Enprotec / Hibbs & Todd

May 31, 2022

Mr. Jim O'Brien
O'Brien Engineering, Inc.
2340 E. Trinity Mills Road, Ste. 220
Carrollton, Texas 75006

Re: Geotechnical Investigation
CLC Phase 3
VA Medical Center
Big Spring, Texas

Dear Mr. O'Brien:

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 for the geotechnical and materials testing services during construction as recommended in the Report. If there are any further questions, please do not hesitate to call.

Sincerely,

Enprotec/Hibbs & Todd, Inc.

31 MAY 22

STATE OF TEXAS
GARY SCOTT YUNGBLUT
85640
LICENSED
PROFESSIONAL ENGINEER

G. Scott Yungblut, P.E.
Geotechnical Engineer

Enclosure
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GEOTECHNICAL INVESTIGATION
CLC PHASE 3
VA MEDICAL CENTER
BIG SPRING, TEXAS

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GEOTECHNICAL INVESTIGATION
FOR THE
CLC PHASE 3
VA MEDICAL CENTER
BIG SPRING, TEXAS

EXECUTIVE SUMMARY

The following is a summarized outline of the report recommendations. This summary should be read in complete context with the attached report.

SITE PREPARATION:

- Initial site preparation will require the removal of the moderately organic topsoil present across the majority of site.
- Site preparation will also require the removal of the Portland cement concrete pavement and sidewalks covering the remainder of the site.
- Preserve existing subgrade properties by controlling disturbance and storm water during construction and throughout the life of the structure.

BUILDING FOUNDATION AND FLOOR SLAB:

- A shallow foundation founded a minimum 30 to 36 inches in the existing soils or newly placed select fill utilizing a maximum net allowable bearing pressure of 2.5 kips per square foot.
- Slab-on-grade underlain by properly compacted existing soils or select fill used to level or raise site grades.
- PVR less than ½ of an inch.

INTRODUCTION

GENERAL: This investigation was authorized in April 2022 by Mr. Jim O'Brien, Project Engineer representing O'Brien Engineering, Inc. The purpose of this investigation is to provide foundation and floor slab design information along with construction recommendations for the proposed CLC building on the south side of the VA Medical Center Campus in Big Spring, Texas.

The improvements are anticipated to include a single-story building with about 7,500 square feet. Anticipated construction includes steel framing with a brick veneer to match the surrounding structures. Detailed structural loading was not provided, however for this analysis it has been assumed that maximum column loads will be less than 40 kips per column and maximum wall loads will be less than 2.5 kips per linear foot of wall, based upon dead load plus design live load. Detailed site grading has also not been provided therefore, it has been assumed that the floor slab for the structure will be constructed to match the existing buildings requiring about 1 to 3 feet of fill in areas. No basement or underground construction is anticipated.

SCOPE: The scope of the exploration and analysis to be performed by 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 and floor slab along with construction recommendations for the proposed structure. 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 building is located on the south side of the existing VA Medical Center at 300 W. Veterans Boulevard in Big Spring, Texas. At the time of the subsurface exploration the majority of the site was covered with sparce grasses. The remainder of the site was covered with Portland cement concrete pavement and sidewalks. The site appeared slightly rolling and sloped from the north down to the south with approximately 3 to 4 feet of elevation difference across the area.

DESCRIPTION OF WORK

FIELD INVESTIGATION: Drilling and soil sampling activities were performed at select locations of the site on April 28, 2022. Two test borings were drilled to a depth of about 20 feet below the existing ground surface elevation at the locations shown on Figure 1 in Appendix A. The site location plan was provided by Mr. O'Brien.

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 indications of foundation strata shear strength were obtained using Standard Penetration Test methods (SPT). 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. Push-tube samples and split barrel samples were placed in polyethylene plastic bags to minimize moisture changes. Samples will be retained for 30 days from the date of this report. The samples will then be discarded unless notified in writing by the client.

The borings were observed for groundwater at the test locations, during and following the completion of the borings. 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 fieldwork. 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 and from information provided by Mr. O'Brien. 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 must be notified to determine if changes in our recommendations are required.

SUBSURFACE MATERIALS AND CONDITIONS

SITE GEOLOGY: As shown on the Big Spring Sheet of the Geologic Atlas of Texas, the site is located in an area where Quaternary Age deposits of the Lingos Formation are present at or near the ground surface. The Lingos Formation in the project area generally consists of upward-fining sequence from fluvial gravel to eolian sand and silt.

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:

Eighteen inches of hard comparative consistency sandy clay with gravel was present at the surface at Test Boring No. 1. Firm to very dense relative density clayey and silty sands, some with gravel, were present at the surface at Test Boring No. 2 and beneath the sandy clays at Test Boring No. 1 which extended to at least a depth of 20 feet, the termination depth of the test borings. The sands appeared to be slightly cemented below 6½ feet.

GROUNDWATER: Groundwater was not encountered in the test borings during or at completion of 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 soil moisture contents the groundwater table was considered to exist at depths greater than 20 feet below current grades at the time of the subsurface exploration, although shallower perched water may exist. The water table may fluctuate seasonally and during periods of heavy rainfall.

LABORATORY RESULTS: The results of the Atterberg Limits Testing indicate that one of the samples tested had a Liquid Limit (LL) of 25 with corresponding Plasticity Index (PI) of 10. The remainder of the samples tested were found to be non-plastic. Soil Classification Tests indicate that the soils exhibit a low expansive potential with a slight degree of plasticity. The soils are classified as CL and SM materials according to the Unified Soil Classification System (USCS). Refer to Appendix B for the laboratory test results of the materials tested.

FOUNDATION DESIGN RECOMMENDATIONS

GENERAL: The proposed site is underlain by moderate strength, low expansive sandy clays further underlain by clayey and silty sands and cemented sands. The Potential Vertical Rise (PVR) has been estimated using the *State of Texas Highway Department Materials and Testing Division Test Method TEX-124-E "Methods of Determining the Potential Rise"* for the existing soils. For this site, the PVR estimation was based on a plasticity index (PI) ranging from non-plastic to 10. The estimation assumed average seasonal minimum moisture corresponding to the dry line of the test method. The PVR for this site was estimated to be less than ½ of an inch. A differential movement of half of the PVR can be assumed. However, differential movement can be equal to or even double the PVR in extreme conditions such as soils exposed to moisture and swelling in one area and drying and shrinkage in another. Based upon the boring log information this site falls in Seismic Site Class C according to the International Building Code.

SHALLOW FOUNDATION: Following proper site preparation, the structure may be supported by a shallow foundation system. Continuous wall footings for load bearing walls and spread footings for building columns may be designed for maximum net allowable bearing pressures of 2.5 and 3.0 kips per square foot (ksf), respectively, based upon dead load plus design live load considerations. A subgrade modulus of 120 psi/in may be used for foundation design within the existing soils or select fill material used to level the site grades. The bottoms of the exterior footings should bear a minimum 24 to 30 inches below adjacent surface grades along the perimeter to reduce seasonal effects on the supporting soils and should also be in accordance with local building code requirements. The grade beams should have a minimum width of 16 inches and the pads should have a minimum width of 36 inches even if the actual bearing pressure is less than the design value. Any shallow or near ground supported foundation should be designed by a structural engineer experienced in design of shallow foundations.

FLOOR SLAB: The slab-on-grade for the structure should be supported on properly compacted existing soils or select fill used to raise and/or level site grades to provide a PVR of less than one-half of an inch. Based upon the assumed floor slab live loads a minimum 5-inch thick concrete slab reinforced with at least #4 rebar 18 inches on center, each way, placed mid-height within the floor slab is recommended due to the underlying soils. However, the structural engineer should provide the actual floor slab design.

PERIMETER MOISTURE CONTROL: Proper design of a foundation shall include perimeter surface moisture control. Basically, soils experience volume changes when allowed to dry or when allowed access to moisture. Thus, if the soil moisture content remains constant, soil volume changes will be minimal. In reality it is difficult to prevent seasonal soil-moisture fluctuations, but these moisture changes can be limited.

Proper grading and drainage around foundation to prevent ponding of water is essential from construction through the life of the structure. Outlets for gutter systems must empty either into storm drains or onto paved surfaces to allow for quick discharge of water away from the area. Where possible, paving surfaces should extend to the building line to serve as a barrier to soil moisture evaporation and infiltration.

This report is being prepared assuming that conscientious watering will occur and any landscape areas near the foundation will not be continuously saturated. Trees should be kept away from the foundation edge a distance at least equal to their expected mature height. Metal or concrete edging around flower beds are not recommended near the building. Flowerbed edging will trap and pool water near the foundation and potentially cause excess swelling of the soils. If edging is installed there should be areas in the edging to allow water to quickly drain out of the flowerbed and away from the building.

FOUNDATION CONSTRUCTION RECOMMENDATIONS

SITE CLEARING/STRIPPING: Initial site preparation will require the removal of the moderately organic topsoil present across the majority of the site. Site preparation will also require the removal of the Portland cement concrete pavement and sidewalks covering the remainder of the area. Removal depths should be verified in the field by a representative of the geotechnical engineer at the time of site grading based upon the subgrade soils and the subgrade stability.

PROOFROLLING: Following site clearing, the subgrade should be proofrolled with a loaded tandem axle truck in the presence of and approved by a qualified geotechnical engineer to locate any soft or unstable areas. If present, these soft or loose soils should be removed to a stable subgrade and replaced with select fill material. Following proofrolling, the subgrade should be scarified to a depth of 6 to 8 inches; moisture conditioned to not less than 2 percent below optimum moisture content; and recompacted to a minimum 95 percent dry density of Standard Proctor. Specific recommendations for the select fill are presented in the following section of this report. Extreme care must be exercised to prevent excessive drying of the expansive soil subgrade since a subsequent increase in moisture content can cause swell.

SELECT FILL: Select fill should be used in areas where site filling is necessary. The select fill should consist of non-granular (cohesive) soils free of organics and other deleterious materials and should have a maximum liquid limit of 35, a plasticity index between 5 and12 and have a maximum particle size of 2 inches. The select fill should also meet the USCS classification of SC, GC or CL. The structural fill beneath the building and extending 5 feet out from the building edge should be compacted to a minimum 95 percent Standard proctor (ASTM D 698) at not less than 2 percent below optimum moisture content. A portion of the site soils tested meet the select fill criteria.

VAPOR BARRIER: A vapor barrier such as polyethylene sheeting should be placed below the slab-on-grade floor slab in moisture sensitive areas and where the floor will be covered with moisture sensitive materials. If the subgrade underlying the vapor barrier contains sharp or angled particles, a layer of cushion sand (approximately 1 to 2 inches thick) could be placed in contact with the sheet to provide protection against puncture.

FOUNDATION EXCAVATION: Excavations should be observed by the geotechnical consultant to make sure that the proper bearing material has been reached in accordance with the recommendations given herein. The excavations should be checked for size and observed to make sure that all loose material has been removed prior to concrete placement. Prompt placement of the concrete following building pad preparation is strongly recommended.

UTILITIES: Evidence of underground utilities was present across the improvement area. Prior to construction all underground utilities should be located and, if present in the construction area, permanently capped and removed at the property line or rerouted around the proposed new development to preserve their function. Special attention should be performed in evaluating the backfill of utilities that will remain which may not be suitable for support of the proposed structure. If found unsuitable, the soils should be removed and recompacted as described herein. A representative of the geotechnical engineer should make this determination during construction.

Granular material or buckshot should not be used to backfill new utility lines entering the building. If utilized, the granular material could provide a conduit for water to travel beneath the building and cause the underlying soils to swell and potentially heave the slab. A utility trench plug should be provided for all utility trenches entering the building footprint including electrical, gas, water and sewer, etc. The plug should extend a minimum 2 feet beyond the footing, each way, and from the bottom of the trench to the surface. The plug should be constructed of low permeable higher plasticity clays or a lean concrete. Utility excavations through the select fill pad beneath the structure shall be backfilled with select fill and compacted as specified for the building pad.

FOUNDATION CONSTRUCTION CONSIDERATIONS

WET WEATHER: If construction is performed during wet weather, disking or windrowing of the top 6 inches of wet unsuitable soils beneath structural areas may be necessary in order to dry out the soil. Following soils removal to a stable subgrade the excavated soils could be air-dried and reused. Mechanical stabilization through the use of a crushed limestone flex-base material working mat could also be considered. The actual depths and stabilization methods should be confirmed through continuous testing under the observation of a representative of the geotechnical engineer.

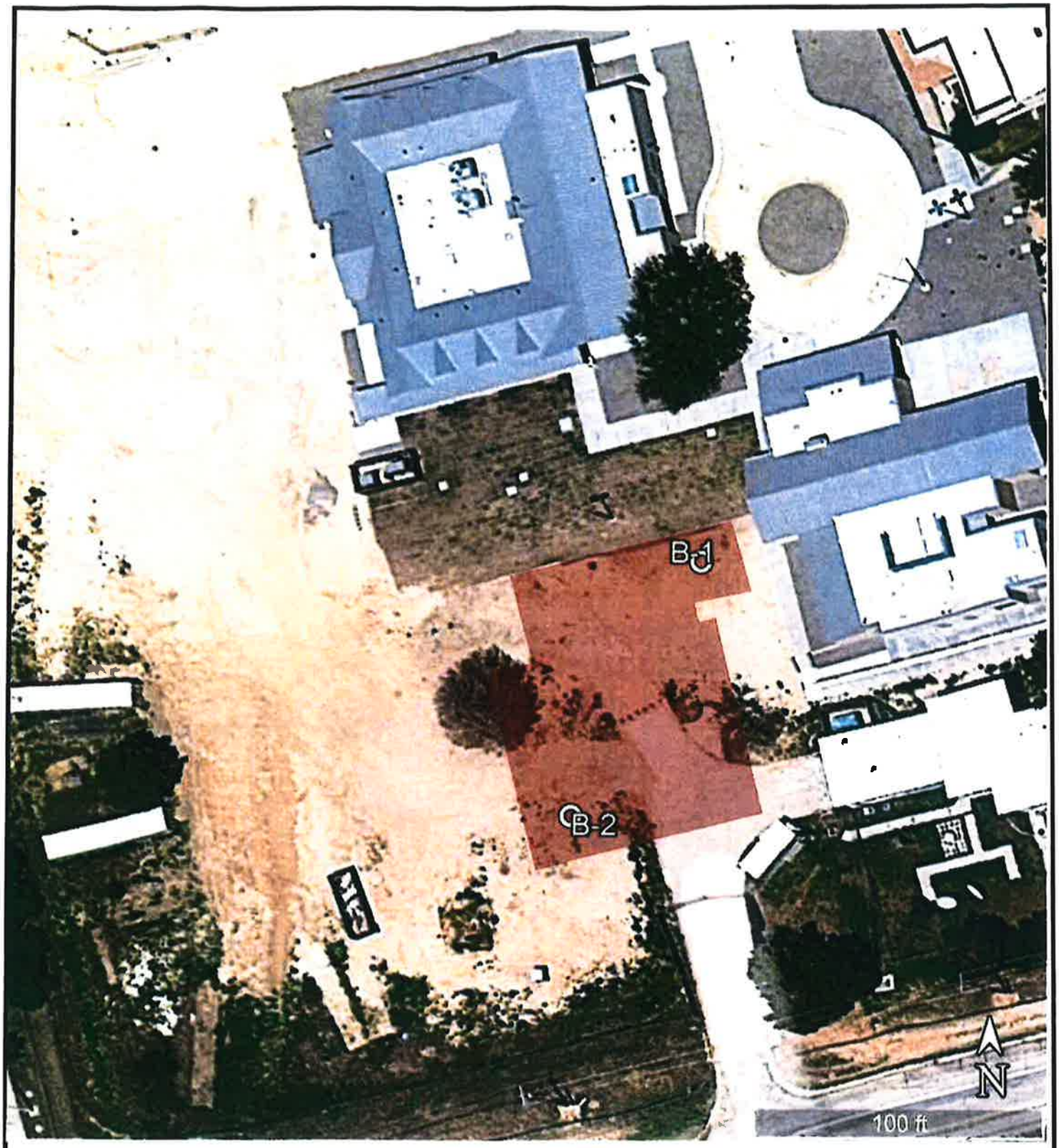
EXCAVATION SAFETY: All excavations should be in accordance with local and federal (OSHA) regulations and the trench safety plan. If instability problems occur, stability within the excavations should be maintained by flattening or widening slope sidewalls. In addition, the on-site soils are susceptible 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 services sufficient to verify compliance with our recommendations. It is recommended that site preparation, foundation, and floor slab construction be monitored by the 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 1 density and moisture content test per 2,500 square feet should be performed on the subgrade soils, and at least 1 density and moisture content test per 2,500 square feet should be performed for each compacted 6-inch thickness of fill in the building pad. Testing of backfilled trenches should be at least 1 density and moisture content test per 100 linear feet of trench per 6-inch compacted lift thickness.

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 100 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



NOT TO SCALE

Enprotec / Hibbs & Todd

BORING LOCATION PLAN

FIGURE 1

CLC PHASE 3
VA MEDICAL CENTER
BIG SPRING, TEXAS

Project No.: 22-8267 Date: April 2022

APPENDIX B

CLC PHASE 3
VA MEDICAL CENTER
BIG SPRING, TEXAS

SUMMARY OF CLASSIFICATION TESTS

Boring No.	Depth (ft)	Liquid Limit %	Plasticity Index	% Passing #200 Mesh Sieve	Water Content %	USCS	Description
B-1	2-3½'	25	10	46	5.4	SC	Tan Clayey Fine Sand with gravel
B-1	5-7'	---	non-plastic	15	5.7	SM	Light Brown Clayey fine sand with gravel
B-2	0-1½'	---	non-plastic	35	3.9	SM	Brown Clayey Fine Sand
B-2	5-6'	---	non-plastic	15.3	4.6	SM	Light Brown and Tan Clayey Silty sand with gravel
B-2	8½-10'	---	non-plastic	35	4.2	SM	Tan and Brown Silty Sand (slightly cemented)

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: **NEW BUILDING** Date: APRIL 28, 2022

Location: **BIG SPRING VETERANS ADMIN** 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	BROWN SANDY CLAY WITH GRAVEL				4.5+	
		ST	BROWN CLAYEY FINE SAND WITH TRACE GRAVEL				4.5+	
5		SS	LIGHT BROWN CLAYEY FINE SAND WITH GRAVEL -INTERMITTENT SAND SEAMS BELOW 5'	50/5"				
		AU						
		ST	TAN AND BROWN SILTY SAND (SLIGHTLY CEMENTED)				4.5+	
10		SS		50/5"*				
		SS	TAN SILTY SAND (SLIGHTLY CEMENTED)	50/4"				
15								
		SS		50/3"				
20			TOTAL DEPTH OF BORING 20 FEET					

NOTE

NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.

* WITH 6" SEAT

8267

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: **NEW BUILDING** Date: APRIL 28, 2022

Location: **BIG SPRING VETERANS ADMIN** 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	BROWN CLAYEY FINE SAND				4.5+	
		ST					4.5+	
		AU						
		SS	LIGHT BROWN AND TAN CLAYEY SILTY SAND WITH GRAVEL	33				
5		ST					4.5+	
		AU	TAN AND BROWN SILTY SAND (SLIGHTLY CEMENTED)					
		SS		50/3"				
10								
		SS	TAN SILTY SAND (SLIGHTLY CEMENTED)	50/5"				
15								
		SS		50/2"*				
20			TOTAL DEPTH OF BORING 20 FEET					

NOTE

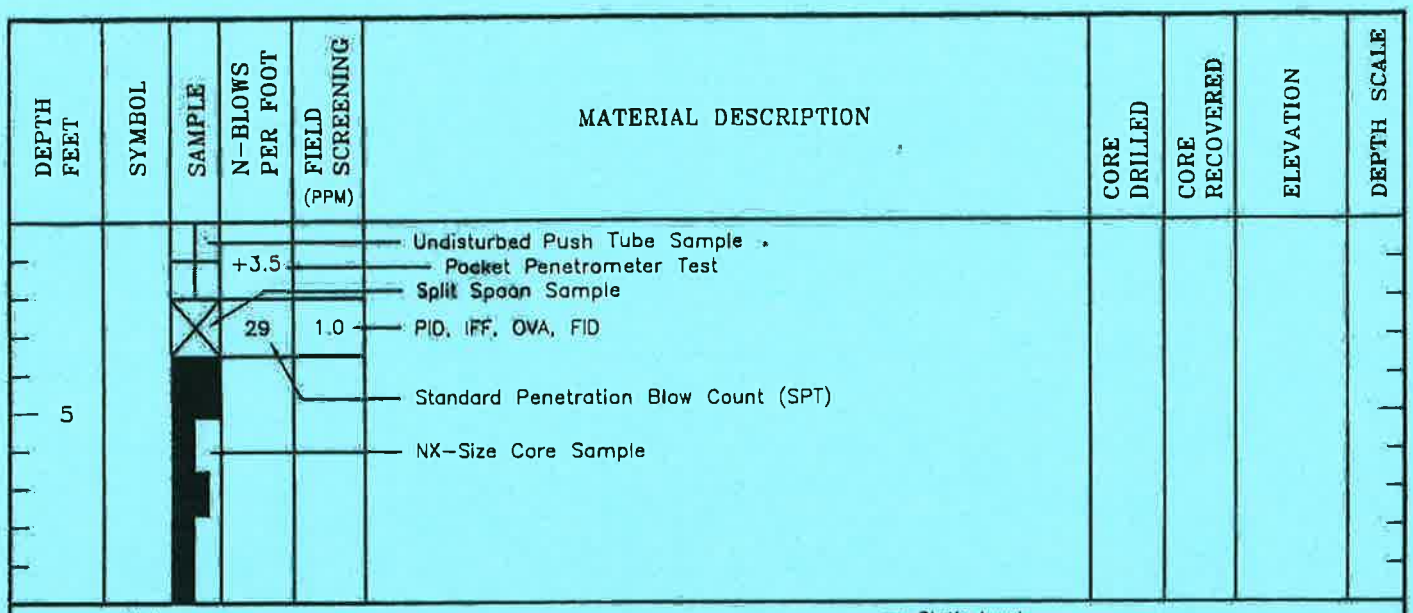
NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.

* WITH 6" SEAT

8267

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 +