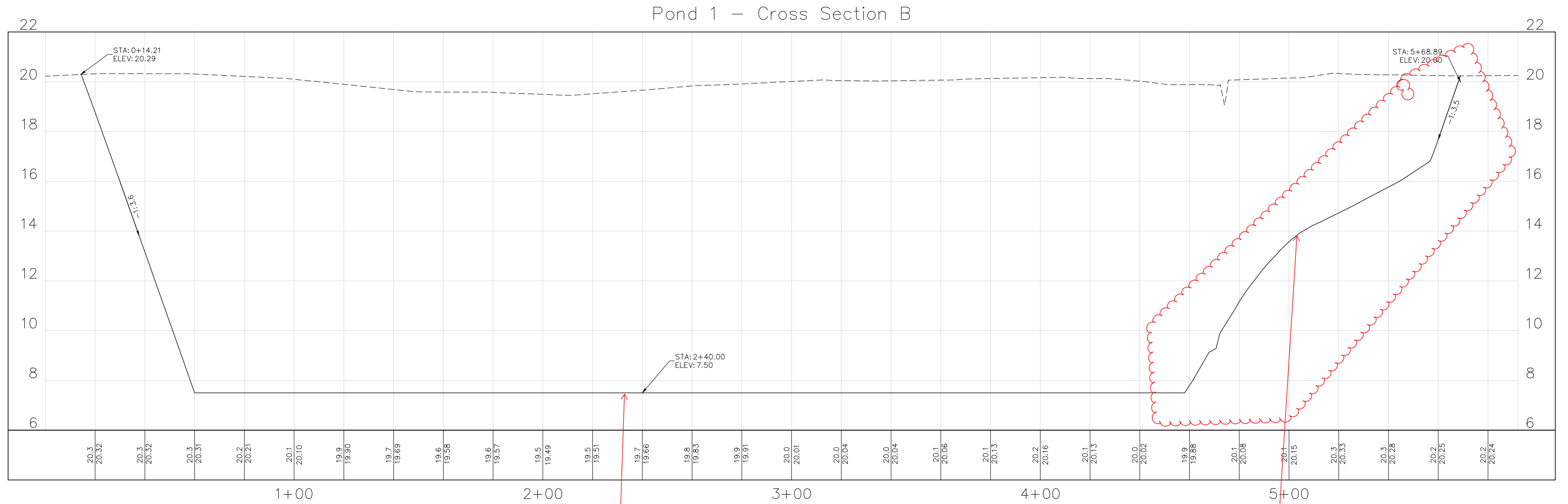
APPENDIX C

Information Received from RPS



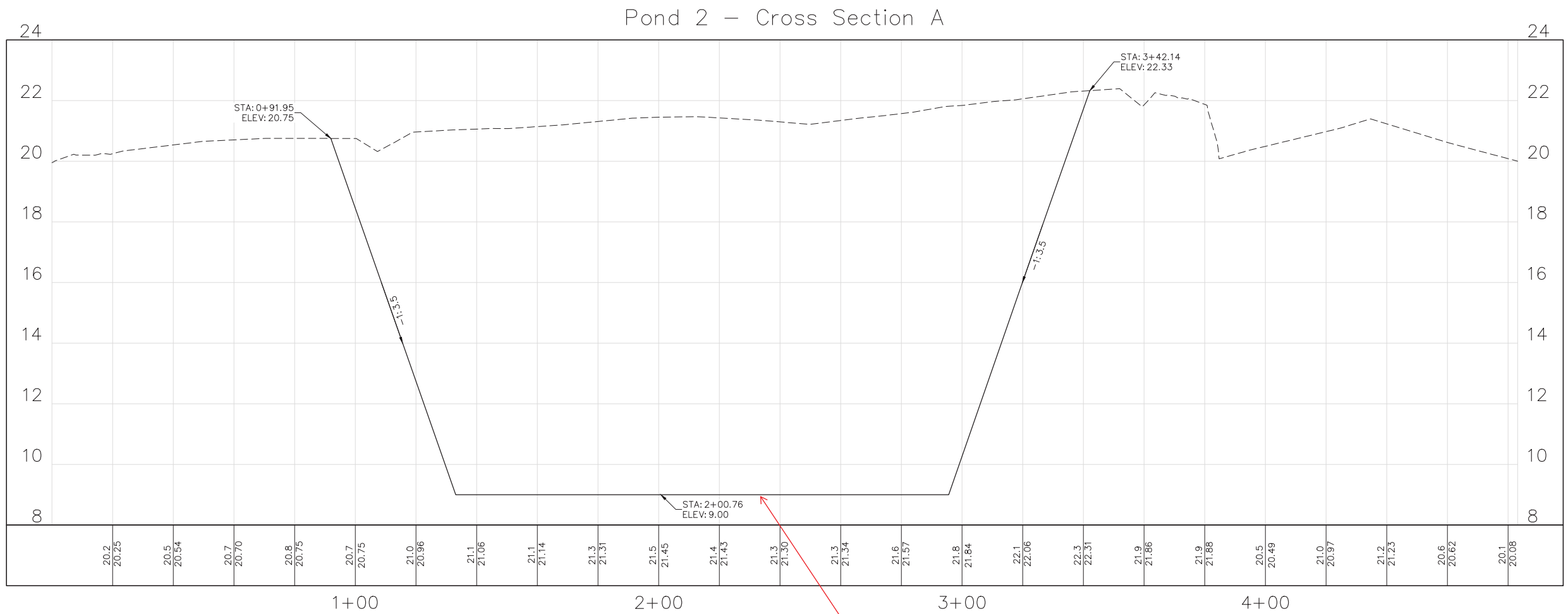


PRELIMINARY BOTTOM OF POND,
SUBJECT TO CHANGE +/- 2'

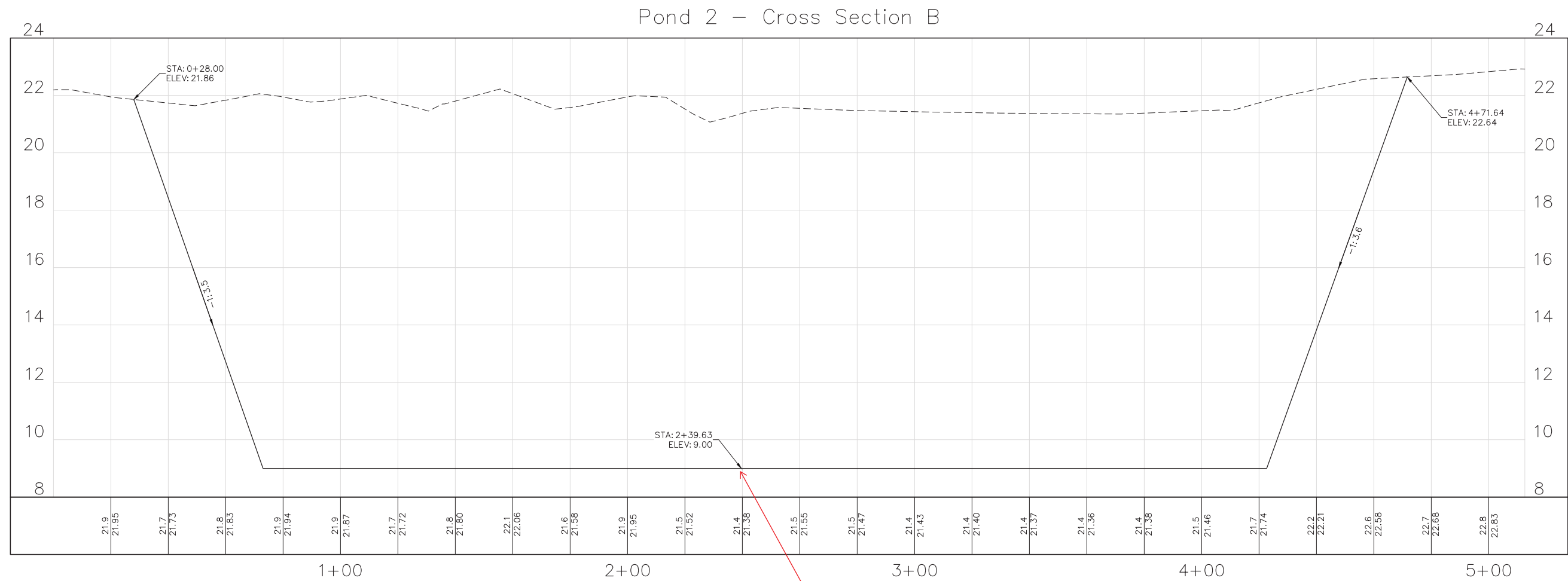


PRELIMINARY BOTTOM OF POND,
SUBJECT TO CHANGE +/- 2'

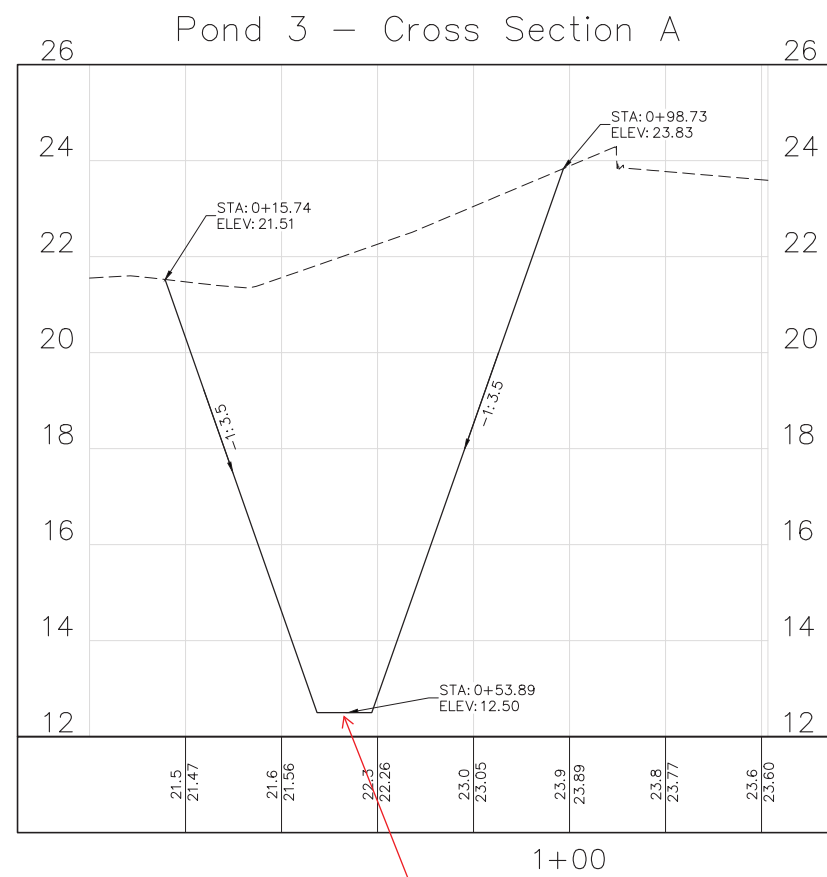
ISSUE WITH CAD GRADING MODEL,
WILL BE CORRECTED AND GRADED
AT A 3.5:1 MAX



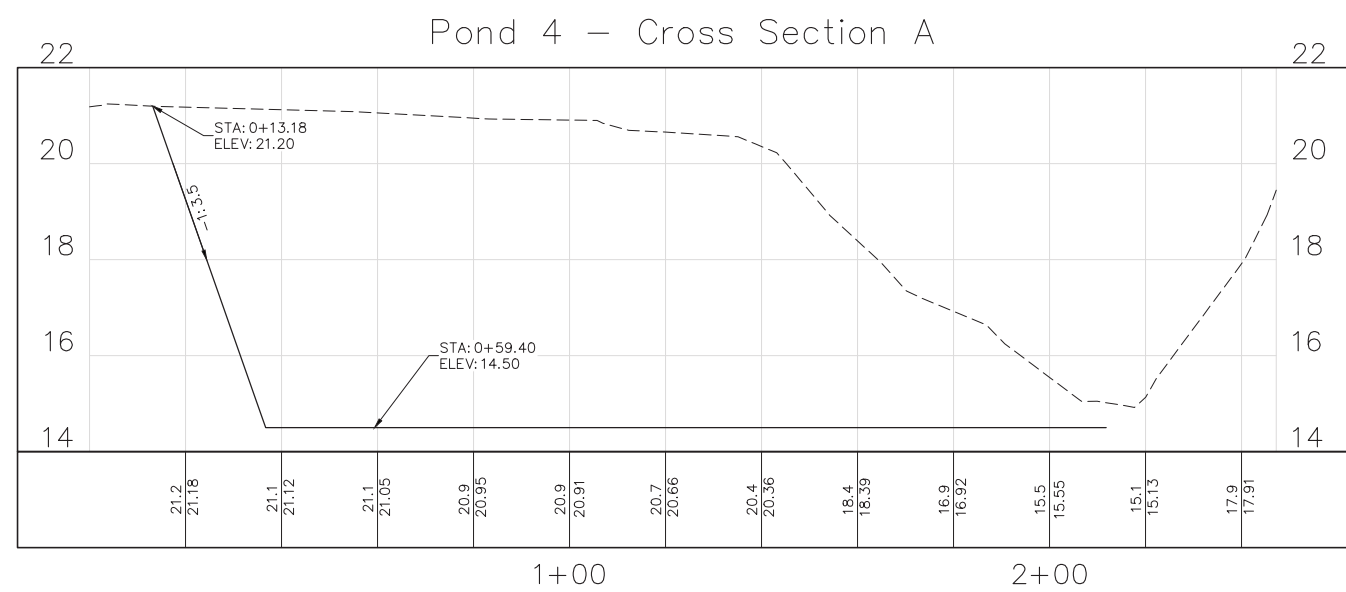
PRELIMINARY BOTTOM OF POND,
SUBJECT TO CHANGE +/- 2'



PRELIMINARY BOTTOM OF POND,
SUBJECT TO CHANGE +/- 2'



PRELIMINARY BOTTOM OF POND,
SUBJECT TO CHANGE +/- 1'



APPENDIX D

Backup Calculations and Slope Stability Output

GEOTEST ENGINEERING, INC.

5600 Bintliff Drive, Houston, Texas 77036
 Tel: (713)266-0588, Fax: (713)266-2977
 www.geotesteng.com

Project: Forest Bird Detention

Subject: Weathered Panss Lr Lean Clay

Computed By: Amr

Date: 12/21/20

Checked By: WZ

Date:

Weathered Panss

Based on CU Test (AB-6, Sat. $\sigma'_v = 8'$), $C' = 186 \text{ psf}$ $\phi' = 28.2^\circ$ $\gamma' = 62 \text{ pcf}$ $LL = 49$ $PI = 27$

Considering 7' weathered zone,

$$\sigma'_v = 62 \times 7 = 434 \text{ psf} = 20.78 \text{ kPa} \quad (1 \text{ psf} = 0.0478812 \text{ kPa})$$

For $LL = 49$, $\phi_c = 19.6^\circ$ (from sheet 2 of 3) $PI = 27$, $L = 0.86$ (from sheet 3 of 3)

$$S_{peak} = C' + \sigma'_v \tan \phi'$$

$$= 186 + 434 \tan(28^\circ)$$

$$= 416.8 \text{ psf}$$

$$S_{mob} = L \times S_{peak}$$

$$= 0.86 \times 416.8$$

$$= 358.4 \text{ psf}$$

$$S_{mob} = C'_w + \sigma'_v \tan \phi'_w$$

$$\Rightarrow 358.4 = C'_w + 434 \tan 19.6^\circ$$

$$C'_w = 208.9 > 186 \text{ psf}$$

$$\text{Therefore } C'_w = 186 \text{ psf}$$

$$\phi'_w = 19.6^\circ \approx 20^\circ$$

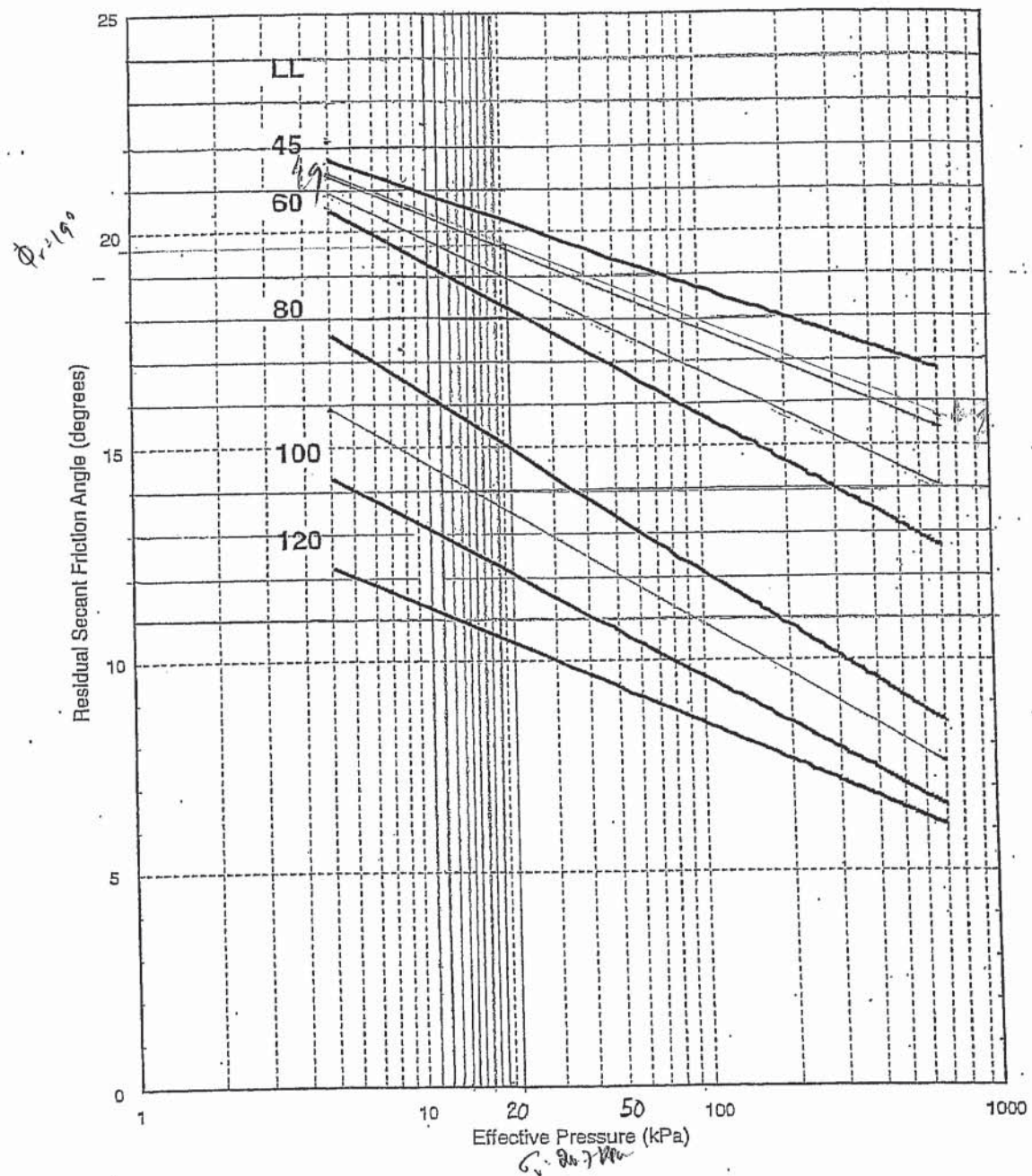


Figure 3.2 Correlation between residual secant friction angle and effective stress for selected values of liquid limit

Ref: Saleh, A.A. and Wright, Stephen G. (1977), "Shear strength correlations and Remedial Measure Guidelines for Long-Term stability of slopes constructed of Highly Plastic Clay soils," Center for Transportation Research, Bureau of Engineering Research, The Univ. of Texas at Austin, FHWA/77/18-01/85

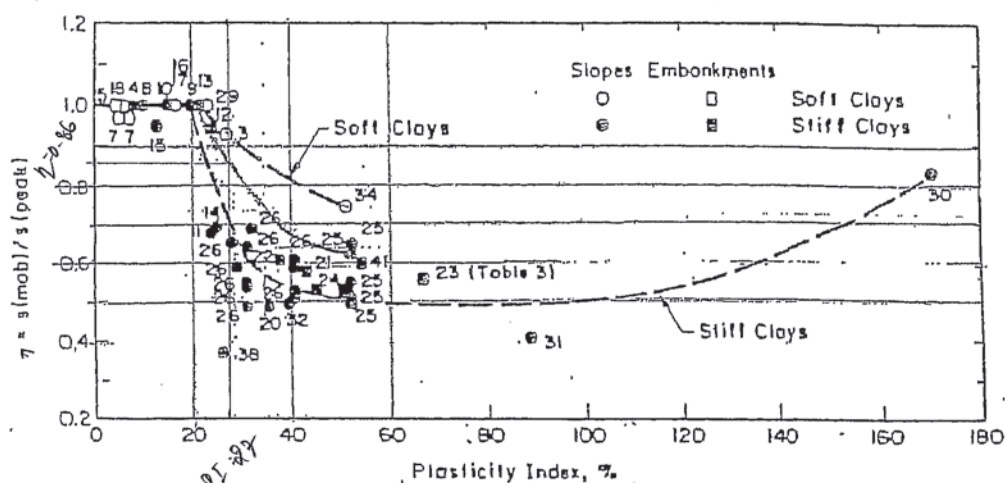


FIG. 13. Correction Factor for Peak Shear Strength Used in Effective Stress Stability Analysis

Ref: Mesri, G. and Abdel-Ghaffar, M.E.M. (1993) " Cohesion Intercept in Effect Stress-Stability Analysis. " Journal of Geotechnical Engineering, Vol. 119, No. 8, ASCE 1229-1249

GEOTEST ENGINEERING, INC.

5600 Bintliff Drive, Houston, Texas 77036

Tel: (713)266-0588, Fax: (713)266-2977

www.geotesteng.com

Project: Forest Road DetentionSubject: Weathered Params for FaltclayComputed By: hswDate: 12/21/20Checked By: RVB

Date: _____

Weathered Params:Based on CWT cut (WB-2 S#3 4'-6'), $c' = 172 \text{ psf}$ $\phi' = 15.2^\circ$ $\gamma' = 60 \text{ pcf}$ $LL = 69$ $PI = 42$

considering 7' weathered zone,

$$\sigma_v' = 60 \times 7 = 420 \text{ psf} = 20.78 \text{ kPa} \quad (1 \text{ psf} = 0.0478812 \text{ kPa})$$

$$\text{for } LL = 69, \quad \phi_r = \frac{16.8}{16} \quad (\text{from sheet 2 of 3}), \text{ so using } 15^\circ$$

$$PI = 42, \quad h = 0.66 \quad (\text{from sheet 3 of 3})$$

$$\begin{aligned} S_{peak} &= c' + \sigma_v' \tan \phi' \\ &= 172 + 420 \tan(15) \\ &= 288.3 \text{ psf} \end{aligned}$$

$$\begin{aligned} S_{mobil} &= h \times S_{peak} \\ &= 0.66 \times 288.3 = 190.3 \text{ psf} \end{aligned}$$

$$\begin{aligned} S_{mobil} &= c_w' + \sigma_v' \tan \phi_v' \\ \Rightarrow 190.3 &= c_w' + 420 \tan(15) \end{aligned}$$

$$\Rightarrow c_w = 74 \text{ psf } 59$$

$$\phi_v = 15^\circ \quad 16.8 \text{ to } 17^\circ$$

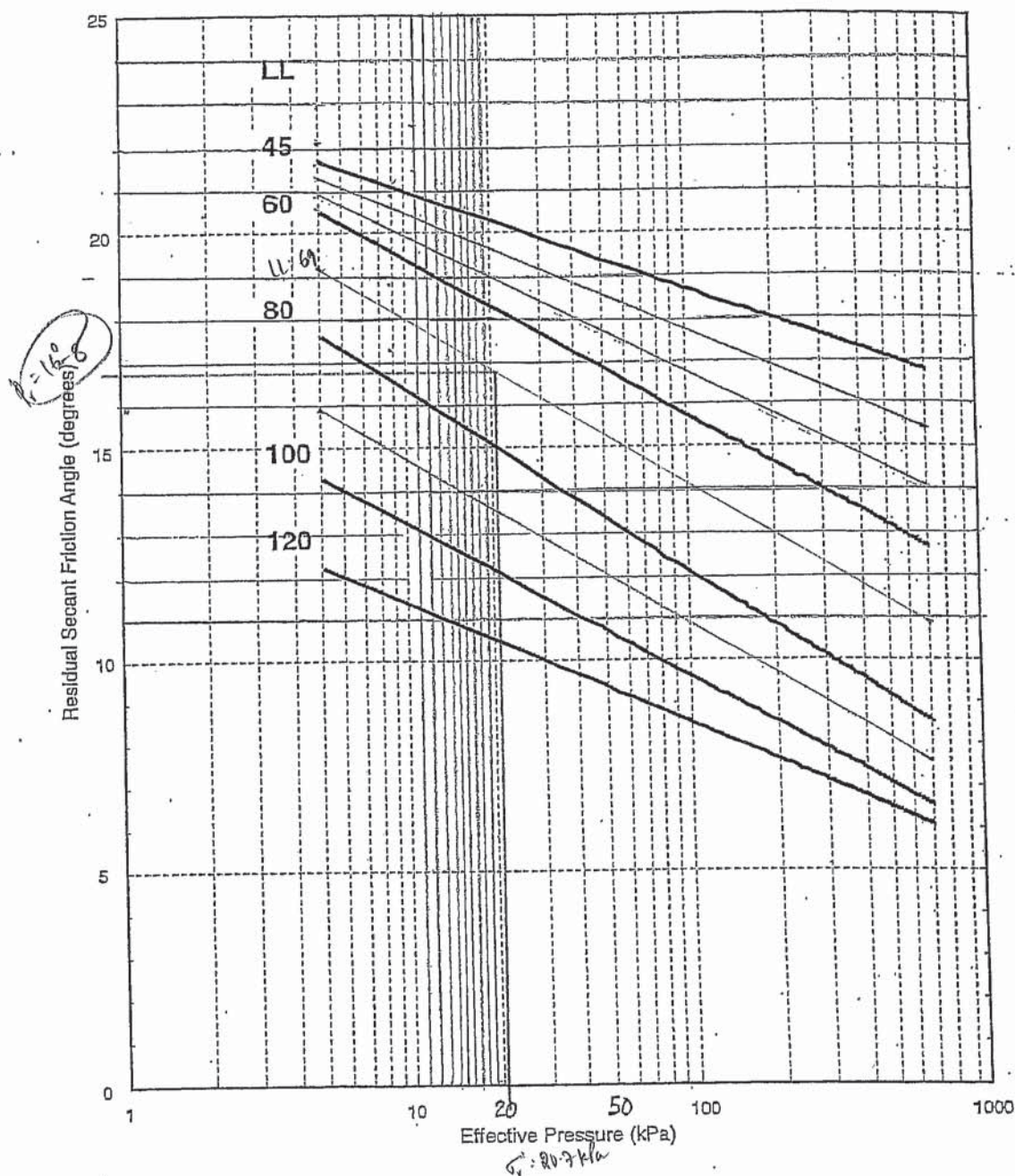


Figure 3.2 Correlation between residual secant friction angle and effective stress for selected values of liquid limit

Ref: Saleh, A.A. and Wright, Stephen G. (1977), "Shear strength correlations and Remedial Measure Guidelines for Long-Term stability of slopes Constructed of Highly Plastic Clay soils," Center for Transportation Research, Bureau of Engineering Research, The Univ. of Texas at Austin, FHWA/221-01/85/

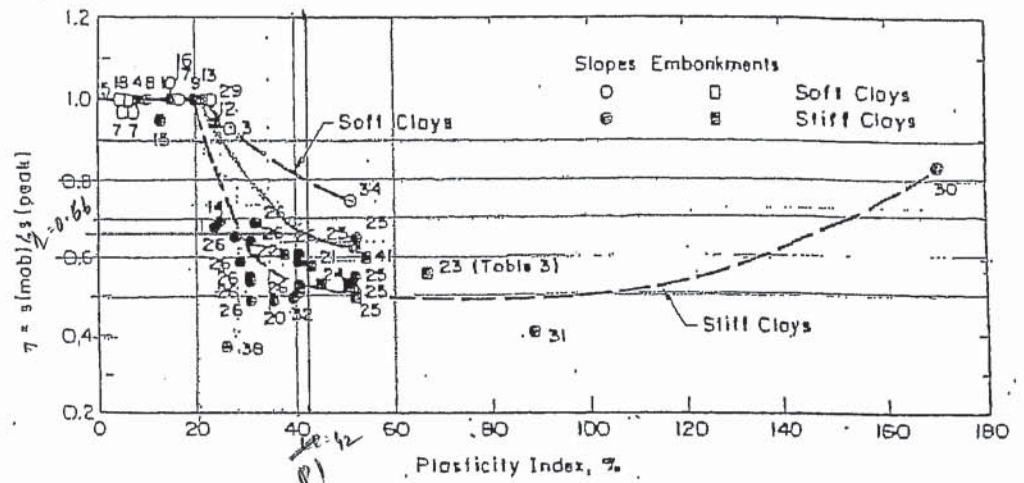


FIG. 13. Correction Factor for Peak Shear Strength Used in Effective Stress Stability Analysis

Ref: Mesri, G. and Abdel-Ghaffar, M.E.M. (1993) " Cohesion Intercept in Effect Stress-Stability Analysis. " Journal of Geotechnical Engineering, Vol. 119, No. 8, ASCE 1229-1249

case1_3.5to1_eoc.OUT
 *** GEOSTASE(R) ***

** GEOSTASE(R) (c)Copyright by Garry H. Gregory, Ph.D., P.E.,D.GE **

** Current Version 4.30.30-Double Precision, January 2019 **
 (All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SOFTWARE
 Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
 (Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
 Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
 Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
 Nonlinear Undrained Shear Strength, Curved Strength Envelope,
 Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
 2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

Analysis Date: 4/ 6/ 2021
 Analysis Time:
 Analysis By: GEI Job No. 1140258201

Input File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
 Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case1_3.5to1_eoc.gsd

Output File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
 Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case1_3.5to1_eoc.OUT

Unit System: English

PROJECT: Forest Bend Detention Pond

DESCRIPTION: Case-1 - Boring GB-4 - 3.5(H):1(V) - EOC

BOUNDARY DATA

4 Surface Boundaries
 13 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	-30.000	5.500	20.000	5.500	4
2	20.000	5.500	42.750	12.000	3
3	42.750	12.000	79.850	22.600	1
4	79.850	22.600	130.000	22.600	1
5	80.830	15.600	130.000	15.600	2
6	68.230	12.000	80.830	15.600	2
7	42.750	12.000	68.230	12.000	3
8	68.230	12.000	130.000	12.000	4
9	45.480	5.500	68.230	12.000	4
10	20.000	5.500	45.480	5.500	4
11	-30.000	4.000	130.000	4.000	5
12	-30.000	-3.000	130.000	-3.000	6
13	-30.000	-11.000	130.000	-11.000	7

User Specified X-Origin = -30.000(ft)

User Specified Y-Origin = -20.000(ft)

MOHR-COULOMB SOIL PARAMETERS

7 type(s) of soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio (ru)	Pressure Constant (psf)	Water Surface No.	Water Option
1 Fat Clay	127.0	127.0	1200.00	0.00	0.000	0.0	1	0
2 Fat Clay	127.0	127.0	1200.00	0.00	0.000	0.0	1	0
3 Fat Clay with Sand	127.0	127.0	1200.00	0.00	0.000	0.0	1	0
4 Fat Clay with Sand	127.0	127.0	1200.00	0.00	0.000	0.0	1	0

case1_3.5to1_eoc.OUT

5 Fat Clay with Sand	132.0	132.0	2500.00	0.00	0.000	0.0	1	0
6 Fat Clay	132.0	132.0	1300.00	0.00	0.000	0.0	1	0
7 Silty Sand	120.0	120.0	0.00	32.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 5 Coordinate Points
Pore Pressure Inclination Factor = 1.00

Point No.	X-Water (ft)	Y-Water (ft)
1	-30.00	5.50
2	20.00	5.50
3	42.75	12.00
4	79.85	22.60
5	130.00	22.60

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load Deflection from Vert)	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	(deg)
0.00	1	4	79.850	22.600	250.000	130.000	22.600	250.000

NOTE - Load Stress Varies Linearly within Specified Range.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.6006(in) Equally Spaced within the Start Range
Along The Specified Surface Between X = 0.00(ft)
and X = 50.00(ft)

Each Surface Enters within a Range Between X = 60.00(ft)
and X = 110.00(ft)

Unless XCLUDE Lines were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = -20.00(ft)

Specified Maximum Radius = 5000.000(ft)

3.000(ft) Line Segments were Used For Each Trial Failure Surface.

The simplified Bishop Method was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

WARNING! The Factor of Safety Calculation for one or More Trial surfaces
Did Not Converge in 50 Iterations.

Number of Trial Surfaces with Non-Converged FS = 29

Number of Trial Surfaces with Valid FS = 971

Percentage of Trial Surfaces with Non-Converged and/or

case1_3.5to1_eoc.OUT
Non-Valid FS Solutions of the Total Attempted = 2.9 %

Statistical Data On All Valid FS Values:

FS Max = 17.844 FS Min = 2.128 FS Ave = 6.330
Standard Deviation = 1.999 Coefficient of Variation = 31.58 %

Critical Surface is Sequence Number 611 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 15.727448(ft) ; Y = 173.819236(ft); and Radius = 165.971976(ft)

Circular Trial Failure Surface Generated With 20 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	30.531	8.509
2	33.516	8.803
3	36.496	9.152
4	39.469	9.554
5	42.434	10.010
6	45.390	10.519
7	48.337	11.082
8	51.273	11.698
9	54.197	12.367
10	57.109	13.089
11	60.008	13.863
12	62.892	14.690
13	65.760	15.568
14	68.612	16.498
15	71.447	17.480
16	74.264	18.512
17	77.061	19.596
18	79.839	20.730
19	82.595	21.913
20	84.118	22.600

Factor of Safety for the Preceding Surface is Between NaN and NaN

Factor of Safety For The Preceding Specified Surface = 900.0

Table 1 - Geometry Data on the 22 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	2.99	0.28	32.02	8.66	8.94	5.63	15.95	3.00
2	2.98	0.81	35.01	8.98	9.79	6.67	15.95	3.00
3	2.97	1.28	37.98	9.35	10.64	7.71	15.95	3.00
4	2.97	1.70	40.95	9.78	11.49	8.74	15.95	3.00
5	0.32	1.92	42.59	10.04	11.95	9.78	15.95	0.32
6	2.64	2.09	44.07	10.29	12.38	9.78	15.95	2.68
7	2.95	2.37	46.86	10.80	13.18	10.81	15.95	3.00
8	2.94	2.63	49.80	11.39	14.02	11.85	15.95	3.00
9	1.32	2.77	51.93	11.85	14.62	12.88	15.95	1.35
10	1.61	2.86	53.39	12.18	15.04	12.88	15.95	1.65
11	2.91	2.96	55.65	12.73	15.69	13.92	15.95	3.00
12	2.90	3.04	58.56	13.48	16.52	14.96	15.95	3.00
13	2.88	3.07	61.45	14.28	17.34	15.99	15.95	3.00
14	2.87	3.04	64.33	15.13	18.16	17.03	15.95	3.00
15	2.85	2.95	67.19	16.03	18.98	18.06	15.95	3.00
16	2.83	2.81	70.03	16.99	19.79	19.10	15.95	3.00
17	2.82	2.61	72.86	18.00	20.60	20.13	15.95	3.00
18	2.80	2.35	75.66	19.05	21.40	21.17	15.95	3.00
19	2.78	2.04	78.45	20.16	22.20	22.21	15.95	3.00
20	0.01	1.87	79.84	20.73	22.60	23.24	15.95	0.01
21	2.75	1.28	81.22	21.32	22.60	23.24	0.00	2.99

case1_3.5tol_eoc.OUT
 22 1.52 0.34 83.36 22.26 22.60 24.28 0.00 1.67

Table 2 - Force Data On The 22 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Distributed Load (lbs)
1	105.9	0.0	52.3	0.0	0.0	0.0
2	306.5	0.0	151.6	0.0	0.0	0.0
3	485.1	0.0	240.5	0.0	0.0	0.0
4	641.7	0.0	319.0	0.0	0.0	0.0
5	77.0	0.0	38.4	0.0	0.0	0.0
6	699.2	0.0	348.6	0.0	0.0	0.0
7	888.6	0.0	444.5	0.0	0.0	0.0
8	979.0	0.0	491.5	0.0	0.0	0.0
9	464.8	0.0	234.3	0.0	0.0	0.0
10	582.6	0.0	293.7	0.0	0.0	0.0
11	1094.1	0.0	553.9	0.0	0.0	0.0
12	1119.3	0.0	569.2	0.0	0.0	0.0
13	1123.1	0.0	574.0	0.0	0.0	0.0
14	1105.9	0.0	568.3	0.0	0.0	0.0
15	1068.1	0.0	552.0	0.0	0.0	0.0
16	1009.9	0.0	525.1	0.0	0.0	0.0
17	932.0	0.0	487.7	0.0	0.0	0.0
18	834.7	0.0	439.8	0.0	0.0	0.0
19	718.6	0.0	381.4	0.0	0.0	0.0
20	2.6	0.0	1.4	0.0	0.0	0.0
21	444.9	0.0	237.9	0.0	0.0	686.4
22	66.4	0.0	35.8	0.0	0.0	380.5

TOTAL WEIGHT OF SLIDING MASS = 14750.00(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 7502.75(lbs)

TOTAL AREA OF SLIDING MASS = 116.14(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 22 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	3	1200.00	0.00	
2	3	1200.00	0.00	
3	3	1200.00	0.00	
4	3	1200.00	0.00	
5	3	1200.00	0.00	
6	3	1200.00	0.00	
7	3	1200.00	0.00	
8	3	1200.00	0.00	
9	3	1200.00	0.00	
10	1	1200.00	0.00	
11	1	1200.00	0.00	
12	1	1200.00	0.00	
13	1	1200.00	0.00	
14	1	1200.00	0.00	
15	1	1200.00	0.00	
16	1	1200.00	0.00	
17	1	1200.00	0.00	
18	1	1200.00	0.00	
19	1	1200.00	0.00	
20	1	1200.00	0.00	
21	1	1200.00	0.00	
22	1	1200.00	0.00	

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
 F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
 R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
 NOTE: Phi and C in Table 4 are modified values based on specified
 Soil Options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 22 Slices

Slice	Alpha	X-Coord.	Base	Effective	Available	Mobilized
-------	-------	----------	------	-----------	-----------	-----------

No. *	(deg)	slice Cntr (ft)	Leng. (ft)	case1_3.5to1_eoc.OUT		Shear Stress (psf)
				Normal Stress (psf)	Strength (psf)	
1	5.63	32.02	3.00	NaN	NaN	NaN
1	5.63	32.02	3.00	NaN	NaN	NaN
2	6.67	35.01	3.00	NaN	NaN	NaN
2	6.67	35.01	3.00	NaN	NaN	NaN
3	7.71	37.98	3.00	NaN	NaN	NaN
3	7.71	37.98	3.00	NaN	NaN	NaN
4	8.74	40.95	3.00	NaN	NaN	NaN
4	8.74	40.95	3.00	NaN	NaN	NaN
5	9.78	42.59	0.32	NaN	NaN	NaN
5	9.78	42.59	0.32	NaN	NaN	NaN
6	9.78	44.07	2.68	NaN	NaN	NaN
6	9.78	44.07	2.68	NaN	NaN	NaN
7	10.81	46.86	3.00	NaN	NaN	NaN
7	10.81	46.86	3.00	NaN	NaN	NaN
8	11.85	49.80	3.00	NaN	NaN	NaN
8	11.85	49.80	3.00	NaN	NaN	NaN
9	12.88	51.93	1.35	NaN	NaN	NaN
9	12.88	51.93	1.35	NaN	NaN	NaN
10	12.88	53.39	1.65	NaN	NaN	NaN
10	12.88	53.39	1.65	NaN	NaN	NaN
11	13.92	55.65	3.00	NaN	NaN	NaN
11	13.92	55.65	3.00	NaN	NaN	NaN
12	14.96	58.56	3.00	NaN	NaN	NaN
12	14.96	58.56	3.00	NaN	NaN	NaN
13	15.99	61.45	3.00	NaN	NaN	NaN
13	15.99	61.45	3.00	NaN	NaN	NaN
14	17.03	64.33	3.00	NaN	NaN	NaN
14	17.03	64.33	3.00	NaN	NaN	NaN
15	18.06	67.19	3.00	NaN	NaN	NaN
15	18.06	67.19	3.00	NaN	NaN	NaN
16	19.10	70.03	3.00	NaN	NaN	NaN
16	19.10	70.03	3.00	NaN	NaN	NaN
17	20.13	72.86	3.00	NaN	NaN	NaN
17	20.13	72.86	3.00	NaN	NaN	NaN
18	21.17	75.66	3.00	NaN	NaN	NaN
18	21.17	75.66	3.00	NaN	NaN	NaN
19	22.21	78.45	3.00	NaN	NaN	NaN
19	22.21	78.45	3.00	NaN	NaN	NaN
20	23.24	79.84	0.01	NaN	NaN	NaN
20	23.24	79.84	0.01	NaN	NaN	NaN
21	23.24	81.22	2.99	NaN	NaN	NaN
21	23.24	81.22	2.99	NaN	NaN	NaN
22	24.28	83.36	1.67	NaN	NaN	NaN
22	24.28	83.36	1.67	NaN	NaN	NaN

Table 4 - Base Force Data on the 22 slices

Slice No. *	Alpha (deg)	x-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	5.63	32.02	3.00	NaN	NaN	NaN
1	5.63	32.02	3.00	NaN	NaN	NaN
2	6.67	35.01	3.00	NaN	NaN	NaN
2	6.67	35.01	3.00	NaN	NaN	NaN
3	7.71	37.98	3.00	NaN	NaN	NaN
3	7.71	37.98	3.00	NaN	NaN	NaN
4	8.74	40.95	3.00	NaN	NaN	NaN
4	8.74	40.95	3.00	NaN	NaN	NaN
5	9.78	42.59	0.32	NaN	NaN	NaN
5	9.78	42.59	0.32	NaN	NaN	NaN
6	9.78	44.07	2.68	NaN	NaN	NaN
6	9.78	44.07	2.68	NaN	NaN	NaN
7	10.81	46.86	3.00	NaN	NaN	NaN
7	10.81	46.86	3.00	NaN	NaN	NaN
8	11.85	49.80	3.00	NaN	NaN	NaN
8	11.85	49.80	3.00	NaN	NaN	NaN
9	12.88	51.93	1.35	NaN	NaN	NaN
9	12.88	51.93	1.35	NaN	NaN	NaN
10	12.88	53.39	1.65	NaN	NaN	NaN
10	12.88	53.39	1.65	NaN	NaN	NaN
11	13.92	55.65	3.00	NaN	NaN	NaN
11	13.92	55.65	3.00	NaN	NaN	NaN
12	14.96	58.56	3.00	NaN	NaN	NaN

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12	14.96	58.56	3.00	NaN	NaN	NaN
13	15.99	61.45	3.00	NaN	NaN	NaN
13	15.99	61.45	3.00	NaN	NaN	NaN
14	17.03	64.33	3.00	NaN	NaN	NaN
14	17.03	64.33	3.00	NaN	NaN	NaN
15	18.06	67.19	3.00	NaN	NaN	NaN
15	18.06	67.19	3.00	NaN	NaN	NaN
16	19.10	70.03	3.00	NaN	NaN	NaN
16	19.10	70.03	3.00	NaN	NaN	NaN
17	20.13	72.86	3.00	NaN	NaN	NaN
17	20.13	72.86	3.00	NaN	NaN	NaN
18	21.17	75.66	3.00	NaN	NaN	NaN
18	21.17	75.66	3.00	NaN	NaN	NaN
19	22.21	78.45	3.00	NaN	NaN	NaN
19	22.21	78.45	3.00	NaN	NaN	NaN
20	23.24	79.84	0.01	NaN	NaN	NaN
20	23.24	79.84	0.01	NaN	NaN	NaN
21	23.24	81.22	2.99	NaN	NaN	NaN
21	23.24	81.22	2.99	NaN	NaN	NaN
22	24.28	83.36	1.67	NaN	NaN	NaN
22	24.28	83.36	1.67	NaN	NaN	NaN

SUM OF MOMENTS = NaN (ft/lbs); Imbalance (Fraction of Total Weight) = NaN

Sum of the Resisting Forces = NaN (lbs)

Average Available Shear Strength = NaN(psf)

Sum of the Driving Forces = NaN (lbs)

Average Mobilized Shear Stress = NaN(psf)

Total length of the failure surface = 55.67(ft)

Factor of Safety Balance Check: FS = 2.12796

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

***** END OF GEOSTASE OUTPUT *****

case1_3.5to1_rd.OUT
*** GEOSTASE(R) ***

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** Current Version 4.30.30-Double Precision, January 2019 **
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SLOPE STABILITY ANALYSIS SOFTWARE
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

Analysis Date: 4/ 2/ 2021
Analysis Time:
Analysis By: GEI Job No. 1140258201

Input File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case1_3.5to1_rd.gsd

Output File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case1_3.5to1_rd.OUT

Unit System: English

PROJECT: Forest Bend Detention Pond

DESCRIPTION: Case-1 - Boring GB-4 - 3.5(H):1(V) - RD

BOUNDARY DATA

4 Surface Boundaries
13 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	-30.000	5.500	20.000	5.500	4
2	20.000	5.500	42.750	12.000	3
3	42.750	12.000	79.850	22.600	1
4	79.850	22.600	130.000	22.600	1
5	80.830	15.600	130.000	15.600	2
6	68.230	12.000	80.830	15.600	2
7	42.750	12.000	68.230	12.000	3
8	68.230	12.000	130.000	12.000	4
9	45.480	5.500	68.230	12.000	4
10	20.000	5.500	45.480	5.500	4
11	-30.000	4.000	130.000	4.000	5
12	-30.000	-3.000	130.000	-3.000	6
13	-30.000	-11.000	130.000	-11.000	7

User Specified X-Origin = -30.000(ft)

User Specified Y-Origin = -20.000(ft)

MOHR-COULOMB SOIL PARAMETERS

7 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio (ru)	Pressure Constant (psf)	Water Surface No.	Water Option
1 Fat Clay (w)	127.0	127.0	59.00	17.00	0.000	0.0	1	0
2 Fat Clay	127.0	127.0	172.00	15.00	0.000	0.0	1	0
3 Fat Clay with Sand (w)	127.0	127.0	186.00	20.00	0.000	0.0	1	0
4 Fat Clay with Sand	127.0	127.0	186.00	28.00	0.000	0.0	1	0

	132.0	132.0	186.00	28.00	0.000	0.0	1	0
5 Fat Clay with Sand	132.0	132.0	186.00	28.00	0.000	0.0	1	0
6 Fat Clay	132.0	132.0	186.00	28.00	0.000	0.0	1	0
7 Silty Sand	120.0	120.0	0.00	32.00	0.000	0.0	1	0

WATER SURFACE DATA

2 Water Surface(s) Defined for 3-Stage Rapid Drawdown Analysis.
 Water Surface No. 1 is Prior to Drawdown.
 Water Surface No. 2 is After Drawdown.

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 2 Coordinate Points
 Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	-30.00	22.60
2	130.00	22.60

Water Surface No. 2 Specified by 2 Coordinate Points
 Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	-30.00	5.50
2	130.00	5.50

SOIL PARAMETERS FOR 3-STAGE RAPID DRAWDOWN ANALYSIS

3-Stage Rapid Drawdown Method = Duncan, Wright, and Wong (1990)

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	CR (psf)	PhiR (deg)	dk (psf)	PSIk (deg)
1 Fat Clay (w)	127.00	127.00	59.00	17.00	59.00	17.00	76.25	21.56
2 Fat Clay	127.00	127.00	172.00	15.00	227.00	8.00	252.24	8.88
3 Fat Clay with Sand (w)	127.00	127.00	186.00	20.00	186.00	20.00	249.62	26.03
4 Fat Clay with Sand	127.00	127.00	186.00	28.00	209.00	20.00	263.54	24.65
5 Fat Clay with Sand	132.00	132.00	186.00	28.00	209.00	20.00	263.54	24.65
6 Fat Clay	132.00	132.00	186.00	28.00	209.00	20.00	263.54	24.65
7 Silty Sand	120.00	120.00	0.00	32.00	0.00	0.00	0.00	0.00

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load Deflection No. from Vert)	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	(deg)
0.00	1	4	79.850	22.600	250.000	130.000	22.600	250.000

NOTE - Load Stress Varies Linearly Within Specified Range.

DISTRIBUTED LOAD DATA HAS BEEN SUPPRESSED

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.6006(in) Equally Spaced within the Start Range

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Along The Specified Surface Between X = 0.00(ft)
and X = 50.00(ft)

Each Surface Enters within a Range Between X = 55.00(ft)
and X = 120.00(ft)

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = -20.00(ft)

Specified Maximum Radius = 5000.000(ft)

3.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces
Did Not Converge in 50 Iterations.

Number of Trial Surfaces with Non-Converged FS = 33

Number of Trial Surfaces with Valid FS = 967

Percentage of Trial Surfaces with Non-Converged and/or
Non-Valid FS Solutions of the Total Attempted = 3.3 %

Statistical Data On All Valid FS Values:

FS Max = 7.075 FS Min = 1.585 FS Ave = 2.760
Standard Deviation = 0.616 Coefficient of Variation = 22.33 %

Critical Surface is Sequence Number 2738 of Those Analyzed.

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 3 ****

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 51.677467(ft) ; Y = 55.517741(ft); and Radius = 43.114433(ft)

Circular Trial Failure Surface Generated With 14 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	45.646	12.827
2	48.629	12.511
3	51.627	12.403
4	54.625	12.504
5	57.609	12.813
6	60.565	13.329
7	63.477	14.049
8	66.332	14.970
9	69.116	16.088
10	71.816	17.396
11	74.418	18.888
12	76.910	20.558
13	79.280	22.398
14	79.345	22.456

Factor of Safety For The Critical or Specified Surface = 1.585

Table 1 - Geometry Data on the 13 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
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1	2.98	0.58	47.14	12.67	13.25	-6.05	15.95	3.00
2	3.00	1.65	50.13	12.46	14.11	-2.06	15.95	3.00
3	3.00	2.51	53.13	12.45	14.96	1.93	15.95	3.00
4	2.98	3.16	56.12	12.66	15.82	5.91	15.95	3.00
5	2.96	3.60	59.09	13.07	16.67	9.90	15.95	3.00
6	2.91	3.82	62.02	13.69	17.51	13.89	15.95	3.00
7	2.86	3.82	64.90	14.51	18.33	17.88	15.95	3.00
8	2.78	3.61	67.72	15.53	19.14	21.86	15.95	3.00
9	2.70	3.18	70.47	16.74	19.92	25.85	15.95	3.00
10	2.60	2.53	73.12	18.14	20.68	29.84	15.95	3.00
11	2.49	1.68	75.66	19.72	21.40	33.83	15.95	3.00
12	2.37	0.62	78.10	21.48	22.10	37.81	15.95	3.00
13	0.06	0.02	79.31	22.43	22.45	41.80	15.95	0.09

Table 2 - Force Data On The 13 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force		Distributed Load (lbs)
				Hor (lbs)	Ver (lbs)	
1	221.4	1809.5	1859.0	0.0	0.0	0.0
2	628.5	1652.2	1898.7	0.0	0.0	0.0
3	956.1	1485.7	1899.4	0.0	0.0	0.0
4	1197.7	1313.1	1861.0	0.0	0.0	0.0
5	1349.8	1137.8	1783.8	0.0	0.0	0.0
6	1411.6	962.8	1668.1	0.0	0.0	0.0
7	1385.2	791.2	1514.5	0.0	0.0	0.0
8	1275.3	626.0	1323.7	0.0	0.0	0.0
9	1089.4	469.7	1096.7	0.0	0.0	0.0
10	837.6	324.9	834.5	0.0	0.0	0.0
11	531.9	193.4	538.5	0.0	0.0	0.0
12	186.8	77.1	210.0	0.0	0.0	0.0
13	0.2	0.6	0.9	0.0	0.0	0.0

TOTAL WEIGHT OF SLIDING MASS = 11071.42(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 6048.84(lbs)

TOTAL AREA OF SLIDING MASS = 87.18(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 13 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	59.00	17.00	R
2	1	59.00	17.00	R
3	1	59.00	17.00	R
4	1	59.00	17.00	R
5	1	59.00	17.00	R
6	1	59.00	17.00	R
7	1	59.00	17.00	R
8	1	59.00	17.00	R
9	1	59.00	17.00	R
10	1	59.00	17.00	R
11	1	59.00	17.00	R
12	1	59.00	17.00	R
13	1	59.00	17.00	R

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
NOTE: Phi and C in Table 4 are modified values based on specified
Soil Options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 13 Slices

Slice No.	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)	Multi-Stage Strength Type
1	-6.05	47.14	3.00	41.98	71.83	45.32	Drained
2	-2.06	50.13	3.00	108.48	92.17	58.15	Drained

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3	1.93	53.13	3.00	160.18	107.97	68.12	Drained
4	5.91	56.12	3.00	197.29	119.32	75.28	Drained
5	9.90	59.09	3.00	220.06	126.28	79.67	Drained
6	13.89	62.02	3.00	228.81	128.95	81.36	Drained
7	17.88	64.90	3.00	223.89	127.45	80.41	Drained
8	21.86	67.72	3.00	205.75	121.91	76.91	Drained
9	25.85	70.47	3.00	174.92	112.48	70.96	Drained
10	29.84	73.12	3.00	131.99	99.35	62.68	Drained
11	33.83	75.66	3.00	77.70	82.76	52.21	Drained
12	37.81	78.10	3.00	12.89	62.94	39.71	Drained
13	41.80	79.31	0.09	1.11	0.34	0.21	Drained

Table 4 - Base Force Data on the 13 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)	
1	-6.05	47.14	3.00	125.94	215.50	135.96	Drained
2	-2.06	50.13	3.00	325.45	276.50	174.45	Drained
3	1.93	53.13	3.00	480.54	323.91	204.36	Drained
4	5.91	56.12	3.00	591.86	357.95	225.84	Drained
5	9.90	59.09	3.00	660.18	378.84	239.01	Drained
6	13.89	62.02	3.00	686.42	386.86	244.08	Drained
7	17.88	64.90	3.00	671.67	382.35	241.23	Drained
8	21.86	67.72	3.00	617.26	365.72	230.74	Drained
9	25.85	70.47	3.00	524.75	337.43	212.89	Drained
10	29.84	73.12	3.00	395.97	298.06	188.05	Drained
11	33.83	75.66	3.00	233.10	248.27	156.63	Drained
12	37.81	78.10	3.00	38.68	188.83	119.13	Drained
13	41.80	79.31	0.09	0.10	0.03	0.02	Drained

SUM OF MOMENTS = -0.875095E-01 (ft/lbs); Imbalance (Fraction of Total Weight) = -0.7904093E-05

Sum of the Resisting Forces = 3760.24 (lbs)

Average Available Shear Strength = 104.20(psf)

Sum of the Driving Forces = 2372.40 (lbs)

Average Mobilized Shear Stress = 65.74(psf)

Total length of the failure surface = 36.09(ft)

Factor of Safety Balance Check: FS = 1.58499

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 1 ****

Factor of Safety For The Critical or Specified Surface = 1.585

Table 1 - Geometry Data on the 13 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	2.98	0.58	47.14	12.67	13.25	-6.05	15.95	3.00
2	3.00	1.65	50.13	12.46	14.11	-2.06	15.95	3.00
3	3.00	2.51	53.13	12.45	14.96	1.93	15.95	3.00
4	2.98	3.16	56.12	12.66	15.82	5.91	15.95	3.00
5	2.96	3.60	59.09	13.07	16.67	9.90	15.95	3.00
6	2.91	3.82	62.02	13.69	17.51	13.89	15.95	3.00
7	2.86	3.82	64.90	14.51	18.33	17.88	15.95	3.00
8	2.78	3.61	67.72	15.53	19.14	21.86	15.95	3.00
9	2.70	3.18	70.47	16.74	19.92	25.85	15.95	3.00
10	2.60	2.53	73.12	18.14	20.68	29.84	15.95	3.00
11	2.49	1.68	75.66	19.72	21.40	33.83	15.95	3.00
12	2.37	0.62	78.10	21.48	22.10	37.81	15.95	3.00

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13 0.06 0.02 79.31 22.43 22.45 41.80 15.95 0.09

Table 2 - Force Data On The 13 slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Distributed Load (lbs)
1	221.4	0.0	0.0	0.0	0.0	0.0
2	628.5	0.0	0.0	0.0	0.0	0.0
3	956.1	0.0	0.0	0.0	0.0	0.0
4	1197.7	0.0	0.0	0.0	0.0	0.0
5	1349.8	0.0	0.0	0.0	0.0	0.0
6	1411.6	0.0	0.0	0.0	0.0	0.0
7	1385.2	0.0	0.0	0.0	0.0	0.0
8	1275.3	0.0	0.0	0.0	0.0	0.0
9	1089.4	0.0	0.0	0.0	0.0	0.0
10	837.6	0.0	0.0	0.0	0.0	0.0
11	531.9	0.0	0.0	0.0	0.0	0.0
12	186.8	0.0	0.0	0.0	0.0	0.0
13	0.2	0.0	0.0	0.0	0.0	0.0

TOTAL WEIGHT OF SLIDING MASS = 11071.42(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 11071.42(lbs)

TOTAL AREA OF SLIDING MASS = 87.18(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 13 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	71.83	0.00	R
2	1	110.55	0.00	R
3	1	127.35	0.00	R
4	1	139.92	0.00	R
5	1	147.72	0.00	R
6	1	150.73	0.00	R
7	1	149.04	0.00	R
8	1	142.81	0.00	R
9	1	132.32	0.00	R
10	1	118.02	0.00	R
11	1	101.87	0.00	R
12	1	62.94	0.00	R
13	1	59.34	0.00	R

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
NOTE: Phi and C in Table 4 are modified values based on specified
Soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 13 slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)	Multi-stage Strength Type
1	-6.05	47.14	3.00	79.23	71.83	45.32	Undrained
2	-2.06	50.13	3.00	212.27	110.55	69.75	Undrained
3	1.93	53.13	3.00	316.05	127.35	80.35	Undrained
4	5.91	56.12	3.00	391.81	139.92	88.28	Undrained
5	9.90	59.09	3.00	439.72	147.72	93.20	Undrained
6	13.89	62.02	3.00	460.10	150.73	95.10	Undrained
7	17.88	64.90	3.00	453.39	149.04	94.03	Undrained
8	21.86	67.72	3.00	420.18	142.81	90.10	Undrained
9	25.85	70.47	3.00	361.17	132.32	83.48	Undrained
10	29.84	73.12	3.00	277.14	118.02	74.46	Undrained
11	33.83	75.66	3.00	168.36	101.87	64.27	Undrained
12	37.81	78.10	3.00	46.55	62.94	39.71	Undrained
13	41.80	79.31	0.09	2.51	0.00	0.00	Undrained

case1_3.5to1_rd.OUT
 Table 4 - Base Force Data on the 13 Slices

Slice No. *	Alpha (deg)	X-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)	
1	-6.05	47.14	3.00	237.68	215.50	135.96	Undrained
2	-2.06	50.13	3.00	636.80	331.65	209.24	Undrained
3	1.93	53.13	3.00	948.14	382.06	241.05	Undrained
4	5.91	56.12	3.00	1175.42	419.76	264.83	Undrained
5	9.90	59.09	3.00	1319.15	443.16	279.60	Undrained
6	13.89	62.02	3.00	1380.29	452.19	285.29	Undrained
7	17.88	64.90	3.00	1360.18	447.11	282.09	Undrained
8	21.86	67.72	3.00	1260.55	428.44	270.31	Undrained
9	25.85	70.47	3.00	1083.51	396.95	250.44	Undrained
10	29.84	73.12	3.00	831.42	354.07	223.39	Undrained
11	33.83	75.66	3.00	505.07	305.61	192.81	Undrained
12	37.81	78.10	3.00	139.64	188.83	119.13	Undrained
13	41.80	79.31	0.09	0.22	0.00	0.00	Undrained

SUM OF MOMENTS = -0.578530E-14 (ft/lbs); Imbalance (Fraction of Total Weight) = -0.5225440E-18

Sum of the Resisting Forces = 4365.33 (lbs)

Average Available Shear Strength = 120.97(psf)

Sum of the Driving Forces = 2754.16 (lbs)

Average Mobilized Shear Stress = 76.32(psf)

Total length of the failure surface = 36.09(ft)

Factor of Safety Balance Check: FS = 1.58499

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 2 ****

Factor of Safety For The Critical or Specified Surface = 1.585

Table 1 - Geometry Data on the 13 slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	2.98	0.58	47.14	12.67	13.25	-6.05	15.95	3.00
2	3.00	1.65	50.13	12.46	14.11	-2.06	15.95	3.00
3	3.00	2.51	53.13	12.45	14.96	1.93	15.95	3.00
4	2.98	3.16	56.12	12.66	15.82	5.91	15.95	3.00
5	2.96	3.60	59.09	13.07	16.67	9.90	15.95	3.00
6	2.91	3.82	62.02	13.69	17.51	13.89	15.95	3.00
7	2.86	3.82	64.90	14.51	18.33	17.88	15.95	3.00
8	2.78	3.61	67.72	15.53	19.14	21.86	15.95	3.00
9	2.70	3.18	70.47	16.74	19.92	25.85	15.95	3.00
10	2.60	2.53	73.12	18.14	20.68	29.84	15.95	3.00
11	2.49	1.68	75.66	19.72	21.40	33.83	15.95	3.00
12	2.37	0.62	78.10	21.48	22.10	37.81	15.95	3.00
13	0.06	0.02	79.31	22.43	22.45	41.80	15.95	0.09

Table 2 - Force Data On The 13 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Distributed Load (lbs)
1	221.4	0.0	0.0	0.0	0.0	0.0
2	628.5	0.0	0.0	0.0	0.0	0.0

				case1_3.5to1_rd.OUT		
3	956.1	0.0	0.0	0.0	0.0	0.0
4	1197.7	0.0	0.0	0.0	0.0	0.0
5	1349.8	0.0	0.0	0.0	0.0	0.0
6	1411.6	0.0	0.0	0.0	0.0	0.0
7	1385.2	0.0	0.0	0.0	0.0	0.0
8	1275.3	0.0	0.0	0.0	0.0	0.0
9	1089.4	0.0	0.0	0.0	0.0	0.0
10	837.6	0.0	0.0	0.0	0.0	0.0
11	531.9	0.0	0.0	0.0	0.0	0.0
12	186.8	0.0	0.0	0.0	0.0	0.0
13	0.2	0.0	0.0	0.0	0.0	0.0

TOTAL WEIGHT OF SLIDING MASS = 11071.42(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 11071.42(lbs)

TOTAL AREA OF SLIDING MASS = 87.18(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 13 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	options
1	1	71.83	0.00	R
2	1	110.55	0.00	R
3	1	127.35	0.00	R
4	1	139.92	0.00	R
5	1	147.72	0.00	R
6	1	150.73	0.00	R
7	1	149.04	0.00	R
8	1	142.81	0.00	R
9	1	132.32	0.00	R
10	1	118.02	0.00	R
11	1	101.87	0.00	R
12	1	62.94	0.00	R
13	1	59.34	0.00	R

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
NOTE: Phi and C in Table 4 are modified values based on specified soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 13 Slices

Slice No. *	Alpha (deg)	X-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)	Multi-Stage strength Type
1	-6.05	47.14	3.00	79.23	71.83	45.32	Undrained
2	-2.06	50.13	3.00	212.27	110.55	69.75	Undrained
3	1.93	53.13	3.00	316.05	127.35	80.35	Undrained
4	5.91	56.12	3.00	391.81	139.92	88.28	Undrained
5	9.90	59.09	3.00	439.72	147.72	93.20	Undrained
6	13.89	62.02	3.00	460.10	150.73	95.10	Undrained
7	17.88	64.90	3.00	453.39	149.04	94.03	Undrained
8	21.86	67.72	3.00	420.18	142.81	90.10	Undrained
9	25.85	70.47	3.00	361.17	132.32	83.48	Undrained
10	29.84	73.12	3.00	277.14	118.02	74.46	Undrained
11	33.83	75.66	3.00	168.36	101.87	64.27	Undrained
12	37.81	78.10	3.00	46.55	62.94	39.71	Undrained
13	41.80	79.31	0.09	2.51	0.00	0.00	Undrained

Table 4 - Base Force Data on the 13 Slices

Slice No. *	Alpha (deg)	X-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)	
1	-6.05	47.14	3.00	237.68	215.50	135.96	Undrained
2	-2.06	50.13	3.00	636.80	331.65	209.24	Undrained
3	1.93	53.13	3.00	948.14	382.06	241.05	Undrained
4	5.91	56.12	3.00	1175.42	419.76	264.83	Undrained
5	9.90	59.09	3.00	1319.15	443.16	279.60	Undrained
6	13.89	62.02	3.00	1380.29	452.19	285.29	Undrained

				case1_3.5to1_rd.OUT				
7	17.88	64.90	3.00	1360.18	447.11	282.09		Undrained
8	21.86	67.72	3.00	1260.55	428.44	270.31		Undrained
9	25.85	70.47	3.00	1083.51	396.95	250.44		Undrained
10	29.84	73.12	3.00	831.42	354.07	223.39		Undrained
11	33.83	75.66	3.00	505.07	305.61	192.81		Undrained
12	37.81	78.10	3.00	139.64	188.83	119.13		Undrained
13	41.80	79.31	0.09	0.22	0.00	0.00		Undrained

SUM OF MOMENTS = -0.578530E-14 (ft/lbs); Imbalance (Fraction of Total Weight) = -0.5225440E-18

Sum of the Resisting Forces = 4365.33 (lbs)

Average Available Shear Strength = 120.97(psf)

Sum of the Driving Forces = 2754.16 (lbs)

Average Mobilized Shear Stress = 76.32(psf)

Total length of the failure surface = 36.09(ft)

Factor of Safety Balance Check: FS = 1.58499

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 3 ****

case1_3.5to1_lt.OUT
 *** GEOSTASE(R) ***

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 SLOPE STABILITY ANALYSIS SOFTWARE
 Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
 (Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
 Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
 Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
 Nonlinear Undrained Shear Strength, Curved Strength Envelope,
 Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
 2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

Analysis Date: 4/ 2/ 2021
 Analysis Time:
 Analysis By: GEI Job No. 1140258201

Input File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
 Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case1_3.5to1_lt.gsd

Output File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
 Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case1_3.5to1_lt.OUT

Unit System: English

PROJECT: Forest Bend Detention Pond

DESCRIPTION: Case-1 - Boring GB-4 - 3.5(H):1(V) - LT

BOUNDARY DATA

4 Surface Boundaries
 13 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	-30.000	5.500	20.000	5.500	4
2	20.000	5.500	42.750	12.000	3
3	42.750	12.000	79.850	22.600	1
4	79.850	22.600	130.000	22.600	1
5	80.830	15.600	130.000	15.600	2
6	68.230	12.000	80.830	15.600	2
7	42.750	12.000	68.230	12.000	3
8	68.230	12.000	130.000	12.000	4
9	45.480	5.500	68.230	12.000	4
10	20.000	5.500	45.480	5.500	4
11	-30.000	4.000	130.000	4.000	5
12	-30.000	-3.000	130.000	-3.000	6
13	-30.000	-11.000	130.000	-11.000	7

User Specified X-Origin = -30.000(ft)

User Specified Y-Origin = -20.000(ft)

MOHR-COULOMB SOIL PARAMETERS

7 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio (ru)	Pressure Constant (psf)	Water Surface No.	Water Option
1 Fat Clay (W)	127.0	127.0	59.00	17.00	0.000	0.0	1	0
2 Fat Clay	127.0	127.0	172.00	15.00	0.000	0.0	1	0
3 Fat Clay with Sand (W)	127.0	127.0	186.00	20.00	0.000	0.0	1	0
4 Fat Clay with Sand	127.0	127.0	186.00	28.00	0.000	0.0	1	0

				case1_3.5to1_1t.OUT				
5 Fat Clay with Sand	132.0	132.0	186.00	28.00	0.000	0.0	1	0
6 Fat Clay	132.0	132.0	186.00	28.00	0.000	0.0	1	0
7 Silty Sand	120.0	120.0	0.00	32.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 2 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	-30.00	6.50
2	130.00	6.50

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load Deflection from vert)	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	(deg)
0.00	1	4	79.850	22.600	250.000	130.000	22.600	250.000

NOTE - Load Stress Varies Linearly Within Specified Range.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.6607(in) Equally Spaced within the Start Range
Along The Specified Surface Between X = 0.00(ft)
and X = 55.00(ft)

Each Surface Enters within a Range Between X = 60.00(ft)
and X = 120.00(ft)

Unless XCLUDE Lines were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = -20.00(ft)

Specified Maximum Radius = 5000.000(ft)

3.000(ft) Line Segments were Used For Each Trial Failure Surface.

The Simplified Bishop Method was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces
Did Not Converge in 50 Iterations.

Number of Trial Surfaces with Non-Converged FS = 12

Number of Trial Surfaces with Valid FS = 988

Percentage of Trial Surfaces with Non-Converged and/or
Non-Valid FS Solutions of the Total Attempted = 1.2 %

Statistical Data On All valid FS values:

case1_3.5to1_1t.OUT
 FS Max = 6.572 FS Min = 1.638 FS Ave = 3.147
 Standard Deviation = 0.628 Coefficient of Variation = 19.97 %

Critical Surface is Sequence Number 840 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 54.325709(ft) ; Y = 69.702922(ft); and Radius = 57.300065(ft)

Circular Trial Failure Surface Generated with 16 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	46.191	12.983
2	49.171	12.635
3	52.165	12.444
4	55.165	12.409
5	58.162	12.531
6	61.149	12.811
7	64.117	13.246
8	67.059	13.836
9	69.965	14.579
10	72.829	15.473
11	75.642	16.515
12	78.396	17.704
13	81.085	19.035
14	83.700	20.505
15	86.235	22.110
16	86.926	22.600

Factor Of Safety For The Critical or Specified Surface = 1.638

Table 1 - Geometry Data on the 16 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	2.98	0.60	47.68	12.81	13.41	-6.66	15.95	3.00
2	2.99	1.72	50.67	12.54	14.26	-3.66	15.95	3.00
3	3.00	2.69	53.66	12.43	15.12	-0.66	15.95	3.00
4	3.00	3.51	56.66	12.47	15.98	2.34	15.95	3.00
5	2.99	4.16	59.66	12.67	16.83	5.34	15.95	3.00
6	2.97	4.65	62.63	13.03	17.68	8.34	15.95	3.00
7	2.94	4.98	65.59	13.54	18.53	11.34	15.95	3.00
8	2.91	5.15	68.51	14.21	19.36	14.34	15.95	3.00
9	2.86	5.16	71.40	15.03	20.18	17.34	15.95	3.00
10	2.81	5.00	74.24	15.99	21.00	20.34	15.95	3.00
11	2.75	4.68	77.02	17.11	21.79	23.34	15.95	3.00
12	1.45	4.33	79.12	18.06	22.39	26.34	15.95	1.62
13	1.24	3.87	80.47	18.73	22.60	26.34	0.00	1.38
14	2.62	2.83	82.39	19.77	22.60	29.34	0.00	3.00
15	2.53	1.29	84.97	21.31	22.60	32.34	0.00	3.00
16	0.69	0.25	86.58	22.35	22.60	35.34	0.00	0.85

Table 2 - Force Data On The 16 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Distributed Load (lbs)
1	226.9	0.0	0.0	0.0	0.0	0.0
2	655.1	0.0	0.0	0.0	0.0	0.0
3	1025.7	0.0	0.0	0.0	0.0	0.0
4	1334.3	0.0	0.0	0.0	0.0	0.0
5	1577.8	0.0	0.0	0.0	0.0	0.0
6	1754.0	0.0	0.0	0.0	0.0	0.0
7	1862.0	0.0	0.0	0.0	0.0	0.0

				case1_3.5to1_1t.OUT		
8	1902.3	0.0	0.0	0.0	0.0	0.0
9	1876.4	0.0	0.0	0.0	0.0	0.0
10	1786.9	0.0	0.0	0.0	0.0	0.0
11	1637.7	0.0	0.0	0.0	0.0	0.0
12	799.0	0.0	0.0	0.0	0.0	0.0
13	607.1	0.0	0.0	0.0	0.0	308.8
14	939.9	0.0	0.0	0.0	0.0	653.8
15	416.1	0.0	0.0	0.0	0.0	633.7
16	21.5	0.0	0.0	0.0	0.0	172.8

TOTAL WEIGHT OF SLIDING MASS = 18422.75(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 18422.75(lbs)

TOTAL AREA OF SLIDING MASS = 145.06(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 16 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	1	59.00	17.00	
2	1	59.00	17.00	
3	1	59.00	17.00	
4	1	59.00	17.00	
5	1	59.00	17.00	
6	1	59.00	17.00	
7	1	59.00	17.00	
8	1	59.00	17.00	
9	1	59.00	17.00	
10	1	59.00	17.00	
11	1	59.00	17.00	
12	1	59.00	17.00	
13	1	59.00	17.00	
14	1	59.00	17.00	
15	1	59.00	17.00	
16	1	59.00	17.00	

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
NOTE: Phi and C in Table 4 are modified values based on specified
Soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 16 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-6.66	47.68	3.00	99.22	89.33	54.54
1	-6.66	47.68	3.00	99.22	89.33	54.54
2	-3.66	50.67	3.00	237.41	131.58	80.34
2	-3.66	50.67	3.00	237.41	131.58	80.34
3	-0.66	53.66	3.00	346.11	164.82	100.63
3	-0.66	53.66	3.00	346.11	164.82	100.63
4	2.34	56.66	3.00	428.00	189.85	115.91
4	2.34	56.66	3.00	428.00	189.85	115.91
5	5.34	59.66	3.00	485.38	207.39	126.62
5	5.34	59.66	3.00	485.38	207.39	126.62
6	8.34	62.63	3.00	520.26	218.06	133.13
6	8.34	62.63	3.00	520.26	218.06	133.13
7	11.34	65.59	3.00	534.47	222.40	135.79
7	11.34	65.59	3.00	534.47	222.40	135.79
8	14.34	68.51	3.00	529.68	220.94	134.89
8	14.34	68.51	3.00	529.68	220.94	134.89
9	17.34	71.40	3.00	507.46	214.15	130.74
9	17.34	71.40	3.00	507.46	214.15	130.74
10	20.34	74.24	3.00	469.34	202.49	123.63
10	20.34	74.24	3.00	469.34	202.49	123.63
11	23.34	77.02	3.00	416.78	186.42	113.82
11	23.34	77.02	3.00	416.78	186.42	113.82
12	26.34	79.12	1.62	363.55	170.15	103.88
12	26.34	79.12	1.62	363.55	170.15	103.88
13	26.34	80.47	1.38	507.31	214.10	130.72
13	26.34	80.47	1.38	507.31	214.10	130.72
14	29.34	82.39	3.00	388.54	177.79	108.55

				case1_3.5to1_lt.OUT		
14	29.34	82.39	3.00	388.54	177.79	108.55
15	32.34	84.97	3.00	232.24	130.00	79.37
15	32.34	84.97	3.00	232.24	130.00	79.37
16	35.34	86.58	0.85	127.55	98.00	59.83
16	35.34	86.58	0.85	127.55	98.00	59.83

Table 4 - Base Force Data on the 16 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-6.66	47.68	3.00	297.66	268.00	163.63
1	-6.66	47.68	3.00	297.66	268.00	163.63
2	-3.66	50.67	3.00	712.23	394.75	241.01
2	-3.66	50.67	3.00	712.23	394.75	241.01
3	-0.66	53.66	3.00	1038.33	494.45	301.88
3	-0.66	53.66	3.00	1038.33	494.45	301.88
4	2.34	56.66	3.00	1284.00	569.56	347.74
4	2.34	56.66	3.00	1284.00	569.56	347.74
5	5.34	59.66	3.00	1456.13	622.18	379.87
5	5.34	59.66	3.00	1456.13	622.18	379.87
6	8.34	62.63	3.00	1560.78	654.18	399.40
6	8.34	62.63	3.00	1560.78	654.18	399.40
7	11.34	65.59	3.00	1603.41	667.21	407.36
7	11.34	65.59	3.00	1603.41	667.21	407.36
8	14.34	68.51	3.00	1589.03	662.82	404.67
8	14.34	68.51	3.00	1589.03	662.82	404.67
9	17.34	71.40	3.00	1522.39	642.44	392.23
9	17.34	71.40	3.00	1522.39	642.44	392.23
10	20.34	74.24	3.00	1408.01	607.47	370.88
10	20.34	74.24	3.00	1408.01	607.47	370.88
11	23.34	77.02	3.00	1250.33	559.26	341.45
11	23.34	77.02	3.00	1250.33	559.26	341.45
12	26.34	79.12	1.62	589.64	275.96	168.49
12	26.34	79.12	1.62	589.64	275.96	168.49
13	26.34	80.47	1.38	699.12	295.05	180.14
13	26.34	80.47	1.38	699.12	295.05	180.14
14	29.34	82.39	3.00	1165.62	533.37	325.64
14	29.34	82.39	3.00	1165.62	533.37	325.64
15	32.34	84.97	3.00	696.72	390.01	238.11
15	32.34	84.97	3.00	696.72	390.01	238.11
16	35.34	86.58	0.85	108.09	83.04	50.70
16	35.34	86.58	0.85	108.09	83.04	50.70

SUM OF MOMENTS = 0.670011E+01 (ft/lbs); Imbalance (Fraction of Total weight) = 0.3636865E-03

Sum of the Resisting Forces = 7719.76 (lbs)

Average Available Shear Strength = 180.17(psf)

Sum of the Driving Forces = 4713.21 (lbs)

Average Mobilized Shear Stress = 110.00(psf)

Total length of the failure surface = 42.85(ft)

Factor of Safety Balance Check: FS = 1.63790

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

case2_3.5to1_eoc.OUT
*** GEOSTASE(R) ***

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** Current Version 4.30.30-Double Precision, January 2019 **
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SLOPE STABILITY ANALYSIS SOFTWARE
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

Analysis Date: 4/ 6/ 2021
Analysis Time:
Analysis By: GEI Job No. 1140258201

Input File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case2_3.5to1_eoc.gsd

Output File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case2_3.5to1_eoc.OUT

Unit System: English

PROJECT: Forest Bend Detention Pond

DESCRIPTION: Case-2 - Borings GB-1P, GB-2, GB-5 & GB-6 - 3.5(H):1(V) - EOC

BOUNDARY DATA

6 Surface Boundaries
26 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	-30.000	5.500	10.000	5.500	7
2	10.000	5.500	20.000	5.500	11
3	20.000	5.500	48.280	13.580	11
4	48.280	13.580	58.500	16.500	2
5	58.500	16.500	79.850	22.600	1
6	79.850	22.600	130.000	22.600	1
7	58.500	16.500	130.000	16.500	2
8	80.830	15.600	130.000	15.600	3
9	73.480	13.500	80.830	15.600	3
10	48.280	13.580	73.480	13.500	4
11	73.480	13.500	130.000	13.500	5
12	48.280	11.500	48.280	13.580	4
13	66.480	11.500	73.480	13.500	5
14	48.280	11.500	66.480	11.500	6
15	66.480	11.500	130.000	11.500	6
16	34.280	7.500	48.280	11.500	6
17	34.280	7.500	130.000	7.500	7
18	23.780	4.500	34.280	7.500	7
19	-30.000	4.500	10.000	4.500	8
20	10.000	4.500	10.000	5.500	11
21	23.780	4.500	130.000	4.500	8
22	10.000	3.500	10.000	4.500	11
23	20.280	3.500	23.780	4.500	8
24	10.000	3.500	20.280	3.500	8
25	-30.000	-5.500	130.000	-5.500	9
26	-30.000	-10.500	130.000	-10.500	10

User Specified X-origin = -30.000(ft)

User Specified Y-origin = -20.000(ft)

MOHR-COULOMB SOIL PARAMETERS

11 Type(s) of soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	Pressure Constant (psf)	Water Surface No.	Water Option
1 Fat Clay	124.0	124.0	900.00	0.00	0.000	0.0	1	0
2 Fat Clay	124.0	124.0	1000.00	0.00	0.000	0.0	1	0
3 Fat Clay	124.0	124.0	1000.00	0.00	0.000	0.0	1	0
4 Lean Clay	135.0	135.0	1000.00	0.00	0.000	0.0	1	0
5 Lean Clay	135.0	135.0	1000.00	0.00	0.000	0.0	1	0
6 Sandy Silt	110.0	110.0	0.00	27.00	0.000	0.0	1	0
7 Silty Sand	115.0	115.0	0.00	30.00	0.000	0.0	1	0
8 Fat Clay	133.0	133.0	1800.00	0.00	0.000	0.0	1	0
9 Fat Clay	135.0	135.0	3000.00	0.00	0.000	0.0	1	0
10 Silty Sand	115.0	115.0	0.00	30.00	0.000	0.0	1	0
11 Clay Liner	120.0	120.0	1000.00	0.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 7 Coordinate Points
Pore Pressure Inclination Factor = 1.00

Point No.	X-Water (ft)	Y-Water (ft)
1	-30.00	5.50
2	10.00	5.50
3	20.00	5.50
4	48.28	13.58
5	58.50	16.50
6	79.85	22.60
7	130.00	22.60

DISTRIBUTED LOAD(S)

1 Load(s) specified

Load Deflection No. from Vert)	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	(deg)
0.00	1	6	79.850	22.600	250.000	130.000	22.600	250.000

NOTE - Load Stress Varies Linearly within Specified Range.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.6607(in) Equally Spaced within the Start Range
Along The Specified Surface Between X = -10.00(ft)
and X = 45.00(ft)

Each Surface Enters within a Range Between X = 55.00(ft)
and X = 120.00(ft)

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = -20.00(ft)

Specified Maximum Radius = 5000.000(ft)

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3.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

Number of Trial Surfaces With Valid FS = 1000

Statistical Data On All Valid FS Values:

FS Max = 78.862 FS Min = 2.282 FS Ave = 6.980
Standard Deviation = 5.824 Coefficient of Variation = 83.45 %

Critical Surface is Sequence Number 639 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 44.592597(ft) ; Y = 85.522178(ft); and Radius = 80.934043(ft)

Circular Trial Failure Surface Generated With 26 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	25.125	6.964
2	28.050	6.297
3	30.997	5.738
4	33.964	5.289
5	36.944	4.950
6	39.936	4.722
7	42.933	4.605
8	45.933	4.599
9	48.932	4.705
10	51.924	4.921
11	54.906	5.248
12	57.874	5.685
13	60.824	6.232
14	63.751	6.888
15	66.652	7.652
16	69.523	8.523
17	72.359	9.500
18	75.158	10.582
19	77.914	11.766
20	80.625	13.051
21	83.286	14.437
22	85.894	15.919
23	88.445	17.498
24	90.936	19.170
25	93.363	20.933
26	95.488	22.600

Factor of Safety For The Critical or Specified Surface = 2.282

Table 1 - Geometry Data on the 38 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	2.92	0.75	26.59	6.63	7.38	-12.86	15.95	3.00
2	1.21	1.79	28.66	6.18	7.97	-10.73	15.95	1.24
3	1.73	2.49	30.13	5.90	8.39	-10.73	15.95	1.76
4	2.97	3.55	32.48	5.51	9.07	-8.61	15.95	3.00
5	0.32	4.26	34.12	5.27	9.53	-6.48	15.95	0.32
6	2.66	4.86	35.61	5.10	9.96	-6.48	15.95	2.68
7	2.99	5.93	38.44	4.84	10.77	-4.36	15.95	3.00
8	3.00	6.96	41.43	4.66	11.62	-2.24	15.95	3.00
9	3.00	7.88	44.43	4.60	12.48	-0.11	15.95	3.00
10	2.35	8.60	47.11	4.64	13.24	2.01	15.95	2.35

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11	0.65	8.98	48.61	4.69	13.67	2.01	15.95	0.65
12	2.99	9.38	50.43	4.81	14.19	4.14	15.95	3.00
13	2.98	9.96	53.41	5.08	15.05	6.26	15.95	3.00
14	2.97	10.43	56.39	5.47	15.90	8.38	15.95	3.00
15	0.63	10.67	58.19	5.74	16.41	10.51	15.95	0.64
16	2.32	10.82	59.66	6.02	16.83	10.51	15.95	2.36
17	2.93	11.02	62.29	6.56	17.58	12.63	15.95	3.00
18	2.32	11.14	64.91	7.19	18.33	14.75	15.95	2.40
19	0.41	11.17	66.28	7.55	18.72	14.75	15.95	0.42
20	0.17	11.17	66.57	7.63	18.80	14.75	15.95	0.18
21	2.87	11.15	68.09	8.09	19.24	16.88	15.95	3.00
22	2.84	11.04	70.94	9.01	20.05	19.00	15.95	3.00
23	1.12	10.90	72.92	9.72	20.62	21.13	15.95	1.20
24	1.68	10.76	74.32	10.26	21.02	21.13	15.95	1.80
25	2.14	10.52	76.23	11.04	21.56	23.25	15.95	2.33
26	0.62	10.33	77.60	11.63	21.96	23.25	15.95	0.67
27	1.94	10.10	78.88	12.22	22.32	25.37	15.95	2.14
28	0.77	9.73	80.24	12.87	22.60	25.37	0.00	0.86
29	0.21	9.50	80.73	13.10	22.60	27.50	0.00	0.23
30	0.66	9.27	81.16	13.33	22.60	27.50	0.00	0.74
31	1.80	8.63	82.39	13.97	22.60	27.50	0.00	2.03
32	2.05	7.58	84.31	15.02	22.60	29.62	0.00	2.35
33	0.56	6.84	85.61	15.76	22.60	29.62	0.00	0.65
34	0.94	6.39	86.36	16.21	22.60	31.75	0.00	1.10
35	1.61	5.60	87.64	17.00	22.60	31.75	0.00	1.90
36	2.49	4.27	89.69	18.33	22.60	33.87	0.00	3.00
37	2.43	2.55	92.15	20.05	22.60	35.99	0.00	3.00
38	2.12	0.83	94.43	21.77	22.60	38.12	0.00	2.70

Table 2 - Force Data On The 38 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force		Distributed Load (lbs)
				Hor (lbs)	Ver (lbs)	
1	263.8	0.0	140.7	0.0	0.0	0.0
2	260.9	0.0	138.1	0.0	0.0	0.0
3	514.9	0.0	274.4	0.0	0.0	0.0
4	1242.6	0.0	665.0	0.0	0.0	0.0
5	158.4	0.0	84.7	0.0	0.0	0.0
6	1511.5	0.0	813.1	0.0	0.0	0.0
7	2054.1	0.0	1110.5	0.0	0.0	0.0
8	2400.1	0.0	1303.0	0.0	0.0	0.0
9	2705.9	0.0	1474.9	0.0	0.0	0.0
10	2303.3	0.0	1260.6	0.0	0.0	0.0
11	687.6	0.0	365.4	0.0	0.0	0.0
12	3308.9	0.0	1756.1	0.0	0.0	0.0
13	3519.9	0.0	1865.0	0.0	0.0	0.0
14	3685.2	0.0	1952.6	0.0	0.0	0.0
15	797.3	0.0	423.9	0.0	0.0	0.0
16	3007.2	0.0	1594.8	0.0	0.0	0.0
17	3877.7	0.0	2063.3	0.0	0.0	0.0
18	3122.7	0.0	1669.1	0.0	0.0	0.0
19	549.8	0.0	293.1	0.0	0.0	0.0
20	232.9	0.0	124.1	0.0	0.0	0.0
21	3896.2	0.0	2087.5	0.0	0.0	0.0
22	3847.9	0.0	2067.2	0.0	0.0	0.0
23	1511.8	0.0	817.4	0.0	0.0	0.0
24	2246.6	0.0	1207.9	0.0	0.0	0.0
25	2822.8	0.0	1527.9	0.0	0.0	0.0
26	804.9	0.0	433.9	0.0	0.0	0.0
27	2451.4	0.0	1350.2	0.0	0.0	0.0
28	940.2	0.0	520.7	0.0	0.0	193.7
29	242.7	0.0	137.2	0.0	0.0	51.3
30	755.8	0.0	428.1	0.0	0.0	164.1
31	1925.8	0.0	1092.6	0.0	0.0	449.8
32	1923.6	0.0	1113.6	0.0	0.0	511.5
33	476.5	0.0	275.8	0.0	0.0	140.4
34	743.5	0.0	440.0	0.0	0.0	234.6
35	1120.1	0.0	662.9	0.0	0.0	403.2
36	1317.7	0.0	798.6	0.0	0.0	622.7
37	767.1	0.0	477.1	0.0	0.0	606.8
38	219.6	0.0	140.5	0.0	0.0	531.2

TOTAL WEIGHT OF SLIDING MASS = 64219.03(lbs)

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EFFECTIVE WEIGHT OF SLIDING MASS = 30955.12(lbs)

TOTAL AREA OF SLIDING MASS = 533.08(ft²)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 38 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	11	1000.00	0.00	
2	11	1000.00	0.00	
3	7	0.00	30.00	
4	7	0.00	30.00	
5	7	0.00	30.00	
6	7	0.00	30.00	
7	7	0.00	30.00	
8	7	0.00	30.00	
9	7	0.00	30.00	
10	7	0.00	30.00	
11	7	0.00	30.00	
12	7	0.00	30.00	
13	7	0.00	30.00	
14	7	0.00	30.00	
15	7	0.00	30.00	
16	7	0.00	30.00	
17	7	0.00	30.00	
18	7	0.00	30.00	
19	6	0.00	27.00	
20	6	0.00	27.00	
21	6	0.00	27.00	
22	6	0.00	27.00	
23	6	0.00	27.00	
24	6	0.00	27.00	
25	6	0.00	27.00	
26	5	1000.00	0.00	
27	5	1000.00	0.00	
28	5	1000.00	0.00	
29	5	1000.00	0.00	
30	5	1000.00	0.00	
31	3	1000.00	0.00	
32	3	1000.00	0.00	
33	2	1000.00	0.00	
34	2	1000.00	0.00	
35	1	900.00	0.00	
36	1	900.00	0.00	
37	1	900.00	0.00	
38	1	900.00	0.00	

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
NOTE: Phi and C in Table 4 are modified values based on specified
Soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 38 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-12.86	26.59	3.00	166.14	1000.00	438.21
1	-12.86	26.59	3.00	166.14	1000.00	438.21
2	-10.73	28.66	1.24	205.22	1000.00	438.21
2	-10.73	28.66	1.24	205.22	1000.00	438.21
3	-10.73	30.13	1.76	150.33	86.80	38.03
3	-10.73	30.13	1.76	150.33	86.80	38.03
4	-8.61	32.48	3.00	206.99	119.50	52.37
4	-8.61	32.48	3.00	206.99	119.50	52.37
5	-6.48	34.12	0.32	243.26	140.45	61.55
5	-6.48	34.12	0.32	243.26	140.45	61.55
6	-6.48	35.61	2.68	273.74	158.05	69.26
6	-6.48	35.61	2.68	273.74	158.05	69.26
7	-4.36	38.44	3.00	324.18	187.17	82.02
7	-4.36	38.44	3.00	324.18	187.17	82.02
8	-2.24	41.43	3.00	370.80	214.08	93.81
8	-2.24	41.43	3.00	370.80	214.08	93.81
9	-0.11	44.43	3.00	410.57	237.04	103.88

case2_3.5to1_eoc.OUT						
9	-0.11	44.43	3.00	410.57	237.04	103.88
10	2.01	47.11	2.35	439.86	253.96	111.29
10	2.01	47.11	2.35	439.86	253.96	111.29
11	2.01	48.61	0.65	489.43	282.57	123.83
11	2.01	48.61	0.65	489.43	282.57	123.83
12	4.14	50.43	3.00	509.05	293.90	128.79
12	4.14	50.43	3.00	509.05	293.90	128.79
13	6.26	53.41	3.00	540.25	311.91	136.68
13	6.26	53.41	3.00	540.25	311.91	136.68
14	8.38	56.39	3.00	564.94	326.17	142.93
14	8.38	56.39	3.00	564.94	326.17	142.93
15	10.51	58.19	0.64	574.70	331.80	145.40
15	10.51	58.19	0.64	574.70	331.80	145.40
16	10.51	59.66	2.36	585.59	338.09	148.15
16	10.51	59.66	2.36	585.59	338.09	148.15
17	12.63	62.29	3.00	595.41	343.76	150.64
17	12.63	62.29	3.00	595.41	343.76	150.64
18	14.75	64.91	2.40	600.49	346.69	151.92
18	14.75	64.91	2.40	600.49	346.69	151.92
19	14.75	66.28	0.42	610.85	311.24	136.39
19	14.75	66.28	0.42	610.85	311.24	136.39
20	14.75	66.57	0.18	612.20	311.93	136.69
20	14.75	66.57	0.18	612.20	311.93	136.69
21	16.88	68.09	3.00	610.53	311.08	136.32
21	16.88	68.09	3.00	610.53	311.08	136.32
22	19.00	70.94	3.00	609.88	310.75	136.17
22	19.00	70.94	3.00	609.88	310.75	136.17
23	21.13	72.92	1.20	604.61	308.06	135.00
23	21.13	72.92	1.20	604.61	308.06	135.00
24	21.13	74.32	1.80	603.59	307.54	134.77
24	21.13	74.32	1.80	603.59	307.54	134.77
25	23.25	76.23	2.33	593.86	302.59	132.60
25	23.25	76.23	2.33	593.86	302.59	132.60
26	23.25	77.60	0.67	425.32	1000.00	438.21
26	23.25	77.60	0.67	425.32	1000.00	438.21
27	25.37	78.88	2.14	380.79	1000.00	438.21
27	25.37	78.88	2.14	380.79	1000.00	438.21
28	25.37	80.24	0.86	601.16	1000.00	438.21
28	25.37	80.24	0.86	601.16	1000.00	438.21
29	27.50	80.73	0.23	559.05	1000.00	438.21
29	27.50	80.73	0.23	559.05	1000.00	438.21
30	27.50	81.16	0.74	542.77	1000.00	438.21
30	27.50	81.16	0.74	542.77	1000.00	438.21
31	27.50	82.39	2.03	501.52	1000.00	438.21
31	27.50	82.39	2.03	501.52	1000.00	438.21
32	29.62	84.31	2.35	410.96	1000.00	438.21
32	29.62	84.31	2.35	410.96	1000.00	438.21
33	29.62	85.61	0.65	365.29	1000.00	438.21
33	29.62	85.61	0.65	365.29	1000.00	438.21
34	31.75	86.36	1.10	310.59	1000.00	438.21
34	31.75	86.36	1.10	310.59	1000.00	438.21
35	31.75	87.64	1.90	295.27	900.00	394.39
35	31.75	87.64	1.90	295.27	900.00	394.39
36	33.87	89.69	3.00	187.62	900.00	394.39
36	33.87	89.69	3.00	187.62	900.00	394.39
37	35.99	92.15	3.00	55.09	900.00	394.39
37	35.99	92.15	3.00	55.09	900.00	394.39
38	38.12	94.43	2.70	-78.77	900.00	394.39
38	38.12	94.43	2.70	-78.77	900.00	394.39

Table 4 - Base Force Data on the 38 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-12.86	26.59	3.00	498.43	3000.00	1314.64
1	-12.86	26.59	3.00	498.43	3000.00	1314.64
2	-10.73	28.66	1.24	253.52	1235.35	541.35
2	-10.73	28.66	1.24	253.52	1235.35	541.35
3	-10.73	30.13	1.76	265.29	153.16	67.12
3	-10.73	30.13	1.76	265.29	153.16	67.12
4	-8.61	32.48	3.00	620.96	358.51	157.10
4	-8.61	32.48	3.00	620.96	358.51	157.10
5	-6.48	34.12	0.32	77.45	44.72	19.60
5	-6.48	34.12	0.32	77.45	44.72	19.60
6	-6.48	35.61	2.68	734.08	423.82	185.72

				case2_3.5to1_eoc.OUT		
6	-6.48	35.61	2.68	734.08	423.82	185.72
7	-4.36	38.44	3.00	972.54	561.50	246.05
7	-4.36	38.44	3.00	972.54	561.50	246.05
8	-2.24	41.43	3.00	1112.41	642.25	281.44
8	-2.24	41.43	3.00	1112.41	642.25	281.44
9	-0.11	44.43	3.00	1231.71	711.13	311.63
9	-0.11	44.43	3.00	1231.71	711.13	311.63
10	2.01	47.11	2.35	1032.78	596.28	261.30
10	2.01	47.11	2.35	1032.78	596.28	261.30
11	2.01	48.61	0.65	319.13	184.25	80.74
11	2.01	48.61	0.65	319.13	184.25	80.74
12	4.14	50.43	3.00	1527.14	881.70	386.37
12	4.14	50.43	3.00	1527.14	881.70	386.37
13	6.26	53.41	3.00	1620.74	935.74	410.05
13	6.26	53.41	3.00	1620.74	935.74	410.05
14	8.38	56.39	3.00	1694.83	978.51	428.79
14	8.38	56.39	3.00	1694.83	978.51	428.79
15	10.51	58.19	0.64	365.96	211.29	92.59
15	10.51	58.19	0.64	365.96	211.29	92.59
16	10.51	59.66	2.36	1383.87	798.98	350.12
16	10.51	59.66	2.36	1383.87	798.98	350.12
17	12.63	62.29	3.00	1786.22	1031.27	451.92
17	12.63	62.29	3.00	1786.22	1031.27	451.92
18	14.75	64.91	2.40	1442.09	832.59	364.85
18	14.75	64.91	2.40	1442.09	832.59	364.85
19	14.75	66.28	0.42	256.89	130.89	57.36
19	14.75	66.28	0.42	256.89	130.89	57.36
20	14.75	66.57	0.18	108.93	55.50	24.32
20	14.75	66.57	0.18	108.93	55.50	24.32
21	16.88	68.09	3.00	1831.60	933.25	408.96
21	16.88	68.09	3.00	1831.60	933.25	408.96
22	19.00	70.94	3.00	1829.64	932.25	408.52
22	19.00	70.94	3.00	1829.64	932.25	408.52
23	21.13	72.92	1.20	726.39	370.11	162.19
23	21.13	72.92	1.20	726.39	370.11	162.19
24	21.13	74.32	1.80	1085.61	553.14	242.39
24	21.13	74.32	1.80	1085.61	553.14	242.39
25	23.25	76.23	2.33	1381.68	704.00	308.50
25	23.25	76.23	2.33	1381.68	704.00	308.50
26	23.25	77.60	0.67	286.41	673.40	295.09
26	23.25	77.60	0.67	286.41	673.40	295.09
27	25.37	78.88	2.14	815.90	2142.65	938.93
27	25.37	78.88	2.14	815.90	2142.65	938.93
28	25.37	80.24	0.86	515.40	857.35	375.70
28	25.37	80.24	0.86	515.40	857.35	375.70
29	27.50	80.73	0.23	129.43	231.51	101.45
29	27.50	80.73	0.23	129.43	231.51	101.45
30	27.50	81.16	0.74	401.66	740.03	324.29
30	27.50	81.16	0.74	401.66	740.03	324.29
31	27.50	82.39	2.03	1017.30	2028.46	888.89
31	27.50	82.39	2.03	1017.30	2028.46	888.89
32	29.62	84.31	2.35	967.31	2353.77	1031.45
32	29.62	84.31	2.35	967.31	2353.77	1031.45
33	29.62	85.61	0.65	236.06	646.23	283.19
33	29.62	85.61	0.65	236.06	646.23	283.19
34	31.75	86.36	1.10	342.71	1103.44	483.54
34	31.75	86.36	1.10	342.71	1103.44	483.54
35	31.75	87.64	1.90	560.01	1706.90	747.99
35	31.75	87.64	1.90	560.01	1706.90	747.99
36	33.87	89.69	3.00	562.85	2700.00	1183.17
36	33.87	89.69	3.00	562.85	2700.00	1183.17
37	35.99	92.15	3.00	165.27	2700.00	1183.17
37	35.99	92.15	3.00	165.27	2700.00	1183.17
38	38.12	94.43	2.70	-212.72	2430.62	1065.13
38	38.12	94.43	2.70	-212.72	2430.62	1065.13

SUM OF MOMENTS = -0.341544E-01 (ft/lbs); Imbalance (Fraction of Total Weight) = -0.5318418E-06

Sum of the Resisting Forces = 37574.55 (lbs)

Average Available Shear Strength = 503.00(psf)

Sum of the Driving Forces = 16465.62 (lbs)

Average Mobilized Shear Stress = 220.42(psf)

Total length of the failure surface = 74.70(ft)

Factor of Safety Balance Check: FS = $\frac{\text{case2_3.5to1_eoc.OUT}}{2.28200}$

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

case2_3.5to1_rd.OUT
*** GEOSTASE(R) ***

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** Current Version 4.30.30-Double Precision, January 2019 **
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SLOPE STABILITY ANALYSIS SOFTWARE
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

Analysis Date: 4/ 6/ 2021
Analysis Time:
Analysis By: GEI Job No. 1140258201

Input File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case2_3.5to1_rd.gsd

Output File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case2_3.5to1_rd.OUT

Unit System: English

PROJECT: Forest Bend Detention Pond

DESCRIPTION: Case-2 - Borings GB-1P, GB-2, GB-5 & GB-6 - 3.5(H):1(V) - RD

BOUNDARY DATA

6 Surface Boundaries
26 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	-30.000	5.500	10.000	5.500	7
2	10.000	5.500	20.000	5.500	11
3	20.000	5.500	48.280	13.580	11
4	48.280	13.580	58.500	16.500	2
5	58.500	16.500	79.850	22.600	1
6	79.850	22.600	130.000	22.600	1
7	58.500	16.500	130.000	16.500	2
8	80.830	15.600	130.000	15.600	3
9	73.480	13.500	80.830	15.600	3
10	48.280	13.580	73.480	13.500	4
11	73.480	13.500	130.000	13.500	5
12	48.280	11.500	48.280	13.580	4
13	66.480	11.500	73.480	13.500	5
14	48.280	11.500	66.480	11.500	6
15	66.480	11.500	130.000	11.500	6
16	34.280	7.500	48.280	11.500	6
17	34.280	7.500	130.000	7.500	7
18	23.780	4.500	34.280	7.500	7
19	-30.000	4.500	10.000	4.500	8
20	10.000	4.500	10.000	5.500	11
21	23.780	4.500	130.000	4.500	8
22	10.000	3.500	10.000	4.500	11
23	20.280	3.500	23.780	4.500	8
24	10.000	3.500	20.280	3.500	8
25	-30.000	-5.500	130.000	-5.500	9
26	-30.000	-10.500	130.000	-10.500	10

User Specified X-Origin = -30.000(ft)

User Specified Y-Origin = -20.000(ft)

MOHR-COULOMB SOIL PARAMETERS

11 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	Pressure Constant (psf)	Water Surface No.	Water Option
1 Fat Clay (w)	124.0	124.0	59.00	17.00	0.000	0.0	1	0
2 Fat Clay (w)	124.0	124.0	59.00	17.00	0.000	0.0	1	0
3 Fat Clay	124.0	124.0	172.00	15.00	0.000	0.0	1	0
4 Lean Clay (w)	135.0	135.0	186.00	20.00	0.000	0.0	1	0
5 Lean Clay	135.0	135.0	186.00	28.00	0.000	0.0	1	0
6 Sandy Silt	110.0	110.0	0.00	27.00	0.000	0.0	1	0
7 Silty Sand	115.0	115.0	0.00	30.00	0.000	0.0	1	0
8 Fat Clay	133.0	133.0	172.00	15.00	0.000	0.0	1	0
9 Fat Clay	135.0	135.0	172.00	15.00	0.000	0.0	1	0
10 Silty Sand	115.0	115.0	0.00	30.00	0.000	0.0	1	0
11 Clay Liner	120.0	120.0	100.00	20.00	0.000	0.0	1	0

WATER SURFACE DATA

2 Water Surface(s) Defined for 3-Stage Rapid Drawdown Analysis.
 Water Surface No. 1 is Prior to Drawdown.
 Water Surface No. 2 is After Drawdown.

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 2 Coordinate Points
 Pore Pressure Inclination Factor = 1.00

Point No.	X-Water (ft)	Y-Water (ft)
1	-30.00	22.60
2	130.00	22.60

Water Surface No. 2 Specified by 2 Coordinate Points
 Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	-30.00	5.50
2	130.00	5.50

SOIL PARAMETERS FOR 3-STAGE RAPID DRAWDOWN ANALYSIS

3-Stage Rapid Drawdown Method = Duncan, Wright, and Wong (1990)

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	CR (psf)	PhiR (deg)	dk (psf)	PSIk (deg)
1 Fat Clay (w)	124.00	124.00	59.00	17.00	59.00	17.00	76.25	21.56
2 Fat Clay (w)	124.00	124.00	59.00	17.00	59.00	17.00	76.25	21.56
3 Fat Clay	124.00	124.00	172.00	15.00	227.00	8.00	252.24	8.88
4 Lean Clay (w)	135.00	135.00	186.00	20.00	186.00	20.00	249.62	26.03
5 Lean Clay	135.00	135.00	186.00	28.00	209.00	20.00	263.54	24.65
6 Sandy Silt	110.00	110.00	0.00	27.00	0.00	0.00	0.00	0.00
7 Silty Sand	115.00	115.00	0.00	30.00	0.00	0.00	0.00	0.00
8 Fat Clay	133.00	133.00	172.00	15.00	227.00	8.00	252.24	8.88
9 Fat Clay	135.00	135.00	172.00	15.00	227.00	8.00	252.24	8.88
10 Silty Sand	115.00	115.00	0.00	30.00	0.00	0.00	0.00	0.00
11 Clay Liner	120.00	120.00	100.00	20.00	100.00	20.00	134.20	26.03

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

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1000 Surfaces Generated at Increments of 0.6607(in) Equally Spaced within the Start Range
Along The Specified Surface Between X = -10.00(ft)
and X = 45.00(ft)

Each Surface Enters within a Range Between X = 50.00(ft)
and X = 120.00(ft)

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = -20.00(ft)

Specified Maximum Radius = 5000.000(ft)

3.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces
Did Not Converge in 50 Iterations.

Number of Trial Surfaces with Non-Converged FS = 30

Number of Trial Surfaces with Valid FS = 970

Percentage of Trial Surfaces with Non-Converged and/or
Non-Valid FS solutions of the Total Attempted = 3.0 %

Statistical Data On All Valid FS Values:

FS Max = 8.510 FS Min = 1.401 FS Ave = 2.294
Standard Deviation = 0.770 Coefficient of Variation = 33.55 %

Critical Surface is Sequence Number 1002 of Those Analyzed.

***** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 3 *****

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 44.129211(ft) ; Y = 49.106978(ft); and Radius = 56.417315(ft)

Circular Trial Failure Surface Generated With 35 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	8.333	5.500
2	10.702	3.659
3	13.165	1.946
4	15.716	0.367
5	18.347	-1.074
6	21.051	-2.374
7	23.820	-3.528
8	26.646	-4.533
9	29.522	-5.387
10	32.440	-6.086
11	35.390	-6.629
12	38.365	-7.015
13	41.357	-7.242
14	44.356	-7.310
15	47.354	-7.218
16	50.344	-6.967
17	53.316	-6.557
18	56.262	-5.990
19	59.173	-5.268
20	62.042	-4.391
21	64.861	-3.363
22	67.621	-2.187

		case2_3.5to1_rd.OUT
23	70.314	-0.866
24	72.933	0.597
25	75.471	2.197
26	77.921	3.929
27	80.274	5.789
28	82.526	7.772
29	84.669	9.871
30	86.697	12.082
31	88.605	14.397
32	90.387	16.810
33	92.039	19.314
34	93.555	21.903
35	93.914	22.600

Factor of Safety For The Critical or Specified Surface = 1.401

Table 1 - Geometry Data on the 57 slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.29	0.50	8.98	5.00	5.50	-37.86	0.00	1.63
2	0.38	1.15	9.81	4.35	5.50	-37.86	0.00	0.48
3	0.70	1.57	10.35	3.93	5.50	-37.86	0.00	0.89
4	0.23	1.92	10.82	3.58	5.50	-34.81	0.00	0.28
5	2.23	2.78	12.05	2.72	5.50	-34.81	0.00	2.72
6	2.55	4.34	14.44	1.16	5.50	-31.76	0.00	3.00
7	2.63	5.85	17.03	-0.35	5.50	-28.72	0.00	3.00
8	1.65	6.97	19.17	-1.47	5.50	-25.67	0.00	1.83
9	0.28	7.48	20.14	-1.94	5.54	-25.67	15.95	0.31
10	0.77	7.88	20.67	-2.19	5.69	-25.67	15.95	0.86
11	2.73	9.13	22.42	-2.94	6.19	-22.62	15.95	2.96
12	0.04	10.11	23.80	-3.52	6.59	-22.62	15.95	0.04
13	2.83	11.03	25.23	-4.03	7.00	-19.58	15.95	3.00
14	0.63	12.12	26.96	-4.63	7.49	-16.53	15.95	0.66
15	2.24	12.95	28.40	-5.05	7.90	-16.53	15.95	2.34
16	0.47	13.73	29.76	-5.44	8.29	-13.48	15.95	0.49
17	2.44	14.50	31.22	-5.79	8.71	-13.48	15.95	2.51
18	1.84	15.57	33.36	-6.26	9.32	-10.43	15.95	1.87
19	1.11	16.27	34.84	-6.53	9.74	-10.43	15.95	1.13
20	2.98	17.14	36.88	-6.82	10.32	-7.39	15.95	3.00
21	2.99	18.30	39.86	-7.13	11.17	-4.34	15.95	3.00
22	3.00	19.31	42.86	-7.28	12.03	-1.29	15.95	3.00
23	3.00	20.15	45.86	-7.26	12.89	1.75	15.95	3.00
24	0.93	20.63	47.82	-7.18	13.45	4.80	15.95	0.93
25	2.06	20.93	49.31	-7.05	13.87	4.80	15.95	2.07
26	2.97	21.36	51.83	-6.76	14.59	7.85	15.95	3.00
27	2.95	21.71	54.79	-6.27	15.44	10.89	15.95	3.00
28	1.98	21.89	57.25	-5.75	16.14	13.94	15.95	2.04
29	0.26	21.93	58.37	-5.47	16.46	13.94	15.95	0.27
30	0.67	21.95	58.84	-5.35	16.60	13.94	15.95	0.69
31	2.87	21.93	60.61	-4.83	17.10	16.99	15.95	3.00
32	2.82	21.79	63.45	-3.88	17.91	20.04	15.95	3.00
33	1.62	21.57	65.67	-3.02	18.55	23.08	15.95	1.76
34	1.14	21.37	67.05	-2.43	18.94	23.08	15.95	1.24
35	2.69	21.02	68.97	-1.53	19.49	26.13	15.95	3.00
36	2.62	20.38	71.62	-0.13	20.25	29.18	15.95	3.00
37	0.55	19.93	73.21	0.77	20.70	32.22	15.95	0.65
38	1.99	19.50	74.48	1.57	21.06	32.22	15.95	2.35
39	2.45	18.64	76.70	3.06	21.70	35.27	15.95	3.00
40	0.72	17.94	78.28	4.21	22.15	38.32	15.95	0.92
41	1.21	17.45	79.25	4.98	22.43	38.32	15.95	1.54
42	0.06	17.12	79.88	5.48	22.60	38.32	0.00	0.07
43	0.37	16.96	80.09	5.64	22.60	38.32	0.00	0.47
44	0.56	16.57	80.55	6.03	22.60	41.37	0.00	0.74
45	1.39	15.71	81.52	6.89	22.60	41.37	0.00	1.85
46	0.31	14.96	82.37	7.64	22.60	41.37	0.00	0.41
47	2.14	13.78	83.60	8.82	22.60	44.41	0.00	3.00
48	1.49	11.91	85.42	10.69	22.60	47.46	0.00	2.21
49	0.53	10.81	86.43	11.79	22.60	47.46	0.00	0.79
50	1.17	9.81	87.28	12.79	22.60	50.51	0.00	1.84
51	0.74	8.65	88.24	13.95	22.60	50.51	0.00	1.16
52	0.89	7.60	89.05	15.00	22.60	53.55	0.00	1.50
53	0.66	6.55	89.83	16.05	22.60	53.55	0.00	1.12
54	0.23	5.95	90.27	16.65	22.60	53.55	0.00	0.39

				case2_3.5to1_rd.OUT				
55	1.65	4.54	91.21	18.06	22.60	56.60	0.00	3.00
56	1.52	1.99	92.80	20.61	22.60	59.65	0.00	3.00
57	0.36	0.35	93.73	22.25	22.60	62.70	0.00	0.78

Table 2 - Force Data On The 57 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Distributed Load (lbs)
1	74.0	1372.7	1789.5	0.0	0.0	0.0
2	51.2	405.7	548.3	0.0	0.0	0.0
3	132.1	749.0	1035.7	0.0	0.0	0.0
4	52.7	243.8	330.3	0.0	0.0	0.0
5	767.2	2384.4	3375.8	0.0	0.0	0.0
6	1407.1	2721.7	4014.2	0.0	0.0	0.0
7	1980.0	2807.4	4296.9	0.0	0.0	0.0
8	1490.0	1764.1	2755.3	0.0	0.0	0.0
9	271.0	310.0	475.6	0.0	0.0	0.0
10	786.7	845.7	1322.6	0.0	0.0	0.0
11	3241.5	2906.6	4712.9	0.0	0.0	0.0
12	52.4	41.4	70.3	0.0	0.0	0.0
13	4047.4	2862.5	4985.2	0.0	0.0	0.0
14	993.5	621.3	1122.9	0.0	0.0	0.0
15	3749.6	2139.2	4036.4	0.0	0.0	0.0
16	836.1	439.1	850.8	0.0	0.0	0.0
17	4555.5	2204.3	4453.8	0.0	0.0	0.0
18	3673.7	1586.3	3369.2	0.0	0.0	0.0
19	2309.9	926.6	2051.7	0.0	0.0	0.0
20	6499.8	2370.5	5507.8	0.0	0.0	0.0
21	6939.6	2218.0	5565.2	0.0	0.0	0.0
22	7299.9	2057.3	5592.8	0.0	0.0	0.0
23	7576.0	1890.1	5590.5	0.0	0.0	0.0
24	2384.8	549.7	1725.9	0.0	0.0	0.0
25	5453.1	1168.7	3832.6	0.0	0.0	0.0
26	7999.9	1544.0	5496.6	0.0	0.0	0.0
27	8044.3	1368.9	5405.2	0.0	0.0	0.0
28	5424.4	827.7	3599.5	0.0	0.0	0.0
29	723.1	104.8	474.7	0.0	0.0	0.0
30	1851.6	262.4	1210.2	0.0	0.0	0.0
31	7869.7	1023.6	5134.8	0.0	0.0	0.0
32	7657.5	857.0	4956.5	0.0	0.0	0.0
33	4341.1	425.7	2813.5	0.0	0.0	0.0
34	3025.0	270.7	1936.7	0.0	0.0	0.0
35	7001.4	543.5	4516.4	0.0	0.0	0.0
36	6570.3	399.5	4255.9	0.0	0.0	0.0
37	1335.9	67.3	880.1	0.0	0.0	0.0
38	4745.0	198.4	3089.2	0.0	0.0	0.0
39	5542.2	143.2	3657.4	0.0	0.0	0.0
40	1565.0	21.0	1056.6	0.0	0.0	0.0
41	2542.9	13.5	1691.5	0.0	0.0	0.0
42	121.3	0.0	79.8	0.0	0.0	0.0
43	750.5	0.0	493.2	0.0	0.0	0.0
44	1115.2	0.0	765.3	0.0	0.0	0.0
45	2648.0	0.0	1812.3	0.0	0.0	0.0
46	562.5	0.0	383.8	0.0	0.0	0.0
47	3628.1	0.0	2579.4	0.0	0.0	0.0
48	2224.1	0.0	1643.6	0.0	0.0	0.0
49	725.3	0.0	532.3	0.0	0.0	0.0
50	1431.0	0.0	1125.1	0.0	0.0	0.0
51	792.7	0.0	627.3	0.0	0.0	0.0
52	837.7	0.0	709.6	0.0	0.0	0.0
53	539.8	0.0	457.3	0.0	0.0	0.0
54	168.7	0.0	142.9	0.0	0.0	0.0
55	929.2	0.0	849.5	0.0	0.0	0.0
56	374.3	0.0	372.7	0.0	0.0	0.0
57	15.5	0.0	17.0	0.0	0.0	0.0

TOTAL WEIGHT OF SLIDING MASS = 159728.51(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 81485.50(lbs)

TOTAL AREA OF SLIDING MASS = 1274.37(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 57 SLICES

case2_3.5to1_rd.OUT

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	7	0.00	30.00	
2	8	172.00	15.00	R
3	11	100.00	20.00	R
4	11	100.00	20.00	R
5	8	172.00	15.00	R
6	8	172.00	15.00	R
7	8	172.00	15.00	R
8	8	172.00	15.00	R
9	8	172.00	15.00	R
10	8	172.00	15.00	R
11	8	172.00	15.00	R
12	8	172.00	15.00	R
13	8	172.00	15.00	R
14	8	172.00	15.00	R
15	8	172.00	15.00	R
16	8	172.00	15.00	R
17	9	172.00	15.00	R
18	9	172.00	15.00	R
19	9	172.00	15.00	R
20	9	172.00	15.00	R
21	9	172.00	15.00	R
22	9	172.00	15.00	R
23	9	172.00	15.00	R
24	9	172.00	15.00	R
25	9	172.00	15.00	R
26	9	172.00	15.00	R
27	9	172.00	15.00	R
28	9	172.00	15.00	R
29	8	172.00	15.00	R
30	8	172.00	15.00	R
31	8	172.00	15.00	R
32	8	172.00	15.00	R
33	8	172.00	15.00	R
34	8	172.00	15.00	R
35	8	172.00	15.00	R
36	8	172.00	15.00	R
37	8	172.00	15.00	R
38	8	172.00	15.00	R
39	8	172.00	15.00	R
40	8	172.00	15.00	R
41	7	0.00	30.00	
42	7	0.00	30.00	
43	7	0.00	30.00	
44	7	0.00	30.00	
45	7	0.00	30.00	
46	6	0.00	27.00	
47	6	0.00	27.00	
48	6	0.00	27.00	
49	5	186.00	28.00	R
50	5	186.00	28.00	R
51	3	172.00	15.00	R
52	3	172.00	15.00	R
53	2	59.00	17.00	R
54	1	59.00	17.00	R
55	1	59.00	17.00	R
56	1	59.00	17.00	R
57	1	59.00	17.00	R

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
NOTE: Phi and C in Table 4 are modified values based on specified
soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 57 slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)	Multi-Stage Strength Type
1	-37.86	8.98	1.63	34.77	20.07	14.33	
2	-37.86	9.81	0.48	152.87	212.96	152.00	Drained
3	-37.86	10.35	0.89	156.56	156.98	112.04	Drained
4	-34.81	10.82	0.28	171.98	162.60	116.05	Drained

case2_3.5to1_rd.OUT							
5	-34.81	12.05	2.72	261.38	242.04	172.75	Drained
6	-31.76	14.44	3.00	371.92	271.66	193.89	Drained
7	-28.72	17.03	3.00	476.37	299.64	213.86	Drained
8	-25.67	19.17	1.83	549.47	319.23	227.85	Drained
9	-25.67	20.14	0.31	587.21	329.34	235.06	Drained
10	-25.67	20.67	0.86	617.21	337.38	240.80	Drained
11	-22.62	22.42	2.96	698.99	359.29	256.44	Drained
12	-22.62	23.80	0.04	771.98	378.85	270.40	Drained
13	-19.58	25.23	3.00	819.48	391.58	279.48	Drained
14	-16.53	26.96	0.66	877.60	407.15	290.60	Drained
15	-16.53	28.40	2.34	931.67	421.64	300.94	Drained
16	-13.48	29.76	0.49	967.78	431.32	307.84	Drained
17	-13.48	31.22	2.51	1016.68	444.42	317.20	Drained
18	-10.43	33.36	1.87	1070.49	458.84	327.49	Drained
19	-10.43	34.84	1.13	1112.72	470.15	335.56	Drained
20	-7.39	36.88	3.00	1148.69	479.79	342.44	Drained
21	-4.34	39.86	3.00	1198.06	493.02	351.88	Drained
22	-1.29	42.86	3.00	1235.35	503.01	359.02	Drained
23	1.75	45.86	3.00	1260.62	509.78	363.85	Drained
24	4.80	47.82	0.93	1266.32	511.31	364.94	Drained
25	4.80	49.31	2.07	1312.26	523.62	373.73	Drained
26	7.85	51.83	3.00	1319.88	525.66	375.18	Drained
27	10.89	54.79	3.00	1320.78	525.90	375.35	Drained
28	13.94	57.25	2.04	1310.09	523.04	373.31	Drained
29	13.94	58.37	0.27	1309.66	522.92	373.23	Drained
30	13.94	58.84	0.69	1309.67	522.93	373.23	Drained
31	16.99	60.61	3.00	1288.62	517.29	369.20	Drained
32	20.04	63.45	3.00	1256.45	508.66	363.05	Drained
33	23.08	65.67	1.76	1220.05	498.91	356.09	Drained
34	23.08	67.05	1.24	1203.78	494.55	352.98	Drained
35	26.13	68.97	3.00	1159.54	482.70	344.52	Drained
36	29.18	71.62	3.00	1095.37	465.50	332.25	Drained
37	32.22	73.21	0.65	1045.76	452.21	322.76	Drained
38	32.22	74.48	2.35	1014.48	443.83	316.78	Drained
39	35.27	76.70	3.00	937.47	423.20	302.05	Drained
40	38.32	78.28	0.92	872.49	405.78	289.62	Drained
41	38.32	79.25	1.54	816.16	471.21	336.32	
42	38.32	79.88	0.07	803.59	463.96	331.14	
43	38.32	80.09	0.47	796.52	459.87	328.23	
44	41.37	80.55	0.74	762.82	440.42	314.34	
45	41.37	81.52	1.85	727.56	420.05	299.81	
46	41.37	82.37	0.41	715.48	364.56	260.20	
47	44.41	83.60	3.00	655.64	334.07	238.43	
48	47.46	85.42	2.21	572.12	291.51	208.06	
49	47.46	86.43	0.79	437.17	418.45	298.66	Drained
50	50.51	87.28	1.84	362.61	378.80	270.36	Drained
51	50.51	88.24	1.16	356.74	267.59	190.99	Drained
52	53.55	89.05	1.50	285.63	248.53	177.39	Drained
53	53.55	89.83	1.12	294.06	148.90	106.28	Drained
54	53.55	90.27	0.39	263.63	139.60	99.64	Drained
55	56.60	91.21	3.00	184.53	115.42	82.38	Drained
56	59.65	92.80	3.00	52.97	75.19	53.67	Drained
57	62.70	93.73	0.78	-30.70	49.61	35.41	Drained

Table 4 - Base Force Data on the 57 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)	
1	-37.86	8.98	1.63	56.65	32.71	23.34	
2	-37.86	9.81	0.48	73.61	102.54	73.19	Drained
3	-37.86	10.35	0.89	139.19	139.56	99.61	Drained
4	-34.81	10.82	0.28	47.86	45.25	32.30	Drained
5	-34.81	12.05	2.72	711.39	658.75	470.17	Drained
6	-31.76	14.44	3.00	1115.77	814.97	581.67	Drained
7	-28.72	17.03	3.00	1429.10	898.93	641.59	Drained
8	-25.67	19.17	1.83	1007.90	585.57	417.94	Drained
9	-25.67	20.14	0.31	182.42	102.31	73.03	Drained
10	-25.67	20.67	0.86	527.73	288.47	205.89	Drained
11	-22.62	22.42	2.96	2066.83	1062.39	758.26	Drained
12	-22.62	23.80	0.04	33.30	16.34	11.66	Drained
13	-19.58	25.23	3.00	2458.43	1174.73	838.45	Drained
14	-16.53	26.96	0.66	580.00	269.09	192.06	Drained
15	-16.53	28.40	2.34	2179.27	986.26	703.93	Drained
16	-13.48	29.76	0.49	470.53	209.70	149.67	Drained
17	-13.48	31.22	2.51	2555.73	1117.18	797.37	Drained

case2_3.5to1_rd.OUT							
18	-10.43	33.36	1.87	2003.06	858.56	612.78	Drained
19	-10.43	34.84	1.13	1256.07	530.72	378.80	Drained
20	-7.39	36.88	3.00	3446.08	1439.37	1027.33	Drained
21	-4.34	39.86	3.00	3594.17	1479.05	1055.65	Drained
22	-1.29	42.86	3.00	3706.04	1509.03	1077.05	Drained
23	1.75	45.86	3.00	3781.87	1529.35	1091.55	Drained
24	4.80	47.82	0.93	1176.12	474.89	338.94	Drained
25	4.80	49.31	2.07	2718.00	1084.54	774.07	Drained
26	7.85	51.83	3.00	3959.63	1576.98	1125.54	Drained
27	10.89	54.79	3.00	3962.35	1577.71	1126.06	Drained
28	13.94	57.25	2.04	2666.14	1064.43	759.72	Drained
29	13.94	58.37	0.27	354.99	141.74	101.17	Drained
30	13.94	58.84	0.69	908.72	362.83	258.97	Drained
31	16.99	60.61	3.00	3865.87	1551.86	1107.61	Drained
32	20.04	63.45	3.00	3769.34	1525.99	1089.15	Drained
33	23.08	65.67	1.76	2147.28	878.08	626.72	Drained
34	23.08	67.05	1.24	1492.70	613.25	437.70	Drained
35	26.13	68.97	3.00	3478.61	1448.09	1033.55	Drained
36	29.18	71.62	3.00	3286.12	1396.51	996.74	Drained
37	32.22	73.21	0.65	675.62	292.15	208.52	Drained
38	32.22	74.48	2.35	2388.02	1044.75	745.67	Drained
39	35.27	76.70	3.00	2812.42	1269.59	906.15	Drained
40	38.32	78.28	0.92	803.55	373.72	266.74	Drained
41	38.32	79.25	1.54	1255.38	724.79	517.31	Drained
42	38.32	79.88	0.07	60.01	34.64	24.73	Drained
43	38.32	80.09	0.47	371.34	214.39	153.02	Drained
44	41.37	80.55	0.74	564.76	326.07	232.73	Drained
45	41.37	81.52	1.85	1344.95	776.51	554.22	Drained
46	41.37	82.37	0.41	294.10	149.85	106.95	Drained
47	44.41	83.60	3.00	1966.93	1002.20	715.30	Drained
48	47.46	85.42	2.21	1264.82	644.46	459.97	Drained
49	47.46	86.43	0.79	345.04	330.26	235.72	Drained
50	50.51	87.28	1.84	666.51	696.28	496.96	Drained
51	50.51	88.24	1.16	414.49	310.91	221.90	Drained
52	53.55	89.05	1.50	427.28	371.79	265.36	Drained
53	53.55	89.83	1.12	329.00	166.60	118.90	Drained
54	53.55	90.27	0.39	101.56	53.78	38.38	Drained
55	56.60	91.21	3.00	553.60	346.25	247.13	Drained
56	59.65	92.80	3.00	158.90	225.58	161.00	Drained
57	62.70	93.73	0.78	-24.07	38.90	27.77	Drained

SUM OF MOMENTS = -0.425201E+00 (ft/lbs); Imbalance (Fraction of Total Weight) = -0.2662020E-05

Sum of the Resisting Forces = 38941.21 (lbs)

Average Available Shear Strength = 390.25(psf)

Sum of the Driving Forces = 27793.68 (lbs)

Average Mobilized Shear Stress = 278.54(psf)

Total length of the failure surface = 99.78(ft)

Factor of Safety Balance Check: FS = 1.40108

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 1 ****

Factor of Safety For The Critical or Specified Surface = 1.401

Table 1 - Geometry Data on the 57 slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.29	0.50	8.98	5.00	5.50	-37.86	0.00	1.63
2	0.38	1.15	9.81	4.35	5.50	-37.86	0.00	0.48
3	0.70	1.57	10.35	3.93	5.50	-37.86	0.00	0.89
4	0.23	1.92	10.82	3.58	5.50	-34.81	0.00	0.28
5	2.23	2.78	12.05	2.72	5.50	-34.81	0.00	2.72

case2_3.Sto1_rd.OUT							
6	2.55	4.34	14.44	1.16	5.50	-31.76	0.00
7	2.63	5.85	17.03	-0.35	5.50	-28.72	0.00
8	1.65	6.97	19.17	-1.47	5.50	-25.67	0.00
9	0.28	7.48	20.14	-1.94	5.54	-25.67	15.95
10	0.77	7.88	20.67	-2.19	5.69	-25.67	15.95
11	2.73	9.13	22.42	-2.94	6.19	-22.62	15.95
12	0.04	10.11	23.80	-3.52	6.59	-22.62	15.95
13	2.83	11.03	25.23	-4.03	7.00	-19.58	15.95
14	0.63	12.12	26.96	-4.63	7.49	-16.53	15.95
15	2.24	12.95	28.40	-5.05	7.90	-16.53	15.95
16	0.47	13.73	29.76	-5.44	8.29	-13.48	15.95
17	2.44	14.50	31.22	-5.79	8.71	-13.48	15.95
18	1.84	15.57	33.36	-6.26	9.32	-10.43	15.95
19	1.11	16.27	34.84	-6.53	9.74	-10.43	15.95
20	2.98	17.14	36.88	-6.82	10.32	-7.39	15.95
21	2.99	18.30	39.86	-7.13	11.17	-4.34	15.95
22	3.00	19.31	42.86	-7.28	12.03	-1.29	15.95
23	3.00	20.15	45.86	-7.26	12.89	1.75	15.95
24	0.93	20.63	47.82	-7.18	13.45	4.80	15.95
25	2.06	20.93	49.31	-7.05	13.87	4.80	15.95
26	2.97	21.36	51.83	-6.76	14.59	7.85	15.95
27	2.95	21.71	54.79	-6.27	15.44	10.89	15.95
28	1.98	21.89	57.25	-5.75	16.14	13.94	15.95
29	0.26	21.93	58.37	-5.47	16.46	13.94	15.95
30	0.67	21.95	58.84	-5.35	16.60	13.94	15.95
31	2.87	21.93	60.61	-4.83	17.10	16.99	15.95
32	2.82	21.79	63.45	-3.88	17.91	20.04	15.95
33	1.62	21.57	65.67	-3.02	18.55	23.08	15.95
34	1.14	21.37	67.05	-2.43	18.94	23.08	15.95
35	2.69	21.02	68.97	-1.53	19.49	26.13	15.95
36	2.62	20.38	71.62	-0.13	20.25	29.18	15.95
37	0.55	19.93	73.21	0.77	20.70	32.22	15.95
38	1.99	19.50	74.48	1.57	21.06	32.22	15.95
39	2.45	18.64	76.70	3.06	21.70	35.27	15.95
40	0.72	17.94	78.28	4.21	22.15	38.32	15.95
41	1.21	17.45	79.25	4.98	22.43	38.32	15.95
42	0.06	17.12	79.88	5.48	22.60	38.32	0.00
43	0.37	16.96	80.09	5.64	22.60	38.32	0.00
44	0.56	16.57	80.55	6.03	22.60	41.37	0.00
45	1.39	15.71	81.52	6.89	22.60	41.37	0.00
46	0.31	14.96	82.37	7.64	22.60	41.37	0.00
47	2.14	13.78	83.60	8.82	22.60	44.41	0.00
48	1.49	11.91	85.42	10.69	22.60	47.46	0.00
49	0.53	10.81	86.43	11.79	22.60	47.46	0.00
50	1.17	9.81	87.28	12.79	22.60	50.51	0.00
51	0.74	8.65	88.24	13.95	22.60	50.51	0.00
52	0.89	7.60	89.05	15.00	22.60	53.55	0.00
53	0.66	6.55	89.83	16.05	22.60	53.55	0.00
54	0.23	5.95	90.27	16.65	22.60	53.55	0.00
55	1.65	4.54	91.21	18.06	22.60	56.60	0.00
56	1.52	1.99	92.80	20.61	22.60	59.65	0.00
57	0.36	0.35	93.73	22.25	22.60	62.70	0.00

Table 2 - Force Data On The 57 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force		Distributed Load (lbs)
				Hor (lbs)	Ver (lbs)	
1	74.0	0.0	50.8	0.0	0.0	0.0
2	51.2	0.0	34.5	0.0	0.0	0.0
3	132.1	0.0	87.0	0.0	0.0	0.0
4	52.7	0.0	33.4	0.0	0.0	0.0
5	767.2	0.0	471.6	0.0	0.0	0.0
6	1407.1	0.0	813.1	0.0	0.0	0.0
7	1980.0	0.0	1095.8	0.0	0.0	0.0
8	1490.0	0.0	798.0	0.0	0.0	0.0
9	271.0	0.0	144.2	0.0	0.0	0.0
10	786.7	0.0	410.2	0.0	0.0	0.0
11	3241.5	0.0	1557.8	0.0	0.0	0.0
12	52.4	0.0	24.3	0.0	0.0	0.0
13	4047.4	0.0	1784.1	0.0	0.0	0.0
14	993.5	0.0	417.6	0.0	0.0	0.0
15	3749.6	0.0	1540.4	0.0	0.0	0.0
16	836.1	0.0	332.0	0.0	0.0	0.0
17	4555.5	0.0	1771.4	0.0	0.0	0.0

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18	3673.7	0.0	1372.6	0.0	0.0	0.0
19	2309.9	0.0	847.2	0.0	0.0	0.0
20	6499.8	0.0	2306.7	0.0	0.0	0.0
21	6939.6	0.0	2364.1	0.0	0.0	0.0
22	7299.9	0.0	2391.7	0.0	0.0	0.0
23	7576.0	0.0	2389.4	0.0	0.0	0.0
24	2384.8	0.0	734.8	0.0	0.0	0.0
25	5453.1	0.0	1622.5	0.0	0.0	0.0
26	7999.9	0.0	2295.5	0.0	0.0	0.0
27	8044.3	0.0	2204.1	0.0	0.0	0.0
28	5424.4	0.0	1428.0	0.0	0.0	0.0
29	723.1	0.0	185.5	0.0	0.0	0.0
30	1851.6	0.0	469.8	0.0	0.0	0.0
31	7869.7	0.0	1933.6	0.0	0.0	0.0
32	7657.5	0.0	1755.4	0.0	0.0	0.0
33	4341.1	0.0	935.5	0.0	0.0	0.0
34	3025.0	0.0	613.6	0.0	0.0	0.0
35	7001.4	0.0	1315.3	0.0	0.0	0.0
36	6570.3	0.0	1054.8	0.0	0.0	0.0
37	1335.9	0.0	190.7	0.0	0.0	0.0
38	4745.0	0.0	577.4	0.0	0.0	0.0
39	5542.2	0.0	456.2	0.0	0.0	0.0
40	1565.0	0.0	73.9	0.0	0.0	0.0
41	2542.9	0.0	50.2	0.0	0.0	0.0
42	121.3	0.0	0.1	0.0	0.0	0.0
43	750.5	0.0	0.0	0.0	0.0	0.0
44	1115.2	0.0	0.0	0.0	0.0	0.0
45	2648.0	0.0	0.0	0.0	0.0	0.0
46	562.5	0.0	0.0	0.0	0.0	0.0
47	3628.1	0.0	0.0	0.0	0.0	0.0
48	2224.1	0.0	0.0	0.0	0.0	0.0
49	725.3	0.0	0.0	0.0	0.0	0.0
50	1431.0	0.0	0.0	0.0	0.0	0.0
51	792.7	0.0	0.0	0.0	0.0	0.0
52	837.7	0.0	0.0	0.0	0.0	0.0
53	539.8	0.0	0.0	0.0	0.0	0.0
54	168.7	0.0	0.0	0.0	0.0	0.0
55	929.2	0.0	0.0	0.0	0.0	0.0
56	374.3	0.0	0.0	0.0	0.0	0.0
57	15.5	0.0	0.0	0.0	0.0	0.0

TOTAL WEIGHT OF SLIDING MASS = 159728.51(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 120681.02(lbs)

TOTAL AREA OF SLIDING MASS = 1274.37(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 57 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	options
1	7	0.00	30.00	
2	8	212.96	0.00	R
3	11	196.66	0.00	R
4	11	202.29	0.00	R
5	8	280.02	0.00	R
6	8	297.07	0.00	R
7	8	316.37	0.00	R
8	8	330.58	0.00	R
9	8	338.05	0.00	R
10	8	344.04	0.00	R
11	8	360.52	0.00	R
12	8	375.37	0.00	R
13	8	385.09	0.00	R
14	8	397.02	0.00	R
15	8	408.16	0.00	R
16	8	415.62	0.00	R
17	9	425.73	0.00	R
18	9	436.88	0.00	R
19	9	445.64	0.00	R
20	9	453.12	0.00	R
21	9	463.38	0.00	R
22	9	471.14	0.00	R
23	9	476.40	0.00	R
24	9	477.59	0.00	R
25	9	487.16	0.00	R
26	9	488.75	0.00	R
27	9	488.94	0.00	R

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28	9	486.71	0.00	R
29	8	486.62	0.00	R
30	8	486.62	0.00	R
31	8	482.24	0.00	R
32	8	475.53	0.00	R
33	8	467.96	0.00	R
34	8	464.57	0.00	R
35	8	455.37	0.00	R
36	8	442.04	0.00	R
37	8	431.75	0.00	R
38	8	425.28	0.00	R
39	8	409.36	0.00	R
40	8	395.97	0.00	R
41	7	0.00	30.00	
42	7	0.00	30.00	
43	7	0.00	30.00	
44	7	0.00	30.00	
45	7	0.00	30.00	
46	6	0.00	27.00	
47	6	0.00	27.00	
48	6	0.00	27.00	
49	5	448.86	0.00	R
50	5	414.30	0.00	R
51	3	294.43	0.00	R
52	3	283.18	0.00	R
53	2	173.90	0.00	R
54	1	163.31	0.00	R
55	1	136.03	0.00	R
56	1	75.19	0.00	R
57	1	49.61	0.00	R

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
 F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
 R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
 NOTE: Phi and C in Table 4 are modified values based on specified
 Soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 57 slices

Slice No. *	Alpha (deg)	X-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)	Multi-Stage Strength Type
1	-37.86	8.98	1.63	38.57	22.27	15.89	
2	-37.86	9.81	0.48	180.38	212.96	152.00	Undrained
3	-37.86	10.35	0.89	198.70	196.66	140.36	Undrained
4	-34.81	10.82	0.28	210.34	202.29	144.38	Undrained
5	-34.81	12.05	2.72	308.07	280.02	199.86	Undrained
6	-31.76	14.44	3.00	411.04	297.07	212.03	Undrained
7	-28.72	17.03	3.00	510.15	316.37	225.80	Undrained
8	-25.67	19.17	1.83	578.84	330.58	235.95	Undrained
9	-25.67	20.14	0.31	618.99	338.05	241.28	Undrained
10	-25.67	20.67	0.86	658.29	344.04	245.55	Undrained
11	-22.62	22.42	2.96	767.30	360.52	257.31	Undrained
12	-22.62	23.80	0.04	864.94	375.37	267.91	Undrained
13	-19.58	25.23	3.00	934.28	385.09	274.85	Undrained
14	-16.53	26.96	0.66	1019.69	397.02	283.37	Undrained
15	-16.53	28.40	2.34	1099.42	408.16	291.32	Undrained
16	-13.48	29.76	0.49	1156.28	415.62	296.64	Undrained
17	-13.48	31.22	2.51	1231.20	425.73	303.86	Undrained
18	-10.43	33.36	1.87	1319.85	436.88	311.82	Undrained
19	-10.43	34.84	1.13	1388.40	445.64	318.07	Undrained
20	-7.39	36.88	3.00	1457.49	453.12	323.40	Undrained
21	-4.34	39.86	3.00	1556.77	463.38	330.73	Undrained
22	-1.29	42.86	3.00	1644.22	471.14	336.27	Undrained
23	1.75	45.86	3.00	1719.72	476.40	340.03	Undrained
24	4.80	47.82	0.93	1757.13	477.59	340.87	Undrained
25	4.80	49.31	2.07	1829.72	487.16	347.70	Undrained
26	7.85	51.83	3.00	1878.92	488.75	348.84	Undrained
27	10.89	54.79	3.00	1929.24	488.94	348.97	Undrained
28	13.94	57.25	2.04	1959.00	486.71	347.38	Undrained
29	13.94	58.37	0.27	1978.52	486.62	347.32	Undrained
30	13.94	58.84	0.69	1986.89	486.62	347.32	Undrained
31	16.99	60.61	3.00	1993.93	482.24	344.19	Undrained
32	20.04	63.45	3.00	2008.86	475.53	339.40	Undrained
33	23.08	65.67	1.76	2008.30	467.96	334.00	Undrained
34	23.08	67.05	1.24	2016.65	464.57	331.58	Undrained

case2_3.5to1_rd.OUT							
35	26.13	68.97	3.00	2002.70	455.37	325.01	Undrained
36	29.18	71.62	3.00	1981.83	442.04	315.50	Undrained
37	32.22	73.21	0.65	1956.12	431.75	308.16	Undrained
38	32.22	74.48	2.35	1947.49	425.28	303.53	Undrained
39	35.27	76.70	3.00	1905.47	409.36	292.17	Undrained
40	38.32	78.28	0.92	1863.76	395.97	282.62	Undrained
41	38.32	79.25	1.54	1567.52	905.01	645.93	
42	38.32	79.88	0.07	1563.80	902.86	644.40	
43	38.32	80.09	0.47	1550.32	895.08	638.85	
44	41.37	80.55	0.74	1475.31	851.77	607.94	
45	41.37	81.52	1.85	1403.00	810.02	578.14	
46	41.37	82.37	0.41	1383.43	704.90	503.11	
47	44.41	83.60	3.00	1250.51	637.17	454.77	
48	47.46	85.42	2.21	1067.70	544.02	388.29	
49	47.46	86.43	0.79	1012.37	448.86	320.37	Undrained
50	50.51	87.28	1.84	867.77	414.30	295.70	Undrained
51	50.51	88.24	1.16	819.54	294.43	210.15	Undrained
52	53.55	89.05	1.50	670.77	283.18	202.12	Undrained
53	53.55	89.83	1.12	645.27	173.90	124.12	Undrained
54	53.55	90.27	0.39	580.42	163.31	116.56	Undrained
55	56.60	91.21	3.00	416.44	136.03	97.09	Undrained
56	59.65	92.80	3.00	155.87	75.19	53.67	Undrained
57	62.70	93.73	0.78	-24.93	49.61	35.41	Undrained

Table 4 - Base Force Data on the 57 slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)	
1	-37.86	8.98	1.63	62.85	36.29	25.90	
2	-37.86	9.81	0.48	86.86	102.54	73.19	Undrained
3	-37.86	10.35	0.89	176.66	174.84	124.79	Undrained
4	-34.81	10.82	0.28	58.54	56.30	40.18	Undrained
5	-34.81	12.05	2.72	838.48	762.12	543.95	Undrained
6	-31.76	14.44	3.00	1233.11	891.21	636.09	Undrained
7	-28.72	17.03	3.00	1530.45	949.10	677.40	Undrained
8	-25.67	19.17	1.83	1061.78	606.39	432.80	Undrained
9	-25.67	20.14	0.31	192.30	105.02	74.96	Undrained
10	-25.67	20.67	0.86	562.86	294.16	209.95	Undrained
11	-22.62	22.42	2.96	2268.82	1066.00	760.84	Undrained
12	-22.62	23.80	0.04	37.31	16.19	11.56	Undrained
13	-19.58	25.23	3.00	2802.85	1155.26	824.55	Undrained
14	-16.53	26.96	0.66	673.92	262.39	187.28	Undrained
15	-16.53	28.40	2.34	2571.64	954.73	681.43	Undrained
16	-13.48	29.76	0.49	562.18	202.07	144.22	Undrained
17	-13.48	31.22	2.51	3095.01	1070.21	763.84	Undrained
18	-10.43	33.36	1.87	2469.67	817.48	583.46	Undrained
19	-10.43	34.84	1.13	1567.27	503.06	359.05	Undrained
20	-7.39	36.88	3.00	4372.46	1359.35	970.21	Undrained
21	-4.34	39.86	3.00	4670.32	1390.14	992.19	Undrained
22	-1.29	42.86	3.00	4932.66	1413.42	1008.81	Undrained
23	1.75	45.86	3.00	5159.15	1429.21	1020.08	Undrained
24	4.80	47.82	0.93	1631.97	443.57	316.59	Undrained
25	4.80	49.31	2.07	3789.76	1009.03	720.18	Undrained
26	7.85	51.83	3.00	5636.76	1466.25	1046.51	Undrained
27	10.89	54.79	3.00	5787.71	1466.82	1046.92	Undrained
28	13.94	57.25	2.04	3986.74	990.50	706.95	Undrained
29	13.94	58.37	0.27	536.29	131.90	94.14	Undrained
30	13.94	58.84	0.69	1378.61	337.64	240.99	Undrained
31	16.99	60.61	3.00	5981.78	1446.71	1032.57	Undrained
32	20.04	63.45	3.00	6026.58	1426.60	1018.21	Undrained
33	23.08	65.67	1.76	3534.59	823.60	587.83	Undrained
34	23.08	67.05	1.24	2500.66	576.07	411.16	Undrained
35	26.13	68.97	3.00	6008.10	1366.11	975.04	Undrained
36	29.18	71.62	3.00	5945.50	1326.13	946.51	Undrained
37	32.22	73.21	0.65	1263.76	278.94	199.09	Undrained
38	32.22	74.48	2.35	4584.28	1001.08	714.50	Undrained
39	35.27	76.70	3.00	5716.40	1228.08	876.52	Undrained
40	38.32	78.28	0.92	1716.50	364.68	260.29	Undrained
41	38.32	79.25	1.54	2411.07	1392.03	993.54	
42	38.32	79.88	0.07	116.77	67.42	48.12	
43	38.32	80.09	0.47	722.76	417.28	297.83	
44	41.37	80.55	0.74	1092.26	630.62	450.09	
45	41.37	81.52	1.85	2593.57	1497.40	1068.74	
46	41.37	82.37	0.41	568.66	289.75	206.80	
47	44.41	83.60	3.00	3751.54	1911.51	1364.31	

				case2_3.5to1_rd.OUT				
48	47.46	85.42	2.21	2360.41	1202.69	858.40		
49	47.46	86.43	0.79	799.02	354.27	252.85		
50	50.51	87.28	1.84	1595.06	761.52	543.52		Undrained
51	50.51	88.24	1.16	952.21	342.10	244.17		Undrained
52	53.55	89.05	1.50	1003.44	423.63	302.36		Undrained
53	53.55	89.83	1.12	721.94	194.56	138.87		Undrained
54	53.55	90.27	0.39	223.59	62.91	44.90		Undrained
55	56.60	91.21	3.00	1249.31	408.09	291.27		Undrained
56	59.65	92.80	3.00	467.61	225.58	161.00		Undrained
57	62.70	93.73	0.78	-19.55	38.90	27.77		Undrained

SUM OF MOMENTS = 0.227007E+00 (ft/lbs); Imbalance (Fraction of Total Weight) = 0.1421205E-05

Sum of the Resisting Forces = 41521.43 (lbs)

Average Available Shear Strength = 416.11(psf)

Sum of the Driving Forces = 29635.27 (lbs)

Average Mobilized Shear Stress = 296.99(psf)

Total length of the failure surface = 99.78(ft)

Factor of Safety Balance Check: FS = 1.40108

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 2 ****

Factor of Safety For The Critical or Specified Surface = 1.401

Table 1 - Geometry Data on the 57 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	1.29	0.50	8.98	5.00	5.50	-37.86	0.00	1.63
2	0.38	1.15	9.81	4.35	5.50	-37.86	0.00	0.48
3	0.70	1.57	10.35	3.93	5.50	-37.86	0.00	0.89
4	0.23	1.92	10.82	3.58	5.50	-34.81	0.00	0.28
5	2.23	2.78	12.05	2.72	5.50	-34.81	0.00	2.72
6	2.55	4.34	14.44	1.16	5.50	-31.76	0.00	3.00
7	2.63	5.85	17.03	-0.35	5.50	-28.72	0.00	3.00
8	1.65	6.97	19.17	-1.47	5.50	-25.67	0.00	1.83
9	0.28	7.48	20.14	-1.94	5.54	-25.67	15.95	0.31
10	0.77	7.88	20.67	-2.19	5.69	-25.67	15.95	0.86
11	2.73	9.13	22.42	-2.94	6.19	-22.62	15.95	2.96
12	0.04	10.11	23.80	-3.52	6.59	-22.62	15.95	0.04
13	2.83	11.03	25.23	-4.03	7.00	-19.58	15.95	3.00
14	0.63	12.12	26.96	-4.63	7.49	-16.53	15.95	0.66
15	2.24	12.95	28.40	-5.05	7.90	-16.53	15.95	2.34
16	0.47	13.73	29.76	-5.44	8.29	-13.48	15.95	0.49
17	2.44	14.50	31.22	-5.79	8.71	-13.48	15.95	2.51
18	1.84	15.57	33.36	-6.26	9.32	-10.43	15.95	1.87
19	1.11	16.27	34.84	-6.53	9.74	-10.43	15.95	1.13
20	2.98	17.14	36.88	-6.82	10.32	-7.39	15.95	3.00
21	2.99	18.30	39.86	-7.13	11.17	-4.34	15.95	3.00
22	3.00	19.31	42.86	-7.28	12.03	-1.29	15.95	3.00
23	3.00	20.15	45.86	-7.26	12.89	1.75	15.95	3.00
24	0.93	20.63	47.82	-7.18	13.45	4.80	15.95	0.93
25	2.06	20.93	49.31	-7.05	13.87	4.80	15.95	2.07
26	2.97	21.36	51.83	-6.76	14.59	7.85	15.95	3.00
27	2.95	21.71	54.79	-6.27	15.44	10.89	15.95	3.00
28	1.98	21.89	57.25	-5.75	16.14	13.94	15.95	2.04
29	0.26	21.93	58.37	-5.47	16.46	13.94	15.95	0.27
30	0.67	21.95	58.84	-5.35	16.60	13.94	15.95	0.69
31	2.87	21.93	60.61	-4.83	17.10	16.99	15.95	3.00
32	2.82	21.79	63.45	-3.88	17.91	20.04	15.95	3.00
33	1.62	21.57	65.67	-3.02	18.55	23.08	15.95	1.76
34	1.14	21.37	67.05	-2.43	18.94	23.08	15.95	1.24
35	2.69	21.02	68.97	-1.53	19.49	26.13	15.95	3.00

case2_3.5to1_rd.OUT								
36	2.62	20.38	71.62	-0.13	20.25	29.18	15.95	3.00
37	0.55	19.93	73.21	0.77	20.70	32.22	15.95	0.65
38	1.99	19.50	74.48	1.57	21.06	32.22	15.95	2.35
39	2.45	18.64	76.70	3.06	21.70	35.27	15.95	3.00
40	0.72	17.94	78.28	4.21	22.15	38.32	15.95	0.92
41	1.21	17.45	79.25	4.98	22.43	38.32	15.95	1.54
42	0.06	17.12	79.88	5.48	22.60	38.32	0.00	0.07
43	0.37	16.96	80.09	5.64	22.60	38.32	0.00	0.47
44	0.56	16.57	80.55	6.03	22.60	41.37	0.00	0.74
45	1.39	15.71	81.52	6.89	22.60	41.37	0.00	1.85
46	0.31	14.96	82.37	7.64	22.60	41.37	0.00	0.41
47	2.14	13.78	83.60	8.82	22.60	44.41	0.00	3.00
48	1.49	11.91	85.42	10.69	22.60	47.46	0.00	2.21
49	0.53	10.81	86.43	11.79	22.60	47.46	0.00	0.79
50	1.17	9.81	87.28	12.79	22.60	50.51	0.00	1.84
51	0.74	8.65	88.24	13.95	22.60	50.51	0.00	1.16
52	0.89	7.60	89.05	15.00	22.60	53.55	0.00	1.50
53	0.66	6.55	89.83	16.05	22.60	53.55	0.00	1.12
54	0.23	5.95	90.27	16.65	22.60	53.55	0.00	0.39
55	1.65	4.54	91.21	18.06	22.60	56.60	0.00	3.00
56	1.52	1.99	92.80	20.61	22.60	59.65	0.00	3.00
57	0.36	0.35	93.73	22.25	22.60	62.70	0.00	0.78

Table 2 - Force Data On The 57 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force	Ualpha Force	Earthquake Force		Distributed Load (lbs)
		Top (lbs)	Bot (lbs)	Hor (lbs)	Ver (lbs)	
1	74.0	0.0	50.8	0.0	0.0	0.0
2	51.2	0.0	34.5	0.0	0.0	0.0
3	132.1	0.0	87.0	0.0	0.0	0.0
4	52.7	0.0	33.4	0.0	0.0	0.0
5	767.2	0.0	471.6	0.0	0.0	0.0
6	1407.1	0.0	813.1	0.0	0.0	0.0
7	1980.0	0.0	1095.8	0.0	0.0	0.0
8	1490.0	0.0	798.0	0.0	0.0	0.0
9	271.0	0.0	144.2	0.0	0.0	0.0
10	786.7	0.0	410.2	0.0	0.0	0.0
11	3241.5	0.0	1557.8	0.0	0.0	0.0
12	52.4	0.0	24.3	0.0	0.0	0.0
13	4047.4	0.0	1784.1	0.0	0.0	0.0
14	993.5	0.0	417.6	0.0	0.0	0.0
15	3749.6	0.0	1540.4	0.0	0.0	0.0
16	836.1	0.0	332.0	0.0	0.0	0.0
17	4555.5	0.0	1771.4	0.0	0.0	0.0
18	3673.7	0.0	1372.6	0.0	0.0	0.0
19	2309.9	0.0	847.2	0.0	0.0	0.0
20	6499.8	0.0	2306.7	0.0	0.0	0.0
21	6939.6	0.0	2364.1	0.0	0.0	0.0
22	7299.9	0.0	2391.7	0.0	0.0	0.0
23	7576.0	0.0	2389.4	0.0	0.0	0.0
24	2384.8	0.0	734.8	0.0	0.0	0.0
25	5453.1	0.0	1622.5	0.0	0.0	0.0
26	7999.9	0.0	2295.5	0.0	0.0	0.0
27	8044.3	0.0	2204.1	0.0	0.0	0.0
28	5424.4	0.0	1428.0	0.0	0.0	0.0
29	723.1	0.0	185.5	0.0	0.0	0.0
30	1851.6	0.0	469.8	0.0	0.0	0.0
31	7869.7	0.0	1933.6	0.0	0.0	0.0
32	7657.5	0.0	1755.4	0.0	0.0	0.0
33	4341.1	0.0	935.5	0.0	0.0	0.0
34	3025.0	0.0	613.6	0.0	0.0	0.0
35	7001.4	0.0	1315.3	0.0	0.0	0.0
36	6570.3	0.0	1054.8	0.0	0.0	0.0
37	1335.9	0.0	190.7	0.0	0.0	0.0
38	4745.0	0.0	577.4	0.0	0.0	0.0
39	5542.2	0.0	456.2	0.0	0.0	0.0
40	1565.0	0.0	73.9	0.0	0.0	0.0
41	2542.9	0.0	50.2	0.0	0.0	0.0
42	121.3	0.0	0.1	0.0	0.0	0.0
43	750.5	0.0	0.0	0.0	0.0	0.0
44	1115.2	0.0	0.0	0.0	0.0	0.0
45	2648.0	0.0	0.0	0.0	0.0	0.0
46	562.5	0.0	0.0	0.0	0.0	0.0
47	3628.1	0.0	0.0	0.0	0.0	0.0

				case2_3.5to1_rd.OUT		
48	2224.1	0.0	0.0	0.0	0.0	0.0
49	725.3	0.0	0.0	0.0	0.0	0.0
50	1431.0	0.0	0.0	0.0	0.0	0.0
51	792.7	0.0	0.0	0.0	0.0	0.0
52	837.7	0.0	0.0	0.0	0.0	0.0
53	539.8	0.0	0.0	0.0	0.0	0.0
54	168.7	0.0	0.0	0.0	0.0	0.0
55	929.2	0.0	0.0	0.0	0.0	0.0
56	374.3	0.0	0.0	0.0	0.0	0.0
57	15.5	0.0	0.0	0.0	0.0	0.0

TOTAL WEIGHT OF SLIDING MASS = 159728.51(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 120681.02(lbs)

TOTAL AREA OF SLIDING MASS = 1274.37(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 57 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	7	0.00	30.00	
2	8	212.96	0.00	R
3	11	100.00	20.00	R
4	11	100.00	20.00	R
5	8	172.00	15.00	R
6	8	172.00	15.00	R
7	8	172.00	15.00	R
8	8	172.00	15.00	R
9	8	172.00	15.00	R
10	8	344.04	0.00	R
11	8	360.52	0.00	R
12	8	375.37	0.00	R
13	8	385.09	0.00	R
14	8	397.02	0.00	R
15	8	408.16	0.00	R
16	8	415.62	0.00	R
17	9	425.73	0.00	R
18	9	436.88	0.00	R
19	9	445.64	0.00	R
20	9	453.12	0.00	R
21	9	463.38	0.00	R
22	9	471.14	0.00	R
23	9	476.40	0.00	R
24	9	477.59	0.00	R
25	9	487.16	0.00	R
26	9	488.75	0.00	R
27	9	488.94	0.00	R
28	9	486.71	0.00	R
29	8	486.62	0.00	R
30	8	486.62	0.00	R
31	8	482.24	0.00	R
32	8	475.53	0.00	R
33	8	467.96	0.00	R
34	8	464.57	0.00	R
35	8	455.37	0.00	R
36	8	442.04	0.00	R
37	8	431.75	0.00	R
38	8	425.28	0.00	R
39	8	409.36	0.00	R
40	8	395.97	0.00	R
41	7	0.00	30.00	
42	7	0.00	30.00	
43	7	0.00	30.00	
44	7	0.00	30.00	
45	7	0.00	30.00	
46	6	0.00	27.00	
47	6	0.00	27.00	
48	6	0.00	27.00	
49	5	448.86	0.00	R
50	5	414.30	0.00	R
51	3	294.43	0.00	R
52	3	283.18	0.00	R
53	2	173.90	0.00	R
54	1	163.31	0.00	R
55	1	136.03	0.00	R
56	1	75.19	0.00	R
57	1	49.61	0.00	R

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
 F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
 R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
 NOTE: Phi and C in Table 4 are modified values based on specified
 soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 57 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)	Multi-Stage Strength Type
1	-37.86	8.98	1.63	38.66	22.32	15.93	
2	-37.86	9.81	0.48	180.97	212.96	152.00	Undrained
3	-37.86	10.35	0.89	182.51	166.43	118.78	Drained
4	-34.81	10.82	0.28	195.40	171.12	122.13	Drained
5	-34.81	12.05	2.72	294.33	250.86	179.05	Drained
6	-31.76	14.44	3.00	404.31	280.33	200.08	Drained
7	-28.72	17.03	3.00	507.50	307.98	219.82	Drained
8	-25.67	19.17	1.83	578.16	326.92	233.33	Drained
9	-25.67	20.14	0.31	619.55	338.01	241.25	Drained
10	-25.67	20.67	0.86	658.89	344.04	245.55	Undrained
11	-22.62	22.42	2.96	767.84	360.52	257.31	Undrained
12	-22.62	23.80	0.04	865.50	375.37	267.91	Undrained
13	-19.58	25.23	3.00	934.77	385.09	274.85	Undrained
14	-16.53	26.96	0.66	1020.12	397.02	283.37	Undrained
15	-16.53	28.40	2.34	1099.85	408.16	291.32	Undrained
16	-13.48	29.76	0.49	1156.64	415.62	296.64	Undrained
17	-13.48	31.22	2.51	1231.57	425.73	303.86	Undrained
18	-10.43	33.36	1.87	1320.14	436.88	311.82	Undrained
19	-10.43	34.84	1.13	1388.69	445.64	318.07	Undrained
20	-7.39	36.88	3.00	1457.70	453.12	323.40	Undrained
21	-4.34	39.86	3.00	1556.90	463.38	330.73	Undrained
22	-1.29	42.86	3.00	1644.26	471.14	336.27	Undrained
23	1.75	45.86	3.00	1719.66	476.40	340.03	Undrained
24	4.80	47.82	0.93	1756.99	477.59	340.87	Undrained
25	4.80	49.31	2.07	1829.57	487.16	347.70	Undrained
26	7.85	51.83	3.00	1878.68	488.75	348.84	Undrained
27	10.89	54.79	3.00	1928.90	488.94	348.97	Undrained
28	13.94	57.25	2.04	1958.57	486.71	347.38	Undrained
29	13.94	58.37	0.27	1978.09	486.62	347.32	Undrained
30	13.94	58.84	0.69	1986.45	486.62	347.32	Undrained
31	16.99	60.61	3.00	1993.40	482.24	344.19	Undrained
32	20.04	63.45	3.00	2008.24	475.53	339.40	Undrained
33	23.08	65.67	1.76	2007.59	467.96	334.00	Undrained
34	23.08	67.05	1.24	2015.94	464.57	331.58	Undrained
35	26.13	68.97	3.00	2001.90	455.37	325.01	Undrained
36	29.18	71.62	3.00	1980.95	442.04	315.50	Undrained
37	32.22	73.21	0.65	1955.14	431.75	308.16	Undrained
38	32.22	74.48	2.35	1946.53	425.28	303.53	Undrained
39	35.27	76.70	3.00	1904.43	409.36	292.17	Undrained
40	38.32	78.28	0.92	1862.64	395.97	282.62	Undrained
41	38.32	79.25	1.54	1565.59	903.89	645.14	
42	38.32	79.88	0.07	1561.87	901.75	643.61	
43	38.32	80.09	0.47	1548.41	893.97	638.06	
44	41.37	80.55	0.74	1473.34	850.64	607.13	
45	41.37	81.52	1.85	1401.13	808.94	577.37	
46	41.37	82.37	0.41	1381.75	704.04	502.50	
47	44.41	83.60	3.00	1248.87	636.33	454.17	
48	47.46	85.42	2.21	1066.18	543.25	387.73	
49	47.46	86.43	0.79	1010.62	448.86	320.37	Undrained
50	50.51	87.28	1.84	865.97	414.30	295.70	Undrained
51	50.51	88.24	1.16	818.26	294.43	210.15	Undrained
52	53.55	89.05	1.50	669.40	283.18	202.12	Undrained
53	53.55	89.83	1.12	644.42	173.90	124.12	Undrained
54	53.55	90.27	0.39	579.63	163.31	116.56	Undrained
55	56.60	91.21	3.00	415.70	136.03	97.09	Undrained
56	59.65	92.80	3.00	155.41	75.19	53.67	Undrained
57	62.70	93.73	0.78	-25.28	49.61	35.41	Undrained

Table 4 - Base Force Data on the 57 Slices

Slice No.	Alpha (deg)	X-Coord. Slice Cntr	Base Leng.	Effective Normal Force	Available Shear Force	Mobilized Shear Force
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*			case2_3.5to1_rd.OUT				
	(ft)	(ft)	(lbs)	(lbs)	(lbs)		
1	-37.86	8.98	1.63	63.00	36.37	25.96	
2	-37.86	9.81	0.48	87.14	102.54	73.19	Undrained
3	-37.86	10.35	0.89	162.26	147.96	105.61	Drained
4	-34.81	10.82	0.28	54.38	47.62	33.99	Drained
5	-34.81	12.05	2.72	801.07	682.78	487.32	Drained
6	-31.76	14.44	3.00	1212.93	841.00	600.25	Drained
7	-28.72	17.03	3.00	1522.49	923.95	659.45	Drained
8	-25.67	19.17	1.83	1060.52	599.67	428.00	Drained
9	-25.67	20.14	0.31	192.47	105.01	74.95	Drained
10	-25.67	20.67	0.86	563.37	294.16	209.95	Undrained
11	-22.62	22.42	2.96	2270.41	1066.00	760.84	Undrained
12	-22.62	23.80	0.04	37.33	16.19	11.56	Undrained
13	-19.58	25.23	3.00	2804.32	1155.26	824.55	Undrained
14	-16.53	26.96	0.66	674.19	262.39	187.28	Undrained
15	-16.53	28.40	2.34	2572.66	954.73	681.43	Undrained
16	-13.48	29.76	0.49	562.35	202.07	144.22	Undrained
17	-13.48	31.22	2.51	3095.93	1070.21	763.84	Undrained
18	-10.43	33.36	1.87	2470.20	817.48	583.46	Undrained
19	-10.43	34.84	1.13	1567.60	503.06	359.05	Undrained
20	-7.39	36.88	3.00	4373.09	1359.35	970.21	Undrained
21	-4.34	39.86	3.00	4670.70	1390.14	992.19	Undrained
22	-1.29	42.86	3.00	4932.77	1413.42	1008.81	Undrained
23	1.75	45.86	3.00	5158.99	1429.21	1020.08	Undrained
24	4.80	47.82	0.93	1631.84	443.57	316.59	Undrained
25	4.80	49.31	2.07	3789.46	1009.03	720.18	Undrained
26	7.85	51.83	3.00	5636.04	1466.25	1046.51	Undrained
27	10.89	54.79	3.00	5786.70	1466.82	1046.92	Undrained
28	13.94	57.25	2.04	3985.86	990.50	706.95	Undrained
29	13.94	58.37	0.27	536.18	131.90	94.14	Undrained
30	13.94	58.84	0.69	1378.31	337.64	240.99	Undrained
31	16.99	60.61	3.00	5980.20	1446.71	1032.57	Undrained
32	20.04	63.45	3.00	6024.72	1426.60	1018.21	Undrained
33	23.08	65.67	1.76	3533.34	823.60	587.83	Undrained
34	23.08	67.05	1.24	2499.79	576.07	411.16	Undrained
35	26.13	68.97	3.00	6005.70	1366.11	975.04	Undrained
36	29.18	71.62	3.00	5942.85	1326.13	946.51	Undrained
37	32.22	73.21	0.65	1263.13	278.94	199.09	Undrained
38	32.22	74.48	2.35	4582.02	1001.08	714.50	Undrained
39	35.27	76.70	3.00	5713.30	1228.08	876.52	Undrained
40	38.32	78.28	0.92	1715.47	364.68	260.29	Undrained
41	38.32	79.25	1.54	2408.10	1390.32	992.32	Undrained
42	38.32	79.88	0.07	116.63	67.33	48.06	
43	38.32	80.09	0.47	721.87	416.77	297.46	
44	41.37	80.55	0.74	1090.81	629.78	449.49	
45	41.37	81.52	1.85	2590.11	1495.40	1067.32	
46	41.37	82.37	0.41	567.97	289.39	206.55	
47	44.41	83.60	3.00	3746.60	1908.99	1362.51	
48	47.46	85.42	2.21	2357.06	1200.98	857.18	
49	47.46	86.43	0.79	797.64	354.27	252.85	Undrained
50	50.51	87.28	1.84	1591.76	761.52	543.52	Undrained
51	50.51	88.24	1.16	950.73	342.10	244.17	Undrained
52	53.55	89.05	1.50	1001.39	423.63	302.36	Undrained
53	53.55	89.83	1.12	721.00	194.56	138.87	Undrained
54	53.55	90.27	0.39	223.28	62.91	44.90	Undrained
55	56.60	91.21	3.00	1247.09	408.09	291.27	Undrained
56	59.65	92.80	3.00	466.23	225.58	161.00	Undrained
57	62.70	93.73	0.78	-19.82	38.90	27.77	Undrained

SUM OF MOMENTS = 0.149776E+00 (ft/lbs); Imbalance (Fraction of Total weight) = 0.9376918E-06

Sum of the Resisting Forces = 41314.80 (lbs)

Average Available Shear Strength = 414.04(psf)

Sum of the Driving Forces = 29487.79 (lbs)

Average Mobilized Shear Stress = 295.52(psf)

Total length of the failure surface = 99.78(ft)

Factor of Safety Balance check: FS = 1.40108

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

case2_3.5to1_rd.OUT

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 3 ****

case2_3.5to1_lt.OUT
*** GEOSTASE(R) ***

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** Current Version 4.30.30-Double Precision, January 2019 **
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SLOPE STABILITY ANALYSIS SOFTWARE
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

Analysis Date: 4/ 6/ 2021
Analysis Time:
Analysis By: GEI Job No. 1140258201

Input File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case2_3.5to1_lt.gsd

Output File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case2_3.5to1_lt.OUT

Unit System: English

PROJECT: Forest Bend Detention Pond

DESCRIPTION: Case-2 - Borings GB-1P, GB-2, GB-5 & GB-6 - 3.5(H):1(V) - LT

BOUNDARY DATA

6 Surface Boundaries
26 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	-30.000	5.500	10.000	5.500	7
2	10.000	5.500	20.000	5.500	11
3	20.000	5.500	48.280	13.580	11
4	48.280	13.580	58.500	16.500	2
5	58.500	16.500	79.850	22.600	1
6	79.850	22.600	130.000	22.600	1
7	58.500	16.500	130.000	16.500	2
8	80.830	15.600	130.000	15.600	3
9	73.480	13.500	80.830	15.600	3
10	48.280	13.580	73.480	13.500	4
11	73.480	13.500	130.000	13.500	5
12	48.280	11.500	48.280	13.580	4
13	66.480	11.500	73.480	13.500	5
14	48.280	11.500	66.480	11.500	6
15	66.480	11.500	130.000	11.500	6
16	34.280	7.500	48.280	11.500	6
17	34.280	7.500	130.000	7.500	7
18	23.780	4.500	34.280	7.500	7
19	-30.000	4.500	10.000	4.500	8
20	10.000	4.500	10.000	5.500	11
21	23.780	4.500	130.000	4.500	8
22	10.000	3.500	10.000	4.500	11
23	20.280	3.500	23.780	4.500	8
24	10.000	3.500	20.280	3.500	8
25	-30.000	-5.500	130.000	-5.500	9
26	-30.000	-10.500	130.000	-10.500	10

User Specified X-Origin = -30.000(ft)

User Specified Y-Origin = -20.000(ft)

MOHR-COULOMB SOIL PARAMETERS

11 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	Pressure Constant (psf)	Water Surface No.	Water Option
1 Fat Clay (w)	124.0	124.0	59.00	17.00	0.000	0.0	1	0
2 Fat Clay (w)	124.0	124.0	59.00	17.00	0.000	0.0	1	0
3 Fat Clay	124.0	124.0	172.00	15.00	0.000	0.0	1	0
4 Lean Clay (w)	135.0	135.0	186.00	20.00	0.000	0.0	1	0
5 Lean Clay	135.0	135.0	186.00	28.00	0.000	0.0	1	0
6 Sandy Silt	110.0	110.0	0.00	27.00	0.000	0.0	1	0
7 Silty Sand	115.0	115.0	0.00	30.00	0.000	0.0	1	0
8 Fat Clay	133.0	133.0	172.00	15.00	0.000	0.0	1	0
9 Fat Clay	135.0	135.0	172.00	15.00	0.000	0.0	1	0
10 Silty Sand	115.0	115.0	0.00	30.00	0.000	0.0	1	0
11 Clay Liner	120.0	120.0	100.00	20.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 2 Coordinate Points
Pore Pressure Inclination Factor = 1.00

Point No.	X-Water (ft)	Y-Water (ft)
1	-30.00	6.50
2	130.00	6.50

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load Deflection No. from Vert)	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	(deg)
0.00	1	6	79.850	22.600	250.000	130.000	22.600	250.000

NOTE - Load Stress Varies Linearly Within Specified Range.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.6607(in) Equally Spaced within the Start Range
Along The Specified surface Between X = -10.00(ft)
and X = 45.00(ft)

Each surface Enters within a Range Between X = 50.00(ft)
and X = 120.00(ft)

Unless XCLUDE Lines were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = -20.00(ft)

Specified Maximum Radius = 5000.000(ft)

3.000(ft) Line Segments were Used For Each Trial Failure Surface.

The simplified Bishop Method was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces Did Not Converge in 50 Iterations.

Number of Trial Surfaces with Non-Converged FS = 10

Number of Trial Surfaces with Valid FS = 990

Percentage of Trial Surfaces with Non-Converged and/or Non-Valid FS solutions of the Total Attempted = 1.0 %

Statistical Data on All Valid FS Values:

FS Max = 9.082 FS Min = 1.681 FS Ave = 2.419
Standard Deviation = 0.731 Coefficient of Variation = 30.20 %

Critical Surface is Sequence Number 439 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 44.834406(ft) ; Y = 50.910348(ft); and Radius = 54.825505(ft)

Circular Trial Failure Surface Generated with 31 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	14.114	5.500
2	16.644	3.888
3	19.258	2.416
4	21.949	1.090
5	24.709	-0.088
6	27.528	-1.112
7	30.400	-1.981
8	33.314	-2.691
9	36.263	-3.241
10	39.238	-3.629
11	42.230	-3.853
12	45.229	-3.914
13	48.227	-3.810
14	51.216	-3.543
15	54.184	-3.112
16	57.125	-2.520
17	60.030	-1.767
18	62.888	-0.857
19	65.693	0.208
20	68.435	1.424
21	71.106	2.789
22	73.699	4.299
23	76.206	5.947
24	78.618	7.730
25	80.929	9.643
26	83.133	11.679
27	85.221	13.833
28	87.189	16.097
29	89.030	18.466
30	90.738	20.932
31	91.763	22.600

Factor of Safety For The Critical or Specified Surface = 1.681

Table 1 - Geometry Data on the 50 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	2.53	0.81	15.38	4.69	5.50	-32.51	0.00	3.00

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2	0.69	1.81	16.99	3.69	5.50	-29.38	0.00	0.79
3	1.93	2.54	18.30	2.96	5.50	-29.38	0.00	2.21
4	0.74	3.27	19.63	2.23	5.50	-26.24	0.00	0.83
5	0.28	3.56	20.14	1.98	5.54	-26.24	15.95	0.31
6	1.67	4.32	21.11	1.50	5.82	-26.24	15.95	1.86
7	1.55	5.52	22.72	0.76	6.28	-23.10	15.95	1.69
8	0.28	6.17	23.64	0.37	6.54	-23.10	15.95	0.30
9	0.93	6.60	24.24	0.11	6.71	-23.10	15.95	1.01
10	2.82	7.85	26.12	-0.60	7.25	-19.97	15.95	3.00
11	2.87	9.61	28.96	-1.55	8.06	-16.83	15.95	3.00
12	0.38	10.55	30.59	-2.03	8.53	-13.70	15.95	0.39
13	2.53	11.32	32.05	-2.38	8.94	-13.70	15.95	2.61
14	0.97	12.22	33.80	-2.78	9.44	-10.56	15.95	0.98
15	1.98	12.92	35.27	-3.06	9.86	-10.56	15.95	2.02
16	2.97	14.01	37.75	-3.43	10.57	-7.43	15.95	3.00
17	2.99	15.17	40.73	-3.74	11.42	-4.29	15.95	3.00
18	3.00	16.16	43.73	-3.88	12.28	-1.16	15.95	3.00
19	3.00	17.00	46.73	-3.86	13.14	1.98	15.95	3.00
20	0.05	17.38	48.25	-3.81	13.57	5.12	15.95	0.05
21	2.94	17.67	49.75	-3.67	14.00	5.12	15.95	2.95
22	2.97	18.17	52.70	-3.33	14.84	8.25	15.95	3.00
23	2.94	18.50	55.65	-2.82	15.69	11.39	15.95	3.00
24	1.37	18.65	57.81	-2.34	16.30	14.52	15.95	1.42
25	1.53	18.68	59.26	-1.97	16.72	14.52	15.95	1.58
26	2.86	18.66	61.46	-1.31	17.35	17.66	15.95	3.00
27	2.80	18.48	64.29	-0.32	18.15	20.79	15.95	3.00
28	0.79	18.29	66.09	0.38	18.67	23.93	15.95	0.86
29	1.95	18.07	67.46	0.99	19.06	23.93	15.95	2.14
30	2.67	17.61	69.77	2.11	19.72	27.06	15.95	3.00
31	2.37	16.96	72.29	3.48	20.44	30.20	15.95	2.75
32	0.22	16.58	73.59	4.23	20.81	30.20	15.95	0.25
33	0.31	16.49	73.85	4.40	20.89	33.34	15.95	0.37
34	2.20	16.02	75.11	5.22	21.24	33.34	15.95	2.63
35	0.75	15.44	76.58	6.22	21.67	36.47	15.95	0.93
36	1.35	14.97	77.63	7.00	21.97	36.47	15.95	1.68
37	0.31	14.59	78.46	7.62	22.20	36.47	15.95	0.39
38	1.23	14.18	79.23	8.24	22.42	39.61	15.95	1.60
39	0.98	13.44	80.34	9.16	22.60	39.61	0.00	1.27
40	0.10	13.00	80.88	9.60	22.60	39.61	0.00	0.13
41	2.01	12.03	81.93	10.57	22.60	42.74	0.00	2.74
42	0.19	11.01	83.04	11.59	22.60	42.74	0.00	0.26
43	1.77	10.01	84.02	12.59	22.60	45.88	0.00	2.54
44	0.32	8.93	85.06	13.67	22.60	45.88	0.00	0.46
45	1.54	7.88	85.99	14.72	22.60	49.01	0.00	2.34
46	0.43	6.75	86.97	15.85	22.60	49.01	0.00	0.66
47	0.31	6.30	87.35	16.30	22.60	52.15	0.00	0.51
48	1.53	5.12	88.27	17.48	22.60	52.15	0.00	2.49
49	1.71	2.90	89.88	19.70	22.60	55.29	0.00	3.00
50	1.03	0.83	91.25	21.77	22.60	58.42	0.00	1.96

Table 2 - Force Data On The 50 slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force		Distributed Load (lbs)
				Hor (lbs)	Ver (lbs)	
1	244.7	157.9	338.1	0.0	0.0	0.0
2	149.3	43.0	138.4	0.0	0.0	0.0
3	601.0	120.2	488.4	0.0	0.0	0.0
4	303.0	46.3	220.2	0.0	0.0	0.0
5	125.1	17.4	88.0	0.0	0.0	0.0
6	913.3	73.8	580.5	0.0	0.0	0.0
7	1096.6	22.3	604.0	0.0	0.0	0.0
8	222.3	0.0	116.5	0.0	0.0	0.0
9	788.0	0.0	402.5	0.0	0.0	0.0
10	2832.9	0.0	1329.1	0.0	0.0	0.0
11	3515.0	0.0	1506.3	0.0	0.0	0.0
12	510.3	0.0	208.3	0.0	0.0	0.0
13	3640.7	0.0	1445.8	0.0	0.0	0.0
14	1494.1	0.0	568.9	0.0	0.0	0.0
15	3234.5	0.0	1203.1	0.0	0.0	0.0
16	5232.8	0.0	1859.8	0.0	0.0	0.0
17	5664.6	0.0	1917.1	0.0	0.0	0.0
18	6018.6	0.0	1943.8	0.0	0.0	0.0
19	6290.1	0.0	1939.7	0.0	0.0	0.0
20	112.3	0.0	33.9	0.0	0.0	0.0

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21	6472.5	0.0	1871.1	0.0	0.0	0.0
22	6719.5	0.0	1839.7	0.0	0.0	0.0
23	6763.7	0.0	1743.9	0.0	0.0	0.0
24	3179.6	0.0	783.4	0.0	0.0	0.0
25	3540.2	0.0	834.7	0.0	0.0	0.0
26	6590.0	0.0	1462.5	0.0	0.0	0.0
27	6378.1	0.0	1277.6	0.0	0.0	0.0
28	1766.2	0.0	328.8	0.0	0.0	0.0
29	4323.0	0.0	735.3	0.0	0.0	0.0
30	5729.5	0.0	822.4	0.0	0.0	0.0
31	4869.0	0.0	517.5	0.0	0.0	0.0
32	437.8	0.0	35.9	0.0	0.0	0.0
33	607.6	0.0	48.0	0.0	0.0	0.0
34	4250.9	0.0	209.7	0.0	0.0	0.0
35	1397.9	0.0	16.0	0.0	0.0	0.0
36	2458.4	0.0	0.0	0.0	0.0	0.0
37	554.0	0.0	0.0	0.0	0.0	0.0
38	2137.6	0.0	0.0	0.0	0.0	0.0
39	1623.2	0.0	0.0	0.0	0.0	245.0
40	159.7	0.0	0.0	0.0	0.0	24.8
41	3015.1	0.0	0.0	0.0	0.0	502.3
42	268.8	0.0	0.0	0.0	0.0	48.5
43	2209.6	0.0	0.0	0.0	0.0	441.5
44	357.5	0.0	0.0	0.0	0.0	80.7
45	1501.0	0.0	0.0	0.0	0.0	383.9
46	361.8	0.0	0.0	0.0	0.0	108.0
47	244.5	0.0	0.0	0.0	0.0	78.2
48	969.5	0.0	0.0	0.0	0.0	382.0
49	614.5	0.0	0.0	0.0	0.0	427.1
50	106.0	0.0	0.0	0.0	0.0	256.3

TOTAL WEIGHT OF SLIDING MASS = 122595.74(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 94743.91(lbs)

TOTAL AREA OF SLIDING MASS = 988.82(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 50 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	11	100.00	20.00	
2	11	100.00	20.00	
3	8	172.00	15.00	
4	8	172.00	15.00	
5	8	172.00	15.00	
6	8	172.00	15.00	
7	8	172.00	15.00	
8	8	172.00	15.00	
9	8	172.00	15.00	
10	8	172.00	15.00	
11	8	172.00	15.00	
12	8	172.00	15.00	
13	8	172.00	15.00	
14	8	172.00	15.00	
15	8	172.00	15.00	
16	8	172.00	15.00	
17	8	172.00	15.00	
18	8	172.00	15.00	
19	8	172.00	15.00	
20	8	172.00	15.00	
21	8	172.00	15.00	
22	8	172.00	15.00	
23	8	172.00	15.00	
24	8	172.00	15.00	
25	8	172.00	15.00	
26	8	172.00	15.00	
27	8	172.00	15.00	
28	8	172.00	15.00	
29	8	172.00	15.00	
30	8	172.00	15.00	
31	8	172.00	15.00	
32	8	172.00	15.00	
33	8	172.00	15.00	
34	7	0.00	30.00	
35	7	0.00	30.00	
36	7	0.00	30.00	
37	6	0.00	27.00	

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38	6	0.00	27.00
39	6	0.00	27.00
40	6	0.00	27.00
41	6	0.00	27.00
42	5	186.00	28.00
43	5	186.00	28.00
44	3	172.00	15.00
45	3	172.00	15.00
46	2	59.00	17.00
47	2	59.00	17.00
48	1	59.00	17.00
49	1	59.00	17.00
50	1	59.00	17.00

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
 F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
 R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
 NOTE: Phi and C in Table 4 are modified values based on specified
 Soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 50 slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-32.51	15.38	3.00	111.56	140.61	83.62
1	-32.51	15.38	3.00	111.56	140.61	83.62
2	-29.38	16.99	0.79	170.30	161.99	96.34
2	-29.38	16.99	0.79	170.30	161.99	96.34
3	-29.38	18.30	2.21	251.39	239.36	142.35
3	-29.38	18.30	2.21	251.39	239.36	142.35
4	-26.24	19.63	0.83	294.52	250.92	149.23
4	-26.24	19.63	0.83	294.52	250.92	149.23
5	-26.24	20.14	0.31	316.74	256.87	152.77
5	-26.24	20.14	0.31	316.74	256.87	152.77
6	-26.24	21.11	1.86	375.42	272.59	162.12
6	-26.24	21.11	1.86	375.42	272.59	162.12
7	-23.10	22.72	1.69	453.66	293.56	174.59
7	-23.10	22.72	1.69	453.66	293.56	174.59
8	-23.10	23.64	0.30	506.59	307.74	183.02
8	-23.10	23.64	0.30	506.59	307.74	183.02
9	-23.10	24.24	1.01	548.88	319.07	189.76
9	-23.10	24.24	1.01	548.88	319.07	189.76
10	-19.97	26.12	3.00	653.32	347.06	206.41
10	-19.97	26.12	3.00	653.32	347.06	206.41
11	-16.83	28.96	3.00	807.39	388.34	230.96
11	-16.83	28.96	3.00	807.39	388.34	230.96
12	-13.70	30.59	0.39	881.68	408.25	242.80
12	-13.70	30.59	0.39	881.68	408.25	242.80
13	-13.70	32.05	2.61	958.28	428.77	255.00
13	-13.70	32.05	2.61	958.28	428.77	255.00
14	-10.56	33.80	0.98	1028.65	447.62	266.22
14	-10.56	33.80	0.98	1028.65	447.62	266.22
15	-10.56	35.27	2.02	1097.59	466.10	277.20
15	-10.56	35.27	2.02	1097.59	466.10	277.20
16	-7.43	37.75	3.00	1185.48	489.65	291.21
16	-7.43	37.75	3.00	1185.48	489.65	291.21
17	-4.29	40.73	3.00	1282.58	515.67	306.68
17	-4.29	40.73	3.00	1282.58	515.67	306.68
18	-1.16	43.73	3.00	1366.55	538.17	320.06
18	-1.16	43.73	3.00	1366.55	538.17	320.06
19	1.98	46.73	3.00	1437.38	557.15	331.35
19	1.98	46.73	3.00	1437.38	557.15	331.35
20	5.12	48.25	0.05	1458.87	562.90	334.78
20	5.12	48.25	0.05	1458.87	562.90	334.78
21	5.12	49.75	2.95	1532.13	582.53	346.45
21	5.12	49.75	2.95	1532.13	582.53	346.45
22	8.25	52.70	3.00	1587.10	597.26	355.21
22	8.25	52.70	3.00	1587.10	597.26	355.21
23	11.39	55.65	3.00	1629.44	608.61	361.96
23	11.39	55.65	3.00	1629.44	608.61	361.96
24	14.52	57.81	1.42	1646.00	613.05	364.60
24	14.52	57.81	1.42	1646.00	613.05	364.60
25	14.52	59.26	1.58	1669.65	619.38	368.36
25	14.52	59.26	1.58	1669.65	619.38	368.36
26	17.66	61.46	3.00	1674.22	620.61	369.09

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26	17.66	61.46	3.00	1674.22	620.61	369.09
27	20.79	64.29	3.00	1676.83	621.31	369.51
27	20.79	64.29	3.00	1676.83	621.31	369.51
28	23.93	66.09	0.86	1662.78	617.54	367.27
28	23.93	66.09	0.86	1662.78	617.54	367.27
29	23.93	67.46	2.14	1667.91	618.92	368.09
29	23.93	67.46	2.14	1667.91	618.92	368.09
30	27.06	69.77	3.00	1643.21	612.30	364.15
30	27.06	69.77	3.00	1643.21	612.30	364.15
31	30.20	72.29	2.75	1607.91	602.84	358.53
31	30.20	72.29	2.75	1607.91	602.84	358.53
32	30.20	73.59	0.25	1601.28	601.06	357.47
32	30.20	73.59	0.25	1601.28	601.06	357.47
33	33.34	73.85	0.37	1569.90	592.65	352.47
33	33.34	73.85	0.37	1569.90	592.65	352.47
34	33.34	75.11	2.63	1451.76	838.17	498.49
34	33.34	75.11	2.63	1451.76	838.17	498.49
35	36.47	76.58	0.93	1413.61	816.15	485.39
35	36.47	76.58	0.93	1413.61	816.15	485.39
36	36.47	77.63	1.68	1387.03	800.80	476.26
36	36.47	77.63	1.68	1387.03	800.80	476.26
37	36.47	78.46	0.39	1394.76	710.67	422.66
37	36.47	78.46	0.39	1394.76	710.67	422.66
38	39.61	79.23	1.60	1328.17	676.74	402.48
38	39.61	79.23	1.60	1328.17	676.74	402.48
39	39.61	80.34	1.27	1459.18	743.49	442.18
39	39.61	80.34	1.27	1459.18	743.49	442.18
40	39.61	80.88	0.13	1421.58	724.33	430.78
40	39.61	80.88	0.13	1421.58	724.33	430.78
41	42.74	81.93	2.74	1304.20	664.52	395.21
41	42.74	81.93	2.74	1304.20	664.52	395.21
42	42.74	83.04	0.26	1113.66	778.15	462.79
42	42.74	83.04	0.26	1113.66	778.15	462.79
43	45.88	84.02	2.54	973.87	703.81	418.58
43	45.88	84.02	2.54	973.87	703.81	418.58
44	45.88	85.06	0.46	1023.38	446.21	265.38
44	45.88	85.06	0.46	1023.38	446.21	265.38
45	49.01	85.99	2.34	885.28	409.21	243.37
45	49.01	85.99	2.34	885.28	409.21	243.37
46	49.01	86.97	0.66	826.46	311.67	185.36
46	49.01	86.97	0.66	826.46	311.67	185.36
47	52.15	87.35	0.51	759.12	291.09	173.12
47	52.15	87.35	0.51	759.12	291.09	173.12
48	52.15	88.27	2.49	644.91	256.17	152.35
48	52.15	88.27	2.49	644.91	256.17	152.35
49	55.29	89.88	3.00	414.78	185.81	110.51
49	55.29	89.88	3.00	414.78	185.81	110.51
50	58.42	91.25	1.96	208.34	122.70	72.97
50	58.42	91.25	1.96	208.34	122.70	72.97

Table 4 - Base Force Data on the 50 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-32.51	15.38	3.00	334.69	421.82	250.87
1	-32.51	15.38	3.00	334.69	421.82	250.87
2	-29.38	16.99	0.79	134.58	128.01	76.13
2	-29.38	16.99	0.79	134.58	128.01	76.13
3	-29.38	18.30	2.21	555.50	528.93	314.57
3	-29.38	18.30	2.21	555.50	528.93	314.57
4	-26.24	19.63	0.83	243.55	207.50	123.40
4	-26.24	19.63	0.83	243.55	207.50	123.40
5	-26.24	20.14	0.31	98.87	80.19	47.69
5	-26.24	20.14	0.31	98.87	80.19	47.69
6	-26.24	21.11	1.86	698.62	507.27	301.69
6	-26.24	21.11	1.86	698.62	507.27	301.69
7	-23.10	22.72	1.69	764.93	494.97	294.38
7	-23.10	22.72	1.69	764.93	494.97	294.38
8	-23.10	23.64	0.30	154.22	93.68	55.72
8	-23.10	23.64	0.30	154.22	93.68	55.72
9	-23.10	24.24	1.01	554.08	322.09	191.56
9	-23.10	24.24	1.01	554.08	322.09	191.56
10	-19.97	26.12	3.00	1959.97	1041.17	619.22
10	-19.97	26.12	3.00	1959.97	1041.17	619.22
11	-16.83	28.96	3.00	2422.18	1165.02	692.87

				case2_3.5to1_lt.OUT		
11	-16.83	28.96	3.00	2422.18	1165.02	692.87
12	-13.70	30.59	0.39	345.20	159.84	95.06
12	-13.70	30.59	0.39	345.20	159.84	95.06
13	-13.70	32.05	2.61	2499.64	1118.43	665.17
13	-13.70	32.05	2.61	2499.64	1118.43	665.17
14	-10.56	33.80	0.98	1010.50	439.73	261.52
14	-10.56	33.80	0.98	1010.50	439.73	261.52
15	-10.56	35.27	2.02	2214.55	940.42	559.30
15	-10.56	35.27	2.02	2214.55	940.42	559.30
16	-7.43	37.75	3.00	3556.43	1468.94	873.62
16	-7.43	37.75	3.00	3556.43	1468.94	873.62
17	-4.29	40.73	3.00	3847.73	1547.00	920.05
17	-4.29	40.73	3.00	3847.73	1547.00	920.05
18	-1.16	43.73	3.00	4099.64	1614.50	960.19
18	-1.16	43.73	3.00	4099.64	1614.50	960.19
19	1.98	46.73	3.00	4312.15	1671.44	994.05
19	1.98	46.73	3.00	4312.15	1671.44	994.05
20	5.12	48.25	0.05	76.92	29.68	17.65
20	5.12	48.25	0.05	76.92	29.68	17.65
21	5.12	49.75	2.95	4515.60	1716.88	1021.08
21	5.12	49.75	2.95	4515.60	1716.88	1021.08
22	8.25	52.70	3.00	4761.29	1791.78	1065.63
22	8.25	52.70	3.00	4761.29	1791.78	1065.63
23	11.39	55.65	3.00	4888.32	1825.82	1085.87
23	11.39	55.65	3.00	4888.32	1825.82	1085.87
24	14.52	57.81	1.42	2337.23	870.49	517.71
24	14.52	57.81	1.42	2337.23	870.49	517.71
25	14.52	59.26	1.58	2638.14	978.66	582.04
25	14.52	59.26	1.58	2638.14	978.66	582.04
26	17.66	61.46	3.00	5022.66	1861.82	1107.28
26	17.66	61.46	3.00	5022.66	1861.82	1107.28
27	20.79	64.29	3.00	5030.50	1863.92	1108.53
27	20.79	64.29	3.00	5030.50	1863.92	1108.53
28	23.93	66.09	0.86	1432.01	531.84	316.30
28	23.93	66.09	0.86	1432.01	531.84	316.30
29	23.93	67.46	2.14	3567.30	1323.73	787.26
29	23.93	67.46	2.14	3567.30	1323.73	787.26
30	27.06	69.77	3.00	4929.62	1836.89	1092.45
30	27.06	69.77	3.00	4929.62	1836.89	1092.45
31	30.20	72.29	2.75	4415.86	1655.60	984.63
31	30.20	72.29	2.75	4415.86	1655.60	984.63
32	30.20	73.59	0.25	406.18	152.47	90.68
32	30.20	73.59	0.25	406.18	152.47	90.68
33	33.34	73.85	0.37	575.43	217.23	129.19
33	33.34	73.85	0.37	575.43	217.23	129.19
34	33.34	75.11	2.63	3823.15	2207.30	1312.74
34	33.34	75.11	2.63	3823.15	2207.30	1312.74
35	36.47	76.58	0.93	1314.58	758.98	451.39
35	36.47	76.58	0.93	1314.58	758.98	451.39
36	36.47	77.63	1.68	2333.40	1347.19	801.21
36	36.47	77.63	1.68	2333.40	1347.19	801.21
37	36.47	78.46	0.39	540.83	275.57	163.89
37	36.47	78.46	0.39	540.83	275.57	163.89
38	39.61	79.23	1.60	2123.76	1082.11	643.56
38	39.61	79.23	1.60	2123.76	1082.11	643.56
39	39.61	80.34	1.27	1856.10	945.73	562.45
39	39.61	80.34	1.27	1856.10	945.73	562.45
40	39.61	80.88	0.13	183.36	93.42	55.56
40	39.61	80.88	0.13	183.36	93.42	55.56
41	42.74	81.93	2.74	3568.30	1818.14	1081.30
41	42.74	81.93	2.74	3568.30	1818.14	1081.30
42	42.74	83.04	0.26	294.01	205.43	122.17
42	42.74	83.04	0.26	294.01	205.43	122.17
43	45.88	84.02	2.54	2470.16	1785.19	1061.70
43	45.88	84.02	2.54	2470.16	1785.19	1061.70
44	45.88	85.06	0.46	474.39	206.84	123.02
44	45.88	85.06	0.46	474.39	206.84	123.02
45	49.01	85.99	2.34	2072.54	958.01	569.76
45	49.01	85.99	2.34	2072.54	958.01	569.76
46	49.01	86.97	0.66	544.54	205.36	122.13
46	49.01	86.97	0.66	544.54	205.36	122.13
47	52.15	87.35	0.51	387.08	148.43	88.27
47	52.15	87.35	0.51	387.08	148.43	88.27
48	52.15	88.27	2.49	1605.90	637.89	379.37
48	52.15	88.27	2.49	1605.90	637.89	379.37
49	55.29	89.88	3.00	1244.34	557.43	331.52
49	55.29	89.88	3.00	1244.34	557.43	331.52
50	58.42	91.25	1.96	407.87	240.20	142.86
50	58.42	91.25	1.96	407.87	240.20	142.86

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SUM OF MOMENTS = 0.996659E+00 (ft/lbs); Imbalance (Fraction of Total Weight) = 0.8129637E-05

Sum of the Resisting Forces = 44080.93 (lbs)

Average Available Shear Strength = 495.53(psf)

Sum of the Driving Forces = 26216.26 (lbs)

Average Mobilized Shear Stress = 294.70(psf)

Total length of the failure surface = 88.96(ft)

Factor of Safety Balance Check: FS = 1.68143

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

***** END OF GEOSTASE OUTPUT *****

case3_3.5to1_eoc_u.OUT
*** GEOSTASE(R) ***

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SLOPE STABILITY ANALYSIS SOFTWARE
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

Analysis Date: 4/ 6/ 2021
Analysis Time:
Analysis By: GEI Job No. 1140258201

Input File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood\RPS\Slope Stability\Updated\case3_3.5to1_eoc_u.gsd

Output File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood\RPS\Slope Stability\Updated\case3_3.5to1_eoc_u.OUT

Unit System: English

PROJECT: Forest Bend Detention Pond

DESCRIPTION: Case-3 - Boring GB-3P - 3.5(H):1(V) - EOC

BOUNDARY DATA

4 Surface Boundaries
13 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	0.000	11.500	20.000	11.500	4
2	20.000	11.500	32.250	15.000	3
3	32.250	15.000	63.050	23.800	1
4	63.050	23.800	80.000	23.800	1
5	64.030	16.800	80.000	16.800	2
6	57.730	15.000	64.030	16.800	2
7	32.250	15.000	57.730	15.000	3
8	57.730	15.000	80.000	15.000	4
9	45.480	11.500	57.730	15.000	4
10	20.000	11.500	45.480	11.500	4
11	0.000	11.000	80.000	11.000	5
12	0.000	7.000	80.000	7.000	6
13	0.000	4.500	80.000	4.500	7

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = -5.000(ft)

MOHR-COULOMB SOIL PARAMETERS

7 Type(s) of Soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	Pressure Constant (psf)	Water Surface No.	Water Option
1 Fat Clay	127.0	127.0	1400.00	0.00	0.000	0.0	1	0
2 Fat Clay	127.0	127.0	1400.00	0.00	0.000	0.0	1	0
3 Fat Clay	126.0	126.0	1000.00	0.00	0.000	0.0	1	0
4 Fat Clay	126.0	126.0	1000.00	0.00	0.000	0.0	1	0

			case3_3.5to1_eoc_u.OUT					
5 Lean Clay	133.0	133.0	1000.00	0.00	0.000	0.0	1	0
6 Silty Sand	115.0	115.0	0.00	30.00	0.000	0.0	1	0
7 Fat Clay	129.0	129.0	2800.00	0.00	0.000	0.0	1	0

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 5 Coordinate Points
Pore Pressure Inclination Factor = 1.00

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	11.50
2	20.00	11.50
3	32.25	15.00
4	63.05	23.80
5	80.00	23.80

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load Deflection No. from Vert)	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	(deg)
0.00	1	4	63.050	23.800	250.000	80.000	23.800	250.000

NOTE - Load Stress Varies Linearly Within Specified Range.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.4204(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 0.00(ft)
and X = 35.00(ft)

Each Surface Enters within a Range Between X = 40.00(ft)
and X = 80.00(ft)

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = -5.00(ft)

Specified Maximum Radius = 5000.000(ft)

3.000(ft) Line Segments were Used For Each Trial Failure Surface.

The Simplified Bishop Method was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces
Did Not Converge in 50 Iterations.

Number of Trial Surfaces with Non-Converged FS = 24

Number of Trial Surfaces with Valid FS = 976

Percentage of Trial Surfaces with Non-Converged and/or

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 Non-valid FS Solutions of the Total Attempted = 2.4 %
 Statistical Data On All Valid FS Values:
 FS Max = 122.436 FS Min = 3.449 FS Ave = 11.476
 Standard Deviation = 11.647 Coefficient of Variation = 101.49 %

Critical Surface is Sequence Number 492 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 39.718891(ft) ; Y = 45.192253(ft); and Radius = 40.523687(ft)

Circular Trial Failure Surface Generated With 23 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	17.202	11.500
2	19.756	9.927
3	22.420	8.546
4	25.179	7.367
5	28.017	6.395
6	30.919	5.636
7	33.870	5.093
8	36.852	4.770
9	39.850	4.669
10	42.848	4.790
11	45.828	5.132
12	48.775	5.694
13	51.673	6.472
14	54.504	7.462
15	57.255	8.659
16	59.910	10.057
17	62.454	11.647
18	64.873	13.421
19	67.155	15.369
20	69.286	17.480
21	71.255	19.743
22	73.051	22.146
23	74.106	23.800

Factor Of Safety For The Critical or Specified Surface = 3.449

Table 1 - Geometry Data on the 34 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	0.81	0.25	17.61	11.25	11.50	-31.63	0.00	0.95
2	1.74	1.04	18.89	10.46	11.50	-31.63	0.00	2.05
3	0.24	1.64	19.88	9.86	11.50	-27.39	0.00	0.27
4	2.42	2.67	21.21	9.17	11.85	-27.39	15.95	2.73
5	2.76	4.63	23.80	7.96	12.59	-23.15	15.95	3.00
6	1.07	5.95	25.71	7.18	13.13	-18.91	15.95	1.13
7	1.77	6.84	27.13	6.70	13.54	-18.91	15.95	1.87
8	2.90	8.19	29.47	6.02	14.21	-14.66	15.95	3.00
9	1.33	9.30	31.58	5.51	14.81	-10.42	15.95	1.35
10	1.62	9.99	33.06	5.24	15.23	-10.42	15.95	1.65
11	2.98	10.96	35.36	4.93	15.89	-6.18	15.95	3.00
12	3.00	12.02	38.35	4.72	16.74	-1.94	15.95	3.00
13	3.00	12.87	41.35	4.73	17.60	2.31	15.95	3.00
14	2.63	13.46	44.16	4.94	18.40	6.55	15.95	2.65
15	0.35	13.72	45.65	5.11	18.83	6.55	15.95	0.35
16	2.95	13.89	47.30	5.41	19.30	10.79	15.95	3.00
17	2.90	14.05	50.22	6.08	20.14	15.04	15.95	3.00
18	1.51	14.03	52.43	6.74	20.77	19.28	15.95	1.60
19	1.32	13.94	53.84	7.23	21.17	19.28	15.95	1.40
20	2.75	13.69	55.88	8.06	21.75	23.52	15.95	3.00
21	0.47	13.43	57.49	8.78	22.21	27.76	15.95	0.54
22	2.18	13.11	58.82	9.48	22.59	27.76	15.95	2.46
23	1.51	12.59	60.66	10.53	23.12	32.01	15.95	1.78

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24	1.03	12.16	61.94	11.32	23.48	32.01	15.95	1.22
25	0.60	11.85	62.75	11.87	23.71	36.25	15.95	0.74
26	0.98	11.36	63.54	12.44	23.80	36.25	0.00	1.22
27	0.84	10.69	64.45	13.11	23.80	36.25	0.00	1.05
28	1.85	9.59	65.80	14.21	23.80	40.49	0.00	2.43
29	0.43	8.62	66.94	15.18	23.80	40.49	0.00	0.57
30	1.44	7.72	67.88	16.08	23.80	44.73	0.00	2.03
31	0.69	6.66	68.94	17.14	23.80	44.73	0.00	0.97
32	1.97	5.19	70.27	18.61	23.80	48.98	0.00	3.00
33	1.80	2.86	72.15	20.94	23.80	53.22	0.00	3.00
34	1.06	0.83	73.58	22.97	23.80	57.46	0.00	1.96

Table 2 - Force Data On The 34 slices (Excluding Reinforcement)

slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force		Distributed Load (lbs)
				Hor (lbs)	Ver (lbs)	
1	25.6	0.0	14.9	0.0	0.0	0.0
2	234.2	0.0	132.4	0.0	0.0	0.0
3	52.2	0.0	28.0	0.0	0.0	0.0
4	845.8	0.0	454.5	0.0	0.0	0.0
5	1667.6	0.0	866.5	0.0	0.0	0.0
6	831.9	0.0	420.5	0.0	0.0	0.0
7	1566.2	0.0	797.1	0.0	0.0	0.0
8	3044.8	0.0	1533.1	0.0	0.0	0.0
9	1574.6	0.0	785.1	0.0	0.0	0.0
10	2052.9	0.0	1026.5	0.0	0.0	0.0
11	4136.1	0.0	2051.2	0.0	0.0	0.0
12	4556.4	0.0	2250.9	0.0	0.0	0.0
13	4878.0	0.0	2409.4	0.0	0.0	0.0
14	4487.9	0.0	2225.7	0.0	0.0	0.0
15	606.1	0.0	300.2	0.0	0.0	0.0
16	5200.5	0.0	2599.8	0.0	0.0	0.0
17	5196.9	0.0	2630.7	0.0	0.0	0.0
18	2716.4	0.0	1400.7	0.0	0.0	0.0
19	2363.9	0.0	1217.6	0.0	0.0	0.0
20	4820.2	0.0	2562.9	0.0	0.0	0.0
21	814.1	0.0	449.6	0.0	0.0	0.0
22	3640.0	0.0	2015.0	0.0	0.0	0.0
23	2411.0	0.0	1398.0	0.0	0.0	0.0
24	1594.3	0.0	926.0	0.0	0.0	0.0
25	895.3	0.0	546.6	0.0	0.0	0.0
26	1411.0	0.0	861.2	0.0	0.0	245.0
27	1143.0	0.0	697.3	0.0	0.0	210.8
28	2251.2	0.0	1455.4	0.0	0.0	462.4
29	472.5	0.0	305.3	0.0	0.0	108.0
30	1415.6	0.0	979.1	0.0	0.0	361.2
31	580.6	0.0	401.6	0.0	0.0	171.6
32	1297.5	0.0	971.2	0.0	0.0	492.3
33	651.3	0.0	534.5	0.0	0.0	449.1
34	110.8	0.0	101.2	0.0	0.0	263.8

TOTAL WEIGHT OF SLIDING MASS = 69546.33(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 35476.30(lbs)

TOTAL AREA OF SLIDING MASS = 545.99(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 34 SLICES

slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	options
1	4	1000.00	0.00	
2	5	1000.00	0.00	
3	5	1000.00	0.00	
4	5	1000.00	0.00	
5	5	1000.00	0.00	
6	5	1000.00	0.00	
7	6	0.00	30.00	
8	6	0.00	30.00	
9	6	0.00	30.00	
10	6	0.00	30.00	
11	6	0.00	30.00	
12	6	0.00	30.00	

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13	6	0.00	30.00
14	6	0.00	30.00
15	6	0.00	30.00
16	6	0.00	30.00
17	6	0.00	30.00
18	6	0.00	30.00
19	5	1000.00	0.00
20	5	1000.00	0.00
21	5	1000.00	0.00
22	5	1000.00	0.00
23	5	1000.00	0.00
24	4	1000.00	0.00
25	4	1000.00	0.00
26	4	1000.00	0.00
27	4	1000.00	0.00
28	4	1000.00	0.00
29	2	1400.00	0.00
30	2	1400.00	0.00
31	1	1400.00	0.00
32	1	1400.00	0.00
33	1	1400.00	0.00
34	1	1400.00	0.00

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
NOTE: Phi and C in Table 4 are modified values based on specified
Soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 34 Slices

Slice No.	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-31.63	17.61	0.95	181.62	1000.00	289.95
1	-31.63	17.61	0.95	181.62	1000.00	289.95
2	-31.63	18.89	2.05	235.42	1000.00	289.95
2	-31.63	18.89	2.05	235.42	1000.00	289.95
3	-27.39	19.88	0.27	251.44	1000.00	289.95
3	-27.39	19.88	0.27	251.44	1000.00	289.95
4	-27.39	21.21	2.73	322.15	1000.00	289.95
4	-27.39	21.21	2.73	322.15	1000.00	289.95
5	-23.15	23.80	3.00	430.71	1000.00	289.95
5	-23.15	23.80	3.00	430.71	1000.00	289.95
6	-18.91	25.71	1.13	497.22	1000.00	289.95
6	-18.91	25.71	1.13	497.22	1000.00	289.95
7	-18.91	27.13	1.87	485.57	280.34	81.28
7	-18.91	27.13	1.87	485.57	280.34	81.28
8	-14.66	29.47	3.00	560.83	323.80	93.88
8	-14.66	29.47	3.00	560.83	323.80	93.88
9	-10.42	31.58	1.35	620.64	358.33	103.90
9	-10.42	31.58	1.35	620.64	358.33	103.90
10	-10.42	33.06	1.65	663.17	382.88	111.01
10	-10.42	33.06	1.65	663.17	382.88	111.01
11	-6.18	35.36	3.00	715.04	412.83	119.70
11	-6.18	35.36	3.00	715.04	412.83	119.70
12	-1.94	38.35	3.00	773.43	446.54	129.47
12	-1.94	38.35	3.00	773.43	446.54	129.47
13	2.31	41.35	3.00	819.07	472.89	137.11
13	2.31	41.35	3.00	819.07	472.89	137.11
14	6.55	44.16	2.65	849.86	490.67	142.27
14	6.55	44.16	2.65	849.86	490.67	142.27
15	6.55	45.65	0.35	868.04	501.17	145.31
15	6.55	45.65	0.35	868.04	501.17	145.31
16	10.79	47.30	3.00	872.28	503.61	146.02
16	10.79	47.30	3.00	872.28	503.61	146.02
17	15.04	50.22	3.00	880.08	508.12	147.33
17	15.04	50.22	3.00	880.08	508.12	147.33
18	19.28	52.43	1.60	875.55	505.50	146.57
18	19.28	52.43	1.60	875.55	505.50	146.57
19	19.28	53.84	1.40	824.95	1000.00	289.95
19	19.28	53.84	1.40	824.95	1000.00	289.95
20	23.52	55.88	3.00	780.96	1000.00	289.95
20	23.52	55.88	3.00	780.96	1000.00	289.95
21	27.76	57.49	0.54	735.11	1000.00	289.95
21	27.76	57.49	0.54	735.11	1000.00	289.95

case3_3.5to1_eoc_u.OUT						
22	27.76	58.82	2.46	710.28	1000.00	289.95
22	27.76	58.82	2.46	710.28	1000.00	289.95
23	32.01	60.66	1.78	644.00	1000.00	289.95
23	32.01	60.66	1.78	644.00	1000.00	289.95
24	32.01	61.94	1.22	613.61	1000.00	289.95
24	32.01	61.94	1.22	613.61	1000.00	289.95
25	36.25	62.75	0.74	565.09	1000.00	289.95
25	36.25	62.75	0.74	565.09	1000.00	289.95
26	36.25	63.54	1.22	783.85	1000.00	289.95
26	36.25	63.54	1.22	783.85	1000.00	289.95
27	36.25	64.45	1.05	741.34	1000.00	289.95
27	36.25	64.45	1.05	741.34	1000.00	289.95
28	40.49	65.80	2.43	639.01	1000.00	289.95
28	40.49	65.80	2.43	639.01	1000.00	289.95
29	40.49	66.94	0.57	485.00	1400.00	405.93
29	40.49	66.94	0.57	485.00	1400.00	405.93
30	44.73	67.88	2.03	375.29	1400.00	405.93
30	44.73	67.88	2.03	375.29	1400.00	405.93
31	44.73	68.94	0.97	307.09	1400.00	405.93
31	44.73	68.94	0.97	307.09	1400.00	405.93
32	48.98	70.27	3.00	152.26	1400.00	405.93
32	48.98	70.27	3.00	152.26	1400.00	405.93
33	53.22	72.15	3.00	-69.36	1400.00	405.93
33	53.22	72.15	3.00	-69.36	1400.00	405.93
34	57.46	73.58	1.96	-286.90	1400.00	405.93
34	57.46	73.58	1.96	-286.90	1400.00	405.93

Table 4 - Base Force Data on the 34 Slices

Slice No. *	Alpha (deg)	X-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-31.63	17.61	0.95	173.14	953.31	276.41
1	-31.63	17.61	0.95	173.14	953.31	276.41
2	-31.63	18.89	2.05	481.82	2046.69	593.43
2	-31.63	18.89	2.05	481.82	2046.69	593.43
3	-27.39	19.88	0.27	68.97	274.29	79.53
3	-27.39	19.88	0.27	68.97	274.29	79.53
4	-27.39	21.21	2.73	878.07	2725.71	790.31
4	-27.39	21.21	2.73	878.07	2725.71	790.31
5	-23.15	23.80	3.00	1292.14	3000.00	869.84
5	-23.15	23.80	3.00	1292.14	3000.00	869.84
6	-18.91	25.71	1.13	563.21	1132.71	328.43
6	-18.91	25.71	1.13	563.21	1132.71	328.43
7	-18.91	27.13	1.87	906.70	523.48	151.78
7	-18.91	27.13	1.87	906.70	523.48	151.78
8	-14.66	29.47	3.00	1682.50	971.39	281.65
8	-14.66	29.47	3.00	1682.50	971.39	281.65
9	-10.42	31.58	1.35	839.90	484.92	140.60
9	-10.42	31.58	1.35	839.90	484.92	140.60
10	-10.42	33.06	1.65	1092.05	630.49	182.81
10	-10.42	33.06	1.65	1092.05	630.49	182.81
11	-6.18	35.36	3.00	2145.12	1238.49	359.10
11	-6.18	35.36	3.00	2145.12	1238.49	359.10
12	-1.94	38.35	3.00	2320.29	1339.62	388.42
12	-1.94	38.35	3.00	2320.29	1339.62	388.42
13	2.31	41.35	3.00	2457.20	1418.66	411.34
13	2.31	41.35	3.00	2457.20	1418.66	411.34
14	6.55	44.16	2.65	2251.54	1299.93	376.91
14	6.55	44.16	2.65	2251.54	1299.93	376.91
15	6.55	45.65	0.35	304.42	175.76	50.96
15	6.55	45.65	0.35	304.42	175.76	50.96
16	10.79	47.30	3.00	2616.85	1510.84	438.06
16	10.79	47.30	3.00	2616.85	1510.84	438.06
17	15.04	50.22	3.00	2640.25	1524.35	441.98
17	15.04	50.22	3.00	2640.25	1524.35	441.98
18	19.28	52.43	1.60	1400.91	808.81	234.51
18	19.28	52.43	1.60	1400.91	808.81	234.51
19	19.28	53.84	1.40	1154.91	1399.98	405.92
19	19.28	53.84	1.40	1154.91	1399.98	405.92
20	23.52	55.88	3.00	2342.87	3000.00	869.84
20	23.52	55.88	3.00	2342.87	3000.00	869.84
21	27.76	57.49	0.54	394.45	536.58	155.58
21	27.76	57.49	0.54	394.45	536.58	155.58
22	27.76	58.82	2.46	1749.71	2463.42	714.26
22	27.76	58.82	2.46	1749.71	2463.42	714.26

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23	32.01	60.66	1.78	1145.98	1779.48	515.96	
23	32.01	60.66	1.78	1145.98	1779.48	515.96	
24	32.01	61.94	1.22	748.93	1220.52	353.89	
24	32.01	61.94	1.22	748.93	1220.52	353.89	
25	36.25	62.75	0.74	417.75	739.25	214.34	
25	36.25	62.75	0.74	417.75	739.25	214.34	
26	36.25	63.54	1.22	952.52	1215.18	352.34	
26	36.25	63.54	1.22	952.52	1215.18	352.34	
27	36.25	64.45	1.05	775.12	1045.57	303.16	
27	36.25	64.45	1.05	775.12	1045.57	303.16	
28	40.49	65.80	2.43	1554.17	2432.16	705.20	
28	40.49	65.80	2.43	1554.17	2432.16	705.20	
29	40.49	66.94	0.57	275.40	794.98	230.50	
29	40.49	66.94	0.57	275.40	794.98	230.50	
30	44.73	67.88	2.03	763.19	2847.08	825.50	
30	44.73	67.88	2.03	763.19	2847.08	825.50	
31	44.73	68.94	0.97	296.76	1352.92	392.28	
31	44.73	68.94	0.97	296.76	1352.92	392.28	
32	48.98	70.27	3.00	456.77	4200.00	1217.78	
32	48.98	70.27	3.00	456.77	4200.00	1217.78	
33	53.22	72.15	3.00	-208.07	4200.00	1217.78	
33	53.22	72.15	3.00	-208.07	4200.00	1217.78	
34	57.46	73.58	1.96	-562.81	2746.38	796.30	
34	57.46	73.58	1.96	-562.81	2746.38	796.30	

SUM OF MOMENTS = -0.125252E-03 (ft/lbs); Imbalance (Fraction of Total Weight) = -0.1800988E-08

Sum of the Resisting Forces = 54032.95 (lbs)

Average Available Shear Strength = 831.77(psf)

Sum of the Driving Forces = 15666.71 (lbs)

Average Mobilized Shear Stress = 241.17(psf)

Total length of the failure surface = 64.96(ft)

Factor of Safety Balance Check: FS = 3.44890

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****

case3_3.5to1_rd_u.OUT
 *** GEOSTASE(R) ***

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** Current Version 4.30.30-Double Precision, January 2019 **
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 SLOPE STABILITY ANALYSIS SOFTWARE
 Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
 (Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
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 Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
 Nonlinear Undrained Shear Strength, Curved Strength Envelope,
 Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
 2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

Analysis Date: 4/ 6/ 2021
 Analysis Time:
 Analysis By: GEI Job No. 1140258201

Input File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
 Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case3_3.5to1_rd_u.gsd

Output File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
 Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case3_3.5to1_rd_u.OUT

Unit System: English

PROJECT: Forest Bend Detention Pond

DESCRIPTION: Case-3 - Boring GB-3P - 3.5(H):1(V) - RD

BOUNDARY DATA

4 Surface Boundaries
 13 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	0.000	11.500	20.000	11.500	4
2	20.000	11.500	32.250	15.000	3
3	32.250	15.000	63.050	23.800	1
4	63.050	23.800	80.000	23.800	1
5	64.030	16.800	80.000	16.800	2
6	57.730	15.000	64.030	16.800	2
7	32.250	15.000	57.730	15.000	3
8	57.730	15.000	80.000	15.000	4
9	45.480	11.500	57.730	15.000	4
10	20.000	11.500	45.480	11.500	4
11	0.000	11.000	80.000	11.000	5
12	0.000	7.000	80.000	7.000	6
13	0.000	4.500	80.000	4.500	7

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = -5.000(ft)

MOHR-COULOMB SOIL PARAMETERS

7 Type(s) of soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	Pressure Constant (psf)	Water Surface No.	Water Option
1 Fat Clay (w)	127.0	127.0	59.00	17.00	0.000	0.0	1	0
2 Fat Clay	127.0	127.0	172.00	15.00	0.000	0.0	1	0
3 Fat Clay (w)	126.0	126.0	59.00	17.00	0.000	0.0	1	0
4 Fat Clay	126.0	126.0	172.00	15.00	0.000	0.0	1	0

			case3_3.5to1_rd_u.OUT						
5 Lean Clay	133.0	133.0	186.00	28.00	0.000	0.0	1	0	
6 Silty Sand	115.0	115.0	0.00	30.00	0.000	0.0	1	0	
7 Fat Clay	129.0	129.0	172.00	15.00	0.000	0.0	1	0	

WATER SURFACE DATA

2 Water Surface(s) Defined for 3-Stage Rapid Drawdown Analysis.
 Water Surface No. 1 is Prior to Drawdown.
 Water Surface No. 2 is After Drawdown.

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 2 Coordinate Points
 Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	23.80
2	80.00	23.80

Water Surface No. 2 Specified by 2 Coordinate Points
 Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	11.50
2	80.00	11.50

SOIL PARAMETERS FOR 3-STAGE RAPID DRAWDOWN ANALYSIS

3-Stage Rapid Drawdown Method = Duncan, Wright, and Wong (1990)

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	CR (psf)	PhiR (deg)	dk (psf)	PSIk (deg)
1 Fat Clay (w)	127.00	127.00	59.00	17.00	59.00	17.00	76.25	21.56
2 Fat Clay	127.00	127.00	172.00	15.00	227.00	8.00	252.24	8.88
3 Fat Clay (w)	126.00	126.00	59.00	17.00	59.00	17.00	76.25	21.56
4 Fat Clay	126.00	126.00	172.00	15.00	227.00	8.00	252.24	8.88
5 Lean Clay	133.00	133.00	186.00	28.00	209.00	20.00	263.54	24.65
6 Silty Sand	115.00	115.00	0.00	30.00	0.00	0.00	0.00	0.00
7 Fat Clay	129.00	129.00	172.00	15.00	227.00	8.00	252.24	8.88

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load Deflection No. from Vert)	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	(deg)
0.00	1	4	63.050	23.800	250.000	80.000	23.800	250.000

NOTE - Load Stress Varies Linearly within Specified Range.

DISTRIBUTED LOAD DATA HAS BEEN SUPPRESSED

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.4204(in) Equally Spaced within the Start Range

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Along The Specified Surface Between X = 0.00(ft)
and X = 35.00(ft)

Each Surface Enters within a Range Between X = 40.00(ft)
and X = 80.00(ft)

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = -5.00(ft)

Specified Maximum Radius = 5000.000(ft)

3.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces
Did Not Converge in 50 Iterations.

Number of Trial Surfaces with Non-Converged FS = 72

Number of Trial Surfaces With Valid FS = 928

Percentage of Trial Surfaces with Non-Converged and/or
Non-valid FS Solutions of the Total Attempted = 7.2 %

Statistical Data On All Valid FS Values:

FS Max = 10.508 FS Min = 1.339 FS Ave = 2.618
Standard Deviation = 0.746 Coefficient of Variation = 28.48 %

Critical Surface is Sequence Number 2418 of Those Analyzed.

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 3 ****

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 39.558177(ft) ; Y = 51.616968(ft); and Radius = 39.442993(ft)

Circular Trial Failure Surface Generated With 16 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	28.203	13.844
2	31.107	13.090
3	34.060	12.559
4	37.044	12.254
5	40.043	12.177
6	43.039	12.328
7	46.015	12.706
8	48.954	13.309
9	51.838	14.134
10	54.652	15.176
11	57.378	16.429
12	60.001	17.885
13	62.505	19.536
14	64.877	21.373
15	67.103	23.385
16	67.497	23.800

Factor of Safety For The Critical or Specified Surface = 1.339

Table 1 - Geometry Data on the 18 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	case3_3.5to1_rd_u.OUT		Alpha (deg)	Beta (deg)	Base Length (ft)
				Y-Cntr-Base (ft)	Y-Cntr-Top (ft)			
1	2.90	0.79	29.66	13.47	14.26	-14.55	15.95	3.00
2	1.14	1.85	31.68	12.99	14.84	-10.19	15.95	1.16
3	1.81	2.54	33.15	12.72	15.26	-10.19	15.95	1.84
4	2.98	3.54	35.55	12.41	15.94	-5.83	15.95	3.00
5	3.00	4.58	38.54	12.22	16.80	-1.48	15.95	3.00
6	3.00	5.40	41.54	12.25	17.65	2.88	15.95	3.00
7	2.98	5.99	44.53	12.52	18.51	7.24	15.95	3.00
8	2.94	6.34	47.48	13.01	19.35	11.60	15.95	3.00
9	2.88	6.46	50.40	13.72	20.18	15.96	15.95	3.00
10	2.34	6.36	53.01	14.57	20.93	20.32	15.95	2.49
11	0.48	6.24	54.41	15.09	21.33	20.32	15.95	0.51
12	2.73	5.99	56.01	15.80	21.79	24.68	15.95	3.00
13	2.62	5.40	58.69	17.16	22.55	29.04	15.95	3.00
14	2.50	4.58	61.25	18.71	23.29	33.40	15.95	3.00
15	0.54	3.98	62.78	19.75	23.72	37.76	15.95	0.69
16	1.83	3.13	63.96	20.67	23.80	37.76	0.00	2.31
17	2.23	1.42	65.99	22.38	23.80	42.11	0.00	3.00
18	0.39	0.21	67.30	23.59	23.80	46.47	0.00	0.57

Table 2 - Force Data On The 18 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force		Distributed Load (lbs)
				Hor (lbs)	Ver (lbs)	
1	289.7	1798.0	1934.4	0.0	0.0	0.0
2	266.4	664.9	783.6	0.0	0.0	0.0
3	578.9	1003.1	1271.0	0.0	0.0	0.0
4	1332.8	1521.7	2132.8	0.0	0.0	0.0
5	1737.0	1362.7	2168.6	0.0	0.0	0.0
6	2047.4	1194.9	2161.7	0.0	0.0	0.0
7	2256.9	1022.1	2112.2	0.0	0.0	0.0
8	2362.2	848.1	2020.3	0.0	0.0	0.0
9	2363.7	676.7	1886.6	0.0	0.0	0.0
10	1888.2	435.3	1436.2	0.0	0.0	0.0
11	377.2	76.2	275.7	0.0	0.0	0.0
12	2072.9	355.6	1497.1	0.0	0.0	0.0
13	1797.9	212.1	1243.6	0.0	0.0	0.0
14	1455.6	83.5	952.8	0.0	0.0	0.0
15	275.0	2.8	174.2	0.0	0.0	0.0
16	727.4	0.0	452.0	0.0	0.0	0.0
17	401.6	0.0	266.0	0.0	0.0	0.0
18	10.4	0.0	7.4	0.0	0.0	0.0

TOTAL WEIGHT OF SLIDING MASS = 22241.09(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 11721.38(lbs)

TOTAL AREA OF SLIDING MASS = 175.53(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 18 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	options
1	3	59.00	17.00	R
2	3	59.00	17.00	R
3	3	59.00	17.00	R
4	3	59.00	17.00	R
5	3	59.00	17.00	R
6	3	59.00	17.00	R
7	3	59.00	17.00	R
8	3	59.00	17.00	R
9	3	59.00	17.00	R
10	3	59.00	17.00	R
11	1	59.00	17.00	R
12	1	59.00	17.00	R
13	1	59.00	17.00	R
14	1	59.00	17.00	R
15	1	59.00	17.00	R
16	1	59.00	17.00	R
17	1	59.00	17.00	R
18	1	59.00	17.00	R

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
 F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
 R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
 NOTE: Phi and C in Table 4 are modified values based on specified
 Soil Options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 18 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)	Multi-Stage Strength Type
1	-14.55	29.66	3.00	58.76	76.96	57.49	Drained
2	-10.19	31.68	1.16	124.98	97.21	72.61	Drained
3	-10.19	33.15	1.84	169.99	110.97	82.89	Drained
4	-5.83	35.55	3.00	231.46	129.76	96.93	Drained
5	-1.48	38.54	3.00	294.87	149.15	111.41	Drained
6	2.88	41.54	3.00	342.76	163.79	122.35	Drained
7	7.24	44.53	3.00	375.23	173.72	129.77	Drained
8	11.60	47.48	3.00	392.43	178.98	133.70	Drained
9	15.96	50.40	3.00	394.60	179.64	134.19	Drained
10	20.32	53.01	2.49	383.20	176.16	131.59	Drained
11	20.32	54.41	0.51	376.28	174.04	130.01	Drained
12	24.68	56.01	3.00	354.44	167.36	125.02	Drained
13	29.04	58.69	3.00	312.56	154.56	115.45	Drained
14	33.40	61.25	3.00	257.42	137.70	102.86	Drained
15	37.76	62.78	0.69	216.05	125.05	93.41	Drained
16	37.76	63.96	2.31	166.66	109.95	82.13	Drained
17	42.11	65.99	3.00	62.14	78.00	58.26	Drained
18	46.47	67.30	0.57	-11.21	55.57	41.51	Drained

Table 4 - Base Force Data on the 18 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)	
1	-14.55	29.66	3.00	176.27	230.89	172.47	Drained
2	-10.19	31.68	1.16	145.15	112.90	84.33	Drained
3	-10.19	33.15	1.84	312.55	204.03	152.41	Drained
4	-5.83	35.55	3.00	694.37	389.29	290.80	Drained
5	-1.48	38.54	3.00	884.60	447.45	334.24	Drained
6	2.88	41.54	3.00	1028.29	491.38	367.05	Drained
7	7.24	44.53	3.00	1125.70	521.16	389.30	Drained
8	11.60	47.48	3.00	1177.30	536.94	401.09	Drained
9	15.96	50.40	3.00	1183.79	538.92	402.57	Drained
10	20.32	53.01	2.49	955.24	439.12	328.02	Drained
11	20.32	54.41	0.51	190.85	88.27	65.94	Drained
12	24.68	56.01	3.00	1063.31	502.09	375.05	Drained
13	29.04	58.69	3.00	937.69	463.68	346.36	Drained
14	33.40	61.25	3.00	772.25	413.10	308.58	Drained
15	37.76	62.78	0.69	148.85	86.16	64.36	Drained
16	37.76	63.96	2.31	385.16	254.11	189.81	Drained
17	42.11	65.99	3.00	186.41	233.99	174.79	Drained
18	46.47	67.30	0.57	-6.42	31.82	23.77	Drained

SUM OF MOMENTS = -0.516843E-03 (ft/lbs); Imbalance (Fraction of Total Weight) = -0.2323822E-07

Sum of the Resisting Forces = 5985.31 (lbs)

Average Available Shear Strength = 140.59(psf)

Sum of the Driving Forces = 4470.94 (lbs)

Average Mobilized Shear stress = 105.02(psf)

Total length of the failure surface = 42.57(ft)

Factor of Safety Balance check: FS = 1.33871

CAUTION - Factor of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure surface

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Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 1 ****

Factor Of Safety For The Critical or Specified Surface = 1.339

Table 1 - Geometry Data on the 18 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	2.90	0.79	29.66	13.47	14.26	-14.55	15.95	3.00
2	1.14	1.85	31.68	12.99	14.84	-10.19	15.95	1.16
3	1.81	2.54	33.15	12.72	15.26	-10.19	15.95	1.84
4	2.98	3.54	35.55	12.41	15.94	-5.83	15.95	3.00
5	3.00	4.58	38.54	12.22	16.80	-1.48	15.95	3.00
6	3.00	5.40	41.54	12.25	17.65	2.88	15.95	3.00
7	2.98	5.99	44.53	12.52	18.51	7.24	15.95	3.00
8	2.94	6.34	47.48	13.01	19.35	11.60	15.95	3.00
9	2.88	6.46	50.40	13.72	20.18	15.96	15.95	3.00
10	2.34	6.36	53.01	14.57	20.93	20.32	15.95	2.49
11	0.48	6.24	54.41	15.09	21.33	20.32	15.95	0.51
12	2.73	5.99	56.01	15.80	21.79	24.68	15.95	3.00
13	2.62	5.40	58.69	17.16	22.55	29.04	15.95	3.00
14	2.50	4.58	61.25	18.71	23.29	33.40	15.95	3.00
15	0.54	3.98	62.78	19.75	23.72	37.76	15.95	0.69
16	1.83	3.13	63.96	20.67	23.80	37.76	0.00	2.31
17	2.23	1.42	65.99	22.38	23.80	42.11	0.00	3.00
18	0.39	0.21	67.30	23.59	23.80	46.47	0.00	0.57

Table 2 - Force Data On The 18 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Distributed Load (lbs)
1	289.7	0.0	0.0	0.0	0.0	0.0
2	266.4	0.0	0.0	0.0	0.0	0.0
3	578.9	0.0	0.0	0.0	0.0	0.0
4	1332.8	0.0	0.0	0.0	0.0	0.0
5	1737.0	0.0	0.0	0.0	0.0	0.0
6	2047.4	0.0	0.0	0.0	0.0	0.0
7	2256.9	0.0	0.0	0.0	0.0	0.0
8	2362.2	0.0	0.0	0.0	0.0	0.0
9	2363.7	0.0	0.0	0.0	0.0	0.0
10	1888.2	0.0	0.0	0.0	0.0	0.0
11	377.2	0.0	0.0	0.0	0.0	0.0
12	2072.9	0.0	0.0	0.0	0.0	0.0
13	1797.9	0.0	0.0	0.0	0.0	0.0
14	1455.6	0.0	0.0	0.0	0.0	0.0
15	275.0	0.0	0.0	0.0	0.0	0.0
16	727.4	0.0	0.0	0.0	0.0	0.0
17	401.6	0.0	0.0	0.0	0.0	0.0
18	10.4	0.0	0.0	0.0	0.0	0.0

TOTAL WEIGHT OF SLIDING MASS = 22241.09(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 22241.09(lbs)

TOTAL AREA OF SLIDING MASS = 175.53(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 18 SLICES

Slice No.	soil Type	Cohesion (psf)	Phi(Deg)	options
1	3	98.97	0.00	R
2	3	118.93	0.00	R
3	3	134.56	0.00	R
4	3	156.39	0.00	R
5	3	179.13	0.00	R
6	3	196.38	0.00	R

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7	3	208.10	0.00
8	3	214.31	0.00
9	3	215.09	0.00
10	3	210.97	0.00
11	1	208.47	0.00
12	1	200.59	0.00
13	1	185.50	0.00
14	1	165.68	0.00
15	1	150.89	0.00
16	1	133.39	0.00
17	1	99.68	0.00
18	1	55.57	0.00

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
NOTE: Phi and C in Table 4 are modified values based on specified
Soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 18 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr. (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)	Multi-Stage Strength Type
1	-14.55	29.66	3.00	118.71	98.97	73.93	Undrained
2	-10.19	31.68	1.16	248.81	118.93	88.84	Undrained
3	-10.19	33.15	1.84	337.73	134.56	100.51	Undrained
4	-5.83	35.55	3.00	458.36	156.39	116.82	Undrained
5	-1.48	38.54	3.00	582.61	179.13	133.81	Undrained
6	2.88	41.54	3.00	676.03	196.38	146.69	Undrained
7	7.24	44.53	3.00	738.84	208.10	155.45	Undrained
8	11.60	47.48	3.00	771.37	214.31	160.08	Undrained
9	15.96	50.40	3.00	774.11	215.09	160.67	Undrained
10	20.32	53.01	2.49	750.10	210.97	157.59	Undrained
11	20.32	54.41	0.51	736.10	208.47	155.73	Undrained
12	24.68	56.01	3.00	692.42	200.59	149.84	Undrained
13	29.04	58.69	3.00	609.48	185.50	138.57	Undrained
14	33.40	61.25	3.00	500.58	165.68	123.76	Undrained
15	37.76	62.78	0.69	418.64	150.89	112.71	Undrained
16	37.76	63.96	2.31	321.88	133.39	99.64	Undrained
17	42.11	65.99	3.00	114.00	99.68	74.46	Undrained
18	46.47	67.30	0.57	-16.80	55.57	41.51	Undrained

Table 4 - Base Force Data on the 18 Slices

Slice No. *	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)	
1	-14.55	29.66	3.00	356.12	296.92	221.80	Undrained
2	-10.19	31.68	1.16	288.96	138.13	103.18	Undrained
3	-10.19	33.15	1.84	620.97	247.40	184.81	Undrained
4	-5.83	35.55	3.00	1375.08	469.16	350.46	Undrained
5	-1.48	38.54	3.00	1747.83	537.39	401.43	Undrained
6	2.88	41.54	3.00	2028.10	589.14	440.08	Undrained
7	7.24	44.53	3.00	2216.52	624.29	466.34	Undrained
8	11.60	47.48	3.00	2314.10	642.92	480.25	Undrained
9	15.96	50.40	3.00	2322.33	645.27	482.01	Undrained
10	20.32	53.01	2.49	1869.83	525.91	392.85	Undrained
11	20.32	54.41	0.51	373.36	105.74	78.99	Undrained
12	24.68	56.01	3.00	2077.26	601.78	449.52	Undrained
13	29.04	58.69	3.00	1828.45	556.50	415.70	Undrained
14	33.40	61.25	3.00	1501.74	497.04	371.29	Undrained
15	37.76	62.78	0.69	288.43	103.96	77.65	Undrained
16	37.76	63.96	2.31	743.87	308.27	230.27	Undrained
17	42.11	65.99	3.00	342.01	299.04	223.38	Undrained
18	46.47	67.30	0.57	-9.62	31.82	23.77	Undrained

SUM OF MOMENTS = 0.258127E-14 (ft/lbs); Imbalance (Fraction of Total Weight) = 0.1160586E-18

Sum of the Resisting Forces = 7220.69 (lbs)

Average Available Shear Strength = 169.61(psf)

sum of the Driving Forces = case3_3.5to1_rd_u.OUT
5393.76 (lbs)

Average Mobilized Shear Stress = 126.70(psf)

Total length of the failure surface = 42.57(ft)

Factor of Safety Balance Check: FS = 1.33871

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 2 ****

Factor Of Safety For The Critical or Specified Surface = 1.339

Table 1 - Geometry Data on the 18 Slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	2.90	0.79	29.66	13.47	14.26	-14.55	15.95	3.00
2	1.14	1.85	31.68	12.99	14.84	-10.19	15.95	1.16
3	1.81	2.54	33.15	12.72	15.26	-10.19	15.95	1.84
4	2.98	3.54	35.55	12.41	15.94	-5.83	15.95	3.00
5	3.00	4.58	38.54	12.22	16.80	-1.48	15.95	3.00
6	3.00	5.40	41.54	12.25	17.65	2.88	15.95	3.00
7	2.98	5.99	44.53	12.52	18.51	7.24	15.95	3.00
8	2.94	6.34	47.48	13.01	19.35	11.60	15.95	3.00
9	2.88	6.46	50.40	13.72	20.18	15.96	15.95	3.00
10	2.34	6.36	53.01	14.57	20.93	20.32	15.95	2.49
11	0.48	6.24	54.41	15.09	21.33	20.32	15.95	0.51
12	2.73	5.99	56.01	15.80	21.79	24.68	15.95	3.00
13	2.62	5.40	58.69	17.16	22.55	29.04	15.95	3.00
14	2.50	4.58	61.25	18.71	23.29	33.40	15.95	3.00
15	0.54	3.98	62.78	19.75	23.72	37.76	15.95	0.69
16	1.83	3.13	63.96	20.67	23.80	37.76	0.00	2.31
17	2.23	1.42	65.99	22.38	23.80	42.11	0.00	3.00
18	0.39	0.21	67.30	23.59	23.80	46.47	0.00	0.57

Table 2 -, Force Data On The 18 Slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Distributed Load (lbs)
1	289.7	0.0	0.0	0.0	0.0	0.0
2	266.4	0.0	0.0	0.0	0.0	0.0
3	578.9	0.0	0.0	0.0	0.0	0.0
4	1332.8	0.0	0.0	0.0	0.0	0.0
5	1737.0	0.0	0.0	0.0	0.0	0.0
6	2047.4	0.0	0.0	0.0	0.0	0.0
7	2256.9	0.0	0.0	0.0	0.0	0.0
8	2362.2	0.0	0.0	0.0	0.0	0.0
9	2363.7	0.0	0.0	0.0	0.0	0.0
10	1888.2	0.0	0.0	0.0	0.0	0.0
11	377.2	0.0	0.0	0.0	0.0	0.0
12	2072.9	0.0	0.0	0.0	0.0	0.0
13	1797.9	0.0	0.0	0.0	0.0	0.0
14	1455.6	0.0	0.0	0.0	0.0	0.0
15	275.0	0.0	0.0	0.0	0.0	0.0
16	727.4	0.0	0.0	0.0	0.0	0.0
17	401.6	0.0	0.0	0.0	0.0	0.0
18	10.4	0.0	0.0	0.0	0.0	0.0

TOTAL WEIGHT OF SLIDING MASS = 22241.09(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 22241.09(lbs)

TOTAL AREA OF SLIDING MASS = 175.53(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 18 SLICES

Slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	3	59.00	17.00	R
2	3	118.93	0.00	R
3	3	134.56	0.00	R
4	3	156.39	0.00	R
5	3	179.13	0.00	R
6	3	196.38	0.00	R
7	3	208.10	0.00	R
8	3	214.31	0.00	R
9	3	215.09	0.00	R
10	3	210.97	0.00	R
11	1	208.47	0.00	R
12	1	200.59	0.00	R
13	1	185.50	0.00	R
14	1	165.68	0.00	R
15	1	150.89	0.00	R
16	1	133.39	0.00	R
17	1	59.00	17.00	R
18	1	59.00	17.00	R

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
 F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
 R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
 NOTE: Phi and C in Table 4 are modified values based on specified
 Soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 18 Slices

Slice No. *	Alpha (deg)	X-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear stress (psf)	Multi-Stage Strength Type
1	-14.55	29.66	3.00	118.02	95.08	71.03	Drained
2	-10.19	31.68	1.16	248.86	118.93	88.84	Undrained
3	-10.19	33.15	1.84	337.79	134.56	100.51	Undrained
4	-5.83	35.55	3.00	458.40	156.39	116.82	Undrained
5	-1.48	38.54	3.00	582.62	179.13	133.81	Undrained
6	2.88	41.54	3.00	676.01	196.38	146.69	Undrained
7	7.24	44.53	3.00	738.78	208.10	155.45	Undrained
8	11.60	47.48	3.00	771.26	214.31	160.08	Undrained
9	15.96	50.40	3.00	773.96	215.09	160.67	Undrained
10	20.32	53.01	2.49	749.91	210.97	157.59	Undrained
11	20.32	54.41	0.51	735.92	208.47	155.73	Undrained
12	24.68	56.01	3.00	692.20	200.59	149.84	Undrained
13	29.04	58.69	3.00	609.24	185.50	138.57	Undrained
14	33.40	61.25	3.00	500.32	165.68	123.76	Undrained
15	37.76	62.78	0.69	418.36	150.89	112.71	Undrained
16	37.76	63.96	2.31	321.63	133.39	99.64	Undrained
17	42.11	65.99	3.00	117.06	94.79	70.81	Drained
18	46.47	67.30	0.57	-15.83	54.16	40.46	Drained

Table 4 - Base Force Data on the 18 Slices

Slice No. *	Alpha (deg)	X-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)	
1	-14.55	29.66	3.00	354.07	285.25	213.08	Drained
2	-10.19	31.68	1.16	289.02	138.13	103.18	Undrained
3	-10.19	33.15	1.84	621.07	247.40	184.81	Undrained
4	-5.83	35.55	3.00	1375.19	469.16	350.46	Undrained
5	-1.48	38.54	3.00	1747.86	537.39	401.43	Undrained
6	2.88	41.54	3.00	2028.03	589.14	440.08	Undrained
7	7.24	44.53	3.00	2216.33	624.29	466.34	Undrained
8	11.60	47.48	3.00	2313.78	642.92	480.25	Undrained
9	15.96	50.40	3.00	2321.89	645.27	482.01	Undrained
10	20.32	53.01	2.49	1869.36	525.91	392.85	Undrained
11	20.32	54.41	0.51	373.26	105.74	78.99	Undrained
12	24.68	56.01	3.00	2076.59	601.78	449.52	Undrained
13	29.04	58.69	3.00	1827.71	556.50	415.70	Undrained

				case3_3.5to1_rd_u.OUT				
14	33.40	61.25	3.00	1500.96	497.04	371.29	Undrained	
15	37.76	62.78	0.69	288.24	103.96	77.65	Undrained	
16	37.76	63.96	2.31	743.30	308.27	230.27	Undrained	
17	42.11	65.99	3.00	351.18	284.37	212.42	Drained	
18	46.47	67.30	0.57	-9.07	31.01	23.17	Drained	

SUM OF MOMENTS = 0.289686E-01 (ft/lbs); Imbalance (Fraction of Total Weight) = 0.1302483E-05

Sum of the Resisting Forces = 7193.53 (lbs)

Average Available Shear Strength = 168.97(psf)

Sum of the Driving Forces = 5373.47 (lbs)

Average Mobilized Shear Stress = 126.22(psf)

Total length of the failure surface = 42.57(ft)

Factor of safety Balance Check: FS = 1.33871

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

***** END OF GEOSTASE OUTPUT FOR RAPID DRAWDOWN STAGE 3 *****

case3_3.5to1_lt_u.OUT
*** GEOSTASE(R) ***

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** Current Version 4.30.30-Double Precision, January 2019 **
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SLOPE STABILITY ANALYSIS SOFTWARE
Simplified Bishop, Simplified Janbu, or General Equilibrium (GE) Options.
(Spencer, Morgenstern-Price, USACE, and Lowe & Karafiath)
Including Pier/Pile, Planar Reinf, Nail, Tieback, Line Loads
Applied Forces, Fiber-Reinforced Soil (FRS), Distributed Loads
Nonlinear Undrained Shear Strength, Curved Strength Envelope,
Anisotropic Strengths, Water Surfaces, 3-Stage Rapid Drawdown
2- or 3-Stage Pseudo-Static & Simplified Newmark Seismic Analyses.

Analysis Date: 4/ 6/ 2021
Analysis Time:
Analysis By: GEI Job No. 1140258201

Input File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case3_3.5to1_lt_u.gsd

Output File Name: S:\Geotechnical Jobs\1140250001-1140259901\1140258201-Forest Bend
Detention Pond; City of Friendswood_RPS\Slope Stability\Updated\case3_3.5to1_lt_u.OUT

Unit System: English

PROJECT: Forest Bend Detention Pond

DESCRIPTION: Case-3 - Boring GB-3P - 3.5(H):1(V) - LT

BOUNDARY DATA

4 Surface Boundaries
13 Total Boundaries

Boundary No.	X - 1 (ft)	Y - 1 (ft)	X - 2 (ft)	Y - 2 (ft)	Soil Type Below Bnd
1	0.000	11.500	20.000	11.500	4
2	20.000	11.500	32.250	15.000	3
3	32.250	15.000	63.050	23.800	1
4	63.050	23.800	80.000	23.800	1
5	64.030	16.800	80.000	16.800	2
6	57.730	15.000	64.030	16.800	2
7	32.250	15.000	57.730	15.000	3
8	57.730	15.000	80.000	15.000	4
9	45.480	11.500	57.730	15.000	4
10	20.000	11.500	45.480	11.500	4
11	0.000	11.000	80.000	11.000	5
12	0.000	7.000	80.000	7.000	6
13	0.000	4.500	80.000	4.500	7

User Specified X-Origin = 0.000(ft)

User Specified Y-Origin = -5.000(ft)

MOHR-COULOMB SOIL PARAMETERS

7 Type(s) of soil Defined

Soil Number and Description	Moist Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Ratio(ru)	Pressure Constant (psf)	Water Surface No.	Water Option
1 Fat Clay (w)	127.0	127.0	59.00	17.00	0.000	0.0	1	0
2 Fat Clay	127.0	127.0	172.00	15.00	0.000	0.0	1	0
3 Fat Clay (w)	126.0	126.0	59.00	17.00	0.000	0.0	1	0
4 Fat Clay	126.0	126.0	172.00	15.00	0.000	0.0	1	0

	133.0	133.0	186.00	28.00	0.000	0.0	1	0
5 Lean Clay	115.0	115.0	0.00	30.00	0.000	0.0	1	0
6 Silty Sand	129.0	129.0	172.00	15.00	0.000	0.0	1	0
7 Fat Clay								

WATER SURFACE DATA

1 Water Surface(s) Defined

Unit Weight of Water = 62.400 (pcf)

Water Surface No. 1 Specified by 2 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	12.50
2	80.00	12.50

DISTRIBUTED LOAD(S)

1 Load(s) Specified

Load Deflection from Vert)	BND No.	X - 1 (ft)	Y - 1 (ft)	Stress (psf)	X - 2 (ft)	Y - 2 (ft)	Stress (psf)	(deg
0.00	1	4	63.050	23.800	250.000	80.000	23.800	250.000

NOTE - Load Stress Varies Linearly Within Specified Range.

TRIAL FAILURE SURFACE DATA

Circular Trial Failure Surfaces Have Been Generated Using A Random Procedure.

1000 Trial Surfaces Have Been Generated.

1000 Surfaces Generated at Increments of 0.4204(in) Equally Spaced Within the Start Range

Along The Specified Surface Between X = 0.00(ft)
and X = 35.00(ft)

Each Surface Enters within a Range Between X = 40.00(ft)
and X = 80.00(ft)

Unless XCLUDE Lines Were Specified, The Minimum Elevation
To Which A Surface Extends Is Y = -5.00(ft)

Specified Maximum Radius = 5000.000(ft)

3.000(ft) Line Segments Were Used For Each Trial Failure Surface.

The Simplified Bishop Method Was Selected for FS Analysis.

Total Number of Trial Surfaces Attempted = 1000

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces
Did Not Converge in 50 Iterations.

Number of Trial Surfaces with Non-Converged FS = 24

Number of Trial Surfaces with Valid FS = 976

Percentage of Trial Surfaces with Non-Converged and/or
Non-valid FS Solutions of the Total Attempted = 2.4 %

Statistical Data On All Valid FS Values:

case3_3.5to1_lt_u.OUT
 FS Max = 11.315 FS Min = 1.582 FS Ave = 2.748
 Standard Deviation = 0.781 Coefficient of Variation = 28.41 %

Critical Surface is Sequence Number 789 of Those Analyzed.

*****BEGINNING OF DETAILED GEOSTASE OUTPUT FOR CRITICAL SURFACE FROM A SEARCH*****

BACK-CALCULATED CIRCULAR SURFACE PARAMETERS:

Circle Center At X = 39.600503(ft) ; Y = 59.327410(ft); and Radius = 47.202751(ft)

Circular Trial Failure Surface Generated With 17 Coordinate Points

Point No.	X-Coord. (ft)	Y-Coord. (ft)
1	27.608	13.674
2	30.532	13.004
3	33.493	12.521
4	36.478	12.228
5	39.477	12.125
6	42.475	12.212
7	45.463	12.490
8	48.426	12.957
9	51.354	13.611
10	54.234	14.450
11	57.055	15.470
12	59.806	16.668
13	62.475	18.038
14	65.052	19.574
15	67.526	21.271
16	69.887	23.122
17	70.647	23.800

Factor Of Safety For The Critical or Specified Surface = 1.582

Table 1 - Geometry Data on the 21 slices

Slice No.	Width (ft)	Height (ft)	X-Cntr (ft)	Y-Cntr-Base (ft)	Y-Cntr-Top (ft)	Alpha (deg)	Beta (deg)	Base Length (ft)
1	2.92	0.75	29.07	13.34	14.09	-12.90	15.95	3.00
2	1.72	1.89	31.39	12.86	14.75	-9.26	15.95	1.74
3	1.24	2.55	32.87	12.62	15.18	-9.26	15.95	1.26
4	0.22	2.88	33.60	12.51	15.39	-5.61	15.95	0.22
5	2.77	3.45	35.09	12.36	15.81	-5.61	15.95	2.78
6	3.00	4.46	37.98	12.18	16.64	-1.97	15.95	3.00
7	3.00	5.32	40.98	12.17	17.49	1.67	15.95	3.00
8	2.99	6.00	43.97	12.35	18.35	5.31	15.95	3.00
9	0.06	6.29	45.49	12.50	18.78	8.95	15.95	0.06
10	2.90	6.48	46.98	12.73	19.21	8.95	15.95	2.94
11	2.93	6.76	49.89	13.28	20.04	12.60	15.95	3.00
12	2.88	6.84	52.79	14.03	20.87	16.24	15.95	3.00
13	1.52	6.77	54.99	14.73	21.50	19.88	15.95	1.62
14	1.30	6.67	56.40	15.24	21.90	19.88	15.95	1.38
15	2.75	6.41	58.43	16.07	22.48	23.52	15.95	3.00
16	2.67	5.90	61.14	17.35	23.25	27.17	15.95	3.00
17	0.57	5.51	62.76	18.21	23.72	30.81	15.95	0.67
18	2.00	4.82	64.05	18.98	23.80	30.81	0.00	2.33
19	2.47	3.38	66.29	20.42	23.80	34.45	0.00	3.00
20	2.36	1.60	68.71	22.20	23.80	38.09	0.00	3.00
21	0.76	0.34	70.27	23.46	23.80	41.73	0.00	1.02

Table 2 - Force Data On The 21 slices (Excluding Reinforcement)

Slice No.	Weight (lbs)	Ubeta Force Top (lbs)	Ualpha Force Bot (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Distributed Load (lbs)
1	277.3	0.0	0.0	0.0	0.0	0.0

case3_3.5to1_1t_u.OUT						
2	409.3	0.0	0.0	0.0	0.0	0.0
3	400.3	0.0	0.0	0.0	0.0	0.0
4	79.2	0.0	0.0	0.0	0.0	0.0
5	1204.7	0.0	23.6	0.0	0.0	0.0
6	1689.8	0.0	60.6	0.0	0.0	0.0
7	2019.3	0.0	62.0	0.0	0.0	0.0
8	2267.2	0.0	27.9	0.0	0.0	0.0
9	50.2	0.0	0.0	0.0	0.0	0.0
10	2379.9	0.0	0.0	0.0	0.0	0.0
11	2507.0	0.0	0.0	0.0	0.0	0.0
12	2498.9	0.0	0.0	0.0	0.0	0.0
13	1307.3	0.0	0.0	0.0	0.0	0.0
14	1101.4	0.0	0.0	0.0	0.0	0.0
15	2239.6	0.0	0.0	0.0	0.0	0.0
16	2000.5	0.0	0.0	0.0	0.0	0.0
17	402.3	0.0	0.0	0.0	0.0	0.0
18	1226.1	0.0	0.0	0.0	0.0	500.4
19	1061.2	0.0	0.0	0.0	0.0	618.5
20	480.9	0.0	0.0	0.0	0.0	590.3
21	32.7	0.0	0.0	0.0	0.0	190.1

TOTAL WEIGHT OF SLIDING MASS = 25634.93(lbs)

EFFECTIVE WEIGHT OF SLIDING MASS = 25461.13(lbs)

TOTAL AREA OF SLIDING MASS = 202.29(ft2)

TABLE 2A - SOIL STRENGTH & SOIL OPTIONS DATA ON THE 21 SLICES

slice No.	Soil Type	Cohesion (psf)	Phi(Deg)	Options
1	3	59.00	17.00	
2	3	59.00	17.00	
3	3	59.00	17.00	
4	3	59.00	17.00	
5	3	59.00	17.00	
6	3	59.00	17.00	
7	3	59.00	17.00	
8	3	59.00	17.00	
9	3	59.00	17.00	
10	3	59.00	17.00	
11	3	59.00	17.00	
12	3	59.00	17.00	
13	3	59.00	17.00	
14	1	59.00	17.00	
15	1	59.00	17.00	
16	1	59.00	17.00	
17	1	59.00	17.00	
18	1	59.00	17.00	
19	1	59.00	17.00	
20	1	59.00	17.00	
21	1	59.00	17.00	

SOIL OPTIONS: A = ANISOTROPIC, C = CURVED STRENGTH ENVELOPE (TANGENT PHI & C),
F = FIBER-REINFORCED SOIL (FRS), N = NONLINEAR UNDRAINED SHEAR STRENGTH,
R = RAPID DRAWDOWN OR RAPID LOADING (SEISMIC) SHEAR STRENGTH
NOTE: Phi and C in Table 4 are modified values based on specified soil options (if any).

TABLE 3 - Effective and Base Shear Stress Data on the 21 slices

slice No. *	Alpha (deg)	X-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Stress (psf)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	-12.90	29.07	3.00	107.00	91.71	57.97
1	-12.90	29.07	3.00	107.00	91.71	57.97
2	-9.26	31.39	1.74	251.04	135.75	85.80
2	-9.26	31.39	1.74	251.04	135.75	85.80
3	-9.26	32.87	1.26	337.41	162.16	102.49
3	-9.26	32.87	1.26	337.41	162.16	102.49
4	-5.61	33.60	0.22	372.56	172.90	109.28
4	-5.61	33.60	0.22	372.56	172.90	109.28
5	-5.61	35.09	2.78	437.87	192.87	121.90
5	-5.61	35.09	2.78	437.87	192.87	121.90
6	-1.97	37.98	3.00	547.93	226.52	143.17

				case3_3.5to1_lt_u.OUT		
6	-1.97	37.98	3.00	547.93	226.52	143.17
7	1.67	40.98	3.00	648.36	257.22	162.57
7	1.67	40.98	3.00	648.36	257.22	162.57
8	5.31	43.97	3.00	734.41	283.53	179.20
8	5.31	43.97	3.00	734.41	283.53	179.20
9	8.95	45.49	0.06	769.01	294.11	185.88
9	8.95	45.49	0.06	769.01	294.11	185.88
10	8.95	46.98	2.94	792.99	301.44	190.52
10	8.95	46.98	2.94	792.99	301.44	190.52
11	12.60	49.89	3.00	816.28	308.56	195.02
11	12.60	49.89	3.00	816.28	308.56	195.02
12	16.24	52.79	3.00	815.49	308.32	194.87
12	16.24	52.79	3.00	815.49	308.32	194.87
13	19.88	54.99	1.62	796.48	302.51	191.19
13	19.88	54.99	1.62	796.48	302.51	191.19
14	19.88	56.40	1.38	783.96	298.68	188.77
14	19.88	56.40	1.38	783.96	298.68	188.77
15	23.52	58.43	3.00	742.04	285.86	180.67
15	23.52	58.43	3.00	742.04	285.86	180.67
16	27.17	61.14	3.00	670.92	264.12	166.93
16	27.17	61.14	3.00	670.92	264.12	166.93
17	30.81	62.76	0.67	614.29	246.81	155.99
17	30.81	62.76	0.67	614.29	246.81	155.99
18	30.81	64.05	2.33	761.58	291.84	184.45
18	30.81	64.05	2.33	761.58	291.84	184.45
19	34.45	66.29	3.00	584.39	237.67	150.21
19	34.45	66.29	3.00	584.39	237.67	150.21
20	38.09	68.71	3.00	374.75	173.57	109.70
20	38.09	68.71	3.00	374.75	173.57	109.70
21	41.73	70.27	1.02	226.69	128.31	81.09
21	41.73	70.27	1.02	226.69	128.31	81.09

Table 4 - Base Force Data on the 21 Slices

Slice No. *	Alpha (deg)	X-Coord. slice Cntr (ft)	Base Leng. (ft)	Effective Normal Force (lbs)	Available Shear Force (lbs)	Mobilized Shear Force (lbs)
1	-12.90	29.07	3.00	321.01	275.14	173.90
1	-12.90	29.07	3.00	321.01	275.14	173.90
2	-9.26	31.39	1.74	437.00	236.31	149.35
2	-9.26	31.39	1.74	437.00	236.31	149.35
3	-9.26	32.87	1.26	424.88	204.20	129.06
3	-9.26	32.87	1.26	424.88	204.20	129.06
4	-5.61	33.60	0.22	81.76	37.94	23.98
4	-5.61	33.60	0.22	81.76	37.94	23.98
5	-5.61	35.09	2.78	1217.52	536.29	338.95
5	-5.61	35.09	2.78	1217.52	536.29	338.95
6	-1.97	37.98	3.00	1643.79	679.56	429.50
6	-1.97	37.98	3.00	1643.79	679.56	429.50
7	1.67	40.98	3.00	1945.08	771.67	487.72
7	1.67	40.98	3.00	1945.08	771.67	487.72
8	5.31	43.97	3.00	2203.22	850.59	537.60
8	5.31	43.97	3.00	2203.22	850.59	537.60
9	8.95	45.49	0.06	49.05	18.76	11.86
9	8.95	45.49	0.06	49.05	18.76	11.86
10	8.95	46.98	2.94	2328.40	885.10	559.41
10	8.95	46.98	2.94	2328.40	885.10	559.41
11	12.60	49.89	3.00	2448.84	925.68	585.06
11	12.60	49.89	3.00	2448.84	925.68	585.06
12	16.24	52.79	3.00	2446.47	924.96	584.60
12	16.24	52.79	3.00	2446.47	924.96	584.60
13	19.88	54.99	1.62	1287.55	489.02	309.07
13	19.88	54.99	1.62	1287.55	489.02	309.07
14	19.88	56.40	1.38	1084.57	413.21	261.16
14	19.88	56.40	1.38	1084.57	413.21	261.16
15	23.52	58.43	3.00	2226.11	857.59	542.02
15	23.52	58.43	3.00	2226.11	857.59	542.02
16	27.17	61.14	3.00	2012.76	792.36	500.79
16	27.17	61.14	3.00	2012.76	792.36	500.79
17	30.81	62.76	0.67	411.22	165.22	104.42
17	30.81	62.76	0.67	411.22	165.22	104.42
18	30.81	64.05	2.33	1774.92	680.15	429.87
18	30.81	64.05	2.33	1774.92	680.15	429.87
19	34.45	66.29	3.00	1753.18	713.00	450.63
19	34.45	66.29	3.00	1753.18	713.00	450.63
20	38.09	68.71	3.00	1124.26	520.72	329.11

				case3_3.5to1_lt_u.OUT		
20	38.09	68.71	3.00	1124.26	520.72	329.11
21	41.73	70.27	1.02	230.97	130.73	82.62
21	41.73	70.27	1.02	230.97	130.73	82.62

SUM OF MOMENTS = -0.199135E-01 (ft/lbs); Imbalance (Fraction of Total Weight) = -0.7768096E-06

Sum of the Resisting Forces = 11108.20 (lbs)

Average Available Shear Strength = 241.38(psf)

sum of the Driving Forces = 7020.67 (lbs)

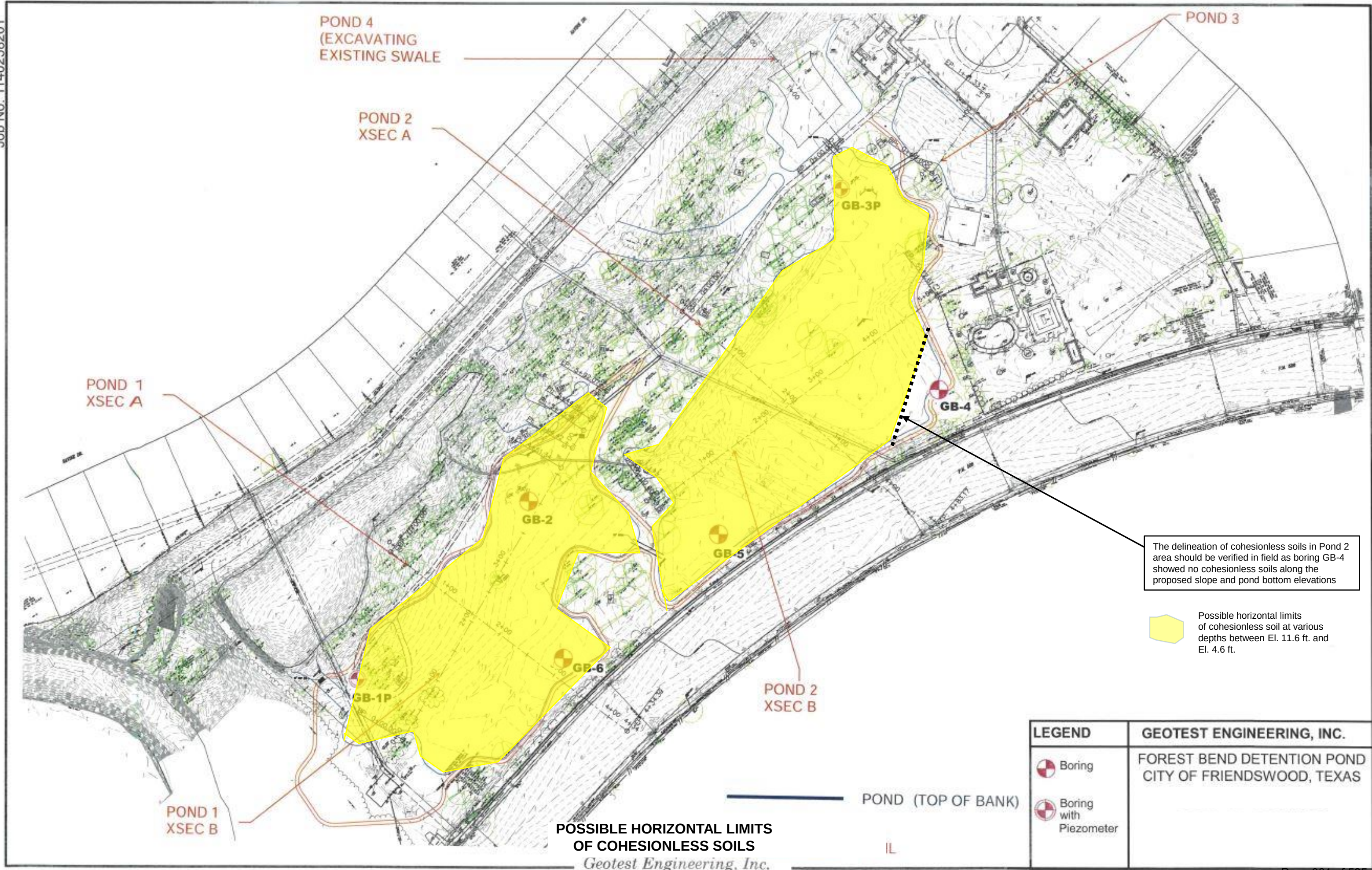
Average Mobilized Shear Stress = 152.56(psf)

Total length of the failure surface = 46.02(ft)

Factor of Safety Balance Check: FS = 1.58221

CAUTION - Factor Of Safety Is Calculated By The Simplified Bishop Method. This Method Is Valid Only If The Failure Surface Approximates A Circular Arc.

**** END OF GEOSTASE OUTPUT ****



Friendswood Forest Bend Detention Basin
100% Cost Estimate - January 2022



ITEM NO.	BID ITEM DESCRIPTION	QUAN.	UNIT	UNIT PRICE	AMOUNT
General					
1	MOBILIZATION - MAX 5%	1	LS	\$ 145,000.00	\$ 145,000.00
2	CONCRETE TEMPORARY WASHOUT	1	EA	\$ 1,500.00	\$ 1,500.00
3	INLET PROTECTION BARRIER (TYPE I)	91	LF	\$ 15.00	\$ 1,362.00
4	INLET PROTECTION BARRIER (TYPE III)	182	LF	\$ 15.00	\$ 2,724.00
5	REINFORCED FILTER FABRIC SILT FENCE	3,671	LF	\$ 3.00	\$ 11,013.00
6	STABILIZED CONSTRUCTION ACCESS	2	EA	\$ 2,250.00	\$ 4,500.00
7	TREE PROTECTION FENCING	6,750	LF	\$ 4.00	\$ 27,000.00
8	CLEARING AND GRUBBING (INCLUDING TREE REMOVAL)	7.70	AC	\$ 5,000.00	\$ 38,500.00
9	REMOVE AND RELOCATE SITE FURNITURE	4	EA	\$ 2,500.00	\$ 10,000.00
10	REMOVE EXISTING GRAVEL TRAIL	1,244	SY	\$ 10.00	\$ 12,440.00
11	REMOVE EXISTING MISC CONCRETE	23	SY	\$ 25.00	\$ 575.00
12	REMOVE EXISTING PEDESTRIAN BRIDGE & 4" PVC	1	LS	\$ 5,000.00	\$ 5,000.00
13	GROUNDWATER CONTROL	1	LS	\$ 120,000.00	\$ 120,000.00
14	24-INCH THICK CLAY LINER	12,600	CY	\$ 20.00	\$ 252,000.00
15	INSTALL CHAIN LINK FENCE & DOUBLE GATE	50	LF	\$ 60.00	\$ 3,000.00
16	4" CRUSHED GRANITE	100	SF	\$ 5.00	\$ 500.00
GENERAL SUBTOTAL:					\$ 635,114.00

Storm Water Items					
17	PRECAST CONCRETE MANHOLE	1	EA	\$ 6,000.00	\$ 6,000.00
18	PROP MANHOLE TIE-IN TO EXISTING STORM SEWER	1	EA	\$ 500.00	\$ 500.00
19	12" RCP	15	LF	\$ 80.00	\$ 1,200.00
20	24" RCP	221	LF	\$ 125.00	\$ 27,625.00
21	48" RCP	410	LF	\$ 300.00	\$ 123,000.00
22	24" CMP	320	LF	\$ 110.00	\$ 35,200.00
23	PRECAST TYPE "A" INLET	1	EA	\$ 4,000.00	\$ 4,000.00
24	EXCAVATION & HAUL OFF	84,108	CY	\$ 16.00	\$ 1,345,728.00
25	RIPRAP - GRADATION NO. 1 (18" THICK)	300	SY	\$ 100.00	\$ 30,000.00
26	TRENCH SHORING SYSTEM	966	LF	\$ 5.00	\$ 4,830.00
27	CONCRETE INTERCEPTOR STRUCTURE	6	EA	\$ 4,200.00	\$ 25,200.00
28	TRENCH DRAIN SYSTEM	12	LF	\$ 405.00	\$ 4,860.00
STORM WATER SUBTOTAL:					\$ 1,608,143.00

Paving Items					
29	CEMENT STABILIZED SAND (8-IN DEPTH)	2,988	SY	\$ 15.00	\$ 44,820.00
30	CONC PILOT CHANNEL (4-IN THICK)	264	SY	\$ 55.00	\$ 14,520.00
31	CONC TRAIL (5-IN THICK)	2,263	SY	\$ 65.00	\$ 147,095.00
PAVING SUBTOTAL:					\$ 206,435.00

Landscaping Items					
32	MEXICAN BALD CYPRESS - 45 GALLON	8	EA	\$ 600.00	\$ 4,800.00
33	POSSUMHAW HOLLY - 30 GALLON	12	EA	\$ 450.00	\$ 5,400.00
34	WOODLAND MIX	0.51	AC	\$ 21,780.00	\$ 11,000.00
35	WILDFLOWER/BERMUDA MIX	1.55	AC	\$ 30,645.16	\$ 47,500.00
36	BERMUDA HYDROMULCH	5.50	AC	\$ 8,700.00	\$ 47,850.00
37	BERMUDA SOD	16,667	SY	\$ 6.00	\$ 100,000.00
38	PICKEREL WEED - 3 GALLON	532	EA	\$ 20.00	\$ 10,640.00

Friendswood Forest Bend Detention Basin
100% Cost Estimate - January 2022



ITEM NO.	BID ITEM DESCRIPTION	QUAN.	UNIT	UNIT PRICE	AMOUNT
39	SPIDER LILY - 1 GALLON	195	EA	\$ 20.00	\$ 3,900.00
40	GIANT SPIDERWORT - 1 GALLON	195	EA	\$ 20.00	\$ 3,900.00
41	DWARF PALMETTO - 1 GALLON	36	EA	\$ 45.00	\$ 1,620.00
42	TEMPORARY WATERING TO ESTABLISH PLANTING	6	MO	\$ 2,500.00	\$ 15,000.00

LANDSCAPING SUBTOTAL: \$ 251,610.00

Electrical Items					
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Temporary Demolition and Documentation

43	TEMPORARY POWER	1	LS	\$ 4,700.00	\$ 4,700.00
44	ELECTRICAL DEMOLITION	1	LS	\$ 1,800.00	\$ 1,800.00
45	RED LINES, O&M MANUALS	1	LS	\$ 400.00	\$ 400.00

Electric Utility Service

46	ELECTRICAL SERVICE EQUIPMENT	1	LS	\$ 16,000.00	\$ 16,000.00
47	RAISED PLATFORM (INCLUDING FOUNDATION)	1	LS	\$ 50,000.00	\$ 50,000.00
48	EXPOSED CONDUIT, FITTINGS AND BOXES	1	LS	\$ 850.00	\$ 850.00
49	CONDUCTORS	1	LS	\$ 1,100.00	\$ 1,100.00
50	TERMINATION, TESTING, START UP	1	LS	\$ 275.00	\$ 275.00

Power Panel and Lighting Controls

51	ELECTRICAL EQUIPMENT	1	LS	\$ 17,750.00	\$ 17,750.00
52	EXPOSED CONDUIT, FITTINGS AND BOXES	1	LS	\$ 1,570.00	\$ 1,570.00
53	CONDUCTORS	1	LS	\$ 1,100.00	\$ 1,100.00
54	TERMINATION, TESTING, START UP, TRAINING	1	LS	\$ 700.00	\$ 700.00

Trail Lighting Fixtures

55	LIGHT FIXTURES (INCLUDING SONOTUBE, CONCRETE & FINISH FOR 12" ELEVATION)	61	EA	\$ 990.00	\$ 60,390.00
56	LIGHT FIXTURES (INCLUDING SONOTUBE, CONCRETE & FINISH FOR 24" ELEVATION)	22	EA	\$ 1,055.00	\$ 23,210.00
57	UNDERGROUND CONDUIT	1	LS	\$ 62,000.00	\$ 62,000.00
58	CONDUCTORS	1	LS	\$ 13,000.00	\$ 13,000.00
59	GROUNDING	83	EA	\$ 30.00	\$ 2,490.00
60	TERMINATION, TESTING, START UP	1	LS	\$ 800.00	\$ 800.00

ELECTRICAL SUBTOTAL: \$ 258,135.00

Other Items					
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61	WELL ABANDONMENT	1	LS	\$ 15,000.00	\$ 15,000.00
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OTHER SUBTOTAL: \$ 15,000.00

TOTAL CONSTRUCTION SUBTOTAL: \$ 2,974,437.00

5% CONTINGENCY: \$ 141,472.00

TOTAL CONSTRUCTION COST: \$ 3,115,909.00

DOCUMENT 00300B

UNIT PRICE BID FORM

To: The Honorable Mayor and City Council of the City of Friendswood
City Hall
910 South Friendswood Drive
Friendswood, Texas 77546

Project: Forest Bend Detention Basin

Project No.: RFQ 2020-06

Bid No.: [Bid No.]

Bidder: Jerdon Enterprise, L.P.

(Print or type full name of proprietorship, partnership, corporation, or joint venture.)

PART I: OFFER

- 1.1 Total Bid Price: Having examined the Project location and all matters referred to in the Bid Documents for the Project, we, the undersigned, offer to enter into a Contract to perform the Work for the Total Bid Price shown on the signature page of this Document.
- 1.2 Security Deposit: Included with the Bid is a Security Deposit in the amount of five percent (5%) of the Total Bid Price subject to terms described in Document 00115 – Instructions to Bidders.
- 1.3 Period for Bid Acceptance: This offer is open to acceptance and is irrevocable for sixty (60) days from the Bid Date. That period may be extended by mutual written agreement of the City and the Bidder.
- 1.4 Addenda: All Addenda have been received. Modifications to the Bid Documents have been considered and all related costs are included in the Total Bid Price.
- 1.5 Bid Supplements: The following documents are attached:
 - A. Security Deposit (as defined in Document 00115 – Instructions to Bidders).
 - B. Document 00310 – Child Support Affidavit.
- 1.6 This document constitutes a government record, as defined by § 37.01 of the Texas Penal Code. Submission of a false government record is punishable as provided in § 37.10 of the Texas Penal Code.

00300B-1

PART II: CONTRACT TIME

- 2.1 If offer is accepted, the Contractor shall achieve the Date of Substantial Completion within ONE HUNDRED AND FIFTY-SIX (156) working days after the date of commencement of the Work as stipulated in Document 00725 – Notice To Proceed, subject to adjustments of Contract Time as provided in the Contract.
- 2.2 It is also understood and agreed that the Work shall be completed in full within ONE HUNDRED AND EIGHTY-SIX (186) working days after the date of commencement of the Work as stipulated in Document 00725 – Notice To Proceed, subject to adjustments of Contract Time as provided in the Contract.

PART III: CONTRACT PRICE

- 3.1 Total Bid Price has been Calculated by the Bidder, using the following component prices and process (Print or Type numerical amounts).
- 3.2 The Total Base Bid Price for the Bid shall be the determining factor for Contract of the successful low Bidder.

PART IV: ACKNOWLEDGEMENT

- 4.1 The undersigned, as the Bidder, declares that the only person or parties interested in this proposal as principals are those named herein, that this proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the Invitation to Bidders, Instructions to Bidders, this Bid Form, the Agreement, the General Conditions, the Supplementary Conditions, the Technical Specifications, the Special Provisions, and the Drawings therein referred to and has carefully examined the locations, conditions, and classes of materials of the proposed work; and agrees that he shall provide all necessary labor, machinery, tools, apparatus and other items incidental to construction and will do all the work and furnish all the materials called for in the Contract and the Technical Specifications in the manner prescribed herein and according to the requirements of the City's Engineer as therein set forth.
- 4.2 It is understood that the following quantities of work to be done at unit prices are approximate only and are intended principally to serve as a guide in evaluating bids. It is further understood that all items of work for which there are no specific pay items are included in the bid items shown on this Bid Form and are considered incidental to the Work.

- 4.3 It is further understood that the quantities of work to be done at the unit prices and materials to be furnished may be considered necessary, in the opinion of the City's Engineer, to complete the work fully as planned and contemplated, and that all quantities of work, whether increased or decreased are to be performed at the unit prices set forth below except as provided for in the specifications.
- 4.4 It is further agreed that the lump sum prices may be increased to cover additional work ordered by the City's Engineer or the City, but not shown on the Drawings or required by the Technical Specifications, in accordance with the provisions of the General Conditions. Similarly, they may be decreased to cover the deletion of work so ordered.
- 4.5 Usual disposition of bid securities is cited in paragraph three (3) of Document 00110 – Invitations to Bidders and Part VI – Bid Security in Document 00115 – Instructions to Bidders; however, if bidder, whose bid is accepted by the City fails to execute the Agreement and/or fails to execute a Performance Bond and a Payment Bond within ten (10) days of Notice to Award, the bid security shall become the property of the City, and shall be considered as payment for damages due to delay, and other inconveniences suffered by the City on account of such failure of the Bidder. Further, should the City bring suit in court to enforce any terms of this bid, it is agreed that the Bidder or his surety shall pay to the City the cost and reasonable attorney's fees.
- 4.6 In the event of the award of a contract to the undersigned, the undersigned shall furnish a Performance Bond for the full amount of the Contract, to secure proper compliance with the terms and provisions of the Contract, to insure and guarantee the Work until final completion and acceptance, and shall furnish a Payment Bond in the same amount to guarantee payment of all lawful claims for labor performed and materials furnished in fulfillment of the Contract.
- 4.7 The work proposed to be done shall be accepted when fully complete and finished in accordance with the Drawings and Technical Specifications to the satisfaction of the City. The undersigned certified that the bid prices contained in this bid form have been carefully checked and submitted as correct and final.
- 4.8 Unit and lump sum prices shall be shown in words and figures for each item listed in this proposal, and in the event of discrepancy, the words shall control. Should bid prices on any item be omitted, the right to apply the lowest prices submitted by any other bidders for the omitted items in payment for work done under this proposal.
- 4.9 Bidder understands that the City reserves the right to reject any and all bids

and to waive any informalities in the bidding. In addition, the City reserves the right to award the Contract on the basis of the Total Base Bid.

4.10 Bids shall be good for sixty (60) days from the date of the bid opening.

PART V: UNIT PRICE BID FORMS

5.1 The following forms shall constitute the Bid Forms.

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
General					
1	Mobilization – Max 5%	1	LS		
@	One hundred seventy five thousand dollars and zero cents			175,000.00	175,000.00
2	Concrete Temporary Washout	1	EA		
@	Six hundred dollars and zero cents			600.00	600.00
3	Inlet Protection Barrier (Type I)	91	LF		
@	One dollar and eighty cents			1.80	163.80
4	Inlet Protection Barrier (Type III)	182	LF		
@	Two dollars and ten cents			2.10	382.20
5	Reinforced Filter Fabric Silt Fence	3,671	LF		
@	One dollar and eighty cents			1.80	6,607.80

00300-5

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
6	Stabilized Construction Access	2	EA		
@ Two thousand two hundred dollars and zero cents				2,200.00	4,400.00
7	Tree Protection Fencing	6,750	LF		
@ One dollar and eighty cents				1.80	12,150.00
8	Clearing and Grubbing (including Tree Removal)	7.70	AC		
@ Eighteen thousand five hundred dollars and zero cents				18,500.00	142,450.00
9	Remove and Relocate Site Furnitures	4	EA		
@ Five hundred dollars and zero cents				500.00	2,000.00
10	Remove Existing Gravel Trail	1,244	SY		
@ Nine dollars and twenty five cents				9.25	11,507.00

00300-6

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
11	Remove Misc Concrete	23	SY		
@	Twenty two dollars and zero cents			22.00	506.00
12	Remove Existing Pedestrian Bridge and 4" PVC	1	LS		
@	Nine thousand two hundred fifty dollars and zero zents			9,250.00	9,250.00
13	Groundwater Control	1	LS		
@	Twenty seven thousand two hundred fifty dollars and zero cents			27,250.00	27,250.00
14	24-inch Thick Clay Liner	12,600	CY		
@	Thirty one dollars and fifty cents			31.50	396,900.00
15	Install Chain Link Fence & Double Gate	50	LF		
@	Ninety five dollars and zero cents			95.00	4,750.00

00300-7

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
16	4" Crushed Granite	100	SF		
@	Five dollars and zero			5.00	500.00
Storm Water Items					
17	Precast Concrete Manhole	1	EA		
@	Nine thousand eight hundred dollars and zero cents			9,800.00	9,800.00
18	Prop Manhole Tie-In to Existing Storm Sewer	1	EA		
@	Two thousand two hundred dollars and zero cents			2,200.00	2,200.00
19	12" RCP	15	LF		
@	One hundred eighteen dollars and zero cents			118.00	1,770.00
20	24" RCP	221	LF		
@	One hundred thirty two dollars and zero cents			132.00	29,172.00

00300-8

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
21	48" RCP	410	LF		
@	Three hundred sixteen dollars and zero cents			316.00	129,560.00
22	24" CMP	320	LF		
@	One hundred twenty eight dollars and zero cents			128.00	40,960.00
23	Precast Type "A" Inlet	1	EA		
@	Four thousand three hundred dollars and zero cents			4,300.00	4,300.00
24	Excavation & Haul Off	84,108	CY		
@	Seventeen dollars and fifty cents			17.50	1,471,890.00
25	Riprap – Gradation No. 1 (18" Thick)	300	SY		
@	One hundred forty three dollars and zero cents			143.00	42,900.00

00300-9

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
26	Trench Shoring System	966	LF		
@	Eighteen dollars and zero cents			18.00	17,388.00
27	Concrete Interceptor Structure	6	EA		
@	Three thousand one hundred dollars and zero cents			3,100.00	18,600.00
28	Trench Drain System	12	LF		
@	Ninety dollars and zero cents			90.00	1,080.00
Paving Items					
29	Cement Stabilized Sand (8-in Depth)	2,988	SY		
@	Twenty seven dollars and fifty cents			27.50	82,170.00
30	Conc Pilot Chanel (4-in Thick)	264	SY		
@	Eighty one dollars and fifty cents			81.50	21,516.00

00300-10

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
31	Conc Trail (5-in Thick)	2,263	SY		
@	Eighty eight dollars and twenty five cents			88.25	199,709.75
Landscaping					
32	Mexican Bald Cypress – 45 Gallon	8	EA		
@	Six hundred five dollars and zero cents			605.00	4,840.00
33	Possumhaw Holly – 30 Gallon	12	EA		
@	Two hundred seventy dollars and zero cents			270.00	3,240.00
34	Woodland Mix	0.51	AC		
@	Four thousand seven hundred eighty dollars and zero cents			4,780.00	2,437.80
35	Wildflower/Bermuda Mix	1.55	AC		
@	Four thousand nine hundred forty dollars and zero cents			4,940.00	7,657.00

00300-11

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
36	Bermuda Hydromulch	5.50	AC		
@	Four thousand two hundred fifty dollars and zero cents			4,250.00	23,375.00
37	Bermuda Sod	16,667	SY		
@	Five dollars and ninety five cents			5.95	99,168.65
38	Pickrel Weed – 3 Gallon	532	EA		
@	Thirty eight dollars and zero cents			38.00	20,216.00
39	Spider Lily – 1 Gallon	195	EA		
@	Sixteen dollars and seventy five cents			16.75	3,266.25
40	Giant Spiderwort – 1 Gallon	195	EA		
@	Nineteen dollars and zero cents			19.00	3,705.00

00300-12

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
41	Dwarf Palmetto – 1 Gallon	36	EA		
@	Forty four dollars and zero cents			44.00	1,584.00
42	Temporary Watering to Establish Planting	6	MO		
@	Twenty one thousand dollars and zero cents			21,000.00	126,000.00
Temporary Demolition and Documentation					
43	Temporary Power	1	LS		
@	Eleven thousand eight hundred dollars and zero cents			11,800.00	11,800.00
44	Electrical Demolition	1	LS		
@	Twelve thousand five hundred dollars and zero cents			12,500.00	12,500.00
45	Red Lines, O&M Manuals	1	LS		
@	One thousand eight hundred dollars and zero cents			1,800.00	1,800.00

00300-13

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
Electric Utility Service					
46	Electrical Service Equipment	1	LS		
@	One thousand five hundred dollars and zero cents			1,500.00	1,500.00
47	Raised Platform (Including Foundation)	1	LS		
@	Thirty five thousand dollars and zero cents			35,000.00	35,000.00
48	Exposed Conduit, Fittings and Boxes	1	LS		
@	One thousand six hundred dollars and zero cents			1,600.00	1,600.00
49	Conductors	1	LS		
@	Six hundred dollars and zero cents			600.00	600.00
50	Termination, Testing, Start Up, Training (Electrical Utility Service)	1	LS		
@	Four thousand eight hundred dollars and zero cents			4,800.00	4,800.00

00300-14

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
Power Panel and Lighting Controls					
51	Electrical Equipment	1	LS		
@	Twelve thousand five hundred dollars and zero cents			12,500.00	12,500.00
52	Exposed Conduit, Fittings, and Boxes	1	LS		
@	Eight thousand five hundred dollars and zero cents			8,500.00	8,500.00
53	Conductors	1	LS		
@	Four hundred dollars and zero cents			400.00	400.00
54	Termination, Testing, Start Up, Training (Power Panel)	1	LS		
@	Four thousand eight hundred dollars and zero cents			4,800.00	4,800.00

00300-15

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
Trail Lighting Fixtures					
55	Light Fixtures (Including Sonotube, Concrete & Finish for 12" Elevation)	61	EA		
@	Two thousand one hundred dollars and zero cents			2,100.00	128,100.00
56	Light Fixtures (Including Sonotube, Concrete & Finish for 24" Elevation)	22	EA		
@	Two thousand one hundred dollars and zero cents			2,100.00	46,200.00
57	Underground Conduit	1	LS		
@	One hundred twenty seven thousand dollars and zero cents			127,000.00	127,000.00
58	Conductors	1	LS		
@	Thirty nine thousand dollars and zero cents			39,000.00	39,000.00
59	Grounding	83	EA		
@	One hundred twenty dollars and zero cents			120.00	9,960.00

00300-16

UNIT PRICE BID FORM

Item No.	Description of Item w/Unit Bid Price Written in Words	Qty.	Unit	Unit Bid Price	Extended Amount
60	Termination, Testing, Start Up (Light Fixtures)	1	LS		
@ <u>Eleven thousand dollars and zero cents</u>				11,000.00	11,000.00
Other Items					
61	Well Abandonment	1	LS		
@ <u>Twelve thousand dollars and zero cents</u>				12,000.00	12,000.00

5.2 Insert a lump sum figure for each of the alternates listed in TABLE 5.2 – ALTERNATES listed below:

Alternate Number	Alternate Description	Alternate Lump Sum
01210-1		\$
01210-2		\$
01210-3		\$
01210-4		\$
01210-5		\$
TOTAL ALTERNATE PRICE		\$

5.3 ADDENDA ACKNOWLEDGEMENT

ADDENDA NUMBER	ADDENDA DATE	DATE RECEIVED	BIDDERS INITIALED
1	3/7/2022	3/10/2022	
2			
3			
4			
5			

5.4 ALLOWANCES

1. Allowance Type \$

5.5 BID PRICES

A. TOTAL BASE BID 3,631,982.25

B. TOTAL ALTERNATES 0.00

C. TOTAL ALLOWANCES 0.00

D. TOTAL STIPULATED PRICE 3,631,982.25

PART VI: SIGNATURES

6.1 By signing this Document, I agree that I have received and reviewed all Addenda and considered all costs associated with the Addenda in calculating the Total Bid Price.

Company: _____ Jerdon Enterprise, L.P.
(Print Company Name)

Signed: _____
(Authorized Signature)

By: Jerdon Holding, LLC, General Partner

By: _____ Darrol Vincent, Jr.
(Print Name)

Title: _____ President
(Print Title)

ATTEST:

(Seal, if Bidder is a Corporation)
Gaye Durbin, Witness

13403 Redfish Lane
(Mailing Address)

Stafford, Texas 77477
(City, State and Zip Code)

13403 Redfish Lane
(Delivery Address)

Stafford, Texas 77477
(City, State and Zip Code)

281-261-5000
(Telephone Number)

281-261-5500
(Fax Number)

estimating@jerdonlp.com
(email Address)

PART VII: AFFADAVIT

All pages in offers' bid proposal containing statements, letters, etc. shall be signed by a duly authorized officer of the company, whose signature is binding on the proposal.

The undersigned offers and agrees to one (1) of the following:

- ☒ I hereby certify that I do not have outstanding debt with the City of Friendswood. Further, I agree to pay succeeding debts as they become due during this agreement.
- ☐ I hereby certify that I do have outstanding debts with the City of Friendswood and agree to pay said debts prior to execution of this agreement.
- ☐ I hereby certify that I do have outstanding debts with the City of Friendswood and agree to enter into an agreement for the payment of said debts. I further agree to pay succeeding debts as they become due.

Name of Offerer: Darrol Vincent, Jr.

Title: President

Address: 13403 Redfish Lane

City/State/Zip: Stafford, Texas 77477

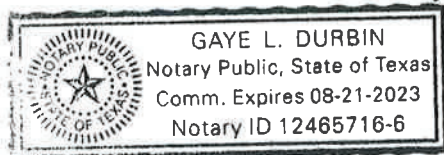
Telephone: 281-261-5000

Signature: [Signature]

By: Jerdon Holding, LLC, General Partner

SWORN AND SUBSCRIBED by me on this 14th day of March,
A. D. 2022.

Notary Public in and for Fort Bend County, Texas.



[Signature]
Notary Public Signature

Gaye L. Durbin
Print or Type Notary Public Name

NOTARY SEAL My Commission Expires: 08-21-2023

END OF DOCUMENT

00300-20

THE STATE OF TEXAS

COUNTY OF GALVESTON

§
§
§

**STANDARD AGREEMENT FOR
CONTRACTING SERVICES**

THIS AGREEMENT, entered into as of this 6th day of June, 2022, by and between the City of Friendswood, Texas (hereinafter called the "CITY") acting herein by its Mayor, duly authorized by approval of the City Council of the City of Friendswood and Jerdon Enterprise, L.P., 13403 Redfish Lane, Stafford, Texas 77477 (hereinafter called the "CONTRACTOR") acting herein by Darrol Vincent, Jr., President hereunto duly authorized:

WITNESSETH THAT:

WHEREAS, the CITY and the CONTRACTOR in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE I: WORK

- 1.1 The Contractor shall complete all the Work as specified in the Contract Documents. The Work is generally described as follows:

Construction of the Forest Bend Detention Pond and Appurtenances

- 1.2 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Forest Bend Detention Pond

ARTICLE II: DESIGN PROFESSIONAL

- 2.1 The Project has been designed by the City of Friendswood Department of Engineering & Projects, 15355 Blackhawk Blvd., Friendswood, TX 77546, who is hereinafter called the Design Professional and who is to act as the City's Representative, assume all duties and responsibilities and shall have the rights and authority assigned to the Design Professional in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE III: CONTRACT TIME

- 3.1 The Work shall be Substantially Complete within THREE HUNDRED AND THIRTY-FIVE (335) Calendar Days after the date when the Contract Time commences to run as provided by the General Conditions.
- 3.2 The Work shall have Final Completion and be ready for Final Payment in accordance with the General Conditions within THREE HUNDRED SIXTY-FIVE (365) Calendar Days after the date when the Contract Time commences to run as provided by the General Conditions.

ARTICLE IV: LIQUIDATED DAMAGES

- 4.1 The City and the Contractor recognize that time is of the essence of this Agreement and that the City shall suffer financial loss if the Work is not completed within the time specified in Article 3.1 above, plus any extensions thereof allowed in accordance with the General Conditions. They also recognize the delays, expense and difficulties involved in proving the actual loss suffered by the City if the Work is not completed on time. Accordingly, instead of requiring any such proof, the City and the Contractor agree that as liquidated damages for delay (not as a penalty) the Contractor shall pay the City FIVE HUNDRED Dollars (\$500.00) for each day that expires after the time specified in Article 3.1, in this Agreement, for Substantial Completion until the Work is Substantially Complete.
- 4.2 After Substantial Completion, if the Contractor shall neglect, refuse or fail to complete the remaining Work within the time specified in Article 3.2 for Final Completion and readiness for Final Payment or any proper extension thereof granted by the City, the Contractor shall pay the City FIVE HUNDRED Dollars (\$500.00) for each day that expires after the time specified in Article 3.2, in this Agreement, for Final Completion until the Work is Finally Complete and ready for Final Payment.
- 4.3 Contractor agrees any assessed liquidated damages may be offset against retainage held by the City.

ARTICLE V: CONTRACT PRICE

- 5.1 The City shall pay the Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Document 00300B – UNIT Price Form.
- 5.2 TOTAL AMOUNT OF BID is THREE MILLION SIX HUNDRED THIRTY-ONE THOUSAND NINE HUNDRED EIGHTY-TWO AND 25/100 DOLLARS (\$3,631,982.25).
- 5.3 As provided in the General Conditions, estimated quantities are not guaranteed and determinations of actual quantities and classifications are to be made by the City as provided in the General Conditions. Unit prices have been computed as provided in the General Conditions. Unit prices specified as per lump sum have been computed an accordance with of the General Conditions.

ARTICLE VI: PAYMENT PROCEDURES

- 6.1 The Contractor shall submit Document 00940 – Contractor Payment Application and Document 00945 – Contractor Pay Request in accordance with the General Conditions. Payment Applications shall be processed by the City as provided in the General Conditions.
- 6.2 Progress Payments; The City shall make progress payments on account of the Contract Price on the basis of the Contractor's Payment Application on or about the twentieth (20th) day of each month during construction as provided in

Paragraph 6.3 below. All such payments shall be measured by the schedule of value established in Section 01295 – Schedule of Values (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

- 6.3 Prior to Substantial Completion progress payments shall be made equal to the percentage of the Work completed, as established above, and materials and/or equipment not incorporated in the work completed but delivered, suitably stored, and accompanied by suitable documentation satisfactory to the City as provided in the General Conditions. Progress payments shall be made less retainage as indicated in Paragraph 6.4 and 6.5 below, but in each case, less the aggregate of payments previously made less such amounts as the City shall determine or withhold, in accordance with of the General Conditions.
- 6.4 Retainage prior to Substantial Completion; If the total Contract Price at the time of Contract Execution is FOUR HUNDRED THOUSAND DOLLARS (\$400,000) or more, pursuant to Section 2252.033 of the Texas Government Code, the agreed retainage until Substantial Completions shall be five percent (5%), otherwise the agreed retainage shall be ten percent (10%).
- 6.5 Retainage after Substantial Completion: On projects where a long period of time is expected to occur between the Substantial Completion and Final Acceptance, retainage may be reduced by one-half (1/2). The reduced retainage shall never be less that the expected value of any work requiring correction or unfinished work. A portion of the retainage shall always be held until issuance of a Certification of Final Completion.

ARTICLE VII: INTEREST

- 7.1 All monies except retainage, not paid when due as provided in the General Conditions shall bear interest at the rate specified in Section 2251.025 of the Texas Government Code.

ARTICLE VII: CONTRACTOR'S REPRESENTATIONS

In order to induce the City to enter into this Agreement the Contractor makes the following representations:

- 8.1 The Contractor has examined and carefully studied the Contract Documents (including the Addenda listed in Article IX) and other related data indentified in the Documents including "technical data" and performed a constructability review.
- 8.2 The Contractor has visited the site and become familiar with and is satisfied as to the general local and site conditions, including utilities that may affect cost, progress, performance and furnishing of the Work.
- 8.3 The Contractor is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work.

- 8.4 The Contractor has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in the General Conditions. Contractor accepts the determination set forth in the Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which the Contractor is entitled to rely as provided in the General Conditions. The Contractor acknowledges that such reports and drawings are not Contract Documents and may not be complete for the Contractor's purposes. The Contractor acknowledges that the City and the Design Professional shall not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract Documents with respect to Underground Facilities at or contiguous to the site. The Contractor has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by the Contractor and safety precautions and programs incident hereto. The Contractor does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with other terms and conditions of the Contract Documents.
- 8.5 The Contractor is aware of the general nature of work to be performed by the City and others at the site that relates to the Work as indicated in the Contract Documents.
- 8.6 The Contractor has correlated the information known to the Contractor, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- 8.7 The Contractor has given the City written notice of all conflicts, errors, ambiguities or discrepancies that the Contractor has discovered in the Contract Documents and the written resolution thereof by the City is acceptable to the Contractor, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE IX: THE CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between the City and the Contractor concerning the Work consists of the following:

- 9.1 Document 00105 – List of Drawings (Cover Sheet and sheets numbered 2 through 83).
- 9.2 Document 00110 – Invitation to Bidders.

- 9.3 Document 00115 – Instructions to Bidders.
- 9.4 Document 00300B – UNIT Price Form (Pages 1 through 20 inclusive) as included herein.
- 9.5 Document 00400 – Standard Agreement for Contracting Services (this agreement, pages 1 through 8 INCLUSIVE).
- 9.6 Document 00430 – Affidavit for Insurance, and Certificates of Insurance, included herein.
- 9.7 Document 00445 – City of Friendswood Drug and Alcohol Policy.
- 9.8 Document 00455 – Storm Preparation Policy.
- 9.9 Document 00460 – Hazardous Communications Policy.
- 9.10 Document 00465 – Homeland Security Policy.
- 9.11 Document 00470 – Performance Bond, included herein.
- 9.12 Document 00475 – Payment Bond, included herein.
- 9.13 Document 00500 – General Conditions.
- 9.14 Document 00600 – Supplemental Conditions.
- 9.15 Document 01295 – Certificate of Interested Parties – Texas Ethics Commission (FORM 1295)
- 9.16 Technical Specifications Divisions 1 through 16, inclusive as listed in Document 00005 – Table of Contents.
- 9.17 Addenda as issued, included herein.
- 9.18 Any modification, including Change Orders, duly delivered after Execution of the Agreement.

There are no Contract Documents other than those listed above in this Article IX. The Contract Documents shall only be altered, amended, or repealed by a modification (as defined in the General Conditions).

ARTICLE X: INDEMNIFICATION

CONTRACTOR SHALL PROTECT, DEFEND, INDEMNIFY, AND HOLD THE CITY, ITS OFFICERS, ELECTED OFFICIALS, AGENTS, AND EMPLOYEES, HARMLESS FROM ANY CLAIMS, FINES, DEMANDS, LOSS, DAMAGE, SUIT, AND LIABILITY OF EVERY KIND, INCLUDING ALL EXPENSES OF LITIGATION, COURT COSTS, AND ATTORNEY'S FEES, FOR INJURY TO OR

DEATH OF ANY PERSON, OR FOR DAMAGE TO ANY PROPERTY, CAUSED BY THE NEGLIGENT, INTENTIONAL OR WILLFUL ACTS OR OMISSIONS OF THE CONTRACTOR, ITS OFFICERS, EMPLOYEES, AGENTS, CONTRACT LABORERS, OR SUBCONTRACTORS IN THE PERFORMANCE OF THIS AGREEMENT.

CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE LAWS, RULES, AND REGULATIONS IN CONNECTION WITH THE SERVICES OF CONTRACTOR AND SHALL EXONERATE, INDEMNIFY, DEFEND, AND HOLD HARMLESS THE CITY, ITS OFFICERS, AGENTS AND ALL EMPLOYEES FROM ANY AND ALL LIABILITY, LOSS OR DAMAGE ARISING OUT OF NONCOMPLIANCE WITH SUCH LAWS, RULES AND REGULATIONS, WITHOUT LIMITATION. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR PAYMENTS OF FEDERAL, STATE AND LOCAL TAXES OR CONTRIBUTIONS IMPOSED OR REQUIRED UNDER THE SOCIAL SECURITY, WORKER'S COMPENSATION, AND INCOME TAX LAWS WITH RESPECT TO CONTRACTOR'S EMPLOYEES. FURTHER, CONTRACTOR SHALL EXONERATE, INDEMNIFY, DEFEND, AND HOLD HARMLESS THE CITY, ITS OFFICERS, AGENTS AND ALL EMPLOYEES FROM ANY AND ALL LIABILITY, LOSS, DAMAGES, EXPENSES OR CLAIMS ARISING OUT OF ANY ACT OR OMISSION, INTENTIONAL TORT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER OF CONTRACTOR, ITS OFFICERS, AGENTS AND EMPLOYEES IN CONNECTION WITH ANY OF THE WORK PERFORMED OR TO BE PERFORMED UNDER THIS CONTRACT BY CONTRACTOR OR AS A RESULT OF CONTRACTOR'S FAILURE TO USE AND EMPLOY REASONABLE SKILL AND CARE BEFITTING THE PROFESSION IN ACCORDANCE WITH THE TERMS OF THIS AGREEMENT. FURTHER, CONTRACTOR SHALL EXONERATE, INDEMNIFY, DEFEND, AND HOLD HARMLESS THE CITY, ITS OFFICERS, AGENTS, AND ALL EMPLOYEES FROM ANY AND ALL LIABILITY, LOSS, DAMAGES, EXPENSES OR CLAIMS FOR INFRINGEMENT OF ANY INTELLECTUAL PROPERTY ARISING OUT OF THE USE OF ANY PLANS, DESIGN, DRAWINGS, OR SPECIFICATIONS FURNISHED BY CONTRACTOR IN THE PERFORMANCE OF THIS AGREEMENT.

THE FOREGOING INDEMNIFICATION PROVISION SHALL APPLY TO CONTRACTOR REGARDLESS OF WHETHER OR NOT SAID LIABILITY, LOSS, DAMAGES, EXPENSES, OR CLAIMS IS CAUSED IN PART BY A PARTY INDEMNIFIED HEREUNDER.

THE CONTRACTOR SHALL REQUIRE ALL OF ITS APPROVED SUBCONTRACTORS TO INCLUDE IN THEIR SUBCONTRACTS, A RELEASE

**AND INDEMNITY IN FAVOR OF THE CITY IN SUBSTANTIALLY THE SAME
FORM AS ABOVE.**

ARTICLE XI: MISCELLANEOUS

- 11.1 Terms used in this Agreement which are defined in the General Conditions will have the meanings indicated in the General Conditions.
- 11.2 No assignment by a party hereto of any rights under or interests in the Contract Documents shall be binding on another party hereto without written consent of the party sought to be bound; and specifically but without limitation, monies that may become due and monies that are due but may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment shall release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 11.3 The City and the Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.
- 11.4 Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon the City and the Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close to expressing the intention of the stricken provision.
- 11.5 Other Provisions – None.

ARTICLE XII: ADDRESSES FOR GIVING NOTICES

- 12.1 The City:

City of Friendswood
910 S. Friendswood Drive
Friendswood, Texas 77546
- 12.2 The Contractor:

Jerdon Enterprise, L.P.
13403 REDFISH LANE
STAFFORD, TX 77477

ARTICLE XIII: VENUE

- 13.1 Any action brought by either party based on any claim arising under or as a result of this contract shall be brought in a court of competent jurisdiction in Galveston

**CITY OF FRIENDSWOOD
STANDARD CONTRACT AGREEMENT**

**CONTRACTING
SERVICES**

County, Texas.

**CITY OF FRIENDSWOOD
STANDARD CONTRACT AGREEMENT**

**CONTRACTING
SERVICES**

EXECUTED IN on behalf of the Contractor by Darrol Vincent its President shown below,
and on behalf of the City by Mike Foreman, its Mayor, thereto duly authorized this 6th day
of June, 2022.

ACCEPTED:

CITY:

CITY OF FRIENDSWOOD, TEXAS

MIKE FOREMAN, Mayor

PROPOSED AND AGREED TO:

CONTRACTOR:

JERDON ENTERPRISE, L.P., a Texas
Limited Partnership

By: JERDON HOLDING, LLC, its
General Partner

BY: _____
(Signature)

Darrol Vincent, Jr.
(Printed Name)

President
(Title)

DATE: _____

DATE: 5-26-22

ATTEST:

LETICIA BRYSCH, City Secretary

ATTEST:

(OFFICER OR SECRETARY)
Gaye Durbin, Secretary

APPROVED AS TO FORM:

KAREN HORNER, City Attorney

END OF SECTION

DOCUMENT 00430
AFFIDAVIT OF INSURANCE

BEFORE ME, the undersigned authority, on this day personally appeared
Darrol Vincent, Jr., who being by me duly sworn on their oath
stated that HE is President of
Jerdon Enterprise, L.P., a representative of the Contractor named
and referred to within the Contract Documents; that they are fully competent and
authorized to give this affidavit and that the attached original insurance
certificate(s) truly and accurately reflects the insurance coverage that is now
available and will be available during the term of the Contract.



(Affiant's Signature) Darrol Vincent, Jr., President
By: Jerdon Holding, LLC, General Partner

June 1, 2022

(Date)

SWORN AND SUBSCRIBED by me on this 1st day of June,
A.D. 2022.

Notary Public in and for Fort Bend County, Texas.

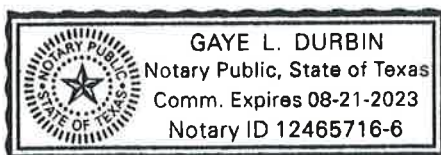


Notary Public Signature

Gaye L. Durbin

Print or Type Notary Public Name

NOTARY SEAL



My Commission Expires: 08-21-2023

END OF DOCUMENT

**DOCUMENT 00445
ALCOHOL AND DRUG FREE WORKPLACE**

The following document is the Alcohol Policy for the City of Friendswood.

15.09 (I) ALCOHOL AND DRUG FREE WORKPLACE POLICY AND PROCEDURE

**CITY OF FRIENDSWOOD
ALCOHOL AND DRUG FREE WORKPLACE**

I. POLICY STATEMENT

In order to effectuate an alcohol and drug free workplace, the following general policy statements are hereby adopted:

- A. Employees shall not be permitted to report to work while under the influence of alcohol or drugs, or to possess or transfer drugs or alcohol to any person while on duty. Provided however, this policy statement shall not be construed to apply to members of the City Police Department or Emergency Medical Technicians when their duties require the lawful possession of seized of alcohol or drugs, or the transport thereof.
- B. Employees who are reasonably suspected of being under the influence of alcohol or drugs shall be prohibited from engaging in further work, and shall be subject to immediate testing in accordance with the procedures herein established.
- C. In recognition of serious duties and responsibilities entrusted to employees of the City and that use of alcohol or drugs hinder one's ability to perform and fulfill such duties and responsibilities, these policies are adopted to establish guidelines for the detection and deterrence of alcohol and drug abuse.
- D. When applying the policies contained herein, Management should always focus on the ability of the employee to prosecute his work. Tests and procedures outlined herein are only intended as tools to assist Management, not as a replacement of Management's responsibilities over employees in the performance of their duties.

II. PURPOSE OF POLICIES

The purpose of the alcohol and drug free workplace policies contained herein is as follows:

- A. To promote and maintain a safe, healthy, and productive work environment for all city employees.
- B. To ensure the safe and efficient delivery of services to the citizens of the city.
- C. To eliminate the abusive use of alcohol, illegal drugs, prescription drugs, or any other substance which could impair an employee's ability to perform safely and effectively the functions of any given job; and
- D. To establish compliance by the city with any and all state and federal rules and regulations relating to the establishment and maintenance of an alcohol and drug free workplace.

III. DEFINITIONS

For the purpose of these policies the following words, terms, and phrases shall have the meanings ascribed thereto:

- A. **"Alcohol"** means any beverage that contains ethyl alcohol (ethanol), including but not limited to, beer, wine and distilled spirits.

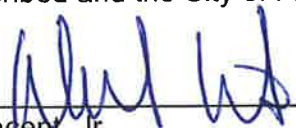
- B. **“Biological Testing”** or **“chemical testing”** or **“drug testing”** means the scientific analysis of urine, blood, breath, saliva, hair, tissue, and other specimens of the human body for the purpose of detecting alcohol or drugs.
- C. **“Chain of custody”** means procedures to account for the integrity of each urine specimen by tracking its handling and storage from point of specimen to collection to final disposition of the specimen. These procedures shall require that an approved chain of custody form be used from time to collection to receipt by the laboratory and that upon receipt of the laboratory an appropriate chain of custody form(s) account for the sample or sample aliquot within the laboratory. Chain of custody forms shall, at minimum, include an entry documenting date and purpose each time a specimen or aliquot is handled or transferred and identifying every individual in the chain of custody.
- D. **“Collection site”** means a place where individuals present themselves for the purpose of providing body fluids or tissue samples to be analyzed for specified controlled substances. A collection site will have all necessary personnel, materials, equipment, facilities and supervision to provide for collection, security, temporary storage, and transportation or shipment of the samples to a laboratory.
- E. **“Collection site person”** means a person who instructs and assists individuals as a collection site and who receives and makes initial examination of the specimens provided by those individuals. A collection site person shall have successfully completed training to carry out this function.
- F. **“Contract vendor”** means an independent testing or administrative agency engaged for the purpose of implementing one or more procedures in the collection or testing of employees for alcohol or drug use.
- G. **“City Premises”** or **“City Facilities”** means all property of the City including, but not limited to, buildings and surrounding areas on City-owned or leased vehicles and equipment wherever located. It also includes premises where the city performs contract services.
- H. **“Confirmatory test”** means a second analytical procedure to identify the presence in urine specimen of a specific drug or metabolite which is independent of initial test and which uses a different technique and chemical principle from that of the initial test in order to ensure reliability and accuracy. Gas chromatography/mass spectrometry (GC/MS) is the only authorized confirmatory test method.
- I. **“Contraband”** means any article, the possession of which on City premises or while on City business,, causes as individual to be in violation of a City work rule. Contraband includes illegal drugs and alcohol beverages and drug paraphernalia.
- J. **“Controlled Substances”** means all substances listed in Schedule I through V of the Controlled Substances Abuse Act as those schedules may be revised from time to time.
- K. **“Drug”** means any substance that is a controlled substance.
- L. **“Employee”** means an employee, contractor, subcontractor, agent, officer, or representative of the City.
- M. **“Illegal Drug”** means any drug which is not legally obtainable; any drug which is legally obtainable but has not been legally obtained; any prescribed drug not being used for the prescribed purpose; and over-the-counter drug being used at a dosage level different than recommended by the manufacturer or being used for a purpose other than intended by the manufacturer or being used for a purpose not in accordance with bona fide medical therapy. Examples of illegal

- drugs are Cannabis substance such as marijuana and hashish, cocaine, heroin, phencyclidine (PCP), and so –called designer drugs and look-alike drugs.
- N. **“Initial test” or “screening test” or “preliminary test”** means in the context of drug detection an immunoassay screen to eliminate negative uria specimens from further consideration. In the context of alcohol detection, these terms mean an analysis of breath or saliva specimens for the purpose of eliminating negative specimens from further consideration.
- O. **“Legal drug”** means any prescribed drug or over-the-counter drug, which has been legally obtained and is being used for the purpose of which prescribed or manufactured.
- P. **“Medical practitioner”** means a licensed physician.
- Q. **“Under the Influence”** means any detectable trace or amount.

**CONTRACTOR’S CERTIFICATION FOR COMPLIANCE TO
THE CITY OF FRIENDSWOOD
ALCOHOL AND DRUG FREE WORKPLACE POLICIES**

This is to certify that the officers and operating management of Jerdon Enterprise, L.P. have read and acknowledge understanding of and agreement with the provisions of the City of Friendswood, Texas Alcohol and Drug Free Workplace policies, and the implementing procedures related thereto.

This certification confirms our obligation to comply with the above-named policies and we further acknowledge and agree that our failure to comply with the provisions thereof shall constitute a material breach of that certain Contract dated June 6, 2022, by and between the aforescribed and the City of Friendswood, Texas.



Darrol Vincent, Jr.
President
By: Jerdon Holding, LLC, General Partner

June 1, 2022

Date

END OF DOCUMENT

**DOCUMENT 00455
CONSTRUCTION STORM PREPARATION POLICY**

PART I: GENERAL

- 1.1 The City of Friendswood has instituted a storm preparation policy to help protect citizens and property from damage due to loose construction materials driven by storm winds. Storms covered by this policy may be tropical disturbances, hurricanes, and systems of disturbed weather associated with weather front movements.
- 1.2 Storms from the Gulf of Mexico and systems of disturbed weather associated with fronts are preceded by a warning system from the National Weather Service that allows some time to prepare.

PART II: DEFINITIONS

2.1 WATCH

- A. A National Weather Service notice indicating that a particular hazard is possible, i.e., that conditions are more favorable than usual for its occurrence. A watch is a recommendation for planning, preparation, and increased awareness (i.e., to be alert for changing weather, listen for further information, and think about what to do if the danger materializes).

2.2 WARNING

- A. A notice issued by the National Weather Service local offices indicating that a particular weather hazard is either imminent or has been reported. A warning indicates the need to take action to protect life and property. The type of hazard is reflected in the type of warning (e.g., tornado warning, hurricane warning, etc.)

2.3 GALE AND STORM WARNINGS

- A. Gale warning may be issued when winds of 39-54 miles an hour (34-47 knots) are expected. Storm Warnings may be issued when winds of 55-73 miles an hour (48-63 knots) are expected. If a hurricane is expected to strike a coastal area, gale or storm warnings will not usually precede hurricane warnings.

2.4 HURRICANE ADVISORY

- A. A notice issued by the National Hurricane Center, numbered consecutively for each storm, describing the present and forecasted position and intensity. Advisories are issued at six (6) hour intervals at midnight, 6 a.m., noon, and 6 p.m., Eastern Daylight Time. Bulletins provide additional information. Each message gives the name, eye position, and intensity and forecast movement of the storm.

2.5 HURRICANE WATCH

- A. An announcement added to a hurricane advisory that hurricane conditions pose a possible threat to a specified coastal area within thirty-six (36) hours. A watch is used to inform the public and marine interests of the storms location and intensity, and movement.

2.6 HURRICANE WARNING

- A. A warning added to a hurricane advisory that sustained winds of 74 mph (64 knots) or higher associated with a hurricane are expected in a specified coastal area within twenty-four (24) hours or less. A hurricane warning can remain in effect when dangerously high water or a combination of dangerously high water and exceptionally high waves continue, even though winds may be less than hurricane force. A warning is issued to inform the public and marine interest of the storms location, intensity, and movement. The NHC chooses a distance of approximately 300 miles.

2.7 SEVERE THUNDERSTORM WATCH

- A. A notice that severe thunderstorms are possible in your area.

2.8 SEVERE THUNDERSTORM WARNING

- A. A notice that severe thunderstorms are occurring.

PART III: EXECUTION

3.1 PHASE 1 – ALERT/WATCH PHASE

- A. This phase shall go into affect with a call and Fax from the City of Friendswood to the Contractor. The Contractor's superintendent on site shall also be informed and the Project Manager shall go over the steps that shall to be taken. This shall be initiated when The National Weather Service issues a watch or warning indicating a Gulf storm system or a severe weather front exists and poses a "potential" threat to the Friendswood area.
- B. The following actions shall be taken during an Alert/Watch Phase:
 - 1. The Contractor shall immediately undertake cleanup operations at the job site.
 - 2. Make preparations to remove all debris and trash from the site.
 - 3. Stack and secure other materials that are subject to wind movement.
 - 4. Make preparations to back-fill all excavations and secure all equipment.
 - 5. Secure all facilities such as trailers, port-a-cans, tool sheds, etc.
 - 6. Doors and windows are to be closed and locked.

3.2 Phase 2 – Threat / Warning Phase

- A. When Friendswood is within the predicted impact area as in the path of a severe weather front, or in the path of a hurricane, additional preparation must be made. Phase Two (2) shall go into affect with a second (2nd) call from the City of Friendswood to the contractor.
- B. The following action shall be taken during a Threat/Warning Phase:
 - 1. The Contractor shall immediately suspend ALL building operations.
 - 2. All materials shall be tied down to resist the reported National Weather Service probable winds. Always assume the worst-case wind.
 - 3. Any materials that are not tied down shall be stored in heavy containers or carried off the job site.
 - 4. If structures are partly finished, storm bracing shall be added to withstand the probable storm winds.
 - 5. All windows are shall protected from flying debris and wind damage.
 - 6. All equipment shall be stored or removed from the job site to a safe

- place.
- 7. Trailers, port-a-cans, and any other facilities shall be tied down.
- 8. All excavations shall be covered.
- 9. All incomplete work shall be stabilized.
- 10. Take necessary precautions against rising water – some sites may be in flood prone areas.

3.3 TRAFFIC CONTROL DEVICES

- A. All Traffic Control devices for the project shall be in place and in good condition. Traffic Control Devices are **NOT** to be secured or extra weight added to hold them in place. Traffic Control Devices are to remain as originally placed and within the guidelines of the TMUTCD.
- B. All Traffic Control signage shall be cleaned for visibility, and if not up to current TMUTCD standards shall be replaced.

3.4 NOTIFICATION CONTACTS

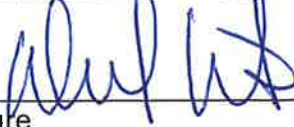
- A. Each Contractor shall provide and maintain a contact name and two Alternates with day and night telephone numbers to The City of Friendswood for these emergency notifications.

**CITY OF FRIENDSWOOD
TECHNICAL SPECIFICATIONS**

**CONSTRUCTION STORM
PREPARATION POLICY**

This is to certify that the officers and operating management of Jerdon Enterprise, L.P. have read and acknowledge understanding of and agreement with the provisions of the City of Friendswood, Storm Policy, and the implementing procedures related thereto. The emergency contacts listed below have been given copies of this policy and instructed in the procedures contained herein.

This certification confirms our obligation to comply with the above-named policies and we further acknowledge and agree that our failure to comply with the provisions thereof shall constitute a material breach of that certain Contract dated June 6, 2022, by and between the aforescribed and the City of Friendswood, Texas.



Signature
By: Jerdon Holding, LLC, General Partner
Jerdon Enterprise, L.P.

Company Name

Darrol Vincent, Jr., President
Print Name

COMPANY CONTACTS:

Darrol Vincent, Jr.
Contact #1 Name

281-261-5000 ext 2005
Daytime Phone Number

832-844-6104
Nighttime Phone Number

Maddie Kuebker
Contact #3 Name

281-261-5000 ext 2010
Daytime Phone Number

713-252-2824
Nighttime Phone Number

Jason Brenner
Contact #2 Name

281-261-5000 ext 2013
Daytime Phone Number

832-600-1630
Nighttime Phone Number

CITY OF FRIENDSWOOD CONTACTS:

Contact #1 Name

Jildardo Arias, PE, CFM
Director of Engineering
(281) 993-3411

Contact #2 Name

Bria Whitmire, PE, CFM
Project Coordinator
(281) 996-3208

Contact #3 Name

Rick Watkins
Project Manager
(281) 996-3292

Any nighttime contact will be made via Police Department Dispatch at (281) 996-3300.

END OF DOCUMENT

**DOCUMENT 00460
HAZARDOUS COMMUNICATIONS PROGRAM
REQUIREMENT AGREEMENT
For Contractors Performing Work Under Contract**

PART I: GENERAL

Whereas, the City of Friendswood desires to comply with the Texas Hazard Communications Act of the Health and Safety Code, provide and maintain a safe and healthy work environment for its employees, citizens and contractors and to provide for the free access to and communication of information pertaining to the use and storage of materials in the workplace; and

Whereas, the City of Friendswood wants to ensure that its contractors do the same.

Accordingly, the City of Friendswood's Hazard Communications Program maintains a list of all materials stored or used within its sites and facilities. Additionally, the City maintains and updates its inventories of MSDS on a routine basis so as to provide its employees, citizens and contractors with the most accurate and up-to-date information pertaining to materials that an employee or contractor might come into contact with during the course of normal operations.

The City acknowledges its obligations under these States and federal laws to make any and all such information available to the contractor, his employees, vendors and sub-contractors for sites or facilities within which its contractors, their employees, vendors and sub-contractors are engaged in work.

It is hereby understood and agreed that Greenscape Six, LLC, performing the work of the contract for FY2021-2022 Concrete Street Maintenance, shall provide and maintain, within the limits of all applicable laws, a satisfactory job-site Hazard Communications program including, but not limited to, an Employer Right to Know information center, which shall have a Hazard Communication Information Binder for all chemicals, materials and substances that are required for, used, stored, or incorporated into the work of the contract and a Workplace chemical list.

The Contractor shall retain all legal responsibility for providing and maintaining this center and providing accurate and an up-to-date list of all such materials chemicals and substances and the appropriate Material Safety Data Sheets (MSDS) throughout the duration of the contract or as long as the Contractor's forces, materials, substances or chemicals remain or continue to be stored on site.

The Contractor further agrees to notify the City's representative in advance if any of the work requires the use of or storage of any "hazardous chemical."

The terms and conditions of this agreement shall remain a part of the Contract and in force whether attached to the Contract or not.

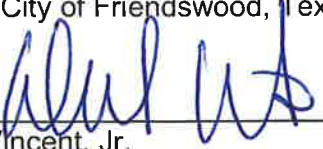
PART II: DEFINITIONS

2.1 "Contractor"

00460-1

- A. Any entity legally contracted with the City of Friendswood for the purpose of providing services or goods of any nature in exchange for monetary consideration.
- 2.2 "Duration of Contract"
- A. The agreed contract time as defined and amended by the terms of the agreement.
- 2.3 "Employee vendor and sub-contractor"
- A. Means a person or group who may be or may have been exposed to hazardous chemicals in the person's workplace under normal operating conditions or foreseeable emergencies, and includes a person working for this state, a person working for a political subdivision of this state, or a member of a volunteer emergency service organization
- 2.4 "Hazardous chemical" or "chemical"
- A. Means an element, compound, or mixture of elements or compounds that is a physical hazard or health hazard as defined by the OSHA standard in 29 CFR Section 1910.1200(c), or a hazardous substance as defined by the OSHA standard in 29 CFR Section 1910.1200(d)(3), or by OSHA's written interpretations. A hazard determination may be made by employers who choose not to rely on the evaluations made by their suppliers if there are relevant qualitative or quantitative differences. A hazard determination shall involve the best professional judgment.
- 2.5 "Material Safety Data Sheet" ("MSDS")
- A. Means a document containing chemical hazard and safe handling information that is prepared in accordance with the requirements of the OSHA standard for that document.
- 2.6 "Workplace chemical list"
- A. Means a list of hazardous chemicals developed under Section 502.005(a) of the Texas Health and Safety Code.

This certification confirms our obligation to comply with the above-named policies and we further acknowledge and agree that our failure to comply with the provisions thereof shall constitute a material breach of that certain Contract dated June 6, 2022, by and between the aforescribed and the City of Friendswood, Texas.



Darrol Vincent, Jr.
President

By: Jerdon Holding, LLC, General Partner

June 1, 2022

Date

END OF DOCUMENT

**DOCUMENT 00465
CITY OF FRIENDSWOOD
HOMELAND SECURITY ISSUES
FOR
CITY'S CONTRACTORS**

On October 8, 2001 the President of the United States established the Department of Homeland Security. The Department of Homeland Security implemented the National Strategy for Homeland Security on October 8, 2002. Providing Homeland Security for potable water systems is a federally mandated requirement for Owner/Operators of public water systems as evidenced in Homeland Security Presidential Directive HSPD-7 on December 17, 2003. The City of Friendswood has accepted this responsibility to protect the potable water system that serves its customers.

The responsibility to maintain a secure site falls upon the Contractors working at or on water system improvements. Unfortunately this responsibility has not always been accepted and maintained by the City's Contractors.

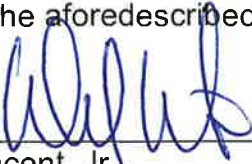
The City is very serious about it's responsibilities to protect the potable water system. Contractors that do not maintain secure sites, per instructions from the City, shall be subject to financial and civil legal action provided by the Contract and the Judicial System. Contractors that repeatedly fail to maintain a secure site may be locked out of the site until they comply with all the requirements of securing the site.

The City has the right to have security provisions implemented and to deduct said cost from the Contract as a last resort.

For the purpose of this document the meaning of secure is as follows: Reducing the vulnerability of critical infrastructure or key resources in order to deter, mitigate or neutralize terrorist attacks.

At a minimum the contractor shall enclose such areas with a fence and padlock so that access to such areas is not easily accomplished.

This certification confirms our obligation to comply with the above-named policies and we further acknowledge and agree that our failure to comply with the provisions thereof shall constitute a material breach of that certain Contract dated June 6, 2022 , by and between the aforescribed and the City of Friendswood, Texas.



Darrol Vincent, Jr.

President

By: Jerdon Holding, LLC, General Partner

June 1, 2022

Date

**END OF DOCUMENT
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SECTION 00500B

GENERAL CONDITIONS

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1. THE AGREEMENT AND THE CONTRACT DOCUMENTS

The Drawings, Technical Specifications and Addenda, enumerated in the Agreement, shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said Documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit, or cast light on the interpretation of the provisions to which they refer.

2. DEFINITIONS

The following terms, as used in this Contract, are respectively defined as the following:

- A. "ADDENDA": Written or graphic instrument issued prior to Bid opening, which clarifies, modifies, corrects, or changes the Bid Documents.
- B. "ALTERNATE": The total amount bid for additions to the Work, as described in Section 01110 - Summary of Work. Each Alternate includes cost of effects on adjacent or related components, and Bidder's overhead and profit.
- C. "APPARENT LOW BIDDER": The bidder at the time of the bid opening who has the lowest documented bid before tabulation of the Bid Form.
- D. "BID": A complete and properly signed offer or proposal on Document 00300B – Unit Price Form or Document 00305B – Total Stipulated Price Form, setting forth price for the Work that shall be performed.
- E. "BID DATE": The date and time set for receipt of Bids as stated in Documents 00110B – Invitation to Bidders and 00115B – Instructions to Bidders, or as modified by Addenda.
- F. "BID DOCUMENTS": The Project Manual, the Drawings, and Addenda.
- G. "BIDDER": The person or firm who submits a Bid to the City.
- H. "CHANGE ORDER": A document which is signed by the Contractor and the City which authorizes an addition, deletion, or revision to the Work or an adjustment of the Contract Price or the Contract Time.
- I. "CITY": The City of Friendswood, Texas.
- J. "CODE": The City of Friendswood Code of Ordinances (CFCO).
- K. "CONSTRUCTABILITY REVIEW": A review and analysis by a Construction

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Professional of the Contract Documents and Drawings to report any errors, omissions, or inconsistencies that would prevent the project from being constructed according to the Contract Documents and Drawings.

- L. "CONTRACT DOCUMENTS": Those documents so designated Article IX of Document 00400 – Standard Agreement for Contracting Services.
- M. "CONTRACT PRICE": The monies payable by the City to the Contractor for Final Completion of the Work in accordance with the Contract Documents and as stated in Article V of Document 00400 – Standard Agreement For Contracting.
- N. "CONTRACT TIME": The number of Working Days to achieve Substantial and/or Final Completion as stated in Article III of Document 00400 – Standard Agreement For Contracting Services.
- O. "CONTRACTOR": A person, firm, or corporation with whom the Contract is made with the City.
- P. "DESIGN PROFESSIONAL": The individual or entity, either Engineer or Architect, with whom the City contracted for design and construction of the Work and named as such in Article II of Document 00400 – Standard Agreement For Contracting Services.
- Q. "DRAWINGS": The part of the Contract Documents prepared and/or approved and sealed by the Engineer which graphically shows the scope, extent, and character of the Work to be performed.
- R. "FINAL COMPLETION": The time at which all punch list items, start up procedures and other Closeout functions have been completed by the Contractor and verified by the Project Manager and recommends Final Acceptance of the Work to the City Council, and to release the Final Payment to the Contractor.
- S. "LOW BIDDER": The Bidder that submits a Bid with lowest Total Bid Price and has been verified by Bid Tabulation.
- T. "PROJECT MANAGER": The person designated by the City to represent the City during bidding, post-bid, and construction periods.
- U. "PROJECT MANUAL": A volume assembled for the Work that includes the bidding requirements, sample forms, the Conditions of the Contract, and the Technical Specifications.
- V. "SECURITY DEPOSIT": A certified check, cashier's check, or bid bond in the amount of five percent (5%) of the Total Bid Price.

- W. "SUBCONTRACTOR": A person, firm or corporation supplying labor and materials or only labor for the Work, and under a separate Contract Agreement with the Contractor.
- X. "SUBSTANTIAL COMPLETION": The time as specified in Paragraph 3.1 of Document 00400 – Standard Agreement For Contracting Service, at which time the Work has progressed to a point whereas the Work is sufficiently complete so that the Work, at the City's discretion, can be utilized and/or occupied.
- Y. "SUCCESSFUL BIDDER": The lowest responsible bidder to whom the City awards the Contract.
- Z. "SUPPLEMENTAL CONDITIONS": The part of the Contract Documents which amends or supplements the General Conditions.
- AA. "TECHNICAL SPECIFICATIONS": The City of Friendswood Technical Specifications (CFTS) and all other Specifications added to the Project Manual by the Design Professional for necessary completion of the Work.
- AB. "TOTAL BID PRICE": The total amount bid for performing the Work as identified by Bidder and including any and all alternates and allowances.
- AC. "WORK": The entire construction required to be provided under the Contract Documents which includes, but is not limited to, performing or providing labor, services, documentation and the furnishing, installation and incorporation of materials and equipment as required by the Contract Documents.
- AD. "WORKING DAY": Any calendar day from Monday through Friday, excluding City Holidays, in which four (4) or more consecutive hours of work on the Critical Path can be performed between the hours of seven (7) A.M. and eight (8) P.M. inclusive.

3. TERMINATION OF CONTRACT FOR CAUSE

If, through any cause, the Contractor shall fail to fulfill in a timely and proper manner the Contractor's obligations under this Contract, or if the Contract shall violate any of the covenants, agreements or stipulations of this Contract, the City shall thereupon have the right to terminate this Contract by giving written notice to the Contractor and specifying the effective date thereof, at least five (5) days before the effective date of such termination. In such event, all finished or unfinished Documents, data, studies, surveys, drawings, maps, models, photographs and reports prepared by the Contractor under this Contract shall, at the option of the City, become its property and the Contractor shall be entitled to receive just and equitable compensation for any work satisfactorily completed hereunder. Notwithstanding the above, the Contractor shall not be relieved of

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liability to the City for damages sustained by the virtue of any breach of the Contract by the Contractor, and the City shall withhold any payments due to the Contractor for the purpose of set-off until such time as the exact amount of damages due the City from the Contractor is determined.

City also has the right to breach the Contract by anticipated repudiation if the rate of progress of the Work is so behind that the Contractor cannot finish on time.

4. PERSONNEL

- A. The Contractor represents that he has, or will secure at his own expense, all personnel required in performing the Work under the Contract. Such personnel shall not be employees of or have any contractual relationship with the City.
- B. All work required hereunder shall be performed by the Contractor or under his supervision and all personnel engaged in the Work shall be fully qualified and shall be authorized or permitted under state and local law to perform such services.
- C. None of the Work covered by this Contract shall be subcontracted without prior written approval of the City. Any work or services subcontracted hereunder shall be specified by written Contract or agreement and shall be subject to each provision of this Contract.

5. REPORTS AND INFORMATION

The Contractor, at such times and in such forms as the City shall require, shall furnish the City such periodic reports as it may request pertaining to the Work or services undertaken pursuant to this Contract, the costs and obligations incurred or to be incurred in connection therewith, and any other matters covered by this Contract.

6. RECORDS AND AUDITS

The Contractor shall maintain accounts and records, including personnel, property and financial records, adequate to identify and account for all costs pertaining to the Contract and such other records as may be deemed necessary by the City to assure proper accounting for all project funds, both federal and non-federal.

These records shall be made available for audit purposes to the City or any authorized representative, and shall be retained for three (3) years after the expiration of this Contract unless permission to destroy them is granted by the City.

7. FINDINGS CONFIDENTIAL

All of the reports, information, data, etc., prepared or assembled by the Contractor under this Contract are confidential and the Contractor agrees that they shall not be made available to any individual or organization without the prior written approval of the City.

8. COPYRIGHT

No report, maps, or other Documents produced in whole in part under this Contract shall be subject of an application for copyright by or on behalf of the Contractor.

9. COMPLIANCE WITH LAWS

The Contractor shall comply with all applicable laws, ordinances, rules, orders, regulations, and codes of federal, state, and local governments relating to performance of the Work herein, the protection of adjacent property and the maintenance of passageways, guard fences or other protective facilities. The Contractor shall also comply with Document 00455 – Construction Storm Preparation Policy.

Failure of the Contractor to comply with all federal, state, and local applicable laws, ordinances, rules, order, regulations and codes, whether through lack of knowledge or negligence, does not relieve the Contractor to bring the Work into compliance at no additional cost to the City.

10. INTEREST OF MEMBERS OF THE CITY

No member of the governing body of the City, and no other officer, employee or agent of the City, who exercises any functions or responsibilities in connection with the planning and carrying out of the program, shall have any personal financial interest, direct or indirect, in this Contract; and, the Contractor shall take appropriate steps to assure compliance.

11. INTEREST OF OTHER LOCAL PUBLIC OFFICIALS

No member of the governing body of the locality and no other public official of such locality, who exercises any functions or responsibilities in connection with the planning and carrying out of the program, shall have any personal financial interest, direct or indirect, in this Contract; and, the Contractor shall take appropriate steps to assure compliance.

12. INTEREST OF CONTRACTOR AND EMPLOYEES

The Contractor covenants that he presently has no interest and shall not acquire any interest, direct or indirect, in the study area or any parcels therein or any other

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interest which would conflict in any manner or degree with the performance of his services hereunder. The Contractor further covenants that in the performance of this Contract, no person having any such interest shall be employed.

13. INCORPORATION OF PROVISIONS REQUIRED BY LAW

Each provision and clause required by law to be inserted into the Contract shall be deemed to be enhanced herein and the Contract shall be read and enforced as though each were included herein. If, through mistake or otherwise, any such provision is not inserted or is not correctly inserted, the Contract shall be amended to make such insertion on application by either party.

14. CERTIFICATES AND PERMITS

Except for required permits issued by the City, which shall be issued at no cost to the Contractor, the Contractor shall secure, at their own expense, from other public authorities all necessary certificates, licenses, approvals and permits required in connection with the Work of this Contract or any part thereof, and shall give all notices required by law, ordinance or regulation. It is the duty of the Contractor to know and find out what permits are needed. The Contractor shall pay all fees and charges incident to the due and lawful prosecution of the Work of this Contract, and any extra work performed by the Contractor.

15. GUARANTEE OF WORK

- A. Neither the Notice of Final Completion, the Final Payment nor any other provision in the Contract Documents nor partial or entire occupancy of the premises by the City shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any warranties or responsibility for faulty materials or workmanship. The Contractor guarantees and warrants that all materials and equipment which are to become part of the Work shall be new unless otherwise specified and that all work shall be of good quality and free from faults and defects and in accordance with the Contract Documents and of any inspections, tests or approvals required by the Contract Documents, law, ordinance, rules, regulations or orders of any public authority having jurisdiction. The City shall give notice of observed defects within reasonable promptness.
- B. Neither observations by the City's Design Professional nor inspections, tests or approvals by persons other than the Contractor shall relieve the Contractor from their obligations to perform the Work in accordance with the requirements of the Contract.
- C. The provisions of this paragraph shall be cumulative of and not in limitation of the responsibility of the Contractor for defects in the Work or materials or damages resulting therefrom as otherwise provided by the law of the State of

Texas or this Contract, including, without limitation, the implied warranty of fitness of the Work and the implied obligation to perform the Work in a good and workmanlike manner.

16. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

The Contractor shall be furnished additional instructions and detail drawings as necessary to carry out the Work included in the Contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and shall be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions. The Contractor and the City's Design Professional shall jointly (a) a schedule, fixing the dates at which special drawings will be required, such drawings, if any, to be furnished by the City's Design Professional in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the Work; each schedule to be subject to change from time to time in accordance with the progress of the Work.

17. SHOP OR SETTING DRAWINGS

The Contractor shall submit promptly to the City's Design Professional two (2) copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the City's Design Professional and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the City's Design Professional with two (2) corrected copies. Regardless of corrections made in or approval given to such drawings by the City's Design Professional, the Contractor shall nevertheless be responsible for the accuracy of such drawings and for their conformity to the Drawings and Technical Specifications, unless the Contractor notifies the City's Design Professional in writing of any deviations at the time such drawings are furnished.

18. MATERIALS, SERVICES, AND FACILITIES

- A. It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendents, temporary construction of every nature and all other services and facilities of every nature whatsoever necessary to execute, complete and deliver the work within the specified time.
- B. Any work necessary to be performed after regular working hours on Saturdays, Sundays or legal City Holidays shall be performed without any additional expense to the City. Such work shall only be performed after written notice is given to and approval given by the City. Notice shall be a

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minimum of forty-eight (48) hours previous to the commencement of such work and only within the specifications specified in Section 01140 – Work Restrictions.

19. CONTRACTOR'S TITLE TO MATERIALS

No materials or supplies for the Work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage or under a conditional sale Contract or other agreement by which an interest is retained by the seller. The Contractor warrants that they have good title to all materials and supplies used by the Contractor in the Work, free from all liens, claims, or encumbrances.

20. INSPECTION AND TESTING OF MATERIALS

- A. All materials and equipment used or any infrastructure produced in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the City. The City shall pay for all first (1st) laboratory inspection services directly and not as a part of the Contract. Should any materials, equipment or infrastructure fail the first (1st) test, the Contractor shall pay for all subsequent testing to show that items meet the specifications of the Contract.
- B. Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with the Technical Specifications and suitability for uses intended.

21. "OR EQUAL" CLAUSE

Whenever a material, article or piece of equipment is identified on the Drawings or in the Technical Specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and, any material, article or equipment of other manufacturers and vendors which shall perform adequately the duties imposed by the general design shall be considered equally acceptable provided the material, article or equipment so proposed is, in the opinion of the City's Design Professional, of equal substance and function. It shall not be purchased or installed by the Contractor without the City's Design Professional's and the City's written approval.

The "or equal" clause shall only pertain to materials, articles or equipment specified or identified as such. Material, articles, or equipment not listed as such shall not be substituted.

22. PATENTS

- A. The Contractor shall indemnify, defend, and hold and save the City and its

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officers, agents, servants and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of the Contract, including its use by the City, unless otherwise specifically stipulated in the Contract Documents.

- B. License or Royalty Fees: License and/or royalty fees for the use of a process which is authorized by the City for a project shall be reasonable and paid to the holder of the patent or their authorized licensee, direct by the City and not by or through the Contractor.
- C. If the Contractor uses any design, device, or materials covered by letters of patent or copyright, he shall provide for each use by suitable agreement with the City of such patented or copyrighted design, device, or material. It is mutually agreed and understood that, without exception, the Contract prices shall include all royalties or costs arising from the use of such design, device, or materials in any way involved in the Work. The Contractor and/or his Sureties shall indemnify, defend and save harmless the City from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this Contract, and shall indemnify the City for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the Work or after completion of the Work.

23. SURVEYS

Unless otherwise expressly provided for in the Technical Specifications, the City shall furnish the Contractor all surveys necessary for the execution of the Work.

At the beginning of the project the City shall have a surveyor set vertical and horizontal control points. All other surveying for construction and progression of the Work shall be the Contractors responsibility and incidental to the Contract.

24. CONTRACTORS OBLIGATIONS

The Contractor shall, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except otherwise expressly specified, necessary or proper to perform and complete all the Work required by this Contract, within the time herein specified, in accordance with the provisions of this Contract and any said Technical Specifications and in accordance with the Drawings covered by this Contract and any and all supplemental drawings and specifications, and in accordance with the directions of the City's Design Professional as given from time to time during the progress of the Work. The Contractor shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required.

The Contractor shall observe, comply with and be subject to all terms, conditions, requirements and limitations of the Contract and Technical Specifications, and shall do, carry on and complete the entire work to the satisfaction of the City and the City's Design Professional.

25. INSURANCE

The Contractor shall not commence and work under this Contract until all insurance required herein has been obtained and such insurance has been approved by the City, nor shall the Contractor allow any Subcontractor to commence work on this Subcontract until the insurance required of the Subcontractor has been so obtained and approved (See Document 00115B – Instructions to Bidders, Part XVIII).

All insurance shall be written by an insurer licensed to conduct business in the State of Texas.

26. SPECIAL CONDITIONS PERTAINING TO HAZARDS, SAFETY STANDARDS, AND ACCIDENT PREVENTION

A. Lead Based Paint Hazards:

(Applicable to Contracts for construction or rehabilitation of residential structures.)

The construction or rehabilitation of residential structures is subject to the HUD Lead-Based Paint regulations, 24 CFR Part 35. The Contractor and Subcontractors shall comply with the provisions for the elimination of lead-base paint hazards under subpart B of said regulations. The City shall be responsible for the inspections and certifications required under Section 35.14(f) thereof.

B. Use of Explosives:

When use of explosives is necessary for the prosecution of the Work, the Contractor shall observe all local, state, and federal laws in purchasing and handling explosives. The Contractor shall take all necessary precautions to protect completed work, neighboring property and all underground structures and utilities.

The Contractor shall notify all owners of public utility property of the intention to use explosives at least forty-eight (48) hours before blasting is done, close to such property. Any supervision or direction of use of explosives by the City does not in any way reduce the responsibility of the Contractor or his Surety for damages that may be caused by such use.

The Contractor shall subcontract to a company or firm that is licensed by

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state and federal entities for the purchase, transport, and use of such explosives. Subcontractor shall have a minimum of ten (10) years experience and shall be subject to the approval and verification of the City.

C. Danger Signals and Safety Devices (Modify as Required):

The Contractor shall make all necessary precautions to guard against damages to property and injury to persons. The Contractor shall put up and maintain in condition sufficient of red or warning lights at night, suitable barricades and other devices and signage necessary to protect the public. In case the Contractor fails or neglects to take such precautions or maintain same, the City shall have such lights, barricades, devices and/or signage installed and charge the cost of this work to the Contractor. Such action by the City does not relieve the Contractor of any liability incurred under these Technical Specifications or Contract. All such Signals or devices shall comply with the latest edition of The Texas Manual on Uniform Traffic Control Devices (TMUTCD).

27. SUSPENSION OF WORK

Should the City be prevented or enjoined from proceeding with work or from authorizing its prosecution either before or after its prosecution, by reason of any litigation, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay, but time completion of the Work shall be extended to such reasonable time as the City shall determine will compensate for time lost by such delay with such determination to be set forth in writing.

28. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

In order to protect the lives and health of the Contractor's employees under the Contract, the Contractor shall comply with all pertinent provisions of the Contract Work Hours and Safety Standards Act, as amended, commonly known as Construction Safety Act as pertains to health and safety standards; and shall maintain an accurate record of all cases of death, occupational disease and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on the Work under this Contract.

The Contractor alone shall be responsible for the safety, efficiency, and adequacy of the project, appliance, and methods, and for any damage which may result from their failure or their improper construction, maintenance or operation.

29. USE AND OCCUPANCY PRIOR TO ACCEPTANCE BY THE CITY

The Contractor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the City, provided the City:

A. Secures written consent of the Contractor except in the event, in the opinion

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of the City or the City's Design Professional, the Contractor is chargeable with unwarranted delay in completing the Contract requirements;

- B. Secures consent of Surety;
- C. Secures endorsement from insurance carrier(s) permitting occupancy of the building or use of the project during the remaining period of construction; or,
- D. When the project consists of more than one (1) building and one (1) of the buildings is occupied, secures permanent fire and extended coverage insurance, including a permit from the insurance construction.

Use and occupancy shall not be allowed without the approval of the City's Design Professional, the Director of Community Development, and the City Manager. All conditions and terms for occupancy prior to acceptance shall be written and agreed to by the Contractor and the City.

30. USE OF PREMISES AND REMOVAL OF DEBRIS

The Contractor expressly undertakes at the Contractor's expense:

- A. To take every precaution against injuries to persons or damage to property;
- B. To store apparatus, materials, supplies and equipment in such orderly fashion at the site of the Work as will not unduly interfere with the progress of the Work or any other Contractor or Subcontractors work;
- C. To place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work;
- D. To clean up frequently all refuse, rubbish, scrap materials and debris caused by construction operations, to the end that at all times the site of the Work shall present a neat, orderly and workmanlike appearance;
- E. Before Final Payment to the Contractor, removal of all surplus material not to be kept and stored, false work temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from the Contractor's operations, and to put the site in a neat, orderly condition.
- F. To effect all cutting, fitting or patching of the Contractor's work required to make the same conform to the Drawings and Technical Specifications and, except with the consent of the City and the City's Design Professional, not to cut or otherwise alter the Work of any other Contractor.

31. QUANTITIES OF ESTIMATE

Wherever the estimated quantities of the Work to be done and materials to be

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furnished under this Contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right shall be reserved, except herein otherwise specifically limited, to increase or diminish them as deemed reasonably necessary or desirable by the City to complete the Work contemplated by the Contract, and such increase or diminution shall in no way vitiate this Contract, nor shall any such increase or diminution give cause for claims or liability for damages.

All quantities shall be based on exact or near exact usage of items actually installed and incorporated into the Work.

32. LAND AND RIGHTS-OF-WAY

Prior to the start of construction, the City shall obtain all lands and rights-of-way necessary for the carrying out and completion of the Work to be performed under this Contract.

33. NOTICE AND SERVICE THEREOF

Any notice to any Contractor from the City relative to any part of this Contract shall be in writing and considered delivered and service thereof completed when said notice is posted, certified or registered mail, to the said Contractor at the last given address or delivered in person to the said Contractor or duly authorized representative on the Work.

34. SEPARATE CONTRACT

The Contractor shall coordinate operations with those of other Contractors. Cooperation shall be required in the arrangement for the storage of materials and in detailed execution of the Work. The Contractor, including the Subcontractors, shall keep informed of the progress and detail work of other Contractors and shall notify the City's Design Professional immediately of lack of progress or defective workmanship on the part of other Contractors.

Failure of a Contractor to keep informed of the Work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by the Contractor of the status of the Work as being satisfactory for proper coordination with the Contractors own work.

35. SUBCONTRACTING

A. The Contractor may utilize the services of specialty Subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty Subcontractors.

B. The Contractor shall not award any work to any Subcontractor without prior

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written approval of the City, which approval shall not be given until the Contractor submits to the City a written statement, Document 00710 – List of Proposed Subcontractors and Suppliers, concerning the proposed award to the Subcontractor, which statement shall contain information as the City may require.

- C. The Contractor shall be as fully responsible to the City for the acts or omissions of Subcontractors performing work under the Contractor's supervision, and of persons directly or indirectly employed by said Subcontractor, as the Contractor is for acts and omission for persons directly employed by the Contractor.
- D. The Contractor shall cause appropriate provisions to be inserted in all Subcontracts relative to the Work to bind Subcontractors to the Contractor by terms of the General Conditions and Contract Documents insofar as applicable to the Work of Subcontractors and to give the Contractor the same power as regards terminating any Subcontractor that the City may exercise over the Contractor under any provision of the Contract Documents.
- E. Nothing contained in this Contract shall create any contractual relation between any Subcontractor and the City.

36. THE CITY'S DESIGN PROFESSIONAL AUTHORITY

The City's Design Professional shall convey all orders and directions contemplated under this Contract and Technical Specifications, relative to the execution of the Work. The City's Design Professional shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which shall be paid for under this Contract and shall decide all questions which may arise in relation to said work and the construction thereof. The City's Design Professional's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any questions shall arise between the parties hereto relative to said Contract or Technical Specifications, the determination or decision of the City's Design Professional shall be condition precedent to right of the Contractor to receive any monies or payment for work under this Contract affected in any manner or to any extent by such question.

37. MEANING AND INTENT

The City's Design Professional shall decide the meaning and intent of any portion of the Technical Specifications and of any Drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the Contractor, under this Contract and other Contractors, performing work for the City, shall be adjusted and determined by the City's Design Professional.

38. CONTRACT SECURITY

If the Contract amount exceeds Twenty-Five Thousand Dollars (\$25,000), a Payment Bond shall be furnished, and if the Contract amount exceeds One Hundred Thousand Dollars (\$100,000) a Performance Bond also shall be furnished, on prescribed forms in the amount of one hundred percent (100%) of the Contract amount as prescribed by the state, territorial or local law, as security for the payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract and as security for faithful performance of this Contract.

39. ADDITIONAL OR SUBSTITUTE BOND

If at any time the City, for justifiable cause, shall be or become dissatisfied with any Surety or Sureties for the Performance and/or Payment Bonds, the Contractor shall, within five (5) working days after notice from the City to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such Surety or Sureties as may be satisfactory to the City. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new Surety or Sureties shall have furnished such an acceptable bond to the City.

For Final Acceptance, the Contractor shall supply a One-year Maintenance Bond dated the date of Council Acceptance, and effective for One-year, in the total amount of the Contract.

40. ASSIGNMENTS

The Contractor shall not assign the whole or any part of this Contract or any monies due or to become due hereunder without written consent of the City. In case the Contractor assigns all or part of the monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that is agreed that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the Work called for this Contract.

41. MUTUAL RESPONSIBILITY OF CONTRACTORS

If, through acts of neglect on the part of the Contractor, and other Contractor or any Subcontractor shall suffer loss or damage on the Work, the Contractor agrees to settle with such other Contractor or Subcontractor by agreement or arbitration if such other Contractor or Subcontractor shall so settle. If such other Contractor or Subcontractor assert any claim against the City on account of damage alleged to have been sustained, the City shall notify the Contractor, who shall indemnify and hold harmless the City against any such claim.

42. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

The acceptance by the Contractor of the Final Payment shall be and shall operate as a release to the City of all claims and all liability to the Contractor for all things done or furnished in connection with this work. No payment, however, final or otherwise, shall operate to release the Contractor or the Contractors Sureties from any obligations under this Contract or the Performance, Payment or Maintenance Bonds.

43. PAYMENTS BY THE CONTRACTOR

The Contractor shall pay the following:

- A. For all transportation and utility services no later than the twentieth (20th) day of the calendar month following that in which the services are rendered;
- B. For all materials, tools, and other expendable equipment to extent of ninety percent (90%) cost thereof, no later than the twentieth (20th) day of the calendar month following that in which such materials, tools and equipment are delivered at the site of the project, and the balance of the cost thereof, no later than the thirtieth (30th) day following the completion of that part of the Work in or on which such materials, tools and equipment are incorporated or used; and
- C. To each of the Subcontractors under contract to the Contractor, no later than the fifth (5th) day following each payment to the Contractor, the respective amounts allowed the Contractor on account of work performed by said Subcontractors to the extent of each Subcontractors interest therein.

44. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

Immediately after execution and delivery of the Contract, and before the first progress payment is made, the Contractor shall deliver to the City an estimated construction progress schedule in form satisfactory to the City, showing proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that shall become due the Contractor in accordance with the project schedule. The Contractor shall also furnish on forms to be supplied by the City:

- A. A detailed estimate giving complete breakdown of the Contract Price and;
- B. Periodic itemized estimates of work done for the purpose of making progress payments thereon. The costs employed in making up any of these schedules shall be used only for determining the basis of progress payments and shall not be considered as fixing basis for additions to or deductions from the Contract Price.

45. PAYMENTS TO THE CONTRACTOR

- A. Not later than the twentieth (20th) day of each calendar month, the City shall make a progress payment to the Contractor on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month under this Contract, but to insure proper performance of the Contract, the City shall retain ten percent (10%) [five percent (5%) if the total Contract Price exceeds Five Hundred Thousand Dollars (\$500,000)] of the amount of each estimate until Final Completion and acceptance of all work covered by this Contract; provided that the Contractor shall submit the estimate no later than the fifth (5th) day of the calendar month. Provided further, that on completion and acceptance of each separate building, public work or other division of the Contract on which the price is stated separately in the Contract, payment may be made in full, including retained percentages thereon, less authorized deductions.
- B. In preparing estimates, the material delivered on the site and preparatory work done may be taken into consideration.
 - 1) Materials shall only be taken into consideration with validation by invoice, or other document showing the materials are paid, and if allowed only in the amount invoiced.
- C. All material and work covered by progress payments made shall thereupon become the sole property of the City, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work or as a waiver of the right of the City to require the fulfillment of all of the terms of the Contract.
- D. The City's Right to Withhold Certain Amounts and Make Application Thereof: The Contractor agrees that they will indemnify, defend and save the City harmless from all claims growing out of lawful demands of Subcontractors, labors, workmen, mechanics, materialmen and furnishers of machinery and parts thereof, equipment, power tools and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. The Contractor shall, at the City's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the Contractor fails to do so, the City shall, after having served written notice on the said Contractor, the City shall either:
 - 1) Withhold from said Contractors unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of this Contract, but in no event shall

provisions of this sentence be construed to impose any obligations upon the City to either the Contractor or the Contractors Surety; or

- 2) Pay unpaid bills direct on which the City has given written notice. In paying any unpaid bills of the Contractor, the City shall be deemed the agent of the Contractor, and any payment so made by the City shall be considered as a payment made under the Contract by the City and the Contractor and the City shall not be liable to the Contractor for any such payments made in good faith. This provision shall not be construed to give rise to any third party beneficiary rights in claimants.
 - 3) If in the opinion of the City the Contractor cannot in due diligence make payment to Subcontractors, suppliers or other debt incurred as a result of the Work or the non-payment is a recurring problem, the City shall immediately notify the Contractors Surety and make claim on the Payment Bond.
- E. Monies in dispute, either due to non-payment as specified above, if more monies withheld from the Contractor than can be justified, and payment to the Contractor has passed beyond one (1) progress payment, the Contractor shall be due interest on the unjustified part of the amount withheld. If the Contractor fails to pay Subcontractors, suppliers or other debt past one (1) progress payment, subcontractors, supplies, or other debt shall be entitled to interest payments on monies owed from the Contractor.

Payments due and unpaid under Contract Documents shall bear interest from the date payment is due at such rate as the legal rate prevailing at the time at the place where project is located.

46. CORRECTION OF WORK

All work, all materials, whether incorporated in the Work or not, all processes of manufacture and all methods of construction shall be at all times and places subject to inspection of the City's Design Professional who shall be the final judge of the quality and suitability of the Work, materials, processes for manufacture and methods of construction for the purposes for which they are used. Should they fail to meet the City's Design Professional's approval, they shall be forthwith reconstructed, made good, replaced, and/or corrected, as the case may be, by the Contractor at the Contractors expense. If, in the opinion of the City's Design Professional, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the Work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the City and the City's Design Professional is determined to be equitable.

If the Contractor cannot or will not remedy the Work that the Contractor has been

notified is defective, the City shall give written notice for the Contractor to bring such defective work into compliance with the Contract Documents in a reasonable number of days. If the Contractor fails to take corrective action, then the City shall have the defective work corrected and deduct the cost from the Contract.

47. SUBSURFACE CONDITIONS

Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the Drawings or indicated in the Technical Specifications, the Contractor shall immediately give notice to the Project Manager and the City's Design Professional of such conditions before they are disturbed. The City's Design Professional shall thereupon promptly investigate the conditions and, if the City's Design Professional finds that they materially differ from those shown on the Drawings or indicated in the Technical Specifications, the City's Design Professional shall at once make such changes in the Drawings and/or Technical Specifications as shall be necessary. Any increase or decrease of the cost resulting from such changes shall be adjusted in the manner provided in Paragraph 49 of the General Conditions.

48. CLAIMS FOR EXTRA COST

No claim for extra work or cost shall be allowed unless the same was done pursuant to a written order of the City's Design Professional and approved by the City, as aforesaid, and the claim presented with the first (1st) estimate after the changed or extra work is done. When work is performed under the terms of Paragraph 49.C of the General Conditions, the Contractor shall furnish satisfactory bills, payrolls, and vouchers covering all items of cost and when requested by the City, shall give the City access to accounts relating hereto.

49. CHANGES IN WORK

No changes in the Work covered by the approved Contract Documents shall be made without having prior written approval of the City. Any work undertaken by the Contractor that changes work covered by the approved Contract Documents shall be at the Contractor's own risk and no claim shall be made against the City if said work is not approved for change.

- A. Unit Bid Prices previously approved by the Contract Documents.
- B. An agreed Lump Sum.
- C. Time and material, in which the actual cost shall be:
 - 1) Labor, including foreman;
 - 2) Materials entering permanently into the Work;

- 3) Ownership or rental cost of construction plant and equipment during the time of use on the extra work;
- 4) Power and consumable supplies for operation of power equipment;
- 5) Insurance;
- 6) Social Security and old age unemployment contributions.

To the cost under subparagraph C of Paragraph 49 there shall be added a fixed fee to set at ten percent (10%) of the extra work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit, and any other general expenses.

50. EXTRAS

Without invalidating the Contract, the City may, to the extent allowed by law, order extra work or make changes by altering, adding to or deducting from the Work, the Contract sum being adjusted accordingly, and consent of the Surety being first (1st) obtained where necessary or desirable. All the Work of the kind bid upon shall be paid for at the price stipulated in the proposal and no claims for any extra work or materials shall be allowed unless the work ordered in writing by the City or the City's Design Professional and approved by the City, acting officially for the City, and the price stated in such order.

51. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- A. It is hereby understood and mutually agreed, by and between the Contractor and the City, that the date of beginning and the time of completion as specified in the Contract of work to be done hereunder are ESSENTIAL CONDITIONS of this Contract; and it is further mutually understood and agreed that the Work embraced in this Contract shall be commenced on a date specified in Document 00725B – Notice To Proceed.
- B. The Contractor agrees that said Work shall be prosecuted regularly, diligently and without interruption at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the City, that the time for completion of the Work described herein is a reasonable time for the completion of same, taking into consideration the average climatic range and industrial conditions prevailing in this locality. City reserves the right to terminate this agreement, and breach by repudiation, without penalty, if the rate of progress is so behind schedule that full completion thereof cannot reasonably be accomplished within the time specified.
- C. If the said Contractor shall neglect, fail or refuse to complete the Work within the time herein specified, or any proper extension thereof granted by the

City, the Contractor does hereby agree, as a part consideration for awarding of this Contract, to pay to the City the amount specified in the Contract, not as a penalty, but as liquidated damages for such breach of Contract as hereinafter set forth, for each and every consecutive working day that the Contractor shall be in default after the time stipulated in the Contract for completing the Work.

- D. The said amount stated in Document 00400 – Standard Agreement For Contracting Services is fixed and agreed upon by and between the Contractor and City because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the City would in such event sustain, and said amount is agreed to be the amount of damages which the City would sustain and said amount shall be retained from time to time by the City from current periodical estimates.
- E. It is further agreed that time is of the essence of each and every portion of this Contract and of the Technical Specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any work, the new time limit fixed by such an extension shall be of the essence of this Contract. Provided, that the Contractor shall not be charged with any liquidated damages or any excess cost when the City determines that any part of the liquidated damages was not the fault of the Contractor and the City determines that the request for extension by the Contractor is justified and due to:
 - 1) Any preference, priority, or allocation duly issued by the government;
 - 2) The following unforeseeable causes namely acts of the public enemy, unjustified acts of the City, acts of another Contractor in performance of a Contract with the City, fires, floods, earthquakes, hurricanes, tornadoes, epidemics and any other acts of nature, quarantine restrictions, strikes, freight embargos; and rainy days claimed by the Contractor; however rainy days shall be considered only if the Contractor notifies the City on the day the Contractor claims he cannot work because of rainy weather that day. Rainy day must be as is specified in Paragraph 51.E.3 below. Failure to report the rainy day and to claim said rainy day on Document 00975 – Time Request shall eliminate any claim for time extension because of rain or inclement weather on that day.
 - 3) Rainy day shall be described as when a minimum of sixty percent (60%) of the Contractors workforce cannot work for four (4) or more consecutive hours on critical path activities and providing that the Contractor has complied with the conditions under Paragraph 51.E.2.
 - 4) Any delays of Subcontractors or suppliers occasioned by any of the

causes specified in subparagraphs one (1) and two (2) of this Paragraph.

- F. Provided, further, that the Contractor shall, within ten (10) days from beginning of such delay, unless the City shall grant a further period of time prior to the date of final completion of the Contract, notify the City, in writing, of the causes of delay, who shall ascertain the facts and extent of delay and notify the Contractor within reasonable time of the City's decision in the matter.
- G. Provided, that this provision for liquidated damages shall be cumulative of and not in limitation of any other remedy available to the City, including, but without limitation, the right to terminate as provided in Paragraph 3 of the General Conditions and recover additional damages for any excess cost in otherwise completing the Work.
- H. The City shall, if it deems necessary, start charging liquidated damages equal to the amount of time over the date of Final Completion listed in Document 00725B – Notice To Proceed. This date shall be adjusted using current changes in Contract Time and allowable Weather Days. The amount of liquidated damages shall be deducted from the next Pay Estimate submitted by the Contractor.

52. WEATHER CONDITIONS

In the event of temporary suspension of work, or during inclement weather, or whenever the City's Design Professional shall direct, the Contractor shall cause the Subcontractors to protect carefully all work and materials against damage or injury from the weather. If, in the opinion of the City's Design Professional, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of the Subcontractors so to protect the Work, such materials and work shall be removed and replaced at the expense of the Contractor.

53. PROTECTION OF THE WORK AND PROPERTY – EMERGENCY

- A. The Contractor shall at all times safely guard the City's property from injury or loss in connection with this Contract. The Contractor shall at all times safely guard and protect the Work and that of adjacent property, from damage. The Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the Contract, by the City or the City's duly authorized representatives.
- B. In case of an emergency which threatens loss or injury of property and/or safety of life, the Contractor shall be allowed to act, without previous instructions from the City or the City's Design Professional, in a diligent manner. The Contractor shall notify the City or the City's Design

Professional immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall promptly be submitted to the City or the City's Design Professional.

- C. Where the Contractor has not taken action but has notified the City or the City's Design Professional of an emergency threatening injury to persons or damage to the Work or any adjoining property, the Contractor shall act as instructed by the City or the City's Design Professional.
- D. The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided for in the General Conditions.

54. INSPECTION

The authorized representatives and agents of the City shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials and other relevant data. The Contractor shall not impede and allow unrestricted access to the Project Mangers, Building Official, and Testing Laboratory personnel.

55. SUPERINTENDENCE BY CONTRACTOR

At the site of the Work, the Contractor shall employ a construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that the representative shall be acceptable to the City's Design Professional and shall remain in such capacity for the particular job involved unless superintendent ceases to be on the Contractors payroll.

56. FEDERAL LABOR STANDARDS PROVISIONS

All laborers and mechanics employed upon the Work covered by this Contract shall be paid unconditionally and not less than once each week and without subsequent deduction or rebate on any account (except such payroll deductions as are mandatory by law and such other payroll deductions as are permitted by the applicable regulations issued by the Secretary of Labor, United States Department of Labor, pursuant to the Anti-Kickback Act hereinafter identified) the full amount due at time of payment computed at wage rates not less than those contained in the wage determination decision of said Secretary of Labor (see either Document 00435 – Wage Scale for Engineering Projects or Document 00440 – Wage Scale for Architect Projects), regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor and such laborers and mechanics. All laborers and mechanics employed upon such work shall be paid in cash, except that payment may be by check if the employer provides or secures satisfactory facilities approved by the City for the cashing of same without cost or expense to the employee. For the purpose of this clause, contributions made or costs reasonably anticipated under Section 1(b)(2) of the Davis Bacon Act on behalf of laborers or mechanics are

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considered wages paid to such laborers or mechanics, subject to the provisions of Section 5.5(a)(1)(iv) of Title 29, Code of Federal Regulations. Also, for the purpose of this clause, regular contributions made or costs incurred more than a weekly period under plans, funds, or programs, but covering the particular work week, are deemed to be constructively made or incurred during such weekly period.

57. UNDERPAYMENTS OF WAGES OR SALARIES

In case of underpayment of wages by the Contractor or by any subcontractors to laborers or mechanics employed by the Contractor or Subcontractor upon the Work covered by the Contract, the City, in addition to such other rights as may be afforded it under this Contract, shall withhold from the Contractor, out of any payments due the Contractor, so much thereof as the City, may consider necessary to pay such laborers or mechanics the full amount of wages required of this Contract. The amount so withheld may be disbursed by the City for and on account of the Contractor or the Subcontractor (as may be appropriate), to the respective laborers and mechanics to whom same is due or on their behalf to plans, funds, or programs for any type of fringe benefit prescribed in the applicable wage determination.

58. EMPLOYMENT OF CERTAIN PERSONS PROHIBITED

No person under the age of sixteen (16) years and no person who, at the time, is serving sentence in a penal, correctional institution or undocumented workers shall be employed on the Work covered by this Contract.

59. EMPLOYMENT OF LABORERS OR MECHANICS NOT LISTED IN AFORESAID WAGE DETERMINATION DECISION

Unlisted classifications needed for work not included within the scope of the classifications listed in the wage determination of this Contract maybe added after award only as provided in the labor standards contract clauses (29CFR, 5.5(a)(1)(ii).

60. FRINGE BENEFITS NOT EXPRESSED AS HOURLY WAGE RATES

The City shall require, whenever the minimum wage rate prescribed in the Contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly wage rate and the Contractor is obligated to pay cash equivalent of such benefit, an hourly cash equivalent thereof established. In the event the interested parties cannot agree upon a cash equivalent of the fringe benefits, the question, accompanied by a recommendation of the City, shall be referred to the Secretary of Housing and Urban Development, to the Secretary of Labor for determination.

61. POSTING WAGE DETERMINATION DECISIONS AND AUTHORIZED WAGE DEDUCTIONS

The applicable wage poster and the applicable wage determination decisions, with respect to the various classification of laborers and mechanic employed upon the Work covered by this Contract, and a statement showing all deductions, if any, in accordance with the provisions of this Contract, to be made from wages actually earned by persons so employed or to be employed in such classifications, shall be posted at the appropriate conspicuous points at the site of the Work.

62. COMPLAINTS, PROCEEDINGS, OR TESTIMONY BY EMPLOYEES

No laborer or mechanic to whom wages, salary or other labor standards provisions of this Contract are applicable shall be discharged or in any manner discriminated against by the Contractor or any Subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to their employer.

63. CLAIMS AND DISPUTES PERTAINING TO WAGE RATES

Claims and disputes pertaining to wage rates or to classifications of laborers and mechanics employed upon the Work covered by this Contract shall be promptly reported by the Contractor in writing to the City for referral by the latter through the Secretary of Housing and Urban Development to the Secretary of Labor, United States Department of Labor, whose decision shall be final with respect thereto.

64. PAYROLLS AND BASIC PAYROLL RECORDS OF THE CONTRACTOR AND THE SUBCONTRACTOR

A. The Contractor and each Subcontractor shall prepare their payrolls on forms satisfactory to and in accordance with instructions to be furnished by the City. The Contractor shall submit weekly to the City one (1) certified copy of all payrolls of the Contractor and of the subcontractors, it is being understood that the Contractor shall be responsible for the submission of copies of payrolls of all subcontractors. Each payroll shall contain the "Weekly Statement of Compliance" set forth in Section 3.3 of Title 29, Code of Federal Regulations. The payrolls and basic payroll records of the Contractor and each Subcontractor covering all laborers and mechanics employed upon the Work covered by this Contract shall be maintained during the course of the Work and for a period of three (3) years thereafter. Such payroll records shall contain name and address of each employee, the employee's correct classification, rate of pay (including rates of contributions or costs anticipated of types described in Section 1(b)(2) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid.

B. In addition, whenever the Secretary of Labor has found, under Section

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5.5(a)(1)(iv) of Title 29, Code of Federal Regulations, that wages of any laborer or mechanic include the amount any costs reasonably anticipated in providing benefits under a plan, or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor or Subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible and that the plan or program has been communicated in writing to the laborers or mechanics affected, and will maintain records which show the costs anticipated or the actual cost incurred in providing such benefits. The Contractor and each Subcontractor shall make their employment records, with respect to persons employed by them upon the Work covered by this Contract, available for inspection by authorized representatives of the Secretary of Housing and Urban Development, the City and the United States Department of Labor. Such representatives shall be permitted to interview employees of the Contractor or of any subcontractors during working hours on the job.

- C. At a minimum the Contractor and subcontractors shall certify their payroll and remit such certification with the progress payment request.

65. SPECIFIC COVERAGE OF CERTAIN TYPES OF WORK BY EMPLOYEES

The transporting of materials and supplies to or from the site of the project or program to which the Contract pertains by the employees of the Contractor or any Subcontractor and manufacturing or furnishing of materials, articles, supplies or equipment on the site of the project of program to which this Contract pertains by persons employed by the Contractor or by any Subcontractor, shall, for the purpose of this Contract, and without limiting the generality of the foregoing provisions of this Contract, shall be deemed to be work which these Federal Labor Standards Provisions are applicable.

66. INELIGIBLE SUBCONTRACTORS

The Contractor shall not subcontract any part of the Work covered by this Contract or permit subcontracted work to be further subcontracted without the City's prior written approval of the Subcontractor. The City shall not approve any Subcontractor for work covered by this Contract who is at the time ineligible under the provisions of any applicable regulations issued by the Secretary of Labor, United States Department of Labor, or the Secretary of Housing and Urban Development to receive an award of such subcontract.

Any Subcontractor shall also not be eligible if they previously or currently, in default of a contract on any other project, have failed to complete any project or was removed from a project for defective work.

67. PROVISIONS TO BE INCLUDED IN CERTAIN SUBCONTRACTS

The Contractor shall include or cause to be included in each subcontract covering

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any of the Work covered by this Contract, provisions which are consistent with these Federal Labor Standards Provisions and also a clause requiring the Subcontractors to include such provisions in any lower tier subcontracts which they may enter into, together with a clause requiring such insertion in any further subcontracts that may be in turn be made.

68. BREACH OF FEDERAL LABOR STANDARDS PROVISIONS

In addition to the causes for termination of this Contract as herein set forth, the City reserves the right to terminate this Contract if the Contractor or any Subcontractor, whose subcontract covers any of the Work covered by this Contract, shall breach any of these Federal Labor Standards Provisions. A breach of these Federal Labor Standards Provisions may also be grounds for debarment as provided by the applicable regulations issued by the Secretary of Labor, United States Department of Labor.

69. EQUAL OPPORTUNITY PROVISIONS (E.O. 11246)

During the performance of this Contract, the Contractor agrees as follows:

- A. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor shall take affirmative actions to ensure that applicants for employment are employed and that employees treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.
- B. The Contractor shall post in conspicuous places, available to employees and applicants for employment notice to be provided Contracting Officer setting forth provisions of this nondiscrimination clause.
- C. The Contractor shall state that all qualified applicants shall receive consideration for employment without regard to race, color, religion, sex, or national origin.
- D. The Contractor shall incorporate foregoing requirements in all subcontracts.

70. CIVIL RIGHTS ACT OF 1964

Under Chapter 106 of the Civil Practice & Remedies Code of the Revised Civil Statutes of Texas, no person shall, on the ground of race, color, national origin, sex, age, or handicap, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity of the City.

71. CONFLICTING CONDITIONS IN THE CONTRACT DOCUMENTS

The Contract Documents are complementary and what is called for by one (1) shall be as binding as if called for by all. In case of conflict between any Contract Documents interpretation shall be as listed in Document 00115B – Instruction to Bidders, Paragraph XXIII.

72. INDEMNIFICATION

- A. The Contractor shall defend, indemnify and hold harmless the City and the City's Design Professional and their respective officers, agents and employees, from and against all damages, claims, losses, demands, suits, judgments and costs, including reasonable attorney's fees and expenses arising out of or resulting from the performance of the Work or any act or omission of the Contractor or the Contractor's employees, agents, suppliers or subcontractors.
- B. The obligation of the Contractor under this Paragraph shall not extend to the liability of the City's Design Professional, their agents or employees arising out of preparation or approval of maps, drawings, reports, surveys, Change Orders, designs or Technical Specifications, or the giving of or failure to give directions or instructions by the City's Design Professional, their agents or employees, provided such giving or failure to give is the primary cause of the injury or damage.

73. DELAYS

The Contractor shall receive no compensation for delays or hindrances to the Work, except when the direct or unavoidable extra cost to the Contractor is caused by failure of the City to provide information or material, if any, which is to be furnished by the City. When such extra compensation is claimed, a written statement thereof shall be presented by the Contractor to the City or the City's Design Professional and, if found correct, shall be referred to the City Council for final approval or disapproval; and action thereon by the City Council shall be final and binding. If delay is caused by specific orders given by the City or the City's Design Professional to stop work, or by the performance of extra work, or by the failure of the City to provide material or necessary instructions for carrying on the Work, then such a delay shall entitle the Contractor to an equivalent extension of time, the application of which shall, however, be subject to the approval or disapproval of the City Council; and no such extension of time shall release the Contractor or the Surety on their performance bond from all obligations hereunder which shall remain in full force until the discharge of the Contract.

74. MAINTENANCE OF WORK

If, after approval of Final Payment and prior to expiration of the one (1) year date of Substantial Completion or such longer period as may be prescribed by law or

any applicable special guarantee required by the Contract Documents, any work is found to be defective, the Contractor shall promptly, without cost to the City and in accordance with the City's written instructions, correct such defective work. If the Contractor does not promptly comply with such instructions, the City shall have defective work corrected and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, shall be paid by the Contractor or the Contractor's Surety. The provisions of this paragraph shall not limit the obligation of the Contractor under Paragraph 15 (Guarantee of Work) of the General Conditions in any respect whatsoever, including the time period of such Guarantee of Work contained therein, as will arise under the laws of the State of Texas and said Paragraph 15 and without regard to the provisions of this Paragraph, nor shall this Paragraph be construed to establish any period of limitations for any cause of action against the Contractor under the obligations of said Paragraph 15.

75. ANTITRUST

The Contractor hereby assigns to the City any and all claims for overcharges associated with this Contract which arise under the anti-trust laws of the United States, 15 U.S.C.A. Sec. 1, et seq. (1973).

76. DELAY, DISRUPTION, OR OTHER CLAIMS

Any claim by the Contractor for delay, disruption or any other claim shall be based on a written notice delivered to the City and to the City's Design Professional promptly (but in no case later than ten (10) working days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Within ten (10) working days of delivering said notice, the Contractor shall deliver to the City and the City's Design Professional notice of the amount of the claim and specific and detailed support documentation and data on the impact claimed. Further, the Contractor shall furnish on a continuing basis all of the documents that in any way are purported to support the damages, costs, expenses, and impact of the claim event. The Contractor's failure to fully comply with any of these requirements with respect to any claim shall constitute a complete and final waiver of said claim.

77. SANITARY AND SAFETY FACILITIES

The Contractor shall be responsible for all sanitary and safety facilities necessary for the Project, including rest rooms, drinking facilities, wash areas, hardhats, trench shoring, etc.

78. SUBMITTALS

The Contractor shall be responsible for verifying that all submittals from the suppliers, manufacturers, subcontractors, and/or any other source of materials, processes, services, equipment, hardware, and/or software, conform to the

Contract Documents and Technical Specifications. **ANY AND ALL** deviations, no matter how minor, shall be listed on the Contractor Submittal sheet and identified on the submittals/shop drawings. Failure to acknowledge deviations from the Contract Documents and Technical Specifications as specified in Section 01330 – Submittal Procedures, even if noted “Acknowledged Receipt”, “No Exception”, or “Exceptions As Noted”, by either the City or the City’s Design Professional, does not alleviate the responsibility and such submittal shall be deemed be Defective Work and shall be corrected according to the Specified Item at no additional charge to the City.

79. WARRANTIES

All warranties and guarantees for all material, labor, equipment, processes, services, hardware, and/or software shall begin at the time that the Project is accepted by the Friendswood City Council, and not at the time of purchase, installation, startup, manufacture, or creation date. Warranties and guarantees shall be for the length of time as stated in the Contract Documents and Technical Specifications, and not that of the supplier, manufacturer, creator, or subcontractor, and shall **NOT** be changed unless authorized by a Change Order approved and signed by the City. Any disparity between the Contractor and the supplier, manufacturer, and /or creator’s Warranty Period and the Warranty Period as stated in the Contract Documents and Technical Specifications, it shall be the Contractors responsibility to fix, repair or replace damaged/defective items for the duration of the One-Year Maintenance Period at no additional cost to the City.

END OF SECTION

**SECTION 00600
SUPPLEMENTAL CONDITIONS**

1. GENERAL

The Provisions of this Section of the Technical Specifications shall govern in the event of any conflict between them and Document 00500B – General Conditions.

2. DESIGN PROFESSIONAL

The words "Design Professional" in these Technical Specifications shall be understood as referring to [INSERT DESIGN PROFESSIONAL'S NAME AND ADDRESS], Design Professional of the City, or such other Design Professional, or persons as may be authorized by the City to act in any particular position.

3. LOCATION OF THE PROJECT

This project is located in Friendswood, Texas, [INSERT COUNTY] County. Map showing the general location of this project is included in the Drawings.

4. CONSTRUCTION IN PUBLIC STREETS AND PRIVATE DRIVES

- A. No public road shall be entirely closed overnight. It shall be the responsibility of the Contractor to build and maintain all-weather bypasses and detours, if necessary, and to properly light, barricade and mark all bypasses and detours that might be required on and across the streets involved in the Work included in this Contract. The residents along the affected road(s) shall be contacted a minimum of forty-eight hours (48 Hrs) prior to the time the construction shall commence at their driveways or entrances and informed as to the length of time the driveways shall be closed.
- B. The Contractor shall make every effort to complete construction and allow immediate access to adjacent property at all driveway entrances located along the streets. The Owners or Tenants of commercial properties where access and/or entrance drives which shall be affected by construction shall be notified a minimum of twenty-four hours (24 Hrs) prior to the time the construction shall be started at their driveways or entrances and informed as to the length of time driveways shall be closed.
- C. During inclement weather the Contractor shall construct temporary gravel or shell crossings and wooden walkways to allow ingress and egress across excavated areas at no expense to the City and as directed by the Project Manager or the City's Design Professional.
- D. The Contractor shall be responsible for all streets and entrance reconstruction and repairs and maintenance of same for a period of one year (1 Yr) from the date of such reconstruction or Substantial Completion, whichever is longer. In the event the repairs and maintenance are not made immediately to the satisfaction of the City, and it becomes necessary for the City to make such repairs, the Contractor shall reimburse the City for the cost of such repairs.
- E. The Contractor shall, at all times, keep a sufficient width of the roadway clear of dirt and other material to allow the free flow of traffic. The Contractor shall assume any and all responsibility for damage, personal or otherwise, that may be caused by the construction along public streets or private drive.
- F. During the prosecution of the Work, the Contractor shall obstruct public travel as little as possible and in no case shall there be less than twelve feet (12 Ft) in width of unobstructed roadway for traffic.

5. **MAINTENANCE OF STORM SEWER, UTILITY CROSSINGS, AND EXISTING ROADWAYS**
The Contractor shall maintain storm sewers, utilities, pipelines, and drainage facilities along the construction route at all times during construction at no additional expense to the City. Storm sewers and utilities crossing existing roadways shall be backfilled in accordance with these Technical Specifications and the Standard Details to an elevation six inches (6 In) below the elevation of the existing roadway. A temporary road patch of six inches (6 In) thick of compacted limestone base shall be constructed to or a little above the elevation of the existing roadway within the limits of the pavement removal at no additional cost to the City. The existing roadway shall be maintained throughout the construction. Pot hole appearing in the base or the existing pavement shall be deemed a hazard to the general public and shall be filled and maintained as directed by the Project Manager.
6. **PUBLIC UTILITIES AND OTHER PROPERTY TO BE CHANGED**
In case it is necessary to change or move the property of any owner or public utility, such property shall not be moved or interfered with until ordered to do so by the Project Manager. The right is reserved to the owner of public utilities to enter upon the limits of the project for the purpose of making such changes or repairs of their property that may be made necessary by performance of this Contract.
7. **TEMPORARY CONSTRUCTION**
No material which has been used by the Contractor for any temporary purpose whatever is to be incorporated in the permanent structure without written permission of the Project Manager.
8. **PROJECT MAINTENANCE**
The Contractor shall maintain and keep in good repair all work contemplated under these Drawings, Exhibits and/or Technical Specifications which shall include the maintenance and repair of all existing streets, storm sewer crossings, utility crossings, temporary crossings for access to adjacent property, wooden walkways, barricades, lights, danger signals and all work which is necessary for the well-being of the general public. In the event the Contractor fails to properly maintain the Work, the City shall make such repairs as are necessary and the cost of said repairs shall be deducted from payment due to the Contractor.
9. **BORINGS**
Wherever certain test borings are made on this site, the locations of such test borings and the information revealed by them is indicated on the Drawings and profiles for the project. These borings shall not be construed as a warranty on the part of the City of the exact nature of the subsurface conditions that will be encountered during construction of the Work. The information thus furnished is intended only as a guide to the Contractor in making their own investigations preliminary to submitting a price for the Work.
10. **PROPERTY LINES AND MONUMENTS**
The Contractor shall protect all property corner markers and when any such markers or monuments are in danger of being disturbed, they shall be properly referenced and if disturbed, shall be reset by a Professional Land Surveyor licensed by the State of Texas, at the expense of the Contractor.

11. EXISTING STRUCTURES

The Drawings show the locations of all known surface and subsurface structures. However, the City assumes no responsibility for failure to show any or all of these structures on the Drawings, or to show them in their exact locations. It is mutually agreed that such failure shall not be considered sufficient basis for claims for additional compensation for extra work or for increasing the pay quantities in any manner whatsoever, unless the obstruction encountered is such as to necessitate substantial changes in the lines or grades, or requires the building of special work, provisions which are not made in the Drawings and the Proposal, in which case the provisions in these Technical Specifications for extra work shall apply.

12. BARRICADES, LIGHTS, AND WATCHMEN

- A. Where the Work is carried on, in or adjacent to any street, alley or public place, the Contractor shall at their own cost and expense furnish and erect such barricades, fences, battery type flasher-markers and danger signals, shall provide watchmen, and shall provide such other precautionary measures for the protection of persons or property and the Work as are necessary. Barricades shall be painted using color that shall be visible at night and reflective. From sunset to sunrise the Contractor shall furnish and maintain at least one (1) battery type flasher-marker at each barricade and sufficient number of barricades shall be erected to keep vehicles from being driven on or into any work under construction. The Contractor shall furnish watchmen in sufficient numbers to protect the Work and the public.
- B. The Contractor shall be held responsible for all damage to the Work due to failure of barricades, signs, lights and watchmen to protect it, and whenever evidence is found of such damage, the Project Manager shall order the damaged portion to be immediately removed and replaced by the Contractor at no additional cost to the City. The Contractor's responsibility for the maintenance and repair of barricades, signs and lights, and for providing watchmen shall not cease until the project has been accepted by the City.
- C. Materials and equipment stored in or near the path of traffic shall be protected with red flags during the day and with lights during the night.

13. FENCES, DRAINAGE CHANNELS, AND CROP DAMAGE

- A. Boundary fences or other improvements removed to permit the installation of the Work shall be replaced in the same location and left in a condition as good or better than that in which they are found. This shall include landscaping, gardens, etc.
- B. Where surface drainage channels are disturbed or blocked during construction, final restoration to their original condition of grade and cross section shall be accomplished after the Work of construction is completed. Interim reshaping and cleanup shall occur immediately after trench backfilling.
- C. The Contractor shall not be held liable for unavoidable damage of crops provided such damage occurs within the construction easement provided by the City.

14. DISPOSAL OF WASTE AND SURPLUS EXCAVATION

- A. All trees, stumps, slashings, brush or other debris removed from the sites as a preliminary to the construction work shall be removed from the property and disposed of in a manner approved by the Project Manager.
- B. All excavated earth in excess of that required for backfilling shall be removed from the job site and disposed of in a satisfactory manner except in locations where, in the judgment of the Project Manager, it can be neatly spread over and along sites to form the finished contours.

15. WATER FOR CONSTRUCTION

- A. Water used for sprinkling, testing and flushing of waterlines or any other purpose incidental to this project, shall be furnished to the Contractor. The Contractor shall make necessary arrangements for securing and transporting said water and shall take said water in a manner and at such times that will not produce a harmful drain or decrease of pressure in the City's water system. Water shall not be used in a wasteful manner.
- B. Water shall be dispensed from a meter from the City' Department of Public Works. The Contractor shall not operate any valves on the existing water supply without a Public Works employee present. All water going into containers shall use a vacuum break.
- C. There shall be no jetting or flooding of trenches.

16. LIGHTS AND POWER

The Contractor shall provide, at the Contractor's expense, electrical power, temporary lighting, and facilities required for the proper prosecution and inspection of the Work.

17. CLEANUP

- A. Cleanup shall follow the execution of the Work. At the conclusion of the Work, all tools, temporary structures, and materials belonging to the Contractor shall be promptly removed and all dirt, rubbish and other foreign substances shall be disposed of properly.
- B. The Contractor shall thoroughly clean all equipment and materials installed by the Contractor and shall deliver over such materials and equipment undamaged in a bright, clean polished and new appearing condition.
- C. During construction of the Work, the Contractor shall, at all times keep the site of the Work and adjacent premises as free of material, debris and rubbish, as is practicable and shall remove same from any portion of the site, if, in the opinion of the Project Manager, such material, debris or rubbish constitutes a nuisance or is objectionable.
- D. The Contractor shall remove from the site all of his surplus materials and temporary structures when no further need therefore develops.

18. EXISTING UTILITIES, PIPELINES, AND SERVICE LINES

The Contractor shall be responsible for the protection of all existing utilities, pipelines, and service lines crossed or exposed by the construction operations. Where existing utilities, pipelines, or service lines are cut, broken, or damaged, the Contractor shall replace or repair them with the same type of original material and construction, or better, at the Contractors own cost, with the exception of those items included in the price schedule.

19. POLES, SIGNS, GUY WIRES, ETC.

- A. All utility poles and guy wires, private sign posts, signs and guy wires, and similar private obstructions which interfere with the construction of this project shall be removed and replaced, or moved to new permanent locations by the owners thereof, at the Contractor's expense. No separate compensation shall be paid for this work, but the costs thereof shall be included in such contract pay items as are provided.
- B. The removal and replacement of the City's street sign post and signs are the responsibility of the Contractor. The Contractor shall be responsible for all damage to street sign posts and signs with in the limits of the Contractor's operations that remain in place or are removed and replaced. In the event street sign posts and/or

signs are damaged or destroyed by the Contractor's operations, said sign posts, or signs shall be replaced by the Contractor at no cost to the City.

- 1) All signs on City Streets that are not Texas Department of Transportation (TxDOT) Highways shall be purchased directly from the Department of Public Works.

20. SALVAGED MATERIALS

All materials removed during the construction of the projects, and designation on the Drawings or by the Project Manager, as salvaged materials, shall be removed, cleaned, and stored as directed by the Project Manager. Salvaged materials shall be the property of the City.

21. PROTECTION OF IMPROVEMENTS

The Contractor shall be entirely responsible for the protection of all improvements that are not designated by the Project Manager to be removed for proper construction of the project; this shall include sidewalks, buildings, walls, existing inlets and manholes, underground utilities, shrubs trees, signs, sod and pavement.

22. PROTECTION OF TREES

No trees shall be removed or cut except upon the specific approval of the City. Trees adjacent to the Work shall be protected from all damage by construction operations and as specified in Section 01560 – Tree and Plant Protection.

23. PROTECTION AND ADJUSTMENT OF EXISTING WATER VALVE BOXES

Water valve locations shall be furnished by the City prior to the grading operations. Protection of existing water valve boxes located within the limit of the Work shall subsequently be the responsibility of the Contractor. Failure to show water valve box locations on the Drawings does not relieve the Contractor of the responsibility to prevent damage to the valves and boxes. The Contractor shall adjust all water valve boxes which require adjustment to new pavement grade. Water valve boxes shall be adjusted as per Technical Specification 02310 – Adjusting Manholes, Inlets, and Valve Boxes to Grade.

24. ADJUSTMENT OF TOPS OF EXISTING SANITARY SEWER MANHOLES

Tops of existing sanitary sewer manholes shall be adjusted where necessary to match the grade of new pavement. Adjustment shall be made by breaking back the top portion of the manhole and rebuilding to conform to the new grade. Tops of manholes shall be adjusted as per Technical Specification 02310 – Adjusting Manholes, Inlets, and Valve Boxes to Grade.

25. PROTECTION AGAINST ACCIDENT TO EMPLOYEES AND THE PUBLIC

The Contractor and Contractor's Sureties shall indemnify, defend and save harmless the City and the City's Design Professional, and all their officers, agents and employees from all suits, actions and claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person or persons or property on account of any act, omission or fault of the Contractor, their agents or employees, in the execution of said Contract; or on account of the failure of the Contractor to provide the necessary barricades, warning lights or signs; and shall be required to pay any judgment, with costs, which may be obtained against the City an/or the City's Design Professional growing out of such injury or damage.

26. LINES AND GRADES

- A. The City's Design Professional shall furnish survey control to enable the Contractor to set construction stakes for the Work. Said controls shall be one (1) horizontal control and one (1) vertical control. The Contractor shall be responsible for all construction staking. Any field conditions that appear to be in conflict with the Drawings shall be submitted to the City's Design Professional in writing with adequate time allowed the City's Design Professional to resolve the conflict. No compensation for surveying shall be made without prior written approval from the City and the City's Design Professional.
- B. **THE FURNISHING OF THE CONTROL DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF INSURING THAT THE WORK IS CONSTRUCTED TO THE LINES AND GRADES SHOWN ON THE DRAWINGS.**

27. AFFIDAVIT OF PAYMENT

- A. Each request for payment shall be accompanied by a Document 00985 – Affidavit of Payment, duly signed, and if a Corporation attested to, stating that all cost of labor, material, equipment, taxes, etc., pertinent to this project, have been paid and are current.
- B. The Final Payment, besides having the Document listed in Paragraph 27.A of Document 00600 – Supplemental Conditions, shall also have filed from each subcontractor, supplier, and/or manufacturer a Document 00990 – Waiver and Release of Lien.

28. INTERRUPTION OF UTILITY SERVICES

Each and every Contractor and Subcontractor performing at the site of the Project shall not operate any valve or other control on existing systems and shall exercise care in performing work so as not to interrupt service. At house connections, every Contractor and Subcontractor performing at the site shall either lift trenching machine over lines or cut and reconnect with minimum interruption of service as approved by the City's Design Professional.

29. LOSSES FROM NATURAL CAUSES

Unless otherwise specified, all loss or damage to the Contractor arising out of the nature of the Work to be done, or from the action of the elements, or from any unforeseen circumstances in the prosecution of the same, or from unusual obstructions or difficulties which may be encountered in the prosecution of the Work, shall be sustained and borne by the Contractor at no additional cost to the City.

30. MAINTENANCE AND INSTRUCTION MANUALS

Furnish three (3) bound sets of Maintenance and Instruction Manuals. Bind manuals in volumes of not more than four inches (4 In) thick, in hard back nine inch by twelve inch (9 In x 12 In) binders. Include like equipment in one (1) volume with heavy duty dividers, separating equipment. Catalog and index all volumes. Operation and Maintenance Manuals or Bulletins shall include necessary data for reordering replacement parts, lubrications schedules, and procedures for required maintenance. These items shall be included but not limited to: exhaust fans, air conditioning units, louvers, generator sets, pumps, motors, variable speed drives, mechanical drives, electrical switchgear and controls, electrical fixtures, valves, instrumentation, chlorinators, meters, gauges and miscellaneous mechanical and electrical components supplied under this Contract.

31. **SUBCONTRACTOR VALUES**
The Contractor shall not employ Subcontractors whose aggregate value of work exceeds fifty percent (50%) if the total amount of the Contract Price as stipulated in Document 00400 – Standard Agreement for Contracting Services.
32. **PROJECT REPRESENTATIVE SERVICES**
Project Representative Services shall be the responsibility of the Project Manager and these services shall be in accordance with Document 004[INSERT 05 OR 10] – Standard Agreement for Professional Services – [INSERT ENGINEER OR ARCHITECT], between the City and the City's Design Professional. The Project Representative's duties shall include preparation of daily reports, determination that the project is proceeding in general compliance with the Contract Documents, measurement of material quantities and reporting to the Project Manager any work that should be stopped when it appears that the completed project may not comply with the requirements of the Contract Documents. The Project Representative shall be the liaison between the Contractor and the City's Design Professional and the City. The Project Representative's responsibilities begin after the Contract is awarded and terminate after the Final Inspection.
33. **CONTRACTOR SUBMITTED ALTERNATE DESIGNS**
A. If alternate design features are proposed for convenience of the Contractor, Contractor shall submit design calculations and detailed Drawings covering the proposed changes and related modifications of the Contract Drawings for review. Contractor shall make the Drawings the same size as the Contract Drawings and of comparable quality. The Contractor shall make payment to the City for all charges resulting from modifications, including engineering charges for checking such designs.
B. If substitute items of equipment are allowed, and they vary materially from those shown on the Contract Drawings, Contractor shall prepare equipment data and detailed Drawings covering necessary modifications for the City's Design Professional for approval. Contractor shall make the Drawings the same size as the Contract Drawings and of comparable quality. The Contractor shall make payment to the City for all charges resulting from the modifications, including engineering charges for checking the modifications.
34. **COST BREAKDOWN**
Within fifteen days (15 D) after the execution of the Contract, Contractor shall submit, in acceptable form, a schedule showing subdivision of the Contract into various items of permanent construction, stating quantities and prices, as basis for computing values to the City of permanent usable parts of the facility to be paid for on monthly estimates. No payment shall be made to the Contractor until such schedule meeting the requirements of Section 01200 – Schedule of Values has been submitted and approved.
35. **MATERIALS AND EQUIPMENT**
Contractor shall incorporate into the Work only new materials and equipment of domestic manufacture unless otherwise designated. Contractor shall store these materials and equipment in a manner to protect them from damages. The manner of protection is subject to the specific approval of the City's Design Professional. Pipe, fittings, equipment and other serviceable materials found on site of work or dismantled by reason of construction, remain property of the City. Contractor shall remove and deliver materials to the City at designated points. Contractor shall pay, at prevailing market price, for usable materials that are damaged through negligence.

36. SPECIAL SPECIFICATIONS AND SPECIAL PROVISIONS

Basic Technical Specification Items are those which follow prescribed general requirements. Special Specifications are those which supplement the Technical Specifications and are specific to this project, where there are no Technical Specifications covering certain portions of the Work. When necessary, Special Provisions are inserted to describe additional requirements appreciable to this Contract. Special Provisions are to be used in conjunction with the Technical Specification and Special Specification Items. In event of conflict, the requirements set forth in the Special Provisions as set forth will govern. In the event of conflict between the requirements shown on the Drawings and those contained in the Technical Specifications, then the governing item shall be as specified in Document 00500[INSERT B, C OR P] – General Conditions.

37. AS-BUILT DIMENSIONS

The Contractor shall make daily measurements of facilities. On completion of the project, the Contractor shall furnish the City with one (1) set of blue lines, marked with red pencil, to show as-built dimensions and location of all the Work constructed.

38. ARCHEOLOGICAL CONSTRUCTIONS

- A. No activity which may affect a State Archeological Landmark is authorized until the City has complied with the provisions of the Antiquities Code of Texas. The City has previously coordinated with the appropriate agencies and impacts to known cultural or archeological deposits have been avoided or mitigated. However, the Contractor may encounter unanticipated cultural or archeological deposits during construction.
- B. If archeological sites or historic structures are discovered after construction operations are begun, the Contractor shall immediately cease operations in that particular area and notify the City and the Texas Historical Commission at (512) 463-6096. The Contractor shall take reasonable steps to protect and preserve the discoveries until they have been inspected by the City and the appropriate State Agency. The City shall promptly coordinate with the Texas Historical Commission and any other appropriate agencies to obtain any necessary approvals or permits to enable the Work to continue. The Contractor shall not resume work in the area of the discovery until authorized to do so by the City.
- C. Contractor, subcontractor and their respective employees shall have no claim to artifacts or treasure, found or discovered and shall assign any claim, as such, to the City.

39. ENDANGERED SPECIES

No activity is authorized that is likely to jeopardize the continued existence of a threatened or endangered species as listed or proposed for listing under the Federal Endangered Species Act (ESA), and/or the State of Texas Parks and Wildlife Code on Endangered Species, or to destroy or adversely modify the habitat of such species. If a threatened or endangered species is encountered during construction, the Contractor shall immediately cease work in the area of the encounter and notify the applicable State Agency. The actions shall include reporting the encounter to the U.S. Fish and Wildlife Service, and the Texas Parks and Wildlife Department, obtaining any necessary approvals or permits to enable the Work to continue, or implement other mitigative actions. The Contractor shall not resume construction in the area of the encounter until authorized to do so by the City.

40. OPERATION OF FACILITIES

The Contractor shall not operate, tap, or tamper with any existing facilities. Where construction involves operation of any existing facilities the City shall perform such

operation. Any connection to existing equipment or systems to be schedule and approved in advance with performance to occur in the presence of the Project Manager.

41. SCOPE OF WORK

- A. Under this Contract, the Contractor shall furnish all materials, appliances, tools, equipment, transportation, services and all labor and superintendence necessary for construction of the Work as described in these Technical Specifications and as shown in the Drawings. The completed installation shall not lack any part which can be reasonably implied as necessary to its proper functioning or any subsidiary item which is customarily furnished, and the Contractor shall deliver the completed and operating installation to the City.
- B. The Work in general under this Contract includes, but is not limited to, that Work which is enumerated in the appropriate Document 00300[INSERT B, C OR P] – Unit Price Form or Document 00305[INSERT B, C OR P] – Total Stipulated Price Form of the Contract Documents.

END OF SECTION



**U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
AND
HARRIS COUNTY COMMUNITY SERVICES DEPARTMENT
AND
TEXAS GENERAL LAND OFFICE**

Subrecipient Federal Procurement & Contract Requirements for
Construction Projects

Community Development Block Grant Disaster Recovery (CDBG-DR)
Program

Construction Type: Infrastructure

Project Name: City of Friendswood Forest Bend Detention Pond Project

Project No: D2017-052

Date Issued: 2/7/2022

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I. INTRODUCTION

This project may be funded by various sources and federal grants, including but not limited to, the Texas General Land Office (GLO), the Federal Emergency Management Agency (FEMA), and the U.S. Department of Housing and Urban Development (HUD). All purchases made with grant monies shall comply with the terms and conditions of the grant, as well as the applicable Federal, State, and County procedures regarding these purchases.

As a recipient of federal funds, the Subrecipient shall ensure all procurements follow a free and open competitive process in securing those products or services.

All Federal grant awards are subject to the Uniform Administrative Requirements and Cost Principles, codified at 2 CFR 200. This includes the standards for procurements under Federal grants, which applies to contracts for services, goods, construction, or repair. The Subrecipient shall follow applicable local and State requirements except to the extent that these are inconsistent with Federal statutes, regulations, or grant conditions. In other words, the Subrecipient shall follow the rule that allows compliance with all the rules that apply to it: Federal, State, and local. If compliance with all applicable levels is not possible and no rule is more restrictive than another, the Subrecipient shall follow the Federal rule.

Minority Business Enterprises, Small Business Enterprises, Women Business Enterprises, Historically Underutilized Businesses, Section 3 Business Concerns, and labor surplus area firms are encouraged to submit responses.

II. GENERAL PROVISIONS & FEDERAL REQUIREMENTS

A. PRICING

Any rates provided to the Subrecipient must be all-inclusive. "All-inclusive" shall be construed as costs incorporating all charges for service, labor, material, equipment, overhead, and any other costs. No price or rate changes, additions, or subsequent qualifications will be honored during the course of the Contract. No separate line item rates or charges for services listed in the scope of work will be accepted.

B. SECTION 3 ACT OF 1968 COMPLIANCE

DISCLAIMER: THIS SOLICITATION DOES INVOLVE HUD FUNDING AND THEREFORE SECTION 3 DOES APPLY.

24 CFR 75 requires that for any HUD-funded contract with a value in excess of \$200,000, contractors and subcontractors must comply with the Section 3 Act of 1968. The purpose of Section 3 is to ensure that employment and other economic opportunities generated by certain HUD financial assistance shall, to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, be directed to low- and very low-income persons, particularly those who are recipients of government assistance for housing, and to business concerns which provide economic opportunities to low- and very low-income persons. Section 3 is triggered when the normal completion of construction and rehabilitation projects creates the need for new employment, contracting, or training opportunities.

Contractors must complete and submit the *Section 3 Obligation Summary for Contract Awardees* (Attachment R) prior to contract award and execution. The *Section 3 Initial Subcontracting Plan* (Attachment V) should detail the Contractor's goals to subcontract with Section 3 Business Concerns. Contractors should indicate all firms proposed as subcontractors on this project, and whether any of the firms are Section 3 Business Concerns. Section 3 Business Concerns can be found on the HUD Section 3 website at <https://portalapps.hud.gov/Sec3BusReg/BRegistry/What>.

Businesses which fit the definition of a Section 3 Business Concern and would like to self-perform in order to comply with Section 3 requirements, must submit Section 3 Self-Certification documentation. At Harris County's discretion, the Subrecipient shall accept the *Harris County Section 3 Business Concern Self-Certification* (Attachment S). Contractors and subcontractors must include the *Section 3 Clause* (Attachment Q) in its entirety, in every subcontract subject to compliance with regulations in 24 CFR 75.

Upon award, Contractors will also be required to provide all pertinent information related to Section 3 Workers and Section 3 Business Concerns including but not limited to the self-certification forms, copies of lease agreements, copies of documents evidencing participation in public assistance programs, copies of documents as proof of income, and other pertinent documents. Harris County shall monitor and evaluate contractor's, and contractor's subcontractors, Section 3 compliance towards achieving the numerical goals relative to Section 3 employment, training, and contracting on a minimum monthly basis throughout the contract period. Contractors and subcontractors shall be responsible for providing monthly reports in the format requested by Harris County.

C. HUB / MWBE UTILIZATION COMMITMENT

2 CFR 200.321 requires that Contractors take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible. Contractors are required to facilitate Historically Underutilized Business (HUB) and/or Minority & Women-Owned Business Enterprise (MWBE) participation. Affirmative steps must include:

1. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
2. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
3. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
4. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and
5. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

Contractors must indicate which of their subcontractors will be HUB / MWBE using the *Subcontractor Listing Form*. Contractors must indicate the type of work to be performed by each firm and whether each firm is a HUB / MWBE or non-HUB / MWBE firm. Contractors must include certification or documentation when the Contractor itself, or its subcontractor(s), is HUB-certified by the Texas Comptroller of Public Accounts or the local MWBE office in their jurisdiction. Harris County shall monitor and evaluate Contractor's HUB / MWBE compliance throughout the contract period. Upon award, Bidder shall be responsible for providing reports in the format requested by Harris County.

D. HISTORICALLY UNDERUTILIZED BUSINESSES

The State of Texas identifies any business at least 51 percent owned by an Asian Pacific American, Black American, Hispanic American, Native American, American woman and/or Service Disabled Veteran, who reside in Texas and actively participate in the control, operations and management of the entity's affairs as a Historically Underutilized Business (also considered MWBE).

E. SUBCONTRACTOR LISTING FORM

Contractor is required to complete and submit the *Subcontractor Listing Form* (Attachment P) to list any potential subcontractors, professionals, suppliers, and vendors that Contractor may work with in connection

the project. The Subrecipient reserves the right to reject Contractor's proposed subcontractors on any reasonable basis. Harris County and/or the Subrecipient must approve the actual subcontractors prior to their use. For each subcontractor listed, the Contractor shall be required to provide the following information, as required by the attached form: approximate contract value, description of subcontractor work, start and end date of the subcontract and identification of the subcontractor's industry. Contractor shall be responsible for ensuring any subcontractors used are properly licensed, insured, and authorized to work under government contracts by checking state, local, and federal debarment lists.

The Contractor shall also be required to list any and all subcontractors used over the course of the Contract. If any of the required information changes throughout the term of the contract, Contractor will be required to submit a revision to the County, identifying any changes. Contractor shall be responsible for ensuring any subcontractors used are properly licensed, insured, and authorized to work under government contracts by checking state, local, and federal debarment lists. Contractor shall be responsible for obtaining, and submitting with their response, licenses for any subcontractors / subconsultants if the work being performed by the subcontractor requires licensing in accordance with state or federal law.

F. RESPONSIBILITY

Subrecipient shall award contracts only to responsible Contractors who have the ability to perform successfully under the terms and conditions of the proposed contract. Information provided in the *Statement of Contractor Qualifications* form (Attachment O) may be used, in part, by Subrecipient to assess Contractors' responsibility.

To be considered responsible, a Contractor must:

1. Have adequate financial resources to perform the contract, or the ability to obtain them;
2. Be able to comply with the required or proposed delivery or performance schedule, taking into consideration all existing business commitments;
3. Have a satisfactory performance record;
4. Have a satisfactory record of integrity and business ethics;
5. Have the necessary organization, experience, accounting and operational controls, and technical skills, or the ability to obtain them;
6. Have the necessary production, construction, and technical equipment and facilities, or the ability to obtain them; and
7. Be otherwise qualified and eligible to receive an award under applicable laws and regulations.

Before being considered for award, the Contractor may be requested by Subrecipient submit a statement or other documentation regarding any of the items above. Failure by the Contractor to provide such additional information shall render the Contractor nonresponsive and ineligible for award.

Responsible Contractor must have the experience necessary to complete the Scope of Work and ability to comply with Texas and Harris County requirements and all federal codes, policies and regulations applicable to this project.

For any work which may involve or require Architects or Engineers, Bidders must submit Form SF-330 – Architect-Engineer Qualifications (found at <https://www.gsa.gov/forms-library/architect-engineer-qualifications>). If applicable, Contractors must submit a completed Form SF-330 – Architect-Engineer Qualifications for each of the subcontractors proposed to be used in the completion of the Contract (Subrecipient must approve the actual subcontractors prior to their use).

Subrecipient shall conduct research to determine that a Bidder is responsible. Some methods to determine responsibility include:

- Compliance with Delivery and Performance Schedules: The County may request information on other active contracts the Bidder is performing and verify the status with those buyers;
- Performance Record: The County may require Bidders to submit contact information for recent contracts they have performed for other customers and contact them to ascertain the Bidder's quality of performance, including timeliness of delivery/completion, quality of work, compliance with terms and conditions of the contract, and cost control, if applicable.
- Integrity and Business Ethics: The County may check local offices of Code Compliance and Business Licenses or other regulatory agencies for business ethics record and compliance with public policy. The County may verify the Bidder's compliance with payments, wage rates, and affirmative action requirements with other customers and with applicable State and Federal Government offices, e.g., DOL Wage and Hour Division;
- Necessary Organization, Experience, Operational Controls, and Technical Skills: The County may verify experience with other customers, request copies of audits, or verify that necessary personnel will be available to work on the County's contract;
- Necessary Production, Construction, and Technical Equipment and Facilities: The County may request evidence that the Bidder has all the equipment and facilities he/she will need or the capability to obtain them; and
- System for Award Management: The County shall verify that the Bidder is not debarred through the System for Award Management (www.SAM.gov).

Contractors are responsible for determining the responsibility of their prospective subcontractors. Contractors shall submit the *Subcontractor Listing Form* (Attachment P) and provide information on any prospective subcontractors to be used in completion of the Project. Determinations of prospective subcontractor responsibility may affect the Subrecipient's determination of the Contractor's responsibility. A Contractor may be required to provide written evidence of a proposed subcontractor's responsibility.

The Subrecipient may directly determine a prospective subcontractor's responsibility. In this case, the same standards used to determine a Contractor's responsibility shall be used by the Subrecipient to determine subcontractor responsibility.

G. AUTHORIZATION TO DO BUSINESS IN TEXAS

Contractors must obtain Texas Sales & Use Tax permit from the Texas State Comptroller Office if they are engaged in business in Texas and they are selling tangible personal property, leasing personal property, or selling a taxable service in Texas.

All Contractors are required to have and maintain any licenses, certifications, and registrations required by the State of Texas, Harris County, or recognized professional organization governing the services performed under this contract (such as professional licensing requirements i.e. Licensed Plumbers). The Texas Department of Licensing and Regulation is the primary state agency responsible for the oversight of businesses, industries, general trades, and occupations that are regulated by the state. For businesses to legally operate in Harris County, Contractors must be registered with the Texas Secretary of State to transact business in Texas and must be current on all state and local fees and taxes, including but not limited to Franchise Account Status with the Texas Comptroller of Public Accounts in good standing, delinquent taxes, court judgments, tickets, tolls, fees, or fines.

A Sole Proprietorship, General Partnership, and all business entities (SP, LLC, INC, etc.) doing business under a name other than the name of the owner requires a DBA (Doing Business As) Certificate, which must be filed within the county of which they are doing business. If a Contractor's business isn't located in Harris County, Contractors must submit the licenses, certifications, and other documentation required by the locality in which their business is based.

H. BID BONDS, PERFORMANCE BONDS, & PAYMENT BONDS

2 CFR 200.325 mandates the minimum federal bonding requirements. For construction or facility improvement contracts exceeding \$100,000, the following minimum Federal requirements guarantees, performance bonds, and payment bonds must be met. These include:

- A bid guarantee from each bidder equivalent to 5 percent of the bid price. The "bid guarantee" must be a firm commitment in the form of a bid bond, certified check, or other negotiable instrument as assurance that the bidder is prepared to execute a contract within the time specified for the bid amount.
- A performance bond from the contractor for 100 percent of the contract price to secure the (sub)contractor's fulfillment of all obligations under the contract.
- A payment bond from the contractor for 100 percent of the contract price to assure payment of all persons supplying labor and material under the contract.

If the successful Contractor submits a bank cashier's check as guaranty, the Subrecipient may elect to hold the check until all provisions of the Contract have been completed, and/or require Contractor to submit a performance and/or payment bond. The performance and/or payment bond shall be in the amount equal to the amount of money to be paid by the County under the Contract, unless otherwise stated, and shall be executed by a surety company authorized to do business in the State of Texas.

A bond required by this section must be executed by a corporate surety in accordance with Section 1, Chapter 87, Acts of the 56th Legislature, Regular Session, 1959 (Article 7.19-1, Vernon's Texas Insurance Code).

A bond required under this section must clearly and prominently display on the bond or on an attachment to the bond:

1. The name, mailing address, physical address, and telephone number, including the area code, of the surety company to which any notice of claim should be sent; or
2. The toll-free telephone number maintained by the Texas Department of Insurance under Subchapter B, Chapter 521, Insurance Code, and a statement that the address of the surety company to which any notice of claim should be sent may be obtained from the Texas Department of Insurance by calling the toll-free telephone number.

I. COMPLIANCE WITH STATE, FEDERAL, AND LOCAL LAWS

The following regulations shall apply to this Contract opportunity. Contractors should refer to Attachment A – *Required Federal Contract Provisions* for more detailed information on the requirements and regulations applicable to this contract opportunity:

1. 2 CFR 200 – Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards
2. 24 CFR Part 570 – Community Development Block Grants

3. Texas Local Government Code Section 262 – Purchasing and Contracting Authority of Counties in Texas
4. Texas Local Government Code Section 271 – Purchasing and Contracting Authority of Municipalities, Counties, and Certain Other Local Governments
5. Texas Government Code Section 2269 – Contracting and Delivery Procedures for Construction Projects
6. Harris County Purchasing Rules and Procedures Manual (2013)
7. 24 CFR Part 75 – Economic Opportunities for Low- and Very Low-Income Persons, which implements Section 3 of the Housing and Urban Development Act of 1968.
8. Texas Health & Safety Code Section 361.426 – Governmental Entity Preference for Recycled Products

Contractor shall follow all Federal, State, and local laws, rules, codes, ordinances, and regulations applicable to Contractor's services.

Any Contractor or Contractor's employee doing business with the Subrecipient who believes he or she has witnessed any suspected ethical violation or fraud immediately report the allegations to:

Chief Assistant County Auditor – Audit Division

713-274-5673

All suspected criminal conduct will be investigated and reported to the District Attorney's Office or an appropriate law enforcement agency. Contractors who report suspected ethical violations or fraud can do so without fear of retaliation. Retaliating against any Contractor for reporting suspected ethical violations or fraud is strictly prohibited.

In accordance with Texas Government Code 2270.002, Contractor must warrant that it does not boycott Israel and agrees that it will not boycott Israel during the term of this Contract.

J. DISQUALIFICATION OF CONTRACTOR

Contractor certifies that Contractor has not violated the antitrust laws of this state codified in Texas Business and Commerce Code §15.01, et seq., as amended, or the federal antitrust laws, and has not communicated directly or indirectly the bid/offer made to any competitor or any other person engaged in such line of business. Any or all bids/offers may be rejected if the Subrecipient believes that collusion exists among Contractors.

K. GOVERNING LAW

This solicitation is governed by the procurement requirements of 2 CFR 200 "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards", the County Purchasing Act, and Texas Government Code Section 2269 et seq., as amended. The Subrecipient shall comply with all applicable federal, state and local laws and regulations. In the event of any conflict of interpretation of any part of this overall document, Harris County's interpretation shall govern.

L. FUNDING

The Subrecipient anticipates that all or partial funding for the project subject to this solicitation will consist of federal grant funding. The federal agencies providing this funding may include, but shall not be limited to, the U.S. Department of Housing and Urban Development (HUD), the Federal Emergency Management Agency's (FEMA) Public Assistance program, or H.O.M.E. As such, Contractor acknowledges and is

responsible for ensuring compliance with the general procurement standards applicable to Contractors, as detailed in Title 2 CFR 200. Any Contract awarded pursuant to this solicitation shall include all required Contract clauses in all solicitation and contract awards for services and work associated with this project, and the selected Contractor shall include the applicable clauses in its subcontracts (see 2 CFR 200, Appendix II, Required Contract Clauses).

Contractor must complete and return Attachment M, *Certification of Compliance with Federal Standards & Requirements*, certifying their compliance with and understanding of their responsibility to ensure compliance with federal regulations. Failure by the Contractor to maintain compliance throughout the duration of the project or Contract may be cause to terminate the Contract.

Additionally, any contract entered into by the Subrecipient that is to be paid in whole or in part from grant funds will be subject to termination for convenience by the Subrecipient should grant funding become unavailable at any time for the continuation of services paid for by the grant, and further funding cannot be obtained for the contract. Such termination will be without liability to the Subrecipient, other than for payment of services rendered prior to the date of termination.

M. PUBLIC INFORMATION

All information, documentation, and other materials submitted in response to this solicitation are considered non-confidential and/or non-proprietary and are subject to public disclosure under the Texas Public Information Act after the solicitation is completed and contract(s) executed with selected firm(s). Once opened, bids/offers are public records. There are no exceptions.

N. STANDARDS & SPECIFICATIONS

Applicable standards are included under the *Standards & Specifications* attachment. These Standards and Specifications may include.

O. REGULATORY REQUIREMENTS & PERMITS

Contractors awarded pursuant to this solicitation shall comply with all applicable federal, state, and local laws, rules, regulations, ordinances, and codes and shall identify, prepare and/or obtain all licenses, documentation, coordination, testing, inspections, plans, reports, forms, and permits required to provide the services under this solicitation and as required by Local, State, and Federal Agencies, Departments, Boards, and Commissions at his/her own expense. Contractor shall be responsible for supplying necessary reports and studies (if applicable) to the agencies as required and provide responses to their comments, as necessary.

P. GENERAL CONDITIONS

The successful Contractor must comply with all requirements in the *Harris County General Conditions* attachment, if applicable. **WORK STANDARDS**

It is the responsibility of the Contractor to ensure that each worker provided by the Contractor shall be fully trained and qualified to provide any assigned work. Accordingly, all work provided shall be guaranteed by the Contractor to be performed in a workmanlike, skillful, and competent manner and in accordance with all applicable laws, codes, and/or regulations, including those issued by, but not limited to, Harris County (and/or, if applicable, any city jurisdiction therein in which work will be performed), and/or the State of Texas, and/or any applicable Federal laws, codes, and regulations.

III. CONTRACT REQUIREMENTS

The following Contract terms and payment requirements shall apply to the work intended to be awarded pursuant to this solicitation. To the extent that any of the Contract terms contained in this Section conflict with the Plans, Specifications, Standards or the General Conditions applicable to the Project, the more stringent requirement shall govern.

A. CONTRACT PROVISIONS

The Contractor shall be required to comply with the federal terms and conditions included in Attachment A, *Required Federal Contract Provisions*, which shall apply to and govern all work and services provided under the Contract.

In accordance with 2 CFR 200.326, contracts executed by the Subrecipient which are funded in whole or in part by federal grant monies shall contain the applicable provisions described in 2 CFR Appendix II to Part 200—Contract Provisions for non-Federal Entity Contracts Under Federal Awards. These contracts shall contain the applicable provisions described in 2 CFR Appendix II to Part 200—Contract Provisions for non-Federal Entity Contracts Under Federal Awards.

B. TIME FOR COMPLETION & LIQUIDATED DAMAGES FOR DELAY

1. Normal working hours shall be Monday through Friday, 8:00 AM to 5:00 PM (CST). All other working hours require pre-approval, in the Subrecipient's sole discretion. The Contractor shall be required to provide a minimum five (5) working days for approval and planning of any request for work windows outside normal working hours.
2. *Time is of the essence* of each and every provision of the Contract. If the Contractor fails to acceptably complete the Contract work within the time specified, including any properly authorized extension(s), the Subrecipient will be damaged and will suffer financial loss. The exact amount of damage is, and will be, difficult of exact ascertainment. Accordingly, instead of requiring any such proof, the County and the Contractor agree that the Contractor will pay the Subrecipient the sum of up to **\$500** for each and every calendar day of delay in completing the Contract work beyond the time prescribed for completion the work, as Liquidated Damages and not as a penalty or forfeiture.

The Contractor specially binds and obligates itself to pay such Liquidated Damages to the Subrecipient on demand, or at the Subrecipient's option the Subrecipient may withhold the amount thereof from any sums due the Contractor under this Contract.

C. PAYMENT PROVISIONS

The sum of the payments due to the Contractor is limited to the amount of money stated in the Contract. Any products provided, or services rendered, in excess of this amount will be at the Contractor's expense and not payable by the Subrecipient. No alterations, substitutions or extra charges of any kind will be permitted. Merchandise may not be billed at a price higher than is stated on the order. Because the project is federally-funded through Harris County, Contractors cannot include federal excise, state or city sales tax. Pursuant to Texas Tax Code Section 151.309, as amended, Harris County is exempted from sales and use taxes.

D. PAYROLL SUBMISSION

If Davis-Bacon or Prevailing Wages are applicable to the Project, original Weekly Certified Payrolls in the format required by Harris County must be submitted by all contractors, and subcontractors as applicable, on a weekly basis via LCP Tracker, as directed by Harris County. The Prime Contractor is responsible for

all subcontractor payroll submittals. All contractors and subcontractors are to make available copies of cancelled checks and check stubs for comparison, if requested by Harris County.

Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following. The Statement of Compliance is found on page 2 of the WH-347 form, and additional certifications of compliance may be required by Harris County. Any Statement of Compliance is subject to the penalties provided by 18 U.S.C. § 1001, namely, a fine, possible imprisonment of not more than 5 years, or both. Accordingly, the party signing this statement should have knowledge of the facts represented as true.

E. WAGE & LABOR COMPLIANCE

If Davis-Bacon or Prevailing Wages are applicable to the Project, the U.S. Department of Labor Wage Rate poster must be displayed in a location that all workers have easy access and remain in place at all times until the project is complete. Harris County reserves the right to visit the job site and to interview any employees on any given date or time during the construction period without prior notification.

Harris County and the Subrecipient may require the posting, utilization, and/or submission of the following forms or documents to verify compliance with Davis-Bacon, Prevailing Wages, and other labor requirements, which may include, but are not limited to, the following:

- *Davis Bacon Wage Decision* – This reflects proper minimum hourly compensation, including fringe benefits, which is owed workers by all contractor/subcontractor for this project. Prime Contractors are required to post these wage rates at the job site visible to all workers.
- *Certificate From Contractor Appointing Officer or Employee to Supervise Payment of Employees* – This form must be submitted with first weekly certified payroll form.
- *Daily Work Logs* – Harris County and the Subrecipient may require submission of Daily Work Logs from the Contractor for each day during the course of the project with the corresponding Pay Request.
- *LCP Tracker / Weekly Certified Payrolls* – The Subrecipient shall dictate the format and frequency required of contractors / subcontractors when completing certified payrolls, which must be submitted for each week during the course of the project within five (5) working days after the end of the weekly payroll period.
- *Quarterly Employment Data Report* – This report shall be provided by The Subrecipient to Contractor and must be submitted by all contractors / subcontractors whose contracts and subcontracts exceed \$10,000.00 regardless of the nature and duration of contract.
- *Employees Rights Under Davis-Bacon Act Poster* – This poster will be provided by The Subrecipient to Contractor and must be posted at the job site accompanied by the wage rates, which shall be visible to all workers.
- *Equal Employment Opportunity is the Law (EEO) Poster* – This poster will be provided by Harris County to Contractor, and must be posted at the job site in an area visible to all workers.
- *Project Sign* – The Subrecipient shall provide Contractor with the Project Sign requirements, if applicable, including language, formatting, size, and other specifications to be used when preparing and installing the required project sign(s).

Harris County and the Subrecipient will ascertain that the proper wage rates are being paid to the employees in accordance with the contract documents. The Prime Contractor shall not allow work requiring a license to be performed by a worker who does not have the proper license. The Prime Contractor shall require, and shall require all its subcontractors and lower tier subcontractors, that workers carry their license upon their persons while performing work on the Project and that such persons produce their licenses to the Harris County representative upon request. Should work requiring a license be performed by an unlicensed person despite the prohibitions of this paragraph, that person must be paid the required wage rate applicable for a licensed craftsman performing such work pursuant to the issued DBRA Wage Decision for this Project. Harris County will not recognize a worker that holds a journeyman's license in a trade as eligible for pay as an apprentice rate for work in that trade.

Apprentices may be used in any of the crafts listed in the Wage Decision, if they are currently certified in a program recognized by the Office of Apprenticeship Training, U.S. Department of Labor, providing the proper ratio between journeyman and apprentice is observed. Apprenticeship certification certificates must be supplied with the first weekly payroll upon which the apprentice's name appears. If they are not certified as an apprentice, they must be paid as a journeyman and used as an apprentice.

In the event of discrepancy between the services performed and the wages paid, it will be documented and the Prime Contractor will be so notified. Harris County and/or the Subrecipient reserve the right to withhold any payment due the Prime Contractor until such discrepancy is resolved and the necessary adjustment made.

F. COST PLUS CONTRACTING PROHIBITED

Cost-plus-a-percentage-of-cost (CPPC) contracts are prohibited by 2 CFR 200.323(d). The cost plus a percentage of cost and percentage of construction cost methods of contracting must never be used, including in subcontracts and third-party contracts. A cost-plus contract is one that is structured to pay the contractor or subcontractor their actual costs incurred, plus a fixed percent for profit or overhead.

A cost-plus-a-percentage-of-cost (CPPC) contract is a contract containing some element that obligates Harris County, the Subrecipient, or the Contractor to pay a contractor or subcontractor an amount (in the form of either profit or cost), undetermined at the time the contract was made, to be incurred in the future, and based on a percentage of future costs. The inclusion of an overall contract ceiling price does not make these forms of contracts acceptable.

This type of contract is prohibited because there is no incentive for the contractor or subcontractor to keep its incurred costs low. Instead, there is a reverse incentive for the contractor or subcontractor to continue to incur additional costs in order to continue to drive the percentage of cost up. In other words, increased spending by the contractor will yield higher profits. This prohibition applies to all work, regardless of the circumstances, and applies to subcontracts of the contractor cases where the prime contract is a cost-reimbursement type contract or subject to price redetermination.

G. INFORMATION SECURITY

1. Definitions

"Breach of Security" or "Breach" means unauthorized acquisition of computerized data that compromises the security, confidentiality, or integrity of sensitive personal information including data that is encrypted if the person accessing the data has the key required to decrypt the data.

"Personal Identifying Information" or "PII" means information that alone, or in conjunction with other information, identifies an individual, as defined at Tex. Bus. & Com. Code § 521.002(1).

“Sensitive Personal Information” or “SPI” means the information categories listed at Tex. Bus. & Com. Code § 521.002(2).

2. Security and Privacy Compliance

- a. Contractor shall keep all PII and SPI received or generated under the Contract and any documents related thereto strictly confidential.
- b. Contractor shall comply with all applicable federal and state privacy and data protection laws, as well as all other applicable regulations and directives.
- c. Contractor shall implement administrative, physical, and technical safeguards to protect PII and SPI that are no less rigorous than accepted industry practices including, without limitation, the guidelines in the National Institute of Standards and Technology (“NIST”) Cybersecurity Framework Version 1.1. All such safeguards shall comply with applicable data protection and privacy laws.
- d. Harris County shall legally bind any contractors and their subcontractors to the same requirements stated herein and obligations stipulated in the Contract and documents related thereto. Harris County shall ensure that the requirements stated herein are imposed on any subcontractor of Contractor’s subcontractor(s).
- e. Contractor shall not share PII or SPI with any third parties, except as necessary for Contractor’s performance under the Contract.

3. Data Ownership

- a. Upon termination of the Contract, Contractor shall promptly return to Harris County all Harris County-owned data possessed by Contractor and its employees, agents, or contractors, including any subcontractor. Contractor shall retain no copies or back-up records of Harris County-owned data. If such return is infeasible, as mutually determined by Harris County and Contractor, with respect to Harris County-owned data, Contractor shall limit any further use and disclosure of Data to the purposes that make the return of Harris County-owned data infeasible. In lieu of the requirements in this Section, Harris County may direct Contractor to destroy any Harris County-owned data in Contractor’s possession. Any such destruction shall be verified by Contractor and Harris County.

4. Data Mining

- a. Contractor agrees not to use PII or SPI for unrelated purposes, advertising or advertising-related services, or for any other purpose not explicitly authorized by Harris County in the Contract or any document related thereto.
- b. Contractor agrees to take all reasonably feasible physical, technical, administrative, and procedural measures to ensure that no unauthorized use of PII or SPI occurs.

5. Breach of Security

- a. Upon discovery of a Breach of Security or suspected Breach of Security by the Contractor, Contractor agrees to notify Harris County as soon as possible upon discovery of the Breach of Security or suspected Breach of Security, but in no event shall notification occur later than 24 hours after discovery.
- b. Contractor agrees to take all reasonable steps to immediately remedy a Breach of Security and prevent any further Breach of Security.

6. Right to Audit

- a. Upon the Harris County's request and to confirm Contractor's compliance with this Appendix, Contractor grants Harris County permission to perform an assessment, audit, examination, investigation, or review of all controls in the Contractor's, or any of Contractor's contractors, including any subcontractor's, physical and/or technical environment in relation to PII or SPI. Contractor agrees to fully cooperate with such assessment by providing access to knowledgeable personnel, physical premises, documentation, infrastructure, and application software that stores, processes, or transports PII or SPI. Contractor shall ensure that this clause concerning the Harris County's authority to assess, audit, examine, investigate, or review is included in any subcontract it award.

H. INFORMATION SECURITY

1. Definitions

"Breach of Security" or "Breach" means unauthorized acquisition of computerized data that compromises the security, confidentiality, or integrity of sensitive personal information including data that is encrypted if the person accessing the data has the key required to decrypt the data.

"Personal Identifying Information" or "PII" means information that alone, or in conjunction with other information, identifies an individual, as defined at Tex. Bus. & Com. Code § 521.002(1).

"Sensitive Personal Information" or "SPI" means the information categories listed at Tex. Bus. & Com. Code § 521.002(2).

2. Security and Privacy Compliance

- a. Contractor shall keep all PII and SPI received or generated under the Contract and any documents related thereto strictly confidential.
- b. Contractor shall comply with all applicable federal and state privacy and data protection laws, as well as all other applicable regulations and directives.
- c. Contractor shall implement administrative, physical, and technical safeguards to protect PII and SPI that are no less rigorous than accepted industry practices including, without limitation, the guidelines in the National Institute of Standards and Technology ("NIST") Cybersecurity Framework Version 1.1. All such safeguards shall comply with applicable data protection and privacy laws.
- d. Harris County shall legally bind any contractors and their subcontractors to the same requirements stated herein and obligations stipulated in the Contract and documents related thereto. Contractor shall ensure that the requirements stated herein are imposed on Contractor's subcontractor(s).
- e. Contractor shall not share PII or SPI with any third parties, except as necessary for Contractor's performance under the Contract.

3. Data Ownership

- a. Upon termination of the Contract, Contractor shall promptly return to Harris County all Harris County-owned data possessed by Contractor and its employees, agents, or contractors, including any subcontractor. Contractor shall retain no copies or back-up records of Harris County-owned data. If such return is infeasible, as mutually determined by Harris County and Contractor, with respect to Harris County-owned data, Contractor shall limit any further use

and disclosure of Data to the purposes that make the return of Harris County-owned data infeasible. In lieu of the requirements in this Section, Harris County may direct Contractor to destroy any Harris County-owned data in Contractor's possession. Any such destruction shall be verified by Contractor and Harris County.

4. Data Mining

- a. Contractor agrees not to use PII or SPI for unrelated purposes, advertising or advertising-related services, or for any other purpose not explicitly authorized by Harris County in the Contract or any document related thereto.
- b. Contractor agrees to take all reasonably feasible physical, technical, administrative, and procedural measures to ensure that no unauthorized use of PII or SPI occurs.

5. Breach of Security

- a. Upon discovery of a Breach of Security or suspected Breach of Security by the Contractor, Contractor agrees to notify Harris County as soon as possible upon discovery of the Breach of Security or suspected Breach of Security, but in no event shall notification occur later than 24 hours after discovery.
- b. Contractor agrees to take all reasonable steps to immediately remedy a Breach of Security and prevent any further Breach of Security.

6. Right to Audit

- a. Upon the Harris County's request and to confirm Contractor's compliance with this Appendix, Contractor grants Harris County permission to perform an assessment, audit, examination, investigation, or review of all controls in the Contractor's, or any of Contractor's contractors, including any subcontractor's, physical and/or technical environment in relation to PII or SPI. Contractor agrees to fully cooperate with such assessment by providing access to knowledgeable personnel, physical premises, documentation, infrastructure, and application software that stores, processes, or transports PII or SPI. Contractor shall ensure that this clause concerning the Harris County's authority to assess, audit, examine, investigate, or review is included in any subcontract it award.

I. REMEDIES & LIQUIDATED DAMAGES FOR CERTAIN BREACHES

1. As authorized by 41 U.S.C. 1908, in instances where Contractors violate or breach contract terms, the Subrecipient is authorized to impose administrative, contractual, or legal remedies which may provide for sanctions and penalties as appropriate.

In the event of a failure by Contractor to satisfactorily perform the services specified herein and/or a default by Contractor in abiding by the other terms and conditions of the Contract, the Subrecipient may terminate the Contract on written notice to Contractor and Contractor shall be liable for all damages, costs, and expenses (including attorney fees) incurred by County related to this default. Such termination is in addition to and not in lieu of any other remedies that the Subrecipient may have in law or equity. Administrative remedies for non-performance, violation or breach of contract terms, or termination of contract for default may include suspension and debarment. The Subrecipient may assess liquidated damages for failure to meet completion deadlines, contract breaches, or performance failures of the Contractor or its Subcontractors.

2. Contractor shall be provided the opportunity to cure certain performance failures or instances of default as described in the contract documents. The legal dispute resolution process as applicable

under the Texas Civil Practice and Remedies Code shall include, but is not limited to, Texas and Civil Practice and Remedies Section 38 – Attorney’s Fees, Texas Civil Practice and Remedies Section 41 – Damages, and Texas Civil Practice and Remedies Section 154 – General Provisions. The Subrecipient and Contractor(s) should attempt to resolve any claim for breach of contract made by Contractor, to the extent it is applicable to the Contract and not preempted by other law. Except as otherwise provided by law, nothing herein is a waiver by the County or the State of Texas of the right to seek redress in a court of law.

3. In addition, in accordance with Attachment A, *Required Federal Contract Provisions*, liquidated damages may be applied for certain other breaches of the Contract, which may be withheld from amounts due on the Contract.

Any and all moneys collected by the Contractor as liquidated damages from its Subcontractors for any breaches in accordance with Attachment A shall be paid by the Contractor to the Subrecipient. In each subcontract for Work, the Contractor shall include a provision expressly giving the Subrecipient a right of action against the Subcontractor in the event such Subcontractor fails to pay any liquidated damages determined to be due and owing thereunder.

Liquidated damages received hereunder are not intended to be nor shall they be treated as either a partial or full waiver or discharge of the Subrecipient’s right to indemnification, or the Contractor’s obligation to indemnify the Subrecipient, or to any other remedy provided for in this Contract or by Law.

The Subrecipient may deduct and retain out of the monies which may become due hereunder, the amount of any such liquidated damages; and in case the amount which may become due hereunder shall be less than the amount of liquidated damages suffered by the County, the Contractor shall be liable to pay the difference.

J. TAXES

Harris County is exempt from all federal excise, state and local taxes unless otherwise stated in this document. Harris County claims exemption from all sales and/or use taxes under Texas Tax Code 151.309, as amended. Texas Limited Sales Tax Exemption Certificates may be furnished upon written request to Harris County.

K. SAFETY

It shall be the responsibility of the Contractor to ensure, at all times during the performance of the work, to the maximum extent feasible, to protect the safety of County residents and staff, the Contractor’s staff, subcontractors, and the public. This shall include, but not be limited to, compliance with all OSHA-related Federal and local laws, codes, and regulations.

The Contractor shall be entirely responsible for security and safety at the Site until it is turned over to the Subrecipient. The Contractor shall comply with all Safety Guidelines and all laws of any governmental authorities for the safety of persons or property. Hazardous Materials may not be used without prior notice to, approval from, and coordination with the Subrecipient. Contractor shall be responsible for any Hazardous Materials brought to the Site by Contractor, Subcontractors, suppliers or anyone else for whom Contractor is responsible. Contractors shall dispose of all Hazardous Materials in accordance with all applicable laws and Safety Guidelines relating to disposal of Hazardous Materials. Notwithstanding anything herein to the contrary, asbestos, asbestos containing products or polychlorinated biphenyl (PCB) shall not be allowed on the Site nor be used in the Work.

L. HAZARDOUS MATERIALS

Materials used in the project shall be free of hazardous materials, except as may be specifically provided for in the specifications.

M. SUPERVISION

The Contractor shall provide competent management for the Project, approved by the Subrecipient, who shall be at the Site (if applicable) and working on the Project for direction, coordination, sequencing and all other required activities, for the entire duration of and until final acceptance of the work. The approved manager or superintendent shall not be discontinued (except upon Final Completion of the Project or in the event of his or her termination of employment or disability or if the Subrecipient requests a replacement to resolve incompatible working relationships) and no new individual shall be designated without prior approval of the Subrecipient.

N. SUBCONTRACTORS

The Subrecipient must approve the actual subcontractors prior to their use. Contractor must verify subcontractor eligibility based on factors such as past performance, proof of liability insurance, possession of a federal ID tax number, debarment status, and state licensing requirements. Contractor assumes responsibility for the performance of the subcontractor; therefore, Contractor is urged to closely scrutinize subcontractors. If a subcontractor is found to be ineligible after award of a contract, the contract shall be immediately terminated and the matter reported to HUD.

O. INSURANCE

Contractor performing services under the contract awarded pursuant to this solicitation must provide the types and amounts of insurance specified in the *Minimum Insurance Requirements*, included as Attachment K. Contractor is advised to carefully review such insurance requirements. All insurance must provide coverage for work on residential properties. By submitting a response, Contractor acknowledges that it has reviewed the insurance provisions and takes no exceptions to the insurance requirements.

Contractor's certificate(s) shall include all subcontractors as additional insureds under its policies **or** subcontractors shall maintain separate insurance as determined by the Contractor, however, subcontractor's limits of liability shall not be less than \$1,000,000 per occurrence / \$2,000,000 aggregate.

Refer to Attachment K for more information on *Minimum Insurance Requirements*.

P. WORKERS' COMPENSATION INSURANCE COVERAGE RULE 110.110

Contractor must comply with this requirement which is applicable for any building or construction contract – see the *Workers' Compensation Insurance Coverage Rule 110.110* under Attachment L for more detail.

Q. MATERIAL SAFETY DATA SHEETS

Under the "Hazardous Communication Act", commonly known as the "Texas Right To Know Act", Contractor must provide to the Subrecipient with each delivery, material safety data sheets which are applicable to hazardous substances defined in the Act. Contractor shall furnish this documentation for any material proposed within Contractor's response subject to the Act.

R. FAILURE TO COMPLY

Failure to comply with any part of the provisions shall constitute a material breach of the Contract. The event of such a breach may result in compensation being withheld or suspended, termination of the Contract, or suspension or debarment of the Contractor. The Contractor shall also be liable for all damages available under 2 CFR Part 200 and statutes and regulations related to the formation and execution of the Contract.

S. TERMINATION

1. **Termination for Convenience.** This Contract may be Terminated for Convenience due to reasons known to the Subrecipient, i.e., program changes, changes in state-of-the-art equipment or technology, insufficient funding, etc. This type of termination is utilized when the Contractor is not in violation of the contract terms and conditions. The Subrecipient may terminate this contract without Cause upon thirty (30) days written notice.
2. **Termination for Cause.** This Contract may be Terminated for Cause due to actions by the Contractor, i.e., failure to perform, financial difficulty, slipped schedules, etc. In certain instances, the termination settlement may include reprocurement costs to be paid by the Contractor. The Subrecipient reserves the right to terminate this Contract for default if Contractor breaches any of the terms herein, including warranties of Contractor or if the Contractor becomes insolvent or commits acts of bankruptcy. Such right of Termination is in addition to and not in lieu of any other remedies which the Subrecipient may have in law or equity. Default may be construed as, but not limited to, failure to deliver the proper goods and/or services within the proper amount of time, and/or to properly perform any and all services required to the Subrecipient's satisfaction and/or to meet all other obligations and requirements.
3. **Termination for Health and Safety Violations.** The Subrecipient shall terminate this contract immediately without prior notice if Contractor fails to perform any of its obligations in this Contract if the failure (a) created a potential threat to health or safety or (b) violated a law, ordinance, or regulation designed to protect health or safety.

T. WARRANTIES

Contractor shall furnish all data pertinent to warranties or guarantees which may apply to items its response to this contract opportunity. Contractor may not limit or exclude any implied warranties. Contractor warrants that product sold to the County shall conform to the standards established by the U.S. Department of Labor under the Occupational Safety and Health Act of 1970 ("OSHA"). In the event product does not conform to OSHA Standards, where applicable, the Subrecipient may return the product for correction or replacement at Contractor's expense. If Contractor fails to make the appropriate correction within a reasonable time, Harris County and/or the Subrecipient may correct at Contractor's expense.

Labor, materials, and equipment furnished under the Contract shall be of the type and quality required by the Scope of Work and Contract, new (unless otherwise required or permitted by the Contract) and installed in a good and workmanlike manner and otherwise in accordance with the Contract. Contractor shall use sound construction principles and practices in the performance of the work; apply to the work a high degree of skill, care, judgment and supervision to assure that the work is performed properly and in accordance with the Contract; and ensure the work will be free from defects not inherent in the quality required or permitted.

Such warranty will be stipulated in the Contract between the Contractor and the Subrecipient. For a period of one (1) year, the Subrecipient may require the Contractor to correct defects or problems arising from his or her work under the Contract. Should the Contractor fail to do so, the Subrecipient may take any necessary legal recourse as prescribed in the Contract. A reasonable amount of time will be given to correct the problem; however, in no case will such time exceed two weeks for Contractor to respond.

IV. REQUIRED CONTRACTOR DOCUMENTS

Prior to execution of a contract between the Subrecipient and the Contractor, the Contractor must submit all components checked below. If the item is "X" checked, the item must be submitted by the Contractor to the

Subrecipient. Contractor should be thoroughly familiar with all of the following items applicable to the Contract.

☒	1.	Certification Regarding Lobbying – Contractor must sign and submit the <i>Certification Regarding Lobbying</i> form, included as Attachment N.
☒	2.	Form SF-330 – Architect-Engineer Qualifications (if applicable) – Contractor must complete and submit Form SF-330 – Architect-Engineer Qualifications for any work requiring Architects or Engineers, which can be downloaded at https://www.gsa.gov/forms-library/architect-engineer-qualifications
☒	3.	Statement of Contractor Qualifications – Contractors must complete and submit the <i>Statement of Contractor Qualifications</i> form, included as Attachment O.
☒	4.	Contractor and Subcontractor Licensing / Certifications – Contractor must submit any applicable licensing and/or certifications required for the completion of the scope of work under this solicitation.
☒	5.	Subcontractor Listing Form – Contractor must complete and submit the <i>Subcontractor Listing Form</i> , included as Attachment P.
☒	6.	Bid Bond (if applicable) – If the contract value is anticipated to exceed \$100,000, Contractor must furnish a good and sufficient bid bond (either an individual bid bond or a bank cashier's check) in the amount of five (5) percent of the total contract price.
☒	7.	Certification of Compliance with Federal Standards & Requirements – Contractor must sign and submit the <i>Certification of Compliance with Federal Standards & Requirements</i> form, included as Attachment M.
☒	8.	Section 3 Subcontracting Plan – When applicable, Contractor must complete and submit the <i>Subcontracting Plan</i> (Attachment V) which demonstrates the commitment and/or ability to fulfill Section 3 Subcontracting Goals to hire Section 3 Businesses under this contract.
☒	9.	Section 3 Business Concern Self-Certification Form – Bidders intending to self-perform as Section 3 Businesses, or for any subcontractors of Bidder who qualify as Section 3 Businesses and wish to self-certify as Section 3, the <i>Harris County Section 3 Business Concern Self-Certification Form</i> (Attachment S) must be included and submitted with the Bid.
☒	10.	When applicable, certification or documentation that Contractor, or its subcontractor(s), is HUB-certified by the Texas Comptroller of Public Accounts or the local MWBE office in their jurisdiction.
☒	11.	Conflict of Interest Questionnaire – Contractors who enter or seek to enter into a contract with the Subrecipient must disclose Contractors' or employees' affiliation, business relationship, employment, family relationship, or provision of gifts that might cause a conflict of interest with Harris County. By law, the <i>Conflict of Interest Questionnaire</i> (provided by the Texas Ethics Commission at www.ethics.state.tx.us) must be filed with the records administrator of Harris County not later than the 7th business day after the date Contractor becomes aware of facts that require the statement to be filed.

☒	12.	Statement of Conflicts – A statement of conflicts (if any) the Contractor or key employees may have regarding the work or services.
☒	13.	Sample Insurance Certificate – Contractor must provide a sample Insurance Certificate which adheres to the <i>Minimum Insurance Requirements</i> shown under Attachment K (does not supersede the “Hold Harmless” provision).
☒	14.	GLO Compliance Package – For GLO-funded projects, Contractor must complete and submit the <i>GLO Compliance Package</i> , shown under (Attachment Z), which includes the following forms: 1. GLO Contractor Certification 2. GLO Certification of Contractor Regarding Civil Rights Laws and Regulations 3. GLO Contractor Certification of Efforts to Fully Comply with Employment and Training Provisions of Section 3

V. ATTACHMENTS

- Attachment A – Required Federal Contract Provisions
- Attachment B – Davis-Bacon & Related Acts (DBRA) Requirements
- Attachment C – Harris County Payroll Submittal Requirements
- Attachment D – Davis-Bacon Wage Decision
- Attachment E – Certificate From Contractor Appointing Officer Or Employee To Supervise Payment Of Employees
- Attachment F – Daily Work Logs
- Attachment G – LCP Tracker / Weekly Certified Payroll
- Attachment H – Quarterly Employment Data Report
- Attachment I – Employees Rights Under the Davis-Bacon Act Poster
- Attachment J – Equal Employment Opportunity (EEO) is the Law Poster
- Attachment K – Minimum Insurance Requirements
- Attachment L – Workers’ Compensation Insurance Coverage Rule 110.110
- Attachment M – Certification of Compliance with Federal Standards & Requirements
- Attachment N – Certification Regarding Lobbying
- Attachment O – Statement of Contractor Qualifications
- Attachment P – Subcontractor Listing Form
- Attachment Q – Section 3 Clause
- Attachment R – Section 3 Obligation Summary for Contract Awardees
- Attachment S – Section 3 Business Concern Self-Certification Form
- Attachment T – Section 3 Worker and Targeted Worker Self-Certification Form
- Attachment U – Section 3 Business Concern Employee List
- Attachment V – Section 3 Initial Subcontracting Plan
- Attachment W - Standards & Specifications
- Attachment X – Project Signs
- Attachment Y – General
- Attachment Z – GLO Compliance Package

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The Part 200 Uniform Requirements require that non-Federal entities' contracts contain the applicable provisions described in Appendix II to Part 200 — "Contract Provisions for Non-Federal Entity Contracts Under Federal Awards." Violations of law will be referred to the proper authority in the applicable jurisdiction. All Prime Contractors awarded contracts by the Subrecipient which are federally funded, in whole or in part, are required to comply with the provisions below. Additionally, Prime Contractors with the Subrecipient are required to include the provisions below in any contracts executed with subcontractors performing the scope of work and shall pass these requirements on to its subcontractors and third-party contractors, as applicable. In addition to other provisions required by the relevant Federal agency, State of Texas, or Harris County, all contracts made by the Subrecipient under the Federal award shall contain provisions covering the following, as applicable.

ACCESS TO RECORDS & RECORD RETENTION (2 CFR 200.336)

Contractor must provide Harris County, the State of Texas, the Texas General Land Office (GLO), the U.S. Department of Housing and Urban Development (HUD), the FEMA Administrator, the Inspectors General, the Comptroller General of the United States, or any of their pass-through entities or authorized representatives access to any books, documents, papers, and records of the Contractor and its subcontractors which are directly pertinent to this contract/project for the purposes of making/responding to audits, examinations, excerpts, and transcriptions. The right also includes timely and reasonable access to the Contractor's personnel for the purpose of interview and discussion related to such documents. Contractor must keep records within Harris County or note in its submission that records will be available within the boundaries of Harris County to those representatives within twenty-four (24) hours of request by the County. Contractor must maintain all records pertaining to the project for seven (7) years after receiving final payment and after all other pending matters have been closed.

ACCESSIBILITY (24 CFR 570.614) & SECTION 504 (29 U.S.C. Section 794 and 24 CFR Parts 8-9)

Contractor shall comply with all federal, state and local laws and regulations which prohibit recipients of federal funding from discriminating against individuals with disabilities. Applicable laws and regulations with which Contractor shall comply shall include, but are not limited to, the following: Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. Section 794) (24 CFR Parts 8-9); Title II of the Americans with Disabilities Act of 1990; the Architectural Barriers Act of 1968 (42 U.S.C. 4151-4157); the Uniform Federal Accessibility Standards (Appendix A to 24 CFR Part 40 and Appendix A to 41 CFR Part 101-19, subpart 101-19.6); the Americans with Disabilities Act (42 U.S.C. 12131; 47 U.S.C. 155, 201, 218, and 225); Texas Administrative Code, Title 10, Chapter 60, Subchapter (B) the Texas Architectural Barriers Act (TABAA); the Architectural Barriers (AB) Rules; and the Texas Accessibility Standards (TAS).

BYRD ANTI-LOBBYING AGREEMENT (2 CFR 200 APPENDIX II (J) AND 24 CFR 570.303)

Pursuant to 31 U.S.C.A. § 1352 (2003), if at any time during the contract term funding to contract exceeds \$100,000.00, the Contractor shall file with the County the Federal Standard Form LLL titled "Disclosure Form to Report Lobbying."

Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-federal award.

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CIVIL RIGHTS ACT OF 1964 (Title VI 42 U.S.C. § 2000d)

Title VI of the Civil Rights Act of 1964, Section 109 of the Community Development Act of 1974, Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. Section 794) (24 CFR Parts 8-9), and the Americans with Disabilities Act of 1990 (42 U.S.C. 12131; 47 U.S.C. 155, 201, 218, and 225), prohibits Contractors from excluding or denying individuals benefits or participation in this project on the basis of race, color, religion, national origin, sex, or disability. The provisions require that no person in the United States shall on the ground of race, color, religion, national origin, sex, or disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with community development funds made available pursuant to these Acts.

For purposes of this Part “program or activity” is defined as any function conducted by an identifiable administrative unit of the recipient, or private Contractor receiving community development funds or loans from the recipient. “Funded in whole or in part with community development funds” means that community development funds in any amount in the form of grants or proceeds from HUD guaranteed loans have been transferred by the recipient or a subrecipient to an identifiable administrative unit and disbursed in a program or activity. A Contractor may not, under any program or activity to which the regulations of this Part may apply directly or through contractual or other arrangements, on the grounds of race, color, national origin, or sex:

- a. Deny any facilities, services, financial aid or other benefits provided under the program or activity;
- b. Provide any facilities, services, financial aid or other benefits, which are different, or are provided in a different form from that provided to others under the program or activity;
- c. Subject to segregated or separate treatment in any facility in, or in any matter of process related to receipt of any service or benefit under the program or activity;
- d. Restrict in any way access to, or in the enjoyment of any advantage or privilege enjoyed by others in connection with facilities, services, financial aid or other benefits under the program or activity;
- e. Treat an individual differently from others in determining whether the individual satisfies any admission, enrollment, eligibility, membership, or other requirement or condition which the individual must meet in order to be provided any facilities, services or other benefit provided under the program or activity; and
- f. Deny an opportunity to participate in a program or activity as an employee.

CLEAN AIR ACT (2 CFR Appendix II to Part 200 (G))

Pursuant to 2 CFR Appendix II to Part 200 (G), if at any time during the contract term funding to contract exceeds \$150,000, the Contractor must comply with all provisions of the Clean Air Act (42 U.S.C. 85) and Section 308 of the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended. Contractors securing a contract in excess of \$150,000.00 shall not expend such funds by making use of subcontracting with facilities included on the Environmental Protection Agency List of Violating Facilities as per Section 306 of the Clean Air Act, Section 508 of The Clean Water Act, Executive Order 11738, and Environmental Protection Agency Regulations 40 CFR.

For any subcontractors under this contract receiving contracts in excess of \$150,000 Contractor is required to include a provision that requires compliance with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 85) and Section 308 Federal Water Pollution Control Act as amended (33

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U.S.C. 1251-1387). Violations shall be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (2 CFR Appendix II to Part 200 (E))

Pursuant to 2 CFR 200 Appendix II (E), if at any time during the contract term funding to contract exceeds \$100,000, the Contractor must comply with the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence

- (1) Overtime Requirements – No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. The (write in the name of the Federal agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these

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clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

COPELAND “ANTI-KICKBACK” ACT (40 U.S.C. 3145)

Pursuant to 2 CFR Appendix II to Part 200 (D), Contractor must comply with the provisions of the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each vendor, contractor, subcontractor, or subrecipient shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. Contractor shall include this provision in all contracts between itself and any subcontractors in connection with the services performed under this Contract. Harris County shall report all suspected or reported violations to the Federal awarding agency.

COST PLUS CONTRACTING PROHIBITED (2 CFR 200.323(D))

Cost-plus-a-percentage-of-cost (CPPC) contracts are prohibited by 2 CFR 200.323(d). The cost plus a percentage of cost and percentage of construction cost methods of contracting must never be used, including in subcontracts and third-party contracts. A cost-plus contract is one that is structured to pay the contractor or subcontractor their actual costs incurred, plus a fixed percent for profit or overhead.

A cost-plus-a-percentage-of-cost (CPPC) contract is a contract containing some element that obligates the Subrecipient, Harris County, or Contractor to pay a contractor or subcontractor an amount (in the form of either profit or cost), undetermined at the time the contract was made, to be incurred in the future, and based on a percentage of future costs. The inclusion of an overall contract ceiling price does not make these forms of contracts acceptable.

This type of contract is prohibited because there is no incentive for the contractor or subcontractor to keep its incurred costs low. Instead, there is a reverse incentive for the contractor or subcontractor to continue to incur additional costs in order to continue to drive the percentage of cost up. In other words, increased spending by the contractor will yield higher profits. This prohibition applies to all work, regardless of the circumstances, and applies to subcontracts of the contractor cases where the prime contract is a cost-reimbursement type contract or subject to price redetermination.

DAVIS BACON AND RELATED ACTS (2 CFR 200 APPENDIX II (D))

Pursuant to 2 CFR 200 Appendix II (D), for any contract in excess of \$2,000, Contractor must comply with the Davis Bacon and Related Acts, and the requirements shall be applicable to any labor or mechanic work completed in connection with this contract which fall under the Davis Bacon Act. Any Contractor awarded under this contract is required to comply with the Davis Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR part 5) and with the Copeland “Anti-Kickback” Act (18 U.S.C. 874; 40 U.S.C. 3145) as supplemented in Department of Labor regulations (29 CFR part 3). In accordance with the statute, Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week.

If Davis Bacon is applicable, the Subrecipient will provide a copy of the current *Davis Bacon Wage Decision* with this solicitation. The decision to award a contract or subcontract shall be conditioned upon the acceptance of the wage determination. Contractor shall submit certified payroll of contractor and all subcontractors on a

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weekly basis in the format required by the County. At County's request, Contractor shall make available and shall require its subcontractors to make available, copies of cancelled checks and check stubs for comparisons by the County or its agents.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR Part 5.5(a)(1)(ii)) and the Davis Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following. The Statement of Compliance can be found on page 2 of the WH-347 form, and/or additional certifications of compliance may be required by the Subrecipient and Harris County. Any Statement of Compliance is subject to the penalties provided by 18 U.S.C. § 1001, namely, a fine, possible imprisonment of not more than 5 years, or both. Accordingly, the party signing the statement should have knowledge of the facts represented as true.

Contractor must include this provision in all contracts between itself and any subcontractors in connection with the services performed under this Contract. The Subrecipient and Harris County shall report all suspected or reported violations to the Federal awarding agency, as applicable.

DEBARMENT / SUSPENSION AND VOLUNTARY EXCLUSION (2 CFR Appendix II to Part 200 (I))

Pursuant to 2 CFR Appendix II to Part 200 (I), a Contract meeting the definition in 2 C.F.R. § 180.220 must not be made to parties listed on the System for Award Management (SAM) Exclusion lists, in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

Pursuant to Executive Orders 12549 and 12689, a contract award shall not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235). SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549. A contract award must not be made to parties listed in the SAM Exclusions. SAM exclusions can be accessed at www.sam.gov.

Additionally, no contracts shall be awarded to any Contractor that has been debarred, suspended, or otherwise excluded from or ineligible for participation in any federal programs, including but not limited to the Department of Health and Human Work (DHHS), Office of Inspector General (OIG) - List of Excluded Individuals & Entities (LEIE); U.S. General Services Administration (GSA) – Excluded Parties List System (EPLS); All States (50) Health & Human Work Commission Medicaid OIG Sanction List; Government Terrorist Watch List (OFAC / Patriot Act); Department of Commerce, Bureau of Industry and Security, Denied

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Persons List; and Department of Homeland Security, Immigration and Customs Enforcement (ICE) Most Wanted.

This contract is a covered transaction for purposes of compliance with Title 2 C.F.R. parts 180 and 3000, and as such the Contractor is required to verify that none of the contractor, its principals (as defined at 2 C.F.R. § 180.995), or its affiliates (as defined at 2 C.F.R. § 180.905) are excluded (as defined at 2 C.F.R. § 180.940) or disqualified (as defined at 2 C.F.R. § 180.935). These regulations restrict awards, subawards, and contracts with certain parties that are debarred, suspended, or otherwise excluded from or ineligible for participation in Federal assistance programs and activities (See 2 C.F.R. Part 200, Appendix II). The Contractor must comply with 2 C.F.R. part 180, subpart C and 2 C.F.R. part 3000, subpart C and shall include this requirement and similar certification in all contracts between itself and any subcontractors in connection with the services performed under this Contract.

The Contractor confirms that it is eligible or otherwise not disqualified or prohibited from participation in federal or state assistance programs under Executive Order 12549, *Debarment and Suspension*. Additionally, the Contractor warrants that it is not debarred, suspended, or otherwise excluded from or ineligible for participation in any federal programs, including but not limited to the following: Department of Health and Human Work (DHHS), Office of Inspector General (OIG) - List of Excluded Individuals & Entities (LEIE); U.S. General Services Administration (GSA) – Excluded Parties List System (EPLS); All States (50) Health & Human Work Commission Medicaid OIG Sanction List; Government Terrorist Watch List (OFAC / Patriot Act); Department of Commerce, Bureau of Industry and Security, Denied Persons List; and Department of Homeland Security, Immigration and Customs Enforcement (ICE) Most Wanted. The Subrecipient reserves the right to verify any Contractor's status and document instances of debarment, suspension, or other ineligibility.

The Contractor shall verify that all subcontractors performing work under this Contract are not debarred, disqualified, or otherwise prohibited from participation in accordance with the requirements above. The Contractor further must notify the Subrecipient in writing immediately if Contractor or its subcontractors are not in compliance with Executive Order 12549 during the term of this contract. Contractor shall include this provision in all contracts between itself and any subcontractors in connection with the services performed under this Contract.

If it is found that the Contractor did not comply or is not in compliance with Executive Order 12549 (2 C.F.R. part 180, subpart C and 2 C.F.R. part 3000, subpart C), the Contractor may be subject to available remedies, including but not limited to, refunding the Subrecipient for any payments made to the Contractor while ineligible, and also acknowledges that the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

ENERGY EFFICIENCY (42 U.S.C. 6201 and 2 CFR 200 APPENDIX II (H))

Contractor must comply with the mandatory standards and policies relating to energy efficiency, which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201). Contractor must include this provision in all contracts between itself and any subcontractors in connection with the services performed under this Contract.

EQUAL EMPLOYMENT OPPORTUNITY (41 CFR 60-1.4(b) and 2 CFR 200 APPENDIX II (C))

Contractor must comply with, and incorporate or cause to be incorporated into any contract for construction work, or modification thereof, the Equal Employment Opportunity provisions as follows:

During the performance of this contract, the contractor agrees as follows:

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1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:
Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
3. The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
5. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
6. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
7. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
8. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order

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11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The contractor further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the contractor so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The contractor agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The contractor further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the contractor agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the contractor under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such contractor; and refer the case to the Department of Justice for appropriate legal proceedings.

Contractor must include the equal opportunity clause in each of its nonexempt subcontracts, and to require all non-exempt subcontractors to include the equal opportunity clause in each of its nonexempt subcontracts.

EQUAL EMPLOYMENT OPPORTUNITY FOR WORKERS WITH DISABILITIES (48 CFR 52.222-36)

During the performance of this contract, the Contractor must comply with required Equal Employment Opportunity for Workers with Disabilities provisions.

Contractor shall include the following equal opportunity clause in each of its covered Government contracts or subcontracts (and modifications, renewals, or extensions thereof if not included in the original contract): Equal opportunity clause. The Contractor shall abide by the requirements of the equal opportunity clause at 41 CFR 60-741.5(a), as of March 24, 2014. This clause prohibits discrimination against qualified individuals on the basis of disability, and requires affirmative action by the Contractor to employ and advance in employment qualified individuals with disabilities.

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- a. Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of \$15,000 unless exempted by rules, regulations, or orders of the Secretary, so that such provisions will be binding upon each subcontractor or vendor. The Contractor shall act as specified by the Director, Office of Federal Contract Compliance Programs of the U.S. Department of Labor, to enforce the terms, including action for noncompliance. Such necessary changes in language may be made as shall be appropriate to identify properly the parties and their undertakings.

EQUAL EMPLOYMENT OPPORTUNITY FOR VEVRAA PROTECTED VETERANS (41 CFR 60.300)

During the performance of this contract, the Contractor must comply with required Equal Employment Opportunity for VEVRAA Protected Veterans provisions. Contractor shall include the following equal opportunity clause in each of its covered Government contracts or subcontracts (and modifications, renewals, or extensions thereof if not included in the original contract):

- a. The definitions set forth in 41 CFR 60-300.2 apply to the terms used throughout this Clause, and they are incorporated herein by reference.
- b. The contractor shall not discriminate against any employee or applicant for employment because he or she is a disabled veteran, recently separated veteran, active duty wartime or campaign badge veteran, or Armed Forces service medal veteran (hereinafter collectively referred to as “protected veteran(s)”) in regard to any position for which the employee or applicant for employment is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified individuals without discrimination based on their status as a protected veteran in all employment practices, including the following:
 - i. Recruitment, advertising, and job application procedures.
 - ii. Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring.
 - iii. Rates of pay or any other form of compensation and changes in compensation.
 - iv. Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists.
 - v. Leaves of absence, sick leave, or any other leave.
 - vi. Fringe benefits available by virtue of employment, whether or not administered by the contractor.
 - vii. Selection and financial support for training, including apprenticeship, and on-the-job training under 38 U.S.C. 3687, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training.
 - viii. Activities sponsored by the contractor including social or recreational programs.
 - ix. Any other term, condition, or privilege of employment.
- c. The contractor shall immediately list all employment openings which exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract and including those occurring at an establishment of the contractor other than the one where the contract is being performed, but excluding those of independently operated corporate affiliates, with the appropriate employment service delivery system where the opening occurs. Listing employment openings with the state workforce agency job bank or with the local employment service

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delivery system where the opening occurs will satisfy the requirement to list jobs with the appropriate employment service delivery system. In order to satisfy the listing requirement described herein, contractors must provide information about the job vacancy in any manner and format permitted by the appropriate employment service delivery system which will allow that system to provide priority referral of veterans protected by VEVRAA for that job vacancy. Providing information on employment openings to a privately run job service or exchange will satisfy the contractor's listing obligation if the privately run job service or exchange provides the information to the appropriate employment service delivery system in any manner and format that the employment service delivery system permits which will allow that system to provide priority referral of protected veterans.

- d. Listing of employment openings with the appropriate employment service delivery system pursuant to this clause shall be made at least concurrently with the use of any other recruitment source or effort and shall involve the normal obligations which attach to the placing of a bona fide job order, including the acceptance of referrals of veterans and nonveterans. The listing of employment openings does not require the hiring of any particular job applicants or from any particular group of job applicants, and nothing herein is intended to relieve the contractor from any requirements in Executive orders or regulations regarding nondiscrimination in employment.
- e. Whenever a contractor, other than a state or local governmental contractor, becomes contractually bound to the listing provisions in paragraphs 2 and 3 of this clause, it shall advise the employment service delivery system in each state where it has establishments that: (a) It is a Federal contractor, so that the employment service delivery systems are able to identify them as such; and (b) it desires priority referrals from the state of protected veterans for job openings at all locations within the state. The contractor shall also provide to the employment service delivery system the name and location of each hiring location within the state and the contact information for the contractor official responsible for hiring at each location. The "contractor official" may be a chief hiring official, a Human Resources contact, a senior management contact, or any other manager for the contractor that can verify the information set forth in the job listing and receive priority referrals from employment service delivery systems. In the event that the contractor uses any external job search organizations to assist in its hiring, the contractor shall also provide to the employment service delivery system the contact information for the job search organization(s). The disclosures required by this paragraph shall be made simultaneously with the contractor's first job listing at each employment service delivery system location after the effective date of this final rule. Should any of the information in the disclosures change since it was last reported to the employment service delivery system location, the contractor shall provide updated information simultaneously with its next job listing. As long as the contractor is contractually bound to these provisions and has so advised the employment service delivery system, there is no need to advise the employment service delivery system of subsequent contracts. The contractor may advise the employment service delivery system when it is no longer bound by this contract clause.
- f. The provisions of paragraphs 2 and 3 of this clause do not apply to the listing of employment openings which occur and are filled outside of the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, Guam, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, Wake Island, and the Trust Territories of the Pacific Islands.
- g. As used in this clause:
 - i. All employment openings includes all positions except executive and senior management, those positions that will be filled from within the contractor's organization, and positions lasting

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three days or less. This term includes full-time employment, temporary employment of more than three days' duration, and part-time employment.

- ii. Executive and senior management means: (1) Any employee (a) compensated on a salary basis at a rate of not less than \$455 per week (or \$380 per week, if employed in American Samoa by employers other than the Federal Government), exclusive of board, lodging or other facilities; (b) whose primary duty is management of the enterprise in which the employee is employed or of a customarily recognized department or subdivision thereof; (c) who customarily and regularly directs the work of two or more other employees; and (d) who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring, firing, advancement, promotion or any other change of status of other employees are given particular weight; or (2) any employee who owns at least a bona fide 20-percent equity interest in the enterprise in which the employee is employed, regardless of whether the business is a corporate or other type of organization, and who is actively engaged in its management.
- iii. Positions that will be filled from within the contractor's organization means employment openings for which no consideration will be given to persons outside the contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings which the contractor proposes to fill from regularly established "recall" lists. The exception does not apply to a particular opening once an employer decides to consider applicants outside of his or her own organization.
- h. The contractor shall comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- i. In the event of the contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- j. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, Office of Federal Contract Compliance Programs, provided by or through the contracting officer. Such notices shall state the rights of applicants and employees as well as the contractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants who are protected veterans. The contractor must ensure that applicants or employees who are disabled veterans are provided the notice in a form that is accessible and understandable to the disabled veteran (e.g., providing Braille or large print versions of the notice, posting the notice for visual accessibility to persons in wheelchairs, providing the notice electronically or on computer disc, or other versions). With respect to employees who do not work at a physical location of the contractor, a contractor will satisfy its posting obligations by posting such notices in an electronic format, provided that the contractor provides computers that can access the electronic posting to such employees, or the contractor has actual knowledge that such employees otherwise are able to access the electronically posted notices. Electronic notices for employees must be posted in a conspicuous location and format on the company's intranet or sent by electronic mail to employees. An electronic posting must be used by the contractor to notify job applicants of their rights if the contractor utilizes an electronic application process. Such electronic applicant notice must be conspicuously stored with, or as part of, the electronic application.
- k. The contractor will notify each labor organization or representative of workers with which it has a collective bargaining agreement or other contract understanding that the contractor is bound by the

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terms of VEVRAA, and is committed to take affirmative action to employ and advance in employment, and shall not discriminate against, protected veterans.

- l. The contractor will include the provisions of this clause in every subcontract or purchase order of \$100,000 or more, unless exempted by the rules, regulations, or orders of the Secretary issued pursuant to VEVRAA so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Director, Office of Federal Contract Compliance Programs, may direct to enforce such provisions, including action for noncompliance.
- m. The contractor must, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to their protected veteran status.
- n. The Contractor shall forfeit as a penalty to the County who administers the subject Project receiving Federal assistance, Sixty Dollars (\$60.00) for each worker, employed for each calendar day, or a portion thereof, such worker is paid less than the said stipulated rates for any work done under this Project, by him/her or by any contractor under him/her.
- o. All contractors shall keep, or cause to be kept, an accurate record showing the names of all workers, also the actual per diem wages paid to each of such workers.

FAIR LABOR STANDARDS ACT

Contractor must comply the Fair Labor Standards Act of 1938 (29 U.S.C. Section 201 et seq.) as now or hereafter amended, which regulates wage, hour and other employment practices that govern the use of funds provided and the employment of personnel under this contract. The Contractor warrants that it will pay all its workers all monies earned by its workers including, but not limited to regular wages, any overtime compensation, or any additional payments pursuant to the Fair Labor Standards Act, 29 United States Code (U.S.C.) Section 207 9a(1), as amended; the Texas Pay Day Act; the Equal Pay Act; Title VII of the Civil Rights Act of 1964, 42 U.S.C. Section 2000, et al., as amended; or any provisions of the Texas Labor Code Ann., as amended.

FLOOD DISASTER PROTECTION ACT OF 1973 (24 CFR 570.605)

Contractor must comply with the provisions in 24 CFR 570.605, Section 202(a) of the Flood Disaster Protection Act of 1973 (42 U.S.C. 4106), and the regulations in 44 CFR Parts 59-79.

GREEN BUILDING STANDARDS

At a minimum, Contractors must comply with local codes and any applicable national building codes for any work involving rehabilitation or construction, including design. When a contract is funded, in whole or in part, by HUD funding, Contractors must comply with applicable Green Building standards to the maximum extent feasible. Green Building standards may apply to single-family properties, multifamily properties, or both and may include, but are not limited to best practices defined under LEED, Enterprise Green Communities, or NAHB National Green Building Standards and may include specific measures for water conservation, energy efficiency, and indoor air quality. Contractor must comply with the following standards, as applicable:

- 2009 ICC International Energy Conservation Code (IECC)
- ASHRAE 90.1-2007, which sets minimum energy standards for buildings except low-rise residential buildings

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- ASHRAE 62.1-2010 and 62.2-2010, which set minimum standards for ventilation for indoor air quality for common areas in mid- and high-rise buildings, and low-rise residential buildings, respectively.
- New or replacement residential housing, when funded by CDBG-DR grants, must adhere to Green Building standards, including Energy Star Certified Homes or Energy Star for Multifamily High Rise and other applicable green building requirements.
- Moderate residential housing rehabilitation, when funded by CDBG-DR grants, must comply with the Community Planning & Development (CPD) Retrofit Checklist and provide Energy Star appliances, Water Sense or FEMP products if replaced.
- New or replacement residential housing, when funded by CDBG-DR grants, must adhere to Green Building standards, including Energy Star Certified Homes or Energy Star for Multifamily High Rise and other applicable green building requirements.

HOLD HARMLESS AGREEMENT

Contractor shall indemnify, defend, and hold harmless the Subrecipient and/or Harris County from all claims for personal injury, death and/or property damage resulting directly or indirectly from contractor's performance. Contractor shall procure and maintain, with respect to the subject matter of this solicitation, appropriate insurance coverage including, at a minimum, public liability and property damage with adequate limits to cover contractor's liability as may arise directly or indirectly from work performed under terms of this solicitation. Certification of such coverage must be provided to the Subrecipient upon request.

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, contractor, or any other party pertaining to any matter resulting from the contract.

LEAD-BASED PAINT (24 CFR 570.608)

Contractor must comply with the provisions found in 24 CFR 570.608, the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846), the Residential Lead Based Paint Hazard Reduction Act of 1992 (U.S.C. 4851-4856, and 24 CFR Part 35, subparts A, B, J, K, and R. This Article 2(f) is to be included in all subcontracts, for work in connection with this Contract, which relate to residential structures.

NON-COLLUSION (The Sherman Act)

Contractor must comply with the requirements of The Sherman Act, which prohibit collusion. Collusion occurs when two persons or representatives of an entity or organization make an agreement to deceive or mislead another. Such agreements are usually secretive and involve fraud or gaining an unfair advantage over a third party, competitors, consumers or others with whom they are negotiating. The collusion, therefore, makes the bargaining process inherently unfair. Collusion can involve promises of future benefits, price or wage fixing, kickbacks, or misrepresenting the independence of the relationship between the colluding parties.

The Sherman Act prohibits any agreement among competitors to fix prices, rig bids, or engage in other anticompetitive activity. Collusion, bid rigging, or other anticompetitive activity is considered a felony.

Contractor shall not in any way, directly or indirectly:

- a. Collude, conspire, or agree with any other person, firm, corporation, Contractor or potential Contractor to the amount of this Contract or the terms or conditions of this Contract.
- b. Pay or agree to pay any other person, firm, corporation Contractor or potential Contractor any money or anything of value in return for assistance in procuring or attempting to procure a contract or in return for establishing the prices in the attached Contract or the Bid of any other Bidder.
- c. Assemble in coordination with any other organization in an attempt to fix the price of the work.

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Contractors are expected to report any suspected fraud, collusion, or impropriety from the inception of solicitation through the end of the contract term.

NON-SEGREGATED FACILITIES

“Prohibition of Segregated Facilities”

- a. Segregated facilities means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

Sexual orientation has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs, and is found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.

- b. The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.
- c. The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

PARTICIPATION BY MINORITY & WOMEN-OWNED BUSINESS ENTERPRISES (2 CFR 200.321)

Contractor must comply with the Minority and Women-owned Business Enterprise participation requirements under 2 CFR 200.321. Contractors must take all affirmative steps necessary to subcontract with Minority and Women-owned Business Enterprises (MWBEs) to assure that MWBEs are used when possible. These affirmative steps shall include:

- A. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- B. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
- C. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
- D. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and
- E. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

The State of Texas maintains a Historically Underutilized Business Program, which identifies any business at least 51 percent owned by an Asian Pacific American, Black American, Hispanic American, Native American, American woman and/or Service Disabled Veteran, who reside in Texas and actively participate in the control, operations and management of the entity's affairs as a Historically Underutilized Business (also considered MWBE). Contractors who wish to check the status of a firm may visit <https://comptroller.texas.gov/purchasing/vendor/hub/>.

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Contractors and subcontractors are required to facilitate Minority & Women-Owned Business Enterprise participation. Contractors are encouraged to utilize MWBEs / HUB firms as subcontractors, subconsultants, or suppliers in order to comply with the requirements and may check for firms who perform relevant work by searching <https://comptroller.texas.gov/purchasing/vendor/hub/>.

Contractor and subcontractors must facilitate Minority & Women-Owned Business Enterprise participation and take all affirmative steps to utilize MWBEs / HUB firms as subcontractors, subconsultants, or suppliers throughout the life of the Contract.

POTENTIAL CONFLICTS OF INTEREST

Pursuant to 2 CFR 200.112, Contractor must comply with disclosure requirements in accordance with Texas Local Government Code, Chapter 176. Contractor shall not use funds to directly or indirectly pay any person for influencing or attempting to influence any public employee or official in connection with the awarding of any contract or the extension, continuation, renewal, amendment or modification of any contract. By law, the *Conflict of Interest Questionnaire* (provided by the Texas Ethics Commission at www.ethics.state.tx.us) must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the Contractor becomes aware of facts that require the statement to be filed.

This law requires persons desiring to do business with the County to disclose any gifts valued in excess of \$250 given to any County Official or the County Official's family member, or employment of any County Official or the County Official's family member during the preceding twelve (12) month period. The disclosure questionnaire must be filed with the Harris County Clerk. Refer to Texas Local Government Code, Chapter 176 for the details of this law.

An outside consultant or contractor is prohibited from submitting a response for services on a Subrecipient project of which the consultant or contractor was a designer or other previous contributor, or was an affiliate, subsidiary, joint venturer or was in any other manner associated by ownership to any party that was a designer or other previous contributor. If such a consultant or contractor submits a prohibited response, that response shall be disqualified on the basis of conflict of interest, no matter when the conflict is discovered by the Subrecipient or Harris County.

PREVAILING WAGES (2 CFR 200 APPENDIX II (D) and TGC 2258)

Pursuant to 2 CFR 200 Appendix II (D), Contractor must comply with Texas Government Code (TGC) 2258, Prevailing Wage Rates. Accordingly, Contractor must submit a certified payroll records as required, and compensate any worker employed on a public works project not less than as applicable. As noted under "Davis Bacon and Related Acts", when required by Federal program legislation, construction contracts in excess of \$2,000 awarded by the Subrecipient shall require compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, Contractor must pay wages to laborers and mechanics at a rate not less than the local prevailing wages, or Davis Bacon wages, as applicable. If both Texas prevailing wages and Davis Bacon provide rates for a particular class, Contractors must pay the greater wage rate. In addition, Contractor must pay wages not less than once a week.

In compliance with Section 2258 of the Texas Government Code, Contractor and any subcontractor hired by Contractor for the construction of any project, shall pay not less than the rates set forth in the Schedule of Prevailing Wages attached and incorporated by reference. In submitting a response, Contractor warrants that it

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and its subcontractors shall comply with all requirements and worker ratios per the applicable Schedule of Prevailing Wages and Texas state law.

Contractor must submit certified payroll of contractor and all subcontractors on a weekly basis. At County's request, Contractor must make available and shall require its subcontractors to make available, copies of cancelled checks and check stubs for comparisons by the County or its agents. Regardless of whether Davis Bacon or Texas Prevailing Wages apply, the County reserves the right for its agents to visit the project site and to interview contractor, its subcontractors and employees of each on any date or time, as often as desired during the construction period, without prior notification.

The Subrecipient and Harris County will ascertain if proper wage rates are being paid to the employees as required. In the event of a discrepancy between the work performed and the wages paid, the County shall document same and notify Contractor. If, for any length of time and as determined by Harris County, discrepancies appear between the certified payrolls and the actual wage paid, the County shall require check stubs to be attached to each weekly certified payroll.

Pursuant to Texas Government Code Section 2258.051, the County reserves the right to withhold any monies due Contractor until such discrepancy is resolved and the necessary adjustment made. The Contractor shall forfeit as a penalty, in accordance with Texas Government Code Section 2258.023(b), to the County or entity who administers the subject Project receiving Federal assistance, Sixty Dollars (\$60.00) for each worker, employed for each calendar day, or a portion thereof, such worker is paid less than the said stipulated rates for any work done under this Project, by him/her or by any contractor/subcontractor under him/her.

All contractor/subcontractor shall keep, or cause to be kept, an accurate record showing the names of all workers, also the actual per diem wages paid to each of such workers. Contractor shall impose these same obligations upon its Subcontractors. Contractor understands that with weekly or monthly certified payrolls, contractor is responsible for any and all penalties that shall accrue during the month, regardless of the fact that any error could not be discovered by the Contract Compliance Officer until the following certified payroll.

PROCUREMENT OF RECOVERED MATERIALS (2 CFR 200.322)

Pursuant to 2 CFR 200.322, Contractor must comply with Section 6002 of the Solid Waste Disposal Act, Pub. L. No. 89-272 (1965) (codified as amended by the Resource Conservation and Recovery Act at 42 U.S.C. § 6962). As such, any contractors awarded under this contract opportunity is subject to the requirements of Section 6002, which include procuring only items designated in guidelines of the EPA at 40 C.F.R. Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired by the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS

Contractor must comply with 31 U.S.C. Chapter 38, *Administrative Remedies for False Claims and Statements*, which shall apply to the activities and actions of the Contractor and its subcontractors pertaining to any matter resulting from the contract.

RESTRICTIONS ON PUBLIC BUILDINGS AND PUBLIC WORKS PROJECTS CERTIFICATION

- a. Definitions. The definitions pertaining to this provision are those that are set forth on the clause entitled "Restrictions on Public Works Projects." (Set out under "Contract Clauses" below.)
- b. Certification. Except as provided in paragraph (C) of this provision, Contractor certifies that it:

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- i. Is not a Contractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR) (see paragraph (H) of this provision);
 - ii. Has not or will not enter into any subcontract with a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR, and
 - iii. Will not provide any product of a country included on the list of foreign countries that discriminate against the U.S. firms published by the USTR.
- c. Inability to certify. A Contractor unable to certify in accordance with paragraph (b) of this provision shall submit with its offer a written explanation fully describing the reasons for its inability to make the certification.
- d. Applicability of 18 U.S.C. 1001. This certification is paragraph (B) of this provision concerns a matter within the jurisdiction of an agency of the United States, and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18 U.S.C. 1001.
- e. Notice. Contractor shall provide written notice to the Contracting Officer if, at any time before the contract award, Contractor learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- f. Restrictions on contract award. Unless a waiver to these restrictions is granted by the Secretary of Housing and Urban Development, no contract will be awarded to a Contractor (1) who is owned or controlled by a citizen or national of a foreign country included on the list of foreign countries that discriminate against U.S. firms published by the USTR, (2) whose subcontractors are owned or controlled by citizens or national of a foreign country on the USTR list or, (3) who incorporates any product of a foreign country on the USTR list in the public works project.
- g. USTR List. The USTR published an initial list in the Federal Register on December 30, 1987 (53 FR 49244), which identified one country-Japan. The USTR can add countries to the list, and remove countries from it, in accordance with section 109 (C) of PUB. L. 100-202.

RESTRICTIONS ON PUBLIC BUILDINGS AND PUBLIC WORKS PROJECTS

- a. Definitions. “Component”, as used in this clause, means those articles, materials, and supplies incorporated directly into the product. “Contractor or subcontractor of a foreign country,” as used in this clause, means any Contractor or subcontractor that is a citizen or national of a foreign country or is controlled directly or indirectly by citizens or nationals of a foreign country. A contractor or subcontractor shall be considered to be a citizen or national of a foreign country, or controlled directly or indirectly by citizens or nationals of a foreign country:
 - i. If 50 percent or more of the Contractor or subcontractor is owned by a citizen or a national of the foreign country;
 - ii. If the title to 50 percent or more of the stock of the Contractor or subcontractor is held subject to trust or fiduciary obligation in favor of citizens or nationals of the foreign country.
 - iii. If 50 percent or more of the voting power in the Contractor or subcontractor is vested in or exercisable on behalf of a citizen or national of the foreign country;
 - iv. In the case of a partnership, if any general partner is a citizen of the foreign country;

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- v. In the case of a corporation. If its presidents or other chief executive officer or the chairman of its board of directors is a citizen of the foreign country or the majority of any number of its directors necessary to constitute a quorum are citizens of the foreign country or the corporation is organized under the laws of the foreign country or any subdivision, territory, or possession thereof; or
- vi. In case of a contractor or subcontractor who is a joint venture, if any participant firm is a citizen or national of a foreign country or meets any of the criteria in subparagraphs (A) 1 through 5 of this clause. "Product", as used in this clause, means construction materials, i.e. articles, materials and supplies brought to the construction site for incorporation into the public works project, including permanently affixed equipment, instruments, utilities, electronic or other devices, but not including vehicles or construction equipment. In determining the origin of a product, the Subrecipient will consider a product as produce in a foreign country if it has been assembled or manufactured in the foreign country, or if the cost of the components mined, produced, or manufactured in the foreign country exceed 50 percent of the cost of all its components.
- b. Restrictions. The Contractor shall not (1) knowingly enter into any subcontract under this contract with a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the United States Trade Representative (see paragraph (C) of this clause, or (2) supply any product under this contract of a country included on the list of foreign countries that discriminate against U.S. firms published by the USTR.
- c. USTR List. The USTR published an initial list in the Federal Register on December 30, 1987 (53 FR 49244), which identified one country-Japan. The USTR can add other countries to the list, or remove countries from it, in accordance with section 109 (C) of PUB. L. 100-102.
- d. Certification. The Contractor may rely upon the certification of a prospective subcontractor that it is not a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR and that products supplied by such subcontractor for use on the Federal public works project under this contract are not products of a foreign country included on the list of foreign countries that discriminate against U.S. firms published by the USTR, unless such Contractor has knowledge that the certification is erroneous.
- e. Subcontractors. The Contractor shall incorporate this clause, modified only for the purpose of properly identifying the parties, in all subcontracts. This paragraph (E) shall also be incorporated in all subcontracts.

RIGHTS TO INVENTIONS (2 CFR Appendix II to Part 200 (F))

Any discovery or invention that arises during the course of the contract shall be reported to the Subrecipient. This clause requires the Contractor to disclose promptly inventions to the County (within 2 months) after the inventor discloses it in writing to Contractor personnel responsible for patent matters. The awarding agency shall determine how rights in the invention/discovery shall be allocated consistent with "Government Patent Policy" and Title 37 C.F.R. § 401.

If the Federal award meets the definition of "funding agreement" under 37 C.F.R. §.401.2(a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with the requirements of Title 37 C.F.R. §

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401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

SECTION 109 OF THE HOUSING AND COMMUNITY DEVELOPMENT ACT OF 1974 (24 CFR 570.602)

Section 109 of the Act requires that no person in the United States shall on the grounds of race, color, national origin, religion, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance made available pursuant to the Act. Section 109 also directs that the prohibitions against discrimination on the basis of age under the Age Discrimination Act and the prohibitions against discrimination on the basis of disability under Section 504 shall apply to programs or activities receiving Federal financial assistance under Title I programs. The policies and procedures necessary to ensure enforcement of section 109 are codified in 24 CFR part 6.

SECTION 3 ACT OF 1968 (12 U.S.C. 1701u and 24 CFR Part 75)

The work to be performed under this Contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended (12 USC §1701u) ("Section 3"). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted developments covered by Section 3 shall, to the greatest extent feasible, be directed to low- and very low-income persons, including persons who are recipients of HUD assistance for housing, with a preference for both targeted workers living in the service area or neighborhood of the Development and YouthBuild participants, as defined at 24 CFR Part 75 ("Section 3 Regulations").

For any Section 3 Covered Contracts, Contractor and subcontractors must comply with all provisions of the Section 3 Act of 1968, contained under 24 CFR 75. Contractor and subcontractors must include the Section 3 Clause in its entirety, in every subcontract subject to compliance with regulations in 24 CFR 75.

Contractor and subcontractors must assure that to the greatest extent feasible, contracts for work to be performed in connection with the project are awarded to Section 3 Business Concern. Contractor and subcontractors must post all new hire opportunities with the local Workforce Solutions Center and/or Work-in-Texas, in accordance with 24 CFR 75. The benchmarks for Section 3 are:

Section 3 Worker

- 25% of total labor hours for the project worked by:
 - Employee of a Section 3 Business
 - YouthBuild Participant or

Below 80% AMI (area median individual income)

Section 3 Targeted Worker

- 5% of total labor hours for the project worked by:
 - Employee of a Section 3 Business
 - YouthBuild Participant or

Service Area Resident (\$75.5)

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TRANSACTIONS WITH TERRORIST ORGANIZATIONS PROHIBITED (Texas Government Code 2252.152)

Pursuant to Chapter 2252, Texas Government Code, Contractor shall certify that, at the time of execution of this Contract, neither the Contractor, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same (1) engages in business with Iran, Sudan, or any foreign terrorist organization as described in Chapters 806 or 807 of the Texas Government Code, or Subchapter F of Chapter 2252 of the

Texas Government Code, or (2) is a company listed by the Texas Comptroller of Public Accounts under Sections 806.051, 807.051, or 2252.153 of the Texas Government Code.

TERMINATION FOR CAUSE & CONVENIENCE (2 CFR Appendix II to Part 200 (A) and (B))

Pursuant to 2 CFR Appendix II to Part 200 (A), Contracts for more than the simplified acquisition threshold currently set at \$150,000, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, shall address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

Pursuant to 2 CFR Appendix II to Part 200 (B), all contracts in excess of \$10,000 shall address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement. The Subrecipient shall have the right to terminate this contract for cause and convenience.

In the event of a failure by Contractor to satisfactorily perform the services specified herein and/or a default by Contractor in abiding by the other terms and conditions of this Contract, the Subrecipient may terminate the Contract on written notice to Contractor and Contractor shall be liable for all damages, costs, and expenses (including attorney fees) incurred by County related to this default. Such termination is in addition to and not in lieu of any other remedies that the Subrecipient may have in law or equity. Administrative remedies for non-performance, violation or breach of contract terms, or termination of contract for default may include suspension and debarment. The Subrecipient may assess liquidated damages for failure to meet completion deadlines, contract breaches, or performance failures of the Contractor or its Subcontractors.

Contractor shall be provided the opportunity to cure certain performance failures or instances of default as described in the contract documents. The legal dispute resolution process as applicable under the Texas Civil Practice and Remedies Code shall include, but is not limited to, Texas and Civil Practice and Remedies Section 38 – Attorney’s Fees, Texas Civil Practice and Remedies Section 41 – Damages, and Texas Civil Practice and Remedies Section 154 – General Provisions. The Subrecipient and Contractor(s) should attempt to resolve any claim for breach of contract made by Contractor, to the extent it is applicable to the Contract and not preempted by other law. Except as otherwise provided by law, nothing herein is a waiver by the County or the State of Texas of the right to seek redress in a court of law.

VERIFICATION NOT TO BOYCOTT ISRAEL

As required by Texas Government Code Chapter 2270, Contractor verifies that it does not boycott Israel and will not boycott Israel through the term of this Contract. For purposes of this verification, “boycott Israel” means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or

Attachment A

REQUIRED FEDERAL CONTRACT PROVISIONS

entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

WHISTLEBLOWER PROTECTION ACT

Contractor, subcontractors, and employees working on this Project shall be subject 41 U.S. Code § 4712, which requires that an employee of a contractor, subcontractor, grantee, or subgrantee or personal services contractor may not be discharged, demoted, or otherwise discriminated against as a reprisal for disclosing information that the employee reasonably believes is evidence of gross mismanagement of a Federal contract or grant, a gross waste of Federal funds, an abuse of authority relating to a Federal contract or grant, a substantial and specific danger to public health or safety, or a violation of law, rule, or regulation related to a Federal contract (including the competition for or negotiation of a contract) or grant.

The Contractor shall inform its employees and subcontractors in writing, in the predominant language of the workforce, of employee whistleblower rights and protections under 41 U.S.C. 4712, as described in section 3.908 of the Federal Acquisition Regulation. The Contractor shall insert the substance of this clause, including this paragraph, in all subcontracts providing services for this Project.

Attachment A

REQUIRED FEDERAL CONTRACT PROVISIONS

Applicability – The Davis-Bacon and Related Acts apply to all construction work financed in whole or in part with Federal assistance including rehabilitation of residential property, if such property contains 8 or more units.

Exceptions – the provisions relating to wages pursuant to Davis-Bacon and Related Acts requirements in any contract or agreement for assistance, sale, or lease, shall not apply to any individual who performs services for which the individual volunteered, or does not receive compensation for such services, or is paid expenses, reasonable benefits, or a nominal fee for such services for which the individual volunteered and who is not otherwise employed at any time in the construction work.

The Davis-Bacon Act requires the payment of prevailing wage rates (which are determined by the U.S. Department of Labor (DOL)) to all laborers and mechanics on Federally funded and District of Columbia construction projects in excess of \$2,000.00. Construction includes alteration and/or repair, including painting and decorating, of public buildings or public works.

The Davis-Bacon wage rate applies to a HUD project because of a labor provision contained in one of HUD's "Related Acts" such as the U.S. Housing Act of 1937, the National Housing Act, the Housing and Economic Development Act of 1974, the National Affordable Act of 1990, and the Native American Housing Assistance and Self-Determination Act of 1996. The Related Acts are referred to as the Davis-Bacon and Related Acts or DBRA. The DOL has published rules and pertinent implementation information concerning Davis-Bacon and other laws in the Code of Federal Regulations (CFR). These regulations are found in Title 29 C.F.R. Parts 1, 3, 5, 6 and 7.

Part 1 of the DOL regulation (29 CFR) explains how the DOL established and publishes DBA wage determinations (aka wage decisions) and provides instructions on how to use the wage determinations. Part 3 of the DOL regulation (29 CFR) describes Copeland Act requirements for payroll deductions and the submission of weekly certified payroll reports. Part 5 of the DOL regulation (29 CFR) covers the labor standards provisions relating to the Davis-Bacon Act wage rates and the responsibilities of contractors and contracting agencies to administer and enforce the provisions. Part 6 of the DOL regulation (29 CFR) provides for administrative proceedings enforcing Federal labor standards on construction and service contracts. Last, Part 7 of the DOL regulation (29 CFR) sets parameters for practice before the Administrative Review Board. These regulations are used as the basis for administering and enforcing the laws.

The Contract Work Hours and Safety Standards Act (CWHSSA) requires time and one-half pay for overtime (O/T) hours (over 40 in any workweek) worked on the covered project. The CWHSSA applies to both direct Federal contracts and to indirect Federally-assisted contracts *except* where the assistance is solely in the nature of loan guarantee or insurance. CWHSSA violations carry a liquidated damages penalty (\$25/day per violation). Intentional violations of CWHSSA standards can be considered for Federal criminal prosecution.

The Copeland Act (Anti-Kickback Act) makes it a Federal crime for anyone to require any laborer or mechanic (employed on a Federal or Federally-assisted project) to **kickback** (i.e. give up or pay back) any part of their wages. The Copeland Act requires every employer (contractors and subcontractors) to submit weekly certified payroll reports (CPRs) and regulates permissible payroll deductions.

The Federal Labor Standards Provisions (FLSA) contain Federal minimum wage rates, overtime (O/T), and child labor requirements. These requirements generally apply to any labor performed. The DOL has the authority to administer and enforce FLSA. HUD will refer to the DOL any possible FLSA violations that are found on HUD projects.

Attachment B

DAVIS-BACON & RELATED ACTS (DBRA) REQUIREMENTS

Applicability – The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions, pursuant to 29 CFR 5.5, are included in this Contract pursuant to the provisions applicable to such Federal assistance.

(1) Minimum wages.

- (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)

- (A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
 - (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
 - (2) The classification is utilized in the area by the construction industry; and
 - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

Attachment B

DAVIS-BACON & RELATED ACTS (DBRA) REQUIREMENTS

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. Harris County shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

Attachment B

DAVIS-BACON & RELATED ACTS (DBRA) REQUIREMENTS

- (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- (ii)
 - (A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency). The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency), the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).
 - (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

Attachment B

DAVIS-BACON & RELATED ACTS (DBRA) REQUIREMENTS

- (1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
 - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
 - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph (a)(3)(ii)(B) of this section.
- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the (write the name of the agency) or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees -

- (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess

Attachment B

DAVIS-BACON & RELATED ACTS (DBRA) REQUIREMENTS

of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

Attachment B

DAVIS-BACON & RELATED ACTS (DBRA) REQUIREMENTS

- (6) **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the (write in the name of the Federal agency) may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
- (7) **Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- (8) **Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (9) **Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.
- (10) **Certification of eligibility.**
- (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

24 CFR 5.5(b) Contract Work Hours and Safety Standards Act. Harris County and its designees shall insert following clauses set forth in paragraphs 24 CFR 5.5(b)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by § 5.5(a) or § 4.6 of part 4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

- (1) **Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) **Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$26 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

Attachment B

DAVIS-BACON & RELATED ACTS (DBRA) REQUIREMENTS

- (3) **Withholding for unpaid wages and liquidated damages.** Harris County shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.
- (4) **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

24 CFR 5.5(c) – In addition to the clauses contained in 24 CFR 5.5(b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 24 CFR 5.1, Harris County shall require that the contractor or subcontractor maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, Harris County shall require that records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of Harris County and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

The contractor shall include the provisions of this section in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

Attachment C

HARRIS COUNTY PAYROLL SUBMITTAL REQUIREMENTS

A. Payroll Submission Information

1. Original Weekly Certified Payrolls must be submitted by all contractor(s)/subcontractor(s) to the Harris County designated personnel weekly. The Prime Contractor is responsible for all subcontractor payroll submittals.
2. Complete all information requested, using Form WH-347 found at the Wage and <https://www.dol.gov/whd/forms/wh347.pdf> or its successor site.
3. Include Project Number on each payroll.
4. All contractors/subcontractors are to make available copies of cancelled checks and check stubs for comparison, if requested by the HCCSD Project Monitor

B. Wage Rate Compliance

The U.S. Department of Labor Wage Rate poster must be displayed in a location that all workers have easy access and remain in place at all times until the project is complete.

Harris County reserves the right for Harris County designated personnel to visit the job site and to interview any employees on any given date or time during the construction period without prior notification.

Harris County designated personnel will ascertain that the proper wage rates are being paid to the employees in accordance with the contract documents. Contractor shall not allow work requiring a license to be performed by a worker who does not have the proper license. Contractor shall require, and shall require all its subcontractors and lower tier subcontractors, that workers carry their license upon their persons while performing work on the Project and that such persons produce their licenses to Harris County upon request. After being requested to produce a license, a worker is not to be allowed to perform further work requiring a license until the required license is produced. Should work requiring a license be performed by an unlicensed person despite the prohibitions of this paragraph, that person must be paid the required wage rate applicable for a licensed craftsman performing such work pursuant to the issued DBRA Wage Decision for this Project. Harris County will not recognize a worker that holds a journeyman's license in a trade as eligible for pay as an apprentice rate for work in that trade.

Apprentices may be used in any of the crafts listed in the Wage Decision, if they are currently certified in a program recognized by the Office of Apprenticeship Training, U.S. Department of Labor, providing the proper ratio between journeyman and apprentice is observed. Apprenticeship certification certificates must be supplied with the first weekly payroll upon which the apprentice's name appears. If they are not certified as an apprentice, they must be paid as a journeyman and used as an apprentice.

In the event of discrepancy between the services performed and the wages paid, it will be documented and Contractor will be so notified.

The Subrecipient and/or Harris County reserves the right to withhold any payment due Contractor until such discrepancy is resolved and the necessary adjustment made.

Attachment D
DAVIS-BACON WAGE DECISION

Project Name: The City of Friendswood Forest Bend Detention Pond

Project No.: D2017-052

"General Decision Number: TX20210046 01/01/2021

Superseded General Decision Number: TX20200046

State: Texas

Construction Type: Heavy

Counties: Brazoria, Fort Bend, Galveston, Harris, Matagorda, Montgomery, Waller and Wharton Counties in Texas.

FLOOD CONTROL PROJECTS ONLY, (Does not Include any Water & Sewer Line work; Sewage Collection and Disposal Lines; Sewers (Sanitary Storm, etc.), or Shoreline Maintenance Water Mains and Water Supply Lines).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a

Attachment D
DAVIS-BACON WAGE DECISION

classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/01/2021

SUTX1998-009 03/26/1998

	Rates	Fringes
ASPHALT DISTRIBUTOR.....	\$ 9.47	
Asphalt Paving Machine.....	\$ 10.05	
Asphalt Raker.....	\$ 8.28	

Attachment D
DAVIS-BACON WAGE DECISION

Asphalt Shoveler.....	\$ 7.45
Batching Plant Weigher.....	\$ 11.11
Broom or Sweeper Operator.....	\$ 8.01
Bulldozer.....	\$ 9.91
CARPENTER.....	\$ 10.35
Concrete Curbing Mach.....	\$ 8.80
Concrete Finisher-Paving.....	\$ 9.87
Concrete Finisher-Structures.....	\$ 9.86
Concrete Finishing Machine.....	\$ 11.79
Concrete Joint Sealer.....	\$ 10.50
Concrete Paving Float.....	\$ 9.30
Concrete Paving Saw.....	\$ 10.01
Concrete Paving Spreader.....	\$ 9.32
Concrete Rubber.....	\$ 9.00
Crane, Clamshell, Backhoe, Derrick, Dragline, Shovel.....	\$ 11.35

Attachment D
DAVIS-BACON WAGE DECISION

Crusher or Screening Plant Operator.....	\$ 11.00
ELECTRICIAN.....	\$ 16.15
Flagger.....	\$ 7.25
Form Builder (Structures).....	\$ 9.96
Form Liner - Paving & Curb.....	\$ 9.03
Form Setter (PAVING/CURB).....	\$ 8.86
Form Setter-Structures.....	\$ 9.05
Foundation Drill Operator, Crawler Mounted.....	\$ 12.59
Foundation Drill Operator, Truck Mounted.....	\$ 12.73
Front End Loader.....	\$ 9.29
Labor Common.....	\$ 7.45
Laborer-Utility.....	\$ 8.53
Lineperson.....	\$ 7.50
MANHOLE BUILDER (Brick).....	\$ 8.49
MECHANIC.....	\$ 11.38

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DAVIS-BACON WAGE DECISION

Milling Machine Operator.....\$ 10.43

Mixer.....\$ 7.94

Motor Grader

 FINE GRADE.....\$ 11.11

 Other.....\$ 10.67

Oiler.....\$ 9.56

Painter-Structures.....\$ 14.00

Pavement Marking Machine.....\$ 7.45

Piledriver.....\$ 10.96

Pipe layer.....\$ 8.49

Reinforcing Steel Setter

Paving.....\$ 12.50

Reinforcing Steel Setter

Structures.....\$ 12.47

Roller, Pneumatic, Self

Propelled.....\$ 7.96

Roller, Steel Wheel Other

Flatwheel or Tamping.....\$ 7.61

Roller, Steel Wheel Plant Mix

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DAVIS-BACON WAGE DECISION

Pavements.....	\$ 9.25
Scraper.....	\$ 8.69
Servicer.....	\$ 9.51
SIGN ERECTOR.....	\$ 10.06
Sign Installer.....	\$ 7.45
Slipform Machine Operator.....	\$ 9.20
Spreader Box Operator.....	\$ 9.08
Steelworker Structural.....	\$ 10.35
Tractor-Crawler Type.....	\$ 10.12
Tractor-Pneumatic.....	\$ 8.99
Traveling Mixer.....	\$ 9.35
Trenching Machine, Heavy.....	\$ 13.56
Trenching Machine, Light.....	\$ 10.50
Truck Driver Lowboy Float.....	\$ 11.29
Truck Driver Single Axle Heavy...	\$ 8.76
Truck Driver Single Axle, Light.....	\$ 8.15

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DAVIS-BACON WAGE DECISION

Truck Driver Tandem Axle
Semi-Trailer.....\$ 8.00

Wagon Drill, Boring Machine.....\$ 10.15

WELDER.....\$ 10.43

Work Zone Barricade.....\$ 7.45

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO

Attachment D
DAVIS-BACON WAGE DECISION

is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing

Attachment D
DAVIS-BACON WAGE DECISION

the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those

Attachment D
DAVIS-BACON WAGE DECISION

classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the

Attachment D
DAVIS-BACON WAGE DECISION

Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Attachment D
DAVIS-BACON WAGE DECISION

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

"

Attachment E
CERTIFICATE FROM CONTRACTOR APPOINTING OFFICER OR
EMPLOYEE TO SUPERVISE PAYMENT OF EMPLOYEES

Date _____

Project Name: _____ Project No. _____

Project Location _____

Key Map No. _____

Wage Decision No. TX _____

I (We) hereby certify that (I am) (we are) (the prime contractor) (subcontractor) for _____ in connection with construction of the above mentioned Project, and that I (we) have appointed _____ whose signature appears below, to supervise the payment of my (our) employees beginning _____; that he/she is in a position to have full knowledge of the facts set forth in the payroll documents and in the statement of compliance required by the so-called Kick-Back Statute which he/she is to execute with my (our) full authority and approval until such time as I (we) submit to Harris County a new certificate appointing some other person for the purposes herein above stated.

Signature of Appointee

Signature of Authorizing Officer

Print Name of Appointee

Print Name of Authorizing Officer

Title of Appointee

Title of Authorizing Officer

Attest (if required) _____
(Name of Business)

NOTE: This Certificate must be executed by an authorized officer of a corporation, by a member of a partnership, or the sole owner and shall be executed prior to and be submitted with the first certified payroll report. Should the appointee be changes, a new certificate must be submitted with the first certified payroll report for which the new appointee executes a statement of compliance required by the Kick-Back Statute.

FOR HARRIS COUNTY USE ONLY

☐ Contractor **or** ☐ Subcontractor

Attachment F DAILY WORK LOGS

SAMPLE: Daily Work Log

Project Name: XYZ Improvements Project

Date: 9/12/2017

Bid Item	Work Description	Qty.	Unit
12	6" Bore		
15	Fire Hydrant	1	EA
10	6" WL	380	LF

Personnel	Qty.	Hrs.
Foreman	1	11
Operator	2	11
Laborer	5	11
Equipment	Qty.	Hrs.
Backhoe/Loader	2	11
Boring Rig	1	11
Trench Box	2	11
Steel Plates	4	11

Contractor Representative Signature _____

Attachment G
LCP TRACKER / WEEKLY CERTIFIED PAYROLL

Contractor and all subcontractors and third-party contractors are required to submit Davis-Bacon and Related Acts (DBRA) and Section 3 compliance documents using the LCP Tracker system.



Attachment G

LCP TRACKER / WEEKLY CERTIFIED PAYROLL

U.S. Department of Labor
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.



Rev. Dec. 2008

OMB No.: 1235-0008
Expires: 07/31/2024

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐		ADDRESS	
PAYROLL NO.	FOR WEEK ENDING	PROJECT AND LOCATION	PROJECT OR CONTRACT NO.

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	OT OR ST.	(4) DAY AND DATE							(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS						(9) NET WAGES PAID FOR WEEK
				HOURS WORKED EACH DAY										FICA	WITH- HOLDING TAX	OTHER	TOTAL DEDUCTIONS			
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Attachment G
LCP TRACKER / WEEKLY CERTIFIED PAYROLL

Date _____

I, _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____ ; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ — in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ — Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

REMARKS:	
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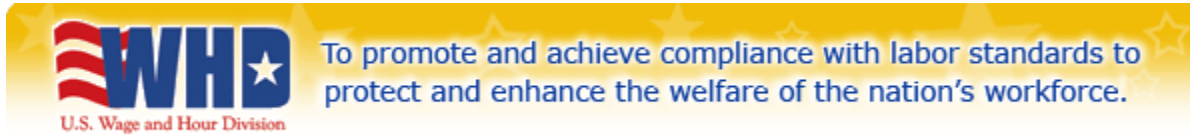
NAME AND TITLE

SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.

Attachment G

LCP TRACKER / WEEKLY CERTIFIED PAYROLL



Instructions For Completing Payroll Form, WH-347

From - <http://www.dol.gov/whd/forms/wh347instr.htm>

General: Form WH-347 has been made available for the convenience of contractors and subcontractors required by their Federal or Federally-aided construction-type contracts and subcontracts to submit weekly payrolls. Properly filled out, this form will satisfy the requirements of Regulations, Parts 3 and 5 (29 C.F.R., Subtitle A), as to payrolls submitted in connection with contracts subject to the Davis-Bacon and related Acts.

While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) requires contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) Regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Under the Davis-Bacon and related Acts, the contractor is required to pay not less than prevailing wage, including fringe benefits, as predetermined by the Department of Labor. The contractor's obligation to pay fringe benefits may be met either by payment of the fringe benefits to bona fide benefit plans, funds or programs or by making payments to the covered workers (laborers and mechanics) as cash in lieu of fringe benefits.

This payroll provides for the contractor to show on the face of the payroll all monies to each worker, whether as basic rates or as cash in lieu of fringe benefits, and provides for the contractor's representation in the statement of compliance on the payroll (as shown on page 2) that he/she is paying for fringe benefits required by the contract and not paid as cash in lieu of fringe benefits. Detailed instructions concerning the preparation of the payroll follow:

Contractor or Subcontractor: Fill in your firm's name and check appropriate box.

Address: Fill in your firm's address.

Payroll No.: Beginning with the number "1", list the payroll number for the submission.

For Week Ending: List the workweek ending date.

Project and Location: Self-explanatory.

Project or Contract No.: Self-explanatory.

Column 1 - Name and Individual Identifying Number of Worker: Enter each worker's full name and an individual identifying number (e.g., last four digits of worker's social security number) on each weekly payroll submitted.

Column 2 - No. of Withholding Exemptions: This column is merely inserted for the employer's convenience and is not a requirement of Regulations, Part 3 and 5.

Attachment G

LCP TRACKER / WEEKLY CERTIFIED PAYROLL

Column 3 - Work Classifications: List classification descriptive of work actually performed by each laborer or mechanic. Consult classification and minimum wage schedule set forth in contract specifications. If additional classifications are deemed necessary, refer to Harris County Contracting Officer. An individual may be shown as having worked in more than one classification provided an accurate breakdown of hours worked in each classification is maintained and shown on the submitted payroll by use of separate entries.

Column 4 - Hours worked: List the day and date and straight time and overtime hours worked in the applicable boxes. On all contracts subject to the Contract Work Hours Standard Act, enter hours worked in excess of 40 hours a week as "overtime".

Column 5 - Total: Self-explanatory

Column 6 - Rate of Pay (Including Fringe Benefits): In the "straight time" box for each worker, list the actual hourly rate paid for straight time worked, plus cash paid in lieu of fringe benefits paid. When recording the straight time hourly rate, any cash paid in lieu of fringe benefits may be shown separately from the basic rate. For example, "\$12.25/.40" would reflect a \$12.25 base hourly rate plus \$0.40 for fringe benefits. This is of assistance in correctly computing overtime. See "Fringe Benefits" below. When overtime is worked, show the overtime hourly rate paid plus any cash in lieu of fringe benefits paid in the "overtime" box for each worker; otherwise, you may skip this box. See "Fringe Benefits" below. Payment of not less than time and one-half the basic or regular rate paid is required for overtime under the Contract Work Hours Standard Act of 1962 if the prime contract exceeds \$100,000. In addition to paying no less than the predetermined rate for the classification which an individual works, the contractor must pay amounts predetermined as fringe benefits in the wage decision made part of the contract to approved fringe benefit plans, funds or programs or shall pay as cash in lieu of fringe benefits. See "FRINGE BENEFITS" below.

Column 7 - Gross Amount Earned: Enter gross amount earned on this project. If part of a worker's weekly wage was earned on projects other than the project described on this payroll, enter in column 7 first the amount earned on the Federal or Federally assisted project and then the gross amount earned during the week on all projects, thus "\$163.00/\$420.00" would reflect the earnings of a worker who earned \$163.00 on a Federally assisted construction project during a week in which \$420.00 was earned on all work.

Column 8 - Deductions: Five columns are provided for showing deductions made. If more than five deduction are involved, use the first four columns and show the balance deductions under "Other" column; show actual total under "Total Deductions" column; and in the attachment to the payroll describe the deduction(s) contained in the "Other" column. All deductions must be in accordance with the provisions of the Copeland Act Regulations, 29 C.F.R., Part 3. If an individual worked on other jobs in addition to this project, show actual deductions from his/her weekly gross wage, and indicate that deductions are based on his gross wages.

Column 9 - Net Wages Paid for Week: Self-explanatory.

Totals - Space has been left at the bottom of the columns so that totals may be shown if the contractor so desires.

Statement Required by Regulations, Parts 3 and 5: While the "statement of compliance" need not be notarized, the statement (on page 2 of the payroll form) is subject to the penalties provided by 18 U.S.C. § 1001, namely, a fine, possible imprisonment of not more than 5 years, or both. Accordingly, the party signing this statement should have knowledge of the facts represented as true.

Items 1 and 2: Space has been provided between items (1) and (2) of the statement for describing any deductions made. If all deductions made are adequately described in the "Deductions" column above, state "See Deductions column in this payroll." See "FRINGE BENEFITS" below for instructions concerning filling out paragraph 4 of the statement.

Attachment G

LCP TRACKER / WEEKLY CERTIFIED PAYROLL

Item 4 FRINGE BENEFITS - Contractors who pay all required fringe benefits: If paying all fringe benefits to approved plans, funds, or programs in amounts not less than were determined in the applicable wage decision of the Secretary of Labor, show the basic cash hourly rate and overtime rate paid to each worker on the face of the payroll and check paragraph 4(a) of the statement on page 2 of the WH-347 payroll form to indicate the payment. Note any exceptions in section 4(c).

Contractors who pay no fringe benefits: If not paying all fringe benefits to approved plans, funds, or programs in amounts of at least those that were determined in the applicable wage decision of the Secretary of Labor, pay any remaining fringe benefit amount to each laborer and mechanic and insert in the "straight time" of the "Rate of Pay" column of the payroll an amount not less than the predetermined rate for each classification plus the amount of fringe benefits determined for each classification in the application wage decision. Inasmuch as it is not necessary to pay time and a half on cash paid in lieu of fringe benefits, the overtime rate shall be not less than the sum of the basic predetermined rate, plus the half time premium on basic or regular rate, plus the required cash in lieu of fringe benefits at the straight time rate. In addition, check paragraph 4(b) of the statement on page 2 the payroll form to indicate the payment of fringe benefits in cash directly to the workers. Note any exceptions in section 4(c).

Use of Section 4(c), Exceptions

Any contractor who is making payment to approved plans, funds, or programs in amounts less than the wage determination requires is obliged to pay the deficiency directly to the covered worker as cash in lieu of fringe benefits. Enter any exceptions to section 4(a) or 4(b) in section 4(c). Enter in the Exception column the craft, and enter in the Explanation column the hourly amount paid each worker as cash in lieu of fringe benefits and the hourly amount paid to plans, funds, or programs as fringe benefits. The contractor must pay an amount not less than the predetermined rate plus cash in lieu of fringe benefits as shown in section 4(c) to each such individual for all hours worked (unless otherwise provided by applicable wage determination) on the Federal or Federally assisted project. Enter the rate paid and amount of cash paid in lieu of fringe benefits per hour in column 6 on the payroll. See paragraph on "Contractors who pay no fringe benefits" for computation of overtime rate.

Attachment H

QUARTERLY EMPLOYMENT DATA REPORT



Quarterly Employment Data Report

Harris County Community Services Department 8410 Lantern Point Drive – IICCSA Grants Management Houston, Texas 77054 (713) 578-2000				Filing of this Report is consistent with Harris County Community Services Department's policy. Executive order 11246, and related HUD requirements; this report is due by the fifth of each quarter during the duration of contract. Failure to submit report(s) can result in contract being suspended, cancelled or terminated. For detailed instructions, see the backside of this form.																			
Project Name:		Contractor's Business Name, Address and Telephone No.				Contract No.			Contractor's Federal Employer I.D. No.			Contractor's Status ☐ Prime ☐ Subcontractor ☐ Lower Tier											
(1) Type of Contract ☐ Construction ☐ Service ☐ Supply		(2) Legal Status ☐ Proprietorship ☐ Partnership ☐ Joint Venture ☐ Corporation		(3) Contract Amount		(4) Covered Workforce Area(s) ☐ Houston SMSA ☐ Houston SMSA plus outside area(s)		(5) Current Employment Goals Minority: _____ Female: _____		(6) Source of Funding ☐ Federal ☐ Nonfederal		(7) Reporting Period From: _____ To: _____		(8) Data Report Number									
All Employees														Minority Group Employees									
EEO Categories		Total Male & Female	Male	Female	Male				Female				Totals		Percent								
					Black (not of Hispanic Origin)	Hispanic	Asian or Pacific Islanders	American Indian or Alaskan Natives	Black (not of Hispanic Origin)	Hispanic	Asian or Pacific Islanders	American Indian or Alaskan Natives	Minority	Female	Minority	Female							
(13) Officials, Managers and Supervisors																							
Professionals																							
Technicians																							
Sales Workers																							
Office and Clerical																							
Craftsmen (Skilled)																							
Operatives (Semi-skilled)																							
Laborers (Unskilled)																							
Service Workers																							
Apprentices																							
Totals																							
Company Official's Signature and Title					Date Signed				Name and Title of Individual Completing Report					Page _____ of _____									

Attachment H

QUARTERLY EMPLOYMENT DATA REPORT

Quarterly Employment Data Report - Instructions

This Quarterly Employment Data Report is to be completed by all third party contractors whose contracts and subcontracts exceed \$10,000 regardless of the nature and duration of contract; this includes, but is not limited to construction, service, supply, and professional and consulting services. All prime contractors considered during the preaward sessions are required to submit this report. The prime contractor will not only be responsible for submitting this information for their particular workforce, but all other subcontractors and lower tier contractors (including suppliers and vendors) who are playing a direct role in performance of this contract. Please note that the Report covers all of the contractor's workforce, and not just the project employees. **BUT FOR ALL FEDERALLY ASSISTED CONSTRUCTION CONTRACTORS, THIS REPORT ONLY APPLIES TO ITS NONFIELD PERSONNEL. (BUT CONSTRUCTION CONTRACTORS, IN ADDITION TO THIS FORM, WILL BE REQUIRED TO COMPLETE AND SUBMIT THE FEDERAL OFCCP MONTHLY UTILIZATION REPORTS WHICH BLANKET ALL MECHANICS, LABORERS, AND APPRENTICES OR TRAINEES.)** Contractors are required to submit reports and direct inquiries to the following party:

Harris County Community Services Department
8410 Lantern Point Drive
Houston, Texas 77054-1552
(713) 578-2000

All reports are due quarterly by the 5th of the month for construction contractors and non-construction contractors.

1. HCCSD Project Name
Self-explanatory.
2. Contractor's Business Name, Address, and Telephone Number
Include actual street address and telephone area code.
3. Contractor's Identification Number
Include the Federal Social Security Number used on Quarterly Tax Return.
4. Contractor's Status
Check (✓) appropriate item.
5. Type of Contract
Check (✓) appropriate item.
Construction
Businesses involved in the construction, alteration, or repair, including painting and decorating of public facilities or public works, i.e., bus facilities, roadways, site preparation, etc.
Service
Businesses conducting and furnishing professional, architectural and engineering, and unskilled or nonprofessional labor excluding construction and supply of materials, i.e., vehicle repairs, security services, architectural and engineering services, insurance providers, etc.

- Supply
Businesses Involved in the wholesale or fabrication of materials, supplies, articles or equipment, i.e., bus parts, office furniture etc.
6. Legal Status
Check (✓) appropriate item. For all joint ventures and partnerships, all firms involved will have to submit separate reports.
7. Contract Amount
Self-explanatory.
8. Covered Workforce Area (s)
Houston SMSA includes Brazoria, Fort Bend, Harris, Liberty, Montgomery and Waller counties. If total aggregate contractor workforce for the Houston SMSA exceeds 80%, check (✓) Houston SMSA item. If less, include total workforce. (Houston SMSA plus outside area (s) and check (✓) appropriate item.
9. Current Goals
For this contract, the goals for minorities and women are _____ and _____ respectively. (If no goals are provided under contract, the aggregate workforce must reflect ethnic and women ratios in the covered area (s).)
10. Source of Funding
Self-explanatory.
11. Reporting Period
For consistency, the reporting period should reflect from the start to the completion of each calendar quarter. (Contracts executed beyond the 10th of the month may be filed starting the succeeding calendar quarter.)
12. Data Report Number
Chronologically number each consecutive report starting with "1".
13. Job Categories
Officials, Managers, and Supervisors
Occupations requiring the exercise of policy making responsibility. Includes officials, executives, managers, superintendents, salaried foremen.
Professionals
Occupations requiring college background. Includes accountants and auditors, architects, engineers, lawyers, personnel workers.
Technicians
Occupations requiring combination of basic scientific knowledge and manual skill. Includes computer programmers and operators, draftsmen, engineering aides, surveyors.
Sales
Occupations engaging wholly in direct selling. Includes salesmen, insurance agents and brokers, sales clerks.

- Office and Clerical
Occupations involving all clerical type work regardless of level of difficulty. Includes bookkeepers, cashiers, messengers, clerks, typists, secretaries, receptionists, telephone operators.
- Craftsmen (skilled)
Occupations requiring a relatively high skill level and independent judgment. Includes electricians, carpenters, mechanics, repairmen.
- Operatives
Occupations requiring operations of machine or processing equipment (factory type duty) using intermediate skills. Includes machinists, welders, routemen.
- Laborers (unskilled)
Occupations engaging in manual work requiring no special training. Includes groundskeepers, laborers, gardeners.
- Service Occupations
Occupations involving protective and nonprotective service. Includes cooks, elevator operators, janitors, guards, watchmen, policemen and detectives.
- Apprentices
Persons engaging in a training program to learn a trade or craft traditionally considered an apprenticeship.
14. All Employees
Include numerical count of all employees.
 15. Minority Group Employees
Black
All persons having origins in any of the Black African racial groups not of Hispanic origin.
Hispanic
All persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race.
Asian and Pacific Islanders
All persons having origins in any of the original people of the Far East, Southeast Asia, the Indian Subcontinent or the Pacific Islands.
American Indian or Alaskan Natives
All persons having origins in any of the original people of North America and maintaining identifiable tribal affiliations through membership and participation or community identification.
 16. Percent
Include the percents by each job category and total
 17. Company Official's Signature and Title
Include the signature of a responsible company official or EEO liaison.
 18. Date Signed – Self-explanatory.
Name and Title of Individual Completing Report- Self-explanatory.

Attachment I

EMPLOYEE RIGHTS UNDER THE DAVIS-BACON ACT POSTER

EMPLOYEE RIGHTS UNDER THE DAVIS-BACON ACT

FOR LABORERS AND MECHANICS EMPLOYED ON FEDERAL OR FEDERALLY ASSISTED CONSTRUCTION PROJECTS

PREVAILING WAGES

You must be paid not less than the wage rate listed in the Davis-Bacon Wage Decision posted with this Notice for the work you perform.

OVERTIME

You must be paid not less than one and one-half times your basic rate of pay for all hours worked over 40 in a work week. There are few exceptions.

ENFORCEMENT

Contract payments can be withheld to ensure workers receive wages and overtime pay due, and liquidated damages may apply if overtime pay requirements are not met. Davis-Bacon contract clauses allow contract termination and debarment of contractors from future federal contracts for up to three years. A contractor who falsifies certified payroll records or induces wage kickbacks may be subject to civil or criminal prosecution, fines and/or imprisonment.

APPRENTICES

Apprentice rates apply only to apprentices properly registered under approved Federal or State apprenticeship programs.

PROPER PAY

If you do not receive proper pay, or require further information on the applicable wages, contact the Contracting Officer listed below:

or contact the U.S. Department of Labor's Wage and Hour Division.



WAGE AND HOUR DIVISION
UNITED STATES DEPARTMENT OF LABOR

1-866-487-9243
TTY: 1-877-889-5627
www.dol.gov/whd



WH1321 REV 10/17

Attachment I

EMPLOYEE RIGHTS UNDER THE DAVIS-BACON ACT POSTER

DERECHOS DEL EMPLEADO BAJO LA LEY DAVIS-BACON

PARA OBREROS Y MECÁNICOS EMPLEADOS EN PROYECTOS DE CONSTRUCCIÓN FEDERAL O CON ASISTENCIA FEDERAL

SALARIOS PREVALECIENTES

No se le puede pagar menos de la tasa de pago indicada en la Decisión de Salarios Davis-Bacon fijada con este Aviso para el trabajo que Ud. desempeña.

SOBRETIEMPO

Se le ha de pagar no menos de tiempo y medio de su tasa básica de pago por todas las horas trabajadas en exceso de 40 en una semana laboral. Existen pocas excepciones.

CUMPLIMIENTO

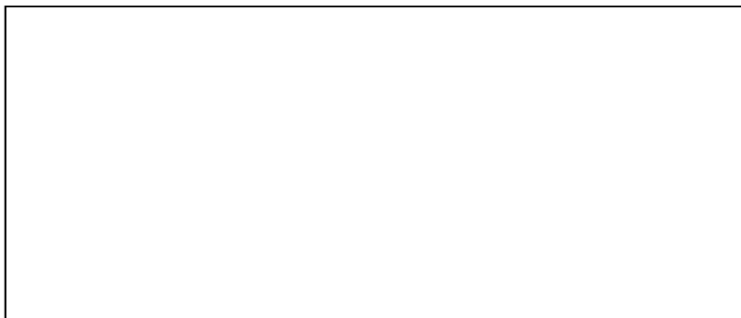
Se pueden retener pagos por contratos para asegurarse que los obreros reciban los salarios y el pago de sobretiempo debidos, y se podría aplicar daños y perjuicios si no se cumple con las exigencias del pago de sobretiempo. Las cláusulas contractuales de Davis-Bacon permiten la terminación y exclusión de contratistas para efectuar futuros contratos federales hasta tres años. El contratista que falsifique los registros certificados de las nóminas de pago o induzca devoluciones de salarios puede ser sujeto a procesamiento civil o criminal, multas y/o encarcelamiento.

APRENDICES

Las tasas de aprendices sólo se aplican a aprendices correctamente inscritos bajo programas federales o estatales aprobados.

PAGO APROPIADO

Si Ud. no recibe el pago apropiado, o precisa de información adicional sobre los salarios aplicables, póngase en contacto con el Contratista Oficial que aparece abajo:



o póngase en contacto con la División de Horas y Salarios del Departamento de Trabajo de los EE.UU.



DIVISIÓN DE HORAS Y SALARIOS
DEPARTAMENTO DE TRABAJO DE LOS EE.UU.

1-866-487-9243
TTY: 1-877-889-5627
www.dol.gov/whd



WH1321 SPA REV 10/17

Attachment J
EQUAL EMPLOYMENT OPPORTUNITY (EEO) IS THE LAW POSTER

Equal Employment Opportunity is
THE LAW

Private Employers, State and Local Governments, Educational Institutions, Employment Agencies and Labor Organizations

Applicants to and employees of most private employers, state and local governments, educational institutions, employment agencies and labor organizations are protected under Federal law from discrimination on the following bases:

RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN

Title VII of the Civil Rights Act of 1964, as amended, protects applicants and employees from discrimination in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment, on the basis of race, color, religion, sex (including pregnancy), or national origin. Religious discrimination includes failing to reasonably accommodate an employee's religious practices where the accommodation does not impose undue hardship.

DISABILITY

Title I and Title V of the Americans with Disabilities Act of 1990, as amended, protect qualified individuals from discrimination on the basis of disability in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. Disability discrimination includes not making reasonable accommodation to the known physical or mental limitations of an otherwise qualified individual with a disability who is an applicant or employee, barring undue hardship.

AGE

The Age Discrimination in Employment Act of 1967, as amended, protects applicants and employees 40 years of age or older from discrimination based on age in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment.

SEX (WAGES)

In addition to sex discrimination prohibited by Title VII of the Civil Rights Act, as amended, the Equal Pay Act of 1963, as amended, prohibits sex discrimination in the payment of wages to women and men performing substantially equal work, in jobs that require equal skill, effort, and responsibility, under similar working conditions, in the same establishment.

GENETICS

Title II of the Genetic Information Nondiscrimination Act of 2008 protects applicants and employees from discrimination based on genetic information in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. GINA also restricts employers' acquisition of genetic information and strictly limits disclosure of genetic information. Genetic information includes information about genetic tests of applicants, employees, or their family members; the manifestation of diseases or disorders in family members (family medical history); and requests for or receipt of genetic services by applicants, employees, or their family members.

RETALIATION

All of these Federal laws prohibit covered entities from retaliating against a person who files a charge of discrimination, participates in a discrimination proceeding, or otherwise opposes an unlawful employment practice.

WHAT TO DO IF YOU BELIEVE DISCRIMINATION HAS OCCURRED

There are strict time limits for filing charges of employment discrimination. To preserve the ability of EEOC to act on your behalf and to protect your right to file a private lawsuit, should you ultimately need to, you should contact EEOC promptly when discrimination is suspected:

The U.S. Equal Employment Opportunity Commission (EEOC), 1-800-669-4000 (toll-free) or 1-800-669-6820 (toll-free TTY number for individuals with hearing impairments). EEOC field office information is available at www.eeoc.gov or in most telephone directories in the U.S. Government or Federal Government section. Additional information about EEOC, including information about charge filing, is available at www.eeoc.gov.

Attachment J

EQUAL EMPLOYMENT OPPORTUNITY (EEO) IS THE LAW POSTER

Employers Holding Federal Contracts or Subcontracts

Applicants to and employees of companies with a Federal government contract or subcontract are protected under Federal law from discrimination on the following bases:

RACE, COLOR, RELIGION, SEX, NATIONAL ORIGIN

Executive Order 11246, as amended, prohibits job discrimination on the basis of race, color, religion, sex or national origin, and requires affirmative action to ensure equality of opportunity in all aspects of employment.

INDIVIDUALS WITH DISABILITIES

Section 503 of the Rehabilitation Act of 1973, as amended, protects qualified individuals from discrimination on the basis of disability in hiring, promotion, discharge, pay, fringe benefits, job training, classification, referral, and other aspects of employment. Disability discrimination includes not making reasonable accommodation to the known physical or mental limitations of an otherwise qualified individual with a disability who is an applicant or employee, barring undue hardship. Section 503 also requires that Federal contractors take affirmative action to employ and advance in employment qualified individuals with disabilities at all levels of employment, including the executive level.

DISABLED, RECENTLY SEPARATED, OTHER PROTECTED, AND ARMED FORCES SERVICE MEDAL VETERANS

The Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended, 38 U.S.C. 4212, prohibits job discrimination and requires affirmative action to employ and advance in employment disabled veterans, recently separated veterans (within

three years of discharge or release from active duty), other protected veterans (veterans who served during a war or in a campaign or expedition for which a campaign badge has been authorized), and Armed Forces service medal veterans (veterans who, while on active duty, participated in a U.S. military operation for which an Armed Forces service medal was awarded).

RETALIATION

Retaliation is prohibited against a person who files a complaint of discrimination, participates in an OFCCP proceeding, or otherwise opposes discrimination under these Federal laws.

Any person who believes a contractor has violated its nondiscrimination or affirmative action obligations under the authorities above should contact immediately:

The Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, 200 Constitution Avenue, N.W., Washington, D.C. 20210, 1-800-397-6251 (toll-free) or (202) 693-1337 (TTY). OFCCP may also be contacted by e-mail at OFCCP-Public@dol.gov, or by calling an OFCCP regional or district office, listed in most telephone directories under U.S. Government, Department of Labor.

Programs or Activities Receiving Federal Financial Assistance

RACE, COLOR, NATIONAL ORIGIN, SEX

In addition to the protections of Title VII of the Civil Rights Act of 1964, as amended, Title VI of the Civil Rights Act of 1964, as amended, prohibits discrimination on the basis of race, color or national origin in programs or activities receiving Federal financial assistance. Employment discrimination is covered by Title VI if the primary objective of the financial assistance is provision of employment, or where employment discrimination causes or may cause discrimination in providing services under such programs. Title IX of the Education Amendments of 1972 prohibits employment discrimination on the basis of sex in educational programs or activities which receive Federal financial assistance.

INDIVIDUALS WITH DISABILITIES

Section 504 of the Rehabilitation Act of 1973, as amended, prohibits employment discrimination on the basis of disability in any program or activity which receives Federal financial assistance. Discrimination is prohibited in all aspects of employment against persons with disabilities who, with or without reasonable accommodation, can perform the essential functions of the job.

If you believe you have been discriminated against in a program of any institution which receives Federal financial assistance, you should immediately contact the Federal agency providing such assistance.

Attachment J
EQUAL EMPLOYMENT OPPORTUNITY (EEO) IS THE LAW POSTER

La igualdad de oportunidades de empleo es
LA LEY

Empleadores privados, gobiernos locales y estatales, instituciones educativas, agencias de empleo y organizaciones de trabajo

Los postulantes y empleados de la mayoría de los empleadores privados, los gobiernos locales y estatales, las instituciones educativas, las agencias de empleo y las organizaciones de trabajo están protegidos por la ley federal contra la discriminación en función de:

RAZA, COLOR, RELIGIÓN, SEXO, PROCEDENCIA

El Título VII de la Ley de Derechos Civiles (Civil Rights Act) de 1964, con sus modificaciones, protege a los postulantes y a los empleados contra la discriminación en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo, en función de raza, color, religión, sexo (incluidas las embarazadas) o procedencia. La discriminación religiosa se refiere a la falta de adaptación razonable a las prácticas religiosas de un empleado, siempre y cuando dicha adaptación no provoque una dificultad económica desmedida para la compañía.

DISCAPACIDAD

Los Títulos I y V de la Ley de Estadounidenses con Discapacidades (Americans with Disabilities Act) de 1990, con sus modificaciones, protege a las personas idóneas contra la discriminación por discapacidad en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo. La discriminación por discapacidad se refiere a la falta de adaptaciones razonables para las limitaciones físicas o mentales de una persona idónea que tiene una discapacidad y que es un postulante o un empleado, salvo que dichas adaptaciones provoquen una dificultad económica desmedida para la compañía.

EDAD

La Ley contra la Discriminación Laboral por Edad (Age Discrimination in Employment Act) de 1967, con sus modificaciones, protege a los postulantes y empleados de 40 años o más contra la discriminación por cuestiones de edad en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo.

SEXO (SALARIOS)

Además de lo establecido en el Título VII de la Ley de Derechos Civiles, con sus modificaciones, la Ley de Igualdad en las Remuneraciones (Equal Pay Act) de 1963, con sus modificaciones, también prohíbe la discriminación sexual en el pago de los salarios a las mujeres y los hombres que realicen básicamente el mismo trabajo, en empleos que requieran las mismas habilidades, esfuerzo y responsabilidad, en condiciones laborales similares, en el mismo establecimiento.

GENÉTICA

El Título II de la Ley de No Discriminación por Información Genética (Genetic Information Nondiscrimination Act, GINA) de 2008 protege a los postulantes y empleados contra la discriminación basada en la información genética en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo. La GINA también limita la adquisición de información genética por parte de los empleadores y condiciona de manera estricta su divulgación. La información genética incluye las pruebas genéticas de los postulantes, empleados o integrantes de sus familias, la manifestación de enfermedades o trastornos de los miembros de la familia (historia médica familiar) y las solicitudes o la recepción de servicios genéticos por parte de los postulantes, empleados o integrantes de sus familias.

REPRESALIAS

Todas estas leyes federales prohíben a las entidades cubiertas que tomen represalias en contra de una persona que presenta una carga por discriminación, participa en un procedimiento por discriminación o que, de algún otro modo, se opone a una práctica laboral ilícita.

QUÉ DEBE HACER SI CONSIDERA QUE ES VÍCTIMA DE LA DISCRIMINACIÓN

Existen plazos estrictos para presentar cargos por discriminación laboral. A fin de preservar la capacidad de la Comisión para la Igualdad de Oportunidades en el Empleo (Equal Employment Opportunity Commission, EEOC) de actuar en representación suya y proteger su derecho a iniciar una demanda privada si fuese necesario en última instancia, debe comunicarse con la EEOC apenas sospeche que se produjo un hecho de discriminación: Comisión para la Igualdad de Oportunidades en el Empleo de los Estados Unidos, 1-800-669-4000 (línea gratuita) o 1-800-669-6820 (línea gratuita TTY para las personas con problemas auditivos). Puede encontrar información sobre las sucursales de la EEOC en www.eeoc.gov o en la mayoría de las guías telefónicas en la sección Gobierno Federal o Gobierno de los Estados Unidos. También puede obtener información adicional sobre la EEOC, incluso cómo presentar un cargo, en www.eeoc.gov.

Attachment J

EQUAL EMPLOYMENT OPPORTUNITY (EEO) IS THE LAW POSTER

Empleadores que tengan contratos o subcontratos con el gobierno federal

Los postulantes y empleados de las compañías que tengan un contrato o subcontrato con el gobierno federal están protegidos por la ley federal contra la discriminación en función de:

RAZA, COLOR, RELIGIÓN, SEXO, PROCEDENCIA

El Decreto Ejecutivo 11246, con sus modificaciones, prohíbe la discriminación en el trabajo en función de raza, color, religión, sexo o procedencia y exige que se implementen acciones afirmativas para garantizar la igualdad de oportunidades en todos los aspectos laborales.

PERSONAS CON DISCAPACIDADES

La Sección 503 de la Ley de Rehabilitación (*Rehabilitation Act*) de 1973, con sus modificaciones, protege a las personas idóneas contra la discriminación por discapacidad en lo que respecta a la contratación, los ascensos, los despidos, los pagos, las compensaciones adicionales, la capacitación laboral, la clasificación, las referencias y los demás aspectos del empleo. La discriminación por discapacidad se refiere a la falta de adaptaciones razonables para las limitaciones físicas o mentales de una persona idónea que tiene una discapacidad y que es un postulante o un empleado, salvo que dichas adaptaciones provoquen una dificultad económica desmedida para la compañía. La Sección 503 también exige que los contratistas federales implementen acciones afirmativas para emplear y avanzar en el empleo de personas idóneas con discapacidades en todos los niveles laborales, incluido el nivel ejecutivo.

VETERANOS DISCAPACITADOS, RECIÉN RETIRADOS, BAJO PROTECCIÓN Y CON MEDALLA POR SERVICIO A LAS FUERZAS ARMADAS

La Ley de Asistencia a la Readaptación de Veteranos de Vietnam (*Vietnam Era Veterans' Readjustment Assistance Act*) de 1974, con sus modificaciones, 38 U.S.C. 4212, prohíbe la discriminación laboral y exige que se implementen acciones afirmativas para emplear y avanzar en el empleo de los veteranos discapacitados, recién retirados

(en el plazo de los tres años posteriores a la baja o al cese del servicio activo), otros veteranos bajo protección (los veteranos que prestaron servicio durante una guerra o en una campaña o expedición para la cual se les autorizó una insignia de campaña) y los veteranos con medalla por servicio a las Fuerzas Armadas (aquellos que durante el servicio activo, participaron en una operación militar de los Estados Unidos por la cual se los reconoció con una medalla por servicio a las Fuerzas Armadas).

REPRESALIAS

Quedan prohibidas las represalias contra una persona que presenta una demanda por discriminación, participa en un procedimiento de la Oficina de Programas de Cumplimiento de Contratos Federales (*Office of Federal Contract Compliance Programs*, OFCCP) o que se oponga, de algún otro modo, a la discriminación según estas leyes federales.

Toda persona que considere que un contratista violó sus obligaciones de acción afirmativa o no discriminación según las autoridades mencionadas anteriormente debe comunicarse de inmediato con:

La Oficina de Programas de Cumplimiento de Contratos Federales (OFCCP), Departamento de Trabajo de los Estados Unidos, 200 Constitution Avenue, N.W., Washington, D.C. 20210, teléfono 1-800-397-6251 (línea gratuita) o (202) 693-1337 (línea TTY). También puede enviar un mensaje de correo electrónico a la OFCCP (OFCCP-Public@dol.gov) o bien, llamar a una de sus oficinas regionales o del distrito, las cuales aparecen en la mayoría de las guías telefónicas en la sección Gobierno de los Estados Unidos, Departamento de Trabajo.

Programas o actividades que reciben asistencia financiera federal

RAZA, COLOR, PROCEDENCIA, SEXO

Además de las protecciones establecidas en el Título VII de la Ley de Derechos Civiles de 1964 y sus modificaciones, el Título VI de dicha ley, con sus modificaciones, prohíbe la discriminación por raza, color o procedencia en los programas o las actividades que reciben asistencia financiera federal. La discriminación laboral está cubierta por el Título VI si el objetivo principal de la asistencia financiera es brindar empleo, o si la discriminación laboral provoca o puede provocar discriminación cuando se proporcionan los servicios de dichos programas. El Título IX de las Reformas Educativas de 1972 prohíbe la discriminación laboral según el sexo en los programas o las actividades educativas que reciben asistencia financiera federal.

PERSONAS CON DISCAPACIDADES

La Sección 504 de la Ley de Rehabilitación de 1973, con sus modificaciones, prohíbe la discriminación laboral por discapacidad en cualquier programa o actividad que reciba asistencia financiera federal. Queda prohibida la discriminación en todos los aspectos laborales contra las personas discapacitadas que, con o sin adaptaciones razonables, pueden desempeñar las funciones esenciales del trabajo.

Si cree que ha sido víctima de discriminación en algún programa de una institución que reciba asistencia financiera federal, debe comunicarse de inmediato con la agencia federal que brinda dicha asistencia.

Versiones utilizables de la EEOC 9/02 y la OFCCP 8/08 con el Suplemento 11/09

EEOC-P/E-1 (Revisado 11/09)

Attachment K

MINIMUM INSURANCE REQUIREMENTS

During the term of the Contract, the Contractor at its sole expense shall provide primary commercial insurance of such type and with such terms and limits as may be reasonably associated with the Contract. As a minimum, the Contractor shall provide and maintain the following coverage and limits:

- A. Workers Compensation**, as required by the laws of Texas, **and Employers' Liability**, as well as All States, USL&H and other endorsements if applicable to the project, and in accordance with state law.

Employers' Liability

- Each Accident: \$1,000,000
- Disease–Each Employee: \$1,000,000
- Policy Limit: \$1,000,000

- B. Commercial General Liability**, including but not limited to the coverage indicated below. Coverage shall not contain any restrictive endorsements nor exclude or limit Products/Completed Operations, Contractual Liability, or Cross Liability. Where exposure exists, the County may require coverage for watercraft, blasting, collapse, explosions, blowout, cratering, underground damage, pollution, or other coverage. *Harris County shall be named Additional Insured on primary/non-contributory basis.*

- Each Occurrence: \$1,000,000
- Personal and Advertising Injury: \$1,000,000
- Products/Completed Operations: \$1,000,000
- General Aggregate (per project): \$2,000,000

- C. Automobile Liability**, including coverage for all owned, hired, and non-owned vehicles used in connection with the Contract. *Harris County shall be named Additional Insured on primary/non-contributory basis.*

- Combined Single Limit-Each Accident: \$1,000,000

- D. Umbrella/Excess Liability** (*Harris County shall be named Additional Insured on primary/non-contributory basis*)

- Each Occurrence/Aggregate: \$1,000,000

- E. Professional/Errors & Omissions Liability** (if applicable)

- Each Occurrence/Aggregate: \$1,000,000

The County reserves the right to require additional insurance if necessary. Coverage shall be issued by companies licensed (by TDI) to do business in Texas, unless said coverage is not available or economically feasible except through an excess or surplus lines company, in which case the company should be registered to do business in Texas. Companies shall have an A.M. Best rating of at least A-VII. Contractor shall furnish evidence of such insurance to the County in the form of unaltered insurance certificates. If any part of the contract is sublet, insurance shall be provided by or on behalf of any subcontractor, and shall be sufficient to cover their portion of the contract. Contractor shall furnish evidence of such insurance to the County as well.

Policies of insurance required by the contract shall waive all rights of subrogation against the County, its officers, employees and agents. If any applicable insurance policies are cancelled, materially changed, or non-renewed, contractor shall give written notice to the County at least 30 days prior to such effective date and within 30 days thereafter, shall provide evidence of suitable replacement policies. Failure to keep in force the required insurance coverage may result in termination of the contract. Upon request, certified copies of original insurance policies shall be furnished to the County. The requirements stipulated in this attachment do not establish limits of contractor liability.

Attachment L

WORKERS' COMPENSATION INSURANCE COVERAGE RULE 110.110

If this contract opportunity is for a building or construction contract, all of the provisions of this rule as shown below apply. Since this is a mandatory requirement, cost increases should not be experienced because of the need to comply with the Texas Workers' Compensation Law. For additional information contact the Texas Workers' Compensation Commission, Southfield Building, 400 S. IH-35, Austin, Texas 78704-7491, (512) 440-3618.

A. Definitions:

Certificate of coverage ("Certificate") - A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement, TWCC-81, TWCC-82, TWCC-83, or TWCC-84 showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project - Includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.

Persons providing services on the project ("subcontractor" in §406.096) - Includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

- B. The Contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the contractor providing services on the project, for the duration of the project.
- C. The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.
- D. If the coverage period shown on the Contractor's current certificate of coverage ends during the duration of the project, the Contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.
- E. The Contractor shall obtain from each person providing services on a project, and provide to the governmental entity:
- (1) A certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and
 - (2) No later than seven (7) days after receipt by the Contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.
- F. The Contractor shall retain all required certificates of coverage for the duration of the project and for one (1) year thereafter.

Attachment L

WORKERS' COMPENSATION INSURANCE COVERAGE RULE 110.110

- G. The Contractor shall notify the governmental entity in writing by certified mail or personal delivery, within ten (10) days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.
- H. The Contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.
- I. The Contractor shall contractually require each person with whom it contracts to provide services on a project to:
- (1) Provide coverage, based on reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all its employees providing services on the project, for the duration of the project.
 - (2) Provide to the Contractor, prior to that person beginning work on the project a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project.
 - (3) Provide the Contractor, prior to the end of coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.
 - (4) Obtain from each other person with whom it contracts, and provide to the Contractor:
 - (a) A certificate of coverage, prior to the other person beginning work on the project, and
 - (b) A new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;
 - (5) Retain all required certificates of coverage on file for the duration of the project and for one (1) year thereafter.
 - (6) Notify the government entity in writing by certified mail or personal delivery, within ten (10) days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and
 - (7) Contractually require each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.
- J. By signing this contract or providing or causing to be provided a certificate of coverage, the Contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.
- K. The Contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the Contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the governmental entity.

Revised 4/02

Attachment N

CERTIFICATION REGARDING LOBBYING

The undersigned [Contractor] certifies, to the best of his or her knowledge that _____, Contractor company or legal entity understands and is in compliance with the applicable federal standards and regulatory requirements, including but not limited to those specified in Title 2 Code of Federal Regulations 200.326 and 2 C.F.R. 200 Appendix II, Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards, and those listed herein, and agrees to pass through these requirements to its subcontractors and third-party contractors who will perform work on or are relevant to this contract, as applicable. **Contractor must initial by each regulatory requirement and sign below.**

- _____ **A. ACCESS TO RECORDS & RECORD RETENTION** – Contractor agrees to comply with 2 CFR 200.336 and provide Harris County, the State of Texas, the Texas General Land Office (GLO), the U.S. Department of Housing and Urban Development (HUD), the FEMA Administrator, the Inspectors General, the Comptroller General of the United States, or any of their pass-through entities or authorized representatives access to any books, documents, papers, and records of the successful Contractor(s) which are directly pertinent to this contract/project for the purposes of making/responding to audits, examinations, excerpts, and transcriptions. Successful Contractor shall maintain all records pertaining to the project for seven (7) years after receiving final payment and after all other pending matters have been closed.
- _____ **B. ACCESSIBILITY** – Contractor agrees to comply with all federal, state and local laws and regulations which prohibit recipients of federal funding from discriminating against individuals with disabilities. Applicable laws and regulations with which Contractor must comply shall include, but are not limited to, the following: Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. Section 794) (24 CFR Parts 8-9); the Architectural Barriers Act of 1968 (42 U.S.C. 4151-4157); the Uniform Federal Accessibility Standards (Appendix A to 24 CFR Part 40 and Appendix A to 41 CFR Part 101-19, subpart 101-19.6); the Americans with Disabilities Act (42 U.S.C. 12131; 47 U.S.C. 155, 201, 218, and 225); Texas Administrative Code, Title 10, Chapter 60, Subchapter (B) the Texas Architectural Barriers Act (TABA); the Architectural Barriers (AB) Rules; and the Texas Accessibility Standards (TAS).
- _____ **C. BYRD ANTI-LOBBYING AGREEMENT** – Contractor submissions exceeding \$100,000 agree to comply with CFR 200 APPENDIX II (J) and 24 CFR 570.303, and shall file the required certification (see Attachment N, *Certification Regarding Lobbying*) under 31 U.S.C. 1352.
- _____ **D. CIVIL RIGHTS ACT OF 1964 (TITLE VI 42 U.S.C. § 2000D)** – Contractor agrees to comply with Title VI of the Civil Rights Act of 1964, Section 109 of the Community Development Act of 1974, Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. Section 794) (24 CFR Parts 8-9), and the Americans with Disabilities Act of 1990 (42 U.S.C. 12131; 47 U.S.C. 155, 201, 218, and 225), which prohibits Contractors from excluding or denying individuals benefits or participation in this project on the basis of race, color, religion, national origin, sex, or disability. The provisions require that no person in the United States shall on the ground of race, color, national origin or sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with community development funds made available pursuant to these Acts.
- _____ **E. CLEAN AIR ACT & THE FEDERAL WATER POLLUTION CONTROL ACT** – If at any time during the contract term funding to contract exceeds \$150,000, Contractor agrees to comply with all provisions of the Clean Air Act (42 U.S.C. 85) and Section 308 of the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended. Contractor agrees it shall not expend such funds by making use of subcontracting with facilities included on the Environmental Protection Agency List of Violating Facilities as per Section 306 of the Clean Air Act, Section 508 of The Clean Water Act, Executive Order 11738, and Environmental Protection Agency Regulations 40 CFR.

Attachment N

CERTIFICATION REGARDING LOBBYING

For any subcontractors under this contract receiving contracts in excess of \$150,000 Contractor agrees to include a provision that requires compliance with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 85) and Section 308 of the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations shall be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

- _____ **F. *CONTRACT WORK HOURS & SAFETY STANDARDS ACT*** – Contractor agrees to comply with the Contract Work Hours and Safety Standards Act. For any contract awarded under this contract opportunity in excess of \$100,000, that contract shall be a covered transaction for purposes of compliance with the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5).
- _____ **G. *COPELAND “ANTI-KICKBACK” ACT*** – Contractor agrees to comply with the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each vendor, contractor, subcontractor, or subrecipient shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled.
- _____ **H. *COST PLUS CONTRACTING PROHIBITED*** – Contractor agrees to comply with the prohibition against cost-plus-a-percentage-of-cost (CPPC) contracting. Pursuant to 2 CFR 200.323(d), Contractor agrees to never use cost plus a percentage of cost and percentage of construction cost methods of contracting, including in subcontracts and third-party contracts. A cost-plus contract is one that is structured to pay the contractor or subcontractor their actual costs incurred, plus a fixed percent for profit or overhead.
- _____ **I. *DAVIS BACON & RELATED ACTS*** – When applicable, Contractor agrees to comply with the Davis Bacon and Related Acts, and the requirements shall be applicable to any labor or mechanic work completed in connection with this contract which fall under the Davis Bacon Act. Any Contractor awarded under this contract is required to comply with the Davis Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR part 3 and part 6). In accordance with the statute, Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week.
- _____ **J. *DEBARMENT AND SUSPENSION*** – Contractor affirms that it is not debarred nor suspended from receiving federally-funded awards. Non-federal entities and contractors are subject to the debarment and suspension regulations implementing Executive Order 12549, Debarment and Suspension (1986) and Executive Order 12689, Debarment and Suspension (1989) at 2 C.F.R. Part 180 and the Department of Homeland Security’s regulations at 2 C.F.R. Part 3000 (Nonprocurement Debarment and Suspension). These regulations restrict awards, sub-awards, and contracts with certain parties that are debarred, suspended, or otherwise excluded from or ineligible for participation in Federal assistance programs and activities.
- _____ **K. *ENERGY EFFICIENCY*** – Contractor agrees to comply with the standards and policies relating to energy efficiency, which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201).
- _____ **L. *EQUAL EMPLOYMENT OPPORTUNITY*** – Contractor agrees to comply with the Equal Opportunity clause provided under 41 C.F.R. § 60-1.4(b), in accordance with Executive Order 11246, Equal Employment Opportunity (30 Fed. Reg. 12319, 12935, 3 C.F.R. Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, Amending Executive Order 11246 Relating to Equal Employment Opportunity, and

Attachment N

CERTIFICATION REGARDING LOBBYING

implementing regulations at 41 C.F.R. Part 60 (Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor).

Contractor agrees it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin.

- _____ **M. *EQUAL EMPLOYMENT OPPORTUNITY FOR WORKERS WITH DISABILITIES*** – Contractor agrees to comply with the requirements of the equal opportunity clause at 41 CFR 60-741.5(a). This clause prohibits discrimination against qualified individuals on the basis of disability, and requires affirmative action by the Contractor to employ and advance in employment qualified individuals with disabilities.

Contractor agrees to include the terms of this clause in every subcontract or purchase order in excess of \$15,000 unless exempted by rules, regulations, or orders of the Secretary, so that such provisions will be binding upon each subcontractor or vendor.

- _____ **N. *EQUAL EMPLOYMENT OPPORTUNITY FOR VETERANS*** – Contractor agrees to comply with required Equal Employment Opportunity for VEVRAA Protected Veterans provisions (41 CFR 60.300). Contractor agrees it shall not discriminate against any employee or applicant for employment because he or she is a disabled veteran, recently separated veteran, active duty wartime or campaign badge veteran, or Armed Forces service medal veteran in regard to any position for which the employee or applicant for employment is qualified. Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified individuals without discrimination based on their status as a protected veteran in all employment practices.

Contractor shall include the Equal Employment Opportunity for VEVRAA Protected Veterans clause in each of its covered Government contracts or subcontracts (and modifications, renewals, or extensions thereof if not included in the original contract).

- _____ **O. *FAIR LABOR STANDARDS ACT*** – Contractor agrees to comply with the Fair Labor Standards Act of 1938 (29 U.S.C. Section 201 et seq.). Contractor warrants and represents that it will pay all its workers all monies earned by its workers including, but not limited to regular wages, any overtime compensation, or any additional payments pursuant to the Fair Labor Standards Act, 29 United States Code (U.S.C.) Section 207 9a(1), as amended; the Texas Pay Day Act; the Equal Pay Act; Title VII of the Civil Rights Act of 1964, 42 U.S.C. Section 2000, et al., as amended; or any provisions of the Texas Labor Code Ann., as amended.

- _____ **P. *FLOOD DISASTER PROTECTION ACT OF 1973*** – Contractor agrees to comply with the provisions in 24 CFR 570.605, Section 202(a) of the Flood Disaster Protection Act of 1973 (42 U.S.C. 4106), and the regulations in 44 CFR Parts 59-79.

- _____ **Q. *GREEN BUILDING*** – Contractor agrees to comply with local codes and national building codes for any work involving rehabilitation or construction, including design. When contract is funded, in whole or in part, by HUD funding, Contractor agrees to comply with applicable Green Building standards to the maximum extent feasible. Green Building standards may apply to single-family properties, multifamily properties, or both and may include, but are not limited to best practices defined under LEED, Enterprise Green Communities, or NAHB National Green Building Standards and may include specific measures for water conservation, energy efficiency, and indoor air quality. Contractor agrees to comply with the following standards, as applicable:

- 2009 ICC International Energy Conservation Code (IECC)
- ASHRAE 90.1-2007, which sets minimum energy standards for buildings except low-rise residential buildings
- ASHRAE 62.1-2010 and 62.2-2010, which set minimum standards for ventilation for indoor air quality for common areas in mid- and high-rise buildings, and low-rise residential buildings, respectively.

Attachment N

CERTIFICATION REGARDING LOBBYING

- New or replacement residential housing, when funded by CDBG-DR grants, must adhere to Green Building standards, including Energy Star Certified Homes or Energy Star for Multifamily High Rise and other applicable green building requirements.
- Moderate residential housing rehabilitation, when funded by CDBG-DR grants, must comply with the Community Planning & Development (CPD) Retrofit Checklist and provide Energy Star appliances, Water Sense or FEMP products if replaced.

- _____ **R. *HOLD HARMLESS AGREEMENT*** – Contractor agrees to indemnify, defend, and hold harmless Harris County and the Subrecipient from all claims for personal injury, death and/or property damage resulting directly or indirectly from contractor's performance. The successful Contractor shall procure and maintain, with respect to the subject matter of this solicitation, appropriate insurance coverage including, at a minimum, public liability and property damage with adequate limits to cover contractor's liability as may arise directly or indirectly from work performed under terms of this solicitation. Certification of such coverage must be provided to the County upon request.
- _____ **S. *LEAD BASED PAINT*** – Contractor agrees to comply with the provisions found in 24 CFR 570.608, the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846), the Residential Lead Based Paint Hazard Reduction Act of 1992 (U.S.C. 4851-4856, and 24 CFR Part 35, subparts A, B, J, K, and R. This Article 2(f) is to be included in all subcontracts, for work in connection with this Agreement, which relate to residential structures.
- _____ **T. *NON-COLLUSION*** – Contractor agrees to comply with The Sherman Act, which prohibits any agreement among competitors to fix prices, rig bids, or engage in other anticompetitive activity. Collusion, bid rigging, or other anticompetitive activity is considered a felony. Contractor agrees that it has not in any way directly or indirectly: Colluded, conspired, or agreed with any other person, firm, corporation, Contractor or potential Contractor to the amount of this contract or the terms or conditions of this contract; Paid or agreed to pay any other person, firm, corporation, Contractor, or potential Bidder any money or anything of value in return for assistance in procuring or attempting to procure a contract or in return for establishing the prices in the attached Contractor or the Bid of any other Bidder; or Assembled in coordination with any other organization in an attempt to fix the price of the work.
- _____ **U. *PARTICIPATION BY MINORITY & WOMEN-OWNED BUSINESS ENTERPRISES*** – Contractor agrees to comply with the Minority and Women-owned Business Enterprise participation requirements under 2 CFR 200.321. Contractors who are awarded contracts with the County are required to take all affirmative steps necessary to subcontract with Minority and Women-owned Business Enterprises (MWBES).
- _____ **V. *POTENTIAL CONFLICT OF INTEREST*** – In accordance with 2 CFR 200.112, Contractor agrees to comply with disclosure requirements pursuant to Texas Local Government Code, Chapter 176. Contractor agrees not to use funds to directly or indirectly pay any person for influencing or attempting to influence any public employee or official in connection with the awarding of any contract or the extension, continuation, renewal, amendment or modification of any contract. By law, the Conflict of Interest Questionnaire (provided by the Texas Ethics Commission at www.ethics.state.tx.us) must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date Contractor becomes aware of facts that require the statement to be filed.
- _____ **W. *PREVAILING WAGES*** – Contractor agrees to comply with Texas Government Code (TGC) 2258, Prevailing Wage Rates. In accordance with the statute, Contractors shall be required to pay wages to laborers and mechanics at a rate not less than the local prevailing wages, or Davis Bacon wages, as applicable. If both Texas prevailing wages and Davis Bacon provide rates for a particular class, Contractors must pay the greater wage rate.
- _____ **X. *PROCUREMENT OF RECOVERED MATERIALS*** – Contractor agrees to comply with Section 6002 of the Solid Waste Disposal Act, Pub. L. No. 89-272 (1965) (codified as amended by the Resource Conservation

Attachment N

CERTIFICATION REGARDING LOBBYING

and Recovery Act at 42 U.S.C. § 6962). As such, any contractors awarded under this contract opportunities are subject to the requirements of Section 6002.

- _____ **Y. PROGRAM FRAUD & FALSE OR FRAUDULENT STATEMENT OR RELATED ACTS** – Contractor agrees to comply with 31 U.S.C. Chapter 38, *Administrative Remedies for False Claims and Statements*, which applies to the activities and actions of the Contractor and its subcontractors pertaining to any matter resulting from the contract.
- _____ **Z. RESTRICTIONS ON PUBLIC BUILDINGS & PUBLIC WORKS PROJECTS** – Contractor certifies that it:
- Is not a Contractor of a foreign country included on the USTR list.
 - Has not and will not enter into any subcontract with a subcontractor of a foreign country included on the USTR list.
 - Will not provide any product of a foreign country included on the USTR list.
- _____ **AA. SECTION 3 ACT OF 1968** – The work to be performed under this Contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended (12 USC §1701u) ("**Section 3**"). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted developments covered by Section 3 shall to the greatest extent feasible, be directed to low- and very low-income persons, including persons who are recipients of HUD assistance for housing, with a preference for both Section 3 workers and targeted workers living in the service area or neighborhood of the Development as defined in 24 CFR Part 75 ("Section 3 Regulations").

If requested by Harris County and/or the Subrecipient, Contractor agrees to provide their policy and/or documentation verifying compliance with each of the above listed regulatory requirements.

Print Name and Title of Contractor's Authorized Official

Signature of Contractor's Authorized Official

Date

Attachment N

CERTIFICATION REGARDING LOBBYING

(Required for each Contract exceeding \$100,000)

The undersigned [Contractor] certifies, to the best of his or her knowledge, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form- LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Contractors are required to complete **Form SF-LLL - Disclosure of Lobbying Activities** to disclose lobbying activities pursuant to 31 U.S.C. 1352.

Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 et seq., apply to this certification and disclosure, if any.

Print Name and Title of Contractor's Authorized Official

Signature of Contractor's Authorized Official

Date

Attachment N

CERTIFICATION REGARDING LOBBYING

1. Type of Federal Action: ☐ a. contract ☐ b. grant ☐ c. cooperative agreement ☐ d. loan ☐ e. loan guarantee ☐ f. loan insurance	2. Status of Federal Action: ☐ a. bid/offer/application ☐ b. initial award ☐ c. post-award	3. Report Type: ☐ a. initial filing ☐ b. material change For material change only: Year _____ quarter _____ Date of last report _____
4. Name and Address of Reporting Entity: _____ Prime _____ Subawardee _____ Tier If Known: Congressional District, if known:		5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime: Congressional District, if known:
6. Federal Department/Agency:		7. Federal Program Name/Description: CFDA Number, <i>if applicable</i>
8. Federal Action Number, if known:		9. Award Amount, if known: \$
10. a. Name and Address of Lobbying Registrant <i>(if individual, last name, first name, MI):</i>		b. Individuals Performing Services <i>(including address if different from No. 10a)</i> <i>(last name, first name, MI):</i>
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure		Signature _____ Print Name _____ Title _____ Telephone No. _____ Date: _____
Federal Use Only		Authorized _____ for _____ Local _____ Standard Form – LLL (Rev. 7-97) Reproduction

Attachment O

STATEMENT OF CONTRACTOR QUALIFICATIONS

This Statement of Contractor Qualifications requests information about Contractor that will be used in the evaluation of Contractor responsibility. Answers should be as thorough and definitive as possible and include all pertinent data. Failure to fully and truthfully disclose the information required may result in the termination of the contract, once awarded. Supplemental materials, additional pages, or requested lists providing additional information may be attached to further clarify answers.

General Information

1. Name of company/organization: _____
2. Address of company/organization: _____
3. Home office address (if other than above): _____
4. Telephone No: _____ Fax No.: _____
5. Type of business entity (corporation, partnership, sole proprietorship, etc.): _____
 - A. If your organization is a corporation, please provide on a separate sheet(s), detailing the following: Date of incorporation, State of incorporation, Names of President, Vice-president, Secretary, and Treasurer.
 - B. If your organization is a partnership or individually owned, please attach a list detailing the following: Date of organization, Name of owner(s) or partners.
6. Place of incorporation (if applicable): _____
7. Type of work performed by your company: _____
8. Year founded/established: _____
9. Has your organization been in business under its present name for at least five (5) years? ☐ YES ☐ NO
 - A. If not, please explain why. _____
10. Primary individual to contact: _____

Litigation Record

Have you or any member of your organization or team brought any claim, litigation, or arbitration against Harris County or any other Federal, State or Local Government during the last five (5) years?

☐ YES ☐ NO

If yes, attach a list of any claims, lawsuits, or requested arbitrations and their final outcome.

Has Harris County or any other Federal, State or Local brought any claim or litigation against you or any member of your organization or team during the last five (5) years?

☐ YES ☐ NO

If yes, attach a list of any claims, lawsuits, or requested arbitrations and their final outcome.

Has you or any member of your organization or team filed any lawsuits or requested arbitration with regards to any contracts within the last five (5) years?

☐ YES ☐ NO

If yes, attach a list of any lawsuits or requested arbitrations and their final outcome.

Are there any administrative proceedings, claims, lawsuits, or other exposures pending against you or any member of your organization or team?

Attachment O

STATEMENT OF CONTRACTOR QUALIFICATIONS

☐ YES ☐ NO

If yes, explain: _____

Have any subcontractors, in which your organization has some ownership, filed any lawsuits or requested arbitration with regards to any contracts within the last five (5) years?

☐ YES ☐ NO

If yes, explain: _____

Have you or any member of your organization or team to be assigned to this engagement been terminated (for cause or otherwise) from any work being performed for Harris County or any other Federal, State or Local Government, or Private Entity?

☐ YES ☐ NO

If yes, explain: _____

Have you ever failed to complete any work awarded to you? ☐ YES ☐ NO

If yes, explain, indicating what was not completed and the reasoning: _____

Have you ever defaulted on a contract? ☐ YES ☐ NO

If yes, explain: _____

Experience Record

How many years has your organization been providing the services identified in this contract opportunity to the following types of entities?

Government (Public) Entities: _____

Private (Commercial) Entities: _____

List three to five (3-5) similar projects as the one specified in this solicitation that your organization has completed over the last five (5) years. For each project, as applicable, provide the name, nature of the project, size (SF), location, cost, completion date, owner and architect. Attach additional pages as necessary:

1. _____
2. _____
3. _____
4. _____
5. _____

List the major projects your organization has in progress, giving the name and location of the project as well as nature of the type of services you are providing. Provide dollar amount of contract, type of work, percent complete, estimated completion date, and owner information for each project:

\$ Amount of Contract	Type of Work	Est. Date of Completion	Name and Address of Owner
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____

Attachment O

STATEMENT OF CONTRACTOR QUALIFICATIONS

4. _____

Describe your organization's concepts for working in a team relationship with the owner and user groups during the completion of projects similar to that identified in this contract opportunity. Attach additional pages as necessary:

Please list categories of work that your organization normally performs with its own forces.

1. _____
2. _____
3. _____
4. _____

Please list subcontractors in which your organization has some ownership or relationship and list the categories of work those subcontractors normally perform.

1. _____
2. _____
3. _____
4. _____

Portions of work Contractor proposes to sublet in case of award of contract, including amount and type:

1. _____
2. _____
3. _____

List of Surety Bonds in Force on the above incomplete work:

\$ Amount of Contract	Amount of Bond	Name of Surety Company
-----------------------	----------------	------------------------

- | | | |
|----------|-------|-------|
| 1. _____ | _____ | _____ |
| 2. _____ | _____ | _____ |
| 3. _____ | _____ | _____ |
| 4. _____ | _____ | _____ |

Equipment Schedule (if applicable)

List of equipment owned by Contractor that is in serviceable condition and available for use:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Attachment O
STATEMENT OF CONTRACTOR QUALIFICATIONS

Dated this day _____ of _____ 20____
(Name of Organization)

By: _____
(Title)

Submitted by _____ an individual
a partnership
a corporation

with principal office at _____
(Full Address or City, State)

To be filled in by Corporation:
Date incorporated _____
Under the laws of _____ State.

To be filled in by Partnership
Date formed _____
State whether partnership is general, limited or associated

Executive Officer _____

List Members:

State of _____

County of _____

_____, being duly sworn, deposes and attests that he/she is
(Name of Contractor's Representative)

_____ of _____,
(Position Title) (Name of Organization)

and that: (1) the Contractor performing this work and the contractors / subcontractors anticipated to perform the work are properly licensed, as applicable, and shall provide proof of said licensure needed to complete the scope of work; (2) the answers to the foregoing questions on the attached/associated forms and all statements therein are correct to the best of their knowledge; (3) the experience record and the schedule of equipment are made part of this affidavit as though written in full herein; and (4) all statements and answers to the questions given in the above-mentioned experience record and schedule of equipment are true and correct.

_____, sworn to before me this _____ day
(Name of Contractor's Representative)
of _____, 20__.

Notary Public

(Seal)
My Commission expires

Attachment P
SUBCONTRACTOR LISTING FORM

Contractor is required to provide information below for each Subcontractor who will perform work or labor or render service to the Contractor in connection with the project (add additional pages if necessary):

Company Name: _____	Industry: _____
DUNS #: _____	Name of Principal: _____
Approximate Contract Value \$ _____	Start & End of Contract _____
Certified HUB / MWBE: ☐ Yes ☐ No	Certified Section 3: ☐ Yes ☐ No
Description of Work to be performed: _____ _____ _____	

Company Name: _____	Industry: _____
DUNS #: _____	Name of Principal: _____
Approximate Contract Value \$ _____	Start & End of Contract _____
Certified HUB / MWBE: ☐ Yes ☐ No	Certified Section 3: ☐ Yes ☐ No
Description of Work to be performed: _____ _____ _____	

Company Name: _____	Industry: _____
DUNS #: _____	Name of Principal: _____
Approximate Contract Value \$ _____	Start & End of Contract _____
Certified HUB / MWBE: ☐ Yes ☐ No	Certified Section 3: ☐ Yes ☐ No
Description of Work to be performed: _____ _____ _____	

Contractor shall be responsible for ensuring any Subcontractors used are properly licensed, insured, and authorized to work under government contracts by checking state, local, and federal debarment lists. A final Subcontractor Listing Form will be required prior to contract award.

☐ **I will not be subcontracting any portion of the contract and will be fulfilling the entire contract with my own resources.**

Signature of Contractor: _____

Print Name: _____

Attachment Q

SECTION 3 CLAUSE

24 CFR 75 Section 3 Clause

- a. The work to be performed under this Contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended (12 USC §1701u) ("**Section 3**"). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted developments covered by Section 3 shall, to the greatest extent feasible, be directed to low- and very low-income persons, including persons who are recipients of HUD assistance for housing, with a preference for both targeted workers living in the service area or neighborhood of the Development and YouthBuild participants, as defined at 24 CFR Part 75 ("**Section 3 Regulations**").
- b. The Parties agree to comply with HUD's regulations in Section 3 Regulations, which implement Section 3. As evidenced by their execution of this Contract, the Parties certify that they are under no contractual or other impediments that would prevent them from complying with the Section 3 Regulations.
- c. The Award Recipient, Contractor, or Development Owner agrees to send to each labor organization or representative of workers with which the Award Recipient, Contractor, or Development Owner has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the Award Recipient, Contractor, or Development Owner's commitments under this section of the Contract and will post copies of the notice in conspicuous places at the worksite where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 preference and shall set forth the following: (i) minimum number and job titles subject to hire, (ii) availability of apprenticeship and training positions, (iii) qualifications for each, (iv) name and location of the person(s) taking applications for each of the positions, and (v) the anticipated date the work shall begin.
- d. The Award Recipient, Contractor, or Development Owner agrees to include this Section 3 clause in every subcontract subject to compliance with regulations in Section 3 Regulations and agrees to take appropriate action, as provided in an applicable provision of the subcontract in this Section 3 clause, upon a finding that the subcontractor violates the regulations in Section 3 Regulations. The Award Recipient, Contractor, or Development Owner will not subcontract with any subcontractor where the Award Recipient, Contractor, or Development Owner has notice or knowledge that the subcontractor has been found in violation of the regulations in Section 3 Regulations.
- e. The Award Recipient, Contractor, or Development Owner will certify that any vacant employment positions, including training positions, that are filled (i) after a contractor is selected but before the Contract is executed, and (ii) with persons other than those to whom the regulations of Section 3 Regulations require employment opportunities to be directed, were not filled to circumvent the Award Recipient, Contractor, or Development Owner's obligations under Section 3 Regulations.
- f. Noncompliance with HUD's regulations in Section 3 Regulations may result in sanctions, termination of this Contract for default, and debarment or suspension from future HUD-assisted contracts.

Revised 6.25.21



Attachment R

SECTION 3 OBLIGATION SUMMARY CONTRACT AWARDEES

HUD Section 3 (Effective 2021), Obligation Summary for Contract Awardees

Harris County will monitor Subrecipients and contractors based on these requirements.

Applies to: HUD-funded project (\$200,000 or more) with construction, reconstruction, rehab, or demolition.

Service area: geographic area defined on a project by project basis.

For the sake of clarity, "Subrecipient" means any entity that receives HUD funds under contract from Harris County.

The basis for Section 3 Requirements (24 CFR 75)

Housing & Urban Development Act of 1968 (12 U.S.C. 1701u) (section 3)

Section 3 Clause recommended in all Section 3-covered HUD contracts [24 CFR §75.27 Contract provisions]. Although HUD no longer dictates specific text, Harris County uses the Section 3 Clause document attached.

Responsibilities of Subrecipient to Harris County:

To the greatest extent feasible, and consistent with existing Federal, State, and local laws and regulations:

Develop a Section 3 Plan describing resource utilization and outreach to notify Section 3 residents and business concerns of training, employment, and contracting opportunities. Document actions are taken to comply with Section 3. Documentation of your plan and actions must be available upon request.

Responsibilities for contractors, for covered projects:

1. "To the greatest extent feasible," recruit, train, and employ Section 3 workers and award contracts to Section 3 businesses, including recruiting Section 3 residents through local advertising, project site signage, liaisons with local Public Housing Authorities, community organizations, public or private institutions, or Local Workforce Development Boards (affiliated with Texas Workforce Commission).
2. Search HUD's Section 3 site and perform outreach for certified Section 3 businesses: <https://hudapps.hud.gov/OpportunityPortal/>.
3. Notify potential contractors of their Section 3 responsibilities [24 CFR §75.27].
4. Maintain data for Summary Report, including employment, labor hours (Section 3 compared to total), and training records.

Benchmarks for Section 3 Workers

- 25% of total labor hours for the project worked by:
 - Employee of a Section 3 Business
 - YouthBuild Participant
 - Below 80% AMI (area median individual income)

Benchmarks for Section Targeted 3 Workers

- 5% of total labor hours for the project worked by:
 - Employee of a Section 3 Business
 - YouthBuild Participant or
 - Service Area Resident (§75.5)

5. Avoid entering into contracts with entities reportedly in violation of Section 3 regulations.

Report Submission

Contractor's Final Section 3 report precedes final disbursement from Harris County.

Business Name

Name of Authorized Officer

Signature

Date

These obligations and requirements substantively reflect 24 CFR 75, guidance from the US Department of Housing and Urban Development (HUD)

Revised 9.20.21



Attachment S

SECTION 3 BUSINESS CONCERN SELF-CERTIFICATION

Business Name:	Business Principal Name:	
Address:	City:	Zip Code:
Email:	Phone #:	

Section 3 Business Concern Criteria: A business is eligible for Section 3 Business Concern status if it meets any one of the following criteria. **Check** all that apply:

- ☐ My business is 51 percent or more owned by a Section 3 worker or workers;
- ☐ Over 75 percent of the labor hours performed for the business referenced above over the prior three-month period are performed by Section 3 Workers; or
- ☐ My business is at least 51 percent owned and controlled by current public housing residents or residents who currently live in Section 8-assisted housing.
- ☐ Not a Section 3 Business Concern.

Appropriate documentation must be attached as evidence of Section 3 eligibility (As defined by 24 CFR 75)

Section 3 Business Concerns claiming status as a Section 3 Worker-owned enterprise must submit the following:

- ☐ Section 3 Worker Self-Certification Form verifying Section 3 Worker status of owner(s)
Additional evidence and supporting documentation may be required, including but not limited to proof of Public Housing Assistance (PHA) lease, evidence of participation in other public program(s), Housing Assistance Payment Contract (HAP) Award or benefit notification letter, proof of other public assistance, etc.

Section 3 Business Concerns claiming Section 3 status by claiming at least 75 percent of labor hours performed for the business over the prior three-month period are performed by Section 3 Workers:

- ☐ List of all current employees certified as Section 3 Workers or Targeted Workers
- ☐ Evidence of employee Section 3 Worker status (including Section 3 Worker Self-Certification Forms)
- ☐ Evidence that 75 percent of the labor hours performed for the business over the prior three-month period are performed by Section 3 Workers

Section 3 Business Concerns claiming Section 3 status as a business at least 51 percent owned and controlled by current public housing residents or residents who currently live in Section 8-assisted housing:

- ☐ List of all owners noting 51 percent of the ownership qualifies as public housing or Section 8-assisted housing
- ☐ Evidence of current public housing lease (HAP) or Section 8 –assisted housing award letter and or lease per owner noted as qualified

I understand that the information above may require verification, and I agree to provide additional documents verifying this information if requested.

Print Name

Signature

Date

For County Use Only

Contract / Project: _____ **Department:** _____ **Date:** _____

Revised 1.20.22

Pursuant to 24 CFR 75, a Section 3 business concern seeking a contract shall submit to Harris County, its contractors and/or subcontractors (as applicable), if requested, sufficient evidence to demonstrate that the Business Concern is responsible and has the ability to perform successfully under the terms and conditions of the proposed contract. The ability to perform successfully under the terms and conditions of the proposed contract is required of all contractors subject to the procurement standards of 2 CFR 200.318(h)

Warning: HUD will prosecute false claims and statements. Conviction may result in criminal and/or civil penalties. (18 U.S.C. 1001, 1010, 1012; 31 U.S.C. 3729, 3802)



Attachment T

SECTION 3 WORKER AND TARGETED WORKER SELF-CERTIFICATION

This form is to comply with Section 3 of the HUD Act of 1968 certification requirements. Applicants may be entitled to claim Section 3 Worker status when applying for Harris County training and employment opportunities generated by certain HUD-funded projects.

Print Name:		
Address:	City:	Zip Code:
Email:	Phone #:	

Harris County Subrecipients and Contractors shall direct its efforts to provide, to the greatest extent feasible, employment opportunities to:

Section 3 Worker who currently or when hired as of November 30, 2020, fits at least one of the following:

- **Category 1 Worker:** Income for the previous or annualized calendar year is below the income eligibility guideline;
- **Category 2 Worker:** Employed by a Section 3 Business Concern;
- **Category 3 Worker:** A Youthbuild Participant;

Income Eligibility Guidelines apply* (individual income does not exceed the following amounts either currently or as of 11/30/20):

Year Hired	2021 (effective 7/1/21)	2020 (effective 11/30/20-6/31/21)
Individual Annual Income	☐ \$44,350	☐ \$44,150

Section 3 Targeted Worker fits at least one of the following:

- **Category 1 Worker:** A worker employed by a Section 3 Business Concern;
- **Category 2 Worker:** A worker currently or when hired as of November 30, 2020, fits one of the following:
 - 1) Lives within the service area or the neighborhood of the project or
 - 2) A Youthbuild Participant;

Check all that apply: **Date Hired:** _____

☐ I meet the Income Eligibility Guidelines. *Please answer questions below:*

What is your individual annual income? \$ _____

☐ I am employed by a Section 3 Business Concern

☐ I live within one mile of the service area or the neighborhood of the project

☐ I am a Youthbuild Participant

☐ I do not meet any of the criteria for a Section 3 Worker or Section 3 Targeted Worker

I understand that the information above may require verification, and I agree to provide documents verifying this information if requested.

Applicant Signature

Date

For County Use Only

Project Name / Contract #: _____ Department: _____ Date: _____

Revised 1.19.22

*Source: U.S. Department of Housing and Urban Development, effective July 1, 2021

Warning: HUD will prosecute false claims and statements. Conviction may result in criminal and/or civil penalties. (18 U.S.C. 1001, 1010, 1012; 31 U.S.C. 3729, 3802)



Attachment U

SECTION 3 BUSINESS CONCERN EMPLOYEE LIST

Section 3 Business Concern Back-Up Document Employee List & Labor Hours

Instructions: List all company employees.

1. Use drop down menu. Select Income Limit 2020 if hired between 11/30/20 - 6/30/21 or select Income Limit 2021 if hired between 7/1/21 - 6/30/22. N/A if hired before 11/30/20.
2. Complete only if one of the HUD Income Limits were selected.
3. Indicate the Employee's Current Individual Annual Income. (For example \$15 per hour multiplied by 2080 hrs. = \$31,200)
4. Complete a Section 3 Worker and Targeted Worker Form for all employees.
5. Indicate the Employee's Total Labor Hours Worked for the Past 3 Months on any project.
6. Indicate if the Employee is a Section 3 Worker. (Refer to the Section 3 Worker and Targeted Worker Self-Certification Form)
7. Indicate if the Employee is a Section 3 Targeted Worker. (Refer to the Section 3 Worker and Targeted Worker Self-Certification Form)
8. **Note:** All Targeted Workers are also Section 3 Workers.

For additional assistance, please contact your Project Monitor - Section 3

Business Name												
Project Number & Name												
Start Work Date												
	Employee First Name	Employee Middle Name	Employee Last Name	Employee Identification Number (Last 4 SSN or Employee ID)	Employee Hire Date	1. HUD Income Limits 2020 & 2021	2. Employee Annual Income at Date of Hire	3. Employee Current Individual Annual Income	4. Section 3 Self - Certification Form Completed	5. Labor Hours Worked (for the past 3 months)	6. Is Employee a Section 3 Worker? Yes or No	7. Is Employee a Targeted Section 3 Worker? Yes or No
(Example):	Michael	M.	Jones	3589	1/31/19			\$31,200	Yes	680	Yes	No
(Example):	Samuel	J.	Williams	4598	12/5/20	2020 \$44,150	\$40,500	\$45,000	Yes	600	Yes	Yes
(Example):	Rosa		Perez	2004	1/15/21	2020 \$44,150	\$50,000	\$50,000	Yes	500	No	No
1												
2												
3												
4												
56												
100												
Total Labor Hours Worked by all Employees for the Past 3 Months												
Total Labor Hours Worked by all Section 3 Workers for the Past 3 Months												
% of Total Labor Hours Worked for the Past 3 Months								#DIV/0!				
Total Labor Hours Worked by all Section 3 Targeted Workers for the Past 3 Months												
% of Total Labor Hours Worked by all Section 3 Targeted Workers for the Past 3 Months								#DIV/0!				

Revised 10/22/21



Attachment V

SECTION 3 INITIAL SUBCONTRACTING PLAN

Business Name		Prime	Sub	Do you qualify as a Section 3 Business Concern?	☐ Yes ☐ No
		☐	☐		
Business Address				Business Email	
Project Title / Project #				Contract Amount	\$

Part I: Section 3 Subcontracting

Section 3 Subcontracting requirements are triggered by the need for subcontracts to complete a Section 3 covered contract. **If a prime contractor anticipates using subcontractors, each subcontractor must submit a separate Section 3 Subcontractor's List.**

If the contractor completing this form, or any of its subcontractors, qualifies as a Section 3 Business Concern, the associated **Section 3 Business Concern Self-Certification and Supporting Document Forms** must be completed and attached to this List for each contractor and subcontractor. NOTE: If subcontracting is anticipated and this section is not completed, the contractor's submission may be deemed non-compliant.

☐ I do anticipate subcontracting any portion of the work on this contract.

☐ I do not anticipate subcontracting any portion of the work on this contract.

IF CONTRACTOR DOES NOT ANTICIPATE THE NEED FOR ANY SUBCONTRACTING, THE SECOND BOX MUST BE CHECKED ABOVE, AND THE CONTRACTOR SHOULD SKIP TO THE STATEMENT OF COMPLIANCE ON THE FINAL PAGE

Subcontractor Name	Work to be performed (Building trade or Other)	Section 3 Business?	Contract Amount
		☐ Yes ☐ No	
		☐ Yes ☐ No	
		☐ Yes ☐ No	
		☐ Yes ☐ No	
		☐ Yes ☐ No	
		☐ Yes ☐ No	
		☐ Yes ☐ No	
		☐ Yes ☐ No	

Revised 10/22/21



Attachment V

SECTION 3 INITIAL SUBCONTRACTING PLAN

PART II: Qualitative Efforts

In accordance with subpart 75.15, 75.25 the Department of Economic Equity and Opportunity (DEEO) will require the vendor to engage in qualitative efforts to satisfy its benchmark goals, which may include, but are not limited to, the following:

1. Engaging in outreach efforts to generate job applicants who are Targeted Section 3 Workers, posting job openings at the jobsite, HUD Opportunity Portal, social media pages, contacting Resident Advisory Councils, and other platforms;
2. Contacting agencies administering YouthBuild Programs and requesting their assistance in recruiting YouthBuild Program participants for training opportunities and employment positions;
3. Consulting with state and local agencies administering training programs, such as those funded through Workforce Investment Act, unemployment compensation programs, community organizations, and other officials or organizations to assist with training and recruiting Section 3 Workers and Targeted Section 3 Workers;
4. Holding job fairs;
5. Providing or connecting Section 3 Workers and Targeted Section 3 Workers with assistance in seeking employment, including drafting, resumes, preparing for interviews, and finding job opportunities connecting residents to job placement services;
6. Providing or referring Section 3 Workers to services supporting work readiness and retention (e.g., work readiness activities, interview clothing, test fees, transportation, child care);
7. Assisting Section 3 Workers to obtain financial literacy training and/or coaching;
8. Engaging in outreach efforts to identify and secure bids from Section 3 Business Concerns.
9. Providing technical assistance to help Section 3 Business Concerns understand and bid on contracts;
10. Dividing contracts into smaller jobs to facilitate participation by Section 3 Business Concerns;
11. Providing bonding assistance, guarantees, or other efforts to support viable bids from Section 3 Business Concerns;
12. Promoting the use of Section 3 Business Registries designed to create opportunities for Section 3, disadvantaged and small businesses.
13. Other Qualitative Efforts. For example, outreach or referrals with the state one-stop system (Workforce Solutions as defined in Section 121(e)(2) of the Workforce Innovation and Opportunity Act.

What Qualitative Efforts will your organization perform? Please explain below:

I understand that the information contained in this Section 3 Initial Subcontracting Plan may require verification, and I agree to provide additional documents verifying this information if requested. Contractor must, upon request, provide such records to Harris County, its staff, or its designees.



Attachment V

SECTION 3 INITIAL SUBCONTRACTING PLAN

Part III: Statement of Compliance

I understand that the information contained in this Subcontractor's List may require verification, and I agree to provide additional documents verifying this information if requested.

I hereby certify that the foregoing is true and correct. False, misleading, or inaccurate information may result in disqualification or debarment as a contractor for Harris County.

Business Name

Name of Authorized Officer

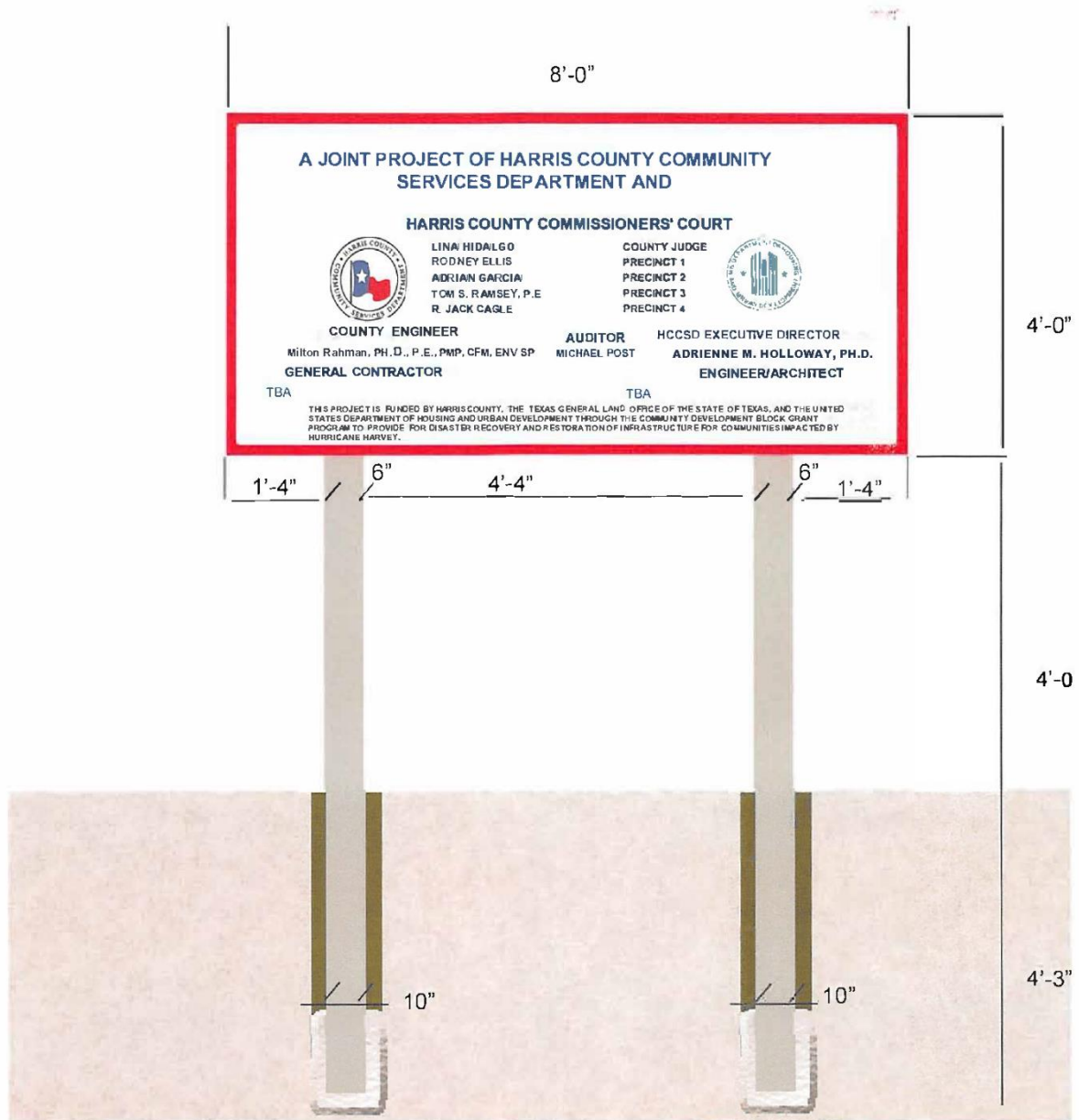
Signature

Date

Attachment W
STANDARDS & SPECIFICATIONS

[INSERT OR ATTACH STANDARDS & SPECIFICATIONS]

Attachment X PROJECT SIGNS



Attachment X

PROJECT SIGNS

A. PROJECT SIGN

1. Provide one painted or film based product project sign 4'-0" x 8'-0" framed as per drawing. Sign shall be single face 3/4" thick exterior grade plywood mounted on 4" x 4" members. Plywood to be Southern Yellow Pine AC Grade.
2. All wood members used are to be preservative treated
3. Locate sign as directed by Harris County personnel
4. Sign must be capable of withstanding 50 mph gale winds.
5. Fabrication and painting shall be done by an approved sign painting shop using experienced, professional sign painters.
6. No other sign shall be permitted on the site unless prior approval is received.
7. The sign shall include, but not be limited to, the information shown on the drawings.
8. It shall be the responsibility of the Contractor to arrange for installation of the project sign. Include cost of project sign in base bid.
9. All letters 1" or less in height to be Helvetica bold style.
10. All letters larger than 1" in height to be Helvetica extra bold condensed.
11. All letters to be navy blue with white background.
12. Carmine red 2-1/2" border at perimeter of sign.
13. 4" x 4" x 12'-0" posts to be set in compacted bank sand fill as dimensioned on drawings.
14. Contractor to be responsible for the required bracing of sign. The sign shall be removed by Contractors at job's end and shall become the property of the Owner.
15. The Contractor shall paint the front, back and sides of the sign with two (2) coats of waterproof enamel white paint before any graphics are painted on sign. Paint per Section 09900.
16. There shall be four (4) 1/2" x 5" long galvanized bolts with nuts per post in locations as shown on drawings.
17. Contractor to fill the information which is shown on drawings.
18. Prior to fabrication, submit sign layout and colors to Harris County personnel for approval.

Attachment Y

GENERAL CONDITIONS

**[ATTACH APPLICABLE GENERAL CONDITIONS I.E. BUILDING, CONSTRUCTION,
BRIDGES, ETC. REMOVE IF NOT APPLICABLE]**

Attachment Z

GLO Compliance Package

GLO INFORMATION SECURITY APPENDIX

1. Definitions

“Breach of Security” or “Breach” means unauthorized acquisition of computerized data that compromises the security, confidentiality, or integrity of sensitive personal information including data that is encrypted if the person accessing the data has the key required to decrypt the data.

“Personal Identifying Information” or “PII” means information that alone, or in conjunction with other information, identifies an individual, as defined at Tex. Bus. & Com. Code § 521.002(1).

“Sensitive Personal Information” or “SPI” means the information categories listed at Tex. Bus. & Com. Code § 521.002(2).

2. Security and Privacy Compliance

- a. Contractor shall keep all PII and SPI received or generated under the Contract and any documents related thereto strictly confidential.
- b. Contractor shall comply with all applicable federal and state privacy and data protection laws, as well as all other applicable regulations and directives.
- c. Contractor shall implement administrative, physical, and technical safeguards to protect PII and SPI that are no less rigorous than accepted industry practices including, without limitation, the guidelines in the National Institute of Standards and Technology (“NIST”) Cybersecurity Framework Version 1.1. All such safeguards shall comply with applicable data protection and privacy laws.
- d. Harris County shall legally bind any contractors and their subcontractors to the same requirements stated herein and obligations stipulated in the Contract and documents related thereto. Harris County shall ensure that the requirements stated herein are imposed on any subcontractor of Contractor’s subcontractor(s).
- e. Contractor will not share PII or SPI with any third parties, except as necessary for Contractor’s performance under the Contract.
- f. Contractor will ensure that initial privacy and security training, and annual training thereafter, is completed by its employees and contractors, including any subcontractor, that have access to PII or SPI or who create, collect, use, process, store, maintain, disseminate, disclose, dispose, or otherwise personally handle PII or SPI on behalf of Harris County. Contractor agrees to maintain and, upon request, provide documentation of training completion.
- g. Any PII or SPI maintained or stored by Contractor or any contractor, including any subcontractor, must be stored on servers or other hardware located within the physical borders of the United States and shall not be accessed outside of the United States.

3. Data Ownership

- a. The GLO shall retain full ownership of all data, including PII and SPI, provided to Contractor by Harris County or the GLO.
- b. Upon termination of the Contract, Contractor shall promptly return to Harris County and/or the GLO all Harris County-owned or GLO-owned data possessed by Contractor and its employees, agents, or contractors, including any subcontractor. Contractor shall retain no copies or back-up records of Harris County-owned or GLO-owned data. If such return is infeasible, as mutually determined by Harris County and the GLO and Contractor, the obligations set forth in this Appendix, with respect to Harris County-owned or GLO-owned data, shall survive termination of the Contract and Contractor shall limit any further use and disclosure of GLO Data to the purposes that make the return of Harris County-owned or GLO-owned data infeasible. In lieu of the requirements in this Section 3.2, Harris County or the GLO may direct Contractor to destroy any Harris County-owned or GLO-owned data in Contractor’s possession. Any such destruction shall be verified by Contractor and Harris County and/or the GLO.

4. Data Mining

Attachment Z

GLO Compliance Package

GLO INFORMATION SECURITY APPENDIX

- a. Contractor agrees not to use PII or SPI for unrelated purposes, advertising or advertising-related services, or for any other purpose not explicitly authorized by Harris County in the Contract or any document related thereto.
- b. Contractor agrees to take all reasonably feasible physical, technical, administrative, and procedural measures to ensure that no unauthorized use of PII or SPI occurs.

5. Breach of Security

- a. Contractor agrees to provide Harris County and/or the GLO with the name and contact information for a Contractor employee which shall serve as the primary data security contact.
- b. Upon discovery of a Breach of Security or suspected Breach of Security by the Contractor, Contractor agrees to notify Harris County as soon as possible upon discovery of the Breach of Security or suspected Breach of Security, but in no event shall notification occur later than 24 hours after discovery. Within 72 hours, Contractor agrees to provide, at minimum, a written preliminary report regarding the Breach or suspected Breach to Harris County with root cause analysis including a log detailing the data affected.
- c. The initial notification and preliminary report shall be submitted to the GLO Information Security Officer at brandon.rogers@glo.texas.gov.
- d. Contractor agrees to take all reasonable steps to immediately remedy a Breach of Security and prevent any further Breach of Security.
- e. If the Breach of Security includes SPI, including Social Security Numbers, payment card information, or health information, Contractor agrees to provide affected individuals complimentary access for one (1) year of credit monitoring services.

6. Right to Audit

- a. Upon the Harris County's request and to confirm Contractor's compliance with this Appendix, Contractor grants Harris County, or the GLO, permission to perform an assessment, audit, examination, investigation, or review of all controls in the Contractor's, or any of Contractor's contractors, including any subcontractor's, physical and/or technical environment in relation to PII or SPI. Contractor agrees to fully cooperate with such assessment by providing access to knowledgeable personnel, physical premises, documentation, infrastructure, and application software that stores, processes, or transports PII or SPI. In lieu of a Harris County or GLO-conducted assessment, audit, examination, investigation, or review, Contractor may supply, upon Harris County or GLO approval, the following reports: SSAE16, ISO/ICE 27001 Certification, FedRAMP Certification, and PCI Compliance Report. Contractor shall ensure that this clause concerning the Harris County and the GLO's authority to assess, audit, examine, investigate, or review is included in any subcontract it awards.
- b. At the GLO's request, Contractor agrees to promptly and accurately complete a written information security questionnaire provided by Harris County or the GLO regarding Contractor's business practices and information technology environment in relation to GLO Data.

Attachment Z

GLO COMPLIANCE PACKAGE

GLO CONTRACTOR CERTIFICATION



GLO Contractor Certification	
Subrecipient: Harris County	Contract Number:
Contractor Name:	
Contractor Address:	Phone:

1. I understand that I am responding to a contract opportunity funded with federal dollars and administered by the Texas General Land Office. I understand that debarment by either the State of Texas or the federal government will make me ineligible.
2. I understand that all work must be completed in accordance with federal construction requirements, CDBG and CDBG-DR Program requirements, and state and local requirements, including but not limited to the following, as applicable:
 - International Residential Code (IRC) – new construction and reconstruction;
 - Housing Quality Standards (HQS) – for rehabilitated properties;
 - All local building codes, standards, and specifications; and
 - All standards and requirements defined by the Texas General Land Office (GLO), Harris County, the Harris County Engineering Department, and the Harris County Community Services Department (CSD).
3. I hereby certify that all work performed will meet or exceed applicable codes, standards, and specifications as they apply to the work for which I am submitting a response. I also understand that compliance with applicable minimum codes, standards, and specifications will be considered part of my contract in the event that my offer is accepted by the above-referenced Subrecipient. I understand that all provisions also apply to my subcontractors and their officers, agents and employees, and I shall be liable for acts of non-compliance of subcontractors. I understand that failure to meet or exceed applicable codes, standards, and specifications may result in debarment from future federally funded contracts.
4. I understand that I must provide a 1-2-10 warranty on all work performed, specifically:
 - 1 year warranty on the entire home;
 - 2 year warranty on mechanical, electrical and plumbing components; and
 - 10 year warranty on structural components.

Failure to complete warranty work in a timely manner may result in debarment from future federally funded construction contracts.

5. I understand that up to twenty percent (20%) of project construction funds may be retained for thirty (30) days pending completion of the Final Inspection and Verification. Failure to complete punch list items or warranty work during this time will result in forfeiture of the 20% retainage.

Signature of Contractor

Date

Attachment Z
[REMOVE ALL ATTACHMENT X DOCS IF NOT GLO-FUNDED]
GLO COMPLIANCE PACKAGE
GLO CERTIFICATION OF CONTRACTOR REGARDING CIVIL RIGHTS LAWS AND
REGULATIONS

U.S. Department of Housing and Urban Development	
INSTRUCTIONS	
CERTIFICATION OF CONTRACTOR REGARDING Executive Order 11246 and Federal Laws Requiring Federal Contractor to adopt and abide by equal employment opportunity and affirmative action in their hiring, firing, and promotion practices. This includes practices related to race, color, gender, religion, national origin, disability, and veterans' rights.	
NAME AND ADDRESS OF CONTRACTOR (include ZIP Code)	
CERTIFICATION BY CONTRACTOR	
Contractor has participated in a previous contract or subcontract subject to Civil Rights Laws and Regulations. ☐ Yes ☐ No	
The undersigned hereby certifies that: ☐ The <u>Section 3 Clause</u> is included in the Solicitation. A written Section 3 plan was prepared and submitted as part of the solicitation proceedings (if contract equals or exceeds \$100,000). ☐ The <u>Non-Segregated Facilities</u> clause is included in the Solicitation. No segregated facilities will be maintained as required by Title VI of the Civil Rights Act of 1964. ☐ The <u>Equal Employment Opportunity</u> clause is included in the Solicitation (if contract equals or exceeds \$10,000). ☐ The <u>Equal Employment Opportunity for Workers With Disabilities</u> clause is included in the Solicitation.	
Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended? ☐ Yes ☐ No	
NAME AND TITLE OF SIGNER (Please type)	
SIGNATURE	DATE

Attachment Z

GLO SECTION 3 SELF-CERTIFICATION FOR BUSINESS CONCERNS

TEXAS GENERAL LAND OFFICE



THE CONTRACTOR REPRESENTS AND CERTIFIES AS PART OF ITS SUBMISSION THAT IT:

- ☐ Is a Section 3 Business Concern. A Section 3 Business Concern means a business concern:
1. That is 51% or more owned by Section 3 Resident(s); or
 2. Whose permanent, full-time employees include persons, at least 30% of whom are currently Section 3 Residents, or
 3. That provides evidence of a commitment to subcontract in excess of 25% of the dollar value of all subcontracts to be awarded to Section 3 Business Concerns, that meet the qualifications set forth in paragraphs 1 or 2 herein.
- ☐ Is **NOT** a Section 3 Business Concern, but who has and will continue to seek compliance with Section 3 by certifying the following efforts to be undertaken.

EFFORTS TO AWARD SUBCONTRACTOR TO SECTION 3 CONCERNS (Check ALL that apply)

- ☐ By contacting business assistance agencies, minority contractors' associations and community organizations to inform them of the contracting opportunities and requesting their assistance in identifying Section 3 businesses which may solicit bids for a portion of the work.
- ☐ By advertising contracting opportunities by posting notices, which provide general information about the work to be contracted and where to obtain additional information, in the common areas of the applicable development(s) owned and managed by a Housing Authority.
- ☐ By providing written notice to all known Section 3 Business Concerns of contracting opportunities. This notice should be in sufficient time to allow the Section 3 Business Concerns to respond to bid invitations
- ☐ By following up with Section 3 Business Concerns that have expressed interest in the contracting opportunities.
- ☐ By coordinating meetings at which Section 3 Business Concerns could be informed of specific elements of the work for which subcontract bids are being sought.
- ☐ By conducting workshops on contracting procedures and specific contracting opportunities in a timely manner so that Section 3 Business Concerns can take advantage of contracting opportunities.
- ☐ By advising Section 3 Business Concerns as to where to seek assistance to overcome barriers such as inability to obtain bonding, lines of credit, financing, or insurance and aiding Section 3 Business in qualifying for such bonding, financing, insurance, etc.
- ☐ Where appropriate, breaking out contract work into economically feasible units to facilitate participation by Section 3 businesses.
- ☐ By developing and using a list of eligible Section 3 Business Concerns.
- ☐ By actively supporting and undertaking joint ventures with Section 3 Businesses.

EFFORTS TO PROVIDE TRAINING AND EMPLOYMENT TO SECTION 3 RESIDENTS

- ☐ By entering into a "first source" hiring agreements with organizations representing Section 3 Residents.
- ☐ By establishing training programs, which are consistent with the requirements of the Department of Labor, specifically for Section 3 Residents in the building trades.
- ☐ By advertising employment and training positions to dwelling units occupied by Category 1 and 2 residents.
- ☐ By contacting resident councils and other resident organizations in the affected housing development request assistance in notifying residents of the training and employment positions to be filled.
- ☐ By arraigining interviews and conducting interviews on the job site.
- ☐ By undertaking such continued job-training efforts as may be necessary to ensure the continued employment of Section 3 Residents previously hired for employment opportunities.
- ☐ By posting job vacancies in Work-In-Texas or with my local Workforce Solutions Center.

Contractor Name/Business Name: _____

Date: _____

Authorized Representative Name: _____ **Signature:** _____



HARRIS COUNTY, TEXAS COMMUNITY SERVICES DEPARTMENT

Adrienne M. Holloway, Ph.D.
Executive Director

13105 Northwest Freeway, Suite 400
Houston, Texas 77040
Tel (832) 927-4961
Fax (832) 927-0187

June 2, 2022

Bria A. Whitmire, PE, CFM
City of Friendswood
15355 Blackhawk Boulevard
Friendswood, Texas 77546

Re: Bid Tabulation and Recommendation for City of Friendswood – Forest Bend Detention
Pond Project, D2017-084

Dear Ms. Whitmire:

This office is in receipt of project bids, bid tabulation, and City's recommendation for the above referenced project. We reviewed the submitted documentation, this office concurs with the City's recommendation to award the contract for the above reference project to the apparent selected bidder that submitted bid proposal, Jerdon Enterprise, L.P. at the base bid for the amount of \$ 3,631,982.25. Based on the approved project budget of \$3,245,900.00 for construction cost, a budget shortfall of \$386,082.25 existed. Please note that CSD has received your letter requesting additional funds to address the shortfall and it is currently under review by management. Also, note that any award to Jerdon Enterprise, L.P. will be at the City's risk to fund the gap until management and the Texas General Land Office officially approve additional funds.

Therefore, the City may proceed with awarding the apparent selected bidder on the next council board meeting for approval of construction contract award. This project is subject to the Section 3 Final "New" Rule, which went into effect on November 30, 2020. The Final "New" Rule Benchmark is that, to the greatest extent feasible, 25% of all labor hours on the project be worked by Section 3 workers and 5% worked by targeted workers. Jerdon Enterprise, L.P. (G/C) and its subcontractor shall identify any qualified Section 3 Workers on the project and provide the total # of labor hours worked by any Section 3 Worker or Section 3 Targeted Worker. As such, the G/C will need to provide the business concern supporting document at the start of the project.

Pursuant to the terms of the bid specifications for the above referenced project, please forward to this office for review and approval the following documents completed by the contractor within fifteen (15) days after being notified as the awarded bidder please submit the following documents:

- Certificate for Contracts, Grants, Loans and Cooperative Agreements – original signature; and list of proposed subcontractors and their corresponding profiles.
- List of proposed subcontractors and their corresponding profiles.
- Draft construction contract for review as to form.
- Section 3 Employment and Minority Business Plan – completed original document

Failure to submit the requested documentation by the above deadline may result in delays in requesting purchase order and/or start of construction work. If you have any questions or comments, please contact Mr. Mike Nguyen, Special Projects Manager at (832) 927-8247.

Sincerely,

A handwritten signature in black ink that reads "Gregory Frazier". The script is cursive and fluid.

Gregory J. Frazier
Assistant Director
GJF/mn

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 05/12/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider approving the Property Sales Agreement with Roger and Shannon Weaver to purchase 0.9470 acres, being a part of Frenchman's Creek Townhomes, Section 2, City of Friendswood, Galveston County, Texas.

Originating Department: Fire Marshal

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

In November of 2019, the citizens of Friendswood voted in favor of pursuing a number of bond projects for constructing, acquiring and installing stormwater drainage and flood control improvements along Clear Creek. The City has made an offer of \$125,000 to purchase 0.9470 acres or 41,251 square feet of unimproved property described as:

ABST 9 PAGE 12 PT OF RESERVE F (0-15) REPLAT POLLY RANCH ESTATES A.K.A. PT OF FRENCHMAN'S CREEK TWNHS SEC 2, CITY OF FRIENDSWOOD, GALVESTON COUNTY, TEXAS.

This is an unimproved tract of land adjacent to and east of the Frenchman's Creek Townhomes, having frontage on Clear Creek. This purchase is contingent on the City acquiring the units in Building Five of Frenchman's Creek.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

Staff recommends approval.

ATTACHMENTS

1. Weaver Earnest Money Agreement

PROPERTY SALES AGREEMENT

STATE OF TEXAS §
 §
COUNTY OF GALVESTON §

This Property Sales Agreement, hereinafter known as the "Agreement," is made and entered into this ____ day of May, 2022, by and between the City of Friendswood, a municipal corporation located in Galveston and Harris Counties, Texas, hereinafter known as the "City," and Roger Weaver and Shannon Weaver, the owners of the Property described herein below, hereinafter, whether one or more, known as the "Seller." The City and the Seller shall hereinafter be known as the "Parties."

1. Contingency. This This Agreement and the City's obligations herein are expressly contingent upon (i) an environmental site assessment satisfactory to the City and (ii) the City Council's approval of this Agreement.
2. Sales Price. The Seller agrees to sell and convey to the City and the City agrees to buy from the seller the property described as follows:

ABST 9 PAGE 12 PT OF RESERVE F (0-15) REPLAT POLLY RANCH ESTATES
A.K.A. PT OF FRENCHMAN'S CREEK TWNHS SEC 2, FRIENDSWOOD,
GALVESTON COUNTY, TEXAS

(the "Property"). The City agrees to pay the Seller for the Property the sum of ONE HUNDRED TWENTY-FIVE THOUSAND AND NO/100 DOLLARS (\$125,000.00) payable at settlement after the City Council's acceptance of this Agreement and approval of the Seller's title; provided (i) the Seller can execute and deliver a good and sufficient general warranty deed conveying marketable title to said property in fee simple, clear of all liens and encumbrances, and (ii) the City closes on all of the units in Building No. 5 on the Closing Date as specified herein.

3. Title Policy. The City shall obtain an Owner Policy of Title Insurance (the "Title Policy") issued by South Land Title, LLC, located at 192 Gulf Fwy S., Suite C-2, League City, Texas 77573 ("Title Company") in the amount of the Sales Price, dated at or after closing, insuring City against loss under the provisions of the Title Policy subject to the promulgated exclusions (including existing building and zoning ordinances) and the following exceptions:
 - (1) restrictive covenants common to the platted subdivision in which the Property is located;
 - (2) the standard printed exception for standby fees, taxes, and assessments;
 - (3) utility easements created by the dedication deed or plat of the subdivision in which the Property is located;
 - (4) reservations or exceptions otherwise permitted by this Agreement or as may be approved by City in writing;
 - (5) the standard printed exception as to discrepancies, conflicts, shortages in area or boundary lines, encroachments or protrusions or overlapping improvements;
 - (6) the standard printed exception as to marital rights; and
 - (7) the standard printed exception as to waters, tidelands, beaches, streams, and related matters.

Within twenty (20) days after the Title Company receives a copy of this Agreement, Seller, at City's expense, shall furnish to the City a commitment for Title Insurance (the "Commitment") and legible copies of restrictive covenants and documents evidencing exceptions in the Commitment other than the standard printed exceptions. Seller authorizes the Title Company to mail or hand deliver the

Commitment and related documents to the City. If the Commitment is not delivered to the City within the specified time, the time for delivery shall be automatically extended up to fifteen (15) days. The City shall have ten (10) days after the receipt of the Commitment to object in writing to matters disclosed in the Commitment. The City may object to existing building and zoning ordinances and items (1) through (7) listed above if the City determines that any such ordinance or item prohibits the proposed use of the Property as land for greenspace, recreational and/or other municipal purposes.

4. Survey. Within ten (10) days after City's receipt of a survey plat required by City or the Title Company, City may object in writing to any matter which constitutes a defect or encumbrance to title shown on a survey plat obtained by City at the expense of Seller. The survey, if required, shall be made by a Registered Professional Land Surveyor acceptable to the Title Company and City. The plat shall (a) identify the Property by metes and bounds or platted lot description; (b) show that the survey was made and staked on the ground with the corners permanently marked; (c) set forth the dimensions and total area of the Property; (d) show the location of all improvements, highways, streets, roads, railroads, rivers, creeks or other waterways, fences, easements and rights-of-way on the Property with all easements and rights-of-way referenced to their recording information; (e) show any discrepancies or conflicts in boundaries, any visible encroachments, and any portion of the Property lying within the one hundred (100) year flood plain as shown on the current Federal Emergency Management Agency map; and (f) contain the surveyor's certificate that the survey as shown by the plat is true and correct.

Utility easements created by the dedication deed and plat of the subdivision in which the Property is located shall not be a basis for objection. City's failure to object under this article within the time allowed shall constitute a waiver of City's right to object except that the requirements in Schedule C of the Commitment shall not be deemed to have been waived. If objections are made by City, Seller shall cure the objection within twenty (20) days after the date Seller receives them and the Closing Date shall be extended as necessary. If objections are not cured by the extended Closing Date, this Agreement shall terminate, unless City elects to waive the objections.

5. Closing and Possession. The closing of the sale shall be on or before the forty-fifth (45th) day after all of the units in Building No. 5 are under a property sales agreement with the City, or within seven (7) days after objections to title, environmental assessment and/or survey have been cured, whichever date is later, such date hereinafter referred to as "Closing Date." At closing, Seller shall furnish tax statements or certificates showing no delinquent taxes are due and owing on the Property, and Seller shall tender a General Warranty Deed conveying good and indefeasible title showing no additional exceptions, other than those not objected to by City or waived by City. The possession of the Property shall be delivered to City at closing.
6. Application of Proceeds. It is understood by all Parties that the proceeds from the sale shall first be applied to all liens on the property, including real estate taxes which are due and payable to the date of settlement. Seller shall be responsible for the expenses associated with the following: releases of existing liens, including prepayment penalties and recording fees; release of Seller's loan liability; and taxes assessed prior to January 1, 2022; tax statements or certificates; and other expenses stipulated to be paid by Seller under other provisions of this Agreement. Furthermore, Seller shall be responsible for interest on any loan, current taxes, any rents, maintenance fees, and assessments, which amounts shall be prorated through the Closing Date. City shall be responsible for expenses associated with any environmental assessment; preparation of deed and other expenses stipulated to be paid by City under other provisions of this Agreement. If the amount of the ad valorem taxes for the year in which the sale is closed is not available on the Closing Date, proration of the taxes shall be made on the basis of the taxes assessed in the previous year. If Seller's change

in use of the Property prior to the closing or denial of a special use valuation on the Property claimed by Seller results in the assessment of additional taxes for periods prior to closing, the additional taxes shall be the obligation of the Seller. Obligations imposed by this article shall survive closing.

7. Default. If City fails to comply with this Agreement, City shall be in default, and Seller may (a) enforce specific performance, seek such other relief as may be provided by law, or both, or (b) terminate this Agreement, thereby releasing both parties from this Agreement. If Seller is unable without fault to deliver the Commitment within the time allowed, City may either terminate this Agreement or extend the time for performance up to fifteen (15) days and the Closing Date shall be extended as necessary at the discretion of the City. If Seller fails to comply with this Agreement for any other reason, Seller shall be in default and City may either (a) enforce specific performance, seek such other relief as may be provided by law, or both, or (b) terminate this Agreement and seek such other relief as may be provided by law, thereby releasing both parties to this Agreement.
8. Representations. Seller represents that as of the Closing Date there will be no liens, assessments, or Uniform Commercial Code or other security interests against any of the Property which will not be satisfied out of the Sales Price, other than ad valorem taxes. If any representation in this Agreement is untrue on the Closing Date, this Agreement may be terminated by City and City shall be entitled to the relief specified in Section 7. All representations contained in this Agreement shall survive the closing
9. Sale of Interest. The Seller may not sell or assign all or part interest in the Property to another party or parties without the express prior written approval of the City Manager of such sale or assignment, nor shall Seller assign any monies due or to become due to it hereunder without the previous consent of the City Manager. It is expressly understood and agreed that this provision shall only apply to the Property as defined herein.
10. Foreign Person. If Seller is a "foreign person" as defined by applicable law or if Seller fails to deliver an affidavit that Seller is not a "foreign person," then City shall withhold from the sales proceeds an amount sufficient to comply with the applicable tax law and deliver the same to the Internal Revenue Service together with appropriate tax forms. IRS regulations require the filing of written reports if cash in excess of specified amounts is received in the transaction.
11. Notice. All notices required to be given hereunder shall be given in writing, in person or by overnight, certified, or registered mail, return receipt requested at the respective addresses of the Parties set forth herein or at such other address as may be designated in writing by either party. Notice given by mail shall be deemed given three (3) days after the date of mailing thereof to the following addresses:

SELLER
Roger Weaver
Shannon Weaver
154 Moss Point Dr.
Friendswood, TX 77546

CITY
City of Friendswood
Attn: City Manager
910 S. Friendswood Drive
Friendswood, TX 77546

12. Use. The intended use of the Property by City is for greenspace, recreational and/or other municipal purposes. If City ascertains that applicable zoning ordinances, easements, restrictions or governmental laws, rules or regulations prevent such intended uses, and City notifies Seller within thirty (30) days after the effective date of this Agreement (but in all events at least seven (7) days prior to closing) of City's inability to use the Property as herein proposed, the Agreement shall terminate. City's failure to give the notice within the required time shall constitute City's acceptance of the Property.
13. No Waiver. Failure of either party hereto to insist on the strict performance of any of the agreements herein or to exercise any rights or remedies accruing thereunder upon default or failure of performance shall not be considered a waiver of the right to insist on and to enforce by an appropriate remedy, strict compliance with any other obligation hereunder to exercise any right or remedy occurring as a result of any future default or failure of performance.
14. Governing Law/Venue. This Agreement shall in all respects be interpreted and construed in accordance with and governed by the laws of the State of Texas and the City of Friendswood, regardless of the place of its execution or performance. The place of making and the place of performance for all purposes shall be Friendswood, Galveston County, Texas.
15. Severability. All Parties agree that should any provision of this Agreement be determined to be invalid or unenforceable, such determination shall not affect any other term of this Agreement, which shall continue in full force and effect.
16. No Right to Arbitration. Notwithstanding anything to the contrary contained in this Agreement, the City and the Seller hereby agrees that no claim or dispute between the City and the Seller arising out of or relating to this Agreement shall be decided by any arbitration proceeding, including, without limitation, any proceeding under the Federal Arbitration Act (9 U.S.C. Sections 1-14), or any applicable state arbitration statute, including, but not limited to, the Texas General Arbitration Act, provided that in the event that the City is subjected to an arbitration proceeding notwithstanding this provision, the Seller consents to be joined in the arbitration proceeding if the Seller's presence is required or requested by the City of complete relief to be recorded in the arbitration proceeding.
17. Authority. The persons executing this Agreement on behalf of the Parties hereby represent that such persons have full authority to execute this Agreement and to bind the party he/she represents.
18. Complete Agreement. This Agreement contains all the agreements of the parties relating to the subject matter hereof and is the full and final expression of the agreement between the parties.
19. Agreement Read. The Seller acknowledges that he/she has had an opportunity to review this contract and that they have had an opportunity, if they so choose, to contact an attorney of his/her choice to review this Agreement, and the Seller enters into this Agreement fully understanding the nature thereof and save and hold harmless the City as a result of this Agreement or anything incident to the sale of the referenced real property.
20. Binding Effect. This Agreement is binding upon the heirs, executors, successors and assigns of all Parties.
21. Expiration. This Agreement shall expire if not signed by the Seller on or before the 2nd day of June, 2022.

Signed this ____ day of _____, 2022.

City of Friendswood

MORAD KABIRI, City Manager

ATTEST:

LETICIA BRYSCH, City Secretary

APPROVED AS TO FORM:

KAREN HORNER, City Attorney

Signed this ____ day of _____, 2022.

Seller:

Roger Weaver

Signed this ____ day of _____, 2022.

Seller:

Shannon Weaver

STATE OF TEXAS §
 §
COUNTY OF GALVESTON §

Before me, _____, the undersigned notary public, on this day personally appeared Roger Weaver, owner of the above-described Property, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

SUBSCRIBED AND SWORN before me this __ day of _____, 2022.

Notary Public in and for the State of Texas

STATE OF TEXAS §
 §
COUNTY OF GALVESTON §

Before me, _____, the undersigned notary public, on this day personally appeared Shannon Weaver, owner of the above-described Property, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that she executed the same for the purposes and consideration therein expressed.

SUBSCRIBED AND SWORN before me this ____ day of _____, 2022.

Notary Public in and for the State of Texas

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 05/24/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider approving an Interlocal Agreement with Galveston County Consolidated Drainage District for a shelving/flood mitigation project located at 212 East Heritage Drive, Friendswood, TX 77546.

Originating Department: Engineering

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

The Galveston County Consolidated Drainage District for the District is acquiring property to develop and construct a flood control project at 212 East Heritage Drive, Friendswood, TX 77546. Under this proposed interlocal agreement, the City would pay the District \$140,978 towards the construction and completion of a flood control project at this property along Mary's Creek. The project will consist of inline detention/shelving at the subject property, approximately 650 feet southeast of the Mary's Creek bridge on FM 2351. The invert of the project shall begin at the ordinary high water (OHM) mark line and slope upward at no greater than 1% until nearing the project limits, where a 4:1 horizontal to vertical minimum slope shall be maintained until the project ties in with the existing ground elevation.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

The construction and completion of a flood control project along Mary's Creek will be beneficial to neighboring floodprone areas.

RECOMMENDATIONS

Staff recommends approval.

ATTACHMENTS

1. Interlocal Agreement GCCDD - 212 E Heritage Dr.

**INTERLOCAL COOPERATION AGREEMENT BY AND BETWEEN
THE CITY OF FRIENDSWOOD, TEXAS
AND THE
GALVESTON COUNTY CONSOLIDATED DRAINAGE DISTRICT**

This Interlocal Cooperation Agreement ("Agreement") is made and entered into as of the 6th day of June 2022, by and between City of Friendswood, a home rule municipal corporation located in Galveston and Harris Counties, Texas ("City"), and the Galveston County Consolidated Drainage District, a conservation and reclamation district organized and existing pursuant to Article XVI, Section 59 of the Constitution of the State of Texas ("District"), each party acting by and through their respective governing bodies.

WITNESSETH:

WHEREAS, pursuant to Chapter 791, Tex. Gov't Code (the "Act"), local governments are authorized to contract among themselves for the provisions of governmental functions and services; and

WHEREAS, City and District are each "local governments," as that term is defined in the Act; and

WHEREAS, the corporate boundaries of City includes territory in both Galveston and Harris Counties, Texas; and

WHEREAS, that portion of City that is located within Galveston County is also located within the corporate boundaries of District; and

WHEREAS, District was created and exists for the purpose of reclamation and drainage of flooded lands and other lands needing drainage within District; and

WHEREAS, in furtherance thereof, District is empowered to acquire, construct, improve, and maintain facilities necessary to carry out its mandated purpose; and

WHEREAS, the District will acquire property, through District funding, described as 151 S McKissick Survey Part of Lot 1 (1-6) Block 2 Friendswood Subdivision (the "Property"); and

WHEREAS, the continued development and construction of a flood control project is a governmental function in which the contracting parties are mutually interested; NOW THEREFORE,

FOR AND IN CONSIDERATION of the mutual obligations and benefits to be derived hereunder, City and District (collectively the "Parties") do hereby find, determine, and agree as follows:

1. **Findings.** The facts and matters set forth in the preamble of this Agreement are hereby found to be true and correct.

2. **Purpose.** The purpose of this Agreement is to promote and protect public health, safety, and welfare by minimizing public and private losses resulting from flood conditions through the construction of a flood control project.

3. **City Responsibilities.**

- A. The City shall pay the District \$140,978 for the construction and completion of a flood control project along the confluence of Mary's Creek, with said detention pond described in **Exhibit A** attached hereto and made a part hereof for all purposes (the "Project").
- B. The City shall provide a lump sum payment within 30 days of the completed execution of this Agreement.

4. **District Responsibilities.**

- A. The District shall design and construct the Project in compliance with current District's policy, criteria, and procedure manual. All engineering services and related support services for the Project shall be at the District's sole cost and expense.
- B. The District will award the construction contract for the Project in accordance with competitive bidding laws applicable to the District. The District's determination of the lowest responsible bidder for the Project shall be final. The City shall have access at all reasonable times to the Project construction site and to all relevant drawings, specifications, contract documents, and records to verify that the Project is constructed in compliance with this Agreement. The District will include the City in all Project design and construction progress meetings.
- C. The District shall construct the Project, consisting of inline detention/shelving at the subject property, located along Mary's Creek approximately 650 feet southeast of the Mary's Creek bridge on FM 2351.

The invert of the Project shall begin at the ordinary high water (OHM) mark line and slope upward at no greater than 1% until nearing the project limits, where a 4:1 horizontal to vertical minimum slope shall be maintained until the project ties in with the existing ground elevation.

The District shall complete the construction of the Project within two years from the date of the commencement of this Agreement as noted in Section 5.A below.

- D. The District shall pay for the remainder of costs required to complete construction of the Project, including structural demolition, clearing, excavation, and hydro-mulching.

- E. Within thirty (30) days of completion of the construction of the Project, the District shall provide the City with record drawings of the Project.
- F. The District will cause to be inserted in the construction contract for the Project an agreement that the contractor will indemnify, defend, protect, covenant not to sue, release, and save and hold harmless the District and City and all their representatives from all suits, actions, or claims of any character brought on account of any injuries or damages sustained by any person or property in consequence of any neglect in safeguarding the work or through the use of unacceptable materials in the construction of the Project or any associated improvements, or on account of any act of omission by the contractor. The District will require its contractors to name the District and the City as additional insureds.
- G. The District shall maintain and mow the flood control project in perpetuity.

5. Term; Termination.

- A. The term of this Agreement shall commence upon the execution of this Agreement by all Parties and shall terminate upon the final completion and acceptance of the Project by the District, except any obligations stated in this Agreement to be perpetual shall survive the expiration or earlier termination of this Agreement.
- B. The City or the District may terminate this Agreement, without cause, upon 30 days' written notice to the other Party until such time as the District starts the acquisition procedures for the Property. If terminated pursuant to this scenario, the District will refund \$140,978 to the City within 30 days from the date of the written notice.

If the District is unable to acquire the Property on or before August 9, 2022, the Agreement shall terminate unless extended in writing by the Parties. Within 30 days of such termination, the District shall refund \$140,978 to the City

- 6. **Payments from Current Revenues.** Each Party paying for the performance of governmental functions or services must make those payments from current revenues available to the paying party
- 7. **Notice.** Any notice required to be given under the provisions of this Agreement shall be in writing and shall be duly served when it shall have been mailed by certified mail, return receipt requested, in a United States Post Office, addressed to the Parties at the following address:

To the City of Friendswood:

City of Friendswood
910 S. Friendswood Drive
Friendswood, TX 77546
Attn: City Manager

To the Galveston County Consolidated Drainage District:

Galveston County Consolidated Drainage District
1605 Whitaker Drive
Friendswood, TX 77546-4178
Attn: Joseph Anderson

8. **No Assignment.** No Party hereto shall make, in whole or in part, any assignment of the Agreement or any obligation hereunder without the prior written consent of the other Party.
9. **Severability.** If any provision of this Agreement is construed to be illegal or invalid, this will not affect the legality or validity of any of the provisions hereof. The illegal or invalid provisions will be deemed stricken from this Agreement and deleted to the same extent and effect as if never incorporated herein.
10. **Prior Agreements Terminated.** This Agreement is intended to be the complete and final understanding of the Parties as to the subject matter of the Agreement, and all prior understandings or interlocal agreements between City and District as to the subject matter of the Agreement are of no force or effect. Any modifications concerning this instrument shall be of no force or effect, excepting a subsequent modification in writing, signed by the Parties hereto.

EXECUTED in duplicate originals on the dates indicated hereinbelow.

ATTEST:

CITY OF FRIENDSWOOD, TEXAS

By: _____
Leticia Brysch
City Secretary

By: _____
Mike Foreman
Mayor (Date)

ATTEST:

**GALVESTON COUNTY
CONSOLIDATED DRAINAGE
DISTRICT**

By: _____
Kathy Grace
Administrative Manager

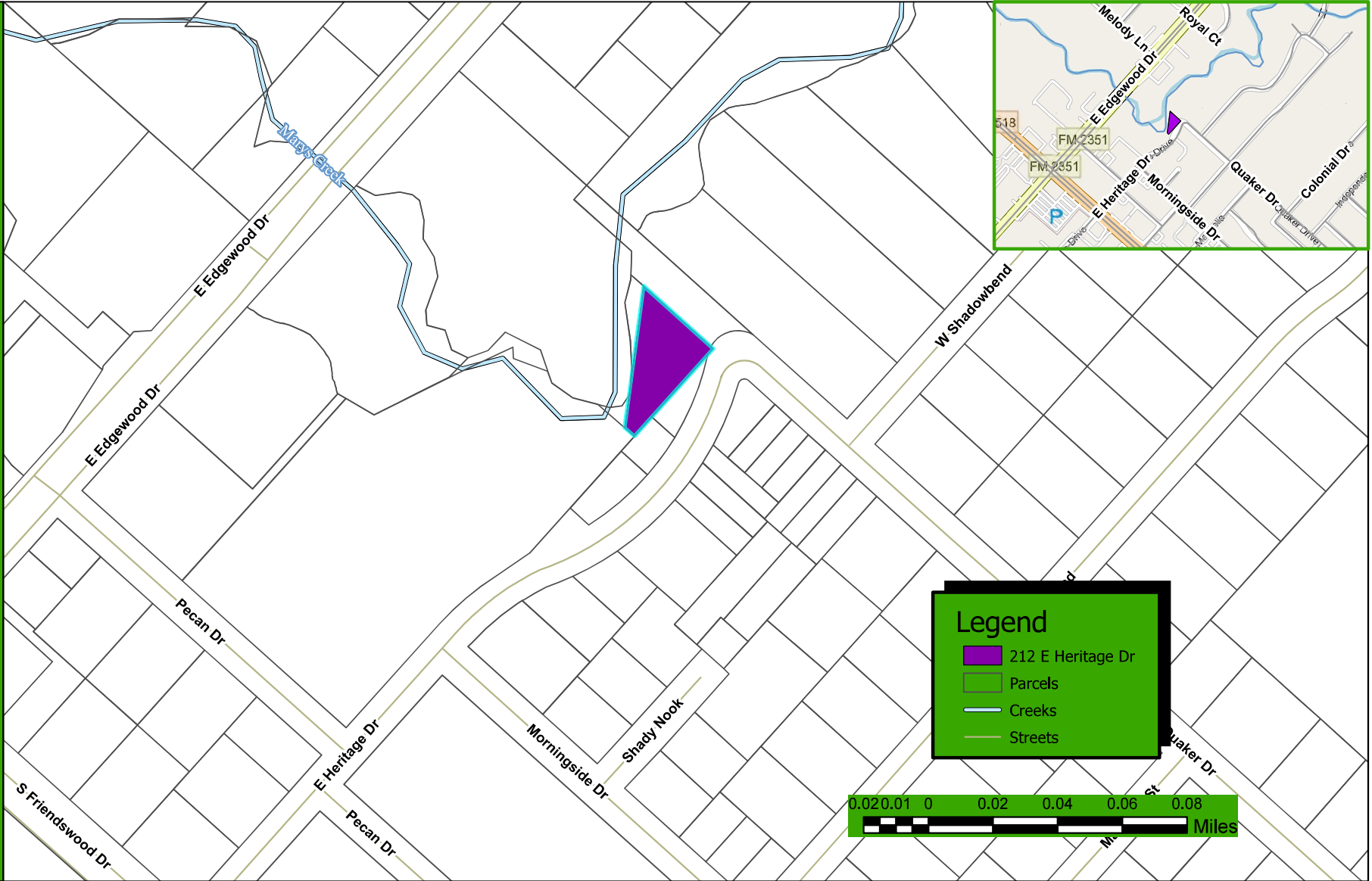
By: _____
Kevin Holland
President (Date)



Exhibit A: 212 East Heritage Drive

City of Friendswood Engineering

May 2022



FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 05/25/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider approving an interlocal agreement with the Harris-Galveston Subsidence District for an Advance Metering Infrastructure (AMI) Large Meter Enhancement Project Grant.

Originating Department: Engineering

Degree of importance:

SUMMARY / ORIGINATING CAUSE

The City of Friendswood has been awarded a grant from the Harris-Galveston Subsidence District for its 2022 Water Conservation Grant Program. The grant will provide partial reimbursement of \$49,415 for the 30 largest meters in the City's Advanced Meter Infrastructure (AMI) upgrade program. In return, the City will collect and provide data relating to the City's AMI program to help the Harris-Galveston Subsidence District research better metrics for assessing water conservation with the installation of AMI systems.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

The City will receive partial reimbursement for the 30 largest meters in the City's Advanced Meter Infrastructure (AMI) upgrade program.

RECOMMENDATIONS

Staff recommends approval.

ATTACHMENTS

1. IA 2022-01-AMI_COF & HGSD

**WATER CONSERVATION GRANT INTERLOCAL AGREEMENT
NO. 2022-01-AMI
FOR THE CONSERVATION OF DISTRICT WATER RESOURCES**

STATE OF TEXAS §
 §
COUNTY OF Harris §

INTERLOCAL AGREEMENT

This Interlocal Agreement ("Agreement") is entered into by and between the Harris-Galveston Subsidence District, a body corporate and politic under the laws of the State of Texas ("Subsidence District") and **The City of Friendswood**, also a body corporate and politic under the laws of the State of Texas ("Grantee").

WITNESSETH:

WHEREAS, the Subsidence District was created in 1975 by an act of the 64th Texas Legislature and is governed by Chapter 8801 of the Special Districts Local Laws Code, as amended (the "Act"); and

WHEREAS, under Section 8801.002 of the Act, the Subsidence District is a conservation and reclamation district created by virtue of Article XVI, Section 59, Texas Constitution, and is a governmental agency and body politic and corporate vested with the full authority to exercise the powers and to perform the functions specified in the Act, and other applicable law; and

WHEREAS, under Section 8801.005 of the Act, the Subsidence District includes the territory located within the boundaries of Harris County and Galveston County, as that territory may have been modified under: (1) Section 8801.006 or its predecessor statute, former Section 151.003(b), Water Code; or (2) other law (hereinafter "district territory"); and

WHEREAS, under Section 8801.03 of the Act, the legislature desires that the Subsidence District administer and enforce the Act and exercise the rights, powers and duties of the Subsidence District in a manner that will effectively and expeditiously provide for the regulation of groundwater

withdrawal in the district territory to end subsidence, which contributes to or precipitates flooding or overflow of the district territory, including rising water resulting from storms or hurricanes; and

WHEREAS, under Section 8801.004 of the Act, the Legislature finds that the Subsidence District serves a public use and benefit, and the works and projects accomplished by the Subsidence District under powers conferred by Section 59, Article XVI, Texas Constitution, will benefit all the land and other property included in the district territory; and

WHEREAS, under Section 8801.106(a) of the Act, the Subsidence District may make or accept a grant, gratuity, advance, or loan in any form to or from any public source approved by the board, including a governmental entity, and may enter into a contract, agreement, or covenant that the board considers appropriate in connection with a grant, gratuity, advance or loan; and

WHEREAS, under Section 8801.113(b) and (c) of the Act, the Subsidence District may cooperate with the commission and any local government to establish water conservation goals, guidelines, and plans to be used in the district territory, and the Subsidence District may contract with a local government in the district territory to provide services needed to meet water conservation requirements that the commission establishes; and

WHEREAS, grant applications are sought by the Subsidence District as a means of supporting conservation research, demonstrating projects for innovative water conservation concepts, or implementation of water efficiency measures; and

WHEREAS, the objective of the Subsidence District Water Conservation Grant Program is to support the district's mission in advancing water conservation education and adoption of water conservation measures, including priority topics such as residential irrigation best management practices, outdoor watering best management practices, and municipal water loss control; and

WHEREAS, pursuant to this Agreement, the Grantee is awarded a Water Conservation Grant and will, as a means of supporting conservation research, implementation of demonstration projects for innovative water conservation concepts or implementation of water efficiency measures, and

WHEREAS, it is in the public interest that the Subsidence District and the Grantee enter into this Agreement.

NOW, THEREFORE, in consideration of the mutual promises and agreements set forth in this Agreement, the sufficiency of which is hereby acknowledged, the Subsidence District and the Grantee agree as follows:

I.

TERM AND PROGRAM ADMINISTRATION

- 1.01 Term.** This Agreement is effective and commences on June 8, 2022 (“Effective Date”), and terminates on July 31, 2023 (“Expiration Date”) if not sooner terminated as provided for herein.
- 1.02 Project.** Subject to the terms and conditions of this Agreement, the Subsidence District authorizes the Grantee to perform the work set forth and described in this Agreement and in the following documents (the “Project”): (1) the Scope of Work & Budget Estimate, which includes information regarding the work that is to be performed by the Grantee and the estimated budget for the Project attached hereto as Attachment A (“Scope of Work & Budget Estimate”); and (2) the Project and Budget Status Worksheets attached hereto as Attachment B (“Project and Budget Status Worksheets”). The Grantee accepts such authorization and agrees to furnish all labor, machinery, equipment, tools, and transportation necessary in furtherance of its authorization.
- 1.03 Commencement and Completion Date.** The Grantee will commence the Project immediately upon the execution of this Agreement or as otherwise provided in Attachment A. The Project will be completed by the Expiration Date and shall be completed in compliance with the schedules, budgets, descriptions and specifications contained herein and in the Exhibits attached hereto. It shall be the Grantee’s responsibility to ensure that the completion times for the Project are met. In order to document water conservation as a result of the Project, the Grantee shall complete and submit quarterly project status updates on September 30, December 31, March 31, and June 30, of each calendar year on the Project and Budget Status Worksheets provided in Attachment B. Time is of the essence in the performance of this Agreement.

- 1.04 Failure to Complete.** If the Grantee notifies the Subsidence District that the Project will not or cannot be completed, or if the Grantee misses any deadline required by this agreement, or otherwise terminates this agreement, Grantee shall, within thirty (30) days, refund to the Subsidence District all moneys paid to that date and deliver to the Subsidence District all Work Product (as defined below) that was performed or accomplished under this Agreement.
- 1.05 Stop Work Orders.** The General Manager may issue a Stop Work Order to the Grantee at any time. Upon receipt of such order, the Grantee shall discontinue all work under this Agreement and cancel all orders pursuant to the Project, unless the order directs otherwise. If the General Manager does not issue a Restart Order within sixty (60) days after receipt by the Grantee of the Stop Work Order, the Grantee shall regard this Agreement as terminated.

II.

COMPENSATION AND PAYMENT

- 2.01 Costs and Expenses.** The Subsidence District agrees to pay the Grantee for Project costs and expenses in accordance with the Scope of Work & Budget Estimate, but in no event shall the grant to the Grantee exceed **\$49,415**. The Grantee may not exceed this amount and will be responsible for the payment of all of its other additional costs and expenses. The Grantee may not exceed the contractual amount without prior written approval from the Subsidence District. The Grantee is not authorized to expend any additional funds in excess of this amount without prior written approval from the Subsidence District. The Subsidence District may not be held accountable for any unauthorized work performed or funds spent by the Grantee in implementing or completing the Project.
- 2.02 Payments.** All payments made to the Grantee by the Subsidence District for the Project costs and expenses shall be made on a reimbursement basis. During the course of the Project, the Grantee shall provide an itemization of the Project costs and expenses incurred, including copies of receipts, purchase orders, and invoices. An itemization of the costs and expenses incurred must be submitted to the Subsidence District prior to grant funds being released to the Grantee by the Subsidence District. All requests for reimbursement must be

submitted by June 30, 2023. The terms of each itemization shall be net thirty (30) days upon the Subsidence District receipt and approval of the itemization.

2.03 Amendments. This Agreement, including details of the Project, may be amended only by written agreement of the Parties.

2.04 Amendments by the General Manager. The Subsidence District’s Board of Directors delegates the authority to the General Manager to enter into amendments to this Agreement without further authorization by the Board consistent with the General Manager’s authority to manage district affairs and operate the district under Section 3 of the Harris-Galveston Subsidence District – Rules (September 14, 2016), as well as the duty to oversee development of district plans and programs under Section 8801.057 of the Act and the authority to enter into contracts under Section 8801.106 of the Act. The terms “Subsidence District” and “General Manager” may be used interchangeably within this Agreement to the extent that certain Subsidence District activities must be performed by an authorized person.

2.05 Budgeted Funds. Both Parties warrant that funds to support the Grant and the Project have been budgeted for the current fiscal year and will continue to be budgeted each year this Agreement is in effect.

III.
TERM AND TERMINATION

3.01 Effective Date and Termination. This Agreement is effective and commences on June 8, 2022 (“Effective Date”), and terminates on July 31, 2023 (“Expiration Date”) if not sooner terminated as provided for herein.

The term of this Agreement shall be from the effective date hereof until completion of the Project, or termination of the program by the Subsidence District. Grantee must provide the Subsidence District with Notice of Termination and must return [unexpended] funds to the Subsidence District within 30 days of the date Grantee provided notice of termination.

IV.
WRITTEN CONFIRMATIONS

- 4.01 Written Affirmations of the Grantee.** The Grantee explicitly affirms the following:
- (a) that funding is available for the Grantee to fully complete the Project made the basis of the grant that has been awarded;
 - (b) that the procedures and anticipated results identified through the grant application will be diligently pursued;
 - (c) that all applicable federal, state and local laws will be complied with in the course of the completion of the Project funded by the grant; and
 - (d) that it will keep the Subsidence District informed on timely basis, and provide reporting to the Subsidence District no less than quarterly while the Project is being implemented.
- 4.02 Entire Agreement.** This Agreement merges the prior negotiations and understandings of the parties hereto and embodies the entire agreement of the parties, and there are no other agreements, assurances, conditions, covenants (expressed or implied) or other terms with respect to the Project, whether written or verbal, antecedent or contemporaneous with the execution hereof.
- 4.03 Non-Exclusive License.** Subject to the terms and conditions stated herein, Grantee hereby grants, and the Subsidence District hereby accepts, a worldwide, non-exclusive, royalty-free, perpetual license to use any information developed by or through the Project along

with any final report, technology, information, or product produced by the project or in conjunction with the project.

4.04 Survival Clause. The Parties remain obligated under all clauses of this Agreement that expressly or by their nature extend beyond the expiration or termination of this Agreement.

IN WITNESS WHEREOF, the parties executed this Agreement on the dates indicated below. This Agreement shall be effective on the date of the last signature hereto.

The City of Friendswood

By: Morad Kabiri, City Manager

ATTEST:

By: _____

(Name and Title)

Date: _____

HARRIS-GALVESTON SUBSIDENCE DISTRICT

By: Michael Turco, General Manager

ATTEST:

By: Gregory M. Ellis, General Counsel

ATTACHMENT A

INTERLOCAL AGREEMENT NO. 2022-01-AMI

SCOPE OF WORK & BUDGET ESTIMATE
BETWEEN THE HARRIS-GALVESTON SUBSIDENCE DISTRICT
AND
THE CITY OF FRIENDSWOOD

SCOPE OF WORK

The City of Friendswood (the “Grantee”) will implement an Advance Metering Infrastructure (AMI) Large Meter Enhancement Project (the “Project”) to gain efficiencies in water meter readings, notify customers of potential leaks, track customer engagement through a Customer Engagement Portal (CEP), and promote water conservation through education and/or incentive programs.

Specifically, this Project includes the installation of up to 30 large meters as well as the implementation of a Customer Engagement Portal (CEP). The Grantee will include a link to Smarter About Water (www.smarteraboutwater.org) on the CEP in all viewing formats (e.g., desktop, tablet, and smart phone) to enhance water conservation education.

The Grantee will complete such tasks according to the schedule outlined in Table 1.

Table 1: Project Timeline and Milestones

<u>Project phase/Milestone</u>	<u>Submittals</u>	<u>Start</u>	<u>Finish</u>
<u>AMI Initial Deployment Area</u>	Written Notification	7/1/2022	7/1/2022
<u>First Half Milestone</u> • AMI CEP Deployment • <u>AMI Large Meter 50 % Deployment</u>	‘Project and Budget Status Worksheets’ with appropriate attachments	10/1/2022	12/31/2022
<u>Second Half Milestone</u> • AMI Large Meter 100% Deployment	‘Project and Budget Status Worksheets’ with appropriate attachments	4/1/2023	6/30/2023
<u>Final Report</u>	Final report template will be determined during the course of the Project.	TBD	6/30/2023

DELIVERABLES

The following deliverables will be provided as a condition of the Grant funding.

- The Grantee will notify the Subsidence District, in writing, once the AMI Large Meter deployment begins.
- The Grantee will arrange and permit site visits for the Subsidence District staff as needed to observe the installation of AMI. The Grantee will allow information, including but not limited to documents, maps, or photos that are collected during the site visit to be shared to the public using various Subsidence District media, such as press releases, social media, presentations, videos and postings on the Subsidence District’s website. However, nothing contained herein shall require the Grantee to provide information to the public, which is subject to a mandatory or permissive exception under the Texas Public Information Act.
- The Grantee will participate in Project Update Meetings to provide a summary of completed tasks and upcoming activities. These meetings will be held quarterly and can be administered virtually. The Grantee must provide an agenda and brief summary of the Project status for each of these quarterly meetings. The Project Update Meetings are anticipated to be scheduled in *September* and *December* of 2022 as well as *March* and *June* of 2023.
- The Grantee will submit a reimbursement request, Project status updates and budget status updates as shown in Table 1 while the Project is underway during calendar year 2022/2023 using the “*Project and Budget Status Worksheets*,” Attachment B. The Grantee will provide the Subsidence District with a report itemization of grant money spent, including a map of AMI installation locations and access to the CEP.
- The Grantee will provide a final report that will include, but is not limited to, the 2022 water loss audit report from a state or federally recognized agency or association (e.g., Texas Water Development Board or American Water Works Association), a detailed summary of the Project, including AMI Large Meter deployment, CEP engagement analytic data, Grantee notification procedures, and incentive program(s) related to this Project targets at customers to be informed of potential leaks and perform repairs, and recommendations for improvements for future projects, as well as geographic information system (GIS) datasets generated from this Project.

To support the Subsidence District’s efforts to understand the long-term benefits of this Project, the Grantee will furnish a water-use data during calendar year 2017 to 2022 including total monthly water-use (gallons) by use-sector as applicable (for example: residential, multi-family, government, commercial, industrial, and fire) where the AMI Large Meters are installed following the format of the example provided by the Subsidence District. The Grantee will provide total gallons delivered/used vs. total gallons billed/paid. The Grantee will continue to provide specified monthly water-use data, CEP analytics and notifications data, and leak repair data to the Subsidence District on an annual basis through the 2028 calendar year.

GRANT FUNDING

The Grantee provided an itemized budget breakdown in its grant proposal. Table 2 provides a summary of the Grantee contribution and the Subsidence District reimbursement. The Subsidence District will reimburse up to 50% of the total Project cost of \$98,831 and shall not exceed \$49,415.

As noted in Section 2.02 of the Interlocal Agreement, all payments made to the Grantee by the Subsidence District for the Project costs and expenses shall be made on a **reimbursement basis**. The Grantee shall provide an itemization of the Project costs and expenses incurred for the AMI Large Meters, including copies of receipts, purchase orders, and invoices. An itemization of the costs and expenses incurred must be submitted to the Subsidence District prior to grant funds being released to the Grantee by the Subsidence District using the Project and Budget Status Worksheets provided in Attachment B. The Grantee will submit a request for reimbursement as outlined in Table 1. The terms of each itemization shall be net thirty (30) days upon the Subsidence District receipt and approval of the itemization.

All reimbursement requests must be submitted to the Subsidence District by June 30, 2023.

Table 2: Summary of Budget and Reimbursement

<u>Items</u>	<u>Grantee Estimated Cost</u>	<u>% of Initial Cost Estimate</u>	<u>Subsidence District Reimbursement *</u>
30 AMI Large Meters	\$49,415	50%	\$49,415
Total	\$98,831	100.0%	\$49,415

* The Subsidence District agrees to pay the Grantee for Project costs and expenses in accordance with the Scope of Work & Budget Estimate, but in no event shall the reimbursement to the Grantee exceed \$49,415.

ATTACHMENT B
INTERLOCAL AGREEMENT NO. 2022-01-AMI
PROJECT AND BUDGET STATUS WORKSHEETS
BETWEEN THE HARRIS-GALVESTON SUBSIDENCE DISTRICT
AND
THE CITY OF FRIENDSWOOD

Date:

Project Status Update:

Budget Status Worksheets:

Grantee Contribution:

<u>Items</u>	<u>Estimated Cost</u>	<u>Total amount previously submitted</u>	<u>Current submission amount (add subordinate line item as needed)</u>	<u>Accompanied References (Invoice or PO #s)</u>	<u>% Project completion to date</u>
AMI Large Meters Installed	\$98,831				
Total	\$98,831				

Subsidence District Reimbursement:

		Columns should correlate with Grantee table for current submittal			
<u>Items</u>	<u>Total amount previously reimbursed</u>	<u>Current reimbursement requested (add subordinate line item as needed)</u>	<u>Accompanied references for current request (Invoice or PO #s)</u>	<u>Subsidence District Reimbursement *</u>	<u>% Project completion to date</u>
AMI Large Meters Installed					
Total					

* The Subsidence District agrees to pay the Grantee for Project costs and expenses in accordance with the Scope of Work & Budget Estimate, but in no event shall the reimbursement to the Grantee exceed \$49,415.

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 05/03/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider a resolution verifying the percentage of completion of cybersecurity training and authorizing the City Manager or his designee to submit all documentation required by Section 2054.5191 of the Texas Government Code.

Originating Department: Information Technology

Degree of importance: High

SUMMARY / ORIGINATING CAUSE

Section 2054.5191 of the Texas Government Code requires the City, at least once a year, (i) to identify all City employees and elected/appointed officials who have access to the City's computer system and use such system for at least 25 percent of their duties and (ii) to mandate those individuals to complete a certified cybersecurity training program. Thereafter, the City Council is required to verify the completion of the training and to report on the same. This resolution confirms that 100% of those required to complete the training have done so and directs the City Manager or his designee to perform periodic audits to ensure compliance with this law and to submit information to the Texas Department of Information Resources regarding the City's compliance.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Failure to comply can result in loss of grants and return of grant funding given.

RECOMMENDATIONS

Staff recommends approval.

ATTACHMENTS

1. Resolution - Cybersecurity Training

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, TEXAS,
VERIFYING THE PERCENTAGE OF COMPLETION OF CYBERSECURITY TRAINING
AND AUTHORIZING THE CITY MANAGER OR HIS DESIGNEE TO SUBMIT ALL
DOCUMENTATION REQUIRED BY SECTION 2054.5191 OF THE TEXAS GOVERNMENT
CODE; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Section 2054.5191 of the Texas Government Code requires the City at least once each year (i) to identify all City employees and elected and appointed officials who have access to the City's computer system or database and use a computer to perform at least 25 percent of the employee's or official's required duties and (ii) to require them to complete a certified cybersecurity training program; and

WHEREAS, the City Manager has identified those employees and officials of the City required to complete the certified cybersecurity training program; and

WHEREAS, the City Manager has ensured that all such employees and officials of the City have had an opportunity to complete this required training; and

WHEREAS, the City Manager has provided the results of the completion of this required training to the City Council; and

WHEREAS, the City Council must verify and report on such results and require periodic audits to ensure compliance with this statutorily required cybersecurity training; NOW THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, STATE OF TEXAS

Section 1 That the facts and matters set forth in the recitals of this resolution are hereby found to be true and correct.

Section 2. That the City Council has verified the completion of the certified cybersecurity training program by not only City employees but also its elected and appointed officials subject to the requirements of Section 2054.5191 of the Texas Government Code and hereby reports that 100% of those required to complete such program have done so.

Section 3 That the City Manager or his designee is authorized to submit documentation evidencing the City's compliance with requirements of Section 2054.5191 of the Texas Government Code to the Texas Department of Information Resources.

Section 4. That the City Council hereby directs the City Manager or his designee to perform periodic audits to ensure compliance with this law

Section 5. That this resolution shall be effective immediately upon its passage and approval.

PASSED, APPROVED and ADOPTED by the affirmative vote of the City Council of the City of Friendswood on this the 6th day of June, 2022.

MIKE FOREMAN, Mayor

ATTEST:

RENEE KROSS, Deputy City Secretary

APPROVED AS TO FORM:

KAREN HORNER, City Attorney

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FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 05/23/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider a resolution authorizing the adoption of the Galveston County Multi-Jurisdiction Hazard Mitigation Plan.

Originating Department: Fire Marshal

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

In January of 2020, the City of Friendswood submitted a letter of intent to participate with Galveston County for the update of its Hazard Mitigation Plan. Galveston County applied for and received a grant to complete the 5-year update. A contractor was hired by the County to coordinate and complete the update with work beginning in September 2021.

Galveston County has received Approval Pending Adoption (APA) from FEMA as of May 6, 2022. All jurisdictions included in the plan must formally adopt it by resolution.

Mitigation is defined in this context as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard. Mitigation planning is the systematic process of learning about the hazards that can affect the community, setting clear goals, identifying appropriate actions, and following through with an effective mitigation strategy. Mitigation encourages long-term reduction of hazard vulnerability and can reduce the enormous cost of disasters to property owners and all levels of government. Mitigation can also protect critical community facilities, reduce exposure to liability, and minimize post-disaster community disruption.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

The Hazard Mitigation Plan is a vital planning tool to be utilized in concert with city-wide hazard mitigation projects to protect residents and property during emergency and/or disastrous situations. The adoption of the Hazard Mitigation Plan is a vital prerequisite to submit and qualify for all future state and federal hazard mitigation grant funding, as well as participate in other grant funding opportunities, along with disaster recovery funding assistance for debris removal and damage restoration projects.

RECOMMENDATIONS

Staff recommends approval.

ATTACHMENTS

1. Resolution - Adopt Galveston County Multi-Jurisdictional HMP
2. Galveston County APA Package

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD,
TEXAS, ADOPTING THE GALVESTON COUNTY MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN, 2022 UPDATE; AND PROVIDING FOR AN
EFFECTIVE DATE.

WHEREAS, the City Council last approved the Galveston County Multi-Jurisdictional Hazard Mitigation Plan on April 3, 2017, via Resolution No. 2017-11; and

WHEREAS, the Federal Disaster Mitigation Act of 2000 and the regulations pertaining thereto require such plan be monitored, evaluated, and updated within a five-year cycle; and

WHEREAS, the Galveston County Multi-Jurisdiction Hazard Mitigation Plan, 2022 Update (the "Plan") has been timely monitored, evaluated, and updated consistent with all applicable laws, rules, and regulations; and

WHEREAS on May 6, 2022, the Federal Emergency Management Agency ("FEMA") completed its review of the Plan and found that the Plan could be approved after the adoption of the Plan by the participating governmental entities; and

WHEREAS, the City Council of the City of Friendswood has reviewed the Plan and believes that the same should be adopted; NOW THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, STATE OF TEXAS:

Section 1. That the City Council finds and determines that the recitals contained hereinabove are true and correct.

Section 2. That the City Council of the City of Friendswood, Texas, hereby adopts the Galveston County Multi-Jurisdictional Hazard Mitigation Plan, 2022 Update. A copy of the Galveston County Multi-Jurisdictional Hazard Mitigation Plan is on file in the office of the City Secretary.

Section 3. That this resolution shall be effective immediately upon its passage and approval.

PASSED, APPROVED and ADOPTED by the affirmative vote of the City Council of the City of Friendswood on this the 6th day of June, 2022.

MIKE FOREMAN, Mayor

ATTEST:

RENEE KROSS, Deputy City Secretary

APPROVED AS TO FORM:

KAREN HORNER, City Attorney

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FEMA

May 6, 2022

Jasper Cooke, Hazard Mitigation Section Chief
Texas Division of Emergency Management
P.O. Box 15467
Austin, TX 78761

RE: Approvable Pending Adoption of the Galveston County, Texas Multi-Jurisdiction
Hazard Mitigation Plan

Dear Mr. Cooke:

This office has concluded its review of the referenced plan, in conformance with the Final Rule on Mitigation Planning (44 CFR § 201.6). Formal approval of this plan is contingent upon the adoption by the participants on Enclosure A, as well as the receipt of the final draft of the plan containing all plan components.

Adopting resolutions must be submitted to this agency for review and approval no later than one year from the date of this letter. Failure to submit these resolutions in a timely manner could lead to a required update of the plan prior to FEMA approval.

Once this final requirement has been met, a letter of official approval will be generated. The Local Hazard Mitigation Planning Tool, with the reviewer's comments has been enclosed to further assist the jurisdictions in complying with planning requirements.

Sincerely,

Ronald C. Wanhanen
Chief, Risk Analysis Branch

Enclosures

Enclosure A

Attached is the list of participating local governments included in the May 6, 2022 review of the referenced Hazard Mitigation plan.

Community Name
1) Bayou Vista
2) Clear Lake Shores
3) Dickinson
4) Friendswood
5) Galveston County
6) Hitchcock
7) Jamaica Beach
8) Kemah
9) La Marque
10) League City
11) Santa Fe
12) Tiki Island

Adoption Submittal (Final)

Following the issuance this of Approvable Pending Adoption letter, all participants are provided one year to adopt the plan and submit it through the State to FEMA. For multi-jurisdictional plans, multiple adoptions should be submitted as a complete package as outlined below.

The State must submit the plan files via:

Floodmaps File eXchange (FFX): <https://www.floodmaps.fema.gov/ffx/>

Risk Management Directorate (RMD) SharePoint:

<https://rmd.msc.fema.gov/Regions/VI/Mitigation%20Planning/Forms/AllItems.aspx>

Note: You will be requested to register if you have not already done so.

All plans containing Protected Critical Infrastructure Information (PCII) must be submitted through the Floodmaps File Exchange (FFX) to ensure secure file submissions.

1. Final draft of the plan in MS Word or pdf format containing:
 - a. The final plan formatted as a single document.
 - b. Documentation demonstrating adoption by the participating jurisdictions seeking approval. (i.e. copies of signed resolutions, official meeting minutes, etc....) Note: Adoption resolutions can be separate files. Additional adoptions are not required to provide a copy of the plan.
 - c. Remove strikethroughs, highlights and all Track Changes must be accepted in the final plan.
2. Send an email addressed to r6-mtd-planning@fema.dhs.gov as notification that the electronic file has been submitted. Please DO NOT send plans to the email inbox as it has very strict size limitations which will lock the inbox and not allow additional emails to be received. The email must include the following information:
 - a. Include the follow when applicable: (Note: A submittal letter is no longer required.)
 - i. Subject line [Approval Review for Name of Plan, State]
 - ii. FEMA funding source, grant or disaster number, and project number (when applicable)
 - iii. list of adopting jurisdictions
 - iv. Plan File name (file name must include date submitted)
3. Submittals which do not conform to the above requirements will be returned to the State for resubmission

May 10, 2022

The Honorable Mark Henry
Judge, Galveston County
722 Moody Avenue
Galveston, Texas 77550

RE: Approvable Pending Adoption of Galveston County, Texas Multi-Jurisdiction
Hazard Mitigation Plan (HMP)

Funding Source: n/a

Judge Henry:

Congratulations! FEMA has concluded the review of the Galveston County, Texas Multi-Jurisdiction HMP, and the plan is found to be approvable pending adoption. For this plan to receive final FEMA approval, the jurisdictions must adopt this plan and submit the complete adoption package to the state within 90 days. The plan update timeline will begin on the date of the FEMA approval letter. Please e-mail the complete adoption package to HM-Plans@tdem.texas.gov as follows:

- The final plan formatted as a single document
 - Plan must be dated to match the date of the first adoption
 - Remove track changes, strikethroughs, and highlights
- All signed resolutions as a separate single document

The previous review tool may contain recommendations to be applied to your next update. DO NOT make any further changes to your plan until it has been approved.

If you have any questions concerning this procedure, please do not hesitate to contact me at jim.guin@tdem.texas.gov. We commend you for your commitment to mitigation.

Respectfully,

A handwritten signature in black ink that reads "Jim Guin". The signature is written in a cursive, flowing style.

Jim Guin
Hazard Mitigation Supervisor
Hazard Mitigation Division
Texas Division of Emergency Management

Cc: Dan Stuckert, daniel.stuckert@tdem.texas.gov
Mike Jones, mike.jones@tdem.texas.gov
Joshua Brogdon, joshua.brogdon@tdem.texas.gov

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA’s evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan’s strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Galveston County, TX	Title of Plan: Galveston County Hazard Mitigation Plan 2022 Update	Date of Plan: February 2022
Local Point of Contact: Laura Norman	Address: Galveston County Office of Emergency Management 1353 FM 646 W. Suite 201 Dickinson, TX 77539	
Title: Deputy Emergency Management Coordinator		
Agency: Galveston County, TX		
Phone Number: 281-309-5013	E-Mail: Laura.norman@co.galveston.tx.us	

State Reviewer: Brian Hurtuk	Title: Hazard Mitigation Planner	Date: 3/24/22
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FEMA Reviewer: David Freeborn	Title: Community Planner	Date: 5/3/2022
Date Received in FEMA Region 6	5/3/2022	
Plan Not Approved		
Plan Approvable Pending Adoption	5/6/2022	
Plan Approved		

SECTION 1: REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	pdf pages used P 9-22, 263-291	X		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	P 22-27, 284-291, 676-797, 852-871	X		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	P 27-28, 798-851	X		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	P 28-29, 55, 269- 274, 290-671	X		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	P 29-30, 261-262	X		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	P 253-261	X		
ELEMENT A: REQUIRED REVISIONS				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	P 58-59, 60-209, 290-671	X		
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(ii))	P 31-32, 64-209, 221	X		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
B3. Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	P 66-214	X		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	P 110-111, 122	X		
ELEMENT B: REQUIRED REVISIONS				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	P 224-243, 261-262, 290-671	X		
C2. Does the Plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	P 20, 109-112, 225, 227, 244, 290-298, 318-324, 346-354, 376-384, 407-414, 448-455, 480-487, 512-519, 537-544, 562-570, 591-610, 616-624, 638-644, 649-654	X		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	P 246-247	X		
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	P 305-312, 338-341, 365-370, 396-401, 431-443, 470-476, 498-507, 532-533, 557-558, 591-613, 638-646, 667-669	X		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	P 250-252, 305-315, 338-343, 365-372, 396-403, 431- 445, 470-478, 498-509, 532-534, 557-559, 667-671	X		
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	P 29, 243, 291-690	X		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT C: REQUIRED REVISIONS				
C6. Upon subsequent review it has been determined that the information contained within the plan does not meet the necessary requirements. However, since the previous revisions complied with the language from the region in the review tool, it will not be necessary to change the plan information prior to approval. The following revisions will be necessary upon the five-year update: The plan must explain how the jurisdictions incorporated the mitigation plan, when appropriate, into other planning mechanisms (such as those listed in tables 9.x-2) since the last version of the plan was approved. If no incorporation has occurred, this must be stated.				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	P 38-40, 72, 83, 91, 105, 126, 132, 145, 150, 157, 171, 184, 193, 199, 214	X		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	P 301-671	X		
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	P 9-15, 56	X		
ELEMENT D: REQUIRED REVISIONS				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	N/A			
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	P 673-675			X
ELEMENT E: REQUIRED REVISIONS				
E2. Once all requirements have been met, the jurisdictions must provide documentation demonstrating that the plan has been adopted.				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
ELEMENT F: REQUIRED REVISIONS				

SECTION 2: PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

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Element B: Hazard Identification and Risk Assessment

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Element C: Mitigation Strategy

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Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

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B. Resources for Implementing Your Approved Plan

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- *What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?*
- *What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?*
- *What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?*
- *Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?*
- *What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?*

SECTION 3: MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Requirements Met (Y/N)					
				<u>A.</u> <u>Planning</u> <u>Process</u>	<u>B.</u> <u>Hazard</u> <u>Identification &</u> <u>Risk Assessment</u>	<u>C.</u> <u>Mitigation</u> <u>Strategy</u>	<u>D.</u> <u>Plan Review,</u> <u>Evaluation &</u> <u>Implementation</u>	<u>E.</u> <u>Plan</u> <u>Adoption</u>	<u>F.</u> <u>State</u> <u>Require-</u> <u>ments</u>
1	Galveston County			Y	Y	Y	Y	N	
2	Bayou Vista			Y	Y	Y	Y	N	
3	Clear Lake Shores			Y	Y	Y	Y	N	
4	Dickinson			Y	Y	Y	Y	N	
5	Friendswood			Y	Y	Y	Y	N	
6	Hitchcock			Y	Y	Y	Y	N	
7	Jamaica Beach			Y	Y	Y	Y	N	
8	Kemah			Y	Y	Y	Y	N	
9	La Marque			Y	Y	Y	Y	N	
10	League City			Y	Y	Y	Y	N	
11	Santa Fe			Y	Y	Y	Y	N	
12	Tiki Island			Y	Y	Y	Y	N	

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 04/27/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider the first and final reading of an ordinance amending the City's General Budget for Fiscal Year 2021-2022 by approving "Budget Amendment IX" and providing for supplemental appropriation and/or transfer of certain funds.

Originating Department: Administrative Services

Degree of importance: Significant

SUMMARY / ORIGINATING CAUSE

By its nature, our budget is an estimate of the revenues and expenditures needed to accomplish the City Council and Staff goals for the year. Throughout the year, events occur that require adjustments to the budget. These adjustments may be needed for various reasons, such as the recognition of extraordinary revenues or expenditures, new projects that are authorized by Council or providing funding for expenditures resulting from extraordinary events like natural disasters. As the need arises, items for budget appropriations are accumulated and then submitted for approval at the City Council meeting each month. The budget adjustments covered by this ordinance comprise the second set for fiscal year 2021-2022.

We have attempted to provide as much explanation of the adjustments as possible through two sets of exhibits. Exhibit A provides a narrative explanation of each budget amendment. Exhibit B provides the details of each accounting transaction.

Ordinance and exhibits are reviewed and approved by the City Attorney prior to inclusion on a City Council meeting agenda.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Approval of this budget amendment will allow for timely procurement of program supplies and limit delays in the progress of capital improvement projects.

RECOMMENDATIONS

Recommend approval of the ordinance and exhibits covering Budget Amendment IX 2021–2022.

ATTACHMENTS

1. Ordinance - Budget Amendment No. IX
2. FY22 BA IX Exhibit A 06-06-2022 v3
3. FY22 BA IX Exhibit B 06-06-2022 v3

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, TEXAS, AMENDING ORDINANCE NO. 2021-22, PASSED AND APPROVED SEPTEMBER 13, 2021, SAME BEING AN ORDINANCE APPROVING AND ADOPTING THE CITY'S GENERAL BUDGET FOR FISCAL YEAR 2021-2022, BY APPROVING "BUDGET AMENDMENT IX" THERETO; PROVIDING FOR SUPPLEMENTAL APPROPRIATION AND/OR TRANSFER OF CERTAIN FUNDS; PROVIDING FOR SEVERABILITY; PROVIDING OTHER MATTERS RELATED TO THE SUBJECT; AND PROVIDING FOR THE EFFECTIVE DATE.

WHEREAS, by Ordinance No. 2021-22, the City Council of the City of Friendswood, Texas, adopted its "Original General Budget for Fiscal Year 2021-2022"; and

WHEREAS, the City Council has determined that revenues and/or reserves are available for supplemental appropriation, and/or that the transfer of certain funds interdepartmentally is economically feasible and in the best interest of prudent budgeting and for municipal purposes; and

WHEREAS, Section 8.04 of the City Charter provides for amendments after adoption of the budget; and

WHEREAS, the City Council desires to amend said Original General Budget to reflect such supplemental appropriation and/or transfer in the fiscal year 2021-2022; NOW THEREFORE:

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, STATE OF TEXAS:

Section 1. The facts and matters set forth in the preamble of this ordinance are hereby found to be true and correct.

Section 2. The "Original General Budget of the City of Friendswood, Texas, for the Fiscal Year 2021-2022," is hereby amended for municipal purposes as shown on "Budget Amendment IX" to the "Original Budget of the City of Friendswood, Texas, for the Fiscal Year 2021-2022" attached hereto. Said Budget Amendment IX shall be attached to and made a part of such Original General Budget by the City Secretary and shall be filed as required by state law. A true and correct copy of said amendment is attached hereto as Exhibits "A" and "B" and is incorporated herein for all intents and purposes.

Section 3. In the event any clause, phrase, provision, sentence, or part of this ordinance or the application of the same to any person or circumstance shall for any reason be adjudged invalid or held unconstitutional by a court of competent jurisdiction, it shall not affect, impair, or invalidate this ordinance as a whole or any part or provision hereof other than the part declared to be invalid or unconstitutional; and the City Council of the City of Friendswood,

Texas, declares that it would have passed each and every part of the same notwithstanding the omission of any such part thus declared to be invalid or unconstitutional, whether there be one or more parts.

Section 4. This ordinance shall take effect immediately from and after its passage by the City Council of the City of Friendswood, Texas.

PASSED, APPROVED and ADOPTED by the affirmative vote of the City Council of the City of Friendswood on this the 6th day of June, 2022.

MIKE FOREMAN, Mayor

ATTEST:

RENEE KROSS, Deputy City Secretary

APPROVED AS TO FORM:

KAREN L. HORNER, City Attorney

**City of Friendswood
Budget Amendment Summary
Fiscal Year 2021 – 2022
Budget Amendment IX – Exhibit A
June 6, 2022**

1. **HMGP Buyout Grant Reimbursement, \$82,215.** Appropriate grant funds received from the Hazard Mitigation Grant Program for Hurricane Harvey buyout properties. The City received \$37,133 for the demolition of 5303 Shady Oak, 13 Haverford, 16614 Oxnard, 807 Penn, and 1204 Myrtlewood. The remaining amount of \$45,082 was received as a partial reimbursement for the acquisition and related assessment of 1204 Myrtlewood. Advance funding for these purchases were originally approved at the January 11, 2021 and May 3, 2021 City Council meetings, respectively. Therefore, the funds will be appropriated back to unassigned general fund balance.
2. **Texas Water Development Board Flood Mitigation Grant Reimbursement, \$4,800.** Appropriate grant funds received from the Texas Water Development Board (TWDB) Flood Mitigation grant program for buyout properties. Advance funding for buyout properties was originally approved in FY2019-2020. This reimbursement represents costs related to grant management services. Therefore, the funds will be appropriated back to unassigned general fund balance.
3. **Galveston County Mayors and Council Members Association Sponsorship, \$16,000.** Appropriate sponsorship monies received from Ameresco, Amoco Federal Credit Union, and PGAL. The City of Friendswood hosted the May 2022 Galveston County Mayors and Council Members Association business meeting and dinner. The event was sponsored by Ameresco, Amoco Federal Credit Union, Memorial Hermann Southeast, and PGAL. Therefore, the funds will be appropriated back to the Mayor & Council's Community Events/Programs expenditure account.
4. **Parks & Recreation – Anonymous Donation, \$500.** Appropriate anonymous donation received from a 20-year resident of the City of Friendswood. The donor wanted to thank the Parks & Recreation department for doing a great job in keeping our parks safe and making Friendswood a wonderful place to live. Over the years, they have enjoyed the lighted trail & various parks with their grandchildren. Funds will be appropriated to the Parks and Recreation Department's Recreation division.
5. **Parks & Recreation – Donations for Park Benches, \$3,531.** Appropriate donations received from David Davis, Trina DeCecco, and Lighthouse Charity Team. The donations will go towards the purchase of dedicated park benches at Lake Friendswood and Stevenson Park. Funds will be appropriated to the Parks and Recreation Department's, Parks division, operating equipment budget.
6. **Parks & Recreation – Donation for Keep Friendswood Beautiful Photo Contest, \$500.** Appropriate donation received from HomeTown Bank for the Keep Friendswood Beautiful Photo Contest. Funds will be appropriated to the Parks and Recreation Department's, KFB division, landscaping budget.
7. **Keep Friendswood Beautiful – Spring Sparkle, \$1,000.** Appropriate funds received from the KFB Spring Sparkle event. The appropriation will be recorded in the Keep Friendswood Beautiful division operating maintenance budget for landscaping.
8. **Keep Friendswood Beautiful – Kendra Scott Gives Back program, \$235.** Appropriate funds received from the KFB Spring Sparkle event. The appropriation will be recorded in the Keep Friendswood Beautiful division operating maintenance budget for landscaping.

*Deferred Maintenance

9. **Police Department Vehicle Insurance Reimbursement, \$394.** Appropriate insurance reimbursement received from TML-IRP. Funding will be appropriated to the Police Department's, Patrol division, vehicle maintenance account for repairs made to unit P429.
10. **Fire Marshal's Office Vehicle Insurance Reimbursement, \$719.** Appropriate insurance reimbursement received from TML-IRP. Funding will be appropriated to the Fire Marshal's Office vehicle maintenance account for repairs made to unit FM12.
11. **PSB Expansion Project Materials Testing, \$9,782.** Appropriate funds for materials testing contractor needed for the PSB Expansion project. Raba Kistner was originally selected in February 2022 as the materials testing contractor for the PSB expansion project. Due to unsatisfactory performance, the City elected to terminate the contract. Paradigm Consultants was selected as the new contractor to perform these services. The amount of funding required is calculated as the difference between the two contract amounts plus what is owed to Raba Kistner. The funding source will be unassigned general fund balance.
12. **Community Development/Information Technology – Cityworks PLL, \$200,000.** Appropriate funds for the implementation of Cityworks PLL, an application that can improve the City of Friendswood's posture by moving our processes to a Smart City design. A Smart City for Friendswood would be defined as "using information and communication technology (ICT) to improve operational efficiency, share information with the public and provide a better quality of government service and citizen welfare." The transition to Cityworks will allow for improvements with permits, inspections, and plan review submissions which will enhance City services with an all-electronic process. The citizen/customer will be able to track their requests with an online portal to improve transparency with the process. Staff will be able to process requests in a timely and paperless transfer from one department to another. The funding source will be split 60/40 between unassigned General Fund balance and Water & Sewer working capital.
13. **Community Development Block Grant-Disaster Recovery (Galveston County) – Frenchman's Creek Acquisition and Relocation Services Contract, \$1,030,000.** Following Hurricane Harvey, the City was allocated \$2,762,650 in CDBG-DR housing funds through the General Land Office (GLO) for use on the Galveston County side of the City. The City pursued residential acquisitions under this housing program with the goal of providing additional flood control through the use of green space. The City utilized the damage assessment map from Harvey to look for clusters of major damage and areas that could be utilized for future flood control. Frenchman's Creek and structures on Deepwood Drive were identified and pursued for acquisition and demolition. The City is in the process of acquiring buildings 4 and 5 at Frenchman's Creek and requested Galveston County seek acquisition of buildings 1, 2, and 3. Advance funding will be appropriated from unassigned general fund balance and will be reimbursed once grant funding has been received from the State agencies.
14. **Parks & Recreation Facilities – Level II Energy Audit and Facilities Assessment, \$12,500.*** Appropriate additional funding needed to complete professional services contracted with LIT Consultants, LLC. The company will perform an *ASHRAE Level 2 Energy Audit* on 11 buildings within the City of Friendswood. The audit will provide the city with a comprehensive inventory of energy consuming equipment, an analysis of the building primary systems sequences of operations, an analysis of current maintenance and operations practices, suggested revisions to building occupant practices, energy efficiency recommendations for the building envelope, lighting systems and heating and cooling systems, and a thorough utility benchmarking process. The audit will also identify areas of opportunity including both high-cost capital expense and no-cost/low-cost recommendations with the goal of reducing the overall energy footprint. Funding in the amount of \$10,000 was originally budgeted in the Risk Management division of the Human Resources Department and will be transferred to Facilities. The remaining \$2,500 will be appropriated from unassigned general fund balance.

*Deferred Maintenance

City of Friendswood				
June 6, 2022				
2021-2022 Budget Amendment IX - Exhibit B				
BA Number	Account Number	Project Number	Description	Amount
1	120-10199		Reimburse unassigned general fund balance for advance funding related to HMGP grant for acquisition & demolition properties	(82,215)
1	120-26010		Reimburse unassigned general fund balance for advance funding related to HMGP grant for acquisition & demolition properties	82,215
1	001-14018		Reimburse unassigned general fund balance for advance funding related to HMGP grant for acquisition & demolition properties	(82,215)
1	001-10199		Reimburse unassigned general fund balance for advance funding related to HMGP grant for acquisition & demolition properties	82,215
2	121-10199		Reimburse unassigned general fund balance for advance funding related to TWDB Flood Mitigation grant for management services	(4,800)
2	121-26010		Reimburse unassigned general fund balance for advance funding related to TWDB Flood Mitigation grant for management services	4,800
2	001-14019		Reimburse unassigned general fund balance for advance funding related to TWDB Flood Mitigation grant for management services	(4,800)
2	001-10199		Reimburse unassigned general fund balance for advance funding related to TWDB Flood Mitigation grant for management services	4,800
3	001-0000-38600		Appropriate sponsorship monies received from Ameresco, Amoco Federal Credit Union, Memorial Hermann and PGAL to Community Events/Programs	(16,000)
3	001-0101-411.7910		Appropriate sponsorship monies received from Ameresco, Amoco Federal Credit Union, Memorial Hermann and PGAL to Community Events/Programs	16,000
4	001-0000-38600		Appropriate donation received as a thank you for the lighted trail and clean, safe parks in Friendswood	(500)
4	001-6420-452.7910		Appropriate donation received as a thank you for the lighted trail and clean, safe parks in Friendswood	500
5	001-0000-38600		Appropriate donations received for dedicated park benches at Lake Friendswood and Stevenson Park	(3,531)
5	001-6430-456.5800		Appropriate donation received from David Davis for dedicated park bench at Lake Friendswood	1,265
5	001-6430-456.5800		Appropriate donation received from Trina DeCecco for dedicated park bench in Stevenson Park	1,066
5	001-6430-456.5800		Appropriate donation received from Lighthouse Charity Team for dedicated park bench in Stevenson Park	1,200
6	001-0000-38600		Appropriate donation received from HomeTown Bank for Keep Friendswood Beautiful Photo Contest	(500)
6	001-6424-458.6210		Appropriate donation received from HomeTown Bank for Keep Friendswood Beautiful Photo Contest	500
7	001-0000-38600		Appropriate funds received from the KFB Spring Sparkle event to the KFB landscaping budget	(1,000)
7	001-6424-458.6210		Appropriate funds received from the KFB Spring Sparkle event to the KFB landscaping budget	1,000
8	001-0000-38600		Appropriate funds received from the Kendra Scott Gives Back community-giving program to the KFB operating budget	(235)
8	001-6424-458.5400		Appropriate funds received from the Kendra Scott Gives Back community-giving program to the KFB operating budget	235
9	001-0000-38310		Appropriate insurance reimbursement from TML-IRP for Police Department Patrol Vehicle Unit P429	(394)
9	001-2120-421.6300	P429	Appropriate insurance reimbursement from TML-IRP for Police Department Patrol Vehicle Unit P429	394
10	001-0000-38310		Appropriate insurance reimbursement from TML-IRP for Fire Marshal's Vehicle Unit FM12	(719)
10	001-2501-422.6300	FM12	Appropriate insurance reimbursement from TML-IRP for Fire Marshal's Vehicle Unit FM12	719
11	001-0000-30500		Appropriate unassigned general fund balance for change in materials testing contractor at the PSB Expansion project	(9,782)
11	001-7001-421.8597	GO1518CONST	Appropriate unassigned general fund balance for change in materials testing contractor at the PSB Expansion project	9,782
12	401-9002-491.9110		Transfer water & sewer working capital to unassigned general fund balance for 40% of the cost to implement Cityworks PLL	80,000
12	401-0000-30600		Transfer water & sewer working capital to unassigned general fund balance for 40% of the cost to implement Cityworks PLL	(80,000)
12	001-0000-39137		Transfer water & sewer working capital to unassigned general fund balance for 40% of the cost to implement Cityworks PLL	(80,000)
12	001-0000-30500		Appropriate unassigned general fund balance for implementation of Cityworks PLL for the Community Development Department	(120,000)
12	001-0716-419.7720		Appropriate unassigned general fund balance for implementation of Cityworks PLL for the Community Development Department	9,681
12	001-0716-419.7720		Appropriate unassigned general fund balance for implementation of Cityworks PLL for the Community Development Department	166,500
12	001-0716-419.7720		Appropriate unassigned general fund balance for implementation of Cityworks PLL for the Community Development Department	23,819
13	001-10199		Due from CDBG-DR (Gal Co) Grant funds for acquisition of Frenchman's Creek, Building 5	(1,030,000)
13	001-14029		Due from CDBG-DR (Gal Co) Grant funds for acquisition of Frenchman's Creek, Building 5	1,030,000
13	124-26010		Due to General Fund from CDBG-DR (Gal Co) Grant for acquisition of Frenchman's Creek, Building 5	(1,030,000)
13	124-10199		Due to General Fund from CDBG-DR (Gal Co) Grant for acquisition of Frenchman's Creek, Building 5	1,030,000
14	001-0000-30500		Appropriate unassigned general fund balance for additional funding needed to complete a Level II Energy Audit*	(2,500)
14	001-0612-415.7400		Transfer funding from Human Resources - Risk Management to Parks & Recreation - Facilities division for Level II Energy Audit & Facilities Assessment*	(10,000)
14	001-6460-456.7800		Transfer funding from Human Resources - Risk Management to Parks & Recreation - Facilities division for Level II Energy Audit & Facilities Assessment*	12,500
*Deferred Maintenance				

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 04/27/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider the second and final reading of an ordinance approving a request to vacate 20-foot drainage easement and a 10-foot drainage access easement for maintenance located at 1309 Falling Leaf Drive, Friendswood, Galveston County, Texas.

Originating Department: Community Development

Degree of importance:

SUMMARY / ORIGINATING CAUSE

The property owner is requesting to abandon a portion of a 20-foot drainage easement and a 10-foot maintenance easement. The attached metes and bounds exhibit identifies the subject easement. The easement does not contain any drainage infrastructure such as swales or pipes and is not being utilized for drainage purposes. The Galveston County Consolidated Drainage District provided a letter of no objection regarding the request to abandon this portion of easement.

Public hearing notices were published in the newspaper and mailed to property owners within 200 feet. The P&Z Final Report is included in the attachments.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

Abandonment of the easement will provide the property owner more usable area of their lot, which is also encumbered with pipelines.

RECOMMENDATIONS

The Planning and Zoning Commission voted 4 to 0 (Commissioners Hinckley, Clark and Koerner were absent) unanimously in favor of the request.

ATTACHMENTS

1. Ordinance - Abandonment of Drainage Easements at 1309 Falling Leaf Drive
2. Exhibit A - Quitclaim Deed

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, TEXAS, AUTHORIZING THE ABANDONMENT OF THE CITY'S INTEREST IN A TWENTY-FOOT (20') WIDE DRAINAGE EASEMENT AND A TEN-FOOT (10') WIDE DRAINAGE EASEMENT ACCESS FOR MAINTENANCE OVER AND ACROSS PROPERTY LOCATED AT 1309 FALLING LEAF DRIVE FRIENDSWOOD, GALVESTON COUNTY, TEXAS; AUTHORIZING THE MAYOR TO EXECUTE A QUITCLAIM DEED RELEASING THE CITY'S INTEREST IN SAID EASEMENTS; AND ESTABLISHING THE EFFECTIVE DATE.

WHEREAS, a twenty-foot (20') wide drainage easement and a ten-foot (10') wide drainage easement access for maintenance were dedicated to the public by way of a subdivision plat known as Mustang Meadows, Section One (1) and recorded in Volume 15, Page 14 of the Map Records of Galveston County, Texas, over and across the certain property located at 1309 Falling Leaf Drive, Friendswood, Texas, which property is more specifically described as Lot 7, Block 1 of Mustang Meadows, Section One, according to the map or plat thereof recorded as Volume 15, Page 14 of the Map Records of Galveston County, Texas (collectively the "Easements"); and

WHEREAS, Ross H. Eubanks and Kerrie Eubanks, the owners of said property (the "Owners"), applied to the City to vacate said drainage easement and drainage easement access for maintenance identified as a 5,597-square-foot tract out of Lot Seven (7), Block One (1), Mustang Meadows, Section One (1), a subdivision in Galveston County, Texas, in the R. Hoppel Survey, Abstract 83 and Sarah McKissick League, Abstract 151, according to the map or plat thereof recorded in Volume 15, Page 14 of the Map Records of Galveston County, Texas; and

WHEREAS, pursuant to Section 70-25 of the Friendswood City Code, Owners supplied all required information to the City for the vacation of the Easements; and

WHEREAS, after conducting a public hearing in the time and manner required by law, the Planning and Zoning Commission of the City of Friendswood provided its final report recommending approval of the request to vacate the Easements to the City Council; and

WHEREAS, on May 2, 2022, the City Council conducted a public hearing to consider any public comments concerning the request to vacate the Easements; and

WHEREAS, after considering the testimony and evidence received at the public hearing as well as the application of the Owners, the City Council has determined that the Easements are no longer necessary for the City; and

WHEREAS, City Council has further determined that all public notices have been posted and published, all required hearings on this matter have been held, and that this ordinance complies with the applicable provisions of the City Charter, the Friendswood City Code, and all other applicable laws; NOW THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, STATE OF TEXAS:

Section 1. That the facts and matters set forth in the preamble of this ordinance are hereby found to be true and correct.

Section 2. That the City Council of the City of Friendswood, Texas, hereby authorizes the abandonment of the City's interest in the drainage easement and drainage easement access for maintenance encumbering the following property:

5,597 square feet out of Lot Seven (7), Block One (1), Mustang Meadows, Section One (1), a Subdivision in Galveston County, Texas, in the R. Hoppel Survey, Abstract 83 and Sarah McKissick League, Abstract 151, according to the map or plat thereof recorded in Volume 15, Page 14 of the Map Records of Galveston County, Texas, as more particularly described in Exhibit "A," which is attached hereto and incorporated herein for all intents and purposes.

Section 3. That Mayor is hereby authorized to execute the Quitclaim Deed, which is attached as Exhibit "A."

Section 4. This ordinance shall take effect immediately from and after its final adoption by the City Council of the City of Friendswood, Texas.

PASSED and APPROVED on first reading this 2nd day of May, 2022.

MIKE FOREMAN, Mayor

ATTEST:

LETICIA BRYSCH, City Secretary

APPROVED AS TO FORM:

KAREN HORNER, City Attorney

PASSED, APPROVED and ADOPTED on second and final reading this 6th day of June, 2022.

MIKE FOREMAN, Mayor

ATTEST:

RENEE KROSS, Deputy City Secretary

APPROVED AS TO FORM:

KAREN HORNER City Attorney

Exhibit "A"

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OF THE FOLLOWING INFORMATION FROM THIS INSTRUMENT BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

QUITCLAIM DEED

THE STATE OF TEXAS §
 § KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF GALVESTON§

THAT the CITY OF FRIENDSWOOD, a home-rule municipality located in Galveston and Harris Counties, Texas, as TRANSFEROR, for and in consideration of the sum of TEN AND NO/100 DOLLARS (\$10.00) and other good and valuable consideration paid by the TRANSFEREES herein named, the receipt and sufficiency of which are hereby acknowledged and confessed, QUITCLAIMS, TRANSFERS, AND ASSIGNS to ROSS H. EUBANKS AND KERRIE EUBANKS, as TRANSFEREES, all TRANSFEROR's right, title, and interest in and to the property depicted in Exhibit "A" and described in Exhibit "B," which exhibits are attached hereto and incorporated herein for all intents and purposes.

TO HAVE AND TO HOLD all of TRANSFEROR's right, title, and interest in and to the property herein transferred, together with all and singular the rights and appurtenances belonging in any way to TRANSFEROR, by TRANSFEREES and TRANSFEREES' heirs, successors or assigns, forever. Neither TRANSFEROR nor TRANSFEROR's successors or assigns shall have, claim, or demand any right, title, or interest in all or any part of the Property.

EXECUTED this the ____ day of _____, 2022.

TRANSFEROR:
CITY OF FRIENDSWOOD

BY: _____
MIKE FOREMAN, Mayor

STATE OF TEXAS §
 §
COUNTY OF GALVESTON§

Before me, _____, the undersigned notary public, on this day personally appeared MIKE FOREMAN, the Mayor of the City of Friendswood, Texas, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed on behalf of the City of Friendswood in the capacity stated.

SUBSCRIBED AND SWORN before me this ____ day of _____, 2022.

Notary Public in and for the State of
Texas

My commission expires: _____

TRANSFEROR'S ADDRESS:
CITY OF FRIENDSWOOD
OFFICE OF THE CITY SECRETARY
910 S. FRIENDSWOOD DRIVE
FRIENDSWOOD, TX 77546

RETURN TO TRANSFEREES:
ROSS H. EUBANKS
KERRIE EUBANKS
1309 FALLING LEAF DRIVE
FRIENDSWOOD, TEXAS 77546

NOTES:

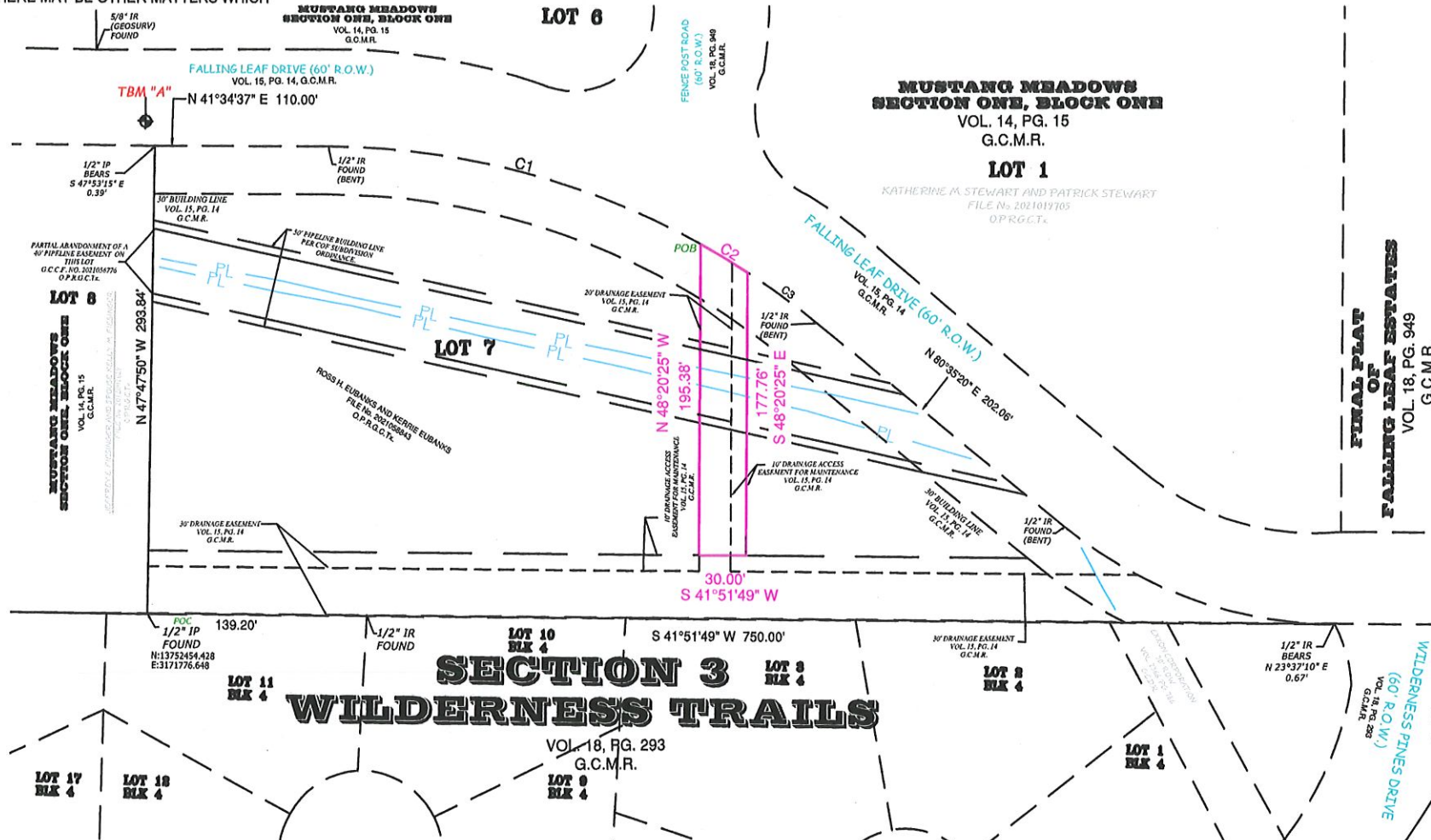
1. ALL BEARINGS ARE LAMBERT GRID BEARINGS AND ALL COORDINATES REFER TO THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, AS DEFINED BY ARTICLE 21.071 OF THE NATURAL RESOURCES CODE OF THE STATE OF TEXAS, 1983 DATUM (2011 ADJUSTMENT) EPOCH 2010.00. ALL DISTANCES ARE ACTUAL DISTANCES. SCALE FACTOR = 0.999867936.

2. THE SURVEYOR HAS NOT ABSTRACTED THIS PROPERTY. THIS DESCRIPTION WAS PREPARED WITHOUT A TITLE COMMITMENT, THERE MAY BE OTHER MATTERS WHICH APPLY.

EXHIBIT "A"

G.C.M.R.
O.P.R.G.C.Tx.
P.O.B.
P.O.C.
PG.
R.O.W.
VOL.

GALVESTON COUNTY MAP RECORDS
OFFICIAL PUBLIC RECORDS GALVESTON COUNTY TEXAS
POINT OF BEGINNING
POINT OF COMMENCING
PAGE
RIGHT OF WAY
VOLUME



CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	492.25'	245.99'	243.44'	N 55°51'26" E	28°37'57"
C2	492.25'	34.85'	34.85'	N 72°14'09" E	4°03'24"
C3	492.25'	54.33'	54.27'	N 77°25'25" E	6°19'10"



SCALE: 1" = 100'

SURVEYOR:
F.M.S. SURVEYING
19701 STATE HIGHWAY 6,
MANVEL, TEXAS 77578
CONTACT: JASON P. SHERIDAN
PHONE: (281) 519-8530, EXT. 102
TBPLS FIRM # 10040400
www.fmssurveying.com
FMS No. 66100
DRAFTING: REC



5,597 SQUARE FEET
OUT OF LOT SEVEN (7), BLOCK
ONE (1), MUSTANG MEADOWS.
SECTION ONE (1), A
SUBDIVISION IN GALVESTON
COUNTY, TEXAS IN THE R.
HOPPEL SURVEY, ABSTRACT
83 AND SARAH MCKISSICK
LEAGUE, ABSTRACT 151,
ACCORDING TO MAP OR PLAT
THEREOF RECORDED IN
VOLUME 15, PAGE 14 OF THE
MAP RECORDS OF
GALVESTON COUNTY, TEXAS.

FEBRUARY 11, 2022

SHEET 1 OF 2

EXHIBIT "B"

METES & BOUNDS DESCRIPTION

OF

a 5,597 square foot tract of land for the purposes of partial vacation of a 20' Drainage Easement and 10' Drainage Access Easement for Maintenance on Lot seven (7), Block one (1), Mustang Meadows, Section one (1), recorded under Volume 15, Page 14 (Vol. Pg.) Galveston County Map Records (G.C.M.R.), out of and being part of that certain tract of land described in deed to Ross H. Eubanks and Kerrie Eubanks under Galveston County Clerk's File Number (G.C.C.F. No.) 2021058843, being situated in the R. Hoppel Survey, Abstract Number 83 and Sarah McKissick League, Abstract Number 151, with said 5,597 square foot tract of land being further described in metes and bounds as follows:

COMMENCING at a 1/2 iron pipe found at the South corner of Lot 7, at the Southeast corner of a certain tract of land described in deed to Jeffrey E. Fiesinger and Spouse Kelly M. Fiesinger, recorded under Galveston County Clerk's File Number (G.C.C.F. No.) 2012042629, Official Public Records Galveston County Texas (O.P.R.G.C.Tx.) and being Lot 8 of Mustang Meadows, Section 1, Block 1, in the North line of Section 3, Wilderness Trails, recorded under Volume 18, Page 293 (G.C.M.R.);

THENCE: N 47°47'50" W, along and with the East line of the Fiesinger tract and the West line of the Eubanks tract, and to the South right-of-way line of Falling Leaf Drive (called 60 feet in width), as shown on map recorded under Vol. 15, Pg. 14 G.C.M.R., a distance 293.84 feet to a Point for Corner, same being the Northwest corner of the Eubanks tract and the Northeast corner of the Fiesinger tract, from which bears a 1/2-inch iron pipe S 47°53'15" E, a distance of 0.39 feet;

THENCE: N 41°34'37" E, departing from the Northwest corner of the Eubanks tract and Northeast corner of the Fiesinger tract, along and with the North line of the Eubanks tract and South right-of-way line of Falling Leaf Drive, a distance of 110.00 feet to a 1/2-inch iron rod found disturbed and the beginning of a curve to the right;

THENCE: continuing along said curve and with the North line of the Eubanks tract and the South right-of-way line of Falling Leaf Drive, having a radius of 492.25 feet, a chord bearing of N 55°51'26" E, a chord distance of 243.44 feet to a Point for Corner, same being the Northwest corner and **POINT OF BEGINNING** of the herein described tract;

THENCE: continuing along the curve to the right, along and with the North line of the Eubanks tract and the South line of Falling Leaf Drive right-of-way, said curve having a radius of 492.25 feet, a chord bearing of N 72°14'09" E, a chord distance of 34.85 feet to a Point for Corner, same being the Northeast corner of this tract;

THENCE: S 48°20'25" E, departing from the South right-of-way line of Falling Leaf Drive, crossing a Partial abandonment of a 40 foot Pipeline Easement on Lot 7, Block 1 of said Mustang Meadows Subdivision, recorded under G.C.C.F. No. 2021056776, (O.P.R.G.C.Tx.), along and with the East line of this tract, a distance of 177.76 feet to a Point for Corner, same being the Southeast corner of the herein described tract;

THENCE: S 41°51'49" W, along and with the Southeast line of this tract, a distance of 30.00 feet to a Point for Corner, same being the Southwest corner of this tract;

THENCE: N 48°20'25" W, along and with the Southwest line of this tract, crossing said 40 foot Partial Abandoned Pipeline Easement, a distance of 195.38 feet to a point for corner and **POINT OF BEGINNING** and containing 5,597 square feet of land.

Scott R. Sheridan

Scott R. Sheridan
Registered Professional
Land Surveyor No. 6171



FEBRUARY 11, 2022

SURVEYOR:
F.M.S. SURVEYING
19701 STATE HIGHWAY 6,
MANVEL, TEXAS 77578
CONTACT: JASON P. SHERIDAN
PHONE: (281) 519-8530, EXT. 102
TBPLS FIRM # 10040400
www.fmssurveying.com
FMS No. 66100
DRAFTING: REC



SHEET 2 OF 2

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 04/21/2022

Prepared by: Karen Horner, City Attorney

Subject: Consider the first reading of an ordinance amending Chapter 82 "Traffic and Vehicles," Article I "In General," Section 82-1 "Unreasonable acceleration" of the Friendswood City Code to add an offense for unreasonable acceleration.

Originating Department: City Attorney

Degree of importance:

SUMMARY / ORIGINATING CAUSE

This is the first reading of an ordinance amending Chapter 82 "Traffic and Vehicles," Article I "In General," Section 82-1 "Unreasonable acceleration" of the Friendswood City Code to add an offense for unreasonable acceleration. When this section of the Code was amended last, the ordinance added definitions and established prima facie evidence for the offense of unreasonable acceleration; however, the ordinance inadvertently removed the offense. This is just a clean-up item to add the offense back into Section 82-1.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

Staff recommends approval.

ATTACHMENTS

1. Ordinance - Acceleration

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, TEXAS, AMENDING CHAPTER 82 "TRAFFIC AND VEHICLES," ARTICLE I "IN GENERAL," SECTION 82-1 "UNREASONABLE ACCELERATION" OF THE FRIENDSWOOD CITY CODE TO PROHIBIT UNREASONABLE ACCELERATION ON THE HIGHWAYS, STREETS AND ROADS WITHIN THE CORPORATE CITY LIMITS OF FRIENDSWOOD; PROVIDING A PENALTY OF AN AMOUNT NOT TO EXCEED TWO THOUSAND AND NO/100 DOLLARS (\$2,000.00) FOR EACH VIOLATION OF ANY PROVISION HEREOF; REPEALING ALL ORDINANCES OR PARTS OF ORDINANCES INCONSISTENT OR IN CONFLICT HERewith; PROVIDING FOR SEVERABILITY, PUBLICATION AND THE EFFECTIVE DATE.

WHEREAS, unreasonable acceleration, as defined in this ordinance, hereby constitutes a public nuisance and shall be prohibited; and

WHEREAS, unreasonable acceleration on city streets also constitutes a traffic safety hazard to other drivers and pedestrians; and

WHEREAS, the City Council has determined that prohibiting unreasonable acceleration is necessary for the health, safety, and welfare of the citizens of Friendswood; NOW THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD, STATE OF TEXAS, THAT:

Section 1. The facts and matters set forth in the preamble of this ordinance are hereby found to be true and correct.

Section 2. That Chapter 82 "Traffic and Vehicles," Article I "In General," Section 82-1 "Unreasonable Acceleration" of the Friendswood City Code is hereby amended to read as follows:

CHAPTER 82. TRAFFIC AND VEHICLES

ARTICLE I. IN GENERAL

Sec. 82-1. Unreasonable acceleration.

- (a) Offense. It shall be unlawful for any operator or driver of any motor vehicle to operate or drive such vehicle in any manner which causes unreasonable acceleration while driving or operating any such vehicle on a public street or roadway within the city.

((a)b) *Definition.*

"Unreasonable acceleration," as used in this section, means:

1. Acceleration which spins a tire or tires resulting in the breaking of traction between a tire or tires and the street surface; and
2. Is accomplished in such a manner as to cause:
 - a. A squealing or screeching sound by the tires; or
 - b. The throwing of sand or gravel by the tires of the vehicle; or
 - c. Both.

((b)c) *Evidence.* The squealing or screeching sounds emitted by the tires or the throwing of sand or gravel by the tires, or both shall constitute prima facie evidence of such unreasonable acceleration for purposes of this Article.

Section 3. Any person who shall violate any provision of this Ordinance shall be deemed guilty of a Class C misdemeanor and shall, upon conviction thereof, be fined in an amount not to exceed TWO THOUSAND AND NO/100 DOLLARS (\$2,000.00). Each day in which any violation shall occur, or each occurrence of any violation, shall constitute a separate offense.

Section 4. All ordinances or parts of ordinances inconsistent or in conflict herewith are, to the extent of such inconsistency, hereby repealed.

Section 5. In the event any clause phrase, provision, sentence, or part of this Ordinance or the application of the same to any person or circumstances shall for any reason be adjudged invalid or held unconstitutional by a court of competent jurisdiction, it shall not affect, impair, or invalidate this Ordinance as a whole or any part or provision hereof other than the part declared to be invalid or unconstitutional; and the City Council of the City of Friendswood, Texas, declares that it would have passed each and every part of the same notwithstanding the omission of any such part thus declared to be invalid or unconstitutional, whether there be one or more parts.

Section 6. That this ordinance shall become effective from and after its date of passage and its publication, as provided by law.

PASSED and APPROVED on first reading this 2nd day of May, 2022.

MIKE FOREMAN, Mayor

ATTEST:

RENEE KROSS, Deputy City Secretary

APPROVED AS TO FORM:

KAREN HORNER, City Attorney

PASSED, APPROVED and ADOPTED on second and final reading this 11th day of July, 2022.

MIKE FOREMAN, Mayor

ATTEST:

LETICIA BRYSCH, City Secretary

APPROVED AS TO FORM:

KAREN HORNER City Attorney

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 05/13/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider excusing City Manager Morad Kabiri's absence from the May 18, 2022, Special City Council Meeting.

Originating Department: City Manager

Degree of importance:

SUMMARY / ORIGINATING CAUSE

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 05/24/2022

Prepared by: Leticia Brysch, City Secretary

Subject: Consider the reappointment of Judge James Woltz and Associate Judge Robert J. Barfield to serve another two-year term as municipal judges for the City of Friendswood, for a term beginning July 1, 2022, and ending June 30, 2024.

Originating Department: City Secretary

Degree of importance: Needed to complete operational and ministerial duties of the court.

SUMMARY / ORIGINATING CAUSE

This item reappoints Judge James Woltz and Associate Judge Robert J. Barfield to serve another two-year term as municipal judges for the City of Friendswood, for a term beginning July 1, 2022, and ending June 30, 2024.

Section 4.02(b) and (c) of the City's Charter state, in part, as follows:

"The Judge of said court shall be appointed by Council to serve for a term of two years."

and

"The Council may appoint such Associate or Alternate Judges of said court as shall be deemed necessary and appropriate by said Council. Associate or Alternate Judges shall be appointed for terms and shall possess the same qualifications as are required of the regular Judge of said court."

Both Judge Woltz and Barfield have agreed to serve another two-year term.

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

Staff recommends approval.

ATTACHMENTS

FRIENDSWOOD CITY COUNCIL AGENDA ITEM FORM

This form should be completed and forwarded to the City Manager's Office as soon as possible prior to the first date that the item is expected to be placed on the Friendswood City Council agenda.

Date requested for City Council consideration: June 6, 2022

Date submitted: 03/24/2022

Prepared by: Glenda Faulkner, Executive Secretary

Subject: Consider accepting the April 2022 tax report.

Originating Department: City Manager

Degree of importance:

SUMMARY / ORIGINATING CAUSE

IMMINENT CONSEQUENCES / BENEFIT TO COMMUNITY

RECOMMENDATIONS

ATTACHMENTS

1. Gal Co Tax April 2022



Cheryl E. Johnson, PCC
Assessor and Collector of Taxes
County of Galveston
722 Moody Avenue, Galveston, Texas 77550
Toll Free (877) 766-2284 Fax: (409) 766-2479
Email: galcotax@co.galveston.tx.us



May 9, 2022

The Governmental Entities of the Galveston County Tax Assessor/Collector's Office:

I, Cheryl E. Johnson, Tax Assessor and Collector of the County of Galveston do solemnly swear that this statement of collections made by me and the disposition thereof during the month of April, 2022 is true and correct.

Under my hand and seal this 9th day of May, 2022.

Cheryl E. Johnson, PCC
Galveston County Tax Assessor/Collector

cc: Randall Rice, County Auditor
Linebarger, Goggan, Blair, & Simpson
Perdue, Brandon, Fielder, Collins, & Mott
Assessment & Collection Partners:

City of Bayou Vista
City of Clear Lake Shores (delinquent)
City of Dickinson
City of Friendswood
City of Galveston
City of Hitchcock
City of Jamaica Beach
City of Kemah
City La Marque
City of League City
City of Santa Fe
City of Texas City
City of Tiki Island
Dickinson Independent School District
Galveston Independent School District
High Island Independent School District
Hitchcock Independent School District
College of the Mainland

Galveston Community College
GC Drainage District No. 1
GC Drainage District No. 2
GC Emergency Services Dist. No. 1
GC Emergency Services Dist. No. 2
GC Fresh Water Supply Dist. No. 6
Bacliff MUD
Bayview MUD
Galveston County MUD No. 12
Galveston County MUD No. 13
Galveston County MUD No. 44
San Leon MUD
Tara Glen MUD
GC Navigation District No. 1
WCID No. 1
WCID No. 12
WCID No. 19
Westwood Management District

05/02/2022 12:24:18 4004497
TC298-D DEPOSIT
RECEIPT DATE: ALL
LOCATION: ALL

TAX COLLECTION SYSTEM
DEPOSIT DISTRIBUTION
FROM: 04/01/2022 THRU 04/30/2022
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 33
INCLUDES AG ROLLBACK

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIF AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
2021	M & O	.385147	101,360.93	.00	8,190.86	.00	109,551.79	80.69	.00	.00	109,632.48
	I & S	.102167	26,887.75	.00	2,172.76	.00	29,060.51	.00	.00	.00	29,060.51
	TOTAL	.487314	128,248.68	.00	10,363.62	.00	138,612.30	80.69	.00	.00	138,692.99
2020	M & O	.392153	2,943.95	.00	693.20	.00	3,637.15	746.93	.00	.00	4,384.08
	I & S	.095161	714.37	.00	168.22	.00	882.59	.00	.00	.00	882.59
	TOTAL	.487314	3,658.32	.00	861.42	.00	4,519.74	746.93	.00	.00	5,266.67
2019	M & O	.432160	151.19	.00	58.45	.00	209.64	50.27	.00	.00	259.91
	I & S	.089279	31.24	.00	12.07	.00	43.31	.00	.00	.00	43.31
	TOTAL	.521439	182.43	.00	70.52	.00	252.95	50.27	.00	.00	303.22
2018	M & O	.437173	1.36	.00	.00	.00	1.36	.00	.00	.00	1.36
	I & S	.095218	.29	.00	.00	.00	.29	.00	.00	.00	.29
	TOTAL	.532391	1.65	.00	.00	.00	1.65	.00	.00	.00	1.65
2017	M & O	.432349	1.34	.00	.00	.00	1.34	.00	.00	.00	1.34
	I & S	.095000	.29	.00	.00	.00	.29	.00	.00	.00	.29
	TOTAL	.527349	1.63	.00	.00	.00	1.63	.00	.00	.00	1.63
2016	M & O	.462000	1.44	.00	.00	.00	1.44	.00	.00	.00	1.44
	I & S	.084000	.26	.00	.00	.00	.26	.00	.00	.00	.26
	TOTAL	.546000	1.70	.00	.00	.00	1.70	.00	.00	.00	1.70
2015	M & O	.497200	1.53	.00	.00	.00	1.53	.00	.00	.00	1.53
	I & S	.071500	.23	.00	.00	.00	.23	.00	.00	.00	.23
	TOTAL	.568700	1.76	.00	.00	.00	1.76	.00	.00	.00	1.76
2014	M & O	.530300	1.64	.00	.00	.00	1.64	.00	.00	.00	1.64
	I & S	.061100	.19	.00	.00	.00	.19	.00	.00	.00	.19
	TOTAL	.591400	1.83	.00	.00	.00	1.83	.00	.00	.00	1.83
2013	M & O	.530300	1.64	.00	.00	.00	1.64	.00	.00	.00	1.64
	I & S	.061100	.19	.00	.00	.00	.19	.00	.00	.00	.19
	TOTAL	.591400	1.83	.00	.00	.00	1.83	.00	.00	.00	1.83
ALL	M & O		104,465.02	.00	8,942.51	.00	113,407.53	877.89	.00	.00	114,285.42
ALL	I & S		27,634.81	.00	2,353.05	.00	29,987.86	.00	.00	.00	29,987.86
ALL	TOTAL		132,099.83	.00	11,295.56	.00	143,395.39	877.89	.00	.00	144,273.28
DLQ	M & O		3,104.09	.00	751.65	.00	3,855.74	797.20	.00	.00	4,652.94
DLQ	I & S		747.06	.00	180.29	.00	927.35	.00	.00	.00	927.35
DLQ	TOTAL		3,851.15	.00	931.94	.00	4,783.09	797.20	.00	.00	5,580.29

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TAX COLLECTION SYSTEM

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TC298-D SELECTION: DEPOSIT
RECEIPT DATE: ALL
LOCATION: ALL

DEPOSIT DISTRIBUTION
FROM: 04/01/2022 THRU 04/30/2022
JURISDICTION: 0337 FRIENDWD CITY

INCLUDES AG ROLLBACK

YEAR	FUND	TAX RATE	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	TIP AMOUNT	DISBURSE TOTAL	ATTORNEY	OTHER FEES	REFUND AMOUNT	PAYMENT AMOUNT
CURR M & O			101,360.93	.00	8,190.86	.00	109,551.79	80.69	.00	.00	109,632.48
CURR I & S			26,887.75	.00	2,172.76	.00	29,060.51	.00	.00	.00	29,060.51
CURR TOTAL			128,248.68	.00	10,363.62	.00	138,612.30	80.69	.00	.00	138,692.99

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TC298-M SELECTION: DEPOSIT

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TAX COLLECTION SYSTEM
DEPOSIT DISTRIBUTION
REVERSAUS DETAIL SCHEDULE

JURISDICTION: 337 FRIENDWD CITY
FROM: 04/01/2022 THRU 04/30/2022

PAGE: 75
INCLUDES AG ROLBACK

YEAR	DEPOSIT	ACCOUNT NUMBER	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	ATTORNEY CAUSE / REV	REFUND AMOUNT	PAYMENT AMOUNT CAT
2020	929041222T	1022320000014	127.40-	0.00	11.47-	0.00 CERT	0.00	138.87-TR
2020	929041222T	732658	266.43-	0.00	18.65-	0.00 20S2	0.00	285.08-TR
2020 TOTAL			393.83-	0.00	30.12-	0.00	0.00	423.95-
2021	RF220420	1000420000007	706.46-	0.00	0.00	0.00 HK08	706.46	0.00 RF
2021	RF220420	1000420000007	0.00	0.00	0.00	0.00 HK08	706.46-	706.46-RF
2021	RF220420	1004130000002	0.00	0.00	0.00	0.00 HK08	122.42-	122.42-RF
2021	RF220420	1004130000002	122.42-	0.00	0.00	0.00 HK08	122.42	0.00 RF
2021	849976040522	1022300000020	105.25-	0.00	0.00	0.00 CERT	0.00	105.25-TR
2021	849976040522	1022300000020	988.67-	0.00	108.76-	0.00 CERT	0.00	1,097.43-TR
2021	849988040722	1043990000042	176.49-	0.00	0.00	0.00 HK08	176.49	0.00 RF
2021	RF220420	1050090000023	0.00	0.00	0.00	0.00 HK08	176.49-	176.49-RF
2021	RF220420	1050090000023	0.00	0.00	0.00	0.00 HK08	199.17	0.00 RF
2021	RF220420	1057810000014	0.00	0.00	0.00	0.00 HK08	199.17-	199.17-RF
2021	RF220420	1057810000014	0.00	0.00	0.00	0.00 HK08	181.97-	181.97-RF
2021	RF220420	1063160000022	0.00	0.00	0.00	0.00 HK08	181.97	0.00 RF
2021	RF220420	1063160000022	1,491.66-	0.00	0.00	0.00 HK08	1,491.66	0.00 RF
2021	RF220420	1408520010001	0.00	0.00	0.00	0.00 HK08	1,491.66-	1,491.66-RF
2021	RF220420	1408520010001	0.00	0.00	352.12-	0.00 CERT	0.00	1,491.66-TR
2021	763040822T	146570	3,912.38-	0.00	19.53-	0.00 CERT	0.00	4,264.50-TR
2021	763041222T	168022	1,096.61-	0.00	5.42-	0.00 CERT	0.00	1,116.14-TR
2021	902041322T	168292	49.20-	0.00	0.00	0.00 CERT	0.00	54.62-TR
2021	RF220421	168960	147.91-	0.00	0.00	0.00 CERT	147.91	0.00 RF
2021	RF220428	168983	0.00	0.00	0.00	0.00 CERT	147.91-	147.91-RF
2021	RF220428	168983	404.47-	0.00	0.00	0.00 CERT	404.47-	404.47-TR
2021	763040822T	200322	1,115.75-	0.00	100.42-	0.00 CERT	0.00	1,216.17-TR
2021	864042222CHC	201743	1,330.61-	0.00	146.37-	221.55-CERT16TX048	0.00	1,698.53-TR
2021	763040722T	202276	2,049.30-	0.00	184.43-	0.00 CERT	0.00	2,233.73-TR
2021	763040722T	202937	533.92-	0.00	48.05-	0.00 CERT	0.00	581.97-TR
2021	RF220428	233467	0.00	0.00	0.00	0.00 CERT	382.86-	0.00 RF
2021	RF220428	233467	382.86-	0.00	102.00-	0.00 CERT	382.86	0.00 RF
2021	763040822T	306955	1,133.21-	0.00	1.91-	0.00 CERT	0.00	1,235.21-TR
2021	763040822T	306955	21.18-	0.00	122.03-	0.00 CERT	0.00	23.09-TR
2021	763040722T	351128	1,355.91-	0.00	61.27-	0.00 CERT	0.00	1,477.94-TR
2021	763040822T	400276	680.66-	0.00	0.00	0.00 CERT	0.00	741.93-TR
2021	RF220428	434316	0.00	0.00	0.00	0.00 CERT	891.79-	891.79-RF
2021	RF220428	434316	891.79-	0.00	0.00	0.00 CERT	891.79	0.00 RF
2021	763040822T	729973	4,922.60-	0.00	0.00	0.00 CERT	0.00	4,922.60-TR
2021	763040722T	731093	2,391.57-	0.00	215.24-	0.00 CERT	0.00	2,606.81-TR
2021	763041222T	734026	1,809.77-	0.00	0.00	0.00 CERT	0.00	1,809.77-TR
2021	RF220420	H0343042	158.88-	0.00	0.00	0.00 HK08	158.88	0.00 RF
2021	RF220420	H0343042	0.00	0.00	0.00	0.00 HK08	158.88-	158.88-RF
2021	763041222T	H2099715	242.34-	0.00	0.00	0.00 CERT	0.00	242.34-TR

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TC298-M SELECTION: DEPOSIT

4004497

TAX COLLECTION SYSTEM
DEPOSIT DISTRIBUTION
REVERSALS DETAIL, SCHEDULE
FROM: 04/01/2022 THRU 04/30/2022
JURISDICTION: 337 FRIENDMD CITY

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INCLUDES AG ROLLBACK

YEAR DEPOSIT	ACCOUNT NUMBER	EFF YR/MO	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	ATTORNEY CAUSE /REV	REFUND AMOUNT	PAYMENT AMOUNT CAT
	2021 TOTAL		28,603.01-	0.00	1,467.55-	221.55-	0.00	30,292.11-
	TOTAL REVERSALS		28,996.84-	0.00	1,497.67-	221.55-	0.00	30,716.06-

4004497

TAX COLLECTION SYSTEM
DEPOSIT DISTRIBUTION
SUMMARY OF PAYMENTS AND REVERSALS
FROM: 04/01/2022 THRU 04/30/2022
JURISDICTION: 337 FRIENDWD CITY

PAGE: 16
INCLUDES AG ROLLBACK

YEAR DEPOSIT	ACCOUNT NUMBER	EFF YR/MO	LEVY PAID	DISCOUNT GIVEN	PENALTY INTEREST	ATTORNEY CAUSE /REV	REFUND AMOUNT	PAYMENT AMOUNT
2013 TOTAL			1.83	0.00	0.00	0.00	0.00	1.83
2014 TOTAL			1.83	0.00	0.00	0.00	0.00	1.83
2015 TOTAL			1.76	0.00	0.00	0.00	0.00	1.76
2016 TOTAL			1.70	0.00	0.00	0.00	0.00	1.70
2017 TOTAL			1.63	0.00	0.00	0.00	0.00	1.63
2018 TOTAL			1.65	0.00	0.00	0.00	0.00	1.65
2019 TOTAL			182.43	0.00	70.52	50.27	0.00	303.22
2020 TOTAL			4,052.15	0.00	891.54	746.93	0.00	5,690.62
2021 TOTAL			156,851.69	0.00	11,831.17	302.24	0.00	168,985.10
TOTAL PAYMENTS			161,096.67	0.00	12,793.23	1,099.44	0.00	174,989.34
2020 TOTAL			393.83-	0.00	30.12-	0.00	0.00	423.95-
2021 TOTAL			28,603.01-	0.00	1,467.55-	221.55-	0.00	30,292.11-
TOTAL REVERSALS			28,996.84-	0.00	1,497.67-	221.55-	0.00	30,716.06-
TOTAL FOR UNIT			132,099.83	0.00	11,295.56	877.89	0.00	144,273.28

FISCAL START: 08/01/2021 END: 07/31/2022 JURISDICTION: 0337 FRIENDWD CITY

	CERT TAXABLE VALUE	ADJUSTMENTS	ADJ TAX VALUE	TAX RATE	TAX LEVY	PAID ACCTS
CURRENT YEAR	4,214,667,192	226,869,582	4,441,536,774	00.487314	20,915,105.24	16,346

YEAR	TAXES DUE	MONTH ADJ	ADJUSTMENT YTD	LEVY PAID	PAID YTD	BALANCE	COLL %	YTD UNCOLL
2021	19,829,708.43	1,085,396.81	1,085,396.81	20,311,200.77	20,311,200.77	603,904.47	97.11	0.00
2020	163,896.15	21,031.66-	21,031.66-	88,614.76	88,614.76	54,249.73	62.03	0.00
2019	51,659.09	4,827.51-	4,827.51-	10,528.60	10,528.60	36,302.98	22.48	0.04-
2018	26,368.69	1,116.38-	1,116.38-	3,966.31	3,966.31	21,286.00	15.71	0.00
2017	16,281.55	65.92-	65.92-	2,363.41	2,363.41	13,852.22	14.57	0.00
2016	14,103.51	123.32-	123.32-	1,692.46	1,692.46	12,287.73	12.11	123.32-
2015	13,124.77	.00	0.00	788.00	788.00	12,336.77	6.00	0.00
2014	13,834.13	.00	0.00	901.67	901.67	12,932.46	6.52	0.00
2013	10,663.54	.00	0.00	671.50	671.50	9,992.04	6.30	0.00
2012	10,529.67	.00	0.00	646.22	646.22	9,883.45	6.14	0.00
2011	9,853.75	.00	0.00	553.03	553.03	9,300.72	5.61	0.00
2010	4,816.43	188.90-	188.90-	584.02	584.02	4,043.51	12.62	188.90-
2009	6,212.93	145.52-	145.52-	577.02	577.02	5,490.39	9.51	145.52-
2008	5,594.70	625.90-	625.90-	559.84	559.84	4,408.96	11.27	625.90-
2007	1,976.80	622.34-	622.34-	9.28	9.28	1,345.18	.69	622.34-
2006	2,757.39	.00	0.00	0.00	0.00	2,757.39		0.00
2005	1,421.45	.00	0.00	122.84	122.84	1,298.61	8.64	0.00
2004	640.47	.00	0.00	0.00	0.00	640.47		0.00
2003	647.12	.00	0.00	0.00	0.00	647.12		0.00
2002	924.85	412.09-	412.09-	0.00	0.00	512.76		412.09-
2001	941.66	412.09-	412.09-	0.00	0.00	529.57		412.09-
2000	510.23	412.09-	412.09-	0.00	0.00	98.14		412.09-
****	20,186,467.31	1,055,413.09	1,055,413.09	20,423,779.73	20,423,779.73	818,100.67		2,942.29-

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2021
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 234
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	5,827,810,207	5,827,810,207	63,624,385	292,613-	63,331,772	5,891,141,979
AG EXCLUSION	33,691,313	33,691,313	204,734	0	204,734	33,896,047
IMPROVEMENTS	775,157,465	775,157,465	232,582,618	13,341,602-	219,241,016	994,398,481
APPRAISED VALUE	5,827,810,207	5,827,810,207	296,207,003	13,634,215-	282,572,788	6,110,382,995
EXEMPTIONS	1,579,451,702	1,579,451,702	49,879,334	5,823,872	55,703,206	1,635,154,908
TAXABLE VALUE	4,214,667,192	4,214,667,192	246,327,669	19,458,087-	226,869,582	4,441,536,774
LEVY	19,829,708.43	19,829,708.43	1,413,915.19	328,518.38-	1,085,396.81	20,915,105.24
UNCOLLECTIBLE	.00	.00	.00	.00	.00	.00
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	10,298	10,298	539	56	59	10,357
OVER 65	3,255	3,255	159	39	40	3,295
DISABLED	181	181	8	3	5	186
VETERAN	240	240	16	3	3	243
TOTAL EXEMPT	84	84	0	0	0	84

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2020
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 235
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	5,043,274,252	5,043,274,252	0	0	0	5,043,274,252
AG EXCLUSION	27,337,308	27,337,308	0	0	0	27,337,308
IMPROVEMENTS	706,413,340	706,413,340	203,488	2,196,991-	1,993,503-	704,419,837
APPRAISED VALUE	5,043,274,252	5,043,274,252	203,488	2,196,991-	1,993,503-	5,041,280,749
EXEMPTIONS	1,218,139,975	1,218,139,975	203,488	2,808,277	3,011,765	1,221,151,740
TAXABLE VALUE	3,797,796,969	3,797,796,969	0	5,005,268-	5,005,268-	3,792,791,701
LEVY	163,896.15	163,896.15	.00	21,031.66-	21,031.66-	142,864.49
UNCOLLECTIBLE	.00	.00	.00	.00	.00	.00
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	10,220	10,220	0	36	36	10,256
OVER 65	3,163	3,163	0	17	17	3,180
DISABLED	182	182	0	1	1	183
VETERAN	221	221	0	2	2	223
TOTAL EXEMPT	80	80	0	0	0	80

ALL PROPERTY

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	4,537,437,822	4,537,437,822	0	0	0	4,537,437,822
AG EXCLUSION	24,683,691	24,683,691	0	0	0	24,683,691
IMPROVEMENTS	645,931,872	645,931,872	1,281,775	175,984-	1,105,791	647,037,663
APPRAISED VALUE	4,537,437,822	4,537,437,822	1,281,775	175,984-	1,105,791	4,538,543,613
EXEMPTIONS	1,018,439,121	1,018,439,121	1,281,775	1,279,603	2,561,378	1,021,000,499
TAXABLE VALUE	3,494,315,010	3,494,315,010	0	1,455,587-	1,455,587-	3,492,859,423
LEVY	51,659.09	51,659.09	.00	4,827.51-	4,827.51-	46,831.58
UNCOLLECTIBLE	.00	.04	.00	.00	.00	.04
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	10,000	10,000	0	15	15	10,015
OVER 65	2,975	2,975	0	7	7	2,982
DISABLED	181	181	0	1	1	182
VETERAN	205	205	0	2	2	207
TOTAL EXEMPT	74	74	0	0	0	74

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2018
JURISDICTION: 0337 FRIENDWD CITY

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	4,207,374,518	4,207,374,518	0	0	0	4,207,374,518
AG EXCLUSION	23,842,910	23,842,910	0	0	0	23,842,910
IMPROVEMENTS	617,900,409	617,900,409	0	1,800-	1,800-	617,898,609
APPRAISED VALUE	4,207,374,518	4,207,374,518	0	1,800-	1,800-	4,207,372,718
EXEMPTIONS	891,117,422	891,117,422	0	207,716	207,716	891,325,138
TAXABLE VALUE	3,292,414,186	3,292,414,186	0	209,516-	209,516-	3,292,204,670
LEVY	26,368.69	26,368.69	.00	1,116.38-	1,116.38-	25,252.31
UNCOLLECTIBLE	.00	.00	.00	.00	.00	.00
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	10,001	10,001	0	3	3	10,004
OVER 65	2,897	2,897	0	3	3	2,900
DISABLED	0	0	0	0	0	0
VETERAN	204	204	0	2	2	206
TOTAL EXEMPT	0	0	0	0	0	0

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2017
JURISDICTION: 0337 FRIENDWD CITY

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INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	4,271,816,787	4,271,816,787	0	0	0	4,271,816,787
AG EXCLUSION	18,989,755	18,989,755	0	0	0	18,989,755
IMPROVEMENTS	615,911,811	615,911,811	0	0	0	615,911,811
APPRAISED VALUE	4,271,816,787	4,271,816,787	0	0	0	4,271,816,787
EXEMPTIONS	988,826,434	988,826,434	0	12,500	12,500	988,838,934
TAXABLE VALUE	3,264,000,598	3,264,000,598	0	12,500-	12,500-	3,263,988,098
LEVY	16,281.55	16,281.55	.00	65.92-	65.92-	16,215.63
UNCOLLECTIBLE	.00	.00	.00	.00	.00	.00
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	10,005	10,005	0	0	0	10,005
OVER 65	2,854	2,854	0	0	0	2,854
DISABLED	0	0	0	0	0	0
VETERAN	207	207	0	2	2	209
TOTAL EXEMPT	647	647	0	0	0	647

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2016
JURISDICTION: 0337 FRIENDWD CITY

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INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	3,999,127,118	3,999,127,118	0	0	0	3,999,127,118
AG EXCLUSION	13,436,213	13,436,213	0	0	0	13,436,213
IMPROVEMENTS	569,888,011	569,888,011	0	0	0	569,888,011
APPRAISED VALUE	3,999,127,118	3,999,127,118	0	0	0	3,999,127,118
EXEMPTIONS	968,850,710	968,850,710	0	0	0	968,850,710
TAXABLE VALUE	3,016,840,195	3,016,840,195	0	0	0	3,016,840,195
LEVY	14,103.51	14,103.51	.00	123.32-	123.32-	13,980.19
UNCOLLECTIBLE	.00	123.32	.00	.00	.00	123.32
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	9,913	9,913	0	0	0	9,913
OVER 65	2,721	2,721	0	0	0	2,721
DISABLED	0	0	0	0	0	0
VETERAN	242	242	0	0	0	242
TOTAL EXEMPT	642	642	0	0	0	642

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2010
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 240
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	3,002,750,969	3,002,750,969	0	0	0	3,002,750,969
AG EXCLUSION	26,708,568	26,708,568	0	0	0	26,708,568
IMPROVEMENTS	0	0	0	0	0	0
APPRAISED VALUE	3,002,750,969	3,002,750,969	0	0	0	3,002,750,969
EXEMPTIONS	694,556,367	694,556,367	0	0	0	694,556,367
TAXABLE VALUE	2,281,486,034	2,281,486,034	0	0	0	2,281,486,034
LEVY	4,816.43	4,816.43	.00	188.90-	188.90-	4,627.53
UNCOLLECTIBLE	.00	188.90	.00	.00	.00	188.90
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	9,651	9,651	0	0	0	9,651
OVER 65	2,079	2,079	0	0	0	2,079
DISABLED	176	176	0	0	0	176
VETERAN	180	180	0	0	0	180
TOTAL EXEMPT	598	598	0	0	0	598

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2009
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 241
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	2,942,056,457	2,942,056,457	0	0	0	2,942,056,457
AG EXCLUSION	23,103,283	23,103,283	0	0	0	23,103,283
IMPROVEMENTS	0	0	0	0	0	0
APPRAISED VALUE	2,942,056,457	2,942,056,457	0	0	0	2,942,056,457
EXEMPTIONS	667,628,670	667,628,670	0	0	0	667,628,670
TAXABLE VALUE	2,251,324,504	2,251,324,504	0	0	0	2,251,324,504
LEVY	6,212.93	6,212.93	.00	145.52-	145.52-	6,067.41
UNCOLLECTIBLE	.00	145.52	.00	.00	.00	145.52
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	9,409	9,409	0	0	0	9,409
OVER 65	1,961	1,961	0	0	0	1,961
DISABLED	167	167	0	0	0	167
VETERAN	174	174	0	0	0	174
TOTAL EXEMPT	583	583	0	0	0	583

ALL PROPERTY

JURISDICTION: 0337 FRIENDWD CITY

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	2,345,825,847	2,345,825,847	0	0	0	2,345,825,847
AG EXCLUSION	20,583,444	20,583,444	0	0	0	20,583,444
IMPROVEMENTS	0	0	0	0	0	0
APPRAISED VALUE	2,345,825,847	2,345,825,847	0	0	0	2,345,825,847
EXEMPTIONS	514,930,336	514,930,336	0	0	0	514,930,336
TAXABLE VALUE	1,810,312,067	1,810,312,067	0	0	0	1,810,312,067
LEVY	5,594.70	5,594.70	.00	625.90-	625.90-	4,968.80
UNCOLLECTIBLE	.00	625.90	.00	.00	.00	625.90
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	7,211	7,211	0	1	1	7,212
OVER 65	1,423	1,423	0	0	0	1,423
DISABLED	98	98	0	1	1	99
VETERAN	127	127	0	0	0	127
TOTAL EXEMPT	517	517	0	0	0	517

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2007
JURISDICTION: 0337 FRIENDWD CITY

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	2,768,485,568	2,768,485,568	0	0	0	2,768,485,568
AG EXCLUSION	27,382,734	27,382,734	0	0	0	27,382,734
IMPROVEMENTS	0	0	0	0	0	0
APPRAISED VALUE	2,768,485,568	2,768,485,568	0	0	0	2,768,485,568
EXEMPTIONS	624,625,914	624,625,914	0	0	0	624,625,914
TAXABLE VALUE	2,116,476,920	2,116,476,920	0	0	0	2,116,476,920
LEVY	1,976.80	1,976.80	.00	622.34-	622.34-	1,354.46
UNCOLLECTIBLE	.00	622.34	.00	.00	.00	622.34
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	9,235	9,235	0	0	0	9,235
OVER 65	1,781	1,781	0	0	0	1,781
DISABLED	159	159	0	0	0	159
VETERAN	168	168	0	0	0	168
TOTAL EXEMPT	587	587	0	0	0	587

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2002
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 244
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	0	0	0	0	0	0
AG EXCLUSION	0	0	0	0	0	0
IMPROVEMENTS	0	0	0	0	0	0
APPRAISED VALUE	0	0	0	0	0	0
EXEMPTIONS	0	0	0	0	0	0
TAXABLE VALUE	0	0	0	0	0	0
LEVY	924.85	924.85	.00	412.09-	412.09-	512.76
UNCOLLECTIBLE	.00	412.09	.00	.00	.00	412.09
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	0	0	0	0	0	0
OVER 65	0	0	0	0	0	0
DISABLED	0	0	0	0	0	0
VETERAN	0	0	0	0	0	0
TOTAL EXEMPT	0	0	0	0	0	0

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2001
JURISDICTION: 0337 FRIENDWD CITY

PAGE: 245
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	0	0	0	0	0	0
AG EXCLUSION	0	0	0	0	0	0
IMPROVEMENTS	0	0	0	0	0	0
APPRAISED VALUE	0	0	0	0	0	0
EXEMPTIONS	0	0	0	0	0	0
TAXABLE VALUE	0	0	0	0	0	0
LEVY	941.66	941.66	.00	412.09-	412.09-	529.57
UNCOLLECTIBLE	.00	412.09	.00	.00	.00	412.09
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	0	0	0	0	0	0
OVER 65	0	0	0	0	0	0
DISABLED	0	0	0	0	0	0
VETERAN	0	0	0	0	0	0
TOTAL EXEMPT	0	0	0	0	0	0

ALL PROPERTY

TAX COLLECTION SYSTEM
SUPPLEMENTAL / ADJUSTMENT CONTROL TOTALS
FOR TAX YEAR: 2000
JURISDICTION: 0337 FRIENDSWOOD CITY

PAGE: 246
INCLUDES AG ROLLBACK

	CERTIFIED ROLL	ROLL AS OF 08/01/2021	SUPPLEMENTALS THIS PERIOD	ADJUSTMENTS THIS PERIOD	NET CHANGE THIS PERIOD	ROLL AS OF 04/30/2022
LAND VALUE	0	0	0	0	0	0
AG EXCLUSION	0	0	0	0	0	0
IMPROVEMENTS	0	0	0	0	0	0
APPRAISED VALUE	0	0	0	0	0	0
EXEMPTIONS	0	0	0	0	0	0
TAXABLE VALUE	0	0	0	0	0	0
LEVY	510.23	510.23	.00	412.09-	412.09-	98.14
UNCOLLECTIBLE	.00	412.09	.00	.00	.00	412.09
RECEIVABLE					.00	
EXEMPTION COUNTS:						
HOMESTEADS	0	0	0	0	0	0
OVER 65	0	0	0	0	0	0
DISABLED	0	0	0	0	0	0
VETERAN	0	0	0	0	0	0
TOTAL EXEMPT	0	0	0	0	0	0

Summary of Jurisdiction Remittances Processed

Report run on: May 2, 2022 4:52 PM

For Remitted Deposit Dates 04/01/2022 thru 04/30/2022 as of 05/02/2022

Ver. 1.52

Tax Unit		M & O Total	I & S Total	TIF Levy	TIF Interest	Fee Total	Total
337 FRIENDWD CITY							
ACH 75714	Print Date:04/07/2022						
	Current	7,494.94	1,988.16	0.00	0.00	0.00	9,483.10
	Delq	19.00	4.61	0.00	0.00	0.00	23.61
Last Deposit Date	04/01/2022	\$7,513.94	\$1,992.77	\$0.00	\$0.00	\$0.00	\$9,506.71
ACH 75751	Print Date:04/07/2022						
	Current	15,777.40	4,185.17	0.00	0.00	0.00	19,962.57
	Delq	152.68	37.06	0.00	0.00	0.00	189.74
Last Deposit Date	04/04/2022	\$15,930.08	\$4,222.23	\$0.00	\$0.00	\$0.00	\$20,152.31
ACH 75792	Print Date:04/07/2022						
	Current	3,993.52	1,059.37	0.00	0.00	0.00	5,052.89
	Delq	39.08	9.17	0.00	0.00	0.00	48.25
Last Deposit Date	04/05/2022	\$4,032.60	\$1,068.54	\$0.00	\$0.00	\$0.00	\$5,101.14
ACH 75828	Print Date:04/07/2022						
	Current	19,723.60	5,232.04	0.00	0.00	0.00	24,955.64
	Delq						
Last Deposit Date	04/06/2022	\$19,723.60	\$5,232.04	\$0.00	\$0.00	\$0.00	\$24,955.64
ACH 75865	Print Date:04/12/2022						
	Current	3,363.04	892.10	0.00	0.00	0.00	4,255.14
	Delq	208.30	43.03	0.00	0.00	0.00	251.33
Last Deposit Date	04/07/2022	\$3,571.34	\$935.13	\$0.00	\$0.00	\$0.00	\$4,506.47
ACH 75902	Print Date:04/12/2022						
	Current	5,979.95	1,586.30	0.00	0.00	0.00	7,566.25
	Delq	256.64	62.27	0.00	0.00	0.00	318.91
Last Deposit Date	04/08/2022	\$6,236.59	\$1,648.57	\$0.00	\$0.00	\$0.00	\$7,885.16
ACH 75937	Print Date:04/14/2022						
	Current	4,011.82	1,064.18	0.00	0.00	0.00	5,076.00
	Delq						
Last Deposit Date	04/11/2022	\$4,011.82	\$1,064.18	\$0.00	\$0.00	\$0.00	\$5,076.00
ACH 75967	Print Date:04/14/2022						
	Current	6,432.94	1,706.43	0.00	0.00	0.00	8,139.37
	Delq	904.85	219.58	0.00	0.00	0.00	1,124.43
Last Deposit Date	04/12/2022	\$7,337.79	\$1,926.01	\$0.00	\$0.00	\$0.00	\$9,263.80
ACH 76001	Print Date:04/18/2022						
	Current	1,371.91	363.94	0.00	0.00	0.00	1,735.85
	Delq	666.62	161.76	0.00	0.00	0.00	828.38
Last Deposit Date	04/13/2022	\$2,038.53	\$525.70	\$0.00	\$0.00	\$0.00	\$2,564.23
ACH 76040	Print Date:04/18/2022						
	Current	601.23	159.49	0.00	0.00	0.00	760.72
	Delq	7.04	1.25	0.00	0.00	0.00	8.29
Last Deposit Date	04/14/2022	\$608.27	\$160.74	\$0.00	\$0.00	\$0.00	\$769.01
ACH 76074	Print Date:04/19/2022						
	Current	15,670.98	4,157.02	0.00	0.00	0.00	19,828.00
	Delq	580.96	140.97	0.00	0.00	0.00	721.93
Last Deposit Date	04/18/2022	\$16,251.94	\$4,297.99	\$0.00	\$0.00	\$0.00	\$20,549.93

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Summary of Jurisdiction Remittances Processed

Report run on: May 2, 2022 4:52 PM

For Remitted Deposit Dates 04/01/2022 thru 04/30/2022 as of 05/02/2022

Ver. 1.52

Tax Unit		M & O Total	I & S Total	TIF Levy	TIF Interest	Fee Total	Total
337 FRIENDWD CITY							
ACH 76107	Print Date:04/20/2022						
	Current	835.07	221.52	0.00	0.00	0.00	1,056.59
Last Deposit Date	04/19/2022	\$835.07	\$221.52	\$0.00	\$0.00	\$0.00	\$1,056.59
ACH 76141	Print Date:04/21/2022						
	Current	5,806.10	1,540.16	0.00	0.00	0.00	7,346.26
Last Deposit Date	04/20/2022	\$5,806.10	\$1,540.16	\$0.00	\$0.00	\$0.00	\$7,346.26
ACH 76167	Print Date:04/25/2022						
	Current	7,127.30	1,890.65	0.00	0.00	0.00	9,017.95
Last Deposit Date	04/21/2022	\$7,127.30	\$1,890.65	\$0.00	\$0.00	\$0.00	\$9,017.95
ACH 76194	Print Date:04/25/2022						
	Current	403.58	107.06	0.00	0.00	0.00	510.64
Last Deposit Date	04/22/2022	\$403.58	\$107.06	\$0.00	\$0.00	\$0.00	\$510.64
ACH 76294	Print Date:05/02/2022						
	Current	10,958.41	2,906.92	0.00	0.00	0.00	13,865.33
	Delq	1,020.57	247.65	0.00	0.00	0.00	1,268.22
Last Deposit Date	04/29/2022	\$11,978.98	\$3,154.57	\$0.00	\$0.00	\$0.00	\$15,133.55
Total:		\$113,407.53	\$29,987.86	\$0.00	\$0.00	\$0.00	\$143,395.39