Consulting Geotechnical Engineers
Environmental Science
Construction Management & Inspection
Construction Materials Testing
Hydrogeology/Groundwater Monitoring
Earth Instrumentation Services

CCG

5871 New Peachtree Road
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Phone: 770/457-9776
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August 13, 2018
Project Number: 4976.002.18

Kaizen Collaborative
2390 Main Street
Tucker, Georgia 30084

Attention: Ms. Greta G. deMayo, PLA

RE: Subsurface Exploration
Briarwood Road Retaining Walls
Peachtree Creek Greenway
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.

William T. Sheppard /PD

William T. Sheppard
Project Engineer

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REPORT OF SUBSURFACE EXPLORATION

BRIARWOOD ROAD RETAINING WALLS

Dekalb County, Georgia

Prepared for:

KAIZEN COLLABORATIVE
2390 Main Street
Tucker, Georgia 30084

August 2018

Prepared by:

Chattahoochee Consulting Group, Inc.

Project No. 4976.002.18

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REPORT OF
SUBSURFACE EXPLORATION

BRIARWOOD ROAD
RETAINING WALLS

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 in the area of the proposed retaining walls which will be constructed in conjunction with the Briarwood Road Trailhead 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. We understand that the retaining walls will be constructed along the path below the parking lot at the Briarwood Road Trailhead. We anticipate that the retaining walls will be cast-in-place concrete cantilevered walls, which will be up to 10 vertical feet high. The retaining walls 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 at the proposed trailhead for the Peachtree Creek Greenway, located along the west side of Briarwood Road adjacent to the north side of the creek. We understand that retaining walls will be constructed along the path, below the parking lot for the trailhead. At the time of this evaluation, the area of the proposed retaining walls was wooded and sloped sharply upward from an existing gravel road constructed to access the sewer easement. A second cleared access road is present just below the area of the proposed path and parking lot.

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 three (3) hand auger borings were performed at the approximate locations requested as shown on the attached Boring Location Plan of Figure 1. 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.

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

The borings encountered similar soils generally consisting of a surficial stratum of loose, rocky, organic laden Sands to depths of 18 to 36 inches below the existing grades. These loose Sands were underlain by apparent hard rock where the borings refused at depths of 18 to 36 inches below existing grades. Several offset borings were performed at each location, which encountered similar soils and refusal depths.

6. Groundwater - The borings were dry augured their full depth in an attempt to locate groundwater levels. No groundwater was encountered in the 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:

Briarwood Road Retaining Walls 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_1 0.091	F_v 2.4	SM_1 0.218	SD_1 0.146

**2% Probability of Exceedence in 50 years for Latitude 33.842002°N and Longitude 84.32216°W*
***At top of bedrock*
MCE = Maximum Considered Earthquake

The Site Coefficients, Fa and Fv 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 (Ss) and 1-second (S1) periods.

Based on Spectral Response Coefficients *SDs* and *SD1* 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).

RETAINING WALL FOUNDATION RECOMMENDATIONS

8. General – We understand that retaining walls are proposed along the path below the parking lot at the Briarwood Road trailhead. The retaining walls are proposed to be up to 10 feet in height and are anticipated to be cast in-place concrete walls. The proposed retaining walls are anticipated to bear 1 to 2 feet below the existing grades. The borings generally encountered a surficial layer of rocky, organic laden Sands underlain by apparent competent rock at depths of 18 to 36 inches below the existing grades. Shallow foundations should adequately support the retaining wall foundations in these areas. The soils exhibited allowable soil bearing pressures of 2500 pounds-per-square foot (psf), while the underlying rock and partially weathered rock exhibited bearing pressures of 4000 psf.

9. Shallow Foundations - Based on the boring data, shallow foundations may be utilized to support the proposed retaining wall foundations. The shallow foundation should bear through the loose upper soils in the underlying rock materials at anticipated depths of 18 to 36 inches below the existing grades. It should be noted that hard rock materials encountered in the area of the proposed walls creates the potential for difficult excavation. Ripping of partially weathered and fractured rock, as well as the use of a pneumatic chipping hammer and isolated blasting could be required to reach proposed foundation grades and to level foundation excavations. If soft or unsuitable soils are encountered, these materials should be excavated to suitable bearing soils and the undercut areas backfilled with crushed stone. Due to the limited boring data, we recommend that test pits be performed to verify the depth to suitable soils.

10. Bearing Capacity - Shallow foundations supporting the proposed retaining walls are anticipated to bear in the firm saprolitic soils or partially weathered to competent rock. We recommend that the walls be designed for two bearing conditions; foundations supported by firm residual soils should be proportioned for maximum allowable bearing pressures of 2500 pounds per square foot (psf) and foundations bearing on partially weathered to competent rock are recommended to be designed for maximum allowable bearing pressures of 4000 psf.

MISCELLANEOUS

11 Settlement - We estimate total settlements for shallow foundations for the retaining wall foundations will be in the range of 0.5 inch. The majority of the estimated

settlement should develop during construction and initial loading and is anticipated to develop within approximately 60 to 90 days.

12. 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 and soils parameters outlined below are recommended based on the boring data.

Equivalent Fluid Pressure (Active) soil	40 psf per foot of wall height
Equivalent Fluid Pressure (Passive) soil	270 psf per foot of wall height
Coefficient of Friction (Sands)	0.45
Soil Angle of Internal Friction (Ø)	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 also 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.

13. 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.

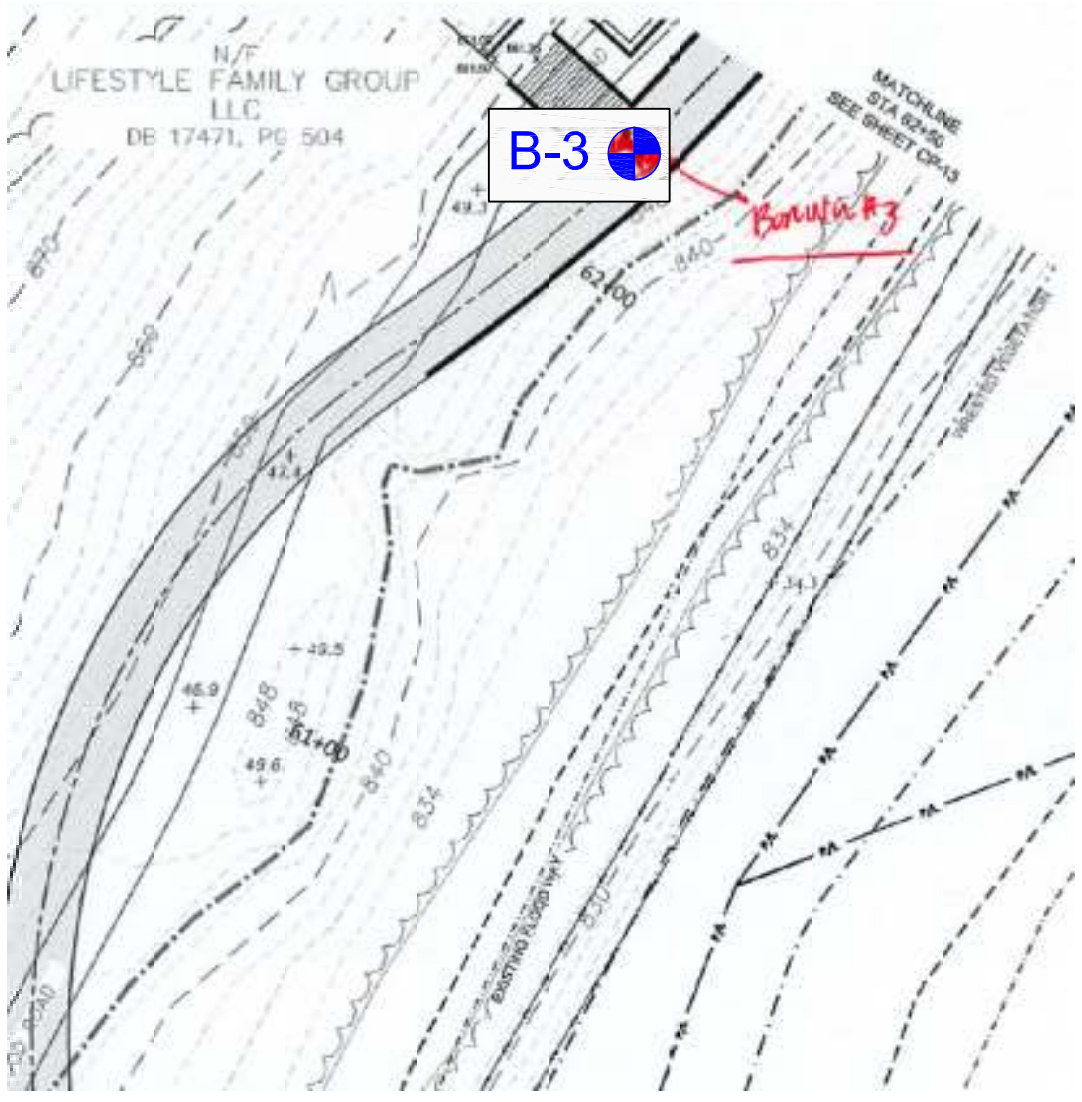
2. Evaluation of test pits prior to foundation excavations to verify the depth to suitable bearing materials and the allowable soil bearing pressures.

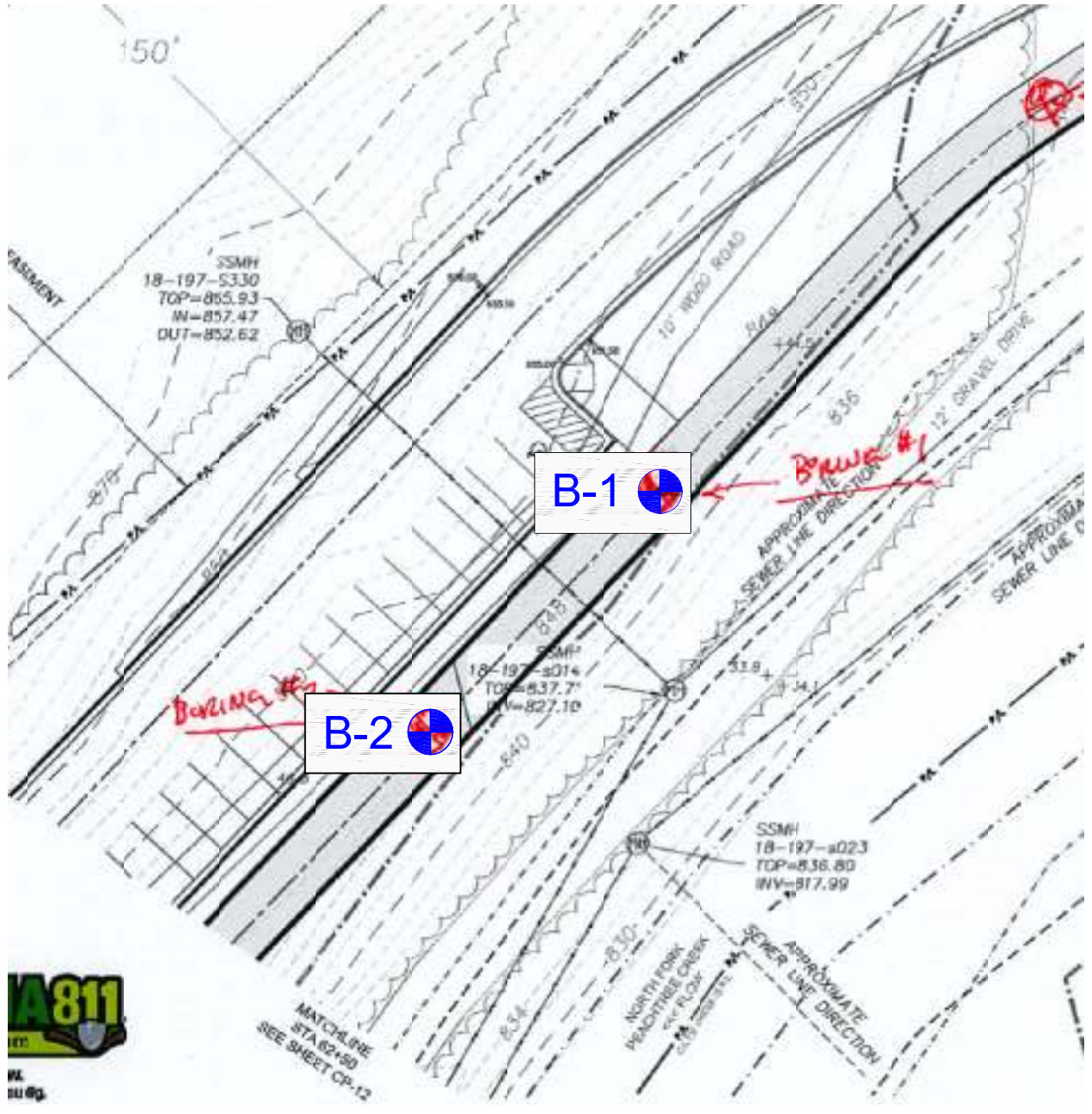
3. Evaluation of shallow foundation excavations immediately prior backfilling with stone and/or prior to foundation concrete placement to verify allowable soil bearing pressures.

4. Permanent fill slopes should not exceed 2(H):1(V).

5. 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).

14. 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

NOT-TO-SCALE

CCG

DATE:	8/10/18
DWN.:	WTS
APPR.:	
REVIS.:	
PROJECT NO.:	4976.002.18

FIGURE NO. 1

KAIZEN COLLABORATIVE
BRIARWOOD ROAD

BORING LOCATION PLAN