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Earth Instrumentation Services



5871 New Peachtree Road
Doraville, GA 30340-1084
Phone: 770/457-9776
Fax: 770/457-9964

June 29, 2018
Project Number: 4976.004.17

Kaizen Collaborative
2390 Main Street
Tucker, Georgia 30084

Attention: Ms. Greta G. deMayo, PLA

RE: Subsurface Exploration
Peachtree Creek Greenway Phase IB
DeKalb County, Georgia


Ladies & Gentlemen:

We have completed our subsurface exploration and are providing our recommendations, together with the results of our field testing and our conclusions based on them. This work was authorized by Ms. Greta G. deMayo, PLA.

If you should have any questions concerning this information, please feel free to call. It has been a pleasure working with you and we look forward to being of continued service to Kaizen Collaborative.

Sincerely,

CHATTAHOOCHEE CONSULTING GROUP, INC.


David W. Maxey, P.E.
Senior Engineer



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**REPORT OF
SUBSURFACE EXPLORATION**

**PEACHTREE CREEK GREENWAY PHASE IB
RETAINING WALL & STRUCTURAL SLAB
ABUTMENTS**

Dekalb County, Georgia

Prepared for:

**KAIZEN COLLABORATIVE
2390 Main Street
Tucker, Georgia 30084**

June 2018

Prepared by:

Chattahoochee Consulting Group, Inc.

Project No. 4976.004.17

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FIGURE 1- Boring Location Plan

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**REPORT OF
SUBSURFACE EXPLORATION**

**Peachtree Creek Greenway Phase IB
Retaining Wall & Structural Slab Abutments**

Dekalb County, Georgia

The findings of this exploration are presented below, together with the analyses and conclusions based on them. The field and exploratory procedures are discussed in the Appendix.

PROJECT CONSIDERATIONS

1. Scope of Work - The purpose of this exploration was to determine the subsurface conditions at the proposed pedestrian bridge abutments and along the proposed retaining walls which will be constructed in conjunction with the Phase IB development of the Peachtree Creek Greenway. The composition and consistencies of the existing overburden soils were explored, as well as the depth to rock and groundwater at each of these areas. Appropriate recommendations are made in this report for the foundation designs.

2. Description of Project - Information for this project was provided by Ms. Greta de Mayo of Kaizen Collaborative and Mr. Jonathan McCaig of the Path Foundation. We understand that the Phase IB of the Peachtree Creek Greenway will run along Peachtree Creek south of Corporate Boulevard. In conjunction with this portion of the trail, a retaining wall is proposed along the southwest side of the trail adjacent to the Salvation Army property. We anticipate that the retaining walls will be cast-in-place concrete cantilevered walls, which will vary in height from less than 2 feet to approximately 9 vertical feet. Additionally, a structural slab crossing is proposed in this area to span across a proposed storm drain outfall. The retaining walls and structural slab crossing are anticipated to be supported on shallow foundations, where the soil conditions allow and on deep foundations where the soils are unsuitable.

3. Limitations - The analyses and recommendations presented in this report are based on the preceding project information, as well as on the result of the exploration. While it is not likely that conditions will differ greatly from those observed in the boring, it is always possible that variations can occur between or away from the borehole locations. If it becomes apparent during construction that soil conditions differing significantly from those discussed in Paragraph (5) are being encountered, this office should be notified at once so that their effects can be determined and any remedial measures necessary be prescribed. Also, should the nature of the project change to a

major degree, these recommendations may have to be re-evaluated. All testing was performed in general compliance with ASTM guidelines. This report has been prepared for the exclusive use of Kaizen Collaborative and their consultants. No other third party beneficiaries may rely on this report without express written approval by CCG, Inc.

SITE CONDITIONS

4. Site Description - The project site is the Peachtree Creek Greenway Phase IB located south of Corporate Boulevard. A pedestrian structural slab crossing is proposed to span approximately 15 linear feet over a proposed storm drain outfall. Additionally, a retaining wall is currently proposed to bench the trail into the existing slope adjacent to the Salvation Army property, extending approximately 625 feet in total length.

The site is located in the Southern Piedmont Physiographic Province of Georgia. This Province is characterized as a broad, gently sloping plateau that decreases in total relief toward the Coastal Plain Province. The Piedmont is intricately dissected by a generally dendritic stream pattern. The topography is generally moderate, but commonly steeper near rivers and small creeks.

According to the mapping of the Georgia Geologic Survey, the rocks that occur in the general vicinity of the site belong to Clairmont Formation of the larger Atlanta Group and consist primarily of gneisses and amphibolites. This is generally consistent with the partially weathered rock materials encountered in the borings. Overlying these rocks are residual, or in-place, soils that have formed as a result of weathering. This weathering is a function of several factors such as mineral composition of the parent rock and degree of natural fracturing. As a result, these residual soils frequently are highly variable in consistency or relative density. Also, they often contain lenses of highly to partially weathered rock of variable sizes which occur at different depths. Residual soils that retain structural characteristics of the parent rocks, such as color and texture, are known as saprolites.

5. Soil Conditions - A total of five (5) hand auger borings were performed at the approximate locations shown on the attached Boring Location Plan of Figure 1. Three borings were performed for the proposed retaining wall and two borings were performed for the proposed structural slab crossing. The borings were located by our project engineer, who performed the hand auger borings and maintained logs of the borings. The boring logs indicate the depths, consistencies and field classification of the soils encountered during the drilling operations. Groundwater levels and any unusual subsurface conditions, if encountered during the drilling operations, are also described on the logs.

Dynamic Cone Penetrometer (DCP) tests were performed at appropriate intervals the borings, where rock fragments and weathered rock were not encountered.

Structural Slab Crossing

Two borings, (B-4 & B-5) were performed for the proposed structural slab crossing southwest of Corporate Boulevard. The borings were performed using hand auger techniques due to access restrictions. These borings encountered similar soils generally consisting of very loose, tan brown alluvial Sands with trace silt and some to trace rock fragments to a depth of approximately 2 to 3 feet below the existing grades. These soils were underlain by firm alluvial Sands with trace silt and some to trace rock fragments to a depth of 4 to 5 feet below existing grades where hand auger refusal on rock fragments or boulders occurred.

Retaining Wall Areas

The remaining borings, (B-1, B-2 and B-3), were performed in the trail section where retaining walls are currently proposed adjacent to the Salvation Army property. The borings were performed using hand auger techniques due to access restrictions. The proposed excavation depth for the walls in this area are 4 to 9 feet below existing grades. These borings encountered similar soils generally consisting of firm, orange brown Silty Sands with trace mica and rock fragments to depths of 2 to 5 feet. These soils were underlain by firm to dense saprolitic Silty Sands with lenses of highly weathered rock in borings B-1 and B-3 to the hand auger refusal depths of 5 to 6 feet below the ground surface.

For more precise details of the soil conditions encountered at each borehole, please refer to the individual boring logs in the Appendix.

6. Groundwater - The borings were dry augured their full depth in an attempt to locate groundwater levels. No groundwater was encountered in borings at the time of drilling. Groundwater levels are subject to seasonal and climatic fluctuations and can change significantly with time.

SEISMIC DESIGN PARAMETERS

7. Site Class - The project site is located in Brookhaven, Dekalb County, Georgia which employs the 2012 International Building Code® (IBC). As part of this Code, the design of structures must consider dynamic forces resulting from seismic events which are dependent upon the magnitude of the earthquake event, as well as the properties of the soils that underlie the site. As part of evaluating seismic forces, the Code requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface.

To define the Site Class for this project, the results of soil test borings drilled for the project site and estimated appropriate soil properties below the base of the borings to a

depth of 100 feet, were interpreted, as permitted by the Code. The estimated soil properties were based upon our experience with subsurface conditions in the general site area.

Based upon the SPT N-values and refusal depths recorded during the field exploration, the subsurface conditions within the site are consistent with the characteristics of a **Site Class “D”** as defined in Table 1613.5.2 of the Code. The associated IBC (2012) probabilistic ground acceleration values and site coefficients for the general site area were obtained from the USGS U.S. Seismic Design Maps Web Application and are presented in the table below:

Peachtree Creek Greenway Ground Motion Values *

Period (sec)	Mapped MCE Spectral Response Acceleration** (g)	Site Coefficients	Adjusted MCE Spectral Response Acceleration (g)	Design Spectral Response Acceleration (g)
0.25	S_s 0.191	F_a 1.6	SM_s 0.305	SD_s 0.203
1.0	S_l 0.091	F_v 2.4	SM_l 0.218	SD_l 0.146

**2% Probability of Exceedence in 50 years for Latitude 33.83859°N and Longitude 84.33362°W*

***At top of bedrock*

MCE = Maximum Considered Earthquake

The Site Coefficients, F_a and F_v presented in the above table were also obtained from the noted USGS webpage, as a function of the site classification and mapped spectral response acceleration at the short (S_s) and 1-second (S_l) periods.

Based on Spectral Response Coefficients SD_s and SD_l above, the Seismic Design Category for this site is **Category C** for Occupancy Categories I, II and III as prescribed by IBC 2012, Tables 1613.3.5(1) and 1613.3.5(2).

STRUCTURAL SLAB FOUNDATION RECOMMENDATIONS

8. General - We understand that a structural slab crossing is proposed southwest of Corporate Boulevard. The proposed crossing will bear at or near the existing grades in the areas of borings B-4 and B-5. Based on the boring data, shallow foundations may adequately support the proposed crossing. Generally, the soils underlying these areas were comprised of very loose to firm alluvial Sands to the hand auger refusal depths of 4 to 4.5 feet below the ground surface. The foundations will be required to bear through the very loose surficial soils to bear at a depth of approximately 3 feet below existing grades. These soils exhibited allowable soil bearing pressures of 1200 pounds-per-square foot (psf).

9. Shallow Foundations - Based on the boring data, shallow foundations may be utilized to support the proposed structural slab crossing abutments. Shallow foundations should bear through the very loose surficial soils to bear at minimum depth of 3 feet below the existing grades

10. Bearing Capacity - Shallow foundations supporting the proposed structural slab crossing should bear in the firm alluvial Sands of Stratum II at an anticipated minimum depth of 3 vertical feet below the existing grades. Maximum allowable bearing pressures of 1200 pounds per square foot are recommended to be used in the design of the proposed structural slab foundations.

RETAINING WALL FOUNDATION RECOMMENDATIONS

11. General – We understand that a retaining wall is proposed along the southwest side of the trail adjacent to the Salvation Army property. The retaining wall is proposed to be 9 feet or less in height and is anticipated to be cast in-place concrete walls. The proposed retaining wall will bear at depths of approximately 6 feet below existing grades in the areas of borings B-1 and B-2 and depths of approximately 9 feet in the area of boring B-3. These borings generally encountered a surficial topsoil layer 3 to 4 inches in thickness, underlain by a stratum of undisturbed residual soils, comprised of firm Silty Sands to a depth of approximately 2 to 5 feet below existing grades. A stratum of firm to dense, saprolitic Silty Sands with lenses of highly weathered rock were penetrated in borings B-1 and B-3 from a depth of approximately 2 feet to where the borings refused on rock fragments at depths of 5 to 6 feet. Shallow foundations should adequately support the retaining wall foundations in these areas. These soils exhibited allowable soil bearing pressures of 2500 pounds-per-square foot (psf).

12. Shallow Foundations - Based on the boring data, shallow foundations may be utilized to support the proposed retaining wall foundations. We anticipate that shallow foundation bearing depths will be 2 feet below the proposed final grades in this area. It should be noted that highly weathered rock lenses and boulders were encountered in the area of the proposed walls and some difficult excavation may be encountered.

13. Bearing Capacity - Shallow foundations supporting the proposed retaining walls are anticipated to bear in the firm to dense saprolitic soils. Maximum allowable bearing pressures of 2500 pounds per square foot are recommended to be used in the design of the proposed wall foundations.

MISCELLANEOUS

14. Settlement - We estimate total settlements for shallow foundations for the retaining wall foundations and structural slab abutments will be in the range of 1 inch. The majority of the estimated settlement should develop during construction and initial

loading. The majority of settlement is anticipated to develop within approximately 60 to 90 days.

15. Retaining Wall Design Parameters - The proposed retaining walls can be categorized as free standing walls which can withstand slight lateral displacement. The free standing walls should be designed for “active” lateral earth pressures. The earth pressure parameters outlined below are based on a wet soil density of 120 pounds per cubic foot (pcf) and an internal soil friction angle ϕ of 30°.

Equivalent Fluid Pressure (Active) soil	40 psf per foot of wall height
Equivalent Fluid Pressure (Passive) soil	300 psf per foot of wall height
Coefficient of Friction (Sands)	0.35
Soil Angle of Internal Friction (ϕ)	30°
Soil Cohesion (c)	0

An equivalent surcharge loading should be applied behind the wall where sloping backfill conditions exist. An appropriate factor of safety should be applied to the above parameters. Proper design and performance of retaining walls depend on properly compacted backfill soils and adequate drainage. The proposed retaining walls are anticipated to be backfilled. Where backfill soils are required we recommend that backfill soils be compacted to a minimum of 95% of the maximum Standard Proctor dry density (ASTM D 698) with a wet density in the range of 110 to 120 pcf. Also, footing drains with proper filtration should be installed.

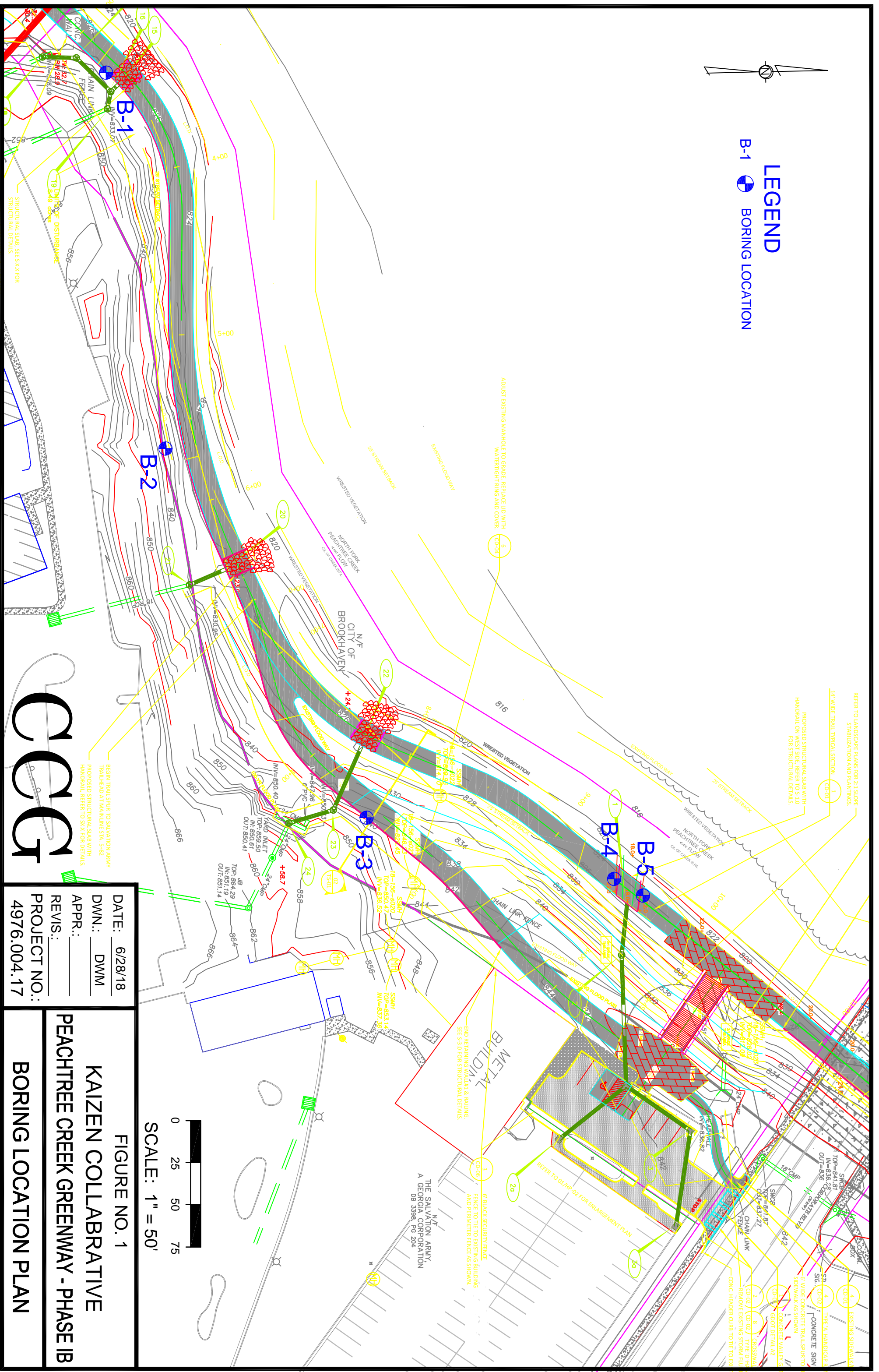
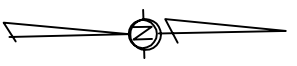
16. Geotechnical Quality Control - We recommend that the following quality control measures be implemented in an effort to avoid unforeseen project costs or delays:

1. Chattahoochee Consulting Group should review all final construction plans to ensure that the geotechnical recommendations are properly implemented.
2. Evaluation of shallow foundation excavations immediately prior backfilling with stone and prior to foundation concrete placement to verify allowable soil bearing pressures.
3. Permanent fill slopes should not exceed 2(H):1(V).
4. Embankment fill should be placed in 6 to 8 inch thick loose lifts and compacted to a minimum of 95% of the appropriate maximum Standard Proctor dry density (ASTM D 698).

17. Consultation - Often, during the final design and/or construction, questions can arise which are not small specifically in the report. These can normally be handled by a brief call or conference with the designers; please feel free to call

LEGEND

B-1 BORING LOCATION



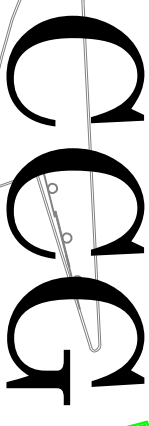
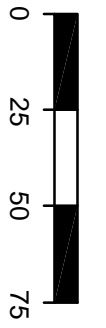
REFER TO LANDSCAPE PLANS FOR 2.1 SLOPE STABILIZATION AND PLANTINGS.
 1A WIDE TRAIL TYPICAL SECTION (CD-09)
 PROPOSED STRUCTURAL SLAB WITH HANDRAIL ON WEST SIDE. REFER TO S.10 FOR STRUCTURAL DETAILS.

4 EXISTING SIDEWALK
 4 THE STANDARD
 CONCRETE SIGN
 6 WIDE CONCRETE TRAIL SPUR TO SIDEWALK AS SHOWN
 1 CONCRETE VALLEY GUT
 2 CONC. GROUT DIAL LAZ
 8 CROSSWALK SIGN
 7 TYPE 'D' FILE BEHIND EXISTING STORM FLE
 CONC. HEADER CURB TO BE EX

REFER TO LANDSCAPE PLANS FOR 2.1 SLOPE STABILIZATION AND PLANTINGS.
 1A WIDE TRAIL TYPICAL SECTION (CD-09)
 PROPOSED STRUCTURAL SLAB WITH HANDRAIL ON WEST SIDE. REFER TO S.10 FOR STRUCTURAL DETAILS.

DATE: 6/28/18
 DWN.: DWM
 APPR.:
 REVIS.:
 PROJECT NO.: 4976.004.17

FIGURE NO. 1
 KAIZEN COLLABRATIVE
 PEACHTREE CREEK GREENWAY - PHASE IB
 BORING LOCATION PLAN



APPENDIX A

FIELD PROCEDURES

FIELD EXPLORATION

General. The Boring Plan of Figure 1 indicates the approximate location of the borings performed on the subject site. The borings were made with hand auger equipment on June 27, 2018. The exploration program consisted of approximately 39.5 linear feet of hand auger borings. Detailed logs of the boring are attached.

Sampling Procedures. In these soil materials, Dynamic Cone Penetrometer tests were performed in general accordance with ASTM Special Technical Publication No. 399. These tests provide a measure of the in-situ characteristics of the soils similar to the Standard Penetration Test. In this test, a 1.5 inch diameter cone on a 1-3/8 inch diameter "E" rod is driven into the undisturbed soil at the bottom of the borehole with a drop hammer weighing 15 pounds and having a fall of 20 inches. It is first seated 2 inches, then driven an additional 1.75 inch increment. The "Penetration Resistance", called N, is the number of such blows required to drive the cone the final 1.75 inches. It is recorded on the boring logs in the following manner:

(10-12)

where the figures in parentheses indicate the number of blows required for each 2 and 1.75 inch increment, respectively.

APPENDIX B
BORING LOGS



LOG of BORING

Project Name: Peachtree Creek Greenway - Phase IB
Client: Kaizen Collaborative
Location: Brookhaven, Georgia

Project No.: 4976.004.17
Boring No.: B-1
Date: 6/27/2018

Elevation	Description	Depth (feet)	Samples No. Type Blows/Increment	Drilling Observations Hand Auger Boring
G.S.	Topsoil 3"			
	Silty SAND, firm, orange brown, trace mica, dry, non plastic, RESIDUAL	1.0		No groundwater encountered at time of drilling. Note: No DCP Tests performed due to weathered rock lenses. Hand auger refusal at 6 feet in highly weathered rock.
		2.0		
	Silty SAND, dense, orange brown, trace mica, mica, rock lenses, dry, non plastic, SAPROLITE	3.0		
		4.0		
		5.0		
		6.0		
	Hand Auger Refusal @ 6'	7.0		
		8.0		
		9.0		
		10.0		
		11.0		
		12.0		
		13.0		
		14.0		
				LEGEND
				DCP=Dynamic Cone Penetrometer GS= Ground Surface



LOG of BORING

Project Name: **Peachtree Creek Greenway - Phase IB**
 Client: **Kaizen Collaborative**
 Location: **Brookhaven, Georgia**

Project No.: **4976.004.17**
 Boring No.: **B-2**
 Date: **6/27/2018**

Elevation	Description	Depth (feet)	Samples No. Type Blows/Increment	Drilling Observations Hand Auger Boring	
G.S.	Topsoil 3"				
	Silty SAND, firm, orange brown, trace mica, rock fragments, dry, non plastic, RESIDUAL	1.0		No groundwater encountered at time of drilling.	
		2.0			
			1 DCP 7-8		
		3.0			
		4.0			
			2 DCP 8-12		
		5.0			
		Hand Auger Refusal @ 5'	6.0		
			7.0		
			8.0		
	9.0				
	10.0				
	11.0				
	12.0				
				<p>LEGEND</p> <p>DCP=Dynamic Cone Penetrometer GS= Ground Surface</p>	
		13.0			
		14.0			



LOG of BORING

Project Name: **Peachtree Creek Greenway - Phase IB**
 Client: **Kaizen Collaborative**
 Location: **Brookhaven, Georgia**

Project No.: **4976.004.17**
 Boring No.: **B-3**
 Date: **6/27/2018**

Elevation	Description	Depth (feet)	Samples No. Type Blows/Increment	Drilling Observations Hand Auger Boring
G.S.	Topsoil 4"			
	Silty SAND, firm, tan, orange brown, trace mica, rock fragments, moist to dry, non plastic, RESIDUAL	1.0		No groundwater encountered at time of drilling. Note: Boring offset twice with hand auger refusal at 3 to 4 feet. Hand auger refusal at 6 feet in highly weathered rock.
		2.0		
	Silty SAND, firm, orange orange brown, trace mica, mica, rock lenses, dry, non plastic, SAPROLITE		1 DCP 13-14	
			2 DCP 10-8	
		3.0	1 DCP 14-15	
		4.0	2 DCP 8-12	
	Hand Auger Refusal @ 5'	5.0		
		6.0		
		7.0		
		8.0		
		9.0		
		10.0		
		11.0		
		12.0		
		13.0		
		14.0		
				LEGEND DCP=Dynamic Cone Penetrometer GS= Ground Surface



LOG of BORING

Project Name: **Peachtree Creek Greenway - Phase IB**
 Client: **Kaizen Collaborative**
 Location: **Brookhaven, Georgia**

Project No.: **4976.004.17**
 Boring No.: **B-4**
 Date: **6/27/2018**

Elevation	Description	Depth (feet)	Samples	Drilling Observations
G.S.	Topsoil 0"		No. Type Blows/Increment	Hand Auger Boring
	SAND, very loose, tan brown, trace silt, rock fragments, moist, non plastic, ALLUVIUM	1.0		No groundwater encountered at time of drilling.
		2.0	1 DCP 5-2	
	SAND, firm, tan brown, trace silt, rock fragments, moist, non plastic, ALLUVIUM	3.0		Hand auger refusal at 4.25 feet on rock fragment.
		4.0	2 DCP 14-16	
		4.25	3 DCP 17-18	
	Hand Auger Refusal @ 4.25'	5.0	2 DCP 15-11	
		6.0		
		7.0		
		8.0		
		9.0		
		10.0		
		11.0		
		12.0		
		13.0		
		14.0		
				LEGEND
				DCP=Dynamic Cone Penetrometer GS= Ground Surface



LOG of BORING

Project Name: **Peachtree Creek Greenway - Phase IB**
 Client: **Kaizen Collaborative**
 Location: **Brookhaven, Georgia**

Project No.: **4976.004.17**
 Boring No.: **B-5**
 Date: **6/27/2018**

Elevation	Description	Depth (feet)	Samples	Drilling Observations
G.S.	Topsoil 0"		No. Type Blows/Increment	Hand Auger Boring
	SAND, very loose, tan brown, trace silt, rock fragments, moist, non plastic, ALLUVIUM	1.0		No groundwater encountered at time of drilling. Note: Boring offset three times with hand auger refusal at 2 to 4 feet. Hand auger refusal at 4.5 feet on rock fragment.
		2.0	1 DCP 12-13	
	SAND, firm, tan brown, trace silt, rock fragments, moist, non plastic, ALLUVIUM	3.0		
		4.0	2 DCP 12-14	
		4.5	2 DCP 14-14	
	Hand Auger Refusal @ 4.5'	5.0		
		6.0		
		7.0		
		8.0		
		9.0		
		10.0		
		11.0		
		12.0		
		13.0		
		14.0		
				LEGEND DCP=Dynamic Cone Penetrometer GS= Ground Surface