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Exhibit 25.
Vidalia Industrial Park & Port Complex South
Geotechnical Site Investigation

Geotechnical Testing Laboratory, Inc.

Engineering and Construction Materials Testing Services

Vidalia Industrial Park & Port
Complex South
Geotechnical Site Investigation

April 14, 2020

Bryan Hammett & Associates, LLC
6885 Highway 84 West
Ferriday, Louisiana 71334

Attention: Mr. Keith Capdepon

RE: Geotechnical Investigation Services
Vidalia Industrial Park and Port Complex
Vidalia, Concordia Parish, Louisiana
Report No. 04-20-055

Dear Mr. Capdepon:

Geotechnical Testing Laboratory, Inc. is pleased to submit this report of subsurface exploration for the above referenced project. Included in the report are the results of the exploration and general recommendations concerning the potential design and construction of the foundations.

We appreciate the opportunity to have provided you with our geotechnical engineering services and look forward to assisting you by providing additional investigation services for individual projects during the development of the subject tract. If you have any questions concerning this report, or if we may be of further service, please contact our office.

Respectfully submitted,
Geotechnical Testing Laboratory, Inc.

N. J. Gorsha, P.E.
Louisiana Registration No. 20082

Ken Gorsha
President

Distribution: (3) Bryan Hammett & Associates, LLC

NJG/krg

Preliminary Geotechnical Investigation Services
Vidalia Industrial Park and Port Complex
Vidalia, Concordia Parish, Louisiana
Report No. 04-20-055

Prepared For:

Bryan Hammett & Associates, LLC
6885 Highway 84 West
Ferriday, Louisiana 71334

Prepared By:

Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, Louisiana 71301

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Preliminary Geotechnical Investigation Services
Vidalia Industrial Park and Port Complex
Vidalia, Concordia Parish, Louisiana
Report No. 04-20-055

Introduction:

This report transmits the findings of a geotechnical investigation performed for the above-referenced project. The purpose of this investigation was to define and evaluate the general subsurface conditions in the general vicinity of a planned new industrial complex. Specifically, the study was planned to determine the following:

- Subsurface stratigraphy within the limits of our exploratory borings.
- Classification, strength, and compressibility characteristics of the foundation strata.
- Suitable foundation systems and allowable soil bearing pressures.
- Construction requirements for the placement of select earth fills.

The purpose of this report is to provide the structural engineer, civil engineer, and other design team professionals with preliminary recommendations to consider for the design and construction of the proposed project. This report should not be used by the contractor in lieu of project plans and specifications.

Project Authorization:

Formal authorization to perform the work was provided by Mr. Keith Capdepon, P.E. with Bryant Hammett & Associates, LLC (Client), by accepting our march 6, 2020 written proposal. Written authorization to proceed was provided on March 30, 2020. Field procedures were conducted on April 8 & 9, 2020. To accomplish the intended purposes, a three-phase study program was conducted which included:

- a field investigation consisting of three exploratory test borings with samples obtained at selected intervals;
- a lab testing program designed to evaluate the expansive and strength characteristics of the subsurface soils; and,
- an engineering analysis of the field and laboratory test data for preliminary foundation design recommendations.

No additional analysis was requested. A brief description of the field and laboratory test procedures are provided in the Appendix.

Project Description:

We understand the project will consist of a characterizing a 126.45-acre site for the purpose of developing an industrial park. Preliminary sizes of the structures and structural information is not available. For the purposes of this report, we have been asked to provide shallow and deep foundation recommendations for a major petrochemical plant, together with approximate size of spread footings and foundations for tanks, pipe racks and independent structures.

For the purpose of this report, we have assumed that maximum column loads will not exceed approximately 200 kips (1 kip = 1,000 pounds), and that maximum continuous wall loads will be approximately one (1) to five (5) kips per linear foot. Grade changes are unknown at the present time, and will be assumed to be a nominal 2 to 3 feet maximum to reach the design

grades. If larger grade changes are anticipated, these should be discussed with our geotechnical engineer prior to finalizing design.

If any of this information should change significantly or be in error, it should be brought to our attention so that we may review recommendations made in this report.

Site Conditions:

The project site is located northeast of the intersection of LA Highway 131 and D.A. Biglane Road in Vidalia, Concordia Parish, Louisiana. The site was noted to slope downward to the northeast with visually-estimated elevation differences of between approximately six (6) and seven (7) feet. The site was recently planted with a soybean crop at the time of drilling. The drilling rig experienced moderate difficulty moving about the site.

Subsurface Stratigraphy:

The subsurface conditions at the proposed site were explored by drilling a total of three (3) borings to depths between approximately 50 and 100 feet. The borings were located in the field by the drilling crew as shown on the Plan of Borings included in the Appendix of this report.

The stratification of the soils encountered during field drilling operations is presented on the boring logs in the Appendix. The stratification of the subsurface materials shown on the boring logs represents the subsurface conditions encountered at the actual boring locations and variations may occur across the site. The lines of demarcation represent the approximate boundary between the soil types, but the actual transition may be gradual. The following subsurface descriptions are of a generalized nature to highlight the major stratification features. The boring logs should be reviewed for more detailed information.

In order of increasing depth, the borings generally encountered the following soil strata beneath the surface: fat clay (CH), lean clay (CL), lean to fat clay (CL-CH), sandy silt (ML)s, silty sand (SM) and poorly graded sand (SP).

Groundwater Conditions:

Seepage was observed at depths of 12.5 to 13.5 feet during advancement of the test borings. Groundwater was measured at depths of one (1) to 13 feet below existing ground surface upon completion of the borings. We feel that the elevated hydraulic water table is most likely from recent heavy area rains and a higher stage for the adjacent Mississippi River. The normal groundwater levels are most likely around the depth that groundwater was encountered and those levels are not expected to impact shallow excavations during construction, but the subsurface water regime is always subject to change with variations in climatic conditions and will likely coincide seasonal fluctuations. Future construction activities may also alter the surface and/or subsurface drainage patterns of this site. Therefore, groundwater conditions should be explored at the start of construction by others due to short-term observations by our field crew.

Perched water may be briefly encountered in low quantities during earthwork and is typically due to storage of recent rainfall or by a barrier to capillary evaporation. Where perched water is encountered the contractor should expect to excavate gravity drainage ditches to divert it away from the construction area. The depth of the ditches should be at least two (2) to three (3) feet deeper than the lowest exterior footing elevation. Additionally, soft, wet and pumpable soils can be expected below perched water tables. In structural areas, these should be removed to firm ground and replaced with select fill soils compacted to project specifications as defined later in this report.

Foundation Recommendations:

The soil parameters represented herein are based on single borings placed at irregular intervals across the site. The deviations between the boring locations indicate variable subsurface conditions across the area and should not be assumed as representative of the entire site. Thus, the findings presented herein should be considered preliminary in nature and should be confirmed through further investigation prior to development of the subject parcel. Prior to developing any section of the tract, a specific subsurface investigation should be obtained and tailored to the individual project. This report should not be used in lieu of a final geotechnical investigation addressing site specific needs for the intended projects.

Detailed information on structural systems and planned grading is currently unavailable. Based on the size and type of anticipated structures, as well as the findings from this investigation, a system of shallow footings with an on-grade floor slab, in conjunction with the recommended subgrade preparation is believed to be the most practical and economical means of support. However, heavier building loads could result in the use of deep foundations. Recommendations for both foundation types are discusses separately below.

Recent area rains are probably responsible for the presence the soft, saturated surface soils, and the elevated moisture contents extend well below ground surface. If these wet conditions exist during construction, this can cause extreme difficulty in the preparation of the building pad areas. *We recommend that the construction take place during warmer and drier time of year*. It is also recommended that the plans and bid documents include a cost item and procedure for removal of wet soils, should they exist at that time, and replacement with properly moisture conditioned select fill. Over-excavation required during wet episodes could extend to depths ranging from one (1) to two (2) feet.

If instability persists within the exposed subgrades, the recommendations presented in our Wet Weather and Soft Ground Considerations section of this report should be reviewed.

Potential Vertical Rise (PVR) values were estimated to vary between approximately 2.75 and three (3) inches for this site. One (1) inch of PVR is generally accepted as the maximum allowable value for design and construction in the geographical area. The surficial soils encountered by the borings are considered to be moderately expansive. In order to limit the PVR to a value of one (1) inch or less, this will require the placement of a minimum of three (3) feet of select fill beneath all areas of the floor slabs.

Foundation Subgrade Preparation:

To prepare for foundation and soil supported floor slab construction, we recommend that all topsoil, vegetation, roots, and any soft soils in the building area be stripped from the site and either properly disposed or stockpiled for later use in landscaping. Utilities should be located and rerouted as necessary.

To provide a consistent subgrade for slab support and reduce the potential for active soils to affect the foundation, GTL recommends that a uniform layer of density-approved select fill be provided beneath the floor slab. After stripping the site, the building pad should be cut to an elevation which allows the placement of at least three (3) feet of density-approved select fill below the final subgrade elevation for the floor slab. The select fill building pad should extend at least five (5) feet beyond the edge of the building.

After stripping and undercutting, as required by the grading plan and the over-excavation as required herein, the building area should be proof-rolled with a heavy, loaded pneumatic-tired vehicle such as a 20 to 25 ton loaded dump truck. It is recommended that all areas beneath the floor slab be proof-rolled to identify loose or soft soils. All proof-rolling and undercutting

activities should be witnessed by GTL or authorized representative and should be performed during a period of dry weather. Any weak areas which yield under the proof-roll, or any areas with a tendency to pump should be mitigated. Such mitigation may include over-excavation and backfilling, reprocessing to remove moisture, modification with lime or cement admixture, or using geotextiles. In the event such mitigation is required, the geotechnical engineer should be contacted to design an appropriate procedure.

After stripping, excavating where required, and proof-rolling but prior to placing fill, the exposed soils should be scarified and then processed to a moisture content between one (1) percentage point below and three (3) percentage points above the Standard Proctor optimum. The subgrade soils should be re-compacted to a density of at least 95 percent of the Standard Proctor (ASTM D-698) maximum dry density for a depth of at least eight (8) inches below the surface.

The near-surface soils have elevated moisture contents. If instability persists within the exposed subgrade at the bottom of the building pad excavation, the area may require over-excavation of the wet material to provide a single over-sized bridge lift of drier material. Over-excavation for a bridge lift could extend to depths ranging from 1.5 to two (2) feet. The fill for this layer should consist of silty or sandy clay with a plasticity index between 25 and 35 and a moisture content no more than four (4) percent below optimum moisture content. To prevent moisture from migrating into the bridge lift from below, compaction levels for the bridge lift should be between 90 and 95 percent of Standard Proctor density.

Select Fill:

After the subgrade has been prepared and inspected, fill placement may begin. Select fill material should be free of organic or other deleterious materials, homogeneous mixture, have a maximum particle size of three (3) inches, have a liquid limit less than 40 and plasticity index between 8 and 20, and consist of silty-clayey sands (SM-SC), low plasticity sandy clays (CL), or clayey sands (SC) as defined by the Unified Soil Classification System. In addition to the above requirements, the material should have a minimum of 30 percent retained on the No. 200 sieve. If a fine-grained material is used for fill, very close moisture content control will be required to achieve the recommended degree of compaction.

Fill should be placed in maximum lifts of eight (8) inches of loose materials and should be compacted within the range of one (1) percentage point below to three (3) percentage points above the optimum moisture content value and a minimum of 95 percent of the maximum density as determined by the Standard Proctor (ASTM D-698) test. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying.

The building pads should extend at least five (5) feet beyond the edge of the structure prior to sloping. Each lift of compacted soil should be tested and inspected by the soils engineer or his representative prior to placement of subsequent lifts. As a guideline, it is recommended that field density tests be taken at a frequency of not less than one (1) test per 2,500 square feet of surface area per lift or a minimum of four (4) per lift for each tested area for the building.

Shallow Foundations:

Based on the limited information from our borings, the grading for the building pads should provide not less than three (3) feet of density-approved select fill below the finished subgrade elevation for the slabs and should extend at least five (5) feet beyond the perimeter of the buildings. The fill can be used to elevate the building pads so that positive drainage is provided away from the buildings. Where feasible, elevating the building pad with fill is generally desirable because this aids in providing positive drainage away from the floor slabs and foundations and helps prevent water from collecting in the filled areas.

Shallow foundations may utilize individual or continuous footings bearing within the upper five (5) feet of the surficial zone. The provision of at least three (3) feet of select fill should be anticipated to provide a suitable subgrade for the floor slabs. Typical bearing capacity values for shallow spread footings may vary from between approximately 2,000 psf to 2,500 psf for soils with consistencies of medium dense or medium stiff. Strip footings for continuous wall loads may be estimated between 1,500 and 1,800 pounds per linear foot.

The factor of safety for the above bearing values is 3.0. Total settlement is estimated to be on the order of one (1) inch or less for foundation units designed in accordance with recommendations provided herein. Differential settlements are estimated to be on the order of ½ inch or less. Approximately half of this settlement is expected to occur during construction. The remaining long-term settlement of ½ inch (¼ occurring differentially) should be tolerable. These settlement estimates are valid for footings up to five (5) feet in plan dimensions. If footings larger than five (5) feet are required, this office should be contacted to issue additional recommendations to mitigate the potential for higher settlement.

Deep Foundations:

As previously discussed, consideration may be given to placing heavier structural or special equipment loads on deep foundations consisting of drilled shafts or driven piles. Recommendations for auger cast piles have been omitted since these piles are not economically competitive until the quantity exceeds 100. However, if auger cast piles are considered, this office should be contacted to provide additional recommendations.

Heavier structural loads should be supported on straight-sided, cast-in-place concrete shafts founded at a minimum depth of 25 feet below the existing ground surface. The table below presents the estimated allowable single shaft capacities for 18- and 24-inch diameter shafts founded at depths between 25 and 50 feet below present ground surface. If additional shaft diameters are considered, this office should be contacted to provide additional recommendations.

Diameter of Shaft (inches)	Depth of Shaft (feet)	Allowable Single Shaft Capacity (kips)	
		Compressive	Uplift
18	25	10	8
	30	15	10
	35	20	15
	40	25	20
	45	40	25
	50	55	35
24	25	15	10
	30	20	15
	35	25	20
	40	35	25
	45	55	35
	50	85	50

Diameter of Shaft (inches)	Depth of Shaft (feet)	Allowable Single Shaft Capacity (kips)	
		Compressive	Uplift
30	25	20	15
	30	25	20
	35	30	30
	40	45	35
	45	75	50
	50	115	65

The factor of safety for these calculations is estimated to be 2.0, and the estimated uplift capacities include the weight of the shaft. Shafts should have a minimum diameter of 18 inches even if the actual bearing pressure is less than the design value. If multiple shafts are used for heavier loads, the individual shafts should be placed at face-to-face spacings no closer than three (3) times the shaft diameter.

Groundwater will most likely be encountered in the drilled shafts. Casing for installing drilled shafts is always a possible necessity when dealing with the unknowns inherent with subsurface conditions. It is prudent for contract documents to include this option.

Drilled Shaft Considerations:

Due to the presence of a shallow groundwater table with a hydrostatic head, consideration should be given to installing the drilled shafts using a slurry method which maintains a constant slurry level equal to or slightly above the hydrostatic water level. If the shafts can be sealed from water intrusion using casing, the slurry option may be eliminated.

It is recommended that the design and construction of drilled shafts should generally follow methods outlined in the manual titled Drilled Shafts: Construction Procedures and Design Methods (Publication No: FHWA-IF-99-025, August 1999).

We emphasize that close engineering supervision is essential during installation of the drilled shaft foundations in order to assure that construction is performed in accordance with the plans and specifications. Also, to ensure proper construction of the drilled shafts at this site, close coordination between the drilling and concreting operations is considered to be of great importance. Detailed inspection of drilled shaft construction should be made to verify that the shafts are vertical and founded in the proper bearing stratum and to verify that all loose materials have been removed prior to concrete placement.

Driven Piles:

The superstructure loads may also be supported on Class B creosote treated timber piles founded at a minimum depth of 30 feet below the existing ground surface. The following table presents preliminary allowable pile capacities.

Depth	Allowable Single Pile Capacity (kips)	
(feet)	Compressive	Uplift
30	10	5
35	15	8
40	20	10
45	50	15
50	85	25

If the above allowable timber pile loads are found to be inadequate, consideration may be given to using 12-inch square per-cast, pre-stressed concrete piles. Such piles may be selected from the following table. The factor of safety for these and the above values is 2.0.

Depth	Allowable Single Pile Capacity (kips)	
(feet)	Compressive	Uplift
30	15	10
35	25	15
40	30	20
45	40	25
50	85	35

Total settlement is estimated to be on the order of one (1) inch or less for driven piles. Differential settlements (between adjacent piles or clusters) are estimated to be on the order of ½ inch or less. In order to utilize the estimated single pile capacities above, the piles should be driven at face-to-face spacings no closer than three (3) times the pile butt diameter.

Driven Pile Considerations:

It is recommended that the installation of driven piles should generally follow methods outlined in Section 804 of the Louisiana Standard Specifications for Roads and Bridges, 2016 Edition. LaDOTD specifications may vary and clarifications may be necessary where this information conflicts with LaDOTD requirements.

Detailed inspection of driven pile construction should be made to verify that the piles are driven vertically and founded in the proper bearing stratum. The installation of all piling should be monitored by personnel familiar with the construction techniques required to install pre-cast, pre-stressed concrete piles.

Pre-drilling for the piles may be necessary to stabilize the driven piles to prevent lateral drifting of the piles prior to achieving their final depth. Pilot holes may extend to a depth no deeper than 10 feet. The piling should be driven below the depth of the pilot hole to depths shown on the final plans, but not less than the required bearing resistance shown on the plans. In any case, piling should not be driven beyond the point where the blow count exceeds 30 blows per foot for timber piles and 250 blows per foot for concrete piles. If damage to the pile is apparent, driving should cease.

All pile driving should be performed with power hammers. Approval of the contractor's pile driving equipment should be based on the wave equation analysis computer program FHWA-WEAP87 or newer version. A wave equation analysis should be performed for each pile type and size required in the plans. Approval of the pile driving system does not relinquish the contractor's responsibility from driving the piles to the required pile tip elevation without damage. The criteria the engineer should use to evaluate the pile driving equipment from the wave equation should be the pile driving resistance. The required number of hammer blows at the required end-of-driving pile capacity should be from 36 to 146 blows per foot. The pile driving resistance at any depth above the required pile tip elevation should be achieved with a reasonable driving resistance of less than 300 blows per foot. All piles, including test pile, should be driven with the same hammer.

Test Piles:

Recommended load-carrying capacities presented in this report are estimates only and should be verified by the performance of a Dynamic Pile Testing Program utilizing a Pile Dynamic Analyzer (PDA). The Dynamic Pile Testing Program load test is also necessary to verify that the Contractor’s equipment and installation procedures can produce a pile that will perform satisfactorily, and to verify that the actual pile response to load is similar to those assumed in the analyses.

We recommend the Dynamic Pile Testing Program be performed in general accordance with Section 804 of the *Louisiana Standard Specifications for Roads and Bridges, 2016 Edition* and ASTM D4945-12. The results of the Dynamic Pile Testing Program and associated analyses should then be used to develop the criteria for production pile installation.

The Dynamic Pile Testing Program, as well as the installation of production piles, should be observed by a GTL inspector working under the direction of a Licensed Professional Geotechnical Engineer.

For production piles, the inspector's responsibility would be to confirm that each pile is installed at the design depth and to confirm that equipment is operating properly.

Seismicity:

Based on Section 1613 of the IBC-2012, a Site Class of E has been estimated for this site due to the lack of subsurface information to a depth of 100 feet. According to the USGS website for Seismic Hazard Design Parameters, the project site has a mapped 0.2 second spectral response acceleration (S_s) of 0.118 g. The project also has a mapped 1.0 second spectral response acceleration (S_l) of 0.069. The design spectral response accelerations, S_{DS} and S_{Dl}, were determined to be 0.197 g and 0.161 g, respectively.

The presence of dense sands at or below the water table results in a moderate potential for liquefaction to occur.

Secondary Design Considerations:

The following information has been assimilated after examination of numerous problems dealing with soil strata throughout Louisiana. It is presented here for implementation by others. If these features are not incorporated, then performance of the structure may be **"at-risk".**

1. Roof drainage should be **routed via pipe or a hard surface at least 5 feet from the structures.**
2. The **depth of frost penetration** in the vicinity of the project site is estimated to be approximately six inches.
3. Pavements, sidewalks, and the general ground surface should be sloped away from the structures on all sides. Water must not be allowed to pond within 5 feet of the buildings.
4. Backfill for utility lines should be compacted to at least 95 percent of the standard compaction test (ASTM D-698).
5. Surficial soils of the type encountered at this site are subject to erosion. Therefore, unpaved areas should be protected from erosion by the establishment of a good vegetation cover.
6. Clayey fill has been specified for select fill to reduce the potential migration of water beneath the proposed establishment. Drainage details must focus on routing water away from the structure. Excessive water intrusion can produce undesirable latent vertical movement.

Safety Considerations:

Prior to the commencement of construction, the owner and the contractor should make themselves aware of and become familiar with applicable local, state, and federal safety regulations, including the current Occupational Safety and Health Association (OSHA) Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing this information solely as a service to our client. Under no circumstances should the information provided herein be construed that GTL is assuming responsibility for construction site safety of the contractor's activities. Such responsibility is not being implied and should not be inferred.

Worker Safety - Excavations and Slopes:

After excavating, footings should be inspected and concrete placed as quickly as possible to avoid exposure of the footing bottoms to wetting and drying. If it is required that footing excavations be left open for more than one (1) day, they should be protected to reduce evaporation or entry of moisture. Adequate protection against sloughing of soil should be provided for workers and inspectors entering the footing excavations and undercut areas.

The contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, or federal safety regulations, e.g., OSHA Standards for Excavations, Title 29, Part 1926, successor regulations as well as other building code requirements. Such regulations are strictly enforced and, if not followed, the owner, contractor, and earthwork and utility subcontractors could be liable for substantial penalties.

Drainage:

Water should not be allowed to collect near the foundations, floor slab or pavement areas of the project either during or after construction. Undercut or excavated areas should be sloped toward a sump area to facilitate removal of any collected groundwater or surface runoff. Proper drainage should be provided by sloping the ground surface away from the structure.

Wet Weather and Soft Ground Considerations:

The soils encountered in the surficial zone at this site are expected to be relatively sensitive to disturbances caused by construction traffic when wet. The contractor should be cognizant of the importance of proper maintenance of surface drainage. Depending on weather-related ground conditions, contractor's maintenance of drainage during construction, and other factors, some difficulty may be encountered by the contractor in achieving compaction on initial lifts of fill placed on loose or soft subgrade. This will be exacerbated by wet weather, particularly if the contractor allows surface drainage to enter and pond in the excavations.

Fine-grained soils are expected to be relatively sensitive to disturbances caused by construction traffic and to changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support characteristics. In addition, fine-grained soil that becomes wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather. Earthwork activities performed during cooler; wetter months may certainly offer more difficulties than if performed during warmer, drier periods.

If construction is performed during wet conditions, work platforms may be necessary; these can be created for earthwork by mixing soil and hydrated lime, cement, or combinations of these additives. Quicklime may also be used in areas where dusting is of concern, if proper worker safety considerations are observed. *"Pumping" (unstable) subgrades are possible at this site and it is recommended that bid documents incorporate this possibility into the bid schedule*.

It is advisable to obtain unit prices in the bid schedule for remedial subgrade preparation options, should these become necessary. The following lists several subgrade preparation options; the best option will depend upon the specific soil and groundwater conditions encountered. All items should be bid "in-place, complete", on a pre-approved, as-needed basis only. Only the necessary quantity should be approved, usually as recommended (and later confirmed) by the geotechnical engineer's representative. Over-excavation presumes that the contractor must dispose of unsuitable (unusable) materials off-site. The contract documents should carefully and specifically state that such options will be allowed only when the work cannot be successfully prosecuted using ordinary or normal construction skill, efforts and equipment. (descriptive wording only; not necessarily to be used for contract language).

Over-excavation and replacement with Select Fill (Cubic Yard)

Over-excavation and replacement with clay bridging layer (drier than optimum, 18<P.I.<35 (or as otherwise approved), attainable compaction as specified by geotechnical engineer's representative (Cubic Yard)

Provide and deploy geogrid (Tensar TriAx or approved equal), cover with minimum 6-inch thick (compacted with plate compactor) layer of minimum one (1) inch durable, crushed gravel (LDOTD Item 1003.03.b Base or approved alternate). (Square Yard)

Provide and deploy light-duty non-woven drainage geotextile (Square Yard)

Provide and install subsurface ("French") drain; drain media of washed, durable one (1) inch crushed stone, 36 inch wide by 18 to 48 inch high, with minimum four (4) inch diameter perforated PVC or HDPE pipe (contractor to submit pipe manufacturer's assurance of "non-crushing" under depth of planned cover), non-woven geotextile layer across top of gravel (Cubic Yard)

Lime-stabilize upper 12 inches (compacted thickness) with minimum 40 lbs hydrated lime per square yard (Square Yard)

Construction de-watering well, including periodic pumping as required (Each, or per vertical foot from surface to bottom)

The above are suggested options; the site civil engineer should adopt these or similar, standardized bid items as deemed appropriate.

Groundwater Control:

Due to potential variations in groundwater levels, difficulty during excavation and construction of the proposed foundation is possible. Shallow groundwater was encountered at this site, and it is reasonable to anticipate that groundwater conditions may vary as noted previously. It is suggested that contract documents address the need for maintaining controls to preclude water from draining into excavations. Some dewatering through shaping of work areas to shed water, and construction of temporary ditches with sumps and pumping may be necessary to remove the loose soils and allow placement of imported select fill in a dry manner. Excavated soils intended for re-use as select fill may require special methods in order to dry the soil to a suitable moisture content prior to re-placing the soil as select fill.

Protection of Work:

Subgrade areas, base courses, and lifts of fill that have been successfully moisture conditioned, processed, and compacted in lifts to the required density, successfully proof-rolled, and approved must be protected from changes in moisture and other influences. Satisfactorily completed areas may be adversely affected by prolonged exposure to dry weather, precipitation, equipment traffic, or by excavations and uncontrolled backfilling for utilities, and other disturbances rendering such areas unsatisfactory. Such areas should be reworked prior to continuing with subsequent construction.

Geotechnical Risk:

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding sections constitutes GTL's professional estimate of those measures that are necessary

for the proposed structure to perform according to the proposed design based on the information generated and referenced during this evaluation, and GTL's experience in working with these conditions.

Limitations:

The exploration and analysis of the site conditions reported herein are considered preliminary in detail and scope and are not intended to form a basis for foundation design. The information submitted is based on the available soil information only and not on design details for the intended projects.

The findings, recommendations or professional advice contained herein have been made after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology. No other warranties are implied or expressed.

The scope of services did not include any environmental assessment for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors, colors, or unusual or suspicious items or conditions are strictly for the information of the client. Prior to purchase or development of this site, an environmental assessment is advisable.

The scope of services did not include a geologic investigation to address any faults, large scale subsidence, or other macro geologic features not specifically addressed in this report or the agreement between GTL and the client.

After plans are more complete, it is recommended that the soils and foundation engineer be retained to provided a subsurface investigation tailored to meet the specific needs of the project.

This report has been prepared for the exclusive use of our client for the general application for the referenced project. GTL cannot be responsible for interpretations, opinions, or recommendations made by others based on the data contained in this report.

This report was prepared for general purposes only and should not be considered sufficient for purposes of preparing accurate plans for construction. Contractors reviewing this report are advised that the discussions and recommendations contained herein were provided exclusively to and for use by the project owner.

END OF REPORT TEXT

SEE FOLLOWING APPENDIX w/BORING LOGS & TEST RESULTS

APPENDIX A

FIELD AND LABORATORY PROCEDURES

Field and Laboratory Procedures
Vidalia Industrial Park and Port Complex
Vidalia, Concordia Parish, Louisiana Report
Number 04-20-054

I. Field Operations:

Subsurface conditions were evaluated by advancing three (3) intermittent sample borings on April 8 & 9, 2020 within the project area. Boring locations were selected by the Client, and staked in the field by representatives of Geotechnical Testing Laboratory, Inc. An illustration of the approximate boring locations with respect to the areas investigated is provided on the Plan of Borings in this report. Descriptive terms and symbols used on the logs are in accordance with the Unified Soil Classification System.

A truck-mounted all-terrain rotary drill rig was used to make the test borings. Each boring was advanced in the dry using flight auger drilling techniques. Intermittent undisturbed samples were obtained in the following manner.

Standard penetration tests were performed in accordance with ASTM D-1586 procedures. This test is conducted by recording the number of blows required for a 140-pound hammer falling 30 inches to drive a split-spoon sampler eighteen inches into the substrata. Depths at which split-spoon samples were taken are indicated by two crossed lines in the "Samples" column on the Log of Boring. The number of blows required to drive the sampler for each 6-inch increment were recorded. The penetration resistance is the number of blows required to drive the split-spoon sampler the final 12-inches of penetration. Information related to the penetration resistance is presented under the "Field Data" heading of the Log of Boring as the Standard Penetration (Blows/Foot). These samples were visually examined, logged, and packaged for transport to our laboratory.

Cohesive strata were sampled in accordance with ASTM D-1587 procedures by means of pushing a thin walled Shelby tube a distance of two feet into the substrata. Consistency of the sample was measured in the field by means of a calibrated hand penetrometer. Such values, in tons per square foot, are provided under the "Field Data" heading on the Log of Boring. Depths which these undisturbed samples were obtained are indicated by a shaded portion in the "Samples" column of the Log of Boring. All samples were prudently extruded in the field were sealed to maintain "in-situ" conditions, labeled, and packaged for transport to our laboratory.

The presence of ground water was monitored during drilling operations. Initial water seepage readings are provided under "Groundwater Information" in the right hand column of the Log of Boring. Upon boring completion, water levels were allowed to rise and stabilize for several minutes prior to final water readings. These readings are found under “Groundwater Information”. Soil sloughing from the walls of the boring are also recorded here as depth of cave-in.

II. Laboratory Studies:

Upon return to the laboratory, all samples were visually examined and representative samples were selected for testing. Tests were performed on selected samples recovered from the test borings to verify classification and to determine pertinent engineering properties of the substrata. Individual test and ASTM designations are provided below:

Test	ASTM Designations
Atterberg Limits	ASTM D4318
Moisture Content	ASTM D2216
Percent Minus #200	ASTM D1140
Unconfined Compression (Soil)	ASTM D2166

Results for soil classifications are located on the Log of Boring in their respective columns under "Laboratory Data."

Samples obtained during our field studies and not consumed by laboratory testing procedures will be retained free of charge for a period of 30 days. Arrangements for storage beyond that period of time must be made in writing to ***Geotechnical Testing Laboratory, Inc.***

APPENDIX B

PLAN OF BORINGS

PLAN OF BORINGS

PROJECT

Vidalia Industrial Park and Port Complex, Vidalia, Concordia Parish, Louisiana

SCALE	DATE	FILENAME	
Not to Scale	3/27/2020	04-20-055	***Bryant Hammett & Associates, LLC***

N

APPENDIX C

BORING LOGS AND SOIL CLASSIFICATION CHART

LOG OF BORING B-1

Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Bryant Hammett & Associates, LLC**
PROJECT: **Vidalia Industrial Park and Port Complex**
LOCATION: **Vidalia, Concordia Parish, Louisiana**
FILE NO.: **04-20-055**
DRILL DATE: **4/8/20**

DRILLING METHOD(S): **Diedrich D-50, Rotary Wash**

DRILLER: **R. Leggett** CHECKED BY: **K. Gorsha**

GROUNDWATER INFORMATION:
Water Seepage Noted @ 13.0 Feet While Drilling
Water Level @ 1.0 Foot After 2 Hours
Boring Walls Collapsed @ 42.0 Feet

SURFACE ELEVATION: **Not Determined**

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PL	ATTERBERG LIMITS PI	MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DESCRIPTION OF STRATUM
			N = 6	32	69	25	44	98			Firm Gray & Brown FAT CLAY (CH)
			P = 1.25	37					78	1918	
	5		P = 1.25	29	65	25	40	99	88	2268	- stiff @ 5.0 feet
			P = 1.50	30					87	2222	
	10										
			P = 1.25	34	57	23	34	98	83	2152	
	15										
			P = 0.75	33					84	1099	- firm @ 19.0 feet
	20										22.0'
			N = 8	34							Stiff Gray & Brown LEAN CLAY (CL)
	25										
			N = 8	31	35	19	16	96			
	30										
			N = 7	37							- firm @ 34.0 feet
	35										
			N = 9	36	42	20	22	97			- stiff @ 39.0 feet
	40										43.0'
			N = 7	35							Loose Gray & Brown Sandy SILT (ML)s
	45										
			N = 5	35	NP	NP	NP	69			50.0'
	50										Boring Terminated @ 50.0 Feet

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE

NOTES:
See Plan of Borings for Location
Approx. GPS Coordinates: 31° 32' 57.71" N / 91° 29' 30.67" W
Stratification And Groundwater Depths Are Not Exact

LOG OF BORING B-2

Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Bryant Hammett & Associates, LLC**
PROJECT: **Vidalia Industrial Park and Port Complex**
LOCATION: **Vidalia, Concordia Parish, Louisiana**
FILE NO.: **04-20-055**
DRILL DATE: **4/8/20**

DRILLING METHOD(S): **Diedrich D-50, Rotary Wash**

DRILLER: **R. Leggett** CHECKED BY: **K. Gorsha**

GROUNDWATER INFORMATION:
Water Seepage Noted @ 12.5 Feet While Drilling
Water Level @ 1.0 Feet After 2 Hours
Boring Walls Collapsed @ 30.0 Feet

SURFACE ELEVATION: **Not Determined**

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PL	ATTERBERG LIMITS PI	MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DESCRIPTION OF STRATUM
			N = 7	39							Firm Gray & Brown FAT CLAY (CH)
			P = 1.50	34	76	26	50	99	83	2619	- very stiff @ 3.0 feet
	5		P = 1.00	28					86	1356	- firm @ 5.0 feet
			P = 1.50	30					86	2268	- stiff @ 7.0 feet
			P = 1.25	29	58	25	33	99	88	2455	
	10										
			P = 1.25	38					81	2242	
	15										
			P = 0.75	38	57	24	33	98	79	1540	- firm @ 19.0 feet
	20										
			N = 5	44							
	25										27.0'
			N = 5	37							Firm Gray & Brown LEAN to FAT CLAY (CL-CH)
	30										
			N = 9	47	50	23	27	95			- stiff below 34.0 feet
	35										
			N = 10	41							
	40										42.0'
			N = 31	26	NP	NP	NP	17			Dense Gray & Brown Silty SAND (SM)
	45										
			N = 21	31							- medium dense @ 49.0 feet
	50										50.0'
											Boring Terminated @ 50.0 Feet

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE

NOTES:
See Plan of Borings for Location
Approx. GPS Coordinates: 31° 33' 21.82" N / 91° 29' 50.19" W
Stratification And Groundwater Depths Are Not Exact

LOG OF BORING B-3

Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Bryant Hammett & Associates, LLC**
PROJECT: **Vidalia Industrial Park and Port Complex**
LOCATION: **Vidalia, Concordia Parish, Louisiana**
FILE NO.: **04-20-055**
DRILL DATE: **4/8/20**

DRILLING METHOD(S):
Diedrich D-50, Rotary Wash

DRILLER: **R. Leggett** CHECKED BY: **K. Gorsha**

GROUNDWATER INFORMATION:
Water Seepage Noted @ 13.5 Feet While Drilling
Water Level @ 13.0 Feet Upon Completion
Boring Walls Collapsed @ 60.0 Feet

SURFACE ELEVATION: **Not Determined**

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PL	ATTERBERG LIMITS PI	MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DESCRIPTION OF STRATUM
			N = 8	36	76	25	51	99			Stiff Gray & Brown FAT CLAY (CH)
			P = 0.25	44					72	748	- soft @ 3.0 feet
	5		P = 0.75	31					85	1286	- firm @ 5.0 feet
			P = 1.25	30	56	22	34	98	87	2339	- stiff @ 7.0 feet
			P = 0.50	32					84	982	- soft @ 9.0 feet
	10										
			P = 1.00	27					88	2011	- stiff @ 14.0 feet
	15										
			P = 0.25	40					78	678	- soft @ 19.0 feet
	20										21.0'
			P = 0.25	32	52	22	30	98	83	655	Soft Gray & Brown LEAN to FAT CLAY (CL-CH)
	25										
			P = 0.75	33					83	1310	- firm @ 29.0 feet
	30										
			N = 6	26	46	21	25	96			
	35										
			N = 9	39							- stiff @ 39.0 feet
	40										
			N = 19	49							- very stiff w/silty sand (SM) layer @ 49.0 feet
	45										48.0'
			N = 30	22	NP	NP	NP	17			Dense Gray Silty SAND (SM)
	50										
			N = 30	23							
	55										
			N = 31	23							
	60										

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE

NOTES:
See Plan of Borings for Location
Approx. GPS Coordinates: 31° 33' 11.69" N / 91° 29' 42.30" W
Stratification And Groundwater Depths Are Not Exact

GTL LOG - LOG A GNNL01.GDT - 4/13/20 09:18 - K:\GINT PROJECTS\2020 JOBS\04-20-055.GPJ

LOG OF BORING B-3

Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Bryant Hammett & Associates, LLC**
PROJECT: **Vidalia Industrial Park and Port Complex**
LOCATION: **Vidalia, Concordia Parish, Louisiana**
FILE NO.: **04-20-055**
DRILL DATE: **4/8/20**

DRILLING METHOD(S):
Diedrich D-50, Rotary Wash

DRILLER: **R. Leggett** CHECKED BY: **K. Gorsha**

GROUNDWATER INFORMATION:
Water Seepage Noted @ 13.5 Feet While Drilling
Water Level @ 13.0 Feet Upon Completion
Boring Walls Collapsed @ 60.0 Feet

SURFACE ELEVATION: **Not Determined**

FIELD DATA			LABORATORY DATA							
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)
	65	☒	N = 25	23	NP	NP	NP	5		
	70	☒	N = 30	25						
	75	☒	N = 26	24						
	80	☒	N = 21	28	NP	NP	NP	6		
	85	☒	N = 33	24						
	90	☒	N = 44	23						
	95	☒	N = 40	22	NP	NP	NP	4		
	100	☒	N = 47	20						

DESCRIPTION OF STRATUM

Dense Gray Silty SAND (SM) *(continued)*

62.0'

Medium Dense Gray, Poorly Graded, SAND (SP)

- dense @ 69.0 feet

- medium dense @ 74.0'

- dense below 84.0 feet

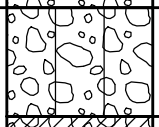
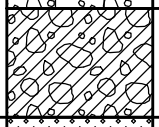
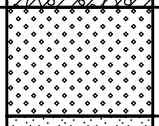
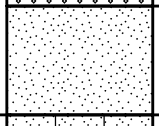
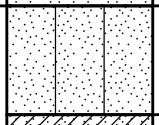
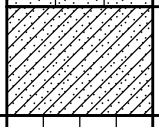
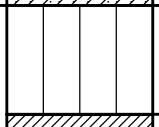
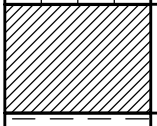
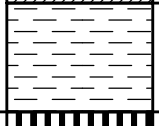
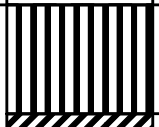
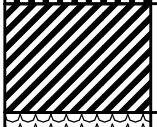
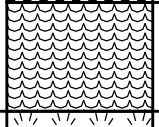
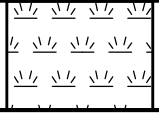
100.0'

Boring Terminated @ 100.0 Feet

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE

NOTES:
See Plan of Borings for Location
Approx. GPS Coordinates: 31° 33' 11.69" N / 91° 29' 42.30" W
Stratification And Groundwater Depths Are Not Exact

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS