DeKalb County
GEORGIA

ADDENDUM

December 2, 2016

TO: ALL PROPOSERS UNDER REQUEST FOR PROPOSAL (RFP) NO. **16-500421**

FROM: Department of Purchasing and Contracting, DeKalb County, Georgia
For additional information, go to: **http://yourdekalb.com/purchasing/index.html**.

ADDENDUM NO. 1

RFP No. 16-500421 for "Design and Construction of New Tag Office" is hereby modified as follows:

1. **Disposal of Concrete and Asphalt: Concrete and asphalt materials from the project site MUST be disposed at the County's Seminole Road Landfill, 4203 Clevemont Road, Ellenwood, GA 30294. Contractor MUST provide the County's Project Manager an estimate tonnage of disposal materials from the site prior to the commencement of the Work. Contractor MUST also provide copy of scale tickets from the landfill for proof of disposal.**

2. We have received questions pertaining to the above-referenced Request for Proposal. The questions and their resulting answers appear below:

   A. **Question** – Room identification. There is a room located on the south side of the building, directly behind the Men's and Women's toilets, that is not labeled. What is this room?
   Answer *- Mech./Elec. Room*

   B. **Question** – Clarification on Notice to Proceed (NTP) and Notice of Commencement. Per section I. Introductions, paragraph K (pg.5), *"Construction must begin within ten (10) days from the date the Contractor acknowledges receipt of the Notice to Proceed"*. Per Article 8, paragraph (A) Notice of Commencement (pg. 41), *"After Owner has approved the Design Documents for the Detailed Design, Owner shall issue a notice to commence the Work..."* Are the NTP, referenced in section I and the Notice of Commencement, referenced in Article 8, being used interchangeably? If not, please clarify the difference between the two statements.
   Answer *– Yes, the NTP and the Notice of Commencement are being used interchangeably. The words "Notice of Commencement" will be deleted and replaced with the words "Notice to Proceed" on the formal contract.*

   C. **Question** – Liquidated damages. Are there any acceptable conditions for delays in completing Detailed Design, Substantial Completion or Final Completion? For example, the RFP states that design progress reviews will be conducted during 30%, 60%, 90% and 100% design development.

The timeliness of the County completing their review and issuing review comments can greatly affect our ability to complete design per the project schedule.
Answer – *The County will review and return any comments promptly. The purpose of this review submission is to insure the County that the design continues to meet the user's needs. The time for which the County takes to review the submittals will not be charged to liquidated damages during this phase. Neither will it be charged to incentive for early completion. The Architect's clock shall restart the day after each return of comments.*

D. Question – Electric copies of RFP documents. Are electronic copies of the required RFP documents available for design/builders to use in completing their submittal?
Answer – *Yes. ACAD drawing shall be provided these drawings consist of Site Survey, Floor Plan and Building Elevations.*

E. **Question** – Small Business Enterprises. Our firm is a Service-Disabled Veteran-Owned Small Business (SDVOSB). This is a small business classification issued through the Veterans Administration. Does the County recognize SDVOSBs as small business enterprises?
Answer – *In order to be recognized as a DeKalb-Local Small Business Enterprise (LSBE) or DeKalb-Metropolitan Statistical Area (MSA), a firm must be registered and certified with DeKalb County. Please go to www.dekalblsb.info for all information regarding becoming certified as a LSBE under the DeKalb First Ordinance.*

F. **Question** – Page 5, Section M-Design Progress Reviews – Will these reviews be required in light that a "bridge document" is supplied. Does same apply to specifications?
Answer – *Yes.*

G. **Question** – Can we select building structural system?
Answer – *Yes.*

H. **Question** – Will county supply property boundary and topographic survey and if so in what format?
Answer – *Yes. See Site Survey attached hereto as "Exhibit A".*

I. **Question** – Will county supply soil report?
Answer – *Yes. See Geotechnical Report (Soil Report) attached hereto as "Exhibit B".*

J. **Question** – If addition information on soils or survey is required, will county supply?
Answer – *No.*

K. **Question** – Will permits be pulled through City of Chamblee or DeKalb County?
Answer – *City of Chamblee.*

L. **Question** – Is review time by City or County counted in the 270 calendar day schedule?
Answer – *No. (Also, see answer to question C)*

M. **Question** – The disposal of the concrete and asphalt cost really depends on the closest inert landfill that will take this material. Does DeKalb County have an inert landfill close to the job site and if

not, will the County require manifest for debris hauled off meaning that we have no choice but to dump at an inert landfill or can the demo contractor dispose of concrete and asphalt debris on property that needs filling in as long as the property owner allows it and is allowed in the County being dumped and the property owner allows it and is allowed in the County being dumped and the property owner puts it in writing that they take all responsibility for materials dumped on their property as long as it is allowed by County where property is located. That meaning that no manifest will be required and no matter how many loads are hauled away DeKalb County will not be held accountable for disposal once it leaves job site.
Answer *– Concrete and asphalt materials from the project site MUST be disposed at the County's Seminole Road Landfill, 4203 Clevemont Road, Ellenwood, GA 30294. Contractor MUST provide the County's Project Manager an estimate tonnage of disposal materials from the site prior to the commencement of the Work. Contractor MUST also provide copy of scale tickets from the landfill for proof of disposal.*
For your convenience, the gate rate at Seminole Road Landfill is $33.00 per ton. Contractor will need to set up a commercial landfill account at the Sanitation Administration Building, 3720 Leroy Scott Dr., Decatur, GA 30032. Items needed for the commercial landfill account include, completion of application, truck # of truck(s) that will be transporting the materials to the landfill. There is a fee of $5.00 per decal/per truck.

N. **Question** – Does the retainage as shown on page 51 of the sample contract apply to the designer?
Answer *– No, it only applies to the Prime Contractor.*

O. **Question** – If the designer is an LSBE firm, will the LSBE credit be given to the team?
Answer *– Yes, if the following conditions are met: (1) That the "designer" is an LSBE certified by DeKalb County; (2) That the "designer's" LSBE certification status is active at the time of the proposal submission; (3) That the written documentation showing at least 20% of the total contract award will be performed by the certified LSBE.*

P. **Question** - Does the E-Verify (Federal Work Authorization) affidavit for each vendor we submit with our proposal have to be included with our technical proposal, or can the E-Verify forms be submitted prior to construction once our final vendors have been selected?
Answer *– The E-verification for Prime Contractor and its sub-contractor(s) are not required to be submitted with the technical proposal. They are, however, required prior to the execution of the forma contract.*

Q. **Question** - Due to the design/build nature and the short amount of time with which to reach out to potential LSBE vendors, please advise if it is acceptable to submit a notarized statement of our intent to comply with LSBE/Section 3 participation according to project goals. If so, will this still qualify us for the 20 percentage points in our proposal package?
Answer *– If the Respondent is unable to meet the minimum 20% LSBE benchmark, they must document and demonstrate good faith efforts. See "Exhibit A, Checklist for Good Faith Efforts" on Page 25 if the RFP package for further instructions.*

R. **Question** - Due to the design/build nature of the project, we may not be able to establish a complete list of subcontractors and/or vendors until a contract is awarded and plans are developed to quote from. Please advise if it still mandatory to submit subcontractor information with our proposal or if these forms (letters of intent, references) can be submitted upon contract award?
Answer *– It is not mandatory for the Respondent to list all non-LSBE subcontractor(s) with the proposal. However, this list is required within 72-hour from the date of Notice of Award. Keep in mind that this solicitation required a Guaranteed Maximum Price. It is the Respondent's responsibility to carefully examine their price proposal to ensure accuracy.*

S. **Question** - Please advise if it is anticipated that the bid due date will be extended to allow for review of any new information received by addenda?
Answer *– No. Respondent is allowed a minimum of 72-hours to review Addendum documents prior to the proposal due date, December 9, 2016.*

3. Proposer **must** acknowledge addenda by signing and returning the Addendum form with the proposal.

Tina T. Phan
Tina T. Phan
Procurement Agent
Department of Purchasing and Contracting

ACKNOWLEDGEMENT

____
Date

The above Addendum is hereby acknowledged:

____
(Name of Proposer)

____
(Signature)

____
(Title)

PAH/TTP

JN:16 456

SITE SURVEY - "EXHIBIT A"

25 0 50 100

1" = 50'

GENERAL NOTES:

1: This Plat has been prepared without the benefit of a current title report. Easements or encumberances may exist that are not shown on this plat.

2: This plat is subject to any restrictions, easements, covenants or restrictions that may exist either written or unwritten.

3: Underground utilities not shown hereon may exist. The Surveyor does not take responsibility for absence or presence of any such utilities.

4: No Geodetic monuments were found within 500 feet of this site

5: This Plat has been prepared for the exclusive use of the person(s) or entities named hereon.

REFERENCE: DB 9015 PG 349
DB 10743 PG 657
DB 22611 PG 636

FLOOD HAZARD NOTE: THIS PROPERTY IS LOCATED IN A FLOOD HAZARD AREA AS DEFINED BY FIRM MAP OF DEKALB COUNTY, GEORGIA 13089C0016J EFFECTIVE DATE MAY 16, 2013

ZONING: VC

IMPERVIOUS SURFACES:
CONC. SIDEWALKS = 1,634 SQ. FT.
BUILDING PAD = 17,816 SQ. FT.
ASPHALT = 8,657 SQ. FT.
TOTAL IMPERVIOUS = 28,107 SQ. FT. (25.2%)
TOTAL LOT = 111,464 SQ. FT.

SURVEY DATA:

TYPE OF SURVEY: TOPOGRAPHIC
SOURCE OF TITLE DESCRIPTION FOR SUBJECT PROPERTY: DB 9015 PG 349
PROPERTY OWNER AT TIME OF SURVEY: DEKALB COUNTY
PARCEL NUMBER: 18-344-05-002

WEST PROPERTY LINE IS BEARING BASIS FROM DB 22611 PG 636

TOTAL AREA: 111,464 SQ FT, 2.56 AC

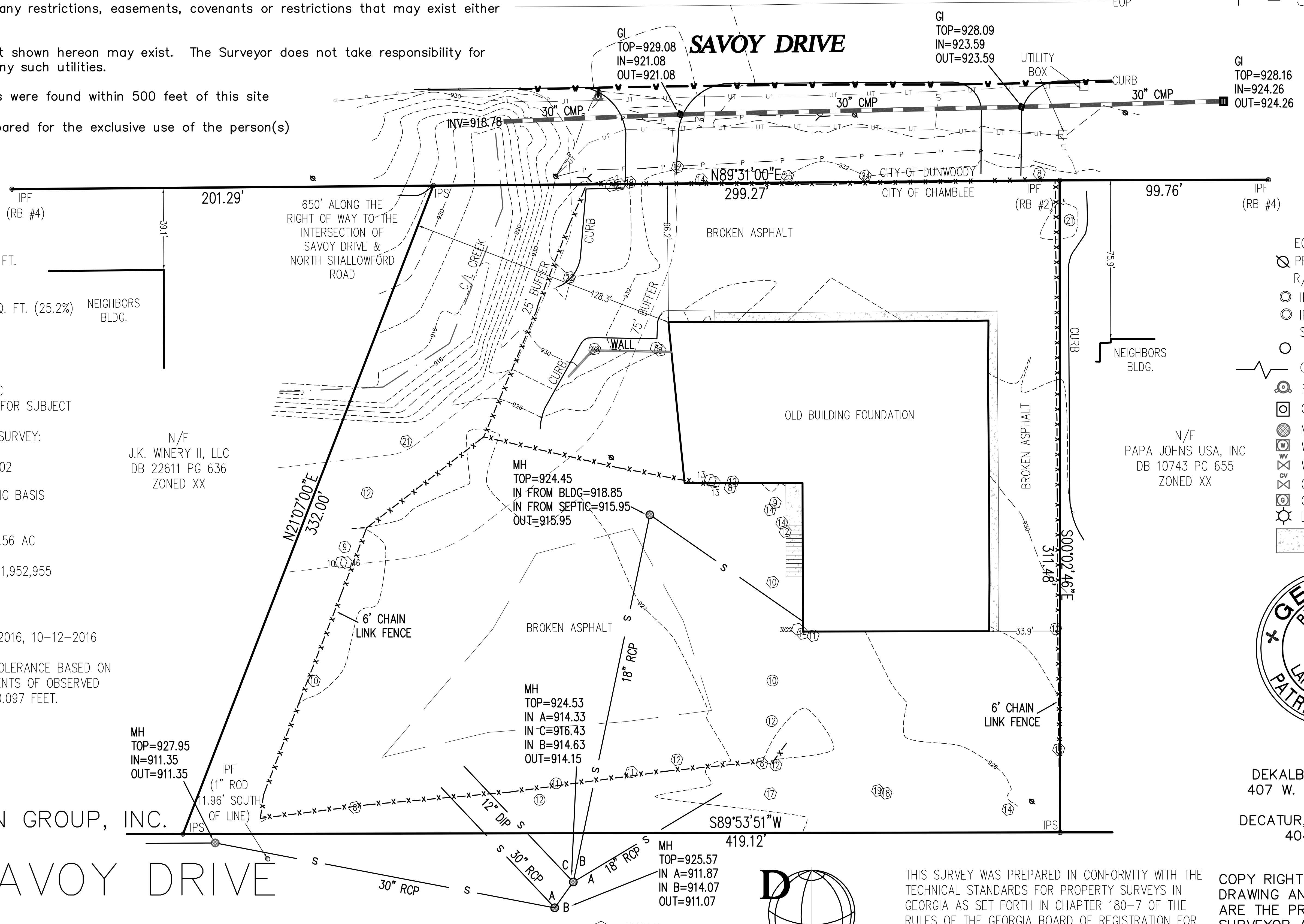
CALCULATED PLAT CLOSURE: 1:1,952,955

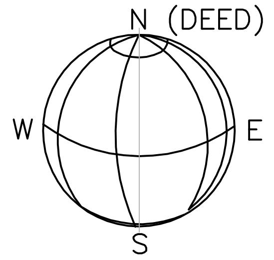
FIELD DATA:

DATE OF FIELD SURVEY 9-26-2016, 10-12-2016

THE CALCULATED POSITIONAL TOLERANCE BASED ON REDUNDANT LINEAR MEASUREMENTS OF OBSERVED POSITIONS WAS FOUND TO BE 0.097 FEET.

EQUIPMENT:
ELECTRONIC TOTAL STATION





LEGEND

	EOP	EDGE OF PAVEMENT (CURB)
⊘	PP	POWER POLE
	R/W	RIGHT OF WAY
◎	IPF	IRON PIN FOUND
◎	IPS	1/2" REBAR SET
	SW	SIDE WALK
○		BOLLARD
	OHP	OVERHEAD POWER
	FH	FIRE HYDRANT
▣	CB	CATCH BASIN
●	MH	MANHOLE
W	WM	WATER METER
⋈	WV	WATER VALVE
⋈	GV	GAS VALVE
G	GM	GAS METER
☼	LP	LIGHT POLE
▨		CONCRETE PAD

GEORGIA REGISTERED No. 3077 LANDSURVEYOR PATRICK F. CAREY

FOR
DEKALB SURVEYS, INC.
407 W. PONCE DE LEON
SUITE B
DECATUR, GEORGIA 30030
404.373.9003

SURVEY FOR
BROWN DESIGN GROUP, INC.

2117 SAVOY DRIVE

CITY OF CHAMBLEE, DEKALB COUNTY, GEORGIA

LAND LOT 344, DIST 18
DATE: SEPTEMBER 29, 2016

ADJUST TOPO 10-13-2016
ADD INVERTS 10-18-2016

TREE SYMBOLS
X = DIAMETER IN INCHES

(X)	MAPLE
⬡X	HARDWOOD
(X)	PINE

DS
www.dekalbsurveys.com
COA 1086

THIS SURVEY WAS PREPARED IN CONFORMITY WITH THE TECHNICAL STANDARDS FOR PROPERTY SURVEYS IN GEORGIA AS SET FORTH IN CHAPTER 180-7 OF THE RULES OF THE GEORGIA BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS AND AS SET FORTH IN THE GEORGIA PLAT ACT O.C.G.A. 15-6-67. AUTHORITY O.C.G.A. SECS. 15-6-67, 43-15-4, 43-15-6, 43-15-19, 43-15-22.

SUBSURFACE EXPLORATION
AND
GEOTECHNICAL ENGINEERING EVALUATION

AT

Proposed DeKalb County Tag Office
2117 Savoy Drive
Chamblee, Georgia

Submitted to

Brown Design Group

Mr. Coy Cooper, Jr. RA
Brown Design Group
3099 Washington Road
East Point, Georgia 30344

PROJECT NUMBER: MEG301922
December 2016

Matrix
Engineering
Group, Inc.

engineers | special inspectors | construction consultants

Matrix
Engineering
Group, Inc.
engineers | special inspectors | construction consultants

December 2, 2016

Mr. Coy Cooper, Jr. RA
Brown Design Group
3099 Washington Road
East Point, Georgia 30344

Re: ***Subsurface Exploration and Geotechnical Engineering Evaluation***
Geotechnical Exploration at DeKalb County Savoy Drive Tag Office
Chamblee, Georgia
Matrix Engineering Group Project Number MEG-301-922

Dear Mr. Cooper:

Matrix Engineering Group, Inc. has completed the authorized Subsurface Exploration for the proposed development at the DeKalb County Tag Office at 2117 Savoy Drive in Chamblee, Georgia. The scope of this work included the drilling of eight (8) soil test borings. This report describes our investigative procedures and presents our findings, conclusions and engineering recommendations.

Matrix Engineering Group, Inc. appreciates the opportunity to have worked with the Brown Design Group on this project and looks forward to our continued association. If you have any questions or need further assistance, please do not hesitate to call.

Best Regards,

MATRIX ENGINEERING GROUP, INC.

Eric Taylor

Eric Taylor
Project Manager
etaylor@matrixengineeringgroup.com

No. 19197
O. SAMIR ALYATEEM

Sam Al Yateem

Sam Alyateem, PE
Senior Geotechnical Engineer
Principal
Sam@matrixengineeringgroup.com

M:\1.0 MATRIX PROJECTS FOLDER\Savoy Drive DeKalb County Tag Office\1.0 GEOTECHNICAL - MEG 301922\Report\Subsurface Exploration - Savoy Drive.doc

EXECUTIVE SUMMARY

The following summarizes our findings and recommendations for the proposed development. For detailed information, references and context, refer to the appropriate section in the body of this report.

- The project is located at 2117 Savoy Drive in Chamblee, Georgia. The proposed construction is one story new Tag Office facility with parking areas, driveways, and sidewalks. Demolition of the existing improvements including elevated post-tensioned slab, concrete columns, footings, retaining walls, and asphalt pavement will be required to facilitate the construction of the proposed Tag Office.

- The site has been developed in the past and is currently occupied by a remnant of a previous development. The driveways, curbs/gutters, parking areas, concrete foundations, concrete walls, columns and slab are still present on site. The site slopes from the northern boundary in a southerly direction from elevations on the order of 934 feet Mean Sea Level (MSL) to elevations of 924 at the southwestern corner of the site. An existing retaining wall in front of the existing building provides a grade separation between the existing driveway and the basement level with approximately relief on the order of 8 to 10 feet.

- A total of eight (8) soil test borings, designated as B1 to B6 and HA1 to HA2 were performed throughout the subject site to explore the subsurface conditions and provide specific geotechnical recommendations for the proposed development.

- Alluvium deposits and Man-made fill were encountered at most of the test borings. The thickness of thislayer ranged between 8.5 and 20 feet BGS. The fill material generally consisted of very loose to medium dense, silty sand (SM). The consistency of the fill material ranged between 1 blows/ft (bpf) and 34 bpf. Organics and gravel were observed within the fill material at test borings B5 and B6 between 3.5 to 5 feet BGS. A strong decomposing organics odor was noted within the fill material at boring B1 at a depth of 18.5 feet BGS.

- Residual soils were encountered at each of the soil borings below the encountered fill and/or alluvial soils, except for boring B1. The residual soils generally consisted of loose to dense, silty coarse to fine sands (SM). The soil consistency of the residual material ranged between 9 and 42 bpf, but was typically observed to be between 12 and 24 bpf. **Partially Weathered Rock (PWR)** was not encountered at any of the test borings. Auger refusal was not encountered at any of the test borings. All borings were advanced to their planned depths. Groundwater was encountered at each of the test borings at the time of drilling ranging in depths from 8 to 14 feet BGS. Due to safety concerns associated with the public, the borings were backfilled at the completion of drilling prior to leaving the site.

- Based on the subsurface conditions encountered at the test borings, we anticipate that shallow foundations will experience excessive settlements as a result of the existing alluvium and man-made fill. Therefore, we provided options of waiting for a period of three months after the placement of the fill, placement of a temporary surcharge, or utilizing aggregate ramped pier in order to minimize settlements of the structure. Refer to Section 7.6 for detailed discussion and recommendations.

- The subgrade preparation will require the demolition of the existing structures including the concrete slab and foundations. The existing elevated concrete slab has been constructed with a post-tension reinforcement system. Demolition of the slab will require a specialized demolition company to de-tension the steel tendons prior to demolition. Otherwise, release of the high tensioned cables could present unsafe conditions to workers as well as damage to neighboring properties.

- Based on the Multi-Channel Analysis of Surface Waves (MASW) technique and the resulting V_{s100} of 1,131 ft/sec, we recommend that a *Site Class "D"* be used for seismic design purposes per IBC2012.

TABLE OF CONTENT

1.0 INTRODUCTION

Matrix Engineering Group, Inc. (Matrix) has completed the authorized Subsurface Exploration and Geotechnical Engineering Evaluation for the proposed DeKalb County Tag Office at 2117 Savoy Drive in Chamblee, Georgia.

The objective of this exploration was to perform eight (8) soil test borings to explore the subsurface conditions, and provide the findings and recommendations regarding the geotechnical aspects of the proposed development. This report describes our investigative procedures and presents our findings, conclusions and engineering recommendations.

This work was authorized on October 28, 2016 and performed in general accordance with our proposal for Geotechnical Services which was issued on October 12, 2016.

2.0 PROJECT DESCRIPTION

- The proposed project consists of the demolition of the existing structures (slab, stairs, footings, retaining walls, and asphalt pavement) to facilitate the construction of a new Tag Office facility with parking areas and driveways, and sidewalks.
- Based on the Civil Drawings, prepared by Brown Design Group, there were two (2) site layout options considered. It is our understanding that Site Layout Option 1 will be implemented. Refer to Figure 1 provided in the Appendix for the proposed site layout. Although the proposed finished floor elevations are not provided, it appears that the finished floor elevations will be near the elevation of the existing concrete slab. Therefore, fill will be required after demolition of the existing improvements.
- Anticipated column loads were not available at the time of writing this report.

3.0 SCOPE OF WORK

The scope of work for this project consisted of:

- Drilling and sampling a total of eight (8) soil test borings located throughout the site to explore the subsurface conditions and provide geotechnical recommendations for the proposed development. Six (6) of the borings were drilled mechanically and extended to a maximum depth of 20 feet below the existing ground surface (BGS). Due to the limited access of the site under the existing concrete slab, two (2) hand-auger borings were performed within the existing building remnants.

- Field and laboratory testing to determine the engineering characteristics of the soils encountered in the soil borings.
- Performing a Seismic Site Classification per Chapter 16 of the 2012 International Building Code (IBC2012) utilizing the measured average shear wave velocity for the upper 100 feet of subsurface ($V_{s,100}$).
- Providing recommended short (0.2 second) and 1-second Design Response Accelerations (S_{Ds} & S_{D1}) for seismic events having a 2% probability of exceedance in 50 years.
- Performing a geotechnical engineering analysis for the proposed development.

The purpose of this report is to document the site subsurface conditions, to analyze and evaluate the data obtained, and to provide recommendations regarding the geotechnical aspects of the proposed development.

4.0 EXPLORATION AND TESTING PROGRAM

4.1 Subsurface Exploration

The geotechnical exploration program consisted of the drilling and sampling of a total of eight (8) soil test borings located throughout the project site. Boring locations were designated and located in the field by Matrix staff. The approximate locations of the soil borings are shown on Figure 2 presented in the Appendix of this report. For exact locations, the owner may elect to survey the boring locations. Matrix should be informed of any deviations to evaluate and modify our recommendations, if necessary.

Six (6) of the test borings, designated B1 through B6, were performed using a truck-mounted CME 55 drill rig equipped with an automatic hammer in general accordance with ASTM D1586 standards. The borings were advanced to depths of up to 20 feet BGS. Borings were advanced by augering through the soils with continuous flights of 3 inch augers. At regular intervals, the auger flights were removed from the bore hole, and soil samples were obtained through the center of the bore hole with a standard 1.4-inch I.D., 2.25-inch O.D., split-tube sampler. The sampler is first seated 6 inches to penetrate any loose cuttings, and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is recorded and is designated as the Standard Penetration Resistance (N-Value). The penetration resistance, when properly evaluated, is an index of the soil strength, consistency and ability to support foundations.

The remaining two (2) soil test borings, designated HA1 and HA2, were performed using a hand auger and portable cone penetrometer. The testing was performed in general accordance with ASTM

STP 399 (*ref. Sowers, George and Hedges, Charles. "Dynamic Cone for Shallow In-Situ Penetration Testing," Vane Shear and Cone Penetration Resistance Testing of In-Situ Soils, ASTM STP 399, Am. Soc. Testing Mats., 1966, p29).* The portable cone penetrometer device utilizes a 15-lb steel ring weight falling 20 inches on an E-rod slide device. The penetration test is performed through an augered hole 4 to 6 inches in diameter. After augering to the test depth, the penetrometer's cone point is seated 2 inches into the undisturbed bottom of the hole to ensure complete point embedment. The cone is further driven 1.75 inches using the ring weight hammer falling freely 20 inches. The number of blows are counted and recorded.

Representative soil samples were obtained using split-spoon sampling techniques. The samples were classified in the field in general accordance with ASTM D2488 (Visual-Manual Procedure for Description of Soils). Representative portions of the soil samples were placed in sealable, plastic bags and transported to our laboratory. During the field operations, Matrix staff maintained a continuous log of the subsurface conditions including changes in the stratigraphy and any observed groundwater levels. Soil descriptions and penetration resistance values are presented graphically on the Soil Boring Records included in the Appendix of this report.

All borings were backfilled with the soil cuttings by Matrix Engineering approximately 24 hours after the conclusion of the drilling operations. Some consolidation of the backfilled soil column should be expected.

4.2 Laboratory Testing

The laboratory testing program for this project consisted of performing soil classifications in accordance with ASTM D2488 (Visual-Manual Method for Identification of Soils). The soil samples were examined in the laboratory by a geotechnical engineer and visually classified based on texture and plasticity in accordance with the Unified Soil Classification System (ASTM D2487).

The soil samples are kept in sealed plastic bags and will be stored for a period of 60 days and then disposed of unless otherwise instructed by the owner or the engineer.

5.0 SITE DESCRIPTION AND GENERAL SITE GEOLOGY

5.1 Site Description

The site is located at 2117 Savoy Drive in Chamblee, Georgia. The subject site is located in Land Lot 344 of the 18th District (Parcel ID 3441805002) of DeKalb County, Georgia. The site is bordered to the north by Savoy Drive, commercial properties (mostly restaurants) to the east and west, and residential properties to the south.

Based on our site visit and reconnaissance, the site has been developed in the past and is currently occupied by a remnant of a previous development. The driveway, curb/gutter, parking, concrete foundations, concrete walls, columns and slab are still present on site. The existing slab includes an elevated post-tension system. Refer to specialized demolishing requirements for the post tensioned structures in Section 7.3 of this report. Underground utilities and other unknown structure may be present that are not in the scope of this exploration.

Based on information obtained from the DeKalb County Tax Assessor’s website, as well as our visual observations, the site slopes from the northern boundary in a southerly direction from elevations on the order of 934 feet Mean Sea Level (MSL) to elevations of 924 at the southwestern corner of the site. An existing retaining wall in front of the existing building provides a grade separation between the existing driveway and the basement level with approximately relief of 8 to 10 feet. The southern areas of the site appear to be relatively flat.

Nancy Creek transects the site at the northwestern corner of the site and bounds the site on the southern boundary. The creek flows in a westerly and southwesterly direction. Flood plains are typically present around creeks that potentially includes alluvium and colluvium deposits, as well as shallow groundwater elevations.

5.2 General Site Geology

The subject site is located in the Piedmont Geologic Province, which contains the oldest rock formations in the Southeastern United States. The parent rocks in the region are primarily comprised of the unconsolidated mass of quartz, feldspar, mica, and a wide variety of dark minerals such as hornblende and amphibole.

The proportion of felsic and mafic minerals in these parent rocks, as well as of quartz that is very resistant to weathering, limits the amount of clay in the soils. Therefore, these soils are sandy and have faint horizons, and in small-scattered areas, hard rock is exposed.

Chemical decomposition initially occurs along the boundaries of individual mineral crystals. Thus, partially weathered rock has the appearance of dense sand (SM, SP). With further weathering, the individual crystals other than quartz are attacked and the mass becomes a micaceous silty sand (SM) or micaceous sandy silt (ML). In this stage, the original banding of the parent rock is apparent, but the original crystalline structure is not observed. Reflecting the composition of the original rock, mica flakes, rather than the quartz grains, often comprise the majority of the sand-size particles. Finally, in the more advanced stages of chemical weathering, the material is changed into a red or reddish-brown silty clay (CL or CH) or clayey silt (ML or MH). Depending on the quartz content, a sandy fraction will be present. In this weathered stage, the banding and crystalline structure of the parent rocks is lost.

6.0 GENERAL SUBSURFACE CONDITIONS

The subsurface conditions were characterized by visual-manual examination of the soils obtained from the split-spoon sampler and observation from the auger's cutting during the drilling operation. The soil boring logs, designated as B1 to B6 and HA1 to HA2, are provided in the Appendix of this report. The test borings were extended to a maximum depth of 20 feet below ground surface (BGS) elevations. The subsurface conditions within the drilled borings are characterized as follows:

6.1 Surface Materials and Man-Made Fill

Based on the existing development, the site appears to have been graded in the past and is occupied by remnants of a previous building. The driveway, curb/gutter, parking, concrete foundations, concrete walls, columns and post-tensioned slab are still present on site. The majority of the surface ground are covered with hardscapes (concrete and asphalt). Since several of the borings were located within the existing asphalt pavement, topsoil was not encountered at any of the borings. Although topsoil was not encountered within the test boring locations, topsoil likely exists elsewhere on site and the thickness may vary. Topsoil typically range between 6 to 12 inches in thickness. Below the asphalt pavement, an underlying layer of Graded Aggregate Base (GAB), which measured approximately 4 inches was encountered at test borings B1, B5, and B6. At each of the borings, the encountered asphalt layer ranged from approximately 2 to 3 inches in thickness.

Man-made fill was encountered at each of the test borings. The fill thickness ranges between 8.5 and 20 feet BGS. The fill material generally consisted of very loose to medium dense, silty sand (SM). The consistency of the fill material ranged between 1 blows/ft (bpf) and 34 bpf. An elevated blow count was observed at test boring B4 at the surface possibly due to the presence of gravel, rock fragments or some other obstruction within the fill material. Organics and gravel were observed within the fill material at test borings B5 and B6 between 3.5 to 5 feet BGS. A strong decomposing organics odor was noted within the fill material at boring B1 at a depth of 18.5 feet BGS.

6.2 Residual Material

Residual soils are those which have weathered in place from the parent rock. Residual soils were encountered at each of the soil borings below the encountered fill and/or alluvial soils, except for boring B1. The residual soils generally consisted of loose to dense, silty coarse to fine sands (SM). The soil consistency of the residual material ranged between 9 and 42 bpf, but was typically observed to be between 12 and 24 bpf.

6.3 Partially Weathered Rock and Bedrock

Partially Weathered Rock (PWR) is a regionally used term for residual material with a Standard Penetration Resistance of 100 bpf or more, but which can be penetrated by the soil drilling equipment. Neither PWR, nor shallow auger refusal in rock material, were encountered at any of the borings performed within the drilled residual soil depths.

6.4 Groundwater

Groundwater readings were obtained at the time of drilling and after completion of the drilling operation to obtain a stabilized groundwater levels. The test borings were backfilled after the drilling operations. Groundwater was encountered at each of the test borings at depths ranging from approximately 8 feet BGS to 14 feet BGS. Groundwater elevations do fluctuate with seasonal changes and typically vary on the order of 4 to 8 feet.

Alluvium soils were encountered at most of the test borings. The alluvium soils appear to be deposits alongside Nancy Creek. Fill soils were encountered above the alluvium soils and most likely were placed during the construction of the previous development.

6.5 Summary of Test Boring Records

The geologic profile described generally represents the conditions encountered in the soil borings. Some variations in the description should be expected. The stratification lines designating the interfaces between earth materials shown on the boring logs are approximate; in-situ transition may be gradual.

Table 1 below summarizes the field findings from the soils test borings.

Table 1: Summary of test boring records.

Boring No.	Planned Depth (ft)	Groundwater Depth (ft)	PWR Depth (ft)	Auger Refusal Depth (ft)
B1	20	14	N/E(1)	N/E
B2	20	8	N/E	N/E
B3	20	8	N/E	N/E
B4	20	8	N/E	N/E
B5	20	14	N/E	N/E
B6	20	11	N/E	N/E
HA-1	5	N/E	N/E	N/E
HA-2	5	N/E	N/E	N/E

(1): *N/E: Not Encountered*

7.0 FINDINGS AND RECOMMENDATIONS

The following recommendations are based on the information furnished to us, the data obtained from the subsurface exploration, and our experience with similar projects. They were prepared in general accordance with established and accepted professional geotechnical engineering practice in this region. Our recommendations are based on findings from the dates referenced within this report and do not reflect any variations that would likely exist at later dates or between the pre-designated borings or unexplored areas. Depths and/or thicknesses are approximate and should not be used for estimating quantities during construction, specifically as it relates to topsoil or other surface materials.

If information becomes available which may impact our recommendations, Matrix Engineering Group shall be afforded the opportunity to review this information and re-evaluate the recommendations contained within this report and make any alterations deemed necessary by a Georgia Registered professional engineer. This report is intended for the use of Brown Design Group and its current design team. No other warranty is expressed or implied. Matrix Engineering Group, Inc. is not responsible for conclusions, opinions, or recommendations made by others based on this report.

It should be noted that the soils below the existing structures were unexplored. We assume that the soils below the existing structures are at least as suitable as the soils encountered at the test boring locations, however, the condition of these soils cannot be ascertained without proper testing.

The following recommendations present general guidelines for the proposed development.

7.1 Excavation Considerations

The recommendations provided in this Section are based on the Conceptual Site Plan designated as Layout Plan Option #1 provided by Brown Design Group. It is our understanding that the planned construction to include demolition of the existing structures and re-build the low areas by placement of structural fill to elevations near the existing driveway along the norther area of the site. Due to the presence of underground utilities and fill materials within the proposed building area, we recommend that any material which is excavated and planned for re-use as structural fill be examined by the geotechnical engineer of record at the time of excavation to determine the its suitability.

PWR was not encountered at any of the test borings, therefore, we do not anticipate difficult excavation to be encountered for the preparation of the proposed building. Depending on the final design elevations and trench excavation of new utility lines, some amount of non-conventional grading, such as localized blasting or hammering may be required near these areas. We recommend that the following general specifications for rock excavation, or a variation thereof, be incorporated into the project documents:

<u>General Recommendations for Rock Excavation</u>:

Rock excavation shall consist of all material which can not be excavated except by drilling, blasting or wedging. It shall consist of un-decomposed stone hard enough to ring under a hammer, and the amount of solid stone shall be not less than one (1) cubic yard in volume. Rock is further defined as follows:

(1) General Excavation: Any material occupying an original volume of more than one cubic yard which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 80,000 pounds (caterpillar D-8 or larger)

(2) Trench Excavation: Any material occupying an original volume of more than one cubic yard which cannot be excavated with a backhoe having a bucket curling force rated at not less than 40,000 pounds, using a rock bucket and rock teeth (a John Deere 790 or larger).

7.2 Groundwater & Dewatering

Based on the groundwater levels at the time of this investigation, and the anticipated finished grades, we do not anticipate groundwater to impact the construction of the proposed development. If encountered, groundwater levels should be lowered and maintained to at least three (3) feet below the bottom of the lowest foundation elevation (only during construction) in order to protect the exposed subgrade's integrity. If groundwater is encountered during the installation of any utility lines, the water should be controlled with a sump and pump system, as warranted at the time of construction.

7.3 Subgrade Preparation

It is our understanding that the proposed finished floor elevation will be close to the elevations at the northern areas of the site (1032+/- MSL). To achieve the proposed subgrade elevations, fill on the order of 5 to 10 feet will be required at the southern, eastern, and western areas of the site.

The subgrade preparation will require the demolition of the existing structures including the concrete slab and foundations. The existing elevated concrete slab has been constructed with a post-tension reinforcement system. Demolition of the slab will require a specialized demolition company to de-tension the steel tendons prior to demolition. Otherwise, release of the high tensioned cables could present unsafe conditions to workers as well as damage to neighboring properties.

Soil backfill behind existing structure will require removal prior to placement of new fill. Additionally, due to the presence of alluvium soils within test borings B2 to B6. Due to the presence of the creek and the potential presence of soft soils, the existing subgrades should be carefully evaluated prior to placement of structural fill. The presence of underground utility lines, or other items, such as septic tanks, or trash pits during the grading operation should be treated on an individual basis. Any underground utility line within the proposed building footprint should be properly abandoned or removed. If removed, the excavation should be backfilled with structural fill in accordance with the recommendations of Section 8.1 of this report.

Once prepared, the suitability of the exposed subgrades in all areas should be confirmed by a geotechnical engineer, prior to placing new fill. A proofroll test should be performed with a loaded tandem-wheeled dump truck with an approximate weight of 25 tons. Any material that deflects excessively or ruts under the loaded truck should be densified or removed and replaced with well-compacted materials. The proofrolling should be observed by the geotechnical engineer.

7.4 Slab-On-Grade Construction

The concrete slab-on-grade for the proposed structure will be supported on new fill. Provided the fill material is installed to a minimum of 95% of the maximum dry density (standard effort), a modulus of subgrade reaction (k) of 100 pci can be used for designing the floor slab-on-grade. Slab reinforcement and joint spacing should be carefully considered to control random cracking due to slab shrinkage. Slabs should be isolated from the foundations to allow differential movements to take place between the slab and walls. We recommend that at least a 10 mil vapor barrier/retarder (such as polyethylene) be installed below the (slab-on-grade) concrete to limit intrusion of water vapor through the slab. Beneath slab-on-grade areas, a minimum of 4 inches of clean, densely-graded, granular material with a balanced content of fines is recommended to facilitate fine grading and provide stable surface for construction traffic and building loads. Open-graded bases do not meet these requirements because they are relatively incompatible, difficult to trim, and are unstable for construction traffic. It is also difficult to fine grade an open-graded base to a relatively uniform elevation, which can result in restraint to concrete movement as the concrete cools or dries, thus increasing the probability of out-of-joint cracking. If open-graded bases are specified, the surface of these bases should be choked off with a clean fine-graded material with at least 10 to 30% of the particles passing a No. 100 sieve, but not contaminated with clay, silt, or organic material.

7.5 Pavement Design

Based on our experience with projects of similar magnitude and soil conditions, we recommend that a CBR value of 4 be used for pavement design of light and heavy duty pavements. The thickness of the base course material under the pavement is dependent upon the pavement type, magnitude and frequency of loading, and expected pavement life. Based on our experience with projects of similar magnitude and soil conditions, we recommend the following design sections be considered in the design of pavements. These recommendations present a wide range of loading conditions. The architect/engineer should select the pavement section most appropriate to the development. Pavements should be constructed in accordance with all applicable specifications of the Asphalt Institute and the Georgia Department of Transportation:

Heavy Duty Asphalt Pavement:

98% compacted soil subgrade (Standard Proctor – ASTM D698)
6 inches Graded Aggregate Base (GAB), compacted to 100% of maximum dry density (Modified Proctor – ASTM D1557C)
2 inches 19mm SP Asphalt Base
1.5 inches 9.5mm SP II Asphalt Topping
Asphalt layers should be separated by a tack coat.

Light & Medium Duty Asphalt Pavement:

98% compacted soil subgrade (Standard Proctor – ASTM D698)
4 inches GAB, compacted to 100% of maximum dry density (Modified Proctor – ASTM D1557C)
2 inches 19mm SP Asphalt Base
1.5 inches 9.5mm SP II Asphalt Topping
Asphalt layers should be separated by a tack coat.

Heavy Duty Concrete Pavement:

98% compacted soil subgrade (Standard Proctor – ASTM D698)
6 inches GAB, compacted to 100% of maximum dry density (Modified Proctor – ASTM D1557C)
6 inches (4000 psi compressive strength) concrete with Welded Wire Fabric (6x6 – W2.9 x W2.9).

Subgrade preparation should be performed in accordance with our recommendations provided in Section 8.1 and 8.2 of Matrix geotechnical report.

Pavements sub-base (Graded Aggregate Base) should conform to Section 815 of the State of Georgia Department of Transportation Specifications for Road and Bridge Construction. The sub-base should be compacted to 100% of the maximum dry density for crushed stone as determined by the modified moisture-density relationship test (ASTM D1557). Additionally, proofrolling of the sub-base should be performed prior to paving in order to detect any soft areas or excessive rutting which may require stabilization.

Exterior pavements should be provided with the facilities for surface and subsurface drainage. Standing water on the pavement surface eventually may seep into the base course layer and softens the pavement subgrade which leads to premature deterioration of the pavement. In areas where landscape areas slope toward the pavement, a perimeter drain along the back of the curb intercepting migration of surface water should be provided to minimize seepage under the pavement.

7.6 Foundations

Based on the soil test borings, fill soils underlain by alluvium soils were encountered at the majority of the site. The alluvium soils were found to be very soft and potentially will consolidate under additional loads resulting from the new structural fills and building. The consolidation of the fill and alluvium will result in settlements that could impact the foundations, slabs, and pavements.

Total and differential settlements are a function of the loading condition, footings size, thickness of the compressible layer, and time. To minimize impact of settlements on the proposed buildings, we recommend that after completion of the fill, a waiting period is provided prior to beginning of the building construction to allow for the consolidation of the existing compressible layer(s). We recommend that a waiting period on the order of 3 months is provided. To expedite the consolidation of the existing materials, a surcharge load should be considered. A temporary surcharge load on the order of 5 feet placed above the finished grade would reduce the waiting time. We recommend that the settlement should be monitored immediately upon completion of the fill to determine the rate of consolidation of the compressible layer and allow the soil's engineer to evaluate the potential total future settlements and advise the owner of a safe time to begin the building construction.

For lightly to moderately loaded structures such as one and two-story buildings, settlement is estimated to be on the order of 1 inch to 2 inches.

In order to reduce the estimated settlements, we recommend to support the building with an **Intermediate Foundation System,** such as **Rammed Aggregate Piers** (RAP's) in order to minimize total and differential settlement. This stabilization system, designed by a professional engineer upon selection of the qualified subcontractor, utilizes the RAP to increase the stiffness and bearing capacity of the unsuitable and/or soft soil (fill) layers. RAP elements are constructed in the field by drilling a hole, and backfilling with lifts of compacted (tamped or vibrated) aggregate (typical #57 stone, Graded Aggregate Base, or similar material). The piers typically range in diameters from 24 to 36 inches and are drilled to depths of up to 30 feet. During the compaction of the aggregates, the surrounding soils immediately around the element are also improved. If this option is exercised, an allowable bearing capacity of up to **5,000 psf** could be achieved. We recommend that one of the following qualified contractors be engaged to design the foundation system and determine suitability of their foundations improvement system relative to the site's subsurface conditions:

- Hayward Baker (Vibro piers)
  Redd Schoening, Project Manager
  Office: (770) 442-1801
  http://www.haywardbaker.com/services/vibro_piers.htm

- Tensar (Geopiers)
  William Bill Beckler, P.E
  Office: (770) 518-2788
  www.geopier.com

A recommended foundation inspection criterion is provided in Section 8.2 of this report. The net allowable soil bearing pressure refers to that pressure which may be transmitted to the foundation soils in excess of the final minimum surrounding overburden pressure. We recommend that all continuous footings have a minimum width of 2 feet, and should be a minimum 18 inches below subgrade elevations to prevent shear failure and to minimize the effects of frost.

7.7 Slopes and Vertical Cuts

A common practice in this region has been to limit slopes to 2.0(H) to 1.0(V) or flatter. The soil conditions at this site may tolerate a maximum temporary slope of 1.0(H) to 1.0(V). The soils in this area may contain fissures, foliation planes and other discontinuities that could cause sloughing or possibly a slope failure, even on relatively flat slopes. Therefore, the excavation for the slopes should be monitored by a geotechnical engineer to ensure that soil conditions are similar to those we have encountered. Potential planes of weakness will be more visible at depth as the excavation proceeds. If weak conditions are evident, the engineer can then recommend any necessary remedial actions.

Vertical cuts that exceed 5 feet should be braced or shored as required by OSHA regulations for safety. Additionally, stairways, ladders, ramps or other means of safe access should be made available for any trenches deeper than 4 feet. If any excavation, including a utility trench, is extended to a depth of more than 20 feet, it will be necessary to have the slopes designed by a professional engineer.

7.8 Retaining Walls and Lateral Earth Pressures

The design of any retaining wall is based on the determination of the lateral earth pressures that will act on the wall. These pressures are a function of the retained soils properties, and the structural design of the wall. Three common conditions are considered to exist behind a retaining wall depending on the wall's structural design; namely Active, At-Rest, and Passive earth pressure conditions. Active earth pressures are mobilized when a relatively flexible retaining structure such as a free standing wall is designed allowing for slight movement or deflection. At-rest conditions apply to restrained retaining wall design such as basement or tunnel walls. The passive state represents the maximum possible pressure when a structure is pushed against the soil, and is used in wall design to help resist at-rest or active pressures. Since significant movement has to occur before the passive earth pressure is mobilized, the total calculated passive pressure should be reduced by one-half to two-thirds for design purposes.

Based on our experience, wall movement (known as tilt), that is necessary for earth pressures to mobilize, range from 0.01H to 0.02H for the Active state and 0.02H to 0.04H for the Passive state. It is assumed that the ground surfaces behind retaining walls will be constructed relatively level and that residual soils like those encountered in our borings will be used for wall backfill. Based on our experience with similar soils and laboratory test data, we recommend that an effective angle of internal friction (ϕ') = 30° and a cohesion c = 200 psf be used as design strength parameters for the silty soils encountered on the site. These strength parameters result in the following earth pressures coefficients and equivalent fluid pressure per foot of depth for compacted fill (based on a total (wet) unit weight (γ_w) of 120 pcf). A coefficient of friction of 0.40 could be used between the wall foundations and the underlying soil. When calculating the resistance to sliding, we recommend using a factor of safety of 1.5.

Table 2

Earth Pressure Condition	*Coefficient*	*Recommended Equivalent Earth Pressure (pcf)*(1)
Active	(K_a) 0.35	42.0
At-Rest	(K_o) 0.5	60.0
Passive(2)	(K_p) 3.0	187.2

(1) *Assumes a constantly functional drainage system*

(2) *Because significant wall movements are required to develop the passive pressure, the design passive pressure should be taken as one-half to two-thirds of the total calculated passive pressure.*

Backfill against the walls should be done carefully to minimize the horizontal load on the wall. Heavy equipment should not be used to compact the soil within 10 feet of the walls. The use of hand-tampers should be sufficient to obtain the required density when working the 10-foot zone adjacent to the wall. Recommended structural fill specifications and procedures are provided in Section 8.1 of this report.

These retaining wall/below grade wall recommendations should not be correlated with soil parameters for use in Mechanically Stabilized Earth (MSE) wall design. We recommend that soil parameters for any MSE retaining wall design be established through appropriate laboratory testing by the wall designer.

7.9 Seismic Site Classification (IBC 2012)

Matrix conducted an analysis, utilizing the Multi-Channel Analysis of Surface Waves (MASW) technique, to determine the Seismic Site Classification for the proposed site. The Probabilistic Ground Motion values were retrieved for a central location within the project site, utilizing the USGS Earthquake Hazards Program, using latitude (N 33.919433) & longitude (W -84.301827). The following are the Spectral Response Acceleration Parameters for a 2% probability in 50 years:

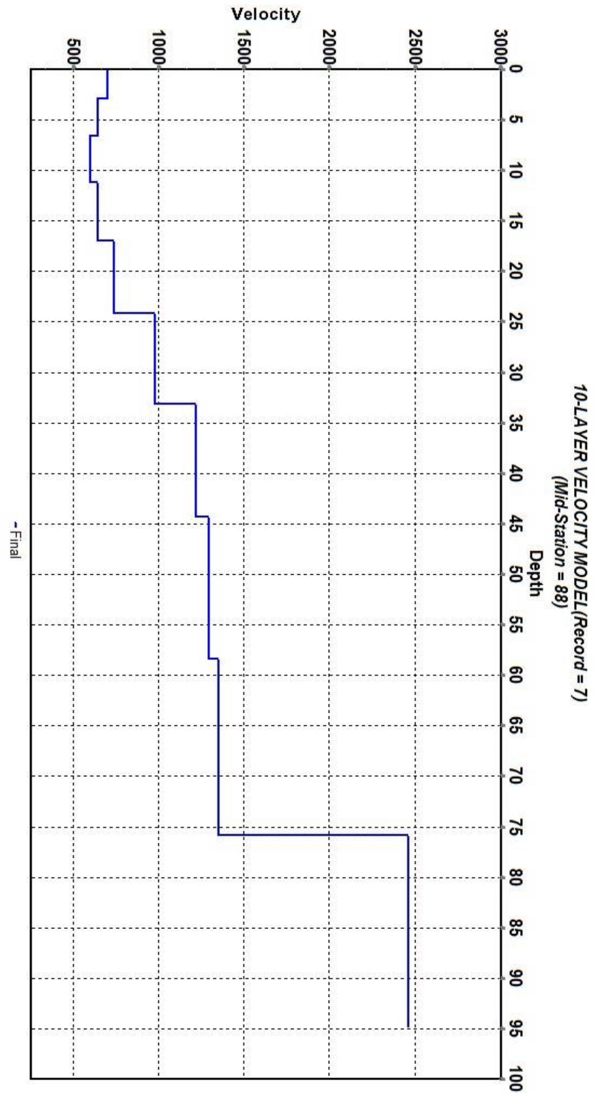
S_s: *Short period (0.2 second), Spectral Response* = **0.197**
S_1: *1-second period, Spectral Response* = **0.092**

The site classification was undertaken in general accordance with the International Building Code 2012 (IBC2012), Table 1613.3.2 and chapter 20 of ASCE 7 by relying on the shear wave velocity for the upper 100 ft of the subgrade.

A site-specific seismic evaluation was carried out by conducting surface velocity testing and performing a Multi-Channel Analysis of Surface Waves (MASW) in order to determine the Seismic Site Classification for the proposed project. One (1) traverse was deployed, as shown on the attached Figure 2. MASW utilizes seismic energy of Rayleigh type surface waves to calculate the shear wave velocity. For this method, the geophones (receivers) remain stationary and data is collected with the source located off the end of the line of geophones. Data is collected at multiple locations (i.e., offsets) in order to obtain the optimal survey settings that would yield the most coherent data set. This data is then processed and inverted to calculate a 1-D shear wave velocity profile.

A weighted average of the 1-D shear wave velocity profile can then be used to get an average shear wave velocity down to the maximum depth of the 1-D shear wave velocity profile. A proprietary pressure-coupled land streamer was deployed in an east-west direction with Geophones spaced 5 ft apart and the source position was located 75 feet off the western end of the transect. The source consisted of a 20 pound hammer striking a steel plate. The surface along which the land streamer was deployed was grass. The data was collected using a 24-channel Geode seismograph, manufactured by Geometrics, Inc., with 4.5 Hz geophones.

The data was processed using the KGS SurfSeis 3 software package, developed by Kansas Geologic Survey. This software is used to process and invert the surface wave data, and produces a 1-D shear wave velocity model, presented below.



The analysis yielded an average shear wave velocity (for the upper 100 ft) **V_{s100} at 1,131 ft/sec.** This value corresponded to a **Seismic Site Class 'D'**. A Site Class C correlates to the following site coefficients adjusted for site class, based on Tables 1613.3.3(1) and 1613.3.3(2) of IBC 2012:

F_a = 1.6

F_v = 2.4

The maximum considered earthquake spectral response accelerations for short periods and at 1-second periods follow:

S_{MS} = 0.315 *Equation (16-37, IBC2012)*

S_{M1} = 0.221 *Equation (16-38, IBC2012)*

This translates to the following Design Spectral Response Acceleration Parameters:

S_{DS} = 0.210 *Equation (16-39, IBC2012)*

S_{D1} = 0.148 *Equation (16-40, IBC2012)*

8.0 CONSTRUCTION RECOMMENDATIONS

8.1 Structural Fill

Staged, methodical and well planned grading is key to avoiding unnecessary costs and time delays. Areas should not be stripped or disturbed if the grading contractor is unable to properly seal the subgrade prior to departure each day. Exposure of soils to moisture from direct rainfall or runoff usually renders these soils un-usable for several days. This usually gets mischaracterized as an unsuitable soils condition which is inaccurate. Unsuitable soils are defined as those containing deleterious matter (such as organics, alluvium, debris and/or trash). Moisture problems should be avoided by employing best management practices that involve maintaining positive drainage, placing berms, diversion channels, and/or sealing the subgrade to avoid water infiltration. Other measures involve covering all stockpiled soils with heavy tarps or plastic to avoid saturating the soils in the event of rainfall. Means and methods of construction are certainly the contractor’s jurisdiction; however, exposing otherwise suitable soils to excessive moisture or softening of existing subgrades as a result of unscrupulous construction traffic should be avoided and planned for.

We recommend that the following criteria be used for structural fill:

1. Adequate laboratory proctor density tests should be performed on representative samples of the proposed fill materials to provide data necessary for the quality control. The moisture content at the time of compaction should be within 3 percentage points of the optimum moisture content. In addition, we recommend that the fill soils be free of organics and relatively non-plastic with plasticity indices less than 20.

2. Suitable fill material should be placed in thin lifts (lift thickness depends on type of equipment used, but generally lifts of 8 inches loose measurements are recommended). The soils should be compacted

by mechanical means such as sheepsfoot rollers. When placing fill adjacent to an existing sloped grade, proper benching into the existing slope should be employed.

3. Any proposed slopes should incorporate only suitable fill, clean of organics or any other vegetative content. Topsoil should only be used to provide a cover over the completed slope so as to promote vegetative growth which in turn protects the slope’s surface against scour and erosion. Slopes should be overbuilt and cut back to the proposed grades, exposing the firm compacted inner core. The amount of overbuilding would vary depending on the site conditions, types of soils used and degree of compaction achieved.

4. We recommend that the fill be compacted to a minimum of 95% of the Standard Proctor Maximum Dry Density (ASTM Specifications D 698). The top 2 feet under pavements or structural areas should be compacted to a minimum of 98% of the Standard Proctor Test.

5. An experienced soil engineering inspector should take adequate density tests throughout the fill placement operation to ensure that the specified compaction is being achieved.

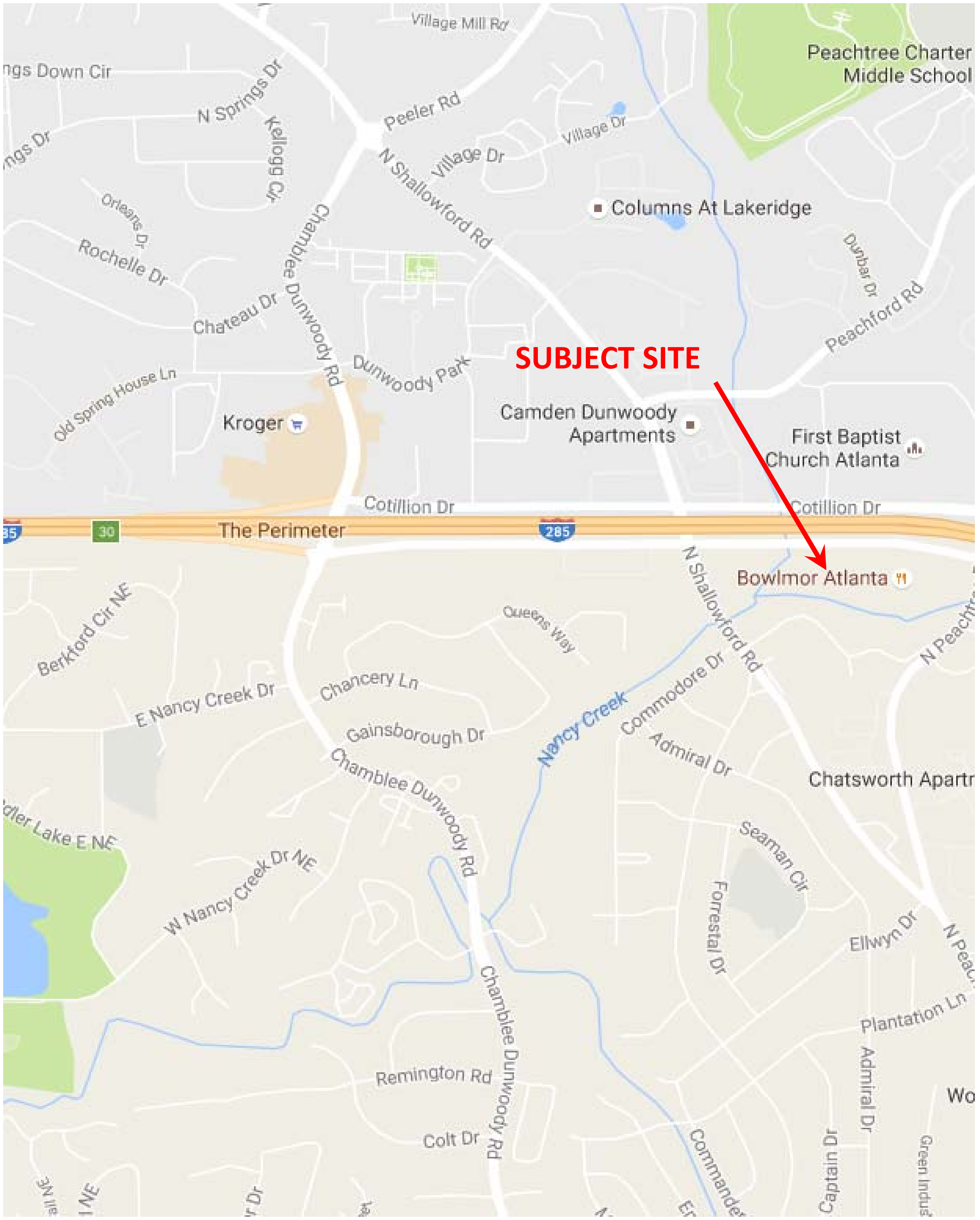
8.2 Construction Inspection and Testing

During construction, it is advisable that Matrix Engineering Group inspect the site preparation and foundation construction work in order to ensure that our recommended procedures are followed. The placement of any compacted fill should be inspected and tested. The utilization of acceptable on-site borrow materials, as well as adequate off-site selected fill must be verified.

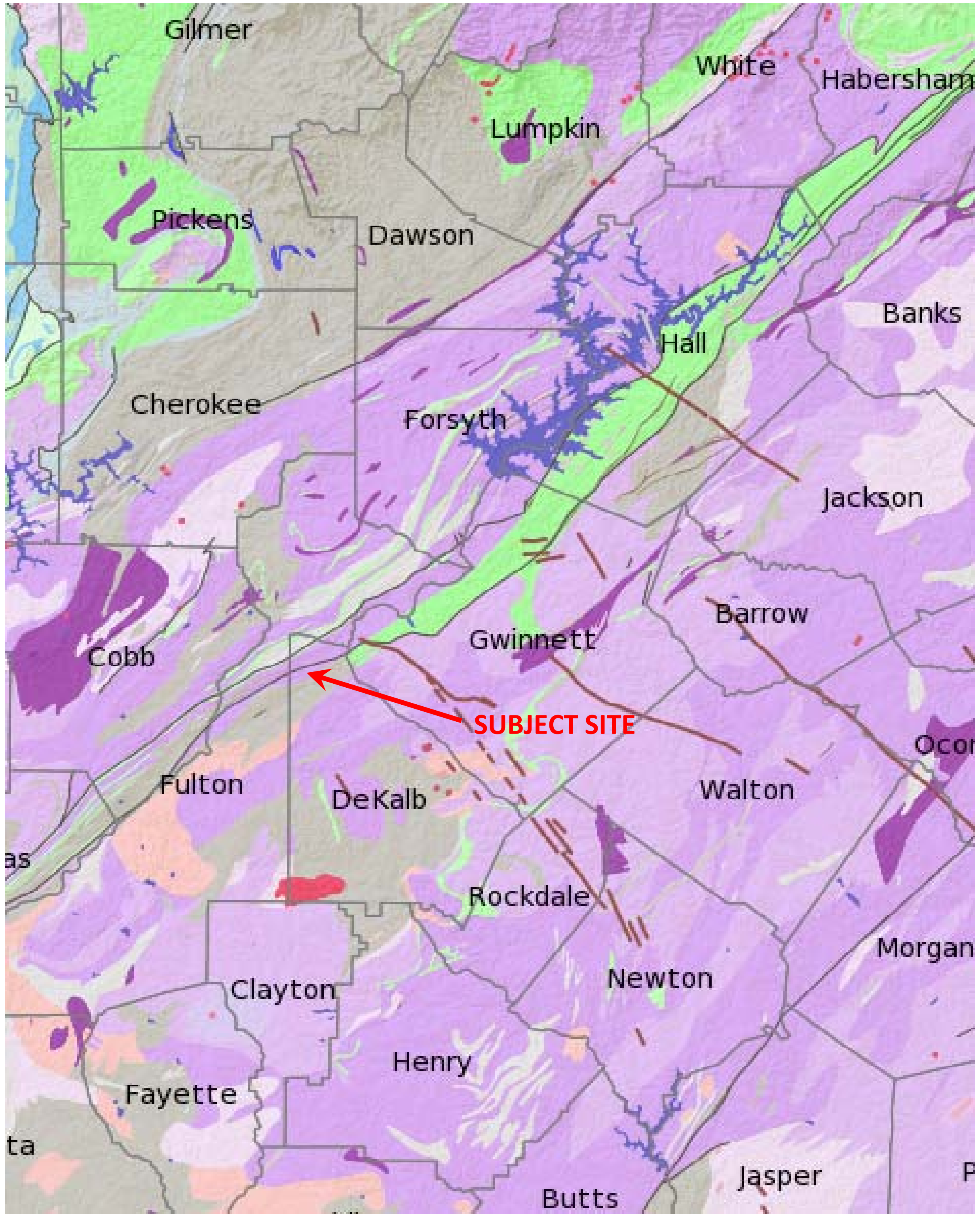
Each footing excavation should be inspected by Matrix Engineering Group, Inc. in order to verify the availability of the required bearing pressure and to determine any special procedures required. At a minimum, Hand Auger and Dynamic Cone Penetrometer testing in accordance with ASTM STP 399 should be performed every 50 feet for wall footing or as directed by the geotechnical engineer.

APPENDIX

GEOTECHNICAL REPORT - "EXHIBIT B"



Site Plan



Geological Map of Georgia
1976

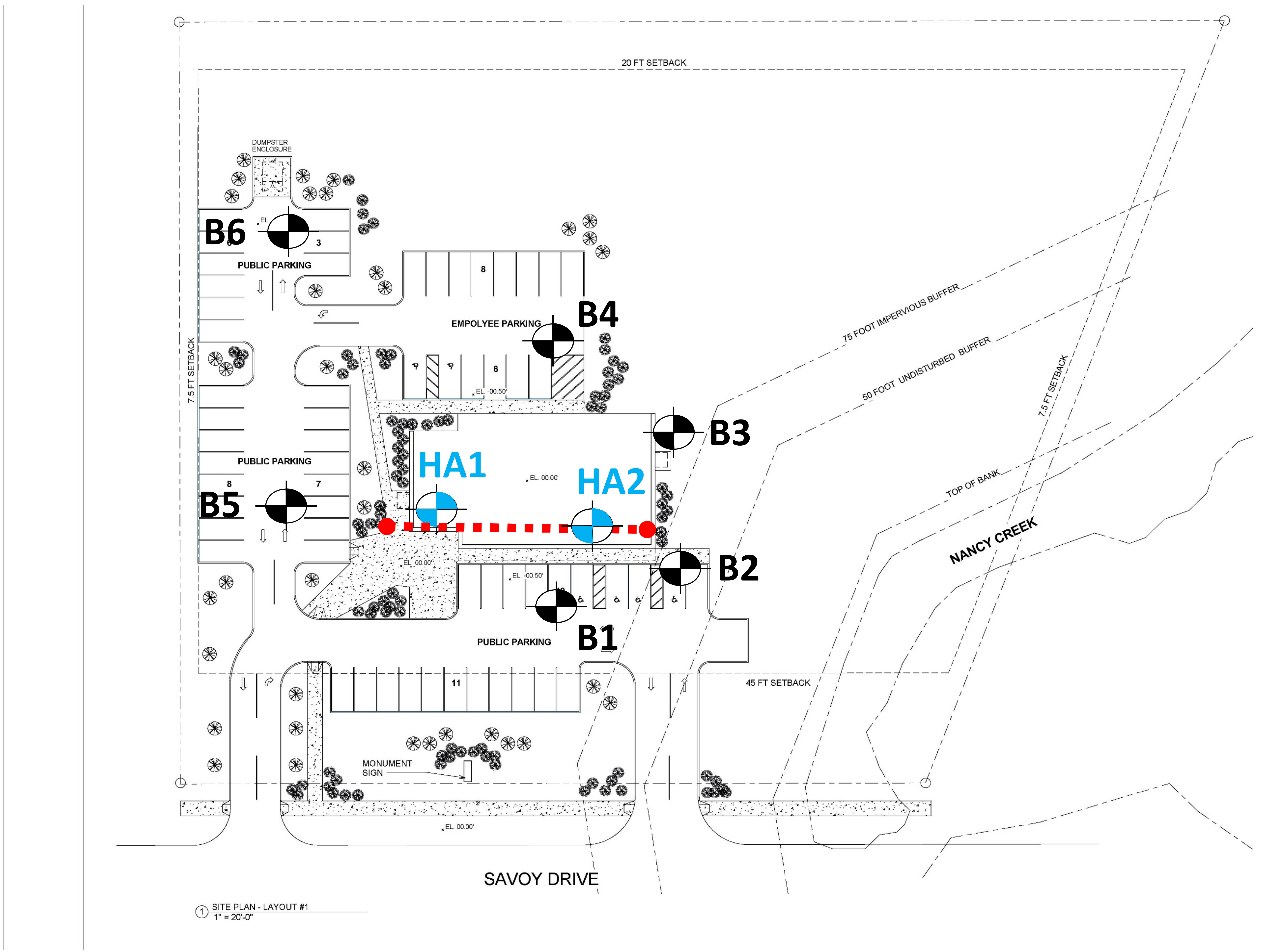
Reprinted 1997

Matrix
Engineering
Group, Inc.
engineers | special inspectors | construction consultants

TITLE	SITE MAP & GEOLOGIC MAP
PROJECT	DEKALB COUNTY SAVOY DRIVE TAG OFFICE
PROJECT NUMBER	MEG301922
CLIENT	BROWN DESIGN GROUP
SCALE	Not To Scale
REVIEWED	SAM ALYATEEM, PE
DATE	12/1/2016
FIGURE	1

LEGEND

bg1	**BIOTITE GNEISS**



Matrix Engineering Group, Inc.

engineers | special inspectors | construction consultants

TITLE

APPROXIMATE TEST BORINGS & MASW LOCATIONS PLAN

PROJECT

DEKALB COUNTY SAVOY DRIVE TAG OFFICE

PROJECT NUMBER

MEG301922

CLIENT

BROWN DESIGN GROUP

SCALE

Not To Scale

REVIEWED

SAM ALYATEEM, PE

DATE

12/1/2016

FIGURE

2

LEGEND

B1 ⊕	Soil Test Boring
HA1 ⊕	Hand Auger Boring
●····●	MASW Line

GEOTECHNICAL REPORT - "EXHIBIT B"

CLASSIFICATION CHART

MAJOR DIVISIONS		SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS (More Than 1/2 of Soil > #200 Sieve)	**GRAVELS** (More Than 1/2 of Coarse Fraction > #4 Sieve)	GW	Well Graded Gravels or Gravel-Sand Mixtures; Little or no fines
		GP	Poorly Graded Gravels or Gravel-Sand Mixtures; Little or no fines
		GM	Silty Gravels, Gravel-Sand-Silt Mixtures
		GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	SANDS (MORE Than 1/2 of Coarse Fraction < #4 Sieve)	SW	Well Graded Sands or Gravelly Sands; Little or no fines
		SP	Poorly Graded Sands or Gravelly Sands; Little or no fines
		SM	Silty Sands, Sand-Silt Mixtures
		SC	Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS (More Than 1/2 of Soil < #200 Sieve)	**SILTS & CLAYS** Liquid Limit Less Than 50	ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
		CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
		OL	Organic Silts and Organic Silty Clays of Low Plasticity
	SILTS & CLAYS Liquid Limit Greater Than 50	MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts
		CH	Inorganic Clays of High Plasticity, Fat Clays
		OH	Organic Clays or Medium to High Plasticity, Organic Silty Clays, Organic Silts
HIGHLY ORGANIC SOILS		PT	Peat and Other Highly Organic Soils

Relative Density of Cohesionless Soils from Standard Penetration Test

Very Loose	≤ 4 bpf
Loose	5-10 bpf
Medium Dense	11-30 bpf
Dense	31-50 bpf
Very Dense	> 50 bpf

(bpf=blows per foot; ASTM D1586)

Consistency of Cohesive Soils

Very Soft	≤ 2 bpf
Soft	3-4 bpf
Firm	5-8 bpf
Stiff	9-15 bpf
Very Stiff	16-30 bpf
Hard	30-50 bpf
Very Hard	> 50 bpf

Relative Hardness of Rock

Very Soft	Hard rock disintegrates or easily compresses to touch; can be hard to very hard soil
Soft	May be broken with fingers
Moderately Soft	May be scratched with a nail, corners and edges may be broken with fingers
Moderately Hard	Light Blow of hammer required to break samples
Hard	Hard blow of hammer required to break sample

Particle Size Identification

Boulders	Larger than 12"
Cobbles	3"-12"
Gravel	
Coarse	3/4"-3"
Fine	4.76mm-3/4"
Sand	
Coarse	2.0-4.76 mm
Medium	0.42-2.00 mm
Fine	0.42-0.074 mm
Fines	
(Silt or Clay)	Smaller than 0.074 mm

Rock Continuity

RECOVERY (%) = Total Length of Core x 100 / Length of Core Run

Description	Core Recovery (%)
Incompetent	Less than 40
Competent	40-70
Fairly Continuous	71-90
Continnuous	91-100

Relative Quality of Rocks

RQD (%) =((Total core, counting only pieces >4" long)/(Length of Core Run)) x 100

Description	RQD (%)
Very Poor	0-25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	90-100

Matrix Engineering Group, Inc.

engineers | special inspectors | construction consultants

Correlation of Penetration Resistance with Relative Density and Consistency Sheet and Soil Classification Chart

GEOTECHNICAL REPORT - "EXHIBIT B"

MATRIX ENGINEERING GROUP, INC.
Geotechnical, Environmental & Construction Materials Consultants

DRILL HOLE LOG

BORING NO. B1

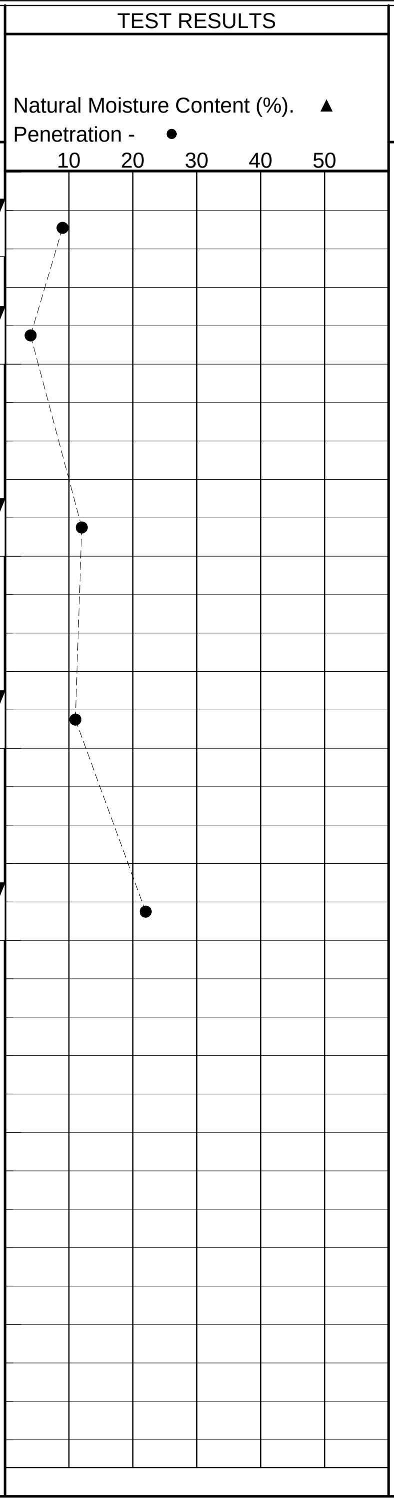
File: Boring Logs - Savoy
Date Printed: 12/2/2016

PROJECT: DeKalb County Tag Office along Savoy Drive
PROJECT NO.: MEG301922
CLIENT: Brown Design Group
DATE: 11/17/2016
LOCATION: Refer to Figure 1
ELEVATION: 933 feet MSL
DRILLER: Kilman Brothers
LOGGED BY: JC Toriz
DRILLING METHOD: ASTM D1586 with Automatic Hammer
STATION:
DEPTH TO - WATER> INITIAL: ▽ 14
After 48+ Hours: ▼
CAVING>

This information pertains only tothis boring and should not be interpreted as being indicitive of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	N-Value Blows/ft (ASTM D1586)
933	0			
932	1	Asphalt pavement Graded Aggregate Base	ASPH GW-SW	9
931	2	Fill - Loose changing to Very Loose, Reddish Brown, Micaceous, Silty SAND	FILL	
930	3			
929	4			4
928	5			
927	6			
926	7			
925	8			
924	9	Soil consistency becomes medium dense		12
923	10			
922	11			
921	12			
920	13			
919	14	▽ Soil color changes to tannish brown		11
918	15			
917	16			
916	17			
915	18			
914	19	Organic odor noted; angular to subangularly shaped rock fragments observed; sample is wet		22
913	20			
912	21	Boring terminated at 20 feet BGS		
911	22			
910	23			
909	24			
908	25			
907	26			
906	27			
905	28			
904	29			
903	30			
902	31			
901	32			
900	33			

SOIL SYMBOL
SAMPLERS



MATRIX ENGINEERING GROUP, INC.
Geotechnical, Environmental & Construction Materials Consultants

GEOTECHNICAL REPORT - "EXHIBIT B"

DRILL HOLE LOG

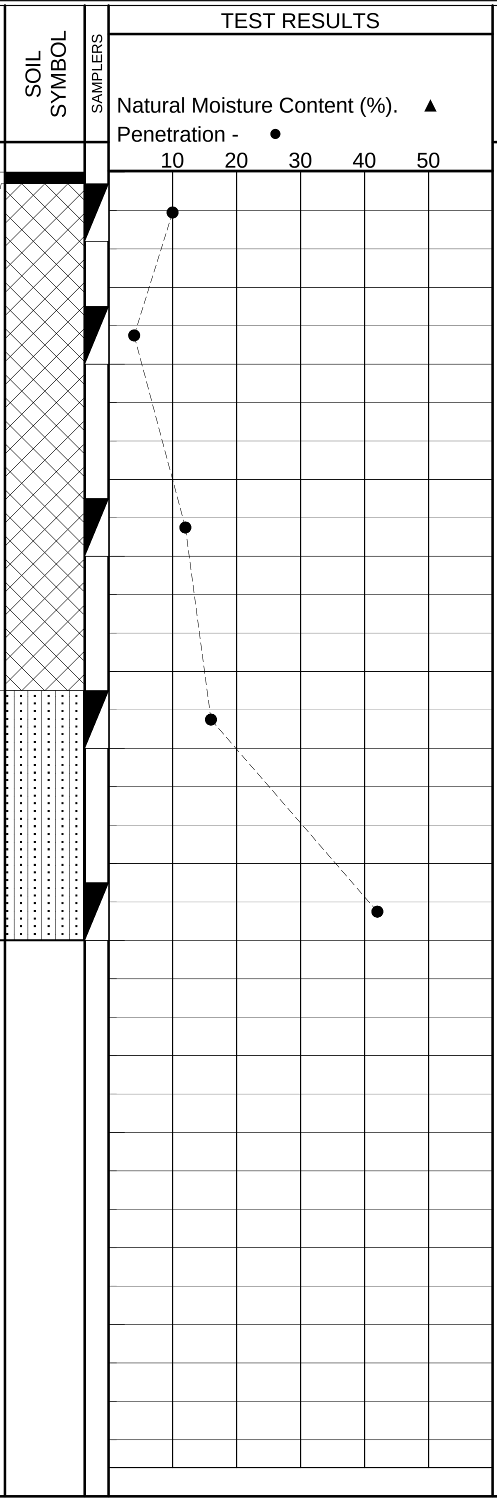
BORING NO. B2

File: Boring Logs - Savoy Date Printed: 12/2/2016

PROJECT: DeKalb County Tag Office along Savoy Drive
PROJECT NO.: MEG301922
CLIENT: Brown Design Group
DATE: 11/17/2016
LOCATION: Refer to Figure 1
ELEVATION: 928 feet MSL
DRILLER: Kilman Brothers
LOGGED BY: JC Toriz
DRILLING METHOD: ASTM D1586 with Automatic Hammer
STATION:
DEPTH TO - WATER> INITIAL: ▽ 8 **After 48+ Hours:** ▼ **CAVING>** C

This information pertains only tothis boring and should not be interpreted as being indicitive of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	N-Value Blows/ft (ASTM D1586)
928	0	Asphalt pavement	ASPH	
927	1	Fill - Loose changing to Very Loose, Tannish Brown, Silty SAND	FILL	10
926	2			
925	3			
924	4			4
923	5			
922	6			
921	7			
920	8 ▽			
919	9	Alluvium - Wet, Medium Dense, Coarse to Fine SAND with little Silt		12
918	10			
917	11			
916	12			
915	13			
914	14	Residual - Moist, Medium Dense changing to Dense, Orange-Brown, Silty Coarse to Fine SAND	SM	16
913	15			
912	16			
911	17			
910	18			
909	19			42
908	20			
907	21	Boring terminated at 20 feet BGS		
906	22			
905	23			
904	24			
903	25			
902	26			
901	27			
900	28			
899	29			
898	30			
897	31			
896	32			
895	33			



GEOTECHNICAL REPORT - "EXHIBIT B"

MATRIX ENGINEERING GROUP, INC.
Geotechnical, Environmental & Construction Materials Consultants

DRILL HOLE LOG

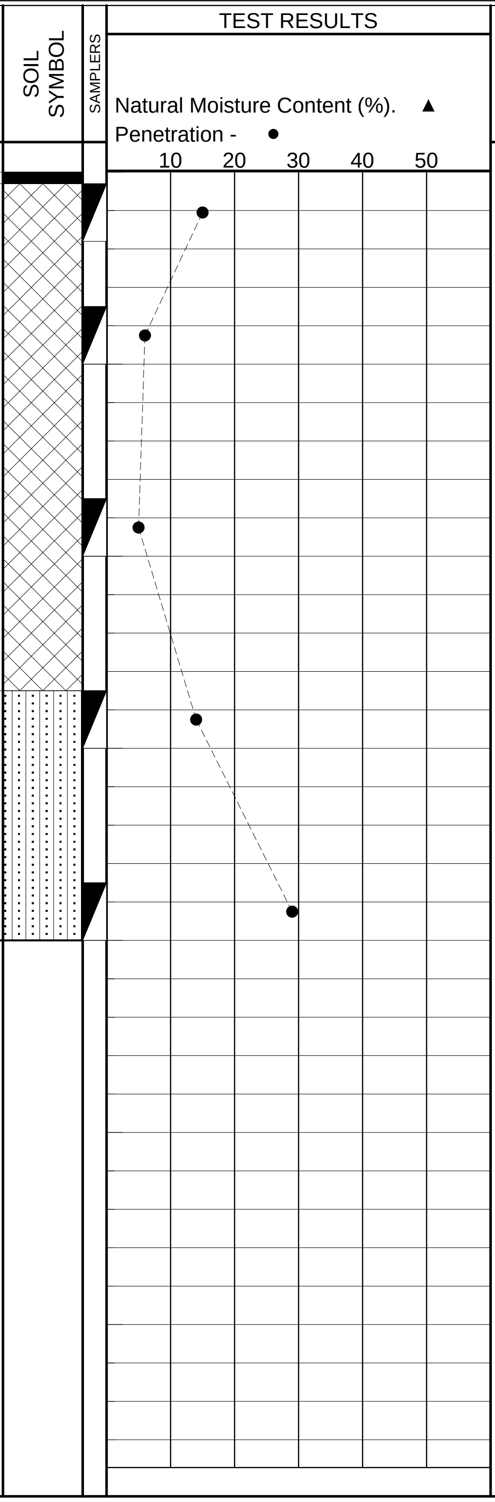
BORING NO. B3

File: Boring Logs - Savoy
Date Printed: 12/2/2016

PROJECT: DeKalb County Tag Office along Savoy Drive
PROJECT NO.: MEG301922
CLIENT: Brown Design Group
DATE: 11/17/2016
LOCATION: Refer to Figure 1
ELEVATION: 925 feet MSL
DRILLER: Kilman Brothers
LOGGED BY: JC Toriz
DRILLING METHOD: ASTM D1586 with Automatic Hammer
STATION:
DEPTH TO - WATER> INITIAL: ▽ 8
After 48+ Hours: ▼
CAVING> C

This information pertains only tothis boring and should not be interpreted as being indicitive of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	N-Value Blows/ft (ASTM D1586)
925	0	Asphalt pavement	ASPH	
924	1	Fill - Medium Dense changing to Loose, Tannish Brown, Silty Coarse to Fine SAND	FILL	15
923	2			
922	3			
921	4	No sample recovery		6
920	5			
919	6			
918	7			
917	8	▽		
916	9	Alluvium - Wet, Loose, Tannish Brown, Silty Coarse to Fine SAND		5
915	10			
914	11			
913	12			
912	13			
911	14	Residual - Moist, Medium Dense, Orange-Brown, Silty Coarse to Fine SAND with MnO staining	SM	14
910	15			
909	16			
908	17			
907	18			
906	19			29
905	20			
904	21	Boring terminated at 20 feet BGS		
903	22			
902	23			
901	24			
900	25			
899	26			
898	27			
897	28			
896	29			
895	30			
894	31			
893	32			
892	33			



MATRIX ENGINEERING GROUP, INC.
Geotechnical, Environmental & Construction Materials Consultants

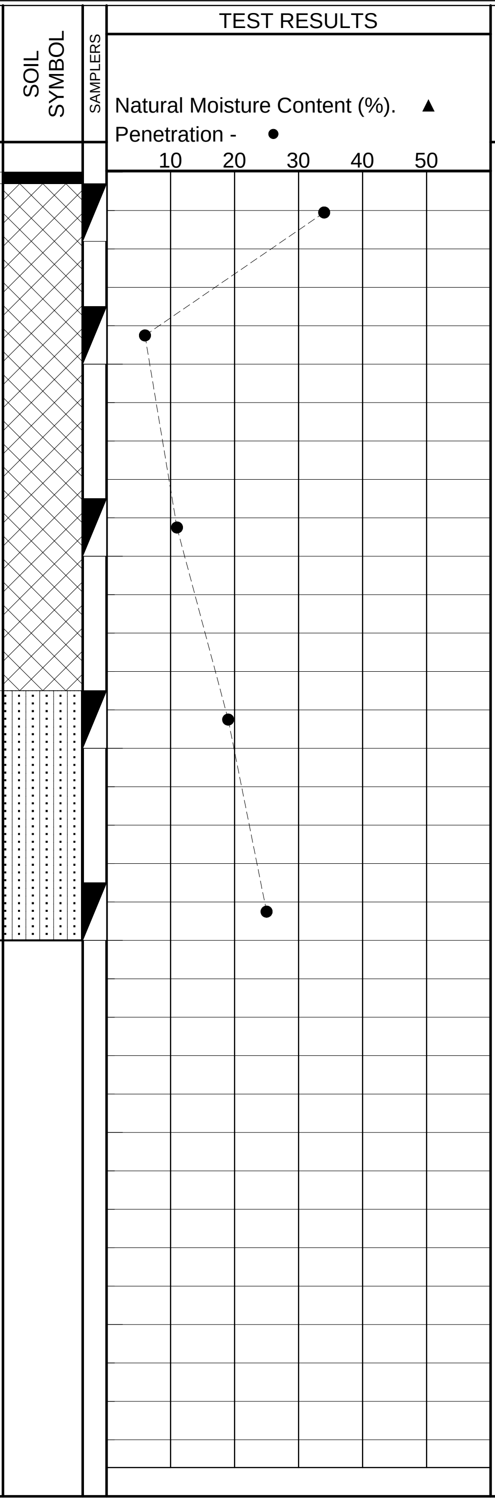
DRILL HOLE LOG

BORING NO. B4

File: Boring Logs - Savoy
Date Printed: 12/2/2016

PROJECT: DeKalb County Tag Office along Savoy Drive
PROJECT NO.: MEG301922
CLIENT: Brown Design Group
DATE: 11/17/2016
LOCATION: Refer to Figure 1
ELEVATION: 926 feet MSL
DRILLER: Kilman Brothers
LOGGED BY: JC Toriz
DRILLING METHOD: ASTM D1586 with Automatic Hammer
STATION:
DEPTH TO - WATER> INITIAL: ▽ 8 **After 48+ Hours:** ▼ **CAVING>** C

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	N-Value Blows/ft (ASTM D1586)
926	0			
925	1	Asphalt pavement	ASPH	34
924	2	Fill - Dense changing to Loose, Tannish Brown, Silty Coarse to Fine SAND	FILL	
923	3			
922	4	Soil becomes moist		6
921	5			
920	6			
919	7			
918	8 ▽			
917	9	Alluvium - Wet, Medium Dense, Tannish Brown, Silty Coarse to Fine SAND		11
916	10			
915	11			
914	12			
913	13			
912	14	Residual - Moist, Medium Dense, Orange-Brown, Silty Coarse to Fine SAND with MnO staining	SM	19
911	15			
910	16			
909	17			
908	18			
907	19			25
906	20			
905	21	Boring terminated at 20 feet BGS		
904	22			
903	23			
902	24			
901	25			
900	26			
899	27			
898	28			
897	29			
896	30			
895	31			
894	32			
893	33			



This information pertains only tothis boring and should not be interpreted as being indicitive of the site.

GEOTECHNICAL REPORT - "EXHIBIT B"

MATRIX ENGINEERING GROUP, INC.
Geotechnical, Environmental & Construction Materials Consultants

DRILL HOLE LOG

BORING NO. B5

File: Boring Logs - Savoy
Date Printed: 12/2/2016

PROJECT: DeKalb County Tag Office along Savoy Drive
PROJECT NO.: MEG301922
CLIENT: Brown Design Group
DATE: 11/17/2016
LOCATION: Refer to Figure 1
ELEVATION: 932 feet MSL
DRILLER: Kilman Brothers
LOGGED BY: JC Toriz
DRILLING METHOD: ASTM D1586 with Automatic Hammer
STATION:
DEPTH TO - WATER> INITIAL: ▽ 14 **After 48+ Hours:** ▼ **CAVING>** C

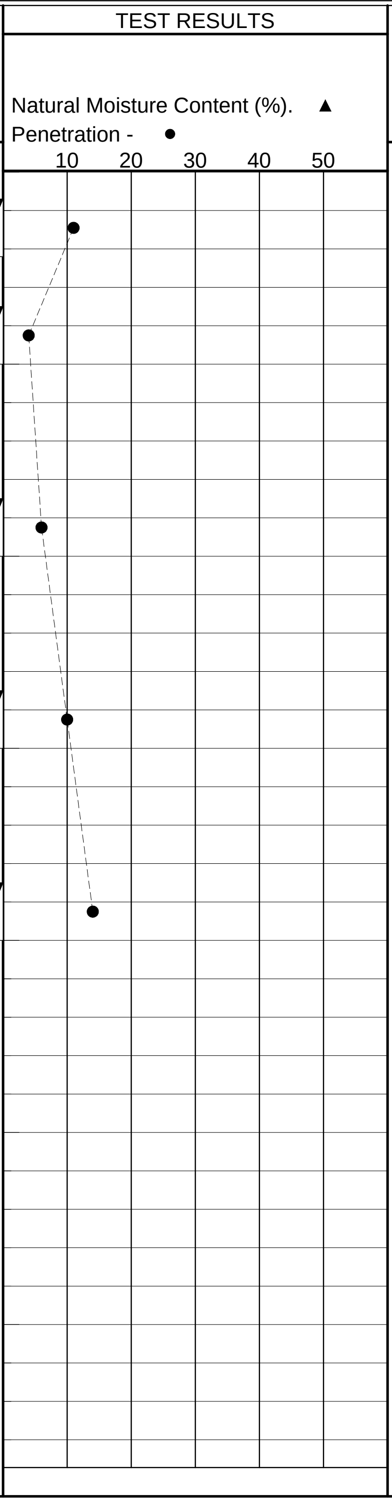
This information pertains only tothis boring and should not be interpreted as being indicitive of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	N-Value Blows/ft (ASTM D1586)
932	0	Asphalt pavement	ASPH	
931	1	Graded Aggregate Base	GW-SW	11
930	2	Fill - Medium Dense changing to Very Loose, Tannish Brown, Silty Coarse to Fine SAND	FILL	
929	3			
928	4	Organics (partially decomposed wood) encountered		4
927	5			
926	6			
925	7			
924	8			
923	9	Possible Alluvium - Wet, Loose, Tannish Brown, Clayey SAND		6
922	10			
921	11			
920	12			
919	13			
918	14 ▽	Residual - Moist, Loose changing to Medium Dense, Orange-Brown, Silty SAND with little Clay	SM	10
917	15			
916	16			
915	17			
914	18			
913	19			14
912	20	Boring terminated at 20 feet BGS		
911	21			
910	22			
909	23			
908	24			
907	25			
906	26			
905	27			
904	28			
903	29			
902	30			
901	31			
900	32			
899	33			

SOIL SYMBOL

SAMPLERS

TEST RESULTS



GEOTECHNICAL REPORT - "EXHIBIT B"

MATRIX ENGINEERING GROUP, INC.
Geotechnical, Environmental & Construction Materials Consultants

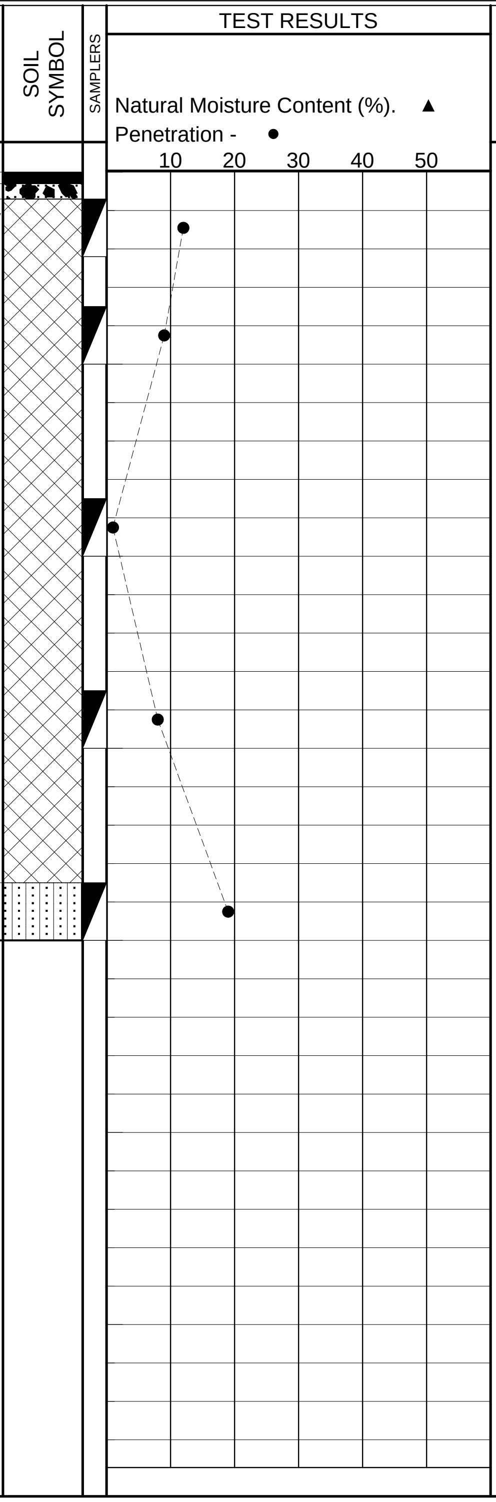
DRILL HOLE LOG

BORING NO. B6

File: Boring Logs - Savoy
Date Printed: 12/2/2016

PROJECT: DeKalb County Tag Office along Savoy Drive
PROJECT NO.: MEG301922
CLIENT: Brown Design Group
DATE: 11/17/2016
LOCATION: Refer to Figure 1
ELEVATION: 929 feet MSL
DRILLER: Kilman Brothers
LOGGED BY: JC Toriz
DRILLING METHOD: ASTM D1586 with Automatic Hammer
STATION:
DEPTH TO - WATER> INITIAL: ▽ 11 **After 48+ Hours:** ▼ **CAVING>** C

This information pertains only tothis boring and should not be interpreted as being indicitive of the site.



ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	N-Value Blows/ft (ASTM D1586)
929	0			
928	1	Asphalt pavement Graded Aggregate Base	ASPH GW-SW	12
927	2	Fill - Medium Dense changing to Very Loose, Dark Tannish Brown, Silty SAND	FILL	
926	3			
925	4	Organics (partially decomposed wood) and gravel encountered		9
924	5			
923	6			
922	7			
921	8			
920	9	No sample recovery		1
919	10			
918	11 ▽			
917	12			
916	13			
915	14	Possible Alluvium - Wet, Loose, Orange-Brown, Silty SAND with little Clay; subrounded rock fragments encountered		8
914	15			
913	16			
912	17			
911	18			
910	19	Residual - Moist, Medium Dense, Orange Tan, Silty SAND	SM	19
909	20	Boring terminated at 20 feet BGS		
908	21			
907	22			
906	23			
905	24			
904	25			
903	26			
902	27			
901	28			
900	29			
899	30			
898	31			
897	32			
896	33			

DRILL HOLE LOG

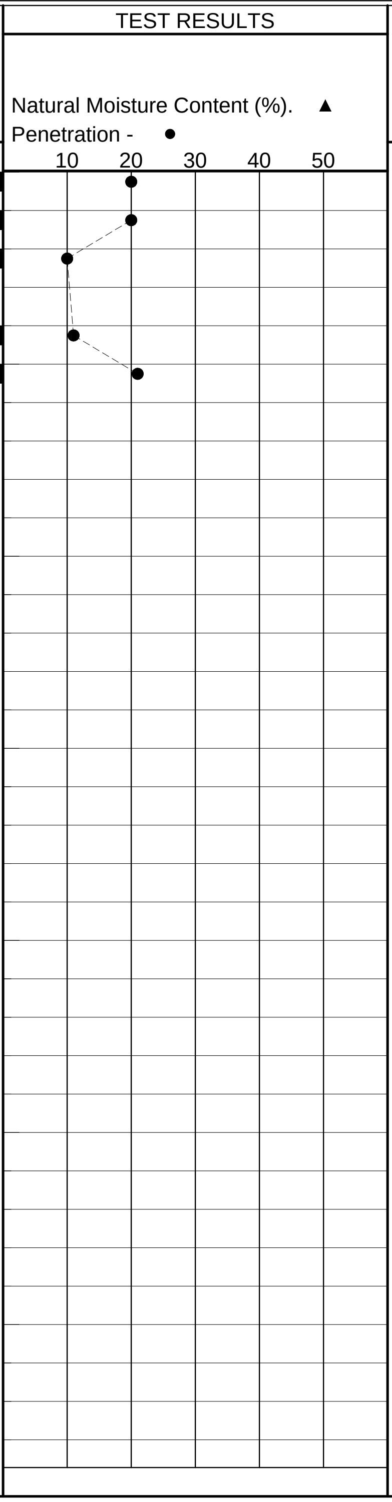
BORING NO. HA1

File: Boring Logs - Savoy
Date Printed: 12/2/2016

PROJECT: DeKalb County Tag Office along Savoy Drive
PROJECT NO.: MEG301922
CLIENT: Brown Design Group
DATE: 11/17/2016
LOCATION: Refer to Figure 1
ELEVATION: 933 feet MSL
DRILLER: Kilman Brothers
LOGGED BY: JC Toriz
DRILLING METHOD: ASTM STP399
STATION:
DEPTH TO - WATER> INITIAL: ∇
After 48+ Hours: ▼
CAVING> C

This information pertains only tothis boring and should not be interpreted as being indicitive of the site.

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	N-Value Blows/ft (ASTM D1586)
933	0					20
932	1	Fill - Medium Dense changing to Loose, Tannish Brown, Silty SAND	FILL			20
931	2					10
930	3					
929	4	Medium Dense, Tannish Brown, Sandy SILT				11
928	5	Boring terminated at 5 feet BGS				21
927	6					
926	7					
925	8					
924	9					
923	10					
922	11					
921	12					
920	13					
919	14					
918	15					
917	16					
916	17					
915	18					
914	19					
913	20					
912	21					
911	22					
910	23					
909	24					
908	25					
907	26					
906	27					
905	28					
904	29					
903	30					
902	31					
901	32					
900	33					



MATRIX ENGINEERING GROUP, INC.
Geotechnical, Environmental & Construction Materials Consultants

GEOTECHNICAL REPORT - "EXHIBIT B"

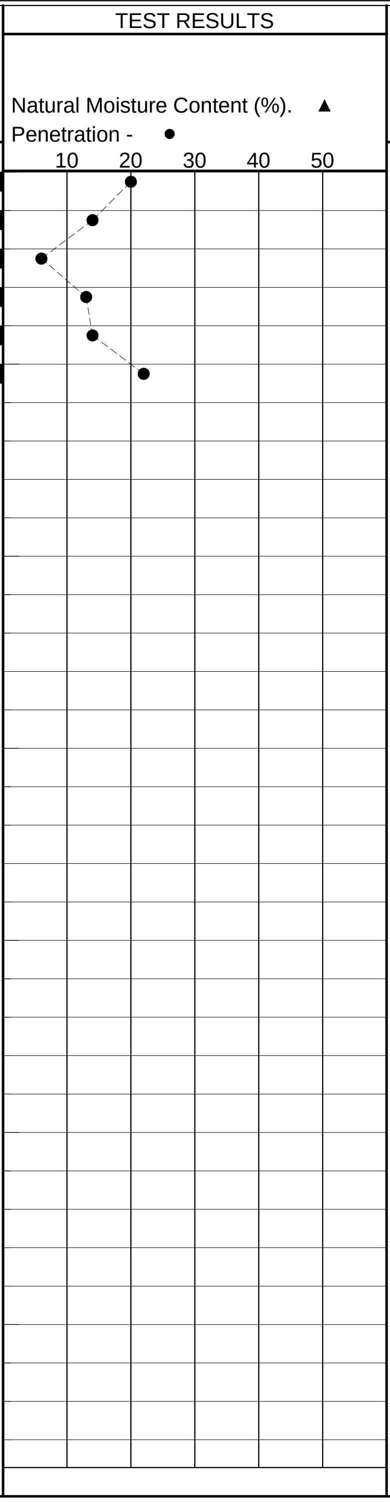
DRILL HOLE LOG

BORING NO. HA2

File: Boring Logs - Savoy
Date Printed: 12/2/2016

PROJECT: DeKalb County Tag Office along Savoy Drive
PROJECT NO.: MEG301922
CLIENT: Brown Design Group
DATE: 11/17/2016
LOCATION: Refer to Figure 1
ELEVATION: 926 feet MSL
DRILLER: Kilman Brothers
LOGGED BY: JC Toriz
DRILLING METHOD: ASTM STP399
STATION:
DEPTH TO - WATER> INITIAL: ▽ ______ **After 48+ Hours:** ▼ ______ **CAVING>** C

ELEVATION (feet)	DEPTH (feet)	Description	SOIL TYPE	SOIL SYMBOL	SAMPLERS	N-Value Blows/ft (ASTM D1586)
926	0	Fill - Medium Dense changing to Loose, Tannish Brown, Silty SAND	FILL	▨	■	20
925	1			▨	■	14
924	2			▨	■	6
923	3	Medium Dense, Tannish Brown, Sandy SILT		▨	■	13
922	4			▨	■	14
921	5	Boring terminated at 5 feet BGS			■	22
920	6					
919	7					
918	8					
917	9					
916	10					
915	11					
914	12					
913	13					
912	14					
911	15					
910	16					
909	17					
908	18					
907	19					
906	20					
905	21					
904	22					
903	23					
902	24					
901	25					
900	26					
899	27					
898	28					
897	29					
896	30					
895	31					
894	32					
893	33					



This information pertains only tothis boring and should not be interpreted as being indicitive of the site.