June 28, 2016

Civil & Environmental Consultants, Inc. (CEC)
Attn: Mr. Guy Wantiez, P.E.
308 Cates Street
Maryville, Tennessee 37801

Subject: Interim Report of Subsurface Exploration
Five Points Phase II
Knoxville, Tennessee
ETS Project Number 16-112

Dear Mr. Wantiez:

This reports represents our Interim Report of Subsurface Exploration for Five Points Phase II in Knoxville, Tennessee. Our services were performed in general accordance with the terms and conditions in our Proposal 16-28 dated June 16, 2016.

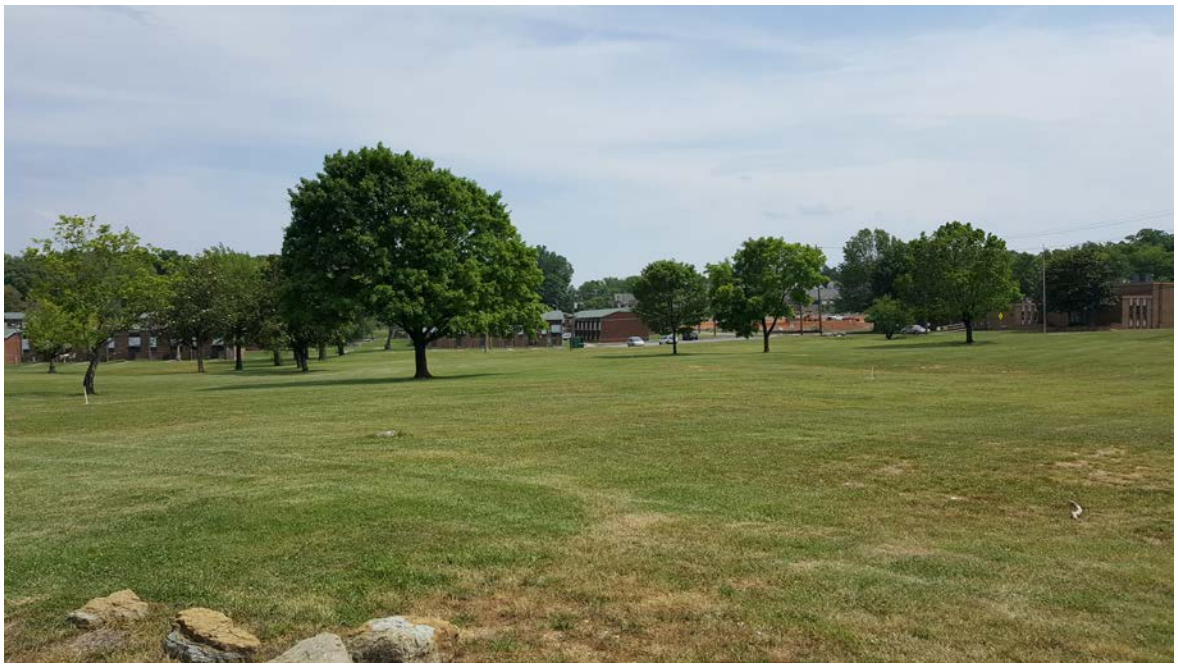
The purpose of this interim report was to determine general subsurface conditions as they are related to engineering properties and submit our preliminary data to aid in the bidding process for the proposed roadways and infrastructure. This report presents our prelim findings of subsurface conditions. Our formal report will be issued upon completion of drilling services and laboratory test results.

An assessment of site environmental conditions was beyond the scope of our services.

Project Description

The proposed development is located at the intersection of Martin Luther King Jr. Avenue and McConnell Street. The site is bound on the north by South Olive Street, on the east by Bethel Avenue, and on the west by Martin Luther King Avenue. The property is generally grass covered with some existing area drains throughout. Elevations range from about 925 feet to 950 feet across the site.

This interim report is regarding new roadway infrastructure that will be constructed. The roadway will connect South Olive Street with McConnell Street just west of the existing housing development. There will also be new connector road from S. Olive Street and Ben Hur Avenue.



View of proposed development area

Geological Conditions

The project site lies in the eastern portion of the Valley and Ridge Province. Review of the Knoxville Geologic Quadrangle indicates this site is geologically mapped to be underlain by Ottosee Shale. Ottosee Shale is a mixture of shale, limestone, some siltstone, and sandstone, and marble. Within a limited area, any one of these lithogic types may dominate a particular section. In the Knoxville Quadrangle, the Ottosee is mainly shale.

Subsurface Conditions

A total of twelve soil test borings were requested for the proposed roadways and infrastructure. Due to utility conflicts, soil test boring B-7 was eliminated from our scope.

Subsurface conditions encountered at the boring locations are shown on the Soil Test Boring Records in Appendix B. The Soil Test Boring Records represent our interpretation of the subsurface conditions based on the field logs and visual examination of the field samples by our engineer. The lines designating the interfaces between various strata on the Soil Test Boring Records represent the approximate interface locations. The elevations listed should be considered approximate, as they were obtained by superimposing our boring locations on the provided preliminary site plan.

All borings were extended to their predetermined termination depths except boring B-12. Boring B-12 encountered auger refusal at a depth of about 16 feet.

Our soil test borings encountered fill soils and residual soils. Fill soils are soils that have been transported to their current location by man. Residual soils are soils that have developed from the in place weathering of the parent bedrock.

Fill soils generally consisting of a tan brown silty clay with rock fragments and occasional cinders/organics was encountered in a majority of our initial soil test borings. The depth of fill varied from about 2 feet to 3.5 feet. No documentation regarding placement of the fill soils has been provided. Standard Penetration Test (SPT) N values for the fill soils ranged from 5 to 16 blows per foot (bpf) indicating firm to very stiff consistencies. Moisture contents for the fill ranged from 14.6 percent to 28.1 percent.

Residual soils were penetrated in all soil test borings. The residual soils generally consisted of an orange brown silty/shaley clay. N values for the residuum ranged from 5 to 20 indicating firm to very stiff consistencies. Natural moisture contents for the residual soils varied from 18.9 percent to 34.3 percent.

Groundwater was not observed within our test borings at the time of drilling. We note, the borings were backfilled upon completion of drilling activities and therefore, long-term readings were not obtained.

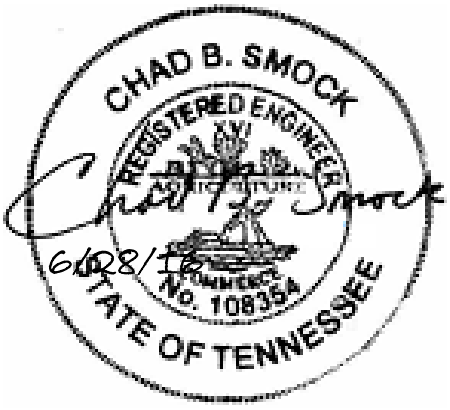
Limitations and basis of recommendations

This interim report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. Our findings are based upon standards of our practice in this area at the time this report is prepared.

Regardless of the thoroughness of a geotechnical exploration, there is always a possibility that conditions between test borings will differ from those at specific test boring locations and that conditions will not be as anticipated by the designers or contractors. In addition, the construction process may itself alter soil conditions. Therefore, experienced geotechnical personnel should observe and document the construction procedures used and the conditions encountered. Unanticipated conditions and inappropriate procedures will be reported to the design team, along with timely recommendations to solve the problems created. We recommend the owner retain ETS to provide this service, based upon our familiarity with the subsurface conditions, the project design and the intent of the recommendations.

We appreciate the opportunity to perform these services and are available to discuss any questions concerning this interim report. As previously mentioned, our final report will be issued upon completion of field work and laboratory testing.

Sincerely,
ENGINEERING & TESTING SOLUTIONS, LLC



Trenton D. Smith, E.I.
Staff Professional

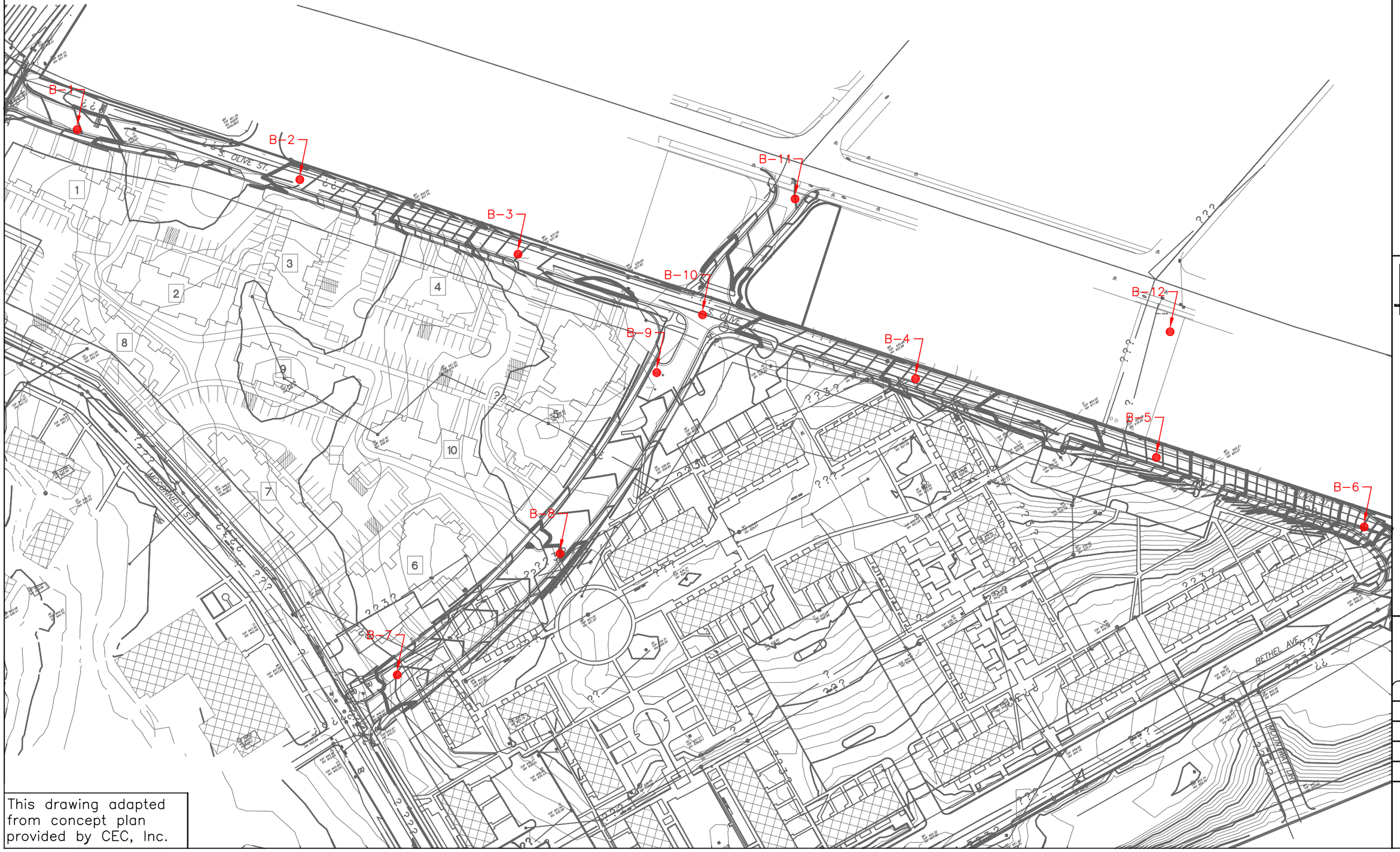
Chad B. Smock, P.E.
Principal

Attachments

- Boring Location Plan Interim
- Soil Test Boring Records (B-1 through B-12)

BORING LOCATION PLAN

BORING LOCATION PLAN INTERIM
FIVE POINTS PHASE II
KNOXVILLE, TENNESSEE
ETS PROJECT 16-112



This drawing adapted from concept plan provided by CEC, Inc.

ENGINEERING & TESTING SOLUTIONS
geotechnical and construction materials consultants
Sevierville, TN 865.428.4468
Knoxville, TN 865.474.6200
www.ets-tn.com

● BORING LOCATION

DRAWN	TDS
CHECKED	CBS
DATE	6/24/16
SCALE	1"=100' ON 11X17
JOB NO.	16-112

BLP

FIELD EXPLORATORY PROCEDURES
BORING KEY SHEET
BORING LOGS

FIELD EXPLORATORY PROCEDURES

Soil Test Boring (Hollow Stem)

All boring and sampling operations were conducted in general accordance with ASTM D 1586. The borings were advanced by mechanically twisting continuous steel hollow-stem auger flights into the ground. At regular intervals, soil samples were obtained with a standard 1.4-inch I.D., 2-inch O.D., split-tube sampler. The sampler was first seated 6 inches to penetrate any loose cuttings and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot of penetration was recorded and is designated the "standard penetration resistance (SPT)." Proper evaluation of the penetration resistance provides an index to the soil's strength, density, and ability to support foundations.

Representative portions of the soil samples obtained from the split-tube sampler were sealed in bags and transported to our laboratory, where they were examined by our engineer to verify the driller's field classifications. Test Boring Records are attached, graphically showing the soil descriptions and penetration resistances.

BORING LOG KEY SHEET

LEGEND TO SOIL AND ROCK SYMBOLS

	TOPSOIL		ASPHALT / GRAVEL
	SILTSTONE		ALLUVIAL
	BEDROCK		RESIDUAL
	DOLOMITE		COLLUVIAL
	LIMESTONE		FILL

DRILLING SYMBOLS

	water table @ time of drilling	spt	split spoon sample
	water table, 24 hours	ud	undisturbed sample

Correlation of Penetration Resistance to Consistency and Relative density

Silts & Clays		Sands & Gravels	
N Value	consistency	N Value	relative density
0-2	very soft	0-4	very loose
3-4	soft	5-10	loose
5-8	firm	11-30	firm
9-15	stiff	31-50	dense
16-30	very stiff	50+	very dense
31-50	hard		
50+	very hard		

Particle Size Identification

Silts & Clays	Less than 0.075 mm
Fine Sand	0.075 mm to 0.425 mm
Medium Sand	0.425 mm to 2.00 mm
Coarse Sand	2.00 mm to 4.75 mm
Fine Gravel	4.75 mm to 19.0 mm
Coarse Gravel	19.0 mm to 75 mm
Cobbles	75 mm to 300 mm
Boulders	Greater than 300 mm

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS (SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS)	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf)	Lab Results % M	LL	PI
0	Asphalt / Stone		949									
	Stiff tan brown silty/shaley clay - Residual			spt	6	5	9	14		30.9		
5			944	spt	4	6	6	12		34.3		
	Boring Terminated @ 5.5 ft											
10			939									
15			934									
20			929									
25			924									
30			919									

SPT (bpf) scale: 5 10 15 20 25 30

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-1**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf)	Lab Results % M	LL	PI
0	Asphalt / Stone		951									
	Stiff orange brown and yellow brown silty clay - Residual			spt	5	4	6	10				
5			946	spt	4	5	7	12				
	Boring Terminated @ 5.5 ft											
10			941									
15			936									
20			931									
25			926									
30			921									

SPT (bpf) axis: 5 10 15 20 25 30

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

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SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-2**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf)	Lab Results % M	Lab Results LL	Lab Results PI
0	Asphalt / Stone		937									
	Slightly stiff black clay with some cinders and trace of organics - Fill			spt	5	5	6	11		19.2		
5	Stiff orange brown silty clay - Residual		932	spt	4	5	7	12		29.8		
	Boring Terminated @ 5.5 ft											
10			927									
15			922									
20			917									
25			912									
30			907									

SPT (bpf) axis: 5 10 15 20 25 30

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-3**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf)	Lab Results % M	LL	PI
0	Asphalt / Stone		928									
	Firm to stiff yellow brown shaley clay - Residual			spt	5	4	5	9				
5			923	spt	5	7	9	16				
	Boring Terminated @ 5.5 ft											
10			918									
15			913									
20			908									
25			903									
30			898									

SPT (bpf) scale: 5 10 15 20 25 30

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-4**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf)	Lab Results % M	LL	PI
0	Asphalt / Stone		928									
	Firm black clay with some organics and traces of cinders - Fill			spt	3	2	3	5				
5	Firm tan brown silty clay with shale - possible residuum		923	spt	2	2	4	6				
	Boring Terminated @ 5.5 ft											
10			918									
15			913									
20			908									
25			903									
30			898									

SPT (bpf) axis: 5 10 15 20 25 30

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-5**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf)	Lab Results % M	LL	PI
0	Asphalt / Stone		950									
	Firm black clay with rock fragmnets - Fill			spt	5	5	6	11				
5	Very stiff orange brown and brown shaley clay - Residual		945	spt	5	7	10	17				
	Boring Terminated @ 5.5 ft Note: N value for spt 1 judged to be inflated by rock fragments											
10			940									
15			935									
20			930									
25			925									
30			920									

SPT (bpf) axis: 5 10 15 20 25 30

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-6**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS	LEGEND	ELEV	SAMPLES TYPE	SAMPLES BLOWS 1st 6"	SAMPLES BLOWS 2nd 6"	SAMPLES BLOWS 3rd 6"	SAMPLES N VALUE	SPT (bpf)	Lab Results % M	Lab Results LL	Lab Results PI
0	Note: Boring B-7 omitted from drilling scope due to utility conflict.		944						5 10 15 20 25 30			
5			939									
10			934									
15			929									
20			924									
25			919									
30			914									

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-7**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS (SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS)	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf)	Lab Results % M	LL	PI
0	Asphalt / Stone		939									
	Stiff tan brown silty/sandy clay with traces of cinders - Fill			spt	9	8	8	16		14.6		
5	Stiff orange brown silty clay - Residual		934	spt	5	7	8	15		29.1		
	Boring Terminated @ 5.5 ft											
10			929									
15			924									
20			919									
25			914									
30			909									

SPT (bpf) axis: 5 10 15 20 25 30

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-8**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf)	Lab Results % M	LL	PI
0	grass / topsoil		937									
	Stiff orange brown silty clay - Fill			spt	6	7	9	16		28.1		
	Very stiff orange brown to tan brown shaley clay - Residual											
5			932	spt	7	9	11	20		27.2		
	Boring Terminated @ 5.5 ft											
10			927									
15			922									
20			917									
25			912									
30			907									

SPT (bpf) axis: 5 10 15 20 25 30

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-9**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf) 5 10 15 20 25 30	Lab Results % M	LL	PI
0	Asphalt / Stone		935									
	Loose rock fragments with asphalt pieces - Fill			spt	5	5	6	11				
5	Stiff orange brown shaley clay - Residual		930	spt	4	5	7	12				
	Boring Terminated @ 5.5 ft											
10			925									
15			920									
20			915									
25			910									
30			905									

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-10**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS	LEGEND	ELEV	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf) 5 10 15 20 25 30	Lab Results % M	LL	PI
0	Grass / rootzone		932									
	Stiff to very stiff orange brown shaley clay - Residual			spt	4	6	7	13				
5			927	spt	5	9	10	19				
	Boring Terminated @ 5.5 ft											
10			922									
15			917									
20			912									
25			907									
30			902									

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

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SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-11**

ETS PROJECT NO. 16-112

ENGINEERING AND TESTING SOLUTIONS

DEPTH	SOIL DESCRIPTION AND REMARKS (SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS)	LEGEND	DEPTH	SAMPLES TYPE	BLOWS 1st 6"	BLOWS 2nd 6"	BLOWS 3rd 6"	N VALUE	SPT (bpf)	Lab Results % M	LL	PI
0	Grass / rootzone		0									
	Stiff grey brown silty clay with organics - Fill			spt	5	5	6	11		18.2		
5	Firm tan brown silty clay with shale - Possible residuum		-5	spt	3	2	3	5		22.2		
				spt	3	3	5	8		18.9		
10	Stiff tan brown and grey brown silty clay with completely weathered shale - Residual		-10	spt	4	4	7	11		24.9		
15			-15	spt	6	21	50+	50+		28.3		
	Auger Refusal @ 16 ft											
20	Note: No topographic information was available near B-12		-20									
25			-25									
30			-30									

SPT (bpf) axis: 5, 10, 15, 20, 25, 30

Remarks:

Groundwater was not encountered at the time of drilling. Borings were backfilled after drilling. Therefore, long term groundwater depth was not measured.

This is an interpretation of subsurface conditions at the boring location.Subsurface conditions may differ at other times and other locations. The interfaces shown between strata are approximate. Transitions between strata may be gradual.

SOIL TEST BORING RECORD

PROJECT: Five-Points Phase II

DRILLED: 6/23/2016 BORING: **B-12**

ETS PROJECT NO. 16-112