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REFERENCE: W-5522

PROJECT: 50143

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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SHEET GUIDE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *WAKE*

PROJECT DESCRIPTION *SR 1656 (TRINITY RD.) AT SR 1658 (YOUTH CENTER DR.) INTERSECTION IN RALEIGH. CONSTRUCT PEDESTRIAN TUNNEL UNDER 1656 (TRINITY RD.)*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5522	1	9

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

J.R. SWARTLEY

O.B. OTI

D.G. PINTER

INVESTIGATED BY *J.R. SWARTLEY*

DRAWN BY *J.R. SWARTLEY*

CHECKED BY *N.T. ROBERSON*

SUBMITTED BY *N.T. ROBERSON*

DATE *DECEMBER 2016*

NORTH CAROLINA LICENSED SEAL 2296 GEOLOGIST JARETT SWARTLEY

DocuSigned by:
Jarett Swartley 12/15/2016
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SIGNATURE DATE

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PROJECT REFERENCE NO.	SHEET NO.
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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	50 MX													
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 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	—		—	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PI	6 MX		NP	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
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	< 4	
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	N/A
	DENSE	30 TO 50	
	VERY DENSE	> 50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	< 2	< 0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	> 30	> 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	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- 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-45C
- [ ] CME-55
- [x] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [x] AUTOMATIC [ ] MANUAL

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

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

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: •see note

ELEVATION: FEET

NOTES:

•Elevations derived from geopak and the .tin file 'W5522_ls_tnl.tin' dated 9/27/2016

DATE: 8-15-14

09/08/99

TIP PROJECT: W-5522

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

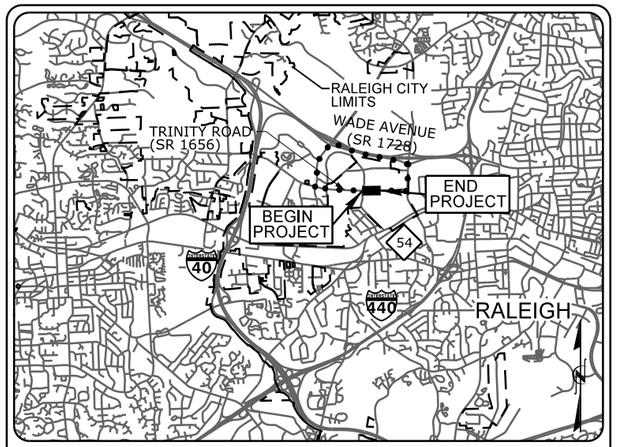
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5522	3	9

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50143.1.FD1	HSIP-1656(5)	

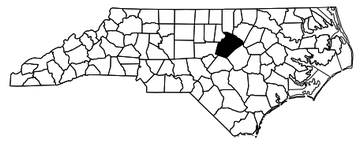
LOCATION: SR 1656 (TRINITY ROAD) EAST OF SR 1658 (YOUTH CENTER DRIVE)

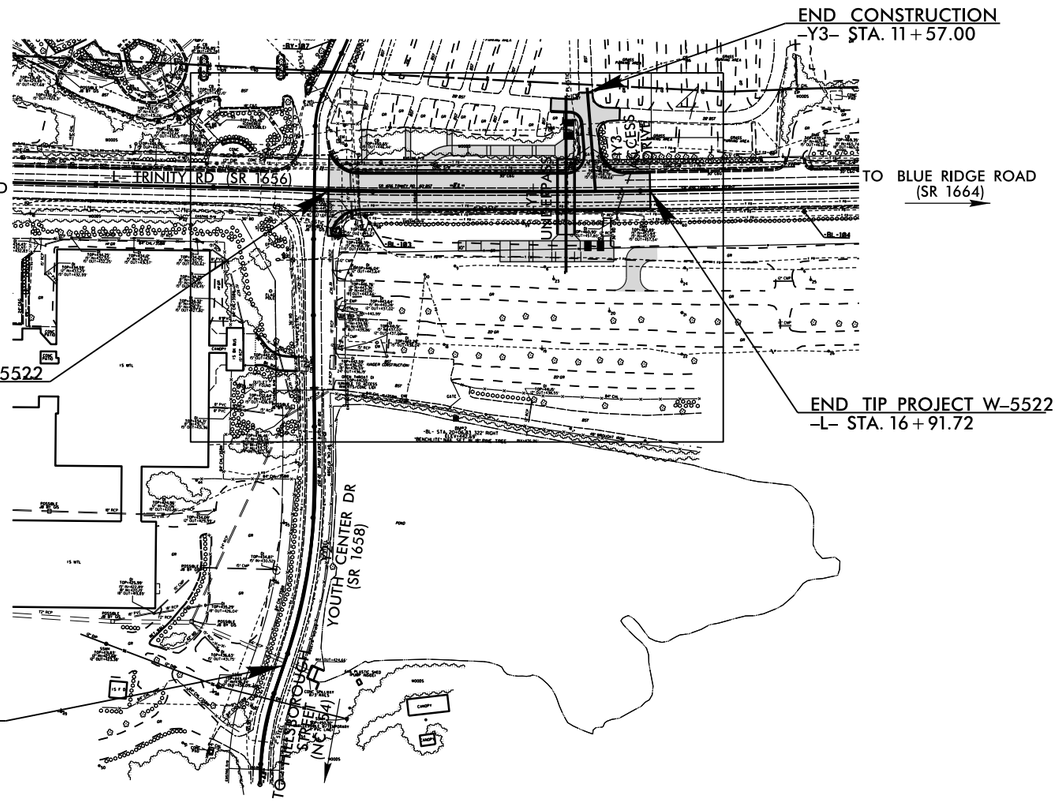
TYPE OF WORK: PEDESTRIAN UNDERPASS, GRADING, PAVING, STRUCTURES, DRAINAGE AND UTILITIES



VICINITY MAP
NOT TO SCALE

• • • *DETOUR ROUTE*





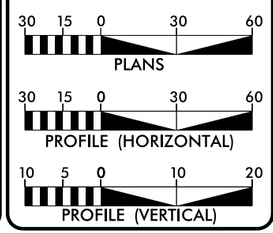
SUBMITTAL: 25% ROADWAY PLANS
DATE: NOVEMBER 1, 2016

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT:

GRAPHIC SCALES



DESIGN DATA

ADT 2013 = 6,000

FUNC CLASS = MAJOR COLLECTOR SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W-5522 = 0.096 MILES

LENGTH BRIDGE TIP PROJECT W-5522 = 0.000 MILES

TOTAL LENGTH OF TIP PROJECT W-5522 = 0.096 MILES

Prepared in the Office of:
AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 2017

LETTING DATE:
JANUARY 2018

EDWARD G. EDENS, P.E.
PROJECT ENGINEER

KIMBERLY KOIVUNIEMI, P.E.
PROJECT DESIGN ENGINEER

BRUCE PAYNE, P.E.
PROJECT ENGINEER
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

28-NOV-2016 11:06
L:\Raleigh Investigation\TIP\W5522_GEO_RDWY\CADD_ORIGINAL\W5522_Rdy_tsh.dgn
$$$$USERNAME$$$$

Transportation

PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

November 29, 2016

STATE PROJECT: 50143.1.FD1 (W-5522)
FEDERAL PROJECT: HSIP-1656(5)
COUNTY: Wake
DESCRIPTION: SR 1656 (Trinity Rd.) at SR 1658 (Youth Center Dr.) Intersection in Raleigh. Construct Pedestrian Tunnel Under SR 1656 (Trinity Rd.)

SUBJECT: Geotechnical Report – Inventory

Project Description

This project lies in the city of Raleigh in Wake County. The project consists of constructing a pedestrian tunnel (-Y1-) underneath Trinity Rd. (-L-). In addition, Trinity Rd. will be upgraded to include sidewalks and curb and gutter. The total mainline (-L-) project length is 0.145 miles.

Six SPT borings were performed at various offset locations along the -L- alignment by the NCDOT Geotechnical Engineering Unit. The work was performed on October of 2016. A CME-550 was used during the field investigation. Representative samples were collected for visual classification in the field and were submitted for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 0.18 miles were investigated. Subsurface soil profiles of these alignments are included in this report.

Line	Stations
-L-	11+82 to 16+92
-Y1-	10+00 to 12+62
-Y3-	10+00 to 11+57

Areas of Special Geotechnical Interest

1) Highly Plastic Clays: Clays with a PI > 25 were encountered in the following locations:

Line	Station	Offset
-L-	16+07	79 RT
-L-	15+31	74 RT
-L-	14+28	73 RT

Physiography and Geology

The project is located in the Piedmont physiographic province of North Carolina. The project corridor is urban commercial. Grassy fields lie along the project corridor. The terrain is generally flat. Geologically, the soils in this region are derived from the underlying phyllites and schists belonging to the Raleigh Belt. These rocks were formed by regional metamorphism in this area during the Permian Period.

Soil Properties

Soils encountered during this investigation are separated into 2 categories: Roadway Embankment and Residual soils.

Roadway Embankment soils are likely derived from nearby sources and are similar to Residual soils in composition. These soils generally consist of stiff, brown and tan, sandy silt (A-4).

Residual soils are derived from the weathering of underlying rock in the area. These soils consist of tan, red and brown, medium stiff to hard, saprolitic, sandy silt (A-4), clayey silt (A-5) and silty clay (A-7-6).

Groundwater

Groundwater was encountered in all borings. Groundwater elevation ranges from 420± to 430± feet above sea level.

Respectfully submitted,

NORTH CAROLINA LICENSED SEAL 2296 GEOLOGIST JARETT R. SWARTLEY

DocuSigned by:
Jarett Swartley
7F355C29F75A413...
12/15/2016

Jarett Swartley, L.G.
Project Geological Engineer

PROJECT REFERENCE NO.	SHEET NO.
W-5522	4

SITE PLAN

0 50 100

FEET

BEGIN TIP PROJECT W-5522
-L- POT Sta. 11+82.29

END TIP PROJECT W-5522
-L- POT Sta. 16+91.72

PETER KARMANOS JR.DR

B6 B5 B4 B3 B2 B1

GR

8' SIDEWALK

16' SIDEWALK

5' SIDEWALK

WOODS

16' RAMP

-Y3- ACCESS DRIVE

2'-6" C&G

END CONSTRUCTION
-Y3- POT Sta.11+57.00

GRASS PARKING AREA

12" DIP

SR 1656 TRINITY RD 60' BST

-L- TRINITY ROAD

4" PLASTIC

-BL-103

-Y1- UNDERPASS

FUTURE DRIVE BY OTHERS

GRAVEL DRIVE (8" ABC)

-Y2- YOUTH CENTER DRIVE

FLAG POLE

BK WALL

2x2 BLK COLUMNS

24" RCP

24" OUT=436.19'

NC GRID
NAD 83 NA 2011

20' GR

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
W-5522	5

BORINGS PROJECTED ALONG RESPECTIVE PROFILES

0 50 100
FEET
VE = 3:1

BEGIN GRADE
STA 11+82.29
EL 450.88

END GRADE
STA 16+91.72
EL 464.94

EXISTING GROUND

PROPOSED GRADE

PROPOSED UNDERPASS

B6 104' LT
(7) (12) (7) (11) (7) (12) (7) (6) (6) (6) (10)
RESIDUAL, RED, WET, CLAYEY SILT, PLASTIC,
10/16

B5 110' LT
SS-8 SS-9
(7) (9) (11) (7) (5) (6) (6) (6) (9) (9) (34)
TAN AND MED. SANDY SILTY
10/16

B1 79' RT
SS-1 SS-2 SS-3 SS-4 SS-5
(7) (25) (13) (13) (14) (11) (8) (8) (6) (14) (33)
BROWN, MOIST TO STIFF TO HARD, SILT AND HIGHLY CLAY
10/16

FOR -L- PLAN SEE SHEET 4

480 470 460 450 440 430 420 410 400 390

10 11 12 13 14 15 16 17 18

-Y1-

-L- STA 15+58.58 =
-Y1- STA 11+28.88

BEGIN GRADE
STA 10+34.00
EL 444.49

EXISTING GROUND

B2 28' LT
BEGIN TUNNEL
STA 10+60.00
EL 444.75
END TUNNEL
STA 11+80.00
EL 445.95
(8) (20) (8) (11) (9) (10) (7) (9) (7) (11) (10)
RESIDUAL, RED, TAN AND MOIST TO WET, MED. STIFF STIFF, CLAYEY SILT, SANDY SILT PLASTIC SILTY CLAY
10/16

PROPOSED UNDERPASS

PROPOSED GRADE

END STAIRS
STA 12+21.95
EL 452.64

BEGIN STAIRS
STA 12+10.95
EL 445.64

BEGIN STAIRS
STA 12+31.95
EL 452.74

END STAIRS
STA 12+42.03
EL 459.15

END GRADE
STA 12+52.03
EL 459.05

B4 21' LT
SS-6 SS-7 SS-10
(9) (11) (9) (6) (10) (6) (8) (8) (7) (7) (12)
BROWN TO VERY AND HIGHLY
10/16

FOR -Y1- PLAN SEE SHEET 4

480 470 460 450 440 430 420 410 400

10 11 12 13

-Y3-

-Y3- STA 10+00.00
-L- STA 16+05.26 =
EL 462.45

BEGIN GRADE -Y3- STA 10+28.08 =
-L- STA 16+03.12 28' LT
EL 461.83

END GRADE
STA 11+57.00
EL 458.83

EXISTING GROUND

B4
SS-6 SS-7 SS-10
58' LT

PROPOSED GRADE

(9) (11) (8) (6) (10) (6) (8) (8) (7) (7) (12)
RESIDUAL, RED, TAN AND BROWN, MOIST TO WET, MED. STIFF TO STIFF, CLAYEY SILT
10/16

FOR -Y3- PLAN SEE SHEET 4

490 480 470 460 450 440 430 420 410

10 11 12

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50143.1.FD1	**TIP** W-5522	**COUNTY** WAKE	**GEOLOGIST** Oti, O. B.	
SITE DESCRIPTION SR 1656 (Trinity Rd.) at SR 1658 (Youth Center Dr.) Intersection in Raleigh. Construct Ped. Tunnel under Trinity Rd.				**GROUND WTR (ft)**
BORING NO. B1	**STATION** 16+07	**OFFSET** 79 ft RT	**ALIGNMENT** -L-	**0 HR.** 25.0
COLLAR ELEV. 457.8 ft	**TOTAL DEPTH** 50.3 ft	**NORTHING** 745,657	**EASTING** 2,084,288	**24 HR.** 24.0
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 85% 07/12/2016		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 10/03/16	**COMP. DATE** 10/03/16	**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)
460											
	457.8	0.0	5	3	4	7		M		457.8 GROUND SURFACE	0.0
455								M		**RESIDUAL** TAN AND BROWN, SANDY SILT	
	454.0	3.8	7	10	15	25	SS-1	M		455.3 RED AND BROWN, HIGHLY PLASTIC, SILTY CLAY	2.5
450										450.8	7.0
	449.0	8.8	4	6	7	13	SS-2	M		TAN, RED AND BROWN, SAPROLITIC, CLAYEY SILT AND SANDY SILT	
445											
	444.0	13.8	5	6	7	13		M			
440											
	439.0	18.8	4	6	8	14	SS-3	M			
435											
	434.0	23.8	4	4	7	11		M			
430										430.8	27.0
	429.0	28.8	2	3	5	8	SS-4	W			
425											
	424.0	33.8	1	3	5	8		W		420.8	37.0
420											
	419.0	38.8	4	3	3	6	SS-5	W			
415											
	414.0	43.8	2	5	9	14		W			
410											
	409.0	48.8	8	13	20	33		W		407.5	50.3
										Boring Terminated at Elevation 407.5 ft IN HARD RESIDUAL (CLAYEY SILT)	

WBS 50143.1.FD1	**TIP** W-5522	**COUNTY** WAKE	**GEOLOGIST** Oti, O. B.	
SITE DESCRIPTION SR 1656 (Trinity Rd.) at SR 1658 (Youth Center Dr.) Intersection in Raleigh. Construct Ped. Tunnel under Trinity Rd.				**GROUND WTR (ft)**
BORING NO. B2	**STATION** 15+31	**OFFSET** 74 ft RT	**ALIGNMENT** -L-	**0 HR.** 26.0
COLLAR ELEV. 455.3 ft	**TOTAL DEPTH** 50.0 ft	**NORTHING** 745,666	**EASTING** 2,084,211	**24 HR.** 24.0
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 85% 07/12/2016		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 10/03/16	**COMP. DATE** 10/03/16	**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)
460											
	455.3	0.0	4	3	5	8		M		455.3 GROUND SURFACE	0.0
455								M		**RESIDUAL** RED AND BROWN, HIGHLY PLASTIC, SILTY CLAY	
	451.8	3.5	6	8	12	20		M		448.3	7.0
450										TAN, RED AND BROWN, SAPROLITIC, CLAYEY SILT AND SANDY SILT	
	446.8	8.5	3	4	4	8		M			
445											
	441.8	13.5	3	5	6	11		M			
440											
	436.8	18.5	3	3	6	9		M			
435											
	431.8	23.5	3	4	6	10		M		434.3	21.0
430											
	426.8	28.5	2	3	4	7		W			
425											
	421.8	33.5	1	3	6	9		W			
420											
	416.8	38.5	2	3	4	7		W		418.3	37.0
415											
	411.8	43.5	2	4	7	11		W			
410											
	406.8	48.5	3	4	6	10		W		405.3	50.0
										Boring Terminated at Elevation 405.3 ft IN STIFF RESIDUAL (CLAYEY SILT)	

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50143.1.FD1	**TIP** W-5522	**COUNTY** WAKE	**GEOLOGIST** Oti, O. B.	
SITE DESCRIPTION SR 1656 (Trinity Rd.) at SR 1658 (Youth Center Dr.) Intersection in Raleigh. Construct Ped. Tunnel under Trinity Rd.				**GROUND WTR (ft)**
BORING NO. B3	**STATION** 14+28	**OFFSET** 73 ft RT	**ALIGNMENT** -L-	**0 HR.** 25.0
COLLAR ELEV. 453.2 ft	**TOTAL DEPTH** 50.0 ft	**NORTHING** 745,673	**EASTING** 2,084,109	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 85% 07/12/2016		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 10/03/16	**COMP. DATE** 10/03/16	**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)
455											
	453.2	0.0	6	7	12	19		M		453.2 GROUND SURFACE	0.0
450	449.7	3.5	7	11	14	25		M		**RESIDUAL** TAN, RED AND BROWN, HIGHLY PLASTIC, SILTY CLAY	
445	444.7	8.5	3	3	5	8		M		446.2 TAN, RED AND BROWN, SAPROLITIC, SANDY SILT AND CLAYEY SILT	7.0
440	439.7	13.5	3	4	6	10		M			
435	434.7	18.5	2	4	4	8		M		431.2	22.0
430	429.7	23.5	2	3	5	8					
425	424.7	28.5	2	3	4	7		W			
420	419.7	33.5	1	2	4	6		W			
415	414.7	38.5	WOH	2	4	6		W		416.2	37.0
410	409.7	43.5	2	3	5	8		W			
405	404.7	48.5	3	4	6	10		W		403.2 Boring Terminated at Elevation 403.2 ft IN STIFF RESIDUAL (CLAYEY SILT)	50.0

WBS 50143.1.FD1	**TIP** W-5522	**COUNTY** WAKE	**GEOLOGIST** Oti, O. B.	
SITE DESCRIPTION SR 1656 (Trinity Rd.) at SR 1658 (Youth Center Dr.) Intersection in Raleigh. Construct Ped. Tunnel under Trinity Rd.				**GROUND WTR (ft)**
BORING NO. B4	**STATION** 15+38	**OFFSET** 111 ft LT	**ALIGNMENT** -L-	**0 HR.** 32.0
COLLAR ELEV. 458.2 ft	**TOTAL DEPTH** 50.2 ft	**NORTHING** 745,851	**EASTING** 2,084,228	**24 HR.** 32.0
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 85% 07/12/2016		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 10/04/16	**COMP. DATE** 10/04/16	**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
460										
	458.2	0.0	3	3	6	9		M		458.2 GROUND SURFACE 0.0
455	454.5	3.7	4	5	6	11	SS-6	M		**RESIDUAL** TAN, RED AND BROWN, SAPROLITIC, CLAYEY SILT
450	449.5	8.7	2	4	4	8		M		
445	444.5	13.7	2	3	3	6		M		
440	439.5	18.7	3	4	6	10		M		
435	434.5	23.7	1	3	3	6	SS-7	M		
430	429.5	28.7	2	3	5	8		M		
425	424.5	33.7	2	3	5	8		W		
420	419.5	38.7	2	3	4	7		W		
415	414.5	43.7	1	2	5	7	SS-10	W		
410	409.5	48.7	3	5	7	12		W		408.0 Boring Terminated at Elevation 408.0 ft IN STIFF RESIDUAL (CLAYEY SILT) 50.2

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 50143.1.FD1	**TIP** W-5522	**COUNTY** WAKE	**GEOLOGIST** Oti, O. B.	
SITE DESCRIPTION SR 1656 (Trinity Rd.) at SR 1658 (Youth Center Dr.) Intersection in Raleigh. Construct Ped. Tunnel under Trinity Rd.				**GROUND WTR (ft)**
BORING NO. B5	**STATION** 14+58	**OFFSET** 110 ft LT	**ALIGNMENT** -L-	**0 HR.** 29.0
COLLAR ELEV. 455.8 ft	**TOTAL DEPTH** 50.0 ft	**NORTHING** 745,854	**EASTING** 2,084,148	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 85% 07/12/2016		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 10/05/16	**COMP. DATE** 10/05/16	**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)
460											
455	455.8	0.0	2	3	4	7		M		455.8 GROUND SURFACE	0.0
	452.3	3.5								**RESIDUAL** TAN, RED AND BROWN, SAPROLITIC, SANDY SILT AND CLAYEY SILT	
450			3	4	5	9		M			
	447.3	8.5								448.8	7.0
445			3	5	6	11	SS-8	M			
	442.3	13.5									
440			2	3	4	7		M			
	437.3	18.5									
435			1	2	3	5		M			
	432.3	23.5									
430			2	3	3	6		M			
	427.3	28.5					SS-9				
425			2	3	3	6		W			
	422.3	33.5									
420			2	3	3	6		W			
	417.3	38.5									
415			3	4	5	9		W			
	412.3	43.5									
410			3	4	5	9		W			
	407.3	48.5									
			7	12	22	34		W		405.8	50.0

Boring Terminated at Elevation 405.8 ft IN HARD RESIDUAL (CLAYEY SILT)

WBS 50143.1.FD1	**TIP** W-5522	**COUNTY** WAKE	**GEOLOGIST** Oti, O. B.	
SITE DESCRIPTION SR 1656 (Trinity Rd.) at SR 1658 (Youth Center Dr.) Intersection in Raleigh. Construct Ped. Tunnel under Trinity Rd.				**GROUND WTR (ft)**
BORING NO. B6	**STATION** 13+70	**OFFSET** 104 ft LT	**ALIGNMENT** -L-	**0 HR.** 32.0
COLLAR ELEV. 453.8 ft	**TOTAL DEPTH** 50.0 ft	**NORTHING** 745,853	**EASTING** 2,084,061	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 85% 07/12/2016		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 10/05/16	**COMP. DATE** 10/05/16	**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
455										
	453.8	0.0								453.8 GROUND SURFACE 0.0
450	450.3	3.5	2	3	4	7		M		**RESIDUAL** TAN, RED AND BROWN, SAPROLITIC, CLAYEY SILT
			3	4	8	12		M		
445	445.3	8.5								
			3	3	4	7		M		
440	440.3	13.5								
			3	5	6	11		M		
435	435.3	18.5								
			3	3	4	7		M		
430	430.3	23.5								
			3	4	8	12		M		
425	425.3	28.5								
			1	3	4	7		W		
420	420.3	33.5								
			2	2	4	6		W		
415	415.3	38.5								
			2	2	4	6		W		
410	410.3	43.5								
			1	2	4	6		W		
405	405.3	48.5								
			3	4	6	10		W		403.8 50.0

Boring Terminated at Elevation 403.8 ft IN STIFF RESIDUAL (CLAYEY SILT)

PROJECT REFERENCE NO.	SHEET NO.
W-5522	9

SOIL TEST RESULTS

SOIL TEST RESULTS

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		
SS-1	79′ RT	16+07	3.8-5.3	A-7-5(30)	71	37	9.9	17.5	10.2	62.4	96	91	74	-	-
SS-2	79′ RT	16+07	8.8-10.3	A-5(0)	47	NP	13.3	47.1	21.5	18.1	99	91	52	-	-
SS-3	79′ RT	16+07	18.8-20.3	A-5(0)	42	NP	15.7	48.5	23.7	12.1	95	86	49	-	-
SS-4	79′ RT	16+07	28.8-30.3	A-4(0)	39	NP	13.1	59.8	19.0	8.1	97	90	40	-	-
SS-5	79′ RT	16+07	38.8-40.3	A-5(0)	43	NP	17.7	51.2	19.0	12.1	91	80	42	-	-
SS-6	111′ LT	15+38	3.7-5.2	A-5(5)	44	7	11.9	33.4	26.5	28.2	100	94	64	-	-
SS-7	111′ LT	15+38	23.7-25.2	A-5(0)	49	NP	21.6	37.9	28.5	12.1	95	80	50	-	-
SS-8	110′ LT	14+58	8.5-10.0	A-5(3)	42	5	12.5	39.9	29.5	18.1	98	91	58	-	-
SS-9	110′ LT	14+58	28.5-30.0	A-5(0)	45	NP	23.2	33.6	29.1	14.1	92	77	50	-	-
SS-10	111′ LT	15+38	43.7-45.2	A-5(0)	44	NP	15.5	52.2	18.2	14.1	92	83	42	-	-