Enprotec | Hibbs & Todd

April 18, 2025

PARKER COUNTY SPECIAL UTILITY DISTRICT
TWDB DWSRF Phase I Distribution System Improvements
Contract A: Central Composite Elevated Storage Tank (CID 01)

Addendum No. 1

Attention is called to the following modifications to the referenced Plans, Specification and Contract Documents for the above referenced project. The Parker County Special Utility District (District) will receive sealed Proposals for TWDB DWSRF (CID 01) Phase I Distribution System Improvements Contract A: Central Composite Elevated Storage Tank project at the District's office, located at 500 Brock Spur, Millsap, TX 76066, until 2:00 p.m., local time on Thursday, May 1, 2025, at which time the sealed Proposals received will be publicly opened and read. We hereby modify the documents as follows:

CONTRACT:

1. **REPLACE** the Appendix A Geotechnical Report with the attached Geotechnical Report.

This addendum consists of twenty-two (22) pages and becomes a part of the referenced plans, specifications and contract documents and shall be acknowledged by the proposer and attached to the sealed proposal submitted.

By Christopher S. Hay, P.E., #111453
Project Engineer

4/18/2025

PE Firm Registration No. 1151
PG Firm Registration No. 50103
RPLS Firm Registration No. 10011900

Enprotec | **Hibbs & Todd**

October 17, 2023

Mr. Cole Leatherman, President
Parker County Special Utility District
500 Brock Spur
Millsap, TX 76066

Re: Geotechnical Investigation
Elevated Storage Tank
Brock High School
Brock, Texas

Dear Mr. Leatherman:

In accordance with your instructions, we have conducted a Geotechnical Investigation for the above referenced project. The conclusions and recommendations of this investigation are to be found in the attached report.

We trust that this will provide the information you have requested. We are also available should geotechnical or materials testing services be desired during construction. If there are any further questions, please do not hesitate to call.

Sincerely,

Enprotec / Hibbs & Todd, Inc.

17 OCT 23

STATE OF TEXAS
GARY SCOTT YUNGBLUT
85640
LICENSED
PROFESSIONAL ENGINEER

G. Scott Yungblut, P.E.
Geotechnical Engineer

Enclosure
19-7546

GEOTECHNICAL INVESTIGATION
ELEVATED STORAGE TANK
BROCK HIGH SCHOOL
BROCK, TEXAS

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GEOTECHNICAL INVESTIGATION
ELEVATED STORAGE TANK
BROCK HIGH SCHOOL
BROCK, TEXAS

INTRODUCTION

GENERAL: This investigation was authorized by Mr. Cole Leatherman, President of the Parker County Special Utility District (PCSUD). The purpose of this investigation is to provide foundation design information along with construction recommendations for the proposed elevated storage tank located southwest of the Brock High School in Brock, Texas.

The design capacity of the elevated storage tank is 500,000 gallons. Based upon the information provided, the anticipated pedestal diameter for the composite storage tank is about 28 feet. The total load including structure weight, water, and snow loads were estimated to be 5,500 kips. The tank height, high water level, and low water levels were not known at the time of the report.

SCOPE: The scope of the exploration and analysis to be performed by Enprotec/Hibbs & Todd, Inc. (eHT) included a site reconnaissance, the subsurface exploration, field and laboratory testing, and an engineering analysis and evaluation to provide design recommendations for the foundation along with construction recommendations for the proposed elevated storage tank. Details and results of the investigation are discussed in the following sections of this report.

LIMITATIONS: The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology. No other warranties are implied or expressed.

SITE DESCRIPTION

SITE LOCATION & TOPOGRAPHY: The proposed elevated tank site is generally located in the southeast quadrant formed by the intersection of FM 1189 and Eagle Spirit Lane southwest of the Brock High School Softball Field in Brock, Texas. At the time of the subsurface exploration the site was covered with native grasses. The area of the proposed tank appeared relatively flat.

DESCRIPTION OF WORK

FIELD INVESTIGATION: Drilling and soil sampling activities were performed at select locations of the site on September 13TH, 2023. Three test borings were drilled to a depth of about 50 feet below the existing ground surface elevation at the locations shown on Figure 1 in Appendix A. The location of the elevated storage tank was provided by Mr. Chris Hay, PE, Project Manager for eHT.

The test borings were drilled utilizing a truck-mounted Failing rotary drilling rig. The test borings were advanced utilizing dry sampling methods and/or rotary air drilling techniques which allow for accurate groundwater observations. Drilling and sampling activities were performed in general accordance with referenced ASTM and/or TxDOT procedures or other accepted methods.

Soil formations were sampled using a 3-inch diameter Shelby-type steel tube sampler (ASTM D 1587) and/or a 2-inch split barrel sampler (ASTM D 1586). Undisturbed soil samples were subjected to calibrated pocket penetrometer tests (Qp) to assist in evaluating the shear strength of the cohesive soils. Quantitative estimates of the foundation strata bearing capacity were also obtained from interpretation of the Standard Penetration Test (SPT) results and widely published empirical correlations. The reports of the field tests are reported on the Logs of Borings in Appendix C.

The borings were visually logged in the field, and all recovered samples were placed in core boxes for delivery to the laboratory. The split-spoon samples were placed in polyethylene plastic bags to minimize moisture changes. Samples will be retained for 60 days from the date of this report. The samples will then be discarded unless notified in writing by the client requesting the samples be retained.

The borings were observed for groundwater at each test location, during and following the completion of the boring. These observations are shown on the Logs of Borings and discussed in a later section of this report. The borings were backfilled with on-site materials upon completion of the field work. Logs of Borings were subsequently prepared, along with a legend titled EXPLANATION OF SYMBOLS AND TERMS USED ON BORING LOGS and GENERAL NOTES. The legend and general notes show typical soil and rock classifications, drilling symbols, weathering descriptions, and soil structure characteristics.

LABORATORY TESTING: Select materials recovered in the borings were tested in the laboratory and classified based on the laboratory test results. Laboratory testing was conducted in general accordance with ASTM procedures and standards. Atterberg Limits (ASTM D 4318) and Minus 200-Mesh Sieve Tests (ASTM D 1140) were performed on selected soil samples in order to classify and establish index properties and grain size characteristics of the soils. Appendix B summarizes the results of these classification tests. The soil classifications are based on the Unified Soil Classification System (USCS).

ENGINEERING ANALYSIS: An engineering analysis was conducted on the information obtained from the field and laboratory investigations. If revisions to the plans for the proposed project, or if deviations from the subsurface conditions presented in this report are encountered during construction, we should be notified to determine if changes in our recommendations are required.

SUBSURFACE MATERIALS AND CONDITIONS

SITE GEOLOGY: As shown on the Sherman Sheet of the Geologic Atlas of Texas, the site is located in an area where Cretaceous Age deposits of the Twin Mountains Formation are present at or near the ground surface. The Twin Mountains Formation in the project area generally consists of sand, clay, and conglomerate which is composed of chert, quartz, and quartzite clasts.

SITE STRATIGRAPHY: A detailed description of the site stratigraphy is provided on the Logs of Borings. Generally, the subsurface conditions at the site may be characterized as follows:

Firm to dense relative density clayey sands and hard sandy clays were present from the surface to a depth of about 6 to 8 feet at the test boring locations. Dense to very dense clayey and silty sands were present beneath the sandy clays, some with gravel, which extended to at least a depth of 50 feet, the termination depth of the test borings.

GROUNDWATER: Groundwater was encountered at a depth of about 28 feet in the test borings during drilling activities. An accurate depiction of the groundwater depth would require leaving the test borings open for an extended period of time due to the moderately impermeable soils. Based upon the measured water levels and soil moisture contents the groundwater table was considered to exist at a depth of about 28 feet below current grades at the time of the subsurface exploration. The water table may fluctuate seasonally and during periods of heavy rainfall. Filtered sump pumps placed in the bottom of excavations are expected to be suitable for water removal above the water table.

FOUNDATION DESIGN RECOMMENDATIONS

ELEVATED STORAGE TANK FOUNDATION: The elevated storage tank may be supported by a mat or raft type foundation. The foundation may be designed for a maximum net allowable bearing pressure of 5.0 kips per square foot (ksf), based upon dead load plus design live load considerations. The foundation should bear a minimum of 10 feet below existing grades in the clayey silty sands. The net allowable bearing capacity value provided includes a safety factor of 3 against a general shear failure in the supporting soils. The upper site soils fall into Site Classification C for ground motion and a Seismic Design Ccategory B. Settlement is anticipated to be on the order of 1 to 1½ inches with a differential settlement of less than ½ inch. The raft or mat foundation should be designed by a structural engineer experienced in designing elevated storage tank foundations. The International Building Code allows an increase of one-third for temporary transient loads when using the alternate load combinations that include wind or earthquake loads.

A compacted unit weight of approximately 125 pounds per cubic foot (pcf) for excavated soils used as backfill material above the foundation can be used for purposes of evaluating resistance to the forces acting on the structure.

FOUNDATION CONSTRUCTION RECOMMENDATIONS

FOUNDATION EXCAVATION: Excavations should be observed by a representative of the geotechnical consultant to make sure that the proper bearing material has been reached in accordance with the recommendations given herein. It is recommended that a mud mat be placed as soon as possible following foundation excavation. The excavation should be checked for size and observed to make sure that all loose material has been removed prior to concrete placement. The mud mat should be placed to prevent deterioration of the bearing surface. The mud mat will protect the bearing surface, maintain more uniform moisture in the subgrade, facilitate dewatering of excavations if required, and provide a working surface for placement of formwork and reinforcing steel. Prompt placement of the concrete following foundation preparation is strongly recommended.

FOUNDATION BACKFILL: Following construction of the pedestal, the interior may be backfilled with the excavated site soils. The backfill should be compacted to a minimum 95 percent Standard Proctor (ASTM D 698) at not less than 2 percent below optimum moisture content. Compacted lift thicknesses should not exceed 6 inches.

FOUNDATION CONSTRUCTION CONSIDERATIONS

EXCAVATION SAFETY: All excavations should be in accordance with local and federal (OSHA) regulations and the trench safety plan. If instability problems occur, stability within the excavations should be maintained by flattening or widening slope sidewalls. In addition, the on-site soils are susceptible to erosion and disturbance by flowing water and construction traffic. If these soils are disturbed by construction traffic and excessive moisture, they may become unstable. The site should therefore be graded to prevent water from ponding near the new foundation and running into excavations.

GENERAL: Many problems can be avoided or solved in the field if proper inspection and testing services are provided. eHT should be retained to perform testing and inspection services sufficient to verify compliance with our recommendations. It is recommended that the site preparation and foundation construction be monitored by a geotechnical engineer or his representative. The following are recommended minimum sampling and testing frequencies.

EARTHWORK: During the earthwork phase of the project at least one Proctor test, Atterberg limits test, and minus 200 sieve test should be performed per soil type for subgrade, backfill, and fill materials. At least 2 density and moisture content tests should be performed for each compacted 6-inch thickness of fill.

CONCRETE: At least 1 slump, air content (if required) and temperature test, and at least 1 set of 3 concrete cylinders should be molded for each type of concrete per 50 cubic yards or fraction thereof placed in a day. Each set of cylinders should be tested for compressive strength with 1 of the cylinders tested at 7 days and 2 of the cylinders tested at 28 days.

APPENDIX A

APPENDIX B

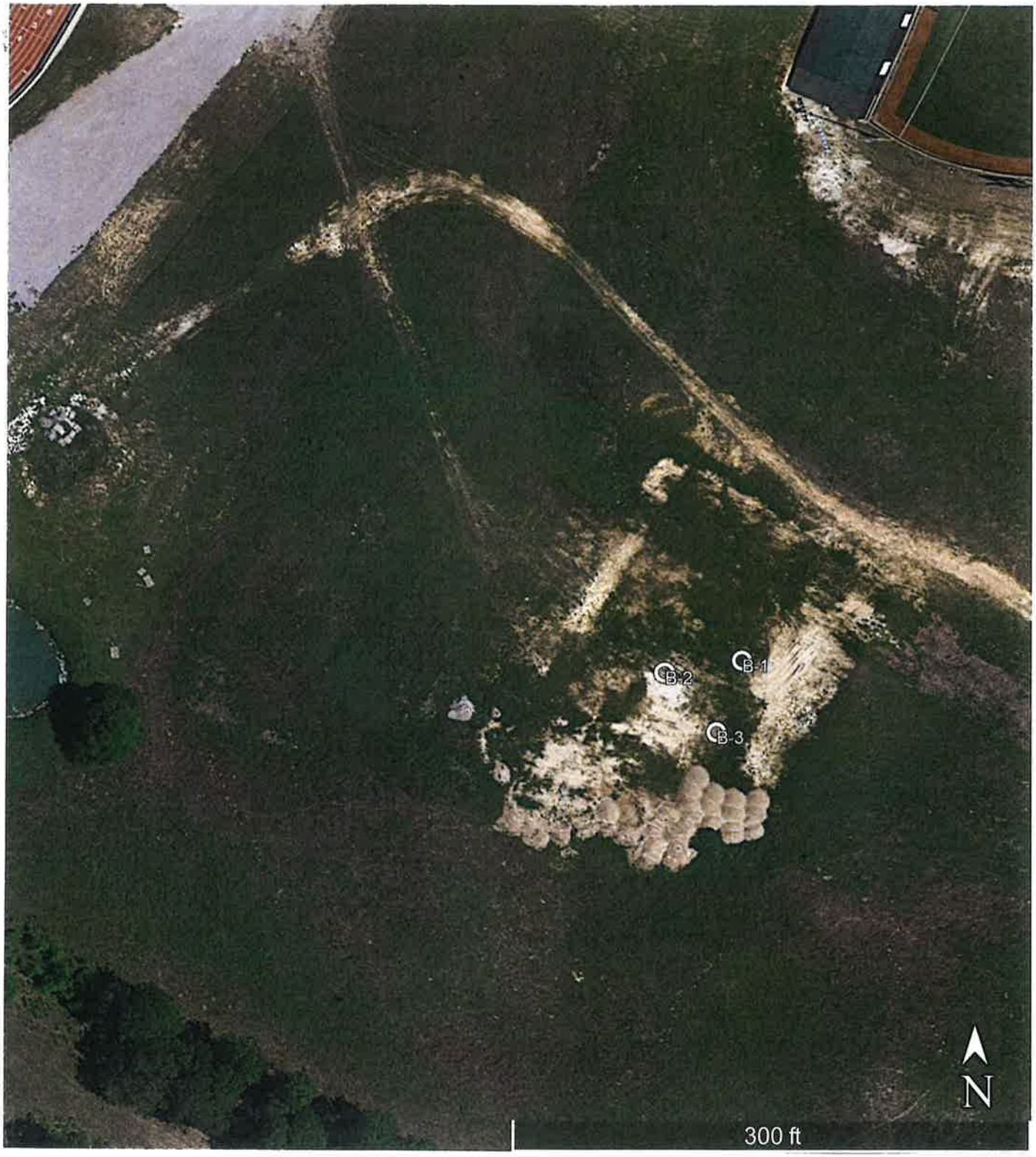
ELEVATED STORAGE TANK
BROCK HIGH SCHOOL
BROCK, TEXAS

SUMMARY OF CLASSIFICATION TESTS

Boring No.	Depth (ft)	Liquid Limit %	Plasticity Index	% Passing #200 Mesh Sieve	Water Content %	USCS	Description
B-1	3½-5'	33	16	54	6.7	CL	Tan and Red-Brown Clayey Sand to Sandy Clay
B-1	8½-10'	---	non-plastic	27	4.3	SM	Tan Clayey Silty Sand
B-2	8½-10'	35	18	---	8.2	SC	Tan Clayey Silty Sand
B-2	13½-15'	---	non-plastic	20	8.9	SM	Tan Clayey Silty Sand
B-2	18½-20'	---	non-plastic	17	7.8	SM	Tan Clayey Silty Sand
B-3	6½-8½'	33	17	37	6.6	SC	Tan and Red-Brown Clayey Sand to Sandy Clay
B-3	18½-20'	---	non-plastic	13	6.2	SM	Tan Clayey Silty Sand

APPENDIX C

APPENDIX A



NOT TO SCALE

Enprotec / Hibbs & Todd

BORING LOCATION PLAN

FIGURE 1

ELEVATED STORAGE TANK
BROCK HIGH SCHOOL
BROCK, TEXAS

Project No.: 19-7546

Date: September 2023

APPENDIX B

ELEVATED STORAGE TANK
BROCK HIGH SCHOOL
BROCK, TEXAS

SUMMARY OF CLASSIFICATION TESTS

Boring No.	Depth (ft)	Liquid Limit %	Plasticity Index	% Passing #200 Mesh Sieve	Water Content %	USCS	Description
B-1	3½-5'	33	16	54	6.7	CL	Tan and Red-Brown Clayey Sand to Sandy Clay
B-1	8½-10'	---	non-plastic	27	4.3	SM	Tan Clayey Silty Sand
B-2	8½-10'	35	18	---	8.2	SC	Tan Clayey Silty Sand
B-2	13½-15'	---	non-plastic	20	8.9	SM	Tan Clayey Silty Sand
B-2	18½-20'	---	non-plastic	17	7.8	SM	Tan Clayey Silty Sand
B-3	6½-8½'	33	17	37	6.6	SC	Tan and Red-Brown Clayey Sand to Sandy Clay
B-3	18½-20'	---	non-plastic	13	6.2	SM	Tan Clayey Silty Sand

APPENDIX C

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
402 Cedar Street
(325) 698-5560
Abilene, Texas 79601
Firm Registration No. 1151

LOG OF BORING

Project: **PCSUD ELEVATED STORAGE TANK**

Date: 13 SEPTEMBER 2023

Location: **BROCK HIGH SCHOOL**

Type: AIR ROTARY

Boring No.: **B-1**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER 1st 6"	TEXAS CONE PENETROMETER 2nd 6"	Qp (tsf)	DEPTH SCALE
		ST	LIGHT BROWN CLAYEY SILTY SAND				4.5+	
		AU	TAN AND RED-BROWN CLAYEY SAND TO SANDY CLAY					
5		SS		35				
		ST					4.5+	
		AU						
		SS		50/6"*				
10			TAN CLAYEY SILTY SAND					
5		SS		75/11"				
		SS	TAN SILTY COARSE SAND	50/5"				
20			- 6" FINE GRAVEL LAYER					
		SS	TAN CLAYEY SILTY SAND	50/6"*				
5			- INCREASED SAND					
		SS		50/6"*				
30			TAN CLAYEY SILTY SAND WITH FINE GRAVEL					
		SS		50/6"				
5								
		SS		50/6"				
40			TAN SILTY FINE GRAVELLY SAND					
5		SS		50/3"*				
		SS		50/6"				
50			TOTAL DEPTH OF BORING 50 FEET					

NOTE

GROUNDWATER ENCOUNTERED AT A DEPTH OF 28 FEET DURING AND AT COMPLETION OF DRILLING ACTIVITIES.

* WITH 6" SEAT

7546

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
402 Cedar Street
(325) 698-5560
Abilene, Texas 79601
Firm Registration No. 1151

LOG OF BORING

Project: **PCSUD ELEVATED STORAGE TANK**

Date: 13 SEPTEMBER 2023

Location: **BROCK HIGH SCHOOL**

Type: AIR ROTARY

Boring No.: **B-2**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER 1st 6"	TEXAS CONE PENETROMETER 2nd 6"	Qp (tsf)	DEPTH SCALE
		ST	TAN CLAYEY SILTY SAND				4.5+	
		ST					4.5+	
5		SS	TAN AND RED-BROWN CLAYEY SAND TO SANDY CLAY WITH GRAVEL	19				
10		SS		54				
5		SS		50/6"*				
20		SS	TAN CLAYEY SILTY SAND	50/6"*				
5		SS		77				
30		SS		50/5"				
5		SS		50/5"				
40		SS	TAN CLAYEY SILTY SAND WITH FINE GRAVEL -INCREASED FINE GRAVEL	50/5"				
5		SS		86/9"				
50		SS	TAN CLAYEY FINE SAND	50/6"				

TOTAL DEPTH OF BORING 50 FEET

NOTE

GROUNDWATER ENCOUNTERED AT A DEPTH OF 28 FEET DURING AND AT COMPLETION OF DRILLING ACTIVITIES.

* WITH 6" SEAT

7546

ENPROTEC/HIBBS & TODD, INC.
ENVIRONMENTAL AND CIVIL ENGINEERING
402 Cedar Street, Abilene, Texas 79601
(325) 698-5560, Firm Registration No. 1151

LOG OF BORING

Project: **PCSUD ELEVATED STORAGE TANK**

Date: 13 SEPTEMBER 2023

Location: **BROCK HIGH SCHOOL**

Type: AIR ROTARY

Boring No.: **B-3**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER 1st 6"	TEXAS CONE PENETROMETER 2nd 6"	Qp (tsf)	DEPTH SCALE
		ST	TAN AND RED-BROWN CLAYEY SAND TO SANDY CLAY				4.5+	
		ST					4.5+	
5		SS		19				
		ST					4.5+	
		AU						
10		SS	TAN CLAYEY SILTY SAND	35				
5		SS		50/6"				
		SS	TAN SILTY COARSE SAND	50/6"*				
20			- 4-6" FINE GRAVEL LAYER					
5		SS		50/6"				
30		SS		50/6"*				
5		SS	TAN CLAYEY SILTY SAND WITH FINE GRAVEL	50/6"				
40		SS		50/5"				
5		SS		50/3"*				
50		SS		50/6"				

TOTAL DEPTH OF BORING 50 FEET

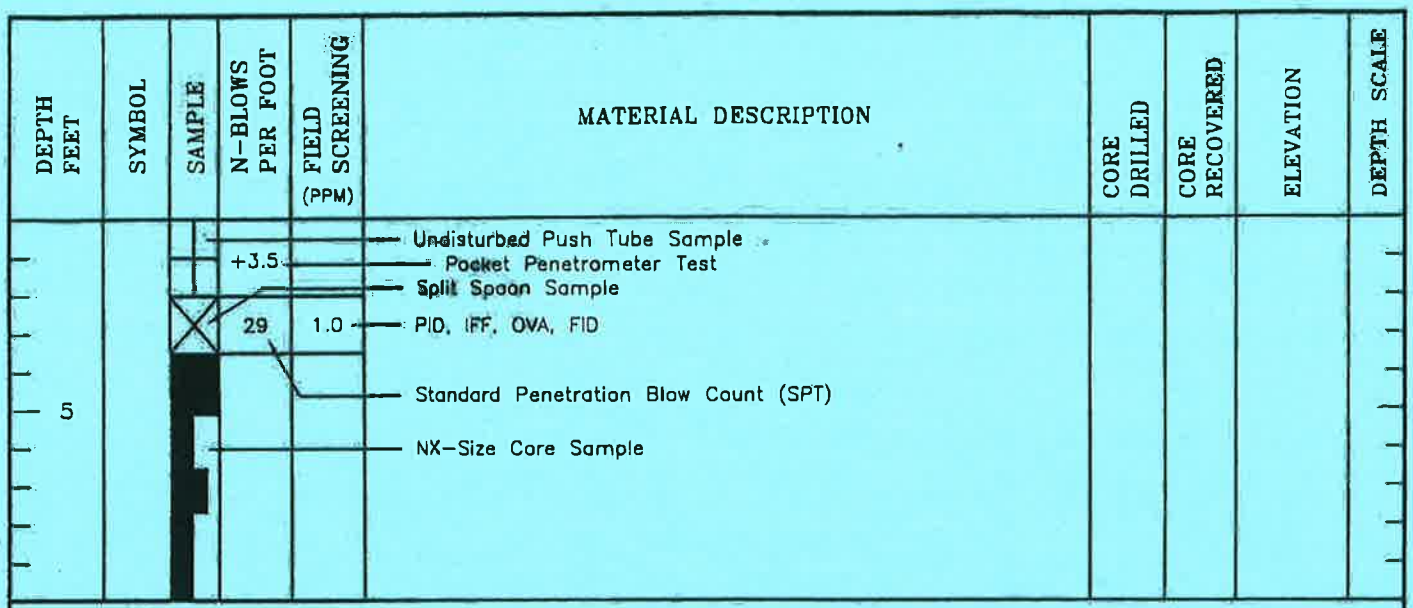
NOTE

GROUNDWATER ENCOUNTERED AT A DEPTH OF 28-1/2 FEET DURING AND AT COMPLETION OF DRILLING ACTIVITIES.
* WITH 6" SEAT

7546

ENPROTEC, INC.

EXPLANATION OF SYMBOLS AND TERMS USED ON BORING LOGS



Water Encountered — Water Level Encountered During Drilling

Static Level (date) — Stabilized Water Level

UNIFIED SOIL CLASSIFICATION DESCRIPTION OF SYMBOLS AND DIVISIONS

- Well-Graded Gravels, Gravel Sand Mixtures (GW)
- Poorly-Graded Gravels, Gravel Sand Mixtures (GP)
- Silty Gravel, Gravel Sand-Silt Mixtures (GM)
- Clayey Gravels, Gravel-Sand-Clay Mixtures (GC)
- Well-Graded Sands, Gravelly Sands (SW)
- Poorly-Graded Sands, Gravelly Sands (SP)
- Silty Sands, Poorly-Graded, Sand-Silt Mixtures (SM)
- Clayey Sands, Poorly-Graded, Sand-Clay Mixtures (SC)
- Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands (ML)
- Inorganic Clays of Low to Medium Plasticity Gravelly, Sandy or Silty Clays, Lean Clays (CL)
- Organic Silts and Organic Silty Clays of Low Plasticity (OL)
- Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils (MH)
- Inorganic Clays of High Plasticity, Fat Clays (CH)
- Organic Clays of Medium to High Plasticity, Organic Silts (OH)
- Caliche and Other Impervious Layer (HP)

BEDROCK SYMBOLS

- Conglomerate (CGL)
- Sandstone (SS)
- Limestone (LS)
- Shale (Sh)
- Weathered Shale (WS)
- Sandy Shale (SSh)
- Shaley Limestone (Sh LS)
- Dolomite (DOL)

MISCELLANEOUS SYMBOLS

- Asphaltic Concrete (HMAC)
- Cement Grout (CMT)
- Bentonite (BENT)

The LOG of BORING is a representation of the subsurface material at specific boring location and within the depth explored. The transition between strata may be gradual and variations in material types and depths between borings can be expected. Water level observations represent those conditions at the time of exploration and may vary with time and location of site.

SOIL COLOR CLASSIFICATION
Determined by
MUNSELL SOIL COLOR CHARTS
1990 EDITION REVISED

GENERAL NOTES

SAMPLE IDENTIFICATION

Soil Samples are visually classified in general accordance with the Unified Soil Classification System (ASTM D2487 or D 2488)

DRILLING AND SAMPLING SYMBOLS

ST:	Shelby Tube - 3" O.D., except where noted
SS:	Split-Spoon
THD:	THD Cone Penetrometer
AU:	Auger Sample
DB:	Diamond Bit
CB:	Carbide Bit
WS:	Wash Sample

SOIL PROPERTY SYMBOLS

N:	Standard "N" penetration: Blows per foot, or fraction thereof, of a 140 pound hammer 30 inches on a split-spoon
Qp:	Calibrated Penetrometer Resistence, TSF
Qu:	Unconfined Compression Strength, TSF
LL:	Liquid Limit, %
PI:	Plasticity Index

SOIL STRENGTH CHARACTERISTICS

NON-COHESIVE (GRANULAR) SOILS

RELATIVE DENSITY	BLOWS PER FOOT(N)
Very Loose	0-4
Loose	5-10
Firm	11-30
Dense	31-50
Very Dense	51 +

COHESIVE (CLAYEY) SOILS

COMPARATIVE CONSISTENCY	BLOWS PER FOOT(N)	UNCONFINED COMPRESSIVE STRENGTH (Qu)
Very Soft	0-2	0 - 0.25
Soft	3-4	0.25 - 0.50
Medium Stiff	5-8	0.50 - 1.00
Stiff	9-15	1.00 - 2.00
Very Stiff	16-30	2.00 - 4.00
Hard	31 +	4.00 +

SOIL CHARACTERISTICS

PARTICLE SIZE

Boulders	8 in. +	Coarse Sand	5mm-0.6 mm	Silt	0.074mm-.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074 mm		

DEGREE OF EXPANSIVE POTENTIAL	PI
Low	0-15
Moderate	15-25
High	25 +

DEGREE OF PLASTICITY	PI
None to Slight	0-4
Slight	5-10
Moderate	11-30
High	31 +