Universal Engineering Sciences

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Report of Geotechnical Exploration

Checker's Drive-In
1936 Lane Ave. S.
Jacksonville, Duval County, Florida

March 2, 2021
UES Project No.: 0530.2100028.0000

For: UES Consulting Services, Inc.

March 2, 2021

Ms. Dawn Kemmerer
UES Consulting Services, Inc.
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Kansas City, MO 64106
Phone: (816) 415-0005
Email: dawn@uesconsulting.com

Site: **Checker's Drive-In**
1936 Lane Ave. S.
Jacksonville, Duval County, Florida
UES Project No. 0530.2100028.0000

Dear Ms. Kemmerer:

Universal Engineering Sciences, LLC (UES) has completed the subsurface exploration and geotechnical engineering evaluation for the above-referenced project in accordance with the geotechnical and engineering service agreement for this project. The scope of services was completed in accordance with our Geotechnical Engineering Proposal (0530.0121.00042) planned in conjunction with and authorized by you.

EXECUTIVE SUMMARY

The purpose of our subsurface exploration was to classify the nature of the subsurface soils and general geomorphic conditions and evaluate their impact upon the proposed construction. This report contains the results of our subsurface exploration at the site and our engineering interpretations of these, with respect to the project characteristics described to us including providing recommendations for site preparation and the design of the foundation system.

UES understands the project will consist of the new construction of a Checker's Drive-Thru fast-food eatery located at 1936 Lane Ave. S. in Jacksonville, Duval County, Florida. We also understand the planned structure will be a one-story structure with floor slab-on-grade. UES was provided preliminary site layout plans at the time or proposal and understands the proposed building footprint will be approximately 954 square feet. Specific loading conditions were not available at the time of this report, but for the purposes of evaluating the bearing capacity and settlement values, we have assumed that the maximum loading conditions will be on the order of 50 kips for individual column footings and 5 kips per lineal foot (klf) for continuous wall footings. The project site is located in a residential area, and some existing structures will need to be demolished prior to construction operations. UES anticipates the addition of up to two feet of fill to raise existing elevations to final elevation. The recommendations provided herein are based upon the above considerations. If the project description has been revised, please inform Universal Engineer Sciences so that we may review our recommendations with respect to any modifications.

The following soil testing was completed for this study:

- Two (2) Standard Penetration Test (SPT) borings advanced to depths of approximately twenty (20) feet Below existing Ground Surface (BGS) within the proposed building footprint.

- Three (3) SPT borings advanced to depths of approximately eight (8) feet BGS within the proposed parking and drive areas.

- One (1) SPT boring advanced to a depth of approximately ten (10) feet BGS within the proposed dumpster pad.

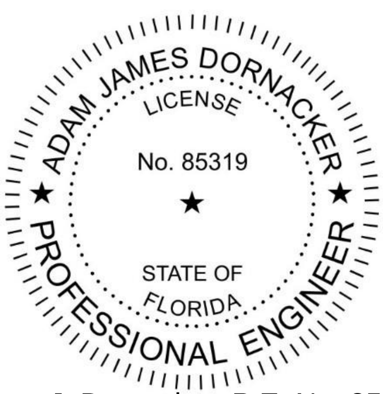
The subsurface soil conditions encountered at this site generally consist of very loose to loose sands (SP), loose slightly silty sands (SP-SM), very loose to dense slightly clayey sands (SP-SC), loose to dense clayey sands (SC), and soft to very stiff clays (CL) to the boring termination depths. Please refer to "Appendix D: Record of Test Borings" for a detailed account of each boring.

Based on our six soil borings and knowledge of the project at the time of this report, the subsurface soil conditions at the project site are generally favorable for the support of the proposed structure on shallow foundations. A maximum allowable bearing pressure of 2,000 psf may be used for foundation design. Based on the projected loads, expected settlement of the structure is less than 1 inch total and less than ½ inch differential.

We appreciate the opportunity to be of service to you on this project and look forward to a continued association. Please do not hesitate to contact us if you have any questions or comments, or if we may further assist you as your plans proceed.

Respectfully Submitted,
Universal Engineering Sciences, LLC
Certificate of Authorization Number 549

Victor Nguyen
Geotechnical Project Professional



Adam J. Dornacker, P.E. No. 85319
State of Florida
Geotechnical Department Manager

This document has been digitally signed and sealed by
Adam Dornacker
on the date adjacent to the seal.

Digitally signed by Adam Dornacker
DN: c=US, o=Agile Frameworks, email=adornacker@teamgfa.com, cn=Adam Dornacker
Date: 2021.03.02 17:45:55 -05'00'

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1.0 INTRODUCTION

1.1 Scope of Services

The objective of our geotechnical services was to collect subsurface data for the subject project, summarize the test results, and discuss any apparent site conditions that may have geotechnical significance for proposed structure construction. The scope of our services was limited to the following:

1. Conduct six Standard Penetration Test (SPT) borings to determine the nature and condition of the subsurface soils and preparing record logs of these soil borings depicting the subsurface soil conditions encountered during our field exploration.

2. Review each soil sample obtained during our field exploration for classification and additional testing, if necessary.

3. Evaluate the existing soil conditions found during our exploration with respect to foundation support for the proposed structure.

4. Prepare this report to document the results of our field exploration, engineering analysis and foundation design recommendations.

1.2 Project Description

UES understands the project will consist of the new construction of a Checker's Drive-Thru fast-food eatery located at 1936 Lane Ave. S. in Jacksonville, Duval County, Florida. We also understand the planned structure will be a one-story structure with floor slab-on-grade. UES was provided preliminary site layout plans at the time or proposal and understands the proposed building footprint will be approximately 954 square feet. Specific loading conditions were not available at the time of this report, but for the purposes of evaluating the bearing capacity and settlement values, we have assumed that the maximum loading conditions will be on the order of 50 kips for individual column footings and 5 kips per lineal foot (klf) for continuous wall footings. The project site is located in a residential area, and some existing structures will need to be demolished prior to construction operations. UES anticipates the addition of up to two feet of fill to raise existing elevations to final elevation. The recommendations provided herein are based upon the above considerations. If the project description has been revised, please inform Universal Engineer Sciences so that we may review our recommendations with respect to any modifications.

2.0 OBSERVATIONS

2.1 Site Inspection

The recovered samples were not evaluated, either visually or analytically, for chemical composition or environmental hazards. UES would be pleased to perform these services for an additional fee, if required.

2.2 Field Exploration

Our field exploration consisted of two Standard Penetration Test (SPT) borings advanced to depths of approximately 20 feet below the existing ground surface (BGS) within the building footprint, three SPT borings advanced to depths of approximately 8 feet BGS within the proposed parking and drive areas, and one SPT boring advanced to a depth of approximately 10 feet BGS within the proposed dumpster pad at the time of our field exploration. The locations of the borings performed are illustrated in "Appendix B: Test Location Plan". The Standard Penetration Test (SPT) boring method was used as the investigative tool within the borings. SPT tests were performed in substantial accordance with ASTM Procedure D-1586, "Penetration Test and Split-Barrel Sampling of Soils". This test procedure consists of driving a 1.4-inch I.D. split-tube sampler into the soil profile using a 140-pound hammer falling 30 inches. The number of blows per foot, for the second and third 6-inch increment, is an indication of soil strength.

The soil samples recovered from the soil borings were visually classified and their stratification is illustrated in "Appendix D: Record of Test Borings". It should be noted that soil conditions might vary between the strata interfaces shown on the logs. The soil boring data reflect information from a specific test location only. Site specific survey staking for the test locations was not provided for our field exploration. The indicated depth and location of each test was approximated based upon existing grade and estimated distances and relationships to obvious landmarks. The boring depths were selected based on our knowledge of vicinity soils and to include the zone of soil likely to be stressed by the proposed construction.

2.3 Laboratory Testing

Soil samples recovered from our field exploration were returned to our laboratory where they were visually examined in general accordance with ASTM D-2488. Samples were evaluated to obtain an accurate understanding of the soil properties and site geomorphic conditions. After a thorough visual examination of the recovered site soils, a total of four fines content determinations and four moisture content determinations were completed. The results are presented in "Appendix D - Record of Test Borings" and in Appendix F. Bag samples of the soil encountered during our field exploration will be held in our laboratory for your inspection for 30 days and then discarded unless we are notified otherwise in writing.

2.4 Geomorphic Conditions

Boring logs derived from our field exploration are presented in "Appendix D: Record of Test Borings". The boring logs depict the observed soils in graphic detail. The Standard Penetration Test borings indicate the penetration resistance, or N-values, logged during the drilling and sampling activities. The classifications and descriptions shown on the logs are generally based upon visual characterizations of the recovered soil samples. All soil samples reviewed have been depicted and classified in general accordance with the Unified Soil Classification System, modified as necessary to describe typical southwest Florida conditions. See "Appendix E: Discussion of Soil Groups", for a detailed description of various soil groups.

The subsurface soil conditions encountered at this site generally consist of very loose to loose sands (SP), loose slightly silty sands (SP-SM), very loose to dense slightly clayey sands (SP-SC), loose to medium dense clayey sands (SC), and soft to very stiff clays (CL) to the boring termination depths. Please refer to "Appendix D: Record of Test Borings" for a detailed account of each boring.

2.5 Hydrogeological Conditions

On the dates of our field exploration, the groundwater table was encountered at a depth of approximately 4.6 feet to 6 feet below the existing ground surface. The groundwater table will fluctuate seasonally depending upon local rainfall and other site specific and/or local influences such as tidal events. Brief ponding of stormwater may occur across the site after heavy rains.

No additional investigation was included in our scope of work in relation to the wet seasonal high groundwater table or any existing well fields in the vicinity. Well fields may influence water table levels and cause significant fluctuations. If a more comprehensive water table analysis is necessary, please contact our office for additional guidance.

3.0 ENGINEERING EVALUATION AND RECOMMENDATIONS

3.1 General

A foundation system for any structure must be designed to resist bearing capacity failures, have settlements that are tolerable, and resist the environmental forces that the foundation may be subjected to over the life of the structure. The soil bearing capacity is the soil's ability to support loads without plunging into the soil profile. Bearing capacity failures are analogous to shear failures in structural design and are usually sudden and catastrophic.

The amount of settlement that a structure may tolerate is dependent on several factors including: uniformity of settlement, time rate of settlement, structural dimensions and properties of the materials. Generally, total or uniform settlement does not damage a structure but may affect drainage and utility connections. These can generally tolerate movements of several inches for building construction. In contrast, differential settlement affects a structure's frame and is limited by the structural flexibility.

UES has provided foundation recommendations based upon the assumed loading conditions discussed above and the subsurface soil conditions encountered in the test borings. In view of our findings, subsurface soil conditions appear to be adequate to allow use of a shallow footing foundation system with slab-on-grade. Compaction of the surface soils is recommended to increase the soil bearing capacity and minimize foundation settlement. The following are our recommendations for overall site preparation and foundation design that we feel are best suited for the proposed construction and existing soil conditions.

We note that the applicability of geotechnical recommendations is very dependent upon project characteristics, specifically (1) improvement locations, (2) grade alterations, (3) and actual applied structural loads. For that reason, UES must be provided with and review the preliminary and final site and grading plans, and structural design loads to validate all recommendations provided in this report. Without performing this review, our recommendations should not be relied upon for final design or construction of any site improvements.

3.2 Site Preparation

UES recommends the following compaction requirements for this project:

- Proof Roll .... 95% of a Modified Proctor
- Building Pad Fill.. 95% of a Modified Proctor
- Footings .... 95% of a Modified Proctor

The compaction percentages presented above are based upon the maximum dry density as determined by a "modified proctor" test (ASTM D-1557). All density tests should be performed to a depth of 12 inches below the tested surface unless noted otherwise. All density tests should be performed using the nuclear method (ASTM D-6938) or the sand cone method (ASTM D-1556).

Our recommendations for preparation of the site for use of shallow foundation systems are presented below. This approach to improving and maintaining the site soils has been found to be successful on projects with similar soil conditions.

1. Initial site preparation should consist clearing, stripping, and de-grubbing of trees, and vegetation and associated root systems to a depth of their vertical reach. This should be done within and to 5-feet outside the perimeter of the proposed building footprint (including exterior isolated columns).

2. In any areas where deep excavations were performed during the demolition process (i.e. pool, septic tank removal), the excavations should be replaced with suitable fill and compacted in one-foot lifts as described in this section.

3. Following site stripping and prior the placement of any fill, areas of surficial sand (not exposed limestone) should be compacted ("proof rolled") and tested. We recommend using a steel drum vibratory roller with sufficient static weight and vibratory impact energy to achieve the required compaction. Density tests should be performed on the proof rolled surface at a frequency of not less than one test per 2,500 square feet, or a minimum of four (4) tests, whichever is greater. Areas of exposed intact limestone shall be visually confirmed by the project geotechnical engineer prior to fill placement, in lieu of proof rolling.

4. Fill material may then be placed in the building pad as required. The fill material should be inorganic (classified as SP, SW, GP, GW, SP-SM, SW-SM, GW-GM, GP-GM) containing not more than 5 percent (by weight) organic materials. **Fill materials with silt-size soil fines in excess of 12% should not be used.** Fill should be placed in lifts with a maximum lift thickness not exceeding 12-inches. Each lift should be compacted and tested prior to the placement of the next lift. Density tests should be performed within the fill at a frequency of not less than one test per 2,500 square feet per lift in the building areas, or a minimum of four (4) tests per lift, whichever is greater.

5. For any footings bearing on a limestone formation, the bottom of all footing excavation shall be examined by the engineer / geologist or his representative to determine the condition of the limestone. The limestone shall be probed for voids and loose pockets of sand. Such areas shall be cleaned to depth of 3 times the greatest horizontal dimension and backfilled with lean concrete.

6. For footings placed on structural fill or compacted native granular soils, the bottom of all footings shall be tested for compaction and examined by the engineer / geologist or his representative to determine if the soil is free of organic and/or deleterious material. Density tests should be performed at a frequency of not less than one (1) density test per each isolated column footing and one (1) test per each fifty (50) lineal feet of wall footings.

7. The contractor should take into account the final contours and grades as established by the plan when executing his backfilling and compaction operations.

Using vibratory compaction equipment at this site may disturb adjacent structures. We recommend that you monitor nearby structures before and during proof-compaction operations. A representative of Universal Engineering Sciences can monitor the vibration disturbance of adjacent structures. A proposal for vibration monitoring during compaction operations can be supplied upon request.

3.3 Design of Footings

Foundation soils prepared in accordance with the above recommendations should be suitable for supporting the proposed structure on an economical and conventionally designed shallow foundation system. The foundations should be designed for an allowable net soil contact pressure of 2,000 pounds per square foot (psf) or less.

Shallow foundations should be embedded a minimum of 18 inches below final grade. This embedment shall be measured from the lowest adjacent grade. Isolated column footings should be at least 24 inches in width and continuous strip footings should have a width of at least 18 inches regardless of contact pressure.

Based on the boring information and the assumed loading conditions, expected settlement of the structure is less than 1 inch total and less than ½ inch differential. Because foundation soils are mostly coarse-grained, the majority of settlement will occur during construction as the load is being applied. All footings and columns should be structurally separated from the floor slab, as they will be loaded differently and at different times, unless a monolithic mat foundation is designed.

3.4 Ground Floor Slabs

The ground floor slabs may be supported directly on the existing grade or on granular fill following the foundation site preparation and fill placement procedures outlined in this report. For purposes of design, a coefficient of subgrade modulus 150 pounds per cubic inch may be used. The ground floor slab should be structurally separated from all walls and columns to allow for differential vertical movement.

Excessive moisture vapor transmission through floor slabs-on-grade can result in damage to floor coverings as well as other deleterious effects. An appropriate moisture vapor retarder should be placed beneath the floor slab to reduce moisture vapor from entering the building through the slab. The retarder should be installed in general accordance with applicable ASTM procedures including sealing around pipe penetrations and at the edges of foundations.

4.0 PARKING AND ROADWAY CONSTRUCTION RECOMMENDATIONS

4.1 General Components

Flexible pavement structures in this geographic area typically consist of an asphaltic wearing course, a limerock base course, and a stabilized subgrade. As an option, concrete pavements can also be utilized and constructed directly on top of prepared grades or on top of a limerock base course and stabilized subgrade for heavier loads. Based on our experience in the area and the anticipated traffic weights, the typical pavement section thicknesses are provided below:

Typical Pavement Section Recommendations

Type of Pavement	Layer	Material Description	Layer Thickness		
			Light Duty	Heavy Duty	FDOT ROW
Flexible	(A)	FDOT Type S (non FDOT) or SP (FDOT)	1.5"	2.5"	3"
	(B)	Crushed Limerock with minimum LBR OF 100, compacted to 98% of the modified Proctor maximum dry density	8"	10"	15"
	(SG)	Compacted sub-grade fill, compacted to 98% of the modified Proctor maximum dry density	12"	12"	12"
	STRUCTURAL NUMBER (SN)		**2.10**	**2.90**	**4.02**
Rigid	(C)	Florida DOT Portland Cement Concrete	NA	8"	NA
	(B)	Crushed Limerock with minimum LBR OF 100, compacted to 98% of the modified Proctor maximum dry density	NA	-	NA
	(SG)	Stabilized sub-grade fill, compacted to 98% of the modified Proctor maximum dry density	NA	12"	NA

A = Asphaltic Concrete (Layer Coefficient = 0.44 per inch)
B = Base Course (Layer Coefficient = 0.18 per inch)
SG = Stabilized Subgrade (Layer Coefficient = 0.00 per inch) **NOTE: Stabilizing the Subgrade to a minimum LBR 40 will provide a layer coefficient of 0.08 per inch**
C = Concrete (based on 4,000 psi compressive strength)

The structural numbers presented are acceptable to provide a 20-year design life for 300,000 equivalent single axle loads (ESAL's) with a reliability of 96% or equivalent traffic load. If projected traffic loads become available and are different than those presented, we recommend a detailed pavement design be performed based on the projected traffic loads. UES would be pleased to perform these services, if necessary.

4.2 Compacted Subgrade or Embankment Fill

The subgrade or embankment fill is the layer that supports the structural pavement section. Subgrade and embankment fill should be placed and compacted in compliance to specifications presented later in the pavement site preparation procedure section of this report.

4.3 Stabilized Subbase

The stabilized subgrade is the portion of the pavement section between the compacted subgrade or embankment fill and the base course. UES recommends subgrade material be compacted to 98 percent of the Modified Proctor maximum dry density value (AASHTO T-180). The subbase material should have a minimum Limerock Bearing Ratio (LBR) of 40. To minimize the potential for perching of the groundwater table, UES does not recommend the use of chemically stabilized subgrade (i.e. sludge).

As an alternative, the pavement section can be designed using the natural sand and consequently a lower LBR value. If this is desired, an LBR test of the natural sands should be performed and incorporated into a modified pavement design. Perform compliance tests on the stabilized subbase for full depth at a frequency of one test per 5,000 square feet, or at a minimum of two test locations, whichever is greater.

4.4 Base Course

The base course is the portion of the pavement section between the surface course and stabilized subbase.

In areas where separation of at least 1½ feet between the estimated wet seasonal high groundwater table and the bottom of the base material occurs, UES recommends the base course be crushed limerock with a minimum LBR of 100. Limerock material should be mined from an approved source. The limerock should be placed in lifts no greater than 6-inches and compacted to at least 98 percent of the Modified Proctor maximum dry density value (AASHTO T-180).

If separation between the estimated wet seasonal high groundwater table and the bottom of the base material is less than 1½ feet, UES recommends that crushed limerock not be used. The base course should be of an asphaltic base (ABC-3 with a minimum Marshall Stability of 1,000 pounds). The subbase should be compacted to a minimum of 98 percent of the soil's Modified Proctor maximum dry density value (AASHTO T-180). Perform compliance tests on the base course to its respective depth (6" or 8") at a frequency of one test per 5,000 square feet, or a minimum of two test locations, whichever is greater.

4.5 Surface Course

The surface course is the portion of the pavement section, which is exposed directly to traffic. Samples of the materials delivered to the project should be tested to verify that the aggregate gradation and asphalt content satisfies the mix design specifications. Asphalt should be compacted to a minimum of 95 percent of the laboratory density.

Perform compliance tests on the surface course, by coring to evaluate the material thickness and to perform laboratory densities, at a frequency of one test per 10,000 square feet, or a minimum of two test locations, whichever is greater.

4.6 Concrete Pavement

The minimum rigid pavement thickness recommended in this report is based upon concrete with a minimum compressive strength of 4,000 psi. Fill that may be required to raise grades in slab areas should be compacted to at least **98 percent** of the Modified Proctor maximum dry density (ASTM D-1557).

The pavement slabs should be reinforced with fiber mesh, steel mesh, or steel rebar depending on the anticipated traffic loads and concrete thickness. Final design of reinforcement should be provided by the Design Civil Engineer. Proper joints should be provided at the junctions of slabs and foundation systems so that a small amount of independent movement can occur without causing structural damage. Construction and control joints should be accordance with ACI and Industry practices.

Actual pavement section thickness should be provided by the Design Civil Engineer based on traffic loads, volume, and the owner's design life requirements. The above section represents the minimum thickness representative of typical local construction procedures and, as such, periodic maintenance should be anticipated. All pavement materials and construction procedures should conform to the FDOT, American Concrete Institute (ACI), or appropriate city/county requirements.

4.7 Effects of Water

Many roadways and parking areas have prematurely deteriorated due to intrusion of the wet seasonal high groundwater table or surface runoff migration.

UES recommends the roadways and parking areas be constructed with a minimum separation of 1½ feet between the wet seasonal high groundwater table and the base course, independent of the type of base material used. In addition, the parking areas should be constructed with full-depth curb sections. The use of extruded curb sections, which lie directly on top of the final surface course, or the elimination of curbing entirely, may allow surface runoff and/or irrigation water to migrate between the base and surface course. This migration can result in the separation of the surface course from the base course causing a rippling effect, which may result in an increased deterioration of the pavement.

4.8 Construction Traffic

Incomplete pavement sections or areas of pavement designed for light duty traffic will not perform satisfactory under construction traffic loadings. UES recommends all construction traffic (i.e. construction equipment, etc.) be re-routed away from these areas or the pavement sections be designed to support these loading conditions.

4.9 Pavement Site Preparation

Upon review of the site soil data, UES's recommendations of site preparation for pavements are noted below. This approach to improving and maintaining the site soils has been found to be successful with similar soil conditions.

1. Initial site preparation should consist of performing dewatering operations, if necessary, prior to any earthwork.

2. The proposed construction limits should be cleared, stripped, and grubbed of all construction debris, trees, and vegetation and associated root systems to a depth of their vertical reach. This should be done within and to a distance of 5 feet beyond the road perimeter.

3. Prior to any fill operations, the existing ground surface should be compacted. UES recommends a medium weight roller be used to prepare the site for the proposed pavement section. Upon completion of the proof-rolling, density tests should be performed at a frequency of one test per 5,000 square feet, or at a minimum of two test locations, whichever is greater, to confirm a minimum compaction compliance of 95 percent of modified proctor maximum density (AASHTO T-180).

4. Place fill material, as required. The fill material should be inorganic (classified as SP/GW) containing not more than 5 percent (by weight) organic materials. **Fill materials with silt-size soil fines in excess of 5% should not be used, this includes cyclone sand material.** Place fill in maximum 12-inch lifts and compact each lift to a minimum density of **98 percent** of the Modified Proctor maximum dry density (AASHTO T-180) with a roller as mentioned previously.

5. Perform compliance tests within the fill at a frequency of not less than one test per 5,000 square feet per lift in the pavement areas, or at a minimum of two test locations, whichever is greater.

6. The appropriate pavement section should be constructed in accordance to specification presented earlier in this report.

7. Representative samples of the on-site material and proposed fill material should be collected and tested to determine the classification and compaction characteristics (AASHTO T-180). The maximum dry density, optimum moisture content, and gradation characteristics should be determined.

8. The contractor shall take into account the final contours and grades as established by the paving and drainage plan when executing any backfilling and / or compaction operations.

Using vibratory compaction equipment at this site may disturb adjacent structures. UES recommends that you monitor nearby structures before and during proof-compaction operations. If disturbance is noted, halt vibratory compaction operations and inform UES immediately. UES will review the compaction procedures and evaluate if the compactive effort resulted in a satisfactory subgrade, complying with design specifications.

5.0 REPORT LIMITATIONS

This consulting report has been prepared for the exclusive use of the current project owners and other members of the design team for the proposed Checker's Drive-In located at 1936 Lane Ave. S. in Jacksonville, Duval County, Florida. This report has been prepared in accordance with generally accepted local geotechnical engineering practices; no other warranty is expressed or implied. The evaluation submitted in this report, is based in part upon the data collected during a field exploration. However, the nature and extent of variations throughout the subsurface profile may not become evident until the time of construction. If variations then appear evident, it may be necessary to reevaluate information and professional opinions as provided in this report. In the event changes are made in the nature, design, or locations of the proposed structure, the evaluation and opinions contained in this report shall not be considered valid, unless the changes are reviewed and conclusions modified or verified in writing by Universal Engineering Sciences, LLC.

UES is not responsible for damage caused by soil improvement and/or construction activity vibrations related to this project. UES is also not responsible for damage concerning drainage or moisture related issues for the proposed or nearby structures.

UES should be provided the opportunity to review the final foundation design drawings and specifications to determine whether UES's recommendations have been properly interpreted, communicated and implemented. If UES is not afforded the opportunity to participate in construction related aspects of foundation installation as recommended in this report or any report addendum, UES will accept no responsibility for the interpretation of our recommendations made in this report or on a report addendum for foundation performance.

6.0 BASIS FOR RECOMMENDATIONS

The analysis and recommendations submitted in this report are based on the data obtained from the tests performed at the locations indicated on the attached figure in Appendix B. This report does not reflect any variations, which may occur between borings. While the borings are representative of the subsurface conditions at their respective locations and for their vertical reaches, local variations characteristic of the subsurface soils of the region are anticipated and may be encountered. The delineation between soil types shown on the soil logs is approximate and the description represents our interpretation of the subsurface conditions at the designated boring locations on the particular date drilled.

Any third party reliance of our geotechnical report or parts thereof is strictly prohibited without the expressed written consent of Universal Engineering Sciences, LLC. The methodology (ASTM D-1586) used in performing our borings and for determining penetration resistance is specific to the sampling tools utilized and does not reflect the ease or difficulty to advance other tools or materials.

Appendix A - Vicinity Map

VICINITY MAP

SOURCE: GOOGLE EARTH PRO©

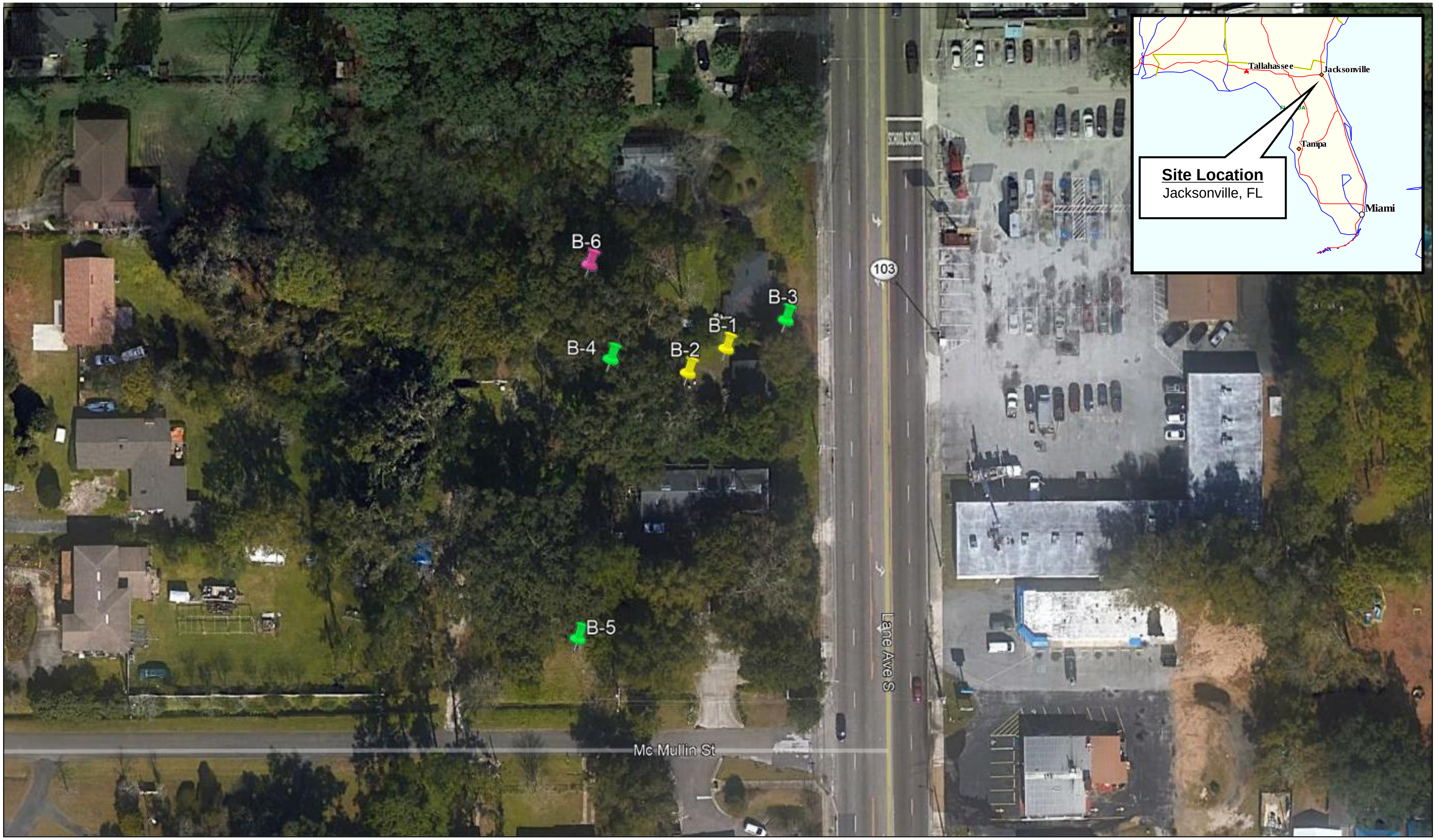
UNIVERSAL ENGINEERING SCIENCES

Checker's Drive-In
1936 Lane Ave. S.
Jacksonville, Duval County, FL

Drawn By:	Checked By:	Date:
Victor Nguyen	AJD	03/01/2021

Project No.:	Approved By:
0530.2100028.0000	Adam Dornacker, P.E.

Appendix B - Test Location Plan



Boring locations are an approximation.

TEST LOCATION PLAN

SOURCE: GOOGLE EARTH PRO©

UNIVERSAL
ENGINEERING SCIENCES

Checker's Drive-In
1936 Lane Ave. S.
Jacksonville, Duval County, FL

Drawn By: Victor Nguyen	Checked By: AJD	Date: 03/01/2021
Project No.: 0530.2100028.0000	Approved By: Adam Dornacker, P.E.	

Appendix C - Notes Related to Borings

NOTES RELATED TO
RECORDS OF TEST BORING AND
GENERALIZED SUBSURFACE PROFILE

1. Groundwater level was encountered and recorded (if shown) following the completion of the soil test boring on the date indicated. Fluctuations in groundwater levels are common; consult report text for a discussion.

2. The boring location was identified and located in the field based on measured and estimated distances from existing site features.

3. The borehole was backfilled to site grade following boring completion, patched with asphalt cold patch mix when pavement was encountered.

4. The Record of Test Boring represents our interpretation of field conditions based on engineering examination of the soil samples.

5. The Record of Test Boring is subject to the limitations, conclusions, and recommendations presented in the report text.

6. The Standard Penetration Test (SPT) was performed in accordance ASTM Procedure D-1586. SPT testing procedure consists of driving a 1.4-inch I.D. split-tube sampler into the soil profile using a 140-pound hammer falling 30 inches.

7. On the Record of Test Boring listed as “Blow Counts”, the N-value is the sum of the SPT hammer blows required to drive the split-tube sampler through the second and third 6-inch increment of the sampling layer, and is an indication of soil strength.

8. Shown on the Record of Test Boring an SPT N-value expressed as 50/2” is descriptive of the fact that 50 hammer blows were required to drive the split-spoon sampler a distance of approximately 2 inches.

9. The soil/rock strata interfaces shown on the Records of Test Boring are approximate and may vary from those in the field. The soil/rock conditions shown on the Records of Test Boring refer to conditions at the specific location tested; soil/rock conditions may vary between test locations.

10. Relative density and consistency for sands/gravels, silts/clays, and limestone are described as follows:

Cohesionless Soils	
SPT (N-Value)	Relative Density
0 – 3	Very Loose
4 – 8	Loose
9 – 24	Medium Dense
25 – 40	Dense
Over 40	Very Dense

Silts and Clays	
SPT (N-Value)	Consistency
0 – 1	Very Soft
2 – 4	Soft
4 – 6	Firm
7 – 12	Stiff
13 – 24	Very Stiff
Over 24	Hard

Limestone	
SPT (N-Value)	Relative Density
0 – 19	Very Soft
20 – 49	Soft
50 – 100	Medium Hard
50 for 3 to 5”	Moderately Hard
50 for 0 to 2”	Hard

11. Definition of descriptive terms of modifiers for silts/clays/shells/gravels are described as follows:

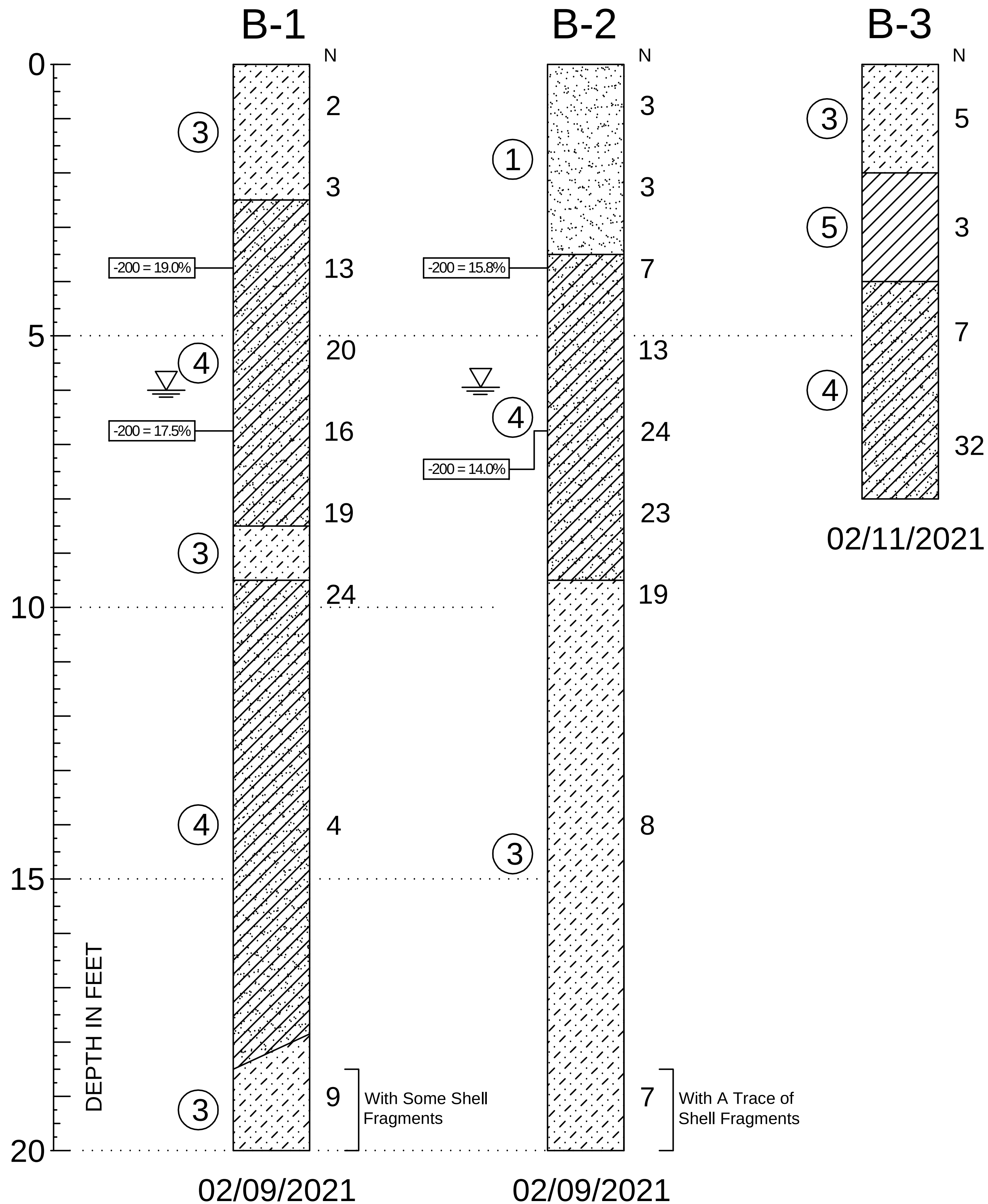
Percentage of Modifier Material	First Qualifier	Second Qualifier
0 – 5	With a Trace of + Modifier	With a Trace
5 – 12	Slightly + Modifier + y	With Little
12 – 30	Modifier + y	With Some
30 – 50	Very + Modifier + y	And

12. Descriptive characteristics for organic content percentages are described as follows:

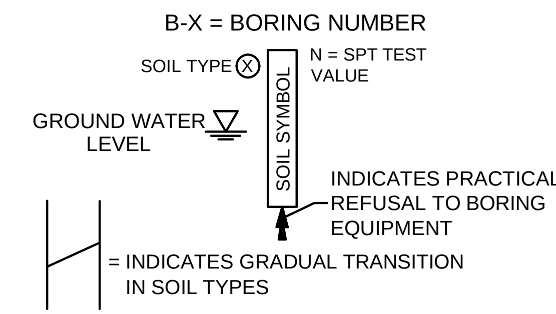
Percentage of Organic Material	Descriptor
0 – 5	With a Trace
5 – 20	With Organics
20 – 75	Highly Organic
75 – 100	Peat

Appendix D - Record of Test Borings

SOIL PROFILES



SOIL PROFILE LEGEND



NOTES:

N - STANDARD PENETRATION RESISTANCE TEST (SPT) VALUE. NUMBERS TO THE RIGHT OF BORINGS INDICATE SPT VALUE FOR 12-INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).

WOH - BORING INTERVAL ADVANCED UNDER WEIGHT OF HAMMER.

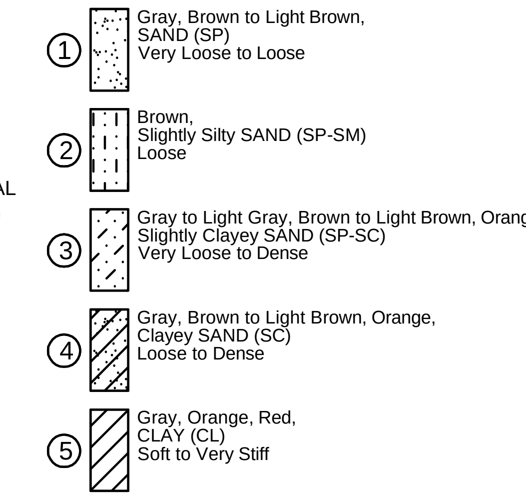
WOR - BORING INTERVAL ADVANCED UNDER WEIGHT OF ROD.

LFC - LOSS OF DRILLING FLUID CIRCULATION.

WLS - WEATHERED LIMESTONE

CS - CEMENTED SANDS

SOIL LEGEND



SOIL CLASSIFICATION

CORRELATION OF N - VALUES WITH RELATIVE DENSITY AND CONSISTENCY

COHESIONLESS SOIL		SILTS AND CLAYS	
N - VALUE	RELATIVE DENSITY	N - VALUE	CONSISTENCY
0 - 3	VERY LOOSE	0 - 1	VERY SOFT
4 - 8	LOOSE	2 - 4	SOFT
9 - 24	MEDIUM DENSE	5 - 6	FIRM
25 - 40	DENSE	7 - 12	STIFF
OVER 40	VERY DENSE	13 - 24	VERY STIFF
		OVER 24	HARD

CORRELATION OF N - VALUES WITH HARDNESS DESCRIPTION

LIMEROCK	
N - VALUE	RELATIVE DENSITY
0 - 19	VERY SOFT
20 - 49	SOFT
50 - 100	MEDIUM HARD
50 FOR 3 TO 5"	MODERATELY HARD
50 FOR 0 TO 2"	HARD

APPROXIMATE FINES CONTENT	MODIFIERS
5% TO 15%	SLIGHTLY SILTY OR SLIGHTLY CLAYEY
16% TO 25%	SILTY OR CLAYEY
26% TO 49%	VERY SILTY OR VERY CLAYEY

APPROXIMATE SHELL CONTENT	MODIFIERS
0% TO 5%	WITH A TRACE OF SHELL
6% TO 12%	SLIGHTLY SHELLY
13% TO 30%	SHELLY
31% TO 50%	VERY SHELLY

APPROXIMATE ORGANIC CONTENT	MODIFIERS
0% TO 5%	WITH A TRACE
5% TO 20%	WITH ORGANICS
20% TO 75%	HIGHLY ORGANIC
75% TO 100%	PEAT

DEFINITION OF DESCRIPTIVE TERMS OF MODIFIERS FOR SILTS/CLAYS/SHELLS/GRAVELS ARE DESCRIBED AS FOLLOWS :

PERCENTAGE OF MODIFIER MATERIAL	FIRST QUALIFIER	SECOND QUALIFIER
0 - 5	WITH A TRACE OF + MODIFIER	WITH A TRACE
5 - 12	SLIGHTLY + MODIFIER + Y	WITH A LITTLE
12 - 30	MODIFIER + Y	WITH SOME
30 - 50	VERY + MODIFIER + Y	AND

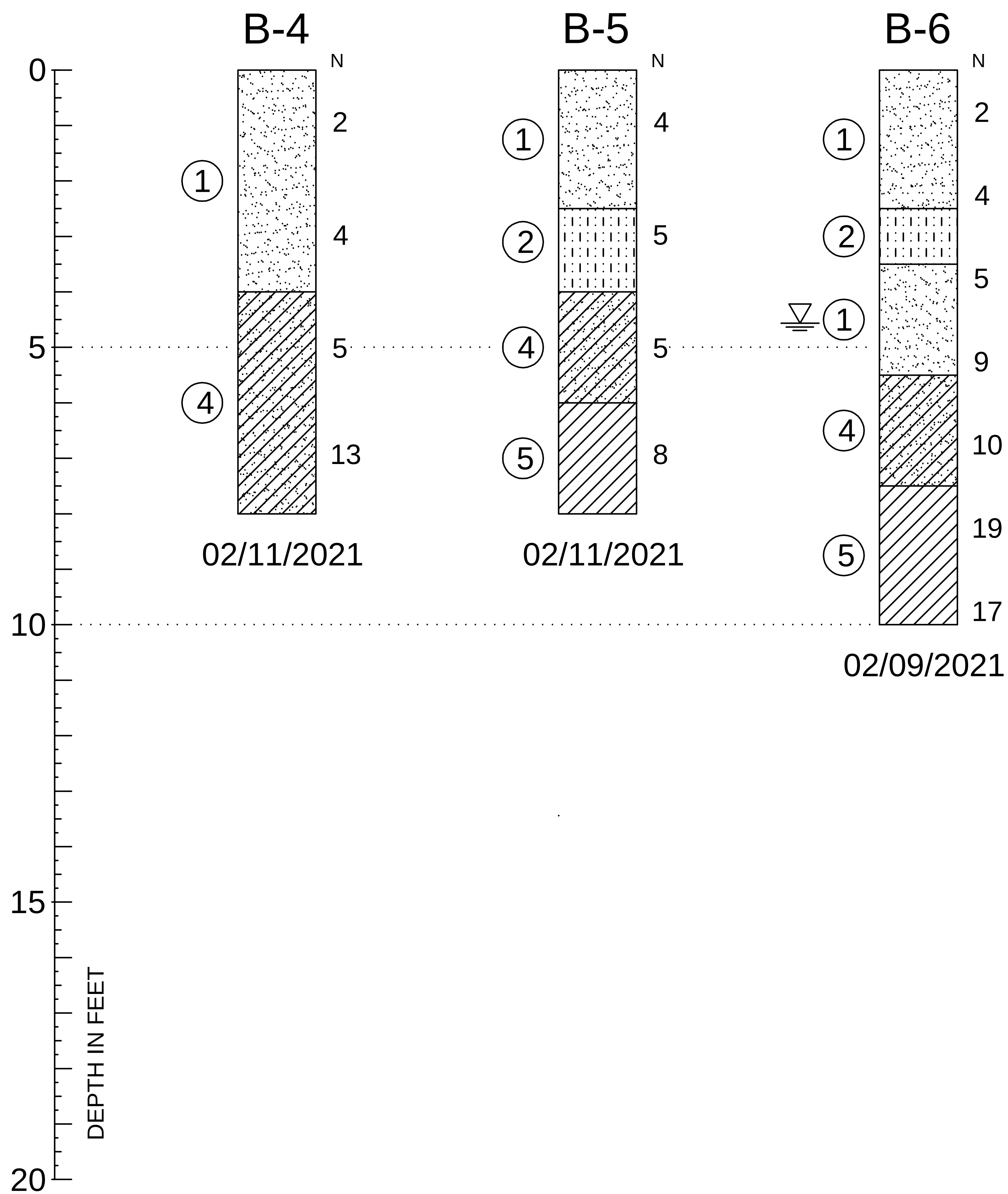
RECORD OF TEST BORINGS

Universal Engineering Sciences
201 Waldo Ave. N.
Lehigh Acres, Florida 33971
239-995-1997
www.universalengineering.com

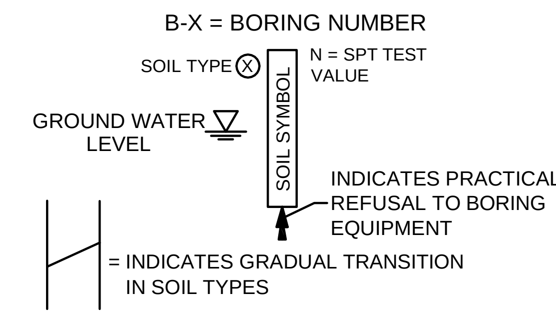
Client: UES Consulting Services, Inc.
Project No: 0530.2100028.0000
Project:
Checker's Drive-In
1936 Lane Ave.,
Jacksonville, Duval County, Florida

Date: 03/01/2021
Drilled By: BT
Drawn By: VN
Approved By: AJD

SOIL PROFILES



SOIL PROFILE LEGEND



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WOR - BORING INTERVAL ADVANCED UNDER WEIGHT OF ROD.

LFC - LOSS OF DRILLING FLUID CIRCULATION.

WLS - WEATHERED LIMESTONE

CS - CEMENTED SANDS

SOIL LEGEND

1. Gray, Brown to Light Brown, SAND (SP) Very Loose to Loose
2. Brown, Slightly Silty SAND (SP-SM) Loose
3. Gray to Light Gray, Brown to Light Brown, Orange, Slightly Clayey SAND (SP-SC) Very Loose to Dense
4. Gray, Brown to Light Brown, Orange, Clayey SAND (SC) Loose to Dense
5. Gray, Orange, Red, CLAY (CL) Soft to Very Stiff

SOIL CLASSIFICATION

CORRELATION OF N - VALUES WITH RELATIVE DENSITY AND CONSISTENCY

COHESIONLESS SOIL		SILTS AND CLAYS	
N - VALUE	RELATIVE DENSITY	N - VALUE	CONSISTENCY
0 - 3	VERY LOOSE	0 - 1	VERY SOFT
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25 - 40	DENSE	7 - 12	STIFF
OVER 40	VERY DENSE	13 - 24	VERY STIFF
		OVER 24	HARD

CORRELATION OF N - VALUES WITH HARDNESS DESCRIPTION

LIMEROCK	
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0% TO 5%	WITH A TRACE OF SHELL
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13% TO 30%	SHELLY
31% TO 50%	VERY SHELLY

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20% TO 75%	HIGHLY ORGANIC
75% TO 100%	PEAT

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PERCENTAGE OF MODIFIER MATERIAL	FIRST QUALIFIER	SECOND QUALIFIER
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5 - 12	SLIGHTLY + MODIFIER + Y	WITH A LITTLE
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30 - 50	VERY + MODIFIER + Y	AND

RECORD OF TEST BORINGS

Universal Engineering Sciences
201 Waldo Ave. N.
Lehigh Acres, Florida 33971
239-995-1997
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Client: UES Consulting Services, Inc.
Project No: 0530.2100028.0000
Project:
Checker's Drive-In
1936 Lane Ave.,
Jacksonville, Duval County, Florida

Date: 03/01/2021
Drilled By: BT
Drawn By: VN
Approved By: AJD

Appendix E - Discussion of Soil Groups

DISCUSSION OF SOIL GROUPS

COARSE GRAINED SOILS

GW and SW GROUPS. These groups comprise well-graded gravelly and sandy soils having little or no plastic fines (less than 5 percent passing the No. 200 sieve). The presence of the fines must not noticeably change the strength characteristics of the coarse-grained fraction and must not interface with it's free-draining characteristics.

GP and SP GROUPS. Poorly graded gravels and sands containing little of no plastic fines (less than 5 percent passing the No. 200 sieve) are classed in GP and SP groups. The materials may be called uniform gravels, uniform sands or non-uniform mixtures of very coarse material and very fine sands, with intermediate sizes lacking (sometimes called skip-graded, gap-graded or step-graded). This last group often results from borrow pit excavation in which gravel and sand layers are mixed.

GM and SM GROUPS. In general, the GM and SM groups comprise gravels or sands with fines (more than 12 percent passing the No. 200 sieve) having low or no plasticity. The plasticity index and liquid limit of soils in the group should plot below the "A" line on the plasticity chart. The gradation of the material is not considered significant and both well and poorly graded materials are included.

GC and SC GROUPS. In general, the GC and SC groups comprise gravelly or sandy soils with fines (more than 12 percent passing the No. 200 sieve), which have a fairly high plasticity. The liquid limit and plasticity index should plot above the "A” line on the plasticity chart.

FINE GRAINED SOILS

ML and MH GROUPS. In these groups, the symbol M has been used to designate predominantly silty material. The symbols L and H represent low and high liquid limits, respectively, and an arbitrary dividing line between the two is set at a liquid limit of 50. The soils in the ML and MH groups are sandy silts, clayey silts or inorganic silts with relatively low plasticity. Also included are loess type soils and rock flours.

CL and CH GROUPS. In these groups the symbol C stands for clay, with L and H denoting low or high liquid limits, with the dividing line again set at a liquid limit of 50. The soils are primarily inorganic clays. Low plasticity clays are classified as CL and are usually lean clays, sandy clays or silty clays. The medium and high plasticity clays are classified as CH. These include the fat clays, gumbo clays and some volcanic clays.

OL and OH GROUPS. The soil in the OL and OH groups are characterized by the presence of organic odor or color, hence the symbol O. Organic silts and clays are classified in these groups. The materials have a plasticity range that corresponds with the ML and MH groups.

HIGHLY ORGANIC SOILS

The highly organic soils are usually very soft and compressible and have undesirable construction characteristics. Particles of leaves, grasses, branches, or other fibrous vegetable matter are common components of these soils. They are not subdivided and are classified into one group with the symbol PT. Peat humus and swamp soils with a highly organic texture are typical soils of the group.

Appendix F - Laboroarty Testing Results

WATER CONTENT AND -200 WORKSHEET

PROJECT: Chackers Lane

ENGINEER: Payton Mann

DATE TESTED: 19-Feb PAGE 1 OF

			A	B	C	B-C	C-A	B-C / C-A	D	C-D	C-D / C-A
			WEIGHT IN GRAMS						WEIGHT IN GRAMS		
BORING NO.	SAMPLE NO.	TARE NO.	TARE	TARE + WET SOIL	TARE + DRY SOIL	WATER	DRY SOIL	WATER CONTENT %	TARE+DRY SOIL AFTER WASH	FINES	% FINES
B1	3	39	84.13	273.32	243.17	30.15	159.04	19.0	178.90	64.27	40.4
B1	5	371	110.62	283.28	257.54	25.74	146.92	17.5	212.97	44.57	30.3
B2	3	43	84.84	279.63	253.04	26.59	168.20	15.8	192.77	60.27	35.8
B2	5	354	110.83	273.87	253.91	19.96	143.08	14.0	209.09	44.82	31.3