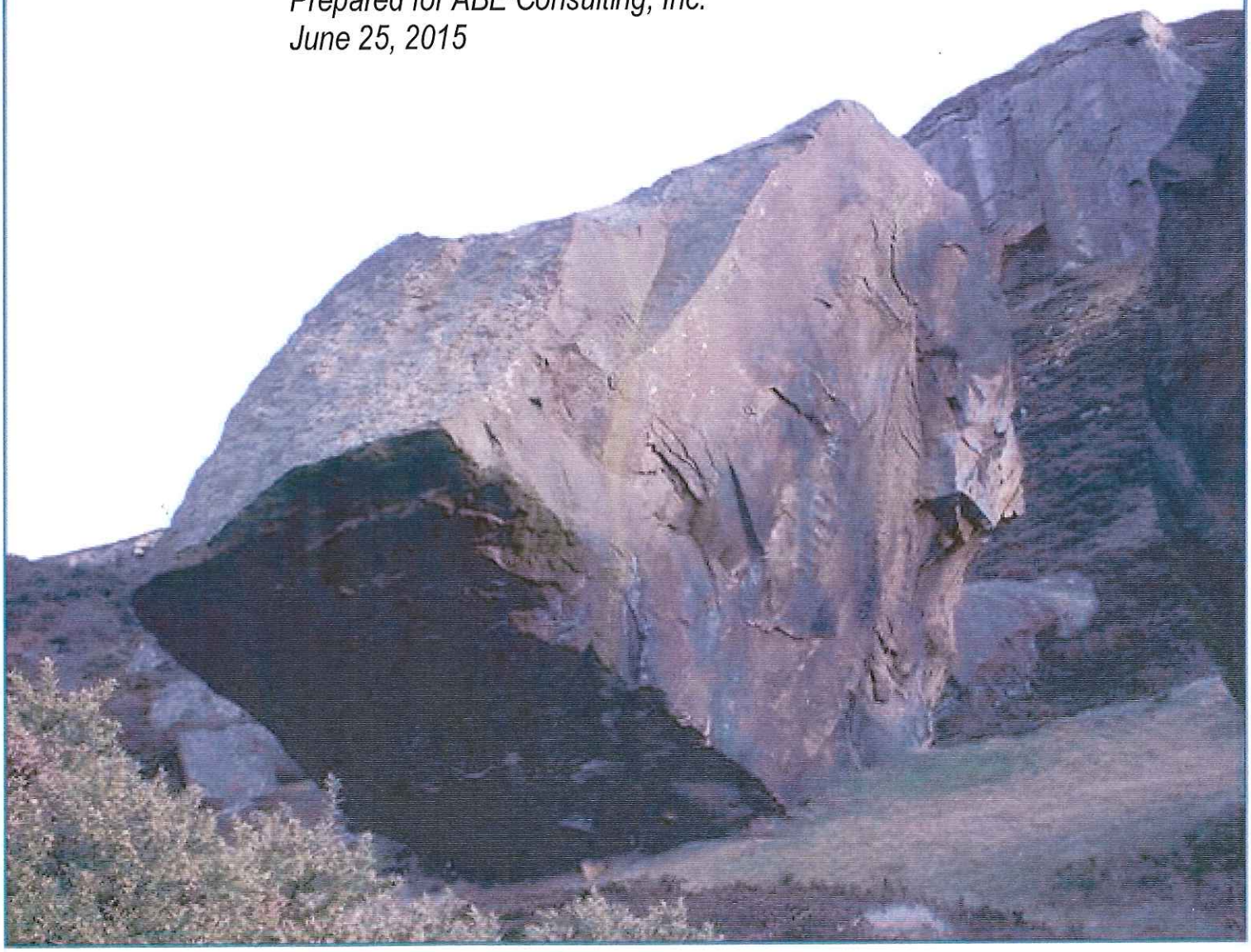
GEO HYDRO ENGINEERS

Report of Subsurface Exploration and Geotechnical Engineering Evaluation

Parkway Boulevard Extension
Oconee County, Georgia
Geo-Hydro Project Number 150329.20

Prepared for ABE Consulting, Inc.
June 25, 2015



Mr. Abe Abouhamdan, P.E.
ABE Consulting, Inc.
2410 Hog Mountain Road, Suite 103
Watkinsville, Georgia 30677

June 25, 2015

Report of Subsurface Exploration
and Geotechnical Engineering Evaluation
Parkway Boulevard Extension
Oconee County, Georgia
Geo-Hydro Project Number 150329.20

Dear Mr. Abouhamdan:

Geo-Hydro Engineers, Inc. has completed the authorized subsurface exploration and geotechnical engineering evaluation for the above referenced project. The scope of services for this project was outlined in our revised proposal number 16556.20 dated May 27, 2015.

PROJECT INFORMATION

The project involves the construction of about 3,400 feet of new roadway to extend the existing Parkway Boulevard southwest to connect with the Oconee Connector in Athens, Georgia. Figure 1 in the Appendix shows the project area.

The proposed roadway alignment will extend southwest from Parkway Boulevard towards Oconee Connector east of Plaza Parkway. The image below illustrates existing site conditions and a rough approximation of the roadway alignment.

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At the time of our exploration, the roadway alignment had been cleared of trees and the centerline staked by others. Prior to clearing, the alignment was heavily wooded.

Exploratory Procedures

The subsurface exploration consisted of 23 machine-drilled soil test borings performed at the approximate locations shown on Figures 2, 3, and 4 included in the Appendix. The test borings were located in the field by Geo-Hydro by measuring angles and distances from centerline stakes. Ground elevations shown on the test boring records were obtained from the topographic site plan provided to us and have been rounded to the nearest foot. In general, the locations and elevations of the borings should be considered approximate.

Standard penetration testing, as provided for in ASTM Dl586, was performed at selected intervals in the machine-drilled soil test borings. Soil samples obtained from the drilling operation were examined and classified in general accordance with ASTM D2488 (Visual-Manual Procedure for Description of Soils). Soil classifications include the use of the Unified Soil Classification System described in ASTM D2487 (Classification of Soils for Engineering Purposes). The soil classifications also include our evaluation of the geologic origin of the soils. Evaluations of geologic origin are based on our experience and interpretation and may be subject to some degree of error.

Descriptions of the soils encountered, groundwater conditions, standard penetration resistances, and other pertinent information are provided in the test boring records and hand auger log included in the Appendix.

Regional Geology

The project site is located in the Southern Piedmont Geologic Province of Georgia. Soils in this area have been formed by the in-place weathering of the underlying crystalline rock, which accounts for their classification as "residual" soils. Residual soils near the ground surface that have experienced advanced weathering frequently consist of red brown clayey silt (ML) or silty clay (CL). The thickness of this surficial clayey zone may range up to roughly 6 feet. For various reasons, such as erosion or local variation of mineralization, the upper clayey zone is not always present.

With increased depth, the soil becomes less weathered, coarser grained, and the structural character of the underlying parent rock becomes more evident. These residual soils are typically classified as sandy micaceous silt (ML) or silty micaceous sand (SM). With a further increase in depth, the soils eventually become quite hard and take on an increasing resemblance to the underlying parent rock. When these materials have a standard penetration resistance of l00 blows per foot or greater, they are referred to as partially weathered rock. The transition from soil to partially weathered rock is usually a gradual one, and may occur at a wide range of depths. Lenses or layers of partially weathered rock are not unusual in the soil profile.

Partially weathered rock represents the zone of transition between the soil and the indurated metamorphic rocks from which the soils are derived. The subsurface profile is, in fact, a history of the weathering process that the crystalline rock has undergone. The degree of weathering is most advanced at the ground

surface, where fine-grained soil may be present. Conversely, the weathering process is in its early stages immediately above the surface of relatively sound rock, where partially weathered rock may be found.

The thickness of the zone of partially weathered rock and the depth to the rock surface have both been found to vary considerably over relatively short distances. The depth to the rock surface may frequently range from the ground surface to 80 feet or more. The thickness of partially weathered rock, which overlies the rock surface, may vary from only a few inches to as much as 40 feet or more.

Near-surface geologic conditions at the site have been modified by previous agricultural or grading activities.

TEST BORING SUMMARY

Most of the test borings initially encountered topsoil. Topsoil thickness at the site should be expected to vary and measurements necessary for detailed quantity estimation were not performed for this report. For preliminary estimating purposes we suggest an arbitrary topsoil thickness of 8 inches.

Beneath surface materials, borings B-21 and B-23 encountered fill soils extending to a depth of about 3 and 6 feet, respectively. The fill soils generally consisted of sandy clay with standard penetration resistances ranging from 2 to 16 blows per foot.

Beneath surface materials, boring B-20 encountered alluvial soils (water-deposited) extending to a depth of about 6 feet. The alluvial soils generally consisted of sandy silt and silty sand with standard penetration resistances of 12 and 2 blows per foot

Beneath surface materials, fill materials, or alluvium, all of the borings encountered residual soils typical of the Piedmont Region. The residual soils ware classified as silty sand, clayey sand, sandy clay and sandy silt with varying mica content. Standard penetration resistances recorded in the residuum ranged from 5 to 72 blows per foot.

Partially weathered rock was encountered in borings B-4, B-5, B-13, B-15, B-16, B-17, B-19, and B-19A at depths ranging from about 3 to 26 feet. Partially weathered rock is locally defined as residual material having standard penetration resistance values greater than 100 blows per foot.

Borings B-1, B-4, B-5, B-6, B-14, and B-19 encountered materials causing auger refusal at depths ranging from 5 to 40 feet. Auger refusal is the condition that prevents further advancement of the boring using conventional soil drilling techniques. Auger refusal may be indicative of a boulder, a lens or layer of rock, a rock pinnacle, or a larger rock mass.

At the time of drilling, groundwater was encountered in boring B-20 at a depth of 2.5 feet. The remaining borings did not encountered groundwater. For safety reason the borings were backfilled after the groundwater check. It should be noted that groundwater levels will fluctuate depending on yearly and seasonal rainfall variations and other factors, and may rise in the future.

For more detailed descriptions of subsurface conditions, please refer to the test boring records included in the Appendix.

Summary of Subsurface Conditions

Boring	Approx. Existing Ground Elevation	Proposed Grade	Approx. Bottom of Fill/Alluvium Elevation	Approx. Top of PWR Elevation	Approx. Auger Refusal Elevation	Approx. Boring Termination Elevation	Approx. Groundwater Elevation
B-1	747	746	NE	NE	729	729	NE
B-2	753	746	NE	NE	NE	728	NE
B-3	753	738	NE	NE	NE	723	NE
B-4	751	731	NE	728	725	725	NE
B-5	748	724	NE	**740**	712	712	NE
B-6	743	718	NE	NE	703	703	NE
B-7	733	710	NE	NE	NE	698	NE
B-8	724	704	NE	NE	NE	689	NE
B-9	716	696	NE	NE	NE	681	NE
B-10	709	690	NE	NE	NE	674	NE
B-11	702	684	NE	NE	NE	672	NE
B-12	678	676	NE	NE	NE	663	NE
B-13	671	674	NE	663	NE	651	NE
B-14	680	673	NE	NE	662	662	NE
B-15	684	672	NE	676	NE	654	NE
B-16	683	671	NE	667	NE	653	NE
B-17	679	666	NE	**671**	NE	649	NE
B-18	690	659	NE	NE	NE	660	NE
B-19	664	653	NE	**661**	**659**	**659**	NE
B-19A	665	655	NE	643	NE	635	NE
B-20	630	637	**624**	NE	NE	615	628
B-21	633	636	**630**	NE	NE	618	NE
B-22	643	647	NE	NE	NE	628	NE
B-23	655	655	**649**	NE	NE	640	NE

NE: Not Encountered

EVALUATIONS AND RECOMMENDATIONS

The following evaluations and recommendations are based on the information available on the proposed roadway construction, the data obtained from the test borings, and our experience with soils and subsurface conditions similar to those encountered at this site. Because of the test borings represent a very small statistical sampling of subsurface conditions, it is possible that conditions different from those indicated by the test borings could be encountered during supplemental exploration and during construction.

- The test borings indicate generally favorable excavation conditions. Existing fill materials and residual soils should be readily removable using conventional soil excavation equipment such as loaders and backhoes. However, it is important to note that the depth to rock or partially weathered rock may vary drastically over relatively short distances. It would not be unusual to encounter partially weathered rock, rock lenses, rock pinnacles, or boulders between or around the test borings.

- Boring B-20 encountered groundwater at a depth of 2.5 feet. The test boring was performed near a branch of McNutt Creek. It should be anticipated that groundwater will be encountered in this area at or near the creek water level. Temporary construction dewatering may be necessary in the excavations depending on recent rain events and the level of the creek at the time of construction. Throughout the remainder of the roadway alignment, groundwater should not be a concern for general roadway grading and construction.

The following sections provide recommendations regarding these issues and other geotechnical aspects of the project.

General Site Preparation

Trees, underbrush, topsoil, roots, and other deleterious materials should be removed from the proposed construction area. All existing utilities should be excavated and removed unless they are to be incorporated into the new construction. Additionally, site clearing, grubbing, and stripping should be performed only during dry weather conditions. Operation of heavy equipment on the site during wet conditions could result in excessive mixing of topsoil and organic debris with underlying soils.

All excavations resulting from rerouting of underground utilities should be backfilled in accordance with the *Structural Fill* section of this report.

We recommend that areas to receive structural fill be proofrolled prior to placement of structural fill. Proofrolling should be performed with multiple passes in at least two directions using a fully loaded tandem axle dump truck weighing at least 18 tons. If low consistency soils are encountered that cannot be adequately densified in place, such soils should be removed and replaced with well-compacted fill material placed in accordance with the *Structural Fill* section of this report. Proofrolling should be observed by Geo-Hydro to determine if remedial measures are necessary.

During roadway grading, burn pits, trash pits, or abandoned utility lines may be encountered. All too frequently such buried materials conditions occur in isolated areas which are not detected by the soil test

borings. Any buried waste, construction debris, trash, or abandoned utilities found during the construction operation should be thoroughly excavated, and the waste material should be removed from the site.

Existing Fill Materials

Existing fill materials were encountered in two borings and existing fill should be anticipated within proximity to the developed portions of the alignment outside of the areas explored. There are several important facts that should be considered regarding existing fill materials and the limitations of subsurface exploration.

- The quality of existing fill materials can be highly variable, and test borings are often not able to detect all of the zones or layers of poor quality fill materials.
- The interface between existing fill materials and the original ground surface may include a layer of organic material that was not properly stripped off during the original grading. Depending on its relationship to the road subgrade, an organic layer might adversely affect pavement support. If such organic layers are encountered during construction, it may be necessary to "chase out" the organic layer by excavating the layer along with overlying soils.
- The construction budget should include funds for management of poor quality existing fill materials at this site.
- Subsurface exploration is simply not capable of disclosing all conditions that may require remediation.

Excavation Characteristics

In general, the overburden soils at the site should be readily removable with conventional soil excavation equipment such as loaders, backhoes, etc. However, denser soils may require the use of heavy bulldozers or track-mounted backhoes to effectively achieve excavation. It is possible that very hard soils may require ripping in some instances.

Partially weathered rock will require ripping to pre-loosen the material and facilitate excavation. Backhoes capable of ripping will be required to effectively achieve excavation in partially weathered rock materials. In some instances partially weathered may require the use of hydraulic impact hammers or blasting to achieve excavation.

From the standpoint of the test borings, the term "rock" may be used to refer to materials below the depth of auger refusal, which will require blasting to achieve efficient excavation.

It is important to note that the depth to rock or partially weathered rock can vary drastically over relatively short distances. It would not be unusual for rock or partially weathered rock to occur at higher elevations between or around some of the soil test borings.

For construction bidding and field verification purposes it is common to provide a verifiable definition of rock in the project specifications. The following are typical definitions of mass rock and trench rock:

- Mass Rock: Material which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at 56,000 pounds (Caterpillar D-8K or equivalent), and occupying an original volume of at least one cubic yard.

- Trench Rock: Material occupying an original volume of at least one-half cubic yard which cannot be excavated with a hydraulic excavator having a minimum flywheel power rating of 123 kW (165 hp); such as a Caterpillar 322C L, John Deere 230C LC, or a Komatsu PC220LC-7; equipped with a short tip radius bucket not wider than 42 inches.

Suitability of Excavated Material for Reuse as Structural Fill

Based on the results of soil classifications, overburden soils at the site appear suitable for reuse as structural fill. Routine adjustment of moisture content will be necessary to allow proper placement and compaction.

It is important to establish as part of the construction contract whether soils having elevated moisture content will be considered suitable for reuse. We often find this issue to be a point of contention and a source of delays and change orders. From a technical standpoint, soils with moisture contents wet of optimum as determined by the standard Proctor test (ASTM D698) can be reused provided that the moisture is properly adjusted to within the workable range. From a practical standpoint, wet soils can be very difficult to dry in small or congested sites and such difficulties should be considered during planning and budgeting. A clear understanding by the general contractor and grading subcontractor regarding the reuse of excavated soils will be important to avoid delays and unexpected cost overruns.

Partially weathered rock materials will be suitable for reuse as structural fill only if they break down into a reasonably well-graded material that can be satisfactorily compacted. The presence of cobble size or boulder size material, which does not break down under the action of compaction equipment, will limit the suitability of partially weathered rock materials. Engineering judgment will be required in the field to evaluate the acceptability of partially weathered rock materials for reuse as structural fill.

Use of blasted rock materials as structural fill requires special care during placement to avoid the formation of voids within the rock fill mass. Rock fragments or boulders larger than about 12 inches should be spread evenly over the fill area and care should be taken to place and compact soil or partially weathered rock around and between the larger rock fragments. Placement of rock layers containing little or no fines must be avoided. Based on our experience, the use of blasted rock as fill generally presents problems during foundation excavation and during installation of underground utilities. For this reason we recommend that rock fill be avoided within 5 feet of subgrade elevation.

Structural Fill

Materials selected for use as structural fill should be free of organic debris, waste construction debris, and other deleterious materials. The material should not contain rocks having a diameter over 4 inches. It is our opinion that the following soils represented by their USCS group symbols will typically be suitable for use as structural fill and are usually found in abundance in the Piedmont: (SM), (ML), and (CL). The following soil types are typically suitable but are not abundant in the Piedmont: (SW), (SP), (SC), (SP-SM), and (SP-SC). The following soil types are considered unsuitable: (MH), (CH), (OL), (OH), and (Pt).

Laboratory Proctor compaction tests and classification tests should be performed on representative samples obtained from the proposed borrow material to provide data necessary to determine acceptability and for quality control. The moisture content of suitable borrow soils should generally be no more than 3 percentage points below or above optimum at the time of compaction. Tighter moisture limits may be necessary with certain soils.

It is possible that highly micaceous soils could be utilized as structural fill material. The use of such materials will require very close attention to quality control of moisture content and density. Additionally, it is our experience that highly micaceous soils tend to rut under rubber-tired vehicle traffic. Continuous maintenance of areas subjected to construction traffic is typically required until construction is completed.

Suitable fill material should be placed in thin lifts. Lift thickness depends on the type of compaction equipment, but a maximum loose-lift thickness of 8 inches is generally recommended. The soil should be compacted by a self-propelled sheepsfoot roller. Within small excavations such as in utility trenches, around manholes, above foundations, or behind retaining walls, we recommend the use of "wacker packers" or "Rammax" compactors to achieve the specified compaction. Loose lift thicknesses of 4 to 6 inches are recommended in small area fills.

We recommend that structural fill be compacted to at least 95 percent of the standard Proctor maximum dry density (ASTM D698). The upper 12 inches of floor slab subgrade soils should be compacted to at least 98 percent of the standard Proctor maximum dry density. The upper 12 inches of pavement subgrades should be compacted in accordance with Georgia DOT requirements to at least 100 percent of the standard Proctor maximum dry density (ASTM D698). Additionally, the maximum dry density of structural fill should be no less than 90 pcf. Geo-Hydro should perform density tests during fill placement.

Earth Slopes

Temporary construction slopes should be designed in strict compliance with OSHA regulations. The exploratory borings indicate that most soils at the site are Type B as defined in 29 CFR 1926.650 (1994 Edition). This dictates that temporary construction slopes be no steeper than 1H:1V for excavation depths of 20 feet or less. Temporary construction slopes should be closely observed on a daily basis by the contractor's "competent person" for signs of mass movement: tension cracks near the crest, bulging at the toe of the slope, etc. The responsibility for excavation safety and stability of construction slopes should lie solely with the contractor.

We recommend that extreme caution be observed in trench excavations. Several cases of loss of life due to trench collapses in Georgia point out the lack of attention given to excavation safety on some projects. We recommend that applicable local and federal regulations regarding temporary slopes, and shoring and bracing of trench excavations be closely followed.

Formal analysis of slope stability was beyond the scope of work for this project. Based on our experience, permanent cut or fill slopes should be no steeper than 2H:1V to maintain long term stability and to provide ease of maintenance. The crest or toe of cut or fill slopes should be no closer than 5 feet to the edge of any pavements. Erosion protection of slopes during construction and during establishment of vegetation should be considered an essential part of construction.

Earth Pressure (Cast-in-Place Structures)

Three earth pressure conditions are generally considered for retaining wall design: "at rest", "active", and "passive" stress conditions. Retaining walls which are rigidly restrained at the top and will be essentially unable to rotate under the action of earth pressure should be designed for "at rest" conditions. Retaining walls which can move outward at the top as much as 0.5 percent of the wall height (such as free-standing walls) should be designed for "active" conditions. For the evaluation of the resistance of soil to lateral loads the "passive" earth pressure must be calculated. It should be noted that full development of passive pressure requires deflections toward the soil mass on the order of 1.0 percent to 4.0 percent of total wall height.

Earth pressure may be evaluated using the following equation:

$$p_h = K\,(D_w Z + q_s) + W_w(Z\text{-}d)$$

where: p_h = horizontal earth pressure at any depth below the ground surface (Z).
W_w = unit weight of water
Z = depth to any point below the ground surface
d = depth to groundwater surface
D_w = wet unit weight of the soil backfill (depending on borrow sources). The wet unit weight of most residual soils may be expected to range from approximately 115 to 125 pcf. Below the groundwater level, D_w must be the buoyant weight.
q_s = uniform surcharge load (add equivalent uniform surcharge to account for construction equipment loads)
K = earth pressure coefficient as follows:

Earth Pressure Condition	Coefficient
At Rest (K_o)	0.5
Active (K_a)	0.33
Passive (K_p)	3.0

The groundwater term, $W_w(Z\text{-}d)$, should be used if no drainage system is incorporated behind retaining walls. If a drainage system is included which will not allow the development of any water pressure behind

the wall, then the groundwater term may be omitted. The development of excessive water pressure is a common cause of retaining wall failures. Drainage systems should be carefully designed to insure that long term permanent drainage is accomplished.

The above design recommendations are based on the following assumptions:

- Horizontal backfill
- 95 percent standard Proctor compactive effort on backfill (ASTM D698)
- No safety factor is included

For convenience, equivalent fluid densities are frequently used for the calculation of lateral earth pressures. For "at rest" stress conditions, an equivalent fluid density of 63 pcf may be used. For the "active" state of stress an equivalent fluid density of 42 pcf may be used. These equivalent fluid densities are based on the assumptions that drainage behind the retaining wall will allow *no* development of hydrostatic pressure; that native sandy silts or silty sands will be used as backfill; that the backfill soils will be compacted to 95 percent of standard Proctor maximum dry density; that backfill will be horizontal; and that no surcharge loads will be applied.

For analysis of sliding resistance of the base of a cast-in-place concrete retaining wall, the coefficient of friction may be taken as 0.4 for the soils at the project site. This is an ultimate value, and an adequate factor of safety should be used in design. The force which resists base sliding is calculated by multiplying the normal force on the base by the coefficient of friction. Full development of the frictional force could require deflection of the base of roughly 0.1 to 0.3 inches.

Flexible Pavement Design

Anticipated traffic volumes have not been provided and laboratory testing for determining subgrade CBR was not part of this subsurface exploration. For preliminary planning purposes, we recommend using the minimum base and pavement thickness matching the roadway classification as presented in Table 10.4 of the *Appendix A: Oconee County Unified Development Code* under the Oconee County, Georgia, Code of Ordinances.

Depending on the Average Daily Trips (ADT) expected through the roadway design period, Parkway Boulevard may be classified as a minor collector or major collector. The following table presents the minimum pavement component thickness for these two roadway designations as outlined in Table 10.4 referenced above.

Material	Minor Collector Thickness (inches)	Major Collector Thickness (inches)
Asphaltic Concrete 12.5mm Superpave	1½	1½
Asphaltic Concrete 19mm Superpave	2½	4
Graded Aggregate Base (GAB) (Base Course)	8	8

The top 12 inches of pavement subgrade soils should be compacted to at least 100 percent of the standard Proctor maximum dry density (ASTM D698). Scarification and moisture adjustment will likely be required to achieve the recommended subgrade compaction level. Allowances for pavement subgrade preparation should be considered for budgeting and scheduling.

GAB composed of Group II aggregate (granite, gneiss, quartzite, etc.) must be compacted to at least 100 percent of the modified Proctor maximum dry density (ASTM D1557). GAB composed of Group I aggregate (limestones, dolostones, and marbles) must be compacted to at least 98 percent of the modified Proctor maximum dry density.

All pavement construction should be performed in general accordance with Georgia DOT specifications. Proper subgrade compaction, adherence to Georgia DOT specifications, and compliance with project plans and specifications, will be critical to the performance of the constructed pavement.

Pavement Materials Testing

In order to aid in verifying that the pavement system is installed in general accordance with the design considerations, the following materials testing services are recommended:

- Density testing of subgrade materials.
- Proofrolling of pavement subgrade materials immediately prior to placement of graded aggregate base (GAB). This proofrolling should be performed the same day GAB is installed.
- Density testing of GAB and verification of GAB thickness. In-place density should be verified using the sand cone method (ASTM D1556).
- Coring of the pavement to verify thickness and density (asphalt pavement only).

* * * * *

We appreciate the opportunity to serve as your geotechnical consultant for this project, and are prepared to provide any additional services you may require. If you have any questions concerning this report or any of our services, please call us.

Sincerely,

GEO-HYDRO ENGINEERS, INC.

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APPENDIX

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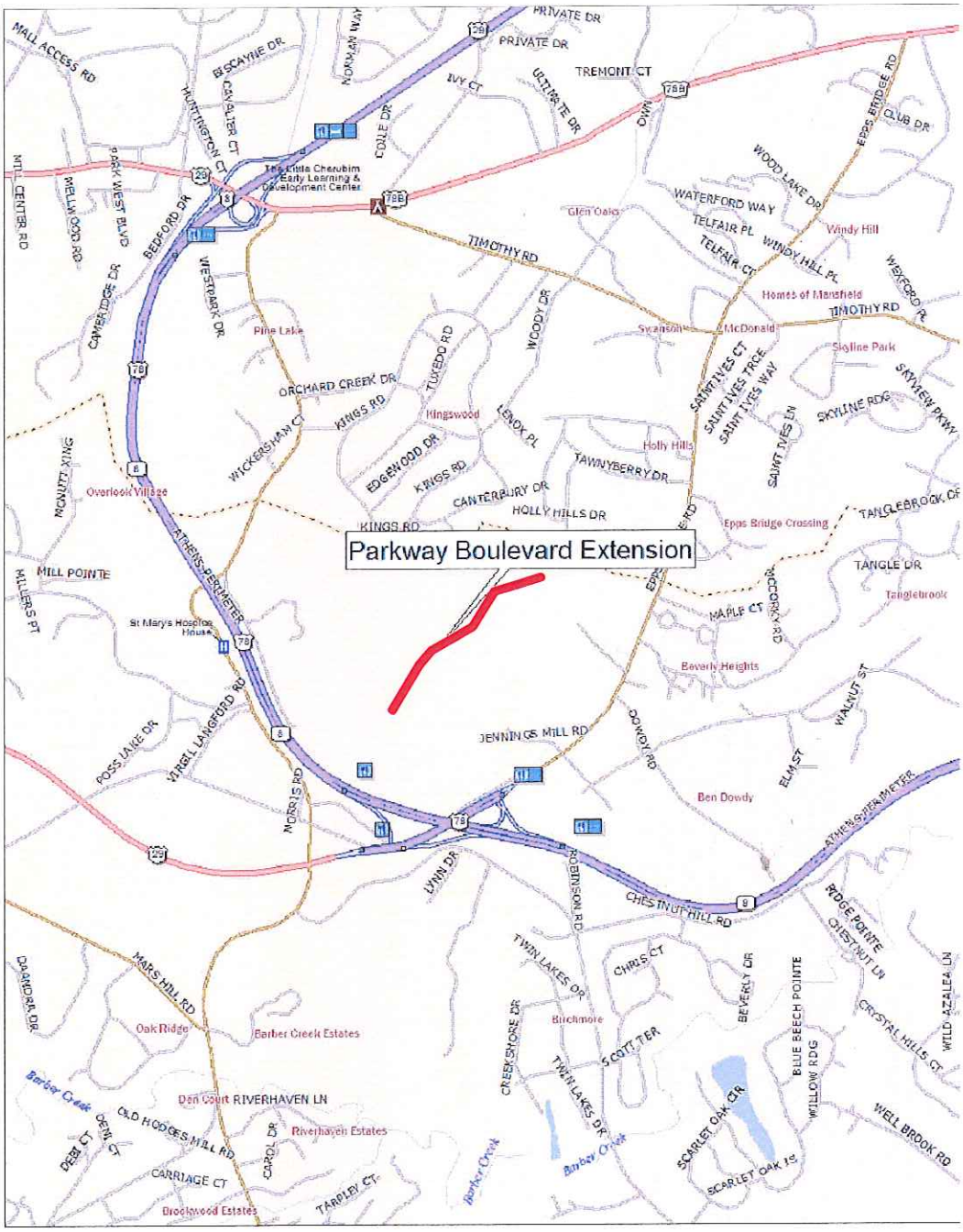

0 0.25 0.5 1 1.5

Approximate Scale, Miles

Figure 1: Site Location Plan

Parkway Boulevard Extension
Athens, Georgia
Geo-Hydro Project Number 150329.20

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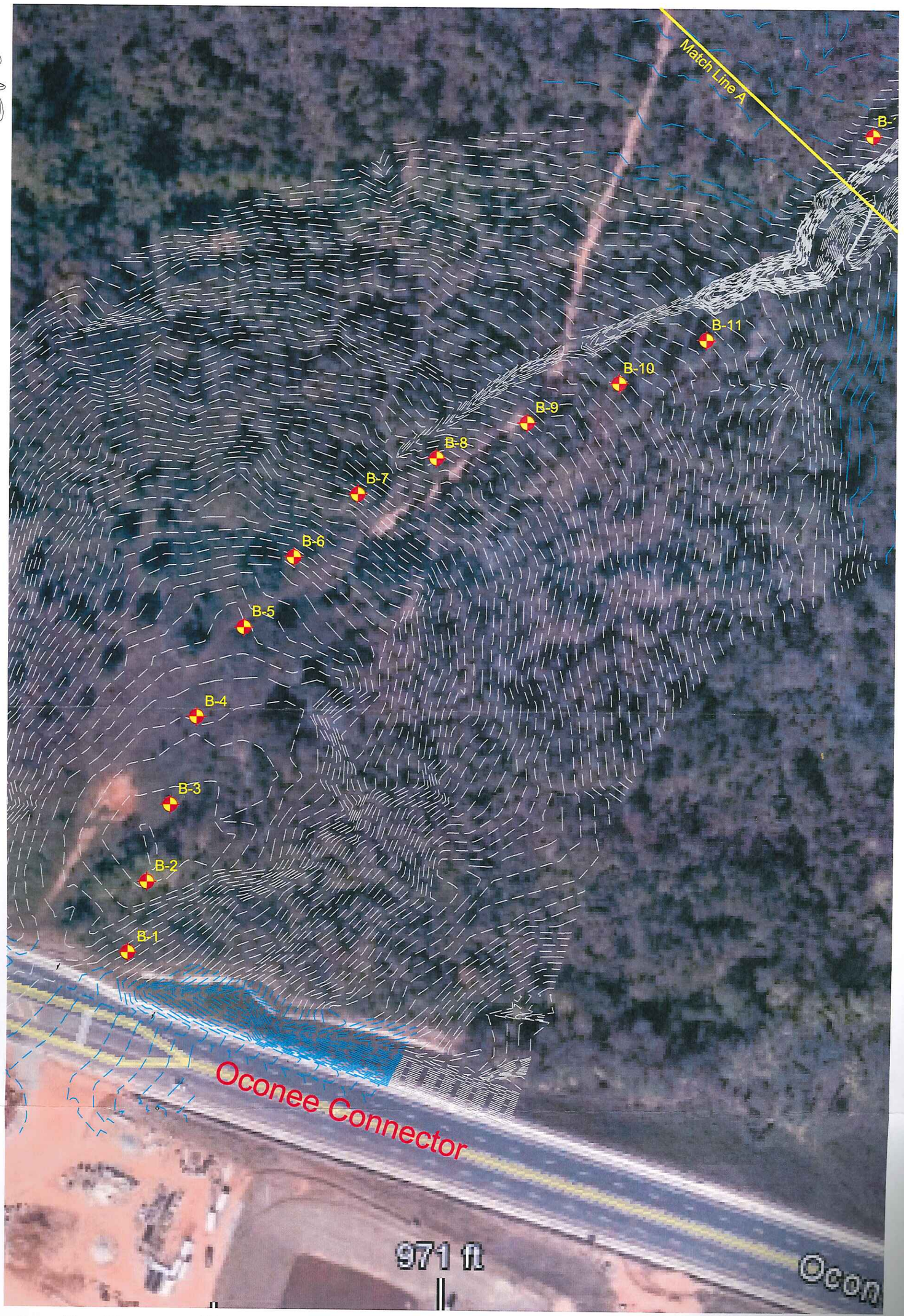

0 50 100 200 300

Approximate Scale: 1"=100'

LEGEND: Soil Test Boring	Figure 2: Boring Location Plan	Parkway Boulevard Extension Athens, Georgia Geo-Hydro Project Number 150329.20

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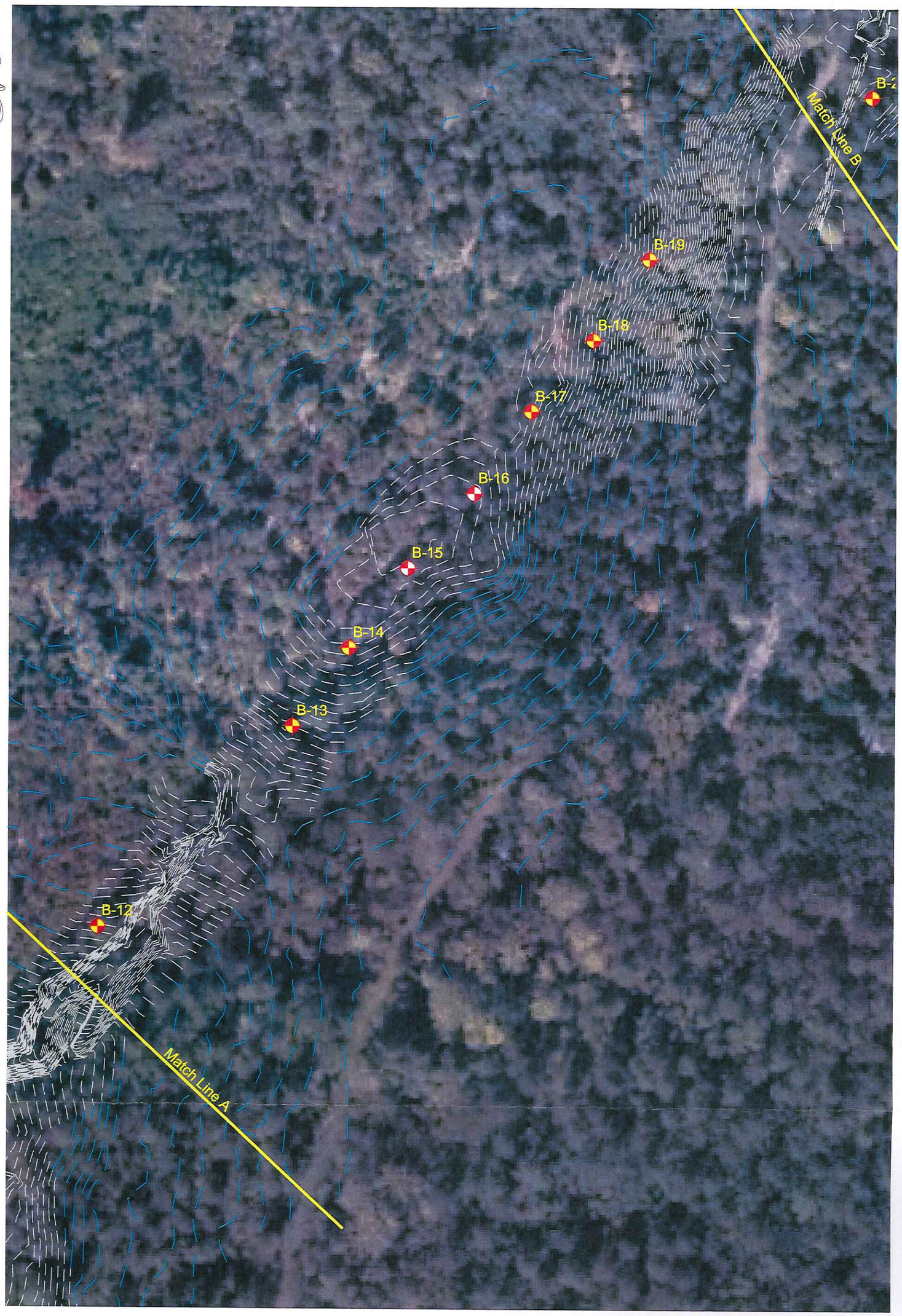

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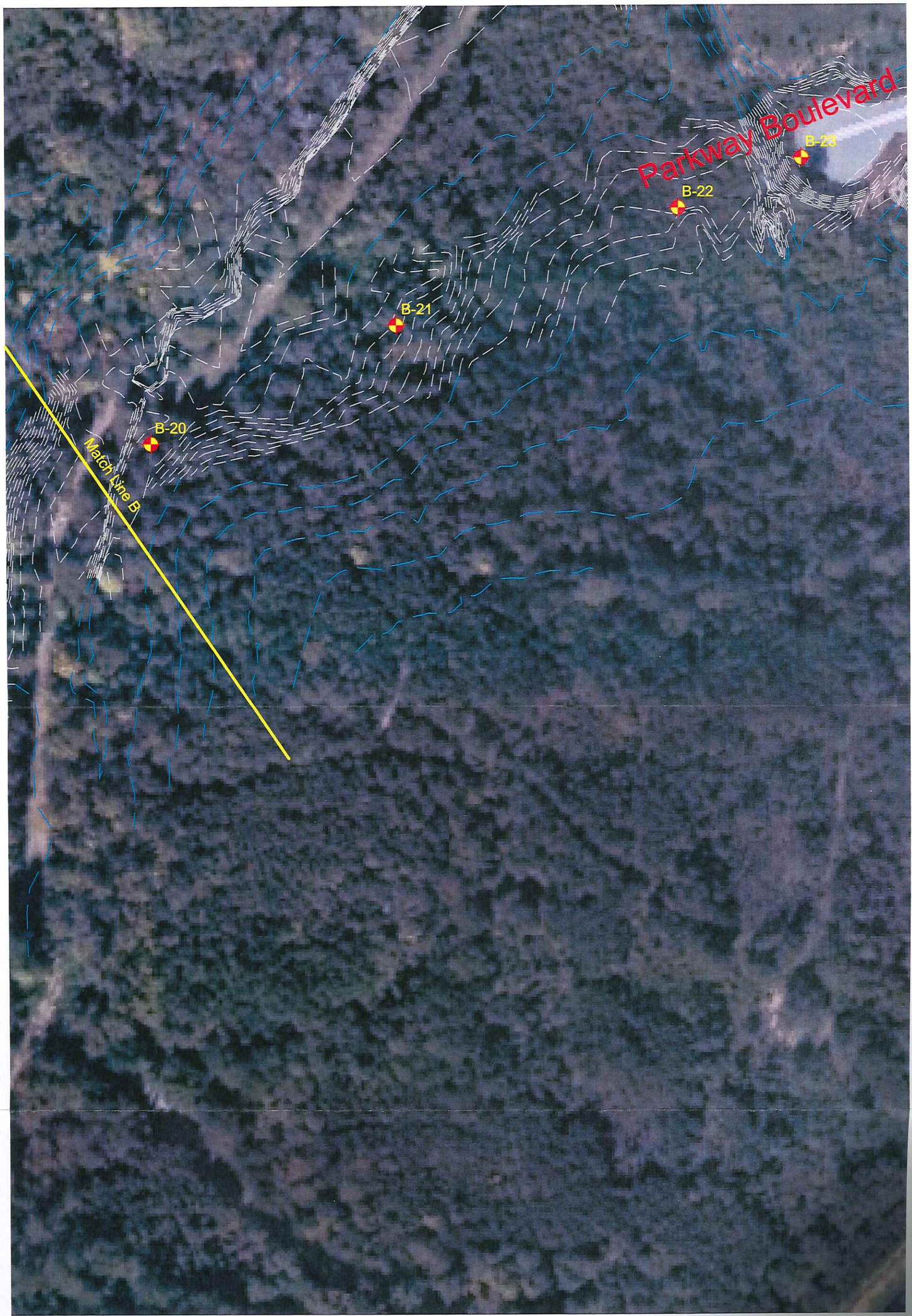
Approximate Scale: 1"=100'

LEGEND: Soil Test Boring

Figure 3: Boring Location Plan

Parkway Boulevard Extension
Athens, Georgia
Geo-Hydro Project Number 150329.20



0 50 100 200 300

Approximate Scale: 1"=100'

LEGEND: Soil Test Boring

Figure 4: Boring Location Plan

Parkway Boulevard Extension
Athens, Georgia
Geo-Hydro Project Number 150329.20

Symbols and Nomenclature

Symbols

▮	Thin-walled tube (TWT) sample recovered
▯	Thin-walled tube (TWT) sample not recovered
●	Standard penetration resistance (ASTM D1586)
50/2"	Number of blows (50) to drive the split-spoon a number of inches (2)
65%	Percentage of rock core recovered
RQD	Rock quality designation - % of recovered core sample which is 4 or more inches long
GW	Groundwater
▼	Water level at least 24 hours after drilling
▽	Water level one hour or less after drilling
ALLUV	Alluvium
TOP	Topsoil
PM	Pavement Materials
CONC	Concrete
FILL	Fill Material
RES	Residual Soil
PWR	Partially Weathered Rock
SPT	Standard Penetration Testing

Penetration Resistance Results

	Number of Blows, N	Approximate Relative Density
Sands	0-4	very loose
	5-10	loose
	11-20	firm
	21-30	very firm
	31-50	dense
	Over 50	very dense

	Number of Blows, N	Approximate Consistency
Silts and Clays	0-1	very soft
	2-4	soft
	5-8	firm
	9-15	stiff
	16-30	very stiff
	31-50	hard
	Over 50	very hard

Drilling Procedures

Soil sampling and standard penetration testing performed in accordance with ASTM D 1586. The standard penetration resistance is the number of blows of a 140-pound hammer falling 30 inches to drive a 2-inch O.D., 1.4-inch I.D. split-spoon sampler one foot. Rock coring is performed in accordance with ASTM D 2113. Thin-walled tube sampling is performed in accordance with ASTM D 1587.

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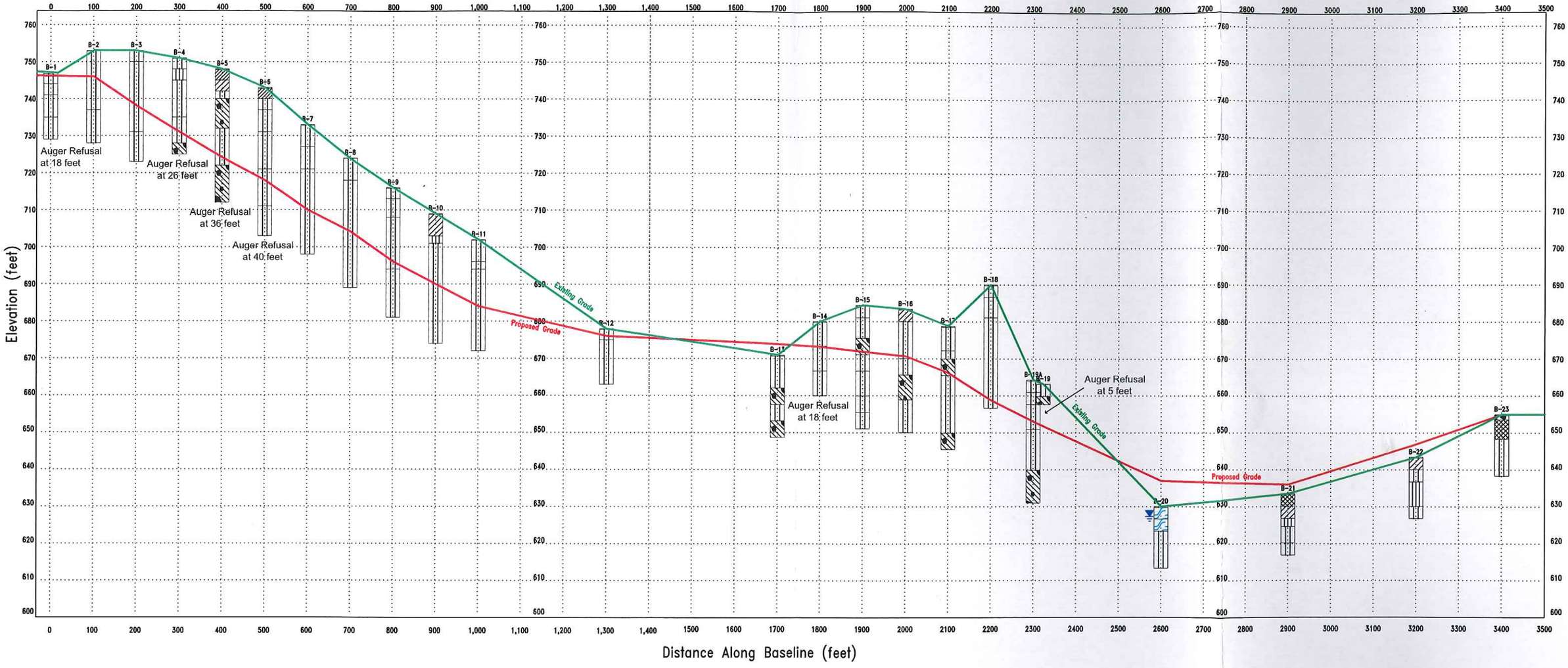

Scale - Graphic	Profile 1: Parkway Boulevard Extension	Parkway Boulevard Extension Athens, Georgia Geo-Hydro Project Number 150329.20

B-1 Test Boring Record

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Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/12/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **747**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
745	0			Topsoil (Approximately 2 inches)	
				Firm brown silty fine sand (SM) (RESIDUUM)	13
	5			Firm orange-brown silty fine sand (SM) with clay	14
740				Loose brown micaceous silty fine sand (SM)	9
	10				6
735				Very firm brown micaceous silty fine sand (SM)	
	15				22
730				Auger Refusal at 18 feet	
	20				
725					
	25				
720					
	30				
715					
	35				
710					
	40				
705					
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO.HYDRO.GDT 6/25/15

B-2

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/12/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **753**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **BI**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
753	0			Topsoil (Approximately 2 inches)	
750	3			Loose to firm red-tan to brown micaceous silty fine sand (SM) (RESIDUUM)	9
	5				12
745	8				7
	10				9
740	13				
	15				7
735	18			Firm to very firm brown highly micaceous silty fine sand (SM)	
	20				15
730	23				
	25			Boring Terminated at 25 feet	26
725	28				
	30				
720	33				
	35				
715	38				
	40				
710	43				
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-3

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/12/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **753**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
753	0			Topsoil (Approximately 2 inches)	
750	3			Firm red-tan silty fine to coarse sand (SM) with rock fragments (RESIDUUM)	20
	5			Very firm to firm red-orange to brown slightly micaceous silty fine sand (SM)	26
745					21
	10				28
740					
	15				19
735					
	20				14
730				Dense to very firm orange to brown slightly micaceous silty fine sand (SM)	
	25				31
725					
723	30			Boring Terminated at 30 feet	19
720	35				
715					
	40				
710					
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-4

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/11/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **751**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
750	0			Topsoil (Approximately 2 inches)	
				Firm tan-brown silty fine to medium sand (SM) (RESIDUUM)	20
	5			Very stiff red-tan fine sandy silt (ML)	16
745					
				Firm to loose brown slightly micaceous silty fine to medium sand (SM) with rock fragments	14
	10				7
740					
	15				8
735				Dense brown silty fine to coarse sand (SM)	
	20				35
730					
	25			Partially weathered rock - No Sample Recovered	50/1"
725				Auger Refusal at 26 feet	
	30				
720					
	35				
715					
	40				
710					
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-5

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/11/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **748**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N	Standard Penetration Test (Blows/Foot)
				Topsoil (Approximately 2 inches)		
745				Stiff red silty clay (CL) (RESIDUUM)	9	
	5			Firm red clayey fine sand (SC)	13	
740				Dense red highly micaceous silty fine sand (SM)	33	
	10			Partially weathered rock sampled as tan-brown silty fine to coarse sand (SM)	50/5"	
735						
	15				50/4"	
730				Firm brown micaceous silty fine sand (SM)		
	20				17	
725						
	25				15	
720				Partially weathered rock sampled as brown and black slightly micaceous silty fine sand (SM)		
	30			No sample recovered at 35 feet	50/3"	
715						
	35				50/0"	
				Auger Refusal at 36 feet		
710	40					
705						
	45					

Standard Penetration Test (Blows/Foot): 0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-6

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/12/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **743**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
740	0			Topsoil (Approximately 2 inches)	
				Firm red silty clay (CL) (RESIDUUM)	8
	5			Firm brown silty fine sand (SM) with clay	11
735				Loose tan to brown highly micaceous silty fine sand (SM)	7
	10				10
730				Very firm brown to tan slightly micaceous silty fine sand (SM)	
	15				26
725					
	20				24
720				Firm to very firm brown micaceous silty fine sand (SM)	
	25				20
715					
	30				24
710				Firm to very firm tan to brown micaceous silty fine sand (SM)	
	35				18
705					
	40			Auger Refusal at 40 feet	22
700					
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-7

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/12/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **733**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
733	0			Topsoil (Approximately 2 inches)	
730	3			Firm orange-brown silty fine to medium sand (SM) (RESIDUUM)	15
	5				18
725	8			Loose to firm tan to brown micaceous silty fine sand (SM)	17
	10				10
720	13			Firm to very firm brown micaceous silty fine sand (SM)	
	15				17
715	18				
	20				14
710	23				
	25				16
705	28				
	30				24
700	33				
	35			Boring Terminated at 35 feet	26
695	38				
	40				
690	43				
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-8

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/11/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **724**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N	Standard Penetration Test (Blows/Foot)
				Topsoil (Approximately 2 inches)		
720	5			Loose to firm red-tan silty fine sand (SM) (RESIDUUM)	10 12	
715	10			Loose to firm brown to tan-brown micaceous silty fine sand (SM)	9 13	
710	15				13	
705	20				18	
700	25				15	
695	30				12	
690	35			Boring Terminated at 35 feet	13	
685	40					
680	45					

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO.HYDRO.GDT 6/25/15

B-9

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/11/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **716**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
715	0			Topsoil (Approximately 2 inches)	
				Firm red-brown silty fine sand (SM) (RESIDUUM)	12
710	5			Firm red to brown slightly micaceous silty fine sand (SM)	15
					13
705	10			Firm white and tan silty fine to coarse sand (SM)	11
700	15				16
695	20				15
690	25			Firm to very firm brown slightly micaceous silty fine sand (SM)	17
685	30				19
680	35			Boring Terminated at 35 feet	22
675	40				
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-10

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/10/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **709**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **BI**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
709	0			Topsoil (Approximately 2 inches)	
				Loose to firm red-tan clayey fine to medium sand (SC) (RESIDUUM)	10
705	5				19
				Stiff red-tan fine sandy silt (ML)	10
700	10			Firm to very firm tan to brown highly micaceous silty fine sand (SM)	12
695	15				14
690	20				16
685	25				29
680	30				24
675	35			Boring Terminated at 35 feet	19
670	40				
665	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-11

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/11/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **702**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
702	0			Topsoil (Approximately 2 inches)	
700	2			Loose to firm silty fine sand (SM) (RESIDUUM)	5
	5				16
695	7			Loose white micaceous silty fine sand (SM)	10
	10			Firm brown slightly micaceous silty fine sand (SM)	12
690					
	15				12
685					
	20				16
680					
	25				20
675					
	30			Boring Terminated at 30 feet	18
670					
	35				
665					
	40				
660					
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-12

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/11/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **678**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
675	0			Topsoil (Approximately 2 inches)	
				Loose brown micaceous silty fine sand (SM) (RESIDUUM)	7
	5			Firm brown to tan-brown micaceous silty fine sand (SM)	11
670					11
	10				11
665					
	15			Boring Terminated at 15 feet	12
660					
	20				
655					
	25				
650					
	30				
645					
	35				
640					
	40				
635					
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-13

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/11/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **671**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **BI**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
670	0			Topsoil (Approximately 2 inches)	
				Loose to firm brown micaceous silty fine sand (SM) (RESIDUUM)	10
665	5				11
					14
				Partially weathered rock sampled as brown micaceous silty fine sand (SM)	50/4"
660	10				
				Very firm brown micaceous silty fine sand (SM)	27
655	15				
				Partially weathered rock sampled as brown micaceous silty fine sand (SM)	50/1"
650	20			Boring Terminated at 20 feet	
645	25				
640	30				
635	35				
630	40				
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-14

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/10/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **680**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Loose to firm red-tan micaceous silty fine sand (SM) (RESIDUUM)	8
675	5				15
				Very firm to dense brown micaceous silty fine sand (SM)	29
670	10				36
				Firm brown micaceous silty fine sand (SM)	
665	15				17
				Auger Refusal at 18 feet	
660	20				
655	25				
650	30				
645	35				
640	40				
635	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-15

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/10/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **684**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Loose brown micaceous silty fine sand (SM) (RESIDUUM)	7
680	5			Firm brown to red-tan silty fine sand (SM)	16
					14
675	10			Partially weathered rock sampled as red and white silty fine to coarse sand (SM)	50/5"
670	15			Loose brown highly micaceous silty fine sand (SM)	7
				Very dense tan-brown micaceous silty fine sand (SM)	
665	20				53
				Very firm brown micaceous silty fine sand (SM)	
660	25				25
				Very dense brown to back micaceous silty fine sand (SM)	
655	30			Boring Terminated at 30 feet	73
650	35				
645	40				
640	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-16

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/10/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **683**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **BI**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
680	0			Topsoil (Approximately 2 inches)	
				Firm red-brown clayey fine sand (SC) RESIDUUM)	9
	5			Loose to firm red-brown slightly micaceous silty fine sand (SM)	14
675					6
	10				8
670				Very firm brown-gray micaceous silty fine sand (SM)	
	15				29
665				Partially weathered rock sampled as orange micaceous silty fine sand (SM)	
	20				50/4"
660				Firm brown to gray silty fine to medium sand (SM)	
	25				20
655					
	30			Boring Terminated at 30 feet	16
650					
	35				
645					
	40				
640					
	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-17

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/10/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **679**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
679	0			Topsoil (Approximately 2 inches)	
				Loose to firm red-brown silty fine sand (SM) (RESIDUUM)	10
675	5				16
				Loose brown micaceous silty fine sand (SM)	8
670	10			Partially weathered rock sampled as gray silty fine to coarse sand (SM)	50/5"
665	15			Firm to very firm brown highly micaceous silty fine sand (SM)	14
660	20				12
655	25				25
				Partially weathered rock sampled as brown silty fine sand (SM)	
650	30			Boring Terminated at 30 feet	50/1"
645	35				
640	40				
635	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-18

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/10/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **690**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
				Topsoil (Approximately 2 inches)	
				Firm brown silty fine to medium sand (SM) (RESIDUUM)	11
685	5			Firm orange-brown silty fine sand (SM)	13
					11
				Firm brown micaceous silty fine sand (SM)	
680	10				13
675	15				14
670	20				15
665	25				12
660	30			Boring Terminated at 30 feet	12
655	35				
650	40				
645	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-19

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/10/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **664**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **BI**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N	Standard Penetration Test (Blows/Foot)
660	5			Very firm silty fine sand (SM) with rock fragments	23	
				Partially weathered rock sampled as brown slightly micaceous silty fine sand (SM)	50/2"	
				Auger Refusal at 5 feet		
				Boring Offset 30 feet south		
655	10					
650	15					
645	20					
640	25					
635	30					
630	35					
625	40					
620	45					

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-19A

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/12/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **665**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
665	0			Topsoil (Approximately 2 inches)	
				Loose brown silty fine to medium sand (SM) with rock fragments (RESIDUUM)	10
660	5			Very dense tan and brown silty fine to coarse sand (SM)	61
				Loose to firm tan and brown micaceous silty fine sand (SM)	17
655	10				10
				Very firm to firm brown micaceous silty fine sand (SM)	
650	15				21
645	20				17
				Partially weathered rock sampled as micaceous silty fine sand (SM)	
640	25				50/5"
635	30			Boring Terminated at 30 feet	50/5"
630	35				
625	40				
620	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-20

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/10/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **2.5 feet**	G.S. Elev: **630**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **2.5 feet**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
		▼		Topsoil (Approximately 2 inches)	
				Stiff brown fine sandy silt (ML) with organics (ALLUVIUM)	12
625	5			Very loose gray highly micaceous silty fine sand (SM) (ALLUVIUM)	2
				Firm gray to brown highly micaceous silty fine sand (SM) (RESIDUUM)	11
620	10				16
615	15			Boring Terminated at 15 feet	16
610	20				
605	25				
600	30				
595	35				
590	40				
585	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-21

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/9/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **633**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **BI**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
633	0			Topsoil (Approximately 2 inches)	
				Very stiff red-brown fine sandy clay (CL) with wood fragments (FILL)	16
630	5			Dense gray-brown clayey fine to medium sand (SC) (RESIDUUM)	42
				Firm tan highly micaceous fine sandy silt (ML)	7
625	10			Very firm brown highly micaceous silty fine sand (SM)	22
				Loose brown highly micaceous silty fine sand (SM)	8
620	15			Boring Terminated at 15 feet	
615	20				
610	25				
605	30				
600	35				
595	40				
590	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-22

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/9/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **643**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **BI**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
640	0			Topsoil (Approximately 2 inches)	
				Loose brown clayey fine sand (SC) (RESIDUUM)	8
	5			Very firm red-tan micaceous silty fine sand (SM)	23
635				Stiff red-tan micaceous fine sandy silt (ML)	11
	10				12
630				Firm to very firm tan-brown highly micaceous silty fine sand (SM)	
	15			Boring Terminated at 15 feet	21
625	20				
620	25				
615	30				
610	35				
605	40				
600	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15

B-23

Test Boring Record

GEO HYDRO ENGINEERS

Project: **Parkway Boulevard Extension**		Project No: **150329.20**
Location: **Athens, Georgia**		Date: **6/12/15**
Method: **HSA- ASTM D1586**	GWT at Drilling: **Not Encountered**	G.S. Elev: **655**
Driller: **B&C (Auto Hammer)**	GWT at 24 hrs: **Not Encountered**	Logged By: **JR**

Elev. (Ft)	Depth (Ft)	GWT	Symbol	Description	N
650	5			Asphalt (Approximately 3 inches) Gravel (Approximately 12 inches) Soft to firm red and brown fine sandy clay (CL) (FILL)	2 5
				No Sample recovered at 2.5 feet	
645	10			Firm red-brown to brown slightly micaceous silty fine to medium sand (SM) (RESIDUUM)	12 17
640	15			Boring Terminated at 15 feet	20
635	20				
630	25				
625	30				
620	35				
615	40				
610	45				

Standard Penetration Test (Blows/Foot)

0 10 20 30 40 50 60 70 80 90 100

Remarks:

TEST BORING RECORD PARKWAY BORINGS.GPJ GEO HYDRO.GDT 6/25/15