SUBSOIL INVESTIGATION
FOUNDATION RECOMMENDATION
HILLSBOROUGH COUNTY SHERIFF'S OFFICE
VALRICO, FLORIDA

Prepared for:
JBM&R Enterprises, Inc.
ATTN: MR. Ralph Remmert
P.O. BOX 1566
VALRICO, FLORIDA 33595

Prepared by:
IMPERIAL TESTING LABORATORIES, INC.
3905 KIDRON ROAD
LAKELAND, FLORIDA 33811
(863) 647-2877
PROJECT NUMBER 10357

December 1, 2010

Imperial
Testing Laboratories, Inc.

3905 Kidron Road • Lakeland, FL 33811 • 863-647-2877 • Fax 863-647-1770

December 1, 2010

JBM&R Engineering, Inc
Attn: Ralph Remmert
P.O. Box 1566
Valrico, Florida 33595

Re: Hillsborough County Sheriff's Office Training Facility
Subsoil Investigation/ Foundation Recommendation

Dear Mr. Remmert:

As requested, Imperial Testing Laboratories, Inc. (Imperial) has performed eight (8) standard penetration tests at the above-mentioned site. The scope of work was completed as a subsoil investigation/ foundation recommendation for the future construction of a proposed training area. The training area will include buildings that simulate a community that includes a school, bank, gasoline station, shopping center (possible duplex) and a two story building. A storage building and water tank area will also be constructed. The buildings will be metal structures with the exception of the two story building that will be a masonry structure.

The site is located off of Highway 39 in Valrico and is in an area of former phosphate mining activity. The borings reveal that the majority of the site was impacted by former phosphate mining. The mined soils appear to have been replaced with hydraulically installed soils post mining. Further details can be found in the conclusions and recommendations section of this report. The following is the report of our findings.

SCOPE OF WORK

A total of eight (8) standard penetration tests (SPT) were completed during this site investigation. The borings were completed between November 5, 2010 and November 10, 2010. The SPT's were advanced using Imperial's truck mounted drilling rig. The borings were performed in the locations shown on the attached location map. The boring locations were staked prior to the field work.

The SPT borings were designated as borings SPT-1 through SPT-8. The original soil boring depths were estimated at 30 feet but deeper borings were needed due to the presence of very loose soils. The SPT borings were completed in general accordance with ASTM D1586 using a truck mounted drilling rig. The soils were sampled continuously to ten feet and at five feet intervals thereafter to the boring termination depth. The soils were stored in sealed plastic bags and returned to our laboratory for visual classification. The SPT resistance ('N') values reported at various depth intervals on the boring logs represent the number of hammer blows (140 pound hammer falling 30 inches) required to advance a 2 inch split spoon sampler a

distance of one foot. SPT boring logs are included in the Appendix of this report. The auger borings were conducted in accordance with ASTM D1452. Visual Classifications of all soil samples were accomplished with the aid of the *Unified Soil Classification System.* The boring locations can be found on **Figure 1**.

SOIL ASSESSMENT

Soil borings SPT-1, SPT-2, SPT-4 and SPT-6 were drilled to the depth of 30 feet below land surface (BLS). Soil boring SPT-3 was drilled to 35 feet and SPT-5 was drilled to 40 feet. Soil borings SPT-7 and SPT-8 were installed to 45 feet and 50 feet, respectively. The location of the borings can be found on **Figure 1**. The following is a summary of the soil types and consistency reported during the recent drilling campaign.

Table 1- STANDARD PENETRATION TEST DATA

Date	Boring	Depth	"N" Value	Soil Classification	Consistency
11/5/10	SPT-1	0-2	7	Gray fine sand with cemented sands	Loose
11/5/10	SPT-1	2-4	18	Dark gray silty fine sand with finger roots (5%)	Medium Dense
11/5/10	SPT-1	4-6	14	Tan, brown and gray mottled silty fine sand	Medium Dense
11/5/10	SPT-1	6-8	16	Dark gray silty fine sand	Medium Dense
11/5/10	SPT-1	8-10	11	Dark gray silty fine sand to gray slightly silty fine sand	Medium Dense
11/5/10	SPT-1	13-15	7	Light gray fine to medium grain sand	Loose
11/5/10	SPT-1	18-20	1	Gray silty cemented sands	Very Loose
11/5/10	SPT-1	23-25	2	Dark gray silty fine sand with cemented sands	Very Loose
11/5/10	SPT-1	28-30	2	Dark gray silty fine sand with cemented sands	Very Loose
11/5/10	SPT-2	0-2	5	Brown slightly silty fine sand to dark gray silty fine sand	Loose
11/5/10	SPT-2	2-4	16	Dark gray silty fine sand to gray slightly silty fine to medium grain sand	Medium Dense
11/5/10	SPT-2	4-6	14	Dark gray silty fine sand with cemented sands	Medium Dense
11/5/10	SPT-2	6-8	22	Dark gray silty fine sand with cemented sands to light gray fine to medium grain sands	Dense
11/5/10	SPT-2	8-10	14	Light gray fine to medium grain sand	Medium Dense
11/5/10	SPT-2	13-15	0	Dark gray silty fine sand with light gray waste phosphatic clay lenses	Very Loose
11/5/10	SPT-2	18-20	2	Dark brown silty fine sand to very dark gray very silty fine sand	Very Loose
11/5/10	SPT-2	23-25	4	Very dark gray silty fine sand	Loose
11/5/10	SPT-2	28-30	2	Very dark gray silty fine sand with cemented sands to brown clayey sand	Very Loose

Table 1- STANDARD PENETRATION TEST DATA (continued)

Date	Boring	Depth	"N" Value	Soil Classification	Consistency
11/9/10	SPT-3	0-2	7	Gray fine sand	Loose
11/9/10	SPT-3	2-4	12	Gray and brown mottled silty fine sand with finger roots (~5%)	Medium Dense
11/9/10	SPT-3	4-6	15	Gray and brown mottled silty fine sand with finger roots (~5%)	Medium Dense
11/9/10	SPT-3	6-8	21	Gray and brown mottled silty fine sand with finger roots (~5%) to light gray fine to medium grain sand	Dense
11/9/10	SPT-3	8-10	27	Light gray fine to medium grain sand	Dense
11/9/10	SPT-3	13-15	12	Light gray fine to medium grain sand	Medium Dense
11/9/10	SPT-3	18-20	1	Light gray silty fine sand to dark gray silty fine sand	Very Loose
11/9/10	SPT-3	23-25	5	Dark brown slightly silty fine sand	Loose
11/9/10	SPT-3	28-30	1	Very dark gray very silty fine sand	Very Loose
11/9/10	SPT-3	33-35	6	Very dark gray very silty fine sand	Loose
11/9/10	SPT-4	0-2	7	Dark gray slightly silty fine sand	Loose
11/9/10	SPT-4	2-4	21	Dark gray and brown mottled silty fine sand	Dense
11/9/10	SPT-4	4-6	22	Dark gray and brown mottled silty fine sand	Dense
11/9/10	SPT-4	6-8	9	Dark gray and brown mottled silty fine sand	Medium Dense
11/9/10	SPT-4	8-10	2	Dark brown silty sand to brown clayey sand	Very Loose
11/9/10	SPT-4	13-15	---	Very dark gray very silty fine sand	---
11/9/10	SPT-4	18-20	---	Very dark gray very silty fine sand	---
11/9/10	SPT-4	23-25	4	Very dark gray very silty fine sand	Loose
11/9/10	SPT-4	28-30	4	Very dark gray very silty fine sand	Loose
11/9/10	SPT-5	0-2	6	Gray fine sand	Loose
11/9/10	SPT-5	2-4	22	Gray brown and dark gray mottled slightly silty fine sand	Dense
11/9/10	SPT-5	4-6	11	Gray brown and dark gray mottled slightly silty fine sand	Medium Dense
11/9/10	SPT-5	6-8	4	Dark gray and dark brown silty fine sand	Loose
11/9/10	SPT-5	8-10	2	Dark gray and dark brown silty fine sand with cemented sands	Very Loose
11/9/10	SPT-5	13-15	---	Very dark gray very silty fine sand	---
11/9/10	SPT-5	18-20	---	Very dark gray very silty fine sand	---
11/9/10	SPT-5	23-25	---	Very dark gray very silty fine sand to 30'	---
11/9/10	SPT-5	28-30	---	Spoon for 23-25 dropped to 30'	---
11/9/10	SPT-5	33-35	6	Grayish green silty fine sand	Loose
11/9/10	SPT-5	38-40	10	Grayish green silty fine sand to greenish gray highly phosphatic clay to tan weathered limestone	Medium Dense
11/10/10	SPT-6	0-2	6	Gray slightly silty fine sand	Loose
11/10/10	SPT-6	2-4	20	Light gray fine to medium grain sand	Dense
11/10/10	SPT-6	4-6	16	Light gray fine to medium grain sand	Medium Dense
11/10/10	SPT-6	6-8	13	Light gray fine to medium grain sand	Medium Dense
11/10/10	SPT-6	8-10	12	Light gray fine to medium grain sand	Medium Dense
11/10/10	SPT-6	13-15	7	Light gray fine to medium grain sand	Loose
11/10/10	SPT-6	18-20	5	Very dark gray and dark brown mottled silty fine sand	Loose
11/10/10	SPT-6	23-25	3	Dark brown silty fine sand with cemented sands to vey dark gray silty fine sand	Very Loose
11/10/10	SPT-6	28-30	---	Very dark gray very silty fine sand	---

Table 1- STANDARD PENETRATION TEST DATA (continued)

Date	Boring	Depth	"N" Value	Soil Classification	Consistency
11/9/10	SPT-7	0-2	10	Light gray fine to medium grain sand	Medium Dense
11/9/10	SPT-7	2-4	19	Light gray fine to medium grain sand	Medium Dense
11/9/10	SPT-7	4-6	15	Light gray fine to medium grain sand	Medium Dense
11/9/10	SPT-7	6-8	12	Light gray fine to medium grain sand	Medium Dense
11/9/10	SPT-7	8-10	10	Light gray fine to medium grain sand	Medium Dense
11/9/10	SPT-7	13-15	10	Light gray fine to medium grain sand	Medium Dense
11/9/10	SPT-7	18-20	2	Light gray fine to medium grain sand to gray waste phosphatic clay	Very Loose
11/9/10	SPT-7	23-25	0	Gray slightly silty fine sand	---
11/9/10	SPT-7	28-30	0	Dark gray silty fine sand	---
11/9/10	SPT-7	33-35	4	Grayish green sandy clay	Loose
11/9/10	SPT-7	38-40	50+	Tan weathered limestone	Very Dense
11/9/10	SPT-7	43-45	44	Tan to light gray weathered limestone	Dense
11/10/10	SPT-8	0-2	5	Gray fine sand to light gray fine to medium grain sand	Loose
11/10/10	SPT-8	2-4	13	Light gray fine to medium grain sand	Medium Dense
11/10/10	SPT-8	4-6	12	Light gray fine to medium grain sand	Medium Dense
11/10/10	SPT-8	6-8	10	Light gray fine to medium grain sand	Medium Dense
11/10/10	SPT-8	8-10	13	Light gray fine to medium grain sand	Medium Dense
11/10/10	SPT-8	13-15	0	Very dark gray very silty fine sand	---
11/10/10	SPT-8	18-20	---	Very dark gray very silty fine sand	---
11/10/10	SPT-8	23-25	---	Very dark gray very silty fine sand	---
11/10/10	SPT-8	28-30	6	Dark brown and gray mottled silty fine sand	Loose
11/10/10	SPT-8	33-35	17	Dark brown silty fine sand to light gray clayey sand with rock fragments and phosphatic pebbles	Medium Dense
11/10/10	SPT-8	38-40	6	Greenish gray sand clay with rock fragments	Loose
11/10/10	SPT-8	43-45	20	Tan weathered limestone	Medium Dense
11/10/10	SPT-8	48-50	50+	No recovery	Very Dense

The site is in an area of former phosphate mining activity. The borings reveal that the entire area was disturbed by the removal of the soil matrix for phosphate recovery. The surficial soils appear to have been layered during installation but the intermediate zone appears to be hydraulically placed. Further details follow.

In general, the upper 10 feet consist of predominantly medium dense soil conditions. The loose zones appear to be isolated to the upper 2 feet. The area around SPT-4 and SPT-5 became loose at 8 feet and 6 feet, respectively. The intermediate zone was loose to extremely loose from 10 to 40 feet. Several weight of hammer (WOH) and weight of rod (WOR) readings were recorded for the site indicating soils with minimal resistance to penetration. A stiffer consistency was reported for the site at approximately 35-40 feet below land surface (BLS).

Generally homogenous soil conditions were reported for the upper zone and to approximately 35 feet concerning soil coloration and consistency. Similarity in soils to the reported depth is atypical unless the soils were manually placed. Natural soil conditions are typically more heterogeneous. The soils in the upper 35 feet were generally gray to brown in color and consisted of fine to medium grain sands (sand tailings). Some silt and cementation was documented for this zone.

Evidence of waste phosphatic clay (WPC), a mining byproduct, was apparent in soil borings SPT-2 and SPT-7. These waste clays are very fine and highly susceptible to settlement and have high consolidation rates.

The groundwater elevation at the site was encountered at approximately 5-7 feet below land surface (BLS) for the majority of the site. The area around SPT-8 yielded a slightly deeper groundwater elevation at 10.5 feet BLS. The deeper water table may be a function of elevation or related to the former disturbance from phosphate mining. The groundwater elevation can and will fluctuate with changes caused by naturally occurring conditions and may rise above the level during our investigation. The groundwater elevation may need to be considered during implementation of the recommended tasks if the site preparation is completed during the rainy season.

CONCLUSIONS

The site appears to have been mined to approximately 35 feet based on the soil conditions. Only a historic review of aerial documents can determine if the area has been mined. The historical review may only determine evidence of mining and not actual excavation boundaries since mining in the area may have occurred prior to dated historical documents.

The soils in the upper 10 feet were generally medium dense. Loose to extremely loose soil conditions were prevalent in the intermediate zone to approximately 35 feet. Evidence of the remaining confining layer clays and limestone layer was documented in deeper borings SPT-5, SPT-7 and SPT-8.

The soil conditions in the upper 35 feet are indicative of sand tailings that was placed post mining. These soils may have been layered with some compactive effort applied in the upper 10 feet. The soils between 10 feet and the bottom of the mining cut appear to have been hydraulically installed and also consist of sand tailings. Loose to extremely loose soils were apparent between 10-35 feet BLS.

Evidence of waste phosphatic clay (WPC) was found in SPT-2 and SPT-7. These clays are highly compressible under weight and are typically found in areas that have been mined and backfilled. WPC is likely located beneath other areas throughout the site that were not

detected during the boring installations. The borings appear to indicate only isolated areas of WPC on site.

The soil conditions at the site are generally sandy. There is also an approximate 10 feet layer of medium dense soils atop the loose to extremely loose soil conditions. There also appears to be minimal waste phosphatic clays at the site. These conditions will allow for a floating slab but potentially significant total settlement may be realized over time. A deep foundation or post tension slab mat is typically desired for these type sites. Discussion with JBM&R indicates that the site will only be used for training purposes and some settlement will be tolerable.

The final tank foundation was not completed at this drafting but a preliminary design indicates that soil loads will be relatively light. The strip foundation is not expected to exceed 500 pounds per linear foot. The bottom of the tank will also rest on the existing soil and will only exert 600-700 pounds per square foot. The tank area can be supported on a shallow foundation since point loads will not be significant.

Discussions with the Hillsborough County Sherriff's office personnel and JBM&R indicate that the two story building will be relatively small. The square footage is proposed to be approximately 200 square feet but a slightly larger building may be desired. The building is proposed to be masonry and will have wood trusses and a metal roof. Lightweight concrete is proposed for the upper floor. The proposed structure will have and interior and exterior staircase and windows will not be installed in the structure. The heaviest loads will be the wall loads and the staircase loads.

The groundwater table may need consideration since excavating at the site will be recommended. The groundwater table was found at approximately 5-7 feet below land surface at the majority of the boring locations and will likely rise during normal rainfall fluctuations. The groundwater table was found at approximately 10.5 feet at the proposed tank pad location. The following are recommendations for the site.

RECOMMENDATIONS

The site will contain training buildings that will not be inhabited and some settlement of the structures would be tolerable. This was considered during the recommended site preparation at the site. It is important for the reader to understand that settlement cracks and some slab imperfections will be eminent for the site due to the very loose subsurface soils. Also, if glass is reconsidered for the window openings, safety glass should be used.

Minimal amounts of backfill will be required for the site. Discussions with JBM&R indicate that a maximum of one foot of backfill will be required for the site. Imperial shall be contacted

for further review if additional backfill is anticipated for the structures. The following are recommendations for site preparation for the various structures on site.

One Story Buildings

The proposed building areas shall be cleared of all vegetation. The clearing shall extend a minimum of 5 feet outside the building perimeter and is expected to extend 8-10 inches below land surface. Over-excavation of the building areas is recommended.

Excavate the natural soil to 2 feet below grade level and 5 feet outside the building footprint. The entire building footprint and 5 feet outside the footprint should be compacted to 98 percent of modified proctor. The bottom of the excavation should be compacted with a vibratory compactor with at least 10,000 pounds of exerted energy. Compaction should be verified through field densities performed to 2 feet below the bottom of the excavation. The removed soil should be placed back in the excavation in one-foot lifts. The lifts should be compacted to a minimum of 98 percent of a modified proctor (ASTM D1557) to the original land surface. Soil above natural land surface should also be compacted to a minimum of 98 percent of a modified proctor. Compaction testing should be performed to verify soil consolidation. A minimum of two test locations per building and 12 inch lift of soil shall be performed. The addition of water may be required to consolidate the sandy soils.

Provided the recommendations are followed, the site will be suitable for standard construction with a re-enforced monolithic type concrete slab. An allowable 1,000 pounds per square foot allowable bearing capacity can be used for foundation design. The monolithic slab shall be 6 inches thick. The monolithic slab shall be re-enforced with #5 rebar that is placed at 24 inches on center, and each way, and tied back into the footer rebar. Imperial recommends a minimum footing depth of 18 inches excluding the slab thickness and a minimum width of 20 inches. A structural engineer shall design the slab. Settlement of 1.5 inch total and 3/4 inch differential can be expected for the buildings.

Two story buildings

The site preparation for the two story building shall be as specified for the one story buildings. Larger strip footings will be required for the two story structure.

Provided the recommendations are followed, the site will be suitable for standard construction with a re-enforced monolithic type concrete slab. An allowable 1,000 pounds per square foot allowable bearing capacity can be used for foundation design. The monolithic slab shall be 6 inches thick. The monolithic slab shall be re-enforced with #5 rebar that is placed at 24 inches on center, and each way, and tied back into the footer rebar. Imperial recommends a minimum footing depth of 18 inches excluding the slab thickness and a minimum width of 24 inches. Interior footers should assist in supporting the staircase loads. A structural engineer shall

design the slab. Settlement of 1.5 inch total and 3/4 inch differential can be expected for the buildings.

Tank Pad

The tank pad location is expected to exert light loads due to the width of the proposed tank. The diameter of the tank may be on the order of 24 feet. As previously mentioned, a strip footer is desired and the bottom of the tank will rest on the existing soil. The site preparation for the tank pad follows:

The proposed tank area shall be cleared of all vegetation. The clearing shall extend a minimum of 5 feet outside the proposed foundation perimeter and is expected to extend 8-10 inches below land surface. Proof-rolling of the entire tank pad area is recommended.

Compact the natural soils and 5 feet outside the tank area to 3 feet below grade level. The tank area should be compacted with a vibratory compactor with at least 10,000 pounds of exerted energy. The entire tank area and 5 feet outside the area should be compacted to 98 percent of modified proctor. Compaction should be verified through field densities performed to 2 feet below grade level. Additional compaction of the proposed footer areas will be required as follows.

Imperial recommends a minimum footing depth of 24 inches and a minimum width of 36 inches. The recommended footer dimensions should be maintained even if the bearing capacity is attained with a smaller dimension. The bottom of the exposed footer areas should be watered and compacted until the soil to 2 feet below the bottom of the strip footer elevation is compacted to 98 percent of a modified proctor. Compaction testing shall be performed every 50 lineal feet to assure soil consolidation.

Provided the recommendations are followed, the site will be suitable for standard construction with a strip footer. An allowable 1,000 pounds per square foot allowable bearing capacity can be used for foundation design. Settlement of the tank foundation should be minimal since the interior of the tank will rest on compacted soils. Settlement of approximately 1 inch total can be expected for the tank foundation.

Any isolated column pads shall be designed using the allowable 1,000 psf soil bearing capacity. Minimum isolated column dimensions shall be on the order of 3 feet square. The minimum depth of any isolated columns should be 1.5 feet.

The majority of the total settlement will likely occur during construction due to the sandy soil conditions. Long term settlement will also occur with the fluctuation of groundwater levels. Mined areas sitting atop loose to extremely loose soils can continue to settle over long periods of time. This settlement is less significant with sandy soil conditions.

Please feel free to contact Al McGhin should any questions arise or if any additional information is required.

Sincerely,

Al McGhin
President

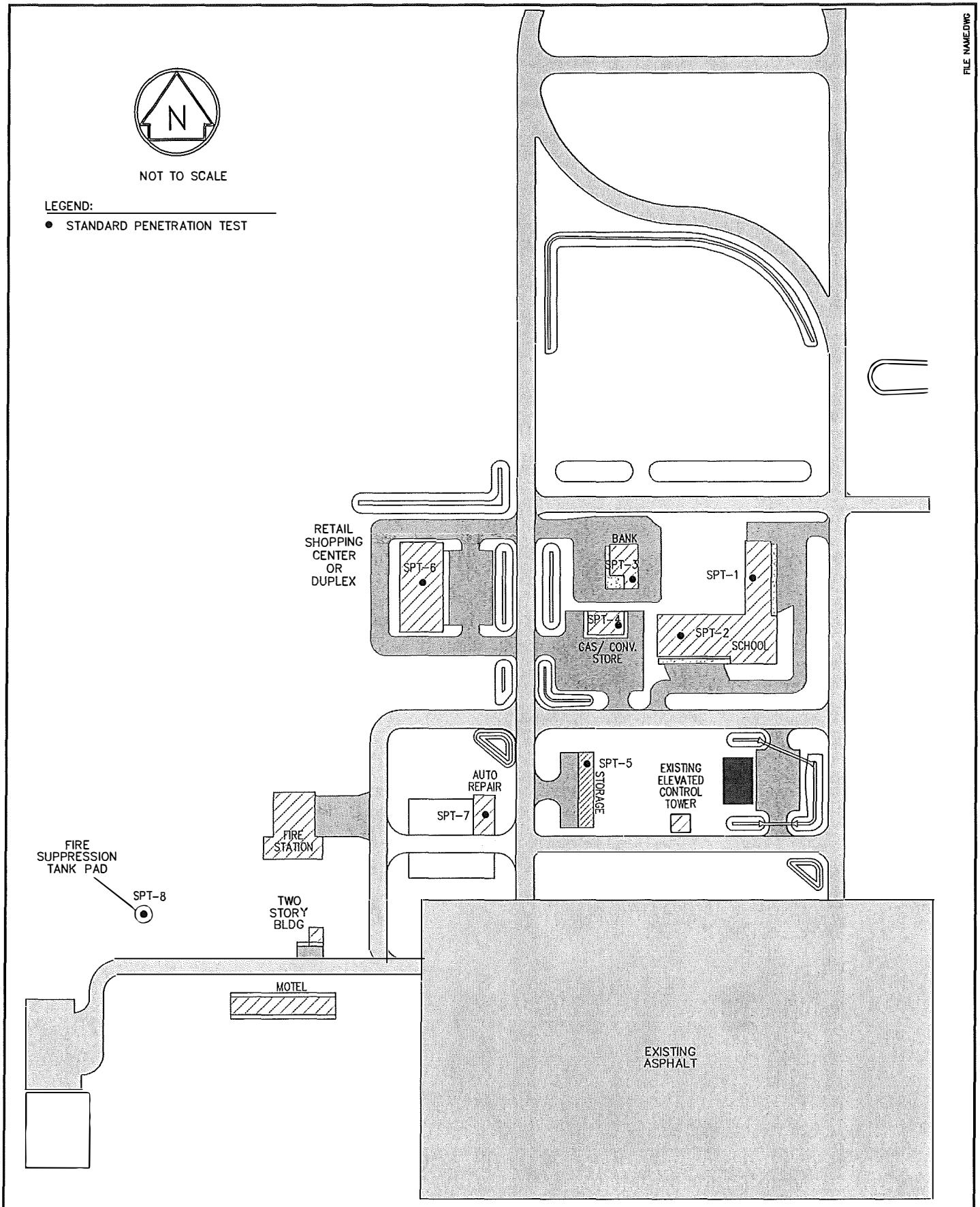
Michael Stillinger, P.E. #47011
Vice-President of Engineering

Cc: File 10357

Basis for recommendations:

The recommendations provided are based in part on project information provided to us and only apply to the specific project and site discussed in this report. If the project information section in this report contains incorrect information or if additional information is available, Imperial Testing Laboratories can be retained to review the corrected or additional information. We can modify our recommendations, if they are appropriate for the proposed project. This report should not be construed as a sinkhole investigation or evaluation of potential of occurrence. Imperial can perform additional investigations to document indicators of sinkhole activity through ground penetrating radar or other studies. Additionally, the recommendations are based on reasonable groundwater fluctuations based on historical information. A modification in the recommendations may be warranted if significant groundwater fluctuations occur as a result of sinkholes, manmade artificial conditions or natural conditions.

Regardless of the thoroughness of geotechnical exploration, there is always a possibility that conditions between borings will be different from those at the specific areas explored and that conditions will not be as anticipated by the designers or contractors. In addition, the construction process may itself alter soil conditions. Therefore, experienced geotechnical personnel should observe and document the construction procedures used and the conditions encountered. Unanticipated conditions and inadequate procedures should be reported to the design team along with timely recommendations to solve the problems created. We recommend that the owner retain Imperial Testing Laboratories to provide this service based upon our familiarity with the project, the subsurface conditions and the intent of the recommendations and design.



IMPERIAL TESTING LABORATORIES, INC. 3905 KIDRON ROAD LAKELAND FL 33811	HILLSBOROUGH COUNTY SHERIFF'S OFFICE TRAINING FACILITY VALRICO, FLORIDA	DATE OF DRAWING 11-30-10	SITE MAP PROJ. NO. 10357 FIGURE NO. 1

Imperial
Testing Laboratories, Inc.

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DRILLERS FIELD REPORT

CLIENT: JBM&R Engineering **PROJECT NUMBER:** 10357 **HOLE NUMBER:** SPT-1

PROJECT LOCATION: Hillsborough County Sheriff's Office Training Facility

DATE STARTED: November 5, 2010 **DATE COMPLETED:** November 5, 2010

HOLE LOCATION: Proposed school area; North section- see location map

DRILLER(S): D. Xanders/J. Conner **LAND SURFACE TYPE:** Dirt

EXPECTED SHWM: _____ **SLOPE OF LAND/ DEGREE:** _____

SAMPLER DIAMETER AND TYPE: 2" split spoon **HAMMER WEIGHT:** 140 lbs **FALL:** 30"

GROUNDWATER DEPTH- IMMEDIATE: ~6.5 feet **AFTER 24 HRS:** _____

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
SS	0-2	20	1-2-5-6	7	Gray fine sand with cemented sands	N	0	SM	D
SS	2-4	24	7-7-11-13	18	Dark gray silty fine sand with finger roots (5%)	N	5%	SM	D
SS	4-6	24	10-7-7-8	14	Tan, brown and gray mottled silty fine sand	N	0	SM	M
SS	6-8	24	8-8-8-7	16	Dark gray silty fine sand	N	0	SM	W
SS	8-10	24	4-5-6-9	11	Dark gray silty fine sand to gray slightly silty fine sand	N	0	SM	S
SS	13-15	12	5-4-3-1	7	Light gray fine to medium grain sand	N	0	SP	S
SS	18-20	2	1-0-1-0	1	Gray silty cemented sands	N	0	SM	S
SS	23-25	24	1-1-1-1	2	Dark gray silty fine sand with cemented sands	N	0	SM	S
SS	28-30	20	1-1-1-1	2	Dark gray silty fine sand with cemented sands	N	0	SM	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: JBM&R Engineering **PROJECT NUMBER:** 10357 **HOLE NUMBER:** SPT-2

PROJECT LOCATION: Hillsborough County Sheriff's Office Training Facility

DATE STARTED: November 5, 2010 **DATE COMPLETED:** November 5, 2010

HOLE LOCATION: Proposed school area; South section- see location map

DRILLER(S): D. Xanders/J. Conner **LAND SURFACE TYPE:** Dirt

EXPECTED SHWM: _____ **SLOPE OF LAND/ DEGREE:** _____

SAMPLER DIAMETER AND TYPE: 2" split spoon **HAMMER WEIGHT:** 140 lbs **FALL:** 30"

GROUNDWATER DEPTH- IMMEDIATE: ~5.5 feet **AFTER 24 HRS:** _____

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
SS	0-2	20	1-2-3-4	5	Brown slightly silty fine sand to dark gray silty fine sand	N	0	SM	D
SS	2-4	20	4-6-10-10	16	Dark gray silty fine sand to gray slightly silty fine to medium grain sand	N	0	SM	D
SS	4-6	24	10-6-8-10	14	Dark gray silty fine sand with cemented sands	N	0	SM	M
SS	6-8	24	8-10-12-11	22	Dark gray silty fine sand with cemented sands to light gray fine to medium grain sands	N	0	SP	W
SS	8-10	24	7-7-7-6	14	Light gray fine to medium grain sand	N	0	SP	S
SS	13-15	4	1-0-0-0	0	Dark gray silty fine sand with light gray waste phosphatic clay lenses	N/H	0	SM	S
SS	18-20	8	2-1-1-1	2	Dark brown silty fine sand to very dark gray very silty fine sand	N	0	SM	S
SS	23-25	16	2-2-2-2	4	Very dark gray silty fine sand	N	0	SM	S
SS	28-30	18	2-1-1-2	2	Very dark gray silty fine sand with cemented sands to brown clayey sand	N/L	0	SM/SC	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: JBM&R Engineering **PROJECT NUMBER:** 10357 **HOLE NUMBER:** SPT-3

PROJECT LOCATION: Hillsborough County Sheriff's Office Training Facility

DATE STARTED: November 9, 2010 **DATE COMPLETED:** November 9, 2010

HOLE LOCATION: Proposed bank area; Southeast side- see location map

DRILLER(S): D. Xanders/J. Conner **LAND SURFACE TYPE:** Dirt

EXPECTED SHWM: _____ **SLOPE OF LAND/ DEGREE:** _____

SAMPLER DIAMETER AND TYPE: 2 "split spoon **HAMMER WEIGHT:** 140 lbs **FALL:** 30"

GROUNDWATER DEPTH- IMMEDIATE: ~6.5 feet **AFTER 24 HRS:** _____

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
SS	0-2	20	2-3-4-5	7	Gray fine sand	N	0	SP	D
SS	2-4	20	4-6-6-9	12	Gray and brown mottled silty fine sand with finger roots (~5%)	L	5%	SM	M
SS	4-6	20	6-10-11-13	15	Gray and brown mottled silty fine sand with finger roots (~5%)	L	5%	SM	W
SS	6-8	24	9-8-7-6	21	Gray and brown mottled silty fine sand with finger roots (~5%) to light gray fine to medium grain sand	L/N	5%/0	SM/SP	S
SS	8-10	24	10-13-14-14	27	Light gray fine to medium grain sand	N	0	SP	S
SS	13-15	24	6-6-6-6	12	Light gray fine to medium grain sand	N	0	SP	S
SS	18-20	20	WOH-WOH-1-1	1	Light gray silty fine sand to dark gray silty fine sand	N	0	SM	S
SS	23-25	18	3-3-2-2	5	Dark brown slightly silty fine sand	N	0	SM	S
SS	28-30	18	1-0-1-1	1	Very dark gray very silty fine sand	N	0	SM	S
SS	33-35	20	3-3-3-3	6	Very dark gray very silty fine sand	N	0	SM	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic

Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: JBM&R Engineering **PROJECT NUMBER:** 10357 **HOLE NUMBER:** SPT-4

PROJECT LOCATION: Hillsborough County Sheriff's Office Training Facility

DATE STARTED: November 9, 2010 **DATE COMPLETED:** November 9, 2010

HOLE LOCATION: Proposed gas/convenience store area; East side- see location map

DRILLER(S): D. Xanders/J. Conner **LAND SURFACE TYPE:** Dirt

EXPECTED SHWM: _____ **SLOPE OF LAND/ DEGREE:** _____

SAMPLER DIAMETER AND TYPE: 2" split spoon **HAMMER WEIGHT:** 140 lbs **FALL:** 30"

GROUNDWATER DEPTH- IMMEDIATE: ~6.5 feet **AFTER 24 HRS:** _____

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
SS	0-2	20	2-2-5-8	7	Dark gray slightly silty fine sand	N	0	SM	D
SS	2-4	18	8-8-13-18	21	Dark gray and brown mottled silty fine sand	N	0	SM	M
SS	4-6	18	12-12-10-10	22	Dark gray and brown mottled silty fine sand	N	0	SM	W
SS	6-8	20	5-5-4-4	9	Dark gray and brown mottled silty fine sand	N	0	SM	W
SS	8-10	24	2-1-1-1	2	Dark brown silty sand to brown clayey sand	N/M	0	SM/SC	S
SS	13-15	20	WOH	---	Very dark gray very silty fine sand	N	0	SM	S
SS	18-20	20	WOH	---	Very dark gray very silty fine sand	N	0	SM	S
SS	23-25	24	2-2-2-2	4	Very dark gray very silty fine sand	N	0	SM	S
SS	28-30	24	2-2-2-2	4	Very dark gray very silty fine sand	N	0	SM	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: JBM&R Engineering **PROJECT NUMBER:** 10357 **HOLE NUMBER:** SPT-5

PROJECT LOCATION: Hillsborough County Sheriff's Office Training Facility

DATE STARTED: November 9, 2010 **DATE COMPLETED:** November 9, 2010

HOLE LOCATION: Proposed storage area; North side-see location map

DRILLER(S): D. Xanders/J. Conner **LAND SURFACE TYPE:** Dirt

EXPECTED SHWM: **SLOPE OF LAND/ DEGREE:**

SAMPLER DIAMETER AND TYPE: 2" split spoon **HAMMER WEIGHT:** 140 lbs **FALL:** 30"

GROUNDWATER DEPTH- IMMEDIATE: ~7 feet **AFTER 24 HRS:**

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
SS	0-2	20	1-3-3-6	6	Gray fine sand	N	0	SP	D
SS	2-4	24	8-12-10-10	22	Gray brown and dark gray mottled slightly silty fine sand	N	0	SM	D
SS	4-6	22	8-6-5-6	11	Gray brown and dark gray mottled slightly silty fine sand	N	0	SM	M
SS	6-8	20	3-2-2-2	4	Dark gray and dark brown silty fine sand	N	0	SM	W
SS	8-10	18	1-1-1-1	2	Dark gray and dark brown silty fine sand with cemented sands	N	0	SM	S
SS	13-15	16	WOH	---	Very dark gray very silty fine sand	N	0	SM	S
SS	18-20	12	WOH	---	Very dark gray very silty fine sand	N	0	SM	S
SS	23-25	20	WOR	---	Very dark gray very silty fine sand to 30'	N	0	SM	S
SS	28-30	---	---	---	Spoon for 23-25 dropped to 30'	N	0	SM	S
SS	33-35	6	2-3-3-4	6	Grayish green silty fine sand	L	0	SM	S
SS	38-40	10	2-3-7-7	10	Grayish green silty fine sand to greenish gray highly phosphatic clay to tan weathered limestone	L/H/M	0	CL	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: JBM&R Engineering **PROJECT NUMBER:** 10357 **HOLE NUMBER:** SPT-6

PROJECT LOCATION: Hillsborough County Sheriff's Office Training Facility

DATE STARTED: November 10, 2010 **DATE COMPLETED:** November 10, 200

HOLE LOCATION: Proposed retail shopping center area-see location map

DRILLER(S): D. Xanders/J. Conner **LAND SURFACE TYPE:** D it

EXPECTED SHWM: **SLOPE OF LAND/ DEGREE:**

SAMPLER DIAMETER AND TYPE: 2" split spoon **HAMMER WEIGHT:** 140 lbs **FALL:** 30"

GROUNDWATER DEPTH- IMMEDIATE: ~7 feet **AFTER 24 HRS:**

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
SS	0-2	20	1-2-4-6	6	Gray slightly silty fine sand	N	0	SM	D
SS	2-4	18	8-10-10-11	20	Light gray fine to medium grain sand	N	0	SP	D
SS	4-6	22	7-8-8-7	16	Light gray fine to medium grain sand	N	0	SP	M
SS	6-8	24	6-6-7-7	13	Light gray fine to medium grain sand	N	0	SP	W
SS	8-10	24	5-6-6-6	12	Light gray fine to medium grain sand	N	0	SP	S
SS	13-15	12	2-4-3-3	7	Light gray fine to medium grain sand	N/H	0	SP	S
SS	18-20	24	2-2-3-3	5	Very dark gray and dark brown mottled silty fine sand	N/L	0	SM	S
SS	23-25	18	5-1-2-2	3	Dark brown silty fine sand with cemented sands to vey dark gray silty fine sand	N	0	SM	S
SS	28-30	18	WOR	---	Very dark gray very silty fine sand	N	0	SM	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High N = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: JBM&R Engineering **PROJECT NUMBER:** 10357 **HOLE NUMBER:** SPT-7

PROJECT LOCATION: Hillsborough County Sheriff's Office Training Facility

DATE STARTED: November 9, 2010 **DATE COMPLETED:** November 9, 2010

HOLE LOCATION: Proposed two story building area; Approximate Center-see location map

DRILLER(S): D. Xanders/J. Conner **LAND SURFACE TYPE:** Dirt

EXPECTED SHWM: **SLOPE OF LAND/ DEGREE:**

SAMPLER DIAMETER AND TYPE: 2" split spoon **HAMMER WEIGHT:** 140 lbs **FALL:** 30"

GROUNDWATER DEPTH- IMMEDIATE: ~6 feet **AFTER 24 HRS:**

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
SS	0-2	20	5-5-5-8	10	Light gray fine to medium grain sand	N	0	SP	D
SS	2-4	18	8-9-10-8	19	Light gray fine to medium grain sand	N	0	SP	D
SS	4-6	20	7-7-8-8	15	Light gray fine to medium grain sand	N	0	SP	M
SS	6-8	24	6-6-6-6	12	Light gray fine to medium grain sand	N	0	SP	W
SS	8-10	24	5-5-5-6	10	Light gray fine to medium grain sand	N	0	SP	S
SS	13-15	18	5-5-5-5	10	Light gray fine to medium grain sand	N	0	SP	S
SS	18-20	24	2-1-1-1	2	Light gray fine to medium grain sand to gray waste phosphatic clay	N/H	0	SP	S
SS	23-25	20	1-0-0-0	0	Gray slightly silty fine sand	L	0	SM	S
SS	28-30	20	1-0-0-0	0	Dark gray silty fine sand	N	0	SM	S
SS	33-35	20	1-2-2-3	4	Grayish green sandy clay	M	0	SL	S
SS	38-40	12	6-50 @ 4"	50+	Tan weathered limestone	N	0	---	S
SS	43-45	24	12-16-28-24	44	Tan to light gray weathered limestone	M	0	---	S

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

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DRILLERS FIELD REPORT

CLIENT: JBM&R Engineering **PROJECT NUMBER:** 10357 **HOLE NUMBER:** SPT-8

PROJECT LOCATION: Hillsborough County Sheriff's Office Training Facility

DATE STARTED: November 10, 2010 **DATE COMPLETED:** November 10, 2010

HOLE LOCATION: Proposed fire suppression water tank area-see location map

DRILLER(S): D. Xanders/J. Conner **LAND SURFACE TYPE:** Dirt

EXPECTED SHWM: _____ **SLOPE OF LAND/ DEGREE:** _____

SAMPLER DIAMETER AND TYPE: 2 "splitspoon **HAMMER WEIGHT:** 140 lbs **FALL:** 30"

GROUNDWATER DEPTH- IMMEDIATE: ~10.5 feet **AFTER 24 HRS:** _____

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	"N" Value	Sample Description (inches and order of each material) (sand; clayey sand; sandy clay; clay)	Plasticity	Roots/ Organic %	USCS Symbol	Moisture Content
SS	0-2	12	1-2-3-5	5	Gray fine sand to light gray fine to medium grain sand	N	0	SP	D
SS	2-4	18	6-6-7-7	13	Light gray fine to medium grain sand	N	0	SP	D
SS	4-6	20	7-7-5-6	12	Light gray fine to medium grain sand	N	0	SP	D
SS	6-8	22	5-5-5-5	10	Light gray fine to medium grain sand	N	0	SP	M
SS	8-10	24	5-7-6-6	13	Light gray fine to medium grain sand	N	0	SP	M
SS	13-15	18	1-0-0-1	0	Very dark gray very silty fine sand	L	0	SM	S
SS	18-20	18	WOR	---	Very dark gray very silty fine sand	L	0	SM	S
SS	23-25	18	WOR	---	Very dark gray very silty fine sand	L	0	SM	S
SS	28-30	20	2-2-3-3	6	Dark brown and gray mottled silty fine sand	L	0	SM	S
SS	33-35	16	3-7-10-6	17	Dark brown silty fine sand to light gray clayey sand with rock fragments and phosphatic pebbles	N/M	0	SM/SC	S
SS	38-40	20	2-2-4-4	6	Greenish gray sand clay with rock fragments	M/H	0	SC	S
SS	43-45	6	50-10-10-12	20	Tan weathered limestone	L	0	---	S
SS	48-50	0	50 @ 0"	50+	No recovery	---	---	---	---

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings **AF**= Auger Flight
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated Plasticity: **L** = Low **M** = Moderate **H** = High **N** = Non Plastic
Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)