Report of Geotechnical Subsurface Investigation

50 ACRE MANUFACTURING FACILITY DEVELOPMENT

Opelika, Alabama
Our Job No. G04-1342

Prepared For:

City of Opelika Economical Development Department
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Attachments :

- Boring Plan
- Test Boring Logs
- Laboratory Test Data
- Notes and References
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1.0 Introduction

Carmichael Engineering, Inc., is pleased to provide this report of our preliminary subsurface investigation for the planned Manufacturing Facility Development. The scope of this investigation included 8 soil test bores positioned over a 50 acre parcel. Our investigation also included a review of geotechnical data prepared by Gallet & Associates, their project no. 01BHOPE02.01G which included one boring (G-4) just south of the site center. Building and pavement location information was not available for this report. The intent of this report was to develop preliminary recommendations for building and pavement development and is not intended to be the final recommendations for the development of this property. Once the building and pavement locations and grades have been established, we should be contacted for review and to modify our recommendations (if required) based on the specific project location, grading and loading conditions. Please note that it may be necessary to complete additional field and laboratory testing to address specific parameters of the planned construction.

This report has been prepared in accordance with generally accepted current standards of geotechnical engineering practices and no other warranties are expressed or implied. The recommendations of this report are based on our professional judgement considering the proposed construction as described by this report and the data available to us. The construction should include follow up geotechnical monitoring and construction materials testing by a qualified geotechnical and materials testing consultant. The consultant should be familiar with the site conditions, the planned construction, and the contents of this report. This report is presented on the basis that all of our recommendations will be followed.

2.0 Summary

Generally, the preliminary subsurface investigation indicated conditions which should be compatible with the planned Manufacturing Development provided the site preparation and construction is completed in accordance with the recommendations which follow in this report. Please note that our recommendations are site specific and may not be suitable for other types of structures or other locations.

Eight soil test bores were completed with this study to determine the subsurface profile. Beneath clayey sandy or sandy topsoil, the test bores penetrated in-situ earth described as cohesive clayey sand, silty clayey sand. sandy silt, sandy clayey silt, clayey sandy silt, clayey silt, micaceous sandy silt, sandy silty clay, silty clay, sandy clay, non-cohesive silty sand, and weathered schist rock (drill cuttings described as silty sand). The predominate sand earth is of a marginal to good drainage classification. The predominate clay and silt earth is of a poor drainage classification. The test bores indicated soil strengths of low to moderate and consolidation characteristics which are expected to be compatible with the planned construction.

Three of the test bores indicated ground water during drilling at depths of 4 to 18.5'. Twenty-four hours following drilling, all eight of the test bores indicated water levels at depths of 1.8 to 17.7'. The test bores caved following drilling at depths of 3 to 31.8'. The ground water condition at this site is subject to seasonal variation and is expected to fluctuate. We do not anticipate that the ground water condition will affect the construction or long term performance of the development. Ground water (if any) encountered during construction can be controlled using shallow drainage ditches, sump pumps, and/or permanent underdrains.

There are several geotechnical considerations which will impact the site preparation and the foundation development for this project. These considerations are listed as follows;

1. Due to the low soil strengths and the consolidation characteristics of the predominate silt soils at this site, the use of relatively low net allowable soil bearing pressures for shallow foundations will be required in order to control total and differential settlements to an acceptable level. If the planned building structure exhibits high concentrated loads or if heavy equipment loads are present then alternate intermediate foundation systems such as Geopiers or deep foundation systems such as driven steel piles or auger cast may be required.

2. The clean, non-organic, non-saturated native soil may be used to develop "engineered fill" for building and pavement support. Some sections of the native soil exhibit high moisture contents and will require processing (mixing and drying) for use as "engineered fill".

3. The test bores indicated ground water at varying levels over the site. It is likely that some of the cut areas will exhibit ground water seepage and/or localized "spring" like conditions. Therefore, the use of permanent aggregate filled underdrains may be required

along the edges of cut slopes and in other areas where ground water seepage occurs in order to control the ground water. Unit prices should be established for the use of underdrains on a "as needed" basis. Other types of temporary dewatering controls may be required for the installation of deep sewer lines or other deep excavations.

4. One of the characteristics of the predominate high moisture content silt soil present in sections of the site is that the material will rut and yield under construction traffic. In order to stabilize the subgrade for building floor slab and pavement support, it may be necessary to use crushed stone aggregate, geotextile stabilization fabrics or grids, and/or other stabilization techniques. The use of stabilization materials and techniques will be dependent on the conditions exposed at the subgrade levels in the building and pavement areas.

The test bores penetrated soil derived from the weathering of schist and gneiss rock expected to underlie the site. The weathered gneiss and schist rock has been folded and distorted during the geologic past and has been subjected to irregular weathering. Due to the irregular weathering, hard sections of rock may be encountered at various elevations beneath the ground surface. Large rock boulders or rock lenses are common in the residual soil mass overlying the parent schist rock. Generally, those materials exhibiting "N" values of 50 or less may be excavated with conventional earth excavating equipment. Excavations in weathered rock material exhibiting "N" values greater than 50, especially in confined excavations, may require pneumatic hammers, rippers, blasting or other rock removal techniques to advance excavations. The test bores did not indicate any hard rock for the depths tested. However, as a contingency, the construction documents should establish unit prices for rock removal.

In order to minimize total and differential settlements for the building structure we recommend that fill thicknesses be limited to 10 to 12'. If thicker fill sections are utilized a careful analysis of the foundations will be required to limit differential settlement. Generally, shallow foundations may be designed for net allowable soil bearing pressures in a range of 1500 to 2500 psf. For building or equipment concentrated loads greater than 200 to 250 kips, it may be necessary to use an intermediate type deep foundation system such as Geopiers. Geopiers utilize a method of ground improvement and compacted crushed aggregate columns to transfer the building structural loads to the surrounding soil mass allowing for higher bearing capacities and limiting - settlements. The Geopier System is a proprietary system which would be designed by the Geopier Foundation Company and is compatible with the soil conditions at this site. For very high concentrated loads, a deep foundation system such as driven steel piles, a auger cast pile, or a drilled pier foundation A friction type pile will be best suited for the soil conditions at this site. A driven steel pile foundation system or a auger cast pile foundation system may be used for this project. The selection of a deep foundation system will depend on the magnitude of the loads being supported.

The pavements for this project can be developed using locally available materials and conventional construction techniques. The pavement sections may be constructed using a crushed

aggregate base and high stability bituminous pavement section or a concrete pavement section placed directly over an improved layer of the subgrade earth.

3.0 Evaluation

3.1 Site Location

The subject site is located along Andrews Road west of Interstate I-85 just west of the Mando Facility in the City of Opelika, Lee County, Alabama. Our field personnel utilized the provided site plan and instructions to locate the site and test bores. The test bores were field located using a hand held GPS unit. The boring locations should be considered approximate with an accuracy of 50'±. The enclosed boring plans show the test bore locations.

The ground elevations were extrapolated from the provided topography plan. These elevations are shown on the test bore records and should be considered approximate.

3.2 Site Conditions

The site consisted of an irregularly shaped parcel of property containing approximately 50 acres. The site included some open areas, wooded areas, two ponds, and several miscellaneous building structures or remnants of structures. Two unimproved roads lying in a north to south direction were located in the central section of the site. The old abandoned section of Andrews Road (asphalt paved) was located in the southern of the site.

The local terrain is described as rolling hills. A quad map indicated approximately 50' of relief over the property. Overall surface drainage was described as fair to good. Generally, surface water is expected to flow over the site and discharge beyond the area planned for development. There were two small ponds located in the northern and eastern section of the site.

Site access was described as fair to good. A dozer was required to perform light clearing to access approximately half of the test bore locations. There was no unusual difficulty mobilizing our conventional truck mounted drilling equipment over the site to complete the test bores.

3.3 Site Geology And Subsurface Stratigraphy

Geologically, the site is located in the Inner Piedmont Province and is underlain by the Auburn Gneiss Formation, a member of the Opelika Complex, formed in the Precambrian to Paleozoic Period. Typically, this formation yields gneiss and schist rock, the upper sections of which have weathered into various combinations of clay, silt and sand.

The test bores penetrated 3 to 12" of clayey sandy and sandy topsoil. Beneath the topsoil, the bores continued into in-situ earth described cohesive clayey sand, silty clayey sand. sandy silt, sandy clayey silt, clayey sandy silt, clayey silt, micaceous sandy silt, sandy silty clay, silty clay, sandy clay, non-cohesive silty sand, and weathered schist rock (drill cuttings described as silty sand). Laboratory analyses confirmed "ML" and "MH" Unified Soil Classifications of the predominate silt earth with plasticity indices of 11 to 32%. The penetration resistance values, "N", ranged from 2 to 64 blows per foot indicating relative densities of very loose to loose in the predominate sand earth and consistencies of soft to hard in the predominate clay and silt earth and weathered schist rock. Moisture tests indicated in-situ soil water contents ranging from 10.8

to 68.9%. The test bores were terminated in the in-situ earth at depths of 25 to 40' below existing grade.

During drilling, bores B-1, B-3, and B-8 indicated ground water at depths of 4 to 18.5'. Twenty-four hours following drilling, the test bores indicated ground water at depths of 1.8 to 17.7' below grade. The test bores caved at depths of 5 to 31.2'.

The enclosed test boring records further describe the subsurface stratigraphy, Unified Soil Classifications, penetration resistance values, moisture contents, water levels, caved depths and boring termination depths.

3.4 General Construction Information

The following data was extrapolated from the information provided by the City of Opelika Economic Development Department. The construction data described in this section is a preliminary estimate for a manufacturing facility and was considered in the formulation of our recommendations; therefore, the final construction details should be evaluated by our office for compatibility with our recommendations.

Specific building location and construction information was not available but we expect concrete floor slab on grade, steel frame and metal roof, and tilt-up concrete wall type construction. The building may also include some dock height wall construction. Specific structural loads were not provided; however, we anticipate that concentrated loads will be less than 250 kips and that wall loads will be less than 5 kips per linear foot. We do not expect that the planned construction will be particularly sensitive to usual settlements.

Based on the existing grades we expect earth cutting/filling thicknesses of up to 15'. Fill earth required to establish subgrade elevation is expected to originate from on-site cuts and/or local off-site borrow sources.

Specific pavement design information was not available. Sections of the pavements are expected to be designed for employee parking with a light duty classification of traffic including a moderate volume of automobiles. The remaining drives and service areas are expected to be designed for a heavy duty traffic classification including a moderate volume of automobiles and approximately 50 heavy trucks per day.

4.0 Recommendations - Site Preparation

4.1 "Controlled Areas"

Define those areas throughout and 10' beyond the proposed building area, throughout and 5' beyond pavement areas, and throughout significant slopes as "controlled areas".

4.2 Stripping

Remove all vegetation, stumps, topsoil, old foundations, asphalt pavements, etc., and otherwise unsuitable materials from the "controlled areas". All unsuitable materials should be wasted off-site.

4.3 Surface Drainage

Maintain the "controlled areas" in a drained condition that will insure the continual removal of surface water that may flow over the construction areas. Temporary site drainage can be enhanced by the installation of the final drainage structures during the early phases of the site development.

4.4 Site Examination

Prior to the placement of fill earth and following removal of cut earth, the "controlled areas" should be examined by the projects geotechnical consultant. This consultant should use proof rolling with construction equipment, test pits, supplemental bores, visual examinations, etc., as needed to determine the presence, location, and extent of any latent weak, and/or otherwise unsuitable soil conditions which may exist at the site. During the site examination, the presence of existing underground utilities, buried structures, etc., if any, should be identified. All existing utilities, buried structures, etc., which may interfere with the planned construction or performance of the development should be removed and backfilled with "engineered fill" or modified as directed by the projects geotechnical consultant. Areas which exhibit weak soil or otherwise unsuitable conditions should be corrected in accordance with the geotechnical consultant's recommendations. Typically, areas which yield excessively under proof rolling should be undercut to a firm level of soil followed by backfilling with "engineered fill".

4.5 Subgrade Improvements

Following removal of topsoil and required cut earth, the exposed layer of subgrade should be mixed, moisture conditioned, and compacted to at least 98% of the materials ASTM D-698 standard density. The clean, non-organic, non-saturated sections of the native earth undercut from the site may be stockpiled for reuse in the development of "engineered fills". Areas which fail to compact should be undercut to a firm level of soil followed by backfilling with "engineered fill". Densification of the subgrade should not be attempted when the soils moisture content is significantly above the materials optimum moisture content. Undercutting, if required, should be monitored by a qualified geotechnical consultant. "Stone aggregate matting" and/or geotextile fabrics may be used for stabilization purposes in pavement areas depending on site specific conditions. Unit prices should be established for the use of stone aggregate matting consisting of no.1 to no. 467 graded stone and an allowance should be established for the use of

stabilization fabric or geogrids to be used for stabilization purposes.

4.6 Fill Earth

Fill earth required to establish subgrade elevation in the "controlled areas" can consist of the clean, non-saturated, and non-organic sections of the native earth or existing fill earth typical of the majority of that penetrated by the bores. Sections of the native soil or existing fill earth exhibit moisture contents above the materials expected optimum moisture contents and will require mixing, processing and moisture conditioning to achieve proper compaction.

4.7 "Select Fill"

Fill earth placed in "controlled areas" and originating from an off-site borrow source, if any, should be designated as "select fill". The "select fill" should consist of a clean, non-saturated, and non-organic clayey sand or sandy clay that meets the following criteria.

"Select Fill" Composition

Sieve Requirements	% Passing
3"	100
No. 4	70 - 100
No. 200	20 - 55
Liquid Limit	40 % max
Plasticity Index	6 to 16%
Maximum Dry Unit Weight Based on ASTM-698 Standard Density Test	$\geq$ 100 pcf

4.8 "Engineered Fill"

Unless otherwise specified, all fill earth placed in the "controlled areas" should be designated as "engineered fill". Place fill earth in thin lifts not to exceed 8" loose measure and thoroughly compact each lift of fill to at least 98% of the materials ASTM D-698 standard density. The final 8" of subgrade in the building and pavement areas should be compacted to 100% of the materials ASTM -D698 standard density. At the time of densification, the moisture content of the "engineered fill" should be within 3% of the materials optimum water content. Following acceptance for moisture and density, any "engineered fill" areas which are disturbed should be corrected and retested prior to the placement of additional fill earth or structures.

4.9 Control of Differential Settlements

The building floor slab will bear over varying thicknesses of new "engineered fill" earth and firm to stronger in-situ earth. In order to control differential settlements it is critical that all "engineered fill" be placed in thin loose layers and thoroughly compacted prior to placing additional fill.

4.10 Ground Water Control

The test bores indicated that ground water levels are present at varying depths below the existing grade therefore ground water may be encountered in the grading operations or in localized excavations. A contingency should be provided in the construction documents for the use of underdrains to control shallow ground water. An add / deduct unit price per foot of underdrain should be established for 1000 linear feet of underdrain to be used on an as needed basis. Permanent aggregate filled underdrainage may consist of perforated 4" diameter PVC underdrainage pipe meeting the minimum requirements of the Alabama Department of Transportation (ALDOT) Section 853.10 placed in a minimum 12" wide trench, 5' deep. The drainage pipe should be surrounded by ALDOT Section 800 Size #57 or #67 aggregate. The aggregate should be enveloped by filter cloth such as Amoco's 4545 filter fabric (or equivalent) to prevent clogging of the underdrain and/or the loss of soil fines. Provide a positive outlet for the underdrains. The location and final depth of the underdrains should be determined by the project geotechnical consultant on a as needed basis during the site preparation.

5.0 Recommendations - Shallow Spread Foundations And Ground Supported Floor Slabs

5.1 Maximum Net Allowable Soil Bearing Pressures

2,000 to 2,500 pounds per square foot for isolated square foundations.
1500 to 2,000 pounds per square foot for continuous foundations.

Note: Foundations may bear transitional between the firm to stronger in-situ and/or new "engineered fill" earth. Please note that in some sections of the site, the depth of the foundations may require increasing to reach suitable bearing material.

5.2 Minimum Foundation Dimensions

Depth - The bottom of perimeter wall and column foundations below outside finish grades should be at least 24". Increase depth as required to extend foundations through weak soil conditions.

- The bottom of interior foundations below the top of ground supported floor slabs should be at least 18". Increase depth as required to extend foundations through weak soil conditions.

Width - Isolated square foundations - 28".
- Continuous wall foundations - 18".

Note: All foundations should be sized for total load but should not be less than the minimums described preceding in this report. The use of the recommended minimum foundation depths considers that adequate surface drainage is provided at finish subgrade elevation.

5.3 Settlement

A settlement analysis should be completed once the final building locations and grades have been established. Assuming fill thicknesses of less than 12' and building loads of less than 250 kips, we estimate that building structures will be subjected to total long term settlements of less than 1" with differential settlements of less than 3/4". The foundations should be designed to tolerate these estimated settlements.

5.4 Foundation Construction

Do not permit foundation bearing soil to become saturated or dry excessively. Sections which become saturated or dry excessively should be undercut just prior to placement of the foundation concrete. All foundations should be constructed as expediently as possible following excavation of the foundation trench.

Weak soil exposed in foundation trenches should be undercut to a firm level of soil prior to the placement of the foundation concrete. Foundations should be stepped down as required to extend through weak soil zones or the weak soil may be replaced with non-reinforced lean con-

crete (mud sill). A unit price should be established for increasing the foundation depth to penetrate weak soil or for the use of mud sills. The reinforced foundation should bear directly on top of the mud sill. All loose soil material or other debris should be removed from the top of the mud sill before placing the foundation concrete.

5.5 Acceptance Of Foundation Bearing Levels

All foundation excavations should be examined by the project geotechnical consultant prior to the installation of the foundation reinforcement and concrete. All unacceptable conditions should be corrected in accordance with the geotechnical consultant's recommendations.

5.6 Floor Slab Bearing Conditions

The floor slabs should bear over the firm to stronger in-situ earth (remolded as required) or properly constructed "engineered fill" (minimum 98% standard density). Provide a layer of drainage aggregate consisting of free draining pea gravel or other suitable drainage material and a minimum 10 mil vapor barrier between the subgrade layer and the floor slab. Please note that in large spaces such as warehouse or manufacturing spaces which are not sensitive to moisture vapor transmittance thru the floor slab may delete the vapor barrier. Office space and other sections of the building where moisture vapor emissions through the floor slab are problematic should incorporate the use of a vapor barrier.

5.7 Acceptance Of Floor Slab Bearing Levels

All floor slab bearing levels should be examined by the projects geotechnical consultant prior to the placement of the drainage fill and vapor barrier. All unacceptable conditions should be corrected in accordance with the geotechnical consultant's recommendations.

5.8 Control/Expansion Joints

All masonry walls related to the construction should include control/expansion joints to reduce the effects of the usual differential settlement and concrete shrinkage that can occur. The design and location of control/expansion joints should be in accordance with the recommendations of the Portland Cement Association.

6.0 Recommendations - Dock Height Walls

6.1 Lateral Earth Pressures

Table 1 provides lateral earth pressures for foundation walls which are restrained from rotation.

Table 1

Material	Wet Unit Weight (pcf)	Ko ("At Rest" Earth Pressure Coefficient)	Lateral Earth Pressure (Psf Per Foot Of Depth)*
Off-Site Clean Free Draining Coarse Sand	125	0.46	58.0*

* Note: These pressures do not include lateral pressures introduced from adjacent foundations, floor slabs, equipment or other extraneous sources. In order to utilize the lateral earth pressure for coarse sand fill, the sand fill should be sloped from the foundation level behind the dock wall at 1(H):1(V) or flatter.

6.2 Backfill

Develop as "engineered fill", 98% of the materials ASTM D-698 standard density. Place fill using hand directed compaction equipment. Do not use heavy construction equipment adjacent to the dock height walls unless the walls are adequately braced to withstand the lateral pressures imposed by such loadings.

6.3 Wall Drainage

Place minimum 1" diameter weep holes at minimum spacings of 6' on center along the face of the wall near the base. Use filter fabric to prevent clogging of the weep holes. Fill material placed against the weep holes should consist of a coarse free draining sand.

7.0 Recommendations - Retaining Walls

7.1 Lateral Earth Pressures

Table 2 provides lateral earth pressures for retaining walls which are permitted to rotate .

Table 2 - Retaining Walls

Material	Wet Unit Weight (Pcf)	"Active" Earth Pressure Coefficient (Ka)	Lateral Earth Pressure (psf per foot of depth)*
On-site Native Silt (Fill or In-situ)	125	0.58	68
Off-Site Free Draining Clean Medium Sand	110	0.30	33

*Note: These pressures do not include lateral pressures introduced from adjacent foundations, floor slabs, equipment, slopes above the top of the wall or other extraneous sources. In order to utilize the lower lateral earth pressure for medium sand fill, the sand fill should be sloped from the wall foundation at 1(H):1(V) or flatter. For foundation walls with limited backfill zones, the higher lateral pressure for on-site soils should be used for design. Use a coefficient of friction of 0.30 between the bottom of the foundation and the native sandy silt to resist sliding.

7.2 Retaining Wall Backfill

Develop as "engineered fill", 95% of the ASTM D-698 standard density. Place fill using hand directed compaction equipment. Do not use heavy construction equipment adjacent to retaining walls unless the walls are adequately braced to withstand the lateral pressures imposed by such loadings. The final 12" of fill along the retaining walls should consist of the less permeable native clayey sand, sandy clay or "select fill" material to prevent large volumes of water from permeating the backfill zone.

7.3 Underdrainage

Provide an underdrain system to prevent water from perching against the retaining walls during or following construction. Aggregate filled underdrainage may consist of perforated 4" diameter PVC underdrainage pipe meeting the minimum requirements of the Alabama Department of Transportation (ALDOT) Section 853.10. The drainage pipe should be surrounded by ALDOT Section 800 Size #57 or #67 aggregate. The aggregate should be enveloped by filter cloth such

as Amoco's 4545 filter fabric (or equivalent) to prevent clogging of the underdrain and/or the loss of soil fines. Provide a positive outlet for the underdrains. Fill placed above the aggregate filled underdrain should consist of free draining coarse sand. Weep holes may be provided in the retaining walls in lieu of underdrainage. Place minimum 1" diameter weep holes at minimum spacings of 3' on center along the face of the wall near the base. Use filter fabric to prevent clogging of the weep holes. Fill material placed against the weep holes should consist of a coarse free draining sand.

8.0 Recommendations - Pavement Development

8.1 Reference
Alabama Department of Transportation (ALDOT), Standard Specifications For Highway Construction - 2002 Edition.

8.2 Subgrade Support Values
An estimated design CBR value of 5 is recommended for the pavement design for this project.

8.3 Traffic Data
Specific traffic data was not provided . We have assumed the following traffic volumes for the pavement design. The light duty pavement sections are to be designed for a design period of 20 years with a moderate volume of automobiles (less than 500 vehicles per day). The heavy duty pavement sections are to be designed for a design period of 20 years with up to 50 heavy trucks per day. Please contact our office if specific traffic data becomes available so that we may modify our pavement recommendations to fit the specific traffic loadings.

8.4 Subgrade Improvements
Thoroughly mix and compact the top 8" of subgrade to 100% of the materials ASTM D-698 standard density.

Slope subgrade to provide positive drainage to side drainage ditches, underdrains, and/or storm drains to prevent the entrapment of water in the subgrade layer.

8.5 Light Duty Pavement Sections
The light duty pavement sections may be developed using a crushed aggregate base and high stability high stability bituminous pavement section or a concrete pavement section placed over the improved subgrade layer as follows;

8.5.1 Crushed Aggregate Base and High Stability Bituminous Pavement Section
1.5" - ALDOT Section 429 A-200, ESAL Range A, bituminous wearing surface.
1 - ALDOT Section 405 bituminous tack coat.
2.0" - ALDOT Section 429 B-201, ESAL Range A, bituminous binder.
1 - ALDOT Section 401-A bituminous prime coat.
8" - ALDOT Section 825 crushed aggregate base (100% standard density).
8" - ALDOT Section 230 modified roadbed (100% standard density).

Note: The prime coat may be omitted provided the pavement is placed immediately following the base preparation and the moisture in the base layer is maintained near optimum moisture content prior to paving.

8.5.2 Concrete Pavement Section
5" - 4000 psi compressive strength (575 psi flexural strength) concrete, maximum 4" slump.
5" - ALDOT Section 825 crushed aggregate base (100% standard density).
8" - ALDOT Section 230 modified roadbed (100% standard density).

8.6 Heavy Duty Pavement Sections
The heavy duty pavement sections may be developed using a crushed aggregate base and high stability bituminous pavement section or a concrete pavement section placed over the improved subgrade layer as follows;

8.6.1 Crushed Aggregate Base and High Stability Bituminous Pavement Section
1.5" - ALDOT Section 429 A-201, ESAL Range A, bituminous wearing surface.
1 - ALDOT Section 405 bituminous tack coat.
4.5" - ALDOT Section 429 B-202, ESAL Range A, bituminous binder.
1 - ALDOT Section 401-A bituminous prime coat.
8" - ALDOT Section 825 crushed aggregate base (100% standard density).
8" - ALDOT Section 230 modified roadbed (100% standard density).

Note: The prime coat may be omitted provided the pavement is placed immediately following the base preparation and the moisture in the base layer is maintained near optimum moisture content prior to paving.

8.6.2 Concrete Pavement Section
8.0" - 5000 psi compressive strength (625 psi flexural strength) concrete, maximum 4" slump.
5" - ALDOT Section 825 crushed aggregate base (100% standard density).
8" - ALDOT Section 230 modified roadbed (100% standard density).

Note: Concrete pavements are recommended for areas subject to abuse, fuel spillage, and heavy trucks with short turning radii.

8.7 Trash Dumpster Loading Areas
A minimum 6" thick concrete pad should be developed in front and beneath trash dumpster areas to provide support for the sanitation vehicles during handling of the dumpsters.

8.8 Concrete Pavement Construction Joints
The design and location of construction joints should be in accordance with the recommendations of the Portland Cement Association. We recommend a maximum joint spacing of 12'. All joints should be filled with a suitable flexible joint compound to prevent water intrusion at the joints.

8.9 Material Thicknesses
All material thicknesses referred to in this section are completed thicknesses.

9.0 Recommendations - General

9.1 Utility Trenches
All utility trenches (new and existing) extending through the "controlled areas" should be back-filled with "engineered fill".

9.2 Grading And Drainage Improvements
Incorporate finish grades, side drainage ditches, underdrains, etc., to reduce the possibility of ponding surface water within 5' of the building and related pavements and at the "toe" of significant slopes.

9.3 Vertical Cuts
Vertical cuts greater than 4' or cuts required to remain open for extended periods of time should be sloped or braced as required for the protection of workmen entering deep excavations. Heavy construction traffic and stockpiling of excavated earth or other materials should not be permitted near the top of open unsupported excavations. Current OSHA regulations should be adhered to with respect to excavations for this project.

9.4 Cut And Fill Slopes
Permanent cut and fill slopes should perform satisfactorily as steep as 3.0(H):1(V) in the native silt earth expected at the site. All slopes should be protected from erosion using suitable vegetation or pavements.

9 .5 Quality Control
A qualified geotechnical and construction materials testing consultant should provide the following services;

9.5.1 Verify the results of topsoil stripping, proof rolling, undercutting and correction of weak soil conditions, the quality and density of "engineered fill", and the conditions of the floor slab bearing levels.

9.5.2 Complete soil particle size, atterberg limit and laboratory compaction tests on each different type of fill earth used in the "controlled areas".

9.5.3 Complete a minimum of 1 field density test per each 5000 square feet of surface area per each foot of vertical thickness of fill placed in the "controlled areas". Also a minimum of 1 field density test should be taken for each 100 linear feet per each 2' of vertical thickness of fill placed at utility trenches extending through "controlled areas".

9.5.4 Test all structural concrete in accordance with the guidelines established by the American Concrete Institute.

10.0 General Comments

The comments of this report do not consider local flood conditions. The local flood condition/elevation (if any) should be determined and considered in the design of this project.

The frost penetration depth in the area of this project is generally taken to be less than 10". Provided our recommendations for the development of foundations and floor slabs are followed, we do not expect that the frost penetration will have any detrimental affects on the performance of these structures.

The comments of this report are based upon our interpretation of the construction information supplied by others, the data collected at the 8 soil bores and our visual examination of the site. The evaluation of subsurface conditions based on the 8 soil bores taken with this study requires a significant amount of interpolation. Improper site preparation, extremes in climatic conditions, significant changes in locations, grades, time, etc., can each affect ground water, surface, and subsurface conditions. If conditions are encountered as the construction advances which vary significantly from those described by this report, we should be contacted for supplemental comment.

The scope of this investigation is not intended to establish volumetric estimates of the various subsurface materials at the site. Volumetric estimates may require a large number of bores placed on a close grid to establish reliable cross sections. If volume estimates are required of us for the design/development of this project to advance, please contact us for further comment.

We are available to provide a review of the final plans and project specifications with respect to their compatibility with the contents of this report. Furthermore, our firm would appreciate the opportunity to continue to serve as the geotechnical consultant and to provide the construction materials testing and monitoring for this project.

11.0 Signature

Thank you for selecting Carmichael Engineering, Inc., to provide the geotechnical services for this project. We are available to answer any questions concerning our findings and recommendations. If we can be of any further assistance, please contact our office.

Sincerely,

J. Stephen Carmichael, P.E.
Registered AL # 15730

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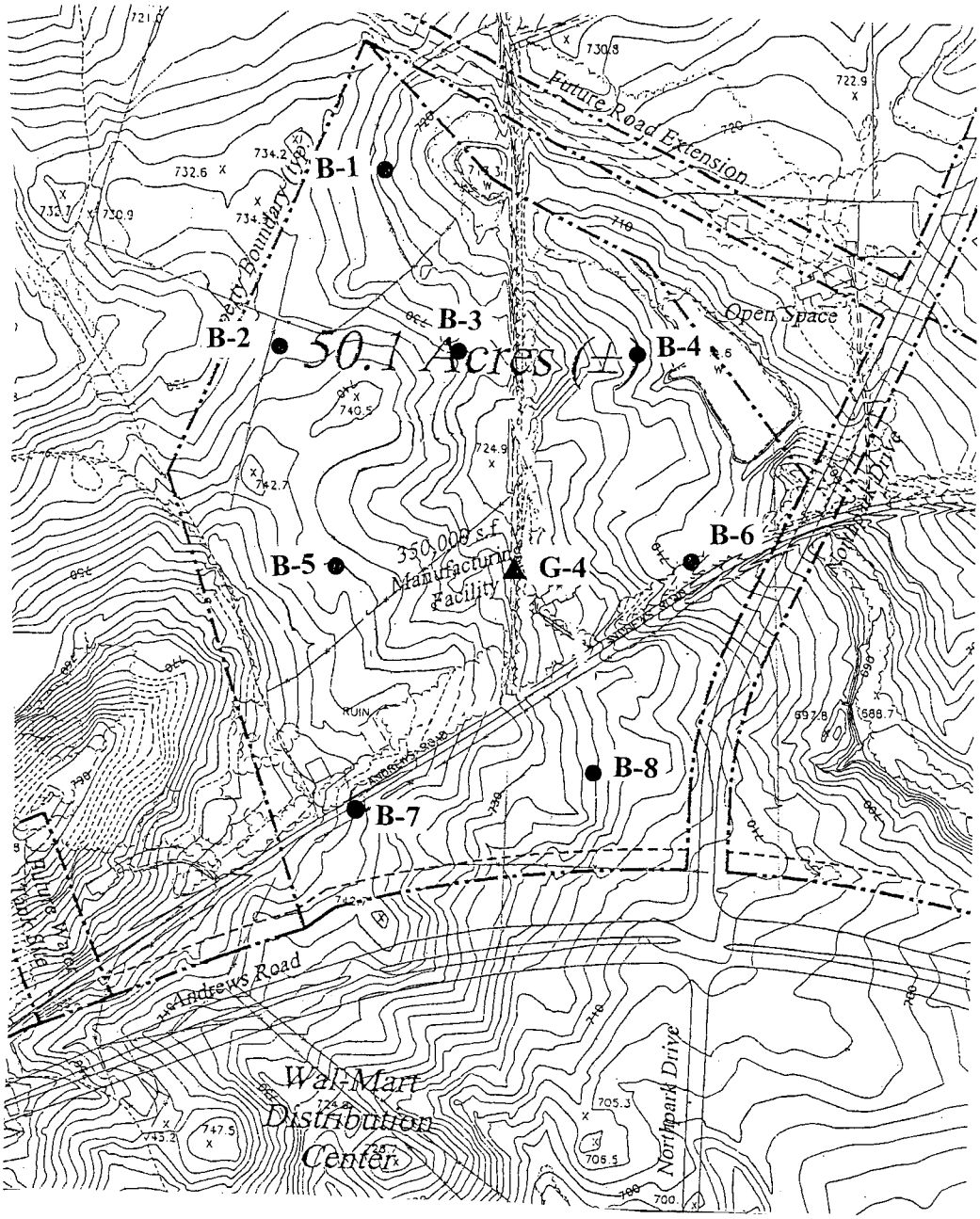
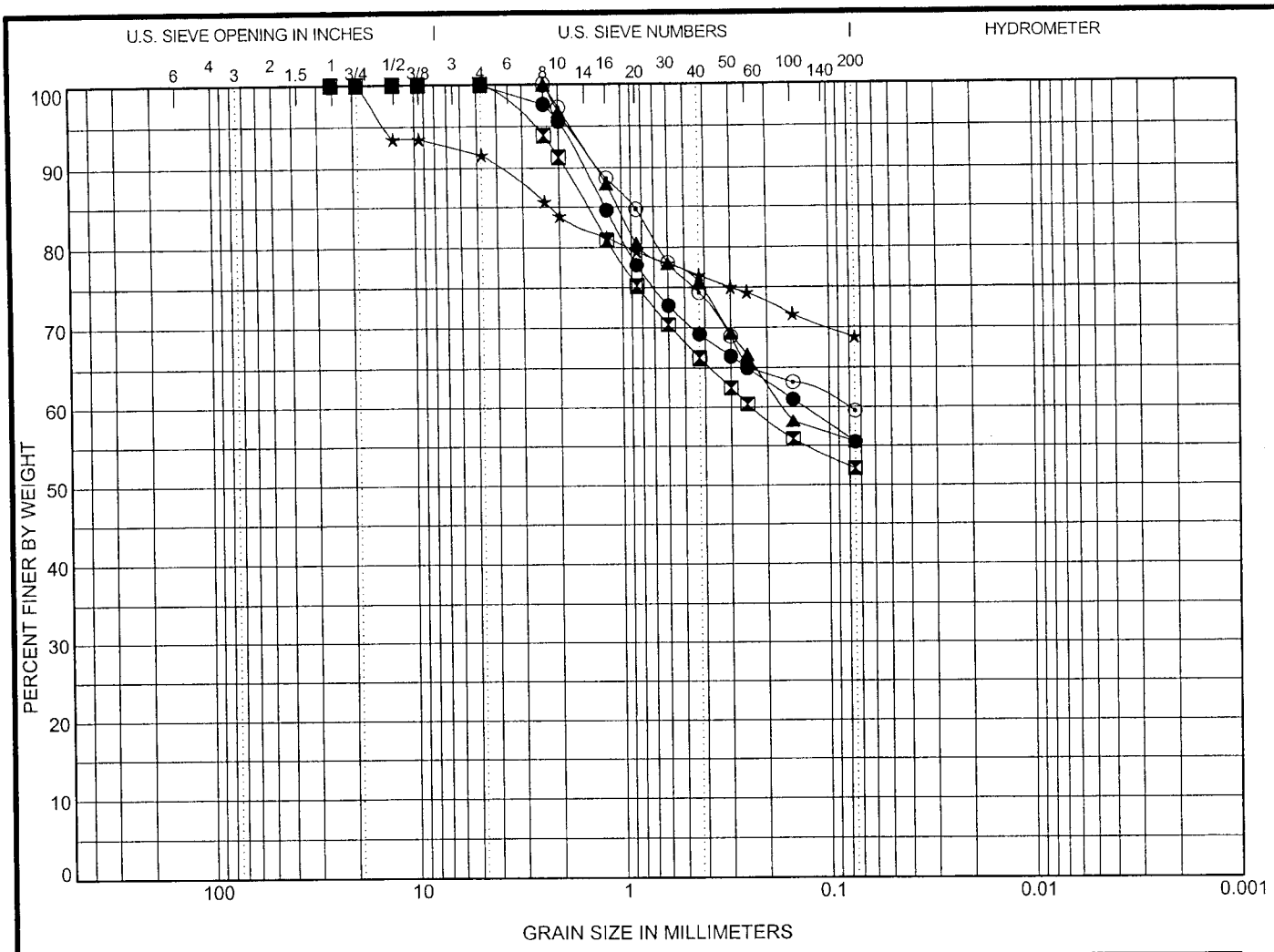


BORING PLAN

● Boring Locations
Not To Scale

50 Acre Parcel For Manufacturing Facility
Opelika, Alabama
Our Job No. : G04-1342



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● 7702	B-3 5-6.5'	SANDY ELASTIC SILT MH	58	40	18		
⊠ 7703	B-2 2.5-4'	SANDY ELASTIC SILT MH	59	47	12		
▲ 7704	B-7 2.5-4'	SANDY SILT ML	47	36	11		
★ 7705	B-4 5-6.5'	SANDY SILT ML	37	26	11		
⊙ 7706	B-5 2.5-4'	SANDY ELASTIC SILT MH	65	33	32		

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 7702	B-3 5-6.5'	75	0.132			0.0	44.5	55.5	
⊠ 7703	B-2 2.5-4'	75	0.239			0.0	47.9	52.1	
▲ 7704	B-7 2.5-4'	75	0.167			0.0	44.5	55.5	
☆ 7705	B-4 5-6.5'	75				8.4	22.8	68.8	
⊙ 7706	B-5 2.5-4'	75	0.082			0.0	40.5	59.5	

Client: City of Opelika Economical Development

Opelika, AL

Test Methods: ASTM D422, ASTM D4318
Sample Received Date: 3/8/2004
Test Date(s): Grain Size - 3/11/2004, Atterberg Limits - 3/12/04

CARMICHAEL
ENGINEERING, INC.
650 Oliver Road
Montgomery, Alabama 36117

GRAIN SIZE DISTRIBUTION

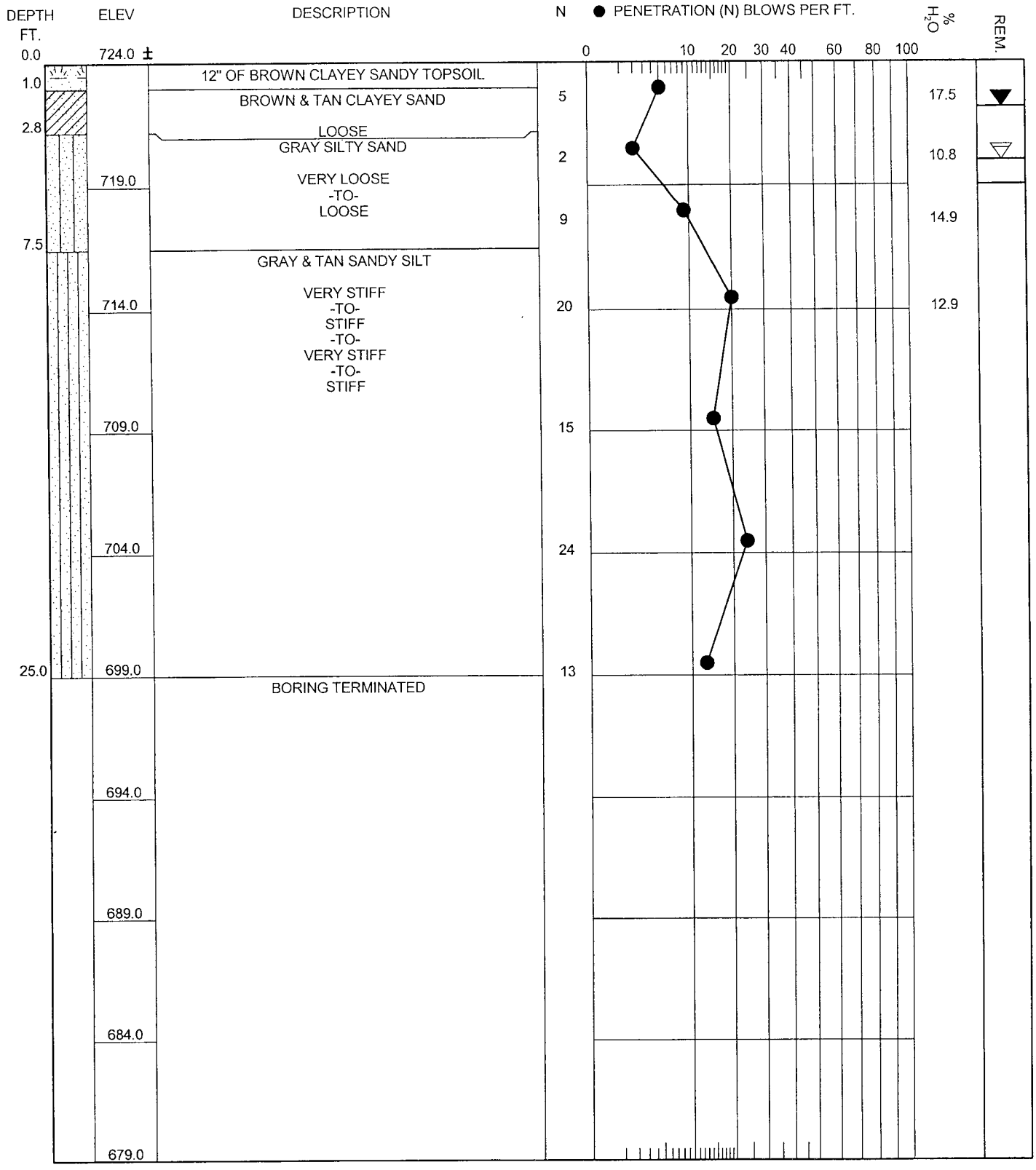
Project: 50 Acre Parcel For Manufacturing Facility

Location: Opelika, AL

Job No.: G04-1342 Report Date: 3/19/2004

Reviewed By: Brandon M. Rountree, EI

US_GRAIN_SIZE2_G04-1342.GPJ CARMICHL.GDT 3/22/04



Boring and Sampling Meets ASTM D-1586

Penetration (N) is the Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft.

☒ Undisturbed Sample

LA Lab Analysis

▼ Water Level 1.8' AFTER 24 HOURS

▽ Water Level 4.0' DURING DRILLING

Boring Caved 5.0' AFTER 24 HOURS

CARMICHAEL
ENGINEERING, INC.

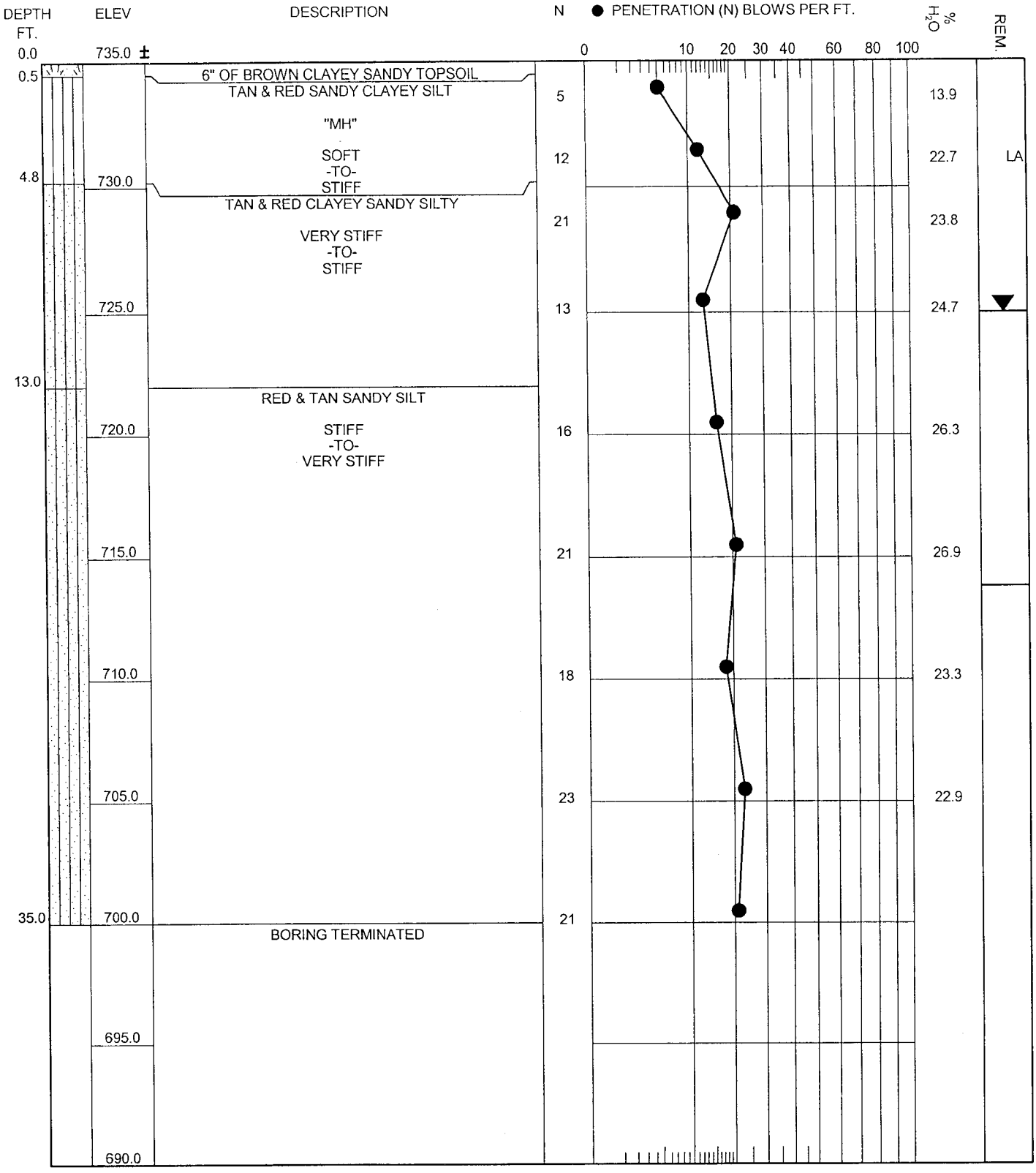
TEST BORING LOG

JOB NO. G04-1342

BORING NO. B-1

DATE DRILLED 3/8/04

TYPE BORING SB



Boring and Sampling Meets ASTM D-1586

Penetration (N) is the Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft.

☒ Undisturbed Sample

LA Lab Analysis

▼ Water Level 10.0' AFTER 24 HOURS

▽ Water Level

Boring Caved 21.2' AFTER 24 HOURS

CARMICHAEL ENGINEERING, INC.

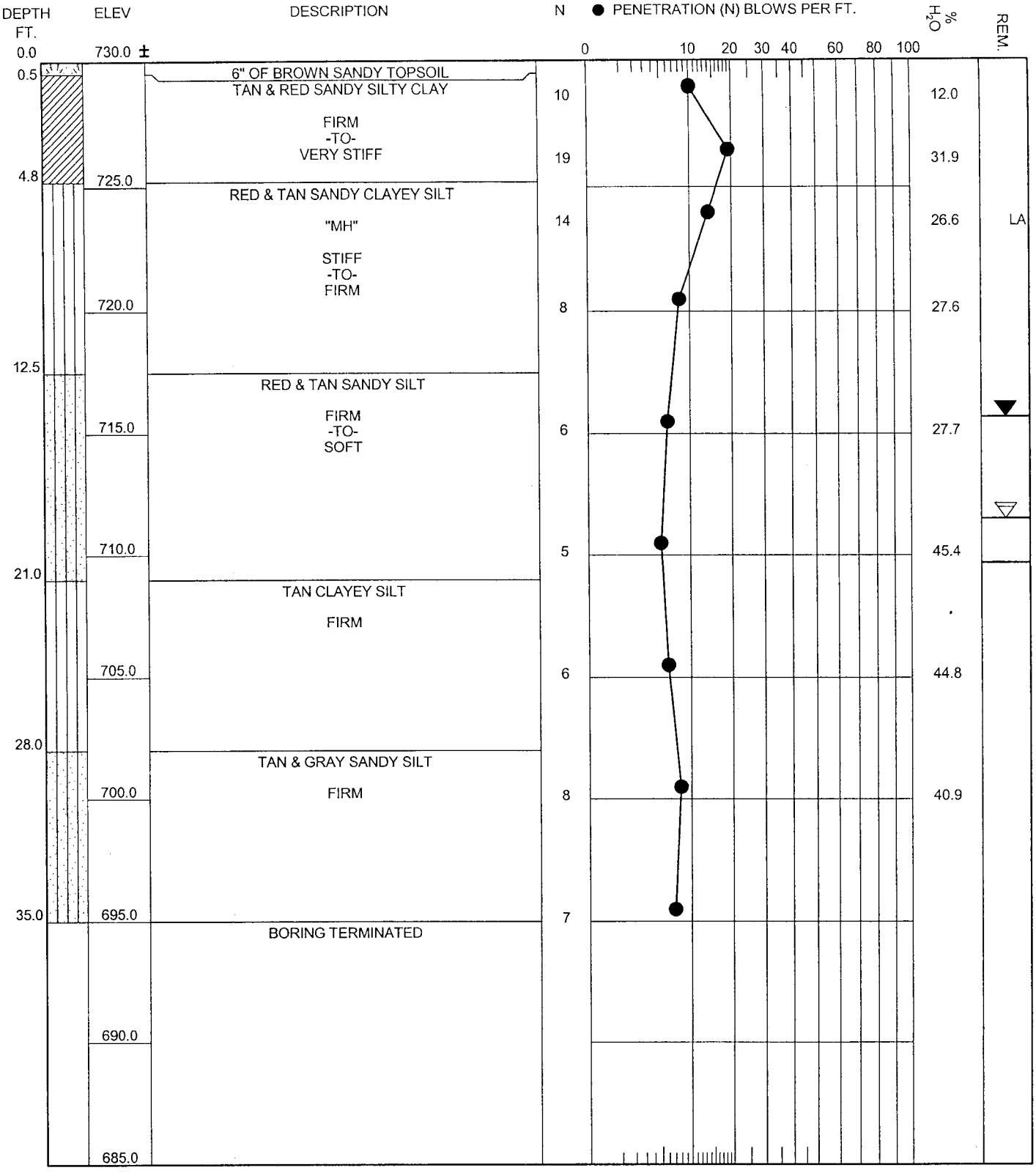
TEST BORING LOG

JOB NO. G04-1342

BORING NO. B-2

DATE DRILLED 3/8/04

TYPE BORING SB



Boring and Sampling Meets ASTM D-1586

Penetration (N) is the Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft.

☒ Undisturbed Sample

LA Lab Analysis

▼ Water Level 14.3' AFTER 24 HOURS

▽ Water Level 18.5' DURING DRILLING

Boring Caved 20.3' AFTER 24 HOURS

CARMICHAEL ENGINEERING, INC.

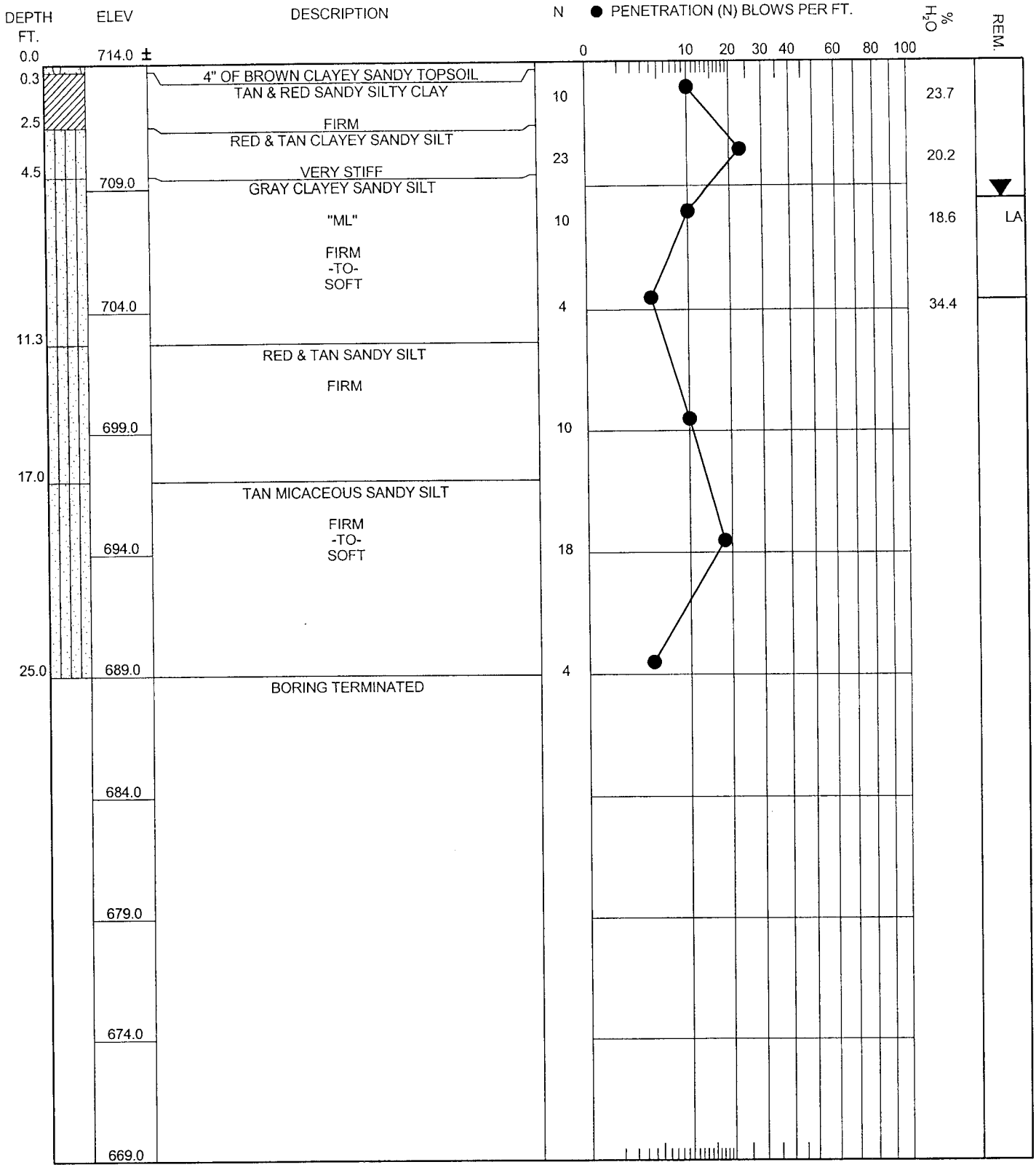
TEST BORING LOG

JOB NO. G04-1342

BORING NO. B-3

DATE DRILLED 3/8/04

TYPE BORING SB



Boring and Sampling Meets ASTM D-1586

Penetration (N) is the Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft.

☒ Undisturbed Sample

LA Lab Analysis

Water Level 5.5' AFTER 24 HOURS

Water Level

Boring Caved 9.6' AFTER 24 HOURS

CARMICHAEL
ENGINEERING, INC.

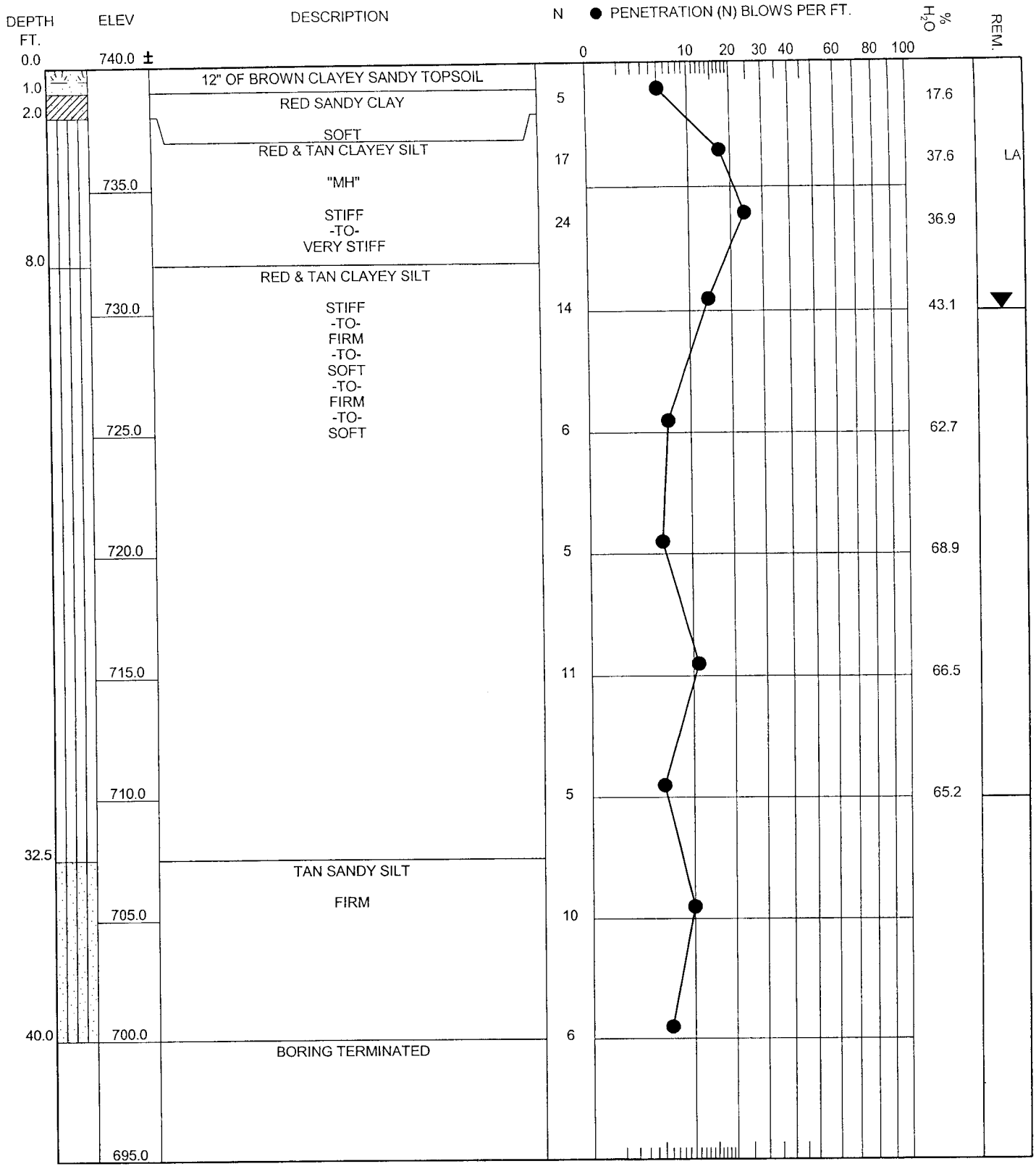
TEST BORING LOG

JOB NO. G04-1342

BORING NO. B-4

DATE DRILLED 3/8/04

TYPE BORING SB



Boring and Sampling Meets ASTM D-1586

Penetration (N) is the Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft.

☒ Undisturbed Sample

LA Lab Analysis

Water Level 10.0' AFTER 24 HOURS

Water Level

Boring Caved 30.0' AFTER 24 HOURS

CARMICHAEL ENGINEERING, INC.

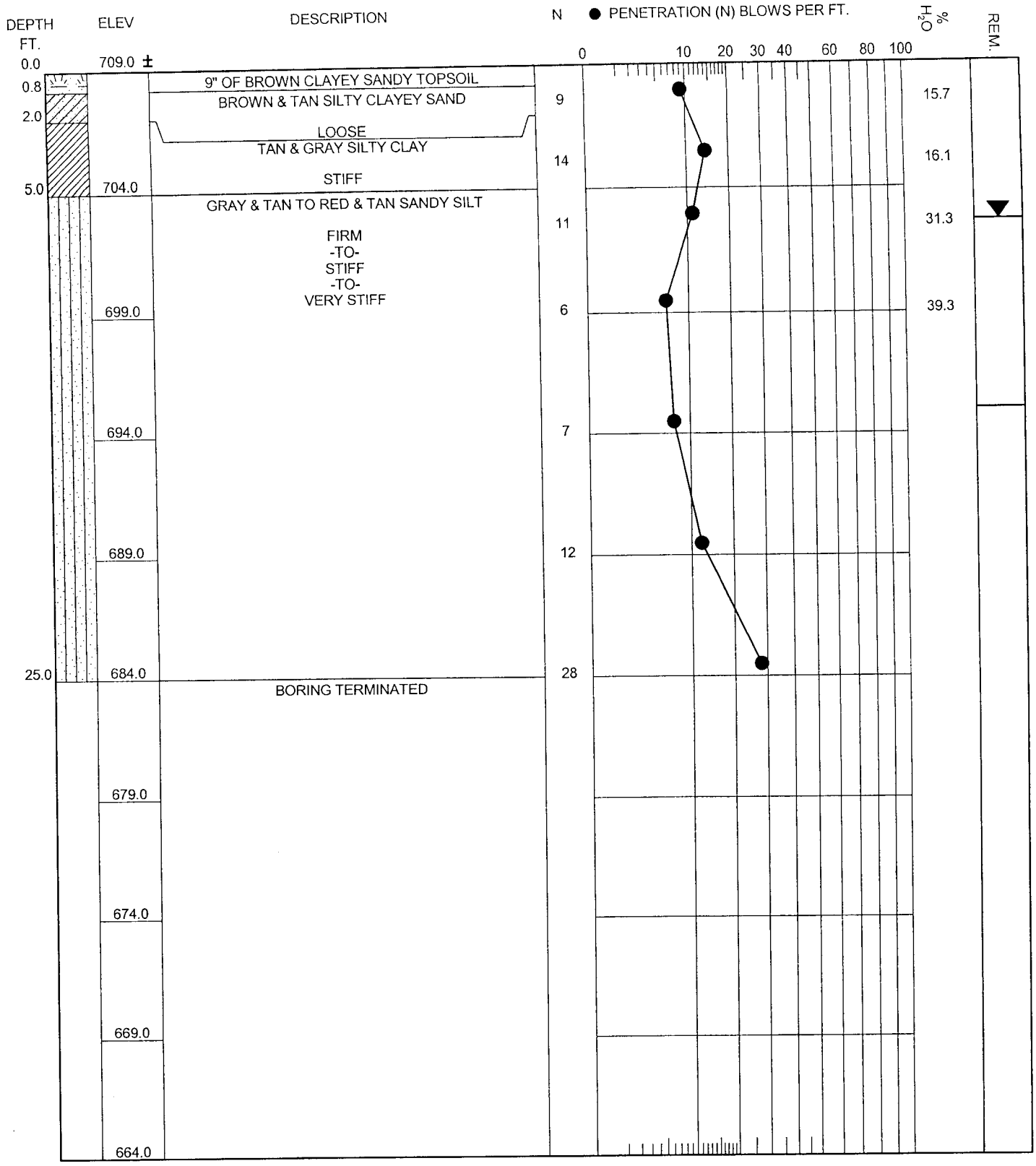
TEST BORING LOG

JOB NO. G04-1342

BORING NO. B-5

DATE DRILLED 3/8/04

TYPE BORING SB



Boring and Sampling Meets ASTM D-1586

Penetration (N) is the Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft.

☒ Undisturbed Sample

LA Lab Analysis

Water Level 6.3' AFTER 24 HOURS

Water Level

Boring Caved 14.0' AFTER 24 HOURS

CARMICHAEL
ENGINEERING, INC.

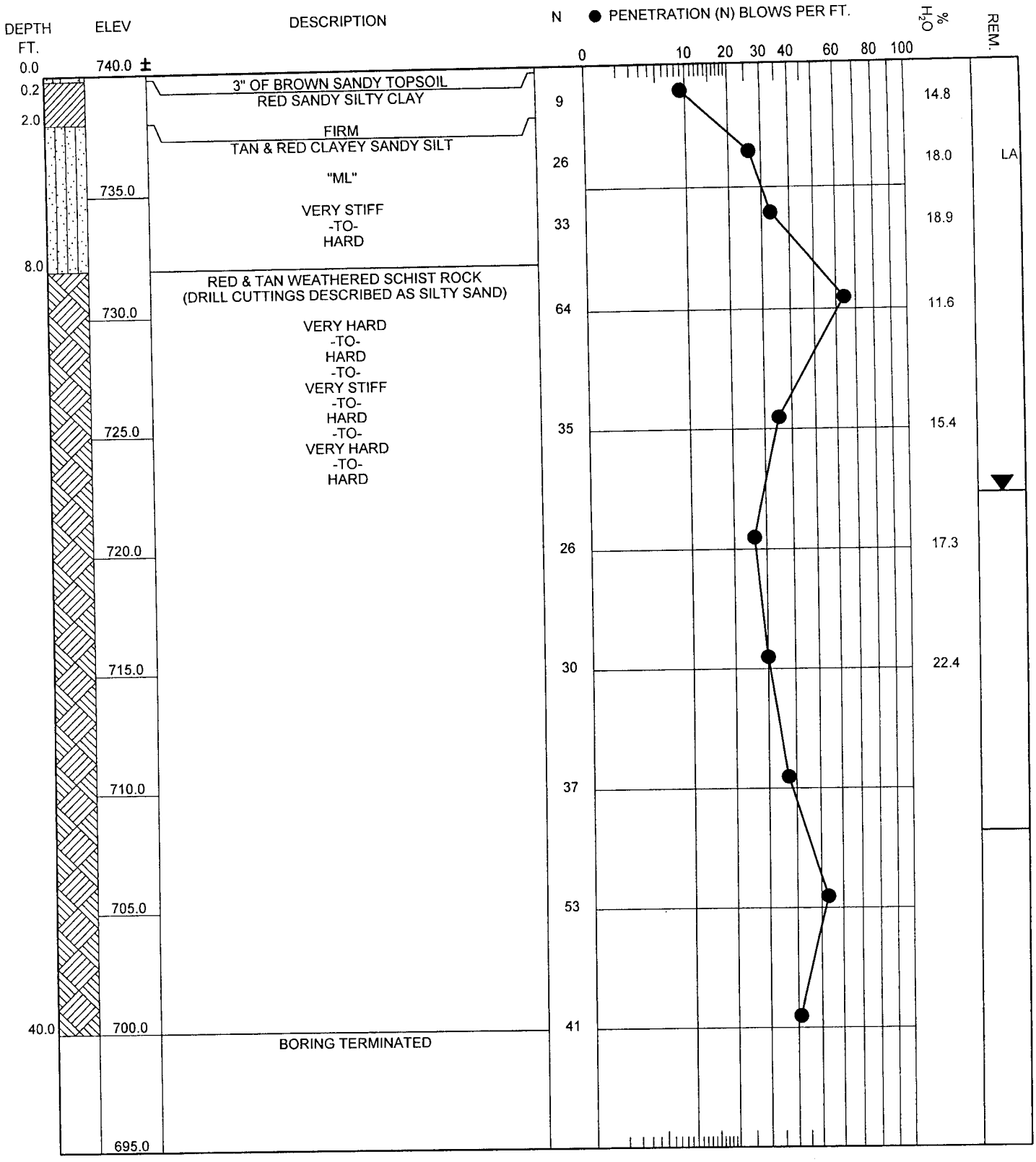
TEST BORING LOG

JOB NO. G04-1342

BORING NO. B-6

DATE DRILLED 3/8/04

TYPE BORING SB



Boring and Sampling Meets ASTM D-1586

Penetration (N) is the Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft.

☒ Undisturbed Sample

LA Lab Analysis

Water Level 17.7' AFTER 24 HOURS

Water Level

Boring Caved 31.8' AFTER 24 HOURS

CARMICHAEL ENGINEERING, INC.

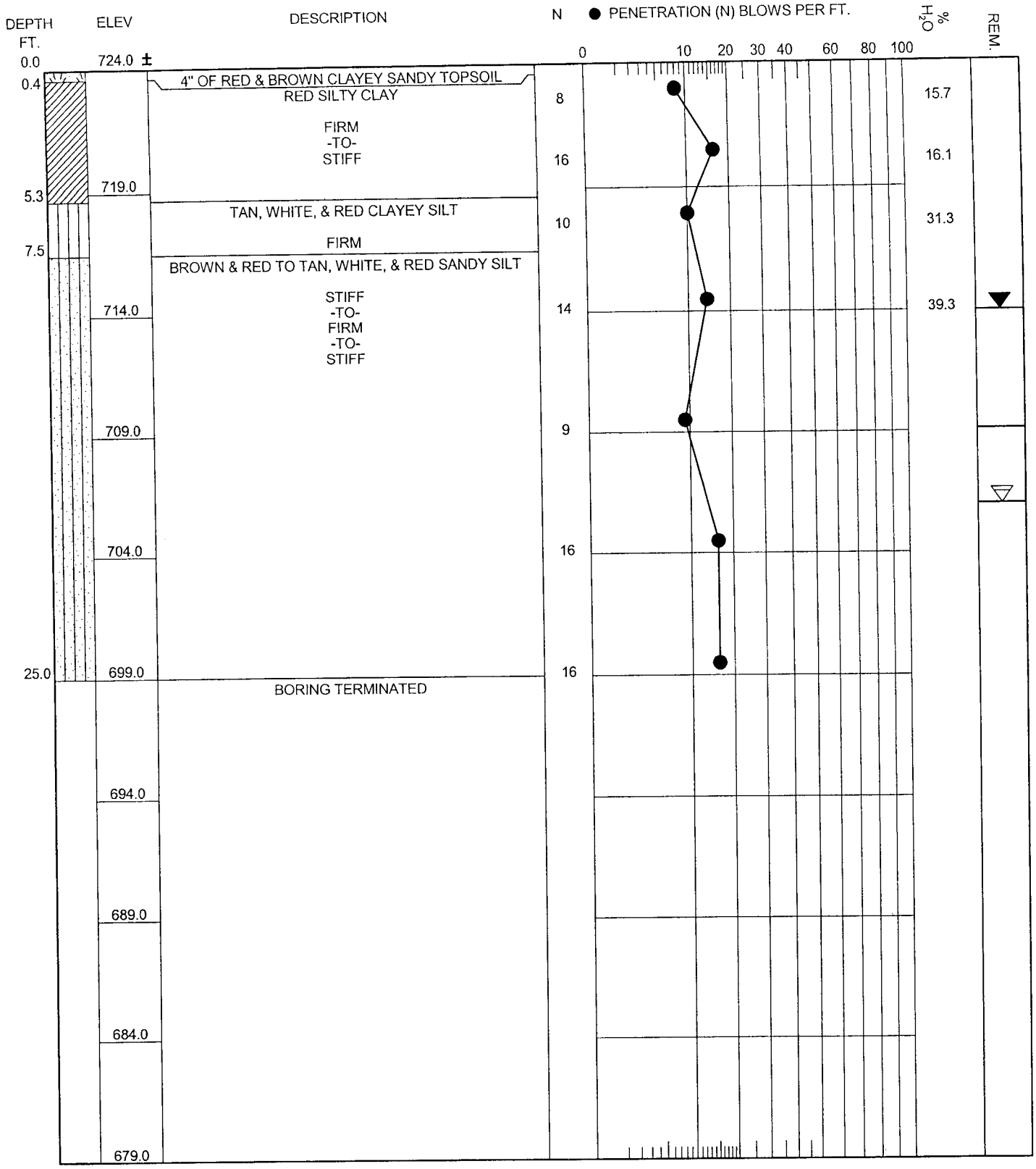
TEST BORING LOG

JOB NO. G04-1342

BORING NO. B-7

DATE DRILLED 3/9/04

TYPE BORING SB



Boring and Sampling Meets ASTM D-1586

Penetration (N) is the Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft.

☒ Undisturbed Sample

LA Lab Analysis

▼ Water Level 10.0' AFTER 24 HOURS

▽ Water Level 18.0' DURING DRILLING

Boring Caved 14.9' AFTER 24 HOURS

CARMICHAEL
ENGINEERING, INC.

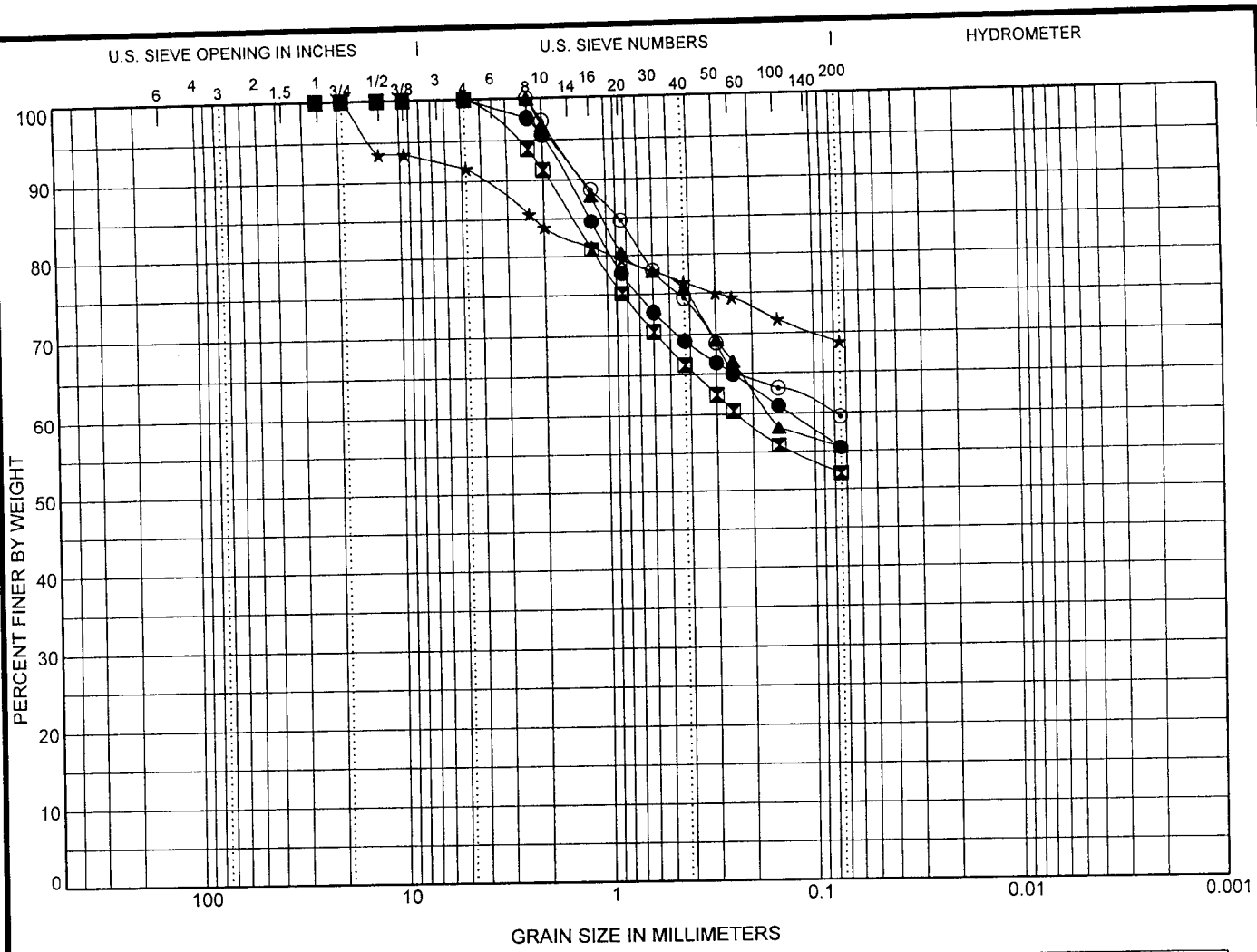
TEST BORING LOG

JOB NO. G04-1342

BORING NO. B-8

DATE DRILLED 3/9/04

TYPE BORING SB



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Client: City of Opelika Economical Development Department
204 Seventh Street South
Opelika, AL 36801

Test Methods: ASTM D422, ASTM D4318
Sample Received Date: 3/8/2004
Test Date(s): Grain Size - 3/11/2004, Atterberg Limits - 3/12/04

CARMICHAEL
ENGINEERING, INC.
650 Oliver Road
Montgomery, AL 36117

GRAIN SIZE DISTRIBUTION

Project: 50 Acre Parcel For Manufacturing Facility

Location: Opelika, AL

Job No.: G04-1342 Report Date: 3/19/2004

Reviewed By: Brandon M. Rountree, EI

US GRAIN SIZE2 G04-1342.GPJ CARMICHL.GDT 3/22/04

INVESTIGATIVE FIELD PROCEDURES

Penetration Testing & Split Barrel Sampling: A standard 2.0" O.D. (1.4" I.D.) split barrel sampler is first seated 6" to penetrate any loose cuttings and then driven an additional 12" with blows of a 140-pound hammer falling 30". The number of blows required to drive the sampler the final foot is recorded and designated the "penetration resistance" (N). (ASTM D-1586)

Soil Boring (SB): The test bore is advanced by a truck-mounted drill rig utilizing 5-5/8" O.D. (2-1/4" I.D.) hollow stem augers. Soil samples are obtained with a standard split-tube sampler by driving the sampler thru the hollow auger. Collected soil specimens are sealed in air tight containers and delivered to the laboratory to confirm the drillers classifications. (ASTM D-1452 & 1586)

Auger Boring (AB): Steel flight augers are utilized to advance the test bore. The soils are visually classified and sampled from the cuttings which are brought to the surface. (ASTM D-1452)

Undisturbed Sampling (UD): Relatively undisturbed soil samples are obtained by forcing a section of 3" O.D. 16-gauge steel tubing into the soil at the desired sample location. The tube is then sealed from moisture loss and delivered to the laboratory for possible laboratory testing.

Rotary-Wash Boring (RB): The drilling operation is performed by first setting a length of casing and then advancing the test bore by "jetting" a bentonite solution thru drill rods and bit.

Core Drilling (CD): The test bore is advanced thru rock by coring which utilizes a diamond bit and a double tube, swivel type core barrel. (ASTM D-2113)

Monitoring Wells (MW): Temporary or permanent wells may be installed to provide the accurate water table determination and periodic monitoring. The well is constructed with 1.5" to 4" diameter PVC pipe meeting current standards for monitoring well construction.

NOTES AND REFERENCES

Soil descriptions are based on the predominate constituent of the material and are further described by appropriate modifiers in reverse order of their importance. For example, a predominate sand soil containing clay would be described as "clayey sand". Additional modifiers may be used, beginning with the least important constituent such as "silty clayey sand", etc..

Water levels shown on the test boring logs reflect those levels measured at the specified time and date indicated on the logs. These water levels are subject to seasonal fluctuation and can be effected by local surface drainage and/or rainfall during the monitoring period.

The following table describes soil relative densities and consistencies based on penetration resistance values (N) determined by the Standard Penetration Test. The "N" values are estimated for hand tool bores using a portable dynamic cone penetrometer.

	N	Relative Density
Sand	0 - 3	Very Loose
	4 - 9	Loose
	10 - 19	Firm
	20 - 29	Very Firm
	30 - 49	Dense
	50 +	Very Dense

	N	Consistency
Clay and Silt	0 - 2	Very Soft
	3 - 5	Soft
	6 - 11	Firm
	12 - 17	Stiff
	18 - 29	Very Stiff
	30 - 49	Hard
	50 +	Very Hard

Laboratory Test References

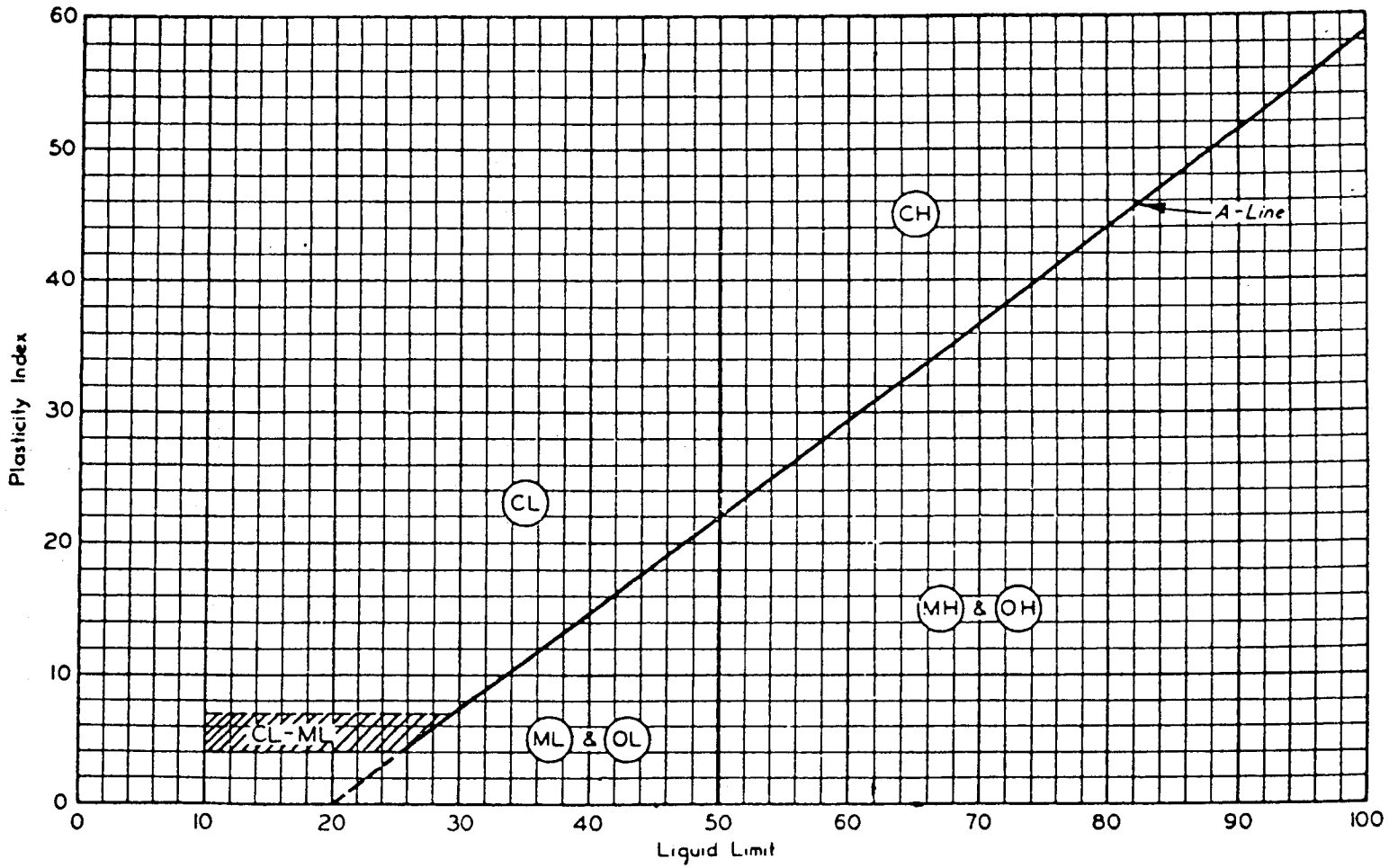
Test	Reference
Moisture Content	ASTM D-854
Particle Size Analysis	ASTM D-421, 422 & 1140
Atterberg Limit	ASTM D-423, 424
Specific Gravity	ASTM D-2216
Compaction Test	ASTM D-698, 1557
California Bearing Ratio Test	AASHTO T-193
Triaxial Shear Test	ASTM D-2850
Unconfined Compression Test	ASTM D-2166
Consolidation Test	ASTM D-2435
Soil Permeability Test	ASTM D-2434

The Unified Soil Classification System

Major divisions			Group symbol	Typical names	Classification criteria for coarse-grained soils	
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U \geq 4$ $1 \leq C_C \leq 3$	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW ($C_U < 4$ or $1 > C_c > 3$)	
		Gravels with fines (appreciable amount of fines)	GM $\frac{d}{u}$	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below *A* line or $I_p < 4$	Above *A* line with $4 < I_p < 7$ are borderline cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above *A* line with $I_p > 7$	
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_U \geq 6$ $1 \leq C_C \leq 3$	
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW ($C_U < 6$ or $1 > C_C > 3$)	
		Sands with fines (appreciable amount of fines)	SM $\frac{d}{u}$	Silty sands, sand-silt mixtures	Atterberg limits below *A* line or $I_p < 4$	Limits plotting in hatched zone with $4 \leq I_p \leq 7$ are borderline cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above *A* line with $I_p > 7$	
Fine-grained soils (more than half of material is smaller than No. 200)	Silts and clays (liquid limit < 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain-size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5%–GW, GP, SW, SP More than 12%–GM, GC, SM, SC 5 to 12%–Borderline cases requiring dual symbols	
			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 > 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			CH	Inorganic clays or high plasticity, fat clays		
			OH	Organic clays of medium to high plasticity, organic silts		
	Highly organic soils		Pt	Peat and other highly organic soils		

$$C_U = \frac{D_{60}}{D_{10}}$$

$$C_C = \frac{D_{30}^2}{D_{10} D_{60}}$$



PLASTICITY CHART

EXHIBIT C
CARMICHAEL ENGINEERING, INC.
GENERAL CONDITIONS OF AGREEMENT WITH THE CLIENT

1. **PAYMENT TERMS**. CARMICHAEL ENGINEERING, INC., (hereinafter called "CEI") will submit invoices to client monthly and a final bill upon completion of services. Invoice will show charges for different personnel, unit prices and/or expense classifications unless a lump sum payment is agreed to as part of this agreement. Payment is due upon presentation of invoice and is past due thirty (30) days from the invoice date. Client agrees to pay a finance charge of one and one-half percent (1 1/2%) per month (minimum of $15.00 per month) on the principal amount of any past due account. In the event CEI deems it necessary to refer the account to an attorney for collection, client agrees to pay all costs of collection, including a reasonable attorney's fee.

2. **INSURANCE**. CEI maintains Worker's Compensation and Employer's Liability Insurance in conformance with applicable state law. In addition, we maintain Comprehensive General Liability Insurance and Automobile Liability Insurance with bodily injury limits and property damage limits of, to wit $1,000,000 combined single limit. A certificate of insurance can be supplied evidencing such coverage which contains a clause providing that fifteen (15) days written notice be given prior to cancellation. Cost of the above is included in our quoted fees. If additional coverage, such as additional insured endorsements, waiver of subrogation or increased limits of liability are required, CEI will endeavor to obtain the requested insurance and charge separately for costs associated with additional coverage or increased limits.

3. **STANDARD OF CARE**. The only warranty or guarantee made by CEI in connection with the services performed hereunder is that we will use 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, expressed or implied, is made or intended by our proposal for geotechnical/environmental services or by our furnishing oral or written reports.

4. **LIMITATION OF LIABILITY**. Client agrees to limit CEI's liability to client, and to all construction contractors and subcontractors on the project, arising from CEI's professional acts, errors or omissions or other professional negligence, so that the total aggregate liability of CEI to all those named shall not exceed $50,000 If the client prefers to have higher limits or professional liability, CEI agrees to increase the limits up to a maximum of $1,000,000 upon the clients written request at the time of accepting our proposal, provided that the client agrees to pay an additional consideration of two percent (2%) of our total fee, or $250, whichever is greater. The additional charge for the higher liability limits is because of the greater risk assumed and is not strictly a charge for additional professional liability insurance.

5. **RIGHT OF ENTRY**. Unless otherwise agreed in writing, client will provide for the right of entry for CEI, its agents and employees and all equipment necessary for the completion of the work. While CEI will take reasonable precautions to minimize any damage to the site, it is understood by the client that in the normal course of work some damage may occur and that the cost of correction or repairing such damage is not included in the quoted fee and CEI is not responsible unless specifically stated. If client desires CEI to repair or correct the damage, the cost of such repairs or corrections will be paid by client as an additional fee.

6. **EXISTING MAN MADE OBJECTS**. It is the duty of the client to disclose the presence and accurate location of all hidden or obscure man made objects, including utility lines, relative to field test or boring locations. CEI field personnel are trained to recognize clearly identifiable stakes or markings in the field and, without special written instructions to initiate field testing, drilling and/or sampling within a reasonable distance of each designated location. If CEI is notified in writing of the presence or potential presence of underground or above ground obstructions, such as utilities, CEI will give special instructions to its field personnel. Client agrees to indemnify and save harmless CEI from all claims, suits, losses, personal injuries, deaths and property liability resulting from unusual subsurface structures, owned by client or third parties, occurring in the performance of the proposed services, the presence and exact locations of which were not revealed to CEI in writing, and to reimburse CEI for expenses in connection with any such claims or suits, including reasonable attorney's fees.

7. **SAMPLING OR TESTING LOCATION**. The fees included in the Agreement do not include costs associated with surveying of the site or the accurate horizontal and vertical locations of tests. Field test or boring locations described in CEI's report or shown on sketches are based on specific information furnished by the client or clients agent or estimates made by CEI technicians. Such dimensions, depths or elevations should be considered as approximations unless otherwise stated in the report or contracted for at the inception of the Agreement.

8. **SAMPLE DISPOSAL AGREEMENT**. CEI will retain soil and rock samples which are not used for testing for forty-five (45) days after submission of our report. After forty-five (45) days the retained samples will be discarded unless the client has made written request for storage or transfer of the samples. Client shall be responsible for the expense of such storage or transfer.

9. **SAFETY**. When CEI provides periodic observations or monitoring services at the job site during construction, Client agrees that, in accordance with generally accepted construction practices, the contractor (i.e. not CEI) will be solely and completely responsible for working conditions on the job site, including safety of all persons and property during the performance of the work, and compliance with OSHA regulations, and that these requirements will apply continuously and not be limited to normal working hours. Any monitoring of the contractor's procedures conducted by CEI is not intended to include review of the adequacy of the contractor's safety measures in, on, adjacent to, or near the construction site.

10. **ENGINEERING, EQUIPMENT AND TECHNICAL SERVICES**. Fees for such services are based on all time spent on the project by engineering or technical personnel at the hourly or unit rates of the Fee Schedules. The quoted fee may not cover the cost of conferences, site visits, review of foundation plans and specifications, or other services subsequent to submission of our report. Such additional services will be invoiced at the applicable rates. All engineering and technical work is generally done by CEI's regular employees; however, special services by other firms or consultants may be needed on occasion and will be invoiced at the applicable rates but no "outside" services will be contracted for without clients prior permission.

11. **ASSIGNMENT**. Neither client or CEI may delegate, assign, sublet or transfer its duties or interest in this agreement without the prior written consent of the other party.

12. **OWNERSHIP OF DOCUMENTS**. All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates and other documents prepared by CEI, as instruments or service, shall remain the property of CEI. Client agrees that under no circumstances shall any documents or reports produced by CEI pursuant to this Agreement be used at any location or for any project not expressly provided for in this agreement without the written permission of CEI. Client agrees that all reports and other work furnished to client or its agents, which are not paid for, will be returned upon demand and will not be used by client for any purpose whatsoever. CEI will retain all pertinent written records relating to the services performed for a period of five (5) years following submission of the report, during which period the records will be made available to client at all reasonable times. During this five (5) year period, CEI will provide client with copies of documents created in the performance of the work, at the expense of client.

13. **TERMINATION**. This agreement may be terminated by either party upon fourteen (14) days written notice in the event of material failure by the other party to perform in accordance with the terms hereof. Such termination shall not be effective if the material failure has been remedied before the expiration of the period specified in the written notice. In the event of termination, CEI shall be paid for all services performed and expenses incurred up to the termination notice data plus reasonable termination expenses. The expenses of termination or suspension shall include all direct costs or CEI in completing such analysis, records and reports.

14. **GOVERNING LAW**. This agreement shall be governed and construed in accordance with the laws of the State of Alabama, United States of America.

15. **SEPARABILITY**. The provisions of this agreement are separate and divisible, and, if any court of competent jurisdiction shall determine that any provision hereof is void and/or unenforceable, the remaining provisions shall be construed and shall be valid as if the void and/or unenforceable provisions or were not included in this Agreement.

16. **WAIVER**. Except as otherwise especially provided in this Agreement, no failure on the part of either party to exercise, and no delay in exercising, any rights, privilege or power under this Agreement shall operate as a waiver or relinquishment thereof, nor shall any single partial exercise by either party or any right, privilege or power under this Agreement preclude any other or further exercise thereof, or the exercise of any right, privilege or power. Waiver by any party of any breach of any provisions of the Agreement shall not constitute or be construed as a continuing waiver, or a waiver of any other breach of any provision of this Agreement.

17. **BINDING**. This agreement shall be binding upon all of the parties and their respective estates, heirs, administrators, executors, successors and assigns.

18. **STIPULATION**. Each of the parties to this Agreement as set forth herein and in the Work Order furnished by CEI stipulates that they have read, understand and agree to be bound by all of the terms set forth pursuant to the documents which are the basis of this agreement.

(Revised 1/31/03)