ST. TAMMANY PARISH

MICHAEL B. COOPER
PARISH PRESIDENT

March 18, 2024

Please find the following addendum to the below mentioned BID.

Addendum No.: 2

Bid#: 23-46-2

Project Name: Safe Haven Campus Improvements

Bid Due Date: Thursday, March 21, 2024

QUESTIONS & ANSWERS:

1. Please clarify what sewer lines need to be removed on drawing CU-02. There are sewer lines in multiple locations on this sheet, so can clarity be provided on what needs to be removed? **ALL EXISTING SEWER INFRASTRUCTURE IS BEING REMOVED WHERE THE NEW SEWER INFRASTRUCTURE IS BEING INSTALLED.**

2. Is there an existing survey of the area on sheet DR-08, the location of the pond? If not, is the pond being dug per the existing conditions with no site fill? **THE POND IS BEING DUG PER THE EXISTING CONDITION WITH NO SITE FILL REQUIRED. THE TOP BANK ELEVATION OF 13.0 IS APPROXIMATE AND THE POND SHALL BE DUG DOWN FROM THE EXISTING GROUND ELEVATION.**

3. At the prebid, it was mentioned that prevailing wages did not apply for this job. However, the specs have the prevailing wages in them. Please clarify. **DAVIS BACON/PREVAILING WAGES ARE REQUIRED PER INFORMATION PROVIDED IN THE BIDDING DOCUMENTS.**

4. General Questions:
    a. Will Pollution, OCP & Builders Risk be required for this project? **SEE ATTACHED SECTION 06 – REVISED FOR ALL INSURANCE REQUIREMENTS. REMOVE THE PREVIOUS VERSION OF THIS SECTION AND REPLACE IT IN ITS ENTIRETY WITH THE VERSION**

INCLUDED WITH THIS ADDENDUM.

b. Who pays for testing and any permits needed (Electrical, CLECO, Parish, Environmental)? **CONTRACTOR SHALL BE RESPONSIBLE FOR PAYING FOR ALL TESTING REQUIRED FOR THE PROJECT AS INDICATED IN THE CONTRACT DOCUMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR APPLYING FOR AND PAYING FOR ALL PERMITS, INCLUDING, BUT NOT LIMITED TO, LAND CLEARING, SITEWORK, ELECTRICAL, AND LA DEQ STORMWATER PERMIT.**

c. Is this project going to be sales tax free? **NO. ST. TAMMANY PARISH DOES NOT OFFER THIS OPTION.**

d. Will the contractor have access to water from the owner onsite at no cost? **NO. THE WATER SYSTEM IS OWNED AND OPERATED BY THE ST. TAMMANY DEPARTMENT OF UTILITIES. THE CONTRACTOR WILL BE REQUIRED TO CONTACT THE DEPARTMENT OF UTILITIES TO REQUEST A WATER METER AND PAY A DEPOSIT FOR THE EQUIPMENT. ONCE THE WATER USAGE IS COMPLETE, THE CONTRACTOR WILL BE RESPONSIBLE TO RETURN THE EQUIPMENT AND PAY FOR THE USAGE.**

e. Will we be required to have an onsite office trailer? **NO.**

f. Pre and Post Video Documentation of the site. Will we be required to video any inside of the buildings on site? **NO.**

5. Sewer Items:

a. How do we handle the grease trap as shown on sheet CU-02? **INSTALL A NEW SERVICE LINE FROM THE GREASE TRAP AS INDICATED. NO WORK ON THE ACTUAL GREASE TRAP IS REQUIRED.**

b. On the removal of the old lines, it appears we will need to bypass the system in order to keep the systems "live". Is this the intention to do so, or are these homes/structures in use? **THE EXISTING SYSTEM IS LIVE AND BYPASSING MAY BE REQUIRED WHILE REMOVING/REPLACING THE EXISTING SEWER SYSTEM. IT WILL BE UP TO THE CONTRACTOR TO SEQUENCE THE REMOVAL/REPLACEMENT OF**

THE SEWER LINES TO ENSURE SERVICE TO THE STRUCTURES AT ALL TIMES. THIS IS CONSIDERED MEANS AND METHODS. THE CONTRACTOR WILL BE REQUIRED TO SUBMIT THEIR PLAN FOR REMOVING/REPLACING THE SEWER TO THE ENGINEER FOR APPROVAL BY THE ENGINEER AND THE DEPT. OF UTILITIES.

c. Are the sewer service lines to 4" or 6" services? **4" SERVICES**.

6. Electrical Items:

a. Electrical plans E1.0 note 1 call for 4 each weatherproof receptacles in shelters. Arch. Plans 2.1a and 2.1b details only indicate two, with no reference to typical sections. Please clarify which is correct. **PROVIDE (4) RECEPTACLES PER SHELTER AS INDICATED ON THE ELECTRICAL DRAWINGS.**

b. Electrical plans E1.0 note 1 says to provide fan and light as specified by architect. Can a catalog reference number and color selection be provided for pricing? Nothing indicated in plans and specifications provided give us the direction or selection that is needed. **FAN/LIGHT SHALL BE SOLARIA OUTDOOR ENERGY STAR WITH LED LIGHT – 60 INCHES, MATTE BLACK COLOR BY HUNTER OR EQUAL.**

c. Note 5 on E1.1 calls to run to the nearest CLECO power pole for power to the panel. Can this location be provided to us so that we can calculate any cost for this and restoration? **THE CONTRACTOR IS RESPONSIBLE FOR VISITING THE SITE AND COORDINATING WITH CLECO PRIOR TO BIDDING PER NOTE 5 ON E1.1.**

7. Traffic Control:

a. Will we be able to close street to street and by pass traffic? **YES.**

b. Do we need to have a stamped traffic control plan? **A TRAFFIC CONTROL PLAN IS REQUIRED BUT IT DOES NOT NEED TO BE STAMPED BY A TRAFFIC ENGINEER. IT MAY BE GENERATED BY THE CONTRACTOR AND MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO COMMENCING CONSTRUCTION.**

8. Erosion Control:

a. Is there a specific plan/drawing that we are to be using for pricing for SWPP work? **NO. CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING AN APPROPRIATE SWPPP IN ACCORDANCE WITH LA DEQ REQUIREMENTS.**

b. Will we need to file for a SWPP permit? **YES, CONTRACTOR IS RESPONSIBLE TO OBTAIN THE APPROPRIATE LA DEQ STORMWATER DISCHARGE PERMIT FOR CONSTRUCTION ACTIVITIES.**

c. Do we have to hydro seed the banks of the pond? **STABILIZATION OF THE BANKS IS REQUIRED TO PREVENT EROSION. HYDRO-SEEDING OR SODDING ARE ACCEPTABLE MEASURES OF STABILIZATION.**

9. Drainage:

a. Would you create an alternate item for conflict boxes for the project? With the current utilities that are onsite, it is inevitable that we will have conflicts with design. This would at least give the owner and the contractor a level field going into the job. **NO. CONFLICT BOXES WILL BE CONSIDERED ON A CASE-BY-CASE BASIS IF UNFORESEEN CONDITIONS ARISE DURING CONSTRUCTION.**

b. Please clarify the extent of the cleaning of the drainage pipe that is the owner's intention. **THE DRAINAGE PIPES/STRUCTURES INDICATED TO BE CCTV'D AND CLEANED SHALL BE FULLY CLEANED OF ALL SEDIMENT, DEBRIS, ETC. TO ALLOW FULL FLOW WITHIN THE PIPES/STRUCTURES.**

c. Can the control structure in the pond be revisited in order to reduce the cost/type of grating that is called for? A cost savings is possible if an alternate design that is a more typical "catch basin" within the pond footprint. **NO. THE CONTROL STRUCTURE AS PROVIDED IN THE DOCUMENTS SHALL BE BID AS INDICATED.**

d. Please review sheet DR09 drainage flow pattern. The system that is called for to stay in place appears to not have the correct fall in it to make the system work correctly. **INVERT ELEVATIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION AND FINDINGS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW. ANY POTENTIAL ADJUSTMENTS WILL BE CONSIDERED ON A CASE-BY-CASE BASIS**

DURING CONSTRUCTION.

10. Nature Path:

a. Please confirm that all of this work has to be cleared by hand with no machinery as the plans call out for. **THAT IS CORRECT. THERE SHALL BE NO MACHINERY WITHIN THE WETLAND AREAS.**

b. If there is not sufficient chipped/mulch material generated from onsite trees, is the contractor required to import additional mulch to meet any requirements? **NO ADDITIONAL MATERIAL IS REQUIRED, ONLY WHAT CAN BE GENERATED FROM THE EXISTING TREES THROUGH THE CORRIDOR.**

c. Is there any special permitting that we need to apply for or get for this work in the wetlands? **NO.**

d. If we matted equipment in the wetlands to work, would this be acceptable means and methods in order to keep the permits in tack? **NO. MECHANICAL EQUIPMENT IS NOT ALLOWED PER PERMIT CONSTRAINTS.**

11. Contract General Questions:

a. Please confirm that this will be governed by Davis Bacon Wages and certified pay roll requirements. **DAVIS BACON WAGES ARE REQUIRED. CONTRACTOR ARE REQUIRED TO PROVIDE WEEKLY CERTIFIED PAYROLLS AND BE SUBJECT TO MONTHLY INTERVIEWS OF EMPLOYEES BY PARISH REPRESENTATIVE TO VERIFY PAY ROLL INFORMATION.**

b. Please clarify the contract time is calendar days, not working days. **CALENDAR DAYS.**

c. Please clarify the order in which the alternates will be awarded. **IT IS INTENDED TO AWARD THE ALTERNATES IN THE LISTED ORDER UNLESS THEY CAN BE AWARDED IN A DIFFERENT ORDER WITHOUT AFFECTING THE OVERALL LOW BIDDER.**

d. How many project signs will be required? **ONE**

12. Plan DR-13. Rain Garden. Plans show a boarder at the edge of the rain garden planting area. Need detail. **THERE IS NO BORDER. REFER TO LS-1 FOR PLANTING INFORMATION.**

13. Plan DR-13. Need a detail of the area between the Gravel walkway path and the rain garden. All we are given is the slope. **AREA BETWEEN RAIN GARDEN AND WALKWAY SHALL BE SOD.**

14. Is Western Red Cedar an acceptable material for the pavilion structures? **YES. THIS IS AN ACCEPTABLE MATERIAL FOR THE PAVILION STRUCTURES.**

15. Do you have any soil borings around the proposed retention pond area or anywhere else on site? **SEE GEOTECHNICAL ENGINEERING REPORT BEING PROVIDED AS PART OF THIS ADDENDUM.**

ATTACHMENTS:

Section 06 – INSURANCE REQUIREMENTS – REVISED (4 pages)

Geotechnical Engineering Report by Terracon – dated February 15, 2022 (46 pages)

End of Addendum # 2

Section 06 - REVISED

INSURANCE REQUIREMENTS*

Construction Project: Safe Haven Campus Improvements

Project/Quote/Bid#: 23-46-2

IMPORTANT – PLEASE READ

Prior to submitting your quote or bid, it is recommended that you review these insurance requirements with your insurance broker/agent.

These requirements modify portions of the insurance language found in the General Conditions and/or* Supplementary *General Conditions; however, there is no intention to remove all sections pertaining to insurance requirements and limits set forth in the General Conditions and/or Supplementary General Conditions, only to amend and specify those items particular for this Project.

A. The Provider shall secure and maintain at its expense such insurance that will protect it and St. Tammany Parish Government (the "Parish") from claims for bodily injury, death or property damage as well as from claims under the Workers' Compensation Acts that may arise from the performance of services under this agreement. All certificates of insurance shall be furnished to the Parish and provide thirty (30) days prior notice of cancellation to the Parish, in writing, on all of the required coverage.

B. All policies shall provide for and certificates of insurance shall indicate the following:

1. Waiver of Subrogation: The Provider's insurers will have no right of recovery or subrogation against the Parish of St. Tammany, it being the intention of the parties that all insurance policy(ies) so affected shall protect both parties and be the primary coverage for any and all losses covered by the below described insurance.

2. Additional Insured: St. Tammany Parish Government shall be named as Additional Insured with respect to general liability, automobile liability and excess liability coverages, as well as marine liability and pollution/environmental liability, when those coverages are required or necessary.

3. Payment of Premiums: The insurance companies issuing the policy or policies will have no recourse against St. Tammany Parish Government for payment of any premiums or for assessments under any form of policy.

4. Project Reference: The project(s) and location(s) shall be referenced in the Comment or Description of Operations section of the Certificate of Insurance (Project ##-###, or Bid # if applicable, Type of Work, Location).

C. Coverage must be issued by insurance companies authorized to do business in the State of Louisiana. Companies must have an A.M. Best rating of no less than A-, Category VII. St. Tammany Parish Risk Management Department may waive this requirement only for Workers Compensation coverage at their discretion.

Provider shall secure and present proof of insurance on forms acceptable to St. Tammany Parish Government, Office of Risk Management no later than the time of submission of the Contract to the Parish. However, should any work performed under this Contract by or on behalf of Provider include exposures that are not covered by those insurance coverages, Provider is not relieved of its obligation to maintain appropriate levels and types of insurance necessary to protect itself, its agents and employees, its subcontractors, St. Tammany Parish Government (Owner), and all other interested third parties, from any and all claims for damage or injury in connection with the services performed or provided throughout the duration of this Project, as well as for any subsequent periods required under this Contract.

The insurance coverages checked (✓) below are those required for this Contract.

☑ 1. **Commercial General Liability*** insurance – **Occurrence Form** - with a Combined Single Limit for bodily injury and property damage of at least $1,000,000 per Occurrence / $2,000,000 General Aggregate and $2,000,000 Products-Completed Operations. Contracts over $1,000,000 may require higher limits. The insurance shall provide for and the certificate(s) of insurance shall indicate the following coverages:

a) Premises - operations;
b) Broad form contractual liability;
c) Products and completed operations;
d) Personal/Advertising Injury;
e) Broad form property damage (for Projects involving work on Parish property);
f) Explosion, Collapse and Damage to underground property.
g) Additional Insured forms CG 2010 and CG 2037 in most current edition are required.

☑ 2. **Business Automobile Liability*** insurance with a Combined Single Limit of $1,000,000 per Occurrence for bodily injury and property damage, and shall include coverage for the following:

a) Any auto;
or
b) Owned autos; **and**
c) Hired autos; **and**
d) Non-owned autos.

☑ 3. **Workers' Compensation/Employers Liability insurance*** - Workers' Compensation coverage as required by State law. Employers' liability limits shall be a minimum of $1,000,000 each accident, $1,000,000 each disease, $1,000,000 disease policy aggregate. When water activities are expected to be performed in connection with this project, coverage under the USL&H Act, Jones Act and/or Maritime Employers Liability (MEL) must be included. **Coverage for owners, officers and/or partners in any way engaged in the Project shall be included in the policy.** The names of any excluded individual must be shown in the Description of Operations/Comments section of the Certificate**.**

☑ 4. **Pollution Liability and Environmental Liability*** insurance in the minimum amount of $1,000,000 per occurrence / $2,000,000 aggregate including full contractual liability and third party claims for bodily injury and/or property damage, for all such hazardous waste, pollutants and/or environmental exposures that may be affected by this project stemming from pollution/environmental incidents as a result of Contractor's operations.

If coverage is provided on a claims-made basis, the following conditions apply:

1) the retroactive date must be prior to or coinciding with the effective date of the Contract, or prior to the commencement of any services provided by the Contractor on behalf of the Parish, whichever is earlier; AND
2) continuous coverage must be provided to the Parish with the same retro date for 24 months following acceptance or termination of the Project by the Parish either by
    a) continued renewal certificates **OR**
    b) a 24 month Extended Reporting Period

*The Certificate must indicate whether the policy is written on an occurrence or claims-made basis and, if claims-made, the applicable retro date must be stated.

☐ 5. **Contractor's Professional Liability/Errors and Omissions*** insurance in the sum of at least $1,000,000 per claim / $2,000,000 aggregate is required when work performed by Contractor or on behalf of Contractor includes professional or technical services including, but not limited to, construction administration and/or management, engineering services such as design, surveying, and/or inspection, technical services such as testing and laboratory analysis, and/or environmental assessments. An occurrence basis policy is preferred.

If coverage is provided on a claims-made basis, the following conditions apply:

1) the retroactive date must be prior to or coinciding with the effective date of the Contract, or prior to the commencement of any services provided by the Contractor on behalf of the Parish, whichever is earlier; AND
2) continuous coverage must be provided to the Parish with the same retro date for 24 months following acceptance or termination of the Project by the Parish either by
    a) continued renewal certificates **OR**
    b) a 24 month Extended Reporting Period

*The Certificate must indicate whether the policy is written on an occurrence or claims-made basis and, if claims-made, the applicable retro date must be stated.

☐ 6. **Marine Liability/Protection and Indemnity*** insurance is required for any and all vessel and/or marine operations in the minimum limits of $1,000,000 per occurrence / $2,000,000 per project general aggregate. The coverage shall include, but is not limited to, the basic coverages found in the Commercial General Liability insurance and coverage for third party liability

***Excess/Umbrella Liability** insurance may be provided to meet the limit requirements for any Liability coverage. For example: if the General Liability requirement is $3,000,000 per occurrence, but the policy is only $1,000,000 per occurrence, then the excess policy should be at least $2,000,000 per occurrence thereby providing a combined per occurrence limit of $3,000,000.)

☑ 7. **Owners Protective Liability (OPL)** shall be furnished by the Contractor and shall provide coverage in the minimum amount of $3,000,000 CSL each occurrence / $3,000,000 aggregate. **St. Tammany Parish Government, ATTN: Risk Management Department, P. O. Box 628, Covington, LA 70434 shall be the first named insured on the policy**.

☑ 8. **Builder's Risk Insurance** written as an "all-risk" policy providing coverage in an amount at or greater than one hundred percent (100%) of the completed value of the contracted project. Any contract modifications increasing the contract cost will require an increase in the limit of the Builder's Risk policy. Deductibles should not exceed $5,000 and Contractor shall be responsible for all policy deductibles. This insurance shall cover materials at the site, stored off the site, and in transit. The Builder's Risk Insurance shall include the interests of the Owner, Contractor and Subcontractors and shall terminate only when the Project is accepted in writing. **St. Tammany Parish Government, ATTN: Risk Management Department, P. O. Box 628, Covington, LA 70434 shall be named as a Loss Payee on the policy**.

☐ 9. **Installation Floater Insurance**, on an "all-risk" form, shall be furnished by Contractor and carried for the full value of the materials, machinery, equipment and labor for each location. The Contractor shall be responsible for all policy deductibles. The Installation Floater Insurance shall provide coverage for property owned by others and include the interests of the Owner, Contractor and Subcontractors and shall terminate only when the Project is accepted in writing. **St. Tammany Parish Government, ATTN: Risk Management Department, P. O. Box 628, Covington, LA 70434 shall be named as a Loss Payee on the policy**.

D. All policies of insurance shall meet the requirements of the Parish prior to the commencing of any work. The Parish has the right, but not the duty, to approve all insurance coverages prior to commencement of work. If any of the required policies are or become unsatisfactory to the Parish as to form or substance; or if a company issuing any policy is or becomes unsatisfactory to the Parish, the Provider shall promptly obtain a new policy, timely submit same to the Parish for approval, and submit a certificate thereof as provided above. The Parish agrees not to unreasonably withhold approval of any insurance carrier selected by Provider. In the event that Parish cannot agree or otherwise authorize a carrier, Provider shall have the option of selecting and submitting a new insurance carrier within 30 days of said notice by the Parish. In the event that the second submission is insufficient or is not approved, then the Parish shall have the unilateral opportunity to thereafter select a responsive and responsible insurance carrier all at the cost of Provider and thereafter deduct from Provider's fee the cost of such insurance.

E Upon failure of Provider to furnish, deliver and/or maintain such insurance as above provided, this contract, at the election of the Parish, may be declared suspended, discontinued or terminated. Failure of the Provider to maintain insurance shall not relieve the Provider from any liability under the contract, nor shall the insurance requirements be construed to conflict with the obligation of the Provider concerning indemnification.

F. Provider shall maintain a current copy of all annual insurance policies and agrees to provide a certificate of insurance to the Parish on an annual basis or as may be reasonably requested for the term of the contract or any required Extended Reporting Period. Provider further shall ensure that all insurance policies are maintained in full force and effect throughout the duration of the Project and shall provide the Parish with annual renewal certificates of insurance evidencing continued coverage, without any prompting by the Parish.

G. It shall be the responsibility of Provider to require that these insurance requirements are met by all contractors and sub-contractors performing work for and on behalf of Provider. Provider shall further ensure the Parish is named as an additional insured on all insurance policies provided by said contractor and/or sub-contractor throughout the duration of the project.

H. Certificates of Insurance shall be issued as follows:

St. Tammany Parish Government
Attn: Risk Management
P O Box 628
Covington, LA 70434

To avoid contract processing delays, be certain the project name/number is included on all correspondence including Certificates of Insurance.

***NOTICE*: St. Tammany Parish Government reserves the rights to remove, replace, make additions to and/or modify any and all of the insurance requirements at any time.**

Any inquiry regarding these insurance requirements should be addressed to:

St. Tammany Parish Government
Office of Risk Management
P O Box 628
Covington, LA 70434
Telephone: 985-898-5226
Email: riskman@stpgov.org

Geotechnical Engineering Report

Safe Haven Blue-Green Campus – Phase 2
Mandeville, LA
February 15, 2022
Terracon Project No. ET215099R1

Prepared for:
Kyle Associates, LLC
Mandeville, LA

Prepared by:
Terracon Consultants, Inc.
New Orleans, Louisiana

February 15, 2022

Kyle Associates, LLC
638 Village Lane North
Mandeville, LA 70471

Attn: Mr. James E. Powell, P.E.
P: (985) 727 9377
E: epowell@kyleassociates.net

Re: Geotechnical Engineering Report
Safe Haven Blue-Green Campus – Phase 2
Safe Haven Pkwy.
Mandeville, LA
Terracon Project No. ET215099R1

Dear Mr. Powell:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PET215099 dated October 25, 2021 and email dated December 15, 2021. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and pavements for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Anjelica Moran, E.I.
Project Manager

Lynne E. Roussel, P.E.
Department Manager

Reviewed by Lizzy Stark, P.E. – Senior Staff Engineer

REPORT TOPICS

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report

Safe Haven Blue-Green Campus – Phase 2

Safe Haven Pkwy.

Mandeville, LA

Terracon Project No. ET215099R1

February 15, 2022

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed pavilions and pavement to be located at Safe Haven Pkwy. in Mandeville, LA. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Excavation considerations
- Foundation design and construction
- Floor slab design and construction
- Seismic site classification per IBC
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of six test borings to depths of 10 feet below existing site grades.

Maps showing the site and boring locations are shown on the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and as separate graphs in the **Exploration Results** section. Soil samples in addition to the soil borings were also obtained. These soil samples were sent to Louisiana State University Ag Center for testing. The results are also included in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information See **Site Location**.	The project is located at Safe Haven Pkwy. in Mandeville, La. 30.3490°N 90.0196°W (approximate)
Existing Improvements	Existing buildings, parking areas, drive areas, and sidewalks.

Item	Description
Current Ground Cover	Grassed with concrete drives and sidewalks.
Existing Topography	Relatively flat.
Geology	Our experience near the vicinity of the proposed development and USGS geologic maps indicate subsurface conditions consists of Prairie Terraces. This consist of light gray to light brown clay, sandy clay, silt, sand, and some gravel. These deposits are generally characterized as over-consolidated, stiff clay that are relatively incompressible. These deposits can support light to moderate loads via a conventional shallow foundation system.

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	Project information was proved by Mr. James E. Powell, P.E of Kyle Associates, LLC. via email dated October 21, 2021. The email consisted of a brief description and site plan.
Project Description	The project consists of constructing small pavilions. The pavilions will be 30 ft. by 15 ft. or 20 ft. by 40 ft. in plan dimension. The project will also consist of removing and replacing the existing concrete pavement at various intersections.
Proposed Structures	30 ft. by 15 ft. and 20 ft. by 40 ft. pavilions
Finished Floor Elevation	Assumed to be within 2 feet of existing grades.
Pavements	We understand permeable pavement sections will be considered. Anticipated traffic is as follows: ■ Autos/light trucks: 200 vehicles per day ■ Light delivery and trash collection vehicles: 10 vehicles per week ■ Tractor-trailer trucks: 2 vehicles per week The pavement design period is 20 years.

GEOTECHNICAL CHARACTERIZATION

Subsurface Profile

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical

calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Concrete**	Concrete and sand base course
2	**Silty Clay**	Silty clay, lean clay with silt; brown and gray; stiff
3	**Lean Clay**	Lean clay, lean clay with sand; light gray and tan; medium stiff to stiff
4	**Fat Clay**	Fat clay, trace sand, gray and brown, medium stiff

Groundwater was initially encountered in boring B-07, during drilling at the approximate 16 foot depth below the existing ground surface. After 15 minutes, the water was measured at the approximate 15.5 foot depth Groundwater was not observed in the other borings while auger drilling, or for the short duration the borings could remain open. This does not necessarily mean the borings terminated above groundwater, or that the water levels summarized above are stable groundwater levels. Due to the low permeability of the soils encountered in the borings, a relatively long period of time may be necessary for the groundwater level to develop and stabilize in a borehole in these materials. Long term observations in piezometers or observation wells sealed from the influence of surface water are often required to define the field or in-situ groundwater level in materials of this type.

Groundwater fluctuations occur due to seasonal variations in the amount of rainfall, runoff, site modification, and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

The water levels summarized above are not necessarily stable groundwater levels. Due to the low permeability of the soils encountered in the boring, a relatively long period of time may be necessary for the groundwater level to develop and stabilize in a borehole in these materials. Long term observations in piezometers or observation wells sealed from the influence of surface water are often required to define the field or in-situ groundwater level in materials of this type.

GEOTECHNICAL OVERVIEW

In general, the near surface soils encountered at the project site consist of medium stiff to stiff lean clays and lean clays with silt. The surface soils appeared relatively stable at the time of the exploration. However, these soils are expected to become unstable with typical earthwork and construction traffic, especially after precipitation events. To reduce potential for surface instability, effective drainage should be completed early in the construction sequence and maintained during and after construction.

If possible, the grading should be performed during the warmer and drier time of the year. If grading is performed during the winter months or at times with persistent rain, an increased risk for possible undercutting and replacement of unstable subgrade or the need for other mitigation measures will persist.

The near surface soils at the site, to the depth of the approximate seasonal moisture change zone of about 8 to 10 feet, typically consist of low to medium plasticity lean clays. Typically, clays in this region exhibit potential for shrink-swell movements with changes in moisture. In general, lean clays are considered to exhibit low to moderate potential while fat clays are considered to exhibit a high potential for shrink-swell movements. The Potential Vertical Rise (PVR) approach is a common method used to predict vertical movements in plastic clays. The methodology is based on a correlation between the plasticity index (PI) of the soil and the percent volumetric change. Based upon our experience with similar clay and groundwater conditions in the region, it is our opinion that a lightly loaded floor slab placed over 12 inches of compacted low plasticity structural fill over stable subgrade can be constructed with an anticipated PVR of less than 1 inch.

Additional site preparation recommendations, including proof-rolling and fill placement, are provided in the **Earthwork** section.

The in-situ lean clays are predominantly medium stiff to stiff and likely lightly over-consolidated and only moderately compressible. These soil conditions are conducive to support via shallow foundations. The **Shallow Foundations** section addresses support of the building bearing on native medium stiff to stiff lean clay or structural fill. The **Floor Slabs** section addresses slab-on-grade support of the pavilions.

The **Pavements** section addresses the design of a permeable pavement system.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

Earthwork is anticipated to include demolition of existing pavements, clearing and grubbing, proof-rolling, excavations and fill placement. The following sections provide recommendations for use

in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations and pavements.

Site Preparation

We anticipate construction will be initiated by stripping existing pavement sections, vegetation, and loose, soft or otherwise unsuitable material. Complete stripping of the topsoil or root mat should be performed in the proposed pavilions and pavement areas. Stripped materials consisting of vegetation and organic materials should be wasted off site or used to vegetate landscaped areas. Topsoil measurements were made at the boring locations; however, stripping depths at or between our boring locations and across the site could vary considerably. As such we recommend actual stripping depths be evaluated by a representative of Terracon during construction to aid in preventing removal of excess material. Former utility lines and utility backfill, where present, should be removed from beneath the structures, and the resulting excavations should be properly backfilled as outlined herein. If roots are encountered, the entire root ball should be excavated such that the remaining roots measure 1 inch in diameter or less.

Near surface lean silty clays were encountered throughout the project site. These soils are moisture sensitive and are prone to instability especially when wet and/or subject to poor drainage. Therefore, some undercutting and replacing with structural fill will likely be needed. A contingency for undercut/replace with structural fill to a depth of 24 inches in the planned pavilion areas should be included in the project budget. The depth of expected undercut can be adjusted based on final site grading and observations during construction.

The subgrade should be proof-rolled with heavy rubber tire construction equipment such as a loaded scraper or partially loaded tandem axle dump truck. The vehicle should weigh between 15 and 20 Tons (total vehicle weight). The proof-rolling should be performed under the direction of the Geotechnical Engineer. Proof-rolling should be performed after a suitable period of dry weather to avoid degrading an otherwise acceptable subgrade and to reduce the amount of undercutting/remedial work required. Areas excessively deflecting under the proof-roll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should be undercut, replaced with structural fill and compacted. Widespread instability may require chemical treatment with cement as specified by the Geotechnical Engineer at the time of construction. Excessively wet or dry material should either be removed or moisture conditioned and recompacted.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements, constructed slopes, and other structural areas. General fill is material used to achieve grade outside of these

areas, like landscaped areas. Earthen materials used for structural and general fill should meet the following material property requirements:

Soil Type [1]	USCS Classification	Acceptable Parameters (for Structural Fill)
Imported Lean Clay [2], Clayey Sand	CL, SC	Liquid Limit less than 45, Plasticity index greater than 10 and less than 25, maximum 35% retained on the No. 200 Sieve
Aggregate Base	GP, GM	LADOTD 610 Crushed Limestone or similarly graded crushed recycled concrete.

1. Structural and general fill should consist of approved materials free of organic matter and debris. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site.
2. Delineation of fat clays and lean clays should be performed in the field by a qualified geotechnical engineer or their representative and could require additional laboratory testing.

Fill Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill	General Fill
Maximum Lift Thickness	9 inches or less in loose thickness when heavy, self-propelled compaction equipment is used. 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used.	Same as Structural fill.
Minimum Compaction Requirements [1, 2, 3]	95% of maximum dry density below foundations, floor slabs, pavement subgrade, and other structural areas. 100% of maximum dry density for aggregate base beneath pavement.	92% of max.
Water Content Range [1]	Low plasticity cohesive: 0% to +3% of optimum Aggregate Base: -2% to +2% of optimum	As required to achieve min. compaction requirements.

1. Maximum density and optimum water content as determined by the standard Proctor test (ASTM D 698). The moisture content and compaction should be measured for each lift of engineered fill during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.
For moisture levels of granular material, it is also appropriate to be conditioned at workable levels to allow for satisfactory compaction to be achieved without the cohesionless fill material pumping when proof-rolled.

Grading and Drainage

All grades must provide effective drainage away from the pavilions during and after construction and should be maintained throughout the life of the structures. Water retained next to the structures can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential foundation movements, cracked slabs, and roof leaks. The roof should have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the structures.

Exposed ground should be sloped and maintained at a minimum 5 percent away from the structures for at least 10 feet beyond the perimeter of the structures. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. A minimum 12-inch thick layer of cohesive backfill should be placed against and 5 feet laterally from the exterior of foundation walls in unpaved/landscaped areas to reduce infiltration of surface water to underlying foundation support soils. After construction and landscaping, final grades should be verified to document effective drainage has been achieved. Grades around each structure should also be periodically inspected and adjusted as necessary as part of the structure's maintenance program. Where paving or flatwork abuts the structure a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Trees or other vegetation whose root systems can remove excessive moisture from the subgrade and foundation soils should not be planted next to the structure. Trees and shrubbery should be kept away from the exterior edges of the foundation element a distance at least equal to 1.5 times their expected mature height.

Earthwork Construction Considerations

Shallow excavations for the proposed structures, are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of floor slabs. Construction traffic over the completed subgrades should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over, or adjacent to, construction areas should be removed. If the subgrade desiccates, becomes saturated, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted, prior to floor slab construction.

The groundwater table could rise and affect excavations, especially for most excavation depths and replacement of lower strength soils, or utility excavations, where applicable. A temporary dewatering system consisting of sumps with pumps could be necessary to achieve some depths of excavation.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local, and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, shoring, dewatering, or any of the contractor's activities; such responsibility shall neither be implied nor inferred.

Construction Observation and Testing

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of vegetation and topsoil, proof-rolling and mitigation of areas delineated by the proof-roll to require mitigation.

Each lift of compacted fill should be tested, evaluated, and reworked as necessary until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 800 square feet of compacted fill in the pavilion areas and 1,000 square feet in pavement areas.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Design Parameters – Compressive Loads

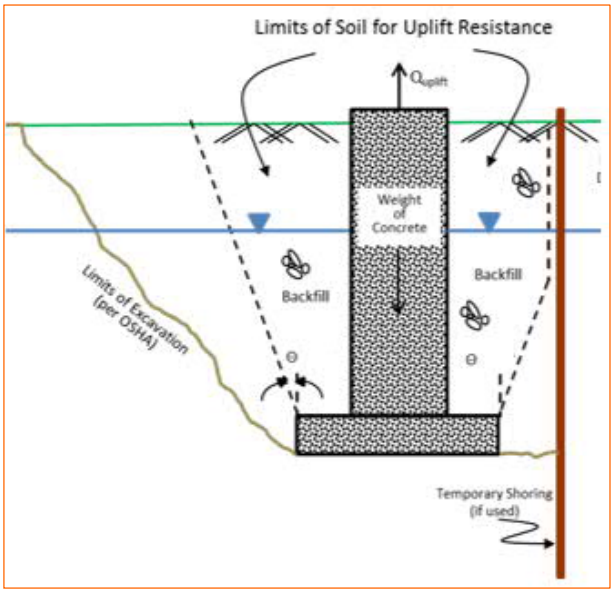
Item	Description
Maximum Net Allowable Bearing Pressure [1, 2]	1,200 psf (Isolated columns and continuous footings).
Required Bearing Stratum [3]	Light gray and tan, medium stiff to stiff, lean clay or structural fill.
Minimum Foundation Dimensions	Columns: 24 inches Continuous: 16 inches

Item	Description
Ultimate Passive Resistance [4] **(equivalent fluid pressures)**	250 pcf (cohesive backfill) 350 pcf (granular backfill)
Ultimate Adhesion/Coefficient of Sliding Friction [5]	400 psf (existing clay) 0.39 (granular material)
Minimum Embedment Below Finished Grade [6]	Exterior footings: 18 inches Interior footings: 12 inches
Estimated Total Movement from Structural Loads [2]	Less than about 1 inch.
Estimated Differential Settlement [2]	About 1/2 of total movement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. The allowable bearing pressure may be increased by one-third when considering highly transient loads such as maximum wind loading.
2. Values provided are for maximum loads noted in **Project Description**. Settlement is for structural loads and up to 2 feet of engineering fill.
3. Unsuitable or soft soils should be over-excavated and replaced per the recommendations in **Earthwork**.
4. Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face. Apply a factor of safety of at least 1.5 to this value when designing for lateral force resistance.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions.
6. Embedment necessary to minimize the effects of seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.

Design Parameters - Uplift Loads

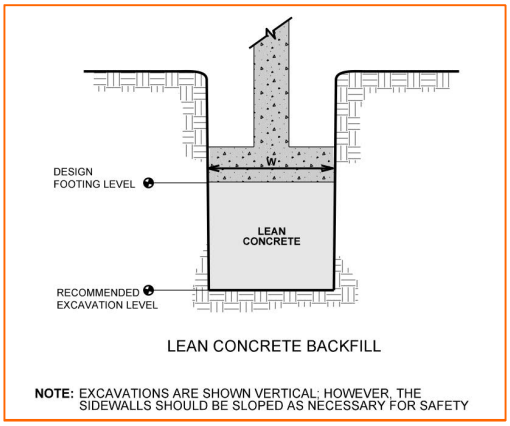
Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils. As illustrated on the subsequent figure, the effective weight of the soil prism defined by diagonal planes extending up from the top of the perimeter of the foundation to the ground surface at an angle, θ, of 20 degrees from the vertical can be included in uplift resistance. The maximum allowable uplift capacity should be taken as a sum of the effective weight of soil plus the dead weight of the foundation, divided by an appropriate factor of safety. A maximum total unit weight of 115 pcf should be used for the backfill. This unit weight should be reduced to 53 pcf for portions of the backfill or natural soils below the groundwater elevation.



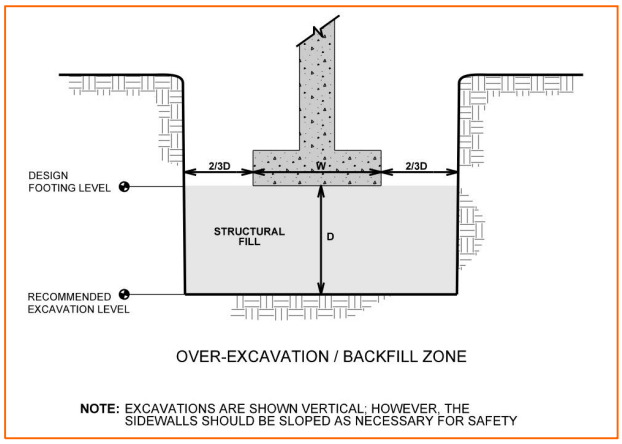
Foundation Construction Considerations

As noted in **Earthwork**, the shallow foundation excavations should be evaluated under the direction of the Geotechnical Engineer. The base of the foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the foundation excavations should be removed/reconditioned before foundation concrete is placed.

If unsuitable bearing soils are encountered at the base of the planned foundation excavation, the excavation should be extended deeper to suitable soils, and the foundation could bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations. This is illustrated on the sketch below.



Over-excavation for structural fill placement below the foundation should be conducted as shown below. The over-excavation should be backfilled up to the foundation base elevation, with structural soil fill or crushed stone wrapped in non-woven geotextile fabric, placed as recommended in the **Earthwork** section.



The following precautions are essential to the satisfactory performance of shallow foundations:

- Provide positive drainage away from the foundations, both during and after construction.
- Avoid excavations during inclement weather and place concrete within the excavations within 24 hours after completion of the excavations.
- Confirm that the excavations are completely within the required bearing stratum or structural fill and remove and replace any unacceptable soils as discussed herein.
- Maintain adequate moisture levels in exposed excavation and slab subgrades, but do not allow the areas to become saturated.
- Place a “mudmat” consisting of lean concrete or crushed stone/gravel to seal the bearing stratum in the event wet conditions are experienced or expected.
- Minimize traffic in excavations to only that necessary to place the steel and concrete for the footings.
- Remove free water in the excavations prior to placing concrete.

SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the soil profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil properties encountered at the site and as described on the exploration logs and results, it is our professional opinion that the **Seismic Site Classification is D**. Subsurface

explorations at this site were extended to a maximum depth of 10 feet. The soil properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Although not considered necessary, additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

FLOOR SLABS

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the granular base beneath the floor slab.

Floor Slab Design Parameters

Item	Description
Floor Slab Support [1]	A leveling course of 4-6 inches of free-draining (less than 5% passing the U.S. No. 200 sieve) granular material compacted to at least 95% of ASTM D 698 [2] over compacted structural fill and/or stable subgrade.
Estimated Modulus of Subgrade Reaction [2]	100 pounds per square inch per inch (psi/in) for point loads.

1. Free-draining granular material should have less than 5 percent fines (material passing the No. 200 sieve). Other design considerations such as cold temperatures and condensation development could warrant more extensive design provisions.
2. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be substantially lower.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or monolithic turn-down slabs are designed to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for

potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

Finished subgrade within and for at least 10 feet beyond the floor slab should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

PERMEABLE PAVEMENT RECOMMENDATIONS

The pavement section and drainage layer should bear directly on a relatively level, uncompacted subgrade that is free of organic material or other debris as outlined in the **Earthwork** section of our Geotechnical Report. If excessively loose subgrade conditions are encountered, they should be undercut and backfilled with No. 57 stone completely wrapped in filter cloth on the sides and bottom or as recommended by the geotechnical engineer. Upon completion of any necessary remediation, the subgrade should be adequate for support of the pavement section recommended below.

Pavement thickness design is dependent upon the following:

- Anticipated traffic conditions during the life of the pavement.
- Subgrade and paving material characteristics.
- Climatic conditions of the region.

We have assumed that traffic loads at the site will be produced primarily by passenger cars and light delivery and trash collection vehicles. A pavement design period of 20-years has been assumed. The following traffic volume has also been assumed.

- Autos/light trucks: 200 vehicles per day.
- Light delivery and trash collection vehicles: 10 vehicles per week
- Tractor-trailer trucks: 1 vehicle per week

Pavement Design Parameters

Based on soil borings B-01, B-02, and B-06, a modulus of subgrade reaction of 130 pci was used for the permeable pavement designs. The values were empirically derived based upon our experience with the existing subgrade soils and our understanding of the quality of the subgrade as prescribed by the **Site Preparation** conditions as outlined in **Earthwork**. A modulus of rupture of 600 psi, corresponding to 4,000 psi compressive strength, was used for concrete pavement.

Pavement Section Thicknesses

The following table provides the minimum recommended permeable thicknesses:

Recommended Pavement Sections		
Pavement Type	**Material**	**Layer Thickness (inches)**
Permeable Concrete /Rigid	Permeable Concrete	6
	LADOT No. 57 base course or equivalent	6
	Filter Fabric	Yes

The placement of a partial pavement thickness for use during construction is not suggested without a detailed pavement analysis incorporating construction traffic. In addition, we should be contacted to confirm the traffic assumptions outlined above. If the actual traffic varies from the assumptions outlined above, modification of the pavement section thickness could be required.

Recommendations for pavement construction presented depend upon compliance with recommended material specifications. To assess compliance, observation and testing should be performed under the direction of the geotechnical engineer.

Concrete and aggregate base course materials should conform to the Louisiana Department of Transportation (LADOTD) “Standard Specifications for Roads and Bridges”, latest edition. Concrete pavement materials should conform to ACI 330.1 “Specifications for Unreinforced Parking Lots”. Concrete pavement should have a minimum flexural strength of 600 psi after 28 days of laboratory curing per ASTM C-31. ACI 330R-01 recommendations should be followed concerning control and expansion joints, as well as other concrete pavement practices.

Pavement Maintenance

Preventative maintenance should be planned and provided for through an ongoing pavement management program to enhance future pavement performance. Preventative maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Terracon recommends that the entire permeable paved area be inspected yearly and maintained in accordance with the system designer's recommendations, as well as with the requirements of any proprietary component within the system. Ongoing maintenance and repairs should be anticipated as part of a routine operating budget, the cost of which will likely increase as the pavement ages, or in response to an unusual weather event, vehicular overload or increased vehicular usage or abuse, and which challenges the expected performance of the overall system, the underlying substrate, or of the sub-grade below the installed components or substrate materials. Accelerated deterioration, especially due to hidden and latent conditions, cannot be anticipated and may require additional repair costs that are not part of cost tables even if replacement or other repair work is included in any estimate.

INFILTRATION TEST RESULTS

Percolation testing was performed in general accordance with City of New Orleans Storm Water Management Guidelines ("Attachment 2: Infiltration Rate Evaluation Guidelines"). One test was performed with a bottom hole depth corresponding to about 2 feet below the existing ground surface. The test locations are provided in the attached Exploration Plan.

A day before performing the test, the test hole was "presoaked" by filling the holes with water. On the day of the test (one day after presoaking), it was observed that the hole still held some water from the presoak period. Prior to performing the test, the holes were refilled with water, and the water level drop in the holes was observed for a period of about 3 hours and it was observed that steady-stage conditions (i.e., water drop was relatively equal over subsequent measuring intervals) were achieved within that time frame. Based on the water level drop, a percolation rate (change in water elevation over a corresponding time interval) was calculated. Subsequently, a representative infiltration rate (i) was calculated based on the formula provided in the City of New Orleans Storm Water Management Guidelines. The formula is presented below:

$$i = \frac{p}{R_f}$$

Where: i is the representative infiltration rate, p is the percolation rate (change in water elevation by the corresponding time interval), and Rf is the reduction factor, which is given by:

$$R_f = \frac{(2d_1 - \Delta d)}{D} + 1$$

Where: d1 is water depth at start of representative time interval, ∆d is the water level drop during the representative time interval and D is the diameter of the percolation hole.

The steady-state percolation rate (p), which occurs when the rate of the water elevation drop in the percolation hole is approximately constant, was achieved after a test duration of about three hours. The representative infiltration based on the steady-state percolation rate was calculated to be on the order of 0.75 inch/hour based on the results of the test hole. It should be noted that the percolation rate can change over time affected by depth to water, site development, and construction disturbance.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until construction begins or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering

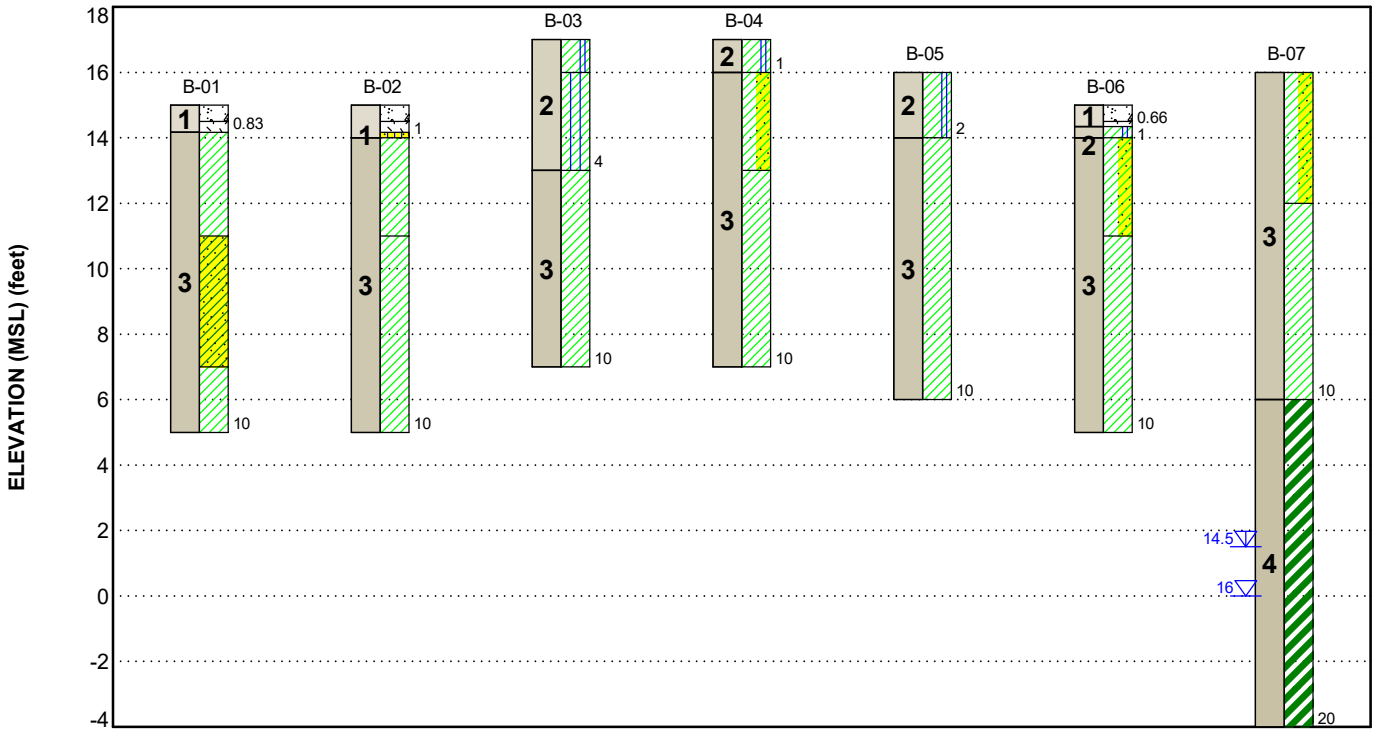
requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either confirm or modify our conclusions in writing.

FIGURES

Contents:

GEOMODEL

Safe-Haven Blue-Green Campus - Phase 2 ■ Mandeville, LA
Terracon Project No. ET215099



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Concrete**	Concrete and sand base course
2	**Silty Clay**	Silty clay, lean clay with silt; brown and gray; stiff
3	**Lean Clay**	Lean clay, lean clay with sand; light gray and tan; medium stiff to stiff
4	**Fat Clay**	Fat clay, trace sand, gray and brown, medioum stiff

LEGEND

- Concrete
- Base
- Lean Clay
- Sandy Lean Clay
- Silty Sand with Gravel
- Lean Clay with Silt
- Silty Clay
- Lean Clay with Sand
- Fat Clay

▽ First Water Observation
▽ Second Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Number of Locations	Type of Exploration	Boring Depth (feet)	Drilled Location
3	Borings	10	Planned pavilion areas
3	Borings	10	Planned pavement areas
1	Boring	20	Planned detention pond area

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provided the boring layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ±10 feet) and the approximate ground surface elevations were estimated from the most recent Google Earth™ imagery. The accuracy of the ground surface at each point is probably about 2 feet. If elevations and a more precise boring layout are desired, we recommend borings be surveyed following completion of fieldwork.

Subsurface Exploration Procedures: We advanced the borings with a track-mounted rotary drill rig using continuous flight augers (solid stem). Samples were continuously obtained in the upper 10 feet of each boring and at maximum intervals of 5 feet thereafter. Thin-walled (Shelby) tube samples were obtained in cohesive soils. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, the borings were backfilled with auger cuttings or cement-bentonite grout, consistent with state regulations, upon completion. Pavement surfaces were patched with cold-mix asphalt and/or pre-mixed concrete, as appropriate.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and transported to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to help estiamte the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to

methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
- Unconfined Compressive Strength of Cohesive Soil
- Laboratory Determination of Density (Unit Weight) of Soil Specimens
- Standard Test Method for Direct Shear Test of Soils

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

SITE LOCATION

Safe Haven Blue-Green Campus – Phase 2 ■ Mandeville, LA
February 15, 2022 ■ Terracon Project No. ET215099R1

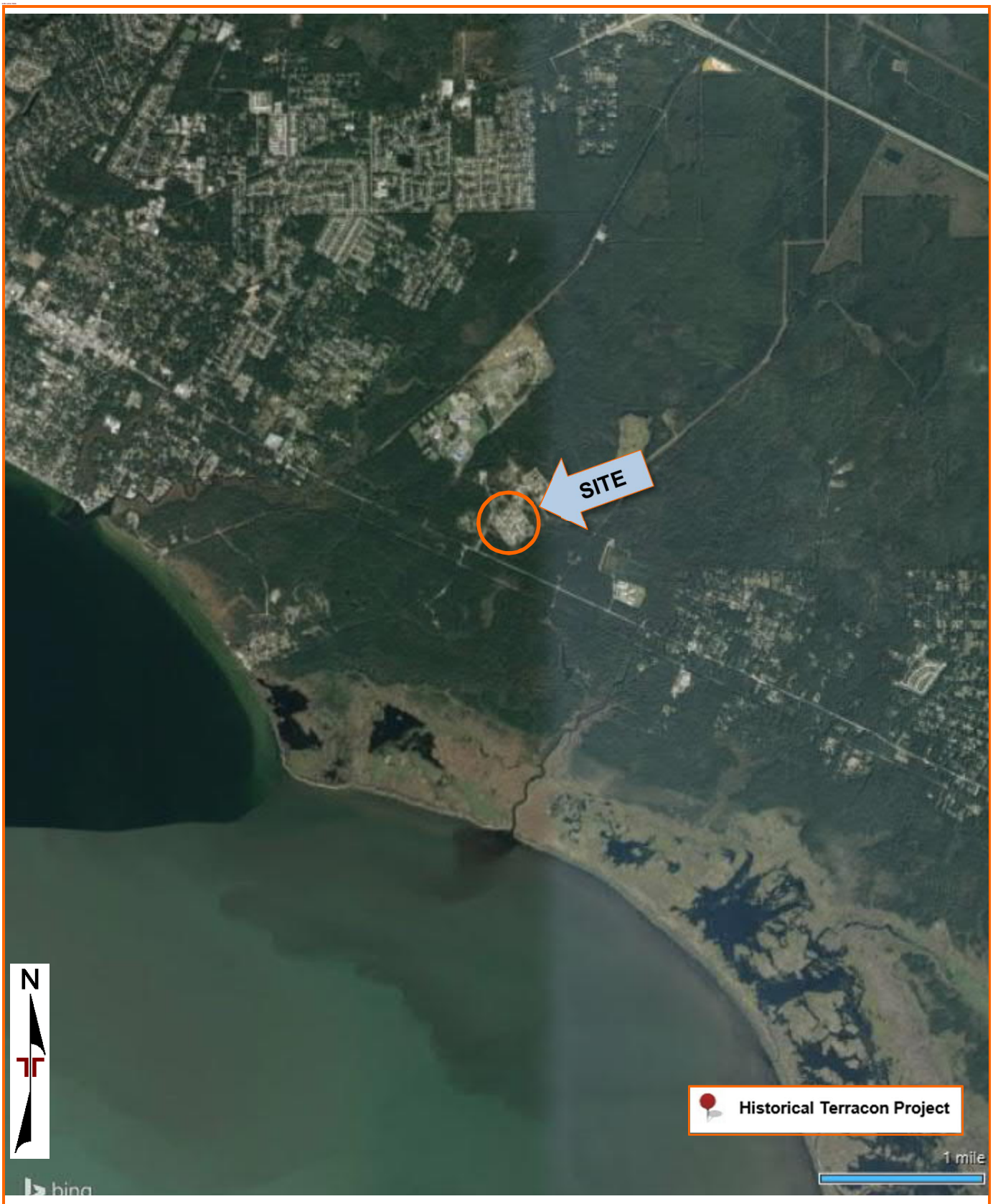


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY USGS TOPO/MICROSOFT BING MAPS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Boring Logs (B-01 through B-07)

Note: All attachments are one page unless noted above.

BORING LOG NO. B-01

PROJECT: Safe-Haven Blue-Green Campus - Phase 2

CLIENT: Kyle Associates, LLC
Mandeville, LA

SITE: Safe Haven Parkway
Mandeville, LA

LOCATION See Exploration Plan

Latitude: 30.2347° Longitude: -90.2480°

Surface Elev.: 15 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI
1		0.5	14.5										
		0.8	14										
			LEAN CLAY (CL), trace sand, tan and light gray, stiff				1.5 (HP)				18.2		41-10-31
							1.0 (HP)	UC	1.04	14	20.5	110	
		4.0	11										
3			**SANDY LEAN CLAY (CL)**, tan and light gray, very stiff	5			2.25 (HP)	UC	2.39	13.9	17.4	115	
							2.5 (HP)						
		8.0	7										
			LEAN CLAY (CL), trace sand, light gray and tan, stiff				2.0 (HP)	UC	1.90	7.9	26.0	101	
		10.0	5	10									
			Boring Terminated at 10 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0'-10' Dry Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed during augering

Terracon
524 Elmwood Park Blvd Ste 170
New Orleans, LA

Boring Started: 11-12-2021 | Boring Completed: 11-12-2021

Drill Rig: Track-Mounted | Driller: D. Gannfois

Project No.: ET215099

BORING LOG NO. B-02

PROJECT: Safe-Haven Blue-Green Campus - Phase 2

CLIENT: Kyle Associates, LLC
Mandeville, LA

SITE: Safe Haven Parkway
Mandeville, LA

LOCATION See Exploration Plan

Latitude: 30.3477° Longitude: -90.0203°

Surface Elev.: 15 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI
		0.5	14.5										
		CONCRETE, 6 Inches											
		0.8	14										
1		**SILTY SAND**, tan, 4 Inches											
		1.0	14										
		SILTY SAND WITH GRAVEL (SM), tan					1.25 (HP)						
		LEAN CLAY (CL), trace sand, tan and light gray, stiff					1.0 (HP)	UC	1.61	14.5	18.9	113	
		4.0	11										
3		**LEAN CLAY (CL)**, trace sand, light gray, stiff		5			3.0 (HP)				13.4		40-11-29
							1.5 (HP)	UC	1.56	9.1	22.2	106	
							2.5 (HP)						
		10.0	5	10									
		Boring Terminated at 10 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0'-10' Dry Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed during augering

Terracon
524 Elmwood Park Blvd Ste 170
New Orleans, LA

Boring Started: 11-12-2021 | Boring Completed: 11-12-2021

Drill Rig: Track-Mounted | Driller: D. Gannfois

Project No.: ET215099

BORING LOG NO. B-03

PROJECT: Safe-Haven Blue-Green Campus - Phase 2

CLIENT: Kyle Associates, LLC
Mandeville, LA

SITE: Safe Haven Parkway
Mandeville, LA

LOCATION See Exploration Plan

Latitude: 30.3469° Longitude: -90.0204°

Surface Elev.: 17 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI
		0.0	**LEAN CLAY WITH SILT (CL)**, brown										
		1.0	16										
2			**SILTY CLAY (CL-ML)**, gray, stiff				1.5 (HP)				11.4		
							2.0 (HP)				9.8		24-18-6
		4.0	13										
3			**LEAN CLAY (CL)**, trace sand, light gray, stiff to very stiff	5			1.5 (HP)	UC	1.63	15	19.6	112	
							2.0 (HP)						
							2.5 (HP)	UC	2.22	15	22.1	105	41-15-26
		10.0	7	10									
			Boring Terminated at 10 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0'-10' Dry Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed during augering

Terracon
524 Elmwood Park Blvd Ste 170
New Orleans, LA

Boring Started: 11-12-2021 | Boring Completed: 11-12-2021

Drill Rig: Track-Mounted | Driller: D. Gannfois

Project No.: ET215099

BORING LOG NO. B-04

PROJECT: Safe-Haven Blue-Green Campus - Phase 2

CLIENT: Kyle Associates, LLC
Mandeville, LA

SITE: Safe Haven Parkway
Mandeville, LA

LOCATION See Exploration Plan

Latitude: 30.3457° Longitude: -90.0175°

Surface Elev.: 17 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI
2		1.0	16										
							1.0 (HP)				12.5		24-14-10
							1.0 (HP)	UC	0.71	9.3	19.3	117	
		4.0	13										
3				5			1.5 (HP)				19.9		48-12-36
							3.0 (HP)	UC	2.10	15	19.0	113	
		10.0	7				3.0 (HP)						
				10									

LEAN CLAY WITH SILT (CL), brown

LEAN CLAY WITH SAND (CL), light gray and tan, medium stiff

LEAN CLAY (CL), trace sand, light gray, very stiff

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0'-10' Dry Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed during augering

Terracon
524 Elmwood Park Blvd Ste 170
New Orleans, LA

Boring Started: 11-12-2021 | Boring Completed: 11-12-2021

Drill Rig: Track-Mounted | Driller: D. Gannfois

Project No.: ET215099

BORING LOG NO. B-05

PROJECT: Safe-Haven Blue-Green Campus - Phase 2

CLIENT: Kyle Associates, LLC
Mandeville, LA

SITE: Safe Haven Parkway
Mandeville, LA

LOCATION See Exploration Plan

Latitude: 30.3471° Longitude: -90.0757°

Surface Elev.: 16 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI
2			**LEAN CLAY WITH SILT (CL)**, brown, stiff										
		2.0	14				1.0 (HP)						
3			**LEAN CLAY (CL)**, trace sand, light gray and tan, stiff to very stiff				1.0 (HP)	UC	1.00	9.7	22.3	108	49-12-37
				5			2.0 (HP)				18.8	113	45-10-35
							3.0 (HP)	UC	2.25	9.9	18.7	112	
		10.0	6				3.0 (HP)	UC	2.13	15	22.3	106	
			Boring Terminated at 10 Feet	10									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0'-10' Dry Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed during augering

Terracon
524 Elmwood Park Blvd Ste 170
New Orleans, LA

Boring Started: 11-12-2021 | Boring Completed: 11-12-2021

Drill Rig: Track-Mounted | Driller: D. Gannfois

Project No.: ET215099

BORING LOG NO. B-06

PROJECT: Safe-Haven Blue-Green Campus - Phase 2

CLIENT: Kyle Associates, LLC
Mandeville, LA

SITE: Safe Haven Parkway
Mandeville, LA

LOCATION See Exploration Plan

Latitude: 30.3485° Longitude: -90.0146°

Surface Elev.: 15 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI
1		0.5	14.5										
2		0.7	14.5										
		1.0	14				1.0 (HP)						
3		4.0	11	5			1.5 (HP)	UC	1.00	8.5	16.0	111	
		10.0	5				2.0 (HP)	UC	1.70	15	18.9	114	39-10-29
				10			3.0 (HP)						
							2.75 (HP)	UC	2.63	12.9	19.7	113	

CONCRETE, 6 Inches

SILTY SAND, 2 Inches

LEAN CLAY WITH SILT (CL), tan

LEAN CLAY WITH SAND (CL), tan and light gray, medium stiff

LEAN CLAY (CL), tan and light gray, stiff to very stiff

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0'-10' Dry Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed during augering

Terracon
524 Elmwood Park Blvd Ste 170
New Orleans, LA

Boring Started: 11-12-2021 | Boring Completed: 11-12-2021

Drill Rig: Track-Mounted | Driller: D. Gannfois

Project No.: ET215099

BORING LOG NO. B-07

PROJECT: Safe-Haven Blue-Green Campus - Phase 2

CLIENT: Kyle Associates, LLC
Mandeville, LA

SITE: Safe Haven Parkway
Mandeville, LA

LOCATION See Exploration Plan

Latitude: 30.3501° Longitude: -90.0185°

Surface Elev.: 16 (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI
			LEAN CLAY WITH SAND (CL), brown and gray, stiff to very stiff				1.50 (HP)						
							1.25 (HP)				18.1		32-15-17
							3.00 (HP)				20.1		29-16-13
		4.0	12										
3			**LEAN CLAY (CL)**, trace sand, gray and brown, stiff	5			2.50 (HP)						
							4.00 (HP)				19.8		40-14-26
		10.0	6				2.50 (HP)	UC	1.70	15	23.2	103	47-17-30
			FAT CLAY (CH), trace sand, gray and brown, medium stiff	10									
							3.50 (HP)						
4					▽								
				15	▽		1.50 (HP)	UC	0.87	6.2	32.8	92	51-26-25
							2.00 (HP)				34.2		
		20.0	-4	20									
			Boring Terminated at 20 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0'-20' Dry Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite
Surface capped with concrete

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater first encountered*

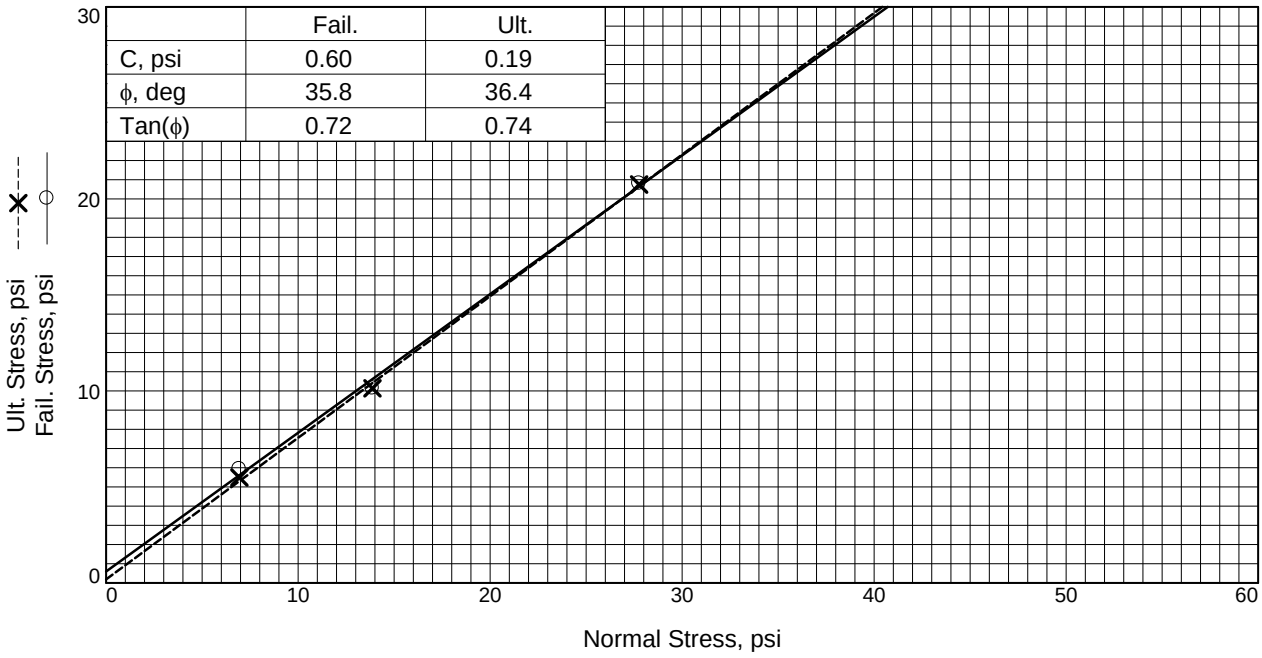
▽ *After 15 minutes*

Terracon
524 Elmwood Park Blvd Ste 170
New Orleans, LA

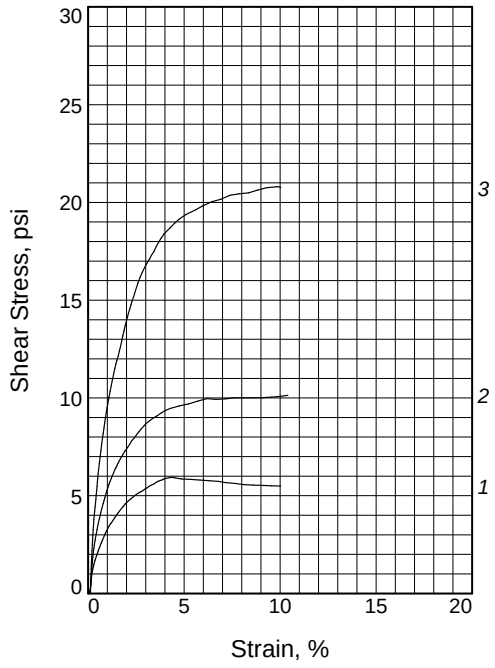
Boring Started: 12-28-2022 | Boring Completed: 12-28-2022

Drill Rig: Track-Mounted | Driller: D. Gannfois

Project No.: ET215099



	Fail.	Ult.
C, psi	0.60	0.19
ϕ, deg	35.8	36.4
Tan(ϕ)	0.72	0.74



Sample No.		1	2	3
Initial	Water Content, %	20.5	20.4	19.3
	Dry Density, pcf	102.4	102.1	105.4
	Saturation, %	85.6	84.7	87.0
	Void Ratio	0.6463	0.6514	0.5992
	Diameter, in.	2.500	2.500	2.500
	Height, in.	1.000	1.000	1.000
At Test	Water Content, %	20.3	20.0	17.4
	Dry Density, pcf	104.2	109.8	110.9
	Saturation, %	88.7	100.9	90.2
	Void Ratio	0.6180	0.5358	0.5202
	Diameter, in.	2.500	2.500	2.500
	Height, in.	0.983	0.930	0.951
Normal Stress, psi		6.94	13.87	27.76
Fail. Stress, psi		5.94	10.14	20.81
Strain, %		4.4	10.4	9.9
Ult. Stress, psi		5.49	10.14	20.75
Strain, %		10.0	10.4	10.0
Strain rate, in./min.		0.002	0.002	0.002

Sample Type: Shelby Tube
Description: Sandy Lean Clay (CL)

LL= 29 **PL=** 16 **PI=** 13
Specific Gravity= 2.7
Remarks:

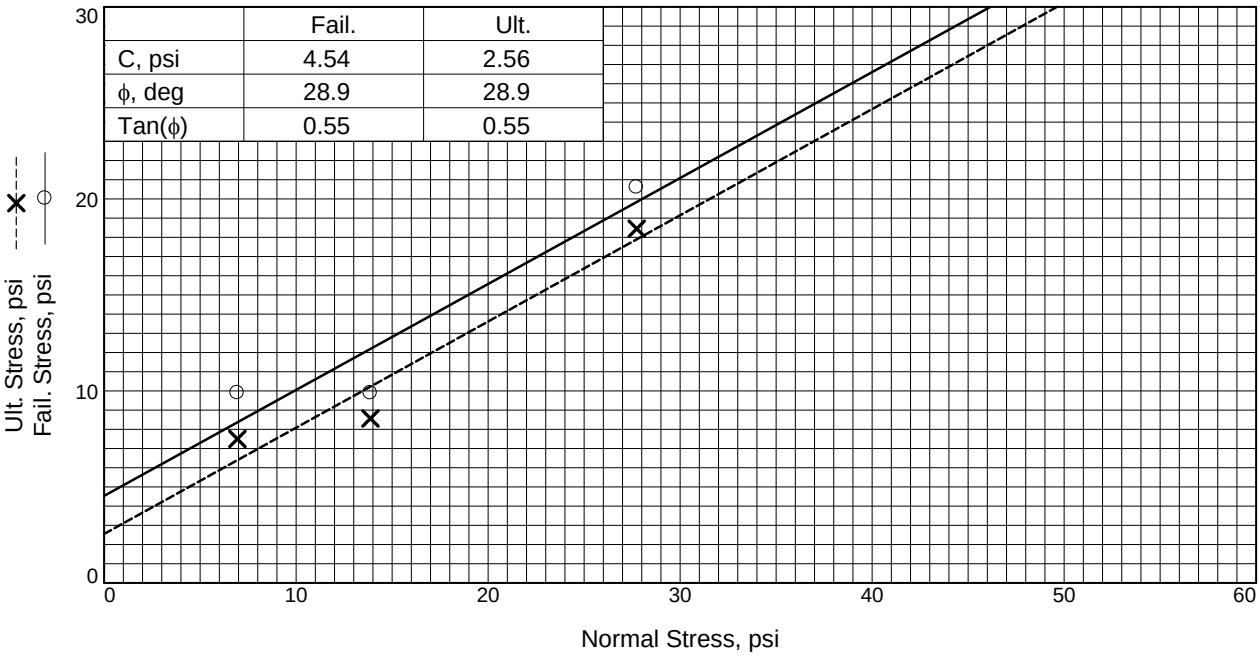
Figure _____

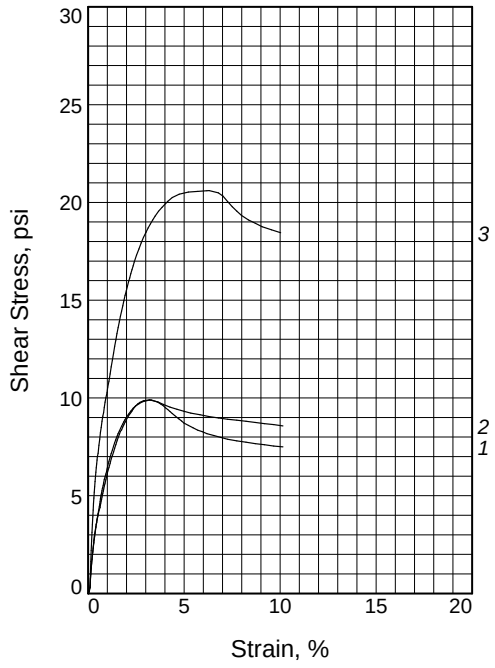
Client: Kyle Associates, LLC

Project: Safe-Haven Blue-Green Campus - Phase 2

Source of Sample: B-07 **Depth:** 2-4'
Sample Number: 3
Proj. No.: ET215099 **Date Sampled:** 12/28/2021

DIRECT SHEAR TEST REPORT
Terracon Consultants, Inc.
Chattanooga, TN





Sample No.		1	2	3
Initial	Water Content, %	19.7	20.7	19.0
	Dry Density, pcf	105.3	103.5	106.9
	Saturation, %	88.5	88.9	89.0
	Void Ratio	0.6009	0.6289	0.5763
	Diameter, in.	2.500	2.500	2.500
	Height, in.	1.000	1.000	1.000
At Test	Water Content, %	20.7	20.4	17.3
	Dry Density, pcf	107.2	106.9	116.1
	Saturation, %	97.8	95.3	103.6
	Void Ratio	0.5724	0.5773	0.4516
	Diameter, in.	2.500	2.500	2.500
	Height, in.	0.982	0.968	0.921
Normal Stress, psi		6.94	13.87	27.74
Fail. Stress, psi		9.90	9.89	20.61
Strain, %		3.2	3.3	6.3
Ult. Stress, psi		7.50	8.57	18.45
Strain, %		10.1	10.1	10.0
Strain rate, in./min.		0.001	0.001	0.001

Sample Type: Shelby Tube
Description: Lean Clay with Sand (CL)

LL= 40 **PL=** 14 **PI=** 26
Specific Gravity= 2.7
Remarks:

Figure _____

Client: Kyle Associates, LLC

Project: Safe-Haven Blue-Green Campus - Phase 2

Source of Sample: B-07 **Depth:** 6-8'
Sample Number: 5
Proj. No.: ET215099 **Date Sampled:** 12/28/2021

DIRECT SHEAR TEST REPORT
Terracon Consultants, Inc.
Chattanooga, TN

Soil Testing and Plant Analysis Laboratory
School of Plant, Environmental and Soil Sciences
Louisiana State University
Baton Rouge, LA 70803
Website: www.lsuagcenter.com/stpal

Soil Test Results

Moran, Anjelica M
524 Elmwood Park Blvd Suite 170
River Ridge, LA 70123

Jefferson
anjelica.moran@terracon.com

Date Received:	01/07/2022
Lab Number:	2222004001
Sample ID:	B-07 Topsoil
Texture:	N/A
Area:	Upland
Irrigated:	No

Nitrogen Test

Element	Results
Nitrogen %	0.25

If there are any questions about this report, please contact your local extension service office at (Telephone 504/736-6519). The extension office also receives a copy of this report.

Note: ppm is equivalent to mg/Kg for soil and plant samples and is equivalent to mg/L for water samples. For a description of methods used, please visit our web site at: http://www.stpal.lsu.edu

Soil Testing and Plant Analysis Laboratory
School of Plant, Environmental and Soil Sciences
Louisiana State University
Baton Rouge, LA 70803
Website: www.lsuagcenter.com/stpal

Soil Test Results

Moran, Anjelica M
524 Elmwood Park Blvd Suite 170
River Ridge, LA 70123

Jefferson
anjelica.moran@terracon.com

Date Received:	01/07/2022
Lab Number:	1222004001
Sample ID:	B-07 Topsoil
Texture:	N/A
Area:	Upland
Irrigated:	No

Organic Matter Test

Element	Results
% Organic Matter	3.17

If there are any questions about this report, please contact your local extension service office at (Telephone 504/736-6519). The extension office also receives a copy of this report.

Note: ppm is equivalent to mg/Kg for soil and plant samples and is equivalent to mg/L for water samples. For a description of methods used, please visit our web site at: http://www.stpal.lsu.edu

Soil Testing and Plant Analysis Laboratory
School of Plant, Environmental and Soil Sciences
Louisiana State University
Baton Rouge, LA 70803
Website: www.lsuagcenter.com/stpal

Moran, Anjelica M
524 Elmwood Park Blvd Suite 170
River Ridge, LA 70123

Date Received:	01/07/2022
Lab Number:	1122004001
Sample ID:	B-07 Topsoil
Soil Texture:	fine sandy loam
Area:	Upland
Irrigated:	No

Soil Test Results

Element (Mehlich3)	Value	Centipede	St. augustine	Vegetables (hm
pH (1:1 Water)	7.30	**Very High**	**Very High**	**Very High**
Phosphorus, ppm	43.83	**High**	**High**	**High**
Potassium, ppm	266.58	**Very High**	**Very High**	**Very High**
Calcium, ppm	7,309.86	**Very High**	**Very High**	**Very High**
Magnesium, ppm	403.11	**Very High**	**Very High**	**Very High**
Sodium, ppm	45.36	**Optimum**	**Optimum**	**Optimum**
Sulfur, ppm	37.93	**High**	**High**	**High**
Copper, ppm	7.69	**High**	**High**	**High**
Zinc, ppm	39.36	**High**	**High**	**High**

RECOMMENDATION

					Expected pH / Acre with adding sulfur
Crop	**Form**	***Units: lb/1000 sq. ft.***	**Nitrogen**	**Phosphate**	**Potash**	**1000 lbs**
centipede	maintain		See Sheet	0	0	6.33 High

For fertilizer timing and methods of application please see (http://www.stpal.lsu.edu/recsheets/T-610.rtf)

					Expected pH / Acre with adding sulfur
Crop	**Form**	***Units: lb/1000 sq. ft.***	**Nitrogen**	**Phosphate**	**Potash**	**1000 lbs**
st. augustine	maintain		See Sheet	0	0	6.33 Optimum

For fertilizer timing and methods of application please see (http://www.stpal.lsu.edu/recsheets/T-610.rtf)

					Expected pH / Acre with adding sulfur
Crop	**Form**	**Nitrogen**	**Phosphate**	**Potash**	**1000 lbs**
vegetables (hm grdn)		See Sheet		0	6.33 Optimum

For fertilizer timing and methods of application please see (http://www.stpal.lsu.edu/recsheets/G-707.rtf)

If there are any questions about this report, please contact your local extension service office at (Telephone 504/736-6519). The extension office also receive a copy of this report.

Note: ppm is equivalent to mg/Kg for soil and plant samples and is equivalent to mg/L for water samples. For a description of methods used, please visit our web site at: http://www.stpal.lsu.edu

Soil Testing and Plant Analysis Laboratory
School of Plant, Environmental and Soil Sciences
Louisiana State University
Baton Rouge, LA 70803
Website: www.lsuagcenter.com/stpal

Soil Test Results

Moran, Anjelica M
524 Elmwood Park Blvd Suite 170
River Ridge, LA 70123

Jefferson
anjelica.moran@terracon.com

Date Received:	01/07/2022
Lab Number:	1822004001
Sample ID:	B-07 Topsoil
Texture:	N/A
Area:	Upland
Irrigated:	No

Salts Test

Element	Results	Interpretation	< 301.00	301.00 - 601.00	601.00 - 1,001.00	1,001.00 - 1,500.00	> 1,500.00
Salts, ppm	210.43	Very Low					

If there are any questions about this report, please contact your local extension service office at (Telephone 504/736-6519). The extension office also receives a copy of this report.

Note: ppm is equivalent to mg/Kg for soil and plant samples and is equivalent to mg/L for water samples. For a description of methods used, please visit our web site at: http://www.stpal.lsu.edu

Soil Testing and Plant Analysis Laboratory
School of Plant, Environmental and Soil Sciences
Louisiana State University
Baton Rouge, LA 70803
Website: www.lsuagcenter.com/stpal

Soil Test Results

Moran, Anjelica M
524 Elmwood Park Blvd Suite 170
River Ridge, LA 70123

Jefferson
anjelica.moran@terracon.com

Date Received:	01/07/2022
Lab Number:	1422004001
Sample ID:	B-07 Topsoil
Texture:	N/A
Area:	Upland
Irrigated:	No

Boron Test

Element	Results	Interpretation			
Boron, ppm	0.69		< 0.25	0.25 - 0.75	> 0.75

If there are any questions about this report, please contact your local extension service office at (Telephone 504/736-6519). The extension office also receives a copy of this report.

Note: ppm is equivalent to mg/Kg for soil and plant samples and is equivalent to mg/L for water samples. For a description of methods used, please visit our web site at: http://www.stpal.lsu.edu

SUPPORTING INFORMATION

Contents:

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS
Safe-Haven Blue-Green Campus - Phase 2 ■ Mandeville, LA
Terracon Project No. ET215099

Terracon GeoReport

SAMPLING	WATER LEVEL	FIELD TESTS
Auger Cuttings Shelby Tube	**Water Initially Encountered** **Water Level After a Specified Period of Time** **Water Level After a Specified Period of Time** **Cave In Encountered** Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	**N** Standard Penetration Test Resistance (Blows/Ft.) **(HP)** Hand Penetrometer **(T)** Torvane **(DCP)** Dynamic Cone Penetrometer **UC** Unconfined Compressive Strength **(PID)** Photo-Ionization Detector **(OVA)** Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or [$Cc<1$ or $Cc>3.0$] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or [$Cc<1$ or $Cc>3.0$] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OL	Organic clay [K, L, M, N] / Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OH	Organic clay [K, L, M, P] / Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.