Report
Design Level Geotechnical Services
Proposed Orlando Health FSED – Confidential
Lake Andrew Drive
Viera, Brevard County, Florida
PSI Project No. 07573442

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RE: Report
Design-Level Geotechnical Engineering Services
Proposed Orlando Health FSED - Confidential
Lake Andrew Drive
Viera, Brevard County, Florida

Dear Ms. Harmon:

In accordance with PSI Proposal Nos. 0757-447905 and 0757-454229 and your authorization, **Professional Service Industries, Inc. (PSI), an Intertek Company**, has completed preliminary and design-level geotechnical services for the subject Free Standing Emergency Department (FSED) project located in Viera, Brevard County, Florida. This report presents the results of PSI's field exploration and geotechnical evaluations conducted as part of the design-level phase for the FSED. The report has been updated to incorporate supplemental fieldwork performed in response to the updated development plan recently provided to PSI.

PROJECT INFORMATION

The subject site is located on the east side of Andrew Drive, between Willet Place and Haynesfield Place, in Viera, Brevard County, Florida. The approximately 45-acre overall parcel is bordered by a large stormwater lake to the north, Interstate 95 to the east, Willet Place and the Linz of Viera Apartments to the south, and Andrew Drive to the west. The site is currently undeveloped, with wooded areas remaining in the west-central and south-central portions. From 2019 to 2020, the site underwent partial clearing and mass grading, and a bowtie-shaped stormwater pond was constructed in the central portion of the property in 2021. The FSED site is within the east-central portion of the overall property, with the planned future hospital expanding from the north wall of the FSED. A temporary loading/delivery area and transformer farm will be located on the FSED building's east side.

PSI received an updated confidential Site Plan for the proposed FSED development on September 9, 2025. The FSED will start as a 2-story structure (2nd story originally shelled) with future expansion to 5 stories with a mechanical penthouse. A porte-cochere/ambulance entrance canopy will be constructed on the FSED's south side. The facility's transformer farm and a future central energy plant (CEP)will be located to the east of the FSED. PSI previously performed due diligence geotechnical engineering for the overall project site, with our report (PSI Project No. 07573442) dated July 7, 2025 providing the results of that phase of exploration.

Updated structural loading information for the project was recently provided to PSI. Based on this information, we understand maximum column loads for the FSED at build-out will be 1,800 kips (1400 kips dead load and 400 kips live load). Based on past experience, we anticipate loads for the porte cochere, transformer farm and dumpster enclosure structures to be less than 300 kips.

The listed information/assumptions have been used for the purpose of preparing this report. Adjustments to PSI's evaluations/recommendations may be necessary if the planned development differs from the noted information/assumptions.

SCOPE OF GEOTECHNICAL SERVICES

The purpose of this evaluation was to obtain information on the subsurface soil and groundwater conditions at the proposed site. The subsurface conditions encountered were then evaluated with respect to the available project characteristics. In this regard, design-level geotechnical engineering evaluations for the following project elements were addressed.

1. Feasibility of utilizing a shallow foundation system for support of the proposed building entrance canopy (porte-cochere), transformer farm and dumpster enclosure.

2. Foundation recommendations for the FSED and its future vertical hospital tower expansion (5 stories plus mechanical penthouse), including allowable pile capacities (axial, tension and lateral) and an assessment for feasibility of utilizing a shallow foundation system in conjunction with ground improvement.

3. Soil subgrade preparation, including stripping, grubbing and compaction. Engineering criteria for placement and compaction of approved structural fill materials.

4. General location and description of potentially deleterious materials encountered in the borings which may interfere with construction progress or structure performance, including existing fills or surficial organic soils, if encountered.

5. Identification of groundwater levels including estimated normal seasonal high groundwater levels.

6. Recommendations for light-duty, medium-duty, and heavy-duty pavement design and construction, including flexible asphalt and rigid concrete sections (as needed).

The following services were provided in order to achieve the preceding objectives:

1. Reviewed readily available published geologic and topographic information. This published information was obtained from the appropriate quadrangle map published by the United States Geological Survey (USGS) and the "Soil Survey of Brevard County, Florida" published by the United States Department of Agriculture (USDA) and Soil Conservation Service (SCS).

2. Reviewed and incorporated boring data from PSI's previous due diligence phase geotechnical work at the site.

3. Executed a program of subsurface sampling and field testing associated with the proposed FSED. PSI performed the following scope of supplemental work.

FSED Building/Future Tower	5 SPT borings to depths 75 to 100 feet
Transformer Farm	1 SPT boring to depth 30 feet
Porte Cochere/Ambulance Canopy	1 SPT boring to depth 30 feet
Parking Lot/Entrance Roads	14 Auger borings to depth 7 feet

   Upon completion of drilling operations, the boreholes were backfilled with soil cuttings and hole plug. The boring locations were established in the field using a hand-held GPS device and the provided site/boring plan.

4. Visually classified and stratified representative soil samples in the laboratory using the Unified Soil Classification System. Conducted a limited laboratory testing program to confirm engineering properties of the soils. Identified soil conditions at each boring location and formed an opinion of the site soil stratigraphy.

5. Collected groundwater level measurements in the boreholes at the time the borings were performed and estimated normal seasonal high groundwater levels.

6. The results of PSI's field exploration and laboratory tests have been used in our engineering evaluations and in the formulation of our design-level geotechnical engineering recommendations for the FSED and associated infrastructure. The results of the subsurface exploration, including PSI's geotechnical recommendations and the data on which they are based, are presented in this engineering report.

REVIEW OF PUBLISHED DATA

USGS Topographic Map

The topographic survey map published by the USGS was reviewed for ground surface features in the area of the proposed FSED development. Based on this review, the natural ground surface elevation is on the order of +25 feet North American Vertical Datum (NAVD) of 1988. No site-specific topographic survey data was available to PSI at the time of this report. An excerpt of the noted USGS map is included on **Figure 1** in the **Appendix**.

SCS Soil Survey

The "Soil Survey of Brevard County, Florida," published by the USDA SCS, was reviewed for general near-surface soil information within the footprint of the FSED. This information indicates that there are two soil groups within the area of the FSED. The general information provided by the Soil Survey for the mapped soil units is summarized in the following table. Refer to **Figure 2** in the Attachments for a Soil Survey map for the project site.

Soil Series	Depth (inches)	Unified Soil Classification	USDA Seasonal High Groundwater Table
			Depth (feet)
2 – Anclote sand, frequently flooded, 0 to 1 percent slopes	0 to 72	SP, SP-SM	0 to 1.0
51 – Pompano sand, 0 to 2 percent slopes	0 to 90	SP, SP-SM	0 to 1.0

Sinkhole Type, Development and Distribution in Florida

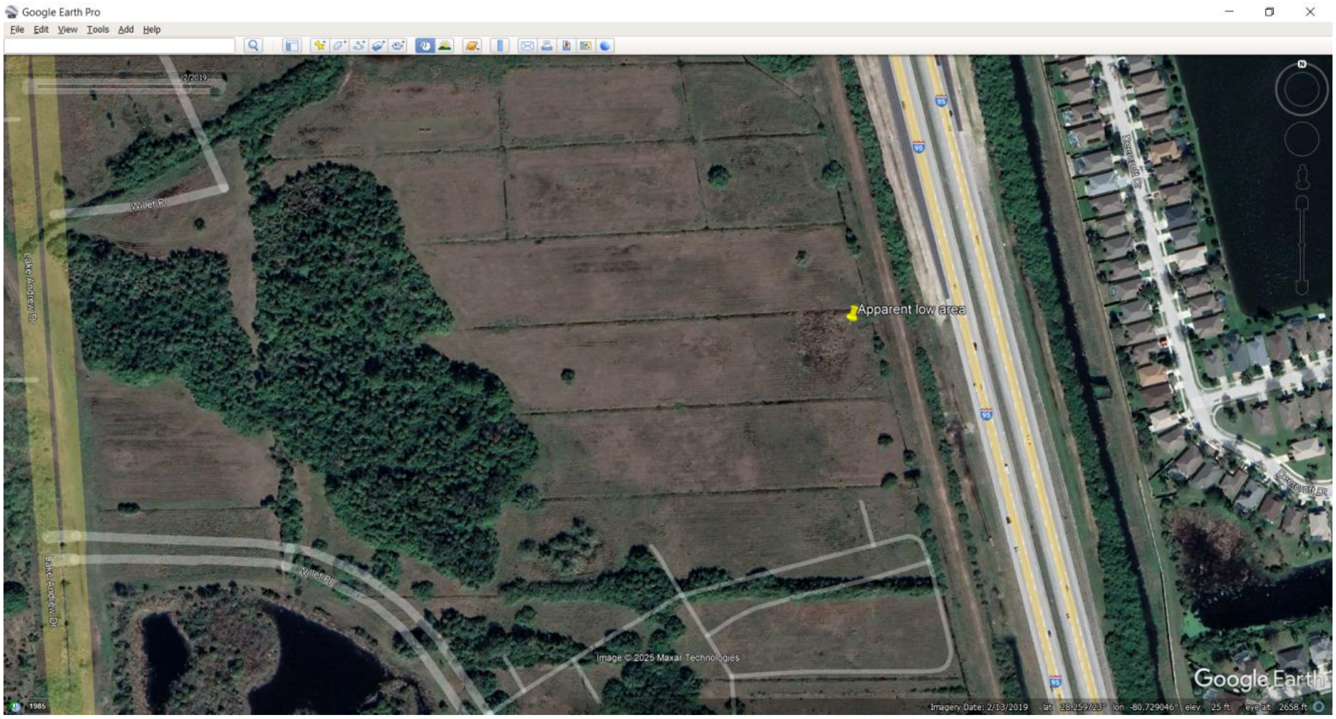
Information from sinkhole maps on the Florida Geologic Survey's website indicates that the project area is located within "Area II". Area II is typically characterized by mainly incohesive and permeable sand. Cover-subsidence sinkholes dominate in Area II. Sinkholes are few, of small diameter and develop gradually. The FGS has reported one sinkhole incident within a 0.8-mile radius of the project site, located southeast of the site on Ambra Drive.

Potentiometric Surface

The potentiometric contour map of the upper Floridan Aquifer published by the U.S. Geological Survey (USGS) indicates that the project area is located within an area with a potentiometric surface elevation of between +30 and +40 feet NGVD. This is some 5 to 15 feet above the existing ground surface as we understand it.

Review of Aerial Photography

A review of historical aerial imagery indicates the presence of a former low-lying area near the location of the proposed Physician/Staff Parking Lot (see image below). This area appears to have been filled during mass grading activities carried out between 2019 and 2020. The location of this former depression aligns with the presence of organic to highly organic soils (muck/peat) encountered in boring H-6, as well as other borings performed east and south of the FSED during our due diligence phase of exploration. These organic soils appear to be associated with the natural ground surface prior to filling/mass grading the site, as they were generally disclosed below a few feet of apparent fill.



FIELD EXPLORATION

General

The supplemental borings for this design-level phase were located in the field using handheld GPS equipment and the updated development plan recently provided to PSI. Upon completion of drilling, the borings were backfilled/sealed with soil cuttings and bentonite chips. The approximate locations at which the borings were drilled are shown on **Sheet 1** in the **Appendix**.

The soil samples recovered from the borings were returned to our Orlando laboratory for visual stratification by a geotechnical engineer. Subsoils were visually stratified following the guidelines contained in the Unified Soil Classification System (USCS). Records of the materials encountered in the borings are presented as soil profiles on **Sheets 2** through **6** in the **Appendix**. The boring sheets include a legend describing the soils in USCS format, together with the laboratory test results and measured groundwater levels in the boreholes at the time of drilling.

The stratification presented is based on visual observation of the recovered soil samples, laboratory testing and interpretation of field logs by a geotechnical engineer. It should be noted that variations in the subsurface conditions are expected and may be encountered between and away from PSI's borings. Also, whereas the individual boring logs indicate distinct strata breaks, the actual transition between the soil layers may be more gradual than shown on the soil profiles.

Soil Conditions

Based on the results of the borings PSI completed for the project, subsurface conditions at the site are somewhat variable in the depth interval explored (7 to 110 feet below existing grade). The borings generally encountered a varying sequence of fine sands grading relatively clean to slightly silty, silty and clayey in composition (i.e. SP, SP-SM, SM, and SC materials). Some areas contained dense to very dense cemented sands and shell ("coquina"). Layers of sandy clay and clay were encountered at depths starting at depths ranging from about 33 to 53 feet below existing grade. The clay layers were typically about 5 feet thick. Boring FSED-3 encountered a layer of clay at depths 88 to 93 feet below existing grade. Some of the soils contained varying amounts of shell. Below the overburden soils, the deeper borings encountered weathered limestone.

Boring H-6 encountered organic to highly organic soils (muck/peat) at depths of about 2 to 4 feet below existing grade. Other borings from PSI's due diligence phase of work disclosed shallow organic soils to the south and east of the FSED. This organic material appears to be native soils that were covered over with about 2 feet of fill during mass grading of the property.

Based on Standard Penetration Test (SPT) blow counts, the sands were generally in a medium dense to dense condition, with some zones grading very loose or very dense. The clays encountered ranged from being in a soft to firm condition. Where encountered, the limestone ranged from very soft (highly weathered) to moderately hard.

Groundwater

Groundwater was encountered in the borings at depths ranging from 2.5 to 6 feet below existing grade. Two large wet-bottom stormwater ponds, one in the central portion of the site between the planned FSED and the western outparcels and another pond north of the site, are likely having some drawdown impact on localized groundwater levels due to pond control levels.

The estimated normal seasonal high groundwater information presented herein is based on the observed soil stratigraphy, conditions observed in the borings, USDA Soil Survey information, and our past experience in the project vicinity. In this regard, we estimate the normal seasonal high groundwater table at the site will occur at a depth of 0 to 12 inches below the natural ground surface. Once detailed topographic survey information is provided to PSI along with site grading information, more detailed groundwater information can be developed addressing the current site grades.

It should be noted the estimated normal seasonal high groundwater level is not intended to define a limit or ensure that future seasonal fluctuations in the groundwater levels will not exceed the estimated levels. Post-development groundwater levels could exceed the estimated levels as a result of a series of rainfall events, changed conditions at the site that alter surface water drainage characteristics or variations in the duration, intensity, or total volume of rainfall.

SITE SUITABILITY

Based on the results of PSI's borings, it is our opinion that subsurface conditions are generally suitable for the planned development from a geotechnical engineering perspective, provided the site is properly prepared as noted herein. We anticipate the planned transformer farm, dumpster enclosure and porte-cochere canopy structures can be supported on shallow spread foundations.

Due to the magnitude of the foundation loads for the FSED (1,800 kips (1400 kips dead load and 400 kips live load), either a pile foundation system or shallow foundations with ground improvement (stone columns, rigid inclusions, etc.) will be required to utilize shallow foundations for these more heavily loaded structures.

Where highly organic soils (muck/peat) are present, they will require excavation/removal and replacement filling with compacted engineered fill to facilitate building construction. Where organic soils are present in planned pavement areas, a program of surcharging might allow the organic soils to remain in place depending on proposed site grading. Otherwise, similar to building areas the unsuitable organic soils will need to be removed and replaced with compacted engineered fill.

If site grades are established so at least 18 inches of clearance is provided between the estimated normal seasonal high groundwater level and the bottom of pavement base, asphalt surfaced pavements can be constructed using either limerock or crushed concrete base material. Similarly, at least 18 inches of clearance between the seasonal high groundwater table and concrete pavement should be provided.

The following geotechnical recommendations have been developed on the basis of the previously described project characteristics and the subsurface conditions encountered.

RECOMMENDATIONS

Pile Foundations

A deep foundation system is a recommended alternative for support for the planned FSED building and its future vertical expansion. Both conventional continuous flight auger cast piles and drilled pressure grouted displacement piles are considered feasible foundation alternatives for the project's heavily loaded structure (FSED Building). Piles should be installed at a minimum center to center spacing of 3 pile diameters, or a reduction in pile capacity will be required.

We consider 16 to 18-inch diameter auger cast piles to be a suitable support system for the FSED building, either conventional continuous flight augercast (CFA) piles or pressure grouted displacement (PGD) piles. Displacement piles typically provide increased capacity when compared to conventional auger cast piles, plus they generate a reduced volume of spoil material that may need to be hauled off site. Both conventional and displacement augered piles produce low levels of noise and vibrations when compared to various driven piles. Installation of auger cast piles should be a minimum of 10 feet from newly cast piles to avoid impacts from the installation of new piles on recently grouted adjacent piles.

The following table provides estimated allowable pile capacities for the FSED Building for properly reinforced piles.

Pile Type	Pile Diameter (inches)	Effective Pile Length (feet)	Allowable Compression Capacity (tons)	Allowable Tension Capacity (tons)	Allowable Lateral Capacity (tons)
CFA Piles	16	90	100	55	6
	18	90	120	60	8
PGD Piles	16	90	120	55	6
	18	90	140	65	8

Notes: Lateral capacity based on piles being in a pinned-head condition within the pile cap and piles being adequately reinforced.
Tension capacity requires piles be reinforced adequately to transmit tension load the full length of the pile.
Effective lengths of piles referenced from existing grades.
Grout strengths should be determined by the Structural Engineer.

Based on the anticipated building loads as noted herein, we estimate that the total settlement of structures supported on pile foundations extending to the noted depth will be less than 1 inch. To confirm pile capacities, we recommend that a load test program be carried out. Auger cast piles should be subjected to static load tests to confirm capacity and installation requirements. In addition to carrying out a static load test, we suggest that several indicator piles be installed throughout the building footprint. The purpose of the indicator piles would be to confirm that the piles can be constructed to the projected tip elevation across the full building footprint. Given the size of the building, we suggest that 6 to 8 indicator piles be installed throughout the building area during the test pile program. The indicator piles should be grouted but not reinforced and they should be installed at non-conflicting throwaway locations.

At one of the auger cast indicator pile locations, a static load test should be completed. The actual test pile should be a throwaway pile, preferably loaded to failure. Four production piles could be used as reaction for the test frame with these piles being monitored for tension movement. The compression test pile should be provided with strain gauges so that load transfer characteristics can be assessed during the test. The load test should be conducted using the quick test procedure in accordance with ASTM D-1143.

Conventional Shallow Foundations with Deep Ground Improvement

Another alternative for foundation support of the planned heavily loaded FSED building entails the use of deep ground improvement in conjunction with shallow footings. Ground improvement using vibro-replacement stone columns or rigid inclusions can be evaluated for support of the FSED Building. A qualified specialty ground improvement contractor should evaluate/review the foundation loads to determine the efficacy of these methods to support the planned heavy structures. Typically, with the implementation of ground improvement a net allowable bearing pressure of 6,000 psf can be achieved. The allowable bearing pressure can be increased by one-third to accommodate transient loads such as wind. Foundations should be designed to accommodate maximum 1-inch total and 0.5-inch differential settlements from the noted loads with foundations sized/designed for 6,000 psf.

The use of stone columns and rigid inclusions requires the utilization of vibration inducing equipment. This should be taken into consideration for the future expansion of the FSED to construct the attached hospital. If ground improvement is employed for the project, consideration of performing ground improvement work for adjacent future foundations should be evaluated to reduce vibration impacts to the FSED during hospital construction. Pre-installation of ground improvement work extending 2 to 3 column lines away from the FSED should be considered. This approach was used for the recent Orlando Health Lake Mary hospital project.

Vibro-Replacement Stone Columns:

For design of shallow foundations based on vibro-replacement stone columns, a net allowable bearing pressure of 6,000 pounds per square foot (psf) should be achievable. Minimum foundation widths for column and strip footings should be 36 inches and 24 inches, respectively. Foundations should be embedded a minimum of 24 inches below finished grades.

The vibro-replacement process is typically performed to a depth equal to approximately 1.5 to 2 times the width of the more heavily loaded column footings and 3 to 4 times the width of strip footings. The number and placement of stone columns should be determined by the specialty ground improvement contractor responsible for carrying out the work using foundation load and subsurface soil information, considering the required bearing pressure and settlement performance as noted herein.

Stone columns would be installed using the vibro-replacement process with stone/gravel meeting the following gradation criteria (ASTM C-33), No. 57 Stone.

Sieve Size	Percent Passing
1.5 inches	100
1.0 inches	95 to 100
½ inch	25 to 60
No. 4	0 to 10
No. 8	0 to 5

The stone columns should be installed by a Specialty Contractor experienced with this type of work and having successfully completed deep ground improvement on at least five projects within Florida of a similar size/nature in the last five years. The contractor will be responsible for carrying out the work on a performance basis to provide the following.

- Achieve an allowable design bearing value of at least 6,000 pounds per square foot (psf).
- Provide for total settlements of 1.0 inches or less with differential settlements not exceeding one-half of an inch over 60 feet for the range of foundation loads noted herein and as confirmed by the structural engineer.

A plate load test should be required to verify the adequacy of the ground improvement achieved by the vibro-replacement stone columns. The plate load test should be conducted on an initial grouping of stone columns prior to installation of the balance of stone columns. Based on past projects, we recommend a nominal 10-foot by 10-foot steel plate be placed atop a group of vibro-replacement stone columns and the plate be loaded to a minimum of 150 percent of the design bearing pressure. The load test will be used to confirm bearing capacity and to evaluate settlement performance of the foundation system. The load set up should employ static procedures and be carried out similar to a quick pile load test (ASTM D-1143 - Procedure A).

Lateral loads that are applied to the spread foundations may be resisted by earth pressure mobilized on the buried vertical faces of the footings and by shearing forces acting along the footing-subgrade interface. Earth pressure resistance may be determined using an equivalent fluid density of 180 pounds per cubic foot for moist soil and 90 pounds per cubic foot for submerged soil below the water table. A friction factor of 0.40 should be used to determine base shearing resistance.

The noted values presume that the foundations are surrounded by well-compacted sand backfill and can withstand horizontal movements on the order of one-quarter to three-eighth inches. Horizontal restraint determined in accordance with the recommended values should be considered resistance that is available rather than allowable. Therefore, the design should incorporate a factor of safety and we recommend that this be taken as 1.5 or somewhat more.

Following installation of stone columns, the subgrade should be proof rolled to densify the near surface soils and provide firm bearing for spread foundation support. For a depth 2 feet below foundation bottoms, the subgrade soils should be compacted to at least 95 percent of the material's modified Proctor maximum dry density.

Rigid Inclusions:

Rigid inclusions (RI's) are high modulus/controlled stiffness cement grout columns installed through loose/soft, compressible soils to reduce settlement and increase bearing capacity. Similar to stone columns, rigid inclusions are typically installed in grid pattern below shallow foundations to meet settlement and bearing capacity requirements. RI's are installed by inserting a bottom-feed mandrel through loose/soft soils with a vibrator, then pumping cementitious grout to form an unreinforced grout column. Rigid inclusions typically extend through loose/soft soils to more competent soils to help transfer foundation loads for improvement foundation performance. Rigid inclusions can be reinforced to provide lateral resistance.

Rigid Inclusions can also be installed as unreinforced grouted augercast piles being extended deep enough into the subgrade soils to provide acceptable settlement performance. A transfer platform is provided between the tops of the Rigid Inclusions and the shallow spread foundations above to provide column load transfer into the underlying bearing soils.

Similar to stone columns, the number, depth and placement of rigid inclusions should be determined by the specialty ground improvement contractor responsible for carrying out the work using foundation load and subsurface soil information, considering the required bearing pressure and settlement performance as noted herein.

- Achieve an allowable design bearing value of at least 6,000 pounds per square foot (psf).

- Provide for total settlements of 1.0 inches or less with differential settlements not exceeding one-half of an inch over 60 feet for the range of foundation loads noted herein.

Conventional Shallow Foundations

Based on the anticipated construction and recommended site preparation, conventional shallow foundations for the lightly loaded entrance canopy (porte cochere), dumpster enclosure and transformer farm may be designed for a net allowable bearing pressure of 3,000 psf. The foundations should bear on properly placed and compacted cohesionless (sand) fills and/or densified native soils. All footings should be embedded so that the bottom of the foundation is a minimum of 18 inches below adjacent finished grades on all sides. Strip or wall footings should be a minimum of 24 inches wide, while column footings should be at least 3 feet by 3 feet in plan. For load combinations that include wind, the allowable bearing pressure can be increased by one-third.

The foundation subgrade soils should be compacted to a minimum density requirement of 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density for a minimum depth of two feet below the bottom of footings, as determined by field density compaction tests. Backfill soils placed adjacent to footings or walls should be carefully compacted with a light walk-behind roller or vibratory plate compactor to avoid damaging in-place footings or walls.

All foundation excavations should be observed by the Geotechnical Engineer or his representative to explore the extent of any fill, excessively loose, soft, or otherwise undesirable materials. If soft or undesirable materials are encountered in the footing excavations, then such materials should be removed and the subgrade re-established by backfilling. This backfilling may be done with a well-compacted, suitable fill such as clean sand (engineered fill), lean cement grout or FDOT No. 57 stone. Sand backfill should be compacted to at least 95 percent of the material's modified Proctor maximum dry density (ASTM D-1557), as previously described. Aggregate/stone should be compacted to a firm/unyielding condition.

Lateral loads that are applied to the foundations may be resisted by earth pressure mobilized on the buried vertical faces of the footings and by shearing forces acting along the footing-subgrade interface. Earth pressure resistance may be determined using an equivalent fluid density of 360 pounds per cubic foot (pcf) for moist soil and 180 pcf for submerged soil. A friction factor of 0.4 should be used to determine base shearing resistance.

The above values presume that the foundations are surrounded by well-compacted sand backfill and can withstand horizontal movements on the order of one-quarter to three-eighths inches. Horizontal restraint determined in accordance with the recommended values should be considered resistance that is available rather than allowable. Therefore, the design should incorporate a factor of safety and we recommend that this be taken as 1.5 or somewhat more.

Provided the recommended subgrade preparation operations presented herein are properly performed, total foundation settlement for the lightly loaded structures should be 1 inch or less. Differential settlements should be approximately 50 percent of the total movements. These estimates are based on foundation loads discussed herein. The settlement of shallow foundations supported on sandy soils should occur relatively quickly after initial loading. Thus, the majority of expected settlement should occur during construction as dead loads are imposed.

OTHER CONSIDERATIONS

Pavements

Provided a minimum separation of 18 inches is maintained between the bottom of the pavement base course from the estimated normal seasonal high groundwater table, new pavement base materials can consist of limerock or crushed concrete. For concrete pavement, at least 18 inches of separation from the estimated normal seasonal high groundwater table to the bottom of the pavement should be provided.

Based on past experience, we recommend the following minimum light-duty (car parking lots) and medium-duty (driveways) pavement sections.

Light-Duty (Car Parking Areas)

1.5 inches	Type SP Asphaltic Concrete (min. PG 67-22)
6.0 inches	Limerock (LBR = 100) or crushed concrete (LBR = 150) basecourse
12.0 inches	Stabilized subgrade (LBR = 40) compacted to at least 98 percent of the soil's ASTM D-1557 maximum dry density

Medium-Duty (Driveway and Entrance Areas)

2.0 inches	Type SP Asphaltic Concrete (min. PG 67-22)
8.0 inches	Limerock (LBR = 100) or crushed concrete (LBR = 150) basecourse
12.0 inches	Stabilized subgrade (LBR = 40) compacted to at least 98 percent of the soil's ASTM D-1557 maximum dry density

For heavy-duty uses, such as in truck delivery areas, truck docks, dumpster pad and approach areas, we recommend the following minimum pavement section.

Heavy-Duty (Rigid Pavement)

8.0 inches	Portland cement concrete, minimum 28-day compressive strength of 4,000 psi
12.0 inches	Well-draining granular subgrade (AASHTO A-3 soils), compacted to at least 98 percent of the material's AASHTO T-180 maximum dry density.

Alternatively, the following flexible pavement section can be considered for truck delivery/driveway areas. However, we recommend the rigid concrete section be used for the dumpster pad/approach areas and truck docks.

Heavy-Duty (Driveway and Entrance Areas)

3.0 inches	Type SP Asphaltic Concrete (min. PG 76-22)
10.0 inches	Limerock (LBR = 100) or crushed concrete (LBR = 150) basecourse
12.0 inches	Stabilized subgrade (LBR = 40) compacted to at least 98 percent of the soil's ASTM D-1557 maximum dry density

Pavement joints and reinforcing for concrete pavement should be in accordance with American Concrete Institute (ACI) standards. The recommended pavement sections are based on past experience with similar projects and the encountered subsurface conditions at the site. All pavement materials and construction should meet the more stringent of the Florida Department of Transportation (FDOT) and local city/county requirements. The noted pavement sections should be considered recommended minimums based on anticipated traffic loadings and our past experience. The actual pavement design should be carried out by the civil engineer using the geotechnical information provided herein along with traffic loading, design life and other criteria provided by the Owner.

Earth Pressures On Walls

Below grade walls and retaining walls for the project should be designed to resist pressures exerted by the adjacent soils and hydrostatic head. For walls that are not restrained during backfilling but are free to rotate at the top, active earth pressure should be used in design. Walls that are restrained should be designed assuming at-rest pressures. Recommended soil parameters for Engineered Fill and in-situ clean sands are presented in the following.

Total Unit Weight, γ_s	=	120 lb/ft^3
Angle of Internal Friction, ϕ	=	30°
Coeff. of Sliding Friction	=	0.40
Active Soil Pressure Coeff., K_a	=	0.33
At-rest Soil Pressure Coeff., K_o	=	0.50
Passive Soil Pressure Coeff., K_p	=	3.00

The recommended parameters assume that adequate drainage is provided behind the walls to prevent the buildup of excess hydrostatic pressures. In order to avoid wall damage due to excessive compaction, hand operated mechanical tampers should be used to densify backfill soils; heavy compaction equipment should not be allowed within five feet of walls. The soils behind walls should be compacted to approximately 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density.

SITE PREPARATION

Site Clearing/Stripping

Clearing and grubbing including root raking and removal of any organic-laden topsoil should be completed. This normally includes removing the surface vegetation, stripping topsoil, grubbing major root systems, and removing any miscellaneous debris, organic soils and/or other deleterious materials. Due to the presence of shallow unsuitable organic soils, a series of test pits are recommended within the development area to assess the presence of organic soils that should be removed in their entirety and replaced with suitable sand fill. At a minimum, it is recommended that the clearing/stripping operations extend at least ten feet beyond the proposed pavement and structure perimeters, where possible. Material generated during stripping operations should be disposed of off-site in a proper manner as directed by the Owner or used in non-structural (building and pavement) areas, subject to approval by the landscape architect. Initial site clearing and preparation work should be carried out under the observation of a representative of PSI's geotechnical engineer.

Engineered Fill

Any fill material for the project should consist of clean fine sand with less than 12 percent by dry weight passing the U.S. Standard No. 200 sieve. Additionally, the material should be free of rubble, organics, clay, debris and other deleterious material. Fill should be tested and approved prior to import and placement. Each lift should have a loose thickness not exceeding 12 inches. Density tests should be performed to confirm the required compaction is being achieved prior to placing the next lift. All engineered fill should be compacted to at least 95 percent of the material's modified Proctor (ASTM D-1557) maximum dry density.

Floor Slabs

We recommend that the upper one foot of the subgrade soils within the building pads be compacted to at least 95 percent of the maximum dry density of the soil's modified Proctor (ASTM D-1557). It is recommended that the floor slab bearing soils be covered by lapped polyethylene sheeting in order to reduce the potential for floor dampness which can affect the performance of floor coverings. This membrane should consist of a minimum six mil thick, single layer of non-corroding, non-deteriorating sheeting material placed to minimize seams and to cover all of the soil below the building floor slabs. Seams should be overlapped a minimum of 12 inches.

On-Site Soil Suitability

Based on the results of our borings, it is our opinion that the near surface relatively clean sandy soils (Strata 1, 2, 3 and 4 with the exception of any topsoil) will be suitable for use as engineered fill material for the project, provided the soil is free of organics, clay, debris, rubble and other unsuitable materials.

Site Dewatering

It is expected that dewatering will be required for some excavations. Excavations that are only a few feet below the water table can likely be dewatered with a sump system. Deeper excavations will most likely require well-pointing or sock drains to achieve adequate drawdown. In either case, the dewatering system should be designed and operated to lower the groundwater table to a depth at least 2 feet below the bottom of surfaces to be compacted in any given area. The design and discharge of the dewatering system should be in accordance with Water Management District/regulatory criteria. Additionally, the dewatering contractor should take into consideration potential impacts resulting from dewatering operations on existing site improvements resulting from drawdown of groundwater levels that can induce increases in effective stresses in the impacted subgrade soils that may cause settlement.

Utility Construction

All utility excavations should be made in accordance with recommendations outlined by the Occupational Safety and Health Administration Document *Construction Standards for Excavations (29CFR Part 1926.650-.652 Subpart P)*. Shoring should be designed in accordance with OSHA 2226, taking into consideration loads resulting from equipment, existing construction and/or fill stockpiles.

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, general construction excavations or footing excavations, 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 “responsible person”, as defined in 29 CFR Part 1926, 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.

PSI is 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 parties’ compliance with local, state, and federal safety or other regulations.

REPORT LIMITATIONS

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This company is not responsible for the conclusions, opinions or recommendations made by others based on these data.

The scope of the geotechnical exploration was intended to evaluate soil and groundwater conditions within the proposed development areas. The analysis and recommendations submitted in this report are based upon the data obtained from PSI’s soil borings and laboratory testing performed at the locations indicated. If any subsoil variations become evident during the course of this project, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed FSED construction.

The scope of our services presented herein does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.

CLOSURE

PSI appreciates the opportunity to provide our services to **Orlando Health** on this project and we trust you find the foregoing and accompanying attachments of assistance to you at this time. If you have any questions regarding the information provided in this report, or if we may be of further service, please contact the undersigned.

Respectfully submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.
Certificate of Authorization No. 3684

Ian Kinnear, P.E.
Chief Geotechnical Engineer
Florida License No. 32614

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Florida License No. 55456

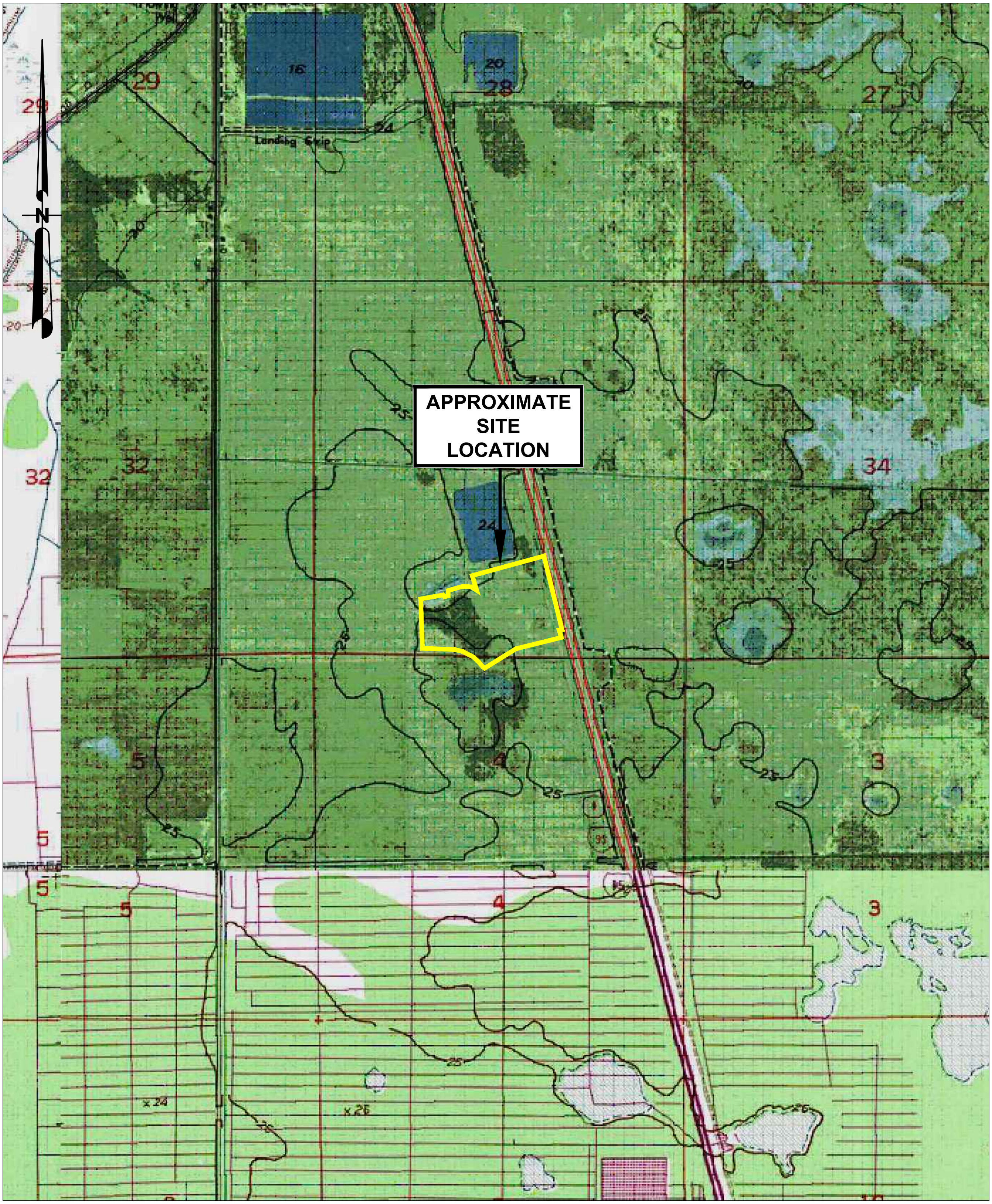
07573442 (Orlando Health Viera FSED - Design Level)

Cc: Ms. Sharon Subryan – Orlando Health

Appendix:

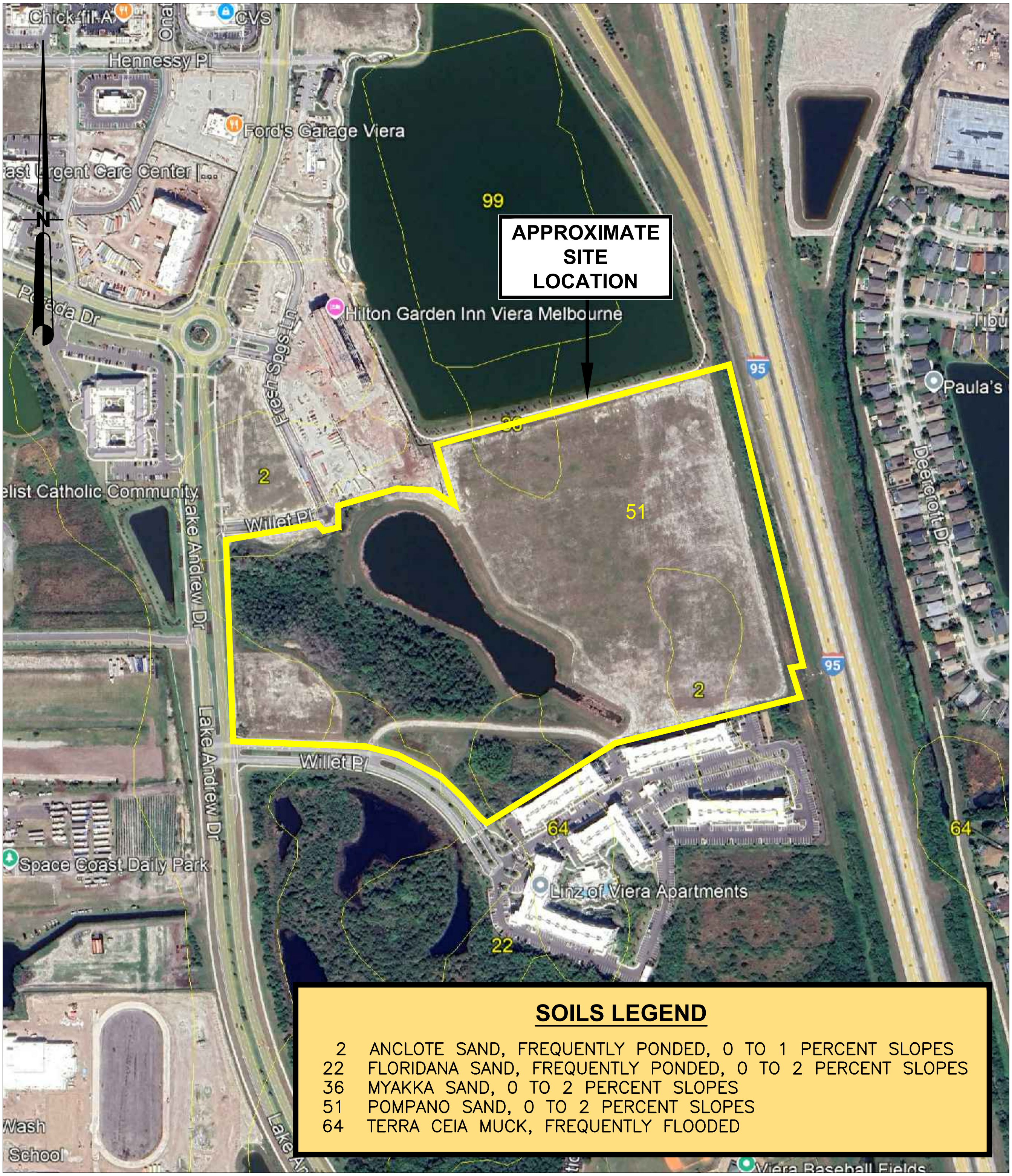
- Figure 1 – USGS Quadrangle Map
- Figure 2 – SCS Soil Survey Map
- Sheet 1 – Boring Location Plan
- Sheets 2 through 6 – Boring Profiles

Appendix



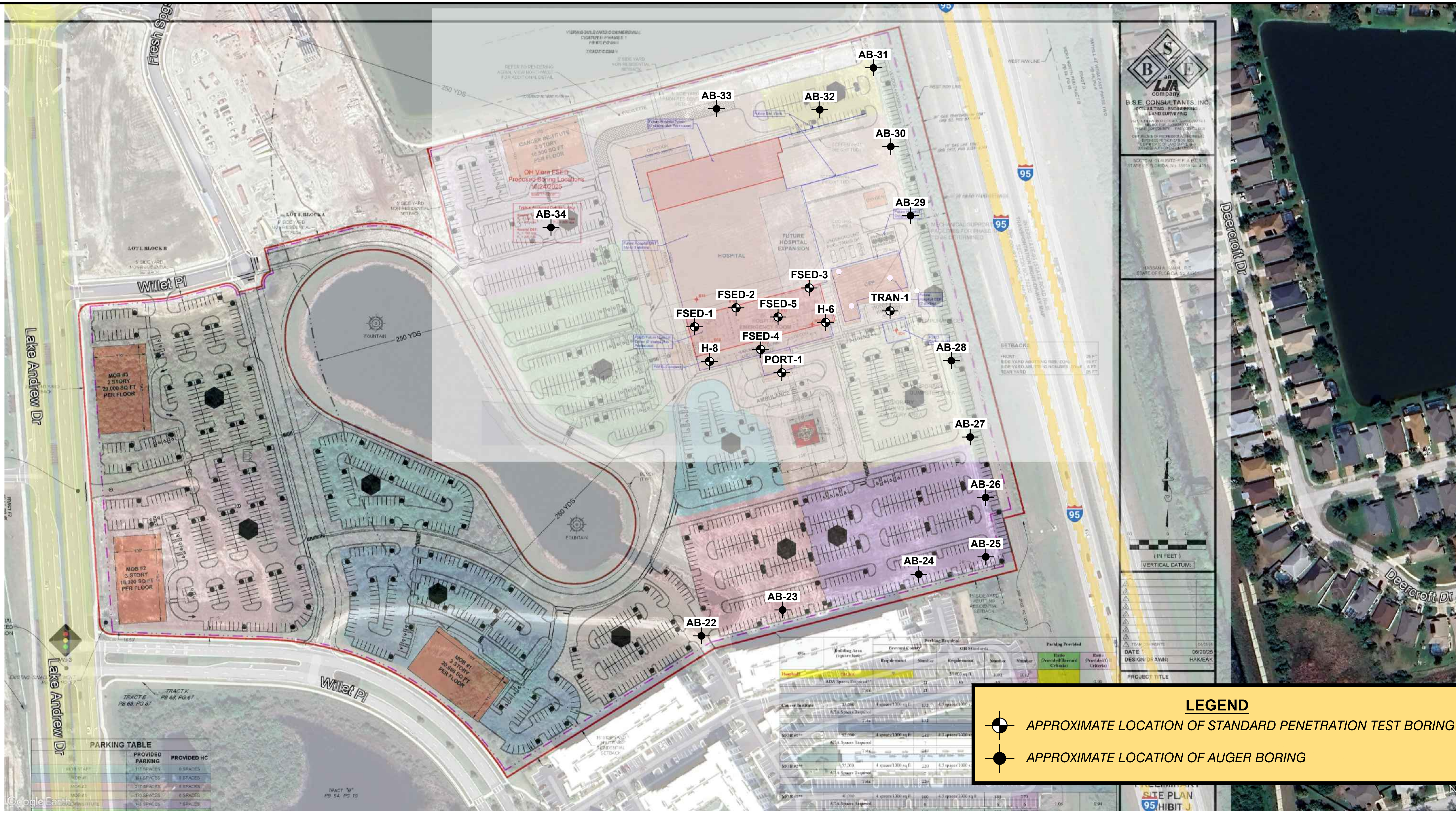
REFERENCE: U.S.G.S. QUADRANGLE MAP. THE REPRESENTED DATA IS FOR INFORMATION PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. INTERTEK-PSI ASSUMES NO RESPONSIBILITY FOR ANY DECISIONS MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON INFORMATION OBTAINED FROM THE ABOVE DATA.

PROJ. NO: 07573442	intertek psi	1748 33rd Street Orlando, FL 32839 (407)304-5560 (407)304-5561 fax	TOPOGRAPHIC MAP **PROPOSED ORLANDO HEALTH HOSPITAL** **LAKE ANDREW DRIVE** VIERA, BREVARD COUNTY, FLORIDA	FIGURE: 1
SCALE: 1"=2000'				DRAWN: DJW
DATE CREATED: 5-9-25				CHECKED: RT



REFERENCE: THE AERIAL PHOTOGRAPH WAS OBTAINED FROM GOOGLE EARTH. THE REPRESENTED DATA IS FOR INFORMATION PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. INTERTEK-PSI ASSUMES NO RESPONSIBILITY FOR ANY DECISIONS MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON INFORMATION OBTAINED FROM THE ABOVE DATA.

PROJ. NO: 07573442	intertek psi	1748 33rd Street Orlando, FL 32839 (407)304-5560 (407)304-5561 fax	SOILS MAP **PROPOSED ORLANDO HEALTH HOSPITAL** **LAKE ANDREW DRIVE** VIERA, BREVARD COUNTY, FLORIDA	FIGURE: 2
SCALE: 1"=500'				DRAWN: DJW
DATE CREATED: 5-9-25				CHECKED: RT



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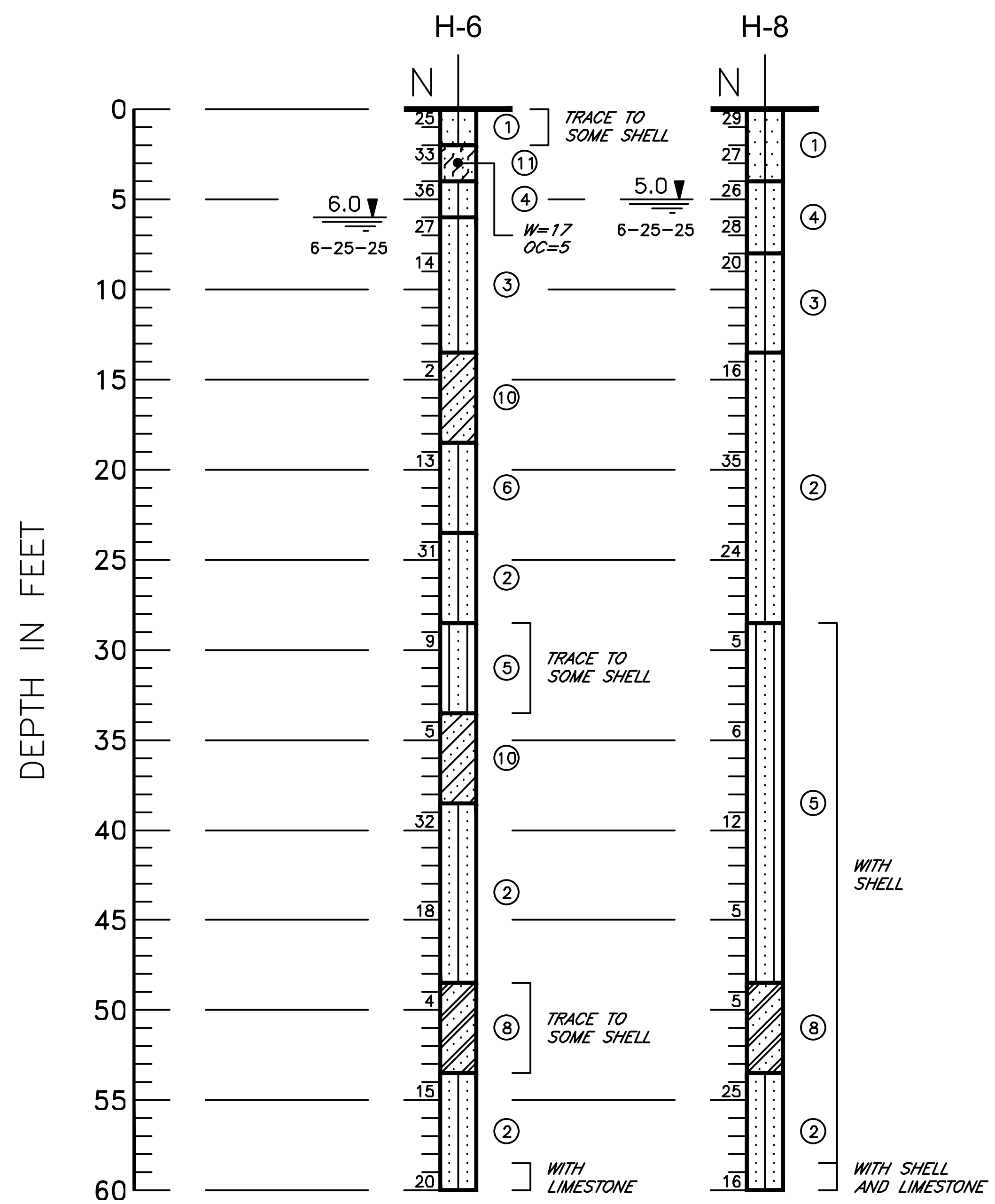
PROJECT NO. 07573442	intertek psi	1748 33rd Street Orlando, FL 32839 (407)304-5560 (407)304-5561 fax	GEOTECHNICAL ENGINEERING SERVICES **PROPOSED ORLANDO HEALTH HOSPITAL** **LAKE ANDREW DRIVE** VIERA, BREVARD COUNTY, FLORIDA	SHEET: 1
SCALE: 1"=200'				DRAWN: DJW
DATE CREATED: 11-24-25				CHECKED: RT



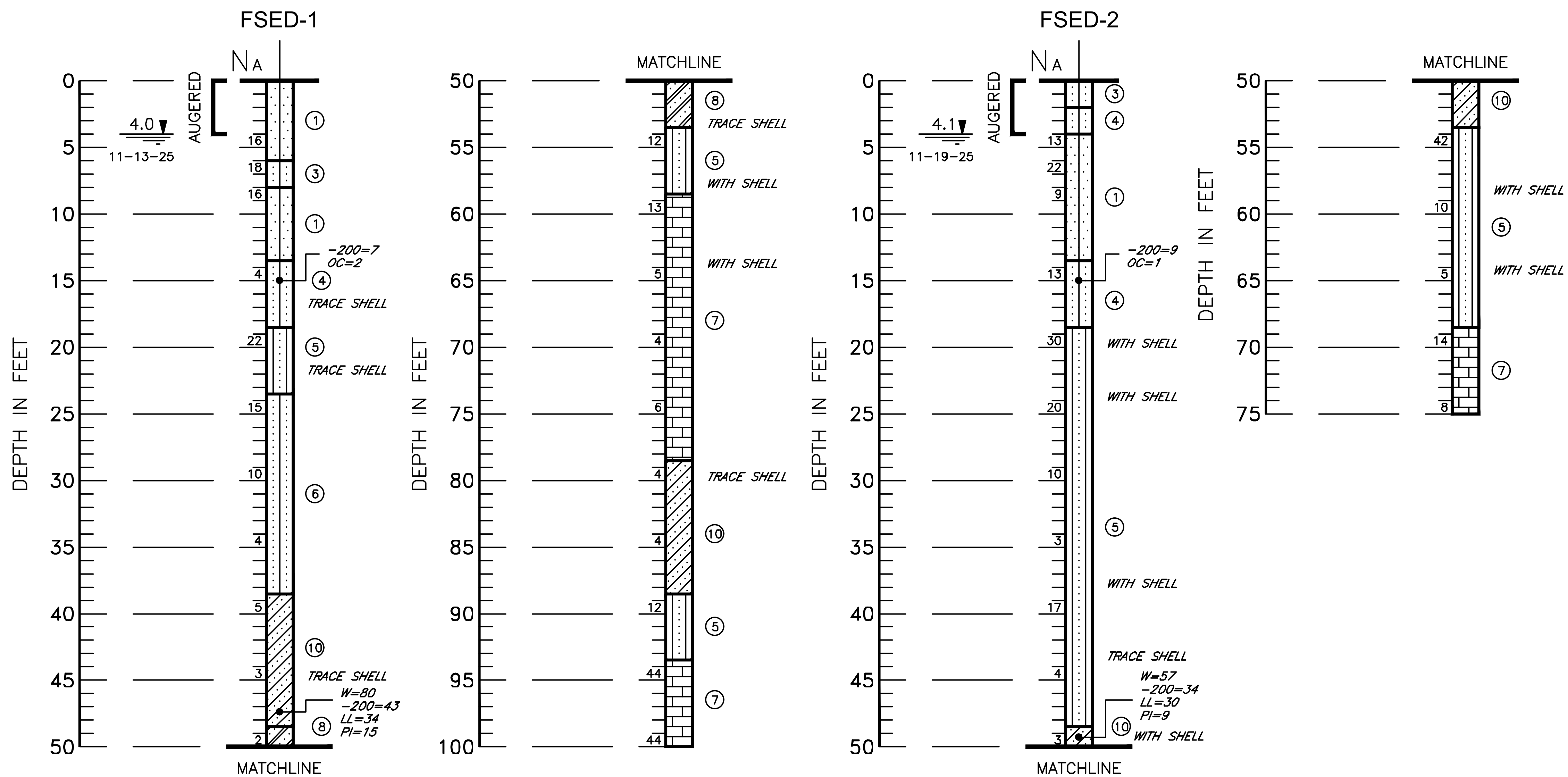
SOIL PROFILES

SCALE: 1"=10'

LEGEND

1	LIGHT GRAY-BROWN TO MEDIUM GRAY-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)
2	GREEN-GRAY TO GRAY SLIGHTLY SILTY FINE SAND, TRACE SHELL, (SP-SM)
3	GRAY-BROWN TO BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)
4	DARK RED-BROWN TO DARK BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)
5	DARK GRAY TO GREEN-GRAY SILTY FINE SAND, (SM)
6	GREEN-GRAY TO DARK GRAY SLIGHTLY SILTY FINE SAND, (SP-SM)
7	LIGHT GRAY WEATHERED LIMESTONE
8	GREEN-GRAY SANDY CLAY TO CLAY, (CL), (CH)
9	DARK RED-BROWN MUCK/PEAT, (PT)
10	GREEN-GRAY TO DARK BROWN CLAYEY FINE SAND, (SC)
11	DARK BROWN ORGANIC SAND
(SP)	UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
N	STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT USING AN AUTOMATIC HAMMER
3.8 / 4-4-25	DEPTH TO GROUNDWATER LEVEL IN FEET WITH DATE OF READING
W	NATURAL MOISTURE CONTENT IN PERCENT
-200	FINES PASSING #200 SIEVE IN PERCENT
OC	ORGANIC CONTENT IN PERCENT

PROJECT NO.			SHEET:
07573442	intertek psi	GEOTECHNICAL ENGINEERING SERVICES	2
SCALE: NOTED	1748 33rd Street Orlando, FL 32839 (407)304-5560 (407)304-5561 fax	**PROPOSED ORLANDO HEALTH HOSPITAL** **LAKE ANDREW DRIVE**	DRAWN: DJW
DATE CREATED: 7-2-25		VIERA, BREVARD COUNTY, FLORIDA	CHECKED: RT



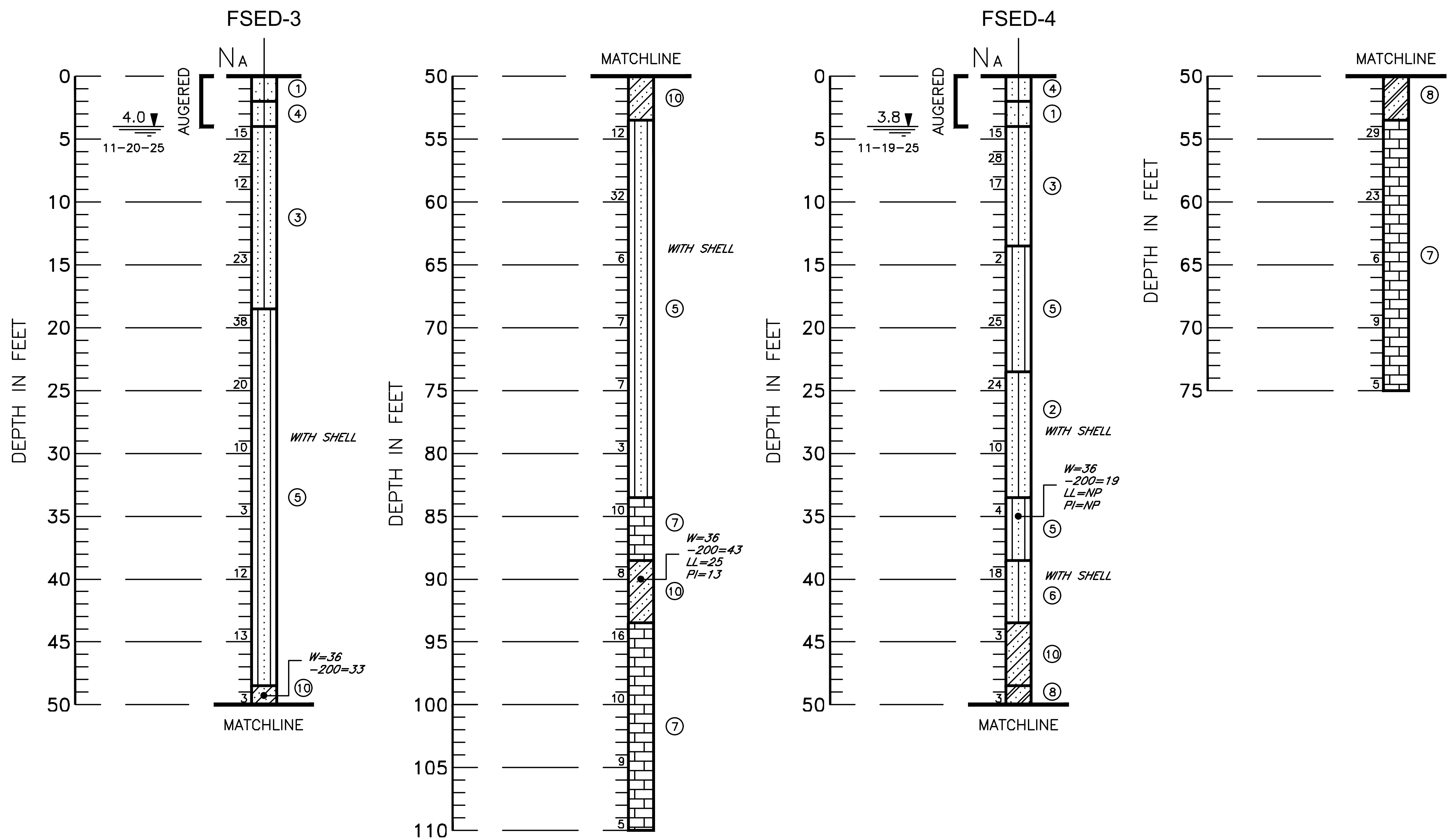
SOIL PROFILES

SCALE: 1"=10'

LEGEND

①	*LIGHT GRAY-BROWN TO MEDIUM GRAY-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)*
②	*GREEN-GRAY TO GRAY SLIGHTLY SILTY FINE SAND, TRACE SHELL, (SP-SM)*
③	*GRAY-BROWN TO BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)*
④	*DARK RED-BROWN TO DARK BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)*
⑤	*DARK GRAY TO GREEN-GRAY SILTY FINE SAND, (SM)*
⑥	*GREEN-GRAY TO DARK GRAY SLIGHTLY SILTY FINE SAND, (SP-SM)*
⑦	*LIGHT GRAY WEATHERED LIMESTONE*
⑧	*GREEN-GRAY SANDY CLAY TO CLAY, (CL), (CH)*
⑨	*DARK RED-BROWN MUCK/PEAT, (PT)*
⑩	*GREEN-GRAY TO DARK BROWN CLAYEY FINE SAND, (SC)*
⑪	*DARK BROWN ORGANIC SAND*
(SP)	*UNIFIED SOIL CLASSIFICATION GROUP SYMBOL*
N A	*STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT USING AN AUTOMATIC HAMMER*
4.0 / 11-13-25	*DEPTH TO GROUNDWATER LEVEL IN FEET WITH DATE OF READING*
W	*NATURAL MOISTURE CONTENT IN PERCENT*
-200	*FINES PASSING #200 SIEVE IN PERCENT*
OC	*ORGANIC CONTENT IN PERCENT*
LL	*LIQUID LIMIT IN PERCENT*
PI	*PLASTICITY INDEX*

PROJECT NO. 07573442	intertek psi	1748 33rd Street Orlando, FL 32839 (407)304-5560 (407)304-5561 fax	GEOTECHNICAL ENGINEERING SERVICES **PROPOSED ORLANDO HEALTH HOSPITAL** **LAKE ANDREW DRIVE** VIERA, BREVARD COUNTY, FLORIDA	SHEET: 3
SCALE: NOTED				DRAWN: DJW
DATE CREATED: 11-24-25				CHECKED: RT



SOIL PROFILES

SCALE: 1"=10'

LEGEND

1	*LIGHT GRAY-BROWN TO MEDIUM GRAY-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)*
2	*GREEN-GRAY TO GRAY SLIGHTLY SILTY FINE SAND, TRACE SHELL, (SP-SM)*
3	*GRAY-BROWN TO BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)*
4	*DARK RED-BROWN TO DARK BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)*
5	*DARK GRAY TO GREEN-GRAY SILTY FINE SAND, (SM)*
6	*GREEN-GRAY TO DARK GRAY SLIGHTLY SILTY FINE SAND, (SP-SM)*
7	*LIGHT GRAY WEATHERED LIMESTONE*
8	*GREEN-GRAY SANDY CLAY TO CLAY, (CL), (CH)*
9	*DARK RED-BROWN MUCK/PEAT, (PT)*
10	*GREEN-GRAY TO DARK BROWN CLAYEY FINE SAND, (SC)*
11	*DARK BROWN ORGANIC SAND*
(SP)	*UNIFIED SOIL CLASSIFICATION GROUP SYMBOL*
NA	*STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT USING AN AUTOMATIC HAMMER*
4.0 ▼ 11-13-25	*DEPTH TO GROUNDWATER LEVEL IN FEET WITH DATE OF READING*
W	*NATURAL MOISTURE CONTENT IN PERCENT*
-200	*FINES PASSING #200 SIEVE IN PERCENT*
LL	*LIQUID LIMIT IN PERCENT*
PI	*PLASTICITY INDEX*
NP	*NON PLASTIC*

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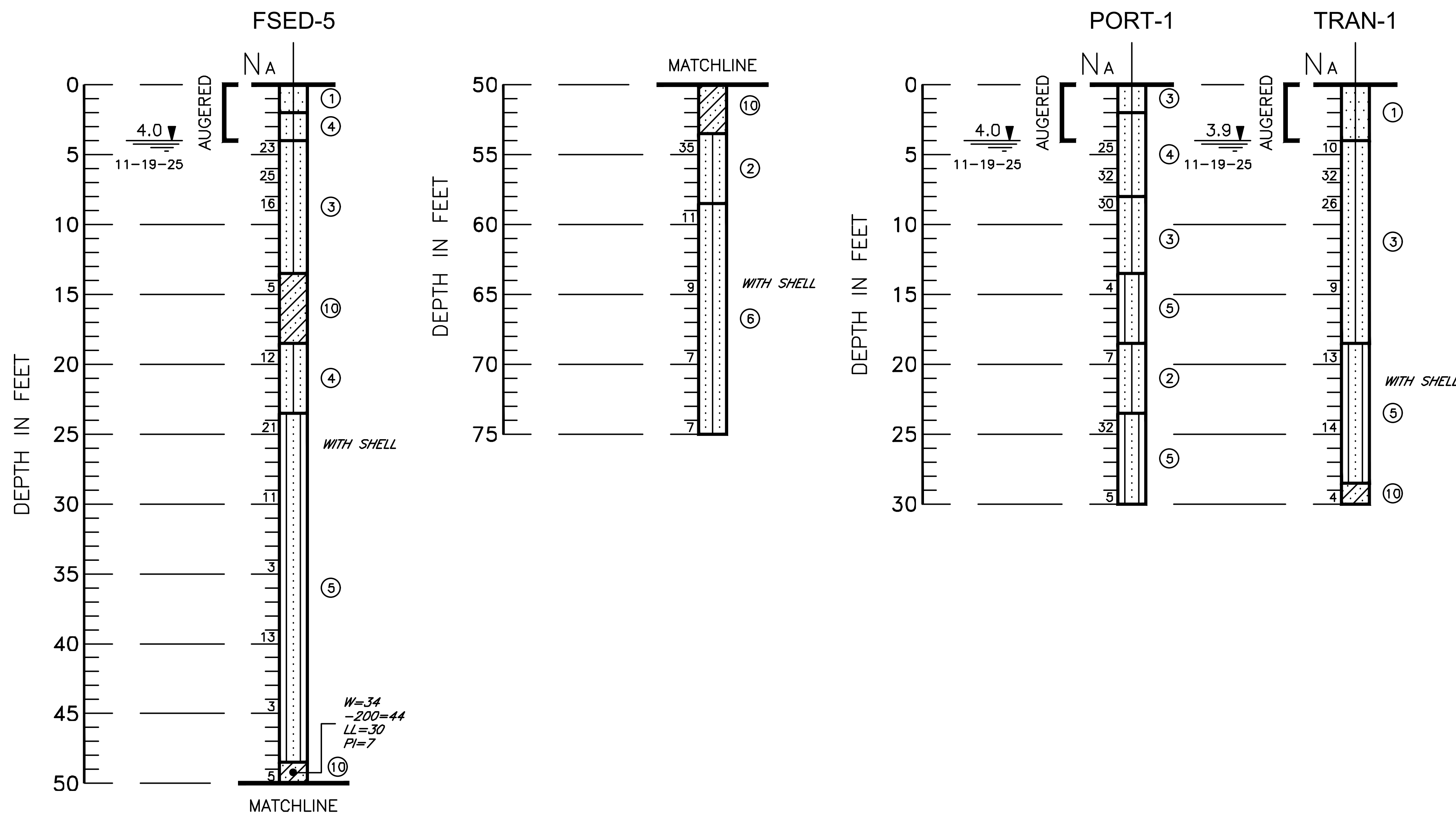
SCALE: NOTED				DRAWN: DJW
DATE CREATED: 11-24-25				CHECKED: RT



SOIL PROFILES

SCALE: 1"=10'

LEGEND

(1)	*LIGHT GRAY-BROWN TO MEDIUM GRAY-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)*
(2)	*GREEN-GRAY TO GRAY SLIGHTLY SILTY FINE SAND, TRACE SHELL, (SP-SM)*
(3)	*GRAY-BROWN TO BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)*
(4)	*DARK RED-BROWN TO DARK BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)*
(5)	*DARK GRAY TO GREEN-GRAY SILTY FINE SAND, (SM)*
(6)	*GREEN-GRAY TO DARK GRAY SLIGHTLY SILTY FINE SAND, (SP-SM)*
(7)	*LIGHT GRAY WEATHERED LIMESTONE*
(8)	*GREEN-GRAY SANDY CLAY TO CLAY, (CL), (CH)*
(9)	*DARK RED-BROWN MUCK/PEAT, (PT)*
(10)	*GREEN-GRAY TO DARK BROWN CLAYEY FINE SAND, (SC)*
(11)	*DARK BROWN ORGANIC SAND*
(SP)	*UNIFIED SOIL CLASSIFICATION GROUP SYMBOL*
N_A	*STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT USING AN AUTOMATIC HAMMER*
4.0 11-13-25	*DEPTH TO GROUNDWATER LEVEL IN FEET WITH DATE OF READING*
W	*NATURAL MOISTURE CONTENT IN PERCENT*
-200	*FINES PASSING #200 SIEVE IN PERCENT*
LL	*LIQUID LIMIT IN PERCENT*
PI	*PLASTICITY INDEX*

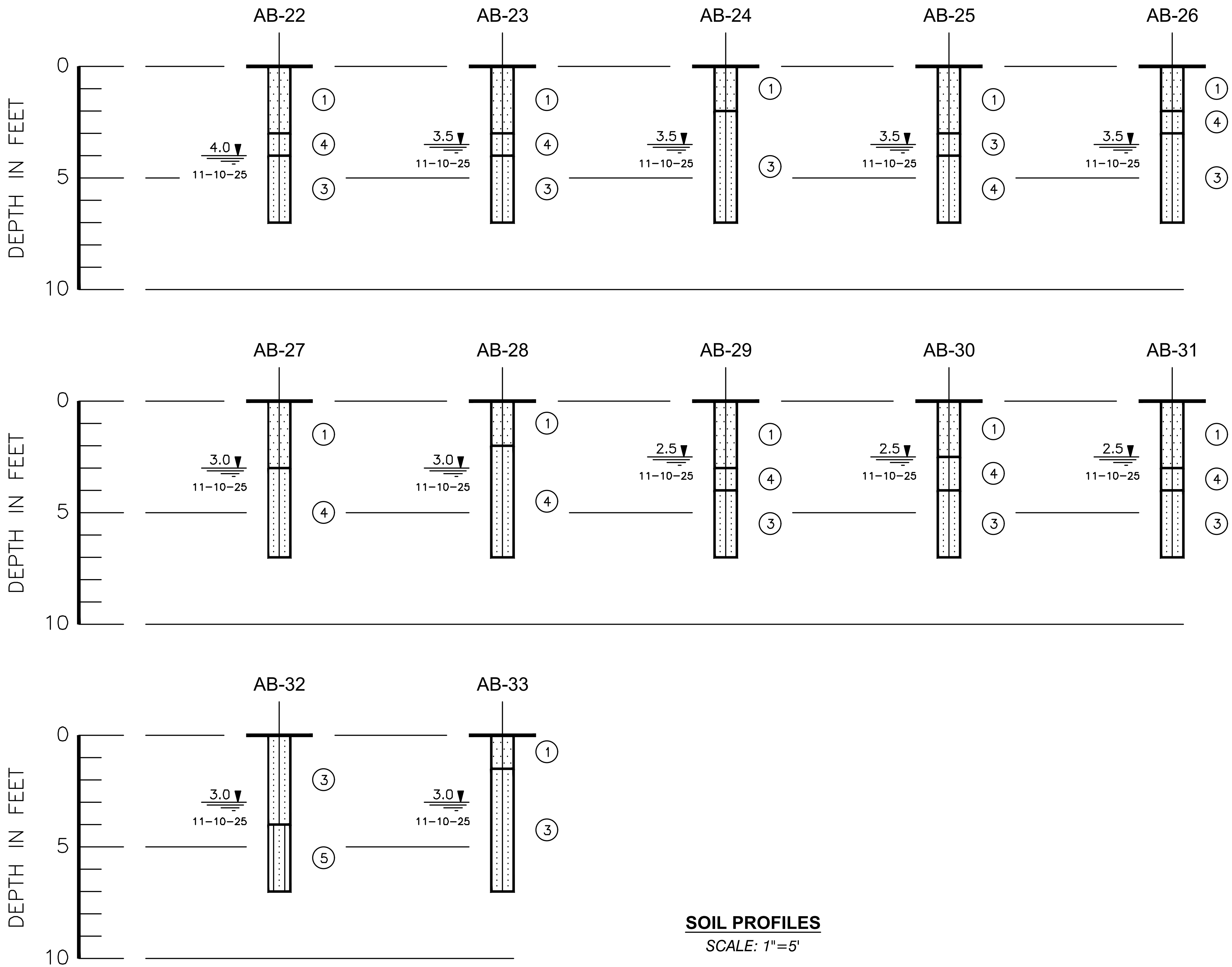
PROJECT NO.: 07573442
SCALE: NOTED
DATE CREATED: 11-24-25

intertek psi
1748 33rd Street
Orlando, FL 32839
(407)304-5560
(407)304-5561 fax

GEOTECHNICAL ENGINEERING SERVICES

PROPOSED ORLANDO HEALTH HOSPITAL
LAKE ANDREW DRIVE
VIERA, BREVARD COUNTY, FLORIDA

SHEET: 5
DRAWN: DJW
CHECKED: RT



SOIL PROFILES
SCALE: 1"=5'

LEGEND

1	*LIGHT GRAY-BROWN TO MEDIUM GRAY-BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND, (SP), (SP-SM)*
2	*GREEN-GRAY TO GRAY SLIGHTLY SILTY FINE SAND, TRACE SHELL, (SP-SM)*
3	*GRAY-BROWN TO BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)*
4	*DARK RED-BROWN TO DARK BROWN SLIGHTLY SILTY FINE SAND, (SP-SM)*
5	*DARK GRAY TO GREEN-GRAY SILTY FINE SAND, (SM)*
6	*GREEN-GRAY TO DARK GRAY SLIGHTLY SILTY FINE SAND, (SP-SM)*
7	*LIGHT GRAY WEATHERED LIMESTONE*
8	*GREEN-GRAY SANDY CLAY TO CLAY, (CL), (CH)*
9	*DARK RED-BROWN MUCK/PEAT, (PT)*
10	*GREEN-GRAY TO DARK BROWN CLAYEY FINE SAND, (SC)*
11	*DARK BROWN ORGANIC SAND*
(SP)	*UNIFIED SOIL CLASSIFICATION GROUP SYMBOL*
4.0 11-13-25	*DEPTH TO GROUNDWATER LEVEL IN FEET WITH DATE OF READING*
W	*NATURAL MOISTURE CONTENT IN PERCENT*
-200	*FINES PASSING #200 SIEVE IN PERCENT*

PROJECT NO.: 07573442
SCALE: NOTED
DATE CREATED: 11-24-25

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(407)304-5561 fax

GEOTECHNICAL ENGINEERING SERVICES
PROPOSED ORLANDO HEALTH HOSPITAL
LAKE ANDREW DRIVE
VIERA, BREVARD COUNTY, FLORIDA

SHEET: 6
DRAWN: DJW
CHECKED: RT