GEOTECHNICAL ENGINEERING REPORT

Paxton Senior Facility

Paxton, Walton County, Florida

PREPARED FOR:

Forefront Architecture + Engineering
1230 Oakley Seaver Drive, Suite 115
Clermont, Florida 34711

NOVA Project Number: 10111-2023055

June 30, 2023

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NOVA

June 30, 2023

FOREFRONT ARCHITECTURE + ENGINEERING
1230 Oakley Seaver Drive, Suite 115
Clermont, Florida 34711

Attention: Ms. Patricia Mugnol, Project Manager

Subject: **Geotechnical Engineering Report**
PAXTON SENIOR FACILITY
Paxton, Walton County, Florida
NOVA Project Number 10111-2023055

Dear Ms. Mugnol:

NOVA Engineering and Environmental, LLC (NOVA) has completed the authorized Geotechnical Engineering Report for the Paxton Senior Facility proposed in Paxton, Florida. The work was performed in general accordance with NOVA Proposal Number 011-20225693 (dated March 23, 2023). This report briefly discusses our understanding of the project at the time of the subsurface exploration, describes the geotechnical consulting services provided by NOVA, and presents our findings, conclusions, and recommendations.

We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
NOVA Engineering and Environmental, LLC

K. Nick Gonzalez
Staff Engineer

WILLIAM LEE LAWRENCE JR
No. 60147

William L. Lawrence, P.E.
Senior Regional Engineer
STATE OF FLORIDA
Professional Engineer No. 60147

This item has been electronically signed and sealed by William L. Lawrence, P.E., using a Digital Signature. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Digitally signed by William L Lawrence
Date: 2023.09.25 09:16:05 -05'00'

Copies Submitted:
Addressee (electronic)

PROFESSIONAL | PRACTICAL | PROVEN
3900 Kennesaw 75 Parkway, Suite 100, Kennesaw, Georgia 30144
t. 770.425.0777 / f. 770.425.1113 / usanova.com

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1.0 INTRODUCTION

This section provides information relating to our contract, the purpose of our work, and a summary of our understanding of the project,

1.1 NAME AND LOCATION OF PROJECT

The Subject Property is located at 22174 North U.S. Highway 331 in Paxton, Walton County, Florida (Walton County Parcel ID Number 36-6N-21-40000-002-0011). The location of the site is indicated on the Site Location Map included as Figure 1 in Appendix A.

1.2 AUTHORIZATION AND SCOPE OF STUDY

Our work on this project was as described in our Proposal Number 011-20225693, dated March 23, 2023 and authorized on March 25, 2023 by **Forefront Architecture + Engineering**.

The primary objectives of this work were to perform a geotechnical exploration within the areas of the proposed construction and to assess these findings as they relate to geotechnical aspects of the planned site development. The authorized geotechnical engineering services included a site reconnaissance, soil test borings and sampling, engineering evaluation of the field and laboratory data, and the preparation of this report.

- A description of the site, fieldwork, laboratory testing and general soil conditions encountered, together with a Boring Location Plan and individual Test Boring Records.
- Site preparation considerations that include geotechnical discussions regarding site stripping and subgrade preparation, and engineered fill/backfill placement.
- Recommendations for controlling groundwater and/or run-off during construction, and the potential need for a permanent dewatering system based on the anticipated post construction groundwater levels.
- Foundation system recommendations for the proposed structure, as appropriate based on the boring results.
- Slab-on-grade construction considerations based on the geotechnical findings, including the need for a sub-slab vapor barrier or a capillary barrier.
- Suitability of on-site soils for re-use as structural fill and backfill. Additionally, the criteria for suitable fill materials will be provided.
- Recommended pavement sections based on assumed traffic loading and subgrade strengths estimate from correlation with test borings, laboratory data, and soil types collected from the test borings.

- Recommended soil related design parameters for the SMS area including (if appropriate based on the boring results) measured hydraulic conductivity rates and an estimated fillable porosity value.
- Recommended quality control measures (i.e., sampling, testing, and inspection requirements) for site grading and pavement section installation operations.

The assessment of the presence of wetlands, floodplains, or water classified as state waters was beyond the scope of this exploration. Additionally, the assessment of site environmental conditions, including the detection of pollutants in the soil, rock, or groundwater, at the site was also beyond the scope of this geotechnical exploration and evaluation.

2.0 PROJECT INFORMATION

Our understanding of this project is based on discussions with the Client, review of the provided site plans, a site reconnaissance during boring layout, and our experience with similar projects.

2.1 Site Plans and Documents

We were furnished with the following plans and documents:

Document:	City of Paxton Aging Facility – Boring Plan
Dated:	May 9, 2023
Created By:	Schematic Design Aging Facility

2.2 Project Site

The 1.696-acre Subject Property (Walton County Parcel ID Number 36-6N-21-40000-002-0011) is located at 22174 North U.S. Highway 331 in Paxton, Walton County, Florida. Based on our review of publicly available web-based aerial imagery, the Subject Property was previously developed with a light commercial building that had been removed prior to this study. At the time of our field exploration, the site was primarily a grassed field with some deteriorated pavement areas remaining from the previous use. A site location map is provided in Appendix A.

2.3 Proposed Development

NOVA understands the project will include the construction of a wood frame, single-story, slab-on-grade structure with a plan footprint of approximately 3,500 square feet with associated paved entrance and parking areas and a Stormwater Management System (SMS) desired to consist of a conventional shallow dry retention pond.

Final structural loadings were not available from the Design Team at the time of the issuance of this report. We have therefore assumed that maximum loadings for the proposed structure will not exceed 30 kips per column for isolated interior columns and 3 kips per linear foot for continuous load bearing walls.

Final site grading details were not available from the design team at the time of the issuance of this report; we have therefore assumed that finish site grades will not change greater than +/- 3 feet from existing grades within the proposed structure footprint, with lesser amounts of fill being required beneath proposed pavement areas. The retention basin has been assumed to be on the order of 3 to 5 feet in depth.

If these assumptions are not accurate, please advise us so that we may adjust our scope of work and costs as appropriate.

3.0 SUBSURFACE EXPLORATION

3.1 AREA GEOLOGY

According to the United States Geological Survey (USGS), the subject site is located in Walton County within the Gulf Coastal Plain, separated from the Florida Platform by geologic structures known as the Gulf Trough and Apalachicola Embayment. These structures formed a bathymetric and environmental barrier from the earliest Eocene or earliest Oligocene periods into the Miocene. According to the “Text to Accompany the Geologic Map of Florida” by Scott, 2001, the site is generally underlain by undifferentiated sediments deposited during the Quaternary period. These sediments typically consist of siliciclastics (sand), organics and freshwater carbonates. These soils are highly permeable and form the Sand and Gravel Aquifer of the surficial aquifer system.

Surficial soils in the region are primarily siliciclastic sediments deposited in response to the renewed uplift and erosion in the Appalachian highlands to the north and sea-level fluctuations. The extent and type of deposit is influenced by numerous factors, including mineral composition of the parent rock and meteorological events.

3.2 LOCAL EXPERIENCE

NOVA has conducted multiple geotechnical studies for projects in and around Paxton Florida, The typical subsurface conditions in this area were found to consist of mixed strata of loose to medium dense slightly clayey sands and clayey sands as well as stiff low-plasticity clays (USCS classifications of SP-SC, SC and CL).

Based on previous experience as well as the laboratory tests results provided herein, the local subsurface soils generally carry high fines contents that could potentially be unsuitable as fill materials, and also have very low permeability to relatively impermeable rates that present challenges to an SMS design.

3.3 FIELD EXPLORATION

Our field exploration was conducted during the period of May 15th to May 17th, 2023, and included performing:

- Two 25 feet deep SPT borings within the footprint of the proposed building.
- Three 5 feet deep hand auger borings within the proposed pavement areas.
- Two 15 feet deep SPT borings within the proposed SMS basin.

Test locations were established in the field by NOVA personnel using a handheld GPS device and estimating distances and angles from site landmarks. Prior to initiating field testing, underground utilities were marked by Florida811. Underground utility related adjustments of the test locations were then made (where required) at the time of the field exploration. The approximate test locations are shown on Figure 2 in Appendix A. If increased accuracy is desired by the client, test locations and elevations may be surveyed.

SPT Borings

The Standard Penetration Test borings were performed using the guidelines of ASTM Designation D-1586, "Penetration Test and Split-Barrel Sampling of Soils". A mud rotary drilling process was used to advance the borings. At regular intervals, soil samples were obtained with a standard 1.4-inch I.D., 2.0-inch O.D., split-tube sampler. The sampler was first seated six inches and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated the "Penetration Resistance". The penetration resistance, when properly interpreted, is an index to the soil strength and density.

Hand Auger Borings

The auger borings were performed using a hand operated soil sampler. Soil samples were obtained from the auger bucket approximately at each stratum break.

Test Boring Records in Appendix B present the soil conditions encountered in the borings. These records represent our interpretation of the subsurface conditions based on the field exploration data, visual examination of the recovered samples, laboratory test data, and generally accepted geotechnical engineering practices. The stratification lines and depth designations represent approximate boundaries between various subsurface strata. Actual transitions between materials may be gradual.

3.4 LABORATORY TESTING

Following completion of the field work, soil and rock samples obtained in the field were returned to our office for classification and laboratory testing assignment. These tests included the following:

- Manual/Visual Soil Classification
- Moisture Content
- Fines Content
- Remolded Falling Head Permeability

The purpose of the testing program was to classify the subsurface materials relative to the Unified Soil Classification System (USCS) and to determine their physical characteristics including strength, and compressibility.

Soil Classification

Soil classification provides a general guide to the engineering properties of various soil types and enable the engineer to apply past experience to current problems. In our explorations, samples obtained during drilling operations are observed in our laboratory and visually classified by an engineer. The soils are classified according to relative density (based on SPT N-values), color and texture. These classification descriptions are included on our Test Boring Records. The classification system discussed above is primarily qualitative; laboratory testing is generally required for detailed soil classification. Using the test results, the soils were visually/manually classified according to the Unified Soil Classification System. This classification system and the in-place physical soil properties provide an index for estimating the soil's behavior. The soil classification and physical properties obtained are presented in this report.

Moisture Content

The moisture content is the ratio expressed as a percentage of the weight of water in a given mass of soil to the weight of the solid particles. This testing was conducted in general accordance with ASTM Designation D-2216. Eight moisture content tests were performed in this study.

Fines Content

The percentage of fines passing through the No. 200 sieve is generally considered to represent the amount of silt and clay of the tested soil sample. The sieve analysis testing was conducted in general accordance with ASTM Designations D-6913 and D-1140. Eight fines content tests were performed in this study.

Falling Head Laboratory Permeability Test

A remolded falling head permeability test (ASTM D-5856) is a common laboratory test used to determine the hydraulic conductivity of saturated soils. The test involves the flow of water through a re-molded, fully saturated soil sample inside a rigid wall permeameter connected to a standpipe of constant diameter. Before beginning the flow measurements, the soil sample is saturated, and the standpipe is filled with water to a given level. The test then starts by allowing the water to flow through the sample until the water in the standpipe reaches a lower limit. The time required for the water to flow from the upper to lower limit is recorded. One falling head permeability test was performed in this study.

Detailed results of the tests conducted are presented in Appendix C. The soil samples will be discarded 30 days following the submittal of this report, unless you request otherwise.

3.5 SUBSURFACE CONDITIONS

The following paragraphs provide generalized descriptions of the subsurface profiles and soil conditions encountered by the borings conducted during this exploration.

The Test Boring Records provided in Appendix B should be reviewed to provide more detailed descriptions of the subsurface conditions encountered at the boring locations. Conditions may vary at other locations and times.

Surface Materials

The test borings generally encountered loose to medium dense fine-grained silty sand (SM) and fine-grained clayey sand (SC) from existing grade to approximately 4 feet below existing grade (BEG).

Fill

Based on the general lithology encountered throughout the site, the silty sand (SM) stratum encountered in Boring B-2 from the ground surface elevation to about 4 feet BEG could potentially be fill material, assumed to have been installed as part of the former development of this property noted previously.

Native (or Residual) Soils

The test borings generally encountered loose to medium dense fine-grained slightly clayey to clayey sands (USCS classification of SP-SC and SC) from the existing ground surface elevation to the maximum depth explored of approximately 25 feet BEG. We note that a stratum of hard clay (CL) was also encountered in Borings S-1 and S-2 beginning at a depth of approximately 14 feet BEG.

Groundwater Conditions

Groundwater in the Guld Coastal Plain typically occurs as an unconfined or semi-confined aquifer condition. Recharge is provided by the infiltration of rainfall and surface water through the soil overburden. More permeable zones in the soil matrix, as well as fractures, joints and discontinuities in the underlying bedrock can affect groundwater conditions. The groundwater table is expected to be a subdued replica of the original surface topography.

Groundwater was encountered in the SPT borings at a uniform depth of approximately 13½ feet BEG at the time of our subsurface exploration, which occurred during a period of relatively normal seasonal rainfall and within a pattern of frequent (daily) rain events.

Based on our review of the subsurface conditions encountered in the test borings, we estimate that the normal permanent seasonal high groundwater (SHGW) table for this property will occur within about 1 foot above the groundwater levels measured at those boring locations during our field exploration

Groundwater levels vary with changes in season and rainfall, construction activity, surface water runoff, and other site-specific factors. Groundwater levels in the Walton County area are generally lowest in the late summer-early fall and highest in the late winter-early spring, with annual groundwater fluctuations of 1-foot to 2 feet; consequently, the water table may be different than measured during this study at other times.

4.0 GEOTECHNICAL ASSESSMENT

The following assessment is based on our understanding of the proposed construction, our site observations, our evaluation and interpretation of the field data obtained during this exploration, our experience with similar subsurface conditions, and generally accepted geotechnical engineering principles and practices.

Based on review of geotechnical data, the subject site appears to be favorable for the proposed development. However, we note that the on-site near surface soils that are categorized as fine-grained clayey sand (SC) should be suitable for reuse as backfill/fill materials but will be difficult to compact if overly wet at the time of placement. Additionally, the abundant presence of low-permeability clayey soils throughout the subsurface indicates that the site is unfavorable for the desired dry SMS pond. We suggest that a wet or wet-dry hybrid pond be considered for the SMS design.

We note that subsurface conditions in unexplored locations may be different from those encountered at the test locations considered and discussed herein. If such variations are noted during construction, or if project development plans are changed, we request the opportunity to review the changes and amend our recommendations, if necessary.

5.0 RECOMMENDATIONS

5.1 SITE PREPARATION

Prior to proceeding with construction, all slabs, foundations, pavements, vegetation, root systems, topsoil, and any other deleterious non-soil materials found to be present should be stripped from proposed construction areas. Topsoil may be stockpiled and subsequently re-used in landscaped areas. Debris-laden materials, if present, should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations. All existing utility locations should be reviewed to assess their impact on the proposed construction and relocated/grouted in-place as appropriate.

After clearing and stripping, areas that are at grade or which will receive fill should be carefully evaluated by a NOVA geotechnical engineer. This evaluation should initially include observation of the materials exposed below the stripped subgrade, The exposed materials should be proofrolled with multiple passes of a 20 to 30 ton loaded truck, or other vehicle of similar size and weight under the observation of the geotechnical engineer. The purpose of the proofrolling is to locate soft, weak, or excessively wet fill or residual soils present at the time of construction. Unstable materials observed during the evaluation and proofrolling operations should be undercut and replaced with structural fill or stabilized in-place by scarifying and re-densifying.

Should low consistency and/or debris laden fill materials be encountered during construction, it may need to be excavated and replaced or stabilized in place. Actual remedial recommendations can best be determined by the geotechnical engineer in the field at the time of construction.

5.2 EXCAVATION

Excavations greater than five feet deep (such as for deeper foundations and underground utilities) should be sloped or shored in accordance with local, state, and federal regulations, including OSHA (29CFR Part 1926), excavation safety standards. It should be noted that the Contractor is solely responsible for site safety. This information is provided only as a service and under no circumstances should NOVA be assumed to be responsible for construction site safety. Each excavation should be observed and classified by an OSHA-competent person. All excavations below the groundwater level are classified as OSHA Class C soils for excavation purposes.

After stripping and trench excavation, a NOVA geotechnical engineer should carefully evaluate the exposed soils. We recommend undercutting the proposed pipe trench areas approximately ½ feet below the proposed pipe bearing elevations and installing structural backfill for use as pipe bedding materials. Sewer pipe installation should be constructed in general compliance with ASTM D 2321, standard practice for underground installation of pipe for sewers and other gravity flow applications.

Groundwater Control

Groundwater was encountered in the deeper SPT borings at a uniform depth of about 13½ feet BEG at the time of our subsurface exploration, which occurred during a period of relatively normal seasonal rainfall and within a pattern of frequent (daily) rain events.

Apparent groundwater is therefore not anticipated to adversely impact near-surface construction activities; however, laterally flowing/shallow perched water conditions could potentially be an issue during construction, especially if the site is not properly sloped during initial site stripping and grading activities to prevent the formation of "bird baths".

The site should be properly graded during site work activities to prevent the accumulation of stormwater runoff during and shortly following significant rain events from perching on the underlying relatively low permeability clayey sand subgrade soils. Should perched water conditions be encountered during the earthwork phase of this development, most likely localized dewatering efforts (e.g., construction ditches, temporary sumps, etc.) will suffice to allow for earthwork operations to be performed in the dry. Permanent dewatering measures are not anticipated as being necessary for this development.

We note that groundwater levels are subject to seasonal, climatic and other variations and may be different at other times and locations.

5.3 FILL PLACEMENT

Fill Suitability

Fill materials should be low plasticity soil (with a Liquid Limit of less than 30) with fines contents below 30% that are free of non-soil materials and rock fragments larger than 3 inches in any one dimension **Based on visual examination of the recovered soil samples as well as limited laboratory soil testing, the near-surface strata of fine-grained clayey sands (USCS classification of SC, with fines contents in the upper 8 feet of the SPT borings ranging from 22% to 29%) may or may not be suitable for reuse as structural fill/backfill material depending on their moisture content at the time of placement and compaction.** Any off-site materials used as fill should be approved by NOVA prior to acquisition.

Organic and/or debris-laden material is not suitable for re-use as structural fill. Topsoil, mulch, and similar organic materials can be wasted in architectural areas. Debris-laden materials should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations.

Soil Compaction

Fill should be placed in thin, horizontal loose lifts (maximum 12-inch) and compacted to a minimum soil density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D-1557). The upper 12 inches of soil beneath pavements, the slab-on-grade and all footing excavations should be compacted to at least 98 percent.

In confined areas, such as utility trenches or behind retaining walls, portable compaction equipment and thinner fill lifts (3 to 4 inches) may be necessary. Fill materials used in structural areas should have a target maximum dry density of at least 95 pounds per cubic foot (pcf). If lighter weight fill materials are used, the NOVA geotechnical engineer should be consulted to assess the impact on design recommendations.

Soil moisture content should be maintained within 2 percent of the optimum moisture content. We recommend that the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. Moisture control may be difficult during rainy weather. Soils excavated from below the groundwater table will likely require significant efforts to achieve acceptable moisture contents prior to re-use as fill.

Filling operations should be observed by a NOVA soils technician, who can confirm suitability of material used and uniformity and appropriateness of compaction efforts. The technician can also document compliance with the specifications by performing field density tests using the drive cylinder, nuclear, or sand cone testing methods (ASTM D2937, D6938, or D1556, respectively). One test per 2,500 ft^2 of building footprint and per 5,000 ft^2 of pavement area at the stripped grade elevation and in each lift of placed fill is recommended, with test locations well distributed throughout the fill mass. One compaction test in each column footing and every 50 linear feet of continuous wall footing should also be specified. When filling in small areas, at least one test per day per area should be performed.

The site should be graded during construction to maintain positive drainage away from the construction areas, to prevent ponding of storm water on the site during and shortly following significant rain events. The construction areas should be sealed and crowned with a smooth roller to minimize ponding water from storm events at the end of each day of work.

5.4 FOUNDATIONS

General

Final structural loadings were not available from the design team at the time of issuance of this report. We have therefore assumed that isolated interior column and continuous load bearing wall loads will not exceed 30 kips per column and 3 kips per linear foot, respectively, for the planned structure.

Shallow Foundation System

Design: After the recommended site/subgrade preparation and fill placement, we recommend that the proposed structure be supported on a conventional shallow foundation system bearing upon compacted native soils and/or compacted structural fill. The building foundation may be designed employing a maximum allowable soil bearing pressure of **2,000 pounds per square foot (psf).**

We recommend minimum footing widths of 18 inches for ease of construction and to reduce the possibility of localized shear failures. Isolated exterior and interior footing bottoms should be established at least 16 inches below finished surrounding exterior grades and should be established at least 1 foot above the normal permanent SHGW table.

Settlement: Settlements for a spread foundation bearing on compacted native or approved fill materials were assessed using SPT values to estimate elastic modulus, based on published correlations and previous NOVA experience. We note that the settlements presented are based on the results of the SPT borings. Conditions may be better or worse in other areas, however, we believe the estimated settlements are reasonably conservative.

Based on the soil bearing capacity and the presumed foundation elevations discussed above, we expect primary total settlement beneath individual foundations to be on the order of 1-inch or less. The amount of differential settlement is difficult to predict because the subsurface and foundation loading conditions can vary considerably across the site. However, we anticipate differential settlement between adjacent foundations will be on the order of ½ inch or less. The final deflected shape of the structure will be dependent on actual foundation locations and loading.

Foundation support conditions are highly erratic and may vary dramatically in short horizontal distances. It is anticipated that the geotechnical engineer may recommend a different bearing capacity upon examination of the actual foundation subgrade at numerous locations.

To reduce the differential settlement if lower consistency materials are encountered, a lower bearing capacity should be used, or the foundations should be extended to more competent materials. We anticipate that timely communication between the geotechnical engineer and the structural engineer, as well as other design and construction team members, will be required.

Construction: Foundation excavations should be evaluated by the NOVA geotechnical engineer prior to reinforcing steel placement to observe foundation subgrade preparation and confirm bearing pressure capacity. Foundation excavations should be level and free of debris, ponded water, mud, and loose, frozen, or water-softened soils. Concrete should be placed as soon as is practical after the foundation is excavated, and the subgrade evaluated. Foundation concrete should not be placed on frozen or saturated soil. If a foundation excavation remains open overnight, or if rain or snow is imminent, a 3 to 4-inch thick "mud mat" of lean concrete should be placed in the bottom of the excavation to protect the bearing soils until reinforcing steel and concrete can be placed.

5.5 SLAB-ON-GRADE

The conditions exposed at subgrade levels will vary across the site and may include structural fill or densified in-situ soils. The slab-on-grade may be adequately supported on these subgrade conditions subject to the recommendations in this report. The slab-on-grade should be jointed around columns and along walls to reduce cracking due to differential movement. An impermeable vapor barrier is recommended beneath finished spaces to reduce dampness. Once grading is completed, the subgrade can be exposed to adverse construction activities and weather conditions during the period of sub-slab utility installation. The subgrade should be well drained to prevent the accumulation of water. If the exposed subgrade becomes unstable, excessively wet or exhibits excessive rutting or pumping, the geotechnical engineer should be consulted.

Subgrade Modulus

A coefficient of subgrade reaction (***k***) of 150 pci per inch (psi per inch) may be used for conventional slab design where slabs bear upon subgrades prepared in accordance with previous recommendations. Please note that this magnitude of ***k*** is intended to reflect the elastic response of soil beneath a typical floor slab under light loads with a small load contact area often measured in square inches, such as loads from forklifts, automobile/truck traffic or lightly loaded storage racks. The recommended coefficient of subgrade reaction (***k***) of 125 pci is not applicable for heavy slab loads caused by bulk storage or tall storage racks, or for mat foundation design. Several design methods are applicable for conventional slab design. We have assumed that the slab designer will utilize the methods discussed in the American Concrete Institute (ACI) Committee 360 report, *"Guide to Design of Slabs-on-Ground, (ACI 360R-10)*.

5.6 STORMWATER MANAGEMENT SYSTEM RECOMMENDATIONS

NOVA understands that the stormwater management system (SMS) to treat and dispose of stormwater runoff associated with the proposed development is desired to consist of a conventional shallow dry retention basin. Based on the results of our field exploration, the subsurface conditions encountered beneath the proposed SMS basin appear to be poorly suited for employing a dry retention basin design due to the presence of very low permeability fine-grained clayey sand soils at and extending to well below the anticipated bottom-of-basin elevation. We recommend that consideration be given to designing this basin for wet detention, or possibly employing a wet-dry hybrid detention pond. We recommend that the soil parameters presented in Table 1 below be considered for the design of the SMS for this project.

TABLE 1 – SMS SOIL DESIGN PARAMETERS	
Corresponding Soil Boring Test Location	**S-1, S-2**
Approximate Depth to Confining Stratum, BEG	At-Grade
Measured Vertical Hydraulic Conductivity (k_v)*	< 0.1 ft/day
Estimated Lateral Saturated Hydraulic Conductivity (k_h)*	< 0.1 ft/day
Estimated Fillable Porosity of Soil	20%
Average Depth to Stabilized Groundwater Table, BEG	13½ feet
Estimated Average Normal Permanent SHGW Table, BEG	12 feet
Estimated Normal Permanent SLGW Table, BEG	16 feet

** Factors of Safety have not been applied to the noted hydraulic conductivity and infiltration values.*

The estimated normal permanent SHGW and SLGW levels provided in Table 1 above are based on our experience with projects in this locale; the soil strata encountered in the test boring; and the published information by the "Web Soil Survey" National database, NRCS division of the United States Department of Agriculture (USDA).

5.7 PAVEMENT CROSS SECTION DESIGN

5.7.1 General

A recommended flexible (asphalt) pavement section has been developed for this project based on our understanding of the existing subsurface conditions, review of applicable FDOT specifications, and the assumed loading conditions of 50,000 Equivalent Single-Axle Loads (ESALS) for heavy duty pavement areas and 25,000 Equivalent Single-Axle Loads (ESALS) for standard (light) duty pavement areas, with a 20-year design life. The terminal serviceability index and reliability for these pavement sections were assumed to be 2.0 and 85%, respectively. Traffic exceeding the stated criteria will require a heavier pavement section.

5.7.2 Flexible Pavements

We recommend a minimum compaction of at least 98 percent of the maximum dry density be specified for the base and stabilized subgrade courses as determined by the Modified Proctor test method (ASTM D-1557). A minimum separation of at least 24 inches between the bottom of an FDOT approved Crushed Limerock Base or GAB course and the seasonal high groundwater table should be maintained.

All asphalt material and paving operations should meet applicable specifications of the Asphalt Institute and FDOT requirements. A NOVA technician should observe placement and perform density testing of the stabilized subgrade and base course materials as well as asphalt. We recommend using the parameters shown for a flexible pavement section presented below in Table 2 (Standard Duty) and on the next page in Table 3 (Heavy Duty) for the flexible pavement section designs for this project.

Table 2 – Recommended Standard Duty Flexible Pavement Section	
Asphaltic Concrete Structural Course (SuperPave SP-9.5 or SP-12.5)	1½ inch
FDOT Approved Crushed Limerock, Crushed Concrete, or Graded Aggregate Base (GAB) Material (minimum LBR of 100)	6 inches
Stabilized Subgrade Course (minimum LBR of 40)	12 inches

Table 3 – Recommended Heavy Duty Flexible Pavement Section (Primary Entrance, and areas where static wheel turning is required)	
Asphaltic Concrete Surface Course (such as a 9.5 mm SuperPave approved FDOT mix)	1 inch
Asphaltic Concrete Structural Course (such as a 12.5 mm SuperPave approved FDOT mix)	1½ inches
FDOT Approved Crushed Limerock, Crushed Concrete, or Graded Aggregate Base (GAB) Material (minimum LBR of 100)	8 inches
Stabilized Subgrade Course (minimum LBR of 40)	12 inches

Based on visual classification of the near-surface materials encountered in the test borings, it appears that the native clayey sand (SC) soils should meet the minimum LBR requirement of 40 for the stabilized subgrade course (SSC), and therefore stabilization of the native subgrade soils should not be necessary. An imported material having a minimum LBR value of 40 should be specified for the final (12-inch) lift of fill for pavement areas being installed over fill.

All asphalt material and paving operations should meet applicable specifications of the Asphalt Institute and Florida Department of Transportation. A NOVA technician should observe placement and perform density testing of the SSC, base course material and asphalt.

5.7.3 Rigid Pavements

We understand that a rigid (concrete) pavement section may also be employed for the proposed pavement areas planned as part of this development. Recommended heavy duty and light duty pavement sections have been developed for this project based on our understanding of the existing subsurface conditions, review of applicable FDOT specifications, and the assumed pavement design parameters stated previously.

Our recommendations for slab thickness for standard duty and heavy-duty concrete pavements are also based on the subgrade soils being densified to a minimum soil density of at least 98 percent of the Modified Proctor test method (ASTM D-1557), and employment of a design modulus of subgrade reaction (k) equal to 150 pounds per cubic inch.

We recommend using the designs in Table 4 on the next page for Standard Duty and Heavy-Duty concrete (rigid) pavement sections.

<table>
<tr><th colspan="3">Table 4 - Recommended Rigid Pavement Sections</th></tr>
<tr><th colspan="3">STANDARD DUTY PAVEMENT SECTION</th></tr>
<tr><th>Minimum Pavement Thickness</th><th>Maximum Control Joint Spacing</th><th>Recommended Saw-Cut Depth</th></tr>
<tr><td>5½ Inches</td><td>10 feet x 10 feet</td><td>$1^{3}/_{8}$ Inches</td></tr>
<tr><th colspan="3">HEAVY DUTY PAVEMENT SECTION</th></tr>
<tr><th>Minimum Pavement Thickness</th><th>Maximum Control Joint Spacing</th><th>Recommended Saw-Cut Depth</th></tr>
<tr><td>8 Inches</td><td>12 feet x 12 feet</td><td>2 Inches</td></tr>
</table>

All concrete materials and placement should conform to applicable FDOT specifications. We recommend that a non-woven geotextile (about 3 feet wide) be placed beneath the construction joints to prevent upward "pumping" movement of soil fines through the joints.

The recommend using concrete with a minimum compressive strength of 4000 psi and a minimum 28-day flexural strength (modulus of rupture) of at least 600 pounds per square inch, based on 3rd point loading of concrete beam test samples. All sections should be reinforced with #3 (3/8-in. diameter) rebar every 18-in OC. Layout of the sawcut control joints should form square panels, and the depth of sawcut joint should be ¼ of the concrete slab thickness. The joints should be sawed within six hours of concrete placement or as soon as the concrete has developed sufficient strength to support workers and equipment.

We also recommend allowing NOVA to review and comment on the final concrete pavement design, including section and joint details (type of joints, joint spacing, etc.), prior to the start of construction. For further details on concrete pavement construction, please reference "Building Quality Concrete Parking Areas", published by the Portland Cement Association.

5.8 DRAINAGE CONSIDERATIONS

Soil strength and settlement potential is highly dependent upon the moisture condition of the supportive soil. Soil characteristics can change dramatically when moisture conditions change. As such, building pads, walkways, structures and surrounding grades should be properly designed and constructed to properly control water (surface and subsurface). Building pads should be designed to shed surface water prior to building construction. Grades surrounding structures should be adequately sloped away from the structure to promote positive drainage and prevent water from ponding near or against the structure. Swales and/or storm drainage structures should be constructed to collect and remove all surface water run-off. All roof drain downspouts should be connected to drain leaders that are properly daylighted or connected to storm drainage structures such that water is removed from structural areas. Interior and/or exterior foundation drains, if provided, should be installed to properly protect foundations from changing moisture conditions.

All foundation drains, if provided, should be properly daylighted or connected to storm drain structures to remove all water from foundation areas. Roof drain lines and foundation drain lines should always remain independent of each other. Any subsurface water that may rise near structural grades should be controlled by adequately constructed subsurface drainage mechanisms.

6.0 LIMITATIONS

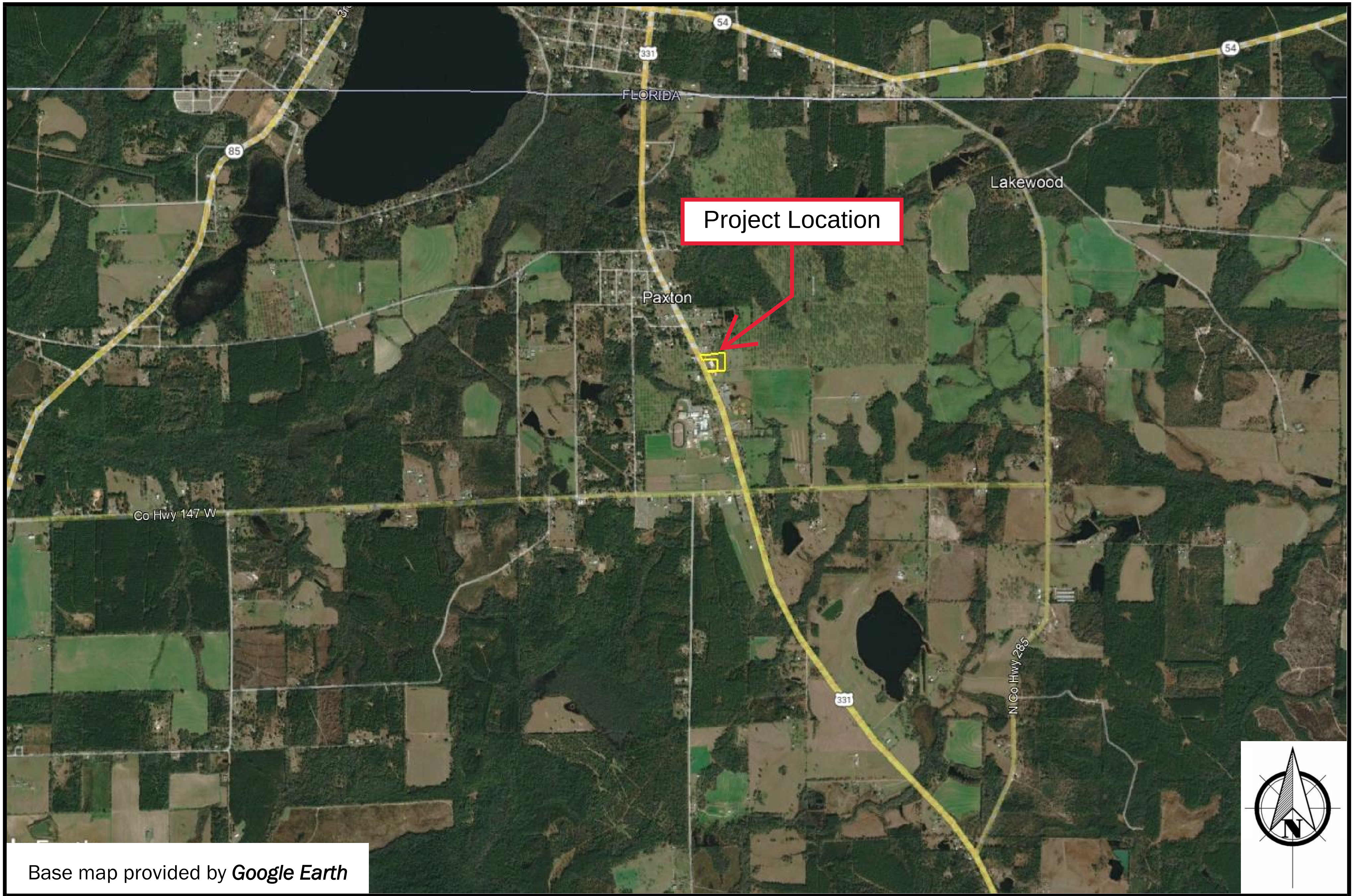
The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at significantly later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for NOVA to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between test locations will differ from those encountered at specific test locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

This report is intended for the sole use of **Forefront Architecture + Engineering** for the above noted project. The scope of work performed during this study may not satisfy other user's requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of Florida. This warranty is in lieu of all other statements or warranties, either expressed or implied.

APPENDIX A
Figures and Maps



Base map provided by *Google Earth*

Scale: Not To Scale
Date Drawn: June 19, 2023
Drawn By: M. Keramidas
Checked By: W. Lawrence

NOVA

17612 Ashley Drive
Panama City Beach, Florida 32413
850.249.6682 ♦ 850.249.6683

PROJECT LOCATION MAP

Paxton Senior Facility

Paxton, Walton County, Florida

NOVA Project Number 10111-2023055

Soil Map—Walton County, Florida
(Paxton Senior Facility)

Map Scale: 1:1,000 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- □ Area of Interest (AOI)

Soils

- □ Soil Map Unit Polygons
- Soil Map Unit Lines
- ■ Soil Map Unit Points

Special Point Features

- Blowout
- ☒ Borrow Pit
- Clay Spot
- ◇ Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- + Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- △ Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Walton County, Florida
Survey Area Data: Version 22, Sep 2, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 2, 2021—Dec 23, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Bonifay loamy sand, 0 to 5 percent slopes	1.3	50.4%
13	Fuquay loamy sand, 0 to 5 percent slopes	0.6	23.9%
20	Leefield-Stilson loamy sands, 0 to 5 percent slopes	0.0	0.1%
31	Troup sand, 0 to 5 percent slopes	0.7	25.6%
Totals for Area of Interest		**2.6**	**100.0%**

APPENDIX B
Subsurface Data

LEGEND

🟥 25’ SPT Boring Locations (B-1 and B-2)

⬛ 5’ Hand Auger Locations (P-1 through P-3)

🟦 15’ STP Boring Locations (S-1 and S-2)

Base map provided by ***Google Earth***

Scale: Not To Scale

Date Drawn: June 19, 2023

Drawn By: M. Keramidas

Checked By: W. Lawrence

NOVA

17612 Ashley Drive
Panama City Beach, Florida 32413
850.249.NOVA(6682) ♦ 850.249.6683

BORING LOCATION PLAN

Paxton Senior Facility

Paxton, Walton County, Florida

NOVA Project Number 10111-2023055

KEY TO BORING LOGS

SYMBOLS AND ABBREVIATIONS

SYMBOL	DESCRIPTION
N-Value	No. of Blows of a 140-lb. Weight Falling 30 Inches Required to Drive a Standard Spoon 1 Foot
WOR	Weight of Drill Rods
WOH	Weight of Drill Rods and Hammer
▮	Sample from Auger Cuttings
◩	Standard Penetration Test Sample
▯	Thin-wall Shelby Tube Sample (Undisturbed Sampler Used)
% REC	Percent Core Recovery from Rock Core Drilling
RQD	Rock Quality Designation
▼	Stabilized Groundwater Level
⧨	Seasonal High Groundwater Level (also referred to as the W.S.W.T.)
NE	Not Encountered
GNE	Groundwater Not Encountered
BT	Boring Terminated
-200 (%)	Fines Content or % Passing No. 200 Sieve
MC (%)	Moisture Content
LL	Liquid Limit (Atterberg Limits Test)
PI	Plasticity Index (Atterberg Limits Test)
K	Coefficient of Permeability
Org. Cont.	Organic Content
G.S. Elevation	Ground Surface Elevation

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS More than 50% retained on the the No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES	GM	Silty gravels and gravel-sand-silt mixtures
			GC	Clayey gravels and gravel-sand-clay mixtures
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS 5% or less passing No. 200 sieve	SW**	Well-graded sands and gravelly sands, little or no fines
			SP**	Poorly graded sands and gravelly sands, little or no fines
		SANDS with 12% or more passing No. 200 sieve	SM**	Silty sands, sand-silt mixtures
			SC**	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS 50% or more passes the No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diamicaceous fine sands or silts, elastic silts
			CH	Inorganic clays or clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
			PT	Peat, muck and other highly organic soils

*Based on the material passing the 3-inch (75 mm) sieve
** Use dual symbol (such as SP-SM and SP-SC) for soils with more than 5% but less than 12% passing the No. 200 sieve

RELATIVE DENSITY

(Sands and Gravels)
Very loose – Less than 4 Blow/Foot
Loose – 4 to 10 Blows/Foot
Medium Dense – 11 to 30 Blows/Foot
Dense – 31 to 50 Blows/Foot
Very Dense – More than 50 Blows/Foot

CONSISTENCY

(Silts and Clays)
Very Soft – Less than 2 Blows/Foot
Soft – 2 to 4 Blows/Foot
Medium Stiff – 5 to 8 Blows/Foot
Stiff – 9 to 15 Blows/Foot
Very Stiff – 16 to 30 Blows/Foot
Hard – More than 30 Blows/Foot

RELATIVE HARDNESS

(Limestone)
Soft – 100 Blows for more than 2 Inches
Hard – 100 Blows for less than 2 Inches

MODIFIERS

These modifiers Provide Our Estimate of the Amount of Minor Constituents (Silt or Clay Size Particles) in the Soil Sample
Trace – 5% or less
With Silt or With Clay – 6% to 11%
Silty or Clayey – 12% to 30%
Very Silty or Very Clayey – 31% to 50%

These Modifiers Provide Our Estimate of the Amount of Organic Components in the Soil Sample
Trace – Less than 3%
Few – 3% to 4%
Some – 5% to 8%
Many – Greater than 8%

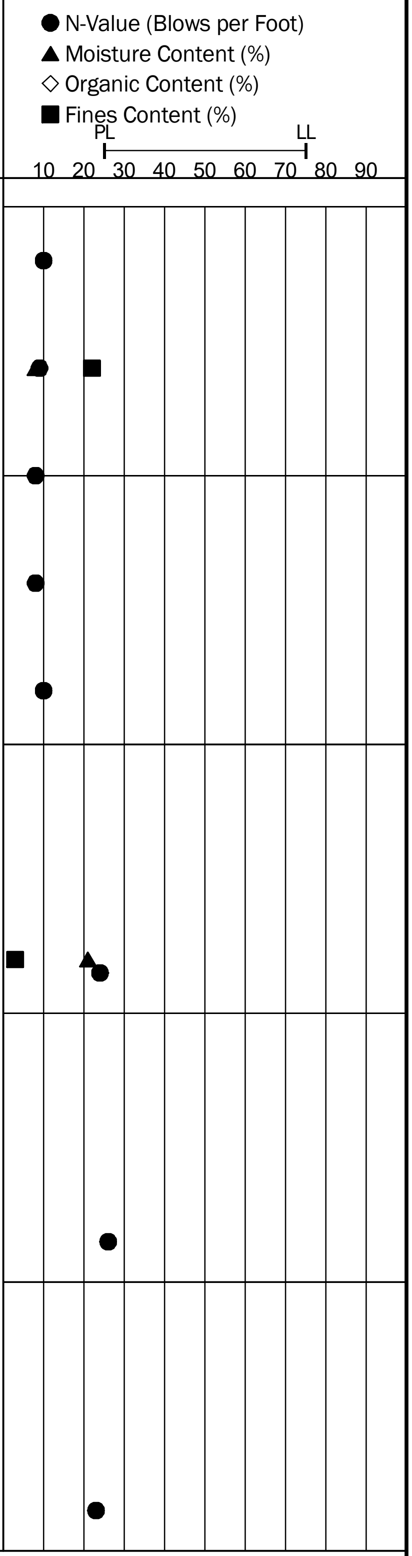
These Modifiers Provide Our Estimate of the Amount of Other Components (Shell, Gravel, Etc.) in the Soil Sample
Trace – 5% or less
Few – 6% to 12%
Some – 13% to 30%
Many – 31% to 50%

NOVA

TEST BORING RECORD B-1

PROJECT NAME: Paxton Senior Facility **DATE:** 5/15/2023
PROJECT NO.: 2023055 **CLIENT:** Forefront Architecture + Engineering
PROJECT LOCATION: Paxton, Walton County, Florida
LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade
DRILLED BY: L. Griffin **LOGGED BY:** N. Gonzalez
DRILLING METHOD: Mud Rotary **HAMMER:** Manual
INITIAL GW DEPTH: ▼ 13.5 feet **EST. SHGW DEPTH:** ▽ 12.5 feet

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Loose red/brown fine-grained slightly clayey SAND (SP-SC)				10 9 8 8 10
12.5		Medium dense red/brown fine-grained SAND (SP)		▽ ▼		24
15		Medium dense grey to light red/brown fine-grained slightly clayey SAND (SP-SC)				26 23
25						

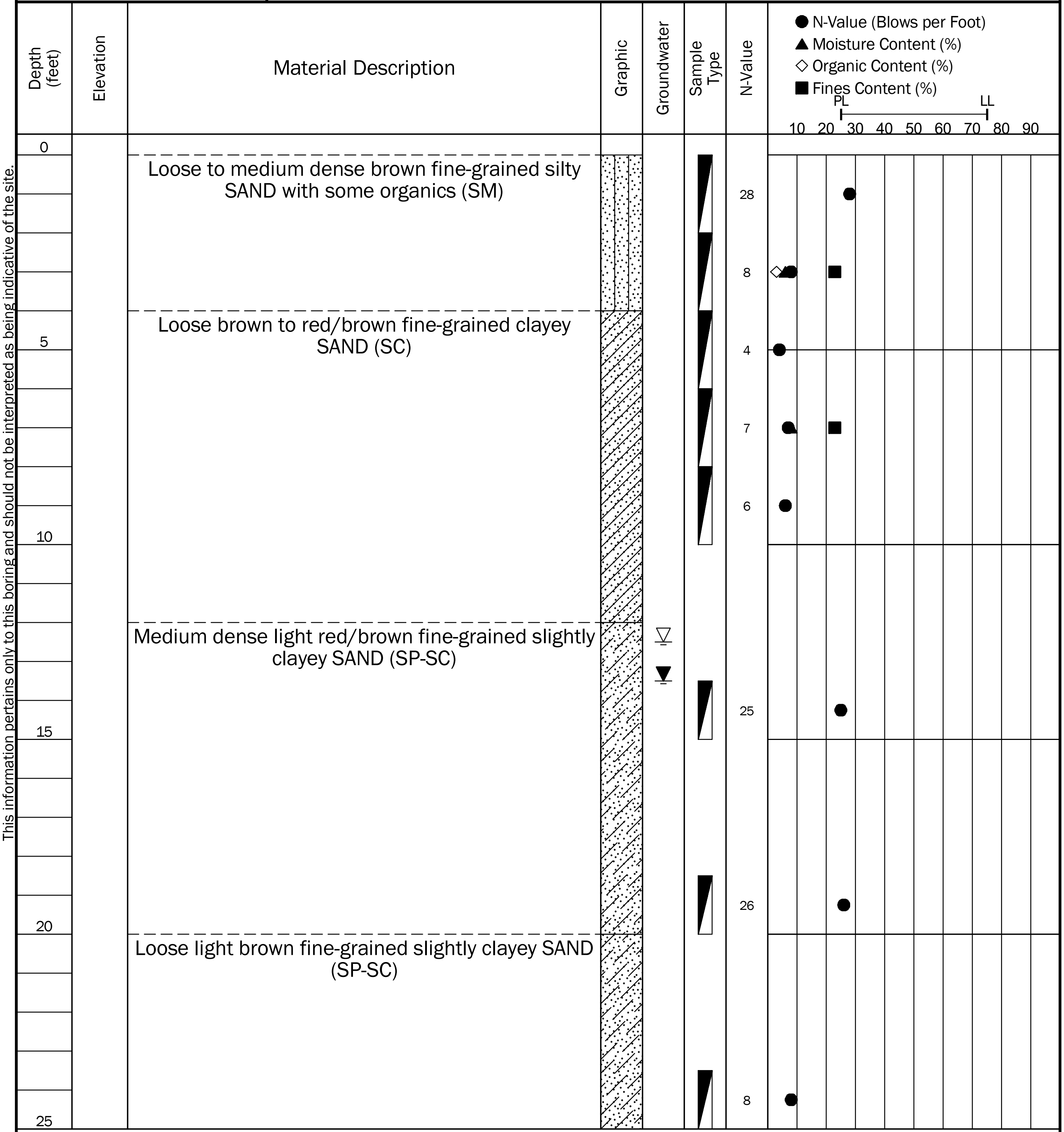


Note: Boring Terminated at 25 feet

This information pertains only to this boring and should not be interpreted as being indicative of the site.

TEST BORING RECORD
B-2

PROJECT NAME: Paxton Senior Facility **DATE:** 5/15/2023
PROJECT NO.: 2023055 **CLIENT:** Forefront Architecture + Engineering
PROJECT LOCATION: Paxton, Walton County, Florida
LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade
DRILLED BY: L. Griffin **LOGGED BY:** N. Gonzalez
DRILLING METHOD: Mud Rotary **HAMMER:** Manual
INITIAL GW DEPTH: ▼ 13.5 feet **EST. SHGW DEPTH:** ▽ 12.5 feet



Depth (feet)	Material Description
0 – 4	Loose to medium dense brown fine-grained silty SAND with some organics (SM)
4 – 12	Loose brown to red/brown fine-grained clayey SAND (SC)
12 – 20	Medium dense light red/brown fine-grained slightly clayey SAND (SP-SC)
20 – 25	Loose light brown fine-grained slightly clayey SAND (SP-SC)

Note: Boring Terminated at 25 feet

This information pertains only to this boring and should not be interpreted as being indicative of the site.

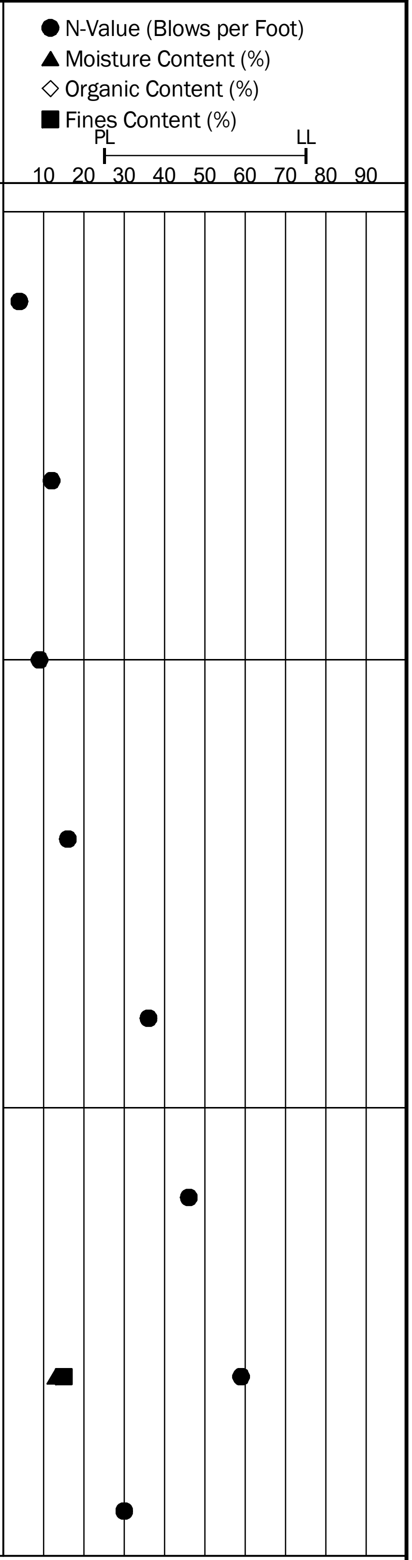
NOVA

TEST BORING RECORD S-1

PROJECT NAME: Paxton Senior Facility **DATE:** 5/15/2023
PROJECT NO.: 2023055 **CLIENT:** Forefront Architecture + Engineering
PROJECT LOCATION: Paxton, Walton County, Florida
LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade
DRILLED BY: L. Griffin **LOGGED BY:** N. Gonzalez
DRILLING METHOD: Mud Rotary **HAMMER:** Manual
INITIAL GW DEPTH: ▼ 13.5 feet **EST. SHGW DEPTH:** ▽ 12.5 feet

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Loose brown fine-grained clayey SAND (SC)				4
		Loose to medium dense red/brown fine-grained clayey SAND (SC)				12
5						9
						16
		Dense to very dense light red/brown fine-grained slightly clayey SAND (SC)				36
10						46
				▽		
				▼		59
		Hard light red/brown CLAY (CL)				30
15						



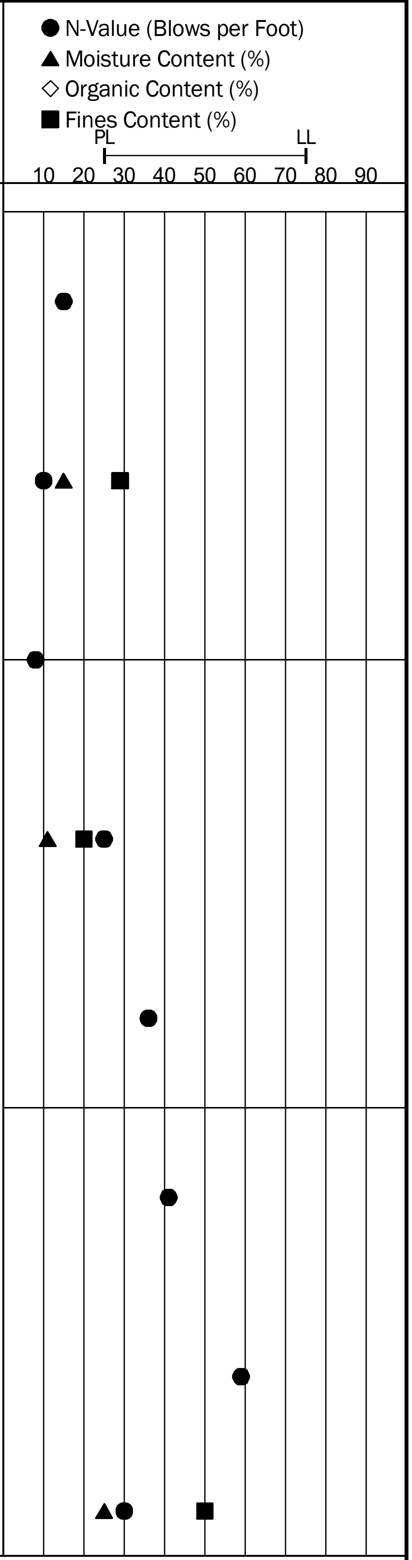
Note: Boring Terminated at 15 feet

NOVA

TEST BORING RECORD
S-2

PROJECT NAME: Paxton Senior Facility **DATE:** 5/15/2023
PROJECT NO.: 2023055 **CLIENT:** Forefront Architecture + Engineering
PROJECT LOCATION: Paxton, Walton County, Florida
LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade
DRILLED BY: L. Griffin **LOGGED BY:** N. Gonzalez
DRILLING METHOD: Mud Rotary **HAMMER:** Manual
INITIAL GW DEPTH: ▼ 13.5 feet **EST. SHGW DEPTH:** ▽ 12.5 feet

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value
0		Medium dense brown fine-grained clayey SAND (SC)				15
		Loose to medium dense red/brown fine-grained clayey SAND (SC)				10
5						8
						25
		Medium dense to very dense light red/brown fine-grained slightly clayey SAND (SC)				36
10						41
				▽ ▼		59
		Hard light red/brown CLAY (CL)				30
15						



Note: Boring Terminated at 15 feet

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

TEST BORING RECORD
P-1

PROJECT NAME: Paxton Senior Facility **DATE:** 5/17/2023
PROJECT NO.: 2023055 **CLIENT:** Forefront Architecture + Engineering
PROJECT LOCATION: Paxton, Walton County, Florida
LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade
DRILLED BY: Z. Cooper **LOGGED BY:** N. Gonzalez
DRILLING METHOD: Hand Auger **HAMMER:** None
INITIAL GW DEPTH: ▼ GNE **EST. SHGW DEPTH:** ▽ GNE

● N-Value (Blows per Foot)
▲ Moisture Content (%)
◇ Organic Content (%)
■ Fines Content (%)
PL ├──┤ LL
10 20 30 40 50 60 70 80 90

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Brown to red/brown fine-grained clayey SAND (SC)	▨		▌	
5						

Note: Boring Terminated at 5 feet

This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

TEST BORING RECORD
P-2

PROJECT NAME: Paxton Senior Facility **DATE:** 5/17/2023
PROJECT NO.: 2023055 **CLIENT:** Forefront Architecture + Engineering
PROJECT LOCATION: Paxton, Walton County, Florida
LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade
DRILLED BY: Z. Cooper **LOGGED BY:** N. Gonzalez
DRILLING METHOD: Hand Auger **HAMMER:** None
INITIAL GW DEPTH: ▼ GNE **EST. SHGW DEPTH:** ▽ GNE

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value	● N-Value (Blows per Foot) ▲ Moisture Content (%) ◇ Organic Content (%) ■ Fines Content (%) PL LL 10 20 30 40 50 60 70 80 90
0							
		Brown to red/brown fine-grained clayey SAND (SC)	▨		▮		
5							

Note: Boring Terminated at 5 feet

This information pertains only to this boring and should not be interpreted as being indicative of the site.

TEST BORING RECORD
P-3

PROJECT NAME: Paxton Senior Facility **DATE:** 5/17/2023

PROJECT NO.: 2023055 **CLIENT:** Forefront Architecture + Engineering

PROJECT LOCATION: Paxton, Walton County, Florida

LOCATION: See Boring Location Plan **ELEVATION:** Existing Grade

DRILLED BY: Z. Cooper **LOGGED BY:** N. Gonzalez

DRILLING METHOD: Hand Auger **HAMMER:** None

INITIAL GW DEPTH: ▼ GNE **EST. SHGW DEPTH:** ▽ GNE

Depth (feet)	Elevation	Material Description	Graphic	Groundwater	Sample Type	N-Value	● N-Value (Blows per Foot) ▲ Moisture Content (%) ◇ Organic Content (%) ■ Fines Content (%) PL ├──┤ LL 10 20 30 40 50 60 70 80 90
0							
		Brown to red/brown fine-grained clayey SAND (SC)	▨		█		
5							

Note: Boring Terminated at 5 feet

APPENDIX C
Laboratory Data

SUMMARY OF CLASSIFICATION & INDEX TESTING

Paxton Senior Facility
Paxton, Walton County, Florida
NOVA Project Number 10111-2023055

Boring Number	Sample Depth (ft)	Natural Moisture (%)	Percent (%) Passing Sieve #200	Organic Content (%)	USCS Soil Classification
B-1	2 – 4	8	22	——	SC
B-1	13.5	21	3	——	SP
B-2	2 – 4	6	23	3	SM
B-2	6 – 8	8	23	——	SC
S-1	12 – 14	13	15	——	SC
S-2	2 – 4	15	29	——	SC
S-2	8 – 10	11	20	——	SC
S-2	14 – 15	25	50	——	CL

PERMEABILITY, -200 SIEVE WASH, AND MOISTURE CONTENT

PROJECT: Paxton Senior Facility

NOVA PROJECT #: 10111-2023055

DATE: 6/20/2023

ASSIGNED BY: W.Lawrence

TESTED BY: N. Gonzalez

Sample LOCATION / BORING NO.	S-1 and S-2
Sample NUMBER / DEPTH	0' - 6'

PERMEABILITY TESTING SUMMARY			
PERMEABILITY (K_V)	→	0	ft/day
Corresponding K_h	→	0	ft/day
DRY DENSITY	→	93	lbs/ft^3
MOISTURE CONTENT	→	12	%
-200 FINES CONTENT	→	33	%

FALLING HEAD PERMEABILITY (ASTM D 5084)

No. of LAYERS:	3	**Wt. of MOLD (lbs):**	9.31
BLOWS/LAYER:	15	**Wt. of MOLD/SOIL (lbs):**	12.80
HEIGHT (FT)	**TRIAL #1 (SEC)**	**TRIAL #2 (SEC)**	**PERMEABILITY**
5	0.0	0.0	
4	3600.0	3500.0	1.12E-05
Average Permeability		1.1E-05	**cm/sec**

NUMBER OF INCHES MOLD WAS SHORT? 0.000 **INCHES**

PERMEABILITY CONSTANT USED WAS → 0.41 **(Includes 1/2"ID tubing)**

(ZERO INCHES IS DEFAULT)

MOISTURE CONTENT (ASTM D 2216)	
Pan NUMBER	P-4
Wt. of WET SOIL & PAN (g)	181.9
Wt. of DRY SOIL & PAN (g)	167.9
Wt. of PAN (g)	50.8
Wt. of Water (g)	14.1
Wt. of Dry Soil (g)	117.1
MOISTURE CONTENT (%)	12.0

-200 SIEVE WASH (ASTM D 1140)	
Pan NUMBER	P-4
Wt. of DRY SOIL & PAN (g)	155.0
Wt. of WASH SOIL & PAN (g)	120.2
Wt. of PAN (g)	50.8
Wt. of Original Dry Sample (g)	104.2
Wt. of -200 Material (g)	34.8
Wt. of Washed Dry Sample (g)	69.4
-200 FINES CONTENT (%)	33.4

APPENDIX D
Support Documents

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GBC GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org