BURNS COOLEY DENNIS, INC.

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November 22, 2024

Neel-Schaffer, Inc.
3036 Longfellow Drive
Bay St. Louis, Mississippi 39520

Report No. 240528B

Attention: Alex Davis, P.E.

Geotechnical Investigation
KHSA Site 10 Warehouse
Stennis International Airport
Kiln, Mississippi

Gentlemen:

Submitted here are the results of the geotechnical investigation for the above-captioned project. This investigation was authorized through Task Order No. 13 to the Neel-Schaffer, Inc. contract with Burns Cooley Dennis, Inc., and was performed in general accordance with our Proposal No. 24001P-116 dated April 12, 2024. Subsurface soils encountered in the exploratory borings indicate that shallow and grade-supported foundations are appropriate for the planned building providing proper earthwork methods are employed. Recommendations for the KHSA Site 04 Corporate Hangar are presented in a separate report.

We appreciate the opportunity to be of service. If you should have any questions concerning this report, please do not hesitate to call us.

Very truly yours,

BURNS COOLEY DENNIS, INC.

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1.0 INTRODUCTION AND PURPOSES

1.1 Project Description

Burns Cooley Dennis, Inc. (BCD) understands that a Corporate Hangar and a Warehouse will be constructed for the Hancock County Port & Harbor Commission (HCPHC) at Stennis International Airport in Hancock County, Mississippi. The Corporate Hangar (which is identified as KHSA Site 04) will be constructed on a 1.4-acre tract located west of Fred and Al Key Road between the Packaging Hangar and Hangar 3 of the Terminal. The results of our investigation for KHSA Site 04 are presented in our Report No. 240528A.

The Warehouse (which is identified as KHSA Site 10) will be constructed on a 2-acre tract located on the east side of Fred and Al Key Road north of the HCPHC Administration Building. John C. Robinson Road is immediately north of the Warehouse site. The approximate site location is shown on Figure 1.

The exact location within the site that the Warehouse will be situated is not yet known. Current plans are for the Warehouse to have a footprint area of about 20,000 sq ft. We understand that the building will be supported on shallow foundations as other buildings at the airport are supported. For the purposes of this proposal, we understand that the building will be fairly lightly loaded with maximum column loads of 125 kips and maximum wall loads of 4 kips per ft. We also assume that no more than 2 ft of grade increase or decrease will be required to achieve finish grades for the building.

The areas around the Warehouse will be paved with either asphalt or concrete. The parking lot and drive areas will encompass most of the rest of the 2-acre site. We anticipate that traffic on the pavement will consist mainly of light vehicles such as automobiles and pickup trucks. The site where the Warehouse and associated parking and drive areas will be constructed was recently cleared of trees and brush.

1.2 Purposes

The specific purposes of this investigation were:

1) to explore subsurface soil conditions by means of borings at locations within the areas to be occupied by the building and pavements;

2) to determine pertinent physical properties of the soils encountered by means of laboratory tests performed on selected representative samples; and

3) after analysis of all field and laboratory data, to provide recommendations for site preparation, earthwork construction and foundation design and construction, and guideline recommendations for pavements.

Environmental study, detailed slope and trench stability, retaining wall evaluation, groundwater dewatering, structure foundation design, detailed pavement design, review of plans and specifications, and construction phase services are not a part of the current scope of study.

2.0 FIELD INVESTIGATION

2.1 General

Subsurface soil conditions within the proposed building and pavement areas were explored by means of ten (10) borings. The borings were made with a tractor-mounted drill rig. Borings 5 through 9 were each made to a depth of 20 ft for the Warehouse building. Borings 10 through 14 were each made to a depth of 6 ft for the pavements. Borings 1 through 4 were made for the KHSA Site 04 Corporate Hangar and are presented in our Report No. 240258A. The borings were located and marked in the field by BCD representatives within the middle area of the site where we anticipate that construction is likely. The approximate locations of the borings are illustrated on Figure 1 of this report. Ground surface elevations were not determined as part of our scope.

All soils were classified in general accordance with the Unified Soil Classification System. A legend is shown on Figure 2 which presents a summary of the Unified Soil Classification System and also the symbols and terminology typically utilized on the graphic logs. Graphical logs of the borings indicating the types of soils encountered and stratification at each location explored are shown on Figures 3 through 12. Approximate GPS coordinates for each boring location as determined by our drilling personnel using a hand-held device are shown at the bottom of each graphical boring log within the “Comments” section.

2.2 Drilling Methods and Groundwater Observations

The borings were advanced full depth by dry augering. Observations were made continuously during auger drilling in an attempt to detect groundwater seepage emerging into the open boreholes. Notes pertaining to observed groundwater conditions are indicated in the lower right corner of the graphic logs.

2.3 Sampling Methods

Relatively undisturbed samples of the soils were obtained in Borings 5 through 9 made for the building by pushing a 3-in. OD Shelby tube sampler approximately 2 ft into the soil. The Shelby tube samples were obtained within the depth intervals illustrated as shaded portions of the "Samples" column of the graphic boring logs. Disturbed samples of soil were also obtained in Borings 5 through 9 by driving a standard 2-in. OD split-spoon sampler 18 in. into the soil with a 140-lb hammer falling freely a distance of 30 in. The depths at which the split-spoon samples were taken are indicated by crossed-slashed symbols under the "Samples" column of the graphic logs for Borings 5 through 9. An automatic hammer was used for SPT testing. The number of blows required to drive the split-spoon sampler each 6-in. increment (total of 18 in. of penetration) is recorded under the "Field Test Data/Poc. Pen. (tsf)" column of the graphic logs. The standard penetration test (SPT) blow count required to penetrate the last foot (sum of the second and third blow count values) is considered the N_{60} value and is plotted as a small circled "x" in the data section of the graphic logs after applying a correction factor for hammer energy. The Shelby tube and split-spoon samples were obtained at approximate 3-ft to 5-ft intervals of depth in the borings.

Disturbed auger cutting samples were obtained at approximate 1-ft to 3-ft depth intervals in Borings 10 through 14 made for pavements. Disturbed auger cutting samples were also taken near the ground surface in the borings made for the building. The depths at which the auger cutting samples were taken are illustrated as small I-shaped symbols under the "Samples" column of the graphic boring logs.

2.4 Field Classifications, Sample Preservation, and Borehole Completion

All soils encountered during drilling were examined and classified in the field by a geotechnical engineering technician. The undisturbed Shelby tube samples were extruded from the sampling tubes in the field. An approximate 6-in. long portion of each Shelby tube sample was sealed with melted paraffin in a cylindrical cardboard container to prevent moisture loss and structural disturbance. An additional portion of each Shelby tube sample, representative portions of the split-spoon samples, and the auger cutting samples were sealed in jars to provide material for visual examination and testing in the laboratory. Unless other disposition is requested, we routinely discard soil samples after about six months of storage. The boreholes were filled with soil cuttings after completion of drilling and sampling.

3.0 LABORATORY INVESTIGATION

3.1 General

An evaluation of the strength, compressibility, classification, and expansive properties of the subsurface soils encountered in the borings was considered to be of primary importance for this investigation. These properties were evaluated by visual examination and from the results of compressive strength and routine laboratory index tests described in the following paragraphs. The strength and compressibility characteristics of the soils encountered in the borings were estimated by means of field classifications of consistency, standard penetration tests, pocket penetrometer tests, and also from results of laboratory compression tests.

3.2 Strength Properties

The strength characteristics of the fine-grained soils encountered in the borings were investigated by means of unconfined compression tests performed on selected Shelby tube samples. The results of unconfined compression tests are plotted as small open circles in the data section of the graphic logs. The water content and dry density were also determined for each compression test specimen. The actual consistency assigned on the boring logs also considers other data including physical examination of the sample. The water contents are plotted as small shaded circles in the data section of the logs. The dry densities are tabulated to the nearest lb per cu ft under the "Dry Density" column of the logs.

3.3 Classification Tests

The classification and expansive properties of the soils encountered were investigated by means of visual examination and Atterberg liquid and plastic limit tests. The numerical difference between the liquid and plastic limits is defined as the plasticity index (PI). The magnitude of the plasticity index and the proximity of the natural water content to the plastic limit are indicators of the potential for a clay to shrink or swell upon changes in moisture content or to consolidate under loading. The magnitude of the plastic limit is an indicator of the optimum moisture content for compaction, and the proximity of the natural water content to the plastic limit is an indicator of the strength. The results of the liquid and plastic limit tests are plotted as small crosses interconnected by dashed lines in the data section of the logs.

To assist in classifying soils which include sand, tests were performed to determine the percent fines passing the No. 200 sieve. The percentage of fines resulting from each test is tabulated at the appropriate depth under the far-right column of the graphic logs.

3.4 Water Content Tests

Water content tests were performed on samples to corroborate field classifications and to extend the usefulness of the plasticity data. The results of the water content tests are plotted as small shaded circles in the data section of the graphic boring logs. The water content data have been interconnected on the logs to illustrate a continuous profile with depth.

4.0 GENERAL SOIL CONDITIONS

4.1 General

A general description of subsurface soil and groundwater conditions encountered in the borings made for this investigation is provided in the following subsections. The graphical logs of the borings shown on Figures 3 through 12 should be referred to for the specific soil conditions encountered at each location explored. Stick logs of the borings are shown in profile on Figure 13 to aid in visualizing subsurface soil conditions. Tabulated adjacent to the stick logs are water contents, Atterberg liquid and plastic limits, dry densities, SPT blow counts, and cohesions.

4.2 Soil Stratification

The generalized soil conditions encountered in our borings are as follows:

STRATUM	TYPICAL BOTTOM DEPTH	MATERIAL DESCRIPTION	DENSITY/ CONSISTENCY
1	1 ft to 4 ft	Sandy Silts (ML) and Silts (ML)	Loose to Medium Dense
2	6 ft (Termination Depth of B-10 through B-14	Silty Clays (CL) and Sandy Clays (CL)	Soft to Very Stiff
3	20 ft (Termination Depth of B-5 through B-9)	Clays (CH)	Medium Stiff to Very Stiff

Although not tabulated above, stiff sandy clays (CL) were encountered below a depth of 17 ft in Boring 6 and loose silty sands (SM) were encountered below a depth of 18 ft in Boring 7. The sandy clays (CL) and silty sands (SM) were found to extend to the termination depth of Borings 6 and 7.

The silty clays (CL) were found to be soft from a depth of 2 ft to 4 ft in Boring 6. Sandy clays (CL) encountered from the ground surface to a depth of 4 ft in Boring 8 and from a depth of 2 ft to the termination depth of B-11 were found to be medium stiff. The soft and medium stiff soils are considered to have low to low-moderate strength and moderate-high to high compressibility.

The silts (ML) were found to be loose from the ground surface to a depth of 4 ft in Borings 7 and 9 made for the building and from the ground surface to a depth of 2 ft in Boring 12 made for the pavements. The loose silts (ML) are considered to have low-moderate strength and moderate-high potential for elastic settlement.

The remaining silts (ML) are considered to have moderate strength and moderate potential for elastic settlement. The remaining clays (CL and CH) are considered to have moderate to high strength and moderate to low compressibility.

The silts (ML), silty clays (CL), sandy clays (CL), and sands (SM) are considered to have low or no shrink/swell potential. The clays (CH) are considered to be expansive with high shrink/swell potential.

4.3 Groundwater Observations

As indicated previously, observations were made continuously during auger drilling to detect groundwater seepage entering the open boreholes. Free water was initially encountered in Borings 7 and 8 at a depth of 18 ft. Free water was observed in Borings 7 and 8 at those same depths after 15 minutes. Free water was not encountered in the remaining borings during auger drilling. It should be recognized that the groundwater levels at this site are influenced by rainfall, water levels in the nearby ditches, creeks, ponds or other bodies of water, local drainage conditions, and other environmental factors. Groundwater conditions at the site can also be influenced by man-made changes. Surficial soils can become saturated and weak to relatively shallow depths during periods of prolonged and heavy rainfall. Surface water may become perched within the surficial sandy silts (ML) upon the underlying less permeable silty clays (CL) and sandy clays (CL).

5.0 DISCUSSION

The soils encountered in our borings are generally stable. However, the presence of some weaker, less stable soils encountered directly beneath the ground surface or at shallow depths will have to be addressed during site preparation and foundation construction. The weaker, less stable soils encountered near the ground surface in our borings are as follows:

- In the building area:
    - loose sandy silts (ML) encountered from the ground surface to a depth of 4 ft in Borings 7 and 9; and
    - soft and medium stiff silty clays (CL) and sandy clays (CL) encountered from a depth of 2 ft to a depth of 4 ft in Boring 6 and from the ground surface to a depth of 4 ft in Boring 8.
- In pavement areas:
    - loose sandy silts (ML) encountered from the ground surface to a depth of 2 ft in Boring 12; and
    - medium stiff sandy clays (CL) encountered from a depth of 2 ft to the 6 ft termination depth of Boring 14.

Where the unstable soils are exposed at the surface in building and pavement areas, and at the depth of the foundations in the building area, the presence of these unstable soils will have to be addressed through removal and replacement with select fill materials or chemical treatment during site preparation.

Expansive clays (CH), such as those encountered below depths of 4 ft to 8 ft in each building boring and below a depth of 4.5 ft in pavement Boring 11, will tend to shrink during dry conditions and swell during wet conditions. The expansive clays (CH) can experience significant shrink/swell movements associated with seasonal moisture content fluctuations. Cover materials overlying expansive clay (CH) soils act as a buffer against seasonal moisture content changes caused by rainy weather, droughts and evapotranspiration. Thus, the potential magnitude of moisture content changes and associated shrink/swell movements within expansive clay (CH) soils is proportionate to the thickness of overlying cover materials. Seasonal moisture content changes and shrink/swell movements within expansive clay (CH) soils decrease as the thickness of cover materials increases. There is a general trend for expansive clay (CH) soils under structures to swell due to an increase in water content caused by capillary and vapor phase movement of moisture within the clays (CH). Expansive clay (CH) soils will also experience considerable swelling if directly supplied with water from rainfall, sprinkler systems, broken underground water and sewer pipes, or any other source. Trees growing adjacent to a structure can extract a considerable amount of moisture from the ground resulting in localized shrinkage of expansive clay (CH) soils accompanied by vertical and lateral movements.

Providing site grades are not reduced below the current elevations, a 4-ft buffer of nonexpansive cover soils will be provided naturally by the existing site soils and any select fill materials that are used to replace unstable soils. We do not consider that the presence of the expansive clays (CH) will adversely affect foundation or pavement performance due to their depth of confinement below the ground surface.

A foundation for the Site 10 Warehouse Building should be utilized which will accommodate the anticipated fill and structural loads and also minimize future differential vertical movements resulting from settlement due to soil consolidation/compression under fill and structural loads. For the soil conditions revealed by the borings, it is our opinion that a shallow foundations system could be used for support of the structure provided: 1) column loads are less than 125 kips and wall loads do not exceed 4 kips per ft; 2) site grades will not be increased by more than 2 or 3 ft and site grades will not be reduced, and 3) our recommendations for site preparation and earthwork construction are implemented.

Details of our recommendations for site preparation, earthwork construction, and for the design and construction of the recommended foundation systems are included in the following subsections. Guideline recommendations for pavement design and construction are also provided.

6.0 RECOMMENDATIONS

6.1 Site Preparation and Earthwork Construction

6.1.1 General. Unless otherwise noted, our recommendations for earthwork construction are the same for the Site 10 Warehouse building and pavement areas. As an initial step of site preparation within the planned construction areas, any stumps and root systems that remain should be removed. Stripping should then be performed throughout the construction areas to remove organic-laden surficial soils, vegetation, debris, brush and roots and the stability of the exposed soils should be evaluated by proofrolling the building and pavement areas where practical. As previously mentioned, the loose sandy silts (ML) and soft and medium stiff silty clays (CL) and sandy clays (CL) encountered at the ground surface or below a depth of about 2 ft were found to be relatively weak at the time of our investigation. Overexcavation to expose stable soils and replacement of unstable soils with compacted select fill material will likely be necessary if the soil conditions do not improve through drying prior to construction. In general, excavation should extend to a sufficient depth to expose soils that will support compaction with stability.

The actual vertical and lateral extent of excavation required to remove weak or unstable soils must be determined in the field during earthwork construction. Excavation of any weak soils should extend laterally not less than 5 ft beyond the edges of the building and 2 ft beyond the edges of pavements. In order to minimize the amount of excavation, we recommend that a representative of Burns Cooley Dennis, Inc. be present to observe excavation operations and assist in evaluating the depth and lateral extent of excavation required.

Excavations made to remove unstable soils and tree root systems should be backfilled with select fill materials in accordance with recommendations provided in a subsequent paragraph. Excavated soils that meet the requirements of select fill may be stockpiled for later use as backfill.

The actual moisture content conditions at the time of construction will be influenced by the rainfall preceding and during construction and also by the drying conditions during construction. Therefore, we recommend that the work be performed during a dry season of the year if the schedule permits.

6.1.2 Groundwater Seepage Control. Free water was encountered at a depth of 18 ft in two of the borings made for our investigation. It should be noted that surface water is likely to become perched within the silts (ML) upon the underlying less permeable clays (CL) encountered at depths of 1 ft to 4 ft below grade. Depending on the season when earthwork is performed, groundwater may be encountered during excavation. The means and methods for intercepting, collecting and removing groundwater entering excavations should be the sole responsibility of the earthwork contractor.

6.1.3 Subgrade Preparation. Prior to the placement of any fill materials, the soils exposed after stripping and excavation should be scarified to a minimum depth of 6 in. and compacted to not less than **<u>95</u> percent** of standard Proctor maximum dry density (ASTM D 698) with stability present. Alternatively, the exposed soils could be proofrolled with loaded dump trucks to demonstrate stability. Stability is defined as the absence of significant pumping, rutting or yielding of soils during compaction or proofrolling.

If stability is not evident in some areas, either additional excavation or treatment of the in-situ soils with an admixture, or a combination of these approaches, might be required to achieve stable conditions. The upper 8 in. of soil directly beneath the pavement can be treated with lime as discussed subsequently in Section 6.6.

The effort required to mitigate unstable soils will be influenced by the season of the year when earthwork is performed. The subsurface soils would likely be drier during the hot late summer and could weaken during heavy rainfall events. We recommend that earthwork be performed during a dry summer or fall season, if the schedule permits. <u>It should be recognized that soils which are</u>

demonstrated to be adequately stable during stripping and excavation can become unstable if they are disturbed by construction traffic or if they are exposed to rainfall prior to filling.

Even though the soil boring information indicates generally stable soil at the time of drilling, we recommend the owner be advised to consider a unit pay item for undercut and backfill of unstable or poor quality soil, and include a contingency for unstable soils when determining site preparation and earthwork costs. An undercut of up to 4 ft may be required in the area represented by Borings 6 and 8 made for the building.

The construction techniques, types of equipment utilized and site drainage provided during construction will have a great effect on the performance of the exposed soils. The routing of heavy, rubber-tired equipment should be controlled to minimize, as much as possible, traffic in the construction areas. All traffic should be discouraged during periods of inclement weather. If pumping is initiated in the soils, as a construction expedient the pumping can be counteracted by treating these materials with lime. It is estimated that about 4 to 6 percent lime by dry weight of soil could be required.

6.1.4 Delays. If there is some delay between completion of earthwork operations and placement of the new fill, deterioration of subgrade conditions may occur. Thus, we recommend that the density and stability of the subgrade soils be confirmed or re-established immediately prior to construction of structure footings and slab.

6.2 Fill Materials and Placement

6.2.1 Select Fill. After stripping, undercutting, and visual evaluation or compaction/ densification have been performed as recommended in the preceding paragraphs, fill materials can be placed to achieve planned grades. Imported fill materials should consist of select nonorganic and debris-free silty clays (CL) or sandy clays (CL) having a liquid limit less than 45 and a plasticity index (PI) within the range of 10 to 24, or clayey sands (SC) with a PI in the range of 7 to 15 and a liquid limit less than 35. Existing silty clays (CL) and sandy clays (CL) excavated during site preparation can be used as select fill, provided they are free of organic matter and other deleterious materials, they meet the classification requirements for imported select fill, and they are not too wet or dry and can be processed to achieve a moisture content within 3 percentage points of the optimum water content. The existing silts (ML) encountered directly beneath the ground surface will be especially susceptible to instability when wet and should only be reused as select fill if the contractor understands that the soils will be very difficult to compact when wet. Soils containing organic matter and other deleterious materials should be placed outside the limits of the proposed building and pavement areas.

6.2.2 Fill Placement. The fill materials should be compacted from lifts not exceeding 9 in. in loose thickness to not less than **95 percent** of standard Proctor (ASTM D 698) maximum dry density with stability present. Fill materials should be placed in horizontal lifts at moisture contents within 3 percentage points of the optimum water content. Stability must be evident during compaction of each lift before any subsequent lifts of fill material are added. All backfill over utilities, storm drains, etc., should be placed in accordance with the preceding recommendations, except the lift thickness should be reduced to about 4 in. where hand-operated compaction equipment is used.

Finished site grades should be sloped to promote quick runoff of storm water and provide positive drainage away from the building on all sides. Fill materials should extend laterally not less than 5 ft beyond the perimeter of the building and not less than 2 ft beyond pavement edges and then slope down to natural ground at an inclination not steeper than 3H:1V. Finished site grades should be sloped to promote quick runoff of storm water and provide positive drainage away from the building and across the pavement areas.

Increased moisture contents resulting from rainfall can substantially reduce the strength of the on-site and proposed fill soils. We recommend that proper surface drainage be provided throughout the site to prevent surface water from percolating into the subsurface soils.

6.2.3 Laboratory and Field Testing. Laboratory classification tests, including Atterberg limit determinations and grain-size analyses, should be performed on the fill soils initially and routinely during earthwork operations to check for compliance with the recommendations provided herein. Field moisture/density tests should be performed frequently in the compacted on-site soils and in each compacted lift of fill material to assist in evaluating whether the recommended moisture contents and dry densities are being achieved. As a guide for earthwork construction, we suggest a minimum of one test per lift per 2,500 sq ft of surface area within the building area and a minimum of one test per lift per 5,000 sq ft of surface area within pavement areas.

6.3 Foundation Design

6.3.1 General. In conjunction with the recommended earthwork construction, it is our opinion that the planned building can be supported on a shallow foundation system with the floor slab cast on grade provided the structure is not heavily loaded. The allowable capacities provided are for column loads no greater than 125 kips and continuous loads no greater than 4 kips per ft.

6.3.2 Foundation and Slab Design. The foundations for the Site 10 Warehouse building can consist of strip footings supporting wall loads, spot footings supporting column loads, and a separate slab on-grade. Spot footings and exterior strip footings should be brought to bear at a depth of not less than 24 in. below finished outside grades adjacent to the building or the bottom of the floor slab, whichever is lower. Interior grade beams or strip footings should extend to a depth of not less than 18 in. below the bottom of the floor slab. The grade beams or strip footings should be proportioned for critical combinations of dead, live, and wind loads using a net allowable soil bearing pressure of 2,000 lbs per sq ft. We recommend a minimum base width of 18 in. for the grade beams or strip footings. Square or spot footings with widths of 24 in. or greater should be designed assuming a net allowable soil bearing pressure of 2,500 lbs per sq ft when total dead plus live loads are applied. These net allowable bearing pressures include an appropriate factor of safety with respect to soil shear strength.

Spot footings can be connected with grade beams if needed to better accommodate structural loadings. Footings can be designed for lateral loading considering an allowable passive equivalent fluid unit weight of 200 lbs per cu ft per ft and a sliding resistance coefficient against the base of 0.4, where lateral loads against the structure are not accommodated in uplift and compression.

The uplift capacity of each footing should be computed as the weight of the concrete plus the weight of the backfill immediately above the footing base. The weight of the backfill soils should be computed using a unit weight of 120 lbs per cu ft. The unit weight of the concrete should be taken as 150 lbs per cu ft. The size of the base or the bearing depth of the footing should be increased to provide an uplift capacity that will result in an adequate safety factor against uplift loads as determined by the designer.

The building floor slab can be supported by properly compacted subgrade soils or by select fill materials placed and compacted in accordance with the recommendations given previously in this report. The floor slab should be adequately reinforced for anticipated loading conditions and deflections and to minimize slab cracking. Stiffening ribs or grade beams cast monolithically with the slabs could be utilized to provide rigidity.

6.3.3 Stiffened Slab-on-Grade Foundation. The new Site 10 Warehouse building could alternatively be supported by a foundation system consisting of a slab-on-grade stiffened with perimeter grade beams, or turned-down edges, and interior grade or tie beams. Grade beams should be utilized to support all exterior walls and all interior load-bearing and partition walls, or otherwise they should be spaced in a grid pattern on not greater than about 15-ft to 20-ft centers in each direction, or as otherwise directed by the project structural engineer. Any columns should be supported by widened portions of the grade beams. We recommend that grade beams or turned-down edges around the perimeter of the building be brought to bear at a depth not less than 24 in. below finished outside grade. Interior tie or grade beams should be brought to bear at a depth not less than 18 in. below the bottom of the slab. We recommend that grade beams be proportioned for critical combinations of dead, live, and wind loads utilizing a net allowable soil bearing pressure of 2,000 lbs per sq ft. A net allowable soil bearing pressure of 2,500 lbs per sq ft should be utilized to dimension widened portions of grade beams used to support column loads. We recommend a minimum base width of 12 in. for the grade beams. The grade beams should be reinforced for both positive and negative bending. The floor slab should be reinforced for anticipated loading conditions and deflections and to minimize slab cracking. We recommend that the slab be reinforced with a grid of relatively closely spaced reinforcing bars in lieu of welded wire fabric.

6.3.4 Potential Movement. We estimate that total settlements under compressive structural loads will be on the order of 1 in. Differential settlements between adjacent footings may be on the order of 3/4 in. Differential settlements are not expected to be more than 3/4 in. over a horizontal distance of 25 ft or 30 ft.

Differential vertical movements of the foundation resulting from potential long-term volumetric changes within the expansive clays (CH) cannot be predicted with any degree of accuracy; however, if proper drainage is maintained and no other unexpected sources of water develop, they are estimated to be within normally tolerable structural limits. The potential long-term differential movements due to normal seasonal fluctuations in water content within the clays (CH) are generally expected to be on the order of about 3/4 in. over a horizontal distance of about 25 ft to 30 ft, provided that proper drainage is maintained and any leaks that develop in pipes are promptly repaired. It should be noted that differential movements of the magnitude stated in the preceding sentence could result in minor cracking of the foundation, walls, and floor slab. The actual magnitude of the differential shrink/swell movements can be influenced by any number of events or circumstances that occur during the life of the building. For example, surface drainage conditions, broken water pipes, trees and shrubs, etc., can influence the actual shrink/swell movements which develop. <u>We emphasize that poor drainage, groundwater or other excess water in the building addition area could result in significant</u>

differential movement, up to several inches over a spacing of about 25 ft to 30 ft, and major cracking of the foundation, walls and floor slab, even with the minimum recommended buffer thickness.

6.4 Foundation Construction

All foundation excavations should be carefully inspected by a knowledgeable soil technician or engineer to verify bearing on generally strong soils. Foundation elements should be promptly poured after completion of the excavations. Drainage should be maintained away from the foundation excavations during construction. Ponded water in the foundation excavations can weaken the exposed soils. Foundation soils exposed in the bottom of the foundation excavations should be inspected prior to concrete placement. If these materials are found to be weak or loose, overexcavation and backfilling will be required to provide strong foundation soils immediately beneath the grade beams and footings.

It should be noted that foundation excavations made through on-site low plasticity silty soils could slough. The contractor should be made aware of this issue. Low plasticity silts will also be susceptible to erosion and surface protection will need to be provided. The best method for protecting the surface is plating the low plasticity soils with about 12 in. to 18 in. of silty clays (CL) or sandy clays (CL). This plating material along with some topsoil would also help facilitate growth of grass.

6.5 Other Design Considerations

If flower and shrub beds including sprinkler systems are placed adjacent to the building, the beds should be prepared such that they do not trap water, and sprinklers should be operated only enough to satisfy the water demands of the plants and shrubs. Excessive watering and ponding within the flower and shrub beds could result in downward percolation of water into the underlying foundation soils causing them to lose strength and causing expansive clays (CH) to swell. Rainwater falling on the roof of the building should be collected and prevented from reaching the ground immediately adjacent to the building. Downspouts extending from roof gutters should be equipped with extensions at ground level that are sloped to emit collected rainwater not less than 7 ft away from the building. The downspouts could be connected to solid discharge pipes buried beneath the ground. We caution that these pipes should be flexible enough to accommodate some differential movement and all pipe connections must be leak free.

Final grades around the building should provide rapid and effective drainage of rainwater and downspout water away from the building, with no areas allowed for water to pond. Underground sources of water such as leaking water lines, sewer lines, etc., should be prevented as much as possible in the initial construction, and any leaks that develop should be promptly repaired.

The site for the proposed Site 10 Warehouse Building at the Stennis International Airport in Kiln in Hancock County, Mississippi lies within a relatively low seismic activity region according to the seismic zone mapping referenced in the International Building Code. Given the site soil profile as revealed by the borings and anticipated for the area based on our experience, a site class D could be used in a seismic load evaluation.

6.6 Guideline Pavement Recommendations

In areas to be paved, there is often some delay between completion of earthwork operations and placement of the pavement structure materials, possibly resulting in deterioration of subgrade conditions. Therefore, we recommend that the density and stability of the subgrade soils be confirmed or re-established immediately prior to construction of the pavement.

In our opinion, either flexible asphalt concrete or rigid Portland cement concrete (PCC) pavement can be utilized for the parking and drive areas. Site preparation and earthwork construction should be performed for the areas to be paved in accordance with the recommendations given in the "Site Preparation and Earthwork Construction" section of this report. Guideline pavement recommendations are given in the following paragraphs that represent typical construction practice. However, we recommend that pavement thicknesses be verified for the actual expected traffic volumes and loadings using appropriate design parameters for the subgrade soils and pavement structure materials. If the subgrade soils are prepared and select fill materials are placed within the areas to be paved in accordance with recommendations provided in this report, it is our opinion that a CBR of 5 would be appropriate to use as the subgrade support value for flexible asphalt concrete pavement. For PCC pavements, it is our opinion that a modulus of subgrade reaction (k) of 120 lbs per cu in. would be appropriate for the subgrade support value. Where a 6-in. thick granular subbase is utilized under PCC pavements as described in this report, the modulus of subgrade reaction can be increased up to 325 lbs per cu in.

It is our opinion that chemical treatment of the subgrade soils with lime will provide the best performing pavement system during construction and will extend the service life of the pavement. Although not required, the top 12 in. of the subgrade can be treated utilizing 6 percent lime by dry weight of soil. The lime-treated subgrade soils should be compacted to not less than **98 percent** of standard Proctor maximum dry density (ASTM D 698). The lime treatment should be in accordance with Section 307 of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge

Construction using the Class C lime treatment procedure. The lime treatment should extend not less than 2 ft beyond the back of curb or edge of pavement.

For light automobile and pickup truck traffic, the flexible pavement structure could consist of a 2-in. thick asphalt surface course and a 4-in. thick asphalt base course on the prepared subgrade soils. A thicker asphalt concrete pavement section should be utilized if the flexible pavement will be subjected to heavy truck traffic. For the heavier loading, the flexible pavement structure could consist of a 4-in. thick asphalt surface course and a 6-in. thick asphalt base course on the prepared subgrade soils. The asphalt concrete surface course materials should conform to all applicable specifications for SC-1, Type 8 presented in the 1990 Edition of the Mississippi Standard Specifications for Road and Bridge Construction. The asphalt concrete base course materials should conform to all applicable specifications for BB-1, Type 6.

For rigid pavement, jointed plain (unreinforced) PCC pavement can be utilized with limited use of steel reinforcement such as described herein. The minimum compressive strength of the concrete mixture should be 4,000 lbs per sq in. It is our opinion that a 5-in. thick PCC pavement cast directly upon the prepared subgrade soils would be appropriate for light automobile and pickup truck traffic. For heavy truck traffic, a 7-in. thick PCC pavement directly underlain and separated from the prepared subgrade soils by a granular subbase would likely be required. We recommend the use of 8-in. thick PCC pavement directly underlain and separated from the prepared subgrade soils by a granular subbase immediately in front of any garbage dumpsters to provide support for the wheels of a garbage truck during loading.

We recommend the use of a 6-in. thick granular subbase directly under PCC pavements that support heavy truck traffic. This granular subbase is part of the pavement structure and prevents subgrade soils from pumping up through joints. We recommend that the granular subbase materials consist of No. 610 crushed limestone. The portion of the crushed limestone passing the No. 40 sieve should have a liquid limit not greater than 25 and a plasticity index not greater than 5. The crushed limestone should be compacted to not less than **100 percent** of standard Proctor maximum dry density (ASTM D 698) at moisture contents within 2 percentage points of the optimum water content. The pavement surface should be sufficiently elevated to allow drainage of the granular subbase.

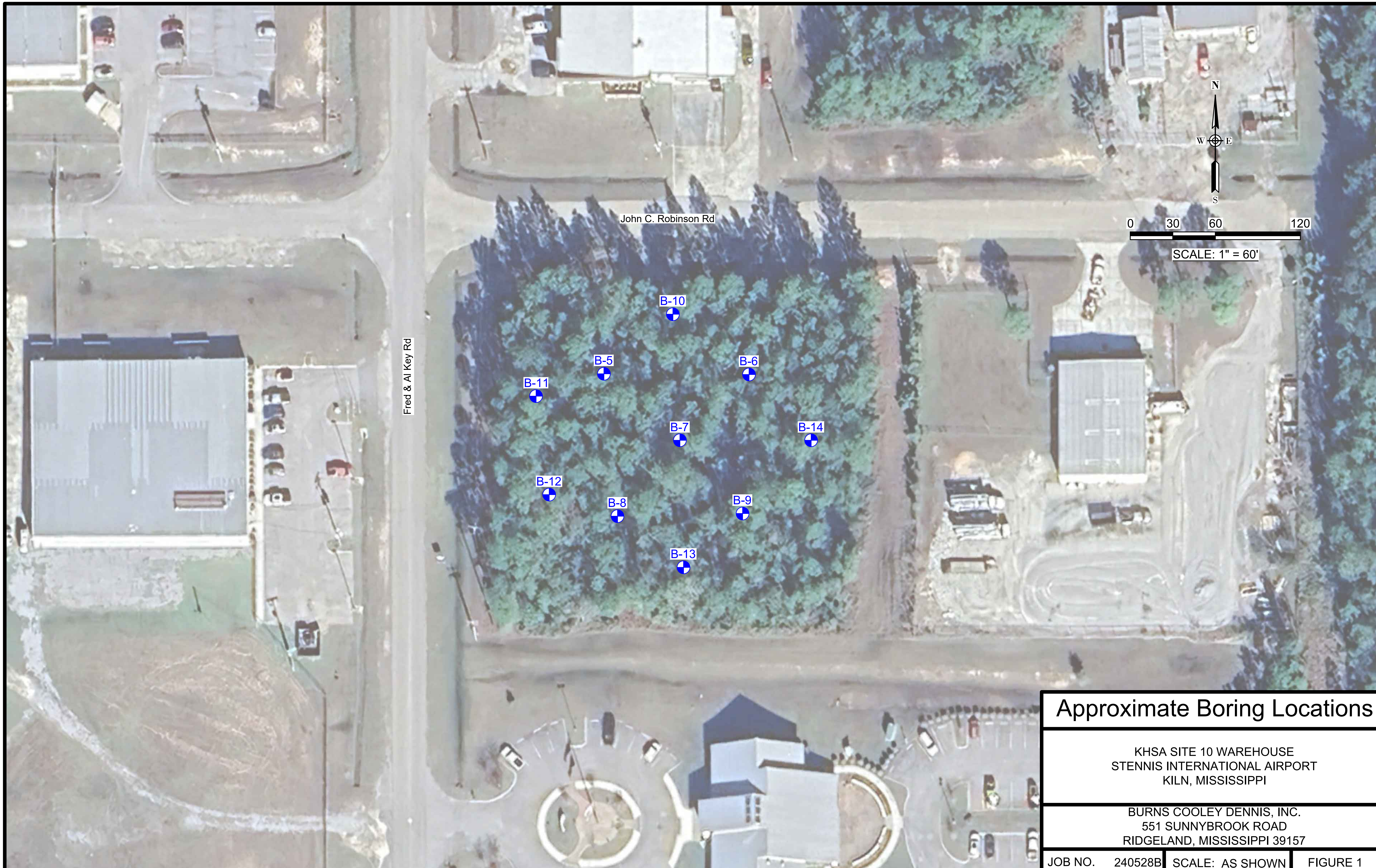
General guidance for the design and construction of PCC pavements is presented in ACI 330 "Guide for the Design and Construction of Concrete Parking Lots," including proper jointing, thickened edges that receive heavy truck traffic, thickened edges or load transfer devices at construction joints, tie-bars, and steel reinforcement in irregular shaped slabs or panels. Joints should form panels that are approximately square with the longest panel dimension no more than 1.25 times the shortest panel dimension. The maximum joint spacing should be 10 ft for 5-in. thick and 15 ft for the 7-in. or 8-in. thick PCC pavements. The pavement joints should be properly sealed and maintained. We recommend that a jointing plan and details be developed for construction of the PCC pavements. Burns Cooley Dennis, Inc. can be contracted to provide this additional service if we are provided with a CAD file of the proposed site. As an alternative, BCD can be contracted to review and approve jointing layouts and details that are generated by others. The surface of the pavement should be crowned and sloped to promote quick runoff of storm water.

7.0 REPORT LIMITATIONS

The analyses, conclusions, and recommendations included in this report are based on conditions which existed at the time of our field investigation and further on the assumption that the exploratory borings are representative of subsurface conditions throughout the areas planned for construction. It should be noted that actual subsurface conditions between borings might differ from those encountered at the boring locations. Additional borings may be required if the location of the building varies significantly from where the borings were made. If subsurface conditions are encountered during construction that vary from those discussed in this report, Burns Cooley Dennis, Inc. should be notified immediately in order that we may evaluate the effects, if any, on design and construction.

Burns Cooley Dennis, Inc. should be retained for a general review of project plans and specifications. It is advised that we be retained to observe earthwork, foundation, and pavement construction for the project in order to help confirm that our recommendations are valid or to modify them accordingly. Burns Cooley Dennis, Inc. cannot assume responsibility or liability for the adequacy of recommendations if we do not observe construction.

This report has been prepared for the exclusive use of Neel-Schaffer, Inc. for specific application to the geotechnical-related aspects of design and construction of the KHSA Site 10 Warehouse in Kiln in Hancock County, Mississippi. The only warranty made by us in connection with the services provided is that we have used that degree of care and skill ordinarily exercised under similar conditions by reputable members of our profession practicing in the same or similar locality. No other warranty, express or implied, is made or intended.



Approximate Boring Locations

KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

BURNS COOLEY DENNIS, INC.
551 SUNNYBROOK ROAD
RIDGELAND, MISSISSIPPI 39157

JOB NO. 240528B	SCALE: AS SHOWN	FIGURE 1

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			SYMBOL & LETTER	DESCRIPTION
COARSE-GRAINED SOILS More than half of material larger than No. 200 sieve size	GRAVELS More than half of coarse fraction larger than No.4 sieve size	Clean Gravels (Little or no fines)	GW	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURE
			GP	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURE
		Gravels with fines (Appreciable amount of fines)	GM	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURE
			GC	CLAYEY GRAVEL, GRAVEL-SAND-CLAY MIXTURE
	SANDS More than half of coarse fraction smaller than No.4 sieve size	Clean Sands (Little or no fines)	SW	WELL GRADED SAND, GRAVELLY SAND
			SP	POORLY GRADED SAND, GRAVELLY SAND
		Sands with fines (Appreciable amount of fines)	SM	SILTY SAND, SAND-SILT MIXTURE
			SP-SM	SLIGHTLY SILTY SAND
			SC	CLAYEY SAND, SAND-CLAY MIXTURE
FINE-GRAINED SOILS More than half of material smaller than No. 200 sieve size	SILTS AND CLAYS	Liquid limit less than 50	ML	SILT WITH LITTLE OR NO PLASTICITY
			ML	CLAYEY SILT, SILT WITH SLIGHT TO MEDIUM PLASTICITY
			ML	SANDY SILT
			CL	SILTY CLAY, LOW TO MEDIUM PLASTICITY
			CL	SANDY CLAY, LOW TO MEDIUM PLASTICITY (30% TO 50% SAND)
	SILTS AND CLAYS	Liquid limit greater than 50	MH	SILT, FINE SANDY OR SILTY SOIL WITH HIGH PLASTICITY
			CH	CLAY, HIGH PLASTICITY
			OH	ORGANIC CLAY OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOIL
SEDEMENTARY ROCK TYPES:			LS	LIMESTONE
			MARL	MARL

TERMS CHARACTERIZING SOIL STRUCTURE

Slickensided	- Clays with polished and striated planes created as a result of volume changes related to shrinking, swelling and/or changes in overburden pressure.
Fissured	- Clays with a blocky or jointed structure generally created by seasonal shrinking and swelling.
Laminated	- Composed of thin alternating layers of varying color and texture.
Calcareous	- Containing appreciable quantities of calcium carbonate.
Parting	- Paper thin (less than 1/8 inch).
Seam	- 1/8 inch to 3 inch thickness.
Layer	- Greater than 3 inches in thickness.

DENSITY AND CONSISTENCY

COARSE-GRAINED SOILS

DENSITY	PENETRATION RESISTANCE, N Blows per Foot
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	>50

FINE-GRAINED SOILS

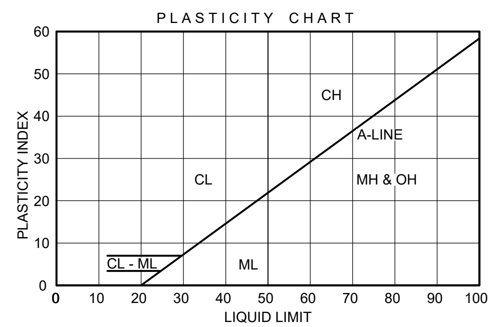
CONSISTENCY	COHESION Kips/Sq. Ft	PENETRATION RESISTANCE, N Blows per Foot
Very Soft	<0.25	0 - 1
Soft	0.25 - 0.50	2 - 4
Medium Stiff	0.50 - 1.00	5 - 8
Stiff	1.00 - 2.00	9 - 15
Very Stiff	2.00 - 4.00	16 - 30
Hard	>4.00	>30

PARTICLE SIZE IDENTIFICATION

Cobbles	- Greater than 3 inches
Gravel	- Coarse - 3/4 inch to 3 inches Fine - 4.76 mm to 3/4 inch
Sand	- Coarse - 2 mm to 4.76 mm Medium - 0.42 mm to 2 mm Fine - 0.074 mm to 0.42 mm
Silt & Clay	- Less than 0.074 mm

RELATIVE COMPOSITION

Slightly	5 - 15%
With	16 - 29%
Sandy (or gravelly)	30 - 50%



FOR CLASSIFICATION OF FINE GRAINED SOILS

SAMPLE TYPES
(Shown in Sample Column)

Shelby Tube

Split Spoon

No Recovery

Auger

Dennison Barrel

CLASSIFICATION, SYMBOLS AND TERMS USED ON GRAPHICAL BORING LOGS

LOG OF BORING NO. 5

KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B

SURFACE EL: N/A ±ft

DEPTH, ft	DESCRIPTION OF MATERIAL	FIELD TEST DATA/ POC. PEN (TSF)	DRY DENSITY LBS/CU FT	Cohesion, kips/sq ft (○ - UC, △ - UU)	SPT (N_{60})	WATER CONTENT %	% PASSING NO. 200 SIEVE
0–1	Medium dense tan silt (ML)						
				1.20		21.4	
1–4	Stiff tan and light gray sandy clay (CL)					21.2	
4–20	Very stiff light gray, tan and red clay (CH)	4.5	103	3.20		21.6	
		3.0				28.8	96.4
	- gray below 13'	1.0				36.3	
	- medium stiff below 18'	2-3-2			8	38.2	

Note: SPT performed using a calibrated Auto-Hammer. An energy correction factor of 1.67 is applied to calculate the plotted N_{60} values.

BORING DEPTH: 20 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 46.2"
W 89° 26' 59.2"

GROUNDWATER DATA: No free water encountered during auger drilling.

240528.GPJ

BURNS COOLEY DENNIS, INC.
GEOTECHNICAL AND MATERIALS ENGINEERING CONSULTANTS

FIGURE 3

LOG OF BORING NO. 6

KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B

SURFACE EL: N/A ±ft

Column headings: DEPTH, ft | SYMBOL | SAMPLES | DESCRIPTION OF MATERIAL | FIELD TEST DATA/ POC. PEN (TSF) | DRY DENSITY LBS/CU FT | ○ - UC Cohesion, kips/sq ft △ - UU (1, 2, 3, 4) | SPT (N_{60}) ⊗ | PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT (20, 40, 60, 80) | % PASSING NO. 200 SIEVE

Depth, ft	Description of Material	Field Test Data / Poc. Pen (TSF)	Dry Density lbs/cu ft	Cohesion, kips/sq ft	SPT (N_{60})	Plastic Limit	Water Content %	Liquid Limit	% Passing No. 200 Sieve
0–2	Medium dense gray sandy silt (ML)						24.1		
2–8	Soft tan and light gray silty clay (CL)	1-1-1			3	17	19.6	31	
	- stiff, tan, red and light gray, slightly sandy below 4'	2.0				17	20.3	43	
8–17	Stiff tan and light gray clay (CH)	2.0	95	1.67			31.7		
	- light gray below 13'	1.0					42.8		
17–20	Stiff gray sandy clay (CL)						25.1		56.2

Note: SPT performed using a calibrated Auto-Hammer. An energy correction factor of 1.67 is applied to calculate the plotted N_{60} values.

BORING DEPTH: 20 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 46.2"
W 89° 26' 58.1"

GROUNDWATER DATA: No free water encountered during auger drilling.

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FIGURE 4

LOG OF BORING NO. 7

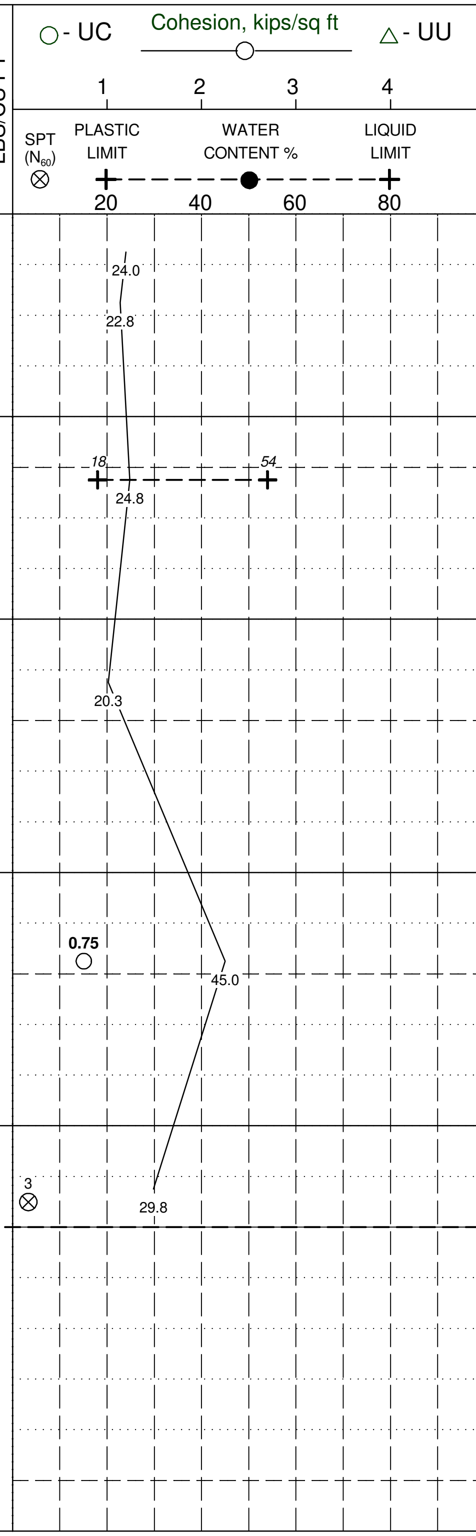
KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B

SURFACE EL: N/A ±ft

DEPTH, ft	DESCRIPTION OF MATERIAL	FIELD TEST DATA/ POC. PEN (TSF)	DRY DENSITY LBS/CU FT	% PASSING NO. 200 SIEVE
0–4	Loose gray sandy silt (ML) with trace of organics - slightly clayey below 1'	0.5		53.8
4–8	Very stiff tan clay (CH), slightly sandy	3.5		
8–13	Stiff light gray, red and tan sandy clay (CL)	4.0		
13–18	Medium stiff light gray clay (CH)	4.0	76	
18–20	Loose gray silty fine sand (SM)	1-1-1		



Note: SPT performed using a calibrated Auto-Hammer. An energy correction factor of 1.67 is applied to calculate the plotted N_{60} values.

BORING DEPTH: 20 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 45.7"
W 89° 26' 58.6"

GROUNDWATER DATA: Free water encountered at an approximate depth of 18' during auger drilling. Water level at an approximate depth of 18' after about 15 minutes.

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FIGURE 5

LOG OF BORING NO. 8

KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

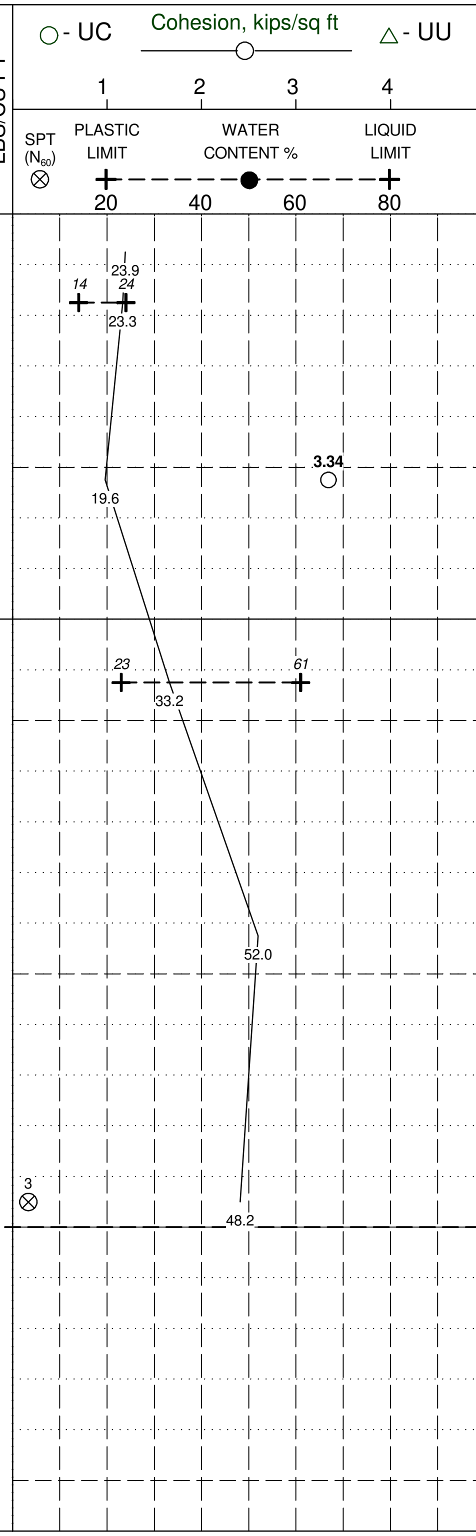
TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B

SURFACE EL: N/A ±ft

DEPTH, ft	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	FIELD TEST DATA/ POC. PEN (TSF)	DRY DENSITY LBS/CU FT	% PASSING NO. 200 SIEVE
0–8			Medium stiff gray sandy clay (CL) - with trace of organics to 1' -very stiff below 4'	2.5	101	
8–20			Very stiff light gray and tan clay (CH) - very soft, dark gray below 18'	2.5 1.5 1-1-1		

Note: SPT performed using a calibrated Auto-Hammer. An energy correction factor of 1.67 is applied to calculate the plotted N_{60} values.



BORING DEPTH: 20 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 45.2"
W 89° 26' 59.1"

GROUNDWATER DATA: Free water encountered at an approximate depth of 18' during auger drilling. Water level at an approximate depth of 18' after about 15 minutes.

240528.GPJ

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FIGURE 6

LOG OF BORING NO. 9

KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B

SURFACE EL: N/A ±ft

○ - UC Cohesion, kips/sq ft △ - UU (scale 1, 2, 3, 4)

SPT (N_{60}) ⊗ — PLASTIC LIMIT + — WATER CONTENT % ● — LIQUID LIMIT + (scale 20, 40, 60, 80)

DEPTH, ft	DESCRIPTION OF MATERIAL	FIELD TEST DATA/ POC. PEN (TSF)	DRY DENSITY LBS/CU FT	SPT (N_{60}) / Cohesion / Plastic Limit / Water Content % / Liquid Limit	% PASSING NO. 200 SIEVE
0	Loose gray sandy silt (ML), slightly clayey - with trace of organics to 1' - light gray and tan below 1'			21 25 25.6	
		0.25		21.3	
4	Stiff tan and light gray sandy clay (CL)				
5		4.0		20.8	
8	Stiff light gray and tan clay (CH)				
10		4.0	89	1.71 36.2	
13	- light gray below 13'				
15		4.0		40.6	
18	- medium stiff, gray and black, with sand and organics below 18'				
20		1-1-3		7 39.4	72.0

Note: SPT performed using a calibrated Auto-Hammer. An energy correction factor of 1.67 is applied to calculate the plotted N_{60} values.

BORING DEPTH: 20 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 45.2"
W 89° 26' 58.1"

GROUNDWATER DATA: No free water encountered during auger drilling.

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FIGURE 7

LOG OF BORING NO. 10

KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B

SURFACE EL: N/A ±ft

DEPTH, ft	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	FIELD SPT DATA	DRY DENSITY LBS/CU FT	○ - UC Cohesion, kips/sq ft △ - UU (1, 2, 3, 4); SPT (N_{60}) ⊗; PLASTIC LIMIT + — WATER CONTENT % ● — LIQUID LIMIT + (20, 40, 60, 80)	% PASSING NO. 200 SIEVE
0 – 2	ML		Medium dense tan and light gray sandy silt (ML) with trace of organics		119	18.2	
2 – 6	CL		Stiff tan and light gray sandy clay (CL)			19.4	
			- gray and tan below 4'			23.4	
5							
10							

BORING DEPTH: 6 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 46.6"
W 89° 26' 58.7"

GROUNDWATER DATA: No free water encountered during auger drilling.

240528.GPJ

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LOG OF BORING NO. 11

KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B

DEPTH, ft	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE EL: N/A ±ft	FIELD SPT DATA	DRY DENSITY LBS/CU FT	○ - UC Cohesion, kips/sq ft △ - UU (1, 2, 3, 4) SPT (N_{60}) ⊗ PLASTIC LIMIT, WATER CONTENT %, LIQUID LIMIT (20, 40, 60, 80)	% PASSING NO. 200 SIEVE
0			Stiff tan and light gray sandy clay (CL)			22.4	
						16, 21.6, 31	
5			Very stiff tan and light gray clay (CH), slightly silty			23.5	
10							

BORING DEPTH: 6 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 46.0"
W 89° 26' 59.8"

GROUNDWATER DATA: No free water encountered during auger drilling.

240528.GPJ

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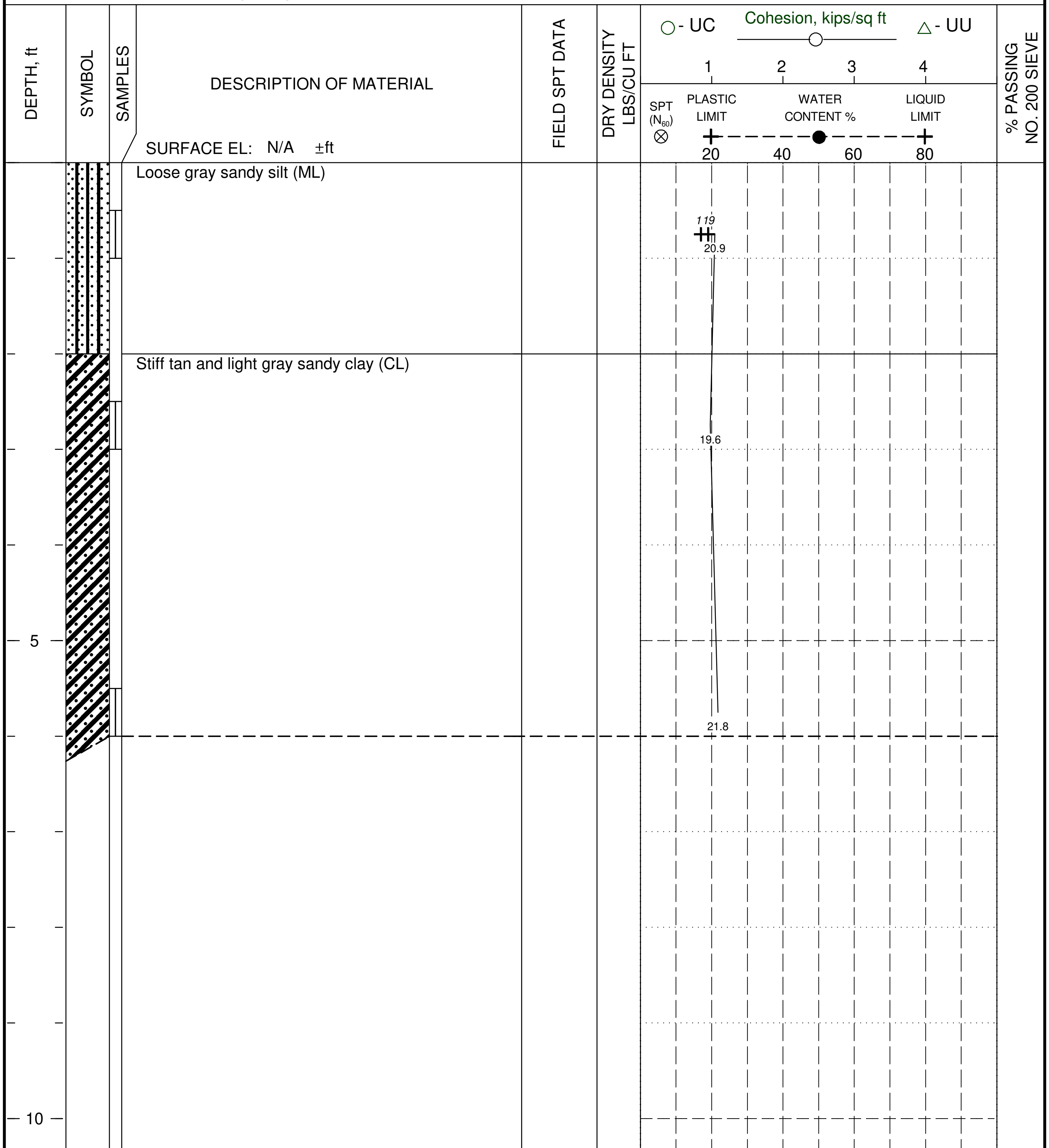
FIGURE 9

LOG OF BORING NO. 12

KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B



BORING DEPTH: 6 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 45.3"
W 89° 26' 59.7"

GROUNDWATER DATA: No free water encountered during auger drilling.

240528.GPJ

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FIGURE 10

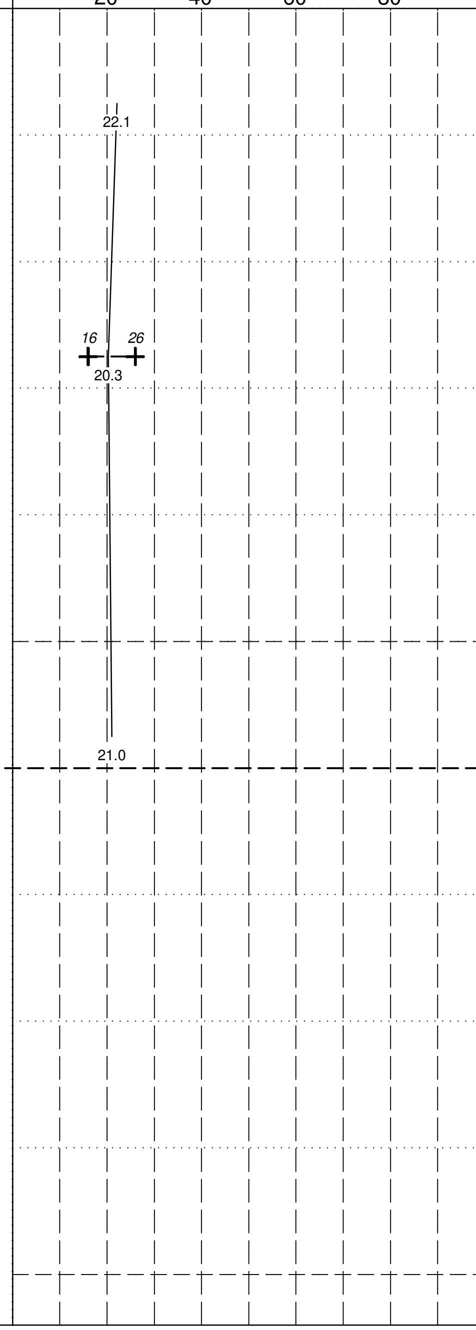
LOG OF BORING NO. 13

KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B

DEPTH, ft	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL SURFACE EL: N/A ±ft	FIELD SPT DATA	DRY DENSITY LBS/CU FT	○ - UC Cohesion, kips/sq ft △ - UU (1, 2, 3, 4) SPT (N_{60}) ⊗ PLASTIC LIMIT + WATER CONTENT % ● LIQUID LIMIT + (20, 40, 60, 80)	% PASSING NO. 200 SIEVE
			Stiff gray sandy clay (CL)				
			- tan and gray below 2'				
5							
10							



BORING DEPTH: 6 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 44.8"
W 89° 26' 58.6"

GROUNDWATER DATA: No free water encountered during auger drilling.

240528.GPJ

BURNS COOLEY DENNIS, INC.
GEOTECHNICAL AND MATERIALS ENGINEERING CONSULTANTS

FIGURE 11

LOG OF BORING NO. 14

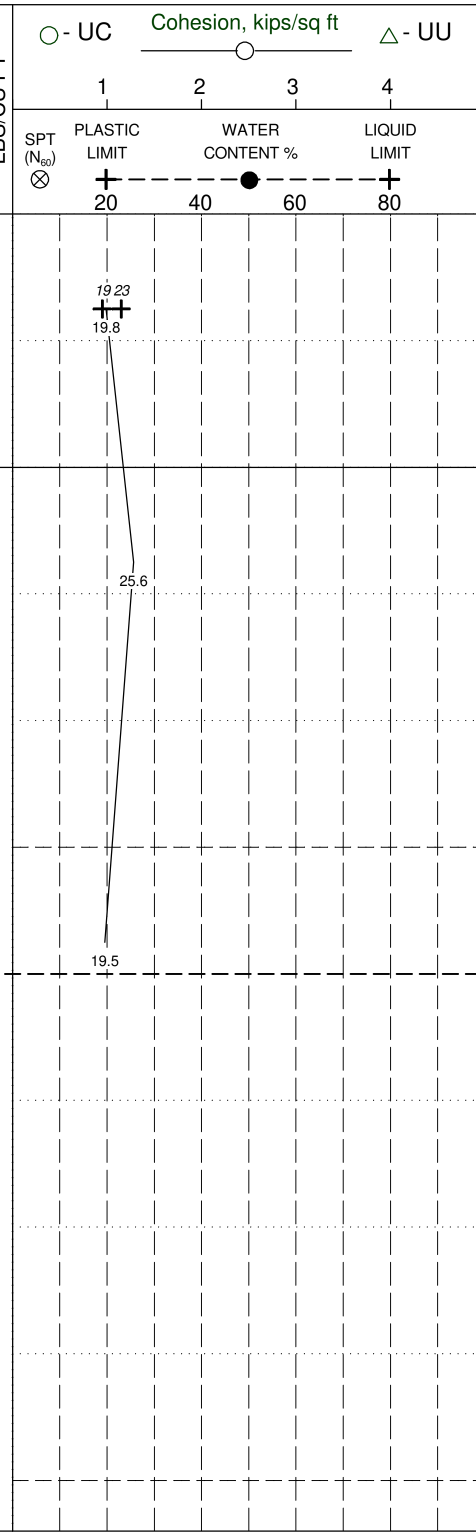
KHSA SITE 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
KILN, MISSISSIPPI

TYPE: 4" Continuous-flight auger

LOCATION: See Figure 1B

SURFACE EL: N/A ±ft

DEPTH, ft	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	FIELD SPT DATA	DRY DENSITY LBS/CU FT	% PASSING NO. 200 SIEVE
0–2			Medium dense gray sandy silt (ML)			
2–6			Medium stiff tan, light gray and red sandy clay (CL)			



BORING DEPTH: 6 ft

DATE: 10/16/24

COMMENTS:
GPS Coordinates
N 30° 22' 45.7"
W 89° 26' 57.6"

GROUNDWATER DATA: No free water encountered during auger drilling.

240528.GPJ

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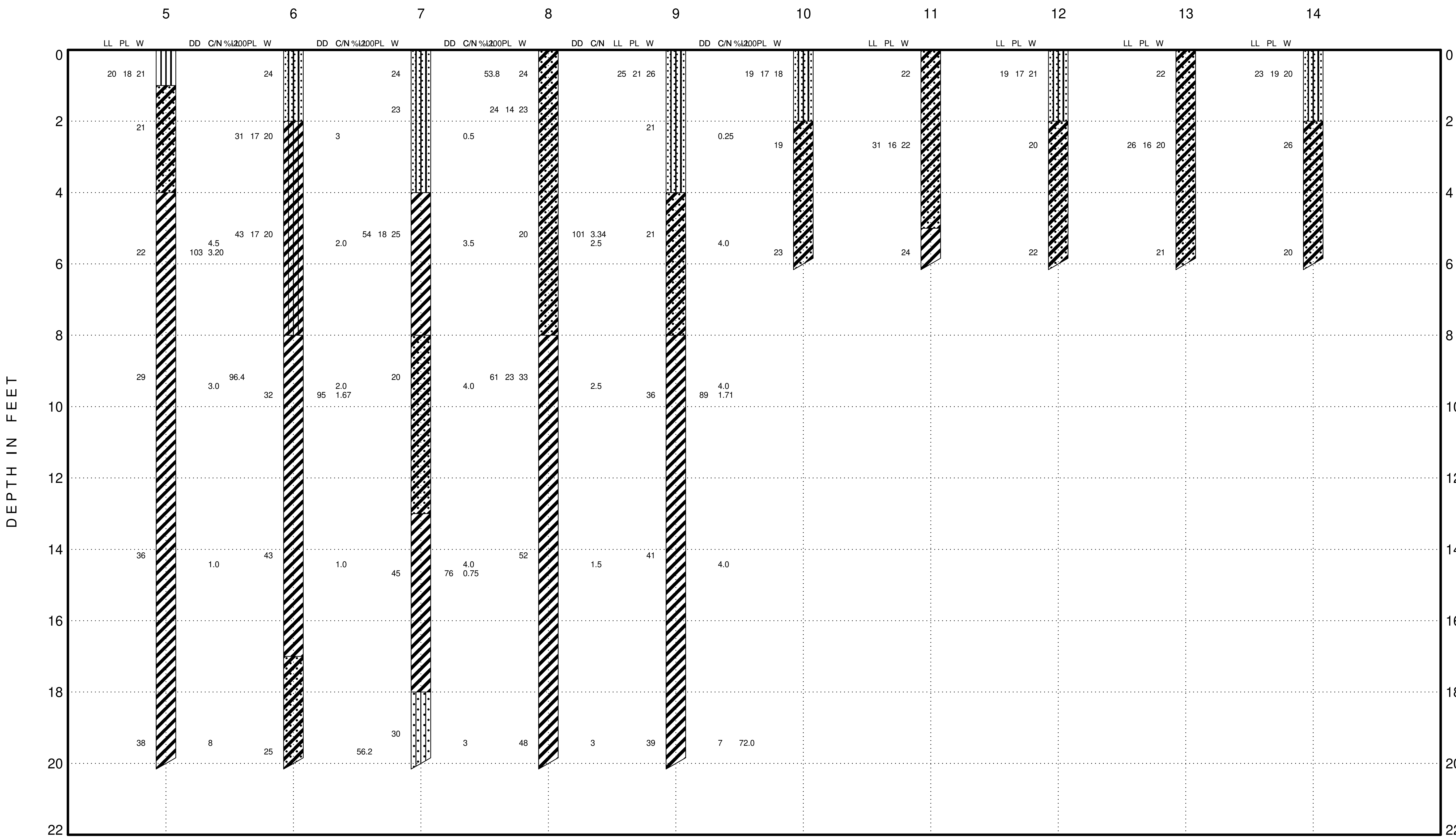
GEOTECHNICAL AND MATERIALS ENGINEERING CONSULTANTS

FIGURE 12



LEGEND:
LL = Liquid Limit
PL = Plastic Limit
W = Water Content
DD = Dry Density (pcf)
C/N = Cohesion (ksf)/Penetration Resistance, N (blows per ft) in the same column
% -200 = % Passing No. 200 Sieve

NOTE: See Figure 2 for boring log legend.

SUBSURFACE SOIL PROFILE

KHSA 10 WAREHOUSE
STENNIS INTERNATIONAL AIRPORT
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Job No.	240528-1	Date	11/7/24	Figure	13

BURNS COOLEY DENNIS, INC.