REFERENCE: U-6055

PROJECT: N/A

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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LINE	STATION	PLAN	PROFILE
-L-	12+00 - 14+10	4	N/A
-Y-	10+00 - 10+25	4	N/A
-Y1-	10+70 - 12+52	4	N/A
-Y2-	10+00 - 11+50	4	N/A
-Y3-	10+00 - 12+50	4	N/A
-Y4-	10+55 - 11+94	4	N/A

APPENDICES

APPENDIX	TITLE	SHEETS
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B	HAND AUGER/DCP LOGS	13-17
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *HAYWOOD*

PROJECT DESCRIPTION *INTERSECTION OF PISGAH DR (NC 110), HOLTZCLAW ST, AND LOCUST ST IN THE TOWN OF CANTON*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6055	1	23

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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PERSONNEL

S. SAWYER, P.E.

D. KESTNER

M. BREWER, P.E.

INVESTIGATED BY *ECS SOUTHEAST, LLP*

DRAWN BY *M. BREWER, P.E.*

CHECKED BY *M. WALKO, P.E.*

SUBMITTED BY *ECS SOUTHEAST, LLP*

DATE *SEPTEMBER 2018*

Prepared in the Office of:

ECS SOUTHEAST, LLP
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED
ENGINERING
FIRM # F-1078

NORTH CAROLINA PROFESSIONAL SEAL 026917 ENGINEER MICHAEL J. WALKO

DocuSigned by:
Michael J. Walko
99589EECD3814D9...
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-6055	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	25 MX	50 MX 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45D
- [ ] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [ ] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [ ] -N _____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [X] KESSLER DCP
- [X] CORING MACHINE

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION: FEET

NOTES:

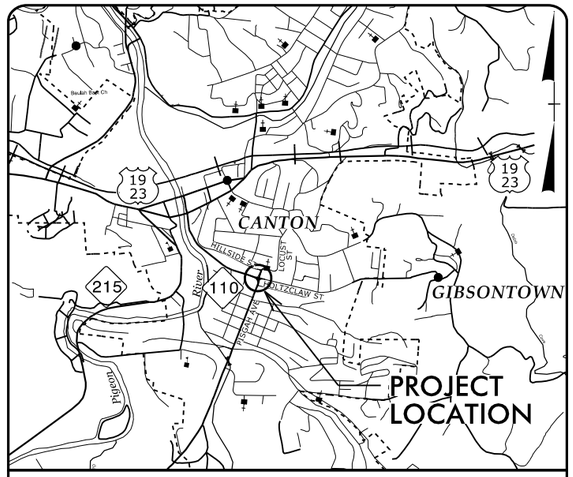
SURVEY INFORMATION AND DESIGN FILES PROVIDED BY TGS ENGINEERS

DATE: 8-15-14

09/08/95

TIP PROJECT: U-6055

See Sheet 1A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

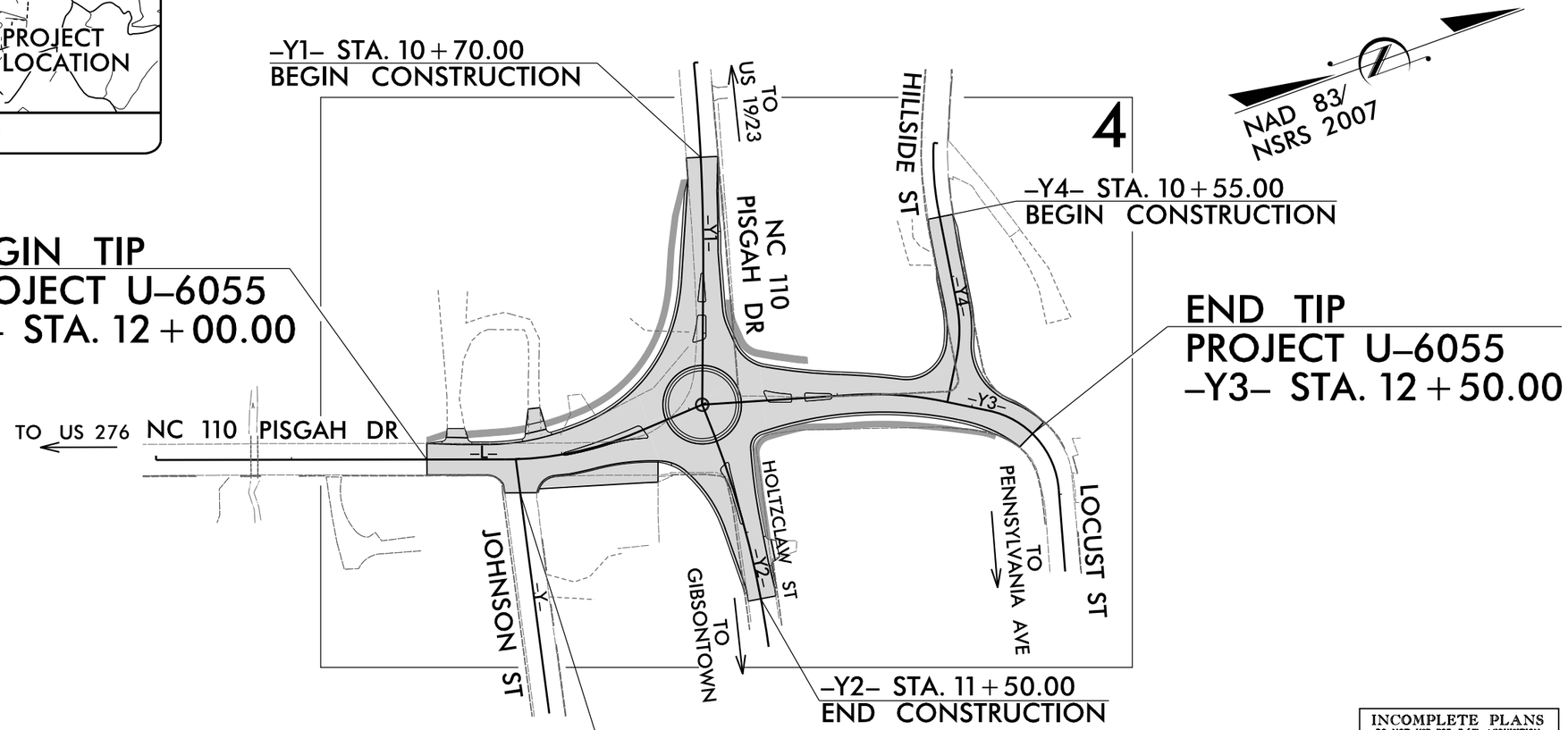
HAYWOOD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6055	1	23

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
47166.1.1		PE

LOCATION: INTERSECTION OF PISGAH DR (NC 110), HOLTZCLAW ST, AND LOCUST ST IN THE TOWN OF CANTON

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND CURB & GUTTER



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF CANTON.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT:

GRAPHIC SCALES

PLANS: 20 10 0 20 40

PROFILE (HORIZONTAL): 20 10 0 20 40

PROFILE (VERTICAL): 4 2 0 4 8

DESIGN DATA

ADT 2019 = 8,100
ADT 2040 = 9,980
V = 30 MPH

FUNC CLASS = URBAN ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–6055 = 0.150 MILES
TOTAL LENGTH TIP PROJECT U–6055 = 0.150 MILES

NCDOT CONTACT: STEVE WILLIAMS

PLANS PREPARED BY:
TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PLANS PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORATION
DIVISION 14
253 WEBSTER RD
SYLVA, NC 28779

RIGHT OF WAY DATE:

LETTING DATE:

2012 STANDARD SPECIFICATIONS

JIMMY L. TERRY, PE
PROJECT ENGINEER

SANDRA G. MELVIN
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

3/23/2017
X:\NCDOT\U-6055\Roadway\Proj\U-6055_Rdy_tsh.dgn
User:smelvin

ECS Southeast, LLP

1812 Center Park Drive, Suite D
Charlotte, NC 28217
T 704.525.5152 I F 704.357.0023
www.ecslimited.com

September 26, 2018

WBS NO: N/A
TIP NO: U-6055
F.A. NUMBER: N/A
COUNTY: Haywood
DESCRIPTION: Intersection of Pisgah Drive (NC 110), Holtzclaw Street, and Locus Street in the Town of Canton

SUBJECT: **Geotechnical Report – Inventory**

Project Description

The project site is at the intersection of Pisgah Drive (NC 110), Holtzclaw Street, and Locus Street in Canton, North Carolina. We understand improvements to intersection will consist of the addition of a traffic circle with lane widening and associated sidewalk, curb, and gutter.

The project consists of the construction of a roundabout with various roadway improvements at the intersection of NC 110 and Pisgah Drive in Canton, North Carolina. The following roads are included as part of this exploration:

Line	Road Name	Station (±)	Offsets
-L-	NC 110/Pisgah Drive	12+00 to 14+10	LT to RT
-Y-	Johnston Street	10+00 to 10+25	LT to RT
-Y1-	NC 110/Pisgah Drive	10+70 to 12+52	LT to RT
-Y2-	Holtzclaw Street	10+00 to 11+50	LT to RT
-Y3-	Locust Street	10+00 to 12+50	LT to RT
-Y4-	Hillside Street	10+55 to 11+94	LT to RT

A geotechnical field investigation was performed by ECS on May 25 & 26, 2017. During this time period, a total of eleven (11) Hand Auger (HA) borings (4 pavement borings, 4 roadway borings, and 3 slope borings) were advanced with a hand auger. Hand auger DCP testing and Kessler DCP testing was performed in general accordance with applicable ASTM standards. Representative soil samples were collected for visual classification in the field and for analysis by ECS's testing laboratory.

A project slope along Hillside Street and Locust Street was encountered at the following locations:

Location	Line	Station (±)	Offsets
Cut Slope	-Y3-	11+81 to 12+50	LT
Cut Slope	-Y4-	10+55 to 11+94	LT

Site Description

The project corridor is comprised mainly of residential and commercial properties. The project is centered around the intersection of Pisgah Drive, Holtzclaw Street and Locust Street. At approximate Station 14+10 -L-, a roundabout will be constructed at the 4-way intersection. From the roundabout, intersection improvements will continue north along Locust Street and west along Hillside Street.

The road elevations along the various alignments are generally sloping and range from approximately 2,661 to 2,611 feet. Soils encountered in the proposed widened areas generally consisted of surficial organic materials underlain by roadway embankment and residual soils. Based on the Roadway Plans provided to us by TGS Engineers, a majority of the widening will occur along -L-, -Y1-, and -Y3-. Mass grading will generally be limited to the existing shoulders and new pavement areas with cut and fill depths on the order of approximately 4 feet or less. The existing slope on -Y3- and -Y4- will be re-graded with a cut of approximately 10 to 14 feet. The slope inclination will be decreased from 1H:1V (existing) to 1.5H:1V.

Areas of Special Geotechnical Interest

1) Artificial Fill: The following areas encountered artificial fill. Artificial fill poses risks associated with undetected deleterious inclusions or soft zones within the fill and/or deleterious materials at the virgin ground/fill interface.

Line	Station (±)	Offsets
-L-	13+50 to 14+50	LT
-Y2-	10+50 to 11+00	RT

2) Moderate to High Plasticity Soils: The following areas contain moderate to high plasticity soils with plasticity indices (PI's) in excess of 25. These soils have the potential to cause subgrade problems during construction, embankment stability or long term settlement problems:

Line	Station (±)	Offsets
-Y2-	10+50 to 11+00	RT

3) Wet or Saturated Soils: The field exploration did not encounter soils with natural moisture contents in excess of the liquid limit or soils below the ground water table. During the field exploration, soils were labeled as wet at the following locations:

Line	Station (±)	Offsets
-Y2-	10+50 to 11+00	RT
-Y4-	11+25 to 11+75	LT

4) Soft/Very Loose Soils: The following areas contain relatively soft or very loose soils that have the potential for subgrade problems, embankment stability or long-term settlement problems during construction:

Line	Station (±)	Offsets
-Y2-	10+50 to 11+00	RT
-Y4-	10+55 11+94	LT

5) Shallow Groundwater: Shallow groundwater was not encountered within six feet of the proposed subgrade elevation at the locations explored on the project.

6) Organic Soil: Soils with little organic content with organic soil thicknesses in excess of 0.3 feet were not encountered at the locations explored on the project.

Physiography and Geology

The site is located in the Coweeta Group of the Blue Ridge Physiographic Province of North Carolina. According the Geological Map of North Carolina, 1985, the Coweeta Group is in the Middle/Late Proterozoic geologic age consisting primarily of Biotite Gneiss (ZYbn) and amphibolite. The parent bedrock was not encountered at the locations and depths explored on the project. The virgin soils encountered are the residual product of in-place chemical weathering of rock that was similar to the rock presently underlying the site.

In general, the topography along a majority of the corridor is sloping. Soils encountered in the project corridor generally consisted of artificial fill soils underlain by residual soils.

Soil Properties

The subsurface conditions discussed below represent the subsurface conditions based on interpretation of the boring data using normally accepted geotechnical engineering judgments. The transitions between different soil strata are usually less distinct than those shown on the Borelogs. Sometimes the relatively small sample obtained in the field is insufficient to definitively describe the origin of the subsurface material. Although individual soil test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of subsurface conditions at other locations or at other times.

Soils within the area of this project have been divided into two categories: artificial fill and residual soils.

Artificial Fill: Artificial fill (A.F.) soils were encountered along the following alignments and at the approximate stationing:

Line	Station (±)	Offsets
-L-	13+50 to 14+50	LT
-Y2-	10+50 to 11+00	RT

The artificial fill encountered generally consisted of loose, brown, moist, silty fine to coarse sand (A-2-4), and very soft to soft, brown, moist to wet, silty clay (A-7-6) and extends to depths of approximately 2.0 feet below existing grades. Laboratory testing indicated a PI of 27 for the A-7-6 soil.

Residual Soils: Residual soils throughout the project corridor are derived from the weathering of the underlying parent bedrock. A majority of the residual soils encountered generally consisted of orange-brown-red, wet, very soft to medium stiff, fine sandy clay (A-6), orange-brown-red, moist, very soft to very stiff, fine sandy, silt (A-4), or orange-brown, moist, loose to medium dense, silty fine sand (A-2-4). Laboratory testing indicated PI's ranging from 7 to 9 for the A-4 soils.

Groundwater Properties

Groundwater levels were measured in the borings both immediately after augering and, where applicable, after a stabilization period of at least 24 hours. At the time of drilling, ground water was not encountered in any of the borings. For safety reasons, several of the borings located in or in close proximity to the roadway were backfilled immediately after augering making stabilized water readings unobtainable.

No geotechnical cross sections or profiles will be included as part of this inventory report.

Respectively submitted,

DocuSigned by:
D. Matthew Brewer
0EAF318632CF43A...

D. Matthew Brewer, P.E.
Senior Project Engineer

DocuSigned by:
Michael J. Walko
99589EECD3814D9...

09/26/18

Michael J. Walko, P.E.
Principal Engineer
N.C. Registration No. 026917

8/17/99

REVISIONS

P:\Projects\U-6055\Plan Prof\U-6055_geo_psh_04.dgn

28-JUN-2017 10:38
J:\2000 PROJECTS\12000-12999\12100\12175 - U-6055 Pisgah Drive Roadway Improvement Project\CADD_GEOTECH\PlanProf\U-6055_geo_psh_04.dgn
$$$$USERNAME$$$$

-L- CURVE DATA
PI Sta 13+08.52
Δ = 22° 57' 33.0" (LT)
D = 22° 55' 05.9"
L = 100.18'
T = 50.77'
R = 250.00'
SE = 02
DS = 25 MPH
① -L-PC 12+57.75
② -L-PT 13+57.93

-Y1- CURVE DATA
PI Sta 10+87.53
Δ = 5° 15' 45.0" (RT)
D = 3° 41' 47.4"
L = 142.36'
T = 71.23'
R = 1,550.00'
SE = NC
DS = 45 MPH

-Y2- CURVE DATA
PI Sta 11+00.02
Δ = 14° 08' 54.6" (RT)
D = 8° 11' 06.4"
L = 172.86'
T = 86.87'
R = 700.00'
SE = 03
DS = 40 MPH
③ -Y2-PC 10+13.15

-Y3- CURVE DATA
PI Sta 11+44.84
Δ = 15° 17' 45.1" (RT)
D = 22° 55' 05.9"
L = 66.74'
T = 33.57'
R = 250.00'
SE = 02
DS = 25 MPH

PI Sta 12+61.87
Δ = 73° 57' 13.4" (RT)
D = 88° 08' 50.5"
L = 83.90'
T = 48.94'
R = 65.00'
SE = EXIST.

-Y4- CURVE DATA
PI Sta 10+24.92
Δ = 14° 12' 20.8" (LT)
D = 28° 38' 52.4"
L = 49.59'
T = 24.92'
R = 200.00'

PI Sta 11+40.70
Δ = 22° 41' 35.3" (RT)
D = 57° 17' 44.8"
L = 39.61'
T = 20.07'
R = 100.00'
SE = 03
DS = 20 MPH

BEGIN CONSTRUCTION
-Y1- STA. 10+70.00

BEGIN CONSTRUCTION
-Y4- STA. 10+55.00

BEGIN TIP
PROJECT U-6055
-L- STA. 12+00.00

END CONSTRUCTION
-Y- STA. 10+25.00

END CONSTRUCTION
-Y2- STA. 11+50.00

END TIP
PROJECT U-6055
-Y3- STA. 12+50.00

MATCHLINE -L- STA. 11+40.00
MATCH TO INSET A

INSET A
MATCHLINE -L- STA. 11+40.00
MATCH TO THIS SHEET

CHADRICK D. PLEMMONS
DB 469 PG 2225

JOHN T. WELLS, SR.
DB 180 PG 554
DB 185 PG 529
DB 226 PG 92

SPENCER LEE REEVES
DB 407 PG 178
W.E. FILE #200E-460

TOWN OF CANTON, N.C.
DB 204 PG 68

RON L. BARBATO
DB 523 PG 173
"TRACT TWO"

GUDGER Y. PALMER
GUDGER Y. PALMER
W.E. FILE #985E-213

GERTRUDE LOGAN
DB 729 PG 1230
DB 429 PG 1285

ROY H. PATTON
DB 118 PG 384
DB 119 PG 4

TOWN OF CANTON, N.C.
DB 473 PG 2545
CONC/ASPHALT PAVING

TOWN OF CANTON, N.C.
DB 386 PG 191

RON L. BARBATO
DB 523 PG 173
"TRACT ONE"

UNKNOWN OWNER
DB 277 PG 771
PIN # 8696-89-8013

LISA C. GREEN
DB 469 PG 362

LISA C. GREEN
DB 458 PG 413

CHARLES F. CALLOWAY
AND WIFE,
CARLYN P. CALLOWAY
DB 119 PG 122

MOUNTAIN REALTY
DB 498 PG 360

JAMES B. COWARD, SR.
DB 241 PG 586

BETTYE CONLEY
DB 407 PG 1214

NAD 83/NSRS 2007

PROJECT REFERENCE NO.	SHEET NO.
U-6055	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
804-C N. LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

FOR ROUNDABOUT LAYOUT SEE SHEET NO. 2B-1
FOR -L-, -Y1- & -Y2- PROFILES, SEE SHEET NO. 5
FOR -Y3- & -Y4- PROFILES, SEE SHEET NO. 6

GEOTECHNICAL BORING REPORT
BORE LOG

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-1	**STATION** 10+66	**OFFSET** 28 ft LT	**ALIGNMENT** -Y4-	**0 HR.** Dry
COLLAR ELEV. 2,673.3 ft	**TOTAL DEPTH** 7.5 ft	**NORTHING** 669,045	**EASTING** 858,829	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/25/17	**COMP. DATE** 05/25/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2675										ELEV. (ft) / DEPTH (ft)
										2,673.3 — 0.0 — GROUND SURFACE
										RESIDUAL Very Soft to Medium Stiff, Wet, Orange-Brown, Fine Sandy CLAY (A-6), with trace organics.
2670										2,669.3 — 4.0 — Stiff, Moist, Orange-Brown, Fine Sandy SILT (A-4).
										2,667.3 — 6.0 — Medium Dense, Moist, Brown, Silty Fine to Coarse SAND (A-2-4).
										2,665.8 — 7.5 — Boring Terminated at Elevation 2,665.8 ft In Residual Silty Fine to Coarse Sand (A-2-4)
										- Hand Auger Refusal at 7.5 feet.

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-2	**STATION** 11+11	**OFFSET** 41 ft LT	**ALIGNMENT** -Y4-	**0 HR.** Dry
COLLAR ELEV. 2,676.1 ft	**TOTAL DEPTH** 6.5 ft	**NORTHING** 669,050	**EASTING** 858,875	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/25/17	**COMP. DATE** 05/25/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2680										
										2,676.1 — 0.0 — GROUND SURFACE
2675										**RESIDUAL** Very Soft to Soft, Wet, Orange-Brown, Fine Sandy SILT (A-4), with trace organics.
										2,673.1 — 3.0 — Loose to Medium Dense, Moist, Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel-sized rock fragments.
2670										2,669.6 — 6.5 — Boring Terminated at Elevation 2,669.6 ft In Residual Silty Fine to Coarse Sand (A-2-4)
										- Hand Auger Refusal at 6.5 feet.

GEOTECHNICAL BORING REPORT
BORE LOG

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-3	**STATION** 11+55	**OFFSET** 48 ft LT	**ALIGNMENT** -Y4-	**0 HR.** Dry
COLLAR ELEV. 2,671.4 ft	**TOTAL DEPTH** 7.0 ft	**NORTHING** 669,037	**EASTING** 858,934	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/25/17	**COMP. DATE** 05/25/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
2675										
										2,671.4 GROUND SURFACE 0.0
2670										**RESIDUAL**
										2,668.4 Very Soft to Medium Stiff, Wet, Orange-Brown, Fine Sandy CLAY (A-6), with trace organics. 3.0
										2,666.4 Medium Stiff to Stiff, Moist, Orange-Brown, Fine Sandy SILT (A-4). 5.0
2665										2,664.4 Medium Dense, Moist, Brown, Silty Fine to Coarse SAND (A-2-4). 7.0
										Boring Terminated at Elevation 2,664.4 ft In Residual Silty Fine to Coarse Sand (A-2-4)
										- Hand Auger Refusal at 7.0 feet.

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-4	**STATION** 11+76	**OFFSET** 15 ft LT	**ALIGNMENT** -Y3-	**0 HR.** Dry
COLLAR ELEV. 2,648.5 ft	**TOTAL DEPTH** 6.0 ft	**NORTHING** 668,976	**EASTING** 858,925	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/25/17	**COMP. DATE** 05/25/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2650										
							S-1	23%		2,648.5 GROUND SURFACE 0.0
2645										**RESIDUAL**
										2,645.5 Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy SILT (A-4(3)), with trace organics. 3.0
										Medium Dense, Moist, Brown, SIlty Fine to Coarse SAND (A-2-4), with trace mica.
										2,642.5 6.0
										Boring Terminated at Elevation 2,642.5 ft In Residual Silty Fine to Coarse Sand (A-2-4)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-5	**STATION** 10+74	**OFFSET** 12 ft LT	**ALIGNMENT** -Y3-	**0 HR.** Dry
COLLAR ELEV. 2,630.6 ft	**TOTAL DEPTH** 6.0 ft	**NORTHING** 668,880	**EASTING** 858,889	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/25/17	**COMP. DATE** 05/25/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2635										ELEV. (ft) DEPTH (ft)
										2,630.6 GROUND SURFACE 0.0
2630										**RESIDUAL** Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy SILT (A-4), with trace organics. 2,627.6 3.0
										Medium Dense, Moist, Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica. 2,624.6 6.0
2625										Boring Terminated at Elevation 2,624.6 ft In Residual Silty Fine to Coarse Sand (A-2-4)

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-6	**STATION** 13+82	**OFFSET** 24 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,623.0 ft	**TOTAL DEPTH** 7.0 ft	**NORTHING** 668,777	**EASTING** 858,855	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/25/17	**COMP. DATE** 05/25/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2625										2,623.0 GROUND SURFACE 0.0
										ARTIFICIAL FILL
2620							S-2	18%		2,621.0 Loose, Moist, Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel 2.0
										RESIDUAL
										Medium Siff to Stiff, Moist, Red-Orange-Brown, Fine Sandy SILT (A-4(2)), with trace mica. 2,617.0 6.0
										2,616.0 7.0
										Medium Dense, Moist, Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica.
										Boring Terminated at Elevation 2,616.0 ft In Residual Silty Fine to Coarse Sand (A-2-4)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-7	**STATION** 10+67	**OFFSET** 13 ft RT	**ALIGNMENT** -Y2-	**0 HR.** Dry
COLLAR ELEV. 2,626.9 ft	**TOTAL DEPTH** 6.0 ft	**NORTHING** 668,791	**EASTING** 858,944	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/25/17	**COMP. DATE** 05/25/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2630											
										2,626.9 GROUND SURFACE	0.0
2625							S-3	23%		**ARTIFICIAL FILL** 2,624.9 Very Soft to Soft, Wet, Brown, Silty CLAY (A-7-6(14)).	2.0
										RESIDUAL 2,622.9 Stiff, Wet to Moist, Red-Brown, Fine Sandy Clay (A-6).	4.0
										2,620.9 Very Stiff, Moist, Red-Brown, Fine Sandy SILT (A-4), with trace mica.	6.0
										Boring Terminated at Elevation 2,620.9 ft In Residual Fine Sandy Silt (A-4)	

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-8	**STATION** 11+44	**OFFSET** 2 ft RT	**ALIGNMENT** -Y1-	**0 HR.** Dry
COLLAR ELEV. 2,627.0 ft	**TOTAL DEPTH** 5.0 ft	**NORTHING** 668,845	**EASTING** 858,776	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/26/17	**COMP. DATE** 05/26/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2630										
										2,627.0 GROUND SURFACE 0.0
2625										2,625.8 Asphalt (0.4') and ABC Stone (0.8') 1.2
										RESIDUAL 2,624.0 Moist, Red-Brown, Fine Sandy CLAY (A-6). 3.0
										2,622.0 Moist, Red-Brown, Fine Sandy SILT (A-4). 5.0
										Boring Terminated at Elevation 2,622.0 ft In Residual Fine Sandy Silt (A-4)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-9	**STATION** 12+22	**OFFSET** 5 ft LT	**ALIGNMENT** -Y3-	**0 HR.** Dry
COLLAR ELEV. 2,655.6 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 669,012	**EASTING** 858,961	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/26/17	**COMP. DATE** 05/26/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
2660										
2655										2,655.6 GROUND SURFACE 0.0
										2,654.4 Asphalt (0.4) and ABC Stone (0.8'). 1.2
										RESIDUAL
										2,652.6 Moist, Brown, Silty Fine SAND (A-2-4). 3.0
										Boring Terminated at Elevation 2,652.6 ft In Residual Silty Fine Sand (A-2-4)
										- Hand Auger Refusal at 3.0 feet.

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-10	**STATION** 10+18	**OFFSET** 21 ft RT	**ALIGNMENT** -Y3-	**0 HR.** Dry
COLLAR ELEV. 2,625.9 ft	**TOTAL DEPTH** 5.0 ft	**NORTHING** 668,817	**EASTING** 858,903	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** Automatic	
DRILLER S. Sawyer	**START DATE** 05/26/17	**COMP. DATE** 05/26/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2630										
2625										2,625.9 GROUND SURFACE 0.0
										2,625.1 Asphalt (0.2') and ABC Stone (0.6'). 0.8
										RESIDUAL
										Moist, Red-Brown, Fine Sandy CLAY (A-6).
										2,620.9 5.0
										Boring Terminated at Elevation 2,620.9 ft In Residual Fine Sandy Clay (A-6)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS N/A	**TIP** U-6055	**COUNTY** HAYWOOD	**GEOLOGIST** S. Sawyer	
SITE DESCRIPTION Intersection of Pisgah Drive (NC 110), Holzclaw Street, & Locust Street in Town of Canton				**GROUND WTR (ft)**
BORING NO. HA-11	**STATION** 12+82	**OFFSET** 12 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,615.7 ft	**TOTAL DEPTH** 5.0 ft	**NORTHING** 668,675	**EASTING** 858,881	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger		**HAMMER TYPE** Automatic
DRILLER S. Sawyer	**START DATE** 05/26/17	**COMP. DATE** 05/26/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2620											
										2,615.7 GROUND SURFACE	0.0
2615										2,614.2 Asphalt (0.5') and ABC Stone (1.0').	1.5
										RESIDUAL Moist, Orange-Brown, Fine Sandy SILT (A-4).	
										2,610.7	5.0
										Boring Terminated at Elevation 2,610.7 ft In Residual Fine Sandy Silt (A-4)	

PROJECT REFERENCE NO.	SHEET NO.
U–6055	11

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX A
LABORATORY TEST RESULTS

REFERENCE: U–6055

PROJECT: N/A

Prepared in the Office of:
ECS SOUTHEAST, LLP
1900 HENDERSONVILLE ROAD #10
ASHEVILLE, NC 28803
(828) 665-23-7 [PHONE]
NC REGISTERED
ENGINERING
FIRM # F-1078

PROJECT REFERENCE NO.	SHEET NO.
U-6055	12

SOIL TEST RESULTS

BORING NO.	SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
HA–4	S–1	15' LT	11+76 –Y3–	0.0 – 1.0'	A–4(3)	38	7	25.2	23.0	26.9	24.9	98.0	83.0	55.0	22.7	*
HA–6	S–2	24' LT	13+82 –L–	2.0 – 6.0'	A–4(2)	37	9	31.2	22.1	23.0	23.7	95.0	74.0	48.0	18.1	*
HA–7	S–3	13' RT	10+67 –Y2–	0.0 – 2.0'	A–7–6(14)	50	27	25.4	15.6	13.4	45.6	99.0	84.0	60.0	22.6	*

LAB TECHNICIAN: DILLON KESTNER NCDOT CERTIFICATION NO. 135–01–0816

SIGNATURE: _____

PROJECT REFERENCE NO.	SHEET NO.
U–6055	13

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX B
HAND AUGER / DCP LOGS

REFERENCE: U–6055

PROJECT: N/A

Prepared in the Office of:
ECS SOUTHEAST, LLP
1900 HENDERSONVILLE ROAD #10
ASHEVILLE, NC 28803
(828) 665-23-7 [PHONE]
NC REGISTERED
ENGINERING
FIRM # F-1078

ECS SOUTHEAST, LLP
1812 Center Park Drive Suite D
Charlotte, North Carolina 28217
(704)525.5152

Client TGS Engineers
Project U-6055 - Pisgah Road
Location Canton, North Carolina
Job No. 12175
Boring HA-1 **Alignment** Y4
Station 10+66 **Offset** 28' LT

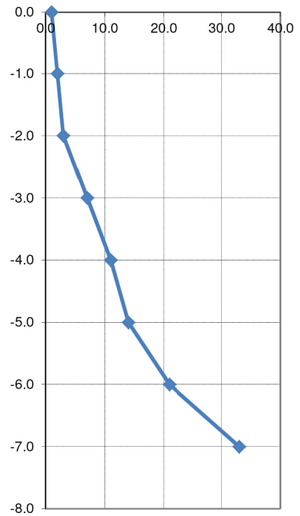
Depth*	Soil Description
0.5 ft	Surficial Organic Soils
0 - 4 ft	Residual: Very Soft to Soft, Wet, Orange-Brown, Fine Sandy CLAY (A-6), with trace organics.
4 - 6 ft	Stiff, Moist, Orange-Brown, Fine Sandy SILT (A-4).
6 - 7.5 ft	Medium Dense, Moist, Brown, Silty Fine to Coarse SAND (A-2-4).
Hand Auger Refusal at 7.5 feet	

*Depths are measured below soil subgrade.
**Groundwater not encounted.

Dyanmic Cone Penetrometer Measurements per Drive Increments

Depth	0" to 2"	2" to 3.75"	3.75" to 5.5"	Average
0.0	2	1	2	1.0
-1.0	2	2	3	2.0
-2.0	3	3	3	3.0
-3.0	5	7	7	7.0
-4.0	11	12	11	11.0
-5.0	14	13	16	14.0
-6.0	17	19	24	21.0
-7.0	26	32	34	33.0

Dynamic Cone Penetrometer



ECS SOUTHEAST, LLP
1812 Center Park Drive Suite D
Charlotte, North Carolina 28217
(704)525.5152

Client TGS Engineers
Project U-6055 - Pisgah Road
Location Canton, North Carolina
Job No. 12175
Boring HA-2 **Alignment** Y4
Station 11+11 **Offset** 41' LT

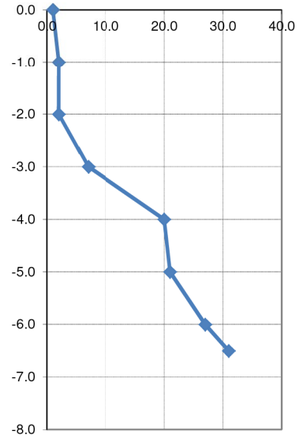
Depth*	Soil Description
0.5 ft	Surficial Organic Soils
0 - 3 ft	Residual: Very Soft to Soft, Wet, Orange-Brown, Fine Sandy SILT (A-4), with trace organics.
3 - 6.5 ft	Loose to Medium Dense, Moist, Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel-sized rock fragments.
Hand Auger Refusal at 6.5 feet	

*Depths are measured below soil subgrade.
**Groundwater not encounted.

Dyanmic Cone Penetrometer Measurements per Drive Increments

Depth	0" to 2"	2" to 3.75"	3.75" to 5.5"	Average
0.0	2	1	2	1.0
-1.0	2	1	3	2.0
-2.0	2	3	2	2.0
-3.0	5	5	9	7.0
-4.0	12	22	19	20.0
-5.0	16	23	19	21.0
-6.0	18	26	28	27.0
-6.5	26	28	34	31.0

Dynamic Cone Penetrometer



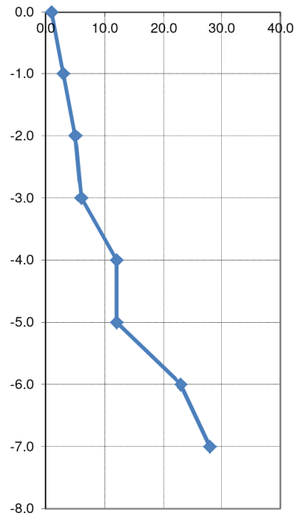
ECS SOUTHEAST, LLP
1812 Center Park Drive Suite D
Charlotte, North Carolina 28217
(704)525.5152

Client TGS Engineers
Project U-6055 - Pisgah Road
Location Canton, North Carolina
Job No. 12175
Boring HA-3 **Alignment** Y4
Station 11+55 **Offset** 48' LT

Depth*	Soil Description
0.5 ft	Surficial Organic Soils
0 - 3 ft	Residual: Very Soft to Medium Stiff, Wet, Orange-Brown, Fine Sandy CLAY (A-6), with trace organics.
3 - 5 ft	Medium Stiff to Stiff, Moist, Orange-Brown, Fine sandy SILT (A-4).
5 - 7 ft	Medium Dense, Moist, Brown, Silty Fine to Coarse SAND (A-2-4).
Hand Auger Refusal at 7.0 feet	

*Depths are measured below soil subgrade.
**Groundwater not encounted.

Dynamic Cone Penetrometer



Dyanmic Cone Penetrometer Measurements per Drive Increments

Depth	0" to 2"	2" to 3.75"	3.75" to 5.5"	Average
0.0	1	2	1	1.0
-1.0	2	3	3	3.0
-2.0	4	5	6	5.0
-3.0	4	6	6	6.0
-4.0	12	12	13	12.0
-5.0	10	13	12	12.0
-6.0	20	22	24	23.0
-7.0	20	28	29	28.0

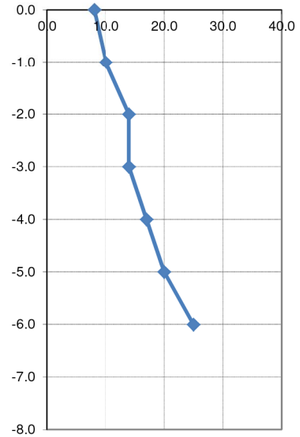
ECS SOUTHEAST, LLP
1812 Center Park Drive Suite D
Charlotte, North Carolina 28217
(704)525.5152

Client TGS Engineers
Project U-6055 - Pisgah Road
Location Canton, North Carolina
Job No. 12175
Boring HA-4 **Alignment** Y3
Station 11+76 **Offset** 15' LT

Depth*	Soil Description
Asphalt	None
ABC Stone	None
0 - 3 ft	Residual: Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy SILT (A-4(3)), with trace organics.
3 - 6 ft	Medium Dense, Moist, Brown, Silty Fine to Coase SAND (A-2-4), with trace mica.
Hand Auger Terminated at 6.0 feet	

*Depths are measured below soil subgrade.
**Groundwater not encounted.

Dynamic Cone Penetrometer



Dyanmic Cone Penetrometer Measurements per Drive Increments

Depth	0" to 2"	2" to 3.75"	3.75" to 5.5"	Average
0.0	4	5	11	8.0
-1.0	9	8	12	10.0
-2.0	10	12	17	14.0
-3.0	12	16	12	14.0
-4.0	15	17	18	17.0
-5.0	20	18	23	20.0
-6.0	21	26	24	25.0

ECS SOUTHEAST, LLP
1812 Center Park Drive Suite D
Charlotte, North Carolina 28217
(704)525.5152

Client TGS Engineers
Project U-6055 - Pisgah Road
Location Canton, North Carolina
Job No. 12175
Boring HA-5 **Alignment** Y3
Station 10+74 **Offset** 12' LT

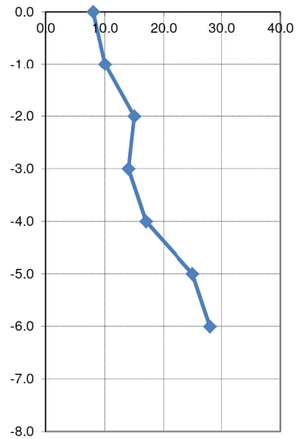
Depth*	Soil Description
Asphalt	None
ABC Stone	None
0 - 3 ft	Residual: Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy SILT (A-4), with trace organics.
3 - 6 ft	Medium Dense, Moist, Brown, Silty Fine to Coase SAND (A-2-4), with trace mica.
Hand Auger Terminated at 6.0 feet	

*Depths are measured below soil subgrade.
**Groundwater not encounted.

Dyanmic Cone Penetrometer Measurements per Drive Increments

Depth	0" to 2"	2" to 3.75"	3.75" to 5.5"	Average
0.0	4	8	8	8.0
-1.0	10	9	11	10.0
-2.0	15	16	15	15.0
-3.0	17	14	14	14.0
-4.0	16	18	17	17.0
-5.0	22	26	24	25.0
-6.0	24	28	28	28.0

Dynamic Cone Penetrometer



ECS SOUTHEAST, LLP
1812 Center Park Drive Suite D
Charlotte, North Carolina 28217
(704)525.5152

Client TGS Engineers
Project U-6055 - Pisgah Road
Location Canton, North Carolina
Job No. 12175
Boring HA-6 **Alignment** L
Station 13+82 **Offset** 24' LT

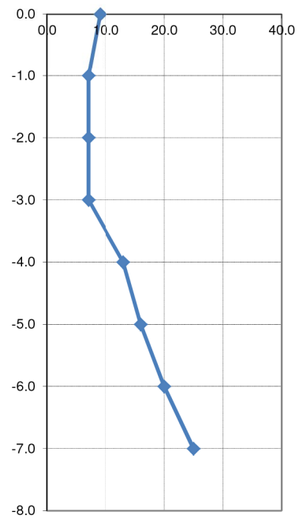
Depth*	Soil Description
Asphalt	None
ABC Stone	None
0 - 2 ft	Artificial Fill: Loose, Moist, Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel.
2 - 6 ft	Residual: Medium Stiff to Stiff, Moist, Red-Orange-Brown, Fine Sandy SILT (A-4(2)), with trace mica.
6 - 7 ft	Medium Dense, Moist, Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica.
Hand Auger Terminated at 7.0 feet	

*Depths are measured below soil subgrade.
**Groundwater not encounted.

Dyanmic Cone Penetrometer Measurements per Drive Increments

Depth	0" to 2"	2" to 3.75"	3.75" to 5.5"	Average
0.0	10	10	8	9.0
-1.0	9	10	5	7.0
-2.0	7	8	7	7.0
-3.0	6	7	7	7.0
-4.0	14	12	14	13.0
-5.0	15	15	18	16.0
-6.0	21	20	21	20.0
-7.0	19	26	24	25.0

Dynamic Cone Penetrometer



PROJECT REFERENCE NO.	SHEET NO.
U-6055	17

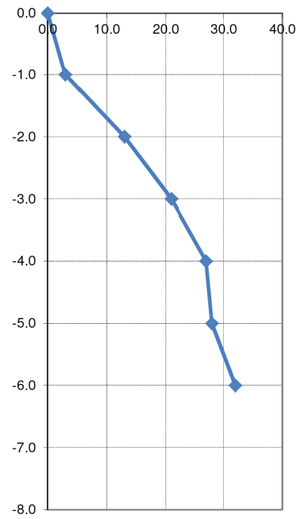
ECS SOUTHEAST, LLP
1812 Center Park Drive Suite D
Charlotte, North Carolina 28217
(704)525.5152

Client TGS Engineers
Project U-6055 - Pisgah Road
Location Canton, North Carolina
Job No. 12175
Boring HA-7 **Alignment** Y2
Station 10+67 **Offset** 13' RT

Depth*	Soil Description
Asphalt	None
ABC Stone	None
0 - 2 ft	Artificial Fill: Very Soft to Soft, Wet, Brown, Silty CLAY (A-7-6(14)).
2 - 4 ft	Residual: Stiff, Wet to Moist, Red-Brown, Fine Sandy CLAY (A-6).
4 - 6 ft	Very Stiff, Moist, Red-Brown, Fine Sandy SILT (A-4), with trace mica.
Hand Auger Terminated at 6.0 feet	

*Depths are measured below soil subgrade.
**Groundwater not encountered.

Dynamic Cone Penetrometer



Dyanmic Cone Penetrometer Measurements per Drive Increments				
Depth	0" to 2"	2" to 3.75"	3.75" to 5.5"	Average
0.0	1	0	1	0.0
-1.0	5	3	3	3.0
-2.0	7	12	15	13.0
-3.0	15	18	24	21.0
-4.0	19	26	29	27.0
-5.0	27	29	27	28.0
-6.0	27	31	33	32.0

PROJECT REFERENCE NO.	SHEET NO.
U–6055	18

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX C
KESSLER DCP LOGS

REFERENCE: U–6055

PROJECT: N/A

Prepared in the Office of:
ECS SOUTHEAST, LLP
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED
ENGINERING
FIRM # F-1078

DCP TEST DATA

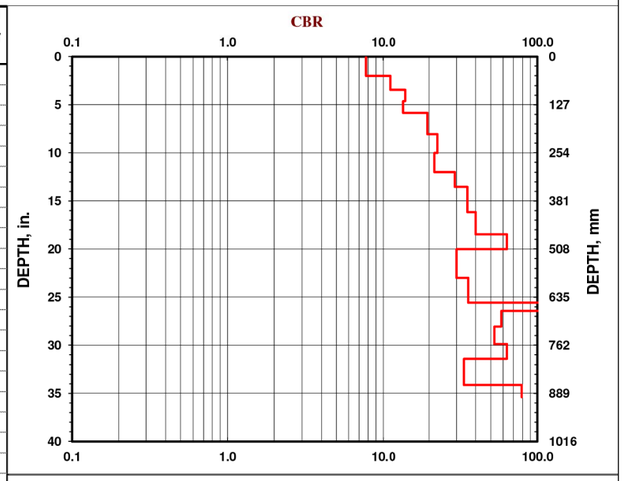
File Name:

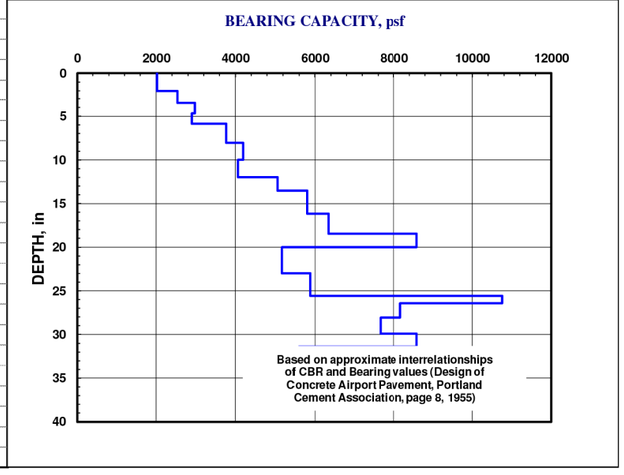
Project: *U-6055 - Pisgah Road*
Location: HA-8, -Y1- 11+44, 2' RT
Date: 26-May-17
Soil Type(s): Soil Subgrade: A-6

Hammer: ○ 10.1 lbs. ◉ 17.6 lbs. ○ Both hammers used

Soil Type: ○ CH ○ CL ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
2	51	1
2	88	1
2	118	1
2	149	1
5	205	1
5	254	1
5	305	1
5	344	1
10	410	1
10	469	1
10	508	1
10	584	1
10	649	1
10	671	1
10	713	1
10	759	1
10	798	1
10	867	1
10	899	1





DCP TEST DATA

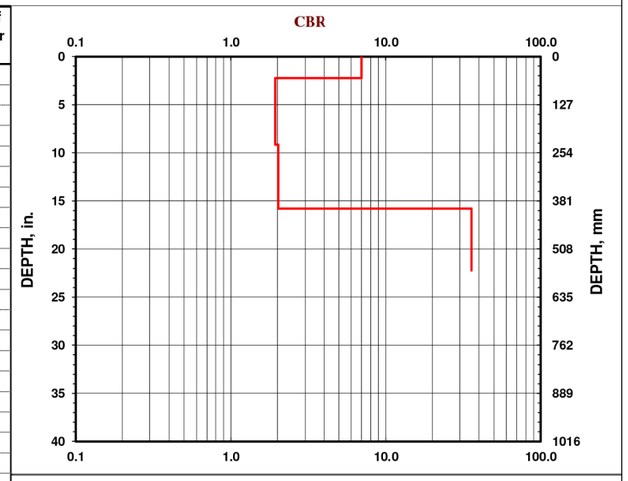
File Name:

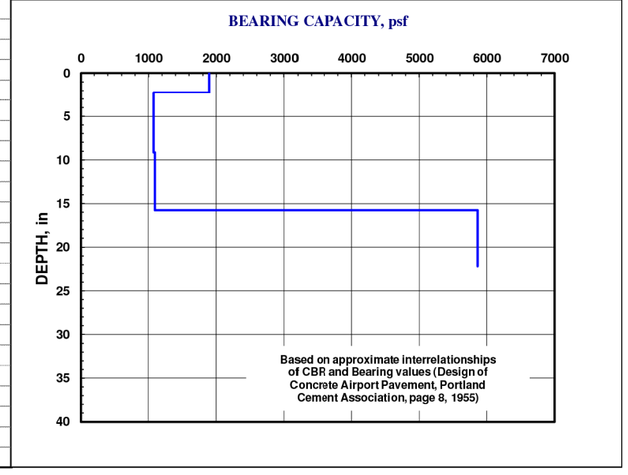
Project: *U-6055 - Pisgah Road*
Location: HA-9, -Y3- 12+22, 5' LT
Date: 26-May-17
Soil Type(s): Soil Subgrade: A-2-4

Hammer: ○ 10.1 lbs. ◉ 17.6 lbs. ○ Both hammers used

Soil Type: ○ CH ○ CL ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
2	56	1
2	232	1
2	401	1
25	564	1





DCP TEST DATA

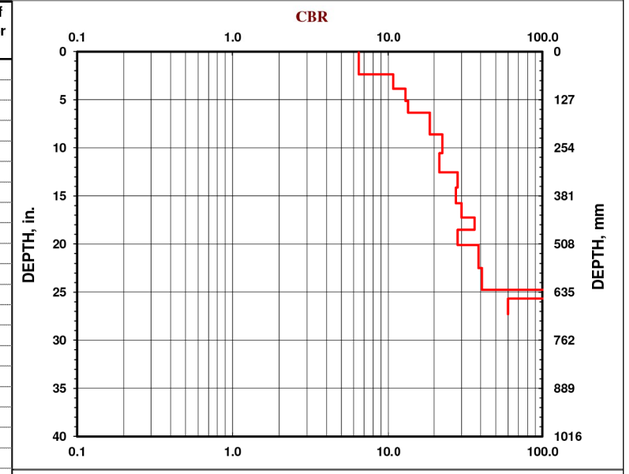
File Name:

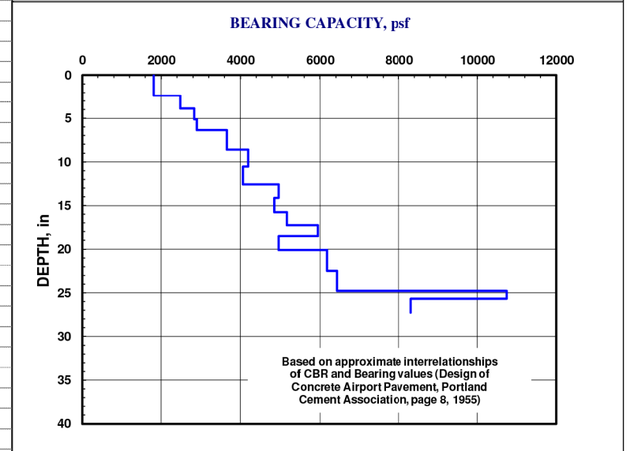
Project: *U-6055 - Pisgah Road*
Location: HA-11, -L- 12+82, 12' RT
Date: 26-May-17
Soil Type(s): Soil Subgrade: A-4

Hammer: ○ 10.1 lbs. ◉ 17.6 lbs. ○ Both hammers used

Soil Type: ○ CH ○ CL ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
2	60	1
2	98	1
2	130	1
2	161	1
5	219	1
5	268	1
5	319	1
5	359	1
5	400	1
5	438	1
5	470	1
5	510	1
10	571	1
10	629	1
10	652	1
10	693	1





DCP TEST DATA

File Name:

Project: *U-6055 - Pisgah Road*
Location: HA-10, -Y3- 10+18, 21' RT
Date: 26-May-17
Soil Type(s): Soil Subgrade: A-6

Hammer: ○ 10.1 lbs. ◉ 17.6 lbs. ○ Both hammers used

Soil Type: ○ CH ○ CL ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
2	63	1
2	132	1
2	202	1
2	261	1
2	302	1
2	344	1
2	380	1
5	480	1
5	527	1
5	591	1
5	642	1
5	687	1
5	724	1
5	762	1
5	799	1
5	842	1