GEOTECHNICAL ENGINEERING REPORT

Proposed Development at Tigner Tract
Anchor Road (County Road 44)
Angleton, Texas

PSI Project No. 286-2371

PREPARED FOR:

Baker & Lawson, Inc
300 E. Cedar St.
Angleton, TX 77515

March 8, 2021

BY:

PROFESSIONAL SERVICE INDUSTRIES, INC.
3730 Dacoma Street
Houston, Texas 77092
Phone: (713) 224–2047
Fax: (713) 682–2665

Professional Service Industries, Inc.
3730 Dacoma St.
Houston, TX, 77493
Office – (713) 224-2047

March 8, 2021

Baker & Lawson, Inc.
300 E. Cedar St.
Angleton, TX 77515

Attn: Mr. Steve Matula

RE: GEOTECHNICAL ENGINEERING REPORT
PROPOSED DEVELOPMENT AT TIGNER TRACT
ANCHOR ROAD (COUNTY ROAD 44)
ANGLETON, TEXAS
PSI Project No. 286-2371

Dear Mr. Matula:

Professional Service Industries, Inc. (PSI), an Intertek company, is pleased to submit this Geotechnical Engineering Report for the referenced project. This report includes the results from the field and laboratory investigation along with recommendations for use in preparation of the appropriate design and construction documents for this project.

PSI appreciates the opportunity to provide this Geotechnical Engineering Report and looks forward to continuing participation during the design and construction phases of this project. PSI also has great interest in providing materials testing and inspection services during the construction of this project and will be glad to meet with you to further discuss how we can be of assistance as the project advances.

If there are questions pertaining to this report, or if PSI may be of further service, please contact us at your convenience.

Respectfully submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.
Texas Board of Professional Engineers Certificate of Registration # F003307

STATE OF TEXAS
3/8/21
SANJAY KUMAR DHAKAL
122625
LICENSED PROFESSIONAL ENGINEER

Imran Hossain, E.I.T.
Staff Geotechnical Engineer

Sanjay Dhakal, P.E.
Project Engineer

Shailendra N. Endley, Ph. D, P.E.
Chief Engineer

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1.0 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries, Inc. (PSI), an Intertek company, has completed a field exploration and geotechnical evaluation for the proposed Tigner Tract project to be constructed in Angleton, Texas. Mr. Wayne L. Rea. II, representing Tejas-Angleton Development. LLC, authorized PSI's services on January 27, 2021 by signing the PSI Proposal No. 286-331024, Rev .1. PSI's proposal contained a proposed scope of work, lump sum fee, and PSI's General Conditions.

1.2 PROJECT DESCRIPTION

Based on information provided by the Client and PSI's review, a summary of our understanding of the proposed project is provided in Table 1.1.

TABLE 1-1: GENERAL PROJECT DESCRIPTION

Project Items	One detention pond and concrete pavements
Existing Grade Change within Project Site Area	± 2 feet estimate (Google Earth Pro Data)
Pavement for Parking and Drives	Concrete pavement
Anticipated Traffic	Not known at this time
Depth of Detention Pond	Approximately 10 feet deep from the existing grade

The geotechnical recommendations presented in this report are based on the available project information, structure locations, and the subsurface materials encountered during the field investigation. If the noted information or assumptions are incorrect, please inform PSI so that the recommendations presented in this report can be amended as necessary. PSI will not be responsible for the implementation of provided recommendations if not notified of changes in the project.

1.3 PURPOSE AND SCOPE OF SERVICES

The purpose of this study is to evaluate the subsurface conditions at the site and develop geotechnical engineering recommendations and guidelines for use in preparing the design and other related construction documents for the proposed project. The scope of services included drilling soil borings, performing laboratory testing, and preparing this geotechnical engineering report.

This report briefly outlines the available project information, describes the site and subsurface conditions, and presents the recommendations regarding the following:

- Description of subsurface conditions and groundwater information;
- Boring logs with laboratory test results;
- Discussion about soil swell/shrink potential;
- Site preparation recommendations;

- Recommendation for detention pond;
- Rigid concrete pavement recommendations; and
- Discussions of factors which may impact construction and performance of the proposed construction.

The scope of services for this geotechnical exploration did not include an environmental, mold nor detailed seismic/fault assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air on or below, or around this site. Statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

Please note that, PSI already submitted separate reports addressing the Environmental Scope discussed on Proposal No. 286-331024, Rev.1 on February 19, 2021.

2.0 SITE AND SUBSURFACE CONDITIONS

2.1 SITE DESCRIPTION

Table 2.1 provides a generalized description of the existing site conditions based on visual observations during the field activities, as well as other available information.

TABLE 2-1: SITE DESCRIPTION

Site Location	East side of intersection of Anchor Road and Carr Road, Angleton, Texas
Site History	Undeveloped land
Existing Site Ground Cover	Mostly covered with grass and trees
Existing Grade/Elevation Changes	29 ±2 Feet (Based on the provided grade plan)
Description of Adjacent Property	North: Vacant land East: Drainage channel South: Drainage ditch West: Anchor Road
Ground Surface Soil Support Capability	The site was firm enough for field equipment during field explorations and is anticipated to be soft surface during wet periods

2.2 FIELD EXPLORATION

Field exploration for the project consisted of drilling a total of sixteen (16) borings. The boring design element, boring labels, approximate depths and drilling footage are provided in Table 2.2.

TABLE 2-2: FIELD EXPLORATION SUMMARY

Design Element	Number of Borings	Boring Designation	Boring Depth (ft)	Drilling Footage (ft)
Pavement	4	B-02, B-03, B-05 and B-06	5	20
	7	B-01, B-07 and B-08, B-12 to B-15	10	70
	1	B-04	15	15
	1	B-16	20	20
Detention Pond	3	B-09, B-10 and B-11	25	75
TOTAL:	**16**		**---**	**200**

The boring locations were selected by PSI personnel and located in the field using a recreational-grade GPS system. Elevations of the ground surface at the boring locations were not provided. The references to elevations of various subsurface strata are based on depths below existing grade at the time of drilling. The approximate boring locations are depicted on the Boring Location Plan provided in the Appendix. The field exploration methods are described in Table 2.3.

TABLE 2-3: FIELD EXPLORATION DESCRIPTION

Drilling Equipment	Track-mounted drilling rig
Drilling Method	Continuous flight augers
Drilling Procedure	Applicable ASTM and PSI Safety Manual
Field Testing	Hand Penetrometer, Standard Penetration Test (ASTM D1586)
Sampling Procedure	Soils: ASTM D1587/1586
Sampling Frequency	Continuously to a depth of 10 feet and at 5-foot intervals thereafter
Frequency of Groundwater Level Measurements	During and after drilling
Boring Backfill Procedures	Soil cuttings

During field activities, the encountered subsurface conditions were observed, logged, and visually classified (in general accordance with ASTM D2487). Field notes were maintained to summarize soil types and descriptions, water levels, changes in subsurface conditions, and drilling conditions.

2.3 LABORATORY TESTING PROGRAM

PSI supplemented the field exploration with a laboratory testing program to determine additional engineering characteristics of the subsurface soils encountered. Table 2.4 represents the laboratory testing program.

TABLE 2-4: LABORATORY TESTING PROGRAM

Laboratory Test	Procedure Specification
Visual Classification	ASTM D2488
Moisture Content	ASTM D2216
Atterberg Limits	ASTM D4318
Material Finer than No. 200 Sieve	ASTM D1140
Unconfined Compression Strength	ASTM D2166

The laboratory testing program was conducted in general accordance with applicable ASTM Test Methods. The results of the laboratory tests are provided on the Boring Logs in the Appendix. Portions of samples not altered or consumed by laboratory testing will be discarded 60 days from the date shown on this report.

2.4 SUBSURFACE CONDITIONS

The results of the field and laboratory investigation have been used to generalize a subsurface profile at the project site. The subsurface descriptions mentioned in Table 2.5 provide a highlighted generalization of the major subsurface stratification features and material characteristics.

TABLE 2-5: GENERALIZED SOIL PROFILE FOR BORINGS

Stratum	Top (ft)	Bot. (ft)	Soil Type	LL Range (%)	PI Range	% Passing #200 Sieve	N (Range/Avg)	Su Range (tsf)
1	0	10	Fat Clay (CH), Fat Clay with sand (CH), Lean Clay (CL), Lean Clay with Sand (CL), Silty Clay (CL-ML)	21 to 64	5 to 47	69 to 98	4 to 21	0.17 to 2.22
2	10	15	Silt with Sand (ML), Silt (ML)	NP	NP	75 to 99	8 to 20	-
3	15	25	Silty Sand (SM), Clayey Sand (SC)	NP	NP	14 to 23	14 to 65	-

Where: LL= Liquid limit (%)
PI = Plasticity Index
N=Standard Penetration Test blow count (blows/foot)
Su = Undrained Shear Strength based on Hand Penetrometer, Unconfined or UU Compressive Strength
NP = Non-Plastic

The boring logs included in the Appendix should be reviewed for specific information at individual boring locations. The boring logs include soil descriptions, stratifications, locations of the samples, and field and laboratory test data. The descriptions provided on the logs only represent the conditions at that actual boring location; the stratifications represent the approximate boundaries between subsurface materials. The actual transitions between strata may be more gradual and less distinct. Variations will occur and should be expected across the site.

2.4.1 GROUNDWATER INFORMATION

Groundwater was not encountered, during the field explorations. Water level measurements were performed during drilling and after completion of drilling. Specific information concerning groundwater is noted on each boring log presented in the Appendix of this report. The groundwater measurements are summarized in Table 2.6.

TABLE 2-6: MEASURED GROUNDWATER LEVELS (DEPTHS)

Boring Designation	During Drilling (feet)	After Drilling (feet)
B-01 through B16	Not encountered during drilling	Not encountered upon completion

It is possible that seasonal variations (temperature, rainfall, etc.) will cause fluctuations in the groundwater level. Additionally, perched water may be encountered in discontinuous zones within the overburden soil. It is recommended that the contractor determine the actual groundwater levels at the site at the time of the construction activities to determine the impact, if any, on the construction procedures.

3.0 GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

3.1 SOIL SHRINK-SWELL POTENTIAL

The results of laboratory plasticity tests indicate that the near surface soils at this site have moderate to high potential for shrink or swell. The soils have a tendency to swell when soil moisture increases and shrink when the soil moisture decreases. The amount of potential movement due to shrink and swell with soil moisture variations can be estimated using the Potential Vertical Rise (PVR) value. In designing a foundation system, the structural engineer should consider these potential movements from shrinking-swelling soils.

PVR estimates are based on an assumed depth known as the "Active Depth" where changes in soil moisture could occur due to seasonal variations. The PVR estimates should be considered approximate probable estimates based on industry standard practice and experience, and the movements predicted herein should not be construed as absolute values that could occur in the field.

PVR value of about two (2) to three (3) inches was estimated for this site using the Texas Department of Transportation (TxDOT) TEX-124-E method. This method uses the uniform percent swell through the entire active depth. This method is considered appropriate for extreme soil moisture variations such as extreme rainfall variations in this area.

For the proposed site, for any grade supported structures, to reduce the PVR to one (1) inch or less, it is recommended that at least three (3) feet of low plasticity structural fill be placed between the natural soils and the final grade. This thickness can be achieved through excavation and replacement, and placement of new structural fill over the existing exposed subgrade, or combination thereof. The structural fill should be placed within the plan area of the structure and to a distance of at least five (5) feet beyond the perimeter of the structure.

Poor drainage and water infiltration to the foundation soils for an extended period can be detrimental to the floor slab and foundation. Excessive wetting of soil (due to accumulation of water), or, excessive drying (due to the presence of large trees, etc.) could possibly result in greater PVR values than those estimated herein as the moisture variations could occur down to deeper depths; or, the moisture variations can be greater than those inherently assumed by the methods mentioned above. We recommend that the moisture-related problems be corrected immediately as they can be detrimental to the foundation and floor slab.

It is common to assume the differential movement to be about half the value of the PVR. This is based on the assumption that a certain amount of moisture variation may occur beneath the plan area of the floor slab. It is possible that under extreme moisture variation conditions, the differential movements could be equal to, or even double, the value of PVR.

Swelling or shrinkage occurs in soils due to changes in moisture content. Ponding of water around the slab may result in reduction of soil strength, thereby causing adverse and damaging movements.

It is important to control the possibility of moisture changes by following precautions shown below:

- Direct surface runoff away from structures by sloping the subgrade away from the slabs.
- Extend paving or other impervious coverings, such as sidewalks, to the slab edge.
- Extend roof drain downspouts so that the discharge is at least 5 feet from the slab.

- Avoid placing trees or shrubs adjacent to slab.
- Avoid excessive drying of soil around the slab.
- Repair any leaking underground utility or irrigation lines as soon as identified.

3.2 SITE PREPARATION

It is recommended that the grass, trees, topsoil, existing roots, organic material, and other miscellaneous debris be removed from the site and wasted. Voids left by tree removal should be backfilled with properly compacted structural fill soils.

After stripping and excavating to the required undercut depth, the exposed soil should be proof-rolled to locate any soft or loose areas. Proof-rolling can be performed in accordance with Item 216 of TxDOT Specification. Soils that are observed to rut or deflect under the moving load should be undercut and replaced with properly compacted structural fill. The proof-rolling and undercutting activities should be witnessed by a PSI representative and should be performed during a period of dry weather.

After proof-rolling and undercutting have been completed, any necessary fill placement may begin. The first layer of fill should be placed in a relatively uniform horizontal lift and be adequately keyed into the subgrade soils. Structural fill materials should be sandy clay soils free of organic or other deleterious materials, have a maximum clay lump size of less than three inches, and have a liquid limit not greater than 35 and a plasticity index between 8 and 20. Structural fill should be compacted to at least 95 percent of standard Proctor maximum dry density as determined by ASTM D 698.

Structural fill should be placed in maximum lifts of eight inches of loose material and should be compacted within the range of zero to three percentage (0% to +3%) points above the optimum moisture content value. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Each lift of structural fill should be tested by a representative of the geotechnical engineer prior to the placement of subsequent lifts. Care should be taken to apply compactive effort throughout the fill and fill scope areas. The moisture content and the degree of compaction of the structural fill soils should be maintained until the construction of the structures within the area.

It is extremely important to establish and maintain good and positive drainage with the construction area as soon as practical. Wet or saturated near surface soils could pose significant difficulties during earthwork operations. This good and positive collection and drainage of surface water should be maintained throughout the construction period.

3.3 DETENTION POND RECOMMENDATION

Based on the provided information, PSI understands that a detention pond is planned to be constructed for the proposed development in the east side of the site. We understand that the detention pond will have a depth of about 10 feet.

Considering the subsurface soils encountered, a pond-side slope configuration of 4H:1V or flatter is recommended. Based on our local experience, slopes steeper than 4H:1V slopes may experience localized sloughing and/or erosion.

A pond-side slope configuration of 3H:1V or steeper may experience more sloughing and caving, which would require more frequent maintenance.

PSI recommends that the pond side slopes have a well-placed and well-maintained vegetation cover or utilize other erosion protection products to reduce the amount of localized sloughing and/or erosion.

It is recommended that the slope be monitored periodically to detect undesirable slope performance. Any erosion or minor sloughing on the slopes should be repaired immediately. This maintenance activity will help to prevent further erosion or slope failure.

4.0 PAVEMENT DESIGN RECOMMENDATIONS

4.1 PAVEMENT SUBGRADE PREPARATION

PSI recommends that the existing subgrade be proof-rolled as recommended in the 3.2 Site Preparation section of this report. Any soft or loose soils identified by the proof-rolling should be undercut and replaced with compacted structural fill.

We anticipate that at least the upper six (6) inches of the soils would require a lime application of about 6% to 8%, expressed as a percent of the dry weight of the soil to be treated. In order to determine the exact percentage of lime addition, lime series testing should be performed in accordance with ASTM D 6276 or TxDOT test method TEX-121-E. Lime stabilization should be performed in accordance with the applicable provisions of Item 260 of the TxDOT Specification. Lime stabilized subgrade should be compacted to at least 95 percent of standard Proctor maximum dry density as determined by ASTM D 698 within zero to three percentage points above the optimum moisture content.

Due to grading considerations, if at least 12-inches of sandy clay structural fill is provided below, the pavement materials stabilization is not necessary. The degree of compaction and moisture content of the subgrade soils should be maintained till the subgrade is paved.

4.2 PAVEMENT DESIGN

AASHTO design methodology could be used to design the pavements. According to AASHTO design methodology, the pavement design thickness considers pavement performance, traffic, subgrade soils, pavement materials, environment, drainage and reliability. Traffic includes several types of vehicles with various magnitudes of axle loads that may be subjected to the pavement during its service life. The design involves a traffic analyses that converts various types of vehicles with various magnitudes axle loads to a number of 18-kip equivalent single axle load (ESAL) repetitions. The design engineer should perform the traffic analyses to compute the number of ESALs repetitions that would be subjected to the pavement during its service life or design life. Based on the computed ESALs, an economical and appropriate pavement can be designed accordingly.

In order to design a pavement, the subgrade soil conditions and anticipated levels of traffic must be known. The subgrade soils are evaluated based on our limited testing. The anticipated traffic on the proposed pavement is not known at this time. Based on our previous experience with similar facilities, the traffic for the proposed pavement could include lightly loaded cars/pick-up trucks, delivery vans or trucks, dump trucks and occasional 18-wheeler truck traffic.

Based on AASHTO design methodology and our experience with similar projects in the local area, we are providing pavement thickness for rigid pavement in Table 4.1. The table includes pavement sections corresponding to generic traffic levels (total ESALs). In general, pavement thicknesses corresponding to the lower traffic conditions may be considered for parking areas, while the higher traffic conditions may be considered for driveways, exit and entry lanes and frequently used areas. Pavements within trash pick-up areas should be Portland cement concrete with at least 7 inches in thickness.

TABLE 4.1: RIGID PAVEMENT DESIGN THICKNESS

Pavement Material(s)	Life Expectancy, ESALs	
	Light Duty 116,000	Heavy Duty 200,000
	Design Thickness (inch)	
Portland Cement Concrete	5.0	6.0
Subgrade or Subbase	As Discussed Previously	

The final pavement sections should be adjusted by the project Civil Engineer based the actual design traffic loading criteria for the project when that information becomes available. PSI can assist with the final pavement section design if requested.

Proper finishing of concrete pavement requires the use of appropriate construction joints to reduce the potential for cracking. Construction joints should be designed in accordance with the current Portland Cement Association and the American Concrete Institute guidelines. Joints should be sealed to reduce the potential for water infiltration into pavement joints and subsequent infiltration into the supporting soils. Load transfer devices at the pavement joints should be designed in accordance with accepted codes. The concrete should have a minimum compressive strength of 4,000 psi at 28 days. The concrete should also be designed with 5±1 percent entrained air to improve workability and durability. Normal periodic maintenance will be required.

4.2.1 CIVIL AND DRAINAGE CONSIDERATIONS

Related civil design factors such as drainage, cross-sectional configurations, surface elevations and environmental factors which will significantly affect the service life of the pavement must be included in the preparation of the construction drawings and specifications. Concrete pavement slabs should be provided with adequate steel reinforcement. Proper finishing of concrete pavements requires the use of sawed and sealed joints. Joint spacing is recommended at 15-foot intervals for plain concrete. Dowel bars should be used to transfer loads at the transverse joints.

Surface water infiltration to the pavement subgrade layers may soften the subgrade soils. Considering several factors in the pavement design can reduce surface infiltration. To summarize, the following are some of the factors that need to be emphasized in order to maintain proper drainage.

- Appropriate slopes should be provided.
- Joints should be properly sealed and maintained.
- Side drains or sub drains along a pavement section may be provided.
- Proper pavement maintenance programs such as sealing surface cracks, and immediate repair of distressed pavement areas should be adopted.
- During and after the construction, site grading should be kept in such a way that the water drains freely off the site and off any prepared or unprepared subgrade soils. Excavations should not be kept open for a long period of time

5.0 CONSTRUCTION CONSIDERATIONS

PSI should be retained to provide observation and testing of construction activities involved in the foundations, earthwork, and related activities of this project. PSI cannot accept any responsibility for any conditions that deviate from those described in this report, nor for the performance of the foundations if not engaged to also provide construction observation and testing for this project.

5.1 MOISTURE SENSITIVE SOILS/WEATHER RELATED

During wet weather periods and/or poor site drainage, an increase in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. Soils that become wet might be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

5.2 DRAINAGE CONCERNS

Water should not be allowed to collect in foundation excavations or on prepared subgrade of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff. Positive site surface drainage should be provided to reduce infiltration of surface water around the perimeter of the foundation. The grades should be sloped away from the foundation and surface drainage and roof drainage should be collected and discharged such that water is not permitted to infiltrate and/or accumulate within the foundation or any backfill areas.

5.3 EXCAVATIONS

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavation or footing excavations etc. be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "competent person", as defined in 29 CFR Part 1926.650 to 652 should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case, should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

We are providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other party's compliance with local, state, and federal safety or other regulations.

6.0 REPORT LIMITATIONS

The recommendations submitted in this report are based on the available subsurface information obtained by PSI and design details furnished by the client for the proposed project. If there are revisions to the plans for this project, or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation recommendations are required. If PSI is not notified of such changes, PSI will not be responsible for the impact of those changes on the project.

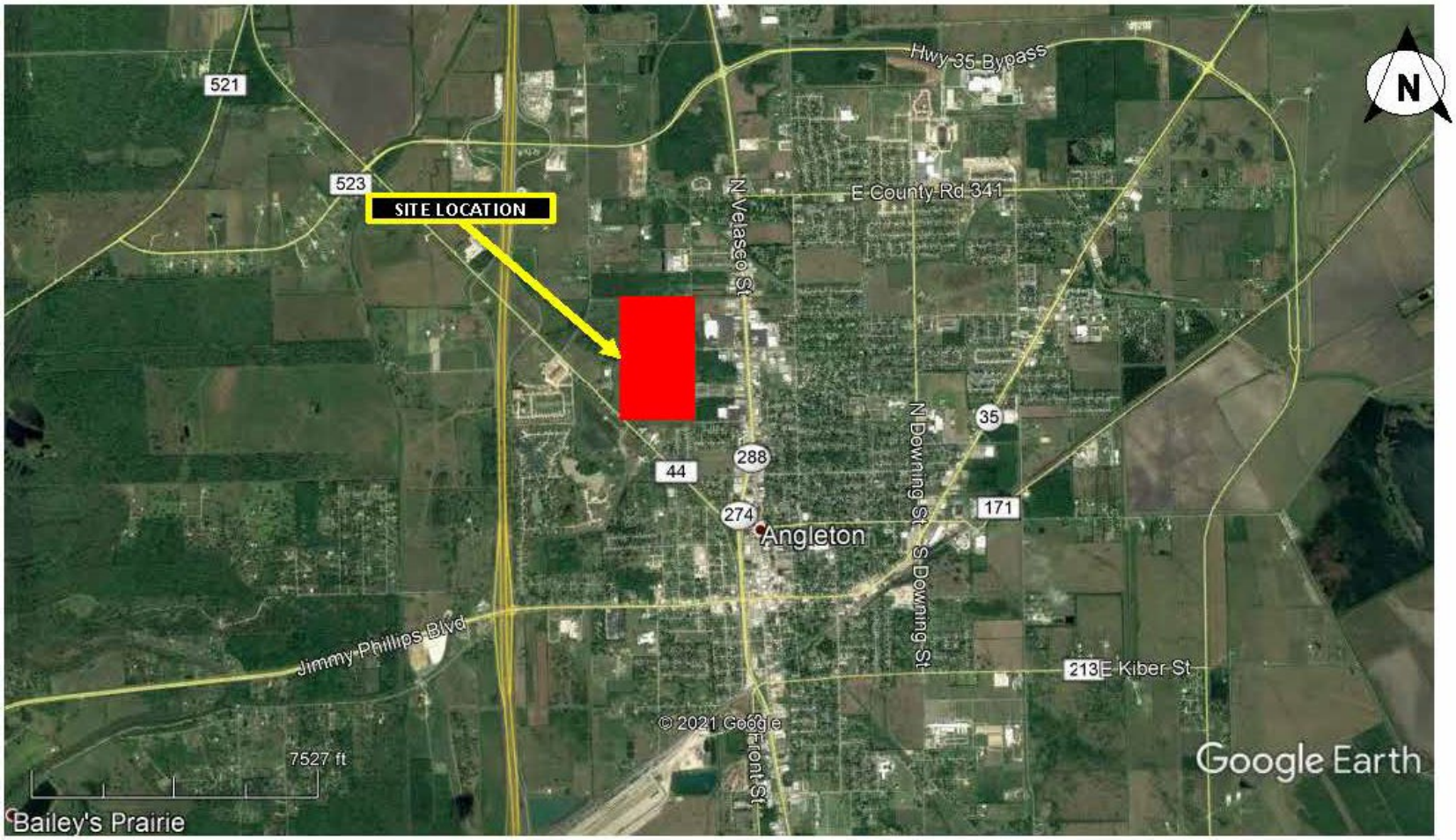
The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional Geotechnical Engineering practices in the local area. No other warranties are implied or expressed. This report may not be copied without the expressed written permission of PSI.

After the plans and specifications are more complete, the Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that the engineering recommendations have been properly incorporated in the design documents. At this time, it may be necessary to submit supplementary recommendations. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project.

This report has been prepared for the exclusive use of Baker & Lawson, Inc. for specific application to the proposed Tigner Tract to be constructed at Anchor Road (CR 44) in Angleton, Texas.

APPENDIX

SITE LOCATION PLAN



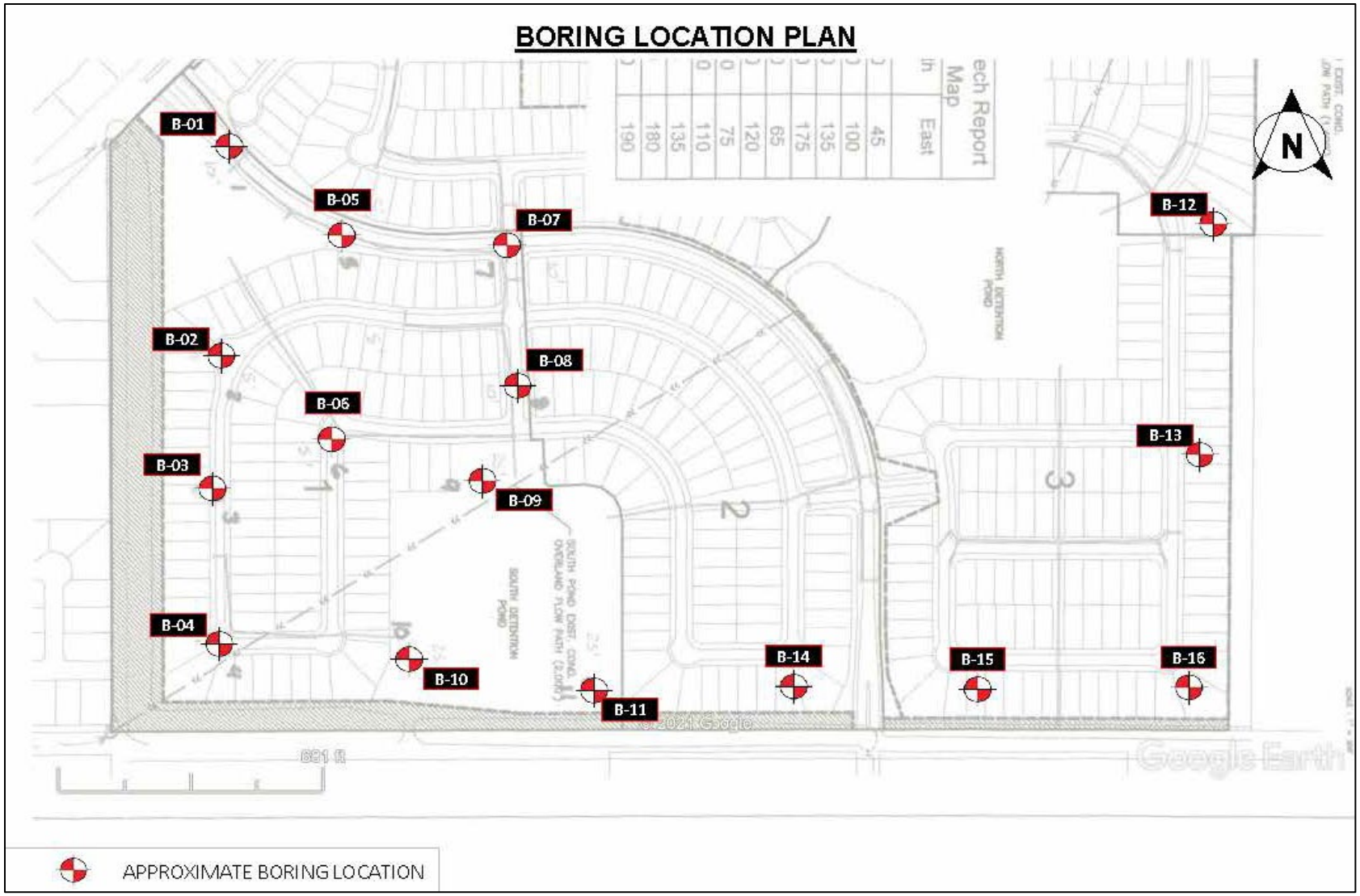
intertek psi

3730 Dacoma Street
Houston, Texas 77092
(713) 224-2047

PSI Project No.: 286-2371

Proposed Tigner Tract, Anchor Road, Angleton, Texas

BORING LOCATION PLAN



3730 Dacoma Street
Houston, Texas 77092
(713) 224-2047

PSI Project No.: 286-2371

Proposed Tigner Tract, Anchor Road, Angleton, Texas

Boring Logs

LOG OF BORING B-01

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 10 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○ HP ● UC △ TV ▲ UU	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** STIFF, REDDISH BROWN		91	55	16	39	24		99
				-with sand seams, 2 to 4 feet						19		
5				-brown, 4 to 6 feet			51	16	35	22		
		ML		**SILT WITH SAND (ML),** MEDIUM DENSE, REDDISH BROWN	10	76				17		
10					16					20		
15												
20												
25												

SHEAR STRENGTH (tons/square foot) scale: 0.0 0.5 1.0 1.5 2.0 2.5

DEPTH OF BORING: 10 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-02

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 5 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** FIRM, DARK BROWN						33	○	
		CL		**LEAN CLAY (CL),** FIRM TO STIFF, BROWN		87	48	14	34	18	●	107
5										17	○	
10												
15												
20												
25												

DEPTH OF BORING: 5 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-03

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 5 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○HP ●UC △TV ▲UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** FIRM, BROWN						22	○	
		CH		**SANDY FAT CLAY (CH),** STIFF, BROWN		69	54	16	38	20	○ ●	105
5				-with calcareous nodules, 4 to 5 feet						16	○	
10												
15												
20												
25												

DEPTH OF BORING: 5 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-04

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 15 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○HP ●UC △TV ▲UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** SOFT TO VERY STIFF, REDDISH BROWN						23	○	
				-calcareous nodules, 2 to 6 feet		86	59	17	42	20	○ ●	112
5										19	○	
		ML		**SILT (ML),** FIRM TO VERY STIFF, REDDISH BROWN	6		NP	NP	NP	23		
					13	86				26		
10												
					18					23		
15												
20												
25												

DEPTH OF BORING: 15 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-05

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 5 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** FIRM, DARK BROWN		88	55	16	39	20	○	
										19	○	
5				-brown, 4 to 5 feet						20	○	
10												
15												
20												
25												

DEPTH OF BORING: 5 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-06

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 5 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○ HP ● UC △ TV ▲ UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** STIFF TO VERY STIFF, DARK BROWN		93	62	15	47	20		105
				-brown, with calcareous nodules, 2 to 5 feet						21		
5										20		
10												
15												
20												
25												

DEPTH OF BORING: 5 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-07

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 10 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	USCS SYMBOL	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)
	CL	**LEAN CLAY (CL),** FIRM, BROWN						20	
	CH	**FAT CLAY (CH),** STIFF TO VERY STIFF, BROWN		86	50	15	35	19	111
5		-with calcareous nodules, 4 to 6 feet						18	
	ML	**SILT WITH SAND (ML),** FIRM, GRAY	7	77	NP	NP	NP	19	
	SM	**SILTY SAND (SM),** MEDIUM DENSE, REDDISH BROWN	10					20	
10									
15									
20									
25									

SHEAR STRENGTH (tons/square foot)
○ HP ● UC △ TV ▲ UU
0.0 0.5 1.0 1.5 2.0 2.5

DEPTH OF BORING: 10 FEET
DATE DRILLED: 2/3/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-08

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 10 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○HP ●UC △TV ▲UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CL		**LEAN WITH SAND (CL),** FIRM, DARK BROWN, with root fiber		84	46	15	31	32		
		CH		**FAT CLAY WITH SAND (CH),** FIRM TO STIFF, BROWN						33		93
5						81	50	16	34	23		
		SC		**CLAYEY SAND (SC),** REDDISH BROWN						29		
		SM		**SILTY SAND (SM),** MEDIUM DENSE, REDDISH BROWN	13					23		
10												
15												
20												
25												

DEPTH OF BORING: 10 FEET
DATE DRILLED: 2/3/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-09

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 25 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○HP ●UC △TV ▲UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** STIFF, DARK BROWN			64	18	46	20		
										18		
5				-brown, 4 to 6 feet						21		
				-reddish brown, 6 to 8 feet		98	55	17	38	18		107
		CH		**SANDY FAT CLAY (CH),** SOFT, REDDISH BROWN	4					32		
10		SM		**SILTY SAND (SM),** MEDIUM DENSE, REDDISH BROWN								
					20					24		
15												
					23	23	NP	NP	NP	22		
20												
					65					22		
25												

DEPTH OF BORING: 25 FEET
DATE DRILLED: 2/3/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-10

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 25 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○ HP ● UC △ TV ▲ UU	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** STIFF, DARK BROWN								
				-with organics, 0 to 2 feet						50		
				-brown, 2 to 4 feet						22		
5		CL		**LEAN CLAY WITH SAND (CL),** FIRM, REDDISH BROWN		83	30	17	13	16		110
		ML		**SILT WITH SAND (ML),** FIRM, REDDISH BROWN	8					21		
10		SM		**SILTY SAND (SM),** MEDIUM DENSE TO DENSE, REDDISH BROWN	6	77	NP	NP	NP	25		
				-with gravel, 13 to 15 feet	10					23		
15				-gray, 18 to 25 feet								
					16	18				22		
20												
25					32		NP	NP	NP	19		

DEPTH OF BORING: 25 FEET
DATE DRILLED: 2/3/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-11

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 25 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○HP ●UC △TV ▲UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** STIFF, DARK BROWN						20		
				-reddish brown, 2 to 4 feet						19		
5		CL-ML		**SILTY CLAY (CL-ML),** VERY STIFF, REDDISH BROWN						14		
				-gray, 6 to 8 feet	18	90	26	19	7	20		
10		CL		**LEAN CLAY (CL),** STIFF, REDDISH BROWN						21		
						99	38	14	24	31		92
15												
		SM		**SILTY SAND (SM),** MEDIUM DENSE, BROWN	14					21		
20												
					14	14				20		
25												

DEPTH OF BORING: 25 FEET
DATE DRILLED: 2/3/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-12

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 10 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○ HP ● UC △ TV ▲ UU	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** STIFF TO VERY STIFF, DARK BROWN						19		
						95	56	19	37	21		108
5		CL		**LEAN CLAY (CL),** STIFF, DARK BROWN, with calcareous nodules						13		
		ML		**SILT (ML),** FIRM TO STIFF, REDDISH BROWN	6	91	NP	NP	NP	21		
10					9					21		
15												
20												
25												

SHEAR STRENGTH (tons/square foot): 0.0 0.5 1.0 1.5 2.0 2.5

DEPTH OF BORING: 10 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-13

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 10 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○HP ●UC △TV ▲UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CL		**LEAN CLAY (CL),** FIRM TO HARD, DARK BROWN		90	34	18	16	18		
										22		116
5						86	43	16	27	16		
		ML		**SANDY SILT (ML),** VERY STIFF, GRAY	16					21		
10					21					21		
15												
20												
25												

DEPTH OF BORING: 10 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-14

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 10 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○HP ●UC △TV ▲UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CH		**FAT CLAY (CH),** STIFF, DARK BROWN						25	○	
				-with organics, 0 to 2 feet								
				-with calcareous nodules, 2 to 6 feet								
				-gray, 2 to 4 feet		95	54	17	37	22	●	102
				-reddish brown, 4 to 6 feet								
5										26	○	
		CL		**LEAN CLAY (CL),** FIRM, REDDISH BROWN			47	18	29	21	○	
		CH		**FAT CLAY (CH),** FIRM, REDDISH BROWN	6					27		
10												
15												
20												
25												

DEPTH OF BORING: 10 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-15

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 10 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	SOIL TYPE	USCS SYMBOL	SAMPLES	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	SHEAR STRENGTH (tons/square foot) ○HP ●UC △TV ▲UU 0.0 0.5 1.0 1.5 2.0 2.5	DRY UNIT WEIGHT (pcf)
		CL-ML		**SILTY CLAY WITH SAND (CL-ML),** DARK BROWN		83	21	16	5	14		
		CL		**LEAN CLAY (CL),** HARD, BROWN, with calcareous nodules						17		111
5		CH		**FAT CLAY (CH),** BROWN			50	12	38	20		
				-with sand seams, 6 to 8 feet						17		
		ML		**SANDY SILT (ML),** FIRM, REDDISH BROWN	7					23		
10												
15												
20												
25												

DEPTH OF BORING: 10 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

NOTES:

LOG OF BORING B-16

PROPOSED DEVELOPMENT AT TIGNER TRACT
HOUSTON, TEXAS

TYPE OF BORING: AUGER TO 20 FEET

PSI Project No.: 286-2371-1

COORDINATE (X) OR EASTING:
COORDINATE (Y) OR NORTHING:
APPROXIMATE SURFACE ELEVATION: feet
LATITUDE:
LONGITUDE:

DEPTH, FT.	USCS SYMBOL	SOIL DESCRIPTION	N-BLOWS/FT.	% PASSING No. 200 SIEVE	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)
	CH	**FAT CLAY (CH),** FIRM TO VERY STIFF, DARK BROWN						16	
		-brown, 2 to 4 feet		90	54	15	39	22	
		-reddish brown, 4 to 6 feet						19	110
5	CL	**LEAN CLAY WITH SAND (CL),** REDDISH BROWN			47	14	33	21	
	ML	**SILT WITH SAND (ML),** FIRM, REDDISH BROWN	4					24	
10									
			8	75	NP	NP	NP	22	
15									
	SM	**SILTY SAND (SM),** MEDIUM DENSE, BROWN	15					23	
20									
25									

SHEAR STRENGTH (tons/square foot)
○ HP ● UC △ TV ▲ UU
0.0 0.5 1.0 1.5 2.0 2.5

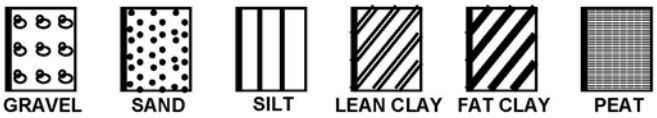
DEPTH OF BORING: 20 FEET
DATE DRILLED: 2/5/21

INITIAL GROUND WATER: NOT ENCOUNTERED
FINAL GROUND WATER: NOT ENCOUNTERED

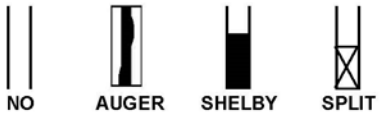
NOTES:

KEY TO TERMS AND SYMBOLS USED ON LOGS

SOIL TYPE



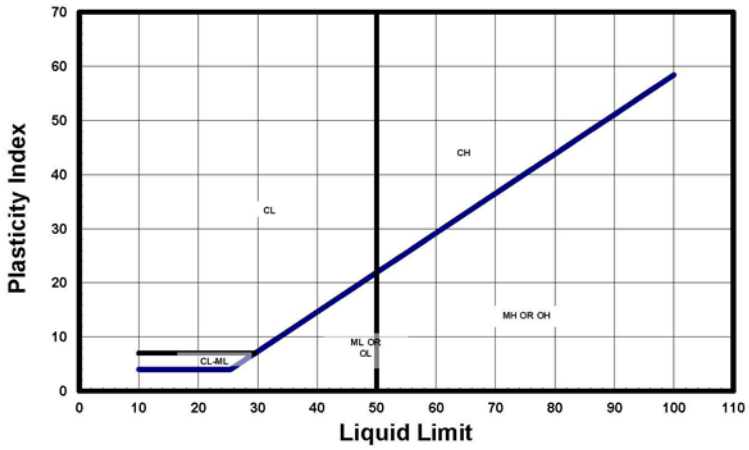
SAMPLER TYPE



MODIFIERS

(SEE TEXT ON LOG)

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D 2487



CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	SHEAR STRENGTH IN TONS/FT^2
VERY SOFT	0 TO 0.125
SOFT	0.125 TO 0.25
FIRM	0.25 TO 0.5
STIFF	0.5 TO 1.0
VERY STIFF	1.0 TO 2.0
HARD	> 2.0 OR 2.0+

RELATIVE DENSITY - GRANULAR SOILS

CONSISTENCY	N-VALUE (BLOWS/FOOT)
VERY LOOSE	0 TO 4
LOOSE	5 TO 9
MEDIUM DENSE	10 TO 29
DENSE	30 TO 50
VERY DENSE	> 50 OR 50+

DEGREE OF PLASTICITY OF COHESIVE SOILS

DEGREE OF PLASTICITY	PLASTICITY INDEX	SWELL POTENTIAL
NONE OR SLIGHT	0 TO 4	NONE
LOW	4 TO 20	LOW
MEDIUM	20 TO 30	MEDIUM
HIGH	30 TO 40	HIGH
VERY HIGH	> 40	VERY HIGH

MOISTURE CONDITION COHESIVE SOILS

DESCRIPTION	CONDITION
Absence of moisture, dusty, dry to touch	DRY
Damp but no visible water	MOIST
Visible free water	WET

CONSISTENCY OF COHESIVE SOILS AFTER TERZAGHI (1948)

CONSISTENCY	N-VALUE (BLOWS/FOOT)
VERY SOFT	< 2
SOFT	2 TO 4
FIRM	4 TO 8
STIFF	8 TO 15
VERY STIFF	15 TO 30
HARD	> 30

ABBREVIATIONS

HP - HAND PENETROMETER
TV - TORVANE
MV - MINIATURE VANE
UC - UNCONFINED COMPRESSION TEST
UU - UNCONSOLIDATED UNDRAINED TRIAXIAL
CU - CONSOLIDATED UNDRAINED

NOTE: PLOT INDICATES SHEAR STRENGTH AS OBTAINED BY ABOVE TESTS

FINAL GROUND WATER LEVEL

INITIAL GROUND WATER LEVEL

CLASSIFICATION OF GRANULAR SOILS

U.S. STANDARD SIEVE SIZE(S)

6"	3"	3/4"	4	10	40	200

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

152	76.2	19.1	4.76	2.0	0.42	0.074	0.002

GRAIN SIZE IN MM