Florida Department of Transportation

CHARLIE CRIST
GOVERNOR

District Two
1109 South Marion Avenue
Mail Station 2015
Lake City, Florida 32025-5874

STEPHANIE C. KOPELOUSOS
SECRETARY

January 15, 2008

To: Prospective Bidders and Plan Holders

Addendum No: **1, E2L29, Financial Project # 41021317241**
Pressure grout Injection stabilization of subgrade on SR 26 in the vicinity of West 46th Street in Gainesville.

QUESTIONS AND ANSWERS:

Q. I need the geotechnical report with boring logs included to prepare my bid.
A. The geotechnical report is attached to this addendum.

You must sign, date and fax a copy of this addendum back to me by close of business today to indicate receipt. A copy of this addendum must be returned with your bid.

_____
Company Name

_____
Date

_____
Signature

Thanks,

Patsy Elkins, CPPB
Contracts Coordinator
Phone: 386-758-3703
Fax: 850-412-8082

Report of Subsurface Exploration
&
Subgrade Improvement

SR 26 ROADWAY DEPRESSIONS
NW 67TH St. to NW 66TH St.
&
NW 44TH St., NW 45TH St., & NW 46TH St.

FIN No. 213940-1-A1-02
Gainesville, Alachua County, Florida

Project No.: WILLIAMS 2302-621-36; SEI 2006–G364

August 2007

Prepared for:

DISTRICT II MATERIALS OFFICE

Lake City, Florida

Prepared by:

WILLIAMS EARTH SCIENCES
&
SALIBA ENGINEERING, INC.

WILLIAMS
EARTH SCIENCES, INC.
Choose Integrity.

10600 Endeavour Way
Largo, Florida 33777
Office: (727) 541-3444
Fax: (727) 541-1510
www.williamsearthsciences.com

August 24, 2007

FDOT District II, Materials Office
1109 South Marion Avenue
Lake City, Florida 32025

Attention: Mr. Binay Prakash
Project Manager

Subject: Report of Subsurface Exploration & Subgrade Improvement
SR 26 Roadway Depressions
Gainesville, Alachua County, Florida
FIN No.: 213940-1-A1-02
Project No.: Williams 2302-621-36; SEI 2006-G364

Dear Mr. Prakash:

Williams Earth Sciences, Inc. (Williams) and Saliba Engineering, Inc. (SEI) have completed the subsurface exploration, recommendations, and Subgrade Improvement Plans for the subject depressions and roadway settlements along SR 26 in the city of Gainesville, Alachua County, Florida. The subject depressions are located within the eastbound travel lanes of SR 26. Our services were provided in accordance with Williams' Proposal and Schedule B dated December 23, 2006 and Supplement 1 dated April 25, 2007. Authorization to proceed with this study was provided by FDOT under Contract C-8621, Task Work Orders (TWO) 36 (dated December 28, 2006) and 50 (dated April 26, 2007).

The purpose of this study was to determine the general subsurface conditions in the vicinity of the subject roadway depressions and to evaluate those conditions with regard to subgrade improvement and repair of the roadway sections in those areas. Technical Special Provision (TSP) and grout injection plans will be provided under separate report.

Williams Earth Sciences, Inc. and Saliba Engineering, Inc. appreciate the opportunity to assist you during this phase of the project. Should you have any questions concerning this report or if we may be of further assistance, please feel free to call us.

Sincerely,

WILLIAMS EARTH SCIENCES, INC.

Larry Spears, P.E.
Senior Geotechnical Engineer
Florida Registration No. 52105

SALIBA ENGINEERING, INC.

Raymond E. Saliba, P.E.
Senior Engineer/Principal
Florida Registration No. 51032

Distribution: FDOT District II (3)
Williams (1)
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1.0 INTRODUCTION

1.1 Purpose and Scope of Work

The purpose of the geotechnical exploration was to evaluate the subsurface conditions and to assess the cause of the roadway depressions and subgrade failures that have been noted between NW 66TH Street and NW 67TH Street, in front of Oaks Mall, and between NW 44TH Street and NW 46TH Street, along SR 26 (W Newberry Road) in the city of Gainesville, Alachua County, Florida, and to develop a plan of action for subgrade improvement and repair. This letter contains a brief description of our understanding of the project conditions (based on our site visits), a discussion of the site conditions encountered at the time of our visits, an evaluation of the subsurface conditions encountered in the soil test borings performed, and our recommendations.

1.2 Site Location

Several roadway depressions are present along SR 26 (W Newberry Road) in the city of Gainesville, Alachua County, Florida. The depressions are located within the eastbound travel lanes, in front of Oaks Mall (between 66TH Street and 67TH Street) and between NW 44TH Street, NW 45TH Street, and NW 46TH Street. **Figure 1** included in the **Appendix** shows the approximate site locations.

2.0 SUBSURFACE EXPLORATION

2.1 Field Exploration

Williams performed nineteen (19) Standard Penetration Test (SPT) borings within the roadway depressions and failed subgrade areas and four auger borings outside the concrete sidewalk, in the wooded areas between 44TH Street and 46TH Street. Seven SPT borings (B-1 through B-3, B-1A, and B-15 through B-18) were drilled between 66TH Street and 67TH Street, in front of Oaks Mall. The remaining eleven borings (B-4 through B-14) were drilled between NW 44TH Street, NW 45TH Street, and NW 46TH Street. The test borings were located in the field by representatives from Williams, SEI, and FDOT District 2 Materials Office, using existing roadway intersections, concrete curbs, and edge of travel lanes as reference for measuring distances and turning angles. The approximate locations of the SPT borings are presented on Table 1, Summary of Soil Borings, and on the Report of Core Borings, Sheets 1 of 7 through 7 of 7, included in the **Appendix**.

SPT Borings: The SPT borings were extended to depths ranging from 8.1 to 55 feet below the existing pavement surface. The SPT borings provide soil samples and Standard Penetration Resistances “N”-Values. Engineering properties of the soils can be obtained from the N-Values and index property soil classifications based on published empirical correlations. All SPT borings were performed using a truck mounted CME 55 drill rig with automatic hammer. Slurry drilling fluids were used to maintain open holes. Sampling was performed in general accordance with ASTM D 1586 and FDOT Standard Guidelines. For the shallow borings (B-1 through B-9), continuous samples were taken in the upper 10 feet, with one sample taken every 2.5 feet thereafter to the termination depths of 8 to 25 feet. For the deep borings (B-10 through B-18), one sample was taken every 5 feet in the upper 20 feet, with one sample taken every 2.5 feet thereafter to the termination depths of 34.9 to 55 feet. Split spoon soil samples were placed in glass jars and returned to our office for additional visual classification by a qualified geotechnical engineer. All boreholes were grouted and sealed prior to the crew leaving the site.

The boring logs graphically show the Penetration Resistances and present the soil description for each test boring. The stratification lines and depth designations on the boring records represent the approximate boundaries between soil types. The SPT boring logs and a classification sheet representing the Unified and AASHTO classification systems are included in the **Appendix**.

Auger Borings: Four (4) hand auger borings (HA-1 through HA-4) were performed 1 to 5 feet outside the concrete sidewalk, along the wooded area between NW 44TH Street and NW 46TH Street, to assess the near surface soils condition present outside roadway area and their possible impact on the subject depressions. The auger borings were performed at the locations presented on the Report of Auger Borings sheet included in the **Appendix**, and extended to the depth of 6 feet. The hand auger borings were located in the field by representatives from Williams, using the existing roadway intersections and concrete sidewalk as reference for measuring distances and turning angles. Groundwater measurements were taken at the time of drilling at each boring.

The hand auger borings were advanced by manually twisting a hand auger into the ground. Sampling was performed in general accordance with ASTM and FDOT Standard Guidelines. Each boring was logged by a representative of Williams. Soil samples collected were placed in sealed Ziploc bags and returned to the office for additional visual classification by a qualified geotechnical engineer and potential laboratory testing. All boreholes were backfilled prior to the field crew leaving the site. The Report of Auger Borings sheet presents the soils encountered at the site within each auger boring. The depth designations represent the approximate boundaries between soil types. The Report of Auger Borings is included in the **Appendix**.

2.2 Laboratory Testing

Once the samples were received in SEI's office, a geotechnical engineer visually examined each sample to estimate the distribution of grain sizes, plasticity, organic content, moisture condition, color, presence of lenses and seams, and apparent geological origin. The results of the engineer's classifications as well as field test results are presented in the **Appendix**. Similar soils were grouped into strata on the logs. The strata lines represent approximate boundaries between soil types; the actual transition between soil types in the field may be gradual in both the horizontal and vertical directions.

Several representative samples of the soils obtained during the field-testing program were tested in Williams' laboratory. The limited testing program was designed to determine selected engineering properties of the on-site soils relative to their use for the project. Tests performed included grain size distribution and Atterberg limits. Results of the laboratory testing performed for this study are presented on the Summary of Laboratory Testing sheets included in the **Appendix**.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

Oaks Mall – 66TH Street to 67TH Street: The roadway depressions in this area are located within the eastbound outside travel lane and middle travel lane, and were not very defined. SR 26 (W Newberry Road) within the limits of the roadway depressions consists of six travel lanes (12-foot wide each), with turn lanes, curb and gutters, concrete sidewalk, and a concrete median. Underground utility lines are present in the area. Some of the utility lines are located within the travel lanes, with others located outside the road, under the curb or under the

concrete sidewalk. Outside the concrete sidewalk from the south (side of Oaks Mall) the ground drops about 10 to 14 feet, to the top of a masonry block wall present along the north side of the parking area. Wall height varies from 3 to more than 5 feet. The wall shows signs of lateral movement outward near the top, with several vertical cracks and lateral differential movement / separation.

NW 44TH, NW 45TH, & NW 46TH Streets: Several depressions were present in the area. Most of the roadway depressions are within the eastbound outside travel lane with small intrusions into the inside eastbound travel lane. Limits of the depressions extend thirty to more than fifty feet along the outside edge of travel lane, with a circular arc into the inside lane. Approximate plan view of the depressions is presented on the Report of Core Borings sheets, included in the **Appendix**. SR 26 (W Newberry Road) within the limits of the roadway depressions in this area is a four lane divided road, 12-foot wide each, with bike lane, curb and gutters, and concrete sidewalks. Based on visual observations, drops within the depressions range from less than one inch to more than three or four inches.

3.2 Soil Conservation Service - Soil Survey

The "Soil Survey of Alachua County, Florida (1985)" prepared by the United States Department of Agriculture was reviewed to determine the soil types throughout the project limits. The soil survey mapping identifies four surficial units encountered in the vicinity of the roadway depressions in front of Oaks Mall, and two between NW 44TH, NW 45TH, and NW 46TH Streets. The soil units in front of Oaks Mall consist of Millhopper sand, 0 to 5 percent slopes, Lochloosa fine sand, 2 to 5 percent slopes, Blichton sand, 5 to 8 percent slopes, and Bivans sand, 5 to 8 percent slopes. The soil units two between NW 44TH, NW 45TH, and NW 46TH Streets consist of Arredondo fine sand, 0 to 5 percent slopes and Millhopper sand, 0 to 5 percent slopes. Copies of the soil survey maps are presented as **Figures 2A** and **2B**, in the **Appendix**.

Arredondo fine sand, 0 to 5 percent slopes: This nearly level to gently sloping, well drained soil is in both small and large areas of uplands. Slopes are smooth to convex. The areas are irregular in shape and range from about 10 to 160 areas in size.

Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The subsurface layer is fine sand to a depth of 49 inches. The upper 23 inches is yellowish brown, and the lower 18 inches is brownish yellow. The subsoil extends to a depth of 86 inches or more. The upper 5 inches is yellowish brown loamy sand; the next 10 inches is yellowish brown sandy clay loam, and the lower 22 inches is dark yellowish brown sandy clay and sandy clay loam.

Included with this soil in mapping are small depressional areas of soils that have a very dark gray or black surface layer 8 to 24 inches thick. This layer overlies gray sandy material. These areas are shown by wet spot symbols. Also included are small areas of Fort Meade, Gainesville, Kendrick, and Millhopper soils. A few areas of this soil include Arredondo soils that have 5 to 8 percent slopes. Some areas of this soil in the western part of the county have small spots of strongly acid to medium acid soil material 40 to 70 inches deep to calcareous limestone. Limestone boulders, fragments of limestone, sinkholes are in some areas of this soil mainly in the limestone plain sections of the western part of the county. Most of these boulders are siliceous. The sinkholes and the boulders are shown by appropriate map symbols. Total included areas are about 15 percent. In this Arrendondo soil, the available water capacity is low in sandy surface and subsurface layer and low to medium in the loamy subsoil. Permeability is

rapid in the surface and subsurface layers and moderately slow to moderate in the loamy subsoil. The water table in this soil is at a depth of more than 72 inches.

Millhopper sand, 0 to 5 percent slopes: This nearly level to gently sloping, moderately well drained soil is in small and large irregularly shaped areas on uplands and on slightly rolling knolls in the broad flatwoods. Slopes are mostly nearly smooth or convex. The areas are variable in size. They range from about 10 to 250 acres.

Typically, the surface layer is dark grayish brown sand about 9 inches thick. The subsurface layer is sand or fine sand about 49 inches thick. The upper 17 inches is yellowish brown, the next 22 inches is light yellowish brown, and the lower 10 inches is very pale brown. The subsoil extends to a depth of 89 inches. The upper 6 inches is yellowish brown loamy sand that has grayish and brownish mottles; the next 22 inches is light gray, mottled sandy clay loam; and the lower 3 inches is light gray, mottled sandy loam.

This Millhopper soil has a water table that is at a depth of 40 to 60 inches for 1 to 4 months and at a depth of 60 to 72 inches for 2 to 4 months during most years. The available water capacity is low in the surface and subsurface layers and is low to medium in the subsoil. Permeability is rapid in the surface and subsurface layers, moderately rapid in the upper 6 inches of the subsoil, and slow to moderately slow below this depth.

Lochloosa fine sand, 2 to 5 percent slopes: This gently sloping, somewhat poorly drained soil is in small and large areas on the rolling uplands. Slopes are slightly convex. The areas are irregular in shape and range from about 10 to 100 acres.

Typically, the surface layer is dark gray fine sand about 7 inches thick. The subsurface layer is yellowish brown loamy sand or sand to a depth of 31 inches. It has gray and yellowish brown mottles below a depth of 21 inches. The subsoil extends to 76 inches. The upper 4 inches is dark gray, mottled find sandy loam; the next 19 inches is gray sandy loam; and the lower 22 inches is gray sandy clay loam. Between depths of 76 and 83 inches, the underlying material is mixed light gray and greenish gray sandy clay loam.

This Lochloosa soil has a water table that is about 30 to 40 inches below the surface for 1 to 4 months during most years. The water table rises to a depth of 20 to 30 for 1 to 3 weeks. Surface runoff is slow. The available water capacity is low to medium in the sandy surface and subsurface layers and medium in the subsoil. Permeability is rapid in the surface and subsurface layers, moderate in the upper part of the subsoil, and slow in the lower part.

Blichton sand, 5 to 8 percent slopes: This sloping, poorly drained soil is on the rolling uplands. The areas are irregular in shape and elongated and range from about 5 to 45 acres.
Typically, the surface layer is dark gray sand about 5 inches thick. It is about 2 percent nodules of ironstone and fragments of phosphatic limestone. The subsurface layer is sand to a depth of 31 inches. The upper 21 inches is gray. The lower 5 inches is light gray. It is about 2 percent nodules of ironstone and fragments of phosphatic limestone. The subsoil extends to a depth of 78 inches. The upper 6 inches is light brownish gray sandy loam. It is about 4 percent nodules of ironstone and fragments of phosphatic limestone. The next 12 inches is light brownish gray sandy clay loam and are about 2 percent nodules of ironstone and fragments of phosphatic limestone. It is about 6 percent plinthite, by volume. The next 17 inches is light gray sandy clay loam and are about 1 percent nodules of ironstone and weathered fragments of phosphatic

limestone. About 8 percent is plinthite, by volume. The lower 12 inches is light gray sandy clay loam. Between depths of 78 and 80 inches, the underlying material is gray sandy clay loam.

This Blichton soil is saturated by a perched water table within 10 inches of the surface for 1 to 4 months during most years. Wetness is caused by hillside seepage. Surface runoff is rapid. The available water capacity is low in the sandy surface and subsurface layers, and it is low to medium in the loamy subsoil. Permeability is rapid in the sandy surface and subsurface layers. It is slow to moderately slow in the loamy subsoil.

Bivans sand, 5 to 8 percent slopes: This is a sloping, poorly drained soil on short breaking slopes and along hillsides of the uplands. The areas are irregular and elongated in shape. They range from about 5 to 40 acres.

Typically, the surface layer is dark gray sand about 5 inches thick. The subsurface layer is light brownish gray sand about 5 inches thick. It has a few nodules of ironstone and fragments of phosphatic limestone. The subsoil extends to a depth of 59 inches. The upper 20 inches is gray sand clay and a few nodules of ironstone and fragments of phosphatic limestone. The next 29 inches is gray, mottled sandy clay. Between depths of 59 and 80 inches, the underlying material is gray, mottled sandy clay.

Included with this soil in mapping are small areas of Blichton, Boardman, Lochloosa, and Wacahoota soils. Small areas of soils that are similar to Bivans soils but that have a very dark gray or black loamy sand surface layer 8 to 12 inches thick over sandy clay loam subsoil are also included in some areas. Small areas of Bivans soils that have slopes of 2 to 5 percent are included. Total included areas are about 15 percent or less.

In this Bivans soil, the subsurface layer and upper part of the subsoil are saturated by a perched water table for 1 to 3 months during most years. Wetness is caused mainly by hillside seepage. Surface runoff is rapid. The available water capacity is low to medium. Permeability is moderate to moderately rapid in the surface and subsurface layers. It is very slow to slow in the subsoil.

3.3 Topographic Conditions

The United States Department of Interior Geological Survey (USGS) Gainesville West Quadrangle Topographic Map dated 1994 reveals that the vicinity of the project site in front of Oaks Mall has a ground surface near Elevation 125 feet and slopes downward to the east and west outside the roadway section between NW 66Th Street and NW 67Th Street. The Quadrangle Map also reveals that the vicinity of the project site between NW 44Th Street and NW 46Th Street has a ground surface near Elevation 115 feet at the intersection of SR 26 and NW 44Th Street and slopes downward to the east and west away from the intersection. Ground elevation at NW 46Th Street is between 90 and 95 feet. The ground continues to slope downward to the west, pass NW 46Th Street. Reproduction of the USGS quadrangle map is presented in **Figures 3A and 3B**, in the **Appendix**.

3.4 Area Geology

Dr. H. K. Brooks indicates the SR 26 roadway depressions project limits area is characterized by the Miocene Formations, Hawthorne Fm (Mh3) and Eocene Formation, Ocala Limestone (Eo). The Hawthorne Fm., Statenville type, sand, silty sand and clay with phosphorite pebbles, granules, clast concentrations and replacements, oyster bars common, clays may be siliceous but are typically mixed montmorillonite and palygorskite, greenish fresh clays are over-

consolidated with penetrometer readings of 2.5 to 4 tons/ft.^{2}. The Eo, Ocala Ls., "limerock" consisting of the skeletons of fossils in a silt to sand size matrix, skeletons originally as aragonite are now molds, 93-96% $CaCo_3$, usually soft porous and friable, massive chert nodules occur near top, lower portion is rubbly and very small spheroidal fossils are dominant;

The Guide to The Physiographic Divisions of Florida by H. K. Brooks indicates the SR 26 roadway depressions project limits are within Ocala Uplift District of the Florida Sections. The Florida Section is the area of the Florida Structural Platform upon which Cretaceous, Tertiary and Quarternary limestone have been deposited. In most places, solution of the limestone has influenced the landscape and the courses of the creeks and rivers. Sand is the dominant surficial material.

The Ocala Uplift District is the Lime Sink Region of the pioneers. Early Tertiary limestone is at or near the surface in most places. Structurally, this is a broad uplift that occurred in Middle and Late Tertiary time. The most distinctive features are the low rolling limestone plains, but the landscape is varied. Within the Ocala Uplift District, the site is within the regions known as the Northern Peninsual Plains and Northern Peninsual Slopes. The Northern Peninsual Plains are Karst plains generally between 90 and 100 feet in elevation. In the southern portion a secondary level has developed at about 60 feet which is the water table. The Northern Peninsual Slopes are erosional slopes and hills developed along the western margin of the High Flatwoods. The land is well drained by both surface and subsurface drainage systems. Rich sandy soils developed upon the phosphatic sand and clayey sand of Miocene and Pliocene age originally supported a hardwood forest; however, places with thicker residual sand soils occur and woodlands of longleaf pine and turkey oak are common.

Within the Northern Peninsual Plains the site is more specifically within the Haile Limestone Plain. This is a plain with low subdued hills. There is a very thin sand soil. There are pockets of Terra Rosa soil. This was originally a hardwoods forest.

Within the Northern Peninsual Slopes the site is more specifically within the San Felasco Hammock. This is a broad scarp and karst terrain with many high hills. A hardwoods forest originally thrived on soils derived from weathering of Miocene and Pliocene clayey phosphatic sands. Elevations are to 195 feet.

3.5 Subsurface Conditions

Borings B-1 through B-3 and B-15 through B-18, were drilled within the eastbound outside and central travel lanes, in front of Oaks Mall. Borings B-1 through B-3 were drilled within the outside eastbound travel lane, and Borings B-15 through B-18 drilled within the central eastbound travel lane. Borings B-4 through B-14 were drilled within the eastbound outside travel lane, between NW 44TH Street, NW 45TH Street, and NW 46TH Street. A soil profile for each boring drilled during this phase of the study is presented on the Report of Core Borings sheets, included in the **Appendix**. Adjacent to the boring profiles are the SPT N-values for the subsurface soils. The Report of Core Borings presents a detailed description of the subsurface conditions encountered at each boring location. However, it should be noted that the soil conditions could vary between boring locations. The subsurface conditions encountered at the project site are outlined below.

Borings in Front of Oaks Mall: From the ground surface in Borings B-1 through B-3 and B-15 through B-18, a pavement section consisting of 4.5 to 12 inches of asphalt and 0 to 20 inches of limerock base is present. Full depth asphalt thickness of 12 inches was encountered in Borings

B-2 and B-3, with no limerock base present. The majority of asphalt thickness at the rest of the borings is on the order of 4.5 to 6 inches, with limerock thickness of 19 to 20 inches.

Beneath the pavement section at the borings, loose to medium dense sand (SP), slightly silty sand (SP-SM), silty sand to slightly clayey silty sand (SM), and silty clayey sand (SC) layers were encountered and extended to depths ranging from 4 to 8.1 feet below the existing pavement surface. Standard Penetration Resistances (N-values) in the SP, SP-SM, SM, and SC layers ranged from 9 to 44 blows per foot (bpf). Borings B-1 and B-1A were terminated in the sandy soil at the depth of 8.1 feet, upon refusal over an underground utility line.

Underlying sandy soils in Borings B-2, B-3, and B-15 through B-18, soft to very stiff sandy silty clay (CH) layer was encountered and extended to depths ranging from 18 to 25 feet below the existing ground surface. N-values in the CH layer ranged from 4 to 19 bpf. Isolated layers of loose to medium dense clayey silty sand (SM) and silty clayey sand (SC) were encountered in Borings B-2 and B-3, between the depths of 20 to 23.5 feet. N-values in the SM and SC layers ranged from 8 to 23 bpf. Borings B-2 and B-3 were terminated in the clayey soil at the depth of 25 feet.

Beneath the CH layer in Borings B-15, B-17 and B-18, loose to very dense silty sand to slightly clayey silty sand and clayey silty sand (SM) and silty clayey sand (SC) layers were encountered to the top of limestone at depths ranging from 23 to 33 feet. N-values in the SM and SC soils ranged from 5 to 61 bpf, with the majority being on the order of 10 to 20 bpf. Isolated layers of stiff to very stiff sandy silty clay (CH / CL) with limestone were encountered in Borings B-15 (from 25.5 to 28 feet) and B-18 (from 26 to 28 feet). N-values in the CH and CL layers ranged from 9 to 19 bpf.
Underlying the sandy soils in Borings B-15, B-17, and B-18, and clayey soil in Boring B-16, limestone was encountered. N-values in the limestone ranged from 7 to over 100 bpf. Borings B-15 through B-18 were terminated in the limestone at depths ranging from 34.9 to 39.9 feet below the existing ground surface.

Borings Between NW 44TH, NW 46TH, and NW 46TH Street: From the ground surface in Borings B-4 through B-14, a pavement section consisting of 3 to 5 inches of asphalt and 9 to 19 inches of limerock base is present. Beneath the pavement section at the borings, loose to dense sand (SP), slightly silty sand (SP-SM), silty sand to slightly clayey silty sand (SM), and silty clayey sand (SC) layers were encountered and extended to depths ranging from 3 to 10 feet below the existing pavement surface. N-values in the SP, SP-SM, SM, and SC layers ranged from 8 to 40 blows per foot (bpf).

Underlying sandy soils at all borings (B-4 through B-14), very soft to very stiff sandy silty clay (CH & CL) layers with sand seams and limestone were encountered and extended to depths ranging from 13 to 48 feet below the existing ground surface. N-values in the CH & CL layers ranged from weight of hammer (WOH) per 18 inches to 16 bpf. Borings B-4, B-5, B-6, B-8, and B-9 were terminated in the clayey soils at the depths of 15 to 17.5 feet. Beneath the clay in Boring B-6, loose silty clayey sand (SC) layer was encountered to the termination depth of 15 feet. N-values in the SC layer were on the order of 9 bpf. Intermittent layers of very loose to medium dense clayey silty sand (SM) and silty clayey sand (SC) were encountered in Borings B-12 (from 16 to 21 feet, 28 to 30.5 feet, and 36 to 43 feet), and B-14 (from 21 to 23 feet). N-values in the SM and SC layers ranged from 3 to 22 bpf.

Beneath the CH & CL layers in Borings B-10, B-12, and B-13, very loose to dense silty sand to slightly clayey silty sand and clayey silty sand (SM) and silty clayey sand (SC) layers were encountered to the top of limestone at depths ranging from 40.5 feet in Boring B-13 to 48 feet in Boring B-10, and to the termination depth of 55 feet in Boring B-12. N-values in the SM and SC soils ranged from WOH per 12 inches to 43 bpf.

Underlying the sandy soils in Borings B-10 and B-13, and the clayey soils in Borings B-11 and B-14, limestone was encountered. N-values in the limestone ranged from 11 to over 100 bpf. Borings B-10, B-11, B-13, and B-14 were terminated in the limestone at depths ranging from 43.5 to 52.5 feet below the existing ground surface. An isolated layer of soft sandy silty clay (CL) with limestone was encountered in Boring B-13 between the depths of 42 and 45 feet. N-values in the CL layer were on the order of 4 bpf. It should be noted that 100 percent loss of circulation was reported in the borings listed below:

Table 1: List of Borings and Depth with 100 Percent Loss of Circulation

Boring No.	Depth (ft)	Remarks
B-10	38.5	Low recovery at 41 feet, with no recovery at 46 feet.
B-11	33.5	
B-12	38.5	
B-13	44.0	
B-14	43.5	
B-16	28.5	
B-17	30.0	80 percent loss of circulation at 35 feet.
B-18	31.0	

3.6 Ground Penetration Radar (GPR) Test

A Ground Penetration Radar (GPR) investigation of the SR 26 depressions between NW 44TH Street, NW 45TH Street, and NW 46TH street was performed by the FDOT Materials Research Park, Gainesville, Florida. The GPR can not be used to determine the strength or stiffness of the soil in the vicinity of the depression and sinkholes. However, it can be used to estimate the quality of the soil by identifying anomalies typically associated with the conditions that can lead to a loss of support such as the presence of high moisture and voids. A concentration of moisture and/or air in a soil typically reflects a large portion of the radar signal due to the significant contrasts with the surrounding material.

GPR test results are not available at this time, and therefore are not included with this report.

3.7 Groundwater

The groundwater level was measured at the depths of 22 to 26 feet in Borings B-12, B-13, and B-14. The groundwater level was not encountered at the rest of the borings drilled in the area due to the use of drilling fluid. However, we anticipate that groundwater level could be present between the depths of 20 to 30 feet in the deep borings. It should be noted that groundwater levels are highly dependent on environmental and seasonal conditions such as frequency and magnitude of rainfall patterns, as well as man-made influences such as existing drainage ditches, ponds, and areas of covered soils.

3.8 Subsurface Cavities and Sinkholes

Subsurface cavities and sinkholes are generally common in the middle region of Florida and are associated with the limestone material present. The cavities and sinkholes are affected primarily by the nature of the limestone present, its composition, structure, and weathering.

Regionally, the limestone present is very porous with interconnected voids of varying size. Additionally, these voids are frequently enlarged by solution and seepage that create a network of small cavities. One of the major factors contributing in sinkholes formation in Florida is soil raveling. Downward seepage erodes portions of the soil into the rock cavities leaving a dome-shaped cavity within the residual soil layer. Parts of the dome's upper portion spall off when moisture weakens the soil. When this process continues until the portion of the dome collapses, a sinkhole is created. Soil raveling is typically caused by changes in groundwater levels, unusually dry weather, diversion of surface water into the ground, and weakening of residual soils by excavation. Construction activity in the area often speeds the raveling and collapse process.

Gainesville, Alachua County, is within the middle region of Florida, which is prone for cavities and sinkhole activities. Based on the SPT Borings, the presence of soils with low N-values, indicate formation of some chimneys connected to small or large cavities in the limestone, or chimney failure above the hard limestone, that can cause subgrade failures.

4.0 EVALUATIONS AND RECOMMENDATIONS

4.1 General

Based on the available information and subsurface conditions, it appears that the present depressions at both sites may be due to several factors. These may include, but should not be limited to the following:

- Possible water seepage from the existing underground storm drainage lines that causes softening of the existing clayey soils.
- Lack of proper compaction of the trench backfill for the underground utility lines in the area, and densification of the soil layer over time due to increased traffic volume and heavier traffic loads.
- Possible settlement in the upper soft to stiff clay layers between the depths of 3 to 12 feet, due to increased traffic volume and heavier traffic loads.
- Possible sinkhole development and deep subgrade failure in the area between NW 44Th Street, NW 45Th Street, and NW 46Th Street. This was evident by the presence of very loose and WOH materials in several of the deep borings as shown in the table below:

Table 2: Summary of Very Loose Soils Layers

Boring No.	Boring Locations	Depth of Very Loose Layers		N-Values	Top of Limestone	Boring Termination (ft)
		From	To			
B-2	170' E of NW 67Th & 1.5' N of EBTL	11	13	4	N/A	25
B-3	235' E of NW 67Th & 0.5' N of EBTL	11	25	4	N/A	25
B-5	198' E of NW 45Th & 3' N of EBTL	14	16.5	3	N/A	17.5
B-10	218' E of NW 45Th & 1.5' N of EBTL	28	31	4	48	52.5

		35	47	WOH=12" to 3	-	-
B-11	76' E of NW 46Th & 1' N of EBTL	6	9	4	38	45
		29	37	WOH=18" to 5	-	-
B-12	237' W of NW 44Th & 1' N of EBTL	39	46.5	WOH=12" to 5	N/A	55
B-13	324' W of NW 44Th & 2' N of EBTL	42	45	4	45	50
B-14	163' E of NW 46Th & 6' N of EBTL	6	14	WOH=6" to 4	30.5	43.5
B-16	243' E of NW 67Th & 4.2' N of MEBTL	6	14	4	21	39.9
B-17	277' E of NW 67Th & 2.3' N of MEBTL	6	14	4	23	36.4
B-18	164' E of NW 66Th & 3.5' N of MEBTL	6	7	4	33	34.9
		16.5	18	4	-	-

4.2 Existing Utilities

Based on information provided to us by the utility companies and our visual observations during the subsurface exploration, we understand that several underground utility lines are present within the project limits. Some of the underground utility lines are located within a few feet away from the roadway depressions. We recommend that all underground utility lines should be assessed by a remote camera if possible, to determine if there is any leak or seepage outside the pipes. Active underground utility lines should be evaluated using pressure gages or dies, as deemed necessary by the appropriate utility company.

After all underground utility lines have been evaluated and approved with no leakage, seepage or damage; we recommend that all underground utility lines be located prior to beginning construction activities and subgrade improvement at the site. Any damaged utility lines present within the roadway improvement limits should be located and repaired. Any loose soil condition or voids caused by the leakage should be improved / injected with chemical grout using Polyurethane. Care should be considered not to damage any of the existing underground utility lines.

4.3 Subgrade Improvement

Based on the SPT boring information and the presence of underground utility lines within the upper soil stratum, we recommend that deep subgrade improvements should consist of a cement grout injection program. This is to improve the deep very loose conditions within the existing depressions, below the depth of 30 feet, as discussed in more detail in subsequent sections of this report. However, to protect the existing underground utility lines and minimize potential damage to underground structures, chemical injection using polyurethane should be considered to improve any shallow / upper soil stratum that is identified by the video camera or other tests may be warranted to allow for shallow subgrade improvement. Subgrade

improvement should be implemented within the existing depressions, as discussed in more detail in subsequent sections of this report.

Cement Grout Injection: Cement grout injection should be implemented inside the travel lanes, in the vicinity of the existing depressions between NW 44TH Street, NW 45TH Street, and NW 46TH Street, within the limits shown on the subgrade improvement plans. No cement grout injections are recommended in front of Oaks Mall at this time. We have developed a detailed grout injection plan and TSP for the repair and improvements of the deep subsurface conditions. Cement grout injections for the existing depressions are recommended on 5 ft by 5 ft grid pattern within the limits shown on the Cement Grout Injection Plan (CGIP), attached with the TSP. A brief summary of the grout injection procedure is outlined below:

- Grout injection points shall proceed from the deepest casing and moving outward from the depressions and / or sinkholes on a grid pattern as noted above and as shown on the CGIP, or as directed by the Geotechnical Engineer.
- Depth of injection shall start at the bottom of the very loose material as shown on the CGIP.
- Injection pipe extraction shall be limited to 2 foot increments or as directed by the Geotechnical Engineer.
- Grout injection shall terminate at the depth of approximately 30 feet below the top of pavement / ground surface, or as directed by the Geotechnical Engineer.
- The grouting contractor shall carry out monitoring of the cement grout injection to detect any movement from the grouting operations whenever grouting is being performed.
- More detailed information on the cement grout injection program specification is provided in the TSP.
- Some variation of the pipe injection depths shall be anticipated due to the variation to the depth of limestone encountered in the borings, and possible variations in the subsurface conditions.
- All injection points shall be extended to depths ranging from 40 to 50 feet or the top of limestone refusal, whichever occurs first, or as directed by the Geotechnical Engineer.
- Depending on the injection pipe refusal depth and grout volume injected within the primary injections, additional secondary injection pipes may be required to be installed, as shown on the CGIP or as directed by the Geotechnical Engineer.

Casing and grout quantities estimated for the site are listed below:

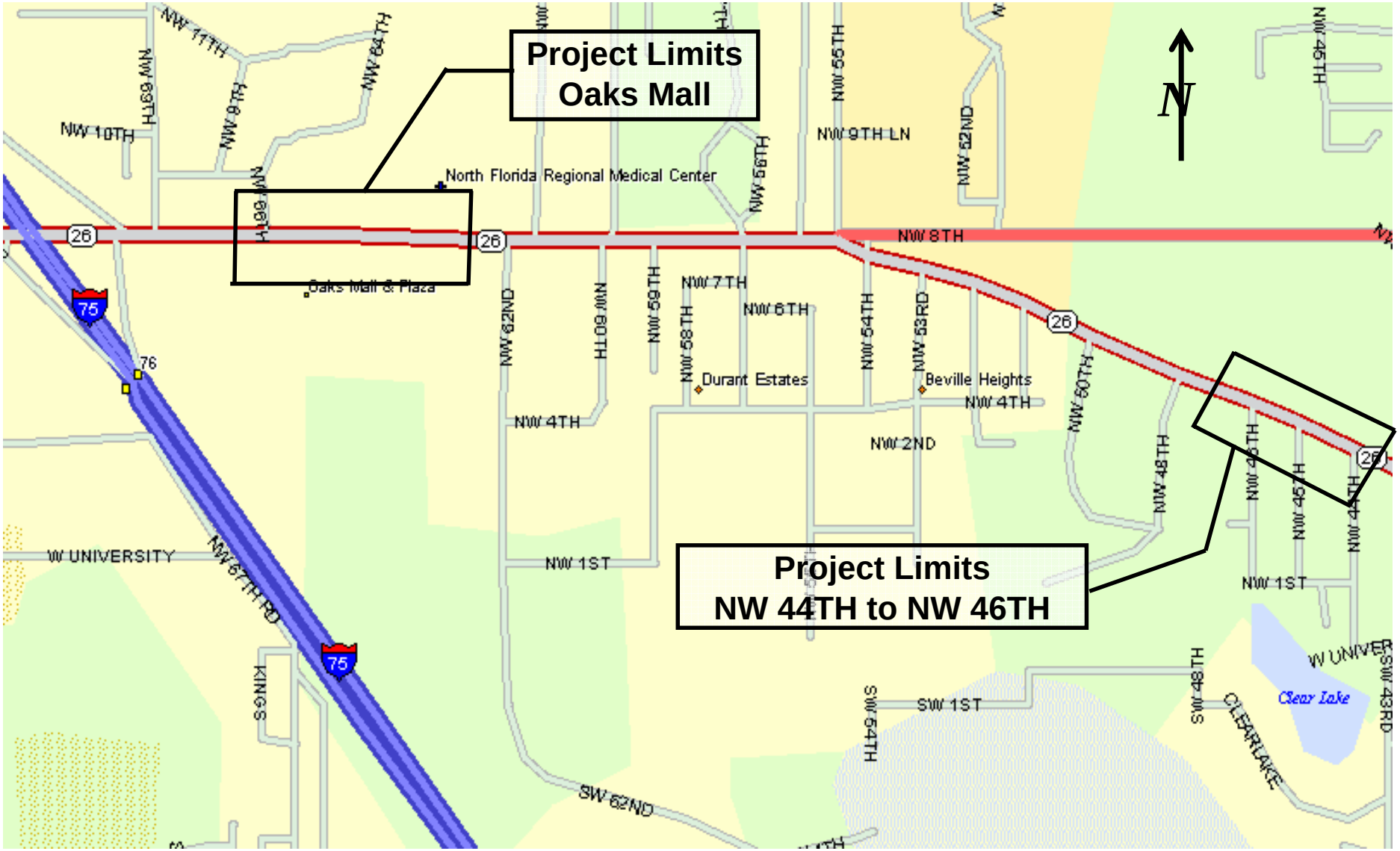
- Cement Grout Volume = 800 CY.
- Casing Length = 4,200 LF.

Chemical Injection: Due to the presence of moderate to high blow count in the upper sandy soils and the possibility that cement grout injection can not seal around the pipes in case of seepage and separation, we recommend that a water-blown Polyurethane injection be considered at shallow depths, if needed. It is recommended that chemical injection operation shall start after the cement grout injection has been completed. Location of the chemical grout injection points and chemical grout quantity are not provided at this time. If it is determined that they are needed, they will be provided in a separate addendum.

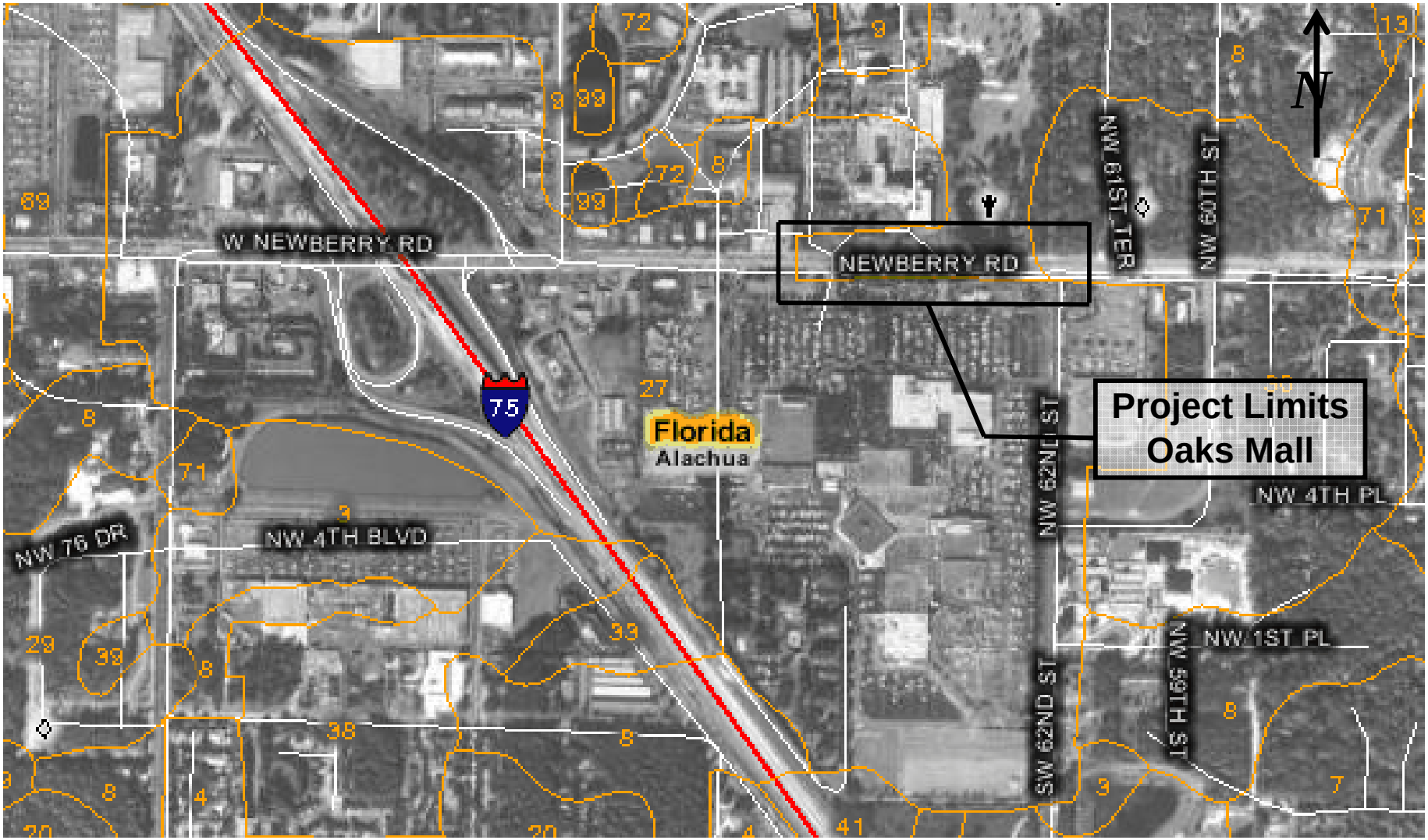
5.0 LIMITATIONS

Evaluations and recommendations in this report were prepared for the exclusive use of Florida Department of Transportation, District II Materials Office for the specific application to the **SR 26 Roadway Depressions in front of Oaks Mall and Between NW 44TH, NW 45TH, and NW 46TH Street, in Gainesville, Alachua County, Florida** within the limits previously described. These evaluations and recommendations were prepared using generally accepted standards of geotechnical engineering practices. No other warranty is expressed or implied. Also, these evaluations and recommendations are based on design information provided to date.

Involvement of the geotechnical engineer during subgrade improvements and repair is vitally important to ensure the project is constructed in accordance with the geotechnical report. In addition, if varying subsurface conditions are encountered, resolutions can be obtained more quickly. Therefore, we recommend that Williams Earth Sciences, Inc. and Saliba Engineering, Inc. provide construction inspection services for the subgrade improvements of this project.



SALIBA ENGINEERING, INC. 10175 Fortune Parkway, Suite 805 Jacksonville, Florida 32256 Ph: (904) 519-2324 Fax: (904) 519-2329 E-mail: salibaeng@bellsouth.net	**SR 26 Roadway Depressions Gainsville, Alachua County, Florida**				
	SITE LOCATION MAP				
	Drawn By:	JZ	Date:	05/18/07	Scale: NTS
	Checked by:	RES	Report No.:	SEI 2006-G364	Figure No.: **1**



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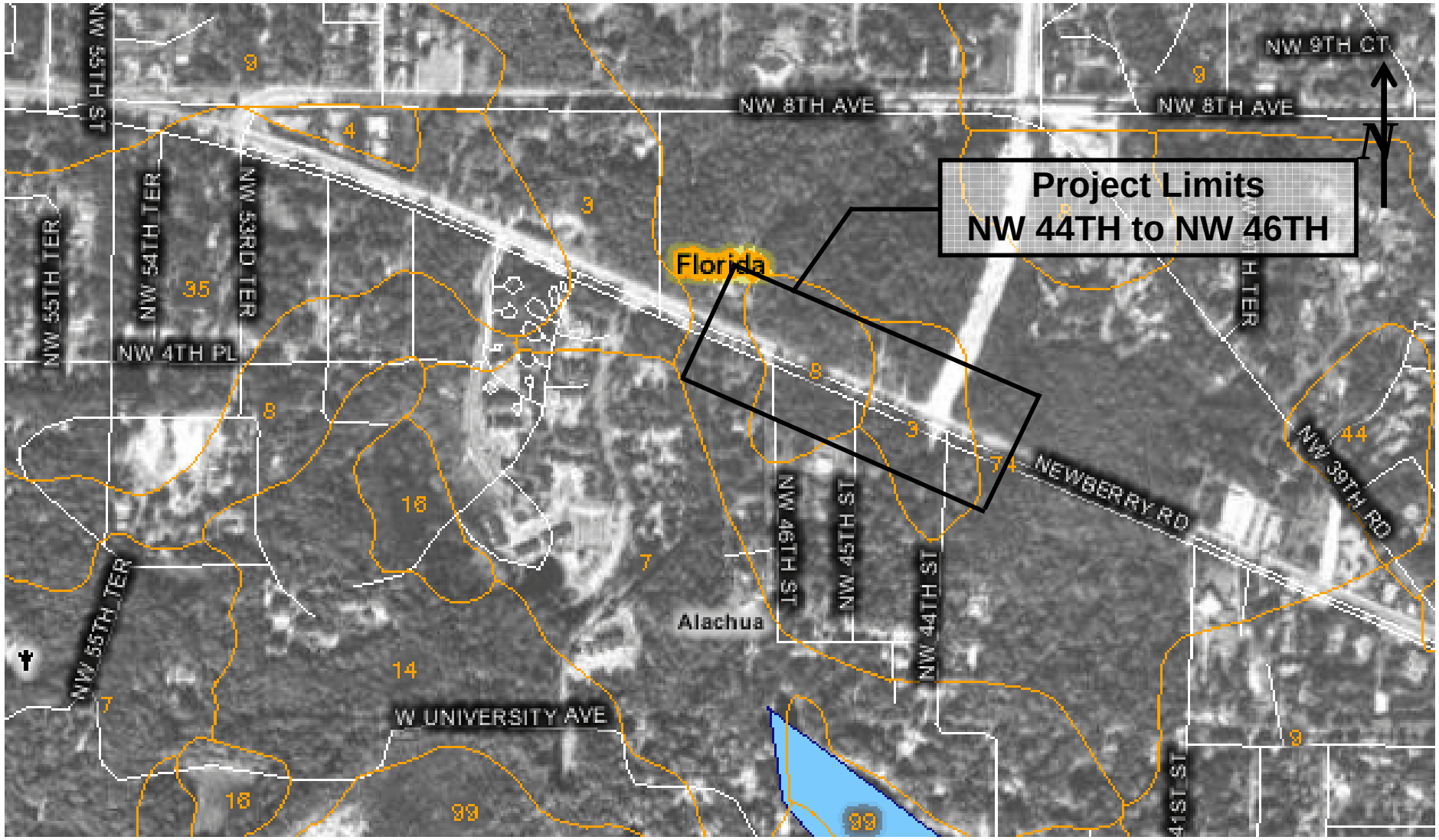
Ph: (904) 519-2324 Fax: (904) 519-2329
E-mail: salibaeng@bellsouth.net

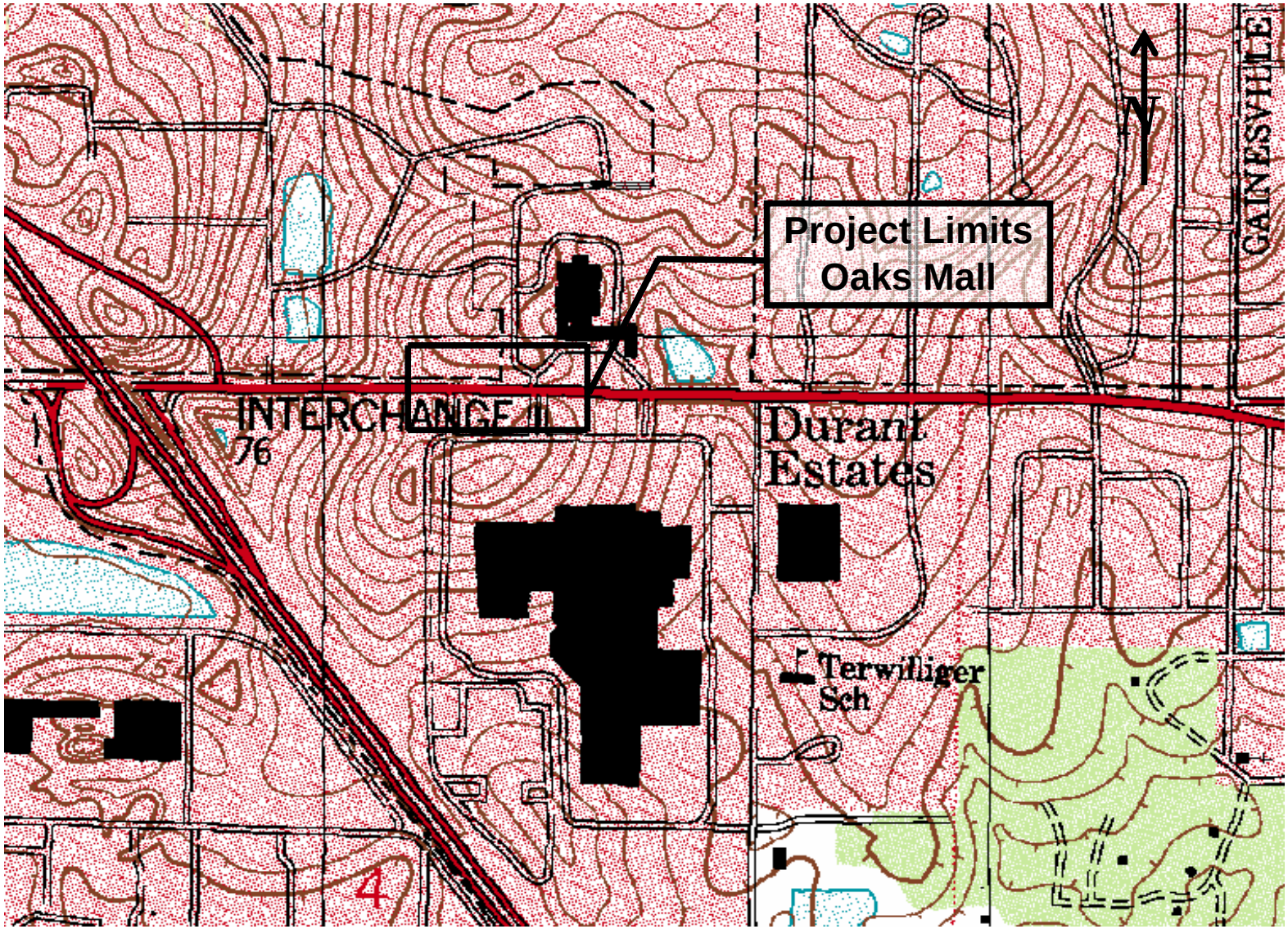
SR 26 Roadway Depression Gainsville, Alachua County, Florida

SOIL SURVEY MAP

Drawn By:	JZ	Date:	05/18/07	Scale:	NTS
Checked by:	RES	Report No.:	SEI 2006-G364	Figure No.:	**2A**



SALIBA ENGINEERING, INC.	SR 26 Roadway Depression Gainsville, Alachua County, Florida		
10175 Fortune Parkway, Suite 805	SOIL SURVEY MAP		
Jacksonville, Florida 32256	Drawn By: JZ	Date: 05/18/07	Scale: NTS
Ph: (904) 519-2324 Fax: (904) 519-2329	Checked by: RES	Report No.: SEI 2006-G364	Figure No.: **2B**
E-mail: salibaeng@bellsouth.net			



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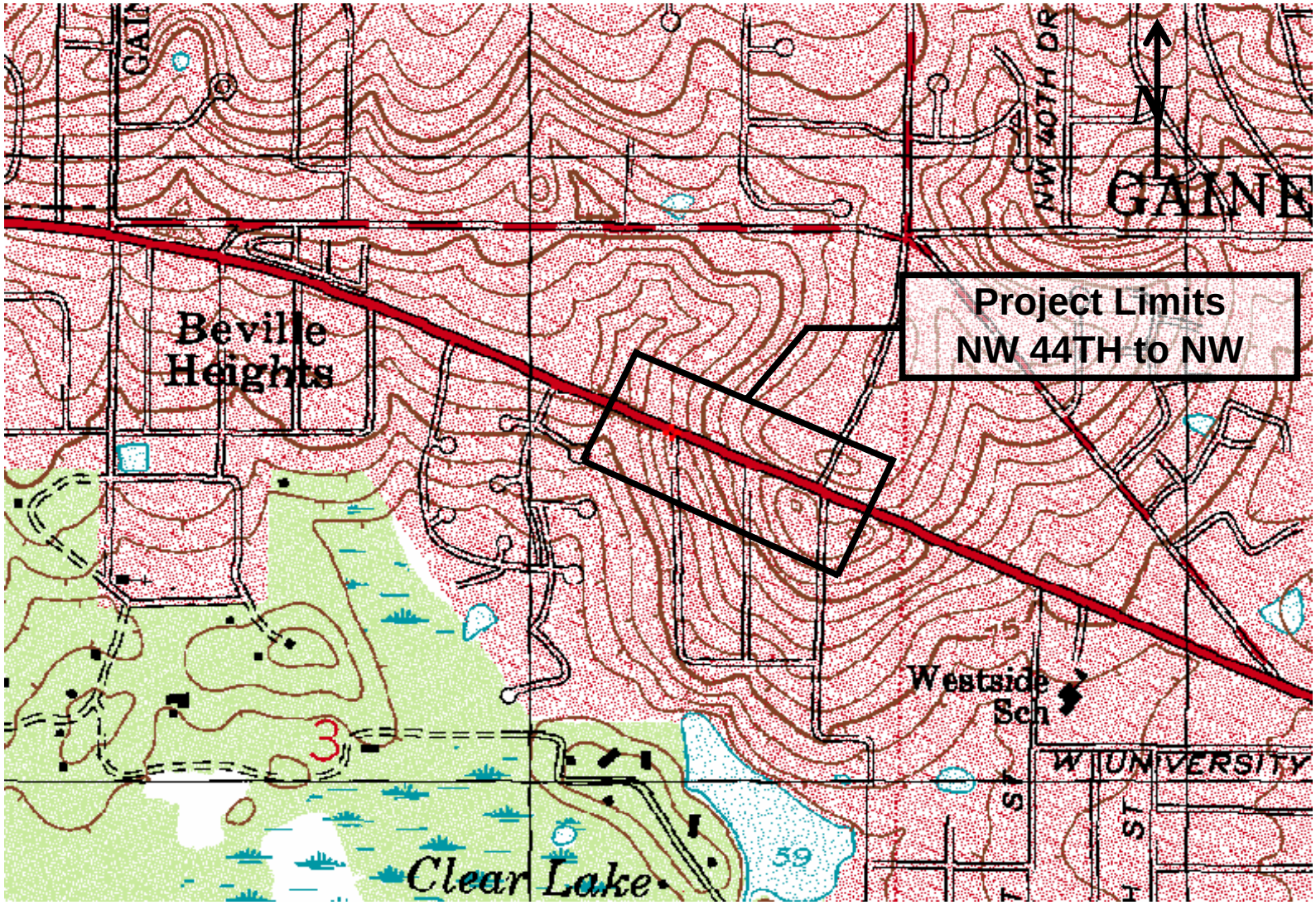
Jacksonville, Florida 32256
Ph: (904) 519-2324 Fax: (904) 519-2329
E-mail: salibaeng@bellsouth.net

SR 26 Roadway Depression Gainsville, Alachua County, Florida

USGS MAP

Drawn By:	JZ	Date:	05/18/07	Scale:	NTS
Checked by:	RES	Report No.:	SEI 2006-G364	Figure No.:	**3A**



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SR 26 Roadway Depression Gainsville, Alachua County, Florida

USGS MAP

Drawn By:	JZ	Date:	05/18/07	Scale:	NTS
Checked by:	RES	Report No.:	SEI 2006-G364	Figure No.:	**3B**

TABLE I
Summary of Soil Borings
SR 26 Roadway Depressions
Gainesville, Alachua County, Florida
FIN No.: 213940-1A-1-02
Project No.: Williams 2302-621-36; SEI 2006-G364

Boring No.	Date Drilled	Location	Boring Depth (ft)	Depth of Very Loose From (ft)	Depth of Very Loose To (ft)	Low N-Values (bpf)	Top of LR (ft)	Water Level (ft)
B-1	01/04/07	75' E of NW 67th St. & 6' N of ETL	8.1	N/A	N/A	N/A	N/A	GNE
B-1A	01/04/07	80' E of NW 67th St. & 6' N of ETL	8.1	N/A	N/A	N/A	N/A	GNE
B-2	01/05/07	170' E of NW 67th St. & 1.5' N of EBTL	25.0	11.0	13.0	4	N/A	GNE
B-3	01/05/07	235' E of NW 67th St. & 0.5' N of EBTL	25.0	11.0 23.5	20.0 25.0	4 4	N/A	GNE
B-4	01/06/07	276' E of NW 45th St. & 4.5' N of EBTL	15.0	N/A	N/A	N/A	N/A	GNE
B-5	01/06/07	198' E of NW 45th St. & 3' N of EBTL	17.5	14.0	16.5	3	N/A	GNE
B-6	01/06/07	145' E of NW 45th St. & 3.5' N of EBTL	15.0	N/A	N/A	N/A	N/A	GNE
B-7	01/06/07	290' E of NW 46th St. & 7' N of EBTL	15.0	N/A	N/A	N/A	N/A	GNE
B-8	01/08/07	140' E of NW 46th St. & 5.5' N of EBTL	15.0	N/A	N/A	N/A	N/A	GNE
B-9	01/08/07	80' E of NW 46th St. & 3' N of EBTL	15.0	N/A	N/A	N/A	N/A	GNE
B-10	04/18/07	218' E of NW 45th St. & 1.5' N of EBTL	52.5	28.0 35.0	31 47.0	4 WOH=12" to 3	48.0	GNE

TABLE I
Summary of Soil Borings
SR 26 Roadway Depressions
Gainesville, Alachua County, Florida
FIN No.: 213940-1A-1-02
Project No.: Williams 2302-621-36; SEI 2006-G364

Boring No.	Date Drilled	Location	Boring Depth (ft)	Depth of Very Loose From (ft)	Depth of Very Loose To (ft)	Low N-Values (bpf)	Top of LR (ft)	Water Level (ft)
B-11	04/19/07	76' E of NW 46th St. & 1' N of EBTL	45.0	6.0 29.0	9.0 37.0	4 WOH=18" to 5	38.0	GNE
B-12	04/24/07	150' E of NW 45th St. & 1' N of EBTL	55.0	39.0	46.5	WOR=12" to 5	N/A	26.0
B-13	04/25/07	62' E of NW 45th St. & 2' N of EBTL	50.0	42.0	45.0	4	45.0	25.0
B-14	04/25/07	163' E of NW 46th St. & 6' N of EBTL	43.5	6.0	14.0	WOH=6" to 4	30.5	22.0
B-15	04/30/07	163' E of NW 67th St. & 3.5' N within MEBTL	38.7	N/A	N/A	N/A	30.0	GNE
B-16	05/02/07	243' E of NW 67th St. & 4.2' N within MEBTL	39.9	6.0	14.0	4	21.0	GNE
B-17	05/01/07	277' E of NW 67th St. & 2.3' N within MEBTL	36.4	6.0	14.0	4	23.0	GNE
B-18	05/02/07	164' E of NW 66th St. & 3.5' N within MEBTL	34.9	6.0 16.5	7.0 18.0	4	33.0	GNE
		Total =	**554.6**					

Note: ETL = Edge of Travel Lane EBTL = Eastbound Travel Lane MEBTL = Middle Eastbound Travel Lane

▽ = Groundwater Table

GNE = Goundwater not encountered
-200 = % Passing #200 Sieve
LL = Liquid Limit
PI = Plasticity Index

GENERAL NOTES

DRILL AND PENETRATION TESTING WERE PERFORMED IN ACCORDANCE WITH ASTM D 1586. NUMBER TO THE LEFT OF BORING INDICATES BLOWS OF 1⅜" I.D., 2" O.D. SPLIT-SPOON FOR 12" PENETRATION (UNLESS OTHERWISE NOTED) WITH A 140 LB HAMMER DROPPED 30 INCHES.

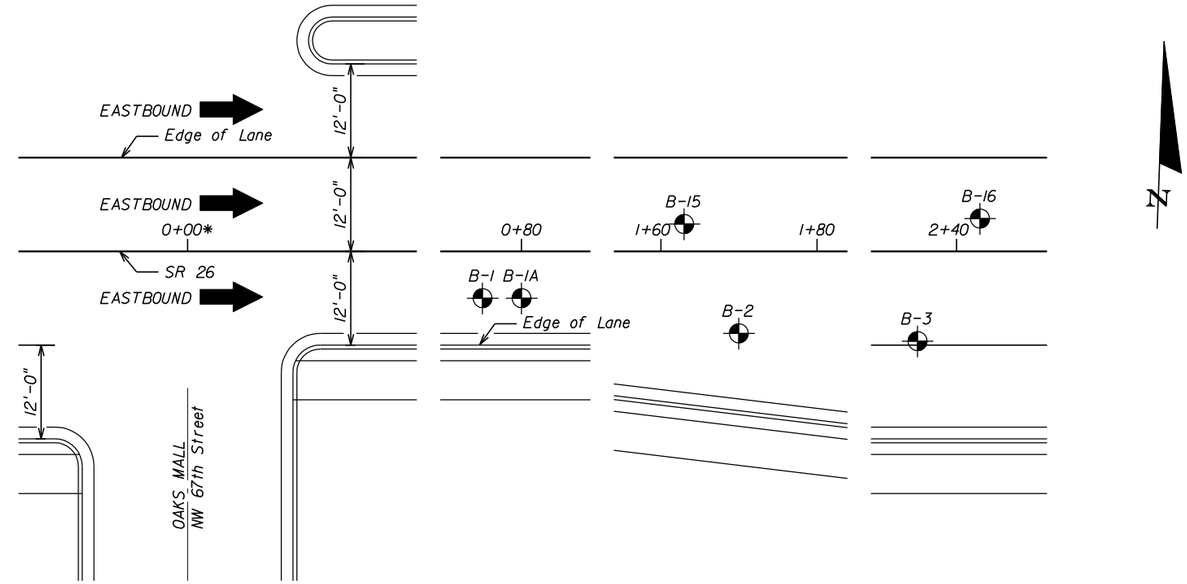
THE BORING LOGS SHOWN REPRESENT SUBSURFACE CONDITIONS WITHIN THE BOREHOLE AT THE TIME OF DRILLING. NO WARRANTY AS TO THE SUBSURFACE CONDITION, STRATA DEPTH OR SOIL CONSISTENCY BETWEEN OR OUTSIDE BORING LOCATIONS IS EXPRESSED OR IMPLIED BY THIS DRAWING.

GRANULAR MATERIALS-

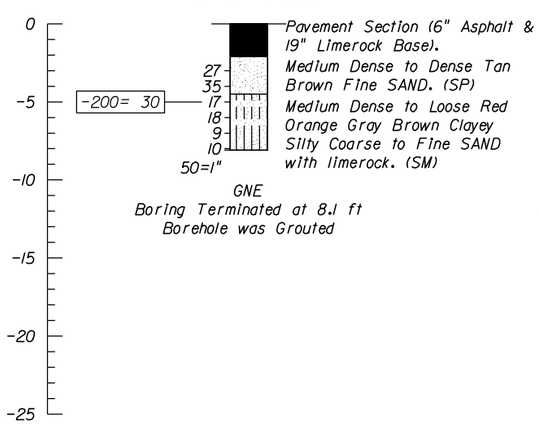
Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 4	Less than 3
Loose	4 - 10	3 - 8
Medium Dense	10 - 30	8 - 24
Dense	30 - 50	24 - 40
Very Dense	Greater than 50	Greater than 40

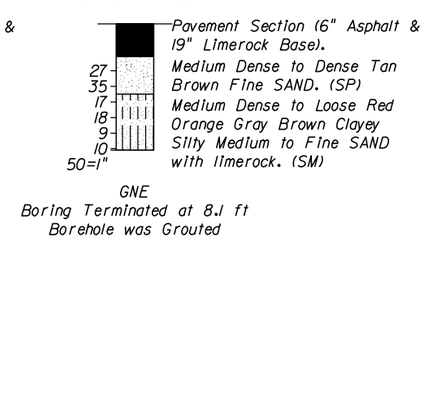
SILTS AND CLAYS-

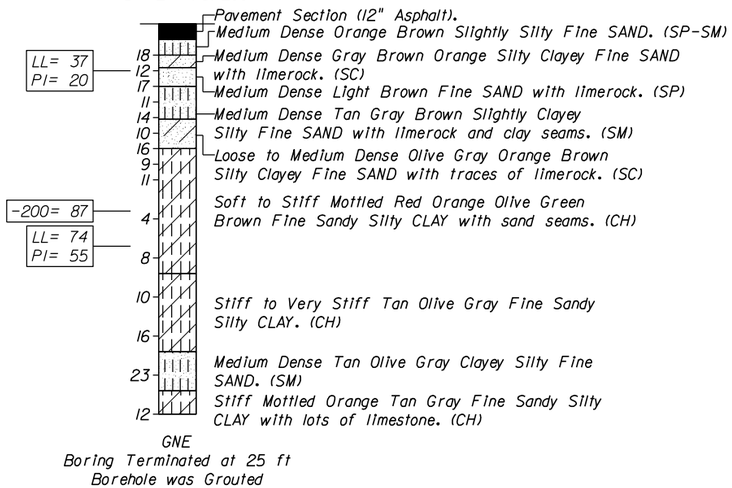
Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
Stiff	8 - 15	6 - 12
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24

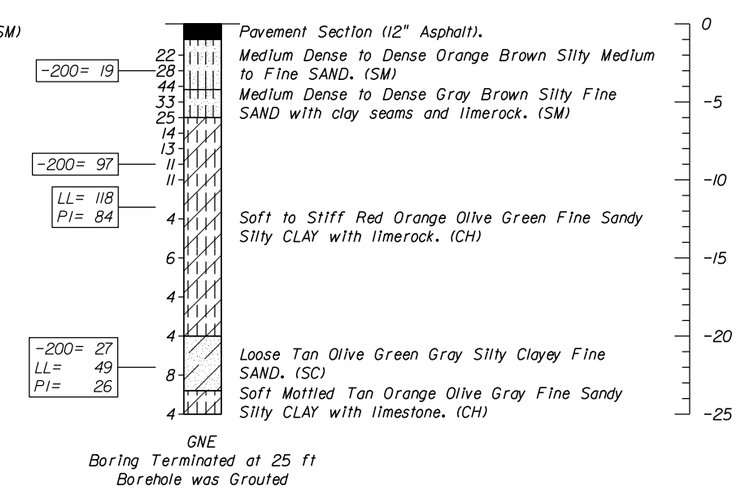


* 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of the NW 67th Street and the center of the Eastbound traffic lanes.









2302-621-36 BOIBORING

(SHEET 1 OF 7)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RAYMOND SALIBA, P.E.
P.E. LICENSE NUMBER 51032
WILLIAMS EARTH SCIENCES, INC.
11329 DISTRIBUTION AVE. WEST
JACKSONVILLE, FLORIDA 32256
CERTIFICATE OF AUTHORIZATION 6378

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

▽ = Groundwater Table

GNE = Goundwater not encountered
-200 = % Passing #200 Sieve
LL = Liquid Limit
PI = Plasticity Index

GENERAL NOTES

DRILL AND PENETRATION TESTING WERE PERFORMED IN ACCORDANCE WITH ASTM D 1586. NUMBER TO THE LEFT OF BORING INDICATES BLOWS OF 1 3/8" I.D., 2" O.D. SPLIT-SPOON FOR 12" PENETRATION (UNLESS OTHERWISE NOTED) WITH A 140 LB HAMMER DROPPED 30 INCHES.

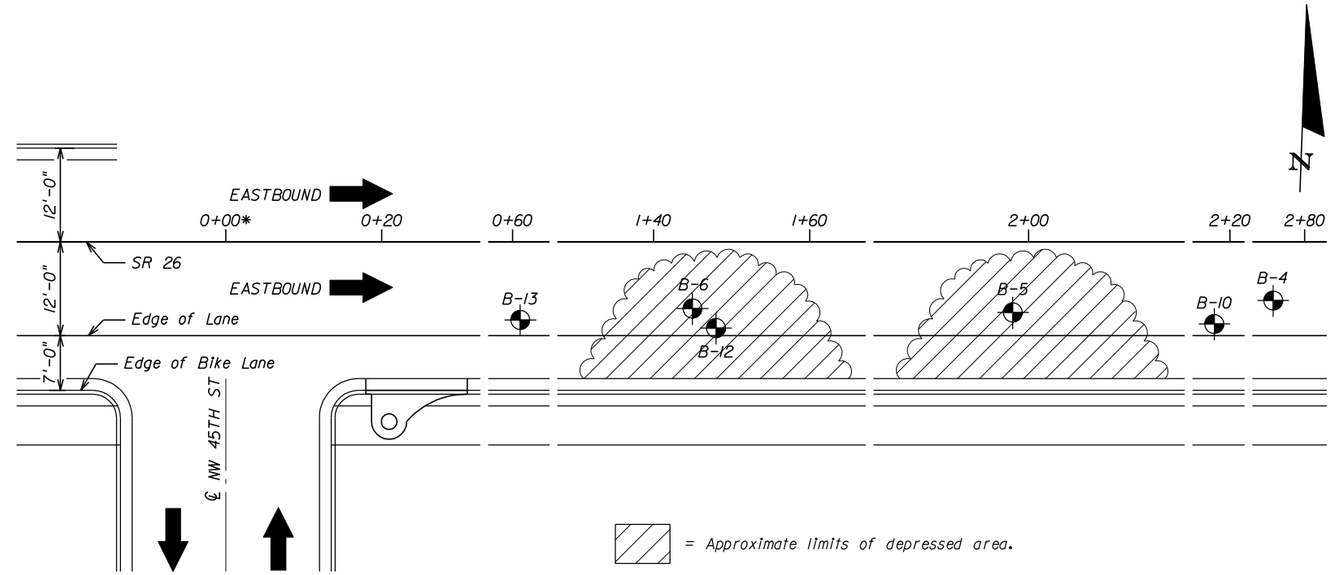
THE BORING LOGS SHOWN REPRESENT SUBSURFACE CONDITIONS WITHIN THE BOREHOLE AT THE TIME OF DRILLING. NO WARRANTY AS TO THE SUBSURFACE CONDITION, STRATA DEPTH OR SOIL CONSISTENCY BETWEEN OR OUTSIDE BORING LOCATIONS IS EXPRESSED OR IMPLIED BY THIS DRAWING.

GRANULAR MATERIALS-

Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 4	Less than 3
Loose	4 - 10	3 - 8
Medium Dense	10 - 30	8 - 24
Dense	30 - 50	24 - 40
Very Dense	Greater than 50	Greater than 40

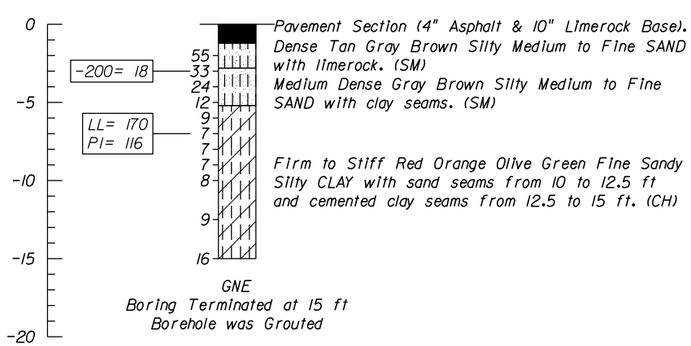
SILTS AND CLAYS-

Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
Stiff	8 - 15	6 - 12
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24



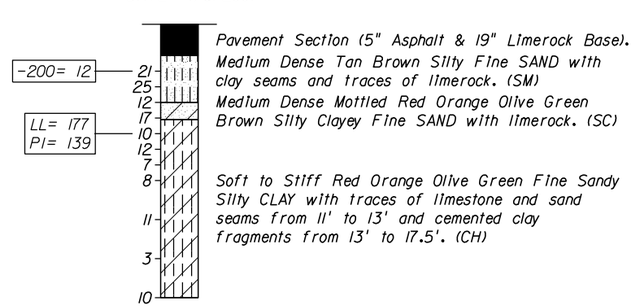
* 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of NW 45th Street and the center of the Eastbound traffic lanes.

BOR # B-6
LOCATION 145'E & 3.5'N*
DATE 1/6/2007



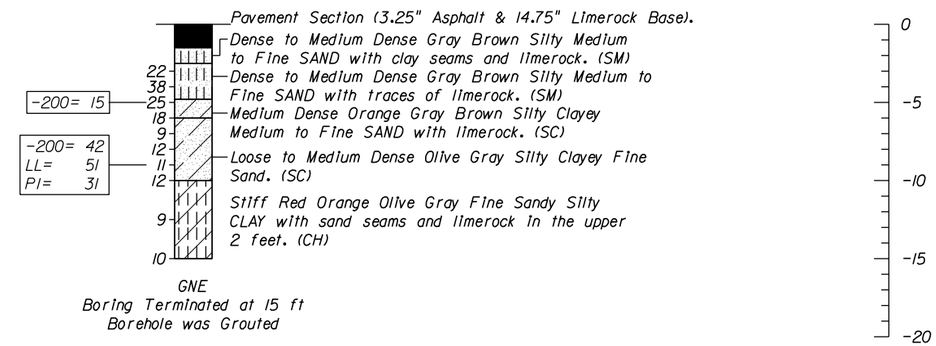
GNE
Boring Terminated at 15 ft
Borehole was Grouted

BOR # B-5
LOCATION 198'E & 3'N*
DATE 1/6/2007



GNE
Boring Terminated at 17.5 ft
Borehole was Grouted

BOR # B-4
LOCATION 276'E & 4.5'N*
DATE 1/6/2007



GNE
Boring Terminated at 15 ft
Borehole was Grouted

2302-621-36 B02BORING

(SHEET 2 OF 7)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RAYMOND SALIBA, P.E.
P.E. LICENSE NUMBER 51032
WILLIAMS EARTH SCIENCES, INC.
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CERTIFICATE OF AUTHORIZATION 6378

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

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Loose	4 - 10	3 - 8
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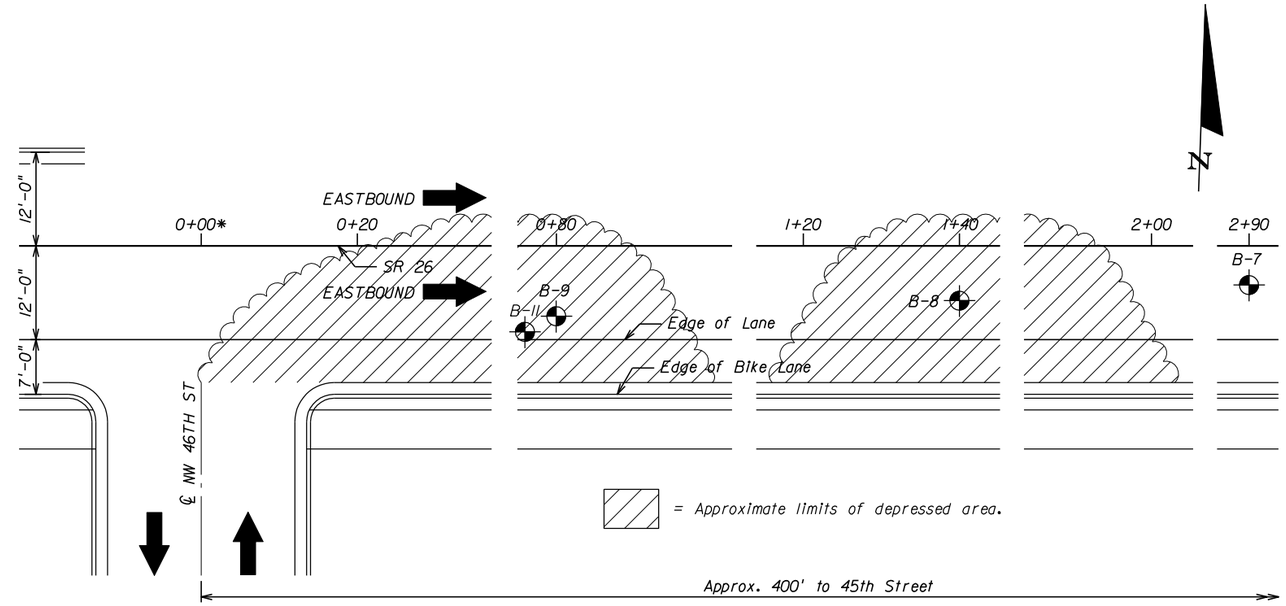
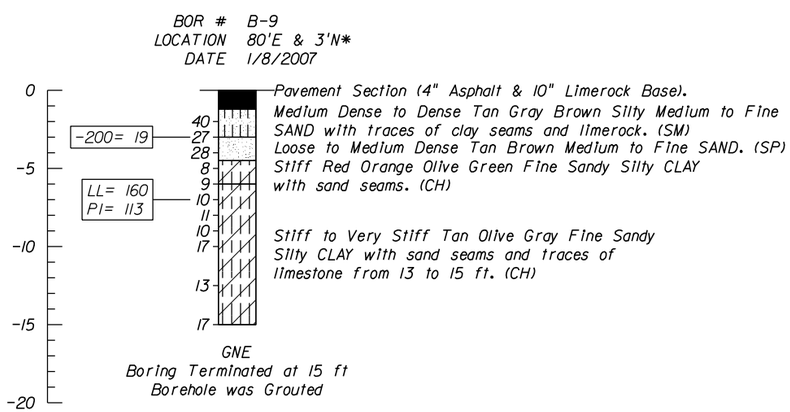
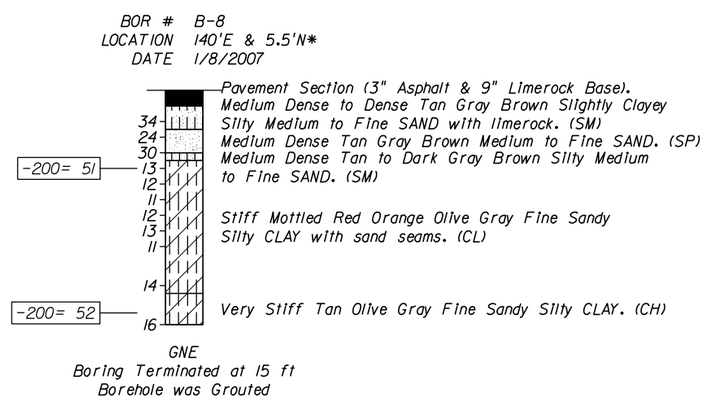
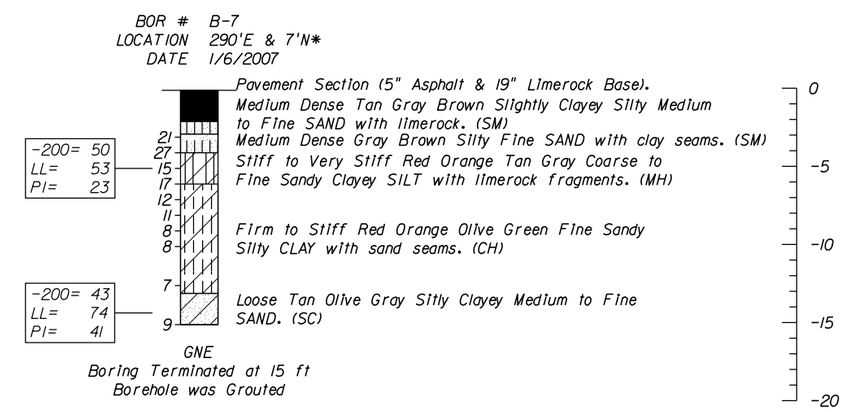
Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
Stiff	8 - 15	6 - 12
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24



* 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of NW 46th Street and the center of the Eastbound traffic lanes.







2302-621-36 B03BORING

(SHEET 3 OF 7)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RAYMOND SALIBA, P.E.
P.E. LICENSE NUMBER 51032
WILLIAMS EARTH SCIENCES, INC.
11329 DISTRIBUTION AVE. WEST
JACKSONVILLE, FLORIDA 32256
CERTIFICATE OF AUTHORIZATION 6378

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

▽ = Groundwater Table

GNE = Goundwater not encountered
-200 = % Passing #200 Sieve
LL = Liquid Limit
PI = Plasticity Index

GENERAL NOTES

DRILL AND PENETRATION TESTING WERE PERFORMED IN ACCORDANCE WITH ASTM D 1586. NUMBER TO THE LEFT OF BORING INDICATES BLOWS OF 1⅜" I.D., 2" O.D. SPLIT-SPOON FOR 12" PENETRATION (UNLESS OTHERWISE NOTED) WITH A 140 LB HAMMER DROPPED 30 INCHES.

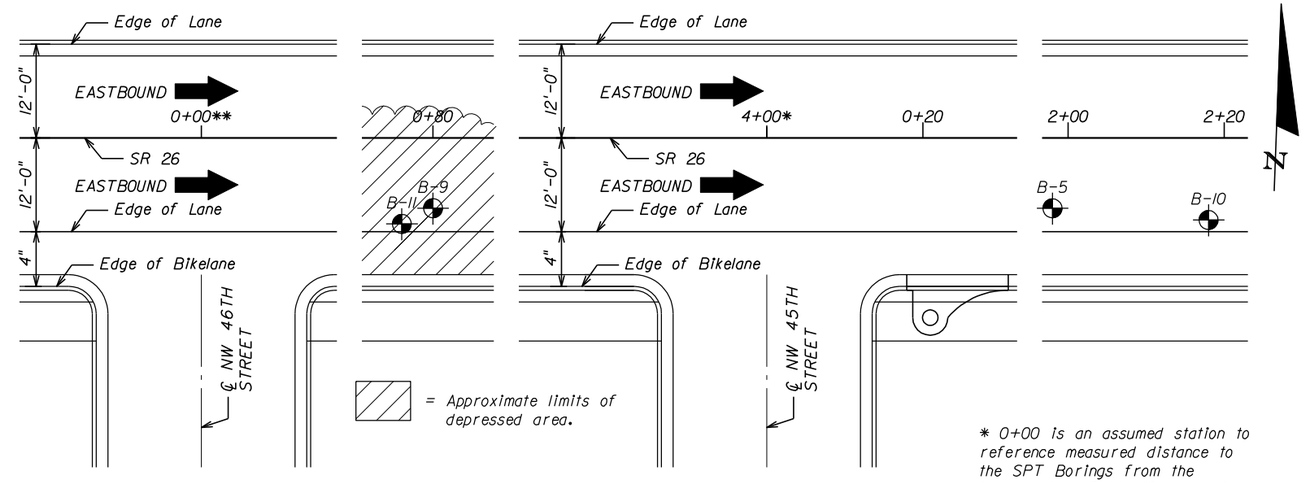
THE BORING LOGS SHOWN REPRESENT SUBSURFACE CONDITIONS WITHIN THE BOREHOLE AT THE TIME OF DRILLING. NO WARRANTY AS TO THE SUBSURFACE CONDITION, STRATA DEPTH OR SOIL CONSISTENCY BETWEEN OR OUTSIDE BORING LOCATIONS IS EXPRESSED OR IMPLIED BY THIS DRAWING.

GRANULAR MATERIALS-

Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 4	Less than 3
Loose	4 - 10	3 - 8
Medium Dense	10 - 30	8 - 24
Dense	30 - 50	24 - 40
Very Dense	Greater than 50	Greater than 40

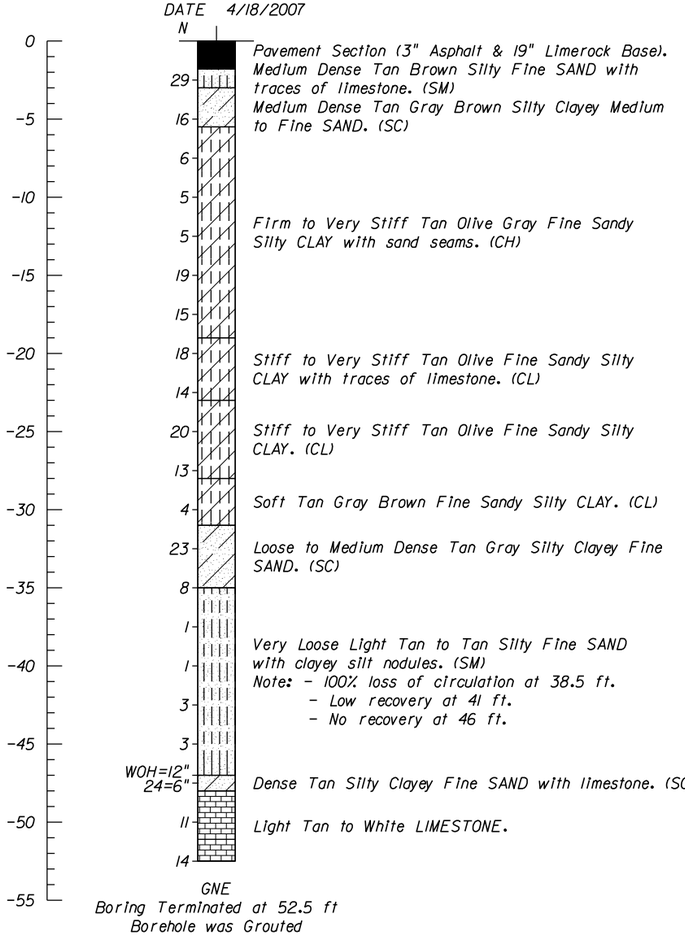
SILTS AND CLAYS-

Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
Stiff	8 - 15	6 - 12
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24

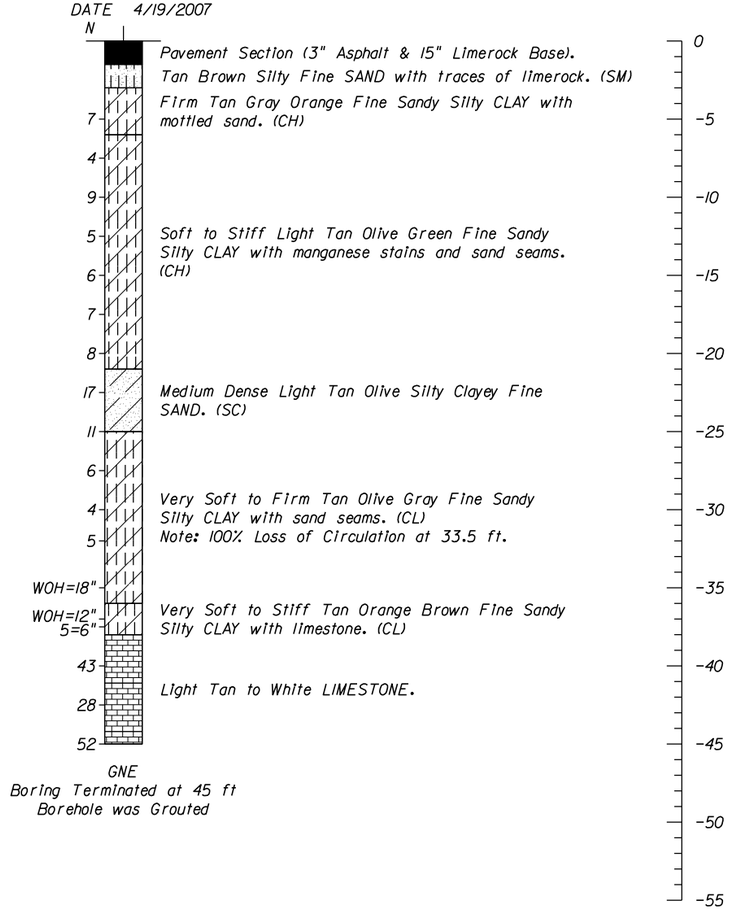


* 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of NW 46th or NW 45th Street and the center of the Eastbound traffic lanes.

BOR # B-10
LOCATION 218'E & 1.5'N*
DATE 4/18/2007



BOR # B-11
LOCATION 76'E & 1'N
DATE 4/19/2007



2302-621-36 B04BORING

(SHEET 4 OF 7)

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RAYMOND SALIBA, P.E.
P.E. LICENSE NUMBER 51032
WILLIAMS EARTH SCIENCES, INC.
11329 DISTRIBUTION AVE. WEST
JACKSONVILLE, FLORIDA 32256
CERTIFICATE OF AUTHORIZATION 6378

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

▽ = Groundwater Table

GNE = Goundwater not encountered
-200 = % Passing #200 Sieve
LL = Liquid Limit
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GENERAL NOTES

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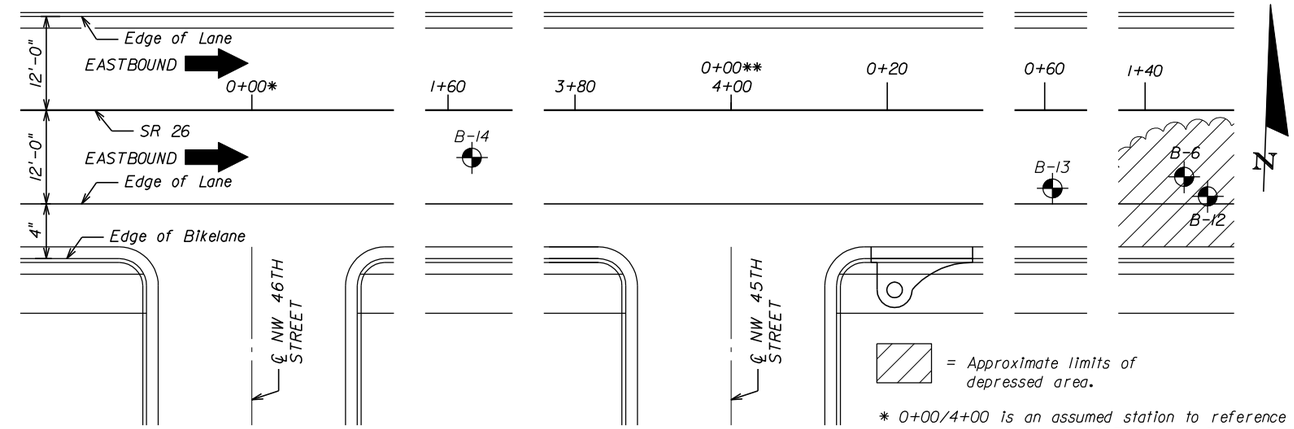
GRANULAR MATERIALS-

Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 4	Less than 3
Loose	4 - 10	3 - 8
Medium Dense	10 - 30	8 - 24
Dense	30 - 50	24 - 40
Very Dense	Greater than 50	Greater than 40

SILTS AND CLAYS-

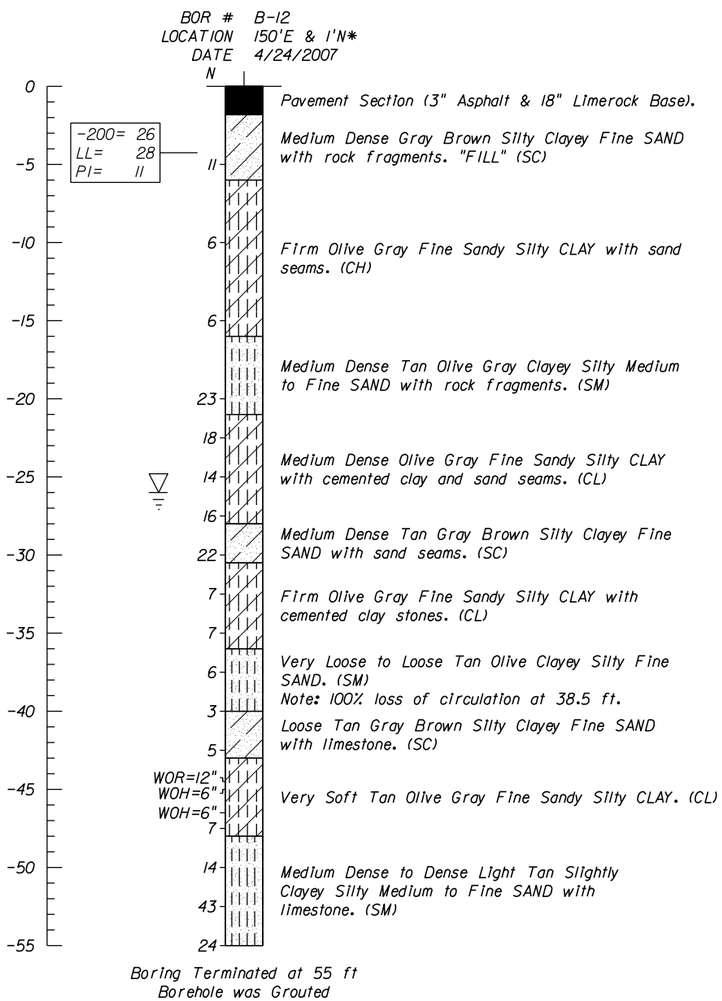
Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
Stiff	8 - 15	6 - 12
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24

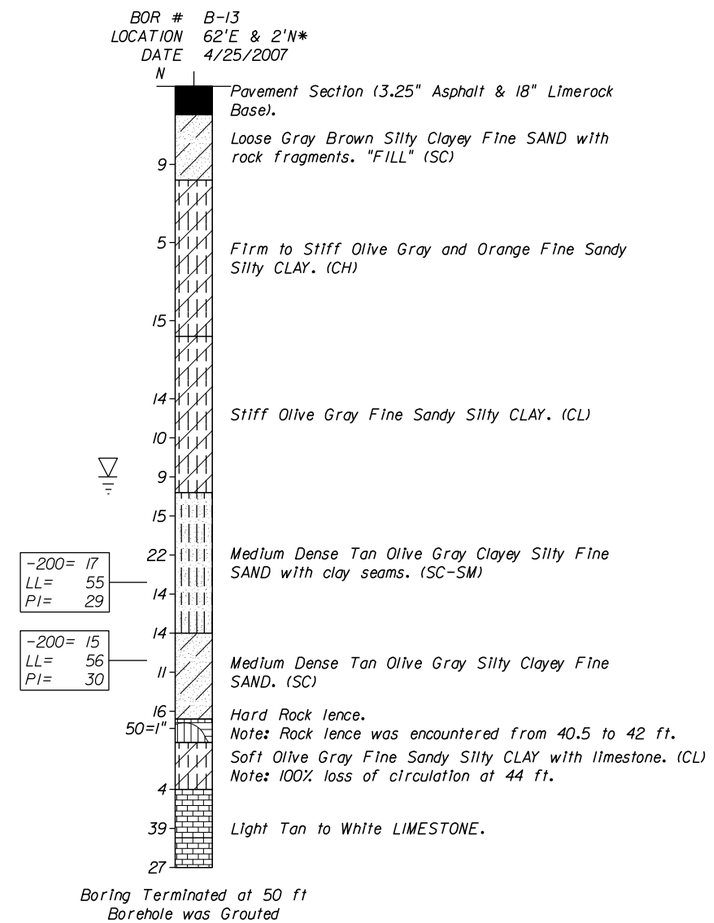


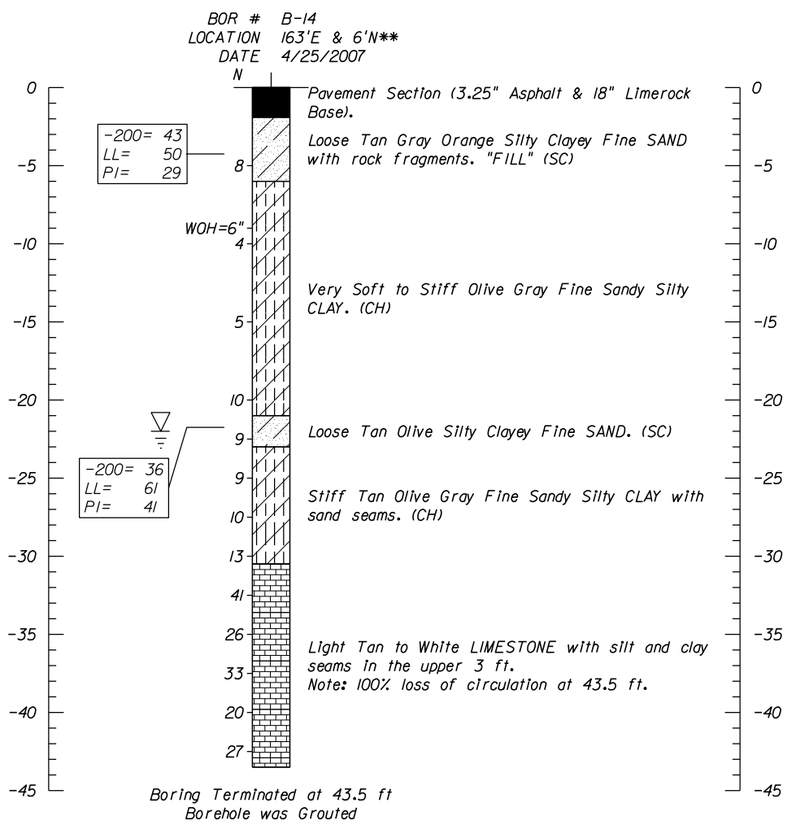
▨ = Approximate limits of depressed area.

* 0+00/4+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of NW 45th Street and the center of the Eastbound traffic lanes.

** 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of NW 46th Street and the center of the Eastbound traffic lanes.







2302-621-36 B05BORING

(SHEET 5 OF 7)

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RAYMOND SALIBA, P.E.
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11329 DISTRIBUTION AVE. WEST
JACKSONVILLE, FLORIDA 32256
CERTIFICATE OF AUTHORIZATION 6378

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

▽ = Groundwater Table

GNE = Goundwater not encountered
-200 = % Passing #200 Sieve
LL = Liquid Limit
PI = Plasticity Index

GENERAL NOTES

DRILL AND PENETRATION TESTING WERE PERFORMED IN ACCORDANCE WITH ASTM D 1586. NUMBER TO THE LEFT OF BORING INDICATES BLOWS OF 1⅜" I.D., 2" O.D. SPLIT-SPOON FOR 12" PENETRATION (UNLESS OTHERWISE NOTED) WITH A 140 LB HAMMER DROPPED 30 INCHES.

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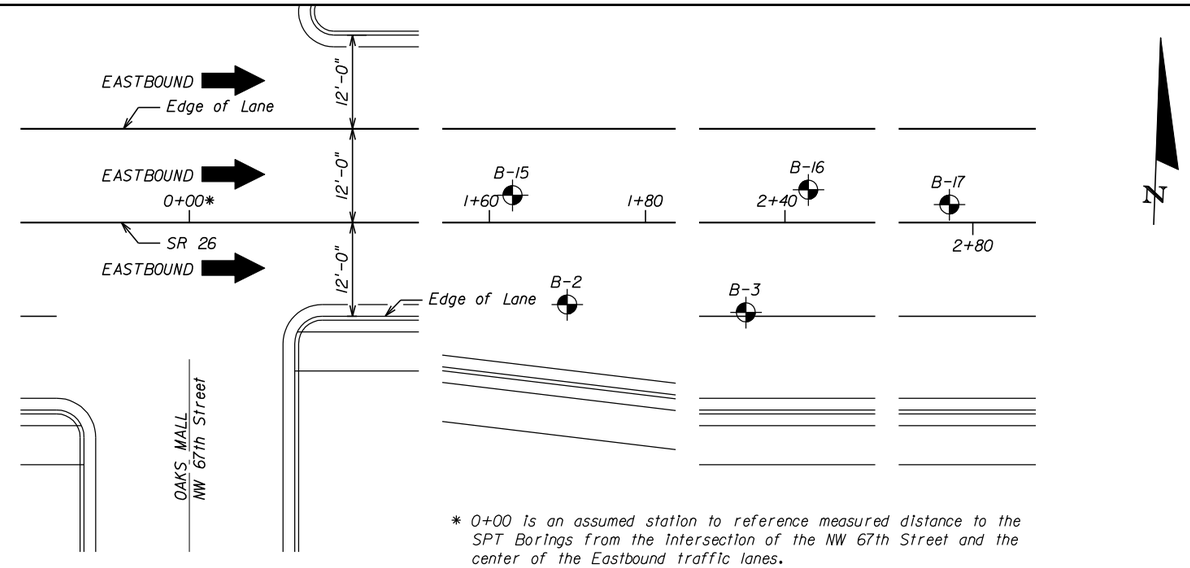
GRANULAR MATERIALS-

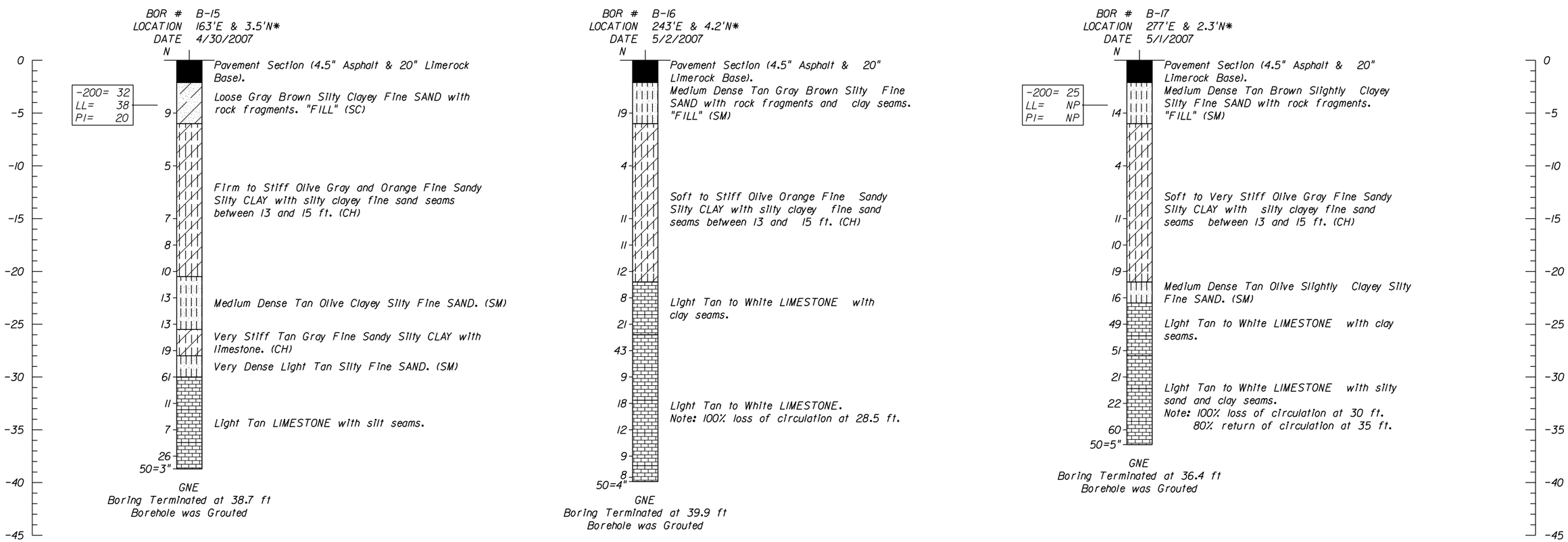
Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 4	Less than 3
Loose	4 - 10	3 - 8
Medium Dense	10 - 30	8 - 24
Dense	30 - 50	24 - 40
Very Dense	Greater than 50	Greater than 40

SILTS AND CLAYS-

Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
Stiff	8 - 15	6 - 12
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24



* 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of the NW 67th Street and the center of the Eastbound traffic lanes.



2302-621-36 B06BORING

(SHEET 6 OF 7)

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RAYMOND SALIBA, P.E.
P.E. LICENSE NUMBER 51032
WILLIAMS EARTH SCIENCES, INC.
11329 DISTRIBUTION AVE. WEST
JACKSONVILLE, FLORIDA 32256
CERTIFICATE OF AUTHORIZATION 6378

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

▽ = Groundwater Table

GNE = Goundwater not encountered
-200 = % Passing #200 Sieve
LL = Liquid Limit
PI = Plasticity Index

GENERAL NOTES

DRILL AND PENETRATION TESTING WERE PERFORMED IN ACCORDANCE WITH ASTM D 1586. NUMBER TO THE LEFT OF BORING INDICATES BLOWS OF 1⅜" I.D., 2" O.D. SPLIT-SPOON FOR 12" PENETRATION (UNLESS OTHERWISE NOTED) WITH A 140 LB HAMMER DROPPED 30 INCHES.

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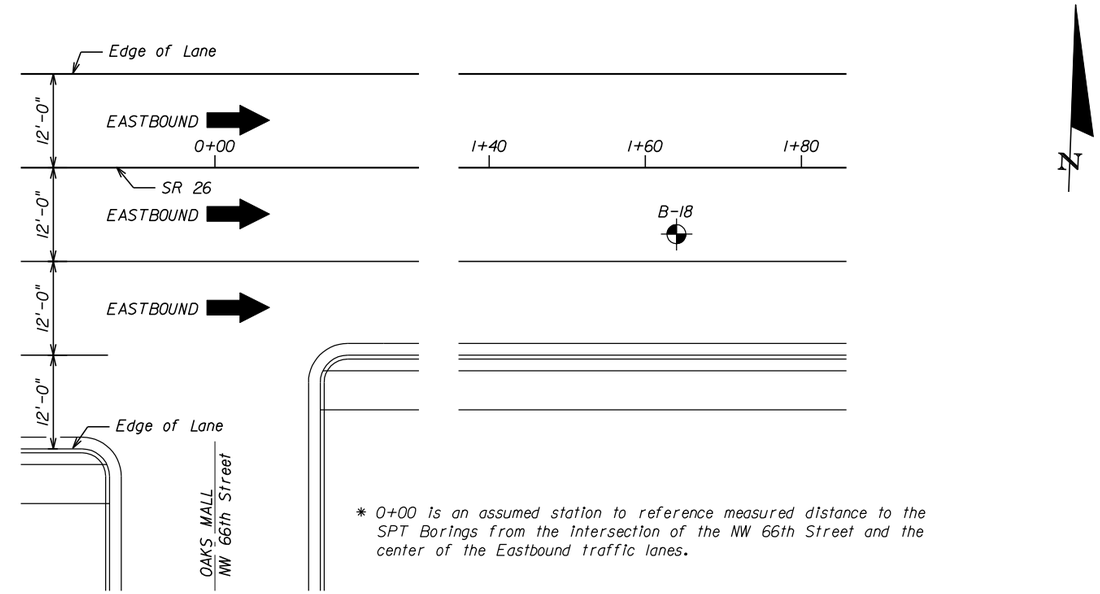
GRANULAR MATERIALS-

Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 4	Less than 3
Loose	4 - 10	3 - 8
Medium Dense	10 - 30	8 - 24
Dense	30 - 50	24 - 40
Very Dense	Greater than 50	Greater than 40

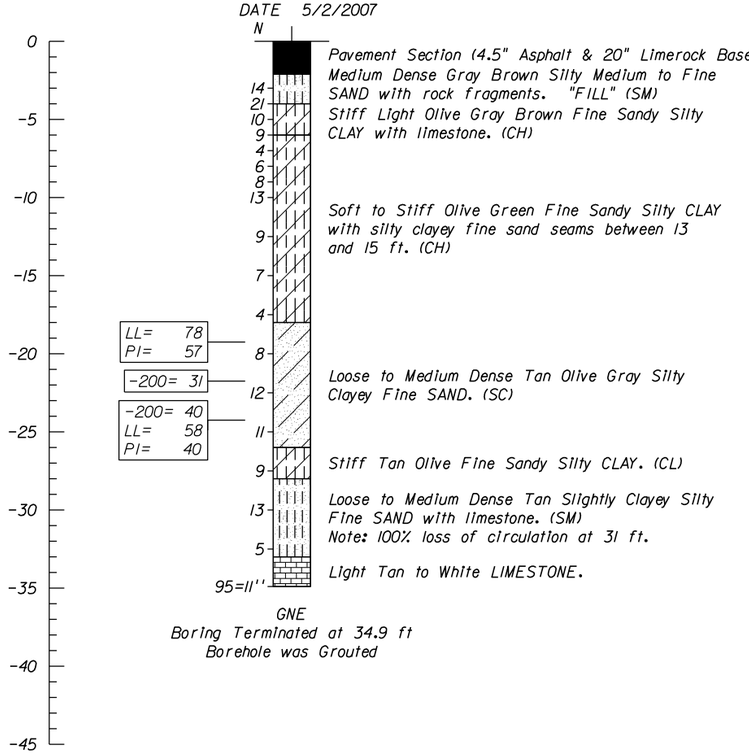
SILTS AND CLAYS-

Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
Stiff	8 - 15	6 - 12
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24



* 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of the NW 66th Street and the center of the Eastbound traffic lanes.

BOR # B-18
LOCATION 164'E & 3.5'N*
DATE 5/2/2007



Pavement Section (4.5" Asphalt & 20" Limerock Base).
Medium Dense Gray Brown Silty Medium to Fine SAND with rock fragments. "FILL" (SM)
Stiff Light Olive Gray Brown Fine Sandy Silty CLAY with limestone. (CH)
Soft to Stiff Olive Green Fine Sandy Silty CLAY with silty clayey fine sand seams between 13 and 15 ft. (CH)
Loose to Medium Dense Tan Olive Gray Silty Clayey Fine SAND. (SC)
Stiff Tan Olive Fine Sandy Silty CLAY. (CL)
Loose to Medium Dense Tan Slightly Clayey Silty Fine SAND with limestone. (SM)
Note: 100% loss of circulation at 31 ft.
Light Tan to White LIMESTONE.

GNE
Boring Terminated at 34.9 ft
Borehole was Grouted

2302-621-36 B07BORING

(SHEET 7 OF 7)

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RAYMOND SALIBA, P.E.
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WILLIAMS EARTH SCIENCES, INC.
11329 DISTRIBUTION AVE. WEST
JACKSONVILLE, FLORIDA 32256
CERTIFICATE OF AUTHORIZATION 6378

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

WILLIAMS EARTH SCIENCES, INC.
Corporate Office: 10600 Endeavour Way. Largo, FL 33777
Largo: (727) 541-3444 Fax: (727) 541-1510
Jacksonville: (904) 262-8852 Fax: (904) 262-8864
Panama City: (850) 747-9419 Fax: (850) 763-2454
Pompano Beach: (954) 972-7570 Fax: (954) 972-6608

REPORT OF AUGER BORINGS

CLIENT: FLORIDA DEPARTMENT OF TRANSPORTATION

PROJECT NAME: SR 26 Roadway Settlements; Gainesville, Alachua Co., Florida

PROJECT NO.: Williams: 2302-621-36; SEI 2006-G364

BORING No. & Date	Station & Offset	DEPTH (FT) FROM/TO	SOIL DESCRIPTION	USCS	STRATUM NO.	GROUNDWATER LEVEL (FT)
HA-1			68' West of NW 44th St. and 1' off the Sidewalk			GNE
01/07/07		0.0 - 2.0	Gray Brown Slightly Silty Fine SAND with traces of roots.	SP-SM	1	
		2.0 - 3.0	Tan Gray Brown Silty Clayey Medium to Fine SAND with sandstone fragments	SC	3	
		3.0 - 6.0	Light Tan Gray Medium to Fine SAND with clay seams and limestone.	SP-SM	1	
		6.0	Boring Terminated			
HA-2			60' East of NW 45th St. and 1.5' off the Sidewalk			GNE
01/07/07		0.0 - 3.0	Brown Silty Medium to Fine SAND with limerock fragments and root traces.	SM	2	
		3.0 - 6.0	Gray Brown Fine Sandy Silty CLAY with sand seams.	SC	3	
		6.0	Boring Terminated			
HA-3			81' West of NW 45th St. and 5' off the Sidewalk			GNE
01/07/07		0.0 - 4.0	Brown Silty Fine SAND with clay seams and rock fragments.	SM	2	
		4.0 - 6.0	Light Tan Gray Slightly Silty Fine SAND with rock fragments.	SP-SM	1	
		6.0	Boring Terminated			
HA-4			120' East of NW 46th St. and 3' off of Sidewalk			GNE
01/07/07		0.0 - 6.0	Brown Silty Fine SAND with rock fragments.	SM	2	
		6.0	Boring Terminated			

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Pompano Beach: (954) 972-7570 Fax: (954) 972-6608

SUMMARY OF LABORATORY TESTING

CLIENT: FLORIDA DEPARTMENT OF TRANSPORTATION
PROJECT: SR 26 Roadway Depressions, Gainesville, Alachua Co. Fl.
PROJECT NO: Williams 2302-621-36; SEI 2006-G364

Boring Number	Sample Depth (ft)		Soil Description	USCS ID	Sieve Analysis (Percent Passing)										Natural Moisture (%)	Atterberg Limits (%)		Organic Content (%)
	From	To			1"	3/4"	1/2"	3/8"	#4	#10	#40	#60	#100	#200		LL	PI	
B-1	4.0	6.0	Red orange gray brown clayey silty coarse to fine SAND with limerock.	SM		97	96	94	91	88	80	68	47	30				
B-2	2.0	4.0	Gray brown orange silty clayey fine SAND with limerock.	SC												37	20	
B-2	11.0	12.5	Mottled red orange olive green brown fine sandy silty CLAY with sand seams.	CH		100	100	100	100	100	100	98	95	87				
B-2	13.5	15.0	Mottled red orange olive green brown fine sandy silty CLAY with sand seams.	CH												74	55	
B-3 T	2.0	4.0	Orange brown silty medium to fine SAND.	SM		100	100	100	99	99	89	64	37	19				
B-3	8.0	10.0	Red orange olive green fine sandy silty CLAY with limerock.	CH		100	100	100	100	100	100	99	97	97				
B-3	11.0	12.5	Red orange olive green fine sandy silty CLAY with limerock.	CH												118	84	
B-3	21.0	22.5	Tan olive green gray silty clayey fine SAND.	SC		100	100	100	100	100	99	95	61	27		49	26	
B-4 T	4.0	6.0	Gray brown silty medium to fine SAND with traces of limerock.	SM		100	100	99	99	99	89	65	33	15				
B-4	8.0	10.0	Red orange olive gray silty clayey fine SAND.	SC		100	100	100	100	100	98	93	80	42		51	31	
B-5 B	2.0	4.0	Tan brown silty medium to fine SAND with clay seams and traces of limerock.	SM		100	99	99	99	99	88	61	31	12				

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SUMMARY OF LABORATORY TESTING

CLIENT: FLORIDA DEPARTMENT OF TRANSPORTATION
PROJECT: SR 26 Roadway Depressions, Gainesville, Alachua Co. Fl.
PROJECT NO: Williams 2302-621-36; SEI 2006-G364

Boring Number	Sample Depth (ft)		Soil Description	USCS ID	Sieve Analysis (Percent Passing)										Natural Moisture (%)	Atterberg Limits (%)		Organic Content (%)
	From	To			1"	3/4"	1/2"	3/8"	#4	#10	#40	#60	#100	#200		LL	PI	
B-5	6.0	8.0	Red orange olive green fine sandy silty CLAY.	CH												177	139	
B-6 B	2.0	4.0	Gray brown silty medium to fine SAND with clay seams.	SM		100	100	100	100	100	90	66	36	18				
B-6	6.0	8.0	Red orange olive green fine sandy silty CLAY.	CH												170	116	
B-7	4.0	6.0	Red orange tan gray coarse to fine sandy clayey SILT with limerock fragments.	MH		94	91	87	83	83	76	59	50	50		53	23	
B-7	13.5	15.0	Red orange olive green silty clayey fine SAND.	SC		100	100	100	99	98	92	81	53	43		74	41	
B-8	4.0	6.0	Mottled red orange olive gray fine sandy silty CLAY with sand seams.	CL		100	100	100	100	100	93	85	72	51				
B-8	13.5	15.0	Tan olive gray fine sandy silty CLAY.	CL		100	100	100	100	100	96	84	54	52				
B-9 T	2.0	4.0	Tan gray brown silty medium to fine SAND with traces of clay seams and limerock.	SM		100	100	99	97	94	83	63	37	19				
B-9	6.0	8.0	Tan olive gray fine sandy silty CLAY with sand seams.	CH												160	113	
B-12	3.5	5.0	Gray brown silty clayey fine SAND with rock fragments.	SC		100	98	96	94	93	88	77	45	26		28	11	
B-13	31.0	32.5	Tan olive gray clayey silty fine SAND with clay seams.	SC-SM		100	100	100	100	100	97	90	60	17		55	29	

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Largo: (727) 541-3444 Fax: (727) 541-1510
Jacksonville: (904) 262-8852 Fax: (904) 262-8864
Panama City: (850) 747-9419 Fax: (850) 763-2454
Pompano Beach: (954) 972-7570 Fax: (954) 972-6608

SUMMARY OF LABORATORY TESTING

CLIENT: FLORIDA DEPARTMENT OF TRANSPORTATION
PROJECT: SR 26 Roadway Depressions, Gainesville, Alachua Co. Fl.
PROJECT NO: Williams 2302-621-36; SEI 2006-G364

Boring Number	Sample Depth (ft)		Soil Description	USCS ID	Sieve Analysis (Percent Passing)										Natural Moisture (%)	Atterberg Limits (%)		Organic Content (%)
	From	To			1"	3/4"	1/2"	3/8"	#4	#10	#40	#60	#100	#200		LL	PI	
B-13	36.0	37.5	Tan olive gray silty clayey fine SAND with clay seams.	SC		100	100	100	99	98	93	87	51	15		56	30	
B-14	3.5	5.0	Tan gray orange silty clayey fine SAND with rock fragments.	SC		100	93	91	88	88	80	61	51	43		50	29	
B-14	21.0	22.5	Tan olive silty clayey fine SAND.	SC		100	100	100	100	100	100	98	76	36		61	41	
B-15	3.5	5.0	Gray brown silty clayey fine SAND with rock fragments.	SC		95	92	91	90	89	81	68	47	32		38	20	
B-17	3.5	5.0	Tan brown slightly clayey silty fine SAND with rock fragments.	SM		100	98	98	96	95	86	69	43	25		NP	NP	
B-18	18.5	20.0	Tan olive gray silty clayey fine SAND.	SC												78	57	
B-18	21.0	22.5	Tan olive gray silty clayey fine SAND.	SC		100	100	100	100	100	97	94	67	31				
B-18	23.5	25.0	Tan olive gray silty clayey fine SAND.	SC		100	100	100	99	97	92	87	65	40		58	40	
HA-1	2.0	3.0	Tan gray brown silty clayey fine SAND with sandstone fragments.	SC		100	100	100	100	100	98	92	51	35				
HA-2	1.5	3.0	Brown silty medium to fine SAND with limerock fragments and root traces.	SM		100	99	99	98	97	86	60	31	27				
HA-2	3.0	6.0	Gray Brown silty clayey fine SAND.	SC		100	100	100	100	100	92	77	48	43		27	12	

N:\Saliba Engineering\SEI\Projects\Geotech\2006\Active Project\SEI 2006-G364 SR 26 Roadway Depressions, Gainesville, FL\Laboratory\[Summary of Lab.XLS]Sheet1

▽ = Groundwater Table

GNE = Goundwater not encountered
-200 = % Passing #200 Sieve
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PI = Plasticity Index

GENERAL NOTES

DRILL AND PENETRATION TESTING WERE PERFORMED IN ACCORDANCE WITH ASTM D 1586. NUMBER TO THE LEFT OF BORING INDICATES BLOWS OF 1⅜" I.D., 2" O.D. SPLIT-SPOON FOR 12" PENETRATION (UNLESS OTHERWISE NOTED) WITH A 140 LB HAMMER DROPPED 30 INCHES.

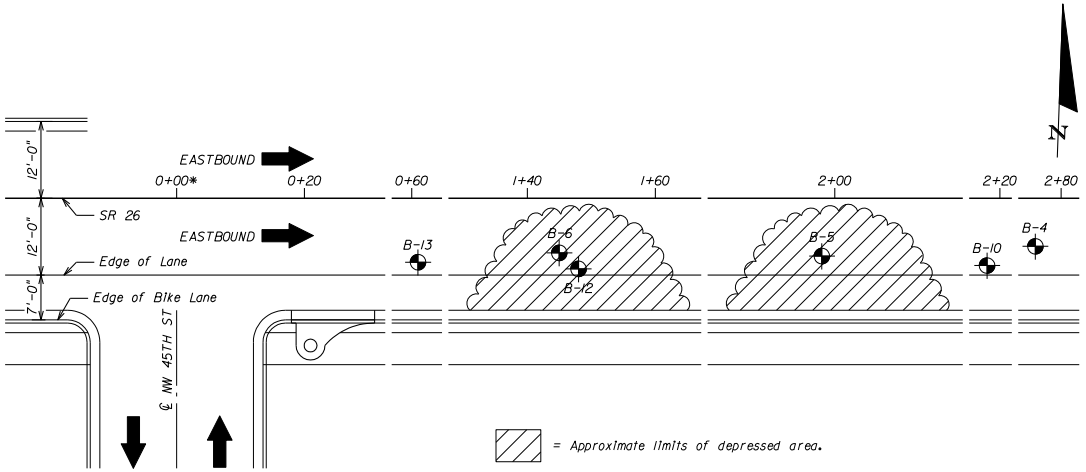
THE BORING LOGS SHOWN REPRESENT SUBSURFACE CONDITIONS WITHIN THE BOREHOLE AT THE TIME OF DRILLING. NO WARRANTY AS TO THE SUBSURFACE CONDITION, STRATA DEPTH OR SOIL CONSISTENCY BETWEEN OR OUTSIDE BORING LOCATIONS IS EXPRESSED OR IMPLIED BY THIS DRAWING.

GRANULAR MATERIALS-

Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 4	Less than 3
Loose	4 - 10	3 - 8
Medium Dense	10 - 30	8 - 24
Dense	30 - 50	24 - 40
Very Dense	Greater than 50	Greater than 40

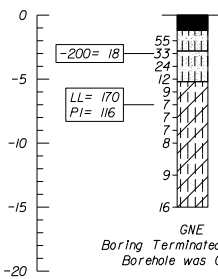
SILTS AND CLAYS-

Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
Stiff	8 - 15	6 - 12
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24



* 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of NW 45th Street and the center of the Eastbound traffic lanes.

BOR # B-6
LOCATION 145'E & 3.5'N*
DATE 1/6/2007

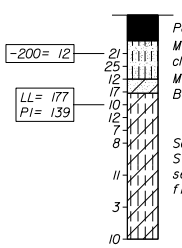


Pavement Section (4" Asphalt & 10" Limerock Base).
Dense Tan Gray Brown Silty Medium to Fine SAND with limerock. (SM)
Medium Dense Gray Brown Silty Medium to Fine SAND with clay seams. (SM)

Firm to Stiff Red Orange Olive Green Fine Sandy Silty CLAY with sand seams from 10 to 12.5 ft and cemented clay seams from 12.5 to 15 ft. (CH)

GNE
Boring Terminated at 15 ft
Borehole was Grouted

BOR # B-5
LOCATION 198'E & 3'N*
DATE 1/6/2007

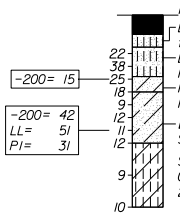


Pavement Section (5" Asphalt & 19" Limerock Base).
Medium Dense Tan Brown Silty Fine SAND with clay seams and traces of limerock. (SM)
Medium Dense Mottled Red Orange Olive Green Brown Silty Clayey Fine SAND with limerock. (SC)

Soft to Stiff Red Orange Olive Green Fine Sandy Silty CLAY with traces of limestone and sand seams from 11' to 13' and cemented clay fragments from 13' to 17.5'. (CH)

GNE
Boring Terminated at 17.5 ft
Borehole was Grouted

BOR # B-4
LOCATION 276'E & 4.5'N*
DATE 1/6/2007



Pavement Section (3.25" Asphalt & 14.75" Limerock Base).
Dense to Medium Dense Gray Brown Silty Medium to Fine SAND with clay seams and limerock. (SM)
Dense to Medium Dense Gray Brown Silty Medium to Fine SAND with traces of limerock. (SM)
Medium Dense Orange Gray Brown Silty Clayey Medium to Fine SAND with limerock. (SC)
Loose to Medium Dense Olive Gray Silty Clayey Fine Sand. (SC)

Stiff Red Orange Olive Gray Fine Sandy Silty CLAY with sand seams and limerock in the upper 2 feet. (CH)

GNE
Boring Terminated at 15 ft
Borehole was Grouted

2302-621-36 B02BORING

(SHEET 2 OF 7)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RAYMOND SALIBA, P.E.
P.E. LICENSE NUMBER 51032
WILLIAMS EARTH SCIENCES, INC.
11329 DISTRIBUTION AVE. WEST
JACKSONVILLE, FLORIDA 32256
CERTIFICATE OF AUTHORIZATION 6378

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

▽ = Groundwater Table

GNE = Goundwater not encountered
-200 = % Passing #200 Sieve
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PI = Plasticity Index

GENERAL NOTES

DRILL AND PENETRATION TESTING WERE PERFORMED IN ACCORDANCE WITH ASTM D 1586. NUMBER TO THE LEFT OF BORING INDICATES BLOWS OF 1⅜" I.D., 2" O.D. SPLIT-SPOON FOR 12" PENETRATION (UNLESS OTHERWISE NOTED) WITH A 140 LB HAMMER DROPPED 30 INCHES.

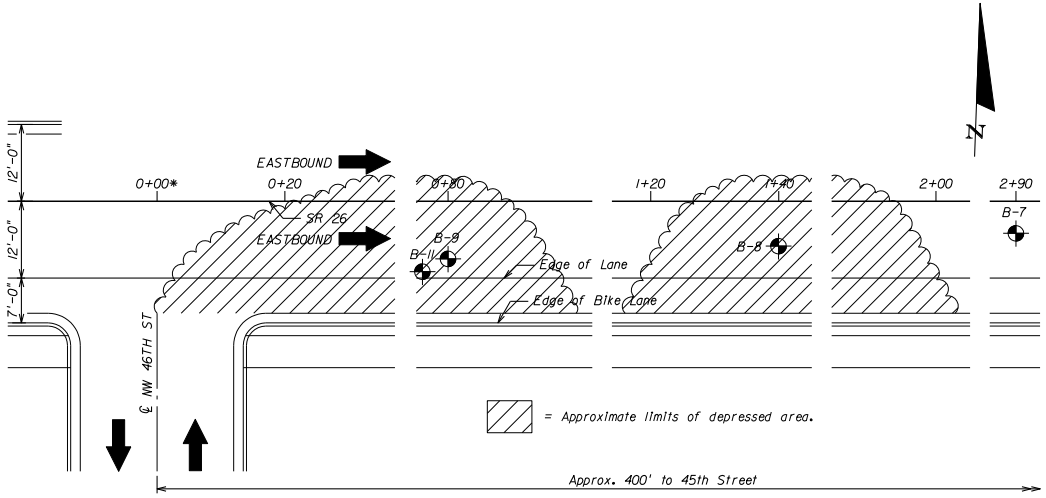
THE BORING LOGS SHOWN REPRESENT SUBSURFACE CONDITIONS WITHIN THE BOREHOLE AT THE TIME OF DRILLING. NO WARRANTY AS TO THE SUBSURFACE CONDITION, STRATA DEPTH OR SOIL CONSISTENCY BETWEEN OR OUTSIDE BORING LOCATIONS IS EXPRESSED OR IMPLIED BY THIS DRAWING.

GRANULAR MATERIALS-

Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Loose	Less than 4	Less than 3
Loose	4 - 10	3 - 8
Medium Dense	10 - 30	8 - 24
Dense	30 - 50	24 - 40
Very Dense	Greater than 50	Greater than 40

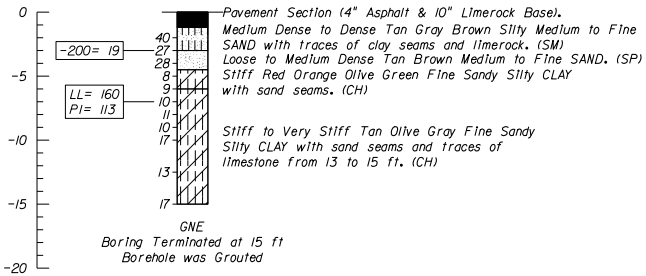
SILTS AND CLAYS-

Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
Stiff	8 - 15	6 - 12
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24



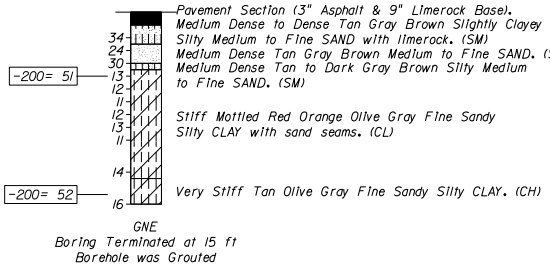
* 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of NW 46th Street and the center of the Eastbound traffic lanes.

BOR # B-9
LOCATION 80'E & 3'N*
DATE 1/8/2007



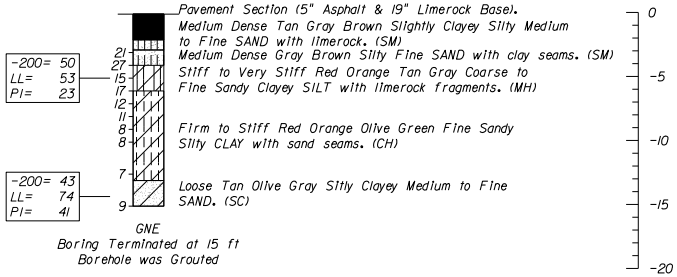
GNE
Boring Terminated at 15 ft
Borehole was Grouted

BOR # B-8
LOCATION 140'E & 5.5'N*
DATE 1/8/2007



GNE
Boring Terminated at 15 ft
Borehole was Grouted

BOR # B-7
LOCATION 290'E & 7'N*
DATE 1/6/2007



GNE
Boring Terminated at 15 ft
Borehole was Grouted

2302-621-36 B03BORING

(SHEET 3 OF 7)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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P.E. LICENSE NUMBER 51032
WILLIAMS EARTH SCIENCES, INC.
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JACKSONVILLE, FLORIDA 32256
CERTIFICATE OF AUTHORIZATION 6378

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

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GENERAL NOTES

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GRANULAR MATERIALS-

Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
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Medium Dense	10 - 30	8 - 24
Dense	30 - 50	24 - 40
Very Dense	Greater than 50	Greater than 40

SILTS AND CLAYS-

Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
Very Soft	Less than 2	Less than 1
Soft	2 - 4	1 - 3
Firm	4 - 8	3 - 6
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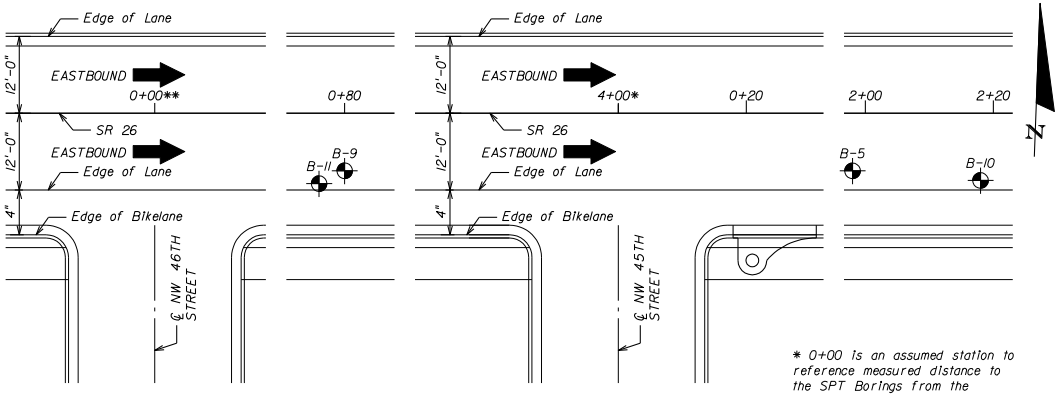
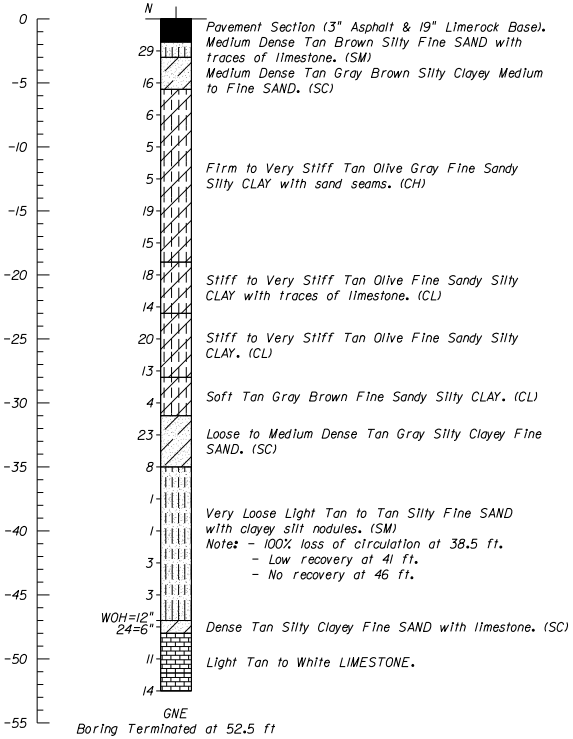
Very Stiff	15 - 30	12 - 24
Hard	Greater than 30	Greater than 24

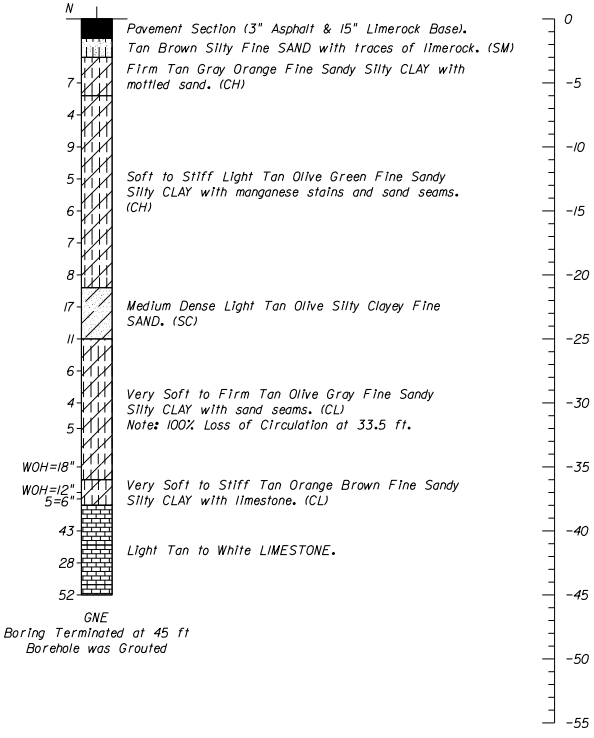


* 0+00 is an assumed station to reference measured distance to the SPT Borings from the intersection of NW 46th or NW 45th Street and the center of the Eastbound traffic lanes.

BOR # B-10
LOCATION 218'E & 1.5'N*
DATE 4/18/2007



BOR # B-11
LOCATION 76'E & 1'N
DATE 4/19/2007



2302-621-36 B04BORING

(SHEET 4 OF 7)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RAYMOND SALIBA, P.E.
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WILLIAMS EARTH SCIENCES, INC.
11329 DISTRIBUTION AVE. WEST
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
26	ALACHUA	231940-1-A1-02

REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$

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GRANULAR MATERIALS-

Relative Density	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
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SILTS AND CLAYS-

Consistency	Safety Hammer SPT N-Value (Blow/Foot)	Automatic Hammer SPT N-Value (Blow/Foot)
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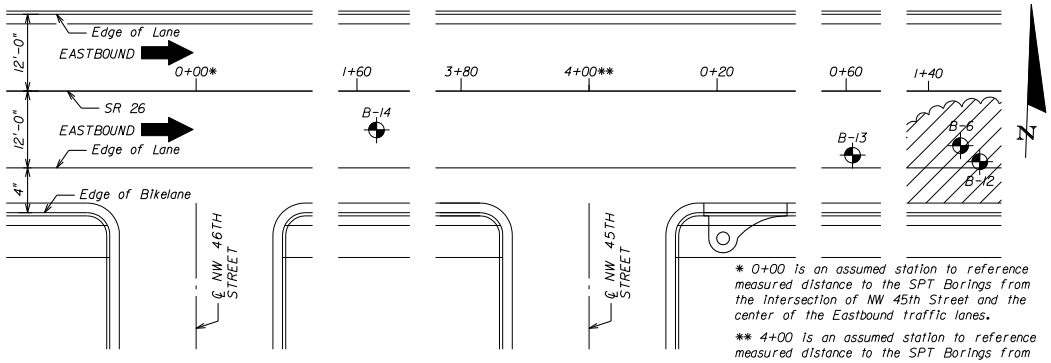
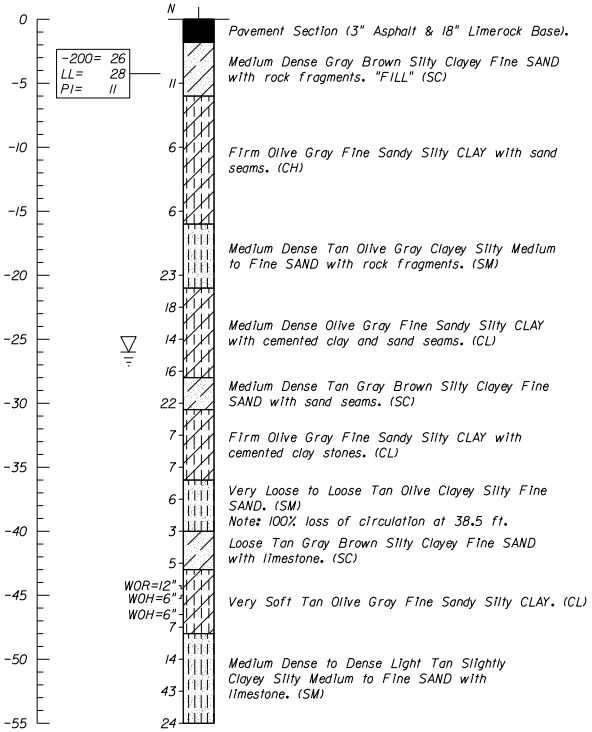


* 0+00 is an assumed station to reference measured distance to the SPT Borings from the Intersection of NW 45th Street and the center of the Eastbound traffic lanes.

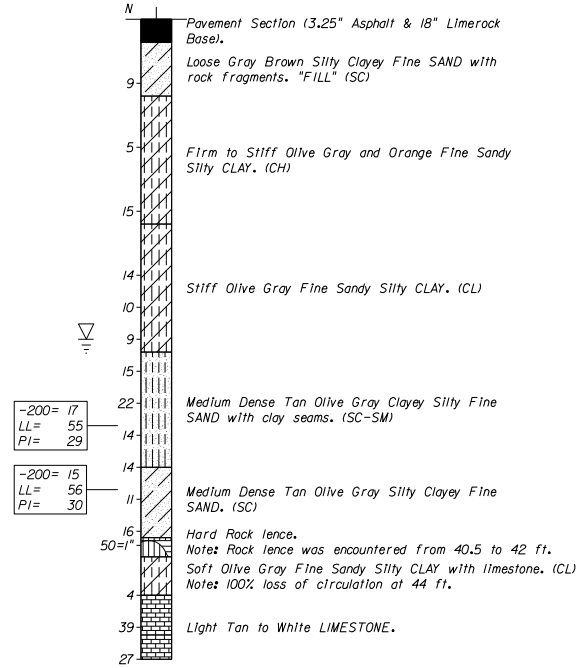
** 4+00 is an assumed station to reference measured distance to the SPT Borings from the Intersection of NW 46th Street and the center of the Eastbound traffic lanes.

BOR # B-12
LOCATION 150'E & 1'N*
DATE 4/24/2007



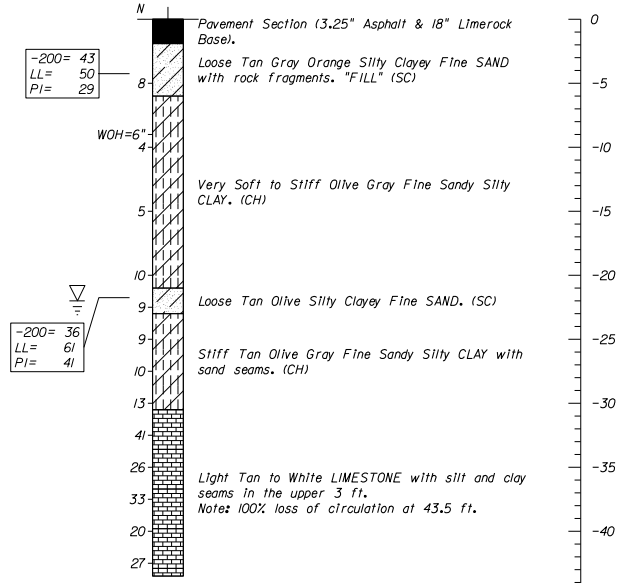
Boring Terminated at 55 ft
Borehole was Grouted

BOR # B-13
LOCATION 62'E & 2'N**
DATE 4/25/2007



Boring Terminated at 50 ft
Borehole was Grouted

BOR # B-14
LOCATION 163'E & 6'N**
DATE 4/25/2007



Boring Terminated at 43.5 ft
Borehole was Grouted

2302-621-36 B05BORING

(SHEET 5 OF 7)

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REPORT OF CORE BORINGS
SR 26 ROADWAY DEPRESSION

SHEET NO.

$USER$ $DATE$ $TIME$ $FILE$